General catalogue Civil and Industrial Air Conditioning

WATER CHILLERS

AIR COOLED

RAEF.K. R407C - Two circuits with scroll compressors – Free-cooling version - axial fans – Capacity from 77 to 289 kW RAEC.K R407C - One circuit with scroll compressors – centrifugal fans – Capacity from 11 to 18 kW RAEC.K R407C - One and two circuits with scroll compressors – centrifugal fans – Capacity from 19 to 83 kW RAEC.K R407C - Two circuits with scroll compressors – centrifugal fans – Capacity from 19 to 83 kW RAEC.K R407C - Two circuits with scroll compressors – centrifugal fans – Capacity from 19 to 83 kW RAEKc R407C - Two circuits with scroll compressors – centrifugal fans – Capacity from 5 to 24 kW NIEWW RAEKc RAHT K – Ka R407C – R134a - Two circuits with screw compressors – axial fans – Capacity from 190 to 737 kW RAHK – Ka R407C – R134a - Multi-circuits with screw compressors – axial fans – Capacity from 307 a 1879 kW AIR PERFORMA EAH Ka R134a - Two circuits with screw compressors – capacity from 289 to 1166 kW
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WATER COOLED

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AIR COOLED

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Data supplied in this catalogue are not binding and subject to variation without prior notice

CAT COND GB - 11/01



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ICONS LEGENDA

scroll compressors

screw compressors

air cooled unit



unit with remote condenser

only cooling and heat pump

only cooling units



AIR

H,0

units



R134a ecological refrigerant

R407C ecological refrigerant

R410A ecological refrigerant

R22 refrigerant



R-410

B-22

unit with centrifugal fans

high efficiency and energy saving units

Units available in low noise versions and/or with options for reduction of sound level



units with free-cooling



REFRIGERANT R407C



Series RAEK / RAEPS.K

Cooling capacity from 4,7 to 17,2 kW - 1 circuit

The air cooled chillers of **RAE K / RAE PS K series** are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. Therefore during their design, it has been given a particular care for dimensions and sound level, so to have compact and silent units at the same time. They can also be matched to fancoils or terminal units or for water cooling in small industrial processes. They are all available with 1 refrigerant circuit.

Thanks to their compact dimensions and to the several options available, these

units are particularly easy to install in small spaces. They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, also with pump and hydraulic tank, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **RAE...K** standard version Horizontal air flow for models from 41M to 101 Vertical air flow for models from 131 to 181 **RAE...PS K** with hydraulic kit

Operation limits (standard units):

AIR: from 15 to 45°C; WATER (out from evaporator): from 5 to 15°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service. For size from 41 to 101, the compressor section is still insulated with close-cell polyurethane foam material. For PS version, the hydraulic kit is installed at the bottom of the unit for size from 41 to 101 and it is composed of: circulation pump, buffer tank, safety valve, pressure gauge, water filing and discharge valves, purging valve, expansion vessel. For other sizes, there is no change in dimensions. High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. Sizel 41M is provided with hermetic piston compressor.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of PS version, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



Accessories

- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- BT Low temperature operation (-20°C): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts.
- HG Hot gas by-pass (from model 131): mechanical device for modulating cooling capacity.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT High and low pressure gauges (from size 131) for measuring circuit pressure.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.

- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM** Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data

RAE		41 M K	71 M K	101 M K	101 K	131 K	151 K	161 K	181 K
Cooling capacity					·				·
Cooling capacity	kW	4,7	7,1	8,0	8,1	10,7	12,6	16,3	17,2
Nominal input power	kW	1,6	2,5	3,1	3,2	3,4	4,4	5,3	5,9
EER		2,93	2,84	2,58	2,53	3,14	2,86	3,07	2,91
Axial fans									
Quantity	n.			1				2	
Rotation speed	rpm				9	00			
Air flow	m³/h	3.600		3.820		7	500	6	984
Air flow	l/s	1.000		1.069		2	.083	1	940
Motor input power	kW		C),15				0,29	
nput current	A			0,6				1,3	
Scroll compressors		1		.,.				<i>i</i> .	
уре		Piston hermetic				Scroll			_
Quantity	n.		I			1			
Circuits	n.					1			
Standard capacity steps	%					/ 100			
Nominal input current	A	7,8	10,0	12,5	5,2	5,3		6,7	9,3
Maximum input current	A	17,0	19,0	22,0	10,0	12,0	14,0	16,0	18,0
nrush current	A	54,0	76,0	8,6	46,0	56,0	68,0	77,0	81,0
Evaporator		5 1/0	10,0	0,0	10,0	50,0	00,0	11,0	01,0
ype					Braze	ed plate			
Quantity	n.					1			
Nater flow	m ³ /h	0,80	1,20	1	,40	1,80	2,20	2,80	3,00
Vater flow	/s	0,22	0,33		,10	0,50	0,61	0,78	0,83
Pressure drop	kPa	19	36		18	31	41	33	36
Electrical data	Kiu	17	50		10	51		55	50
Total input power	kW	1,7	2,6	-	3,2	3,7	4,7	5,6	6,2
Sound pressure level	KW	1,7	2,0		<i>1,</i> ∠	5,7	י,ד	5,0	0,2
Sound pressure at 1 m	dB(A)			50		54		55	56
PS Version	UD(N)			50		77		55	50
Available pressure	kPa	61	52		55	67	54	65	56
Pump group motor power	kra kW	UI		.,08		07		0,18	0.
Capacity of buffer tank				1,00		30		0,10	
Dimensions									
Length	mm			980			1	100	
Width	mm			325				750	
Height	mm			715				1100	
Transport weight	kg	122	125		28	205	209	226	228
Refrigerant charge per circuit	kg kg	122	2,0		28		3,3		5,1
Dimensions for PS version	КУ	C,I	2,0	4	., 1	I	د,د		J, I
	mm			980			1	1.100	
.ength Nidth	mm			325				750	
Height				000				100	
Height Transport weight with empty buffer tank	mm	150	161		64	238	241		260
	kg	158	101		04	238	241	259	260
Electrical power supply	M / 1 /11		220/1/50 1				400 / 2 / 50	T	
Electrical power supply	V / ph / Hz		230 / 1 / 50 + N + T				400/3/50+N+	1	

REMARKS:

REFRIGERANT R407C

R407C - Correction factors for cooling capacity (scroll compressors)

External air te	mperature °C	28	30	32	35	38	40	42	45	48
	17	1,522	1,492	1,463	1,416	1,370	1,339	1,304	1,252	1,212
	16	1,477	1,448	1,419	1,374	1,330	1,330	1,265	1,213	1,174
	15	1,433	1,404	1,376	1,333	1,289	1,260	1,226	1,175	1,137
	14	1,388	1,360	1,333	1,291	1,249	1,221	1,187	1,137	1,099
	13	1,343	1,317	1,290	1,250	1,209	1,182	1,148	1,099	1,062
	12	1,298	1,273	1,247	1,208	1,169	1,142	1,110	1,060	1,024
	11	1,253	1,229	1,204	1,166	1,128	1,103	1,071	1,022	0,987
	10	1,028	1,185	1,161	1,125	1,088	1,064	1,032	0,984	0,949
	9	1,163	1,141	1,118	1,087	1,048	1,025	0,993	0,946	0,912
_	8	1,118	1,097	1,075	1,041	1,008	0,985	0,954	0,907	0,874
Temperature	7	1,073	1,053	1,032	1	0,968	0,946	0,915	0,869	0,837
of water leaving from	6	1,027	1,007	0,986	0,956	0,925	0,904	0,873	0,827	0,800
evaporator °C	5	0,981	0,961	0,941	0,911	0,882	0,862	0,831	0,785	0,763
	4	0,948	0,928	0,909	0,880	0,851	0,831	0,802	0,759	0,735
	3	0,915	0,896	0,877	0,848	0,820	0,801	0,773	0,732	0,708
	2	0,881	0,863	0,845	0,817	0,789	0,770	0,744	0,706	0,681
	1	0,848	0,830	0,813	0,785	0,757	0,739	0,715	0,680	0,654
	0	0,815	0,798	0,781	0,753	0,726	0,708	0,686	0,653	0,626
	-1	0,781	0,765	0,749	0,722	0,695	0,677	0,657	0,627	0,599
	-2	0,748	0,732	0,717	0,690	0,664	0,647	0,628	0,601	0,572
	-3	0,715	0,700	0,685	0,659	0,633	0,616	0,599	0,575	0,544
	-4	0,681	0,667	0,653	0,627	0,602	0,585	0,570	0,548	0,517
	-5	0,648	0,634	0,621	0,596	0,571	0,554	0,541	0,522	0,490

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

If the unit works with an evaporation water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
 - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 - For further clarifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for input power (scroll compressors)

External air te	mperature °C	28	30	32	35	38	40	42	45	48
	17	1,007	1,039	1,071	1,126	1,180	1,217	1,257	1,316	1,366
	16	0,994	1,026	1,058	1,113	1,168	1,204	1,244	1,304	1,355
	15	0,981	1,013	1,046	1,100	1,155	1,192	1,232	1,292	1,345
	14	0,968	1,001	1,033	1,088	1,143	1,179	1,219	1,279	1,335
	13	0,955	0,988	1,020	1,075	1,130	1,167	1,207	1,267	1,324
	12	0,942	0,975	1,008	1,063	1,118	1,154	1,194	1,255	1,314
	11	0,929	0,962	0,995	1,050	1,105	1,142	1,182	1,242	1,304
	10	0,916	0,949	0,982	1,037	1,093	1,129	1,170	1,230	1,294
	9	0,903	0,936	0,970	1,025	1,080	1,117	1,157	1,218	1,283
	8	0,890	0,924	0,957	1,012	1,067	1,104	1,145	1,206	1,273
Temperature	7	0,877	0,911	0,944	1	1,055	1,092	1,132	1,193	1,263
of water leaving from	6	0,872	0,904	0,937	0,987	1,037	1,071	1,110	1,169	1,232
evaporator °C	5	0,866	0,898	0,929	0,974	1,020	1,050	1,088	1,145	1,201
	4	0,853	0,884	0,915	0,961	1,006	1,036	1,074	1,132	1,189
	3	0,839	0,870	0,901	0,947	0,992	1,023	1,061	1,119	1,177
	2	0,825	0,856	0,888	0,933	0,979	1,009	1,048	1,106	1,166
	1	0,812	0,843	0,874	0,919	0,965	0,996	1,034	1,093	1,154
	0	0,798	0,829	0,860	0,906	0,951	0,982	1,020	1,080	0,142
	-1	0,784	0,815	0,846	0,892	0,938	0,968	1,008	1,067	1,130
	-2	0,770	0,801	0,832	0,878	0,924	0,955	0,994	1,054	1,118
	-3	0,757	0,787	0,818	0,864	0,911	0,941	0,981	1,041	1,060
	-4	0,743	0,774	0,804	0,850	0,897	0,928	0,968	1,028	1,094
	-5	0,729	0,760	0,790	0,837	0,883	0,914	0,954	1,015	1,082

REMARKS:

Herwinks:
- The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit
- If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
- Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
- For further clarifications or information, you are kindly request to contact our sales departement.



REFRIGERANT R407C



Series RAE ... K

Cooling capacity from 19 to 82 kW - 1 and 2 circuits

The aircooled chillers of **RAE K series** are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications.

Depending on the cooling capacity, they are available with 1 and 2 cooling circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces, also when supplied with the hydraulic kit.

All sizes are standard provided with an isolated compressors section and the external frame is completely closed.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **RAE...K** standard version **RAE...U K** ultrasilenced version

Operation limits (standard units):

AIR: from 15 to 45°C; WATER (out from evaporator): from 5 to 15°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. For ultrasilenced version, it is insulated with soundproofing material. The external panels, easy to be dismantled, allow the full access in case of service. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit, with no change in overall dimensions.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. In case of 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



Accessories

- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz. BT Low temperature operation (-20°C): electronic device for the
- **BI Low temperature operation (-20°C)**: electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- GP Condensing coil protection grid: metal protection grid against accidental impacts.
- HG Hot gas by-pass: mechanical device for modulating cooling capacity (only for 1-circuit sizes).
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- **MT High and low pressure gauges** for measuring circuit pressure.
- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.

- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- **PT Twin pump group**: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type. (Available from size 482).
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RM Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.
 RP Partial heat recovery (about 20%) of the condensing heat, by
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- RR Copper/copper condensing coils: special execution of the condensing coils with copper pipe and fins.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification.
- RV Personalized frame painting in RAL colour SC Insulated compressors housing with sound
 - **Insulated compressors housing** with sound proofing material (included on ultra-silenced version).
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data - Standard version - 1 circuit

RAE		201 K	241 K	281 K	361 K	421 K
Cooling capacity						
Cooling capacity	kW	18,7	22,2	26,4	34,1	40,4
Nominal input power	kW	6,5	8,4	9,3	10,6	13,3
EER		2,88	2,64	2,84	3,22	3,04
Axial fans						
Quantity	n.			2		
Rotation speed	rpm		900		86	0
Air flow	m³/h	11.7	200	10`200	16.0	000
Air flow	l/s	3.1	11	2.833	4.4	45
Motor input power	kW		0,74	·	1,2	26
Input current	A		3,4		6,	0
Scroll compressors						
Quantity	n.			1		
Circuits	n.			1		
Standard capacity steps	%			0 - 100		
Nominal input current	A	12,2	14,9	16,7	18,5	23,3
Maximum input current	A	17,0	20,0	22,0	27,0	32,0
Inrush current	A	99,0	123,0	127,0	167,0	198,0
Evaporator						
Туре				Brazed plate		
Quantity	n.			1		
Water flow	m³/h	3,20	3,80	4,50	5,90	6,90
Water flow	l/s	0,89	1,06	1,25	1,64	1,92
Pressure drop	kPa	38	43	44	48	68
Pumps						
P1 — Available pressure	kPa	162	149	127	144	134
P1 — Motor input power	kW	· · · · · · · · · · · · · · · · · · ·		0,55	· · · · · · · · · · · · · · · · · · ·	
P1H — Available pressure	kPa	207	194	167	184	169
P1H – Motor input power	kW	·	0,55		0,75	
Capacity of buffer tank	I I		80		18	0
Electrical data						
Total input power	kW	7,2	9,1	10,0	11,9	14,6
Sound pressure level						
Sound pressure at 1 m	dB(A)		62		6	7
Dimensions						
Length	mm		1.600		2.0	00
Width	mm		750		85	0
Height	mm	1`260			1.6	50
Transport weight	kg	250	255	295	400	415
Transport weight with empty buffer tank	kg	300	305	345	465	480
Refrigerant charge per circuit	kg	4,2	4,3	6,3	10	11
Electrical power supply						
Electrical power supply	V / ph / Hz			400 / 3 / 50 + N + T		

REFRIGERANT R407C

Technical data - Ultrasilenced version - 1 circuit

RAEU		201 K	241 K	281 K	361 K	421 K
Cooling capacity					·	
Cooling capacity	kW	18,2	22,4	27,4	33,1	39,4
Nominal input power	kW	6,8	8,3	8,7	11,2	13,9
EER		2,68	2,70	3,15	2,95	2,83
Axial fans	· · ·					
Quantity	n.			2		3
Rotation speed	rpm		680		650	
Air flow	m³/h	8.000	7.000	11	200	17.400
\ir flow	l/s	2.222	1.944		111	4`833
Notor input power	kW		D,44	0	,62	0,93
nput current	A		2,2		3,1	4,7
Scroll compressors						
Quantity	n.			1		
Circuits	n.			1		
Standard capacity steps	%			0 - 100		
Nominal input current	A	12,5	14,8	16,0	19,3	24,1
Maximum input current	A	17,0	20,0	22,0	27,0	32,0
nrush current	A	99,0	123,0	127,0	167,0	198,0
Evaporator		i i i i i i i i i i i i i i i i i i i				
lype -				Brazed plate		
Quantity	n.			1		
Nater flow	m³/h	3,10	3,80	4,70	5,70	6,80
Nater flow	l/s	0,86	1,06	1,31	1,58	1,89
Pressure drop	kPa	36	44	47	45	65
Pumps						,
P1 – Available pressure	kPa	162	149	127	144	134
P1 – Motor input power	kW			0,55		
P1H — Available pressure	kPa	207	194	167	184	169
P1H – Motor input power	kW		0,55		0	75
Capacity of buffer tank	I		80		180	
Electrical data	· · ·			·		
lotal input power	kW	7,2	8,7	9,3	11,8	14,8
Sound pressure level		i i i i i i i i i i i i i i i i i i i				
Sound pressure at 1 m	dB(A)		55		59	61
Dimensions				·		
ength	mm	1	.600	2	000	2`130
Nidth	mm		750		350	1.100
Height	mm		260		650	1.760
Fransport weight	kg	256	261	370	400	570
ransport weight with empty buffer tank	kg	305	310	435	465	635
Refrigerant charge per circuit	kg	4,2	6,2		10	9,4
Electrical power supply		.,-		·		
Electrical power supply	V / ph / Hz			400 / 3 / 50 + N + T		



REFRIGERANT R407C

Technical data - Standard version - 2 circuits

RAE		482 K	562 K	702 K	822 K			
Cooling capacity								
Cooling capacity	kW	45,2	51,0	66,2	77,7			
Nominal input power	kW	16,3	19,6	22,2	28,0			
EER		2,77	2,60	2,98	2,77			
Axial fans								
Quantity	n.		3					
Rotation speed	rpm		860					
Air flow	m³/h	25.2	200	21	300			
Air flow	l/s	7.0	00	5	917			
Motor input power	kW		1,9	1,9				
nput current	A		9,0					
Scroll compressors								
Quantity	n.		2					
Circuits	n.		2					
Standard capacity steps	%		0 - 50 -	- 100				
Nominal input current	A	29,0	35,0	38,0	49,0			
Maximum input current	A	40,0	44,0	54,0	64,0			
Inrush current	A	143,0	149,0	194,0	230,0			
Evaporator			· · · ·		· · ·			
Туре			Brazed	plate				
Quantity	n.		2					
Water flow	m³/h	7,80	8,80	11,40	13,30			
Water flow	l/s	2,17	2,44	3,17	3,69			
Pressure drop	kPa	44	41	45	63			
Pumps			· ·					
P1 – Available pressure	kPa	137	130	122	108			
P1 — Motor input power	kW	0,7	5		1,1			
P1H – Available pressure	kPa	187	185	172	158			
P1H – Motor input power	kW	1,	1		1,5			
PT – Available pressure	kPa	137	140	137	120			
PT — Motor input power	kW		1,5					
Capacity of buffer tank	I		180					
Electrical data								
Total input power	kW	18,2	21,5	24,1	29,9			
Sound pressure level			· · · · ·		· · ·			
Sound pressure at 1 m	dB(A)		69					
Dimensions								
Length	mm		2.13	0				
Width	mm		1.10					
Height	mm		1.76					
Fransport weight	kg	607	611	682	693			
Fransport weight with empty buffer tank	kg	672	676	747	758			
Refrigerant charge per circuit	kg	4,8	4,9	9,2	9,4			
Electrical power supply					· · ·			
Electrical power supply	V / ph / Hz		400 / 3 / 50	+ N + T				

REFRIGERANT R407C

Technical data - Ultrasilenced version - 2 circuits

RAE U		482 K	562 K	702 K
Cooling capacity				
Cooling capacity	kW	43,7	52,9	62,6
Nominal input power	kW	17,2	18,5	21,0
EER		2,54	2,86	2,98
Axial fans				
Quantity	n.		3	
Rotation speed	rpm		650	
Air flow	m³/h	17`700	147	
Air flow	l/s	4`917	3.9	45
Motor input power	kW		0,93	
nput current	A		4,7	
Scroll compressors				
Quantity	n.		2	
Circuits	n.		2	
Standard capacity steps	%		0 - 50 - 100	
Nominal input current	A	30,0	33,0	41,0
Maximum input current	A	40,0	44,0	54,0
Inrush current	A	143,0	149,0	194,0
Evaporator				
Туре			Brazed plate	
Quantity	n.		2	
Water flow	m³/h	7,50	9,10	10,70
Water flow	l/s	2,08	2,53	2,97
Pressure drop	kPa	42	44	41
Pumps				
P1 — Available pressure	kPa	140	12	
P1 — Motor input power	kW		0,75	1,1
P1H – Available pressure	kPa	190	177	172
P1H – Motor input power	kW		1,1	1,5
PT – Available pressure	kPa	140	137	142
PT – Motor input power	kW		1,5	
Capacity of buffer tank			180	
Electrical data				
Total input power	kW	18,1	19,4	21,9
Sound pressure level	10(4)			
Sound pressure at 1 m	dB(A)		61	
Dimensions			2:420	
Length	mm		2'130	
Width	mm		1'100	
Height	mm		1'760	
Transport weight	kg	614	618	689
Transport weight with empty buffer tank	kg	680	684	754
Refrigerant charge per circuit	kg	4,8	9,0	9,2
Electrical power supply				
Electrical power supply	V / ph / Hz		400 / 3 / 50 + N + T	

REFRIGERANT R407C

R407C - Correction factors for cooling capacity (scroll compressors)

External air te	mperature °C	28	30	32	35	38	40	42	45	48
	17	1,522	1,492	1,463	1,416	1,370	1,339	1,304	1,252	1,212
	16	1,477	1,448	1,419	1,374	1,330	1,330	1,265	1,213	1,174
	15	1,433	1,404	1,376	1,333	1,289	1,260	1,226	1,175	1,137
	14	1,388	1,360	1,333	1,291	1,249	1,221	1,187	1,137	1,099
	13	1,343	1,317	1,290	1,250	1,209	1,182	1,148	1,099	1,062
	12	1,298	1,273	1,247	1,208	1,169	1,142	1,110	1,060	1,024
	11	1,253	1,229	1,204	1,166	1,128	1,103	1,071	1,022	0,987
	10	1,028	1,185	1,161	1,125	1,088	1,064	1,032	0,984	0,949
	9	1,163	1,141	1,118	1,087	1,048	1,025	0,993	0,946	0,912
	8	1,118	1,097	1,075	1,041	1,008	0,985	0,954	0,907	0,874
Temperature	7	1,073	1,053	1,032	1	0,968	0,946	0,915	0,869	0,837
of water leaving from	6	1,027	1,007	0,986	0,956	0,925	0,904	0,873	0,827	0,800
evaporator °C	5	0,981	0,961	0,941	0,911	0,882	0,862	0,831	0,785	0,763
	4	0,948	0,928	0,909	0,880	0,851	0,831	0,802	0,759	0,735
	3	0,915	0,896	0,877	0,848	0,820	0,801	0,773	0,732	0,708
	2	0,881	0,863	0,845	0,817	0,789	0,770	0,744	0,706	0,681
	1	0,848	0,830	0,813	0,785	0,757	0,739	0,715	0,680	0,654
	0	0,815	0,798	0,781	0,753	0,726	0,708	0,686	0,653	0,626
	-1	0,781	0,765	0,749	0,722	0,695	0,677	0,657	0,627	0,599
	-2	0,748	0,732	0,717	0,690	0,664	0,647	0,628	0,601	0,572
	-3	0,715	0,700	0,685	0,659	0,633	0,616	0,599	0,575	0,544
	-4	0,681	0,667	0,653	0,627	0,602	0,585	0,570	0,548	0,517
	-5	0,648	0,634	0,621	0,596	0,571	0,554	0,541	0,522	0,490

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

The unit works with an evaporation water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
 Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 For further darifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for input power (scroll compressors)

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	17	1,007	1,039	1,071	1,126	1,180	1,217	1,257	1,316	1,366
	16	0,994	1,026	1,058	1,113	1,168	1,204	1,244	1,304	1,355
	15	0,981	1,013	1,046	1,100	1,155	1,192	1,232	1,292	1,345
	14	0,968	1,001	1,033	1,088	1,143	1,179	1,219	1,279	1,335
	13	0,955	0,988	1,020	1,075	1,130	1,167	1,207	1,267	1,324
	12	0,942	0,975	1,008	1,063	1,118	1,154	1,194	1,255	1,314
	11	0,929	0,962	0,995	1,050	1,105	1,142	1,182	1,242	1,304
	10	0,916	0,949	0,982	1,037	1,093	1,129	1,170	1,230	1,294
	9	0,903	0,936	0,970	1,025	1,080	1,117	1,157	1,218	1,283
_	8	0,890	0,924	0,957	1,012	1,067	1,104	1,145	1,206	1,273
Temperature	7	0,877	0,911	0,944	1	1,055	1,092	1,132	1,193	1,263
of water leaving from	6	0,872	0,904	0,937	0,987	1,037	1,071	1,110	1,169	1,232
evaporator °C	5	0,866	0,898	0,929	0,974	1,020	1,050	1,088	1,145	1,201
	4	0,853	0,884	0,915	0,961	1,006	1,036	1,074	1,132	1,189
	3	0,839	0,870	0,901	0,947	0,992	1,023	1,061	1,119	1,177
	2	0,825	0,856	0,888	0,933	0,979	1,009	1,048	1,106	1,166
	1	0,812	0,843	0,874	0,919	0,965	0,996	1,034	1,093	1,154
	0	0,798	0,829	0,860	0,906	0,951	0,982	1,020	1,080	0,142
	-1	0,784	0,815	0,846	0,892	0,938	0,968	1,008	1,067	1,130
	-2	0,770	0,801	0,832	0,878	0,924	0,955	0,994	1,054	1,118
	-3	0,757	0,787	0,818	0,864	0,911	0,941	0,981	1,041	1,060
	-4	0,743	0,774	0,804	0,850	0,897	0,928	0,968	1,028	1,094
	-5	0,729	0,760	0,790	0,837	0,883	0,914	0,954	1,015	1,082

REMARKS:

Termanx: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions. - For further clarifications or information, you are kindly request to contact our sales departement.



REFRIGERANT R407C



RAE 1352 F.K + MV



Series RAE F.K

Cooling capacity from 77 to 289 kW - 2 circuits

The air cooled chillers of **RAE... F.K series**, are designed for outdoor installation and are particularly suitable for air conditioning systems, in residential and commercial applications. They can also be matched to fancoils or terminal units or for water cooling in industrial processes.

They are all available with 2 refrigerant circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces and easily accessible on all sides for ordinary and extraordinary service operations.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, also with pump and hydraulic tank, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available:

RAE... F.K standard free-cooling version

RAE... FS.K silenced free-cooling version with soundproofing insulation of compressors section

RAE... FU.K ultrasilenced free-cooling version with soundproofing insulation of compressors section by means of a bituminous rubber coating

Operation limits (standard units):

AIR: from 15 to 45°C; WATER (out from evaporator): from 5 to 15°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section, isolated from the air flow, is completely open; for silenced and ultra-silenced versions, the compressors are protected by a suitable soundproofing cabinet. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit, with no change in overall dimensions.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater. Being 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Additional free-cooling water coil with copper tube and aluminium fins, for production of chilled water by means of the very low external air temperatures. This allow a remarkable reduction of the compressor's working hours and their operation under capacity steps, with a consequent energy saving. The coil is complete of mixing valve.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. The fans speed control is standard provided.

Depending on the cooling capacity, **weld-brazed plate evaporator**, with two refrigerant circuits and one water circuit so to make installation easier (when possible), made of AISI 316 steel corrugated plates, with pipes and patented manifold so to reach a high heat exchange coefficient; it is provided with Y-shaped water filter. its design allows a uniform water distribution, compatibly with pressure drops and it is coated with close-cell insulating material. For bigger sizes, the evaporator is of **dry expansion shell and tube type** with two refrigerant circuits, in carbon steel and copper tubes, insulated by close-cell polyurethane foam material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, shut-off valve on liquid line, shut-off valve on compressor discharge side.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter. It allows a multilanguage display reading, a detailed description of parameters, the possibility to manage up to 8 units, to manage non standard communication protocols and a quickest access to the program.



REFRIGERANT R407C

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (already included in Sversion)
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a suitably coated cabinet, vibration dampers under compressors, mufflers on compressors discharge pipes (already included in U version).
- CI Soundproofing jacket on compressors made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (not available for S and U versions).
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts.
- GP1 Protection grid for compressors section: metal protection grid against accidental impacts (not available for 2-fan sizes with CF/ CFU option).
- I1 Victaulic insulation on pump side: insulation of the joints by close-cell polyurethane material, to prevent condense, pump side.
- 12 Victaulic insulation on buffer tank side: insulation of the joints by close-cell polyurethane material, to prevent condense, buffer tank side.
- I3 Victaulic insulation for the free- cooling version: insulation of the joints by close-cell polyurethane material, to prevent condense, free-cooling side.
- IG Watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT High and low pressure gauges for measuring circuit pressure.
- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PT Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type.
- **RA** Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- **RF Power factor correction system cosfi >0,9**: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification.
- RV Personalized frame painting in RAL colour
- Voltmeter: Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data - Standard version

RAE F		752 K	892 K	982 K	1062 K	1332 K	1352 K	1482 K	1622 K	1922 K	1972 K	2292 K	2542 K	2702 K
Cooling capacity		1												
Cooling capacity	kW	76,9	87,8	100.4	107	137,0	133,0	154,0	164,0	197,0	211,0	235,0	259,0	289,0
Nominal input power	kW	28,2	31,1	37,3	37,2	47,4	45,1	54,7	57,0	69,2	74,2	83,4	91,8	102,0
EER		2,73	2,82	2,69	2,88	2,89	2,95	2,81	2,88	2,85	2,84		82	2,83
Free-cooling capacity	kW	60,9	61,7	64,2	63,8	92,2	91,2	93,0	94,7	129,0	128,0	132,0	165,0	166,0
Axial fans	NVV	00,7	01,7	04,2	05,0	72,2	71,2	,0,0	י,דכ	127,0	120,0	152,0	105,0	100,0
Quantity				2				3			4			5
	n.			2				880			4)
Rotation speed	rpm	26:000		0.40	22:040	F1:	120		000	(0:040	(1)	000	04:060	70:020
Air flow	m³/h	36.000	33.		32.040		120		880	68'040		080	84.960	79'920
Air flow	l/s	10.000	9.		8.900	14	200	1	300	18.900	17.	800	23.600	22`200
Motor input power	kW			4				6			8			10
Input current	A			8			1	2			16		-	20
Scroll compressors														
Quantity	n.	2		4	2	4	2	4	2	6			4	
Circuits	n.							2						
Standard capacity steps	n.	2	4	4	2	4	2	4	2			4		
Nominal input current	A	49	58	68	63	81	76	97	96	117	125	140	154	173
Maximum input current	A	64	80	88	82	108	104	128	125	162	164	2	08	250
Inrush current	A	230	183	193	266	248	324	294	373	302	348	4	28	498
Evaporator														
•														Shell and
Туре							Braze	d plate						tube
Quantity	n.							1						
Water flow	m³/h	13,2	15,1	17,3	18,4	23,6	22,9	26,5	28,2	33,9	36,3	40,4	44,5	49,7
Water flow	I/s	3,7	4,2	4,8	5,1	6,5	6,4	7,4	7,8	9,4	10,1	11,2	12,4	13,8
Pressure drop	kPa	80	98	99	112	89	83	89	100	115	116	11,2	145	13,0
Pressure drop in free-cooling	kPa	94	116	123	139	98	92	100	113	136	110	149	186	130
Water volume		3			34		0		51	67	68	71	85	102
Pumps	1		0	-	14		0	-	71	07	00	/1	05	117
P1 – Available pressure	kPa	136	108	131	113	137	147	125	106	138	129	111	167	152
	kPa kW	100		3,0	3	157		,0	100	100		111		
P1 – Motor input power				3,0 407	388	422	413	,u 401	382	249	5,5 238	217		7,5
P1H – Available pressure	kPa	299	419	407	300	422			382	249	238	217	211	202
P1H – Motor input power	kW	5,5						,5		40.5				9,2
PT – Available pressure	kPa	161	135	122	103	124	134	109	89	135	129	119	125	119
PT – Motor input power	kW		3,0		3		3	,0			5,5		7	7,5
Capacity of buffer tank	I				30	00						750		
Electrical data														
Total input power	kW	32,2	35,1	41,3	41,2	53,4	51,1	60,7	63	77,2	82,2	91,4	101,8	112
Total nominal input current	A	57	65	76	71	93	88	109	108	133	141	156	174	193
Maximum total input current	A	72	88	96	90	120	116	140	137	178	180	224	228	270
Total inrush current	A	238	191	201	274	260	336	306	385	318	364	444	448	518
Sound pressure level														
Sound pressure at 1 m	dB(A)	69	7	0	72		74		75	7	6		77	
Dimensions									1					
Length	mm		2	715			3	740			4.765		5.	790
Width	mm							1.370					J	
Height	mm							2.140						
Transport weight		1.322	1.222	1.228	1.249	1.981	1.891	2.087	2.048	2.792	2.2777	2.792	2.111	3.232
	kg												3.114	
Transport weight with empty buffer tank	kg	1.432	1.632	1.638	1.659	2.201	2.111	2:307	2.568	3.012	2.997	3.012	3:334	3.752
Weight in operation	kg	1.355	1.222	1.222	1.284	2.031	1.941	2.138	2.066	2.865	2.846	2'867	3.199	3.621
MARTINE REPORT OF A		1.762	1.962	1.92	1.994	3.001	2.911	3.108	3.068	3.835	3`816	3`837	4.169	4.621
Weight in operation with buffer tank	kg													
Refrigerant charge per circuit	kg kg	8	11	12	15	1			23		30	31	29	40
														40

REMARKS:

- Operating conditions: External air temperature 35°C; water temperature 7/12°C - For free-cooling operation: Air 5°C; Inlet water temperature 15°C, ethylenic glycol 20%. - Sound pressure level at 1 m in open field (ISO 3744).



REFRIGERANT R407C

Technical data - Silenced version

RAE F.S		752 K	892 K	982 K	1062 K	1332 K	1352 K	1482 K	1622 K	1922 K	1972 K	2292 K
Cooling capacity												
Cooling capacity	kW	77,7	86,9	100,5	107,0	137,0	132,0	154,0	163,0	197,0	210,0	234,0
Nominal input power	kW	27,6	31,8	37,3	36,6	48,0	45,7	54,9	57,2	69,0	75,0	83,6
EER		2,81	2,73	2,69	2,92	2,85	2,89	2,80	2	,85	2	,80
Free-cooling capacity	kW	51,8	51,4	75,7	74,6	77,2	76,4	103,9	105,8	131,9	134,4	133,7
Axial fans											,	
Quantity	n.		2			3			4		5	
Rotation speed	rpm					-	660					
Air flow	m³/h	24.840	23.040	40.680	37.440	34	560	50	040	62	640	57.600
Air flow	l/s	6'900	6'400	11'300	10.400		600		900		400	16.000
Motor input power	kW		,5			,8			5		6,3	
Input current	A		,s ,6	6,9	6,4		5.9		<i>)</i> ,2		11,5	
Scroll compressors	N		10	0,7	0,1		, , , , , , , , , , , , , , , , , , ,		<i>1</i> 2		5	
Quantity	n.	2		4	2	4	2	4	2	6		4
Circuits	n.	2		т	2	т	2	т	2	U		т
Standard capacity steps	n.		2	4	2	4	2	4	2		4	
Nominal input current	A	49	58	68	62	81	77	97	96	116	126	140
Maximum input current	A	64	80	88	82	108	104	128	125	162	120	208
Inrush current	A	230	183	193	266	248	324	294	373	302	348	428
Evaporator	A	230	100	כפו	200	240	524	294	5/5	302	540	420
							Due word whete					
Type							Brazed plate					
Quantity Water Bau	n. m³/h	12.4	14.0	17.2	10.4	22.6	1	26.5	20	22.0	2(1	40.2
Water flow		13,4	14,9	17,3	18,4	23,6	22,7	26,5	28	33,9	36,1	40,2
Water flow	l/s	3,7	4,1 96	4,8	5,1	6,5	6,3	7,4	7,8	9,4	10	11,2
Pressure drop	kPa	82		97	111	88	82	89	100	116	115	119
Pressure drop in free-cooling	kPa	96	114	102	117	98	91	102	115	141	143	154
Water volume		1	3	4	48	-	50		65	81	82	85
Pumps	10	422	110	452	124	120		10	101	124	407	100
P1 – Available pressure	kPa	133	110	152	134	138	1	48	104	134	127	106
P1 – Motor input power	kW		,9				3,0				5,5	
P1H – Available pressure	kPa	296	421	428	411	425		15	382	246	238	215
P1H – Motor input power	kW	5,5						7,5				
PT – Available pressure	kPa	158	137	143	124	137	1	28	91	131	127	114
PT – Motor input power	kW					,0					5,5	
Capacity of buffer tank				3	00					750		
Electrical data			1				1	1	1	1		
Total input power	kW	30,1	34,3	41,1	40,4	51,8	49,5	59,9	62,2	75,3	81,3	89,9
Total nominal input current	A	53	62	75	69	88	84	106	105	128	138	152
Maximum total input current	A	69	85	95	89	115	111	137	134	174	176	220
Total inrush current	A	235	188	200	273	255	331	303	382	314	360	440
Sound pressure level												
Sound pressure at 1 m	dB(A)	6	6	67		70			71	72		73
Dimensions				_								
Length	mm	2	715		3.	740		4	765		5.790	
Width	mm						1'370					
Height	mm						2.140					
Transport weight	kg	1'363	1.263	1`850	1`879	2.033	1.943	2'402	2'362	3`180	3.096	3.198
Transport weight with empty buffer tank	kg	1'473	1.673	1.960	1.989	2.143	2.023	2.625	2.282	3'400	3`316	3`418
Weight in operation	kg	1.396	1.226	1`898	1.922	2.083	1.993	2`467	2.428	3`261	3.128	3.583
Weight in operation with buffer tank	kg	1.806	2.006	2.308	2:337	2.493	2'403	3`437	3`398	4.231	4`148	4`253
Refrigerant charge per circuit	kg	11	15	12	17		Ĩ	23		2	.9	38
Electrical power supply												
Electrical power supply	V / ph / Hz	/00/3/4	50 + T + N				4	00 / 3 / 50 + T +	N			

REMARKS:

- Operating conditions: External air temperature 35°C; water temperature 7/12°C - For free-cooling operation: Air 5°C; Inlet water temperature 15°C, ethylenic glycol 20%. - Sound pressure level at 1 m in open field (ISO 3744).

REFRIGERANT R407C

Technical data - Ultrasilenced version

RAE F.U		752 K	892 K	982 K	1062 K	1332 K	1352 K	1482 K	1622 K	1922 K
Cooling capacity										
Cooling capacity	kW	77,0	86,4	101,0	106,0	137,0	132,0	153,0	164,0	196,0
Nominal input power	kW	28,0	32,1	36,9	37,9	47,7	45,4	55,4	56,8	69,6
EER		2,75	2,69	2,74	2,80	2,87	2,91	2,76	2,89	2,82
Free-cooling capacity	kW	45,3	65,9	66,0	66,9	90,2	89,3	91,0	112,3	116,0
Axial fans										
Quantity	n.	2		3			4			5
Rotation speed	rpm					530				
Air flow	m ³ /h	19.080	33.120	29	.880	39	960	38.160	50 [°] 040	47.520
Air flow	l/s	5'300	9.500	8.	300	11	100	10.600	13.900	13.200
Motor input power	kW	1,5		2,3			3,1			,9
Input current	A	3,0		4,5			6,0			,5
Scroll compressors		-,-					-,-			/-
Quantity	n.	2		4	2	4	2	4	2	6
Circuits	n.				-	2	-		-	v
Standard capacity steps	n.		2	4	2	4	2	4	2	4
Nominal input current	A	49	58	67	63	81	77	97	96	117
Maximum input current	A	64	80	88	82	108	104	128	125	162
Inrush current	A	230	183	193	266	248	324	294	373	302
Evaporator	Л	230	105	175	200	240	524	2.94	575	J02
•						Brazed plate				
Type Quantity	n					Diazeu piate				
Water flow	n. m³/h	13,2	14,9	17,4	18,2	23,6	22,7	26,3	28,2	33,7
Water flow	/s	3,7		4,8	5,1	6,5	6,3	7,3	7,8	9,4
	kPa	5,7 81	4,1		107	89	83	88		
Pressure drop	kPa kPa		93	98					101	115
Pressure drop in free-cooling	KPa I	95	97	103	113	100	93	102	119	141
Water volume		33	47		48		54	65	79	81
Pumps	h De	124	100	151	120	120	145	100	101	124
P1 – Available pressure	kPa	134	128	151	139	136	145	125	101	134
P1 – Motor input power	kW		,9	427	415		,0	402	270	5,5
P1H – Available pressure	kPa	297	439	427	415	422	413	402	378	247
P1H – Motor input power	kW	5,5			100		,5			
PT – Available pressure	kPa	159	154	141	129	122	133	109	83	92
PT – Motor input power	kW				5	3,0		750		5,5
Capacity of buffer tank			3	00				750		
Electrical data										
Total input power	kW	29,5	34,4	39,2	40,2	50,8	48,5	58,5	60,7	73,5
Total nominal input current	A	52	63	72	68	87	83	104	103	125
Maximum total input current	A	67	85	93	87	114	110	134	133	170
Total inrush current	A	233	188	198	271	254	330	300	381	310
Sound pressure level										
Sound pressure at 1 m	dB(A)		63		65		56	65	6	18
Dimensions										
Length	mm	2.715		3.240			4.765		5	790
Width	mm					1.320				
Height	mm					2.140				
Transport weight	kg	1`394	1.829	1`884	1`864	2.328	2`238	2`449	2`724	3`240
Transport weight with empty buffer tank	kg	1.204	1.939	1.994	1.924	2.248	2`458	2.699	2.944	3'460
Weight in operation	kg	1'427	1`876	1.935	1.913	2.395	2:302	2`514	2`803	3`321
Weight in operation with buffer tank	kg	1`837	2`286	2.342	2.323	3`362	3.222	3`484	3.773	4`291
Refrigerant charge per circuit	kg	15	11		17		23	30	28	37
Electrical power supply										
Electrical power supply	V / ph / Hz	400/3/5	50 + T + N				400 / 3 / 50 + T + I	١		

REMARKS:

Deparating conditions: External air temperature 35°C; water temperature 7/12°C
 For free-cooling operation: Air 5°C; Inlet water temperature 15°C, ethylenic glycol 20%.
 Sound pressure level at 1 m in open field (ISO 3744).



REFRIGERANT R407C

R407C - Correction factors for cooling capacity (free-cooling units with scroll compressors)

External air te	emperature °C	25	28	30	32	35	38	40	42
	15	1,475	1,433	1,404	1,376	1,333	1,289	1,260	1,226
	14	1,428	1,388	1,360	1,333	1,291	1,249	1,221	1,187
	13	1,382	1,343	1,317	1,290	1,250	1,209	1,182	1,148
_	12	1,336	1,298	1,273	1,247	1,208	1,169	1,142	1,110
Temperature	11	1,290	1,253	1,229	1,204	1,166	1,128	1,103	1,071
of water leaving from	10	1,243	1,028	1,185	1,161	1,125	1,088	1,064	1,032
evaporator °C	9	1,197	1,163	1,141	1,118	1,087	1,048	1,025	0,993
	8	1,151	1,118	1,097	1,075	1,041	1,008	0,985	0,954
	7	1,105	1,073	1,053	1,032	1	0,968	0,946	0,915
	6	1,058	1,027	1,007	0,986	0,956	0,925	0,904	0,873
	5	1,011	0,981	0,961	0,941	0,911	0,882	0,862	0,831

REMARKS:

The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.

- Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.

- For further clarifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for input power (free-cooling units with scroll compressors)

External air te	emperature °C	25	28	30	32	35	38	40	42
	15	0,933	0,981	1,013	1,046	1,100	1,155	1,192	1,232
	14	0,920	0,968	1,001	1,033	1,088	1,143	1,179	1,219
	13	0,906	0,955	0,988	1,020	1,075	1,130	1,167	1,207
	12	0,893	0,942	0,975	1,008	1,063	1,118	1,154	1,194
Temperature	11	0,880	0,929	0,962	0,995	1,050	1,105	1,142	1,182
of water leaving from	10	0,867	0,916	0,949	0,982	1,037	1,093	1,129	1,170
evaporator °C	9	0,854	0,903	0,936	0,970	1,025	1,080	1,117	1,157
	8	0,840	0,890	0,924	0,957	1,012	1,067	1,104	1,145
	7	0,827	0,877	0,911	0,944	1	1,055	1,092	1,132
	6	0,823	0,872	0,904	0,937	0,987	1,037	1,071	1,110
	5	0,819	0,866	0,898	0,929	0,974	1,020	1,050	1,088

REMARKS:

The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5 °C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.

- Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 - For further clarifications or information, you are kindly request to contact our sales departement.

Operation with water and glycol mixture

	Glycol percentage												
	5%	10%	15%	20%	25%	30%	35%	40%					
Freezing temperature °C	-2,1	-3,2	-7	-10	-13	-17	-21	-25					
Correction factors:	-	-	-	-	-	-	-	-					
Cooling capacity	0,993	0,988	0,982	0,978	0,973	0,968	0,958	0,948					
Water flow	1,006	1,015	1,025	1,040	1,060	1,080	1,113	1,142					
Pressure drop	1,040	1,090	1,125	1,187	1,250	1,312	1,375	1,460					

REMARKS:

- If the unit works with an evaporator water temperature below 5 °C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.

- Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 - For further clarifications or information, you are kindly request to contact our sales departement.

Correction factors of the free-cooling capacity

	Glycol percentage													
		5	10	15	20	25	30	35	40					
	3	1,128	1,122	1,115	1,107	1,098	1,087	1,075	1,065					
	4	1,082	1,073	1,063	1,053	1,040	1,025	1,010	0,993					
DT IN-OUT water	5	1,036	1,025	1,012	1	0,983	0,963	0,943	0,920					
temperature	6	0,991	0,978	0,963	0,947	0,926	0,901	0,874	0,844					
temperature	7	0,945	0,931	0,912	0,894	0,869	0,839	0,805	0,765					
	8	0,902	0,884	0,862	0,841	0,811	0,773	0,733	0,682					

REMARKS:

- To be used for the dimensioning of circulating pump according to glycol percentage and DT value between the inlet and the outlet water temperature.



REFRIGERANT R407C

Correction factors of the free-cooling capacity

							Water temp	erature IN °	C					
		6	7	8	9	10	11	12	13	14	15	16	17	18
	- 5	1,057	1,158	1,260	1,356	1,459	1,563	1,667	1,772	1,877	1,982	2,088	2,194	2,300
	- 4	0,961	1,062	1,163	1,260	1,363	1,466	1,571	1,674	1,779	1,884	1,989	2,095	2,201
	- 3	0,866	0,966	1,066	1,163	1,266	1,370	1,475	1,577	1,681	1,786	1,891	1,996	2,102
	- 2	0,770	0,869	0,970	1,067	1,169	1,273	1,378	1,479	1,583	1,688	1,792	1,898	2,003
	-1	0,674	0,773	0,873	0,971	1,073	1,177	1,282	1,381	1,485	1,589	1,694	1,799	1,904
	0	0,578	0,677	0,777	0,875	0,976	1,080	1,186	1,284	1,387	1,491	1,595	1,700	1,805
	1	0,482	0,580	0,680	0,778	0,879	0,983	1,089	1,186	1,289	1,393	1,497	1,601	1,706
	2	0,386	0,484	0,584	0,682	0,783	0,887	0,993	1,089	1,191	1,295	1,398	1,502	1,607
	3	0,290	0,388	0,487	0,586	0,686	0,790	0,897	0,991	1,094	1,196	1,300	1,404	1,508
External air	4	0,194	0,291	0,390	0,489	0,590	0,693	0,801	0,893	0,996	1,098	1,201	1,305	1,408
temperature	5	-	0,195	0,294	0,393	0,493	0,593	0,694	0,796	0,898	1	1,103	1,206	1,309
°C	6	-	-	0,196	0,295	0,395	0,495	0,595	0,696	0,798	0,900	1,003	1,106	1,209
	7	-	-	-	0,197	0,296	0,396	0,496	0,597	0,699	0,800	0,903	1,005	1,108
	8	-	-	-	-	0,198	0,297	0,397	0,498	0,599	0,701	0,803	0,905	1,008
	9	-	-	-	-	-	0,199	0,298	0,399	0,499	0,601	0,702	0,805	0,907
	10	-	-	-	-	-	-	0,199	0,299	0,400	0,501	0,602	0,704	0,807
	11	-	-	-	-	-	-	-	0,200	0,300	0,401	0,502	0,604	0,707
	12	-	-	-	-	-	-	-	-	0,201	0,301	0,402	0,504	0,606
	13	-	-	-	-	-	-	-	-	-	0,201	0,302	0,403	0,506
	14	-	-	-	-	-	-	-	-	-	-	0,202	0,303	0,405
	15	-	-	-	-	-	-	-	-	-	-	-	0,203	0,305

EXAMPLE:

EXAMPLE: You want to know the free-cooling capacity of one unit at the following conditions : 35% ethylenic glycol , inlet temperature 12 °C, DT of 6 °C between the inlet and the outlet temperature and 2 °C of external air temperature. Supposed 100 kW as nominal free cooling capacity at nominal condition, correction factors to be applied are 0,874 and 0,993, so the real capacity will be 100 x 0,874 x 0,993 = 86,788 kW N.B. The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit.



REFRIGERANT R407C



RAE 131 C K



Series RAE ... C K

Cooling capacity from 11 to 18 kW - 1 circuit

The air cooled chillers of **RAE C K series**, with centrifugal fans, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. Therefore during their design, it has been given a particular care for dimensions and sound level, so to have compact and silent units at the same time.

They can also be matched to fancoils or terminal units or for water cooling in small industrial processes.

They are all available with 1 refrigerant circuit.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available with vertical air flow: **RAE...C K** standard version **RAE...C PS K** with hydraulic kit

Operation limits (standard units):

AIR: from 15 to 45°C; WATER (out from evaporator): from 5 to 15°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service. For PS version, the hydraulic kit is installed at the bottom of the unit, with no change in dimensions and it is composed of: circulation pump, buffer tank, safety valve, pressure gauge, water filling and discharge valves, purging valve, expansion vessel. High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Centrifugal fans of double suction type with electrical motor directly joined to the wheel, with a low sound level and provided with short circuit and overload protections and external safety protection grid.

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of PS version, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



REFRIGERANT R407C

Accessories

- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- BT Low temperature operation (-20°C): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts.
- HG Hot gas by-pass: mechanical device for modulating cooling capacity.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- **MT High and low pressure gauges** for measuring circuit pressure.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.

- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
 PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and
- the display of the present alarms.
 Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM** Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data

RAE		131 C K	151 C K	161 C K	181 C K					
Cooling capacity										
Cooling capacity	kW	10,7	12,6	16,3	17,2					
Nominal input power	kW	3,4	4,4	5,3	5,9					
ER		3,15	2,86	3,07	2,91					
Centrifugal fans										
luantity	n.		2							
\ir flow	m³/h	7.5	00	6.7	00					
hir flow	l/s	2.0		1.8	61					
lotation speed	rpm		1'2							
Notor input power	kW	1,(2,	2					
nput current	A		13							
wailable pressure	Pa	40)	16	5					
Scroll compressors										
Juantity	n.		1							
Circuits	n.		1							
itandard capacity steps	%		0							
Nominal input current	A	5,4	6,3	9,0	10,4					
Aaximum input current	A	12,0	14	16,0	18,0					
nrush current	A	56,0	68	77,0	81,0					
Evaporator										
İype		Brazed plate								
)uantity	n.		1							
Vater flow	m³/h	1,80	2,20	2,80	3,00					
Vater flow	l/s	0,50	0,61	0,78	0,83					
Pressure drop	kPa	32	43	34	38					
Electrical data										
otal input power	kW	3,4	4,4	5,3	5,9					
Sound pressure level										
ound pressure at 1 m	dB(A)		6)						
PS Version										
Available pressure	kPa	65	48	52	47					
Pump group motor power	kW		0,							
apacity of buffer tank			3)						
Dimensions										
ength	mm		1'1							
Vidth	mm		75							
leight	mm		11							
ransport weight	kg	217	221	238	240					
efrigerant charge per circuit	kg	3,	3	5,	1					
Dimensions for PS version										
ength	mm		1.1							
Vidth	mm		75							
leight	mm		11							
Transport weight with empty buffer tank	kg	238	241	259	260					
Electrical power supply										
	V / ph / Hz		400 / 3 / 5							

REMARKS:

REFRIGERANT R407C



Series RAE ... C K

Cooling capacity from 19 to 83 kW - 1 and 2 circuits

The air cooled chillers of **RAE** ... **C K** series, with centrifugal fans, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. They can also be matched to fancoils or terminal units or for water cooling in small industrial processes.

They are all available with 1 or 2 refrigerant circuits.

During their design, it has been given a particular care for dimensions and compactness, so to facilitate their handling and positioning in site. In order to further reduce weight and dimensions, in case of particular applications, when the units are provided with buffer tank and pump group, on request it is possible to separately supply the hydraulic kit, usually included in the frame of the unit itself. They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: Vertical air flow RAE...C K standard version RAE...C U K ultrasilenced version Horizontal air flow RAE...C.O K standard version RAE...C.O U K ultrasilenced version

Operation limits (standard units):

AIR: from 15 to 45°C; WATER (out from evaporator): from 5 to 15°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service. When required, the hydraulic kit (buffer tank and pump group) are installed at the bottom of the unit, in a suitable section.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. In case of 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Centrifugal fans of double suction type with electrical motor directly joined and balanced blades, suitably isolated with rubber vibration dampers and sealing on discharge. They are provided with short circuit and overload protections and external safety protection grid. The motor is of 4-pole triphase type, with belt transmission and variable pulleys, placed on slide so to speed up the pulley tension. As a standard, the unit has a vertical airflow or, on request, you can ask for an horizontal airflow (coil side).

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



REFRIGERANT R407C

Accessories

- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
 BF Low temperature operation (-20°C) with inverter fan speed regulation: electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical
- supply.
 BFa-BFb
 Low temperature operation (-20°C) with inverter fan speed regulation (with option 1M and 2M): electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply.
- **BT Low temperature operation (-20°C):** electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (not available for size 822).
- BTa Low temperature operation (-20°C with option 1M): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (not available for size 822).
- CF Soundproofed compressors cabinet: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (included on ultrasilenced version).
- CI Soundproofing jacket on compressors: made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (already included on ultrasilenced version).
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts.
- **HG Hot gas by-pass**: mechanical device for modulating cooling capacity (only for 1-circuit sizes).
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT High and low pressure gauges for measuring circuit pressure.
- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.

- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- **PT Twin pump group**: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type. (Available from size 482).
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- RR Copper/copper condensing coils: special execution of the condensing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data - Standard version - 1 circuit

RAE		201 C K	241 C K	281 C K	361 C K	421 C K
Cooling capacity						
Cooling capacity	kW	19,6	24,1	27,9	33,9	41,8
Nominal input power	kW	6,6	7,7	8,8	11,0	13,2
EER		2,97	3,13	3,17	3,08	3,17
Centrifugal fans						
Quantity	n.		1		2	(*)
Air flow	m³/h	8.800	8.620	9.000	11.200	13.000
Air flow	l/s	2'444	2'403	2.200	3.111	3.611
STD Version						
Available pressure	Pa			80		
Rotation speed	rpm	896	915	975	746	858
Motor input power	kW		2,2	3,0	2,2	3,0
Vominal input current	A		5,3	6,7	5,3	6,7
Sound pressure level	dB(A)		66	67	64	65
1M Version	ub(A)		00	07	1 01	05
wailable pressure	Pa			120		
Rotation speed	ra	935	955	1.014	811	914
	kW	733	3,0	1 014		
Notor input power					2,2	3,0
lominal input current	A		6,7	<i>(</i>)	5,3	6,7
iound pressure level	dB(A)		67	68	65	66
2M Version						
wailable pressure	Pa		a	200	a	
Rotation speed	rpm	1.014	1.036	1.091	938	1.052
Notor input power	kW			3,0		4,0
Nominal input current	A			6,7		9,4
Sound pressure level	dB(A)		68	69	66	67
Scroll compressors						
Quantity	n.			1		
lircuits	n.			1		
itandard capacity steps	%			0-100		
lominal input current	A	12,9	15,1	16,0	18,7	22,7
Aaximum input current	A	17,0	20,0	22,0	27,0	32,0
nrush current	A	99,0	123,0	127,0	167,0	198,0
Evaporator					, ,	
ype				Brazed plate		
Quantity	n.			1		
Nater flow	m³/h	3,4	4,1	4,8	5,8	7,2
Nater flow	l/s	0,94	1,14	1,33	1,61	2,00
Pressure drop	kPa	41	50	48	47	72
Pumps	in u		50	10		12
Parings P1 — Available pressure	kPa	179	152	148	155	132
P1 — Motor input power	kW		,55	(10	0,75	IJŹ
21 — Motol Input powel 21H — Available pressure	kPa	239	207	198	210	262
71H — Avaliable pressure 71H — Motor input power	kPa kW	0,55	207	0,75	210	1,1
TH – Motor Input power		0,55				١,١
apacity of buffer tank				180		
Electrical data	1347	0.0		11.0	12.2	44.3
otal input power	kW	8,8	9,9	11,8	13,2	16,2
Dimensions						
ength	mm		1.320		1.	565
Vidth	mm			750		
leight	mm		1`250		17	460
ength with MV option	mm			1`665		
Vidth with MV option	mm			750		
leight with MV option	mm		1.622		1'8	385
ransport weight	kg	395	406	417	499	522
		575	586	597	679	702
	Ka					
ransport weight with empty buffer tank	kg ka					
	kg kg	4,6	6,0	7,4	9,3	12,0

REMARKS:

herwhans: - Operating conditions: External air temperature 35°C; water temperature 7/12°C - Sound pressure level at 1 m in open field (ISO 3744) with ducted air suction and discharge - (*) 2 fans in tandem, driven by 1 motor. - In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-- trave of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-- trave of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-- trave of a different available pressure included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-- trave of a different available pressure included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. gly.



REFRIGERANT R407C

Technical data - Ultrasilenced version - 1 circuit

RAE		201 C.U K	241 C.U K	281 C.U K	361 C.U K	421 C.U K
Cooling capacity						
Cooling capacity	kW	19,9	23,6	27,9	34,8	41,2
Nominal input power	kW	6,5	8,0	8,8	11,1	13,4
ER		3,06	2,95	3,17	3,13	3,07
Centrifugal fans						
Quantity	n.		1	2	(*)	2
Air flow	m³/h	6'300	7.200	6.920	9.600	13`900
Air flow	l/s	1.750	2.000	1.930	2.666	3`861
STD Version						
Available pressure	Pa		80	50	8	0
Rotation speed	rpm	720	818	637	711	696
Notor input power	kW		1	,5		3,0
Nominal input current	A			,7		7,4
Sound pressure level	dB(A)	62	64	61	6	3
IM Version	(-)					-
wailable pressure	Pa			120		
Rotation speed	rpm	776	866	728	785	752
Notor input power	kW	1,5	2,2		1,5	3,0
Nominal input current	A	3,7	5,3		3,7	7,4
ound pressure level	dB(A)	62	64	61		j4
2M Version	UD(A)	02	04	01	t	14
	D-			200		
Available pressure	Pa	006	0(2	200	0.25	050
Rotation speed	rpm	886	963	891	925	858
Notor input power	kW	1,5	2,2	1,5	2,2	4,4
Nominal input current	A	3,7	5,3	3,7	5,3	10,6
Sound pressure level	dB(A)	63	65	62	6	64
Scroll compressors						
Quantity	n.			1		
ircuits	n.			1		
tandard capacity steps	%			0 - 100		
Nominal input current	A	12,7	15,4	16,1	18,9	23,0
Aaximum input current	Α	17,0	20,0	22,0	27,0	32,0
nrush current	A	99,0	123,0	127,0	167,0	198,0
Evaporator						
ype				Brazed plate		
Quantity	n.			1		
Vater flow	m³/h	3,4	4,0	4,8	6,0	7,1
Nater flow	I/s	1,94	1,11	1,33	1,67	1,97
Pressure drop	kPa	42		1,55	50	71
Pumps	in u	12				/1
P1 — Available pressure	kPa	178	154	148	155	133
P1 – Motor input power	kW		,55	140	0,75	ردا
21 — Motor Input power 21H — Available pressure	kPa	238	209	198	210	263
			209		210	
P1H – Motor input power	kW	0,55	1	0,75		1,1
apacity of buffer tank				80		240
Electrical data						
otal input power	kW	8,0	9,5	10,3	12,6	16,4
Dimensions						
ength	mm	1	320		665	2`120
/idth	mm			50		778
leight	mm	1	250		460	1.220
ength with MV option	mm			665		2`280
Vidth with MV option	mm			50		996
leight with MV option	mm	1.	675		885	1`995
ransport weight	kg	396	407	501	511	642
ransport weight with empty buffer tank	kg	576	587	681	691	872
and a second s						
	ka	5.9	/.1	11.0		17
efrigerant charge per circuit Electrical power supply	kg	5,9	7,3	11,0	11	12

REMARKS:

hermanx: - Operating conditions: External air temperature 35°C; water temperature 7/12°C - Sound pressure level at 1 m in open field (ISO 3744) with ducted air suction and discharge - (*) 2 fans in tandem, driven by 1 motor. - In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordingly.



REFRIGERANT R407C

Technical data - Standard version - 2 circuits

RAE		482 C K	562 C K	702 C K	822 C K
Cooling capacity	114	10.4	55.4	(7.0	02.5
Cooling capacity	kW	48,1	55,6	67,9	83,5
Nominal input power	kW	15,4	17,5	22,2	26,6
ER		3,12	3,18	3,06	3,14
Centrifugal fans					
Quantity	n.			2	1
Air flow	m³/h	16.700	20.900	24.600	28'400
Air flow	l/s	4`639	5`806	6`834	7`889
STD Version					
Available pressure	Pa		8		
Rotation speed	rpm	782	919	640	745
Aotor input power	kW	4,4	8,0	6,0	11,0
Nominal input current	A	10,6	18,8	13,4	24,0
Sound pressure level	dB(A)	65	66		8
1M Version					
Available pressure	Pa		12	20	
Rotation speed	rpm	830	959	669	769
Aotor input power	kW	4,4	8		11,0
Nominal input current	A	10,6	18		24,0
Sound pressure level	dB(A)	66	68	71	72
2M Version			JU	/1	12
Available pressure	Pa		20	10	
Notation speed		923	1.032	725	819
	rpm kW	6,0	1 037		11,0
Notor input power	A		18		24,0
lominal input current		13,4			
ound pressure level	dB(A)	6	57	71	74
Scroll compressors					
Quantity	n.			2	
ircuits	n.			2	
Standard capacity steps	%		0 - 50		
Nominal input current	A	30,0	32,0	38,0	46,0
Maximum input current	A	40,0	44,0	54,0	64,0
nrush current	A	143,0	149,0	194,0	230,0
Evaporator					
Гуре			Brazed	l plate	
Quantity	n.			2	
Water flow	m³/h	8,3	9,6	11,7	14,4
Nater flow	l/s	2,30	2,6	3,2	3,99
Pressure drop	kPa	49	48	47	72
Pumps					
P1 – Available pressure	kPa	132	113	180	107
P1 — Motor input power	kW		75	1,	
P1H — Available pressure	kPa	237	223	250	157
P1H — Motor input power	kW		,1		,5
PT — Available pressure	kPa	132	133	135	127
T – Motor input power	kW			5	
apacity of buffer tank			24		
Electrical data			2	·-	
Total input power	kW	20,0	26,0	28,0	38,0
fotal nominal input current	A	41,0	51		70,0
Maximum total input current	A	51,0	63,0	,0 67,0	88,0
otal inrush current		154,0	168,0	213,0	254,0
	A	134,0	108,0	213,U	Z04,U
Dimensions			120		200
ength	mm		120	2.2	
Vidth	mm	7		99	
leight	mm	11	570	1'8	345
ength with MV option	mm		27		
Vidth with MV option	mm		9		
Height with MV option	mm		995	212	
Fransport weight	kg	752	782	856	929
Fransport weight with empty buffer tank	kg	982	1.015	1`086	1.129
Refrigerant charge per circuit	kg	5,8	5,9	7,8	9,7
et a statue tra succession and the					
Electrical power supply					

REMARKS:

- In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordingly.



REFRIGERANT R407C

Technical data - Ultrasilenced version - 2 circuits

RAE		482 C.U K	562 C.U K	702 C.U K
Cooling capacity				
Cooling capacity	kW	47,9	55,4	67,9
Nominal input power	kW	15,5	17,7	22,2
ER		3,09	3,13	3,06
Centrifugal fans				
Quantity	n.		2	
Air flow	m³/h	14.700	18.000	20'700
Air flow	l/s	4.083	5.000	5.750
STD Version				
Available pressure	Pa		80	
Rotation speed	rpm	460	509	585
Notor input power	kW		3,0	4,4
Nominal input current	A		7,4	10,6
Sound pressure level	dB(A)	60	58	
1M Version				
Available pressure	Pa		120	
Rotation speed	rpm	508	548	616
Notor input power	kW		3,0	4,4
lominal input current	A		7,4	10,6
iound pressure level	dB(A)	61	63	66
2M Version				
Available pressure	Pa		200	
Rotation speed	rpm	599	626	684
Notor input power	kW	3,0	4,4	6,0
lominal input current	A	7,4	10,6	13,4
Sound pressure level	dB(A)	62	64	66
Scroll compressors	uu(n)	V2	V7	00
Quantity	n.		2	
ircuits	n.		2	
itandard capacity steps	%		0-50-100	
	% A	20.0		20.0
lominal input current		30,0	32,0	38,0
Aaximum input current	A	40,0	44,0	54,0
nrush current	A	143,0	149,0	194,0
Evaporator			Durandulate	
уре			Brazed plate	
Juantity	n. 3a	0.2	2	44.7
Nater flow	m³/h	8,2	9,5	11,7
Nater flow	l/s	2,29	2,65	3,24
Pressure drop	kPa	49	48	47
Pumps				
1 – Available pressure	kPa	132	114	180
21 – Motor input power	kW		0,75	1,10
P1H – Available pressure	kPa	237	224	250
P1H — Motor input power	kW		1,1	1,5
PT – Available pressure	kPa	132	134	135
YT — Motor input power	kW		1,5	
apacity of buffer tank			240	
Electrical data				
fotal input power	kW	19,0	21,0	27,0
otal nominal input current	A	38,0	40,0	48,0
Aaximum total input current	A	47,0	51,0	65,0
otal inrush current	A	150,0	156,0	205,0
Dimensions				
ength	mm		2`280	
lidth	mm		990	
eight	mm		1.845	
ength with MV option	mm		2`280	
Vidth with MV option	mm		990	
leight with MV option	mm		2`270	
reigne murinin opdVII	kg		825	869
	NU NU			
ransport weight		1	055	1.000
ransport weight ransport weight with empty buffer tank	kg		76	1'099
ransport weight		7,5	-055 7,6	1`099 9,5

REMARKS:

namentors. - Operating conditions: External air temperature 37°C; water temperature 7/12°C - Sound pressure level at 1 m in open field (ISO 3744) with ducted air suction and discharge - In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordingly.

REFRIGERANT R407C

R407C - Correction factors for cooling capacity (scroll compressors)

External air te	mperature °C	28	30	32	35	38	40	42	45	48
	17	1,522	1,492	1,463	1,416	1,370	1,339	1,304	1,252	1,212
	16	1,477	1,448	1,419	1,374	1,330	1,330	1,265	1,213	1,174
	15	1,433	1,404	1,376	1,333	1,289	1,260	1,226	1,175	1,137
	14	1,388	1,360	1,333	1,291	1,249	1,221	1,187	1,137	1,099
	13	1,343	1,317	1,290	1,250	1,209	1,182	1,148	1,099	1,062
	12	1,298	1,273	1,247	1,208	1,169	1,142	1,110	1,060	1,024
	11	1,253	1,229	1,204	1,166	1,128	1,103	1,071	1,022	0,987
	10	1,028	1,185	1,161	1,125	1,088	1,064	1,032	0,984	0,949
	9	1,163	1,141	1,118	1,087	1,048	1,025	0,993	0,946	0,912
_	8	1,118	1,097	1,075	1,041	1,008	0,985	0,954	0,907	0,874
Temperature	7	1,073	1,053	1,032	1	0,968	0,946	0,915	0,869	0,837
of water leaving from	6	1,027	1,007	0,986	0,956	0,925	0,904	0,873	0,827	0,800
evaporator °C	5	0,981	0,961	0,941	0,911	0,882	0,862	0,831	0,785	0,763
	4	0,948	0,928	0,909	0,880	0,851	0,831	0,802	0,759	0,735
	3	0,915	0,896	0,877	0,848	0,820	0,801	0,773	0,732	0,708
	2	0,881	0,863	0,845	0,817	0,789	0,770	0,744	0,706	0,681
	1	0,848	0,830	0,813	0,785	0,757	0,739	0,715	0,680	0,654
	0	0,815	0,798	0,781	0,753	0,726	0,708	0,686	0,653	0,626
	-1	0,781	0,765	0,749	0,722	0,695	0,677	0,657	0,627	0,599
	-2	0,748	0,732	0,717	0,690	0,664	0,647	0,628	0,601	0,572
	-3	0,715	0,700	0,685	0,659	0,633	0,616	0,599	0,575	0,544
	-4	0,681	0,667	0,653	0,627	0,602	0,585	0,570	0,548	0,517
	-5	0,648	0,634	0,621	0,596	0,571	0,554	0,541	0,522	0,490

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

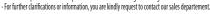
If the unit works with an evaporation water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
 - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 - For further clarifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for input power (scroll compressors)

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	17	1,007	1,039	1,071	1,126	1,180	1,217	1,257	1,316	1,366
	16	0,994	1,026	1,058	1,113	1,168	1,204	1,244	1,304	1,355
	15	0,981	1,013	1,046	1,100	1,155	1,192	1,232	1,292	1,345
	14	0,968	1,001	1,033	1,088	1,143	1,179	1,219	1,279	1,335
	13	0,955	0,988	1,020	1,075	1,130	1,167	1,207	1,267	1,324
	12	0,942	0,975	1,008	1,063	1,118	1,154	1,194	1,255	1,314
	11	0,929	0,962	0,995	1,050	1,105	1,142	1,182	1,242	1,304
	10	0,916	0,949	0,982	1,037	1,093	1,129	1,170	1,230	1,294
	9	0,903	0,936	0,970	1,025	1,080	1,117	1,157	1,218	1,283
	8	0,890	0,924	0,957	1,012	1,067	1,104	1,145	1,206	1,273
Temperature	7	0,877	0,911	0,944	1	1,055	1,092	1,132	1,193	1,263
of water leaving from	6	0,872	0,904	0,937	0,987	1,037	1,071	1,110	1,169	1,232
evaporator °C	5	0,866	0,898	0,929	0,974	1,020	1,050	1,088	1,145	1,201
	4	0,853	0,884	0,915	0,961	1,006	1,036	1,074	1,132	1,189
	3	0,839	0,870	0,901	0,947	0,992	1,023	1,061	1,119	1,177
	2	0,825	0,856	0,888	0,933	0,979	1,009	1,048	1,106	1,166
	1	0,812	0,843	0,874	0,919	0,965	0,996	1,034	1,093	1,154
	0	0,798	0,829	0,860	0,906	0,951	0,982	1,020	1,080	0,142
	-1	0,784	0,815	0,846	0,892	0,938	0,968	1,008	1,067	1,130
	-2	0,770	0,801	0,832	0,878	0,924	0,955	0,994	1,054	1,118
	-3	0,757	0,787	0,818	0,864	0,911	0,941	0,981	1,041	1,060
	-4	0,743	0,774	0,804	0,850	0,897	0,928	0,968	1,028	1,094
	-5	0,729	0,760	0,790	0,837	0,883	0,914	0,954	1,015	1,082

REMARKS:

The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.





REFRIGERANT R407C



RAE 1402 C O K



Series RAE C K

Cooling capacity from 81 to 250 kW - 2 circuits

The air cooled chillers of **RAE C K series**, with centrifugal fans, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. They can also be matched to fancoils or terminal units or for water cooling in industrial processes.

They are all available with 2 refrigerant circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

The whole range is complete of a compressors section, allowing a quick and easy ordinary service to the units.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: Vertical air flow RAE...C K standard version RAE...C U K ultrasilenced version Horizontal air flow RAE...C.O K standard version RAE...C.O U K ultrasilenced version

Operation limits (standard units):

AIR: from 15 to 45°C; WATER (out from evaporator): from 5 to 15°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are installed. The external panels, easy to be dismantled with a quick ¾ key turn, allow the full access to all components in case of service. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater. Being 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Centrifugal fans of double suction type with electrical motor directly joined and balanced blades, suitably isolated with rubber vibration dampers and sealing on discharge. They are provided with short circuit and overload protections and external safety protection grid. The motor is of 4-pole triphase type, with belt transmission and variable pulleys, placed on slide so to speed up the pulley tension. As a standard, the unit has a vertical airflow or, on request, you can ask for an horizontal airflow (coil side).

Dry expansion **shell and tube evaporator** with two refrigerant circuits, in carbon steel and copper tubes, insulated by close-cell polyurethane foam material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, shut-off valve on liquid line, shut-off valve on compressor discharge side.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



REFRIGERANT R407C

Accessories

- 1M–2M Higher available pressure for fan: bigger electrical motor, so to have a higher available pressure to fans to be ducted.
 AE Electrical power supply different from standard: mainly, 230V
- three-phase, 460V three-phase. Frequency 50/60 Hz.
 BF Low temperature operation (-20°C) with inverter fan speed regulation: electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical
- supply. **BFa-BFb Low temperature operation (-20°C) with inverter fan speed regulation (with option 1M and 2M)**: electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply.
- **BT Low temperature operation (-20°C)**: electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- BTa Low temperature operation (-20°C with option 1M): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- CF Soundproofed compressors cabinet: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (included on ultrasilenced version).
- CI Soundproofing jacket on compressors: made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (already included on ultrasilenced version).
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **GP** Condensing coil protection grid: metal protection grid against accidental impacts.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MP Oversized microprocessor: compared to the standard microprocessor, it allows a multi-language display reading, a more detailed description of parameters, the possibility to manage up to 8 units, to manage non standard communication protocols, a better access to the program.
- MT
 High and low pressure gauges for measuring circuit pressure.

 MV
 Buffer tank of suitable capacity complete with expansion vessel,
- safety valve, water gauge, water charge and discharge valves, air purging valves.
 P1 Single pump group: chilled water pump group composed of
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PT Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RR** Copper/copper condensing coils: special execution of the condensing coils with copper pipe and fins.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification. It is necessary to consider option BT.
- RV Personalized frame painting in RAL colour.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data - Standard version

RAE		842 C K	962 C K	1102 C K	1402 C K	1502 C K	1602 C K	2302 C K	2402 C K	2602 C K
Cooling capacity									t n	
Cooling capacity	kW	80,8	86,1	96,0	126,0	133,0	149,0	199,8	215,0	229,0
Nominal input power	kW	27,1	31,8	38,0	44,4	50,2	56,0	69,6	73,4	80,0
EER	KII	2,98	2,71	2,53	2,84	2,65	2,66	2,87	2,93	2,86
Centrifugal fans		2,90	2,71	2,55	2,04	2,05	2,00	2,07	2,75	2,00
Quantity	n.		3			4			6	
Air flow	m ³ /h	40.000		.200	50		48.000		73.200	
Air flow	l/s	11.110					20.330			
	1/5	11 110	10	415	<u>دا</u>	090	12 200		20 330	
STD Version		50			10		100	1		
Available pressure	Pa	50			70		100		80	
Rotation speed	rpm	920		000	9	15	935		920	
Notor input power	kW		12,0			16,0			24,0	
Nominal input current	A		28,2			37,6			56,4	
Sound pressure level	dB(A)		70		7	12	73		74	
1M Version										
Available pressure	Pa	100	1	80	1	90	240		220	
Rotation speed	rpm	970		1.	030		1.062		1.020	
Notor input power	kW		12,0			16,0			24,0	
lominal input current	A		28,2			37,6			56,4	
ound pressure level	dB(A)	72	71	72	7	74	75		78	
2M Version										
wailable pressure	Pa	260)	.70	3	50	355		350	
Rotation speed	rpm	1.110		100				170	550	
Aotor input power	kW	1117	15,5			22,0			33,0	
lominal input current	A		36,0			48,0			72,0	
iound pressure level	dB(A)		75			76		7		78
	UD(A)		/3			/0		<i>I</i> .	/	/0
Scroll compressors		2	1							
Quantity	n.	2					4			
ircuits	n.					2				
tandard capacity steps	n.					2				
)ptional capacity steps	n.	-					4			
lominal input current	A	48,0	57,0	68,0	77,0	89,0	93,0	117,0	126,0	139,0
Aaximum input current	A	64,0	80,0	88,0	108,0	118,0	128,0	164,0	186,0	208,0
nrush current	A	230,0	183,0	193,0	248,0	284,0	294,0	348,0	406,0	428,0
Evaporator										
ype						Shell and tube				
Quantity	n.					1				
Nater flow	m³/h	13,9	14,8	16,5	21,7	22,9	25,6	34,4	36,9	39,4
Vater flow	I/s	3,86	4,11	4,59	6,02	6,35	7,12	9,55	10,27	10,94
Pressure drop	kPa	21	27	30	49	55	69	47	74	80
Pumps	ĸĩŭ	21	27	50		55	07	1	74	00
21 – Available pressure	kPa	124	118	110	116	100	76	133	101	86
	kPa	124		110	110		/0	133		00
P1 – Motor input power		150	1,1	145	1(1	1,5	121	100	3,0	120
21H – Available pressure	kPa	159	153	145	161	145	121	183	151	136
21H — Motor input power	kW	47-	1,5			2,2			4,0	
T – Available pressure	kPa	149	138	130	131	110	86	123	86	71
T – Motor input power	kW		1,5			2,2			3,0	
apacity of buffer tank						720				
Electrical data										
íotal input power	kW	39,0	44,0	50,0	60,0	66,0	72,0	94,0	97,0	104,0
otal nominal input current	A	78,0	88,0	98,0	118,0	131,0	135,0	178,0	187,0	200,0
Aaximum total input current	A	94,0	110,0	118,0	150,0	156,0	170,0	225,0	242,0	269,0
otal inrush current	A	260,0	213,0	223,0	286,0	322,0	336,0	409,0	462,0	489,0
Dimensions										
ength	mm		2.610			3.460			5.120	
Vidth	mm		2 010		1	1.242		1	5 150	
eight	mm					1.995				
ength with MV option			3.460			4.305			5.992	
	mm		J 40U						כעג כ	
Vidth with MV option	mm					1.245				
leight with MV option	mm	4100.1			41005	1.992				
ransport weight	kg	1:334	1.449	1.426	1.800	1.840	1.940	2'400	2.420	2.240
ransport weight with empty buffer tank	kg	1.264	1.629	1.686	2.030	2.020	2`170	2.630	2.680	2.2.2
efrigerant charge per circuit	kg	9,0	12,0	13,0	17,0	22	2,0	34,0		5,0
efrigerant charge per circuit with option O	kg		9,4			20,0			31,0	
lectrical power supply										
lectrical power supply	V / ph / Hz					400/3/50+N+	[
	· · · ·									

REMARKS:

- In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordingly.

REFRIGERANT R407C

Technical data - Ultrasilenced version

RAE U Cooling capacity		842 C K	962 C K	1102 C K	1402 C K	1502 C K	1602 C K	2302 C K	2402 C K	2602 C	
Cooling capacity	kW	74,6	84,0	94,5	126,0	137,0	147,0	204,0	212,0	225,0	
	kW					,		,			
Nominal input power EER	KVV	28,2	32,8	38,2	43,8	49,1	57,2	67,6	75,2	81,2	
		2,64	2,56	2,47	2,88	2,79	2,57	3,02	2,82	2,77	
Centrifugal fans								1			
uantity	n.		3	4		6			8		
ir flow	m³/h	21:300		800		43`800			54`400		
ir flow	l/s	5'920	8.	000		12.120			15.110		
STD Version											
wailable pressure	Pa	60			70				100		
otation speed	rpm	590	760	590		610			650		
lotor input power	kW	3,3	6,6	4,4		6,6			8,8		
lominal input current	A	8,4	15,9	11,2		16,8			22,4		
ound pressure level	dB(A)	60	64	60		61			64		
M Version					1			1			
vailable pressure	Pa	160	190	160			2	50			
otation speed	rpm	750	890	720		880	2		870		
lotor input power	kW	3,3	6,6	4,4		9,0			12,0		
ominal input current	A	8,4	15,9	11,2		22,2			29,6		
							(0				
ound pressure level	dB(A)	(5	66	6	8	69	I	74		
M Version		250		70		2/0			270		
vailable pressure	Pa	250		70		360			370		
otation speed	rpm	870	975	870			1.	015			
lotor input power	kW	4,5	9,0	6,0		13,2			17,6		
ominal input current	A	11,1	20,1	14,8		31,8			42,4		
ound pressure level	dB(A)	67	6	58		69		7	4	75	
croll compressors											
uantity	n.	2					4				
rcuits	n.					2					
andard capacity steps	n.					2					
ptional capacity steps	n.	_					4				
ominal input current	A	48,8	58,8	68,0	75,8	87,0	. 95,0	115,0	129,0	141,0	
laximum input current	A	64,0	80,0	88,0	108,0	118,0	128,0	164,0	186,0	208,0	
rush current	A	230,0	183,0	193,0	248,0	284,0	294,0	348,0	406,0	428,0	
vaporator	A	230,0	103,0	193,0	240,0	204,0	294,0	540,0	400,0	420,0	
						Chall and tuba					
/pe						Shell and tube					
uantity	n.	12.0			24.7	1	25.2	25.4			
/ater flow	m³/h	12,8	14,4	16,2	21,7	23,5	25,3	35,1	36,5	38,7	
/ater flow	l/s	3,56	4,01	4,52	6,02	6,55	7,02	9,75	10,13	10,75	
essure drop	kPa	20	26	29	49	58	67	48	72	81	
umps											
1 – Available pressure	kPa	124	118	110	120	97	83	133	101	86	
1 – Motor input power	kW		1,1			1,5			3,0		
1H – Available pressure	kPa	159	153	145	175	142	133	183	151	136	
1H – Motor input power	kW		1,5			2,2			4,0		
T – Available pressure	kPa	149	138	130	135	107	93	123	86	71	
T – Motor input power	kW		1,5			2,2			3,0		
apacity of buffer tank			1,5			720			570		
lectrical data						720					
otal input power	kW	32,0	39,0	43,0	50,0	56,0	64,0	76,0	84,0	90,0	
otal nominal input current	A	58,0	75,0	81,0	95,6	106,0			155,0	167,0	
							114,0	141,0			
laximum total input current	A	74,0	96,0	99,0	125,0	135,0	147,0	190,0	208,0	234,0	
tal inrush current	A	240,0	199,0	204,0	265,0	301,0	313,0	374,0	428,0	454,0	
imensions								1			
ngth	mm	2.0	510	3'460		5.120			6'840		
idth	mm					1.242					
right	mm					1.992					
ngth with MV option	mm	3.4	160	4`305		5.992			6'840		
idth with MV option	mm					1.242					
eight with MV option	mm					1.995					
J TEAC	kg	1.322	1.462	1.757	2.482	2.525	2.235	2.980	3.000	3.050	
ansport weight		1.282	1.697	1'987	2.715	2.775	2.765	3.210	3.530	3.522	
ansport weight ansport weight with empty buffer tank	ka					L / I J	2 / 05	5 2 10	J 2JU	5 2 3 0	
ansport weight with empty buffer tank	kg ka				27.05			<u> </u>		16 5	
ansport weight with empty buffer tank frigerant charge per circuit	kg	12	2,0	17,0	27.0	26,0		45,5	46,0	46,5	
ansport weight with empty buffer tank		12						45,5 40,0	46,0	46,5 1,0	

REMARKS:

- In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordingly.



REFRIGERANT R407C

R407C - Correction factors for cooling capacity (scroll compressors)

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	17	1,522	1,492	1,463	1,416	1,370	1,339	1,304	1,252	1,212
	16	1,477	1,448	1,419	1,374	1,330	1,330	1,265	1,213	1,174
	15	1,433	1,404	1,376	1,333	1,289	1,260	1,226	1,175	1,137
	14	1,388	1,360	1,333	1,291	1,249	1,221	1,187	1,137	1,099
	13	1,343	1,317	1,290	1,250	1,209	1,182	1,148	1,099	1,062
	12	1,298	1,273	1,247	1,208	1,169	1,142	1,110	1,060	1,024
	11	1,253	1,229	1,204	1,166	1,128	1,103	1,071	1,022	0,987
	10	1,028	1,185	1,161	1,125	1,088	1,064	1,032	0,984	0,949
	9	1,163	1,141	1,118	1,087	1,048	1,025	0,993	0,946	0,912
	8	1,118	1,097	1,075	1,041	1,008	0,985	0,954	0,907	0,874
Temperature	7	1,073	1,053	1,032	1	0,968	0,946	0,915	0,869	0,837
of water leaving from	6	1,027	1,007	0,986	0,956	0,925	0,904	0,873	0,827	0,800
evaporator °C	5	0,981	0,961	0,941	0,911	0,882	0,862	0,831	0,785	0,763
	4	0,948	0,928	0,909	0,880	0,851	0,831	0,802	0,759	0,735
	3	0,915	0,896	0,877	0,848	0,820	0,801	0,773	0,732	0,708
	2	0,881	0,863	0,845	0,817	0,789	0,770	0,744	0,706	0,681
	1	0,848	0,830	0,813	0,785	0,757	0,739	0,715	0,680	0,654
	0	0,815	0,798	0,781	0,753	0,726	0,708	0,686	0,653	0,626
	-1	0,781	0,765	0,749	0,722	0,695	0,677	0,657	0,627	0,599
	-2	0,748	0,732	0,717	0,690	0,664	0,647	0,628	0,601	0,572
	-3	0,715	0,700	0,685	0,659	0,633	0,616	0,599	0,575	0,544
	-4	0,681	0,667	0,653	0,627	0,602	0,585	0,570	0,548	0,517
	-5	0,648	0,634	0,621	0,596	0,571	0,554	0,541	0,522	0,490

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

The unit works with an evaporation water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
 Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 For further darifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for input power (scroll compressors)

External air te	mperature °C	28	30	32	35	38	40	42	45	48
	17	1,007	1,039	1,071	1,126	1,180	1,217	1,257	1,316	1,366
	16	0,994	1,026	1,058	1,113	1,168	1,204	1,244	1,304	1,355
	15	0,981	1,013	1,046	1,100	1,155	1,192	1,232	1,292	1,345
	14	0,968	1,001	1,033	1,088	1,143	1,179	1,219	1,279	1,335
	13	0,955	0,988	1,020	1,075	1,130	1,167	1,207	1,267	1,324
	12	0,942	0,975	1,008	1,063	1,118	1,154	1,194	1,255	1,314
	11	0,929	0,962	0,995	1,050	1,105	1,142	1,182	1,242	1,304
	10	0,916	0,949	0,982	1,037	1,093	1,129	1,170	1,230	1,294
	9	0,903	0,936	0,970	1,025	1,080	1,117	1,157	1,218	1,283
_	8	0,890	0,924	0,957	1,012	1,067	1,104	1,145	1,206	1,273
Temperature	7	0,877	0,911	0,944	1	1,055	1,092	1,132	1,193	1,263
of water leaving from	6	0,872	0,904	0,937	0,987	1,037	1,071	1,110	1,169	1,232
evaporator °C	5	0,866	0,898	0,929	0,974	1,020	1,050	1,088	1,145	1,201
	4	0,853	0,884	0,915	0,961	1,006	1,036	1,074	1,132	1,189
	3	0,839	0,870	0,901	0,947	0,992	1,023	1,061	1,119	1,177
	2	0,825	0,856	0,888	0,933	0,979	1,009	1,048	1,106	1,166
	1	0,812	0,843	0,874	0,919	0,965	0,996	1,034	1,093	1,154
	0	0,798	0,829	0,860	0,906	0,951	0,982	1,020	1,080	0,142
	-1	0,784	0,815	0,846	0,892	0,938	0,968	1,008	1,067	1,130
	-2	0,770	0,801	0,832	0,878	0,924	0,955	0,994	1,054	1,118
	-3	0,757	0,787	0,818	0,864	0,911	0,941	0,981	1,041	1,060
	-4	0,743	0,774	0,804	0,850	0,897	0,928	0,968	1,028	1,094
	-5	0,729	0,760	0,790	0,837	0,883	0,914	0,954	1,015	1,082

REMARKS:

The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5 °C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.

- For further clarifications or information, you are kindly request to contact our sales departement.



REFRIGERANT R410A



RAE ... Kc Series

Cooling capacity from 5 to 24 kW - 1 and 2 circuits

The air cooled chillers of **RAE Kc series** are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. Therefore during their design, it has been given a particular care for dimensions and sound level, so to have compact and silent units at the same time.

They can also be matched to fancoils or terminal units or for water cooling in small industrial processes.

Depending on the cooling capacity, they are available with 1 and 2 cooling circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces, also when supplied with the hydraulic kit.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **RAE...Kc** standard version Horizontal air flow for models from 41 to 111 Vertical air flow for models from 182 to 222 **RAE...PS Kc** with hydraulic kit

Operation limits (standard units):

AIR: from 15 to 45°C; WATER (out from evaporator): from 5 to 15°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service. For size from 41 to 111, the compressor section is still insulated with close-cell polyurethane foam material. For PS version, the hydraulic kit is installed at the bottom of the unit for size from 41 to 111 and it is composed of: circulation pump, buffer tank, safety valve, pressure gauge, water filling and discharge valves, purging valve, expansion vessel. For other sizes, when required, the hydraulic kit is installed inside the unit. **High-efficiency scroll compressor** (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. In case of 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



REFRIGERANT R410A

Accessories

- AE
 Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.

 BT
 Low temperature operation (-20°C): electronic device for the
- continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT High and low pressure gauges for measuring circuit pressure (from size 182).
- **MV Buffer tank** of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves (from size 182).
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type (from size 182).
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type (from size 182).

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R410A

Technical data

RAE		41 Kc	51 Kc	61 Kc	81 Kc	111 Kc	182 Kc	222 Kc	182.PS Kc	222.PS Kc
Cooling capacity										
Cooling capacity	kW	5,5	5,8	7,0	8,9	11,5	17,3	22,4	19,4	24,0
Nominal input power	kW	1,7	1,9	2,6	3,3	4,3	6,3	9,0	5,3	8,1
EER		3,23	3,05	2,69	2,70	2,67	2,75	2,49	3,66	2,96
Axial fans										
Quantity	n.			1					2	
Rotation speed	rpm					900				
Air flow	m³/h		3.420		3`850	3.600	7.280	7.068	11	990
Air flow	l/s		964		1.069	1.000	2.106	1.963	3	331
Motor input power	kW			0,15			0,	,29	0,	74
Input current	A			0,64			1,	,28	3	,4
Scroll compressors										
Quantity	n.			1					2	
Circuits	n.			1					2	
Standard capacity steps	%			0-100				0-5	0 - 100	
Nominal input current	A	8,1	8,7	12,3	16,1	27,0	12,0	16,0	5,2	7,5
Maximum input current	A	,	7,0	20,0	24,0	32,0	17,0	21,0	19,0	23,0
Inrush current	A	59,0	62,0	83,0	98,0	65,0	106,0	140,0	109	143,0
Evaporator			-/-	-,-	-,-		-,-			
Туре						Brazed plate				
Quantity	n.			1		Diazea plate			2	
Water flow	m³/h	0,94	1,01	1,19	1,51	1,98	2,99	3,85	3,35	4,14
Water flow	l/s	0,26	0,28	0,33	0,42	0,55	0,83	1,07	0,93	1,15
Pressure drop	kPa	39	45	36	38	39	36	37	45	43
Electrical data			15	50	50		50	57	15	
Total input power	kW	2	,0	3	,0	4,0	7,0	9,0	6,0	9,0
Total nominal input current	A		.0	13,0	17,0	28,0	12,0	17,0	9,0	11,0
Maximum total input current	A		3,0	21,0	25,0	33,0	18,0	,	2,0	26,0
Total inrush current	A	60,0	63,0	84,0	99,0	66,0	107,0	141,0	112,0	146,0
Sound pressure level	n	00,0	05,0	01,0	55,0	00,0	107,0	141,0	112,0	110,0
Sound pressure at 1 m	dB(A)	5	1		52	53	55	56	6	2
PS Version	uD(A)		1		72	55	00 CC			2
Available pressure	kPa	31	24	33	29	24		_	145	88
Pump group motor power	kW	1	24	0,08	23	24		_		55
Input current	A			0,92				_		,0
Higher available pressure pump group	kPa			0,92	_				195	,0 95
Motor input power	kW								0,55	0,75
Input current	A								4,0	5,5
Capacity of buffer tank	A I			30	_			_	,	0
Expansion vessel				2						5
				2			I)
Dimensions	mm			980			1.	100	1.7	500
Length Width	mm						1		/50	000
	mm			325			1.			0.00
Height	mm		14	715	101	120		100		250
Transport weight	kg	1		115	121	138	278	320	318	343
Refrigerant charge per circuit	kg		1,5		2,0	2,9	2,1	2,5	4,4	2,1
Dimensions for PS version				000					a	100
Length	mm			980				-		500
Width	mm			325				_		50
Height	mm			1.000		1		-		250
Transport weight with empty buffer tank	kg		56	158	164	138		-	376	400
Weight in operation	kg	18	36	188	194	139		-	456	480
Electrical power supply										
Electrical power supply	V / ph / Hz			230/1/50+N+1	[400/3/	50 + N + T	

REMARKS: - Operating conditions: External air temperature 35°C; water temperature 7/12°C - Sound pressure level at 1 m in open field (ISO 3744).

REFRIGERANT R410A



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RAE ... Kc Series

Cooling capacity from 77,5 to 467 kW - 2 circuits

The air cooled chillers of **RAE** **Kc series**, are designed for outdoor installation and are particularly suitable for cooling water in air conditioning systems or in industrial processes for cooling glycol water.

Each group has two independent cooling circuits provided with R410A scroll compressors.

The units have been designed to reduce their footprint as much as possible, keeping high cooling performances, thanks to the use of excellent quality and new technology components.

All units are completely assembled and tested in the factory in compliance with specific quality procedures; they are still provided with all cooling, water and electrical connections so to quickly install them, once on site.

Before the factory test, the cooling circuits are tested under pressure and then supplied with refrigerant and non-freezing oil charge.

The following versions are available: **RAE** **Kc** standard version **RAE** **S Kc** – silenced version **RAE** **U Kc** – ultrasilenced version

For versions S and U, the reduction of the sound level is due to the use of refrigerant/air exchangers with wider surfaces than the standard units, to a soundproofed compressor cabinet and to the control of the fans speed by means of an electronic regulation.

Operation limits (standard units):

AIR: from 15 to 45°C; WATER (out from evaporator): from 5 to 15°C.

Main components:

Structure made of base and frame realized in high thickness galvanized steel, assembled by means of stainless steel rivets. All the galvanized steel surfaces are coated with powder painting of RAL 7035 colour.

Scroll compressor for refrigerant R410A, operating on two independent cooling circuits, in tandem or trio version. Compressors are installed on rubber vibration dampers, provided with direct start motors, cooled by the intaken refrigerant, and equipped with overload protections and crankcase heater. They are charged with polyester oil and their compressors terminal board is IP54. The microprocessor on board enables or disenables the compressors, regulating in this way also the cooling capacity.

Stainless steel plate evaporator of "dual circuit" type, coated with close-cell insulating and of high thickness material. The max operating pressure limits are 10 bar for water side and 32 bar for refrigerant side.

Heat-exchange external coils with micro-finned copper tubes, positioned in staggered rows and mechanichally expanded into an aluminium finned pack. Fins are designed with such a shape so to give the highest heat exchange efficiency (turbo-fin). The max operating pressure refrigerant side is 45 bar rel.

Axial fans, of directly coupled type, with wing-profile aluminium blades, suitably designed not to create air turbulence. They are therefore ensuring the max efficiency with the lowest sound level. Each fan is provided with galvanized steel protection grid, painted after construction. The IP54 fans motors are completely closed and provided with in-built overload protection thermostat, incorporated to the motor windings.

Independent cooling circuits, each one with a shut-off valve for refrigerant charge, antifreeze sensor, shut-off valves on discharge and liquid lines, sight glass, dehydrating filter, high pressure safety device on high pressure refrigerant side, electronic thermostatic expansion valve, high and low pressure switches.

Electric board realized in compliance with 60204-1/IEC 204-1 standards, inside of which are placed the control system and the components for motors starting, wired and tested in the factory. It is made by a cabinet suitable for outdoor installation, containing power and control devices, microprocessor electronic board complete with keypad and display, for visualizing the several fonctions available, main switch of lock-door type, isolation transformer for auxiliary circuits, automatic switches, fuses and protection switches for compressors and fans, terminals for general alarm and remote ON/OFF, terminal board, relais for phase sequencing, possibility to interface to EMS/BMS systems.



REFRIGERANT R410A

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
- **BT Low temperature operation (-20°C)**: electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed, allowing the unit operation down to -20°C.
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (already included in S version).
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a suitably coated cabinet, vibration dampers under compressors, mufflers on compressors discharge pipes (already included in U version).
- CI Soundproofing jacket on compressors made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (not available for S and U versions).
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **GP** Condensing coil protection grid: metal protection grid against accidental impacts.
- GP1 Protection grid for compressors section: metal protection grid against accidental impacts.
- Victaulic insulation on pump side: insulation of the joints by close-cell polyurethane material, to prevent condense, pump side.
 Victaulic insulation on buffer tank side: insulation of the joints
- by close-cell polyurethane material, to prevent condense, buffer tank side.
 IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a
- Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.

MT High and low pressure gauges for measuring circuit pressure.

- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, check valves for filter service operations. (Not available for 1-fan units).
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PT Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type.
- **RA** Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- **RF Power factor correction system cosfi >0,9**: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM** Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RR Copper/copper condensing coils:** special execution of the condensing coils with copper pipe and fins.
- RT Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification. It is necessary to consider option BT.

RV Personalized frame painting in RAL colour.

- **Voltmeter**: Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.
- 1M High pressure fans: installed in the factory, they are available only for standard units, with an available pressure of 60 Pa.

REFRIGERANT R410A

Technical data - Standard version

RAE		772 Kc	852 Kc	1412 Kc	1532 Kc	1642 Kc	2002 Kc	2302 Kc	2702 Kc	3002 Kc	3402 Kc	3802 Kc	4202 Kc	4502 Kc
Cooling capacity														
Cooling capacity	kW	77,5	92,7	140.6	152,5	163,9	207,5	241,0	269,0	300,0	322.0	406.0	424.0	467,0
Nominal input power	kW	25.6	30,2	43,4	47,3	51,2	68.0	75,4	84,8	91,8	101,7	125.0	131,3	158,7
EER		3.03	3.07	3,24	3,22	3.20	3,05	3,20	3,17	3,27	3,17	3,25	3,23	2,94
Axial fans		5,05	5,01	5/21	5/22	5,20	5,05	5,20	5,	5,2.	5,	5725	5/25	2/21
Quantity	n.		1		2			3			4		5	
Rotation speed	rpm				-			915					5	
Air flow	m ³ /h	26.100	23.960	51.200	48.230	47.140	78.800	75.400	72.800	100.500	91.200	124.200	120.400	113.000
Air flow	/s	7.220	6.626	14.222	13.481	13.094	21.889	20.944	20.225	27.833	25:333	34.200	33.444	31'389
Motor input power	kW		48	17 222	4,96	15 071	21 007	6,9	20 222	9,2	9,8	54 500	11,8	51 507
Input current	A	5,			10,3			14,7		19.6	20.0		25,0	
Scroll compressors	n	J,	15		10,5		<u> </u>	17,7		17,0	20,0		23,0	
Quantity	n			2					4			6	4	6
Circuits	n.			2				2	4			0	4	0
	n.			2				2			4			
Standard capacity steps	n.	40.0	56.2		04.2	00.0	145.5	162.4	101 E			275.0	200.0	202.0
Nominal input current	A	49,9 76.0	56,2 89.0	80,6 130.0	84,3 144,0	88,0 158,0	145,5 204.0	163,4 222.0	181,5 248.0	190,0	198,0 288.0	275,0 372,0	280,0 392.0	302,0 432,0
Maximum input current					1					268,0				
Inrush current	A	205,0	240,0	300,3	360,3	364,0	215,0	365,0	385,0	446,0	453,0	468,0	530,0	550,0
Evaporator		1					-	D /						
Туре								Brazed plate						
Quantity	n.		45.0					1				<i>(</i>) =		
Water flow	m³/h	13,3	15,9	24,2	26,2	28,2	35,6	41,4	46,1	51,5	55,1	69,5	72,7	79,9
Water flow	l/s	3,7	4,4	6,7	7,3	7,8	9,9	11,5	12,8	14,3	15,3	19,3	20,2	22,2
Pressure drop	kPa	35	28	36	4	2	59	76	72	82	77	70	69	74
Water connections	DN			1″½				2″½				3″		
Pumps				1										
P1 – Available pressure	kPa	152	147	1.		131	132	120	153	138	125	140	175	163
P1 – Motor input power	kW		,1		1,9			,0		,0		,5		,5
P1H – Available pressure	kPa	192		02	195	186	205	202	200	188	225	220	300	280
P1H – Motor input power	kW		,9		3,0				,5			,5		1,0
PT – Available pressure	kPa	152	157	122	115	166	186	118	81	64	73	136	165	124
PT – Motor input power	kW			2,2			5	,5		4,0			7,5	
Capacity of buffer tank	I		_		300			400		8	00		1.100	
Electrical data														
Total input power	kW	28,1	32,7	48,4	52,3	56,2	74,9	82,3	91,7	101,0	111,5	136,8	143,1	170,5
Total nominal input current	A	55,1	61,4	90,9	94,6	98,3	142,2	161,3	181,5	190,0	197,6	274,6	280,0	301,6
Maximum total input current	A	81,2	94,2	140,3	154,3	168,3	218,7	236,7	262,7	287,6	308,0	397,0	417,0	457,0
Total inrush current	A	210,1	245,1	310,6	370,6	374,3	229,7	379,7	399,7	465,6	473,0	493,0	555,0	575,0
Sound pressure level														
Sound pressure at 1 m	dB(A)	7	'5			77				79		80	83	80
Sound pressure at 10 m	dB(A)	5	9			61				63		64	67	64
Dimensions														
Length	mm	1.0	620		2.660			3.200		4.	740		5.280	
Width	mm							1'370						
Height	mm							2.420						
Transport weight	kq	985	1.080	1.530	1'340	1'390	1.810	2.180	2.330	2.232	2.760	2.872	2.944	3.20
Weight in operation	kg	1.010	1.102	1.255	1'365	1.415	1.885	2.272	2.435	2.640	2.832	2.952	3.022	3.795
Electrical power supply				. 200				2 2.0	2	2 0.0	2 000		5 011	33

REMARKS: - Operating conditions: External air temperature 35°C; water temperature 12/7°C. - Sound pressure levels calculated according to ISO 3744.



REFRIGERANT R410A

Technical data - Silenced version

RAES		772 Kc	852 Kc	1412 Kc	1532 Kc	1642 Kc	2002 Kc	2302 Kc	2702 Kc	3002 Kc	3402 Kc	3802 Kc
Cooling capacity												
Cooling capacity	kW	74,9	91,0	133,6	144,9	155,7	208,8	234,0	270,0	291,0	321,0	406,0
Nominal input power	kW	27,1	32,0	46,0	50,1	52,0	70,2	82,1	89,4	98,0	102,3	133,5
EER		2,76	2,84	2,90	2,89	2,99	2,97	2,85	3,02	2,97	3,14	3,04
Axial fans			,					,	,			
Quantity	n.	1		2			3			4		5
Rotation speed	rpm						720					
Air flow	m ³ /h	19.575	52.600	38'400	36.397	58	800	51'200	78.800	68.400	97.900	87.000
Air flow	I/s	5.438	14.611	10.662	10.110		333	14.222	21.889	19.000	27.194	24.167
Motor input power	kW	1,74		4,96			4,8			,4		3,0
Input current	A	3,60		10,3			8,7			1,6		4,5
Scroll compressors		5,00				1	0,1			.,•	· ·	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Quantity	n.			2					4			6
Circuits	n.			-			2					
Standard capacity steps	n.			2			2			4		
Nominal input current	A	53,4	60,1	86,2	90,2	94,2	128,0	150.0	166,8	170,4	177,6	249.0
Maximum input current	A	76,0	89,0	130,0	144,0	158,0	204,0	222,0	248,0	268,0	288,0	372,0
Inrush current	A	205,0	240,0	300,3	360,3	364.0	215,0	365,0	385,0	446,0	453.0	468,0
Evaporator	/	203,0	210,0	500,5	500,5	504,0	215,0	505,0	505,0	110,0	155,0	100,0
Туре							Brazed plate					
Quantity	n.						1					
Water flow	m ³ /h	12,9	15,7	23,0	24,9	26,8	35,8	40,2	46,4	50,0	55,1	69,7
Water flow	/s	3,6	4,3	6,4	6,9	7,4	10,0	11,2	12,9	13,9	15,3	19,4
Pressure drop	kPa	34	27	37		1 /, 1	61	71		6	79	72
Water connections	DN	J 4	21	1″½		†I	01	2″½	1		3″	12
Pumps	DN			1 /2				2 /2			, ,	
P1 — Available pressure	kPa	152	147	1	51	131	130	125	149	144	123	138
P1 – Motor input power	kW		,1	1	1,9	171		,0	7	4,0	125	5,5
P1H – Available pressure	kPa	192		02	1,5	186	203	,0 207	196	194	223	218
P1H – Motor input power	kW		2 ,9	02	3,0	100		.0	170		,5	210
PT — Available pressure	kPa	152	,9	122	115	166	118	92	78	73	,5	134
PT – Motor input power	kW	IJZ	IJ/	2,2	L I J	100		.0	70	4.0	/1	7.5
Capacity of buffer tank		_		300			400	,0	8	4,0	1.	100
Electrical data		_		300			400		0	00	1	100
Total input power	kW	28,9	37,0	51,0	55,1	56,8	75,0	86,9	95,8	104,4	110,3	141,5
Total nominal input current	A	57,0	70,4	96,5	100,5	102,9	136,7	158,7	178,4	182,0	192,1	263,5
Maximum total input current	A	79,6	99,3	140,3	154,3	166,7	212,7	230,7	259,6	279,6	302,5	386,5
Total inrush current	A	208.6	250,3	310.6	370.6	372,7	212,7	373,7	396.6	457.6	467,5	482,5
Sound pressure level	<u> </u>	200,0	230,5	510,0	570,0	512,1	LLJ,I	515,1	570,0	ט, ונד	<i>L,</i> 10F	402,5
Sound pressure at 1 m	dB(A)	-	2		74		· ·	73	-	'5	76	77
Sound pressure at 10 m	dB(A)		2		58			57		i9	60	61
Dimensions	UD(A)		0		70		· ·)/		17	00	01
Length	mm	1.620		2.660			3.200		۷	740	٤.	780
Width	mm	1 020	l	2 000			1.320		4.	UTU	<u> </u>	00
	mm						2.420					
Height Transport weight		1.020	1.580	1.320	1.410	2.730	1.995	2.242	2.460	2.622	2.970	3.168
Transport weight	kg	1.022					2.040			2.622		
Weight in operation Electrical power supply	kg	1.022	1.302	1.342	1.432	2.755	2 040	2.342	2.270	2.790	3.048	3`252
Electrical power supply Electrical power supply	V/ph/Hz						00V / 3 / 50 + T -					

REMARKS: - Operating conditions: External air temperature 35°C; water temperature 12/7°C. - Sound pressure levels calculated according to ISO 3744.



REFRIGERANT R410A

Technical data - Ultrasilenced version

RAEU		772 Kc	852 Kc	1412 Kc	1532 Kc	1642 Kc	2002 Kc	2302 Kc	2702 Kc	3002 Kc	3402 Kc	3802 Kc
Cooling capacity												
Cooling capacity	kW	69,7	87,3	128,0	139,3	147,5	202,5	227,0	261,8	282,5	311,4	393,6
Nominal input power	kW	27,6	32,6	46,9	51,1	55,4	72,0	84,2	91,6	100,5	104,9	136,8
EER		2,53	2,68	2	,73	2,66	2,81	2,70	2,86	2,81	2,97	2,88
Max ext. air temp. FOR ULTRASILENCED OPERATION	°C		36		35		36		37		6	35
Axial fans											-	
Quantity	n.	1		2			3			4		5
Rotation speed	rpm						670					-
Air flow	m ³ /h	14.616	28	672	27.177	42	100	36.400	54.800	48.400	67.600	59.600
Air flow	l/s	4.060		964	7.549		694	10.111	15.222	13.444	18.778	16.226
Motor input power	kW	1,4	,	2,87	7 517		3,5	10 111		l,6		,8
Input current	A	2,9		5,9			8,4			r,o 1,2		,o 4,0
Scroll compressors	n	2,9		J,9			0,4		1	1,2	1.	+,0
Quantity	n.	1		2					4			6
Circuits				Z			2		4			0
Standard capacity steps	n. n.			2			2			4		
		57.1	64.2	92,2	06 E	100.0	120.4	153.0			100.0	260.2
Nominal input current	A	57,1 76,0	64,3 89,0	92,2	96,5 144,0	100,8 158,0	130,4 204,0	152,8 222,0	169,8 248,0	173,5 268,0	180,8 288,0	268,2 372,0
Maximum input current				,		,	,	,				,
Inrush current	A	205,0	240,0	300,3	360,3	364,0	215,0	365,0	385,0	446,0	453,0	468,0
Evaporator							D					
Туре							Brazed plate					
Quantity	n.						1					
Water flow	m³/h	12,0	15,0	22,0	24,0	25,4	34,8	39,0	44,9	48,5	53,5	67,6
Water flow	l/s	3,3	4,2	6,1	6,7	7,0	9,7	10,8	12,5	13,5	14,8	18,8
Pressure drop	kPa	33	26	34		10	59	68	7	74	75	68
Water connections	DN			1″½				2″½			3″	
Pumps												
P1 – Available pressure	kPa	152	147	1	51	131	132	128	151	146	127	142
P1 – Motor input power	kW		,1		1,9			,0		l,0		,5
P1H – Available pressure	kPa	192		202	195	186	205	210	198	196	227	222
P1H – Motor input power	kW		,9		3,0				,5			,5
PT – Available pressure	kPa	152	157	122	115	166	115	95	82	79	71	139
PT – Motor input power	kW			2,2			3	,0		4,0		7,5
Capacity of buffer tank		-		300			400		8	00	1.	100
Electrical data												
Total input power	kW	29,0	35,5	49,8	54,0	58,9	75,5	87,7	96,2	105,1	110,7	142,6
Total nominal input current	A	60,0	70,2	98,1	102,4	109,2	138,8	161,2	181,0	184,7	194,8	282,2
Maximum total input current	A	78,9	94,9	135,9	149,9	166,4	212,4	230,4	259,2	279,2	302,0	386,0
Total inrush current	A	207,9	245,9	306,2	366,2	372,4	223,4	373,4	396,2	457,2	467,0	482,0
Sound pressure level		, ,										, ,
Sound pressure at 1 m	dB(A)	(58			(59				70	71
Sound pressure at 10 m	dB(A)		52				53				54	55
Dimensions				1								
Length	mm	1.620		2.660			3.200		4	740	5	780
Width	mm		1			1	1.320			-		
Height	mm						2.420					
Transport weight	kg	1.120	1.330	1.380	1.490	2.790	2.020	2.520	2.482	2.692	2.992	3.193
Weight in operation	kg kg	1.145	1.355	1.405	1 490	2 790	2.020	2 270	2 405	2 815	3.023	3 195
Electrical power supply	ку	1 14)	נננו	1400	נוני	2013	2 005	2 30/	2 373	2 0 I J	5 0/ 5	5211
Electrical power supply	V / ph / Hz)0V / 3 / 50 + T -	N				

REMARKS: - Operating conditions: External air temperature 35°C; water temperature 12/7°C. - Sound pressure levels calculated according to ISO 3744.



REFRIGERANT R410A

R410A - Operation limits - Mod. 772 - 1642 Kc

	7	72	8	52	14	112	15	532	16	542
Range of outlet water temperature					from + 5	°C to +15°C				
Range of outlet water+glycol temperature					from -8 °	C to +15°C				
Range of temperature difference					from -	4 to 8 °C				
	min	max	min	max	min	max	min	max	min	max
Water flow – Lt/sec (1)	3,3	4,1	4,0	4,8	6,0	7,4	6,6	8,0	7,0	8,6
Water flow – mc/h (1)	12,0	14,6	14,3	17,5	21,8	26,6	23,6	28,8	25,4	31,0
Pressure drop kPa (1)	28	42	22	34	29	43	34	50	34	50
Max operating pressure water side					10	Bar				
Inlet air temperature – STD	5,0	45,0	5,0	45,0	5,0	45,0	5,0	45,0	5,0	45,0
Inlet air temperature – S	5,0	45,0	5,0	45,0	5,0	45,0	5,0	45,0	5,0	45,0
Inlet air temperature – U (for ULTRASIL. operation)	-5,0	36,0	-5,0	36,0	-5,0	36,0	-5,0	35,0	-5,0	36,0
Minimum control capacity regulation	5	0%	5	0%	5	0%	5	0%	50	0%

(1) Water 12/7°C - External air temperature 35°C

R410A - Operation limits - Mod. 2002 - 4502 Kc

	20	002	23	302	27	702	30	02	34	102	38	802	42	202	45	502
Range of outlet water temperature								from + 5°	'C to +15°C							
Range of outlet water+glycol temperature								from -8 °	C to +15°C							
Range of temperature difference								from 4	to 8 °C							
	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
Water flow – Lt/sec (1)	5,9	13,9	6,9	15,3	7,7	15,3	8,9	15,3	9,9	15,9	11,3	25,3	12,6	29,4	13,5	29,4
Water flow – mc/h (1)	21,2												105,8	48,6	105,8	
Pressure drop kPa (1)	38	140 41 132 42 112 17 92 45 85 46 131 46 140 4										46	136			
Max operating pressure water side								10	Bar							
Inlet air temperature — STD	5,0	44,8	5,0	45,8	5,0	45,5	5,0	46,4	5,0	46,2	5,0	46,0	5,0	45,7	5,0	44,4
Inlet air temperature – S	5,0	44,7	5,0	43,4	5,0	45,8	5,0	44,2	5,0	45,3	5,0	44,1	-	-	-	-
Inlet air temperature – U (for ULTRASIL. operation)	-5,0	-5,0 36,0 -5,0 32,0 -5,0 37,0 -5,0 36,0 -5,0 36,0 -5,0 36,0 -5,0										-	-			
Optimum water content (lt)	6	650 700 800 900 1.020 1.150 1.300 1.380											380			
Minimum control capacity regulation	2	5%	2	5%	2	5%	2	5%	2	5%	2	5%	2	5%	3	3%

(1) Water 12/7°C - External air temperature 35°C



REFRIGERANT R407C - R134A



Series RAH T

Cooling capacity from 190 to 737 kW - 2 circuits

The air cooled chillers of **RAH.T series** are designed for outdoor installation and are particularly suitable for industrial applications. They can also be used for medium and big air conditioning systems and to be matched to fancoils or terminal units. These units are standard provided by a technical housing, always protected by panels.

They are all available with 2 independent refrigerant circuits, with free-cooling coil (version F) and, when required, provided with buffer tanks of remarkable capacity, with no change in the overall dimensions.

Thanks to the several options available, these units are particularly flexible and can be easily adapted to all installation sites.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The available versions with both R407C (K) and R134a (Ka) refrigerants are the following:

K/Ka - standard version

S.K/ Ka - silenced version: oversized coil, reduced air flow, fans with a lower rotation speed, technical partition insulated by means of soundproofing material. **U.K/Ka -** ultra-silenced version: oversized coil, reduced air flow, fans with a very

low rotation speed, technical partition insulated by means of soundproofing material with bituminous rubber coating, vibration dampers on compressors suction and discharge pipes, mufflers on discharge pipes, compressors fixed on springtype vibration dampers.

F.K/Ka - standard version with free-cooling coil

FS.K/Ka - silenced version with free-cooling coil: oversized coil, reduced air flow, fans with a lower rotation speed, technical partition insulated by means of sound-proofing material.

FU.K/Ka - ultra-silenced version with free-cooling coil: oversized coil, reduced air flow, fans with a very low rotation speed, technical partition insulated by means of soundproofing material with bituminous rubber coating, vibration dampers on compressors suction and discharge pipes, mufflers on discharge pipes, compressors fixed on spring-type vibration dampers.

Operation limits (standard units):

AIR: from 15 to 45°C; WATER (out from evaporator): from 5 to 15°C.

Main components:

Strong and compact frame made of pressed and bended galvanized steel profiles, panels and base-frame of high thickness galvanized and painted steel and coated by rust-proof paint, suitable to resist to external agents. The technical housing, completely closed and suitably isolated from the air flow, is containing the compressors and the main components. The external panels, easily to be dismantled, allow the complete access in case of service, without compromising the operation of the unit itself. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit, with no change in overall dimensions.

Semi-hermetic screw compressors equipped with capacity steps, motor thermal protection, oil crankcase heater and phase monitor. The compressors lubrication is of forced type, with no pump and in order to prevent many oil migrations to the cooling circuit, the compressors are provided with an oil separator, in-built to the discharge side. The electrical motor is foreseen for lower inrush current and, in this is case, the unit is equipped with an automatic partial load inrush device and mechanical interlock of the inrush control switches, to prevent accidental short circuits (options DS and PW).

Heat-exchange external coil with copper tube and turbo aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

For free-cooling version (F) only, **additional free-cooling water coil** with copper tube and aluminium fins, complete with mixing valve, for production of chilled water by means of the very low external air temperatures. This allow a remarkable reduction of the compressors working hours with a consequent energy saving, also considering that each circuit is completely independent.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Dry expansion **shell and tube evaporator** with two refrigerant circuits and one water circuit, with very low pressure drops. Shell and tubes plate made in



carbon steel and copper tubes. Some plastic and corrosion-proof baffles are suitably placed inside the shell, allowing a correct water distribution and making the tube bundle particularly strong and vibration-free, also in case of very high water flows.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges, non-return valve on discharge side, shut-off valve on liquid line, shut-off valve on compressor discharge side.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a lock-door main switch. Inside, it is complete with all control and protection switches, the terminal board and auxiliaries. The electrical board also includes the control device for power supply phases, to prevent the compressor to turn in the wrong sense. The micro-processor, complete with display, is also placed inside the electrical board.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the chilled water temperature regulation, the working parameters, auto-detection failure system, remote management and supervision, complete with compressors hour counter.

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
 BT Low temperature operation (-20°C): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (already included in version F).
 CE UV protection on water insulation: particular coat of the evaporator and of water insulations with UV ray proof material.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- DS Star/delta: electric device of close transition type to reduce the inrush current, complete with short circuit safety by mechanical interlock.
- FA Condensing coil protection filters: washable metal filters with very low pressure drop, protecting the condensing coils from dirt, with aluminium mesh against dust and leaves.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts, made of 50x50 4-mesh wire.
- Victaulic insulation on pump side: insulation of the joints by close-cell polyurethane material, to prevent condense, pump side.
- 12 Victaulic insulation on buffer tank side: insulation of the joints by close-cell polyurethane material, to prevent condense, buffer tank side.
- I3 Victaulic insulation for the free-cooling version: insulation of the joints by close-cell polyurethane material, to prevent condense, free-cooling side.
- IG Watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- LI Liquid injection: mechanical device allowing a better cooling of compressors at very high compression level (standard for R407C).
- M12 Modulating capacity control for 2-circuit units: by means of some valves installed on compressors, the capacity is modulated from 12,5 to 100%.
- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- OS Oil flow safety switch: in-built in the compressor oil separator, it indicates the eventual decrease of the oil level.
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture (not available when option MV is required).
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PT Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type.
- PW Part-winding: equipment for step compressors starting, reducing of about 35% the inrush current of each compressor.
- **RA** Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- **RF Power factor correction system cosfi >0,9**: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value \geq 0,9, so to reduce the power absorption from the electrical network.
- RH Shut-off valve on suction side: they are use to isolate compressors during service operations.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RR Copper/copper condensing coils:** special execution of the condensing coils with copper pipe and fins.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification. It is necessary to consider option BT and it is not available on free-cooling.
- RV Personalized frame painting in RAL colour SC Insulated compressors housing with sound

v

Insulated compressors housing with sound proofing material (included on silenced version).

SU Insulated compressors housing with bituminous rubber sound proofing material, muffler on discharge pipe and vibration dampers for compressors (included on ultra-silenced version).

- TE Electronic thermostatic valve: it is requested to make a very accurate regulation of the refrigerant flow and to limit variations of cooling capacity and evaporator leaving temperature water during operation in transitions and for a better performance with fixed superheating.
 - **Voltmeter**: Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C - R134A

Technical data - R407C - Standard version

RAH Cooling capacity		2102 T K	2502 T K	2802 T K	3302 T K	3902 T K	4802 T K	5502 T K
cooling capacity	kW	205,0	255,0	276,0	345,0	377,0	472,0	550,0
		,						
ominal input power	kW	73,0	92,0	114,0	123,0	148,0	180,0	196,0
ER		2,81	2,77	2,42	2,80	2,55	2,62	2,81
xial fans								
luantity	n.		6		8	}	10	12
lotation speed	rpm				880			
ir flow	m ³ /h	126.000	117	000	156	000	195.000	234.000
kir flow	l/s	35.000		500	43		54.167	65`000
Notor input power	kW		12,0		16	,0	20,0	24,0
nput current	A		24,0		32	,0	40,0	48,0
crew compressors								
uantity	n.				2			
,					2			
poling circuits	n.							
andard capacity steps	n.				6			
lodulating capacity steps (option)	%				$0 - 12 \div 100$			
ominal input current	A	124,0	155,0	188,0	204,0	238,0	296,0	327,0
laximum input current	A	172,0	216,0	256,0	288,0	324,0	360,0	432,0
irush current	A	497,0	616,0	613,0	729,0	848,0	981,0	1.129,0
rush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0	828,0
vaporator								
pe					Shell and tube			
uantity	n.				1			
/ater flow	m ³ /h	35,28	43,92	47,52	59,40	64,80	81,36	94,68
						,		,
/ater flow	l/s	9,8	12,2	13,2	16,5	18,0	22,6	26,3
ressure drop	kPa	70	56	60	58	46	35	49
/ater volume		39	49	56	93	88	133	125
1 Pump group						-		
vailable pressure	kPa	107	120	114	111	121	123	98
		107	120	114		121	123	98
lotor input power	kW				5,5			
put current	A				11,0			
rush current	A				70,0			
leight	kg				91			
	ĸy				71			
P1H pump group				1	1		1	
vailable pressure	kPa	157	170	164	162	172	174	149
lotor input power	kW				7,5			
put current	A				15,0			
rush current	A				105,0			
/eight	kg				99			
PT pump group								
vailable pressure	kPa	155	166	160	154	163	161	131
lotor input power	kW				7,5			
iput current	A				15,0			
rush current	A				105,0			
leight	kg				196			
lydraulic kit								
pansion vessel capacity					25			
uantity	n.				2			
uffer tank 900 l					•			
					•			
uffer tank 1°500 l			-				•	
uffer tank 1°800 l				-			· ·	
uffer tank 2°400 l					-			•
lectrical data								
otal input power	kW	85,0	104,0	126,0	139,0	164,0	200,0	220,0
otal nominal input current	A	148,0	179,0	212,0	236,0	270,0	336,0	375,0
laximum total input current	A	196,0	240,0	280,0	320,0	356,0	400,0	480,0
otal inrush current	A	521,0	640,0	637,0	761,0	880,0	1.051'0	1`207,0
rush current with options PW/DS	A	328,0	401,0	442,0	526,0	617,0	740,0	876,0
ound pressure level								,.
	(1) 0L	77	-	70		0	00	01
ound pressure at 1 m	dB(A)	77	· · · · ·	78	7	7	80	82
Dimensions								
ngth	mm		5.085		6.1	20	7.128	8.196
lidth	mm				2.244			
eight					2.370			
	mm	2:0	2.072	2.544		41000	F1242	
ansport weight	kg	2.944	3.023	3.210	4.026	4.090	5.302	5`769
/eight in operation	kg	2.983	3.125	3.266	4.129	4.122	5.432	5`894
efrigerant charge per circuit	kg	35,0	46,0	47,0	63	.0	80,0	95,0
		,-					,-	,,,,,
lectrical power supply								

REMARKS:



REFRIGERANT R407C - R134A

Technical data - R407C - Silenced version

RAH Cooling capacity		2102 T.S K	2502 T.S K	2802 T.S K	3302 T.S K	3902 T.S K	4802 T.S K
Looling capacity	kW	196,0	241,0	274,0	326,0	387,0	480,0
lominal input power	kW	76,0	97,0	115,0	130,0	144,0	177,0
ER		2,58	2,48	2,38	2,51	2,69	2,71
Axial fans							
luantity	n.		6		3	10	12
Rotation speed	rpm			6	50		
Air flow	m³/h	96.000	90.000	128.000	120.000	150.000	180.000
Air flow	l/s	26.667	25.000	35.256	33,333	41.667	50.000
Aotor input power	kW		,5),0	12,5	15,0
nput current	A	14	1,0	18	3,0	23,0	28,0
crew compressors							
luantity	n.				2		
ooling circuits	n.				2		
tandard capacity steps	n.				5		
Nodulating capacity steps (option)	%				÷ 100		
		120.0	162.0			222 A	202.0
ominal input current	A	129,0	162,0	189,0	214,0	233,0	292,0
laximum input current	A	172,0	216,0	256,0	288,0	324,0	360,0
nrush current	A	497,0	616,0	613,0	729,0	848,0	981,0
nrush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0
vaporator							
/pe				Shell a	nd tube		
)uantity	n.			Jicita			
Vater flow	m ³ /h	22.04	11 10		1	66.60	82,44
		33,84	41,40	47,16	56,16	66,60	
Vater flow	I/s	9,4	11,5	13,1	15,6	18,5	22,9
ressure drop	kPa	64	50	60	52	48	36
/ater volume		39	49	56	93	88	133
P1 Pump group							
vailable pressure	kPa	115	127	115	119	117	120
Aotor input power	kW		127		,5	117	120
nput current	A				,0		
nrush current	A			70			
Veight	kg			ç	1		
P1H pump group							
wailable pressure	kPa	165	177	165	170	168	172
Aotor input power	kW	105	1//		,5	100	172
nput current	A				5,0		
nrush current	A			10			
Veight	kg			ç	9		
PT pump group							
wailable pressure	kPa	163	174	161	164	159	158
Notor input power	kW			7			
nput current	A				5,0		
nrush current	A			10			
Veight	kg			1	96		
lydraulic kit							
xpansion vessel capacity				2	5		
Juantity	n. –				2		
uffer tank 900 l					•		
Buffer tank 1.500 l							
						•	
Buffer tank 1 800 l				-			
uffer tank 2°400 l				-			•
Electrical data							
otal input power	kW	84,0	105,0	125,0	140,0	157,0	192,0
otal nominal input current	A	143,0	176,0	207,0	232,0	256,0	320,0
Aaximum total input current	A	186,0	230,0	274,0	306,0	347,0	388,0
otal inrush current	A	511,0	630,0	631,0	747,0	871,0	1.009,0
nrush current with options PW/DS	A	318,0	391,0	436,0	512,0	608,0	728,0
ound pressure level							
ound pressure at 1 m	dB(A)	74		75	7	6	77
Dimensions	20(1)		· · · · · · · · · · · · · · · · · · ·		, 	·	
			102		120	7'100	0:10/
ength	mm	5	082		120	7`158	8`196
/idth	mm				244		
eight	mm				370		
ransport weight	kg	2.944	3.023	3`818	4.026	4.212	5.728
Veight in operation	kg	2.983	3.122	3.874	4.129	4.602	5'861
efrigerant charge per circuit	kg	35,0	46,0	47,0	63,0	77,0	94,0
	ĸy	0,00	40,0	۳/ ,U	0,00	<i>U</i> , <i>I</i> I	74,0
lectrical power supply				400 / 3			
lectrical power supply	V / ph / Hz						



REFRIGERANT R407C - R134A

Technical data - R407C - Ultra-silenced version

RAH Cooling capacity		2102 T.U K	2502 T.U K	2802 T.U K	3302 T.U K	3902 T.U K	4802 T.U I
Looling capacity	kW	195,0	240,0	271,0	331,0	389,0	444,0
lominal input power	kW	77,0	97,0	116,0	128,0	143,0	190,0
ER	11.11	2,53	2,47	2,34	2,59	2,72	2,34
xial fans		2,55	-,	-, s .		-//	<i>L</i> ₁ <i>J</i> 1
uantity	n.	6		}	10	1	2
otation speed	rpm	0			30		2
ir flow	m ³ /h	69.000	100.000	92.000	115.000	138	.000
ir flow	I/s	19.167	27.778	25.556	31.944	38.	
Aotor input power	kW	4,6	6		7,7	9	
	A	9,0	12		15,0	18	
put current	A	9,0	12	.,0	13,0	10),U
crew compressors					<u>.</u> ז		
uantity	n.				2		
poling circuits	n.				2		
andard capacity steps	n.				6		
lodulating capacity steps (option)	%		r		÷ 100		
ominal input current	A	130,0	163,0	191,0	212,0	232,0	311,0
aximum input current	A	172,0	216,0	256,0	288,0	324,0	360,0
irush current	A	497,0	616,0	613,0	729,0	848,0	981,0
rush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0
vaporator							
pe				Shell a	nd tube		
uantity	n.				1		
/ater flow	m³/h	33,48	41,40	46,80	56,88	66,96	76,32
/ater flow	l/s	9,3	11,5	13,0	15,8	18,6	21,2
ressure drop	kPa	64	50	58	53	49	31
/ater volume	1	39	49	56	93	88	133
P1 Pump group		57	17	50	,,	00	155
vailable pressure	kPa	115	127	116	1	17	131
lotor input power	kW		127		,5	17	101
iput current	A				, <u>,</u> 1,0		
nrush current	A),0		
Veight	kg				1		
P1H pump group							
vailable pressure	kPa	165	178	167		68	182
lotor input power	kW				,5		
put current	A				5,0		
nrush current	A				5,0		
/eight	kg			(19		
PT pump group							
vailable pressure	kPa	163	174	1	62	158	170
lotor input power	kW			7	,5	·	
put current	A				5,0		
rush current	A			10	5,0		
/eight	kg				96		
lydraulic kit							
xpansion vessel capacity					5		
luantity	n.				2		
uffer tank 900 l					•		
uffer tank 1:500 l		_					
		_	I		•		
uffer tank 1`800 l			_			•	
uffer tank 2°400 l			-	-		· · · ·	•
lectrical data		02.0	102.0	432.4	4310	452.0	
otal input power	kW	82,0	103,0	122,0	136,0	152,0	199,0
otal nominal input current	A	139,0	175,0	203,0	227,0	250,0	329,0
laximum total input current	A	181,0	228,0	268,0	303,0	342,0	378,0
otal inrush current	A	506,0	628,0	625,0	744,0	866,0	999,0
rush current with options PW/DS	A	313,0	389,0	430,0	509,0	603,0	718,0
ound pressure level							
ound pressure at 1 m	dB(A)	69	71	72		73	74
and pressure de l'ini							
		5'082	6	20	7.128	8.1	196
Dimensions	mm	5 552	0		244		
Dimensions ength	mm						
Dimensions ength Idth	mm				370		
Dimensions ength Jidth leight	mm mm	2.010	3.346	2	370 A:438	1.000	5.676
Dimensions ength fidth eight ansport weight	mm mm kg	3.010	3:346	2. 3.906	4`438	4`890	5.676
Dimensions ength fidth eight ansport weight (eight in operation	mm kg mm mm mm mm mm mm mm mm mm	3`049	3.396	2 [.] 3'906 3'962	4°438 4°532	4`977	5`810
Dimensions ength ridth eight	mm mm kg			2. 3.906	4`438		

REMARKS:



REFRIGERANT R407C - R134A

Technical data - R134a - Standard version

RAH		2502 T Ka	2802 T Ka	3202 T Ka	3602 T Ka	4602 T Ka	5202 T Ka	6002 T Ka	6802 T Ka	8002 T K
Cooling capacity		1	1	1	1					
ooling capacity	kW	260,0	290,0	320,0	348,0	432,0	465,0	568,0	608,0	737,0
lominal input power	kW	73,0	88,0	103,0	126,0	166,0	188,0	198,0	244,0	282,0
ER		3,56	3,30	3,11	2,76	2,60	2,47	2,87	2,49	2,61
Axial fans										
uantity	n.				6				8	10
otation speed	rpm					880				
ir flow	m³/h			000			.000	156	.000	195`000
ir flow	l/s		35	000		32	500	43	333	54`167
lotor input power	kW			1	2,0			16	5,0	20,0
put current	A			24	4,0			32	2,0	40,0
crew compressors										
uantity	n.					2				
poling circuits	n.					2				
andard capacity steps	n.					6				
lodulating capacity steps (option)	%					0 – 12 ÷ 100				
lominal input current	A	125,0	148,0	174,0	206,0	275,0	314,0	332,0	398,0	451,0
laximum input current	A	125,0	248,0	288,0	324,0	364,0	430,0	462,0	598,0	620,0
rush current	A	547,0	609,0	729,0	848,0	983,0	1.128,0	1.524,0	1.644,0	1.752,0
rush current with options PW/DS	A	365,0	414,0	494,0	585,0	702,0	827,0	895,0	1`235,0	1`319,0
vaporator										
rpe						Shell and tube				
uantity	n.					1				
/ater flow	m³/h	44,72	49,88	55,04	59,86	74,30	79,98	97,70	104,58	126,76
later flow	l/s	12,4	13,9	15,3	16,6	20,6	22,2	27,1	29,0	35,2
essure drop	kPa	55	59	72	43	52	28	42	40	38
/ater volume		63		30	90	114		62	184	452
1 Pump group										
vailable pressure	kPa	121	114	98	127	108	131	102	196	190
otor input power	kW	121	117	70	5,5	100	101	102	150	
put current	A				11,0				27	
									194	
rush current	A				70,0			-		
/eight	kg				91				16	00
1H pump group										
vailable pressure	kPa	171	165	148	178	160	183	154	305	297
otor input power	kW				7,5				22	
iput current	A				15,0				39	
rush current	A				105,0				27.	3,0
/eight	kg				99				19	92
T pump group										
vailable pressure	kPa	167	160	142	170	148	170	135	298,0	288
lotor input power	kW				7,5				22	
iput current	A				15,0				39	
rush current	A				105,0				27.	
/eight	kg				196				37	
lydraulic kit	ĸy				190					2
						25				
kpansion vessel capacity						25				
uantity	n.					2				
uffer tank 900 l						•				
uffer tank 1°500 l					_				•	
uffer tank 1°800 l						-				•
lectrical data										
otal input power	kW	85,0	100,0	115,0	138,0	178,0	200,0	214,0	260,0	302,0
otal nominal input current	A	149,0	172,0	198,0	230,0	299,0	338,0	364,0	430,0	491,0
laximum total input current	A	220,0	272,0	312,0	348,0	388,0	454,0	494,0	592,0	660,0
otal inrush current	A	571,0	633,0	753,0	872,0	1.002,0	1.182,0	1.286,0	1.676,0	1.792,0
rush current with options PW/DS	A	389,0	438,0	518,0	609,0	726,0	851,0	927,0	1.267,0	1:359,0
		,*		,•	,.	,.			,•	
ound pressure level	dB(A)		7	78		7	9	Q	0	82
		1		•		1	-	0	-	02
ound pressure at 1 m	uD(A)									
ound pressure at 1 m Dimensions					000			6.100	6.000	7.002
ound pressure at 1 m Dimensions Ingth	mm			5.	082	2.244		6.120	6`960	7`997
ound pressure at 1 m Dimensions Ingth Fidth	mm mm			51	082	2.244		6.120	6`960	7`997
ound pressure level ound pressure at 1 m Dimensions Ingth Ingth eight	mm mm mm					2'370				
ound pressure at 1 m Fimensions Ingth Idth eight ansport weight	mm mm mm kg	3.232	3.224	3.576	3.648	2°370 4°492	4.689	5.140	6`109	6'713
und pressure at 1 m imensions ngth idth eight ansport weight eight in operation	mm mm mm	3.228	3.634	3°576 3°656	3 [°] 648 3 [°] 737	2`370 4`492 4`606	4`850	5°140 5°302	6°109 6°293	6 [°] 713 7 [°] 165
und pressure at 1 m imensions ngth idth ight ansport weight	mm mm mm kg		3.634	3.576	3.648	2°370 4°492		5.140	6`109	6'713

REMARKS:



REFRIGERANT R407C - R134A

Technical data - R134a - Silenced version

RAH Cooling capacity		2202 T.S Ka	2502 T.S Ka	2802 T.S Ka	3202 T.S Ka	3602 T.S Ka	4602 T.S Ka	5202 T.S Ka	6002 T.S Ka	6802 T.S Ka	8002 T.S I
Cooling capacity	kW	218,0	252,0	279,0	306,0	329,0	431,0	464,0	534,0	633,0	747,0
Nominal input power	kW	63,0	77,0	92,0	110,0	134,0	166,0	188,0	212,0	234,0	277,0
ER		3,46	3,27	3,03	2,78	2,46	2,60	2,47	2,52	2,71	2,70
Axial fans											
Juantity	n.			6				8		10	12
Rotation speed	rpm					6	60				
Air flow	m³/h			96.000				000	120.000	150.000	180.000
Air flow	l/s			26.662			35	556	33.333	41.662	50.000
Notor input power	kW			7,5				10,0		12,5	15,0
nput current	A			13,8				18,4		23,0	27,6
Screw compressors											
Quantity	n.						2				
cooling circuits	n.						2				
standard capacity steps	n.						6				
Modulating capacity steps (option)	%						2 ÷ 100				
Nominal input current	A	108,0	131,0	156,0	184,0	218,0	276,0	315,0	353,0	382,0	445,0
Maximum input current	A	158,0	196,0	248,0	288,0	324,0	364,0	430,0	462,0	560,0	620,0
nrush current	A	434,0	547,0	609,0	729,0	848,0	983,0	1.128,0	1`254,0	1`644,0	1`752,0
nrush current with options PW/DS	A	285,0	365,0	414,0	494,0	585,0	702,0	827,0	895,0	1`235,0	1`319,0
Evaporator						ci. "	14.1				
Гуре						Shell a	nd tube			_	
Quantity	n.		10 T ·	497.7-7			1		A4	447-77	
Nater flow	m³/h	37,50	43,34	47,99	52,63	56,59	74,13	79,81	91,85	108,88	128,48
Water flow	l/s	10,4	12,0	13,3	14,6	15,7	20,6	22,2	25,5	30,2	35,7
Pressure drop	kPa	39	52	55	65	39	52	28	37	44	39
Nater volume		6	3	{	30	90	114	1	62	184	452
P1 Pump group					1		1	1			1
Available pressure	kPa	141	125	120	106	133	109	131	112	191	188
Notor input power	kW					5,5					5,0
nput current	A					11,0					7,0
Inrush current	A					70,0					14,0
Weight	kg					91				1	60
P1H pump group					1		1	1			
Available pressure	kPa	192	175	170	156	184	160	183	164	299	296
Notor input power	kW					7,5					2,0
nput current	A					15,0					9,0
nrush current	A				1	05,0					'3,0
Weight	kg					99				1	92
PT pump group											
Available pressure	kPa	189	172	166	151	178	149	170	147	292	286
Notor input power	kW					7,5					2,0
nput current	A					15,0					9,0
nrush current	A					05,0					3,0
Neight	kg					196				3	79
Hydraulic kit											
Expansion vessel capacity							25				
Quantity	n.						2				
Buffer tank 900 l							•				
Buffer tank 1°500 l				-					•		
Buffer tank 1°800 l						-					•
Buffer tank 2°400 l						-					•
Electrical data	1111	74.0	05.0	400.0	440.0	443.0	474.5	400.0	222.2	347.0	303.5
fotal input power	kW	71,0	85,0	100,0	118,0	142,0	176,0	198,0	222,0	247,0	292,0
otal nominal input current	A	122,0	145,0	170,0	198,0	232,0	294,0	333,0	371,0	405,0	473,0
Maximum total input current	A	172,0	210,0	262,0	302,0	338,0	382,0	448,0	480,0	583,0	648,0
Total inrush current	A	448,0	561,0	623,0	743,0	861,0	1.001'0	1.176,0	1.2272,0	1.667,0	1'780,0
nrush current with options PW/DS	A	299,0	379,0	428,0	508,0	598,0	720,0	845,0	913,0	1`258,0	1`347,0
Sound pressure level	15(1)		73		74	70	74		17	70	70
ound pressure at 1 m	dB(A)		73		74	75	76		17	78	79
Dimensions				F1000				///		7:007	
ength	mm			5.085			244	6'120		7'997	9.032
Width	mm						244				
Height	mm						370				
iransport weight	kg	3.213	3.232	3.224	3.226	3.648	4'800	4.997	5.140	6.234	7.139
Neight in operation	kg	3.226	3.208	3.634	3`656	3.737	4.914	5.128	5'302	6.718	7`591
lefrigerant charge per circuit	kg	38	3,0	4	0,0	41,0	55,0	61,0	75,0	92,0	101,0
Electrical power supply							1				
lectrical power supply	V / ph / Hz					400/3	/ 50 + T				

Technical data - R134a - Ultra-silenced version

RAH Cooling capacity		1802 T.U Ka	2202 T.U Ka	2502 T.U Ka	2802 T.U Ka	3202 T.U Ka	3602 T.U Ka	4602 T.U Ka	5202 T.U Ka	6002 T.U Ka	6802 T.U K
Cooling capacity	kW	199,0	211,0	242,0	267,0	289,0	326,0	427,0	483,0	547,0	633,0
Nominal input power	kW	53,0	66,0	81,0	98,0	117,0	136,0	168,0	180,0	207,0	234,0
ER		3,75	3,20	2,99	2,72	2,47	2,40	2,54	2,68	2,64	2,71
Axial fans											
Quantity	n.				б			8		10	12
Rotation speed	rpm					5	30				
Air flow	m³/h			75.000			69.000	92.000	125.000	115.000	138.000
Air flow	I/s			20.833			19.167	25.225	34.722	31.944	38.333
Motor input power	kW				,6			6,2		,7	9,2
nput current	A			9	,0			12,0		5,0	18,0
Screw compressors	n						2				
ooling circuits	n. n.						2				
itandard capacity steps	n.						6				
Nodulating capacity steps (option)	%						÷ 100				
Nominal input current	A	91,0	113,0	138,0	165,0	195,0	220,0	278,0	302,0	345,0	382,0
Maximum input current	A	112,0	158,0	196,0	248,0	288,0	324,0	364,0	430,0	462,0	560,0
nrush current	A	361,0	434,0	547,0	609,0	729,0	848,0	983,0	1.128,0	1.254,0	1.644,0
nrush current with options PW/DS	A	209,0	285,0	365,0	414,0	494,0	585,0	702,0	827,0	895,0	1 235,0
Evaporator											
уре						Shell a	nd tube				
Juantity	n.						1				
Vater flow	m³/h	34,23	36,29	41,62	45,92	49,71	56,07	73,44	83,08	94,08	108,88
Vater flow	l/s	9,5	10,10	11,6	12,8	13,8	15,6	20,04	23,1	26,1	30,2
Pressure drop	kPa	32	36	48	50	58	38	51	30	39	44
Vater volume			63		8	0	90	114	1	62	184
P1 Pump group	kPa	140	144	120	120	115	125	110	120	100	101
Available pressure Motor input power	kPa kW	149	144	130	126	115 5,5	135	110	126	109	191 15,0
nput current	A					11,0					27,0
nrush current	A					70,0					194,0
Veight	kg					91					104,0
P1H pump group	ity					21					100
Available pressure	kPa	199	194	180	177	165	185	161	178	160	299
Motor input power	kW					7,5					22,0
nput current	A					15,0					39,0
nrush current	A					105,0					273,0
Neight	kg					99					192
PT pump group											
Available pressure	kPa	197	192	177	172	160	179	150	164	142	292
Motor input power	kW					7,5					22,0
nput current	A					15,0					39,0
nrush current	A					105,0					273,0
Neight Hydraulic kit	kg					196					379
Expansion vessel capacity	1						5				
Quantity	n.						2				
Buffer tank 900 l							•				
Buffer tank 1 500 l					_					•	
Buffer tank 1 800 l					-					•	
Buffer tank 2°400 l						-					•
Electrical data											
otal input power	kW	58,0	71,0	86,0	103,0	122,0	141,0	174,0	188,0	215,0	243,0
otal nominal input current	A	100,0	122,0	147,0	174,0	204,0	229,0	290,0	317,0	360,0	400,0
Maximum total input current	A	121,0	167,0	205,0	257,0	297,0	333,0	376,0	445,0	477,0	578,0
otal inrush current	A	370,0	443,0	556,0	618,0	738,0	857,0	995,0	1.173,0	1.269,0	1.662,0
nrush current with options PW/DS	A	218,0	294,0	374,0	423,0	503,0	594,0	714,0	842,0	910,0	1`253,0
Sound pressure level	(4) 0L			10		71	77	77		74	75
ound pressure at 1 m	dB(A)		7	0		71	72	73		74	75
Dimensions					082			6:120	7.	150	0.032
ength Vidth	mm			5	JOZ	٦.	244	6.120	1	158	9.032
leight	mm						244 370				
ransport weight	mm kg	3.082	3.488	3.209	3.259	3.22	370	4`888	5`350	5.22	7.524
ransport weight Veight in operation	kg kg	3 085	3 488 3 551	3 509	3 529	3 550	3 7 14	4 888 5'002	5 350	5 522	7 524
VENUE III OUPIAIIOII	кд	J 14ð		3 372							
	ka		28 U		ΛΓ	10	570	60.0	/10	0.02	105 0
efrigerant charge per circuit Electrical power supply	kg		38,0		4(),0	52,0	69,0	71,0	89,0	105,0



REFRIGERANT R407C - R134A

Technical data - R407C - Free-cooling Standard version

AH Jooling conscity		2102 T F K	2502 T F K	2802 T F K	3302 T F K	3902 T F K	4802 T F K	5502 T F I
ooling capacity	kW	193,0	239,0	270,0	325,0	385,0	478,0	515,0
oming capacity ominal input power	kW	76,0	95,8	114,0	128,0	148,0	174,0	204,0
1 1	KVV							,
R	1347	2,54	2,49	2,37	2,54	2,60	2,75	2,52
ee-cooling capacity	kW	216,0	208,0	282,0	270,0	344,0	41	6,0
xial fans				1			I	
Jantity	n.		6		8	10		12
tation speed	rpm				880			
r flow	m³/h	105.000	99.000	140.000	132.000	165.000	198	000
r flow	l/s	29.167	27.200	38.889	36.662	45.833	55	000
otor input power	kW	1	2,0	1	6,0	20,0	2	4,0
but current	A		4,0		2,0	40,0		8,0
crew compressors			1,0	, ,	2,0	10,0		0,0
Jantity	n.				2			
oling circuits					2			
onny circuits	n.							
andard capacity steps	n.				6			
odulating capacity steps (option)	%			1	0 – 12 ÷ 100		1	
minal input current	A	129,0	160,0	188,0	212,0	230,0	288,0	339,0
aximum input current	A	172,0	216,0	256,0	288,0	324,0	360,0	432,0
ush current	A	497,0	616,0	613,0	729,0	848,0	981,0	1.129,0
ush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0	828,0
/aporator				/-				
					Shell and tube			
antity	n.				1			
	m ³ /h	35,46	43,92	10 40	59,76	70,92	87,84	04.69
ater flow				49,68				94,68
iter flow	I/s	9,9	12,2	13,8	16,6	19,7	24,4	26,3
essure drop	kPa	78	62	73	64	60	45	54
essure drop in free-cooling	kPa	178	174	126	127	149	144	161
ater volume		163	173	222	259	296	383	375
1 Pump group								
ailable pressure	kPa	132	134	180	175	147	142	120
ptor input power	kW			,	11,0			
out current	A				20,0			
	A				170,0			
rush current								
leight	kg				134			
1H pump group			1	1			1	1
railable pressure	kPa	218	220	265	261	234	229	208
otor input power	kW				15,0			
put current	A				27,0			
rush current	A				194,0			
leight .	kg				147			
T pump group								
ailable pressure	kPa	215	216	261	254	224	215	191
ptor input power	kW	215	210	201	15,0	227	215	
out current	A				27,0			
rush current	A				194,0			
eight	kg				294			
ydraulic kit								
pansion vessel capacity					25			
iantity	n.				2			
ffer tank 900 l					•			
ffer tank 1 500 l			_			•		
ffer tank 1 800 l				_			•	
ffer tank 2°400 l								•
				-			I	•
lectrical data	1144	00.0	100.0	120.0	444.0	4/0.0	100.0	
tal input power	kW	88,0	108,0	130,0	144,0	168,0	198,0	228,0
tal nominal input current	A	153,0	184,0	220,0	244,0	270,0	336,0	387,0
aximum total input current	A	196,0	240,0	288,0	320,0	364,0	408,0	480,0
al inrush current	A	521,0	640,0	645,0	761,0	888,0	1.029,0	1 207,0
ush current with options PW/DS	A	328,0	401,0	450,0	526,0	625,0	748,0	876,0
ound pressure level								0.0,0
und pressure at 1 m	dB(A)	77	78	-	79	80	81	82
imensions	uD(A)	11	/0	· · · · · · · · · · · · · · · · · · ·	,	00	01	02
			000		120	7:450		107
	mm	5.	082	6	120	7.128	8.	196
ngth					2`244			
ngth dth	mm				2'370			
ngth dth	mm mm				2 5/0			
ngth dth ight nsport weight	mm	3°257	3.382	4.276	4.2370	5.084	6'406	6.447
ngth dth ight nsport weight	mm kg				4.214			
ngth dth ight nsport weight eight in operation	mm kg kg	3'420	3.228	4`498	4 [.] 514 4 [.] 773	5`380	6`789	6`822
ngth dth ight nsport weight	mm kg				4.214			

REMARKS:

HemMAKS: - Operating conditions: External air temperature 35°C; water temperature 7/12°C - For free-cooling operation: Air5°C; Inlet water temperature 15°C, ethylenic glycol 20%. - Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.



Technical data - R407C - Free-cooling Silenced version

RAH Cooling capacity		2102 T F.S K	2502 T F.S K	2802 T F.S K	3302 T F.S K	3902 T F.S K	4802 T F.S
ooling capacity	kW	195,0	235,0	272,0	332,0	360,0	447,0
lominal input power	kW	75,0	97,3	113,2	125,4	150,7	185,1
ER		2,60	2,42	2,40	2,65	2,39	2,41
ree-cooling capacity	kW	171,0	229	223,0	28	3,0	342,0
Axial fans							
luantity	n.	6	{	}	1	0	12
otation speed	rpm			6	60		
ir flow	m³/h	75.000	104.000	100.000	125	.000	150.000
ir flow	l/s	20.833	28.889	27.778	34	722	41.662
lotor input power	kW	8,0	10			3,0	15,0
iput current	A	14,0	18			3,0	28,0
crew compressors		,					
uantity	n.				2		
ooling circuits	n.				2		
tandard capacity steps	n.				6		
lodulating capacity steps (option)	%			0-12	2 ÷ 100		
ominal input current	A	127,0	162,0	187,0	208,0	243,0	304,0
laximum input current	A	172,0	216,0	256,0	288,0	324,0	360,0
aximum input current	A	497,0	616,0	613,0	729,0	848,0	981,0
rush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0
vaporator	Π	JU4,U	ט, ו ז כ	410,0	474,0	0,000	700,0
pe				Chall a	nd tube		
	n			SHELL	1		
uantity	n. m³/h	25 14	AD 01	50.04	61,02	66 20	82,22
		35,46	43,31	50,04		66,28	
/ater flow	l/s	9,9	12,0	13,9	17,0	18,4	22,8
ressure drop	kPa kPa	80	60	74	67	53	40
ressure drop in free-cooling	kPa	161	130	121	135	125	117
/ater volume		163	215	222	301	296	383
P1 Pump group					1	1	1
vailable pressure	kPa	149	178	184	166	174	172
lotor input power	kW				1,0		
nput current	A				0,0		
nrush current	A				70,0		
Veight	kg			1	34		
91H pump group							
vailable pressure	kPa	235	264	270	252	2	60
lotor input power	kW				5,0		
iput current	A			2	7,0		
iput current							
irush current	A				94,0		
nrush current				19	94,0 47		
rush current /eight	A			19			
leight T pump group	A	232	260	19		252	247
rush current leight 'T pump group vailable pressure	A kg kPa	232	260	19 1 265	47	252	247
rush current /eight PT pump group vailable pressure lotor input power	A kg	232	260	19 1 265 1	47 245 5,0	252	247
rush current leight 'T pump group vailable pressure lotor input power put current	A kg kPa kW	232	260	19 1 265 1 2	47 245	252	247
rush current leight IT Dump group vailable pressure lotor input power put current rush current	A kg kPa kVA kW A A kg kVA	232	260	19 1 265 1 2 19 19	47 245 5,0 7,0	252	247
rush current leight IT pump group vailable pressure lotor input power put current ush current leight	A kg kPa kW A	232	260	19 1 265 1 2 19 19	47 245 5,0 7,0 24,0	252	247
rush current /eight YT pump group vailable pressure lotor input power pput current rush current /eight łydraulic kit	A kg kPa kVA kW A A kg kVA	232	260	19 1 265 1 2 19 2 2	47 245 5,0 7,0 24,0	252	247
Inush current /eight /T pump group vailable pressure lotor input power put current /eight /eight łydraulic kit xpansion vessel capacity	A kg kPa kW A A kg kW A A kg kV A A kg	232	260	19 1 265 1 2 19 2	47 245 5,0 7,0 94 25 2	252	247
rush current leight 'T pump group vailable pressure lotor input power put current rush current leight !ydraulic kit !ydraulic kit uantity	A kg kPa kVA kW A A kg kVA	232	260	19 1 265 1 2 19 2 2	47 245 5,0 7,0 94 94	252	247
rush current /eight /T pump group wailable pressure lotor input power put current vrush current /eight !ydraulic kit kypansion vessel capacity uantity uffer tank 900 l	A kg kPa kW A A kg kW A A kg kV A A kg	232	260	19 1 265 1 2 19 2 2	47 245 5,0 7,0 94 95 25 2	252	247
rush current leight T Dump group vailable pressure lotor input power put current leight tydraulic kit ydraulic kit ydraulic kit (fer tank 9001 uffer tank 1 ~5001	A kg kPa kW A A kg kW A A kg kV A A kg	232	260	19 1 265 1 2 19 2 2	47 245 5,0 7,0 94 95 25 2 •		247
rush current /eight /T pump group vailable pressure lotor input power put current /eight /gydraulic kit ypansion vessel capacity uantity uffer tank 900 1 uffer tank 1 500 1 uffer tank 1 500 1	A kg kPa kW A A kg kW A A kg kV A A kg	-		19 265 1 2 15 2	47 245 5,0 7,0 94 95 25 2 •	252	
rush current /eight /T pump group vailable pressure lotor input power put current /eight Hydraulic kit ypansion vessel capacity uantity uffer tank 1 5001 uffer tank 1 5001 uffer tank 1 8001 uffer tank 2 4001	A kg kPa kW A A kg kW A A kg kV A A kg	-		19 1 265 1 2 19 2 2	47 245 5,0 7,0 94 95 25 2 •		
Veight Ve	A kg kPa kW A A kg kV kW	-		19 1 265 1 2 19 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	47 245 5,0 7,0 94 94 25 2 • • • •	•	•
Veight Ve	A kg kPa kW	- 83,0	- 107,0	19 1 265 1 2 19 2 2 	47 245 5,0 7,0 94 95 2 • • 138,0	• 164,0	200,0
rush current /eight /T pump group vailable pressure lotor input power put current /eight ydraulic kit ydraulic kit ydraulic kit uffer tank 9001 uffer tank 1°5001 uffer tank 1°5001 uffer tank 2°4001 Electrical data bial input power stal nominal input current	A kg kPa kW		- 107,0 180,0	19 265 1 25 19 20 20 20 20 20 5,0	47 245 5,0 7,0 94 25 2 • • 138,0 231,0	• 164,0 266,0	200,0 332,0
rush current leight T pump group vailable pressure lotor input power put current leight tydraulic kit vgdraulic kit vgdraulic kit offer tank 9001 uffer tank 1°5001 uffer tank 1°5001 uffer tank 2°4001 Electrical data tal input power tal nominal input current laximum total input current	A kg ka kg kg ka kg kg ka kg kg ka kg	- 83,0 141,0 186,0	- 107,0 180,0 234,0	19 265 1 21 19 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 3 2 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3	47 245 5,0 7,0 94 25 2	• 164,0 266,0 347,0	• 200,0 332,0 388,0
nush current leight T pump group vailable pressure otor input power put current leight lydraulic kit lydraulic kit lifter tank 9001 uffer tank 1 '5001 uffer tank 1 '5001 uffer tank 2 '4001 lectrical data tal input power tal nominal input current vaimum total input current tal inrush current	A kg kPa kPa kW A A A kg V V I A A A Kg V V V I A A A Kg V V V A A A A A A A A A	- 83,0 141,0 186,0 511,0	- 107,0 180,0 234,0 634,0	19 265 1 2 19 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	47 245 5,0 7,0 14,0 94 25 2 • • 138,0 231,0 311,0 752,0	- - - - - - - - - - - - - - - - - - -	200,0 332,0 388,0 1`009,0
nush current leight T pump group vailable pressure otor input power put current leight lydraulic kit lydraulic kit lydraulic kit lydraulic kit lydraulic kit lydraulic kit lydraulic kit lydraulic kit lydraulic kit leight lydraulic kit leight le	A kg ka kg kg ka kg kg ka kg kg ka kg	- 83,0 141,0 186,0	- 107,0 180,0 234,0	19 265 1 21 19 2 2 2 2 2 2 2 2 2 2 2 2 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 2 3 2 3 2 3 2 3 3 2 3 3 2 3 3 2 3 3 2 3	47 245 5,0 7,0 94 25 2	• 164,0 266,0 347,0	• 200,0 332,0 388,0
rush current leight T pump group vailable pressure lotor input power put current leight lydraulic kit lydraulic kit lydraulic kit lydraulic kit lydraulic kit lydraulic kit lydraulic kit lydraulic kit lydraulic kit leight lifer tank 15001 uffer tank 15001 uffer tank 2010 lifectrical data tal input power stal nomial input current tal inrush current tal inrush current tal inrush current tal inrush current tansh current cond pressure level	A kg kPa kW A A A A A A A A A A A A A A A A A A	- 83,0 141,0 186,0 511,0 318,0	- 107,0 180,0 234,0 634,0 395,0	19 265 1 2 19 2 2 2 2 2 2 2 2 2 2 3 2 2 3 2 2 3 0 2 0 5,0 2 74,0 6 31,0 436,0	47 245 5,0 7,0 4,0 94 25 2 • • 138,0 231,0 311,0 752,0 517,0	- 164,0 266,0 347,0 871,0 608,0	200,0 332,0 388,0 1'009,0 728,0
Inush current /eight /T pump group vailable pressure lotor input power put current /eight Hydraulic kit Hydraulic kit Hydraulic kit Hydraulic kit Statistic kit	A kg kPa kPa kW A A A kg V V I A A A Kg V V V I A A A Kg V V V A A A A A A A A A	- 83,0 141,0 186,0 511,0	- 107,0 180,0 234,0 634,0	19 265 1 2 19 2 2 2 2 2 2 2 2 2 2 3 2 2 3 2 2 3 0 2 0 5,0 2 74,0 6 31,0 436,0	47 245 5,0 7,0 4,0 94 25 2 • • 138,0 231,0 311,0 752,0 517,0	- - - - - - - - - - - - - - - - - - -	200,0 332,0 388,0 1`009,0
Inush current /eight /T pump group vailable pressure lotor input power put current /eight /ydraulic kit /ydraulic kit /ydraulic kit /wassion vessel capacity uantity uffer tank 1°5001 uffer tank 1°5001 uffer tank 1°5001 uffer tank 2°4001 Electrical data tal input power tal nominal input current laximum total input current laximum total input current solan current with options PW/DS Sound pressure level pund pressure at 1 m	A kg kPa kW kW kG kKG kKG kKG kKG kKG kKG kKG kKG kKG	- 83,0 141,0 186,0 511,0 318,0 73	- 107,0 180,0 234,0 634,0 395,0 7	19 265 1 2 1 2 1 2 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2	47 245 5,0 7,0 94 95 2 • • • 138,0 231,0 311,0 311,0 752,0 517,0 7	• 164,0 266,0 347,0 871,0 608,0 16	200,0 332,0 388,0 1 009,0 728,0 77
rush current leight T pump group vailable pressure lotor input power put current leight tydraulic kit vparsion vessel capacity uantity uffer tank 900 1 uffer tank 1°500 1 uffer tank 1°500 1 uffer tank 2°400 1 Litectrical data tal input power tal anomial input current laximum total input current tal anirush current tatal inrush current tatal inputs power tatal montal input current tatal montal montal input current tatal montal input current tata	A kg kg kW A kW A kg I n. I i KW i A i A i KW i K i K i K i K i K i	- 83,0 141,0 186,0 511,0 318,0	- 107,0 180,0 234,0 634,0 395,0	19 265 1 265 1 2 19 2 2 19 2 2 19 2 2 19 2 2 2 2 10 2 10 2 2 2 2 2 2 2 2 2 2 2 2 2	47 245 5,0 7,0 94 25 2 • • 138,0 231,0 311,0 752,0 517,0 7	- 164,0 266,0 347,0 871,0 608,0	200,0 332,0 388,0 1`009,0 728,0
rush current leight T pump group vailable pressure lotor input power put current leight tydraulic kit ydraulic kit ydraulic kit ydraulic kit ydraulic kit tydraulic kit ydraulic kit tydraulic kit ydraulic kit lectrical data uffer tank 1°5001 uffer tank 2°4001 Electrical data stal input power stal input power stal input power stal input di input current tal inrush current insuch current vith options PW/DS iound pressure level pund pressure 1 m Dimensions input fidth	A kg kPa k A A A KW A K I I n. I I I KW I KW I KW I I I N I I I	- 83,0 141,0 186,0 511,0 318,0 73	- 107,0 180,0 234,0 634,0 395,0 7	19 265 1 2 19 2 2 19 2 2 2 2 205,0 274,0 631,0 436,0 5 20 20 2 2 2 2 2 2 2 2 2 2 2 2 2	47 245 5,0 7,0 14,0 94 25 2 • • 138,0 231,0 311,0 752,0 517,0 7 244	• 164,0 266,0 347,0 871,0 608,0 16	200,0 332,0 388,0 1 009,0 728,0 77
rush current /eight /T pump group vailable pressure lotor input power /put current /eight /ydraulic kit ydraulic kit yd	A kg kPa kW A A A kg A kg I n. I n. KW Kg KW KW A KW A A KW A A A KW A A A A A A A A A A A A A MM A <t< td=""><td>- 83,0 141,0 186,0 511,0 318,0 73 5'082</td><td>- 107,0 180,0 234,0 634,0 395,0 7 7 6 1</td><td>19 265 1 2 19 2 2 19 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>47 245 5,0 7,0 14,0 94 25 2</td><td>• 164,0 266,0 347,0 871,0 608,0 158</td><td>200,0 332,0 388,0 1'009,0 728,0 77 8'196</td></t<>	- 83,0 141,0 186,0 511,0 318,0 73 5'082	- 107,0 180,0 234,0 634,0 395,0 7 7 6 1	19 265 1 2 19 2 2 19 2 2 2 2 2 2 2 2 2 2 2 2 2	47 245 5,0 7,0 14,0 94 25 2	• 164,0 266,0 347,0 871,0 608,0 158	200,0 332,0 388,0 1'009,0 728,0 77 8'196
rush current leight T pump group wailable pressure lotor input power put current leight lydraulic kit lydraulic kit lydraulic kit spansion vessel capacity uantity uffer tank 1°5001 uffer tank 1°5001 uffer tank 1°5001 uffer tank 2°4001 licectrical data tal input current laximum total input current laximum total input current tal insub, current rush current with options PW/DS iound pressure level pund pressure at 1 m Dimensions ength <i>Ti</i> dth eight ansport weight	A kg kPa kW A A A kg A kg I n. I n. KW Kg KW KW A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A MM A MM <td>- <u>83,0</u> 141,0 186,0 511,0 318,0 73 5'082 <u>3'348</u></td> <td>- 107,0 180,0 234,0 634,0 395,0 7 6 1 3 839</td> <td>19 265 1 2 19 2 2 19 2 2 2 2 2 2 2 2 2 2 2 2 2</td> <td>47 245 5,0 7,0 4,0 94 25 2 • • 138,0 231,0 311,0 752,0 517,0 7 244 370 5 '050</td> <td>• 164,0 266,0 347,0 871,0 608,0 76 158 5`084</td> <td>200,0 332,0 388,0 1`009,0 728,0 77 8`196 6`406</td>	- <u>83,0</u> 141,0 186,0 511,0 318,0 73 5'082 <u>3'348</u>	- 107,0 180,0 234,0 634,0 395,0 7 6 1 3 839	19 265 1 2 19 2 2 19 2 2 2 2 2 2 2 2 2 2 2 2 2	47 245 5,0 7,0 4,0 94 25 2 • • 138,0 231,0 311,0 752,0 517,0 7 244 370 5 '050	• 164,0 266,0 347,0 871,0 608,0 76 158 5`084	200,0 332,0 388,0 1`009,0 728,0 77 8`196 6`406
nush current leight T pump group vailable pressure otor input power put current leight lydraulic kit lydraulic kit ly	A kg kPa k A A A KW A Kg I I n. I M KW KW KW KW KW A A KW A KW A A A A A A A A A A A A A A A Mm Mm mm mm MM Kg kg kg	- 83,0 141,0 186,0 511,0 318,0 73 5'082 3'348 3'511	- 107,0 180,0 234,0 634,0 395,0 7 6 1 3 839 4 054	19 265 1 2 19 2 2 2 2 2 2 2 2 2 4 399 4 4 2 2 2 2 4 399 4 4 2 2 2 2 4 399 4 4 2 2 2 2 2 2 2 2 2 2 2 2 2	47 245 5,0 7,0 44,0 94 25 2 • • 138,0 231,0 311,0 752,0 517,0 7 244 370 5 050 5 '352	• 164,0 266,0 347,0 871,0 608,0 76 158 5'084 5'380	200,0 332,0 388,0 1`009,0 728,0 77 8`196 6`406 6`789
nush current leight T pump group vailable pressure otor input power put current leight lydraulic kit lydraulic kit lydraulic kit lydraulic kit spansion vessel capacity uantity ffer tank 15001 uffer tank 15001 uffer tank 15001 uffer tank 15001 uffer tank 2:4001 lectrical data tal input current tal nominal input current tal nominal input current tal insub current tush current with options PW/DS ound pressure level ound pressure at 1 m Dimensions ingth light ansport weight	A kg kPa kW A A A kg A kg I n. I n. KW Kg KW KW A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A A MM A MM <td>- <u>83,0</u> 141,0 186,0 511,0 318,0 73 5'082 <u>3'348</u></td> <td>- 107,0 180,0 234,0 634,0 395,0 7 6 1 3 839</td> <td>19 265 1 2 19 2 2 19 2 2 2 2 2 2 2 2 2 2 2 2 2</td> <td>47 245 5,0 7,0 44,0 94 25 2 • • 138,0 231,0 311,0 752,0 517,0 7 244 370 5 050 5 '352</td> <td>• 164,0 266,0 347,0 871,0 608,0 76 158 5`084</td> <td>200,0 332,0 388,0 1`009,0 728,0 77 8`196 6`406</td>	- <u>83,0</u> 141,0 186,0 511,0 318,0 73 5'082 <u>3'348</u>	- 107,0 180,0 234,0 634,0 395,0 7 6 1 3 839	19 265 1 2 19 2 2 19 2 2 2 2 2 2 2 2 2 2 2 2 2	47 245 5,0 7,0 44,0 94 25 2 • • 138,0 231,0 311,0 752,0 517,0 7 244 370 5 050 5 '352	• 164,0 266,0 347,0 871,0 608,0 76 158 5`084	200,0 332,0 388,0 1`009,0 728,0 77 8`196 6`406

REMARKS: - Operating conditions: External air temperature 35°C; water temperature 7/12°C - For free-cooling operation: Air 5°C; Inlet water temperature 15°C, ethylenic glycol 20%. - Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.



Technical data - R407C - Free-cooling Ultra-silenced version

RAH Cooling conscient		2102 T F.U K	2502 T F.U K	2802 T F.U K	3302 T F.U K	3902 T F.U K
Cooling capacity	kW	194,0	243,0	275,0	333,0	362,0
	kW					150,2
ominal input power	KVV	75,5	94,5	112,1	125,0	
R	1111		,57	2,45	2,66	2,41
ee-cooling capacity	kW	194,0	247	234,0	2	83,0
xial fans						
Jantity	n.	8		10		12
otation speed	rpm			530		
r flow	m³/h	82.000	102.200	95`000	114	4.000
r flow	l/s	22.778	28'472	26'389	31	667
otor input power	kW	6,0		8,0		9,0
out current	A	12,0		5,0		8,0
crew compressors		,				.,
lantity	n.			2		
oling circuits	n.			2		
indard capacity steps	n.			6		
odulating capacity steps (option)	%			0 - 12 ÷ 100		
		120.0	158.0		207.0	242.0
minal input current	A	128,0	158,0	185,0	207,0	242,0
aximum input current	A	172,0	216,0	256,0	288,0	324,0
ush current	A	497,0	616,0	613,0	729,0	848,0
ush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0
vaporator						
De				Shell and tube		
lantity	n.			1		
ater flow	m³/h	35,75	44,71	50,58	61,24	66,56
ater flow	l/s	9,9	12,4	14,1	17,0	18,5
essure drop	kPa	79	64	75	68	53
essure drop in free-cooling	kPa	133	141	126	137	128
ater volume		205	257	264	343	338
1 Pump group		203	251	204	CHC C	330
ailable pressure	kPa	178	167	179	164	171
		1/0	107		104	1/1
otor input power	kW			11,0		
put current	A			20,0		
rush current	A			170,0		
/eight	kg			134		
1H pump group						
ailable pressure	kPa	263	252	265	250	257
otor input power	kW			15,0		
put current	A			27,0		
rush current	A			194,0		
eight	kg			147		
T pump group						
ailable pressure	kPa	260	249	260	243	249
ptor input power	kW	200	217	15,0	215	217
	A			27,0		
out current						
ush current	A			194,0		
eight	kg			294		
ydraulic kit						
pansion vessel capacity				25		
antity	n.			2		
ffer tank 900 l				•		
ffer tank 1`500 l				•		
ffer tank 1`800 l		-			•	
iffer tank 2°400 l			-			•
lectrical data						
tal input power	kW	82,0	103,0	120,0	134,0	159,0
tal nominal input current	A	140,0	173,0	200,0	225,0	260,0
aximum total input current	A	184,0	231,0	271,0	306,0	342,0
tal inrush current	A	509,0	631,0	628,0	747,0	866,0
rush current with options PW/DS	A	316,0	392,0	433,0	512,0	603,0
ound pressure level	A	510,0	372,0	433,0	512,0	003,0
	(۸) ولے	70		72		72
und pressure at 1 m	dB(A)	70		72		73
imensions						100
ngth	mm	6.120	7	158	8	196
idth	mm			2.244		
ight	mm			2.320		
nsport weight	kg	3.768	4.304	4.895	5.234	5.268
eight in operation	kg	3.973	4.261	5.156	5'878	5.905
frigerant charge per circuit	kg	45,0	57,0	75,0	90,0	91,0
ectrical power supply	i ng		57,0		, ,,,,	21/0
ctrical power supply	V / ph / Hz			400 / 3 / 50 + T		
uncar power suppry	v / µii / nz			400/3/30+1		

REMARKS:

HemMAKS: - Operating conditions: External air temperature 35°C; water temperature 7/12°C - For free-cooling operation: Air5°C; Inlet water temperature 15°C, ethylenic glycol 20%. - Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.

Technical data - R134a - Free-cooling Standard version

RAH		2202 T F Ka	2502 T F Ka	2802 T F Ka	3202 T F Ka	3602 T F Ka	4602 T F Ka	5202 T F Ka	6002 T F Ka	6802 T F Ka	8002 T F K
Cooling capacity	kW	215.0	240.0	775 0	201.0	274.0	472.0	402.0	520.0	620.0	720.0
Cooling capacity	kW	215,0	248,0	275,0	301,0	324,0	423,0	492,0	529,0	628,0	738,0
Nominal input power	KVV	62,7	76,4	91,9	108,9	133,6	165,8	172,6	209,2	230,2	273,9
EER Free-cooling capacity	kW	3,43	3,25	2,99 216,0	2,76	2,43	2,55	2,85	2,53	2,73 344,0	2,69 416,0
Axial fans	KVV			210,0			282,0	21	0,0	344,0	410,0
Quantity	n			6			8	6	8	10	12
Rotation speed	n.			0		0	o 80	0	0	10	IZ
Air flow	rpm m³/h			105.000		0	140.000	122	.000	165.000	198.000
Air flow				29.167			38.889		667	45.833	55.000
	l/s kW						20 009		00/		
Notor input power				12,0				16,0		20,0	24,0
nput current	A			24,0				32,0		40,0	48,0
Screw compressors							2				
Quantity	<u>n.</u>						2				
Cooling circuits	<u>n.</u>						2				
Standard capacity steps	n						6				
Modulating capacity steps (option)	%	100.0	120.0	155.0	102.0		÷ 100	201.0	240.0	277.0	440.0
lominal input current	A	108,0	130,0	155,0	183,0	217,0	275,0	291,0	348,0	377,0	440,0
Aaximum input current	A	158,0	196,0	248,0	288,0	324,0	364,0	430,0	462,0	560,0	620,0
nrush current	A	434,0	547,0	609,0	729,0	848,0	983,0	1.128,0	1 254,0	1'644,0	1.752,0
nrush current with options PW/DS	A	285,0	365,0	414,0	494,0	585,0	702,0	827,0	895,0	1`235,0	1`319,0
Evaporator							1.1				
уре						Shell a	nd tube				
Quantity	<u>n.</u>						1				
Nater flow	m³/h	39,57	45,64	50,61	55,40	59,63	77,85	90,55	97,36	115,58	135,82
Nater flow	l/s	11,0	12,7	14,1	15,4	16,6	21,6	25,2	27,0	32,1	37,7
Pressure drop	kPa	48	63	67	80	47	63	40	46	54	56
Pressure drop in free-cooling	kPa	150	181	158	178	145	125	110	92	123	145
Vater volume		18	7	20)4	214	280	3	28	392	702
P1 Pump group											
wailable pressure	kPa	159	127	148	126	157	168	175	189	143	103
Notor input power	kW						1,0				
nput current	A),0				
nrush current	A						0,0				
Neight	kg						34				
P1H pump group	Ng						51				
Available pressure	kPa	245	212	223	212	243	255	263	277	232	193
Motor input power	kW	275	212	225	212		5,0	205	211	LJL	175
nput current	A						7,0				
nrush current	A						4,0				
Weight	kg						4,0 47				
PT pump group	ку					I	4/				
Available pressure	kPa	242	208	229	206	237	244	248	259	208	184
	kW	242	200	229	200		244	240	239	200	
Notor input power						15,0					22,0
Input current	A					27,0					39,0
Inrush current	A					194,0					273,0
Neight	kg					294					192
Hydraulic kit						-					
Expansion vessel capacity							15				
Quantity	n.						4				
		1									
							•				
Buffer tank 1°500 l				_			•		•		
Buffer tank 1°500 l Buffer tank 1°800 l				_		_	•		•		•
Buffer tank 1°500 Buffer tank 1°800 Buffer tank 2°400				-			•		•		•
Buffer tank 1 '500 Buffer tank 1 '800 Buffer tank 2 '400 Electrical data											•
Buffer tank 1 '500 Buffer tank 1 '800 Buffer tank 2 '400 Electrical data Total input power	kW	75,0	88,0	104,0	121,0	146,0	182,0	189,0	225,0	250,0	• 298,0
Buffer tank 1 '500 Buffer tank 1 '800 Buffer tank 2 '400 Electrical data otal input power	kW A	132,0	154,0	104,0 179,0				323,0			•
Buffer tank 1 '500 Buffer tank 1 '800 Buffer tank 2 '400 Electrical data otal input power otal nominal input current				104,0	121,0	146,0	182,0		225,0 380,0 494,0	250,0	• 298,0
Ruffer tank 1°500 Suffer tank 1°800 Suffer tank 2°400 Electrical data Otal input power Otal nominal input current Aaximum total input current	A	132,0	154,0	104,0 179,0	121,0 207,0		<u>182,0</u> 307,0	323,0	225,0 380,0 494,0	250,0 417,0	298,0 488,0 668,0
Buffer tank 1 '500 Buffer tank 2 '400 Electrical data Total input power Total nominal input current Maximum total input current Total inrush current	A A	132,0 182,0	154,0 220,0	104,0 179,0 272,0	121,0 207,0 312,0	- 146,0 241,0 348,0	182,0 307,0 396,0	323,0 462,0	225,0 380,0	250,0 417,0 600,0	• 298,0 488,0 668,0 1`800,0
Buffer tank 1 '500 Buffer tank 1 '800 Buffer tank 2 '400 Electrical data Total input power fotal nominal input current Maximum total input current fotal inrush current nrush current with options PW/DS	A A A	132,0 182,0 458,0	154,0 220,0 571,0	104,0 179,0 272,0 633,0	121,0 207,0 312,0 753,0	- 146,0 241,0 348,0 872,0	182,0 307,0 396,0 1`015,0	323,0 462,0 1 190,0	225,0 380,0 494,0 1`286,0	250,0 417,0 600,0 1`684,0	• 298,0 488,0 668,0 1`800,0
Suffer tank 900 Suffer tank 1 ⁻ 500 Suffer tank 1 ⁻ 800 Suffer tank 2 ⁻ 400 Electrical data Total input power Total nominal input current Maximum total input current Total inrush current Total inrush current Sound pressure level Sound pressure at 1 m	A A A A	132,0 182,0 458,0	154,0 220,0 571,0 389,0	104,0 179,0 272,0 633,0 438,0	121,0 207,0 312,0 753,0	- 146,0 241,0 348,0 872,0 609,0	182,0 307,0 396,0 1`015,0 734,0	323,0 462,0 1`190,0 859,0	225,0 380,0 494,0 1`286,0 927,0	250,0 417,0 600,0 1`684,0 1`275,0	• 298,0 488,0 668,0 1`800,0 1`367,0
Buffer tank 1 '500 Buffer tank 2 '400 Electrical data fotal input power Total nominal input current Maximum total input current Total inrush current nrush current mush current with options PW/DS Sound pressure level Sound pressure at 1 m	A A A	132,0 182,0 458,0	154,0 220,0 571,0 389,0	104,0 179,0 272,0 633,0	121,0 207,0 312,0 753,0	- 146,0 241,0 348,0 872,0 609,0	182,0 307,0 396,0 1`015,0	323,0 462,0 1`190,0 859,0	225,0 380,0 494,0 1`286,0	250,0 417,0 600,0 1`684,0 1`275,0	• 298,0 488,0
Buffer tank 1 '500 Buffer tank 2 '400 Electrical data fotal input power fotal nominal input current Maximum total input current fotal inrush current nrush current mush current with options PW/DS Sound pressure level iound pressure at 1 m Dimensions	A A A dB(A)	132,0 182,0 458,0	154,0 220,0 571,0 389,0	104,0 179,0 272,0 633,0 438,0 78	121,0 207,0 312,0 753,0	- 146,0 241,0 348,0 872,0 609,0	182,0 307,0 396,0 1`015,0 734,0	323,0 462,0 1`190,0 859,0 859,0	225,0 380,0 494,0 1`286,0 927,0	250,0 417,0 600,0 1`684,0 1`275,0 8	298,0 488,0 668,0 1`800,0 1`367,0
Buffer tank 1:500 Suffer tank 2:400 Electrical data fotal input power fotal nominal input current Maximum total input current fotal inrush current Sound pressure at 1 m Dimensions ength	A A A dB(A)	132,0 182,0 458,0	154,0 220,0 571,0 389,0	104,0 179,0 272,0 633,0 438,0	121,0 207,0 312,0 753,0	- 146,0 241,0 348,0 872,0 609,0 7	182,0 307,0 396,0 1°015,0 734,0 9	323,0 462,0 1`190,0 859,0	225,0 380,0 494,0 1`286,0 927,0	250,0 417,0 600,0 1`684,0 1`275,0	298,0 488,0 668,0 1`800,0 1`367,0
Buffer tank 1 '500 Suffer tank 2 '400 Electrical data Total input power Total nominal input current Maximum total input current Total inrush current Maximum total input current Sound pressure level Sound pressure at 1 m Dimensions ength Nidth	A A A dB(A) mm mm	132,0 182,0 458,0	154,0 220,0 571,0 389,0	104,0 179,0 272,0 633,0 438,0 78	121,0 207,0 312,0 753,0	- 146,0 241,0 348,0 872,0 609,0 7 2	182,0 307,0 396,0 1`015,0 734,0 '9 244	323,0 462,0 1`190,0 859,0 859,0	225,0 380,0 494,0 1`286,0 927,0	250,0 417,0 600,0 1`684,0 1`275,0 8	298,0 488,0 668,0 1`800,0 1`367,0
Buffer tank 1 500 Suffer tank 2 400 Electrical data otal input power otal nominal input current Maximum total input current otal inrush current nrush current with options PW/DS Sound pressure level Sound pressure at 1 m Dimensions ength Width Height	A A A dB(A) mm mm mm	132,0 182,0 458,0 309,0	154,0 220,0 571,0 389,0 7	104,0 179,0 272,0 633,0 438,0 8 5`082	121,0 207,0 312,0 753,0 518,0	- 146,0 241,0 348,0 872,0 609,0 7 2 2 2	182,0 307,0 396,0 1 015,0 734,0 9 244 370	323,0 462,0 1 190,0 859,0 6 120	225,0 380,0 494,0 1 286,0 927,0 30	250,0 417,0 600,0 1 684,0 1 275,0 8 7 158	298,0 488,0 668,0 1`800,0 1`367,0 2 9`035
Buffer tank 1 '500 Suffer tank 2 '400 Electrical data Total input power Total nominal input current Maximum total input current Maximum total input current Sound pressure level Sound pressure level Dimensions ength Midth Height fransport weight	A A A dB(A) mm mm mm kg	132,0 182,0 458,0 309,0	154,0 220,0 571,0 389,0 7 3`847	104,0 179,0 272,0 633,0 438,0 '8 5`082 3`867	121,0 207,0 312,0 753,0 518,0 3`888	- 146,0 241,0 348,0 872,0 609,0 7 2 2 3'960	182,0 307,0 396,0 1 015,0 734,0 9 244 370 5 258	323,0 462,0 1 '190,0 859,0 6 '120 5 '577	225,0 380,0 494,0 1 286,0 927,0 30	250,0 417,0 600,0 1 '684,0 1 '275,0 8 7 '158 7 '103	298,0 488,0 668,0 1`800,0 1`367,0 2 9`035 7`817
Buffer tank 1 '500 Buffer tank 2 '400 Electrical data Total input power Total nominal input current Maximum total input current Maximum total input current Sound pressure level Sound pressure at 1 m Dimensions ength Midth Height fransport weight Neight in operation	A A A dB(A) mm mm mm kg kg	132,0 182,0 458,0 309,0 3'826 4'013	154,0 220,0 571,0 389,0 7 3`847 4`034	104,0 179,0 272,0 633,0 438,0 78 5`082 3`867 4`071	121,0 207,0 312,0 753,0 518,0 318,0 318,8 41092	- 146,0 241,0 348,0 872,0 609,0 7 2 3 3'960 4'174	182,0 307,0 396,0 1°015,0 734,0 9 244 370 5°258 5°538	323,0 462,0 1 190,0 859,0 6 120 5 577 5 905	225,0 380,0 494,0 1 286,0 927,0 30	250,0 417,0 600,0 1`684,0 1`275,0 7`158 7`158 7`103 7`495	298,0 488,0 668,0 1 '800,0 1 '367,0 2 9 '035 7 '817 8 '520
Buffer tank 1 500 Suffer tank 2 400 Electrical data Otal input power Otal nominal input current Maximum total input current otal inrush current otal inrush current Sound pressure level Dimensions ength Width Height fansport weight	A A A dB(A) mm mm mm kg	132,0 182,0 458,0 309,0	154,0 220,0 571,0 389,0 7 3`847 4`034	104,0 179,0 272,0 633,0 438,0 78 5`082 3`867 4`071	121,0 207,0 312,0 753,0 518,0 3`888	- 146,0 241,0 348,0 872,0 609,0 7 2 2 3'960	182,0 307,0 396,0 1 015,0 734,0 9 244 370 5 258	323,0 462,0 1 190,0 859,0 6 120 5 577 5 905	225,0 380,0 494,0 1 286,0 927,0 30	250,0 417,0 600,0 1 '684,0 1 '275,0 8 7 '158 7 '103	298,0 488,0 668,0 1 '800,0 1 '367,0 2 9 '035 7 '817

REMARKS: - Operating conditions: External air temperature 35°C; water temperature 7/12°C - For free-cooling operation: Air 5°C; Inlet water temperature 15°C, ethylenic glycol 20%. - Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.



REFRIGERANT R407C - R134A

Technical data - R134a - Free-cooling Silenced version

RAH Gaalian aana sita		1802 T F.S Ka	2202 T F.S Ka	2502 T F.S Ka	2802 T F.S Ka	3202 T F.S Ka	3602 T F.S Ka	4602 T F.S Ka	5202 T F.S Ka	6002 T F.S Ka	6802 T F.S K
Cooling capacity	kW	107.0	200.0	227.0	261.0	202.0	226.0	420.0	462.0	E40.0	622.0
Looing capacity Nominal input power	kW	197,0 53,0	208,0 66,2	237,0 81,3	261,0 98,2	282,0 117,0	326,0 132,7	428,0 163,5	462,0 185,3	549,0 201,2	633,0 228,0
EER	KVV			2,92					2,49		
ree-cooling capacity	kW	3,72	3,14	2,92 176,0	2,66	2,41	2,46 171,0	2,62	3,0	2,73 283,0	2,78 342,0
Axial fans	KVV	1		170,0			171,0		3,0	203,0	542,0
Quantity	n	1			5				8	10	12
Rotation speed	n.)	6	60		0	10	12
Air flow	rpm m ³ /h			78.000		0		100	.000	125:000	150.000
							75'000			125.000	
Air flow	I/s			21'667	0		20.833		778	34.722	41.667
Notor input power	kW				,0				0,0	13,0	15,0
nput current	A			14	ŀ,U			10	8,0	23,0	27,6
Screw compressors		1					2				
Quantity	n.						2				
ooling circuits	n.						2				
tandard capacity steps	n.						б				
Nodulating capacity steps (option)	%					1	÷ 100				
lominal input current	A	91,0	113,0	138,0	165,0	196,0	216,0	272,0	311,0	336,0	373,0
Aaximum input current	A	130,0	158,0	196,0	248,0	288,0	324,0	364,0	430,0	462,0	560,0
nrush current	A	403,0	434,0	547,0	609,0	729,0	848,0	983,0	1.128,0	1`254,0	1`644,0
nrush current with options PW/DS	A	234,0	285,0	365,0	414,0	494,0	585,0	702,0	827,0	895,0	1`235,0
Evaporator											
уре						Shell a	nd tube				
Juantity	n.						1				
Vater flow	m³/h	36,26	38,28	43,62	48,03	51,90	60,00	78,77	85,03	101,04	116,50
Vater flow	l/s	10,1	10,6	21,1	13,3	14,4	16,7	21,9	22,2	28,1	32,4
ressure drop	kPa	40	45	58	60	70	48	64	35	49	55
ressure drop in free-cooling	kPa	115	125	151	129	144	126	121	93	101	127
Nater volume		115	125	151		04	214	280	328	370	434
P1 Pump group			107		2	04	214	200	520	570	4,04
vailable pressure	kPa	195	185	157	177	161	176	171	195	177	138
	kPa kW	195	100	137	1//			1/1	195	1//	100
lotor input power							1,0				
nput current	A						0,0				
nrush current	A						0,0				
Veight	kg					1	34				
P1H pump group		,									
wailable pressure	kPa	280	270	242	263	247	262	258	282	265	227
Aotor input power	kW						5,0				
nput current	A						7,0				
nrush current	A					19	4,0				
Neight	kg					1	47				
PT pump group											
Available pressure	kPa	278	268	239	259	242	256	247	269	247	202
Aotor input power	kW					1	5,0				
nput current	A					2	7,0				
nrush current	A					19	4,0				
Veight	kg					2	94				
Hydraulic kit										-	
xpansion vessel capacity							25				
Juantity	n.						2				
Buffer tank 900 l							•				
Buffer tank 1.500 l					_					•	
Buffer tank 1 800 l						_					
uffer tank 2°400 l										I	
Electrical data		I				_	· · · · · · · · · · · · · · · · · · ·				•
	kW	61,0	74,0	89,0	104.0	125.0	141,0	174,0	195,0	214.0	242.0
otal input power					106,0	125,0				214,0	243,0
otal nominal input current	A	105,0	127,0	152,0	179,0	210,0	230,0	290,0	329,0	359,0	401,0
Aaximum total input current	A	144,0	172,0	210,0	262,0	302,0	338,0	382,0	448,0	485,0	588,0
otal inrush current	A	417,0	448,0	561,0	623,0	743,0	862,0	1.001'0	1`176,0	1`277,0	1`672,0
nrush current with options PW/DS	A	248,0	299,0	379,0	428,0	508,0	599,0	720,0	845,0	918,0	1`263,0
Sound pressure level											
ound pressure at 1 m	dB(A)		73		74	1	5	7	76		78
Dimensions											
ength	mm			5.0)82			6	120	7.128	9.032
Vidth	mm					2	244				
leight	mm						370				
ransport weight	kg	3.423	3.826	3`847	3`867	3.888	4.02	5'381	5.222	6.134	7.638
		3.610	4.013	4.034	4.021	4.095	4.266	5.660	5.905	6.204	8.023
	ка				4 (17 1	4 (197					
Veight in operation	kg ka	5 010		4 034							
	kg	5 010	38,0	4 054		4 092	52,0	69,0	75,0	89,0	105,0

REMARKS:

HemMAKS: - Operating conditions: External air temperature 35°C; water temperature 7/12°C - For free-cooling operation: Air5°C; Inlet water temperature 15°C, ethylenic glycol 20%. - Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.





Technical data - R134a - Free-cooling Ultra-silenced version

RAH		1502 T F.U Ka	1802 T F.U Ka	2202 T F.U Ka	2502 T F.U Ka	2802 T F.U Ka	3202 T F.U Ka	3602 T F.U Ka	4602 T F.U Ka	5202 T F.U Ka	6002 T F.U I
Cooling capacity											
Cooling capacity	kW	155,0	191,0	201,0	227,0	248,0	281,0	324,0	414,0	472,0	547,0
Nominal input power	kW	41,4	55,6	69,7	86,0	104,5	117,6	133,4	169,4	181,2	201,7
ER	1147	3,74	3,44	2,88	2,64	2,37	2,39	2,43	2,44	2,60	2,71
Free-cooling capacity	kW			149,0			141,0	194,0	247,0	234,0	283,0
Axial fans					:			0	1	0	12
Quantity Potation speed	n.		-		ó	E	30	8		0	12
Rotation speed	rpm m³/h			(1:500).		02:000	102:000	05:000	114:000
Air flow Air flow			17:000	61'500	21:77	17:000	57.000	82.000	102.200	95.000	114.000
Air now Motor input power	l/s kW		17.083	5,	21.667	17.083	15`833	22 [.] 778 6,0	28.472	26'389	31°667 9,0
nput current Screw compressors	A			9,	,0			12,0	1:	5,0	18,0
Quantity		1					2				
Cooling circuits	<u>n.</u>						2				
itandard capacity steps	<u>n.</u>						6				
	n. %						o ! ÷ 100				
Modulating capacity steps (option)		74.0	05.0	110.0	145.0			217.0	201.0	201.0	227.0
Nominal input current	A	74,0	95,0	119,0	145,0	175,0	197,0	217,0	281,0	304,0	337,0
Maximum input current	A	112,0	130,0	158,0	196,0	248,0	288,0	324,0	364,0	430,0	462,0
nrush current	A	361,0	403,0	434,0	547,0	609,0	729,0	848,0	983,0	1.128,0	1'254,0
nrush current with options PW/DS	A	209,0	234,0	285,0	365,0	414,0	494,0	585,0	702,0	827,0	895,0
Evaporator						والمال	nd tube				
ype huantitu						Snell a	nd tube				
Quantity	n.	20.52	25.15	26.00	41 70	45.64	[[[[]]]	50.62	76.10	0(07	100 (7
Nater flow	m ³ /h	28,53	35,15	36,99	41,78	45,64	51,72	59,63	76,19	86,87	100,67
Nater flow	I/s	7,9	9,8	10,3	11,6	12,7	14,4	16,6	-	24,1	28,0
Pressure drop	kPa	71	37	42	53	54	69	47	60	36,0	49
Pressure drop in free-cooling	kPa	128	100	109	131	109	130	98	118	99,0	102
Nater volume		173		187		2	04	256	322	370	412
P1 Pump group	10	101			470	400	477		474	400	474
vailable pressure	kPa	184	210	201	178	198	175	204	176	188	176
Motor input power	kW						1,0				
nput current	A						0,0				
nrush current	A						0,0				
Weight	kg					1	34				
P1H pump group											
Available pressure	kPa	269	295	287	263	284	261	290	263	276	264
Motor input power	kW						5,0				
Input current	A						7,0				
Inrush current	A						4,0				
Weight	kg					1.	47				
PT pump group											
Available pressure	kPa	267	293	284	260	280	256	284	252	262	246
Motor input power	kW						5,0				
nput current	A						7,0				
nrush current	A						4,0				
Weight	kg					2	94				
Hydraulic kit							-				
Expansion vessel capacity	I						25				
Quantity	n.						2				
Buffer tank 900 l							•	1			
Buffer tank 1'500 l				-	_					•	
Buffer tank 1°800 l					-					•	
Buffer tank 2°400 l						-					•
Electrical data											
lotal input power	kW	46,0	61,0	75,0	91,0	110,0	123,0	139,0	177,0	189,0	211,0
fotal nominal input current	A	83,0	104,0	128,0	154,0	184,0	206,0	229,0	296,0	319,0	355,0
Maximum total input current	A	121,0	139,0	167,0	205,0	257,0	297,0	336,0	379,0	445,0	480,0
lotal inrush current	A	370,0	412,0	443,0	556,0	618,0	738,0	860,0	998,0	1`173,0	1`272,0
nrush current with options PW/DS	A	218,0	243,0	294,0	374,0	423,0	503,0	597,0	717,0	842,0	913,0
Sound pressure level											
Sound pressure at 1 m	dB(A)	69		70		71	1	72		73	74
Dimensions											
Length	mm			5.0)82			6.120	7.	158	8 [°] 196
Width	mm					21	244				
Height	mm						370				
	kg	3.2251	3.388	3.800	3`821	3.841	3.954	4.471	5.723	6.020	6.618
ransport weight											
	ka	3'424	3.282	3 98/	4.008	4.042	4 158	4 / 2 /	6 045	6'440	7.030
Transport weight Meight in operation Refrigerant charge per circuit	kg kg	3°424 36,0	3.282	3 [.] 987 38,0	4 008	4 045 40,0	4°158 51,0	4 [.] 727 52,0	6°045 66,0	6 440 89,0	102,0
Weight in operation			3.282		4 008						

REMARKS: - Operating conditions: External air temperature 35°C; water temperature 7/12°C - For free-cooling operation: Air 5°C; Inlet water temperature 15°C, ethylenic glycol 20%. - Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.



REFRIGERANT R407C - R134A

R407C - Correction factors for cooling capacity

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	17	1,401	1,371	1,347	1,306	1,265	1,241	1,217	1,185	1,138
	16	1,366	1,336	1,313	1,272	1,231	1,208	1,185	1,154	1,107
	15	1,330	1,301	1,279	1,238	1,198	1,176	1,154	1,123	1,077
	14	1,295	1,266	1,245	1,205	1,167	1,146	1,125	1,094	1,047
	13	1,260	1,232	1,212	1,171	1,136	1,116	1,096	1,065	1,019
	12	1,221	1,195	1,177	1,138	1,104	1,070	1,052	1,021	0,975
	11	1,183	1,158	1,143	1,106	1,072	1,042	1,027	0,997	0,951
	10	1,145	1,121	1,109	1,073	1,040	1,014	1,002	0,965	0,927
	9	1,113	1,090	1,076	1,049	1,009	0,988	0,966	0,935	0,890
	8	1,081	1,060	1,044	1,024	0,979	0,961	0,942	0,912	0,867
Temperature	7	1,050	1,030	1,011	1	0,948	0,934	0,918	0,888	0,843
of water leaving from	6	1,017	0,997	0,979	0,964	0,917	0,903	0,885	0,855	0,809
evaporator °C	5	0,984	0,965	0,946	0,928	0,886	0,871	0,851	0,820	0,774
	4	0,951	0,932	0,914	0,892	0,854	0,840	0,818	0,778	0,736
	3	0,919	0,898	0,882	0,855	0,823	0,808	0,785	0,758	0,718
	2	0,889	0,870	0,850	0,827	0,797	0,781	0,760	0,734	0,696
	1	0,859	0,842	0,819	0,799	0,770	0,754	0,735	0,711	0,659
	0	0,829	0,813	0,788	0,771	0,744	0,726	0,711	0,689	0,656
	-1	0,800	0,784	0,757	0,743	0,717	0,699	0,686	0,666	0,636
	-2	0,771	0,756	0,731	0,717	0,692	0,673	0,660	0,641	0,612
	-3	0,743	0,728	0,706	0,691	0,666	0,647	0,633	0,626	0,600
	-4	0,715	0,700	0,680	0,665	0,640	0,621	0,607	0,592	0,568
	-5	0,687	0,672	0,654	0,639	0,614	0,596	0,581	0,567	0,547

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

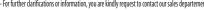
The unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
 Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 For further darifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for input power

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	17	1,054	1,093	1,125	1,175	1,225	1,257	1,289	1,330	1,393
	16	1,036	1,082	1,104	1,155	1,206	1,228	1,250	1,292	1,354
	15	1,018	1,071	1,084	1,135	1,187	1,200	1,213	1,253	1,314
	14	0,999	1,059	1,063	1,115	1,164	1,188	1,201	1,241	1,302
	13	0,981	1,048	1,043	1,096	1,142	1,177	1,189	1,229	1,290
	12	0,965	1,020	1,024	1,077	1,122	1,166	1,178	1,219	1,281
	11	0,948	0,993	1,004	1,059	1,102	1,145	1,166	1,207	1,269
	10	0,932	0,966	0,985	1,041	1,082	1,124	1,154	1,195	1,257
	9	0,915	0,946	0,970	1,027	1,071	1,107	1,142	1,182	1,245
_	8	0,898	0,927	0,955	1,014	1,060	1,090	1,126	1,167	1,229
Temperature	7	0,882	0,907	0,940	1	1,049	1,073	1,106	1,147	1,209
of water leaving from	6	0,868	0,895	0,926	0,980	1,030	1,054	1,087	1,127	1,186
leaving from evaporator °C	5	0,854	0,882	0,910	0,961	1,011	1,036	1,069	1,107	1,165
	4	0,840	0,870	0,895	0,941	0,992	1,017	1,051	1,090	1,148
	3	0,826	0,857	0,880	0,922	0,973	0,999	1,032	1,071	1,129
	2	0,813	0,844	0,866	0,910	0,958	0,986	1,015	1,054	1,112
	1	0,800	0,831	0,852	0,898	0,943	0,973	0,998	1,038	1,096
	0	0,788	0,818	0,837	0,885	0,929	0,960	0,981	1,020	1,079
	-1	0,775	0,805	0,823	0,873	0,914	0,947	0,964	1,002	1,059
	-2	0,763	0,792	0,813	0,858	0,900	0,933	0,952	0,991	1,050
	-3	0,750	0,779	0,802	0,842	0,885	0,918	0,941	0,980	1,039
	-4	0,738	0,766	0,791	0,827	0,871	0,903	0,929	0,969	1,095
	-5	0,726	0,753	0,781	0,811	0,857	0,889	0,918	0,959	1,020

REMARKS:

Termanx: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions. - For further clarifications or information, you are kindly request to contact our sales departement.





REFRIGERANT R407C - R134A

R134a - Correction factors for cooling capacity

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	17	1,518	1,475	1,446	1,417	1,372	1,327	1,297	1,263	1,213
	16	1,474	1,432	1,404	1,375	1,332	1,288	1,259	1,226	1,176
	15	1,429	1,388	1,361	1,334	1,292	1,249	1,221	1,188	1,139
	14	1,384	1,345	1,318	1,292	1,251	1,210	1,183	1,151	1,102
	13	1,339	1,301	1,276	1,250	1,211	1,171	1,145	1,113	1,065
	12	1,294	1,258	1,233	1,209	1,170	1,132	1,107	1,075	1,027
	11	1,250	1,214	1,191	1,167	1,130	1,093	1,069	1,038	0,990
	10	1,205	1,171	1,148	1,125	1,090	1,054	1,031	0,992	0,953
	9	1,160	1,127	1,105	1,083	1,049	1,015	0,993	0,962	0,916
	8	1,115	1,084	1,063	1,042	1,009	0,977	0,955	0,925	0,879
Temperature of water	7	1,070	1,040	1,020	1	0,969	0,938	0,917	0,887	0,842
leaving from -	6	1,025	0,995	0,976	0,956	0,926	0,896	0,876	0,846	0,801
evaporator °C	5	0,980	0,951	0,931	0,912	0,883	0,855	0,836	0,806	0,761
	4	0,947	0,918	0,899	0,881	0,852	0,824	0,806	0,777	0,735
	3	0,914	0,886	0,868	0,850	0,822	0,794	0,776	0,749	0,710
	2	0,880	0,854	0,836	0,818	0,791	0,764	0,746	0,721	0,684
	1	0,847	0,822	0,805	0,787	0,761	0,734	0,716	0,693	0,659
	0	0,814	0,789	0,773	0,756	0,730	0,704	0,686	0,665	0,633
	-1	0,781	0,757	0,741	0,725	0,700	0,674	0,656	0,637	0,608
	-2	0,748	0,725	0,710	0,694	0,669	0,643	0,627	0,609	0,582
	-3	0,715	0,693	0,678	0,663	0,638	0,613	0,597	0,581	0,557
	-4	0,681	0,660	0,646	0,632	0,608	0,583	0,567	0,553	0,531
	-5	0,648	0,628	0,615	0,601	0,577	0,553	0,537	0,524	0,506

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

If the unit works with an evaporation water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
 - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 - For further clarifications or information, you are kindly request to contact our sales departement.

R134a - Correction factors for input power

External air te	mperature °C	28	30	32	35	38	40	42	45	48
	17	1,016	1,067	1,100	1,134	1,192	1,250	1,289	1,331	1,394
	16	1,002	1,053	1,087	1,121	1,179	1,237	1,275	1,318	1,381
	15	0,988	1,039	1,073	1,107	1,165	1,223	1,262	1,304	1,368
	14	0,974	1,025	1,060	1,094	1,152	1,210	1,249	1,291	1,355
	13	0,960	1,012	1,046	1,080	1,139	1,197	1,236	1,278	1,342
	12	0,946	0,998	1,032	1,067	1,125	1,184	1,222	1,265	1,329
	11	0,932	0,984	1,019	1,054	1,112	1,170	1,209	1,252	1,316
	10	0,918	0,970	1,005	1,040	1,099	1,157	1,196	1,239	1,303
	9	0,904	0,957	0,992	1,027	1,085	1,144	1,183	1,225	1,290
_	8	0,890	0,943	0,978	1,013	1,072	1,130	1,169	1,212	1,277
Temperature	7	0,876	0,929	0,965	1	1,059	1,117	1,156	1,199	1,264
of water leaving from	6	0,872	0,923	0,958	0,992	1,045	1,098	1,134	1,176	1,238
evaporator °C	5	0,867	0,917	0,951	0,984	1,032	1,080	1,112	1,152	1,212
	4	0,853	0,903	0,936	0,969	1,017	1,065	1,097	1,138	1,199
	3	0,839	0,888	0,922	0,955	1,003	1,051	1,083	1,124	1,185
	2	0,824	0,874	0,907	0,940	0,988	1,036	1,069	1,110	1,171
	1	0,810	0,859	0,892	0,925	0,974	1,022	1,054	1,096	1,157
	0	0,796	0,845	0,878	0,910	0,959	1,008	1,040	1,081	1,144
	-1	0,781	0,830	0,863	0,896	0,944	0,993	1,026	1,067	1,130
	-2	0,767	0,816	0,848	0,881	0,930	0,979	1,011	1,053	1,116
	-3	0,753	0,801	0,834	0,866	0,915	0,964	0,997	1,039	1,102
	-4	0,738	0,787	0,819	0,851	0,901	0,950	0,983	1,025	1,158
	-5	0,723	0,772	0,805	0,837	0,886	0,935	0,968	1,011	1,075

REMARKS:

Herwinks:
- The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit
- If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
- Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
- For further clarifications or information, you are kindly request to contact our sales departement.



REFRIGERANT R407C AND R134A



Series RAH ...

Cooling capacity from 307 to 1879 kW - from 1 to 4 circuits

The air cooled chillers of **RAH series** are extremely compact units so to reduce the installation spaces and weights.

They are designed for outdoor installation and are particularly suitable for industrial applications. They can also be used for medium and big air conditioning systems and to be matched to fancoils or terminal units.

Depending on the cooling capacity, they are available from 1 to 4 cooling circuits.

Thanks to the several options available, these units are particularly flexible and can be easily adapted to all installation sites.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The available versions with both R407C (K) and R134a (Ka) refrigerants are the following:

K/Ka - standard version

S.K/Ka - silenced version: oversized coil, reduced air flow, fans with a lower rotation speed, cabinet on compressors, insulated by means of soundproofing material.

U.K/Ka - ultra-silenced version: oversized coil, reduced air flow, fans with a very low rotation speed, cabinet on compressors insulated by means of soundproofing material with bituminous rubber coating, vibration dampers on compressors suction and discharge pipes, mufflers on discharge pipes, compressors fixed on spring-type vibration dampers.

Operation limits (standard units):

AIR: from 15 to 45°C; WATER (out from evaporator): from 5 to 15°C.

Main components:

Modular frame made of galvanized and RAL 7035 painted steel profiles and base-frame in painted steel, suitably treated to resist to external agents. The compressors and the main components are suitably placed in the technical partition, completely at sight.

Semi-hermetic screw compressors equipped with capacity steps, motor thermal protection, oil crankcase heater and phase monitor. The compressors lubrication is of forced type, with no pump and in order to prevent many oil migrations to the cooling circuit, the compressors are provided with an oil separator, in-built to the discharge side. The electrical motor is foreseen for lower inrush current and, in this is case, the unit is equipped with an automatic partial load inrush device and mechanical interlock of the inrush control switches, to prevent accidental short circuits (options DS and PW).

Dry expansion **shell and tube evaporator**, 100% counter-current type with two refrigerant circuits and one water circuit, with very low pressure drops. Shell and tubes plate made in carbon steel and copper tubes, insulated by close-cell polyurethane foam material. Some plastic and corrosion-proof baffles are suitably placed inside the shell, allowing a correct water distribution and making the tube bundle particularly strong and vibration-free, also in case of very high water flows.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. Thanks to their "V" positioning, also increasing the total efficiency, the overall dimensions are particularly compact. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges, non-return valve on discharge side, shut-off valve on liquid line, shut-off valve on compressor discharge side.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a lock-door main switch. Inside, it is complete with all control and protection switches, the terminal board and auxiliaries. The electrical board also includes the control device for power supply phases, to prevent the compressor to turn in the wrong sense. The micro-processor, complete with display, is also placed inside the electrical board.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the chilled water temperature regulation, the working parameters, auto-detection failure system, remote management and supervision, complete with compressors hour counter.



Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- **BT Low temperature operation (-20°C)**: electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- CE UV protection on water insulation: particular coat of the evaporator and of water insulations with UV ray proof material.
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (already included in S version).
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a suitably coated cabinet, vibration dampers under compressors, mufflers on compressors discharge pipes (already included in U version).
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- DS Star/delta: electric device of close transition type to reduce the inrush current, complete with short circuit safety by mechanical interlock.
- GP Condensing coil protection grid: metal protection grid against accidental impacts, made of 50x50 4-mesh wire.
- GP1 Protection grid for compressors section: metal protection grid against accidental impacts.
- IG Watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- LI Liquid injection: mechanical device allowing a better cooling of compressors at very high compression level (standard for R407C).
- M6-M25 Modulating capacity control: by means of some valves installed on compressors, depending on their quantity, the capacity is modulated from 6 to 100%.
- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.

- OS Oil flow safety switch: in-built in the compressor oil separator, it indicates the eventual decrease of the oil level.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PW Part-winding: equipment for step compressors starting, reducing of about 35% the inrush current of each compressor.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- **RF Power factor correction system cosfi** >0,9: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value $\ge 0,9$, so to reduce the power absorption from the electrical network.
- RH Shut-off valve on suction side: they are use to isolate compressors during service operations.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM** Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.
- **RR Copper/copper condensing coils:** special execution of the condensing coils with copper pipe and fins.
- TE Electronic thermostatic valve: it is requested to make a very accurate regulation of the refrigerant flow and to limit variations of cooling capacity and evaporator leaving temperature water during operation in transitions and for a better performance with fixed superheating.
 V Voltmeter: Electrical device measuring the electrical tension in the

Voltmeter: Electrical device measuring the electrical tension in the power supply of the unit.

- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C AND R134A

Technical data - R407C - Standard version - 1 circuit

RAH		301 K	391 K	451 K
Cooling capacity				
Cooling capacity	kW	306,6	397,9	459,0
Nominal input power	kW	122,5	153,2	181,9
EER		2,50	2,60	2,52
Axial fans				
Quantity	n.		4	6
Rotation speed	rpm		850	
Air flow	m³/h	112.000	104.000	168`000
Air flow	l/s	31.111	28`889	46`667
Motor input power	kW		13,2	19,8
Input current	A		25,2	37,8
Screw compressors				
Quantity	n.		1	
Cooling circuits	n.		1	
Standard capacity steps	n.		3	
Modulating capacity steps (option)	%		0 – 25 ÷ 100	
Nominal input current	A	183,0	224,0	268,0
Maximum input current	A	246,0	330,0	370,0
Inrush current	A	1.023,0	1*442,0	1`853,0
Inrush current with options PW/DS	A	665,0	1`009,0	1`297,0
Evaporator				
Туре			Shell and tube	
Quantity	n.		1	
Water flow	m³/h	52,6	68,0	78,8
Water flow	l/s	14,6	18,9	21,9
Pressure drop	kPa	48	38	35
Water volume		93	80	133
Electrical data				
Total input power	kW	136,0	166,0	202,0
Total nominal input current	A	208,0	249,0	306,0
Maximum total input current	A	271,0	355,0	408,0
Total inrush current	A	1`048,2	1'467,0	1 891,0
Inrush current with options PW/DS	A	690,2	1`034,0	1`335,0
Sound pressure level				
Sound pressure at 1 m	dB(A)		81	
Dimensions				
Length	mm		3`350	4`850
Width	mm		2`300	
Height	mm		2.700	
Transport weight	kg	2.993	3.626	4.236
Refrigerant charge per circuit	kg	68,0	90,0	102,0
Electrical power supply				
Electrical power supply	V / ph / Hz		400 / 3 / 50 + T	

REFRIGERANT R407C AND R134A

Technical data - R407C - Standard version - 2 circuits

RAH		272 K	312 K	372 K	462 K	522 K	592 K	782 K	892 K	1042 K	1162 K
Cooling capacity											
Cooling capacity	kW	286,3	330,6	368,7	442,9	532,5	600,9	800,0	911,7	1`069,1	1`187,1
Nominal input power	kW	115,0	133,0	156,0	191,0	211,7	247,9	306,6	366,0	408,2	468,4
EER		2,	50	2,40	2,30	2,50	2,40	2,60	2,50	2,60	2,50
Axial fans											
Quantity	n.		4			6		8	10	1	12
Rotation speed	rpm					8	50				
Air flow	m³/h	112.000	104	000	168.000	156	.000	208.000	260.000	312	.000
Air flow	l/s	31.111	28	889	46`667	43	333	57.778	72`222	86	667
Motor input power	kW		13,2			19,8		26,4	33,0	3	9,6
Input current	A		25,2			37,8		50,4	63,0	7.	5,6
Screw compressors											
Quantity	n.						2				
Cooling circuits	n.						2				
Standard capacity steps	n.						б				
Modulating capacity steps (option)	%					0 - 12	÷ 100				
Nominal input current	A	189,0	219,0	249,0	311,0	323,0	371,0	448,0	543,0	605,0	667,0
Maximum input current	A	256,0	288,0	324,0	360,0	432,0	492,0	660,0	740,0	840,0	900,0
nrush current	A	613,0	729,0	848,0	981,0	1.159,0	1.269,0	1.772,0	2.223,0	2.449,0	2.970,0
nrush current with options PW/DS	A	418,0	494,0	585,0	700,0	828,0	811,0	1:339,0	1.667,0	1.840,0	2.214,0
Evaporator			, ,	, ,	, ,	,	,				· · ·
Type						Shell a	nd tube				
Quantity	n.						1				
Water flow	m³/h	49,3	56,9	63,4	76,0	91,1	103,0	137,2	156,6	183,2	203,4
Water flow	l/s	13,7	15,8	17,6	21,1	25,3	28,6	38,1	43,5	50,9	56,5
Pressure drop	kPa	38	50	41	29	47	52	51	66	97	104
Water volume		ç	3	88	133	125	114	207	184	444	435
Electrical data						1 .		1			
Total input power	kW	128,0	146,0	169,0	211,0	232,0	268,0	333,0	399,0	448,0	508,0
Total nominal input current	A	214,0	244,0	274,0	349,0	361,0	409,0	499,0	606,0	680,0	743,0
Maximum total input current	A	281,0	313,0	349,0	398,0	470,0	530,0	710,0	803,0	916,0	976,0
Total inrush current	A	638,0	754,0	873,0	1.019,0	1.197,0	1'307,0	1.822,0	2.286,0	2.525,0	3.046,0
Inrush current with options PW/DS	A	443,0	519.0	610.0	738,0	866,0	849,0	1.389.0	1.730.0	1.916.0	2.290.0
Sound pressure level		.,									
Sound pressure at 1 m	dB(A)		81			82		84	85	8	36
Dimensions			•		1			1		1	
Length	mm		3:350			4.820		6'350	7.850	9.	350
Width	mm						300				
Height	mm						700				
Transport weight	kg	3.303	3.435	3'468	4.800	5.050	5.020	6.868	7.632	8.442	8.289
Refrigerant charge per circuit	kq	34,0	43,0	44,0	51,0	66,0	68,0	90,5	112,0	128,0	129,0
Electrical power supply		5.170	,.		5.10	00,0	00,0	, ,,,,		120,0	.27,0
Electrical power supply	V / ph / Hz						/ 50 + T				

REFRIGERANT R407C AND R134A

Technical data - R407C - Standard version - multicircuit

RAH		913 K	1193 K	1184 K	1544 K		
Cooling capacity							
Cooling capacity	kW	905,4	1`180,8	1`245,5	1`634,8		
Nominal input power	kW	383,0	476,0	496,2	612,4		
EER		2,40	2	2,50	2,70		
Axial fans							
Quantity	n.		12		16		
Rotation speed	rpm		ł	850			
Air flow	m³/h	336.000	312	2.000	416.000		
Air flow	l/s	93.333	86	5`667 115`556			
Notor input power	kW		39,6	52,8			
nput current	A		75,6		100,8		
Screw compressors							
Quantity	n.	3		4	ļ		
Cooling circuits	n.	3		4	ļ		
Standard capacity steps	n.	9		1	2		
Modulating capacity steps (option)	%	0-8÷	- 100	0-6-	0 - 6 ÷ 100		
Nominal input current	A	620,0	749,0	746,0	891,0		
Maximum input current	A	738,0	990,0	984,0	1 320,0		
Inrush current	A	1 515,0	2.102,0	1.761,0	2 432,0		
nrush current with options PW/DS	A	1.122,0	1.669,0	1`403,0	1`999,0		
Evaporator							
Гуре			Shell	and tube			
Quantity	n.			1			
Water flow	m³/h	155,5	203,0	213,8	280,1		
Water flow	l/s	43,2	56,4	59,4	77,8		
Pressure drop	kPa	55	60	87	120		
Water volume		184	252	295	423		
Electrical data							
Total input power	kW	423,0	516,0	536,0	665,0		
Total nominal input current	A	696,0	825,0	822,0	992,0		
Maximum total input current	A	814,0	1.066,0	1`060,0	1 421,0		
Total inrush current	A	1 591,0	2.178,0	1`837,0	2`533,0		
nrush current with options PW/DS	A	1`233,0	1`745,0	1`479,0	2.100,0		
Sound pressure level							
Sound pressure at 1 m	dB(A)		86		87		
Dimensions							
.ength	mm		9'350		12.320		
Vidth	mm		2	300			
leight	mm		2	700			
Transport weight	kg	7'988	10.141	9.830	13`343		
Refrigerant charge per circuit	kg	69,0	92,0	72,0	96,0		
Electrical power supply			· · · · · ·				
Electrical power supply	V / ph / Hz		400/3	3 / 50 + T			

REFRIGERANT R407C AND R134A

Technical data - R407C - Silenced version - 1 circuit

RAH S		301 K	391 K	451 K
Cooling capacity				
Cooling capacity	kW	309,8	403,0	417,7
Nominal input power	kW	121,1	151,6	179,8
EER		2,56	2,66	2,32
Axial fans				
Quantity	n.	4	б	
Rotation speed	rpm		880	
Air flow	m³/h	82.000	132`000	123`000
Air flow	l/s	22.778	36`667	34.167
Motor input power	kW	8,0	12,0	
Input current	A	16,0	24,0	
Screw compressors				
Quantity	n.		1	
Cooling circuits	n.		1	
Standard capacity steps	n.		3	
Modulating capacity steps (option)	%		0 – 25 ÷ 100	
Nominal input current	A	184,0	221,0	269,0
Maximum input current	A	246,0	330,0	370,0
Inrush current	A	1.023,0	1`442,0	1`853,0
Inrush current with options PW/DS	A	665,0	1.009,0	1 297,0
Evaporator				
Туре			Shell and tube	
Quantity	n.		1	
Water flow	m³/h	53,2	69,1	71,8
Water flow	I/s	14,8	19,2	19,9
Pressure drop	kPa	49	39	35
Water volume		93	80	133
Electrical data				
Total input power	kW	129,0	164,0	192,0
Total nominal input current	A	200,0	245,0	293,0
Maximum total input current	A	262,0	354,0	394,0
Total inrush current	A	1`039,0	1`466,0	1`877,0
Inrush current with options PW/DS	A	681,0	1.033,0	1.321,0
Sound pressure level				
Sound pressure at 1 m	dB(A)		74	75
Dimensions				
Length	mm	3`350	4.820	
Width	mm		2'300	
Height	mm		2'700	
Transport weight	kg	3`041	4.009	4`309
Refrigerant charge per circuit	kg	86,0	99,0	129,0
Electrical power supply				
Electrical power supply	V / ph / Hz		400 / 3 / 50 + T	

REFRIGERANT R407C AND R134A

Technical data - R407C - Silenced version - multicircuit

RAH S		272 K	312 K	372 K	462 K	522 K	592 K	782 K	892 K	1042 K	1162 K	913 K	1184 K
Cooling capacity													
Cooling capacity	kW	291,5	318,3	373,9	451,0	530,5	615,4	795,7	928,3	1.023,3	1.191,8	896,1	1.234,9
Nominal input power	kW	113,0	139,0	154,0	187,0	212,2	242,0	307,9	359,6	406,4	466,3	375,0	483,9
EER		2,58	2,29	2,43	2,41	2,50	2,54	2	,58	2,64	2,56	2,39	2,55
Axial fans													
Quantity	n.		4		6		8	10 12 14				12	16
Rotation speed	rpm		880							-			
Air flow	m³/h	82	000	132.000	123.000	176.000	164.000	205.000	246.000	287	.000	246.000	328.000
Air flow	l/s	22	778	36.662	34 [°] 167	48.889	45`556	56.944	68.333	79	722	68'333	91.111
Motor input power	kW	8	,0	1.	2,0	1	6,0	20,0	24,0	2	8,0	24,0	32,0
Input current	A	10	5,0	24	4,0	3	2,0	40,0	48,0	5	6,0	48,0	64,0
Screw compressors													
Quantity	n.						2					3	4
Cooling circuits	n.		2								3	4	
Standard capacity steps	n.						6					9	12
Modulating capacity steps (option)	%	0 – 12 ÷ 100							$0-8\div100$				
Nominal input current	A	186,0	227,0	246,0	306,0	322,0	365,0	449,0	539,0	604,0	691,0	610,0	734,0
Maximum input current	A	256,0	288,0	324,0	360,0	432,0	492,0	660,0	740,0	840,0	900,0	738,0	984,0
Inrush current	A	613,0	729,0	848,0	981,0	1`159,0	1`269,0	1`772,0	2`223,0	2`449,0	2.920,0	1`515,0	1`761,0
Inrush current with options PW/DS	A	418,0	494,0	585,0	700,0	828,0	811,0	1`339,0	1`667,0	1`840,0	2`214,0	1`157,0	1`403,0
Evaporator													
Туре							Shell a	nd tube					
Quantity	n.												
Water flow	m³/h	50,0	54,7	64,4	77,4	91,1	105,5	136,4	159,1	184,3	204,1	154,1	211,7
Water flow	l/s	13,9	15,2	17,9	21,5	25,3	29,3	37,9	44,2	51,2	56,7	42,8	58,8
Pressure drop	kPa	39	47	43	30	47	55	50	68	97	71	58	91
Water volume		9	3	88	133	125	114	207	184	444	435	184	295
Electrical data													
Total input power	kW	121,0	147,0	166,0	199,0	228,0	258,0	328,0	384,0	434,0	494,0	399,0	516,0
Total nominal input current	A	202,0	243,0	270,0	330,0	354,0	397,0	489,0	587,0	660,0	747,0	658,0	798,0
Maximum total input current	A	272,0	304,0	348,0	384,0	464,0	524,0	700,00	788,0	896,0	956,0	786,0	1`048,0
Total inrush current	A	629,0	745,0	872,0	1`005,0	1`191,0	1`301,0	1`812,0	2`271,0	2`505,0	3`026,0	1`563,0	1`825,0
Inrush current with options PW/DS	A	434,0	510,0	609,0	724,0	860,0	843,0	1`379,0	1`715,0	1`896,0	2.520,0	1`205,0	1`467,0
Sound pressure level													
Sound pressure at 1 m	dB(A)		75			76		77	79			80	
Dimensions													
Length	mm	3.	350	4	850	6.	350	7`850	9'350	10	850	9`350	12:350
Width	mm							300					
Height	mm							700					
Transport weight	kg	3.322	3`363	3`851	4`872	5.2252	5.239	7`358	8.030	8`805	8.922	8.133	10.855
Refrigerant charge per circuit	kg	43	3,0	48,0	65,0	66,0	86,0	109,0	130,0	146,0	147,0	87,0	90,0
Electrical power supply													
Electrical power supply	V / ph / Hz						400/3	/ 50 + T					

REFRIGERANT R407C AND R134A

Technical data - R407C - Ultrasilenced version - 1 circuit

RAHU		301 K	391 K	451 K
Cooling capacity				
Cooling capacity	kW	319,6	408,2	481,7
Nominal input power	kW	116,4	149,5	173,2
EER		2,75	2,73	2,78
Axial fans				
Quantity	n.		6	8
Rotation speed	rpm		660	
Air flow	m³/h	99 [°] 000	93`000	124.000
Air flow	l/s	27.500	25`833	34.444
Motor input power	kW		7,5	10,0
Input current	A		18,4	
Screw compressors	· · ·			
Quantity	n.		1	
Cooling circuits	n.		1	
Standard capacity steps	n.		3	
Modulating capacity steps (option)	%			
Nominal input current	A	179,0	263,0	
Maximum input current	A	246,0	330,0	370,0
Inrush current	A	1`023,0	1`442,0	1`853,0
Inrush current with options PW/DS	A	665,0	1`009,0	1`297,0
Evaporator				
Туре			Shell and tube	
Quantity	n.		1	
Water flow	m³/h	54,8	70,2	82,8
Water flow	l/s	15,2	19,5	23,0
Pressure drop	kPa	51	40	38
Water volume		93	80	133
Electrical data				
Total input power	kW	124,0	157,0	183,0
Total nominal input current	A	193,0	241,0	282,0
Maximum total input current	A	260,0	344,0	388,0
Total inrush current	A	1'037,0	1`456,0	1`871,0
Inrush current with options PW/DS	A	679,0	1`023,0	1`315,0
Sound pressure level				
Sound pressure at 1 m	dB(A)		67	68
Dimensions				
Length	mm		4`850	6`350
Width	mm		2`300	
leight	mm		2'700	
Transport weight	kg	3`493	4.182	4`879
Refrigerant charge per circuit	kg	95,0	126,0	165,0
Electrical power supply		· · · · · · · · · · · · · · · · · · ·		
Electrical power supply	V / ph / Hz		400 / 3 / 50 + T	

REFRIGERANT R407C AND R134A

Technical data - R407C - Ultrasilenced version - multicircuit

RAHU		272 K	312 K	372 K	462 K	522 K	592 K	782 K	892 K	1042 K
Cooling capacity										
Cooling capacity	kW	306,9	318,3	362,6	481,0	538,8	621,6	820,6	911,7	1.081,5
Nominal input power	kW	106,0	139,0	159,0	174,0	209,4	238,1	299,2	366,0	402,8
EER		2,90	2	,30	2,80	2	,60	2,70	2,50	2,70
Axial fans										
Quantity	n.	6			8 10			14	16	
Rotation speed	rpm					660				
Air flow	m³/h	99	000	93.000	124	000	155.000	186.000	217.000	248.00
Air flow	l/s	27	500	25.833	34	444	43.026	51.662	60 [°] 278	68 ⁻ 889
Motor input power	kW		7,5	·	1	0,0	12,5	15,0	17,5	20,0
Input current	A		13,8		1	8,4	23,0	27,6	32,2	36,8
Screw compressors	i i i									
Quantity	n.					2				
Cooling circuits	n.					2				
Standard capacity steps	n.					6				
Modulating capacity steps (option)	%					0 - 12 ÷ 100				
Nominal input current	A	176,0	227,0	253.0	288,0	331,0	362,0	454,0	544,0	619,0
Maximum input current	A	256,0	288,0	324,0	360,0	432,0	492,0	660,0	740,0	840,0
Inrush current	A	613,0	729,0	848,0	981,0	1.159,0	1'269,0	1.772,0	2.223,0	2.449,0
Inrush current with options PW/DS	A	418,0	494,0	585,0	700,0	828,0	811,0	1.339,0	1.667,0	1.840,0
Evaporator										
Type						Shell and tube				
Quantity	n.					1				
Water flow	m³/h	52,7	54,6	62,4	82,7	92,4	106,7	140,8	156,8	185,4
Water flow	l/s	14,6	15,2	17,3	23,0	25,7	29,6	39,1	43,6	51,5
Pressure drop	kPa	43	46	40	34	48	56	53	66	99
Water volume		(93	88	133	125	114	207	184	444
Electrical data										
Total input power	kW	114,0	147,0	167,0	184,0	219,0	251,0	314,0	384,0	423,0
Total nominal input current	A	190,0	241,0	267,0	306,0	349,0	385,0	481,0	577,0	656,0
Maximum total input current	A	270,0	302,0	338,0	378,0	450,0	515,0	688,0	772,0	877,0
Total inrush current	A	627,0	743,0	862,0	999,0	1.177,0	1'292,0	1.800'0	2 255,0	2.486,0
Inrush current with options PW/DS	A	432,0	508,0	599,0	718,0	846,0	834,0	1'367,0	1.699,0	1.877,0
Sound pressure level		. ,			,					
Sound pressure at 1 m	dB(A)		67			(i9		70	71
Dimensions										
Length	mm		4`850		6	350	7`850	9.320	10.820	12:350
Width	mm					2'300				
Height	mm					2.700				
Transport weight	kg	3.804	3.812	4.022	5'443,0	5.487	6.167	7.928	8.600	9.433
Refrigerant charge per circuit	kg	48	48.0	62,0	83.0	84,0	104,0	127,0	148.0	164.0
Electrical power supply			,-	,-	,-	,-	,-		,-	
Electrical power supply	V/ph/Hz					400/3/50+T				



REFRIGERANT R407C AND R134A

Technical data - R134a - Standard version - 1 circuit

RAH		341 Ka	381 Ka	431 Ka	491 Ka			
Cooling capacity								
Cooling capacity	kW	308,0	383,0	403,0	472,0			
Nominal input power	kW	122,0	139,0	158,0	178,0			
EER		2,52	2,76	2,55	2,65			
Axial fans			-,	_,	_,			
Quantity	n.		4					
Rotation speed	rpm		85)				
Air flow	m³/h	119.000	112.0	000	104.000			
Air flow	l/s	33`056	31.1	11	28.889			
Notor input power	kW		13,	2				
Input current	A		25,					
Screw compressors								
Quantity	n.		1					
Cooling circuits	n.		1					
Standard capacity steps	n.		3	3				
Modulating capacity steps (option)	%		0 – 25 -	÷ 100				
Nominal input current	A	199,0	222,0	260,0	292,0			
Maximum input current	A	280,0	310,0	320,0	360,0			
Inrush current	A	1'364,0	1 442,0	1.853,0	2.029,0			
Inrush current with options PW/DS	A	955,0	1.010,0	1 297,0	1 420,0			
Evaporator				i i i i i i i i i i i i i i i i i i i				
Туре			Shell an	d tube				
Quantity	n.		1					
Water flow	m³/h	53,0	65,9	69,3	81,2			
Water flow	l/s	14,7	18,3	19,3	22,6			
Pressure drop	kPa	33	47	45	28			
Water volume		90	130	114	162			
Electrical data								
Total input power	kW	135,2	152,2	171,2	191,2			
Total nominal input current	A	224,0	247,0	285,0	317,0			
Maximum total input current	A	305,0	335,0	345,0	385,0			
Total inrush current	A	1.389,0	1`467,0	1`878,0	2.024,0			
Inrush current with options PW/DS	A	980,0	1`035,0	1'322,0	1.445,0			
Sound pressure level								
Sound pressure at 1 m	dB(A)		81					
Dimensions								
Length	mm		3.3	50				
Width	mm		2.3	00				
Height	mm		2.7	00				
Transport weight	kg	3.445	3.202	3'727	4.022			
Refrigerant charge per circuit	kg	56,0	78,0	82,0	111,0			
Electrical power supply					· · · · ·			
Electrical power supply	V / ph / Hz		400/3/	50 + T				



REFRIGERANT R407C AND R134A

Technical data - R134a - Standard version - 2 circuits

RAH		312 Ka	342 Ka	372 Ka	452 Ka	502 Ka	582 Ka	652 Ka	772 Ka	862 Ka	982 Ka
Cooling capacity											
Cooling capacity	kW	299,0	360,0	393,0	447,0	523,0	580,0	614,0	746,0	809,0	930,0
Nominal input power	kW	116,0	125,0	128,0	166,0	165,0	200,0	246,0	287,0	317,0	356,0
EER		2,60	2,90	3,10	2,70	3,20	3,0	2,90	2,80	2,90	2,60
Axial fans											
Quantity	n.		4					3			
Rotation speed	rpm					8	50				
Air flow	m³/h	119.000				168.000		156.000	224.000	208.000	
Air flow	l/s	33.026	31.111	49`583			46.662		43`333	62.222	57`778
Motor input power	kW	13	13,2			19	9,8			26	i,4
Input current	A	25,2			37	7,8			50),4	
Screw compressors											
Quantity	n.						2				
Cooling circuits	n.		2								
Standard capacity steps	n.						б				
Modulating capacity steps (option)	%					0 - 12	÷ 100				
Nominal input current	A	194,0	204,0	208,0	275,0	279,0	334,0	401,0	459,0	520,0	583,0
Maximum input current	A	288,0	324,0	310,0	364,0	430,0	462,0	560,0	620,0	640,0	720,0
Inrush current	A	729,0	848,0	830,0	983,0	1.128,0	1`254,0	1`644,0	1.752,0	2.173,0	2'389,0
Inrush current with options PW/DS	A	494,0	585,0	594,0	702,0	827,0	895,0	1.235,0	1:319,0	1.617,0	1.780,0
Evaporator											
Туре						Shell a	nd tube				
Quantity	n.						1				
Water flow	m³/h	51,5	61,9	67,7	77,0	90,0	99,7	105,5	128,5	139,3	159,8
Water flow	l/s	14,3	17,2	18,8	21,4	25,0	27,7	29,3	35,7	38,7	44,4
Pressure drop	kPa	31	41	49	25	35	36	48	46	60	39
Water volume		90	1	30	1	62	184	452	435	426	417
Electrical data											
Total input power	kW	129,2	138,2	147,8	185,8	184,8	219,8	266,0	307,0	343,0	382,4
Total nominal input current	A	219,0	229,0	246,0	313,0	317,0	372,0	439,0	497,0	570,0	633,0
Maximum total input current	A	313,0	349,0	348,0	402,0	468,0	500,0	598,0	658,0	690,0	770,0
Total inrush current	A	754,0	873,0	868,0	1.021,0	1.196,0	1 292,0	1.682,0	1.790,0	2.223,0	2.439,0
Inrush current with options PW/DS	A	519,0	610,0	632,0	740,0	865,0	933,0	1.273,0	1.357,0	1.667,0	1.830,0
Sound pressure level								,		,	
Sound pressure at 1 m	dB(A)	8	1			82			83	8	4
Dimensions											
Length	mm	3.	350			4.	850			6	350
Width	mm					2	300				
Height	mm						700				
Transport weight	kg	3.302	3.422	4.826	4.860	5.029	5.179	6.295	6.209	7.026	7.356
Refrigerant charge per circuit	kg	28,0	1	9,0	46,0	60,0	63,0	59,0	75,0	77,0	96,0
Electrical power supply		20,0					00,0	57,0		,.	20,0
······································	V / ph / Hz						/ 50 + T				

REFRIGERANT R407C AND R134A

Technical data - R134a - Standard version - multicircuit

RAH		753 Ka	863 Ka	1023 Ka	1183 Ka	1313 Ka	1154 Ka	1304 Ka	1494 Ka	1624 Ka	1884 Ka
Cooling capacity											
Cooling capacity	kW	782,0	863,0	927,0	1`155,0	1`280,0	1`157,0	1`228,0	1'493,0	1`618,0	1`879,0
Nominal input power	kW	246,0	298,0	367,0	416,0	444,0	400,0	492,0	574,0	634,0	713,0
EER		3,20	2,90	2,50	2,80	2,	90	2,50		2,60	
Axial fans											
Quantity	n.				ŕ	12				1	16
Rotation speed	rpm					8	50				
Air flow	m³/h		357.000		336.000	312.000	336	000	312.000	448.000	416.000
Air flow	l/s		99 [°] 167		93.333	86`667	93	333	86`667	124.444	115.556
Motor input power	kW				3	9,6				57	2,8
Input current	A				7.	5,6				10	0,8
Screw compressors											
Quantity	n.			3					4		
Cooling circuits	n.			3					4		
Standard capacity steps	n.			9					12		
Modulating capacity steps (option)	%			$0-8\div100$					$0-6\div100$		
Nominal input current	A	416,0	498,0	598,0	668,0	733,0	668,0	802,0	918,0	1.040,0	1.167
Maximum input current	A	588,0	642,0	840,0	930,0	960,0	856,0	1 120,0	1 240,0	1.580,0	1.440,0
Inrush current	A	1.335,0	1.451,0	1.924,0	2.062,0	2'493,0	1 665,0	2.204,0	2.372,0	2.813,0	3.109,0
nrush current with options PW/DS	A	1.004,0	1.093,0	1:515,0	1.630,0	1.937,0	1:307,0	1.795,0	1.940,0	2.257,0	2.200,0
Evaporator		,	,			, ,					
Туре						Shell a	nd tube				
Quantity	n.			1					2		
Water flow	m³/h	134,6	148,3	159,5	198,7	220,3	199,1	211,3	256,7	278,3	323,3
Water flow	l/s	37,4	41,2	44,3	55,2	61,2	55,3	58,7	71,3	77,3	89,8
Pressure drop	kPa	46	62	53	66	82	51	48	46	60	55
Water volume		444	431	421	5	99	923	905	869	852	423
Electrical data											
Total input power	kW	286,0	338,0	407,0	456,0	484,0	440,0	532,0	614,0	687,0	766,0
Total nominal input current	A	492,0	574,0	674,0	744,0	809,0	744,0	878,0	994,0	1.141,0	1.268,0
Maximum total input current	A	664,0	718,0	916,0	1.006,0	1.036,0	932,0	1.196,0	1:316,0	1:381,0	1.241,0
Total inrush current	A	1.411,0	1:527,0	2.000'0	2.138,0	2.269,0	1.741,0	2.580'0	2.448,0	2.914,0	3.210,0
Inrush current with options PW/DS	A	1.080,0	1.169,0	1.201'0	1.706,0	2.013,0	1:383,0	1.871,0	2.016,0	2.358,0	2.600'8
Sound pressure level		,.	,.							,:	,.
Sound pressure at 1 m	dB(A)				86				87	8	88
Dimensions											
Length	mm				9.	350				12	350
Width	mm						300				
Height	mm						700				
Transport weight	kq	7.783	7.828	9.738	10.231	10.290	10.221	12.125	12.228	13.620	15.091
Refrigerant charge per circuit	kg	49,0	51,0	68,0	83,0	101,0	57,0	59,0	75,0	77,0	96,0
Electrical power supply	ing	12/0	51/0	00,0	05/0	101/0	51,0	57,0	, ,,,,	,,,,,	20,0
Electrical power supply	V / ph / Hz						/ 50 + T				

REFRIGERANT R407C AND R134A

Technical data - R134a - Silenced version - 1 circuit

RAH S		341 Ka	381 Ka	431 Ka	491 Ka
Cooling capacity					
Cooling capacity	kW	328,0	384,0	405,0	500,0
Nominal input power	kW	114,0	138,0	158,0	167,0
EER		2,88	2,78	2,56	2,99
Axial fans			i i i i i i i i i i i i i i i i i i i		
Quantity	n.		4		6
Rotation speed	rpm		880	<u>)</u>	
Air flow	m³/h	88.000	82.00	00	132.000
Air flow	l/s	24.444	22.7	78	36.662
Motor input power	kW		8,0		12,0
nput current	A		16,0		24,0
Screw compressors					
Quantity	n.		1		
Cooling circuits	n.		1		
Standard capacity steps	n.		3		
Modulating capacity steps (option)	%		0 – 25 ÷	- 100	
Nominal input current	A	186,0	222,0	259,0	274,0
Maximum input current	A	280,0	310,0	320,0	360,0
Inrush current	A	1`364,0	1`442,0	1`853,0	2.029,0
nrush current with options PW/DS	A	955,0	1.010'0	1`297,0	1'420,0
Evaporator					
Туре			Shell and	l tube	
Quantity	n.		1		
Water flow	m³/h	56,5	66,2	69,5	86,0
Water flow	l/s	15,7	18,4	19,3	23,9
Pressure drop	kPa	38	47	45	32
Water volume		90	130	114	162
Electrical data					
Total input power	kW	122,0	146,0	166,0	179,0
Total nominal input current	A	202,0	238,0	275,0	298,0
Maximum total input current	A	296,0	326,0	336,0	384,0
Total inrush current	A	1`380,0	1`458,0	1`869,0	2.023,0
Inrush current with options PW/DS	A	971,0	1`026,0	1`313,0	1`444,0
Sound pressure level					
Sound pressure at 1 m	dB(A)		76		78
Dimensions					
Length	mm		3`350		4`850
Width	mm		2.30	0	
Height	mm		2.20	0	
Transport weight	kg	3`494	3.643	3.776	4.438
Refrigerant charge per circuit	kg	74,0	96,0	100,0	120,0
Electrical power supply					
Electrical power supply	V / ph / Hz		400/3/	50 + T	



REFRIGERANT R407C AND R134A

Technical data - R134a - Silenced version - 2 circuits

RAH S		312 Ka	342 Ka	372 Ka	452 Ka	502 Ka	582 Ka	652 Ka	772 Ka	862 Ka	982 Ka
Cooling capacity											
Cooling capacity	kW	318,0	344,0	380,0	473,0	502,0	551,0	617,0	771,0	813,0	966,0
Nominal input power	kW	108,0	132,0	134,0	155,0	174,0	212,0	245,0	276,0	316,0	341,0
EER		2,90	2,60	2,80	3,10	2,90	3,0	2,80	2,90	2,	80
Axial fans											
Quantity	n.		4			6				8	10
Rotation speed	rpm					8	80				
Air flow	m³/h	88.000	82.000	141.000		132.000		123.000	164	.000	205.000
Air flow	l/s	24.444	22.778	39.167		36`667		34.167	45	556	56`944
Motor input power	kW	8	,0			12,0			1	5,0	20,0
Input current	A	10	5,0			24,0			3	2,0	40,0
Screw compressors											
Quantity	n.						2				
Cooling circuits	n.						2				
Standard capacity steps	n.						б				
Modulating capacity steps (option)	%					0 - 12	÷ 100				
Nominal input current	A	181,0	215,0	217,0	258,0	283,0	353,0	399,0	443,0	518,0	560,0
Maximum input current	A	288,0	324,0	310,0	364,0	430,0	462,0	560,0	620,0	640,0	720,0
Inrush current	A	729,0	848,0	830,0	983,0	1.128,0	1.254,0	1.644,0	1.752,0	2.173,0	2.389,0
nrush current with options PW/DS	A	494,0	585,0	594,0	702,0	827,0	895,0	1.235,0	1:319,0	1.617,0	1.780,0
Evaporator		,	, ,	,	, ,	,	,			,	
Type						Shell a	nd tube				
Quantity	n.						1				
Water flow	m³/h	54,7	59,0	65,4	81,4	86,4	94,7	106,2	132,8	139,7	166,3
Water flow	l/s	15,2	16,4	18,1	22,6	24,0	26,3	29,5	36,9	38,8	46,2
Pressure drop	kPa	35	38	46	29	32	33	L	19	61	42
Water volume		90	1	30	1	62	184	452	435	426	417
Electrical data					1	·					1
Total input power	kW	116,0	140,0	146,0	167,0	186,0	224,0	257,0	292,0	332,0	361,0
Total nominal input current	A	197,0	231,0	241,0	282,0	317,0	377,0	423,0	475,0	550,0	600,0
Maximum total input current	A	304,0	340,0	348,0	388,0	454,0	486,0	584,0	652,0	672,0	760,0
Total inrush current	A	745,0	864,0	868,0	1.002,0	1.182,0	1.278,0	1.668,0	1.784,0	2.205,0	2.429,0
Inrush current with options PW/DS	A	510.0	601.0	609.0	726.0	851,0	919.0	1.259,0	1:351,0	1.649.0	1.820.0
Sound pressure level											
Sound pressure at 1 m	dB(A)	7	6		78		79		80	8	31
Dimensions											
Length	mm	3.	350			4.820			6.	350	7.850
Width	mm					2	300		-		
Height	mm						700				
Transport weight	kg	3.326	3.388	4.483	4.935	4.955	5.026	6'365	6.976	7.123	7.846
Refrigerant charge per circuit	kg	37,0		9,0		0,0	63,0	72,0	93,0	95,0	114,0
nenigerant enarge per encart	ny	51,0	J.	//	0	0,0	0,0	1210	0,00	0,00	114,0
Electrical power supply											

REFRIGERANT R407C AND R134A

Technical data - R134a - Silenced version - multicircuit

RAH S		753 Ka	863 Ka	1023 Ka	1183 Ka	1313 Ka	1154 Ka	1304 Ka	1494 Ka	1624 K
Cooling capacity										
Cooling capacity	kW	756,0	828,0	988,0	1.129,0	1`211,0	1.099,0	1.234,0	1.243,0	1.625,0
Nominal input power	kW	257,0	312,0	341,0	415,0	473,0	424,0	490,0	553,0	631,0
EER		2,90	2,70	2,90	2,80	2	.60	2,50	2,80	2,60
Axial fans										,
Quantity	n.				12				1	6
Rotation speed	rpm					880				
Air flow	 m³/h	282	000	264.000	246	5.000	264.000	246.000	328	.000
Air flow	l/s	78	333	73`333	68	.333	73`333	68.333	91	111
Motor input power	kW				24,0				32	2,0
Input current	A				48,0				64	4,0
Screw compressors										
Quantity	n.			3					4	
Cooling circuits	n.			3					4	
Standard capacity steps	n.			9				1	12	
Modulating capacity steps (option)	%			0-8÷100					÷ 100	
Nominal input current	A	434,0	520.0	559,0	665.0	777,0	705.0	799,0	887.0	1.036
Maximum input current	A	588,0	642,0	840,0	930,0	960,0	856,0	1.120,0	1.240,0	1'280,
Inrush current	A	1:335,0	1.451,0	1.924,0	2.062,0	2'493,0	1.665,0	2°204,0	2.372,0	2`813,
Inrush current with options PW/DS	A	1.004,0	1.093,0	1.515,0	1.630,0	1.937,0	1'307,0	1.795,0	1.940.0	2.257,
Evaporator		1 00 1,0	1 055,0	1 515,6	1 050,0	1 75770	1 507,0	1775,0	1 9 10,0	2 237,
Туре						Shell and tube				
Quantity	n.			1		Sileir und tube			2	
Water flow	m³/h	130.0	142,2	169,9	199,4	208,4	189,0	212,0	265,3	279,4
Water flow	l/s	36,1	39,5	47,2	55,4	57,9	52,5	58,9	73,7	77,6
Pressure drop	kPa	43	57	61	67	73	46	,	19	61
Water volume		444	431	421		i99	923	905	869	852
Electrical data		111	151	121			725	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	005	052
Total input power	kW	281,0	336,0	365.0	439.0	497.0	448.0	514,0	585.0	663.0
Total nominal input current	A	482,0	568,0	607.0	713,0	825,0	753,0	847,0	951,0	1.100
Maximum total input current	A	636,0	690,0	888,0	978,0	1.008,0	904,0	1`216,0	1'304,0	1.344,0
Total inrush current	A	1:383.0	1`499,0	1.972,0	2.110,0	2.541.0	1.713,0	2.2252,0	2.436.0	2.877.0
Inrush current with options PW/DS	A	1.052,0	1.141,0	1.2,0	1.678,0	1.985.0	1.355,0	1.843,0	2.004,0	2.321,0
Sound pressure level	n	1 052,0	1 141,0	1 303,0	1 0/0,0	1 705,0	1 333,0	1 045,0	2 004,0	2 321,
Sound pressure at 1 m	dB(A)	81				82			83	84
Dimensions	UD(A)	01	1			02			05	04
Length	mm				9'350				12	350
Width	mm				9 330	2.300			12	220
Height						2'700				
Transport weight	mm	7.576	7.621	9.883	10 [°] 376	10.283	10.014	12.220	13.220	13.843
	kg						57,0			
Refrigerant charge per circuit Electrical power supply	kg	49,0	51,0	86,0)1,0	57,0	72,0	93,0	95,0
	V/ab/11-					400 / 2 / F0 · T				
Electrical power supply	V / ph / Hz					400/3/50+T				

REFRIGERANT R407C AND R134A

Technical data - R134a - Ultrasilenced version - 1 circuit

RAHU		341 Ka	381 Ka	431 Ka	491 Ka
Cooling capacity					
Cooling capacity	kW	321,0	364,0	423,0	489,0
Nominal input power	kW	117,0	147,0	150,0	171,0
EER		2,74	2,48	2,82	2,86
Axial fans		· · ·	,	· · · · · · · · · · · · · · · · · · ·	
Quantity	n.	4		6	j
Rotation speed	rpm		(560	
Air flow	m³/h	62.0	00	99`000	93.000
Air flow	l/s	17.2		27.200	25.833
Notor input power	kW	5,0)	7,	5
Input current	A	9,2		13	,8
Screw compressors					,
Quantity	n.			1	
Cooling circuits	n.			1	
Standard capacity steps	n.			3	
Modulating capacity steps (option)	%		0-2	5 ÷ 100	
Nominal input current	A	191,0	234,0	247,0	281,0
Maximum input current	A	280.0	310.0	320.0	360.0
Inrush current	A	1`364,0	1.442,0	1`853,0	2.029,0
Inrush current with options PW/DS	A	955,0	1.009,0	1`297,0	1'420,0
Evaporator					,
Туре			Shell	and tube	
Quantity	n.			1	
Water flow	m³/h	55,1	62,6	72,7	83,9
Water flow	l/s	15,3	17,4	20,2	23,3
Pressure drop	kPa	36	42	49	30
Water volume		90	130	114	162
Electrical data					
Total input power	kW	122,0	152,0	158,0	179,0
Total nominal input current	A	200,0	243,0	261,0	295,0
Maximum total input current	A	289,0	319,0	334,0	388,0
Total inrush current	A	1.373,0	1.451,0	1.867,0	2.043,0
Inrush current with options PW/DS	A	964,0	1.018,0	1:311,0	1.434,0
Sound pressure level			· · · · · · · · · · · · · · · · · · ·		
Sound pressure at 1 m	dB(A)	71		7	2
Dimensions					
Length	mm	3:35	50	4.8	350
Width	mm		2	300	
Height	mm			700	
Transport weight	kg	3.611	3.643	4.228	4.614
Refrigerant charge per circuit	kg	92,0	86,0	109,0	147,0
Electrical power supply		210		,.	
Electrical power supply	V / ph / Hz		400/3	3 / 50 + T	

REFRIGERANT R407C AND R134A

Technical data - R134a - Ultrasilenced version - 2 circuits

RAHU		312 Ka	342 Ka	372 Ka	452 Ka	502 Ka	582 Ka	652 Ka	772 Ka	862 Ka	982 Ka
Cooling capacity			·			·					
Cooling capacity	kW	297,0	335,0	356,0	444,0	490,0	552,0	644,0	731,0	825,0	914,0
Nominal input power	kW	117,0	136,0	144,0	167,0	179,0	211,0	234,0	294,0	310,0	362,0
EER			2,50		2	,70	2,60	2,80	2,50	2,70	2,50
Axial fans	· · · · · · · · · · · · · · · · · · ·										
Quantity	n.		4			6			8	1	0
Rotation speed	rpm					6	60				
Air flow	m³/h	66.000	62.000	102.000	99.000	93	000	124	.000	155	.000
Air flow	l/s	18.333	17:222	28.333	27:500	25	833	34	444	43	056
Motor input power	kW	5	5,0		7	7,5		1(),0	1.	2,5
Input current	A	9),2		1	3,8		18	3,4	2	3,0
Screw compressors	· · · · · · · · · · · · · · · · · · ·										
Quantity	n.						2				
Cooling circuits	n.						2				
Standard capacity steps	n.						6				
Modulating capacity steps (option)	%					0 - 12	. ÷ 100				
Nominal input current	A	195,0	220,0	232,0	277,0	301,0	352,0	382,0	469,0	510,0	593,0
Maximum input current	A	288,0	324,0	310,0	364,0	430,0	462,0	560,0	620,0	640,0	720,0
Inrush current	A	729,0	848,0	830,0	983,0	1.128,0	1.2254,0	1.644,0	1.752,0	2.173,0	2.389,0
Inrush current with options PW/DS	A	494,0	585,0	594,0	702,0	827,0	895,0	1.235,0	1:319,0	1.617,0	1.780,0
Evaporator	· · · · · ·										
Туре						Shell a	nd tube				
Quantity	n.						1				
Water flow	m³/h	51,1	57,6	61,2	76,3	84,2	95,0	110,9	125,6	141,8	157,3
Water flow	l/s	14,2	16,0	17,0	21,2	23,4	26,4	30,8	34,9	39,4	43,7
Pressure drop	kPa	31	36	41	25	31	33	53	44	63	38
Water volume		90	1	30	1	62	184	452	435	426	417
Electrical data											
Total input power	kW	122,0	141,0	152,0	175,0	187,0	219,0	244,0	304,0	323,0	375,0
Total nominal input current	A	204,0	229,0	246,0	291,0	315,0	366,0	400,0	487,0	533,0	618,0
Maximum total input current	A	297,0	333,0	338,0	378,0	444,0	476,0	578,0	638,0	663,0	743,0
Total inrush current	A	738,0	857,0	862,0	997,0	1.172,0	1'268,0	1.662,0	1.770,0	2.196,0	2:391,0
Inrush current with options PW/DS	A	503,0	594,0	599,0	716,0	841,0	909,0	1`253,0	1`337,0	1.640,0	1`803,0
Sound pressure level											
Sound pressure at 1 m	dB(A)	7	71	72		73	74	7	'5	7	76
Dimensions											
Length	mm	3.	350		4.	850		6	350	7.	850
Width	mm					2	300				
Height	mm					2	700				
Transport weight	kg	3.326	3.202	4.483	4.935	5.131	5.2252	6.932	6'976	7.751	7`846
Refrigerant charge per circuit	kg	37,0	48,0	39,0	60,0	73,0	76,0	90,0	93,0	113,0	114,0
Electrical power supply											
Electrical power supply	V / ph / Hz					/00 / 3	/ 50 + T				



REFRIGERANT R407C AND R134A

Technical data - R134a - Ultrasilenced version - multicircuit

RAHU		753 Ka	863 Ka	1023 Ka	1154 Ka	1304 Ka
Cooling capacity						
Cooling capacity	kW	709,0	858,0	966,0	1`101,0	1`288,0
Nominal input power	kW	277,0	300,0	351,0	423,0	457,0
EER		2,56	2,86	2,75	2,60	2,76
Axial fans	· · ·					
Quantity	n.		1	2		16
Rotation speed	rpm			660		
Air flow	m³/h	204.000	198.000	186	000	248.000
Air flow	l/s	56.662	55.000	51	667	68.889
Motor input power	kW		1!	5,0		20,0
Input current	A		21	7,6		36,8
Screw compressors						
Quantity	n.		3			1
Cooling circuits	n.		3			1
Standard capacity steps	n.		9		1	2
Modulating capacity steps (option)	%		0-8÷100		0-6	
Nominal input current	A	464,0	501,0	573,0	704,0	764,0
Maximum input current	A	588,0	642,0	840,0	856,0	1.120,0
Inrush current	A	1.335,0	1.451,0	1 924,0	1.665,0	2.204,0
Inrush current with options PW/DS	A	1.004,0	1.093,0	1.515,0	1`307,0	1.795,0
Evaporator						
Туре				Shell and tube		
Quantity	n.		1			2
Water flow	m³/h	122,0	147,6	166,3	189,4	221,4
Water flow	l/s	33,9	41,0	46,2	52,6	61,5
Pressure drop	kPa	38	61	58	46	53
Water volume	I	444	431	421	923	905
Electrical data						
Total input power	kW	292,0	315,0	366,0	438,0	487,0
Total nominal input current	A	492,0	529,0	601,0	732,0	801,0
Maximum total input current	A	616,0	670,0	868,0	884,0	1.157,0
Total inrush current	A	1'363,0	1.479,0	1.952,0	1.693,0	2'241,0
Inrush current with options PW/DS	A	1.032,0	1.121,0	1 543,0	1'335,0	1.832,0
Sound pressure level						
Sound pressure at 1 m	dB(A)		76		77	78
Dimensions						
Length	mm		9.	350		12.320
Width	mm			2'300		
Height	mm			2'700		
Transport weight	kg	7.576	7.973	10.232	10`366	13`468
Refrigerant charge per circuit	kg	49,0	69,0	104,0	71,0	90,0
Electrical power supply						
Electrical power supply	V / ph / Hz			400/3/50+T		

REFRIGERANT R407C AND R134A

R407C - Correction factors for cooling capacity

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	17	1,401	1,371	1,347	1,306	1,265	1,241	1,217	1,185	1,138
	16	1,366	1,336	1,313	1,272	1,231	1,208	1,185	1,154	1,107
	15	1,330	1,301	1,279	1,238	1,198	1,176	1,154	1,123	1,077
	14	1,295	1,266	1,245	1,205	1,167	1,146	1,125	1,094	1,047
	13	1,260	1,232	1,212	1,171	1,136	1,116	1,096	1,065	1,019
	12	1,221	1,195	1,177	1,138	1,104	1,070	1,052	1,021	0,975
	11	1,183	1,158	1,143	1,106	1,072	1,042	1,027	0,997	0,951
	10	1,145	1,121	1,109	1,073	1,040	1,014	1,002	0,965	0,927
	9	1,113	1,090	1,076	1,049	1,009	0,988	0,966	0,935	0,890
	8	1,081	1,060	1,044	1,024	0,979	0,961	0,942	0,912	0,867
Temperature	ature 7 ter 6	1,050	1,030	1,011	1	0,948	0,934	0,918	0,888	0,843
of water leaving from	6	1,017	0,997	0,979	0,964	0,917	0,903	0,885	0,855	0,809
evaporator °C	5	0,984	0,965	0,946	0,928	0,886	0,871	0,851	0,820	0,774
	4	0,951	0,932	0,914	0,892	0,854	0,840	0,818	0,778	0,736
	3	0,919	0,898	0,882	0,855	0,823	0,808	0,785	0,758	0,718
	2	0,889	0,870	0,850	0,827	0,797	0,781	0,760	0,734	0,696
	1	0,859	0,842	0,819	0,799	0,770	0,754	0,735	0,711	0,659
	0	0,829	0,813	0,788	0,771	0,744	0,726	0,711	0,689	0,656
	-1	0,800	0,784	0,757	0,743	0,717	0,699	0,686	0,666	0,636
	-2	0,771	0,756	0,731	0,717	0,692	0,673	0,660	0,641	0,612
	-3	0,743	0,728	0,706	0,691	0,666	0,647	0,633	0,626	0,600
	-4	0,715	0,700	0,680	0,665	0,640	0,621	0,607	0,592	0,568
	-5	0,687	0,672	0,654	0,639	0,614	0,596	0,581	0,567	0,547

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

The unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
 Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 For further darifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for input power

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	17	1,054	1,093	1,125	1,175	1,225	1,257	1,289	1,330	1,393
	16	1,036	1,082	1,104	1,155	1,206	1,228	1,250	1,292	1,354
	15	1,018	1,071	1,084	1,135	1,187	1,200	1,213	1,253	1,314
	14	0,999	1,059	1,063	1,115	1,164	1,188	1,201	1,241	1,302
	13	0,981	1,048	1,043	1,096	1,142	1,177	1,189	1,229	1,290
	12	0,965	1,020	1,024	1,077	1,122	1,166	1,178	1,219	1,281
	11	0,948	0,993	1,004	1,059	1,102	1,145	1,166	1,207	1,269
	10	0,932	0,966	0,985	1,041	1,082	1,124	1,154	1,195	1,257
	9	0,915	0,946	0,970	1,027	1,071	1,107	1,142	1,182	1,245
_	8	0,898	0,927	0,955	1,014	1,060	1,090	1,126	1,167	1,229
Temperature	7	0,882	0,907	0,940	1	1,049	1,073	1,106	1,147	1,209
of water leaving from	6	0,868	0,895	0,926	0,980	1,030	1,054	1,087	1,127	1,186
leaving from evaporator °C	5	0,854	0,882	0,910	0,961	1,011	1,036	1,069	1,107	1,165
	4	0,840	0,870	0,895	0,941	0,992	1,017	1,051	1,090	1,148
	3	0,826	0,857	0,880	0,922	0,973	0,999	1,032	1,071	1,129
	2	0,813	0,844	0,866	0,910	0,958	0,986	1,015	1,054	1,112
	1	0,800	0,831	0,852	0,898	0,943	0,973	0,998	1,038	1,096
	0	0,788	0,818	0,837	0,885	0,929	0,960	0,981	1,020	1,079
	-1	0,775	0,805	0,823	0,873	0,914	0,947	0,964	1,002	1,059
	-2	0,763	0,792	0,813	0,858	0,900	0,933	0,952	0,991	1,050
	-3	0,750	0,779	0,802	0,842	0,885	0,918	0,941	0,980	1,039
	-4	0,738	0,766	0,791	0,827	0,871	0,903	0,929	0,969	1,095
	-5	0,726	0,753	0,781	0,811	0,857	0,889	0,918	0,959	1,020

REMARKS:

The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5 °C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.



REFRIGERANT R407C AND R134A

R134a - Correction factors for cooling capacity

External air te	mperature °C	28	30	32	35	38	40	42	45	48
	17	1,518	1,475	1,446	1,417	1,372	1,327	1,297	1,263	1,213
	16	1,474	1,432	1,404	1,375	1,332	1,288	1,259	1,226	1,176
	15	1,429	1,388	1,361	1,334	1,292	1,249	1,221	1,188	1,139
	14	1,384	1,345	1,318	1,292	1,251	1,210	1,183	1,151	1,102
	13	1,339	1,301	1,276	1,250	1,211	1,171	1,145	1,113	1,065
	12	1,294	1,258	1,233	1,209	1,170	1,132	1,107	1,075	1,027
	11	1,250	1,214	1,191	1,167	1,130	1,093	1,069	1,038	0,990
	10	1,205	1,171	1,148	1,125	1,090	1,054	1,031	0,992	0,953
	9	1,160	1,127	1,105	1,083	1,049	1,015	0,993	0,962	0,916
	8	1,115	1,084	1,063	1,042	1,009	0,977	0,955	0,925	0,879
Temperature	7	1,070	1,040	1,020	1	0,969	0,938	0,917	0,887	0,842
	f water 6 ving from -	1,025	0,995	0,976	0,956	0,926	0,896	0,876	0,846	0,801
evaporator °C	5	0,980	0,951	0,931	0,912	0,883	0,855	0,836	0,806	0,761
	4	0,947	0,918	0,899	0,881	0,852	0,824	0,806	0,777	0,735
	3	0,914	0,886	0,868	0,850	0,822	0,794	0,776	0,749	0,710
	2	0,880	0,854	0,836	0,818	0,791	0,764	0,746	0,721	0,684
	1	0,847	0,822	0,805	0,787	0,761	0,734	0,716	0,693	0,659
	0	0,814	0,789	0,773	0,756	0,730	0,704	0,686	0,665	0,633
	-1 -2	0,781	0,757	0,741	0,725	0,700	0,674	0,656	0,637	0,608
		0,748	0,725	0,710	0,694	0,669	0,643	0,627	0,609	0,582
	-3	0,715	0,693	0,678	0,663	0,638	0,613	0,597	0,581	0,557
	-4	0,681	0,660	0,646	0,632	0,608	0,583	0,567	0,553	0,531
	-5	0,648	0,628	0,615	0,601	0,577	0,553	0,537	0,524	0,506

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

If the unit works with an evaporation water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
 - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 - For further clarifications or information, you are kindly request to contact our sales departement.

R134a - Correction factors for input power

External air te	mperature °C	28	30	32	35	38	40	42	45	48
	17	1,016	1,067	1,100	1,134	1,192	1,250	1,289	1,331	1,394
	16	1,002	1,053	1,087	1,121	1,179	1,237	1,275	1,318	1,381
	15	0,988	1,039	1,073	1,107	1,165	1,223	1,262	1,304	1,368
	14	0,974	1,025	1,060	1,094	1,152	1,210	1,249	1,291	1,355
	13	0,960	1,012	1,046	1,080	1,139	1,197	1,236	1,278	1,342
	12	0,946	0,998	1,032	1,067	1,125	1,184	1,222	1,265	1,329
	11	0,932	0,984	1,019	1,054	1,112	1,170	1,209	1,252	1,316
	10	0,918	0,970	1,005	1,040	1,099	1,157	1,196	1,239	1,303
	9	0,904	0,957	0,992	1,027	1,085	1,144	1,183	1,225	1,290
_	8	0,890	0,943	0,978	1,013	1,072	1,130	1,169	1,212	1,277
Temperature	7	0,876	0,929	0,965	1	1,059	1,117	1,156	1,199	1,264
of water leaving from	6	0,872	0,923	0,958	0,992	1,045	1,098	1,134	1,176	1,238
evaporator °C	5	0,867	0,917	0,951	0,984	1,032	1,080	1,112	1,152	1,212
	4	0,853	0,903	0,936	0,969	1,017	1,065	1,097	1,138	1,199
	3	0,839	0,888	0,922	0,955	1,003	1,051	1,083	1,124	1,185
	2	0,824	0,874	0,907	0,940	0,988	1,036	1,069	1,110	1,171
	1	0,810	0,859	0,892	0,925	0,974	1,022	1,054	1,096	1,157
	0	0,796	0,845	0,878	0,910	0,959	1,008	1,040	1,081	1,144
	-1	0,781	0,830	0,863	0,896	0,944	0,993	1,026	1,067	1,130
	-2	0,767	0,816	0,848	0,881	0,930	0,979	1,011	1,053	1,116
	-3	0,753	0,801	0,834	0,866	0,915	0,964	0,997	1,039	1,102
	-4	0,738	0,787	0,819	0,851	0,901	0,950	0,983	1,025	1,158
	-5	0,723	0,772	0,805	0,837	0,886	0,935	0,968	1,011	1,075

REMARKS:

Herwinks:
- The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit
- If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.
- Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
- For further clarifications or information, you are kindly request to contact our sales departement.



AIR PERFORMA R134A

HIGH EFFICIENCY AIR COOLED CHILLERS WITH SCREW COMPRESSORS AND AXIAL FANS



EAH 292 Ka



EAH ... Ka Series

Cooling capacity from 289 to 1166 kW - 2 circuits

The air cooled chillers of **Air Performa EAH series** are extremely compact units so to reduce the installation spaces and weights.

They are designed for outdoor installation and are particularly suitable for cooling water in air conditioning systems or industrial applications and, thanks to the refrigerant and to special manufacturing arrangements, they can achieve average values of EER around 4,0.

They are all available with 2 refrigerant circuits.

Thanks to the several options available, these units are particularly flexible and can be easily adapted to all installation sites.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **EAH... Ka** standard version

Operation limits (standard units):

AIR: from 15 to 45°C

WATER (out from evaporator): from 5 to 15°C - not suitable for glycol

Main components:

Modular frame made of galvanized and RAL 7035 painted steel profiles and base-frame in painted steel, suitably treated to resist to external agents. The compressors and the main components are suitably placed in the technical partition, completely at sight.

Semi-hermetic screw compressors equipped with capacity steps, motor thermal protection, oil crankcase heater and phase monitor. The compressors lubrication is of forced type, with no pump and in order to prevent many oil migrations to the cooling circuit, the compressors are provided with an oil separator, in-built to the discharge side. The electrical motor is foreseen for lower inrush current and, in this is case, the unit is equipped with an automatic partial load inrush device and mechanical interlock of the inrush control switches, to prevent accidental short circuits (options DS and PW).

Dry expansion **shell and tube evaporator**, 100% counter-current type with two refrigerant circuits and one water circuit, with very low pressure drops. Shell and tubes plate made in carbon steel and copper tubes, insulated by close-cell polyurethane foam material. Some plastic and corrosion-proof baffles are suitably placed inside the shell, allowing a correct water distribution and making the

tube bundle particularly strong and vibration-free, also in case of very high water flows.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. Thanks to their "V" positioning, also increasing the total efficiency, the overall dimensions are particularly compact. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges, non-return valve on discharge side, shut-off valve on liquid line, shut-off valve on compressor discharge side.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a lock-door main switch. Inside, it is complete with all control and protection switches, the terminal board and auxiliaries. The electrical board also includes the control device for power supply phases, to prevent the compressor to turn in the wrong sense. The micro-processor, complete with display, is also placed inside the electrical board.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the chilled water temperature regulation, the working parameters, auto-detection failure system, remote management and supervision, complete with compressors hour counter.



AIR PERFORMA R134A HIGH EFFICIENCY AIR COOLED CHILLERS

WITH SCREW COMPRESSORS AND AXIAL FANS

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- **BT** Low temperature operation (-20°C): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- CE UV protection on water insulation: particular coat of the evaporator and of water insulations with UV ray proof material.
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors.
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a suitably coated cabinet, vibration dampers under compressors, mufflers on compressors discharge pipes.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **DS** Star/delta: electric device of close transition type to reduce the inrush current, complete with short circuit safety by mechanical interlock.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts, made of 50x50 4-mesh wire.
- GP1 Protection grid for compressors section: metal protection grid against accidental impacts.
- IG Watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- M12 Modulating capacity control for 2-circuit units: by means of some valves installed on compressors, the capacity is modulated from 12 to 100%.
- OS Oil flow safety switch: in-built in the compressor oil separator, it indicates the eventual decrease of the oil level.

- PF
 Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.

 PM
 Spring-type vibration dampers: support, for insulating the unit (supplied in kit), mainly indicated
 - for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs. **Remote microprocessor**: remote terminal, allowing to display the
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PW Part-winding: equipment for step compressors starting, reducing of about 35% the inrush current of each compressor.
- **RA** Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- **RF Power factor correction system cosfi >0,9**: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- RH Shut-off valve on suction side: they are use to isolate compressors during service operations.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- **RR Copper/copper condensing coils:** special execution of the condensing coils with copper pipe and fins.
- TE Electronic thermostatic value: it is requested to make a very accurate regulation of the refrigerant flow and to limit variations of cooling capacity and evaporator leaving temperature water during operation in transitions and for a better performance with fixed superheating.
 V Voltmeter: Electrical device measuring the electrical tension in the
 - **Voltmeter**: Electrical device measuring the electrical tension in the power supply of the unit.
- VS Solenoid value: electromagnetic solenoid value on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



AIR PERFORMA R134A

HIGH EFFICIENCY AIR COOLED CHILLERS

WITH SCREW COMPRESSORS AND AXIAL FANS

Technical data

EAH		292 Ka	332 Ka	392 Ka	442 Ka	562 Ka	632 Ka	722 Ka	832 Ka	972 Ka	1092 Ka	1172 Ka
Cooling capacity												
Cooling capacity	kW	289,0	335,0	390,0	433,0	568,0	631,0	720,0	832,0	970,0	1`089,0	1`166,0
Nominal input power	kW	71,4	84,6	99,2	111,2	135,6	151,2	172,6	197,6	229,4	262,4	288,0
EER		4,05	3,96	3,93	3,89	4,19	4	17	4,21	4,23	4,15	4,05
Axial fans												
Quantity	n.		6		8	1	10	12	14		16	
Rotation speed	rpm						850					
Air flow	m³/h		168.000		224.000	280.000	260.000	312.000	364.000		416.000	
Air flow	l/s		46.662		62.555	77`778	72`222	86.662	101.111		115.556	
Motor input power	kW		20,0		26,0	33	3,0	40,0	46,0		53,0	
Input current	A		38,0		50,0	63	3,0	76,0	89,0		101,0	
Screw compressors												
Quantity	n.						2					
Cooling circuits	n.						2					
Standard capacity steps	n.						6					
Modulating capacity steps (option)	%						0 - 12,5 ÷ 100					
Nominal input current	A	126,0	147,0	170,0	184,0	231,0	260,0	295,0	327,0	372,0	440,0	478,0
Maximum input current	A	216,0	248,0	288,0	324,0	364,0	430,0	428,0	560,0	620,0	640,0	720,0
Inrush current	A	616,0	609,0	729,0	848,0	983,0	1.128,0	1`237,0	1`644,0	1.752,0	2.173,0	2'389,0
Inrush current with options PW/DS	A	377,0	414,0	484,0	585,0	702,0	827,0	879,0	1`235,0	1`319,0	1`617,0	1.780,0
Evaporator												
Туре							Shell and tube					
Quantity	n.						1					
Water flow	m³/h	50,0	58,0	67,0	74,0	98,0	108,0	124,0	143,0	167,0	187,0	206,0
Water flow	l/s	14,2	16,5	20,5	23,3	27,2	30,7	34,9	40,8	46,6	54,4	57,2
Pressure drop	kPa	57		59	54	59	42	74	81	52	81	51
Electrical data												
Total input power	kW	91,0	104,0	119,0	138,0	169,0	184,0	212,0	244,0	282,0	315,0	341,0
Total nominal input current	A	164,0	185,0	208,0	234,0	281,0	323,0	370,0	416,0	473,0	541,0	579,0
Maximum total input current	A	254,0	286,0	326,0	374,0	414,0	493,0	504,0	649,0	721,0	741,0	821,0
Total inrush current	A	654,0	647,0	767,0	898,0	1.046,0	1`221,0	1`313,0	1.733,0	1`853,0	2`274,0	2'490,0
Inrush current with options PW/DS	A	415,0	452,0	522,0	635,0	765,0	890,0	955,0	1`324,0	1'420,0	1.718,0	1`881,0
Sound pressure level												
Sound pressure at 1 m	dB(A)		83		84	8	35	86	87		88	
Dimensions												
Length	mm		4`850		6'350	7.	850	9`350	10`850		12.320	
Width	mm						2'300					
Height	mm						2.200					
Transport weight	kg	3.120	3.420	3.690	4.240	5`490	5`790	6`740	7`840	8`840	9`340	9`910
Electrical power supply												
Electrical power supply	V / ph / Hz						400/3/50+1					

HIGH EFFICIENCY WATER COOLED CHILLERS WITH HOUSING AND SCROLL COMPRESSORS

REFRIGERANT R407C - R134A



RWE 111 K



Series RWE ...

Cooling capacity from 6 to 87 kW - 1 circuit

The water cooled chillers of **RWE series** are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. For this reason, they are made of a housing in painted steel plate.

They are all available with 1 refrigerant circuit.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **RWE...K** with R407C ecological refrigerant charge **RWE...Ka** with R134a ecological refrigerant charge

Operation limits (standard units):

EVAPORATOR (OUT): from 5 to 15°C CONDENSER (OUT): from 30 to 50°C for R407C – from 30 to 55°C for R134a

Main components:

Strong and compact frame, with a housing made of galvanized and RAL 7035 painted steel plate. The front and the access panels to the electrical board are easy to be opened. The main components are installed inside the housing, which can be isolated with standard soundproofing material (option CL) or with bituminous rubber soundproofing material (option CM). When required, the hydraulic kit (buffer tank and hydraulic kit) is installed into an additional section at the bottom of the unit, so not change the overall dimensions.

High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. Higher capacity units are equipped with two scroll compressors in tandem.

Weld-brazed plate **evaporator** and **condenser** in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the hinged internal safety panel, provided with protection fuses and safety transformer. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management **microprocessor** installed on the external panel, easily accessible, complete with compressors hour counter.



REFRIGERANT R407C - R134A

Accessories

- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz. CL Soundproofing insulation with standard material: insulation
- CL Soundproofing insulation with standard material: insulation of the compressor housing by means of soundproofing material.
- CM Soundproofing insulation with bituminous rubber material: insulation of the compressor housing by means of bituminous rubber coated material.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **HG Hot gas by-pass**: mechanical device for modulating cooling capacity, preventing frequent compressor'stops.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT High and low pressure gauges for measuring circuit pressure.
- **MV Buffer tank** of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
 RL Compressors overload relays: electromechanical protection de-
 - **Compressors overload relays**: electromechanical protection devices against compressor's overload.
 - Personalized frame painting in RAL colour

RV

- SN Main switch: manual switch of lock-door type, switching off the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VP Pressostatic valve: it is placed on condenser and controls the water flow rate according to the unit condensing pressure.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.





HIGH EFFICIENCY WATER COOLED CHILLERS WITH HOUSING AND SCROLL COMPRESSORS

REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C

RWE		61 K	111 K	171 K	201 K	221 K	251 K	301 K	381 K	461 K	501 K	571 K	751 K	901 K
Cooling capacity														
Cooling capacity	kW	5,9	10,8	16,5	19,3	20,9	24,8	29,4	37,8	45,3	49,3	57,0	74,6	87,2
Nominal input power	kW	1,2	2,1	2,9	3,4	4,6	5,6	6,2	8,4	9,9	11,1	12,7	16,9	19,6
EER		4,92	5,14	5,69	5,68	4,54	4,43	4,74	4,50	4,57	4,44	4,49	4,41	4,45
Heating capacity	kW	7,1	12,8	19,3	22,7	25,5	30,4	35,7	46,3	55,1	60,4	69,7	91,4	106,9
Scroll compressors					,									
Quantity	n.					1							2	
Circuits	n.							1						
Standard capacity steps	%					0/100						0/50	0/100	
Nominal input current	A	6,1	11,2	7,2	7,5	10,7	12,5	14,3	16,3	20,0	24,6	28,1	33,7	40,7
Maximum input current	A	11,0	23,0	11,0	13,0	17,0	20,0	22,0	27,0	32,0	40,0	44,0	54,0	64,0
Inrush current	A	47.0	100.0	66.0	72.0	99.0	123.0	127.0	167.0	198.0	143.0	149.0	194.0	230.0
Evaporator	I	,			,			1 /	1 . /		.,			
Туре							W	/eld-brazed pl	ate					
Quantity	n.							1	-					
Circuits	n.							1						
Water flow	m³/h	1,0	1,8	2,8	3,3	3,6	4,3	5,1	6,5	7,8	8,5	9,8	12,8	15,0
Water flow	/s	0,3	0,5	0,8	0,9	1,0	1,2	1,4	1,8	2,2	2,4	2,7	3,6	4,2
Pressure drop	kPa	24	69	46	61	59	61	55	64	41	21	20	25	27
Water cooled condenser	11.0											20	20	
Туре							W	/eld-brazed pl	ate					
Quantity	n.							1	uic					
Water flow	m ³ /h	1,2	2,2	3,4	3,9	4,4	5,3	6,2	8.0	9.6	10,5	12,1	15.9	18,5
Water flow	I/s	0,3	0,6	0,9	1,1	1,2	1,5	1,7	2,2	2,7	2,9	3,4	4,4	5,1
Pressure drop	kPa	26	31	37	44	46	52	53	58	84	2,5	25	23	24
Pumps	N'U	20	51	51		10	52	55	50	01		25	25	21
P1 – Available pressure	kPa	64	43	58	79	72	64	94	85	76	85	67	49	37
P1 – Motor input power	kW		18	50		55	01	21	05		.75	07	17	1,1
P1H – Available pressure	kPa	84	70	90	111	104	98	138	128	120	142	123	112	100
P1H – Motor input power	kW		18	,,,		75	70	150	120		1.1	125	112	1.5
Capacity of buffer tank			10		0,	80					1,1	1	10	ر,۱
Sound pressure level						00							10	
Sound pressure at 1 m	dB(A)	58	59	58	6	60		51	6	52	4	53	6	54
Dimensions	uD(A)	70	J9	70	<u> </u>	10)1	<u>ι</u> ι	12		10		/1
Length	mm					800						1.	600	
Width	mm					500							50	
Height	mm					300		960				1	50	
						1.430		900				1.340		
Height with MV option	mm	119	174	142	145	1 430	199	20.4	721	247	339	345	406	434
Transport weight	kg		126					204	231					
Transport weight with empty buffer tank	kg	169	176	192	195	239	249	254	281	297	499	505	566	594
Refrigerant charge per circuit	kg	2,4	2,5	2,8	2,9	4,5	4,7	5,6	6,4	8,1	5,8	7,0	8,0	19,6
Electrical power supply	N// 1 /**	220 / 6 / 1	- N - T						0 / 2 / 50	T				
Electrical power supply	V / ph / Hz	230/1/5	50 + N + T					40	0/3/50+N	+1				

REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a

RWE		151 Ka	181 Ka	211 Ka	271 Ka	311 Ka	351 Ka	421 Ka	521 Ka	601 K
Cooling capacity										
Cooling capacity	kW	14,6	17,6	20,3	26,7	30,2	34,5	41,4	51,6	58,9
Nominal input power	kW	3,2	3,8	4,4	5,8	6,6	7,6	8,9	11,7	13,7
EER		4,56	4,63	4,61	4,60	4,57	4,54	4,65	4,41	4,30
Heating capacity	kW	17,8	21,4	24,7	32,6	36,8	42,1	50,3	63,3	72,6
Scroll compressors										
Quantity	n.			1					2	
Circuits	n.					1				
Standard capacity steps	%			0 / 100				0 / 50	/ 100	
Nominal input current	A	8,8	10,0	11,4	14,0	15,8	20,4	23,4	26,4	32,1
Maximum input current	A	17,0	20,0	22,0	27,0	32,0	40,0	44,0	54,0	64,0
nrush current	A	99,0	123,0	127,0	167,0	198,0	143,0	149,0	194,0	230,0
Evaporator										
Гуре						Weld-brazed plate				
Quantity	n.					1				
Circuits	n.					1				
Water flow	m³/h	2,5	3,0	3,5	4,6	5,2	5,9	7,1	8,9	10,1
Water flow	I/s	0,7	0,8	1,0	1,3	1,4	1,6	2,0	2,5	2,8
Pressure drop	kPa	58	52	54	70	59	27	22	21	27
Water cooled condenser								1		
Гуре						Weld-brazed plate				
Quantity	n.					1				
Nater flow	m³/h	3,1	3,7	4,0	5,7	6,4	7,3	8,7	11,0	12,5
Vater flow	l/s	0,9	1,0	1,1	1,6	1,8	2,0	2,4	3,1	3,0
Pressure drop	kPa	24	37	38	29	25	19	21	31	27
Pumps								1		
P1 — Available pressure	kPa	72	87	75	71	110	111	110	96	92
P1 – Motor input power	kW			55				0,75		
P1H — Available pressure	kPa	103	118	107	104	152	164	165	152	150
P1H — Motor input power	kW			75		1,1		75		,1
Capacity of buffer tank			-,	80		.,.	,	11		,.
Sound pressure level									-	
Sound pressure at 1 m	dB(A)	56	5	7	5	8		59	f	50
Dimensions	45(1)						-			
Length	mm			800				1.6	00	
Width	mm			500				75		
leight	mm			500		960				
Height with MV option	mm			1.430		,,,,,		1'3	40	
Fransport weight	kg	175	185	193	212	227	315	312	368	389
ransport weight with empty buffer tank	kg	225	235	243	262	277	475	472	528	549
Refrigerant charge per circuit	kg	LLJ	233	2,0	202	211		,0		l,0
Electrical power supply	ry i			2,0				10	7	1,0
Electrical power supply	V / ph / Hz					400/3/50+N+T				



REFRIGERANT R407C - R134A



Series RWE ...

Cooling capacity from 36 to 393 kW - 1 and 2 circuits

The water cooled chillers of **RWE series** are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications.

They are all available with 1 or 2 refrigerant circuits.

They have been designed to be extremely compact, with an easy access for both ordinary and extraordinary service operations.

Thanks to their dimensions (for the whole range, the width is 750 mm) and to the several options available, these units are particularly easy to install also in small spaces, with no building works.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **RWE...K** with R407C ecological refrigerant charge **RWE...Ka** with R134a ecological refrigerant charge

Water operation limits (standard units):

EVAPORATOR (OUT): from 5 to 15°C CONDENSER (OUT): from 30 to 50°C for R407C – from 30 to 55°C for R134a

Main components:

Strong and compact frame, made of bended and RAL 7035 coloured steel profiles, supporting all the main components, installed at sight. On request, the compressors can be isolated by a soundproofing cabinet with standard material (option CF) or with bituminous rubber coated material (option CFU), so to further reduce the overall sound level of the unit itself.

High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. Higher capacity units, with both 1 and 2 cooling circuits, are equipped with two scroll compressors in tandem.

Weld-brazed plate **evaporator** and **condenser** in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges.

Electric board in compliance with CE norms, contained in a suitable partition protected by the hinged internal safety panel, provided with protection fuses and safety transformer.

Unit management **microprocessor** installed on the external panel, easily accessible, complete with compressors hour counter.



REFRIGERANT R407C - R134A

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with soundproofing material and vibration dampers under compressors.
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with bituminous rubber soundproofing material and vibration dampers under compressors, mufflers on compressors discharge pipes.
- CI Soundproofing jacket on compressors: made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit.
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **HG Hot gas by-pass**: mechanical device for modulating cooling capacity (only for 1-circuit sizes).
- IE Funigated wooden crate packing: available on request for critical transports, so to assure a suitable protection to the unit.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- IR Packing with fumigated wooden pallet and transparent film: minimal packing made of wooden pallet and transparent film wrapped all around the unit.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MP Oversized microprocessor: compared to the standard microprocessor, it allows a multi-language display reading, a more detailed description of parameters, the possibility to manage up to 8 units, to manage non standard communication protocols, a better access to the program.

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification.
- V Voltmeter: Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.

REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 1 circuit - tandem compressors

RWE		541 K	631 K	761 K	931 K	1201 K	1501 K	1901 K
Cooling capacity								
Cooling capacity	kW	54,3	62,9	77,1	94,8	125,0	158,0	196,0
Nominal input power	kW	11,8	13,4	17,1	19,9	27,0	33,7	40,3
EER		4,60	4,69	4,51	4,76	4,63	4,69	4,86
Heating capacity	kW	66,1	76,3	94,2	115,0	152,0	191,0	237,0
Scroll compressors								
Quantity	n.				2 (1 tandem)			
Circuits	n.				1			
Standard capacity steps	%				0 / 50 / 100			
Nominal input current	A	26,3	27,1	31,3	37,8	48,2	61,9	72,7
Maximum input current	A	40,0	44,0	54,0	64,0	82,0	104,0	125,0
Inrush current	A	143,0	149,0	194,0	230,0	266,0	324,0	373,0
Evaporator								
Туре					Weld-brazed plate			
Quantity	n.				1			
Circuits	n.				1			
Water flow	m³/h	9,3	10,8	13,3	16,3	21,5	27,2	33,7
Water flow	l/s	2,6	3,0	3,7	4,5	6,0	7,5	9,4
Pressure drop	kPa	40	43	33	39	38	41	43
Water cooled condenser								
Туре					Weld-brazed plate			
Quantity	n.				1			
Water flow	m³/h	11,4	13,1	16,2	19,8	26,1	32,9	40,8
Water flow	l/s	3,2	3,6	4,5	5,5	7,3	9,1	11,3
Pressure drop	kPa	57	61	47	40	54	58	68
Sound pressure level								
Sound pressure at 1 m	dB(A)	7	0		72	75	77	79
Dimensions								
Length	mm				1.200			
Width	mm				750			
Height	mm		1.	600			1`800	
Transport weight	kg	505	521	555	603	715	795	881
Weight in operation	kg	511	528	565	614	731	815	908
Refrigerant charge per circuit	kg	4,4	5,0	7,0	7,3	10,0	13,0	18,0
Electrical power supply								
Electrical power supply	V / ph / Hz				400 / 3 / 50 + N + T			



REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 2 circuits - single compressors

RWE		442 K	532 K	612 K	762 K	922 K	1262 K	1552 K	1912 K
Cooling capacity									
Cooling capacity	kW	45,3	55,1	62,7	77,4	94,4	126,0	158,0	195,0
Nominal input power	kW	9,7	11,6	13,5	16,9	20,1	27,0	33,6	40,6
EER		4,67	4,75	4,64	4,58	4,69	4,67	4,70	4,80
Heating capacity	kW	55,0	66,7	76,2	94,3	114,5	153,0	191,6	235,6
Scroll compressors									
Quantity	n.					2			
Circuits	n.					2			
Standard capacity steps	%				0/50	0 / 100			
Nominal input current	A	22,0	26,0	27,0	31,0	38,0	48,0	62,0	73,0
Maximum input current	A	34,0	40,0	44,0	54,0	64,0	82,0	104,0	125,0
Inrush current	A	116,0	143,0	149,0	194,0	230,0	266,0	324,0	373,0
Evaporator									
Туре					Weld-bra	azed plate			
Quantity	n.			2				1	
Circuits	n.					2			
Water flow	m³/h	7,8	9,5	10,8	13,3	16,2	21,7	27,2	33,5
Water flow	l/s	2,2	2,6	3,0	3,7	4,5	6,0	7,5	9,3
Pressure drop	kPa	27	29	38	37	40	38	42	49
Water cooled condenser									
Туре					Weld-bra	azed plate			
Quantity	n.			2				1	
Water flow	m³/h	9,4	11,5	13,1	16,2	19,7	26,3	32,9	40,5
Water flow	l/s	2,6	3,2	3,6	4,5	5,5	7,3	9,1	11,3
Pressure drop	kPa	38	41		53	56		46	56
Sound pressure level									
Sound pressure at 1 m	dB(A)		70	74	76		73	· · · · · · · · · · · · · · · · · · ·	77
Dimensions									
Length	mm					500			
Width	mm				7	50			
Height	mm			1.600				1.800	
Transport weight	kg	496	516	525	545	596	721	795	859
Weight in operation	kg	502	523	533	555	608	738	815	883
Refrigerant charge per circuit	kg	2,0		2,4	3,1	3,7	5,5	6,7	7,9
Electrical power supply									
Electrical power supply	V / ph / Hz				400/3/	50 + N + T			



REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 2 circuits - tandem compressors

RWE		892 K	1082 K	1212 K	1512 K	1852 K	2462 K	3102 K	3822 K
Cooling capacity									
Cooling capacity	kW	90,4	108,0	125,0	155,0	190,0	250,0	315,0	393,0
Nominal input power	kW	19,3	23,7	27,0	33,8	40,4	54,0	67,4	80,6
EER		4,68	4,56	4,63	4,58	4,70	4,63	4,67	4,87
Heating capacity	kW	109,7	131,7	152,0	188,8	230,4	304,0	382,4	473,6
Scroll compressors									
Quantity	n.				4 (2 ta	indem)			
Circuits	n.					2			
Standard capacity steps	%				0 / 25 / 50) / 75 / 100			
Nominal input current	A	44,0	53,0	54,0	62,0	76,0	96,0	124,0	145,0
Maximum input current	A	68,0	80,0	88,0	108,0	128,0	164,0	208,0	250,0
Inrush current	A	150,0	183,0	193,0	244,0	294,0	348,0	428,0	498,0
Evaporator									
Туре					Weld-br	azed plate			
Quantity	n.			1				2	
Circuits	n.					2			
Water flow	m³/h	15,5	18,6	21,5	26,7	32,7	43,0	54,2	67,6
Water flow	l/s	4,3	5,2	6,0	7,4	9,1	11,9	15,0	18,8
Pressure drop	kPa	41	44	46	48		38	41	43
Water cooled condenser									
Туре					Weld-br	azed plate			
Quantity	n.			1				2	
Water flow	m³/h	18,9	22,6	26,1	32,5	39,6	52,3	65,8	81,5
Water flow	l/s	5,2	6,3	7,3	9,0	11,0	14,5	18,3	22,6
Pressure drop	kPa	35	41		45		54	58	68
Sound pressure level									
Sound pressure at 1 m	dB(A)	72		73	7	'5	78	80	82
Dimensions									
Length	mm		2.	500			3	000	
Width	mm				7	50			
Height	mm				1.	800			
Transport weight	kg	862	884	916	956	1.096	1.338	1.498	1.620
Weight in operation	kg	873	897	931	974	1.124	1`370	1.239	1.725
Refrigerant charge per circuit	kg	3,7	4,3	4,9	6,1	9,2	10,0	13,0	18,0
Electrical power supply									
Electrical power supply	V / ph / Hz				400/3/	50 + N + T			



REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 1 circuit - tandem compressors

RWE		341 Ka	401 Ka	491 Ka	591 Ka	711 Ka	971 Ka	1201 Ka
Cooling capacity								
Cooling capacity	kW	35,6	41,5	50,4	60,1	80,3	99,0	124,0
Nominal input power	kW	8,1	9,2	11,3	13,5	17,5	22,0	27,1
EER		4,39	4,51	4,46	4,45	4,59	4,50	4,57
Heating capacity	kW	43,7	50,7	61,7	73,6	97,8	121,0	151,1
Scroll compressors								
Quantity	n.				2 (1 tandem)			
Circuits	n.				1			
Standard capacity steps	%				0 / 50 / 100			
Nominal input current	A	19,8	22,5	27,7	31,3	37,3	46,8	58,7
Maximum input current	A	40,0	44,0	54,0	64,0	82,0	104,0	125,0
Inrush current	A	143,0	149,0	194,0	230,0	266,0	324,0	373,0
Evaporator								
Туре					Weld-brazed plate			
Quantity	n.				1			
Circuits	n.				1			
Water flow	m³/h	6,1	7,1	8,7	10,3	13,8	17,0	21,3
Water flow	l/s	1,7	2,0	2,4 2,9		3,8	4,7	5,9
Pressure drop	kPa	23	24		28	20	24	25
Water cooled condenser								
Туре					Weld-brazed plate			
Quantity	n.				1			
Water flow	m³/h	7,5	8,7	10,6	12,7	16,8	20,8	26,0
Water flow	l/s	2,1	2,4	2,9	3,5	4,7	5,8	7,2
Pressure drop	kPa	70	62	65	71	51	62	70
Sound pressure level								
Sound pressure at 1 m	dB(A)	7	0		72	75	77	79
Dimensions								
Length	mm				1.200			
Width	mm				750			
Height	mm		1	600			1.800	
Transport weight	kg	498	514	528	579	699	763	833
Weight in operation	kg	504	521	535	588	713	779	854
Refrigerant charge per circuit	kg	3,7	4,4	5,0	6,3	9,0	10,0	13,0
Electrical power supply								
Electrical power supply	V / ph / Hz				400 / 3 / 50 + N + T			



REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 2 circuits - single compressors

RWE		282 Ka	352 Ka	402 Ka	492 Ka	592 Ka	772 Ka	972 Ka	1222 Ka
Cooling capacity									
Cooling capacity	kW	29,1	36,0	41,2	50,7	60,8	79,3	99,5	125,0
Nominal input power	kW	6,7	8,1	9,3	11,3	13,4	17,5	21,8	27,0
EER		4,34	4,51	4,43	4,48	4,54	4,53	4,56	4,63
Heating capacity	kW	35,8	44,1	50,5	62,0	74,2	96,8	121,3	152,0
Scroll compressors									
Quantity	n.					2			
Circuits	n.					2			
Standard capacity steps	%				0 / 50) / 100			
Nominal input current	A	18,0	20,0	23,0	28,0	31,0	37,0	47,0	59,0
Maximum input current	A	34,0	40,0	44,0	54,0	64,0	82,0	102,0	125,0
Inrush current	A	116,0	143,0	149,0	194,0	230,0	266,0	324,0	373,0
Evaporator			·		·		·	·	<u> </u>
Туре					Weld-br	azed plate			
Quantity	n.					2			
Circuits	n.					2			
Water flow	m³/h	5,01	6,21	7,09	8,7	10,5	13,6	17,1	21,5
Water flow	l/s	1,39	1,72	1,97	2,4	2,9	3,8	4,7	5,9
Pressure drop	kPa	18	17	22	25	23	32	29	31
Water cooled condenser									
Туре					Weld-br	azed plate			
Quantity	n.					2			
Water flow	m³/h	6,15	7,58	8,68	10,7	12,8	16,6	20,9	26,1
Water flow	l/s	1,71	2,11	2,41	2,9	3,5	4,6	5,8	7,3
Pressure drop	kPa	50	39	51	48	50	46	43	54
Sound pressure level									
Sound pressure at 1 m	dB(A)	69		70	7	12	75	77	79
Dimensions									
Length	mm				1.	500			
Width	mm				7	50			
Height	mm			1.600				1.800	
Transport weight	kg	488	500	510	532	584	683	757	821
Weight in operation	kg	492	507	516	570	593	694	772	839
Refrigerant charge per circuit	kg	1,5		2,0	2,4	3,1	3,7	4,9	6,1
Electrical power supply					· · · ·	· · · · ·	<u>.</u>	· · · ·	
Electrical power supply	V / ph / Hz				400/3/	50 + N + T			



REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 2 circuits - tandem compressors

RWE		572 Ka	702 Ka	802 Ka	992 Ka	1192 Ka	1522 Ka	1952 Ka	2442 Ka
Cooling capacity									
Cooling capacity	kW	58,0	71,0	83,0	101,0	121,0	161,0	198,0	250,0
Nominal input power	kW	13,2	16,2	18,6	22,6	27,1	35,0	44,0	53,5
EER		4,39	4,38	4,46	4,47	4,46	4,60	4,5	4,67
Heating capacity	kW	71,2	87,4	101,7	123,9	148,1	196,0	242,0	303,5
Scroll compressors									
Quantity	n.				4 (2 t	andem)			
Circuits	n.					2			
Standard capacity steps	%				0/25/5	0 / 75 / 100			
Nominal input current	A	35,0	40,0	45,0	55,0	63,0	75,0	94,0	117,0
Maximum input current	A	68,0	80,0	88,0	108,0	128,0	164,0	208,0	250,0
Inrush current	A	150,0	183,0	193,0	244,0	294,0	348,0	428,0	498,0
Evaporator									
Туре					Weld-br	azed plate			
Quantity	n.		2		1			2	
Circuits	n.					2			
Water flow	m³/h	9,9	12,2	14,3	17,4	20,8	27,7	34,1	43,0
Water flow	l/s	2,8	3,4	3,9	4,8	5,8	7,7	9,5	11,9
Pressure drop	kPa	27	23	26	30	29	20	24	26
Water cooled condenser									
Туре					Weld-br	azed plate			
Quantity	n.		2		1			2	
Water flow	m³/h	12,2	15,0	17,5	21,3	25,5	33,7	41,6	52,2
Water flow	l/s	3,4	4,2	4,9	5,9	7,1	9,4	11,6	14,5
Pressure drop	kPa	35	41		45		54	58	68
Sound pressure level									
Sound pressure at 1 m	dB(A)	72		73		75	78	80	82
Dimensions									
Length	mm		2	500			3	000	
Width	mm				7	/50			
Height	mm				1	800			
Transport weight	kg	835	865	903	930	1.033	1'306	1`434	1.222
Weight in operation	kg	843	876	916	945	1.021	1.334	1.466	1.616
Refrigerant charge per circuit	kg	2,7	3,7	4,3	4,9	6,1	9,0	10,0	13,0
Electrical power supply									
Electrical power supply	V / ph / Hz				400/3/	50 + N + T			



REFRIGERANT R407C - R134A



Series RWH

Cooling capacity from 87 to 2440 kW - from 1 to 3 circuits

The water cooled chillers of **RWH series** are designed for indoor installation and are particularly suitable for industrial processes and air conditioning systems. Depending on the cooling capacity, they are available with 1, 2 or 3 cooling circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install also in small spaces, with no building works. They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **RWH...K** with R407C ecological refrigerant charge **RWH...Ka** with R134a ecological refrigerant charge

Water operation limits (standard units):

EVAPORATOR (OUT): from 5 to 15°C CONDENSER (OUT): from 30 to 50°C for R407C - from 30 to 55°C for R134a

Main components:

Strong and compact frame, made of bended and coloured steel profiles (colour RAL 9005-black), supporting the exchangers of the evapo-condensers group and on which all the main components are installed at sight. On request, the compressors can be isolated by a soundproofing cabinet with standard material (option CF) or with bituminous rubber coated material (option CFU), so to further reduce the overall sound level of the unit itself.

Semi-hermetic screw compressors equipped with capacity steps, motor thermal protection, oil crankcase heater and phase monitor. The compressors lubrication is of forced type, with no pump and in order to prevent many oil migrations to the cooling circuit, the compressors are provided with an oil separator, in-built to the discharge side. The electrical motor is foreseen for lower inrush current and, in this is case, the unit is equipped with an automatic partial load inrush device and mechanical interlock of the inrush control switches, to prevent accidental short circuits (options DS and PW). Dry expansion **shell and tube evaporator** with two refrigerant circuits and one water circuit, with very low pressure drops. Shell and tubes plate made in carbon steel and copper tubes. Some plastic and corrosion-proof baffles are suitably placed inside the shell, allowing a correct water distribution and making the tube bundle particularly strong and vibration-free, also in case of very high water flows.

Shell and tube condensers with copper pipes, externally grooved to increase the heating exchange coefficient and tube bundle in carbon steel. On request, the condenser is also available in cupro-nichel suitable for sea water use (option CA).

Each compressor works on an independent **cooling circuit**, assuring a remarkable reliability to multi-compressor units. Each circuit, made of copper or carbon steel tube, is composed of thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges, non-return valve on discharge side, shutoff valve on liquid line.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a lock-door main switch. Inside, it is complete with all control and protection switches, the terminal board and auxiliaries. The electrical board also includes the control device for power supply phases, to prevent the compressor to turn in the wrong sense. The micro-processor, complete with display, is also placed inside the electrical board.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the chilled water temperature regulation, the working parameters, auto-detection failure system, remote management and supervision, complete with compressors hour counter.



REFRIGERANT R407C - R134A

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- CA Condensers suitable for seawater: made in cupro-nichel or titanium, to be selected on request, suitable for working with seawater
- CC Insulated condensers: insulation on condensers heads and side (10 mm thickness).
- **CF** Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with soundproofing material and vibration dampers under compressors.
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with bituminous rubber soundproofing material and vibration dampers under compressors, mufflers on compressors discharge pipes.
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- DQ Additional box for connection of power supply cables
- **DS Star/delta**: electric device of close transition type to reduce the inrush current, complete with short circuit safety by mechanical interlock.
- IE Funigated wooden crate packing: available on request for critical transports, so to assure a suitable protection to the unit.
- IG Watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- IR Packing with fumigated wooden pallet and transparent film: minimal packing made of wooden pallet and transparent film wrapped all around the unit.

LI Liquid injection: mechanical device allowing a better cooling of compressors at very high compression level (standard for R407C).

- KS Lifting kit: made of belts and brackets to be inserted into the holes present in the unit base-frame. It is used for moving and positioning the unit on site.
- **M8-M25 Modulating capacity control**: by means of some valves installed on compressors, depending on their quantity, the capacity is modulated from 8 to 100%.
- OS Oil flow safety switch: in-built in the compressor oil separator, it indicates the eventual decrease of the oil level.

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PW Part-winding: equipment for step compressors starting, reducing of about 35% the inrush current of each compressor.
- **RA** Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RF Power factor correction system cosfi >0,9: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- RH Shut-off valve on suction side: they are use to isolate compressors during service operations.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification.
- TC Victaulic joints and welding coupling for condenser connection to water circuit.
- TE Electronic thermostatic valve: it is requested to make a very accurate regulation of the refrigerant flow and to limit variations of cooling capacity and evaporator leaving temperature water during operation in transitions and for a better performance with fixed superheating.
- V Voltmeter: Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 1 circuit

RWH		131 K	161 K	191 K	211 K	241 K	301 K	341 K	391 K	531 K	611 K	691 K	731 K	831 K
Cooling capacity					·					·	·			
Cooling capacity	kW	116,0	145,0	169,0	196,0	224,0	281,0	323,0	371,0	487,0	554,0	635,0	726,0	815,0
Nominal input power	kW	32,2	39,9	46,7	54,0	60,8	73,3	84,1	94,5	125,0	143,0	161,0	184,0	205,0
EER		3,	60	3,62	3,63	3,68	3,83	3,84	3,92	3,89	3,87	3,	94	3,97
Heating capacity	kW	149,0	185,0	216,0	250,0	285,0	355,0	407,0	465,0	611,0	698,0	795,0	910,0	1.020,0
Screw compressors									,	, .				
Quantity	n.							1						
Cooling circuits	n.							1						
Standard capacity steps	n.							3						
Modulating capacity steps (option)	%							0 - 25 ÷ 100)					
Nominal input current	A	56,0	69,0	80,0	91,0	100,0	124,0	142,0	159,0	201,0	238,0	265,0	301,0	335,0
Maximum input current	A	86.0	108.0	128.0	144.0	162.0	180.0	216,0	246.0	330.0	370,0	420.0	45	50.0
Inrush current	A	411,0	508,0	485,0	585,0	686,0	801,0	943,0	1.023,0	1.442,0	1.853,0	2.029,0	2.2	520,0
Inrush current with options PW/DS	A	218,0	269,0	290,0	350,0	423,0	520,0	612,0	665,0	1.009,0	1'297,0	1.420,0		/64,0
Evaporator		,.					,-		,.	,:				,-
Туре								Shell and tub	e					
Quantity	n.							1						
Circuits	n.							1						
Water flow	m³/h	20.0	24.9	29.1	33.7	38,5	48.3	55,6	63,8	83,8	95,3	109.2	124,9	140,2
Water flow	/s	5.5	6,9	8,1	9,4	10,7	13,4	15,4	17.7	23,3	26.5	30,3	34,7	38,9
Pressure drop	kPa	61	67	58	52	41	,.	71	,.	52	68	69	72	55
Water volume	1	44	42		39	37	86	82	79		85	179		94
Water cooled condenser			12	-	,,	51	00	02			05		-	
Туре								Shell and tub	ρ					
Quantity	n.							1	-					
Water flow	m ³ /h	25.6	31,8	37.2	43.0	49.0	61.1	70,0	80.0	105.1	120,1	136.7	156.5	175.4
Water flow	I/s	7,1	8,8	10,3	11,9	13,6	17,0	19,4	22,2	29,2	33,3	38,0	43,5	48,7
Pressure drop	kPa	80		5	87	89	77	80	78	82	81	79	84	80
Water volume		21	25	29	36	39	45	50	60	76	86	102	113	128
Sound pressure level					1									
Sound pressure at 1 m	dB(A)	70		76			7	80	81	82	83	84	85	87
Dimensions	(-)						-							
Length	mm			2.430			3	310	3.340			3.200		
Width	mm		800	2.00	8	50		00	850			1'300		
Height	mm		1.225			50		525	1.610			1.900		
Length with CF/CFU	mm		1 525	2.430		510		310	3.340			3.700		
Width with CF/CFU	mm		800	2 150			850	510	5 5 10			1'300		
Height with CF/CFU	mm		1.222		1.	610		525	1.610			1.900		
Transport weight	kq	909	926	1.168	1.262	1.288	1.688	1.716	1.900	3'464	3.203	3.696	3.888	3.929
Weight in operation	kg	909	920	1.232	1'340	1'365	1.819	1.849	2.040	3.724	3'774	3.978	4.304	4.401
Refrigerant charge per circuit	kg	25,0	24,0	23,0	45,0	44,0	50,0	48,0	94,0	91,0	86,0	63,0	77,0	91,0
Electrical power supply	ĸy	23,0	24,0	23,0	0,04	44,0	JU,U	40,0	7 4 ,0	71,V	00,0	0,00	77,0	21,0
Electrical power supply	V / ph / Hz							400/3/50+	т					
Electrical power supply EMARKS:	v / pii / HZ							+ 00 / 0 / 00+	1					

REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 2 and 3 circuits

RWH		252 K	312 K	372 K	422 K	472 K	592 K	672 K	772 K	1062 K	1222 K	1392 K	1462 K	1652 K	1933 K	2203 K	2493 K
Cooling capacity																	
Cooling capacity	kW	241,0	291,0	342,0	394,0	453,0	561,0	642,0	743,0	970,0	1`116,0	1`271,0	1'432,0	1`632,0	1`915,0	2.161,0	2.440,0
Nominal input power	kW	64,0	79,8	92,4	108,0	120,0	147,0	168,0	189,0	245,0	287,0	321,0	366,0	411,0	482,0	550,0	616,0
EER		3,76	3,65	3,70	3,65	3,78	3,	82	3,93	3,96	3,89	3,96	3,91	3,	97	3,93	3,96
Heating capacity	kW	306,0	371,0	435,0	502,0	573,0	708,0	810,0	932,0	1.215,0	1'403,0	1.262,0	1.798,0	2`043,0	2`397,0	2.711,0	3`056,0
Screw compressors																	
Quantity	n.							2								3	
Cooling circuits	n.							2								3	
Standard capacity steps	n.							6								9	
Modulating capacity steps (option)	%						() — 12 ÷ 10	0							0-8÷10	0
Nominal input current	A	111,0	137,0	158,0	182,0	198,0	247,0	285,0	319,0	396,0	476,0	530,0	602,0	670,0	795,0	903,0	1.002,0
Maximum input current	A	172,0	216,0	256,0	288,0	324,0	360,0	432,0	492,0	660,0	740,0	840,0	90	0,0	1`260,0	1.3	50,0
Inrush current	A	497,0	616,0	613,0	729,0	848,0	981,0	1.129,0	1`269,0	1.772,0	2`223,0	2'449,0	2.9	70,0	2`869,0	3.4	20,0
Inrush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0	828,0	911,0	1.339,0	1.667,0	1.840,0	2.5	14,0	2.560,0	2.6	64,0
Evaporator																	
Туре									Shell a	nd tube							
Quantity	n.									1							
Circuits	n.							2								3	
Water flow	m³/h	41,5	50,1	58,8	67,8	77,9	96,5	110,4	127,8	166,8	192,0	218,6	246,3	280,7	329,4	371,7	419,7
Water flow	l/s	11,5	13,9	16,3	18,8	21,6	26,8	30,7	35,5	46,3	53,3	60,7	68,4	78,0	91,5	103,2	116,6
Pressure drop	kPa	62	71	66	61	49	70	71	46	52	36	64	44	87	68	87	36
Water volume	I	1	34	1	29	124	185	179	294	286	271	264	461	444	648	632	615
Water cooled condenser																	
Туре									Shell a	nd tube							
Quantity	n.							2								3	
Water flow	m³/h	52,6	63,8	74,8	86,3	98,6	121,8	139,3	160,3	209,0	241,3	273,8	309,3	351,4	412,3	466,3	525,6
Water flow	l/s	14,6	17,7	20,8	24,0	27,4	33,8	38,7	44,5	58,1	67,0	76,1	85,9	97,6	114,5	129,5	146,0
Pressure drop	kPa	69	79	71	79	75	77	80	78	70	82	79	82	8	0	83	80
Water volume	I	43	49	59	64	75	90	101	121	162	173	205	226	257	307	338	385
Sound pressure level																	
Sound pressure at 1 m	dB(A)	73		79		8	0	83	84	85	86	87	88	90	89	90	92
Dimensions																	
Length	mm	3.2	750		3.860			3.800					512	200			
Width	mm	7.	50		900			1.000				1'300				2.000	
Height	mm			1.790				1.990					2 3	370			
Length with CF/CFU	mm	3.2	750		3.860			3.990					512	200			
Width with CF/CFU	mm	7.	50		900			1.000				1.300				2.000	
Height with CF/CFU	mm	17	790		1.840			1.990					2.7	450			
Transport weight	kg	1`828	1.838	2`348	2:376	2'425	3:376	3'426	3`895	6.056	6.104	6'483	7.006	7.184	9`834	10 [°] 195	10.23
Weight in operation	kg	2.002	2.050	2.235	2.269	2.653	3`651	3.206	4:309	6'475	6`548	6.92	7`693	7`884	10`789	11.165	11.23
Refrigerant charge per circuit	kg	58,0	57,0	55,0	54,0	52,0	50,0	48,0	96,0	87,0	86,0	63,0	73,0	90,0	69,0	80,0	95,0
Electrical power supply																	
Electrical power supply	V / ph / Hz								100 / 2	/ 50 + T							

REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 1 circuit

RWH		91 Ka	111 Ka	131 Ka	151 Ka	171 Ka	211 Ka	241 Ka	271 Ka	321 Ka	361 Ka	421 Ka	481 Ka	541 Ka	621 Ka	721 Ka	771 Ka
Cooling capacity																	
Cooling capacity	kW	86,6	107,0	127,0	150,0	165,0	195,0	213,0	278,0	311,0	352,0	411,0	476,0	534,0	589,0	667,0	718,0
Nominal input power	kW	19,2	23,9	29,5	32,4	36,6	42,8	47,8	58,8	65,8	75,2	86,0	98,6	114,0	125,0	144,0	154,0
EER		4,51	4,48	4,30	4,63	4,51	4,56	4,46	4,	73	4,68	4,78	4,83	4,68	4,71	4,63	4,66
Heating capacity	kW	106,0	131,0	156,0	182,0	201,0	238,0	261,0	337,0	377,0	427,0	497,0	575,0	648,0	713,0	811,0	871,0
Screw compressors																	
Quantity	n.									1							
Cooling circuits	n.									1							
Standard capacity steps	n.									3							
Modulating capacity steps (option)	%								0-25	÷100							
Nominal input current	A	37,0	43,0	52,0	59,0	65,0	75,0	81,0	102,0	116,0	131,0	145,0	162,0	194,0	211,0	243,0	265,0
Maximum input current	A	56,0	65,0	79,0	98,0	124,0	144,0	155,0	182,0	215,0	231,0	280,0	310,0	320,0	360,0	450,0	566,0
Inrush current	A	305,0	338,0	355,0	449,0	485,0	585,0	675,0	801,0	943,0	1.023,0	1.364,0	1.442,0	1.853,0	2.029,0	2.220,0	2.820,0
Inrush current with options PW/DS	A	153,0	169,0	206,0	267,0	290,0	350,0	439,0	520,0	612,0	664,0	955,0	1.009,0	1.297,0	1.420,0	1.764,0	2.009,0
Evaporator																	· · ·
Туре									Shell a	nd tube							
Quantity	n.									1							
Circuits	n.									1							
Water flow	m³/h	14.9	18,4	21,8	25,8	28,4	33,5	36,6	47,8	53,5	60.5	70,7	81,9	91,8	101,3	114,8	123,5
Water flow	/s	4.1	5,1	6,1	7,2	7,9	9,3	10,2	13,3	14.9	16,8	19,6	22.7	25.5	28,1	31.9	34,3
Pressure drop	kPa	58	53	65	, 57	53	54	64	59	57	47	48	58	59	60	48	58
Water volume		42	39	37	8	36	5	6	129	124	119	179	173	294	286	141	262
Water cooled condenser																	
Туре									Shell a	nd tube							
Quantity	n.									1							
Water flow	m³/h	18,2	22,5	26,8	31,3	34.6	40,9	44,9	58,0	64,8	73,4	85,5	98,9	111.5	122,6	139,3	149,8
Water flow	I/s	5,1	6,3	7,4	8,7	9,6	11,4	12,5	16,1	18,0	20,4	23,7	27,5	31,0	34,1	38,7	41,6
Pressure drop	kPa	23	27	30	,	32	26	23	24	30	32	-,	30		29	60	46
Water volume		9	11	13	15	16	19	22	2	7	30	35	40	45	50	83	84
Sound pressure level																	
Sound pressure at 1 m	dB(A)	68		74		75	76	77	79	80	8	1	82	83	84	83	84
Dimensions					-												-
Length	mm			2'430					3'350					3	700		
Width	mm					8	00							10	200		
Height	mm					1	525								390		
Length with CF/CFU	mm			2.430					3'350					3	700		
Width with CE/CEU	mm			800					850						200		
Height with CF/CFU	mm					1.	525		000						390		
Transport weight	kg	674	683	1.113	1.187	1.197	1.2254	1.264	1.202	1.732	1.755	2.842	3.010	3.133	3.196	3:324	3.223
Weight in operation	kg	725	733	1.164	1.288	1.299	1.329	1'342	1.863	1.882	1.903	2.996	3.221	3.342	3.411	3.231	3.913
Refrigerant charge per circuit	kg	15,0	14,0	30,0	31,0	30,0	62,0		0,0		1,0	41,0	53,0	59,0	60,0	61,0	90,0
Electrical power supply	ny .	13,0	11,0	50,0	51,0	50,0	52,0		-,-	0	.,	11,0	55,0	57,0	00,0	01,0	20,0
Electrical power supply	V / ph / Hz								400 / 3	/ 50 + T							
	47 pir / 112	I							1007 3	,							

REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 2 circuits

RWH		182 Ka	222 Ka	252 Ka	292 Ka	332 Ka	412 Ka	472 Ka	542 Ka	642 Ka	732 Ka
Cooling capacity											
Cooling capacity	kW	174,0	213,0	254,0	301,0	330,0	385,0	427,0	560,0	622,0	702,0
Nominal input power	kW	38,4	47,8	58,9	64,6	73,1	85,6	96,0	118,0	132,0	150,0
ER		4,53	4,46	4,31	4,66	4,51	4,50	4,45	4,74	4,71	4,68
leating capacity	kW	213,0	261,0	313,0	366,0	403,0	470,0	522,0	677,0	753,0	852,0
Screw compressors	· · · · ·										
Juantity	n.						2				
ooling circuits	n.						2				
tandard capacity steps	n.						б				
lodulating capacity steps (option)	%					0 - 12	÷ 100				
ominal input current	A	73,0	86,0	104,0	117,0	131,0	151,0	162,0	204,0	232,0	262,0
laximum input current	A	112,0	130,0	158,0	196,0	248,0	288,0	310,0	364,0	430,0	462,0
irush current	A	361,0	403,0	434,0	547,0	609,0	729,0	830,0	983,0	1 158,0	1.254,0
nrush current with options PW/DS	A	209,0	234,0	285,0	365,0	414,0	578,0	594,0	702,0	827,0	895,0
vaporator											
vpe						Shell a	nd tube				
luantity	n.						1				
ircuits	n.						2				
/ater flow	m³/h	29,9	36,6	43,7	51,8	56,8	66,2	73,4	96,3	107,0	120,7
/ater flow	l/s	8,3	10,2	12,1	14,4	15,8	18,4	20,4	26,8	29,7	33,5
essure drop	kPa	48	64	50	54	42	56	51	54	40	56
/ater volume	- I	59	56	129	1	24	119	113	168	286	279
Vater cooled condenser											
/pe						Shell a	nd tube				
uantity	n.						2				
/ater flow	m³/h	36,6	44,9	53,8	63,0	69,3	80,8	89,8	116,4	129,5	146,5
/ater flow	l/s	10,2	12,5	15,0	17,5	19,3	22,5	24,9	32,3	36,0	40,7
ressure drop	kPa	18	27	23	21	26	25	23	24	30	32
/ater volume		2	0	25	3	0	38	43	1	54	59
ound pressure level											
ound pressure at 1 m	dB(A)	71		77		78	79	80	82	83	84
Dimensions											
ength	mm	3	/50			3.860				3.800	
/idth	mm	7	50			900				1.000	
leight	mm	11	710			1.790			1.990	2.	030
ength with CF/CFU	mm	3	750			3.860				3.990	
/idth with CF/CFU	mm	7.	50			900				1.000	
eight with CF/CFU	mm	1	710		1.790		1.8	340	1.990	2.	030
ansport weight	kg	1.525	1.261	1.802	1.821	1.863	2.386	2.414	3'329	3.216	3.226
/eight in operation	kg	1.334	1.332	1.961	2.002	2.016	2.242	2.271	3.221	3`856	3`894
efrigerant charge per circuit	kg	30,0	31,0	30,0	2	9,0	61,0	6	0,0	62,0	61,0
lectrical power supply											
ectrical power supply	V / ph / Hz					400 / 2	/ 50 + T				

REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 2 and 3 circuits

RWH		842 Ka	972 Ka	1092 Ka	1232 Ka	1442 Ka	1542 Ka	1633 Ka	1793 Ka	2163 Ka	2313 Ka
Cooling capacity											
Cooling capacity	kW	815,0	947,0	1.069,0	1.173,0	1:341,0	1'434,0	1.592,0	1.746,0	2.015,0	2.124,0
Nominal input power	kW	172,0	197,0	228,0	250,0	288,0	307,0	342,0	374,0	431,0	461,0
EER		4,74	4,81	4,	69	4,66	4,67	4,65		4,67	
Heating capacity	kW	987,0	1.144,0	1.297,0	1'423,0	1.629,0	1.741,0	1.934,0	2.121,0	2.446,0	2.615,0
Screw compressors		,		,			,				
Quantity	n.				2					3	
Cooling circuits	n.				2					3	
Standard capacity steps	n.				6					9	
Modulating capacity steps (option)	%			0 - 12	2 ÷ 100				0-8	÷ 100	
Nominal input current	A	290,0	323,0	389,0	422,0	486,0	530,0	583,0	632,0	729,0	795,0
Maximum input current	A	560,0	620,0	640,0	720,0	900,0	1.132,0	960,0	1.080,0	1:350,0	1.698,0
Inrush current	A	1.644,0	1.752,0	2.173,0	2.389,0	2.970.0	3.436,0	2.493.0	2.749,0	3.420.0	4.002.0
Inrush current with options PW/DS	A	1.235,0	1.319,0	1.617,0	1.780,0	2.214,0	2.575,0	1.937,0	2.140,0	2.664,0	3.141,0
Evaporator						, ,					
Туре						Shell a	nd tube				
Quantity	n.						1				
Circuits	n.				2					3	
Water flow	m³/h	140,2	162,9	183,9	201,8	230,8	246,6	273,8	300,3	346,7	370.8
Water flow	l/s	38,9	45,2	51,1	56,0	64,1	68,5	76,1	83,4	96,3	103,0
Pressure drop	kPa	44	45	87	50	55	62	47	57	55	62
Water volume		271	461	444	435	3	98	648	632	7	64
Water cooled condenser			1			1					
Туре						Shell a	nd tube				
Quantity	n.				2					3	
Water flow	m³/h	169,8	196,8	223,1	244,8	280,1	299,5	332,6	364,8	421,2	450,0
Water flow	l/s	47,2	54,7	62,0	68,0	77,8	83,2	92,4	101,3	117,0	125,0
Pressure drop	kPa		30	,	28	61	46	29	28	61	46
Water volume		69	80	90	101	132	155	135	151	198	232
Sound pressure level			1		1	1		1			
Sound pressure at 1 m	dB(A)	84	85	86	87	86	87	88	89	88	89
Dimensions											
Length	mm			5	300				5.	100	
Width	mm			1	300				2.	400	
Height	mm			2.	420				2.	480	
Length with CF/CFU	mm			5	300				5.	100	
Width with CF/CFU	mm				300					400	
Height with CF/CFU	mm				500					560	
Transport weight	kg	5'327	5.22	5.757	5.898	6'392	6.21	8.860	9.022	9.855	10.049
Weight in operation	ka	5.679	5'873	6.111	6.228	6.922	7.074	9.262	9.788	10.812	11.042
Refrigerant charge per circuit	kq	50,0	64,0	70,0	72,0	82,0	107,0	90,0	94.0	106,0	132,0
Electrical power supply		50,0	0.,0	,.	. 2,0	52,5	,.	2010	2.10	,.	.52,0
Electrical power supply	V / ph / Hz					/00 / 2	/ 50 + T				

REFRIGERANT R407C - R134A

R407C - Correction factors for cooling capacity

Temperatu leaving from	re of water evaporator °C	15	14	13	12	11	10	9	8	7	6	5
	30	1.396	1.351	1.309	1.265	1.221	1.172	1.133	1.095	1.063	0.961	0.930
	31	1.384	1.338	1.295	1.251	1.208	1.161	1.122	1.085	1.053	0.950	0.919
	32	1.371	1.325	1.281	1.238	1.194	1.149	1.111	1.076	1.039	0.939	0.909
	33	1.358	1.311	1.267	1.224	1.181	1.138	1.099	1.067	1.025	0.927	0.898
	34	1.347	1.298	1.253	1.210	1.168	1.127	1.088	1.053	1.011	0.916	0.888
	35	1.326	1.284	1.239	1.196	1.154	1.116	1.077	1.039	1	0.958	0.877
	36	1.310	1.268	1.224	1.182	1.140	1.102	1.064	1.025	0.987	0.946	0.865
	37	1.294	1.252	1.208	1.167	1.125	1.088	1.050	1.012	0.974	0.934	0.853
Temperature	38	1.278	1.236	1.193	1.152	1.110	1.074	1.036	0.999	0.961	0.922	0.841
of water	39	1.262	1.220	1.178	1.137	1.095	1.060	1.022	0.985	0.948	0.910	0.829
leaving from	40	1.246	1.204	1.163	1.122	1.081	1.046	1.009	0.972	0.935	0.898	0.818
condenser	41	1.227	1.186	1.145	1.105	1.065	1.029	0.993	0.956	0.920	0.884	0.804
°C	42	1.208	1.168	1.127	1.087	1.050	1.013	0.977	0.941	0.905	0.869	0.791
	43	1.189	1.149	1.109	1.070	1.034	0.997	0.961	0.926	0.890	0.854	0.778
	44	1.170	1.131	1.092	1.052	1.019	0.981	0.946	0.910	0.875	0.839	0.764
	45	1.151	1.112	1.074	1.035	1.004	0.965	0.930	0.895	0.860	0.825	0.751
	46	1.133	1.093	1.055	1.018	0.985	0.947	0.912	0.878	0.844	0.809	0.737
	47	1.114	1.074	1.037	1.000	0.967	0.930	0.895	0.861	0.827	0.794	0.723
	48	1.096	1.055	1.019	0.982	0.949	0.912	0.877	0.844	0.911	0.778	0.710
	49	1.078	1.036	1.001	0.965	0.931	0.895	0.860	0.827	0.795	0.763	0.696
	50	1.060	1.018	0.982	0.947	0.912	0.877	0.842	0.811	0.779	0.747	0.682

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

- If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.

- For further clarifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for input power

Temperatu leaving from e		15	14	13	12	11	10	9	8	7	6	5
	30	1.035	1.012	0.995	0.982	0.970	0.956	0.942	0.925	0.916	0.895	0.881
-	31	1.050	1.029	1.013	1.00	0.986	0.973	0.959	0.942	0.933	0.910	0.898
	32	1.065	1.046	1.031	1.017	1.003	0.989	0.976	0.959	0.948	0.925	0.915
	33	1.079	1.063	1.048	1.034	1.020	1.006	0.992	0.976	0.965	0.941	0.931
	34	1.098	1.079	1.066	1.051	1.037	1.023	1.009	0.994	0.983	0.956	0.948
	35	1.113	1.102	1.084	1.069	1.053	1.040	1.021	1.011	1	0.988	0.965
	36	1.132	1.121	1.103	1.088	1.072	1.058	1.041	1.030	1.019	1.007	0.984
	37	1.152	1.139	1.122	1.107	1.091	1.076	1.060	1.049	1.038	1.026	1.003
Temperature	38	1.171	1.158	1.141	1.126	1.110	1.094	1.079	1.068	1.056	1.045	1.022
of water	39	1.191	1.176	1.160	1.145	1.129	1.112	1.098	1.087	1.075	1.063	1.041
leaving from	40	1.210	1.195	1.179	1.163	1.148	1.130	1.118	1.106	1.094	1.082	1.059
condenser	41	1.233	1.217	1.200	1.185	1.169	1.152	1.140	1.128	1.116	1.105	1.082
°C	42	1.255	1.238	1.221	1.207	1.190	1.175	1.163	1.151	1.139	1.127	1.105
	43	1.278	1.260	1.243	1.228	1.211	1.197	1.185	1.173	1.161	1.149	1.127
	44	1.301	1.282	1.264	1.250	1.232	1.220	1.208	1.196	1.183	1.171	1.150
	45	1.323	1.304	1.285	1.271	1.253	1.242	1.230	1.218	1.206	1.194	1.172
	46	1.348	1.330	1.311	1.297	1.280	1.269	1.256	1.244	1.232	1.220	1.198
	47	1.372	1.356	1.337	1.323	1.307	1.295	1.282	1.270	1.258	1.247	1.224
	48	1.396	1.381	1.363	1.349	1.334	1.321	1.308	1.296	1.285	1.273	1.250
	49	1.421	1.407	1.389	1.375	1.360	1.347	1.334	1.322	1.311	1.300	1.276
	50	1.445	1.433	1.415	1.401	1.387	1.373	1.360	1.349	1.337	1.326	1.302

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

The unit work with an evaporator water temperature look of an even with a meteric time performance densities and given in the currection of united to the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.

- For further clarifications or information, you are kindly request to contact our sales departement.



REFRIGERANT R407C - R134A

R134a - Correction factors for cooling capacity

Temperatur leaving from e		15	14	13	12	11	10	9	8	7	6	5
	30	1.395	1.341	1.298	1.256	1.209	1.171	1.124	1.089	1.047	1.012	0.977
	31	1.383	1.333	1.288	1.245	1.199	1.160	1.114	1.079	1.037	1.002	0.967
	32	1.371	1.326	1.277	1.234	1.189	1.149	1.104	1.069	1.028	0.993	0.958
	33	1.358	1.314	1.266	1.223	1.179	1.138	1.094	1.059	1.019	0.984	0.949
	34	1.346	1.300	1.255	1.212	1.169	1.127	1.084	1.049	1.009	0.974	0.940
	35	1.333	1.287	1.244	1.202	1.159	1.116	1.074	1.039	1	0.965	0.930
	36	1.320	1.275	1.231	1.189	1.146	1.104	1.062	1.028	0.989	0.955	0.920
	37	1.306	1.262	1.218	1.176	1.134	1.091	1.058	1.016	0.978	0.944	0.910
Temperature	38	1.295	1.250	1.205	1.163	1.121	1.079	1.047	1.005	0.967	0.934	0.900
of water	39	1.283	1.237	1.191	1.150	1.108	1.067	1.033	0.994	0.957	0.923	0.890
leaving from	40	1.267	1.223	1.178	1.137	1.096	1.054	1.019	0.983	0.946	0.913	0.880
condenser	41	1.253	1.209	1.165	1.124	1.083	1.043	1.007	0.971	0.934	0.901	0.868
°C	42	1.240	1.196	1.152	1.112	1.071	1.031	0.996	0.959	0.922	0.890	0.857
	43	1.226	1.182	1.139	1.099	1.059	1.019	0.984	0.947	0.911	0.878	0.842
	44	1.212	1.169	1.126	1.086	1.047	1.008	0.972	0.936	0.899	0.866	0.833
	45	1.198	1.155	1.112	1.074	1.035	0.996	0.960	0.924	0.888	0.855	0.822
	46	1.184	1.141	1.098	1.060	1.022	0.984	0.948	0.912	0.876	0.843	0.811
	47	1.171	1.128	1.084	1.046	1.009	0.971	0.936	0.900	0.864	0.832	0.800
	48	1.158	1.114	1.071	1.032	0.995	0.959	0.924	0.888	0.853	0.821	0.788
	49	1.145	1.101	1.057	1.018	0.982	0.947	0.911	0.876	0.841	0.809	0.777
	50	1.132	1.087	1.043	1.004	0.969	0.934	0.899	0.864	0.839	0.798	0.766

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

- If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.

- For further clarifications or information, you are kindly request to contact our sales departement.

R134a - Correction factors for input power

Temperatur leaving from e		15	14	13	12	11	10	9	8	7	6	5
	30	0.979	0.971	0.957	0.950	0.943	0.934	0.927	0.915	0.912	0.904	0.896
	31	0.998	0.986	0.975	0.968	0.961	0.953	0.945	0.933	0.929	0.922	0.915
	32	1.016	1.000	0.993	0.986	0.979	0.971	0.963	0.951	0.947	0.940	0.933
	33	1.034	1.019	1.012	1.004	0.997	0.989	0.981	0.969	0.965	0.958	0.951
	34	1.053	1.037	1.030	1.023	1.015	1.008	0.999	0.987	0.982	0.976	0.970
	35	1.071	1.055	1.048	1.041	1.033	1.026	1.017	1.005	1	0.994	0.988
	36	1.092	1.081	1.070	1.062	1.055	1.047	1.036	1.026	1.021	1.015	1.009
	37	1.112	1.102	1.091	1.084	1.076	1.068	1.045	1.047	1.042	1.035	1.029
Temperature	38	1.131	1.122	1.113	1.105	1.097	1.089	1.073	1.069	1.062	1.056	1.050
of water	39	1.151	1.142	1.134	1.126	1.118	1.110	1.095	1.090	1.083	1.077	1.071
leaving from	40	1.171	1.163	1.156	1.148	1.140	1.131	1.118	1.111	1.104	1.098	1.092
condenser	41	1.196	1.188	1.180	1.171	1.163	1.154	1.142	1.134	1.127	1.121	1.115
°C	42	1.220	1.212	1.203	1.195	1.187	1.177	1.166	1.158	1.151	1.145	1.139
	43	1.244	1.236	1.227	1.219	1.210	1.200	1.190	1.182	1.174	1.168	1.162
	44	1.268	1.260	1.251	1.243	1.234	1.223	1.214	1.206	1.198	1.192	1.186
	45	1.292	1.284	1.275	1.266	1.258	1.246	1.238	1.230	1.221	1.215	1.209
	46	1.320	1.311	1.302	1.293	1.284	1.272	1.264	1.256	1.248	1.242	1.236
	47	1.347	1.338	1.329	1.320	1.310	1.299	1.291	1.282	1.274	1.268	1.262
	48	1.374	1.365	1.356	1.346	1.336	1.326	1.317	1.309	1.300	1.294	1.288
	49	1.402	1.392	1.383	1.373	1.362	1.352	1.344	1.335	1.327	1.321	1.315
	50	1.429	1.420	1.410	1.400	1.388	1.379	1.370	1.362	1.353	1.347	1.341

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

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- For further clarifications or information, you are kindly request to contact our sales departement.



WATER PERFORMA R134A

HIGH EFFICIENCY WATER COOLED CHILLERS WITH SCREW COMPRESSORS



Series EWH ... Ka

Cooling capacity from 314 to 1590 kW - 2 circuits

The water cooled chillers of **Water Performa EWH series** are designed for indoor installation and are particularly suitable for industrial processes and air conditioning systems. Thanks to the refrigerant and to the particular construction arrangements, these units are able to reach an average EER values of 5,5. They are all available with 2 refrigerant circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install also in small spaces, with no building works. They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **EWH... Ka** standard version

Water operation limits (standard units):

WATER (out from evaporator): from 5 to 15°C - not suitable for glycol CONDENSER (OUT): from 30 to 55°C for R134a - not suitable for glycol

Main components:

Strong and compact frame, made of bended and coloured steel profiles (colour RAL 9005-black), supporting the exchangers of the evapo-condensers group and on which all the main components are installed at sight. On request, the compressors can be isolated by a soundproofing cabinet with standard material (option CF) or with bituminous rubber coated material (option CFU), so to further reduce the overall sound level of the unit itself.

Semi-hermetic screw compressors equipped with capacity steps, motor thermal protection, oil crankcase heater and phase monitor. The compressors lubrication is of forced type, with no pump and in order to prevent many oil migrations to the cooling circuit, the compressors are provided with an oil separator, in-built to the discharge side. The electrical motor is foreseen for lower inrush current and, in this is case, the unit is equipped with an automatic partial load inrush device and mechanical interlock of the inrush control switches, to prevent accidental short circuits (options DS and PW). Dry expansion **shell and tube evaporator**, 100% counter-current type with two refrigerant circuits and one water circuit, insulated by close-cell polyurethane foam material. Shell and tubes plate made in carbon steel and copper tubes, with a high heat exchange coefficient. The evaporator is provided with Victaulic joints and welding coupling for connection to the water circuit.

Shell and tube condensers with copper pipes, externally grooved to increase the heating exchange coefficient and tube bundle in carbon steel.

Each compressor works on an independent **cooling circuit**, assuring a remarkable reliability to multi-compressor units. Each circuit, made of copper or carbon steel tube, is composed of thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges, non-return valve on discharge side, shutoff valve on liquid line.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a lock-door main switch. Inside, it is complete with all control and protection switches, the terminal board and auxiliaries. The electrical board also includes the control device for power supply phases, to prevent the compressor to turn in the wrong sense. The micro-processor, complete with display, is also placed inside the electrical board.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the chilled water temperature regulation, the working parameters, auto-detection failure system, remote management and supervision, complete with compressors hour counter.



WATER PERFORMA R134A HIGH EFFICIENCY WATER COOLED CHILLERS WITH SCREW COMPRESSORS

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- CC Insulated condensers: insulation on condensers heads and side (10 mm thickness).
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with soundproofing material and vibration dampers under compressors.
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with bituminous rubber soundproofing material and vibration dampers under compressors, mufflers on compressors discharge pipes.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- DQ Additional box for connection of power supply cables
- **DS** Star/delta: electric device of close transition type to reduce the inrush current, complete with short circuit safety by mechanical interlock.
- IE Fumigated wooden crate packing: available on request for critical transports, so to assure a suitable protection to the unit.
- IG Watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- IR Packing with fumigated wooden pallet and transparent film: minimal packing made of wooden pallet and transparent film wrapped all around the unit.
- KS Lifting kit: made of belts and brackets to be inserted into the holes present in the unit base-frame. It is used for moving and positioning the unit on site.
- M12 Modulating capacity control for 2-circuit units: by means of some valves installed on compressors, the capacity is modulated from 12 to 100%.

- OS Oil flow safety switch: in-built in the compressor oil separator, it indicates the eventual decrease of the oil level.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PW Part-winding: equipment for step compressors starting, reducing of about 35% the inrush current of each compressor.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RF Power factor correction system cosfi >0,9: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- RH Shut-off valve on suction side: they are use to isolate compressors during service operations.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- TC Victaulic joints and welding coupling for condenser connection to water circuit.
- TE Electronic thermostatic valve: it is requested to make a very accurate regulation of the refrigerant flow and to limit variations of cooling capacity and evaporator leaving temperature water during operation in transitions and for a better performance with fixed superheating.
- V Voltmeter: Electrical device measuring the electrical tension in the power supply of the unit.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



WATER PERFORMA R134A

HIGH EFFICIENCY WATER COOLED CHILLERS

WITH SCREW COMPRESSORS

Technical data

EWH		312 Ka	372 Ka	432 Ka	472 Ka	622 Ka	692 Ka	782 Ka	912 Ka	1052 Ka	1182 Ka	1292 Ka	1492 Ka	1592 Ka	
Cooling capacity															
Cooling capacity	kW	314,0	368,0	428,0	470,0	617,0	691,0	779,0	909,0	1`050,0	1.178,0	1`294,0	1'487,0	1`592,0	
Nominal input power	kW	57,6	69,6	81,6	90,4	110,4	126,0	142,4	162,6	183,6	214,6	234,2	270,6	288,4	
EER		5,45	5,29	5,24	5,20	5,59	5,48	5,47	5,59	5,72	5,49	5,52	5,49	5,52	
Screw compressors															
Quantity	n.							2							
Cooling circuits	n.							2							
Standard capacity steps	n.							6							
Modulating capacity steps (option)	%							0 - 12 ÷ 100)						
Nominal input current	A	108,0	126,0	145,0	154,0	195,0	225,0	251,0	276,0	304,0	370,0	400,0	462,0	504,0	
Maximum input current	A	216,0	248,0	288,0	324,0	364,0	430,0	248,0	560,0	620,0	640,0	720,0	900,0	1`132,0	
Inrush current	A	616,0	609,0	729,0	848,0	983,0	1.128,0	1`237,0	1`644,0	1`752,0	2.173,0	2`389,0	2.920,0	3`436,0	
Inrush current with options PW/DS	A	377,0	414,0	494,0	585,0	702,0	827,0	879,0	1`235,0	1`319,0	1`617,0	1.780,0	2`214,0	2`575,0	
Evaporator															
Туре			Shell and tube												
Quantity	n.							1							
Water / refrigerant circuits	n.							1/2							
Water flow	m³/h	53,9	63,0	73,5	80,8	105,9	118,5	133,8	156,0	180,2	202,0	222,0	255,1	273,2	
Water flow	l/s	14,9	17,5	20,4	22,4	29,4	32,9	37,2	43,3	50,1	56,1	61,7	70,9	75,9	
Pressure drop	kPa	43	57	49	47	46	72	46	51	49	46	51	64	49	
Water cooled condenser															
Туре								Shell and tub	e						
Quantity	n.							2							
Water flow	m³/h	63,9	75,3	87,6	96,4	125,1	140,5	158,5	184,3	212,2	239,5	262,8	302,3	323,4	
Water flow	l/s	17,7	20,9	24,3	26,8	34,7	39,0	44,0	51,2	58,9	66,5	73,0	83,9	89,8	
Pressure drop	kPa	52	73	43	54	82	57	48	67	54	70	64	86	81	
Sound pressure level															
Sound pressure at 1 m	dB(A)	77	78	79	80	82	83	8	34	85	86	87	8	9	
Dimensions															
Length	mm	3.720		3.860			3.800			51	200		5	500	
Width	mm	750		900			1.000				11	300			
Height	mm	1.210		1.790		1.990	2.	030			2	370			
Length with CF/CFU	mm	3.720		3.860			3.990			5.2	200		5	500	
Width with CF/CFU	mm	750		900			1.000				11	300			
Height with CF/CFU	mm	1.210	1.790	1.5	840	1.990	2.	030			2.4	450			
Transport weight	kg	1.562	1.862	2:390	2.422	3.340	3.250	3.260	5.262	5.960	6.132	6.530	8.220	8.920	
Transport weight with CF/CFU	kg	1.580	1.880	2.402	2.440	3.322	3.232	3.222	5.280	5.972	6.120	6'245	8.262	8.962	
Weight in operation	kg	1.341	1.977	2.233	2.271	3.240	3.731	3.774	5.899	6'318	6.203	6.604	9.063	9.482	
Weight in operation with CF/CFU	kg	1.357	1.993	2.249	2.286	3.556	3.747	3.790	5.915	6'334	6.219	6.620	9.029	9.203	
Refrigerant charge per circuit	kg	29,0	61,0		0,0	62,0	61,0	60,0		9,0	58,0	65,0		3,0	
Electrical power supply						-,-									
Electrical power supply	V / ph / Hz							400 / 3 / 50 +	T						
The second se															





Series PAE ...K / PAE ...PS.K

Cooling capacity from 4,7 to 17,2 kW - 1 circuit

The air cooled heat pumps of **PAE K series** are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. Therefore during their design, it has been given a particular care for dimensions and sound level, so to have compact and silent units at the same time.

They can also be matched to fancoils or terminal units or for water cooling in small industrial processes.

They are all available with 1 refrigerant circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, also with pump and hydraulic tank, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **PAE...K** standard version Horizontal air flow for models from 41M to 101 Vertical air flow for models from 131 to 181 **PAE...PS K** with hydraulic kit

Operation limits (standard units):

SUMMER OPERATION: **air** from 15 to 45°C – **water** (out from evaporator) from 5 to 15°C.

WINTER OPERATION: air from 20 to -4°C - water (out from evaporator) max 50°C

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service. For size from 41 to 101, the compressor section is still insulated with close-cell polyurethane foam material. For PS version, the hydraulic kit is installed at the bottom of the unit for size from 41 to 101 and it is composed of: circulation pump, buffer tank, safety valve, pressure gauge, water filling and discharge valves, purging valve, expansion vessel. For other sizes, there is no change in dimensions. High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. Sizel 41M is provided with hermetic piston compressor.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT - for summer operation only).

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of 4-way valve for refrigerant cycle inversion, thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of PS version, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the automatic defrost system based on a time/temperature logics, complete with compressors hour counter.



AIR COOLED HEAT PUMPS

WITH SCROLL COMPRESSORS AND AXIAL FANS

Accessories

- Electrical power supply different from standard: mainly, 230V AE triphase, 460V triphase. Frequency 50/60 Hz. Low temperature operation (-20°C): electronic device for the BT
- continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (for summer operation only).
- GP Condensing coil protection grid: metal protection grid against accidental impacts
- HG Hot gas by-pass (from model 131): mechanical device for modulating cooling capacity.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- МТ High and low pressure gauges (from size 131) for measuring circuit pressure.
- Rubber-type vibration dampers: bell-shaped vibration dampers PA supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.

- PF Safety water flow switch: installed on evaporator, it switches off
- the unit in case of lack of water flow rate through the evaporator. PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- Condensing coil with pre-painted fins: superficial treatment of RM the condensing coils with epoxy coating. Copper/copper condensing coils: special execution of the con-
- RR densing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.





Technical data

PAE		41 M K	71 M K	101 M K	101 K	131 K	151 K	161 K	181 K
Cooling capacity									
Cooling capacity	kW	4,7	7,1	8,0	8,1	10,7	12,6	16,3	17,2
Nominal input power	kW	1,5	2,5	3,1	3,2	3,4	4,4	5,3	5,9
ER		3,13	2,84	2,58	2,53	3,14	2,86	3,07	2,91
Heating capacity									
Heating capacity	kW	5,6	8,9	10,4	10,6	13,1	15,9	20,2	21,7
nput power (heating)	kW	1,4	2,4	3	,1	3,2	4,3	5,2	5,8
COP		4,0	3,71	3,35	3,42	4,09	3,69	3,88	3,74
Axial fans									
Quantity	n.			1				2	
Rotation speed	rpm				9	00			
Air flow	m³/h	3.600		3.820		7	. 500	6	984
Air flow	I/s	1.000		1.069		1	2.083		940
Notor input power	kW		0	,15				0,29	
nput current	A),6				1,3	
Scroll compressors									
ype		Piston hermetic				Scroll			
Quantity	n.					1			
Circuits	n.					1			
Standard capacity steps	%				0/	100			
Nominal input current	A	6,7	10,6	14,3	5,6	5,4	6,3	9,0	10,4
Naximum input current	A	17,0	19,0	22,0	10,0	12,0	14,0	16,0	18,0
nrush current	A	54,0	76,0	8,6	46,0	56,0	68,0	77,0	81,0
Evaporator		5 1/0	10,0	0,0	10/0	50,0	00,0	1110	0.70
Type					Braze	d plate			
Quantity	n.				Didec	1			
Water flow	m ³ /h	0,80	1,20	1	40	1,80	2,20	2,80	3,00
Water flow	l/s	0,00	0,33		39	0,50	0,61	0,78	0,83
Pressure drop	kPa	19	36		8	31	41	33	36
Sound pressure level	Kru	17	50	<u> </u>	0	51	1	55	50
Sound pressure at 1 m	dB(A)			50		54		55	56
PS Version	ub(n)					51		55	50
Available pressure	kPa	55	49		2	65	48	52	47
Pump group motor power	kW	رر		,08	2	UJ),18	7/
Capacity of buffer tank	KVV		0	,00		30		0,10	
Dimensions									
ength	mm		0	80			1	.100	
Nidth	mm			25				750	
Height	mm			15				· 100	
Transport weight		122			28	205	209	226	228
	kg	2,1	125 2.5		28 2.7		4,3		
efrigerant charge per circuit Dimensions for PS version	kg	Ζ,Ι	۷,۵	3,0	Ζ,/		4,2		6,2
				00			4	:100	
ength	mm			80				100	
Vidth	mm		325			750			
leight	mm	47-	1.000			1'100			
rancpart wought with apprtu buttor taply	kg	158	161	1	64	238	241	259	260
ransport weight with empty buffer tank Electrical power supply	Ng					250			

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15°C.



R407C - Correction factors for cooling capacity

External air te	mperature °C	28	30	32	35	38	40	42	45	48
	15	1,433	1,404	1,376	1,333	1,289	1,260	1,226	1,175	1,137
	14	1,388	1,360	1,333	1,291	1,249	1,221	1,187	1,137	1,099
	13	1,343	1,317	1,290	1,250	1,209	1,182	1,148	1,099	1,062
	12	1,298	1,273	1,247	1,208	1,169	1,142	1,110	1,060	1,024
Temperature	11	1,253	1,229	1,204	1,166	1,128	1,103	1,071	1,022	0,987
of water leaving from	10	1,028	1,185	1,161	1,125	1,088	1,064	1,032	0,984	0,949
evaporator °C	9	1,163	1,141	1,118	1,087	1,048	1,025	0,993	0,946	0,912
	8	1,118	1,097	1,075	1,041	1,008	0,985	0,954	0,907	0,874
	7	1,073	1,053	1,032	1	0,968	0,946	0,915	0,869	0,837
	6	1,027	1,007	0,986	0,956	0,925	0,904	0,873	0,827	0,800
	5	0,981	0,961	0,941	0,911	0,882	0,862	0,831	0,785	0,763

R407C - Correction factors for input power

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	15	0,981	1,013	1,046	1,100	1,155	1,192	1,232	1,292	1,345
	14	0,968	1,001	1,033	1,088	1,143	1,179	1,219	1,279	1,335
	13	0,955	0,988	1,020	1,075	1,130	1,167	1,207	1,267	1,324
	12	0,942	0,975	1,008	1,063	1,118	1,154	1,194	1,255	1,314
Temperature	11	0,929	0,962	0,995	1,050	1,105	1,142	1,182	1,242	1,304
of water leaving from	10	0,916	0,949	0,982	1,037	1,093	1,129	1,170	1,230	1,294
evaporator °C	9	0,903	0,936	0,970	1,025	1,080	1,117	1,157	1,218	1,283
	8	0,890	0,924	0,957	1,012	1,067	1,104	1,145	1,206	1,273
	7	0,877	0,911	0,944	1	1,055	1,092	1,132	1,193	1,263
	6	0,872	0,904	0,937	0,987	1,037	1,071	1,110	1,169	1,232
	5	0,866	0,898	0,929	0,974	1,020	1,050	1,088	1,145	1,201

R407C - Correction factors for heating capacity

Temperature of water I	eaving from evaporator C	30	35	40	45	48
	20	1,415	1,392	1,367	1,315	1,284
	16	1,261	1,241	1,220	1,195	1,180
	14	1,195	1,176	1,155	1,127	1,110
	12	1,127	1,108	1,088	1,068	1,056
	10	1,066	1,047	1,026	1	0,984
Esternal air	8	1,005	0,986	0,987	0,947	0,923
External air temperature °C	7	0,976	0,985	0,939	0,919	0,907
temperature c	6	0,904	0,893	0,870	0,852	0,841
	4	0,802	0,793	0,772	0,761	0,754
	2	0,741	0,732	0,712	0,701	0,694
	0	0,690	0,677	0,659	0,649	0,643
	-2	0,655	0,639	0,630	0,611	0,600
	-4	0,627	0,614	0,609	0,599	0,593

R407C - Correction factors for input power (heating)

	eaving from evaporator °C	30	35	40	45	48
	20	0,909	0,994	1,076	1,160	1,210
	16	0,861	0,938	1,015	1,091	1,137
	14	0,843	0,916	0,898	1,061	1,159
	12	0,826	0,895	0,963	1,030	1,070
	10	0,807	0,872	0,936	1	1,038
Esternal air	8	0,789	0,850	0,910	0,969	1,004
External air temperature °C	7	0,780	0,839	0,897	0,953	0,987
temperature c	6	0,770	0,826	0,883	0,938	0,971
	4	0,749	0,803	0,856	0,906	0,936
	2	0,729	0,778	0,828	0,874	0,902
	0	0,706	0,753	0,799	0,843	0,869
	-2	0,687	0,728	0,768	0,810	0,785
	-4	0,663	0,701	0,738	0,775	0,753

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5° (. It is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon ACSpA desclaims all responsabilities in case of damages deriving from violation of this instructions. - For further danfications or information, you are kindly request to contact our sales departement.



REFRIGERANT R407C



PAE 421 K+MV+P1



Series PAEK

Cooling capacity from 19 to 82 kW - 1 and 2 circuits

The air cooled heat pumps of **PAE K series** are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications.

Depending on the cooling capacity, they are available with 1 and 2 cooling circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces, also when supplied with the hydraulic kit.

All sizes are standard provided with an isolated compressors section and the external frame is completely closed.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **PAE...K** standard version **PAE...U K** ultrasilenced version

Operation limits (standard units):

SUMMER OPERATION: **air** from 15 to 45°C – **water** (out from evaporator) from 5 to 15°C.

WINTER OPERATION: air from 20 to -4°C – water (out from evaporator) max 50°C

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. For ultrasilenced version, it is insulated with soundproofing material. The external panels, easy to be dismantled, allow the full access in case of service. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit, with no change in overall dimensions.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. In case of 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT - for summer operation only).

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of 4-way valve for refrigerant cycle inversion, thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the automatic defrost system based on a time/temperature logics, complete with compressors hour counter.

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PAE 482 K+MV+PT



REFRIGERANT R407C

Accessories

- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- **BT Low temperature operation** (-20°C): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (for summer operation only).
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts.
- **HG Hot gas by-pass**: mechanical device for modulating cooling capacity (only for 1-circuit sizes).
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT High and low pressure gauges for measuring circuit pressure.
- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.

PF Safety water flow switch: installed on evaporator, it switches off

- PQ the unit in case of lack of water flow rate through the evaporator. Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- **PT Twin pump group**: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type. (Available from size 482).
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- **RP Partial heat recovery** (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- **RT Total heat recovery** (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification.
- RV Personalized frame painting in RAL colour
- SC Insulated compressors housing with sound proofing material (included on ultra-silenced version).
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data - Standard version - 1 circuit

PAE		201 K	241 K	281 K	361 K	421 K
Cooling capacity						
Cooling capacity	kW	18,1	21,5	25,6	33,1	39,2
Nominal input power	kW	6,5	8,4	9,3	10,6	13,3
EER		2,78	2,56	2,75	3,12	2,95
Heating capacity						
Heating capacity	kW	22,9	27,9	32,5	40,8	49,0
Input power (heating)	kW	6,8	8,8	9,8	11,1	14,0
COP		3,37	3,17	3,32	3,67	3,50
Axial fans						
Quantity	n.			2		
Rotation speed	rpm		900		8	50
Air flow	m³/h	11	200	10`200	16	000
Air flow	l/s	3.	111	2.833	4.	145
Motor input power	kW		0,74		1,	26
Input current	A		3,4			,0
Scroll compressors						
Quantity	n.			1		
Circuits	n.			1		
Standard capacity steps	%			0 - 100		
Nominal input current	A	12,2	14,9	16,7	18,5	23,3
Maximum input current	A	17,0	20,0	22,0	27,0	32,0
nrush current	A	99,0	123,0	127,0	167,0	198,0
Evaporator						
Гуре Гуре				Brazed plate		
Quantity	n.			1		
Water flow	m³/h	3,1	3,7	4,4	5,7	6,7
Water flow	l/s	0,9	1,0	1,2	1,6	1,9
Pressure drop	kPa	35	40	41	45	65
Pumps						
P1 – Available pressure	kPa	162	149	127	144	134
P1 — Motor input power	kW			0,55		
P1H — Available pressure	kPa	207	194	167	184	169
P1H – Motor input power	kW		0,55		0,	75
Capacity of buffer tank			80			80
Electrical data						
Total input power	kW	7,7	9,7	10,6	12,4	15,1
Sound pressure level						
Sound pressure at 1 m	dB(A)		62		é	7
Dimensions						
ength	mm		1.600		2.	000
Width	mm		750		8	50
leight	mm		1'260		1'	550
Fransport weight	kg	250	255	295	400	415
Fransport weight with empty buffer tank	kg	300	305	345	465	480
Refrigerant charge per circuit	kg	5,5	5,6	8,2	13,0	14,3
Electrical power supply					· · ·	
Electrical power supply	V / ph / Hz			400 / 3 / 50 + N + T		

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15°C.



REFRIGERANT R407C

Technical data - Ultrasilenced version - 1 circuit

PAE		201 U K	241 U K	281 U K	361 U K	421 U K
Cooling capacity						
Cooling capacity	kW	17,6	21,7	26,6	32,1	38,2
Nominal input power	kW	6,4	8,3	8,7	11,0	14,0
EER		2,75	2,61	3,06	2,92	2,73
Heating capacity						
leating capacity	kW	23,0	28,0	33,0	40,0	48,0
nput power (heating)	kW	6,7	8,7	9,1	11,6	14,7
COP		3,43	3,22	3,63	3,45	3,26
Axial fans						
Juantity	n.			2		3
Rotation speed	rpm	(580		650	
Air flow	m³/h	8.000	7`000	11	200	17.400
ir flow	I/s	2.222	1.944	3.	111	4`833
Notor input power	kW	0),44		,62	0,93
nput current	A		2,2		3,1	4,7
Scroll compressors						
Juantity	n.			1		
ircuits	n.			1		
Standard capacity steps	%			0 - 100		
Nominal input current	A	12,5	14,8	16,0	19,0	24,0
Naximum input current	A	17,0	20,0	22,0	27,0	32,0
nrush current	A	99,0	123,0	127,0	167,0	198,0
Evaporator						
İype				Brazed plate		
Quantity	n.			1		
Nater flow	m³/h	3,0	3,7	4,6	5,5	6,6
Nater flow	l/s	0,9	1,0	1,3	1,5	1,8
Pressure drop	kPa	34	41	44	43	62
Pumps						
P1 — Available pressure	kPa	162	149	127	144	134
r1 — Motor input power	kW			0,55		
P1H – Available pressure	kPa	207	194	167	184	169
P1H – Motor input power	kW		0,55		0,	75
Capacity of buffer tank	I		80		180	
Electrical data						
otal input power	kW	7,4	9,3	9,9	12,2	15,5
Sound pressure level				·	·	
ound pressure at 1 m	dB(A)		55		59	61
Dimensions						
ength	mm	1	600	2.	000	2.130
Vidth	mm		750	8	350	1.100
leight	mm	1	260	1.	650	1'760
ransport weight	kg	256	261	370	400	570
ransport weight with empty buffer tank	kg	305	310	435	465	635
Refrigerant charge per circuit	kg	5,5	8,0	1	3,0	12,2
Electrical power supply			· · ·		·	
lectrical power supply	V / ph / Hz			400 / 3 / 50 + N + T		

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15°C.



REFRIGERANT R407C

Technical data - Standard version - 2 circuits

PAE		482 K	562 K	702 K	822 K
Cooling capacity					
Cooling capacity	kW	45,9	53,0	65,9	77,3
lominal input power	kW	16,1	18,9	22,9	29,7
ER		2,85	2,80	2,88	2,60
Heating capacity					
leating capacity	kW	56,0	65,0	81,0	97,0
nput power (heating)	kW	16,9	19,8	24,0	31,2
OP		3,31	3,28	3,37	3,11
Axial fans		-,	-,		-,
Quantity	n.			3	
Rotation speed	rpm			860	
Air flow	m³/h	25		21.	300
Air flow	l/s	7.0		5.5	
Motor input power	kW	70		1,9	
nput current	A			9,0	
Scroll compressors	Π			~,v	
Quantity	n.			2	
Circuits	n.			2	
Standard capacity steps	%		n i	<u>2</u> 50 – 100	
Vominal input current	%	29,0	35,0	38,0	49,0
		40,0	44,0	54,0	64,0
Maximum input current	A	,		-	,
nrush current	A	143,0	149,0	194,0	230,0
Evaporator			Dura	- dalam	
lýpe Duratitu			Braz	ed plate	
Quantity	n. 3a			2	
Vater flow	m³/h	7,9	9,1	11,3	13,3
Nater flow	l/s	2,2	2,5	3,1	3,7
Pressure drop	kPa	45	44	45	63
Pumps					1
P1 – Available pressure	kPa	137	130	122	108
21 — Motor input power	kW	0,7			,1
21H — Available pressure	kPa	187	185	172	158
P1H — Motor input power	kW	1,			,5
PT – Available pressure	kPa	137	140	137	120
PT — Motor input power	kW			1,5	
Capacity of buffer tank				180	
Electrical data					
otal input power	kW	18,8	21,6	25,6	32,4
Sound pressure level					
ound pressure at 1 m	dB(A)			69	
Dimensions					
ength	mm		2	130	
Vidth	mm		1	.100	
leight	mm		1	.760	
ransport weight	kg	607	611	682	693
ransport weight with empty buffer tank	kg	787	791	862	873
Refrigerant charge per circuit	kg	6,2	6,4	12,0	12,2
Electrical power supply		,			, , , , , , , , , , , , , , , , , , ,
Electrical power supply	V / ph / Hz		400/3	/ 50 + N + T	

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressume level at 1 m in open field (ISO 3744). - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15°C.



REFRIGERANT R407C

Technical data - Ultrasilenced version - 2 circuits

PAE		482 U K	562 U K	702 U K
Cooling capacity				
Cooling capacity	kW	42,4	51,3	60,7
Nominal input power	kW	17,2	18,5	21,0
EER		2,46	2,77	2,89
Heating capacity		,		
Heating capacity	kW	56,0	65,0	76,0
Input power (heating)	kW	18,1	19,4	22,0
COP		3.09	3,35	3,45
Axial fans				
Quantity	n.		3	
Rotation speed	rpm		650	
Air flow	m³/h	17`700	14	200
Air flow	l/s	4.917		945
Motor input power	kW		0,93	
Input current	A		4,7	
Scroll compressors			·/·	
Quantity	n.		2	
Circuits	n		2	
Standard capacity steps	%		0 - 50 - 100	
Nominal input current	A	30,0	33,0	40,0
Maximum input current	A	40,0	44,0	54,0
Inrush current	A	143,0	149,0	194,0
Evaporator		13,0	עלדו	ערכו
Туре			Brazed plate	
Quantity	n.		2	
Water flow	m³/h	7,3	8,8	10,4
Water flow	I/s	2,0	2,4	2,9
Pressure drop	kPa	39	42	39
Pumps	N'U	57	12	
P1 – Available pressure	kPa	140	1	27
P1 – Motor input power	kW		0,75	1,1
P1H – Available pressure	kPa	190	177	172
P1H – Motor input power	kW	170	1,1	1,5
PT – Available pressure	kPa	140	137	142
PT – Motor input power	kW	110	1,5	112
Capacity of buffer tank			180	
Electrical data	· · ·			
Total input power	kW	18,9	20,2	22,7
Sound pressure level		10,2	LVjL	
Sound pressure at 1 m	dB(A)		61	
Dimensions	abity			
Length	mm		2.130	
Width	mm		1.100	
Height	mm		1.260	
Transport weight	kg	614	618	689
Transport weight with empty buffer tank	kg	794	798	869
Refrigerant charge per circuit	kg	6,2	11,7	12,0
Electrical power supply	ry I	0,2	11,/	ι <i>Ζ</i> ,υ
Electrical power supply	V / ph / Hz		400 / 3 / 50 + N + T	
Liecuitai powei suppiy	v / pii / nz		400/3/30+N+I	

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15°C.



REFRIGERANT R407C

R407C - Correction factors for cooling capacity

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	15	1,433	1,404	1,376	1,333	1,289	1,260	1,226	1,175	1,137
	14	1,388	1,360	1,333	1,291	1,249	1,221	1,187	1,137	1,099
	13	1,343	1,317	1,290	1,250	1,209	1,182	1,148	1,099	1,062
	12	1,298	1,273	1,247	1,208	1,169	1,142	1,110	1,060	1,024
Temperature	11	1,253	1,229	1,204	1,166	1,128	1,103	1,071	1,022	0,987
of water leaving from	10	1,028	1,185	1,161	1,125	1,088	1,064	1,032	0,984	0,949
evaporator °C	9	1,163	1,141	1,118	1,087	1,048	1,025	0,993	0,946	0,912
	8	1,118	1,097	1,075	1,041	1,008	0,985	0,954	0,907	0,874
	7	1,073	1,053	1,032	1	0,968	0,946	0,915	0,869	0,837
	6	1,027	1,007	0,986	0,956	0,925	0,904	0,873	0,827	0,800
	5	0,981	0,961	0,941	0,911	0,882	0,862	0,831	0,785	0,763

R407C - Correction factors for input power

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	15	0,981	1,013	1,046	1,100	1,155	1,192	1,232	1,292	1,345
	14	0,968	1,001	1,033	1,088	1,143	1,179	1,219	1,279	1,335
	13	0,955	0,988	1,020	1,075	1,130	1,167	1,207	1,267	1,324
	12	0,942	0,975	1,008	1,063	1,118	1,154	1,194	1,255	1,314
Temperature	11	0,929	0,962	0,995	1,050	1,105	1,142	1,182	1,242	1,304
of water leaving from	10	0,916	0,949	0,982	1,037	1,093	1,129	1,170	1,230	1,294
evaporator °C	9	0,903	0,936	0,970	1,025	1,080	1,117	1,157	1,218	1,283
	8	0,890	0,924	0,957	1,012	1,067	1,104	1,145	1,206	1,273
	7	0,877	0,911	0,944	1	1,055	1,092	1,132	1,193	1,263
	6	0,872	0,904	0,937	0,987	1,037	1,071	1,110	1,169	1,232
	5	0,866	0,898	0,929	0,974	1,020	1,050	1,088	1,145	1,201

R407C - Correction factors for heating capacity

Temperature of water I	eaving from evaporator C	30	35	40	45	48
	20	1,415	1,392	1,367	1,315	1,284
	16	1,261	1,241	1,220	1,195	1,180
	14	1,195	1,176	1,155	1,127	1,110
	12	1,127	1,108	1,088	1,068	1,056
	10	1,066	1,047	1,026	1	0,984
Part and a factor	8	1,005	0,986	0,987	0,947	0,923
External air temperature °C	7	0,976	0,985	0,939	0,919	0,907
temperature c	6	0,904	0,893	0,870	0,852	0,841
	4	0,802	0,793	0,772	0,761	0,754
	2	0,741	0,732	0,712	0,701	0,694
	0	0,690	0,677	0,659	0,649	0,643
	-2	0,655	0,639	0,630	0,611	0,600
	-4	0,627	0,614	0,609	0,599	0,593

R407C - Correction factors for input power (heating)

Temperature of water	leaving from evaporator °C	30	35	40	45	48
	20	0,909	0,994	1,076	1,160	1,210
	16	0,861	0,938	1,015	1,091	1,137
-	14	0,843	0,916	0,898	1,061	1,159
	12	0,826	0,895	0,963	1,030	1,070
	10	0,807	0,872	0,936	1	1,038
Fortennia La In	8	0,789	0,850	0,910	0,969	1,004
External air temperature °C	7	0,780	0,839	0,897	0,953	0,987
temperature c	6	0,770	0,826	0,883	0,938	0,971
	4	0,749	0,803	0,856	0,906	0,936
	2	0,729	0,778	0,828	0,874	0,902
	0	0,706	0,753	0,799	0,843	0,869
	-2	0,687	0,728	0,768	0,810	0,785
	-4	0,663	0,701	0,738	0,775	0,753

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5 °C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions. - For further darifications or information, you are kindly request to contact our sales departement.



AIR COOLED HEAT PUMPS FOR LOW AMBIENT TEMPERATURES

WITH SCROLL COMPRESSORS AND AXIAL FANS



Series PAE ... K.LT

Cooling capacity from 5 to 15 kW - 1 circuit

The air cooled heat pumps of **PAE K.LT series** are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. Therefore during their design, apart from the accurate sizing of components allowing their winter operation down to very low external temperatures, it has been given a particular care for dimensions and sound level, so to have compact and silent units at the same time. They can also be matched to fancoils or terminal units or for water cooling in small industrial processes.

They are all available with 1 refrigerant circuit.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, also with pump and hydraulic tank, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available:

PAE...M K.LT single phase standard version **PAE...K.LT** three phase standard version

Operation limits (standard units):

SUMMER OPERATION: air from 15 to 45° C – water (out from evaporator) from 5 to 15° C – WINTER OPERATION: air from 20 to -15° C – water (out from evaporator) max 50°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service.

When required, the hydraulic kit is installed on board of the unit with no change in the overall dimensions and it is composed of: circulation pump, buffer tank, safety valve, pressure gauge, water filling and discharge valves, purging valve, expansion vessel. **High efficiency scroll compressor** of last generation suitable for heat pumps requiring high performances at low ambient temperatures and outlet water temperature of 50°C, with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater, when necessary.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably designed for optimization of defrosting cycles. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. The fans speed control is standard provided.

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material and it is complete with antifreeze heater and differential water flow switch.

Cooling circuit composed of 4-way valve for refrigerant cycle inversion, thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges.

Electric board, in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the automatic defrost system based on a time/temperature logics, complete with compressors hour counter.



WITH SCROLL COMPRESSORS AND AXIAL FANS

Accessories

- Electrical power supply different from standard: mainly, 230V AE three-phase, 460V three-phase. Frequency 50/60 Hz. GP Condensing coil protection grid: metal protection grid against
- accidental impacts.
- HG Hot gas by-pass: mechanical device for modulating cooling capacity
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.

МТ High and low pressure gauges for measuring circuit pressure.

- Buffer tank of suitable capacity complete with expansion vessel, MV safety valve, water gauge, water charge and discharge valves, air purging valves.
- **P1** Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- Condensing coil with pre-painted fins: superficial treatment of RM the condensing coils with epoxy coating.
- Copper/copper condensing coils: special execution of the con-RR densing coils with copper pipe and fins. Personalized frame painting in RAL colour
- RV
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.





AIR COOLED HEAT PUMPS FOR LOW AMBIENT TEMPERATURES

WITH SCROLL COMPRESSORS AND AXIAL FANS

Technical data

PAE		51 M K	61 M K	81 M K	91 M K	51 K	61 K	81 K	91 K	111 K	141 K
Cooling capacity											
Cooling capacity	kW	5,0	6,3	7,1	8,7	5,0	6,3	8,9	10,4	12,9	15,0
Nominal input power	kW	1,9	2,3	2,4	3,1	1,8	2,2	2,8	3,3	4,1	4,8
EER		2,63	2,74	2,96	2,81	2,78	2,86	3,18	3,	15	3,12
Heating capacity			,	, ,	, ,				, ,		
Heating capacity (air 7°C – water 45/50°C)	kW	5,9	7,2	7,7	9,7	5,8	7,1	9,6	11,4	13,9	16,4
Heating capacity (air -5°C – water 45/50°C)	kW	4,5	5,6	5,9	7,5	4,5	5,5	7,4	8,8	10,7	12,6
Input power (heating) (air -5°C – water 45/50°C)	kW	2,1	2,4	2,6	3,2	2,0	2,3	3,1	3,8	4,4	5,2
COP (air -5°C – water 45/50°C)		2,09	2,30	2,29	2,35	2.25	,	.39	2,31	2,43	2,42
Axial fans											,
Quantity	n.					2					3
Rotation speed	rpm				900					860	
Air flow	m³/h	7.499	6.200	11.500	10.199	7.499	6.200	10.199	16.005		301
Air flow	l/s	2.083	1.861	3.111	2.833	2.083	1.861	2.833	4.445		917
Motor input power	kW	0,			,74		29	0,74	1,26		,9
Input current	A		,3		,/		,3	3,4	6,0		,0
Scroll compressors		1	-		, ·	· · · · ·	-	3,1	5,0		-
Quantity	n.						1				
Circuits	n.						1				
Standard capacity steps	%						100				
Nominal input current	A	10,0	1	2,0	15,0		,0		5,0	8,0	9,0
Maximum input current	A	15,0	17,0	19,0	24,0	5,0	6,0	9,0	10,0	14,0	18,0
Inrush current	A	58,0	74,0	76,0	97,0	26,0	32,0	46,0	52,0	64,0	74,0
Evaporator	n	50,0	0,77	70,0	77,0	20,0	J2,0	τυ,υ	J2,0	07,0	7,0
Туре						Brazo	d plate				
Quantity	n.					DId2C	u piate 1				
Water flow	m ³ /h	0,9	1,1	1,2	1,5	0,9	1,1	1,5	1,8	2,2	2,6
Water flow	l/s	0,9	,	,3	0,4	0,9	0,3	0,4	0,5	0,6	0,7
Pressure drop	kPa	31	34	,3 33	35	31	34	35	37	39	40
Pumps	KFd	ונ	34	33	33)))	34))	57	39	40
P1 – Available pressure	kPa	61	55	57	55	61		55	50	65	56
P1 – Motor input power	kPd kW	01			,18		,08	00		18	20
	_										
P1 – Input current	A kPa	,	15		,34		,15	110		34	1((
P1H – Available pressure	kPa kW	135 0,	127	124		135	127	118	117	175	166
P1H – Motor input power					,55		,18			55	
P1H – Input current	A	0,			,05		,34	00	I,	05	
Capacity of buffer tank	1	3	0	(30	-	30	80		180	
Electrical data	1.147	2.0	-	0	4.0	2.0	2.0	4.0	5.0	()	7.0
Total input power	kW	2,0		,0	4,0	2,0	3,0	4,0	5,0	6,0	7,0
Total nominal input current	A	11,0	13,0	16,0	19,0		,0	9,0	12,0	17,0	18,0
Maximum total input current	A	16,0	18,0	22,0	27,0	6,0	7,0	12,0	16,0	23,0	27,0
Total inrush current	A	59,0	75,0	79,0	100,0	27,0	33,0	4,9	58,0	73,0	83,0
Sound pressure level	15(1)				(2)						
Sound pressure at 1 m	dB(A)	5	4	60	62	54	55	61	67	6	i9
Dimensions										-	
Length	mm	1.	100	<u> 1'</u>	600	<u> </u> 1 [°]	100	1.600	2.000		130
Width	mm		100		750		100	1:2/0	850		100
Height	mm		100		260		100	1.260	1.620		760
Transport weight	kg		95		27		95	327	400	607	618
Transport weight with empty buffer tank	kg	2	25	4	.07	2	25	407	589	801	810
Electrical power supply											
Electrical power supply	V / ph / Hz		230/1/	50 + N + T				400/3/	50 + N + T		

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C. - Sound pressure level at 1 m in open field (ISO 3744).



WITH SCROLL COMPRESSORS AND AXIAL FANS

R407C - Correction factors for cooling capacity

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	15	1,433	1,404	1,376	1,333	1,289	1,260	1,226	1,175	1,137
	14	1,388	1,360	1,333	1,291	1,249	1,221	1,187	1,137	1,099
	13	1,343	1,317	1,290	1,250	1,209	1,182	1,148	1,099	1,062
	12	1,298	1,273	1,247	1,208	1,169	1,142	1,110	1,060	1,024
Temperature	11	1,253	1,229	1,204	1,166	1,128	1,103	1,071	1,022	0,987
of water leaving from	10	1,028	1,185	1,161	1,125	1,088	1,064	1,032	0,984	0,949
evaporator °C	9	1,163	1,141	1,118	1,087	1,048	1,025	0,993	0,946	0,912
	8	1,118	1,097	1,075	1,041	1,008	0,985	0,954	0,907	0,874
	7	1,073	1,053	1,032	1	0,968	0,946	0,915	0,869	0,837
	6	1,027	1,007	0,986	0,956	0,925	0,904	0,873	0,827	0,800
	5	0,981	0,961	0,941	0,911	0,882	0,862	0,831	0,785	0,763

REMARKS:

- The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

- If the unit works with an evaporator water temperature below 5 °C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.

- Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.

- For further clarifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for input power

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	15	0,981	1,013	1,046	1,100	1,155	1,192	1,232	1,292	1,345
	14	0,968	1,001	1,033	1,088	1,143	1,179	1,219	1,279	1,335
	13	0,955	0,988	1,020	1,075	1,130	1,167	1,207	1,267	1,324
	12	0,942	0,975	1,008	1,063	1,118	1,154	1,194	1,255	1,314
Temperature	11	0,929	0,962	0,995	1,050	1,105	1,142	1,182	1,242	1,304
of water leaving from	10	0,916	0,949	0,982	1,037	1,093	1,129	1,170	1,230	1,294
evaporator °C	9	0,903	0,936	0,970	1,025	1,080	1,117	1,157	1,218	1,283
	8	0,890	0,924	0,957	1,012	1,067	1,104	1,145	1,206	1,273
	7	0,877	0,911	0,944	1	1,055	1,092	1,132	1,193	1,263
	6	0,872	0,904	0,937	0,987	1,037	1,071	1,110	1,169	1,232
	5	0,866	0,898	0,929	0,974	1,020	1,050	1,088	1,145	1,201

REMARKS:

The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5 °C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.

- Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 - For further clarifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for heating capacity

External air te	emperature °C	-15	-10	-5	0	5	10
_	45	0,765	0,882	1,034	1,202	1,286	1,412
Temperature of	50	0,740	0,854	1	1,163	1,244	1,366
water leaving from evaporator °C	55	0,739	0,840	0,966	1,109	1,176	1,286
evaporator C	60	/	0,824	0,965	1,059	1,126	1,218

REMARKS:

- The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit

- If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.

- For further clarifications or information, you are kindly request to contact our sales departement.

R407C - Correction factors for input power (heating)

External air te	emperature °C	-15	-10	-5	0	5	10
_	45	0,840	0,880	0,910	0,950	0,960	0,990
Temperature of	50	0,930	0,970	1	1,040	1,050	1,080
water leaving from evaporator °C	55	1,040	1,080	1,110	1,150	1,160	1,180
cruporator e	60	/	1,210	1,120	1,270	1,290	1,310

REMARKS:

- The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5°C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart.

Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions.
 For further clarifications or information, you are kindly request to contact our sales departement.



AIR COOLED HEAT PUMPS

WITH SCROLL COMPRESSORS AND CENTRIFUGAL FANS



PAE 131 C K



Serie PAE C K

Cooling capacity from 11 to 17 kW - 1 circuit

The air cooled heat pumps of **PAE C K series**, with centrifugal fans, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. Therefore during their design, it has been given a particular care for dimensions and sound level, so to have compact and silent units at the same time.

They can also be matched to fancoils or terminal units or for water cooling in small industrial processes.

They are all available with 1 refrigerant circuit.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available with vertical air flow: **PAE...C K** standard version **PAE...C PS K** with hydraulic kit

Operation limits (standard units):

SUMMER OPERATION: air from 15 to 45° C – water (out from evaporator) from 5 to 15° C - WINTER OPERATION: air from 20 to -4° C – water (out from evaporator) max 50^{\circ}C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service. For PS version, the hydraulic kit is installed at the bottom of the unit, with no change in dimensions and it is composed of: circulation pump, buffer tank, safety valve, pressure gauge, water filling and discharge valves, purging valve, expansion vessel. High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Centrifugal fans of double suction type with electrical motor directly joined to the wheel, with a low sound level and provided with short circuit and overload protections and external safety protection grid.

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of 4-way valve for refrigerant cycle inversion, thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of PS version, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the automatic defrost system based on a time/temperature logics, complete with compressors hour counter.



Accessories

- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
 BT Low temperature operation (-20°C): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (for summer operation only).
- GP Condensing coil protection grid: metal protection grid against accidental impacts.
- HG Hot gas by-pass: mechanical device for modulating cooling capacity.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT
 High and low pressure gauges for measuring circuit pressure.

 PA
 Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and
 - bell in galvanized steel and natural rubber mixture.

- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RM Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.
- RR
 Copper/copper condensing coils
 special execution of the condensing coils

 densing coils with copper pipe and fins.
 Special execution of the condensing coils
 Special execution of the condensing coils
- RV Personalized frame painting in RAL colour
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



AIR COOLED HEAT PUMPS

WITH SCROLL COMPRESSORS AND CENTRIFUGAL FANS

Technical data

PAEC		131 K	151 K	161 K	181 K
Cooling capacity					
Cooling capacity	kW	10,7	12,6	16,3	17,2
Nominal input power	kW	3,4	4,4	5,3	5,9
ER		3,15	2,86	3,07	2,91
Heating capacity		,	,		,
leating capacity	kW	13,2	16,0	20,3	21,7
nput power (heating)	kW	3,2	4,3	5,2	5,8
OP		4,12	3,72	3,90	3,74
Centrifugal fans		·,·-	-1		-,
uantity	n.			2	
ir flow	m³/h	7	500		700
ir flow	l/s		083		861
otation speed	rpm			1.220	
lotor input power	kW	1	,0		2
nput current	A		, v	13,6	
vailable pressure	Pa		10		55
icroll compressors					
luantity	n.			1	
ircuits	n.			1	
tandard capacity steps	%			0 - 100	
lominal input current	A	5,4	6,3	9,0	10,4
laximum input current	A	12,0	14,0	16,0	18,0
nrush current	A	56,0	68,0	77,0	81,0
vaporator		56,0	00,0	11,0	01,0
ype			Rr	azed plate	
uantity	n.			1	
/ater flow	m³/h	1,8	2,2	2,8	3,0
/ater flow	l/s	0,5	0,6		.8
ressure drop	kPa	32	43	34	38
ectrical data	in u	<u>, , , , , , , , , , , , , , , , , , , </u>	15		50
otal input power	kW	3,4	4,4	5,3	5,9
Sound pressure level		5,1	171	5,5	5,5
ound pressure at 1 m	dB(A)			60	
S Version	ub(n)				
vailable pressure	kPa	65	48	52	47
ump group motor power	kW			0,18	17
apacity of buffer tank				30	
Dimensions	· · ·				
enqth	mm			1.100	
<i>l</i> idth	mm			750	
eight	mm			1.100	
ransport weight	kg	217	221	238	240
	kg		,3		240
etrinerant charge per circuit	NY		15		<u>-</u>
etrigerant charge per circuit					
Dimensions for PS version				1.100	
Dimensions for PS version	mm			1.100	
Dimensions for PS version ength /idth	mm mm			750	
efrigerant charge per circuit Dimensions for PS version ength Vidth leight cascort weicht with ampty buffer task	mm mm mm	738	2/1	750 1°100	260
Dimensions for PS version ength Jidth	mm mm	238	241	750	260

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15 °C.



REFRIGERANT R407C



Serie PAEC K

Cooling capacity from 19 to 83 kW - 1 and 2 circuits

The air cooled heat pumps of **PAE C K series**, with centrifugal fans, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications.

They can also be matched to fancoils or terminal units or for water cooling in small industrial processes.

They are all available with 1 or 2 refrigerant circuits.

During their design, it has been given a particular care for dimensions and compactness, so to facilitate their handling and positioning in site. In order to further reduce weight and dimensions, in case of particular applications, when the units are provided with buffer tank and pump group, on request it is possible to separately supply the hydraulic kit, usually included in the frame of the unit itself. They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: Vertical air flow PAE...C K standard version PAE...C U K ultrasilenced version Horizontal air flow PAE...C.O K standard version PAE...C.O U K ultrasilenced version

Operation limits (standard units):

SUMMER OPERATION: **air** from 15 to 45° C – **water** (out from evaporator) from 5 to 15° C.

WINTER OPERATION: **air** from 20 to -4° C – **water** (out from evaporator) max 50^{\circ}C

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service. When required, the hydraulic kit (buffer tank and pump group) are installed at the bottom of the unit, in a suitable section.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied

with crankcase heater when necessary. In case of 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Centrifugal fans of double suction type with electrical motor directly joined and balanced blades, suitably isolated with rubber vibration dampers and sealing on discharge. They are provided with short circuit and overload protections and external safety protection grid. The motor is of 4-pole triphase type, with belt transmission and variable pulleys, placed on slide so to speed up the pulley tension. As a standard, the unit has a vertical airflow or, on request, you can ask for an horizontal airflow (coil side).

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of 4-way valve for refrigerant cycle inversion, thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the automatic defrost system based on a time/temperature logics, complete with compressors hour counter.



REFRIGERANT R407C

Accessories

- 1M-2M Higher available pressure for fan: bigger electrical motor, so to have a higher available pressure to fans to be ducted.
 AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
 BF Low temperature operation (-20°C) with inverter fan speed regulation: electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical
- supply (only for summer operation).
 BFa-BFb
 Low temperature operation (-20°C) with inverter fan speed regulation (with option 1M and 2M): electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply (only for summer operation).
- **BT Low temperature operation (-20°C)**: electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (not available for size 822 and only for summer operation).
- **BTa Low temperature operation (-20°C with option 1M)**: electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (not available for size 822 and only for summer operation).
- **CF** Soundproofed compressors cabinet: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (included on ultrasilenced version).
- CI Soundproofing jacket on compressors: made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (already included on ultrasilenced version).
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts.
- **HG Hot gas by-pass**: mechanical device for modulating cooling capacity (only for 1-circuit sizes and for summer operation).
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.

- MT
 High and low pressure gauges for measuring circuit pressure.

 MV
 Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PT Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type. (Available from size 482).
- **RA** Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- RR Copper/copper condensing coils: special execution of the condensing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data - Standard version - 1 circuit

PAE C		201 K	241 K	281 K	361 K	421 K
Cooling capacity		10 (244	77.0	22.0	41.0
Cooling capacity	kW	19,6	24,1	27,9	33,9	41,8
Nominal input power	kW	6,6	7,7	8,8	11,0	13,2
ER .		2,97	3,13	3,17	3,08	3,17
Heating capacity						
Heating capacity	kW	24,0	29,0	33,4	40,9	50,1
nput power (heating)	kW	6,8	7,9	9,1	11,5	13,8
COP		3,53		3,67	3,56	3,63
Centrifugal fans						
Quantity	n.		1		2	(*)
Air flow	m³/h	8.800	8.620	9.000	11`200	13.000
Air flow	l/s	2.444	2.403	2.200	3.111	3`611
STD Version						
Available pressure	Pa			80		
Rotation speed	rpm	896	915	975	746	858
Motor input power	kW		2,2	3,0	2,2	3,0
Nominal input current	A		5,3	6,7	5,3	6,7
Sound pressure level	dB(A)		66	67	64	65
1M Version						
Available pressure	Pa			120		
Rotation speed	rpm	935	955	1.014	811	914
Motor input power	kW		3,0	דועי	2,2	3,0
Nominal input current	A		6,7		5,3	6,7
Sound pressure level	dB(A)		67	68	65	66
2M Version	uD(A)		07	00	CU	UU
	D-			200		
Available pressure	Pa	1.011	1:007	200	020	1:005
Rotation speed	rpm	1.014	1.036	1.091	938	1.05
Motor input power	kW			3,0		4,0
Nominal input current	A			6,7		9,4
Sound pressure level	dB(A)		68	69	66	67
Scroll compressors						
Quantity	n.			1		
Circuits	n.			1		
Standard capacity steps	%			0 - 100		
Nominal input current	A	12,9	15,1	16,0	18,7	22,7
Maximum input current	A	17,0	20,0	22,0	27,0	32,0
nrush current	A	99,0	123,0	127,0	167,0	198,0
Evaporator						
lýpe				Brazed plate		
Quantity	n.			1		
Water flow	m³/h	3,4	4,1	4,8	5,8	7,2
Water flow	l/s	0,9	1,1	1,3	1,6	2,0
Pressure drop	kPa	41	50	48	47	72
Pumps						·
P1 – Available pressure	kPa	179	152	148	155	132
P1 – Motor input power	kW		0,55		0,75	
P1H — Available pressure	kPa	239	207	198	210	262
P1H – Motor input power	kW	0,55	207	0,75	-10	1,1
Capacity of buffer tank		0,00	1	180		'''
Electrical data				100		
Total input power	kW	8,8	9,9	11,8	13,2	16,2
Dimensions	I. YY	0,0	7,7	11,0	I J _I Z	10,2
			1'220		4'7	
.ength	mm		1.320	750		565
Nidth	mm		4:250	750		460
leight .ength with MV option	mm		1.520	*****	12	460
enath with MV ontion	mm			1'665		
	mm			750		
Width with MV option			1.(70		1.8	385
Width with MV option Height with MV option	mm		1.672			
Width with MV option Height with MV option Transport weight	mm kg	395	406	417	499	522
Width with MV option Height with MV option Transport weight Transport weight with empty buffer tank	mm	575	406 586	597	499 679	702
Width with MV option Height with MV option Transport weight	mm kg		406		499	

REMARKS:

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744).

- In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-

gly. - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15 $^\circ$ C.



REFRIGERANT R407C

Technical data - Ultrasilenced version - 1 circuit

PAE		201 C.U K	241 C.U K	281 C.U K	361 C.U K	421 C.U K
Cooling capacity						
Cooling capacity	kW	19,9	23,6	27,9	34,8	41,2
Nominal input power	kW	6,5	8,0	8,8	11,1	13,4
ER		3,06	2,95	3,17	3,13	3,07
Heating capacity						
leating capacity	kW	23,9	28,9	33,5	41,1	49,0
nput power (heating)	kW	6,7	8,3	9,1	11,5	14,0
OP		3,57	3,48	3,68	3,57	3,50
Centrifugal fans						
Quantity	n.		1	2	(*)	2
hir flow	m³/h	6'300	7`200	6`950	9.600	13`900
hir flow	l/s	1.750	2.000	1.930	2.666	3`861
STD Version						
vailable pressure	Pa	8	0	50	8	0
otation speed	rpm	720	818	637	711	696
lotor input power	kW		1,			3,0
lominal input current	A		3,			7,4
ound pressure level	dB(A)	62	64	61	6	,
M Version	40(r)			•1		-
vailable pressure	Pa			120		
otation speed	rpm	776	866	728	785	752
Aotor input power	kW	1,5	2,2		,5	3,0
Nominal input current	A	3,7	5,3		,7 ,7	7,4
	dB(A)					
ound pressure level	uD(A)	62	64	61	6	4
2M Version				200		
wailable pressure	Pa	007	0.0	200	025	
lotation speed	rpm	886	963	891	925	858
Aotor input power	kW	1,5	2,2	1,5	2,2	4,4
lominal input current	A	3,7	5,3	3,7	5,3	10,6
ound pressure level	dB(A)	63	65	62	6	4
Scroll compressors						
Quantity	n.			1		
ircuits	n.			1		
tandard capacity steps	%			0 - 100		
lominal input current	A	12,7	15,4	16,1	18,9	23,0
Aaximum input current	A	17,0	20,0	22,0	27,0	32,0
nrush current	A	99,0	123,0	127,0	167,0	198,0
Evaporator		,	,	,	,	
ype				Brazed plate		
Juantity	n.			1		
Nater flow	m³/h	3,4	4,0	4,8	6,0	7,1
Nater flow	l/s	1,9	1,1	1,3	1,7	1,9
ressure drop	kPa	42	4	,	50	71
Pumps	MU	12	· · · · · · · · · · · · · · · · · · ·	<u> </u>	50	/ 1
21 – Available pressure	kPa	178	154	148	155	133
1 – Motor input power	kPa kW		55	140	0,75	ננו
1 — Motor input power 1H — Available pressure	kPa	,	209	100	210	762
	kPa kW	238 0,55	207	198 0,75	2 I U	263
1H – Motor input power		0,00	47			1,1
apacity of buffer tank			18	00		240
Electrical data	1,111	0.0	0.5	10.2	12.4	
otal input power	kW	8,0	9,5	10,3	12,6	16,4
Dimensions						
ength	mm	11	320		665	2.120
/idth	mm		75			778
eight	mm	17	250		460	1`570
ength with MV option	mm		1.6	65		2`280
/idth with MV option	mm		75			996
eight with MV option	mm	1'(575		885	1.995
ransport weight	kg	396	407	501	511	642
ransport weight with empty buffer tank	kg	576	587	681	691	872
Refrigerant charge per circuit	kg	7,8	9,2	VUI	13,0	072
	кy	1,0	J₁∠		1,0	
Electrical power supply						

REMARKS:

REMARXS - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744).

- In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-

gy, - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15 °C.



REFRIGERANT R407C

Technical data - Standard version - 2 circuits

PAEC		482 K	562 K	702 K	822 K
Cooling capacity					
Cooling capacity	kW	48,1	55,6	67,9	82,7
Nominal input power	kW	15,4	17,5	22,2	26,6
EER		3,12	3,18	3,06	3,11
Heating capacity				í í	·
Heating capacity	kW	57,9	66,6	81,9	100,1
nput power (heating)	kW	16,1	18,2	23,1	27,6
COP	NTT	3,59	3,66	3,54	3,63
Centrifugal fans		5,55	5,00	J,J 1	5,05
				2	
Quantity	n.	1(1700			20:400
Air flow	m³/h	16'700	20'900	24.600	28'400
Air flow	l/s	4.639	5`806	6`834	7`889
STD Version					
Available pressure	Pa			0	
Rotation speed	rpm	782	919	640	745
Aotor input power	kW	4,4	8,0	6,0	11,0
Vominal input current	A	10,6	18,8	13,4	24,0
ound pressure level	dB(A)	65	66	68	3
I M Version					
vailable pressure	Pa		1	20	
lotation speed	rpm	830	959	669	769
Aotor input power	kW	4,4		,0	11,0
lominal input current	A	10,6		3,8	24,0
iound pressure level	dB(A)	66	68	71	72
2M Version	ub(n)	JU	00	/1	12
	Do			00	
wailable pressure	Pa	022		705	040
lotation speed	rpm	923	1.032	725	819
Aotor input power	kW	6,0		,0	11,0
lominal input current	A	13,4		3,8	24,0
ound pressure level	dB(A)	67	7	71	74
Scroll compressors					
Juantity	n.			2	
Tircuits	n.			2	
tandard capacity steps	%		0 - 50) - 100	
lominal input current	A	30,0	32,0	38,0	46,0
Maximum input current	A	40,0	44,0	54,0	64,0
nrush current	A	143,0	149,0	194,0	230,0
Evaporator					230,0
ype			Rrazo	d plate	
Juantity	n.		Didze	7	
Water flow	m ³ /h	8,3	9,6	11,7	14,2
Vater flow	l/s	2,3	2,7	3,2	3,9
ressure drop	kPa	49	48	47	71
Pumps		4			
1 – Available pressure	kPa	132	113	180	107
P1 – Motor input power	kW	0,7		1,	
11H — Available pressure	kPa	237	223	250	157
1H – Motor input power	kW	1,		1,	5
T Ausilahla measura	kPa	132	133	135	127
I — Avaliable pressure	Nu				
	kW		1	,5	
T – Motor input power			1	,5 40	
T — Motor input power apacity of buffer tank	kW		1	,5 40	
T – Motor input power apacity of buffer tank Electrical data	kW I		2.	40	28 N
T – Motor input power apacity of buffer tank Electrical data otal input power	kW I kW	20,0	26,0	28,0	<u>38,0</u> 70.0
T – Motor input power apacity of buffer tank :lectrical data otal input power otal nominal input current	kW 	20,0 41,0	2: 26,0 51	40 	70,0
T – Motor input power apacity of buffer tank Electrical data otal input power otal nominal input current Iaximum total input current	kW 	20,0 41,0 51,0	26,0 51 63,0	40 28,0 ,0 67,0	70,0 88,0
T – Motor input power apacity of buffer tank Electrical data otal input power tal nominal input current kavimum total input current otal inrush current	kW 	20,0 41,0	2: 26,0 51	40 	70,0
T – Motor input power apacity of buffer tank Electrical data otal input power tal nominal input current laximum total input current Dimensions	kW 	20,0 41,0 51,0 154,0	26,0 57 63,0 168,0	40 28,0 ,0 67,0 213,0	70,0 88,0 254,0
T - Motor input power apacity of buffer tank ilectrical data tal input power otal nominal input current laximum total input current tal inrush current Dimensions ength	kW I I KW A A A A A mm	20,0 41,0 51,0 154,0 2.1	26,0 57 63,0 168,0 20	40 28,0 ,0 67,0 213,0 2'2	70,0 88,0 254,0 80
T – Motor input power apacity of buffer tank ilectrical data tal input power otal nominal input current laximum total input current tal inrush current Dimensions Digth hidth	kW 	20,0 41,0 51,0 154,0 2`1 77	2 26,0 5 63,0 168,0 20 8	40 28,0 1,0 67,0 213,0 2'2 99	70,0 88,0 254,0 80 0
T – Motor input power apacity of buffer tank Electrical data tal input power dal nominal input current Aaximum total input current otal inrush current Dimensions ength Vidth leight	kW I I KW A A A A A mm	20,0 41,0 51,0 154,0 2.1	2 26,0 5 63,0 168,0 20 8 70	40 28,0 1,0 67,0 213,0 2'2 99 1'8	70,0 88,0 254,0 80 0
T – Motor input power apacity of buffer tank Electrical data otal input power otal nominal input current Aaximum total input current otal inrush current Dimensions ength Vidth leight	kW I I KW A A A A A M M m	20,0 41,0 51,0 154,0 2`1 77	2 26,0 5 63,0 168,0 20 8 70	40 28,0 1,0 67,0 213,0 2'2 99	70,0 88,0 254,0 80 0
T – Motor input power apacity of buffer tank Electrical data tal input power tal nominal input current daximum total input current otal inrush current Dimensions ength Moth leight ength with MV option	kW I I KW A A A A M M M m m M m M m	20,0 41,0 51,0 154,0 2`1 77	2 26,0 5 63,0 168,0 20 8 70 20 20 20 20 20 20 20 20 20 20 20 20 20	40 28,0 1,0 67,0 213,0 2'2 99 1'8	70,0 88,0 254,0 80 0
T – Motor input power apacity of buffer tank Electrical data otal input power otal nominal input current daximum total input current otal inrush current Dimensions ength Vidth leight ength with MV option Vidth with MV option	kW I kW A A mm	20,0 41,0 51,0 154,0 2`1 77 1`5	2 26,0 57 63,0 168,0 20 8 70 20 9 9	40 28,0 1,0 67,0 213,0 222 99 18 280 90	70,0 88,0 254,0 80 0 45
T – Motor input power apacity of buffer tank Electrical data otal input power otal nominal input current daximum total input current otal inrush current Dimensions ength Vidth leight ength with MV option didth with MV option leight with MV option	kW I kW A A Mm mm	20,0 41,0 51,0 154,0 2`1 77 1`5	2 26,0 5' 63,0 168,0 20 8 70 21 9 95	40 28,0 ,0 67,0 213,0 2°2 99 1°8 280 90 2°2	70,0 88,0 254,0 80 0 45 70
T – Motor input power apacity of buffer tank Electrical data otal input power otal nominal input current Aaximum total input current Dimensions ength Vidth leight ength with MV option Eight with MV option iransport weight	kW I kW A A A A Mm mm mm mm mm mm km km km	20,0 41,0 51,0 154,0 2'1 77 1 5 1 5 789	26,0 26,0 57 63,0 168,0 20 8 70 20 8 70 27 9 95 821	40 28,0 ,0 67,0 213,0 2'2 99 18 280 90 2'2 898	70,0 88,0 254,0 80 0 45 70 976
YT – Available pressure YT – Motor input power apacity of buffer tank Electrical data ötal input power ötal input power ötal input power ötal input somer Ötmensions ength Width leight ength with MV option leight with MV option fansport weight with empty buffer tank befissent character and ensities	kW I kW A A A Mm mm mm kg kg	20,0 41,0 51,0 154,0 2`1 77 1`5 1`9 789 1`019	26,0 57 63,0 168,0 20 8 70 20 8 70 20 8 70 20 8 70 27 9 9 95 821 1.051	40 28,0 1,0 67,0 213,0 222 99 18 280 90 222 898 1'128	70,0 88,0 254,0 80 0 45 70 976 1`206
T – Motor input power apacity of buffer tank Electrical data otal input power otal nominal input current Aaximum total input current Dimensions ength Vidth leight ength with MV option Eight with MV option iransport weight	kW I kW A A A A Mm mm mm mm mm mm km km km	20,0 41,0 51,0 154,0 2'1 77 1 5 1 5 789	26,0 26,0 57 63,0 168,0 20 8 70 20 8 70 27 9 95 821	40 28,0 ,0 67,0 213,0 2'2 99 18 280 90 2'2 898	70,0 88,0 254,0 80 0 45 70 976

REMARKS:

REMARXS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Whiter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-n/v

gly. - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15 $^\circ$ C.



REFRIGERANT R407C

Technical data - Ultrasilenced version - 2 circuits

PAE		482 C.U K	562 C.U K	702 C.U K
Cooling capacity				
Cooling capacity	kW	48,1	55,6	67,9
Vominal input power	kW	15,4	17,5	22,2
EER		3,12	3,18	3,06
Heating capacity				
leating capacity	kW	57,9	66,6	81,9
nput power (heating)	kW	16,1	18,2	23,1
IPut power (neating)	N V V	3,60	3,66	3,54
		3,00	5,00	5,54
Centrifugal fans				
Juantity	n.		2	
ir flow	m³/h	14.700	18`000	20'700
ir flow	l/s	4.083	5.000	5.750
STD Version				
vailable pressure	Pa		80	
otation speed	rpm	460	509	585
lotor input power	kW		3,0	4,4
ominal input current	A		7,4	10,6
ound pressure level	dB(A)	60	58	
M Version				
vailable pressure	Pa		120	
otation speed	rpm	508	548	616
otor input power	kW		3,0	4,4
ominal input current	A		7,4	10,6
ound pressure level	dB(A)	61	63	66
M Version		01	05	
	Pa		200	
vailable pressure		500		/04
otation speed	rpm	599	626	684
lotor input power	kW	3,0	4,4	6,0
ominal input current	A	7,4	10,6	13,4
ound pressure level	dB(A)	62	64	66
croll compressors				
luantity	n.		2	
ircuits	n.		2	
tandard capacity steps	%		0 - 50 - 100	
ominal input current	A	30,0	32,0	38,0
laximum input current	A	40,0	44,0	54,0
nrush current	A	143,0	149,0	194,0
Evaporator				
ype			Brazed plate	
Quantity	n.		2	
Vater flow	m³/h	8,3	9,5	11,7
Vater flow	l/s	2,3	2,6	3,2
ressure drop	kPa	49	48	47
Pumps	ni u	12	UT	יד
1 – Available pressure		122	440	
i — wydiiddie biessule				100
4 Material and a second second	kPa	132	113	180
1 – Motor input power	kW	0,	,75	1,10
1H – Available pressure	kW kPa	0, 237	,75 223	1,10 250
1H — Available pressure 1H — Motor input power	kW kPa kW	0, 237 1	75 223 1,1	1,10 250 1,5
1H — Available pressure 1H — Motor input power	kW kPa	0, 237	,75 223	1,10 250
1H — Available pressure 1H — Motor input power T — Available pressure	kW kPa kW kPa	0, 237 1	75 223 1,1 133	1,10 250 1,5
1H – Available pressure 1H – Motor input power T – Available pressure T – Motor input power	kW kPa kW	0, 237 1	75 223 1,1 133 1,5	1,10 250 1,5
1H – Available pressure 1H – Motor input power T – Available pressure T – Motor input power apacity of buffer tank	kW kPa kW kPa	0, 237 1	75 223 1,1 133	1,10 250 1,5
1H – Available pressure 1H – Motor input power T – Available pressure T – Motor input power apacity of buffer tank Electrical data	kW kPa kW kPa kW I	0, 237 132	75 223 1,1 133 1,5 240	1,10 250 1,5 135
1H – Available pressure 1H – Motor input power 7 – Available pressure 7 – Motor input power spacity of buffer tank Ilectrical data stal input power	kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kW kW kW kW kW kW kW kW kW kW kW kW	0, 237 132 19,8	75 223 1,1 133 1,5 240 21,0	1,10 250 1,5 135 27,0
1H – Available pressure 1H – Motor input power 7 – Available pressure 7 – Motor input power apacity of buffer tank ilectrical data tal input power stal nominal input current	kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kPa kW kPa kPa kPa kPa kPa kPa kPa kPa kPa kPa	0, 237 132 19,8 38,0	75 223 1,1 133 1,5 240 21,0 40,0	1,10 250 1,5 135 27,0 48,0
1H – Available pressure 1H – Motor input power 1 – Available pressure 2 – Motor input power apacity of buffer tank Electrical data tal input power tal nominal input current laximum total input current	kW kPa kW kPa kW I KW A A	0, 237 1 132 19,8 38,0 47,0	75 223 1,1 133 1,5 240 21,0 40,0 51,0	1,10 250 1,5 135 27,0 48,0 65,0
IH – Available pressure IH – Motor input power - Available pressure I – Motor input power apacity of buffer tank ilectrical data tal input power tal nominal input current laximum total input current tal inrush current	kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kW kPa kPa kW kPa kPa kPa kPa kPa kPa kPa kPa kPa kPa	0, 237 132 19,8 38,0	75 223 1,1 133 1,5 240 21,0 40,0	1,10 250 1,5 135 27,0 48,0
IH – Available pressure IH – Motor input power I – Available pressure I – Motor input power apacity of buffer tank Electrical data tal input power tal nominal input current aximum total input current binrust current Dimensions	kW kPa kW kPa kW I KW A A	0, 237 1 132 19,8 38,0 47,0	75 223 1,1 133 1,5 240 21,0 40,0 51,0 156,0	1,10 250 1,5 135 27,0 48,0 65,0
IH – Available pressure IH – Motor input power - Available pressure I – Motor input power spacity of buffer tank Iectrical data tal input power tal nominal input current aximum total input current tal inrush current Dimensions	kW kPa kW kPa kW I KW A A	0, 237 1 132 19,8 38,0 47,0	75 223 1,1 133 1,5 240 21,0 40,0 51,0 156,0 2'280	1,10 250 1,5 135 27,0 48,0 65,0
IH – Available pressure IH – Motor input power - Available pressure - Motor input power apacity of buffer tank Electrical data stal input power tal input power tal anominal input current laximum total input current tal inrush current Dimensions ength	kW kPa kW kPa kW l kW A A A A A M mm	0, 237 1 132 19,8 38,0 47,0	75 223 1,1 133 1,5 240 21,0 40,0 51,0 156,0 2'280	1,10 250 1,5 135 27,0 48,0 65,0
1H – Available pressure 1H – Motor input power 7 – Available pressure 1 – Motor input power apacity of buffer tank Electrical data otal input power tal nominal input current laximum total input current Dimensions ength /dth	kW kPa kW kPa kW I KW A A A M mm mm	0, 237 1 132 19,8 38,0 47,0	75 223 1,1 133 1,5 240 21,0 40,0 51,0 156,0 2'280 990	1,10 250 1,5 135 27,0 48,0 65,0
1H – Available pressure 1H – Motor input power T – Available pressure T – Motor input power apacity of buffer tank Electrical data otal input power otal nominal input current laximum total input current Dimensions ength Moth leight	kW kPa kW kPa kW R A A A M mm mm mm mm	0, 237 1 132 19,8 38,0 47,0	,75 223 1,1 133 1,5 240 21,0 40,0 51,0 156,0 2'280 990 1'845	1,10 250 1,5 135 27,0 48,0 65,0
1H – Available pressure 1H – Motor input power 7 – Available pressure Bacity of buffer tank Electrical data stal input power otal nominal input current faimum total input current Dimensions ength Vidth eight ength with MV option	kW kPa kW kPa kW kW A A A mm mm mm mm mm mm mm mm	0, 237 1 132 19,8 38,0 47,0	75 223 1,1 133 1,5 240 21,0 40,0 51,0 51,0 51,0 2'280 990 1 845 2'280	1,10 250 1,5 135 27,0 48,0 65,0
1H – Available pressure 1H – Motor input power - Available pressure T – Motor input power apacity of buffer tank Electrical data tal input power otal input power otal input power otal input power otal input opwer otal input current daximum total input current otal innush current Dimensions ength vidth leight ength with MV option vidth with MV option	kW kPa kW kPa kW kW kW A A A mm mm mm mm mm mm mm mm mm	0, 237 1 132 19,8 38,0 47,0	75 223 1,1 133 1,5 240 21,0 40,0 51,0 51,0 2'280 990 1'845 2 280 990	1,10 250 1,5 135 27,0 48,0 65,0
1H – Available pressure 1H – Motor input power 2 – Available pressure T – Motor input power apacity of buffer tank Electrical data tal input power tal anominal input current laximum total input current tal inrush current Dimensions eight noth MV option /dth with MV option eight with MV option	kW kPa kW kPa kW kW kW A A A mm mm	0, 237 1 132 19,8 38,0 47,0 150,0	75 223 1,1 1,3 1,5 240 21,0 40,0 51,0 156,0 2'280 990 1'845 2'280 990 2'270	1,10 250 1,5 135 27,0 48,0 65,0 205,0
1H – Available pressure 1H – Motor input power 2 – Available pressure T – Motor input power apacity of buffer tank Electrical data tal input power tal input power tal anominal input current daximum total input current Dimensions ength Vidth with MV option vidth with MV option eight with MV option ansport weight	kW kPa kW kPa kW kW kW kW kW a Mm	0, 237 1 132 19,8 38,0 47,0 150,0 862	75 223 1,1 133 1,5 240 21,0 40,0 51,0 156,0 2'280 990 1'845 2'280 990 1'845 2'280 990 2'270 894	1,10 250 1,5 135 27,0 48,0 65,0 205,0 911
1 — Motor input power 1H — Available pressure 1H — Motor input power T — Available pressure T — Motor input power apacity of buffer tank Electrical data otal input power otal nominal input current daximum total input current otal inrush current Dimensions ength Vidth leight ength wV option Vidth WV option leight with MV option fansport weight ransport weight with empty buffer tank	kW kPa kW kPa kW kW kW A A A mm mm	0, 237 1 132 19,8 38,0 47,0 150,0 862 1 165	75 223 1,1 133 1,5 240 21,0 40,0 51,0 156,0 2'280 990 1'845 2'280 990 1'845 2'280 990 2'270 894 1'124	1,10 250 1,5 135 27,0 48,0 65,0 205,0 911 1.141
1H – Available pressure 1H – Motor input power T – Available pressure T – Motor input power apacity of buffer tank Electrical data otal input power otal input power otal input power otal input current Dimensions ength Vidth leight with MV option Vidth with MV option ransport weight ransport weight with empty buffer tank efferand tharee per circuit	kW kPa kW kPa kW kW kW kW kW a Mm	0, 237 1 132 19,8 38,0 47,0 150,0 862 1 165	75 223 1,1 133 1,5 240 21,0 40,0 51,0 156,0 2'280 990 1'845 2'280 990 1'845 2'280 990 2'270 894 1'124	1,10 250 1,5 135 27,0 48,0 65,0 205,0 911 1.141
1H – Available pressure 1H – Motor input power 7 – Available pressure T – Motor input power apacity of buffer tank Electrical data otal input power tal nominal input current takimum total input current Dimensions ength Vidth leight with MV option ransport weight ansport weight with empty buffer tank	kW kPa kW kPa kW kW kW A A A A Mm mm mm mm mm kg	0, 237 1 132 19,8 38,0 47,0 150,0 862	75 223 1,1 133 1,5 240 21,0 40,0 51,0 156,0 2'280 990 1'845 2'280 990 1'845 2'280 990 2'270 894	1,10 250 1,5 135 27,0 48,0 65,0 205,0 911

REMARKS:

REMARS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-n/v

gly. - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15 °C.



REFRIGERANT R407C

R407C - Correction factors for cooling capacity

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	15	1,433	1,404	1,376	1,333	1,289	1,260	1,226	1,175	1,137
	14	1,388	1,360	1,333	1,291	1,249	1,221	1,187	1,137	1,099
	13	1,343	1,317	1,290	1,250	1,209	1,182	1,148	1,099	1,062
	12	1,298	1,273	1,247	1,208	1,169	1,142	1,110	1,060	1,024
Temperature	11	1,253	1,229	1,204	1,166	1,128	1,103	1,071	1,022	0,987
of water leaving from	10	1,028	1,185	1,161	1,125	1,088	1,064	1,032	0,984	0,949
evaporator °C	9	1,163	1,141	1,118	1,087	1,048	1,025	0,993	0,946	0,912
	8	1,118	1,097	1,075	1,041	1,008	0,985	0,954	0,907	0,874
	7	1,073	1,053	1,032	1	0,968	0,946	0,915	0,869	0,837
	6	1,027	1,007	0,986	0,956	0,925	0,904	0,873	0,827	0,800
	5	0,981	0,961	0,941	0,911	0,882	0,862	0,831	0,785	0,763

R407C - Correction factors for input power

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	15	0,981	1,013	1,046	1,100	1,155	1,192	1,232	1,292	1,345
	14	0,968	1,001	1,033	1,088	1,143	1,179	1,219	1,279	1,335
	13	0,955	0,988	1,020	1,075	1,130	1,167	1,207	1,267	1,324
	12	0,942	0,975	1,008	1,063	1,118	1,154	1,194	1,255	1,314
Temperature	11	0,929	0,962	0,995	1,050	1,105	1,142	1,182	1,242	1,304
of water leaving from	10	0,916	0,949	0,982	1,037	1,093	1,129	1,170	1,230	1,294
evaporator °C	9	0,903	0,936	0,970	1,025	1,080	1,117	1,157	1,218	1,283
	8	0,890	0,924	0,957	1,012	1,067	1,104	1,145	1,206	1,273
	7	0,877	0,911	0,944	1	1,055	1,092	1,132	1,193	1,263
	6	0,872	0,904	0,937	0,987	1,037	1,071	1,110	1,169	1,232
	5	0,866	0,898	0,929	0,974	1,020	1,050	1,088	1,145	1,201

R407C - Correction factors for heating capacity

Temperature of water l	eaving from evaporator °C	30	35	40	45	48
	20	1,415	1,392	1,367	1,315	1,284
	16	1,261	1,241	1,220	1,195	1,180
	14	1,195	1,176	1,155	1,127	1,110
	12	1,127	1,108	1,088	1,068	1,056
	10	1,066	1,047	1,026	1	0,984
	8	1,005	0,986	0,987	0,947	0,923
External air temperature °C	7	0,976	0,985	0,939	0,919	0,907
temperature c	6	0,904	0,893	0,870	0,852	0,841
	4	0,802	0,793	0,772	0,761	0,754
	2	0,741	0,732	0,712	0,701	0,694
	0	0,690	0,677	0,659	0,649	0,643
	-2	0,655	0,639	0,630	0,611	0,600
	-4	0,627	0,614	0,609	0,599	0,593

R407C - Correction factors for input power (heating)

Temperature of water	leaving from evaporator °C	30	35	40	45	48
	20	0,909	0,994	1,076	1,160	1,210
	16	0,861	0,938	1,015	1,091	1,137
	14	0,843	0,916	0,898	1,061	1,159
	12	0,826	0,895	0,963	1,030	1,070
	10	0,807	0,872	0,936	1	1,038
	8	0,789	0,850	0,910	0,969	1,004
External air temperature °C	7	0,780	0,839	0,897	0,953	0,987
temperature c	6	0,770	0,826	0,883	0,938	0,971
	4	0,749	0,803	0,856	0,906	0,936
	2	0,729	0,778	0,828	0,874	0,902
	0	0,706	0,753	0,799	0,843	0,869
	-2	0,687	0,728	0,768	0,810	0,785
	-4	0,663	0,701	0,738	0,775	0,753

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5 °C, it is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon AC SpA desclaims all responsabilities in case of damages deriving from violation of this instructions. - For further darifications or information, you are kindly request to contact our sales departement.



REFRIGERANT R407C





Series PAE ... C K

Cooling capacity from 73 to 225 kW - 2 circuits

The air cooled heat pumps of **PAE C K series**, with centrifugal fans, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. They can also be matched to fancoils or terminal units or for water cooling in industrial processes.

They are all available with 2 refrigerant circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

The whole range is complete of a compressors section, allowing a quick and easy ordinary service to the units.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available:

Vertical air flow PAE...C K standard version PAE...C U K ultrasilenced version Horizontal air flow PAE...C.O K standard version PAE...C.O U K ultrasilenced version

Operation limits (standard units):

SUMMER OPERATION: **air** from 15 to 45° C – **water** (out from evaporator) from 5 to 15° C.

WINTER OPERATION: air from 20 to -4°C – water (out from evaporator) max 50°C

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are installed. The external panels, easy to be dismantled with a quick ¾ key turn, allow the full access to all components in case of service. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater, when necessary. Being 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Centrifugal fans of double suction type with electrical motor directly joined and balanced blades, suitably isolated with rubber vibration dampers and sealing on discharge. They are provided with short circuit and overload protections and external safety protection grid. The motor is of 4-pole triphase type, with belt transmission and variable pulleys, placed on slide so to speed up the pulley tension. As a standard, the unit has a vertical airflow or, on request, you can ask for an horizontal airflow (coil side).

Dry expansion **shell and tube evaporator** with two refrigerant circuits, in carbon steel and copper tubes, insulated by close-cell polyurethane foam material.

Cooling circuit composed of 4-way valve for refrigerant cycle inversion, thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches, shut-off valves on liquid line, shut-off valves on compressor discharge side.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the automatic defrost system based on a time/temperature logics, complete with compressors hour counter.



REFRIGERANT R407C

Accessories

- 1M-2MHigher available pressure for fan: bigger electrical motor, so to
have a higher available pressure to fans to be ducted.AEElectrical power supply different from standard: mainly, 230V
- three-phase, 460V three-phase. Frequency 50/60 Hz.
 BF Low temperature operation (-20°C) with inverter fan speed regulation: electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply (only for summer operation).
- **BFa-BFb** Low temperature operation (-20°C) with inverter fan speed regulation (with option 1M and 2M): electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply (only for summer operation).
- BT Low temperature operation (-20°C): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (for summer operation only).
- BTa Low temperature operation (-20°C) (with option 1M): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (not available for standard version and only for summer operation).
- CF Soundproofed compressors cabinet: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (included on ultrasilenced version).
- CI Soundproofing jacket on compressors: made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (already included on ultrasilenced version).
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **GP** Condensing coil protection grid: metal protection grid against accidental impacts.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT High and low pressure gauges for measuring circuit pressure.
- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PT Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- RR Copper/copper condensing coils: special execution of the condensing coils with copper pipe and fins.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification. It is necessary to consider option BT.
- RV Personalized frame painting in RAL colour
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data - Standard version

Cooling capacity onling capacity Iominal input power ER Heating capacity Heating capacity Input power (heating) OP Centrifugal fans Juantity in flow STD Version wailable pressure Notor input power Jordin input current Oolminal input current Ound pressure level IM Version Wailable pressure Valable pressure Idation speed Aotor input current Opminal input current Ound pressure level IM Version wailable pressure Vation speed Aotor input power Iominal input current Ound pressure level 22M Version wailable pressure Vation speed Aotor input power Iominal input current Ound pressure level 23C Conspressors Vauntty Vircuits Candard capacity steps Optional c	kW kW kW kW kW kW kW kW kW kW kW kW kW k	73,3 27,6 2,65 94,0 28,7 3, 40°000 11°110 50 920 100 970 72 72 260 1°110	3 37 10 9 12,0 28,2 70 12,0 28,2 71 12,0 28,2 71 28,2 71 28,2 71 28,2 71 15,5	180	13 70 9 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7	129,0 50,2 2,57 168,0 52,2 3,22 4 000 890 15 16,0 37,6 72 90 16,0 37,6 74	145,0 56,0 2,59 187,0 58,2 3,21 48`000 13`300 100 935 73 73 240 1`065	200,9 66,0 3,04 251,0 68,6 3,66	209,0 73,4 2,85 263,0 76,3 3,45 6 73 200 20 330 20 330 80 920 24,0 56,4 74 220 1 050 24,0 56,4 78	222,0 80,0 2,77 282,0 83,2 3,39
Iominal input power Image: Second	kW kW kW n m³/h l/s Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm W A dB(A) Pa kW A dB(A) wW A wW	27,6 2,65 94,0 28,7 3, 40°000 11°110 50 920 100 970 72 260	31,8 2,62 108,0 33,0 27 3 3 3 3 7 10 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 1 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,	38,0 2,44 122,0 39,5 39,5 3,09 ''500 ''415 7 7000 180 1'('') 72 270	44,4 2,75 156,0 46,2 3,38 50 13 70 9 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	50,2 2,57 168,0 52,2 3,22 4 0000 890 15 15 16,0 37,6 72 90 16,0 37,6 74	56,0 2,59 187,0 58,2 3,21 48 000 13 300 100 935 73 73 240 1 065	66,0 3,04 251,0 68,6	73,4 2,85 263,0 76,3 3,45 6 73 200 20 330 20 330 80 920 24,0 56,4 74 220 1 050 24,0 56,4	80,0 2,77 282,0 83,2
ER leating capacity eating capacity aput power (heating) OP Centrifugal fans uantity ir flow STD Version valiable pressure otation speed lotor input power ominal input current ound pressure level IM Version valiable pressure otation speed lotor input power ominal input current ound pressure level IM Version valiable pressure otation speed lotor input power ominal input current ound pressure level IM Version valiable pressure otation speed lotor input power ominal input current ound pressure level IM Version valiable pressure otation speed lotor input power ominal input current ound pressure level Sitor input power ominal input current ound pressure level Sitor input power ominal input current pound pound pound pound pound pound pound	kW kW kW n m²/h l/s Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm kW A kW kW A	2,65 94,0 28,7 3, 40`000 11`110 50 920 100 970 72 72 260	2,62 108,0 33,0 27 3 3 10 10 9 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 70 12,0	2,44 122,0 39,5 3,09 500 1415 7 200 180 110 72 270	2,75 156,0 46,2 3,38 50' 13' 70 9 	2,57 168,0 52,2 3,22 4 000 890 15 16,0 37,6 72 90 16,0 37,6 74	2,59 187,0 58,2 3,21 48`000 13`300 100 935 73 73 240 1`065	3,04 251,0 68,6	2,85 263,0 76,3 3,45 6 73`200 20`330 80 920 24,0 56,4 74 220 1050 24,0 56,4	2,77 282,0 83,2
Ideating capacity eating capacity eating capacity put power (heating) DP centrifugal fans uantity ir flow TD Version valiable pressure otation speed lotor input power ominal input current budd pressure level M Version valiable pressure otation speed lotor input power ominal input current budd pressure otation speed lotor input power ominal input current budd pressure otation speed lotor input power ominal input current budd pressure otation speed lotor input power ominal input current budd pressure ontion input power ominal input current budd pressure level ictor of put power ominal input current budd pressure level ictor of put power ominal input current	kW n n, m²/h l/s l/s Pa kW A dB(A) Pa rpm kW A dB(A) u Pa rpm kW A dB(A) u Pa rpm kW A dB(A) u Pa kW A kW A kW A kW A kW A kW A kW	94,0 28,7 3, 40'000 11'110 50 920 	108,0 33,0 27 3 3 3 3 3 3 3 10 10 9 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 71 28,2 71 28,2 71 15,5	122,0 39,5 3,09 1415 7000 180 170 180 170 172	156,0 46,2 3,38 50 13 13 70 9 	168,0 52,2 3,22 4 0000 890 15 16,0 37,6 72 90 16,0 37,6 74	187,0 58,2 3,21 48`000 13`300 100 935 73 73 240 1`065	251,0 68,6	263,0 76,3 3,45 6 73`200 20`330 80 920 24,0 56,4 74 220 1`050 24,0 56,4	282,0 83,2
eating capacity	kW n n, m²/h l/s l/s Pa kW A dB(A) Pa rpm kW A dB(A) u Pa rpm kW A dB(A) u Pa rpm kW A dB(A) u Pa kW A kW A kW A kW A kW A kW A kW	28,7 3, 40°000 11°110 50 920 100 970 72 260	33,0 27 3 37 10 9 12,0 28,2 70 12,0 28,2 70 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 71 12,5	39,5 3,09 * 415 7 7 900 180 170 72 270	46,2 3,38 50 13 70 9 9 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	52,2 3,22 4 000 890 15 15 16,0 37,6 72 90 16,0 37,6 74	58,2 3,21 48'000 13'300 100 935 73 73 240 1'065	68,6	76,3 3,45 6 73 200 20 330 80 920 24,0 56,4 74 220 1 050 24,0 56,4	83,2
put power (heating) i pP i centrifugal fans i uantity i if dow i ir flow i TD Version i valiable pressure i otor input power i otor input power i otor input power i multiperssure level i M Version i valiable pressure o otor input power i otor input power i otor input power i otor input power o inal input current i bund pressure level i M Version i valiable pressure o otor input power o inial input current o bund pressure level i ctoll compressors i uantity i rcuits andard capacity steps ptional capacity steps ptional capacity steps	kW n n, m²/h l/s l/s Pa kW A dB(A) Pa rpm kW A dB(A) u Pa rpm kW A dB(A) u Pa rpm kW A dB(A) u Pa kW A kW A kW A kW A kW A kW A kW	28,7 3, 40°000 11°110 50 920 100 970 72 260	33,0 27 3 37 10 9 12,0 28,2 70 12,0 28,2 70 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 71 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 71 12,5	39,5 3,09 * 415 7 7 900 180 170 72 270	46,2 3,38 50 13 70 9 9 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	52,2 3,22 4 000 890 15 15 16,0 37,6 72 90 16,0 37,6 74	58,2 3,21 48'000 13'300 100 935 73 73 240 1'065	68,6	76,3 3,45 6 73 200 20 330 80 920 24,0 56,4 74 220 1 050 24,0 56,4	83,2
p p p p p p p p p p p p p p p p p p p	n. m ³ /h l/s Pa rpm kW A dB(A) Pa rpm kW A dB(A)	40'000 11'110 50 920 100 970 72 260	27 3 37 10 9 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 12,0 28,2 70 11 12,0 28,2 70 11 12,0 28,2 70 11 12,0 28,2 70 12,0 14 15 15 15 15 15 15 15 15 15 15	3,09 500 1415 7 7 700 180 110 72 270	3,38 50' 13' 70 9 77 10 1030 77	3,22 4 000 890 15 15 16,0 37,6 72 90 16,0 37,6 74	3,21 48'000 13'300 100 935 73 240 1'065		3,45 6 73 200 20 330 80 920 24,0 56,4 74 220 1 050 24,0 56,4	
p p p p p p p p p p p p p p p p p p p	m³/h I/s Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm kW A bB(A) www A bB(A) www A www A	40'000 11'110 50 920 100 970 72 260	3 37 10 9 12,0 28,2 70 12,0 28,2 71 12,0 28,2 71 28,2 71 28,2 71 28,2 71 15,5	3,09 500 1415 7 7 700 180 110 72 270	3,38 50' 13' 70 9 77 10 1030 77	3,22 4 000 890 15 15 16,0 37,6 72 90 16,0 37,6 74	3,21 48'000 13'300 100 935 73 240 1'065		3,45 6 73 200 20 330 80 920 24,0 56,4 74 220 1 050 24,0 56,4	3,39
Jantity	m³/h I/s Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm kW A bB(A) www A bB(A) www A www A	40'000 11'110 50 920 100 970 72 260	3 37 10 9 12,0 28,2 70 12,0 28,2 71 12,0 28,2 71 28,2 71 28,2 71 28,2 71 15,5	¹¹ 500 1415 7000 180 180 170 72 270	50 13 70 9 7 7 10 030 7 7	4 000 890 15 16,0 37,6 72 90 16,0 37,6 74	48'000 13'300 100 935 73 240 1'065		6 73 200 20 330 80 920 24,0 56,4 74 220 1 050 24,0 56,4	
iantity flow flow flow flow flow flow flow flow	m³/h I/s Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm kW A bB(A) www A bB(A) www A www A	11'110 50 920 100 970 72 260	37 10 9 12,0 28,2 70 12,0 28,2 70 12,0 28,2 71 28,2 71 28,2 71 28,2 71 15,5	1415 7 7 7 7 7 80 180 1°(72 270	13 70 9 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7	15 16,0 37,6 72 90 16,0 37,6 74	13'300 100 935 73 240 1'065		73 200 20 330 920 24,0 56,4 74 220 1 050 24,0 56,4	
r flow r	m³/h I/s Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa rpm kW A bB(A) www A bB(A) www A www A	11'110 50 920 100 970 72 260	37 10 9 12,0 28,2 70 12,0 28,2 70 12,0 28,2 71 28,2 71 28,2 71 28,2 71 15,5	1415 7 7 7 7 7 80 180 1°(72 270	13 70 9 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7	15 16,0 37,6 72 90 16,0 37,6 74	13'300 100 935 73 240 1'065		73 200 20 330 920 24,0 56,4 74 220 1 050 24,0 56,4	
r flow TD Version TD Version TD Version To Version TD Version TD Version TD Version TD Version TD Version TD Version TD Version TD Version TD Version TD Version TD Version TD Version TD Version TD VERSION TD V	I/s Pa rpm kW A dB(A) wwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwww	11'110 50 920 100 970 72 260	10 9 12,0 28,2 70 12,0 28,2 71 28,2 71 28,2 71 28,2 11 15,5	1415 7 7 7 7 7 80 180 1°(72 270	13 70 9 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7	15 16,0 37,6 72 90 16,0 37,6 74	13'300 100 935 73 240 1'065		20'330 80 920 24,0 56,4 74 220 1'050 24,0 56,4	
TD Version ailable pressure ailable pressure tation speed otor input power minal input current und pressure level M Version ailable pressure ailable pressure tation speed otor input power minal input current und pressure level M Version ailable pressure ailable pressure tation speed otor input power minal input current und pressure level M Version station speed otor input power minal input current und pressure level croll compressors startity cruits andard capacity steps vitional capacity steps	Pa rpm kW A dB(A) Pa rpm kW A dB(A) Pa dB(A) Pa kW A kW A A KW A	50 920 100 970 72 260	9 12,0 28,2 70 12,0 28,2 12,0 28,2 71 28,2 71 2 2 15,5	7 200 180 1°0 72 270	0 9 7 1 030 7 7	15 16,0 37,6 72 90 16,0 37,6 74	100 935 73 240 1°065		80 920 24,0 56,4 74 220 1 050 24,0 56,4	
ailable pressure initial input current tation speed initial input current und pressure level initial input current ailable pressure initial input current ailable pressure initial input current und pressure level initial input current M Version initial input current ailable pressure initial input current und pressure initial input current und pressure initiano speed otor input power input power minal input current input power und pressure level input power and input current input power und pressores input current und pressore level input current und pressore input current und apacitly steps input current	rpm kW kW A dB(A) B rpm kW A dB(A) Pa galaxie rpm Pa rpm KW KW KW KW KW KW KW	920 100 970 72 260	12,0 28,2 70 12,0 28,2 71 28,2 71 28,2 71 28,2 71 28,2 71 20,0 28,2 71 20,0 28,2 71 20,0 28,2 70 20,0 20,0 20,0 20,0 70 20,0 20,0 70 20,0 20,	2000 180 72 270	9	16,0 37,6 72 90 16,0 37,6 74	935 73 240 1.065		920 24,0 56,4 74 220 1.050 24,0 56,4	
station speed instation speed otor input power instation speed minal input current instation speed M Version instation speed otor input power instation speed otor input power instation speed M Version instation speed M Version instation speed M Version instation speed ailable pressure level instation speed otor input power instation speed	rpm kW kW A dB(A) B rpm kW A dB(A) Pa galaxie rpm Pa rpm KW KW KW KW KW KW KW	920 100 970 72 260	12,0 28,2 70 12,0 28,2 71 28,2 71 28,2 71 28,2 71 28,2 71 2,0 2,0 2,0 2,0 2,0 2,0 2,0 2,0 2,0 2,0	2000 180 72 270	9	16,0 37,6 72 90 16,0 37,6 74	935 73 240 1.065		920 24,0 56,4 74 220 1.050 24,0 56,4	
otor input power input current und pressure level input current M Version input current ailable pressure otor input power otor input power input current und pressure level input current M Version input current ailable pressure input current und pressure level input current more input power input current und pressure level input current und pressure level input current croll compressors input current uardity input current und pressure level input current croll compressors input current uardity input current und pressure level input current current input current und pressure level input current current input current und pressure level input current und pressure level input current input current input current und pressure level input current input current input current und pressure level input current input current input current und pressure level input curre	kW A ABB(A) Pa rpm kW A AB(A) Pa rpm kW kW	100 970 72 260	12,0 28,2 70 12,0 28,2 71 28,2 71 28,2 71 28,2 71 28,2 71 2,0 2,0 2,0 2,0 2,0 2,0 2,0 2,0 2,0 2,0	180 1°1 72 270	1 030 7	16,0 37,6 72 90 16,0 37,6 74	73 240 1`065		24,0 56,4 74 220 1`050 24,0 56,4	
minal input current minal input current und pressure level minal input current ailable pressure minal input current und pressure level minal input current M Version minal input current ailable pressure minal input current und pressure level minal input current motion input power minal input current und pressure level minal input current	A dB(A) Pa rpm kW A dB(A) Pa rpm kW A	970 72 260	28,2 70 12,0 28,2 71 28,2 71 28,2 71 28,2 71 28,2 71 20,2 71 20,2 71 20,2 71 20,2 71 20,2 70 70 20,2 70 20,2 70 20,2 70 20,2 70 20,2 70 20,2 70 70 20,2 70 70 20,2 70 70 70 70 70 70 70 70 70 70 70 70 70	1°(72 270	1 030 	37,6 72 90 16,0 37,6 74	240 1`065		56,4 74 220 1`050 24,0 56,4	
und pressure level M Version ailable pressure tation speed totor input power minal input current und pressure level M Version ailable pressure tation speed toto input power minal input current und pressure tation speed toto input power minal input current und pressure level croll compressors antity cuits andradr capacity steps titonal capacity steps	dB(A) Pa rpm kW A dB(A) Pa Pa rpm kW	970 72 260	70 12,0 28,2 71 22 11 15,5	1°(72 270	1 030 	72 90 16,0 37,6 74	240 1`065		74 220 1`050 24,0 56,4	
M Version ailable pressure ailable pressure otor input power minal input current und pressure level M Version ailable pressure ailable pressure tation speed tor input power minal input current und pressure level croll compressors antity cuits andradr capacity steps trional capacity steps	Pa pa kW A BA Pa Pa kW A Pa kW A Pa Pa kW A A Pa kW A A Pa PA PA PA PA PA PA PA PA	970 72 260	12,0 28,2 71 22 11 15,5	1°(72 270	1 030 	90 <u>16,0</u> 37,6 74	240 1`065		220 1`050 24,0 56,4	
ailable pressure attion speed bit or input power attion speed bit or input power and pressure level bit or input power bit of the speed bit or input power bit on speed bit or input power and input current current current bit of pressure level bit or input power bit on a capacity steps bit on a	rpm kW A dB(A) Pa Pa kW kW kW A A dB(A) Pa kW A A dB A dB A dB A dB A dB A dB A dB A	970 72 260	12,0 28,2 71 28,2 71 71 15,5	1°(72 270	030 	16,0 37,6 74	1.062		1`050 24,0 56,4	
ailable pressure attion speed bit or input power attion speed bit or input power and pressure level bit or input power bit of the speed bit or input power bit on speed bit or input power and input current current current bit of pressure level bit or input power bit on a capacity steps bit on a	rpm kW A dB(A) Pa Pa kW kW kW A A dB(A) Pa kW A A dB A dB A dB A dB A dB A dB A dB A	970 72 260	12,0 28,2 71 28,2 71 71 15,5	1°(72 270	030 	16,0 37,6 74	1.062		1`050 24,0 56,4	
tation speed consistent of the set	rpm kW A dB(A) Pa Pa kW kW kW A A dB(A) Pa kW A A dB A dB A dB A dB A dB A dB A dB A	970 72 260	12,0 28,2 71 28,2 71 71 15,5	1°(72 270	030 	16,0 37,6 74	1.062		1`050 24,0 56,4	
tor input power minal input current minal input current models and server the server of the server o	kW A B(A) B(A) B(A) B(A) B(A) B(A) B(A) B(72 260	28,2 71 2 15,5	72	7	37,6 74			24,0 56,4	
minal input current minal input current und pressure level minal M Version ailable pressure ailable pressure input power tation speed oti input power minal input current und pressure level croll compressors antity cuits cuits andradr capacity steps titional capacity steps	A dB(A) Pa rpm kW A	260	28,2 71 2 15,5	270		37,6 74	75		56,4	
und pressure level M Version ailable pressure tation speed tor input power minal input current und pressure level croll compressors antity (cuits indradr capacity steps tional capacity steps	dB(A) Pa rpm kW A	260	71 2 1 [°] 15,5	270		74	75			
M Version ailable pressure tation speed totin put power minal input current und pressure level croll compressors tantity cuits andrd capacity steps titional capacity steps	Pa rpm kW A	260	2 1 [°] 15,5	270			/5			
ailable pressure tation speed tation speed to input power minial input current und pressure level croll compressors tantity cuits cuits to indicard capacity steps titional capacity steps titional capacity steps to indicard capacity steps titional capacity steps to indicard capacity steps titional capacity steps to indicard capacity steps titional capacity steps to indicard capacity steps titional capacity steps to indicard capacity steps titional capacity steps to indicard capacity steps to indicard capacity steps titional capacity steps to indicard capac	rpm kW A		1 [.] 15,5		3				78	
tation speed otor input power otor input power otor input power consume level croll compressors lantity curits calardity steps otional capacity steps otical capacit	rpm kW A		1 [.] 15,5		3		-			
otor input power of an analysis of a second	kW A	1.110	15,5	100	1	50	355		350	
minal input current und pressure level croll compressors cuits cuits anadrad capacity steps trional capacity steps cuital capacity steps	A						1	170		
minal input current und pressure level croll compressors antity cuits nardard capacity steps titional capacity steps	A					22,0			33,0	
und pressure level croil compressors antity cuits cuits cindard capacity steps tional capacity steps			36,0			48,0			72,0	
croll compressors antity cuits andard capacity steps tional capacity steps	ub(n)		75			76		7		78
antity cuits and capacity steps tional capacity steps tional capacity steps control capacit			15		1	70		· · · · ·	/	10
cuits andard capacity steps titional capacity steps	n.	2					4			
andard capacity steps		2					+			
ntional capacity steps	n.					2				
	n.					2				
minal input current	n.	-					4			
omman mput current	A	47,8	59,8	69,8	77,0	89,0	97,4	121,6	130,6	143,6
aximum input current	A	64,0	80,0	88,0	108,0	118,0	128,0	164,0	186,0	208,0
rush current	A	230,0	183,0	193,0	248,0	284,0	294,0	348,0	406,0	428,0
vaporator										
pe						Shell and tube				
Jantity	n.					1				
ater flow	m ³ /h	12,6	14,4	15,9	21,0	22,2	24,9	34,5	35,9	38,2
ater flow	l/s	3,5		4,4			6,9	9,6	10,0	10,6
			4,1		5,8	6,2				,
essure drop	kPa	21	27	30	49	55	69	45	74	84
umps	1.0									
- Available pressure	kPa	124	118	110	116	100	76	133	101	86
 Motor input power 	kW		1,1			1,5			3,0	
H – Available pressure	kPa	159	153	145	161	145	121	183	151	136
H – Motor input power	kW		1,5			2,2			4,0	
– Available pressure	kPa	149	138	130	131	110	86	123	86	71
- Motor input power	kW		1,5			2,2			3,0	
pacity of buffer tank			U,I		1	720		1	5,0	
ectrical data	1					720				
	kW/	40.0	44.0	50.0	60.0	66.0	72.0	00.0	07.0	10/ 0
tal input power	kW	40,0	44,0	50,0	60,0	66,0	72,0	90,0	97,0	104,0
tal nominal input current	A	78,0	88,0	98,0	118,0	131,0	135,0	178,0	187,0	200,0
aximum total input current	A	94,0	110,0	118,0	150,0	156,0	170,0	225,0	242,0	269,0
al inrush current	A	260,0	213,0	223,0	286,0	322,0	336,0	409,0	462,0	489,0
imensions										
ngth	mm		2.610			3.460			5.120	
dth	mm				·	1.242				
iqht	mm					1.995				
			2.100						5.992	
ngth with MV option	mm		3'460			4:305		L	כלל כ	
dth with MV option	mm					1.242				
ight with MV option	mm					1.992				
nsport weight	kg	1.334	1.420	1.426	1.800	1.840	1.940	2'360	2.420	2`540
insport weight with empty buffer tank	kg	1.264	1.680	1.686	2.030	2.020	2.120	2.290	2.680	2.240
		14,0		17,0	26,0		1,0		35,0	
		14.0	14,0		20,0	29,0	.,-		40,0	
frigerant charge per circuit	kg	14,0				27,0		1		
frigerant charge per circuit frigerant charge per circuit with option 0 lectrical power supply		14,0	14,0						40,0	

REMARKS:

nemnns. - Operating ocnditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744).

- In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-

gly. - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15 $^\circ$ C.

REFRIGERANT R407C

Technical data - Ultrasilenced version

PAE C Cooling capacity		842 U K	962 U K	1102 U K	1402 U K	1502 U K	1602 U K	2302 U K	2402 U K	2602 U
	kW	74,6	84,0	94,5	126,0	137,0	147,0	204,0	212,0	225,0
lominal input power	kW	28,2	32,8	38,2	43,8	49,1	57,2	67,6	75,2	81,2
R		2,64	2,56	2,47	2,88	2,79	2,57	3,02	2,82	2,77
leating capacity										
eating capacity	kW	95,5	107,5	121,0	161,3	175,4	188,2	255,2	271,4	336,0
put power (heating)	kW	29,3	34,1	39,7	45,5	51,5	60,0	70,3	78,2	85,5
)P		3,26	3,15	3,05	3,54	3,40	3,14	3,63	3,47	3,93
entrifugal fans										
uantity	n.		3	4		6			8	
ir flow	m³/h	21.300	28	800		43`800			54.400	
ir flow	l/s	5.920	8.	000		12.120			15.110	
TD Version										
vailable pressure	Pa	60			70				100	
otation speed	rpm	590	760	590		610			650	
lotor input power	kW	3,3	6,6	4,4		6,6			8,8	
ominal input current	A	8,4	15,9	11,2		16,8			22,4	
ound pressure level	dB(A)	60	64	60		61			64	
M Version										
vailable pressure	Pa	160	190	160			2	50		
otation speed	rpm	750	890	720		880			870	
otor input power	kW	3,3	6,6	4,4		9,0			12,0	
ominal input current	A	8,4	15,9	11,2		22,2			29,6	
ound pressure level	dB(A)	6	5	66	6	8	69		74	
M Version										
vailable pressure	Pa	250	2	70		360			370	
otation speed	rpm	870	975	870			1.	015		
otor input power	kW	4,5	9,0	6,0		13,2			17,6	
ominal input current	A	11,1	20,1	14,8		31,8			42,4	
und pressure level	dB(A)	67		58		69		7	4	75
croll compressors										
Jantity	n.	2					4			
rcuits	n.					2				
tandard capacity steps	n.					2				
ptional capacity steps	n.	-					4			
ominal input current	A	49,6	59,1	69,8	78,8	89,2	97,2	118,6	132,6	144,6
laximum input current	A	64,0	80,0	88,0	108,0	118,0	128,0	164,0	186,0	208,0
rush current	A	230,0	183,0	193,0	248,0	284,0	294,0	348,0	406,0	428,0
vaporator										
/pe						Shell and tube				
uantity	n.					1				
/ater flow	m³/h	12,8	14,4	16,2	21,7	23,5	25,3	35,1	36,5	38,5
/ater flow	l/s	3,6	4,0	4,5	6,0	6,5	7,0	9,7	10,1	10,7
essure drop	kPa	20	26	29	49	58	67	46	72	81
umps										
1 – Available pressure	kPa	124	118	110	120	97	83	133	101	86
1 — Motor input power	kW		1,1			1,5			3,0	
1H — Available pressure	kPa	159	153	145	175	142	133	183	151	136
1H — Motor input power	kW		1,5			2,2			4,0	
I – Available pressure	kPa	149	138	130	135	107	93	123	86	71
– Motor input power	kW		1,5			2,2			3,0	
pacity of buffer tank						720				
lectrical data										
tal input power	kW	32,0	39,0	43,0	50,0	56,0	64,0	76,0	84,0	90,0
tal nominal input current	A	58,0	75,0	81,0	95,6	106,0	114,0	141,0	155,0	167,0
aximum total input current	A	74,0	96,0	99,0	125,0	135,0	147,0	190,0	208,0	234,0
tal inrush current	A	240,0	199,0	204,0	265,0	301,0	313,0	374,0	428,0	454,0
vimensions										
ngth	mm	2.	610	3`460		5.120			6`840	
idth	mm					1`245				
ight	mm					1.992				
ngth with MV option	mm	3.4	460	4`305		5.992			6`840	
/idth with MV option	mm					1.542				
eight with MV option	mm					1.992				
ansport weight	kg	1'352	1.462	1.757	2.482	2.225	2.235	2.980	3.000	3.050
ansport weight with empty buffer tank	kg	1.285	1.692	1.982	2.715	2.752	2.765	3°210	3`230	3`250
	kg	1	7,0	26,0		44,0			45,0	
frigerant charge per circuit	Rg									
rfrigerant charge per circuit rfrigerant charge per circuit with option 0	kg		4,0	29,0		48,0			45,0	
frigerant charge per circuit frigerant charge per circuit with option 0 lectrical power supply ectrical power supply						48,0 400 / 3 / 50 + N + 1			45,0	

REMARKS:

newnno. - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744).

- In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-

gly. - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15 $^\circ$ C.

REFRIGERANT R407C

R407C - Correction factors for cooling capacity

External air te	emperature °C	28	30	32	35	38	40	42	45	48
	15	1,433	1,404	1,376	1,333	1,289	1,260	1,226	1,175	1,137
	14	1,388	1,360	1,333	1,291	1,249	1,221	1,187	1,137	1,099
	13	1,343	1,317	1,290	1,250	1,209	1,182	1,148	1,099	1,062
_	12	1,298	1,273	1,247	1,208	1,169	1,142	1,110	1,060	1,024
Temperature	11	1,253	1,229	1,204	1,166	1,128	1,103	1,071	1,022	0,987
of water leaving from	10	1,028	1,185	1,161	1,125	1,088	1,064	1,032	0,984	0,949
evaporator °C	9	1,163	1,141	1,118	1,087	1,048	1,025	0,993	0,946	0,912
	8	1,118	1,097	1,075	1,041	1,008	0,985	0,954	0,907	0,874
	7	1,073	1,053	1,032	1	0,968	0,946	0,915	0,869	0,837
	6	1,027	1,007	0,986	0,956	0,925	0,904	0,873	0,827	0,800
	5	0,981	0,961	0,941	0,911	0,882	0,862	0,831	0,785	0,763

R407C - Correction factors for input power

External air te	mperature °C	28	30	32	35	38	40	42	45	48
	15	0,981	1,013	1,046	1,100	1,155	1,192	1,232	1,292	1,345
	14	0,968	1,001	1,033	1,088	1,143	1,179	1,219	1,279	1,335
	13	0,955	0,988	1,020	1,075	1,130	1,167	1,207	1,267	1,324
	12	0,942	0,975	1,008	1,063	1,118	1,154	1,194	1,255	1,314
Temperature	11	0,929	0,962	0,995	1,050	1,105	1,142	1,182	1,242	1,304
of water leaving from	10	0,916	0,949	0,982	1,037	1,093	1,129	1,170	1,230	1,294
evaporator °C	9	0,903	0,936	0,970	1,025	1,080	1,117	1,157	1,218	1,283
	8	0,890	0,924	0,957	1,012	1,067	1,104	1,145	1,206	1,273
	7	0,877	0,911	0,944	1	1,055	1,092	1,132	1,193	1,263
	6	0,872	0,904	0,937	0,987	1,037	1,071	1,110	1,169	1,232
	5	0,866	0,898	0,929	0,974	1,020	1,050	1,088	1,145	1,201

R407C - Correction factors for heating capacity

Temperature of water I	eaving from evaporator C	30	35	40	45	48
	20	1,415	1,392	1,367	1,315	1,284
	16	1,261	1,241	1,220	1,195	1,180
	14	1,195	1,176	1,155	1,127	1,110
	12	1,127	1,108	1,088	1,068	1,056
	10	1,066	1,047	1,026	1	0,984
	8	1,005	0,986	0,987	0,947	0,923
External air temperature °C	7	0,976	0,985	0,939	0,919	0,907
temperature c	6	0,904	0,893	0,870	0,852	0,841
	4	0,802	0,793	0,772	0,761	0,754
	2	0,741	0,732	0,712	0,701	0,694
	0	0,690	0,677	0,659	0,649	0,643
	-2	0,655	0,639	0,630	0,611	0,600
	-4	0,627	0,614	0,609	0,599	0,593

R407C - Correction factors for input power (heating)

	eaving from evaporator C	30	35	40	45	48
	20	0,909	0,994	1,076	1,160	1,210
	16	0,861	0,938	1,015	1,091	1,137
	14	0,843	0,916	0,898	1,061	1,159
	12	0,826	0,895	0,963	1,030	1,070
	10	0,807	0,872	0,936	1	1,038
Eutomolein	8	0,789	0,850	0,910	0,969	1,004
External air temperature °C	7	0,780	0,839	0,897	0,953	0,987
temperature c	6	0,770	0,826	0,883	0,938	0,971
	4	0,749	0,803	0,856	0,906	0,936
	2	0,729	0,778	0,828	0,874	0,902
	0	0,706	0,753	0,799	0,843	0,869
	-2	0,687	0,728	0,768	0,810	0,785
	-4	0,663	0,701	0,738	0,775	0,753

REMARKS: - The above coefficients correspond to the mean of the values for the different units, therefore the performances calculated using this the chart could be different up to 5% from the data of a specific unit - If the unit works with an evaporator water temperature below 5° (. It is absolutely necessary to use a mixture of water and glycol in the percentages listed in the suitable chart. - Emicon ACSpA desclaims all responsabilities in case of damages deriving from violation of this instructions. - For further danfications or information, you are kindly request to contact our sales departement.





REFRIGERANT R410A





Series PAE ... Kc

Cooling capacity from 5,5 to 24 kW - 1 and 2 circuits

The air cooled heat pumps of **PAE Kc series** are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. Therefore during their design, it has been given a particular care for dimensions and sound level, so to have compact and silent units at the same time.

They can also be matched to fancoils or terminal units or for water cooling in small industrial processes.

Depending on the cooling capacity, they are available with 1 and 2 cooling circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces, also when supplied with the hydraulic kit.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The following versions are available: **PAE...Kc** standard version Horizontal air flow for models from 41 to 111 Vertical air flow for models from 182 to 222 **PAE...PS Kc** with hydraulic kit

Operation limits (standard units):

SUMMER OPERATION: **air** from 15 to 45° C – **water** (out from evaporator) from 5 to 15° C - WINTER OPERATION: **air** from 20 to -4° C – **water** (out from evaporator) max 50^{\circ}C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service. For size from 41 to 111, the compressor section is still insulated with close-cell polyurethane foam material. For PS version, the hydraulic kit is installed at the bottom of the unit for size from 41 to 111 and it is composed of: circulation pump, buffer tank, safety valve, pressure gauge, water filling and discharge valves, purging valve, expansion vessel. For other sizes, when required, the hydraulic kit is installed inside the unit. **High-efficiency scroll compressor** (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. In case of 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of 4-way valve for refrigerant cycle inversion, thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the automatic defrost system based on a time/temperature logics, complete with compressors hour counter.



REFRIGERANT R410A

Accessories

- AE
 Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.

 BT
 Low temperature operation (-20°C): electronic device for the
- continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT High and low pressure gauges for measuring circuit pressure (from size 182).
- **MV Buffer tank** of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves (from size 182).
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type (from size 182).
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type (from size 182).

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- **RA** Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R410A

Technical data

PAE		41 Kc	51 Kc	61 Kc	81 Kc	111 Kc	182 Kc	222 Kc	182.PS Kc	222.PS Kc
Cooling capacity										
Cooling capacity	kW	5,5	5,8	7,0	8,9	11,5	17,3	22,4	19,4	24,0
Nominal input power	kW	1,7	1,9	2,6	3,3	4,3	6,3	9,0	5,3	8,1
EER		3,23	3,05	2,69	2,70	2,67	2,75	2,49	3,66	2,96
Heating capacity										
Heating capacity	kW	7,1	7,7	9,4	12,0	15,6	23,3	39,9	24,3	31,6
Input power (heating)	kW	2,0	2,3	2,6	3,3	4,0	5,9	8,3	5,0	7,5
OP		3,55	3,35	3,61	3,64	3,9	3,95	4,81	4,86	4,21
Axial fans		5,55	5,55	5,61	570 1	5/5	5,75	.,	1,00	.,
Quantity	n.			1					2	
lotation speed	rpm					900			2	
Air flow	m ³ /h		3'470		3.820	3.600	7.280	7`068	11.	990
Air flow	l/s		964		1.069	1.000	2.106	1.963	313	
Notor input power	kW			0,15			0,		0,	
nput current	A			0,64			1,	28	3	,4
Scroll compressors										
uantity	n.			1					2	
ircuits	n.			1					2	
tandard capacity steps	%			0 - 100						
lominal input current	A	8,1	8,7	12,3	16,1	27,0	12,0	16,0	10,0	15,0
lominal input current (heating)	A),0	12,5	16,5	27,0	12,0	16,0	10,0	15,0
	A		7,0	20,0			12,0	,	1	23,0
Maximum input current			·		24,0	32,0	,	21,0	19,0	
nrush current	A	59,0	62,0	83,0	98,0	65,0	106,0	140,0	109,0	143,0
Evaporator										
ype						Brazed plate				
luantity	n.			1					2	
Vater flow	m³/h	0,94	1,0	1,2	1,5	2,0	3,0	3,9	3,3	4,1
Vater flow	l/s	0,26	0	,3	0,4	0,5	0,8	1,1	0,9	1,1
ressure drop	kPa	39	45	36	38	39	36	37	45	43
Vater flow (heating)	m ³ /h	1,22	1,3	1,6	2,0	2,7	2,0	2,7	2,1	2,7
Vater flow (heating)	l/s	0,34	,	,4	0,6	0,7	0,6	0,7	0,6	0,8
				,				,	,	
Pressure drop (heating)	kPa	65	78	65	68	72	64		70	74
Electrical data										
lotal input power	kW		,0	3,		4,0	7,0	9,0	6,0	9,0
otal nominal input current	A	11,0	12,0	13,0	17,0	29,0	13,0	17,0	13,0	18,0
Naximum total input current	A	18	3,0	21,0	25,0	33,0	18,0	2	2,0	26,0
otal inrush current	A	60,0	63,0	84,0	99,0	66,0	107,0	141,0	112,0	146,0
Sound pressure level										
ound pressure at 1 m	dB(A)		51	5	2	53	55	56	6	2
PS Version	ub(n)				-	55	55	50	· · · · ·	-
vailable pressure	kPa	31	24	33	29	24		_	145	88
	kPd	١٢	24	0,08	27	24		_	145	
oump group motor power				,					,	
nput current	A			0,92			-	_	4	
ligher available pressure pump group	kPa				-				195	95
lotor input power	kW				-				0,55	0,75
an orthogona and									4,0	5,5
	A				-					
	A			30	-		-	-	8	0
apacity of buffer tank	A I I			30 2	_			-		0
apacity of buffer tank xpansion vessel	1				-					
apacity of buffer tank xpansion vessel Dimensions				2	_		-	-	-	5
apacity of buffer tank xpansion vessel Dimensions ength	I I mm			2 980	-			-	1.6	5
apacity of buffer tank xpansion vessel Dimensions ength Vidth	I I mm mm			2 980 325	-		1'1	- 100 7	1 ⁻ 6	5
apacity of buffer tank xpansion vessel Dimensions ength Vidth leight	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII			2 980 325 715			1'1	- 00 7 00	1 (50 1 2	5 500 250
apacity of buffer tank xpansion vessel Dimensions ength Vidth leight ansport weight	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	1	17	2 980 325	124	142	1°1 1°1 288	- 00 7 00 330	1 (c 50 329	5 500 250 354
apacity of buffer tank xpansion vessel Dimensions ength Vidth leight ransport weight efrigerant charge per circuit	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	1	17 2,9	2 980 325 715		142 4,3	1'1	- 00 7 00	1 (50 1 2	5 500 250
apacity of buffer tank xpansion vessel Dimensions ength Vidth leight ransport weight lefrigerant charge per circuit	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	1		2 980 325 715	124		1°1 1°1 288	- 00 7 00 330	1 (c 50 329	5 500 250 354
apacity of buffer tank xpansion vessel Dimensions ength Vidth leight ransport weight efrigerant charge per circuit Dimensions for PS version	IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	1		2 980 325 715	124		1°1 1°1 288 4,2	- 00 7 00 330	1 (c 50 329	5 500 250 354 6,6
apacity of buffer tank Expansion vessel Dimensions ength Width Height Fransport weight Refrigerant charge per circuit Dimensions for PS version ength	I I I I I I I I I I I I I I I I I I I	1		2 980 325 715 119 980	124		1'1 1'1 288 4,2	- 00 7 00 330 5,1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 500 250 354 6,6
apacity of buffer tank xpansion vessel Dimensions ength Width leight teringerant charge per circuit Dimensions for PS version ength Width	I I I I I I I I I I I I I I I I I I I	1		2 980 325 715 119 980 325	124		1.1 1.1 288 4,2	- 00 7 00 330 5,1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 500 250 354 6,6 500
nput current (apacity of buffer tank (xpansion vessel Dimensions ength Width leight fransport weight Refrigerant charge per circuit Dimensions for PS version ength Width leight fassport weight with empty buffer tank	I mm mm mm kg kg mm mm mm		2,9	2 980 325 715 119 980 325 1.000	124 3,4	4,3	1.1 1.1 288 4,2	- 00 7 00 330 5,1 - -	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 500 250 354 6,6 500 50 250
apacity of buffer tank xpansion vessel Dimensions ength Vidth leight ransport weight lefrigerant charge per circuit Dimensions for PS version ength Vidth leight ransport weight with empty buffer tank	I I I I I I I I I I I I I I I I I I I	1.	2,9	2 980 325 715 119 980 325 1.000 162	124 3,4 167	4,3	1 ¹¹ 1 ¹¹ 288 4,2	- 00 7 00 330 5,1 - - - -	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 500 250 354 6,6 50 50 250 412
apacity of buffer tank xpansion vessel Dimensions ength Vidth leight ransport weight lefrigerant charge per circuit Dimensions for PS version ength Vidth	I mm mm mm kg kg mm mm mm	1.	2,9	2 980 325 715 119 980 325 1.000	124 3,4	4,3	1 ¹¹ 1 ¹¹ 288 4,2	- 00 7 00 330 5,1 - -	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 500 250 354 6,6 500 50 250

REMARKS:

REMARX: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744).



AIR COOLED HEAT PUMPS WITH SCROLL COMPRESSORS

REFRIGERANT R410A



PAE 2302 S Kc + CF



PAE Kc Series

Cooling capacity from 70 to 420 kW - 2 circuits

The air cooled heat pumps of **PAE Kc series**, are designed for outdoor installation and are particularly suitable for cooling water in air conditioning systems. Each group has two independent cooling circuits provided with R410A scroll compressors.

The units have been designed to reduce their footprint as much as possible, keeping high cooling performances, thanks to the use of excellent quality and new technology components.

All units are completely assembled and tested in the factory in compliance with specific quality procedures; they are still provided with all cooling, water and electrical connections so to quickly install them, once on site.

Before the factory test, the cooling circuits are tested under pressure and then supplied with refrigerant and non-freezing oil charge.

The following versions are available:

- PAE Kc standard version
- PAE S Kc silenced version
- PAE U Kc ultrasilenced version

For versions S and U, the reduction of the sound level is due to the use of refrigerant/air exchangers with wider surfaces than the standard units, to a soundproofed compressor cabinet and to the control of the fans speed by means of an electronic regulation.

Operation limits (standard units):

SUMMER OPERATION: **air** from 15 to 45°C – **water** (out from evaporator) from 5 to 15°C.

WINTER OPERATION: **air** from 20 to -4°C – **water** (out from evaporator) max 50°C

Main components:

Structure made of base and frame realized in high thickness galvanized steel, assembled by means of stainless steel rivets. All the galvanized steel surfaces are coated with powder painting of RAL 7035 colour.

Scroll compressor for refrigerant R410A, operating on two independent cooling circuits, in tandem or trio version. Compressors are installed on rubber vibration dampers, provided with direct start motors, cooled by the intaken refrigerant, and equipped with overload protections and crankcase heater. They are charged with

polyester oil and their compressors terminal board is IP54. The microprocessor on board enables or disenables the compressors, regulating in this way also the cooling capacity.

Stainless steel plate evaporator of "dual circuit" type, coated with close-cell insulating and of high thickness material. The max operating pressure limits are 10 bar for water side and 32 bar for refrigerant side.

Heat-exchange external coils with micro-finned copper tubes, positioned in staggered rows and mechanichally expanded into an aluminium finned pack. Fins are designed with such a shape so to give the highest heat exchange efficiency (turbo-fin). The max operating pressure refrigerant side is 45 bar rel.

Axial fans, of directly coupled type, with wing-profile aluminium blades, suitably designed not to create air turbulence. They are therefore ensuring the max efficiency with the lowest sound level. Each fan is provided with galvanized steel protection grid, painted after construction. The IP54 fans motors are completely closed and provided with in-built overload protection thermostat, incorporated to the motor windings.

Independent cooling circuits, each one with a 4-way valve for refrigerant cycle inversion, shut-off valve for refrigerant charge, antifreeze sensor, shut-off valves on discharge and liquid lines, sight glass, dehydrating filter, high pressure safety device on high pressure refrigerant side, electronic thermostatic expansion valve, high and low pressure switches.

Electric board realized in compliance with 60204-1/IEC 204-1 standards, inside of which are placed the control system and the components for motors starting, wired and tested in the factory. It is made by a cabinet suitable for outdoor installation, containing power and control devices, microprocessor electronic board complete with keypad and display, for visualizing the several fonctions available, main switch of lock-door type, isolation transformer for auxiliary circuits, automatic switches, fuses and protection switches for compressors and fans, terminals for general alarm and remote ON/OFF, terminal board, relais for phase sequencing, possibility to interface to EMS/BMS systems.



REFRIGERANT R410A

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
- **BT Low temperature operation (-20°C)**: electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed allowing the unit operation down to -20°C (for summer operation only).
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (already included in S version).
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a suitably coated cabinet, vibration dampers under compressors, mufflers on compressors discharge pipes (already included in U version).
- CI Soundproofing jacket on compressors made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (not available for S and U versions).
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **GP** Condensing coil protection grid: metal protection grid against accidental impacts.
- GP1 Protection grid for compressors section: metal protection grid against accidental impacts.
- Victaulic insulation on pump side: insulation of the joints by close-cell polyurethane material, to prevent condense, pump side.
 Victaulic insulation on buffer tank side: insulation of the joints
- by close-cell polyurethane material, to prevent condense, buffer tank side.
 IH RS 485 serial interface: electronic card to be connected to mi-
- croprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.

MT High and low pressure gauges for measuring circuit pressure.

- **MV Buffer tank** of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves. (Not available for 1-fan units).
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PT Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type.
- **RA** Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- **RF Power factor correction system cosfi >0,9**: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- RT Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification. It is necessary to consider option BT.

RV Personalized frame painting in RAL colour.

- **Voltmeter**: Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.
- 1M High pressure fans: installed in the factory, they are available only for standard units, with an available pressure of 60 Pa.

AIR COOLED HEAT PUMPS WITH SCROLL COMPRESSORS

REFRIGERANT R410A

Technical data - Standard version

PAE		772 Kc	852 Kc	1412 Kc	1532 Kc	1642 Kc	2002 Kc	2302 Kc	2702 Kc	3002 Kc	3402 Kc	3802 Kc	4202 Kc	4502 Kc
Cooling capacity														
Cooling capacity	kW	69,8	83,4	126,6	137,2	147,5	186,8	216,9	242,1	270,0	289,8	365,4	381,6	420,3
Nominal input power	kW	25,6	30,2	43,4	47,3	51,2	68,0	75,4	84,8	91,8	101,7	125,0	131,3	158,7
EER		2,73	2,76	2,92	2,90	2,88	2,75	2,88	2,85	2,94	2,85	2,92	2,91	2,65
Heating capacity			-/			_,	-,		_/	-,				
Heating capacity	kW	90,0	107,6	163,3	177,0	190,3	240,9	279,8	312,3	348,3	373,8	471,4	492,3	542,2
Input power (heating)	kW	24,0	28,4	40,8	44,5	48,1	63,9	70,9	79,7	86,3	95,6	117,5	123,4	149,2
(OP		3,74	3,79	4,00	3,98	3,95	3,77	3,95	3,92	4,04	3,91	4,01	3,99	3,63
Axial fans	I	<i>J</i> ,/ 1	5,17	4,00	5,70	5,75	5,11	5,75	5,72	1,01	5,71	ויסקד	5,77	5,05
Quantity	n.		1		2			3			4		5	
Rotation speed	rpm				2			915					5	
Air flow	m³/h	26.100	23.960	51.500	48.230	47.140	78.800	75.400	72.800	100.500	91.200	124.200	120.400	113.000
Air flow	l/s	7.220	6.626	14.222	13.481	13.094	21.889	20.944	20.225	27.833	25.333	34.200	33.444	31.389
Motor input power	kW		48	14 222	4,96	13 074	21 007	6,9	20 222	9,2	9,8	J4 J00	11,8	JI J07
Input current	A		15		10,3			14,7		19,6	20,0		25,0	
Scroll compressors	A	J,	IJ		10,5			14,7		19,0	20,0		23,0	
•	n			2					4			6	4	6
Quantity	n.			2				2	4			0	4	0
Circuits	n.			2				2			4			
Standard capacity steps	n.	40.0	5()	2 80,6	04.2	00.0	145.5	162.4	101 5			275.0	200.0	202.0
Nominal input current	A	49,9	56,2	· · ·	84,3	88,0	145,5	163,4	181,5	190,0	198,0	275,0	280,0	302,0
Maximum input current	A	76,0	89,0	130,0	144,0	158,0	204,0	222,0	248,0	268,0	288,0	372,0	392,0	432,0
Inrush current	A	205,0	240,0	300,3	360,3	364,0	215,0	365,0	385,0	446,0	453,0	468,0	530,0	550,0
Evaporator														
Туре								Brazed plate						
Quantity	n.							1						
Water flow	m³/h	12,0	14,3	21,8	23,6	25,4	32,1	37,3	41,6	46,4	49,8	62,8	65,6	72,3
Water flow	l/s	3,3	4,0	6,0	6,6	7,0	8,9	10,4	11,6	12,9	13,8	17,5	18,2	20,1
Pressure drop	kPa	35	28	36	4	2	59	76	72	82	77	70	69	74
Water connections	DN			1″½				2‴1⁄2				3″		
Pumps														
P1 – Available pressure	kPa	152	147	1	51	131	132	120	153	138	125	140	175	163
P1 — Motor input power	kW	1	,1		1,9		3	3,0	4	,0	5	,5	7	,5
P1H – Available pressure	kPa	192	2	02	195	186	205	202	200	188	225	220	300	280
P1H — Motor input power	kW	1	,9		3,0			5	,5		7	,5	1	1,0
PT — Available pressure	kPa	152	157	122	115	166	186	118	81	64	73	136	165	124
PT — Motor input power	kW			2,2			5	i,5		4,0			7,5	
Capacity of buffer tank					300			400		8	00		1.100	
Electrical data														
Total input power	kW	28,1	32,7	48,4	52,3	56,2	74,9	82,3	91,7	101,0	111,5	136,8	143,1	170,5
Total nominal input current	A	55,1	61,4	90,9	94,6	98,3	142,2	161,3	181,5	190,0	197,6	274,6	280,0	301,6
Maximum total input current	A	81,2	94,2	140,3	154,3	168,3	218,7	236,7	262,7	287,6	308,0	397,0	417,0	457,0
Total inrush current	A	210,1	245,1	310,6	370,6	374,3	229,7	379,7	399,7	465,6	473,0	493,0	555,0	575,0
Sound pressure level		,					,							
Sound pressure at 1 m	dB(A)	7	'5			77				79		80	83	80
Sound pressure at 10 m	dB(A)		i9			61				63		64	67	64
Dimensions	abiny					51				55			57	
Length	mm	11	620		2.660			3.200		4.	740		5.780	
Width	mm		020	1	2 000		1	1.320		4	V'''V		5700	
Height								2.420						
Transport weight	mm	1.002	1.100	1.250	1.260	1.410	1.940	2 420	2.460	2.665	2.000	2.00L	2.024	3.720
1 2	kg			1.220	1'360						2.890	3.002	3.024	
Weight in operation	kg	1.030	1.152	1.5275	1.382	1`435	2.012	2.382	2.235	2.737	2.962	3.080	3.149	3.262
Electrical power supply								N/ / 2 / 50 · T	- M					
Electrical power supply	V / ph / Hz						400	OV / 3 / 50 + T	+ N					

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 12/7°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure levels calculated according to ISO 3744. - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15°C.



AIR COOLED HEAT PUMPS WITH SCROLL COMPRESSORS

REFRIGERANT R410A

Technical data - Silenced version

PAE		772 S Kc	852 S Kc	1412 S Kc	1532 S Kc	1642 S Kc	2002 S Kc	2302 S Kc	2702 S Kc	3002 S Kc	3402 S Kc	3802 S Kc
Cooling capacity												
Cooling capacity	kW	67,4	81,9	120,2	130,4	140,2	187,9	210,6	243,0	261,9	288,9	365,4
Nominal input power	kW	27,1	32,0	46,0	50,1	52,0	70,2	82,1	89,4	98,0	102,3	133,5
EER		2,49	2,56	2,61	2,60	2,70	2,68	2,57	2,72	2,67	2,82	2,74
Heating capacity											, .	
Heating capacity	kW	87,0	105,7	155,1	168,2	180,8	242,4	271,7	313,5	337,9	372,7	471,4
Input power (heating)	kW	25,5	30,1	43,2	47,1	48,9	66,0	, 77,2	84,0	92,1	96,2	125,5
COP		3,41	3,51	3,59	3,57	3,70	3,67	3,52	3,73	3,67	3,88	3,76
Axial fans		5,	5,51	5,55	5,51	5,7.5	5,01	5,52	5,15	5,07	5,00	5,10
Quantity	n.	1		2			3			4		5
Rotation speed	rpm			-			720					
Air flow	m ³ /h	19.575	52.600	38'400	36'397	58	800	51'200	78.800	68.400	97.900	87.000
Air flow	I/s	5.438	14.611	10.662	10.110		333	14.222	21.889	19.000	27.194	24.167
Motor input power	kW	1,74	IT VII	4,96	10 110	10	4,8	17 222		,4		3,0
Input current	A	3,60		10,3			8,7			, , 1,6		4,5
Scroll compressors	A	5,00		10,5		I	0,7			1,0	-	τ _ι σ
Quantity	n.			2					4			6
Circuits	n.			2			2		7			U
Standard capacity steps	n.			2			2			4		
Nominal input current	A	53,4	60,1	86,2	90,2	94,2	128,0	150,0	166,8	170,4	177,6	249,0
1		76,0	89,0	130,0		158,0	,	222,0			288,0	372,0
Maximum input current	A				144,0		204,0		248,0	268,0		
Inrush current	A	205,0	240,0	300,3	360,3	364,0	215,0	365,0	385,0	446,0	453,0	468,0
Evaporator		1					Durandulate					
Туре							Brazed plate					
Quantity	n.	11.6		20.7	22.4	24.4	1	26.2	44.0	45.0	10.7	(2.0
Water flow	m³/h	11,6	14,1	20,7	22,4	24,1	32,3	36,2	41,8	45,0	49,7	62,8
Water flow	l/s	3,2	3,9	5,7	6,2	6,7	9,0	10,1	11,6	12,5	13,8	17,5
Pressure drop	kPa	34	27	37	4	11	61	71		6	79	72
Water connections	DN			1″½				2‴1⁄2			3″	
Pumps			1				1					
P1 — Available pressure	kPa	152	147	1	51	131	130	125	149	144	123	138
P1 – Motor input power	kW		,1		1,9			,0		4,0		5,5
P1H – Available pressure	kPa	192		02	195	186	203	207	196	194	223	218
P1H – Motor input power	kW		,9		3,0			,0			,5	
PT – Available pressure	kPa	152	157	122	115	166	118	92	78	73	71	134
PT – Motor input power	kW			2,2			3	,0		4,0		7,5
Capacity of buffer tank		-		300			400		8	00	1	100
Electrical data												
Total input power	kW	28,9	37,0	51,0	55,1	56,8	75,0	86,9	95,8	104,4	110,3	141,5
Total nominal input current	A	57,0	70,4	96,5	100,5	102,9	136,7	158,7	178,4	182,0	192,1	263,5
Maximum total input current	A	79,6	99,3	140,3	154,3	166,7	212,7	230,7	259,6	279,6	302,5	386,5
Total inrush current	A	208,6	250,3	310,6	370,6	372,7	223,7	373,7	396,6	457,6	467,5	482,5
Sound pressure level												
Sound pressure at 1 m	dB(A)		72		74		7	'3	7	'5	76,0	77
Sound pressure at 10 m	dB(A)	l	56		58		L	7	L	i9	60,0	61
Dimensions												
Length	mm	1.620		2.660			3.200		4.	740	5	780
Width	mm			_ 000			1.320					
Height	mm						2'420					
Transport weight	kg	1.020	1.300	1.340	1.430	2.750	2.125	2.322	2.290	2.805	3.100	3.298
Weight in operation	kg	1.092	1'325	1.365	1.455	2.775	2.200	2'450	2.665	2.802	3.100	3.373
Electrical power supply	ny .	1000	1 323	1,000	, LUD	2115	2 200	2 TJU	2 005	2 0/1	51/5	5515
Electrical power supply	V / ph / Hz						00V / 3 / 50 + T -					

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 12/7°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure levels calculated according to ISO 3744. - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15°C.



AIR COOLED HEAT PUMPS WITH SCROLL COMPRESSORS

REFRIGERANT R410A

Technical data - Ultrasilenced version

PAE		772 U Kc	852 U Kc	1412 U Kc	1532 U Kc	1642 U Kc	2002 U Kc	2302 U Kc	2702 U Kc	3002 U Kc	3402 U Kc	3802 U Ko
Cooling capacity												
Cooling capacity	kW	62,7	78,6	115,2	125,4	132,8	182,3	204,3	235,6	254,3	280,3	354,2
Nominal input power	kW	27,6	32,6	46,9	51,1	55,4	72,0	84,2	91,6	100,5	104,9	136,8
EER		2,27	2,41	2,46	2,45	2,40	2,53	2,43	2,57	2,53	2,67	2,59
Max ext. air temp. FOR ULTRASILENCED OPERATION	°C		36	,	35		36		37		36	35
Heating capacity												
Heating capacity	kW	80,9	101,4	148,6	161,7	171,2	235,1	263,5	303,9	328,0	361,5	457,0
Input power (heating)	kW	25,9	30,6	44,1	48,0	52,1	67,7	79,1	86,1	94,5	98,6	128,6
COP	KW	3,12	3,31		,37	3,29	3,47	3,33	3,53	3,47	3,67	3,55
Axial fans		J,12	1,51	J	10,	J,27	J,4/	J,JJ	در,د	J,4/	5,07	رر,ر
Quantity		1		2			3			4		5
· · ·	n.			2			670			4		2
Rotation speed	rpm	14:010	20		27:177	(2)		26:400	E 4:000	40:400	(7:00)	50:000
Air flow	m³/h	14.616		3.622	27.177		100	36'400	54.800	48'400	67.600	59.600
Air flow	l/s	4.060	/	964	7.549	11	694	10.111	15.222	13.444	18.778	16.226
Motor input power	kW	1,4		2,87			3,5			,6		,8
Input current	A	2,9		5,9			8,4		1	1,2	14	4,0
Scroll compressors												
Quantity	n.			2					4			6
Circuits	n.						2					
Standard capacity steps	n.			2						4		
Nominal input current	A	57,1	64,3	92,2	96,5	100,8	130,4	152,8	169,8	173,5	180,8	268,2
Maximum input current	A	76,0	89,0	130,0	144,0	158,0	204,0	222,0	248,0	268,0	288,0	372,0
Inrush current	A	205,0	240,0	300,3	360,3	364,0	215,0	365,0	385,0	446,0	453,0	468,0
Evaporator							, ,					
Туре							Brazed plate					
Quantity	n.						1					
Water flow	m ³ /h	10,8	13,5	19,8	21,6	22,8	31,3	35,1	40,5	43,7	48,2	60,9
		,	,	5,5				,	40,5			
Water flow	l/s kPa	3,0	3,8 26		6,0	6,3 Ю	8,7 59	9,8	1. P.	12,1 74	13,4 75	16,9
Pressure drop		33	20	34		łŪ	29	68		4	3″	68
Water connections	DN			1″½				2‴1⁄2			5	
Pumps												
P1 – Available pressure	kPa	152	147	1	51	131	132	128	151	146	127	142
P1 – Motor input power	kW		,1		1,9			,0		,0		,5
P1H – Available pressure	kPa	192		202	195	186	205	210	198	196	227	222
P1H – Motor input power	kW	1	,9		3,0				5,5			,5
PT – Available pressure	kPa	152	157	122	115	166	115	95	82	79	71	139
PT — Motor input power	kW			2,2			3	,0		4,0		7,5
Capacity of buffer tank		-		300			400		8	00	1.	100
Electrical data												
Total input power	kW	29,0	35,5	49,8	54,0	58,9	75,5	87,7	96,2	105,1	110,7	142,6
Total nominal input current	A	60,0	70,2	98,1	102,4	109.2	138,8	161,2	181,0	184,7	194,8	282,2
Maximum total input current	A	78,9	94,9	135,9	149,9	166,4	212,4	230,4	259,2	279,2	302,0	386,0
Total inrush current	A	207,9	245,9	306,2	366,2	372,4	212,4	373,4	396,2	457,2	467,0	482,0
Sound pressure level	M	201,7	243,7	500,2	JU0,Z	J1Z,4	223,4	5/3 _/ 4	J90,Z	۲J/,Z	-107,0	40Z,U
<u> </u>	dp(A)		0				:0				70	71
Sound pressure at 1 m	dB(A)		58				59				/0	71
Sound pressure at 10 m	dB(A)		52				53				54	55
Dimensions		41.777								7.10		
Length	mm	1.650		2.660			3.200		4.	740	5.	780
Width	mm						1'370					
Height	mm						2'420					
Transport weight	kg	1.140	1.320	1.400	1.210	2.810	2.120	2.400	2.612	2.822	3.122	3.353
Weight in operation	kg	1.165	1.375	1.425	1.232	2.832	2.55	2.475	2.690	2.805	3`200	3`398
Electrical power supply	, ,											

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 12/7°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure levels calculated according to ISO 3744. - Option BT allows summer operation (therefore with chilled water production) with external temperature lower than 15 °C.



REFRIGERANT R410A

R410A - Operation limits - Mod. 772 - 1642 Kc

	7	72	8	52	14	412	15	32	16	542
Range of outlet water temperature					from + 5	°C to +15°C				
Range of outlet water+glycol temperature					from -8 °	°C to +15°C				
Range of temperature difference					from	4 to 8 °C				
	min	max	min	max	min	max	min	max	min	max
Water flow – Lt/sec (1)	3,3	4,1	4,0	4,8	6,0	7,4	6,6	8,0	7,0	8,6
Water flow – mc/h (1)	12,0	14,6	14,3	17,5	21,8	26,6	23,6	28,8	25,4	31,0
Pressure drop kPa (1)	28	42	22	34	29	43	34	50	34	50
Max operating pressure water side			·		1() Bar				
Inlet air temperature – STD	5,0	45,0	5,0	45,0	5,0	45,0	5,0	45,0	5,0	45,0
Inlet air temperature — S	5,0	45,0	5,0	45,0	5,0	45,0	5,0	45,0	5,0	45,0
Inlet air temperature – U (for ULTRASIL. operation)	-5,0	36,0	-5,0	36,0	-5,0	36,0	-5,0	35,0	-5,0	36,0
Minimum control capacity regulation	50	0%	5	0%	5	0%	50	0%	50	0%

(1) Water 12/7°C - External air temperature 35°C

R410A - Operation limits - Mod. 2002 - 4502 Kc

	20	02	23	302	27	/02	30	02	34	02	38	302	42	202	45	502
Range of outlet water temperature								from + 5°	°C to +15°C							
Range of outlet water+glycol temperature								from -8 °	C to +15°C							
Range of temperature difference								from 4	to 8 °C							
	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
Water flow – Lt/sec (1)	5,9	13,9	6,9	15,3	7,7	15,3	8,9	15,3	9,9	15,9	11,3	25,3	12,6	29,4	13,5	29,4
Water flow – mc/h (1)	21,2	50,0	24,8	55,1	27,7	55,1	32,0	55,1	35,6	57,2	40,7	91,1	45,4	105,8	48,6	105,8
Pressure drop kPa (1)	38	140	41	132	42	112	17	92	45	85	46	131	46	140	46	136
Max operating pressure water side								10	Bar							
Inlet air temperature — STD	5,0	44,8	5,0	45,8	5,0	45,5	5,0	46,4	5,0	46,2	5,0	46,0	5,0	45,7	5,0	44,4
Inlet air temperature – S	5,0	44,7	5,0	43,4	5,0	45,8	5,0	44,2	5,0	45,3	5,0	44,1	-	-	-	-
Inlet air temperature – U (for ULTRASIL. operation)	-5,0	36,0	-5,0	32,0	-5,0	37,0	-5,0	36,0	-5,0	36,0	-5,0	35,0	-	-	-	-
Optimum water content (It)	6	50	7	/00	8	00	9	00	1.	020	1.	150	1.	300	1.	380
Minimum control capacity regulation	2	5%	2	5%	2	5%	2	5%	2	5%	2	5%	2	5%	3	3%

(1) Water 12/7°C - External air temperature 35°C



REFRIGERANT R407C - R134A



Series PAH ... T K

Cooling capacity from 205 to 778 kW - 2 circuits

The air cooled heat pumps of **PAH.T series** are designed for outdoor installation and are particularly suitable for industrial applications. They can also be used for medium and big air conditioning systems and to be matched to fancoils or terminal units.

These units are standard provided by a technical housing, always protected by panels.

They are all available with 2 independent refrigerant circuits and, when required, provided with buffer tanks of remarkable capacity, with no change in the overall dimensions.

Thanks to the several options available, these units are particularly flexible and can be easily adapted to all installation sites.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

The available versions with both R407C (K) and R134a (Ka) refrigerants are the following:

K/Ka - standard version

S.K/ Ka - silenced version: oversized coil, reduced air flow, fans with a lower rotation speed, technical partition insulated by means of soundproofing material.

U.K/Ka - ultra-silenced version: oversized coil, reduced air flow, fans with a very low rotation speed, technical partition insulated by means of soundproofing material with bituminous rubber coating, vibration dampers on compressors suction and discharge pipes, mufflers on discharge pipes, compressors fixed on spring-type vibration dampers.

Operation limits (standard units):

SÜMMER OPERATION: air from 15 to 45° C – water (out from evaporator) from 5 to 15° C.

WINTER OPERATION: air from 20 to -4°C – water (out from evaporator) max 50°C for R407C - max 55°C for R134a.

Main components:

Strong and compact frame made of pressed and bended galvanized steel profiles, panels and base-frame of high thickness galvanized and painted steel and coated by rust-proof paint, suitable to resist to external agents. The technical housing, completely closed and suitably isolated from the air flow, is containing the compressors and the main components. The external panels, easily to be dismantled, allow the complete access in case of service, without compromising

the operation of the unit itself. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit, with no change in overall dimensions.

Semi-hermetic screw compressors equipped with capacity steps, motor thermal protection, oil crankcase heater and phase monitor. The compressors lubrication is of forced type, with no pump and in order to prevent many oil migrations to the cooling circuit, the compressors are provided with an oil separator, in-built to the discharge side. The electrical motor is foreseen for lower inrush current and, in this is case, the unit is equipped with an automatic partial load inrush device and mechanical interlock of the inrush control switches, to prevent accidental short circuits (options DS and PW).

Heat-exchange external coil with copper tube and turbo aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Dry expansion **shell and tube evaporator**, 100% counter-current type with two refrigerant circuits and one water circuit, with very low pressure drops. Shell and tubes plate made in carbon steel and copper tubes, insulated by close-cell polyurethane foam material. Some plastic and corrosion-proof baffles are suitably placed inside the shell, allowing a correct water distribution and making the tube bundle particularly strong and vibration-free, also in case of very high water flows.

Cooling circuit composed of: 4-way valve for refrigerant cycle inversion, thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges, non-return valve on discharge side, shut-off valve on liquid line, shut-off valve on compressor discharge side.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a lock-door main switch.



REFRIGERANT R407C - R134A

Inside, it is complete with all control and protection switches, the terminal board and auxiliaries. The electrical board also includes the control device for power supply phases, to prevent the compressor to turn in the wrong sense. The micro-processor, complete with display, is also placed inside the electrical board.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the chilled water temperature regulation, the working parameters, auto-detection failure system, remote management and supervision, automatic defrosting system based on a time/ temperature logics, complete with compressors hour counter.

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- BT Low temperature operation (-20°C): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (for summer operation only).
- CE UV protection on water insulation: particular coat of the evaporator and of water insulations with UV ray proof material.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- DS Star/delta: electric device of close transition type to reduce the inrush current, complete with short circuit safety by mechanical interlock.
- FA Condensing coil protection filters: washable metal filters with very low pressure drop, protecting the condensing coils from dirt, with aluminium mesh against dust and leaves.
- GP Condensing coil protection grid: metal protection grid against accidental impacts, made of 50x50 4-mesh wire.
- I1
 Victaulic insulation on pump side: insulation of the joints by close-cell polyurethane material, to prevent condense, pump side.

 I2
 Victaulic insulation on buffer tank side: insulation of the joints
- by close-cell polyurethane material, to prevent condense, buffer tank side. IG Watch card: Electronic card to program the switch-over and rota-
- is watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- LI Liquid injection: mechanical device allowing a better cooling of compressors at very high compression level (standard for R407C).
- M12 Modulating capacity control for 2-circuit units: by means of some valves installed on compressors, the capacity is modulated from 12 to 100%.
- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- OS Oil flow safety switch: in-built in the compressor oil separator, it indicates the eventual decrease of the oil level.
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture (not available when option MV is required).
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PT Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type.
- PW Part-winding: equipment for step compressors starting, reducing of about 35% the inrush current of each compressor.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RF Power factor correction system cosfi >0,9: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- RH Shut-off valve on suction side: they are use to isolate compressors during service operations.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM** Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RR** Copper/copper condensing coils: special execution of the condensing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- SC Insulated compressors housing with sound proofing material (included on silenced version).
- SU Insulated compressors housing with bituminous rubber sound proofing material, muffler on discharge pipe and vibration dampers for compressors (included on ultra-silenced version).
- TE Electronic thermostatic valve: it is requested to make a very accurate regulation of the refrigerant flow and to limit variations of cooling capacity and evaporator leaving temperature water during operation in transitions and for a better performance with fixed superheating.
 V Voltmeter: Electrical device measuring the electrical tension in the
 - **Voltmeter**: Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C - R134A

Technical data - R407C - Standard version

PAH T Cooling capacity		2102 K	2502 K	2802 K	3302 K	3902 K	4802 K	5502 K
ooling capacity	kW	205,0	255,0	276,0	345,0	377,0	472,0	550,0
ominal input power	kW	73,0	92,0	114,0	123,0	148,0	180,0	196,0
ER		2,81	2,77	2,42	2,80	2,55	2,62	2,81
leating capacity								
leating capacity	kW	283,0	352,0	396,0	476,0	533,0	662,0	758,0
nput power (heating)	kW	70,0	89,0	110,0	119,0	143,0	174,0	190,0
OP		4,04	3,95	3,60	4,00	3,73	3,80	3,99
Axial fans								
Juantity	n.		6			8	10	12
Rotation speed	rpm				880			
Air flow	m³/h	126.000		000		5.000	195'000	234.000
Air flow	l/s	35.000		500		333	54.167	65.000
Aotor input power	kW		12,0			6,0	20,0	24,0
nput current	A		24,0		3	2,0	40,0	48,0
Screw compressors								
luantity	n.				2			
ooling circuits	n.				2			
tandard capacity steps	n				6			
Adulating capacity steps (option)	%	424.2	455.0	400.0	0 - 12 ÷ 100	330.0	2010	
lominal input current	A	124,0	155,0	188,0	204,0	238,0	296,0	327,0
lominal input current (heating)	A	120,0	150,0	182,0	198,0	231,0	288,0	317,0
Aaximum input current	A	172,0	216,0	256,0	288,0	324,0	360,0	432,0
nrush current	A	497,0	616,0	613,0	729,0	848,0	981,0	1`159,0
nrush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0	828,0
Evaporator								
/pe					Shell and tube			
luantity	n.				1			
Vater flow	m³/h	35,3	43,9	47,5	59,4	64,8	81,4	94,7
Vater flow	l/s	9,8	12,2	13,2	16,5	18,0	22,6	26,3
ressure drop	kPa	70	56	60	58	46	35	49
Vater flow (heating)	m³/h	48,6	60,5	68,0	81,7	91,8	113,8	227,5
Vater flow (heating)	l/s	13,5	16,8	18,9	22,7	25,5	31,6	63,2
ressure drop (heating)	kPa	133	108	124	110	92	69	92
Vater volume		39	49	56	93	88	133	125
P1 Pump group								
wailable pressure	kPa	107	120	114	111	121	123	98
Aotor input power	kW				5,5			
nput current	A				11,0			
nrush current	A				70,0			
Veight	kg				91			
P1H pump group								
wailable pressure	kPa	157	170	164	162	172	174	149
Aotor input power	kW				7,5			
nput current	A				15,0			
nrush current	A				105,0			
Veight	kg				99			
PT pump group								
vailable pressure	kPa	155	166	160	154	163	161	131
Notor input power	kW				7,5			
nput current	A				15,0			
rrush current	A				105,0			
Veight	kg				196			
lydraulic kit								
xpansion vessel capacity					25			
uantity	n.				2			
uffer tank 900 l					•			
uffer tank 1°500 l			-				•	
uffer tank 1°800 l				-				•
uffer tank 2°400 l					-			•
ectrical data								
otal input power	kW	85,0	104,0	126,0	139,0	164,0	200,0	220,0
otal nominal input current	A	148,0	179,0	212,0	236,0	270,0	336,0	375,0
otal nominal input current (heating)	A	144,0	174,0	206,0	230,0	263,0	328,0	365,0
laximum total input current	A	196,0	240,0	280,0	320,0	356,0	400,0	480,0
otal inrush current	A	521,0	640,0	637,0	761,0	880,0	1.021,0	1'207,0
rrush current with options PW/DS	A	328,0	401,0	442,0	526,0	617,0	740,0	876,0
ound pressure level	· · · · ·							
ound pressure at 1 m	dB(A)	77		78		79	80	82
Dimensions							· · · · · · · · · · · · · · · · · · ·	
ength	mm		5.085		6	120	7.128	8.196
/idth	mm				2.244			
eight	mm				2.370			
ransport weight	kg	3.182	3.314	3.762	4'320	4`355	5.286	6.021
Veight in operation	kg	3.226	3.364	3.821	4.413	4.443	5.729	6.192
lefrigerant charge per circuit	kg	61,0	70,0	71,0	84,0	85,0	100,0	113,0
enigerant enarge per encant	ку	01,0	70,0	, 1,0	ייייט	0,0	100,0	115,0
Electrical power supply								

REMARKS: - Operating conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.



REFRIGERANT R407C - R134A

Technical data - R407C - Silenced version

PAH T.S Cooling capacity		2102 K	2502 K	2802 K	3302 K	3902 K	4802 K
Cooling capacity	kW	196.0	241,0	274,0	326,0	387,0	480.0
Nominal input power	kW	76,0	97,0	115,0	130.0	144,0	177,0
EER	KII	2,58	2,48	2,38	2,51	2,69	2,71
Heating capacity		2,50	2,10	2,00	2,5 .	2,05	-,
Heating capacity	kW	277,0	343,0	395,0	463,0	540,0	667,0
Input power (heating)	kW	74,0	94,0	111,0	125,0	139,0	171,0
COP		3,75	3,65	3,56	3,70	3,88	3,90
Axial fans							
Quantity	n.	6			8	10	12
Rotation speed	rpm				60		
Air flow	m³/h	96.000	90.000	128.000	120.000	150`000	180.000
Air flow	l/s	26.667	25.000	35`556	33.333	41.667	50.000
Motor input power	kW	7,			0,0	12,5	15,0
Input current	A	14	,0	1	8,0	23,0	28,0
Screw compressors					2		
Quantity	n.				2		
Cooling circuits	n.				2		
Standard capacity steps	n.				6		
Modulating capacity steps (option)	%	120.0	162.0		2 ÷ 100	222.0	202.0
Nominal input current	A	129,0	162,0	189,0	214,0	233,0	292,0
Nominal input current (heating)	A	126,0 172,0	157,0 216,0	183,0 256,0	208,0 288,0	226,0 324,0	283,0 360,0
Maximum input current Inrush current	A	497,0	616,0	613,0	288,0	324,0 848,0	360,0 981,0
Inrush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0
Evaporator	M	U,FUC	517,0	±10,0	474,U	0,000	700,0
				(hall a	nd tube		
Quantity	n.			JIEII d	1		
Water flow	m ³ /h	33,8	41,4	47,2	56,2	66,6	82,4
Water flow	/s	9,4	11,5	13,1	15,6	18,5	22,9
Pressure drop	kPa	64	50	60	52	48	36
Water flow (heating)	m³/h	47,5	16,4	68,0	79.6	92,9	114,8
Water flow (heating)	I/s	13,2	59,0	18,9	22,1	25,8	31,9
Pressure drop (heating)	kPa	128	102	124	104	94	70
Water volume		39	49	56	93	88	133
P1 Pump group							
Available pressure	kPa	115	127	115	119	117	120
Motor input power	kW			5	,5		
Input current	A			1	1,0		
Inrush current	A			7	0,0		
Weight	kg			(91		
P1H pump group							
Available pressure	kPa	165	177	165	170	168	172
Motor input power	kW				,5		
Input current	A				5,0		
Inrush current	A				15,0		
Weight	kg				99		
PT pump group	LD-	1()	174	1/1	174	150	150
Available pressure	kPa	163	174	161	164	159	158
Motor input power	kW				5		
Input current	A				5,0		
Inrush current Weight	A				15,0 96		
Weight Hydraulic kit	kg			I	70		
Expansion vessel capacity					25		
Quantity	n. 1				2		
Buffer tank 900 l					•		
Buffer tank 1 500 l			-			•	
Buffer tank 1 800 l				-			,
Buffer tank 2'400 l				-			•
Electrical data							
Total input power	kW	84,0	105,0	125,0	140,0	157,0	192,0
Total nominal input current	A	143,0	176,0	207,0	232,0	256,0	320,0
Total nominal input current (heating)	A	140,0	171,0	201,0	226,0	249,0	311,0
Maximum total input current	A	186,0	230,0	274,0	306,0	347,0	388,0
Total inrush current	A	511,0	630,0	631,0	747,0	871,0	1.009,0
Inrush current with options PW/DS	A	318,0	391,0	436,0	512,0	608,0	728,0
Sound pressure level							
Sound pressure at 1 m	dB(A)	74		75	7	76	77
Dimensions							
Length	mm	5.0	82		120	7.128	8.196
Width	mm				244		
Height	mm				370		
Transport weight	kg	3.182	3`314	4.081	4'320	4.786	6'028
Weight in operation	kg	3.556	3`364	4.137	4.413	4`873	6.161
Refrigerant charge per circuit	kg	61,0	70,0	71,0	84,0	97,0	111,0
Electrical power supply							
	V / ph / Hz				/ 50 + T		

REMARKS: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.



REFRIGERANT R407C - R134A

Technical data - R407C - Ultra-silenced version

PAH T.U Cooling capacity		2102 K	2502 K	2802 K	3302 K	3902 K	4802 K
poling capacity	kW	195,0	240,0	271,0	331,0	389,0	444,0
ominal input power	kW	77,0	97,0	116,0	128,0	143,0	190,0
R		2,53	2,47	2,34	2,59	2,72	2,34
leating capacity							
eating capacity	kW	276,0	343,0	393,0	466,0	541,0	643,0
put power (heating)	kW	74,0	94,0	112,0	124,0	138,0	183,0
OP		3,73	3,65	3,51	3,76	3,92	3,51
Axial fans					10		
uantity	n.	6	8		10	1	2
otation speed	rpm	(0:000	100:000		30	120	000
ir flow	m³/h	69.000	100.000	92.000	115.000	138	
ir flow	I/s	19:167	27.778	25.556	31.944	38	
lotor input power	kW	4,6	6,		7,7	9,	
put current	A	9,0	12,	0	15,0	18	,0
crew compressors)		
uantity ooling circuits	<u>n.</u>				2		
tandard capacity steps	<u>n.</u>				<u>,</u>		
lodulating capacity steps (option)	n. %			0 - 12			
ominal input current	% A	130.0	163,0	191,0	÷ 100 212,0	232,0	311,0
ominal input current (heating)	A	126,0	158,0	191,0	212,0	232,0	301,0
aximum input current	A	172,0	216,0	256,0	206,0	324,0	360,0
naximum input current	A	497,0	616,0	613,0	729,0	848,0	981,0
nrush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0
vaporator	A	JU 1 ,U	U,11C	410,0	474,U	ע,כטכ	700,0
/pe				Shell a	nd tube		
uantity	n.			JIICH d	1		
Vater flow	m ³ /h	33,5	41,4	46,8	56.9	67,0	76,3
/ater flow	I/s	9,3	11,5	13.0	15,8	18,6	21,2
ressure drop	kPa	64	50	58	53	49	31
/ater flow (heating)	m ³ /h	47,5	59,0	67,7	80,3	93,2	110,5
/ater flow (heating)	I/s	13,2	16,4	18,8	22,3	25,9	30,7
ressure drop (heating)	kPa	127	10,4	122	106	94	65
/ater volume		39	49	56	93	88	133
1 Pump group		55	17	50	,,	00	155
vailable pressure	kPa	115	127	116		117	131
Notor input power	kW	115	127		,5		151
nput current	A				,0		
nrush current	A),0		
Veight	kg			9			
1H pump group	,,						
vailable pressure	kPa	165	178	167		168	182
lotor input power	kW				.5		
nput current	A				,0		
nrush current	A				5,0		
/eight	kg			9	9		
PT pump group							
vailable pressure	kPa	163	174	1	52	158	170
lotor input power	kW			7	,5		
iput current	A				,0		
rush current	A				5,0		
/eight	kg			1	96		
lydraulic kit							
kpansion vessel capacity					5		
uantity	n.				2		
uffer tank 900 l					•		
uffer tank 1°500 l		-			•		
uffer tank 1 800 l			-			•	
uffer tank 2°400 l							
lectrical data		02.0	402.0	400.0	421.0	450.0	
tal input power	kW	82,0	103,0	122,0	136,0	152,0	199,0
otal nominal input current	A	139,0	175,0	203,0	227,0	250,0	329,0
otal nominal input current (heating)	A	135,0	170,0	197,0	221,0	243,0	319,0
laximum total input current	A	181,0	228,0	268,0	303,0	342,0	378,0
tal inrush current	A	506,0	628,0	625,0	744,0	866,0	999,0
	A	313,0	389,0	430,0	509,0	603,0	718,0
	16(1)	(0	74	70		72	
ound pressure level		69	71	72		73	74
ound pressure level	dB(A)						
irush current with options PW/DS Gound pressure level ound pressure at 1 m Dimensions		51000		20			
iound pressure level ound pressure at 1 m Dimensions ength	mm	5.082	6.1		7.128	8.1	96
ound pressure level ound pressure at 1 m Dimensions nonth hidth	mm mm	5`082	611	21	244	8.1	96
ound pressure level ound pressure at 1 m Dimensions ength didh eight	mm m mm m		·	27	244 370		
ound pressure level ound pressure at 1 m imensions ingth idth eight ansport weight	mm mm mm kg	3`250	3.226	212 213 41165	44 370 4`707	5.162	5`975
iound pressure level ound pressure at 1 m Dimensions ength jridth eight ansport weight /eight in operation	mm mm kg kg	3°250 3°289	3 596 3 645	212 213 4165 41221	44 870 4`707 4`800	5°165 5°252	5 ⁻ 975 6 ⁻ 108
ound pressure level ound pressure at 1 m imensions ngth idth ight ansport weight eight in operation drigerant charge per circuit	mm mm mm kg	3`250	3.226	212 213 41165	44 370 4`707	5.162	5`975
ound pressure level und pressure at 1 m /imensions ngth idth eight saport weight eight in peration	mm mm kg kg	3°250 3°289	3 596 3 645	212 213 4165 41221	244 370 4 '707 4 '800 96,0	5°165 5°252	5 ⁻ 975 6 ⁻ 108

REMARKS conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C -Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.



REFRIGERANT R407C - R134A

Technical data - R134a - Standard version

AH T poling capacity		2502 Ka	2802 Ka	3202 Ka	3602 Ka	4602 Ka	5202 Ka	6002 Ka	6802 Ka	8002 K
bling capacity	kW	259,0	286,0	319.0	364,0	478,0	508.0	610.0	696,0	778,0
minal input power	kW	76,0	90,0	107,0	121,0	150,0	169,0	183,0	211,0	267,0
}		3,41	3,18	2,98	3,01	3,19	3,01	3,33	3,30	2,91
eating capacity										
ating capacity	kW	317,0	356,0	405,0	461,0	596,0	643,0	752,0	860,0	994,0
ut power (heating)	kW	73,0	86,0	103,0	117,0	144,0	163,0	176,0	203,0	257,0
xial fans		4,34	4,14	3,93	3,94	4,14	3,94	4,82	4,24	3,87
antity	n.			5			}	10	1	2
tation speed	rpm					880				-
flow	m³/h		126.000		117.000	156	000	195`000	234	000
flow	l/s		35.000		32.200		333	54.167	65	
otor input power	kW		12				i,0	20,0	24	
ut current	A		24	,0		32	2,0	40,0	48	,0
rew compressors						2				
antity Jling circuits	n.					2				
ndard capacity steps	n. n.					6				
dulating capacity steps (option)	%					0 - 12 ÷ 100				
minal input current	A	130,0	153,0	181,0	199,0	252,0	287,0	309,0	348,0	429,0
minal input current (heating)	A	126,0	147,0	175,0	192,0	243,0	277,0	299,0	336,0	414,0
ximum input current	A	196,0	248,0	288,0	324,0	364,0	430,0	462,0	560,0	620,0
ush current	A	547,0	609,0	729,0	848,0	983,0	1.128,0	1.224,0	1.644,0	1.752,0
ish current with options PW/DS	A	365,0	414,0	494,0	585,0	702,0	827,0	895,0	1 235,0	1`319,
aporator										
e						Shell and tube				
antity	n.	44.5	40.3	F4.0	() (02.2	07.4	104.0	110 7	177.0
ter flow	m ³ /h	44,5	49,2	54,9	62,6	82,2	87,4	104,9	119,7	133,8
ter flow ssure drop	l/s kPa	12,4 55	13,7 57	15,2 36	17,4 43	22,8 30	24,3 33	29,1 41	33,3 61	37,2 51
ter flow (heating)	m ³ /h	54,5	61,2	69,7	79,3	102,5	110,6	129,3	147,9	171.0
er flow (heating)	/s	15,1	17,0	19,4	22,0	28,5	30,7	35,9	41,1	47.5
ssure drop (heating)	kPa	82	89	58	69	46	54	62	93	84
ter volume		63	80	90	130		52	184	222	435
l Pump group										
ilable pressure	kPa	121	117	137	125	128	120	97	168	172
tor input power	kW				5,5				15	
ut current	A				11,0				27	
ish current	A				70,0				194	
ight I H pump group	kg				91				16	U
ilable pressure	kPa	172	167	187	176	179	171	149	276	279
tor input power	ki u	172	107	107	7.5	177	17.1	112	270 22	
ut current	A				15,0				39	
ish current	A				105,0				273	3,0
ght	kg				99				19	2
pump group										
lable pressure	kPa	168	162	181	168	165	156	127	267,0	268
or input power	kW				7,5				22	
ut current	A				15,0				39	
sh currentaht	A				105,0 196				27:	
ynt rdraulic kit	kg				190				37	9
ansion vessel capacity						25				
						2				
	n.									
ntity	n.					•				
ntity er tank 900 l	n.			-		•		•		
ntity er tank 900 l er tank 1`500 l er tank 1`800 l	n.				-	•		•	•	
ntity er tank 900 l er tank 1'500 l er tank 1'800 l er tank 2'400 l	n.					•		•	•	,
ntity er tank 9001 er tank 15001 er tank 18001 er trank 24001 ectrical data		00.0		-	-		105.0			
ntity fer tank 900 I fer tank 1500 I fer tank 21 800 I fer tank 22 400 I sectrical data I input power	kW	88,0	102,0	- 119,0	- 133,0	166,0	185,0	203,0	235,0	291,0
ntity fer tank 900 I fer tank 1: 500 I fer tank 2: 400 I sectrical data I input power I nominal input current	kW	154,0	102,0 177,0	- 119,0 205,0	- 133,0 223,0	166,0 284,0	319,0	203,0 349,0	235,0 396,0	291,0 477,0
ntity er tank 9001 er tank 1°5001 er tank 1°8001 er tank 2°4001 ectrical data linput power I nominal input current I nominal input current (heating)	kW A A	154,0 150,0	102,0 177,0 171,0		- 133,0 223,0 216,0	166,0 284,0 275,0	319,0 309,0	203,0 349,0 339,0	235,0 396,0 384,0	291,0 477,0 462,0
ntity er tank 9001 er tank 1°5001 er tank 1°8001 er tank 2°4001 sctrical data input power I nominal input current I nominal input current (heating) imum total input current	kW A A A A	154,0 150,0 220,0	102,0 177,0 171,0 272,0	119,0 205,0 199,0 312,0	- 133,0 223,0 216,0 348,0	166,0 284,0 275,0 396,0	319,0 309,0 462,0	203,0 349,0 339,0 502,0	235,0 396,0 384,0 608,0	291,0 477,0 462,0 668,0
ntity er tank 9001 er tank 15001 er tank 18001 er tank 24001 ectrical data input power nominal input current nominal input current (hating) imum total input current linrush current	kW A A A A A	154,0 150,0 220,0 571,0	102,0 177,0 171,0 272,0 633,0	119,0 205,0 199,0 312,0 753,0	- 133,0 223,0 216,0 348,0 872,0	166,0 284,0 275,0 396,0 1 '015,0	319,0 309,0 462,0 1 190,0	203,0 349,0 339,0 502,0 1 294,0	235,0 396,0 384,0 608,0 1 692,0	291,0 477,0 462,0 668,0 1`800,
titly r tank 900 1 r tank 1'500 1 r tank 1'800 1 r tank 2'400 1 ctrical data input power nominal input current nominal input current inrush current inrush current sh current with options PW/DS	kW A A A A	154,0 150,0 220,0	102,0 177,0 171,0 272,0	119,0 205,0 199,0 312,0	- 133,0 223,0 216,0 348,0	166,0 284,0 275,0 396,0	319,0 309,0 462,0	203,0 349,0 339,0 502,0	235,0 396,0 384,0 608,0	291,0 477,0 462,0 668,0 1`800,
htty r tank 9001 er tank 1:5001 er tank 1:8001 er tank 2:4001 ctrical data input power nominal input current nominal input current inrush current sh current sh current sh current with options PW/DS und pressure level	kW A A A A A	154,0 150,0 220,0 571,0	102,0 177,0 171,0 272,0 633,0	119,0 205,0 199,0 312,0 753,0 518,0	- 133,0 223,0 216,0 348,0 872,0	166,0 284,0 275,0 396,0 1`015,0 734,0	319,0 309,0 462,0 1 190,0	203,0 349,0 339,0 502,0 1 294,0	235,0 396,0 384,0 608,0 1`692,0 1`283,0	291,0 477,0 462,0 668,0 1`800,
ntity er tank 9001 er tank 1:5001 er tank 1:8001 er tank 2:4001 ectrical data input gower I nominal input current I nominal input current (heating) imum total input current inruns, current sh current sh current with options PW/DS und pressure level nd pressure at 1 m	kW A A A A A A A	154,0 150,0 220,0 571,0	102,0 177,0 171,0 272,0 633,0 438,0 7	119,0 205,0 199,0 312,0 753,0 518,0 9	- 133,0 223,0 216,0 348,0 872,0	166,0 284,0 275,0 396,0 1`015,0 734,0	319,0 309,0 462,0 1 190,0 859,0	203,0 349,0 339,0 502,0 1.294,0 935,0 81	235,0 396,0 384,0 608,0 1`692,0 1`283,0 8	291,0 477,0 462,0 668,0 1`800, 1`367, 2
ntity fer tank 900 1 fer tank 1:500 1 fer tank 1:800 1 fer tank 2:400 1 ectrical data al input power al nominal input current al nominal input current al nominal input current al nunsh current und pressure level ind pressure at 1 m mensions gth	kW A A A A A A dB(A)	154,0 150,0 220,0 571,0	102,0 177,0 171,0 272,0 633,0 438,0	119,0 205,0 199,0 312,0 753,0 518,0 9	- 133,0 223,0 216,0 348,0 872,0	166,0 284,0 275,0 396,0 1 015,0 734,0 8	319,0 309,0 462,0 1 190,0 859,0	203,0 349,0 339,0 502,0 1 294,0 935,0	235,0 396,0 384,0 608,0 1`692,0 1`283,0	291,0 477,0 462,0 668,0 1 '800, 1 '367, 2
Initive Formation of the second secon	kW A A A A A A B A B (A) mm mm	154,0 150,0 220,0 571,0	102,0 177,0 171,0 272,0 633,0 438,0 7	119,0 205,0 199,0 312,0 753,0 518,0 9	- 133,0 223,0 216,0 348,0 872,0	166,0 284,0 275,0 396,0 1'015,0 734,0 8 6'' 2'244	319,0 309,0 462,0 1 190,0 859,0 0	203,0 349,0 339,0 502,0 1.294,0 935,0 81	235,0 396,0 384,0 608,0 1`692,0 1`283,0 8	291,0 477,0 462,0 668,0 1 '800, 1 '367, 2
Initive Formation of the second secon	kW A A A A A A dB(A) mm mm	154,0 150,0 220,0 571,0 389,0	102,0 177,0 171,0 272,0 633,0 438,0 7 5 ° (- 133,0 223,0 216,0 348,0 872,0 609,0	166,0 284,0 275,0 396,0 1`015,0 734,0 8 6`` 2`244 2`370	319,0 309,0 462,0 1 190,0 859,0 0	203,0 349,0 339,0 502,0 1 '294,0 935,0 81 7 '158	235,0 396,0 384,0 608,0 1 692,0 1 283,0 8 9 0	291,0 477,0 462,0 668,0 1`800, 1`367, 2
ntity er tank 2001 er tank 15001 er tank 15001 er tank 12001 er tank 24001 ectrical data linput gower I nominal input current (heating) dimum total input current (heating) dimum total input current al inrush cur	kW A A A A A A dB(A) mm mm kg	154,0 150,0 220,0 571,0 389,0	102,0 177,0 171,0 272,0 633,0 438,0 7 5 ° 0 3 ° 835		- 133,0 223,0 216,0 348,0 872,0 609,0 4`045	166,0 284,0 275,0 396,0 1 015,0 734,0 8 6 2 244 2 370 5 420	319,0 309,0 462,0 1 190,0 859,0 0 20 5 442	203,0 349,0 333,0 502,0 1 294,0 935,0 81 7'158 5'993	235,0 396,0 384,0 608,0 1`692,0 1`283,0 8 9`0 7`429	291,0 477,0 462,0 668,0 1`800, 1`367, 2 335 7`534
ntity fer tank 900 1 fer tank 1:500 1 fer tank 1:800 1 fer tank 2:400 1 ectrical data al input power al nominal input current al nominal input current al inrush current (heating) minum total input current al inrush current al inr	kW A A A A A A A dB(A) mm mm kg kg kg	154,0 150,0 220,0 571,0 389,0 389,0 389,0	102,0 177,0 171,0 272,0 633,0 438,0 7 5 (3 : 835 3 : 915		- 133,0 223,0 216,0 348,0 872,0 609,0 4'045 4'174	166,0 284,0 275,0 396,0 1 015,0 734,0 8 6 2 244 2 370 5 420 5 581	319,0 309,0 462,0 1 190,0 859,0 0 20 5 442 5 603	203,0 349,0 339,0 502,0 1 294,0 935,0 81 7 158 5 993 6 178	235,0 396,0 384,0 608,0 1 '692,0 1 '283,0 8 9 '(7 '429 7 '651	291,0 477,0 462,0 1°800, 1°367, 2 35 7°534 7°534 7°969
ntity er tank 2001 er tank 15001 er tank 15001 er tank 12001 er tank 24001 ectrical data linput gower I nominal input current (heating) dimum total input current (heating) dimum total input current al inrush cur	kW A A A A A A dB(A) mm mm kg	154,0 150,0 220,0 571,0 389,0	102,0 177,0 171,0 272,0 633,0 438,0 7 5 ° 0 3 ° 835		- 133,0 223,0 216,0 348,0 872,0 609,0 4`045	166,0 284,0 275,0 396,0 1 015,0 734,0 8 6 2 244 2 370 5 420 5 581	319,0 309,0 462,0 1 190,0 859,0 0 20 5 442	203,0 349,0 333,0 502,0 1 294,0 935,0 81 7'158 5'993	235,0 396,0 384,0 608,0 1`692,0 1`283,0 8 9`0 7`429	291,0 477,0 462,0 668,0 1`800, 1`367, 2 335 7`534

REMARKS: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.



REFRIGERANT R407C - R134A

Technical data - R134a - Silenced version

AH T.S Cooling capacity		2202 Ka	2502 Ka	2802 Ka	3202 Ka	3602 Ka	4602 Ka	5202 Ka	6002 Ka	6802 K
poling capacity	kW	219,0	249,0	274,0	321,0	364,0	469,0	524,0	616,0	664,0
ominal input power	kW	66,0	79,0	94,0	106,0	122,0	153,0	163,0	181,0	223,0
R		3,32	3,15	2,91	3,03	2,98	3,07	3,21	3,40	2,98
leating capacity										
eating capacity	kW	270,0	312,0	350,0	406,0	461,0	591,0	652,0	755,0	842,0
put power (heating)	kW	63,0	76,0	91,0	102,0	117,0	147,0	157,0	174,0	214,0
)P		4,28	4,10	3,85	3,98	3,94	4,02	4,15	4,34	3,93
xial fans				,		0	1	0	1	
uantity	n.			5		<u>8</u> 660	I	0	1.	2
ptation speed	rpm		96.000		90.000	128.000	160.000	150.000	180.	000
	m³/h									
r flow	I/s		26.667	r	25.000	35.226	44`444	41.667	50'(
otor input power put current	kW A			,5		9,2		2,5	15	
crew compressors	A			ŀ,0		18,0	23	3,0	28	,U
antity	n.					2				
oling circuits	n.					2				
andard capacity steps						6				
odulating capacity steps (option)	n. %					0 - 12 ÷ 100				
minal input current	90 A	113.0	136.0	160.0	180.0	0 - 12 ÷ 100 199.0	257,0	277.0	306.0	366,0
minal input current (heating)	A	109,0	130,0	154,0	174,0	199,0	237,0	268,0	296,0	353,0
aximum input current (neating)	A	109,0	196,0	248,0	288,0	324,0	364,0	430,0	462,0	560,0
ush current	A	434,0	547,0	609,0	729,0	848,0	983,0	1.128,0	1.2254,0	1.644,
rush current with options PW/DS	A	285,0	365,0	414,0	494,0	585,0	702,0	827,0	895,0	1 044,
vaporator	м	203,0	0,000	414,0	424,0	0,000	702,0	027,0	0,070	1 200,
						Shell and tube				
antity	n.					1				
ater flow	m ³ /h	37,7	42,8	47,1	55,2	62,6	80,7	90,1	106.0	114,2
ater flow	l/s	10,5	42,0	13,1	15,3	17,4	22,4	25,0	29,4	31,7
essure drop	kPa	39	51	52	37	43	22,4	36	42	55
ater flow (heating)	m ³ /h	46.4	53,7	60,2	69,8	79,3	101.7	112.1	129.9	144,8
ater flow (heating)	l/s	12,9	14,9	16,7	19,4	22,0	28,2	31,2	36,1	40,2
essure drop (heating)	kPa	60	80	86	59	69	45	55	62	55
ater volume		6		80	90	130		52	184	222
1 Pump group		0	5	00	70	150) <u>L</u>	101	
ailable pressure	kPa	141	126	123	136	125	130	115	95	176
ptor input power	kW	111	120	125	5		150	115	,,,,	15.0
put current	A				11					27,0
ush current	A				70					194,0
eight	kq				9					160
1H pump group	ng					•				100
ailable pressure	kPa	191	177	173	187	176	182	167	148	284
ptor input power	kW	171		115	7		102	107	110	22,0
out current	A				15					39,0
rush current	A				10					273,0
eight	kq				9					192
T pump group	ing					, 				172
ailable pressure	kPa	188	173	169	181	1	58	150	125	276
ptor input power	kW	100	175	102	7			150	125	22.0
but current	A				15					39,0
ush current	A				10					273,0
einht	kg				19					379
vdraulic kit	ny					·				517
pansion vessel capacity						25				
antity	n.					2				
ffer tank 900 l						•				
ffer tank 1 500 l								•		
ffer tank 1 800 l				_					,	
ffer tank 2 400 l					_				•	,
ectrical data										
al input power	kW	74,0	87,0	102,0	114,0	132,0	166,0	176,0	196,0	238,0
al nominal input current	A	127,0	150,0	174,0	194,0	217,0	280,0	300.0	334,0	394,0
al nominal input current (heating)	A	123,0	145,0	168,0	188,0	210,0	271,0	291,0	324,0	381,0
iximum total input current	A	172,0	210,0	262,0	302,0	342,0	387,0	453,0	490,0	588,0
tal inrush current	A	448,0	561,0	623,0	743,0	866,0	1.006,0	1.181,0	1`282,0	1.672
ush current with options PW/DS	A	299,0	379,0	428,0	508,0	603,0	725,0	850,0	923,0	1.263
ound pressure level		277,0	5, 5, 0	120,0	550,0	005/0	, 23,0	030,0	72310	1 200
und pressure at 1 m	dB(A)		7	3		76	7	8	7	9
imensions			,				· · · · · · · · · · · · · · · · · · ·			
ngth	mm		5.0)82		6.120	7	158	8.196	9.03
idth	mm					2.244	1		0.70	/J.
ight	mm					2'370				
nsport weight	kg	3.263	3`815	3.832	4.014	4.362	5.702	5`878	6'431	7.429
eight in operation	kg	3.826	3.878	3.912	4.103	4'491	5.864	6.039	6.615	7.65
frigerant charge per circuit	kg		,0 ,0	71,0	83,0	85,0	103,0	120,0	136,0	140,0
	ку	05		71,0	0,00	0,0	0,001	120,0	130,0	140,0
ectrical power supply										

REMARKS conditions: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C -Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.

REFRIGERANT R407C - R134A

Technical data - R134a - Ultra-silenced version

AH T.U ooling capacity		1802 Ka	2202 Ka	2502 Ka	2802 Ka	3202 Ka	3602 Ka	4602 Ka	5202 Ka
ooling capacity	kW	197,0	212,0	238,0	271,0	321,0	361,0	464,0	524,0
minal input power	kW	55,0	69,0	84,0	95,0	106,0	123,0	155,0	163,0
eating capacity		3,58	3,07	2,83	2,85	3,03	2,93	2,99	3,21
eating capacity ating capacity	kW	238,0	266,0	306,0	349,0	406,0	460,0	589,0	652,0
but power (heating)	kW	53,0	66,0	80,0	91,0	102,0	118,0	149,0	157,0
P		4,49	4,03	3,82	3,83	3,98	3,90	3,95	4,15
kial fans									
antity	n.			6		8	6	10	12
tation speed flow	rpm m³/h		75.000		69.000	100.000	92.000	115.000	138.000
flow	I/s		20.833		19.167	27.778	25.556	31.944	38.333
tor input power	kW			,6	17 107		6,2	7,5	9,2
ut current	A			,0			2,0	15,0	18,0
rew compressors									
antity Jing singuity	n.					2			
oling circuits Indard capacity steps	n. n.					2 6			
dulating capacity steps (option)	%					2 ÷ 100			
minal input current	A	94,0	118,0	143,0	161,0	180,0	201,0	260,0	277,0
minal input current (heating)	A	91,0	114,0	138,0	156,0	174,0	194,0	251,0	268,0
ximum input current	A	112,0	158,0	196,0	248,0	288,0	324,0	364,0	430,0
ush current	A	361,0	434,0	547,0	609,0	729,0	848,0	983,0	1 158,0
ish current with options PW/DS	A	209,0	285,0	365,0	414,0	494,0	585,0	702,0	827,0
/aporator					Challa	and tube			
eantity	n.				Sueira	1 1			
anny	m ³ /h	33,9	36,5	40,9	46,6	55,2	62,1	79,8	30,1
ter flow	l/s	9,4	10,1	11,4	12,9	15,3	17,2	22,2	25,0
issure drop	kPa	32	37	46	52	37	42	28	36
ater flow (heating)	m³/h	40,9	45,8	52,6	60,0	69,8	79,1	101,3	112,1
iter flow (heating)	l/s	11,4	12,7	14,6	16,7	19,4	22,0	28,1	31,2
ssure drop (heating)	kPa	47	58	77	85	59	69	45	55
ter volume			63		80	90	130	1	62
1 Pump group ailable pressure	kPa	150	144	132	124	136	126	131	115
otor input power	kW	100	144	132		5,5	120	101	ID
put current	A					1,0			
ush current	A					0,0			
eight	kg					91			
1H pump group									
ailable pressure	kPa	200	194	182	174	187	177	183	167
otor input power	kW					7,5			
out current	A					5,0			
ush current eight	A kg)5,0 99			
r pump group	Ng				· · · ·	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
ailable pressure	kPa	198	192	179	170	181	169	170	150
otor input power	kW					7,5			
out current	A				1	5,0			
ush current	A)5,0			
eight	kg				1	96			
ydraulic kit pansion vessel capacity						25			
antity	n.					25			
ffer tank 900 l						•			
ffer tank 1'500 l				_				•	
ffer tank 1°800 l					-				•
ffer tank 2°400 l					-				•
ectrical data	111/	(1.0	75.0	00.0	101.0	111.0	124.0	1/5.0	476.0
al input power	kW	61,0	75,0	90,0	101,0	114,0	131,0	165,0	175,0
al nominal input current al nominal input current (heating)	A	103,0 100,0	127,0 123,0	152,0 147,0	170,0 165,0	192,0 186,0	213,0 206,0	275,0 266,0	295,0 286,0
ai nominai input current (neating) iximum total input current	A	100,0	123,0	205,0	257,0	300,0	336,0	266,0	286,0
al inrush current	A	370,0	443,0	556,0	618,0	741,0	860,0	998,0	1.176,0
ish current with options PW/DS	A	218,0	294,0	374,0	423,0	506,0	597,0	717,0	845,0
und pressure level		-,-					,		,•
nd pressure at 1 m	dB(A)		7	70			73	74	75
mensions									
gth	mm		5	082			120	7.128	8.196
dth	mm					244			
ight nsport weight	mm	3.323	3.767	3.789	3.902	370 4.292	4.421	5`812	6`262
ight in operation	kg kg	3 353	3.830	3 789	3.902	4 295	4 451	5 812	6.424
rigerant charge per circuit	kg kg	J 410	69,0	J 0JZ	82,0	83,0	99,0	120,0	134,0
ectrical power supply	ny		07,0		52,0		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	120,0	סקרכו
	V / ph / Hz				100 / 2	/ 50 + T			

REMARKS: Summer operation external air temperature 35°C; water temperature 7/12°C Winter operation external air temperature 10°C; water temperature 40/45°C - Sound pressure level at 1 m in open field (ISO 3744). - Unit weight including oil and refrigerant charge.



UNITS FOR 4-PIPE SYSTEMS R407C

WITH SCROLL COMPRESSORS



Series GPE ... K

Cooling capacity from 34 to 78 kW - 1 circuit

The units of **GPE.K series** can be installed in all the applications where there is the need to produce at the same time cold and warm water. The peculiarity of this "Polyvalent Groups" is to suit all the needs of the system, independently from weather conditions.

These units are 4-pipes heat pumps with separate and not interchangeable circuits, supplied with an additional water/refrigerant condenser/recovery on each cooling circuit, able to entirely replace the air/refrigerant condensing coil and to produce "free" warm water, when needed.

OPERATION MODES

MODE 1: Only Cooling Mode

When warm water production is not required, the unit runs as a water chiller and only produces chilled water. With such a running mode and in order to complete the cooling process, the exchangers in use are the evaporator and the finned air cooled condensing coil.

MODE 2: Cooling Mode with heat recovery

When warm water is required as well, the unit can operate as water chiller with heat recovery and produce warm water at the same time, without additional costs and exploiting the heating power of the condensing process. In this way, in order to complete the cooling process, the evaporator and the water cooled condenser/recovery, where the condensing process takes place, are the exchangers in use.

MODE 3: Heat Pump Mode

The unit runs as an heat pump and therefore produces warm water. With such a running mode and in order to complete the cooling process, the finned condensing coil (as evaporator) and the water cooled condenser/recovery, where the condensing process takes place, are the exchangers in use

Operation limits (standard units):

SUMMER OPERATION: **air** from 15 to 45°C – **water** (out from evaporator) from 5 to 15°C.

WINTER OPERATION: air from 20 to -4°C – water (out from evaporator) max 50°C

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. For ultrasilenced version, it is insulated with soundproofing material. The external panels, easy to be dismantled, allow the full access in case of service. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit, with no change in overall dimensions.

High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material and it is complete with anti-freeze heater and water flow switch.

Weld-brazed plate heat recovery / condenser in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. The fans speed control is standard provided.

Cooling circuit realized with copper or steel pipes, composed of thermostatic expansion valve, solenoid valves for automatic changeover of the different operation modes, dehydrating filter, sight glass, check valves on the liquid line, safety valves, shut off valves, high and low pressure switches and gauges.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.



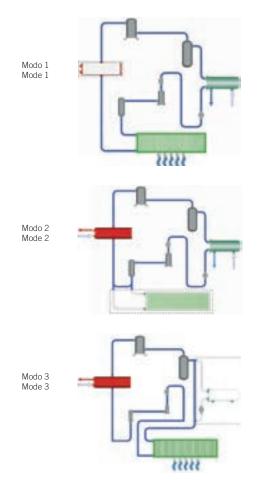
WITH SCROLL COMPRESSORS

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.

Accessories

- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- G2 Cooling capacity control with 2 steps (standard from size 481) GP Condensing coil protection grid: metal protection grid against accidental impacts.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PT Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type. (Available from size 481).
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RM Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- SC Insulated compressors housing with sound proofing material. VB Brine version: unit suitable for working with evaporator outlet
 - water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.





UNITS FOR 4-PIPE SYSTEMS R407C

WITH SCROLL COMPRESSORS

Technical data

GPE Only cooling mode		361 K	421 K	481 K	561 K	701 K	821 K
Only cooling mode	LAAZ		40.2	A7 7	F4.0	(())	70.0
Looling capacity	kW	34,3	40,3	47,7	54,8	66,2	78,0
Compressors input power	kW A		0,5	14,8	17,5	22,2	29,3
Confirmer and a with best recovery		16,2	23,3	27,4	32,1	33,9	48,4
Cooling mode with heat recovery	kW	22.0	41.1	A7 1	54.0	(7)	01.0
517		33,8	41,1	47,1	54,9	67,3	81,8
leating capacity (heat recovery)	kW	44,5	54,6	62,3	72,4	89,0	108,9
ompressors input power	kW	10,7	13,5	15,2	17,05	21,6	27,1
ompressors input current	A	16,5	22,6	27,9	32,0	33,2	45,4
Heat pump mode	1111	12.4			(12)		
leating capacity	kW	43,0	50,6	57,2	64,3	82,4	97,2
ompressors input power	kW	10,7	13,5	15,2	17,3	21,5	26,9
ompressors input current	A	16,5	22,6	27,8	31,8	33,1	45,0
Axial fans							
uantity	n.		2			3	
otation speed	rpm				860		
ir flow	m³/h		.992		4`300		256
ir flow	l/s		720	6	5 750		460
lotor input power	kW	1	,26			1,9	
Scroll compressors							
Quantity	n.		1			2	
ircuits	n.				1		
itandard capacity steps	%		100		0/5	0 / 100	
Optional capacity steps	n.		G2			-	
nrush current	A	148,0	167,0	140,0	148,0	184,0	217,0
Evaporator							
ype				Braz	zed plate		
luantity	n.				1		
Vater flow	m³/h	5,9	6,9	8,2	9,4	11,4	13,4
Vater flow	l/s	1,6	1,9	2,3	2,6	3,2	3,7
ressure drop	kPa	42	40	17		15	17
leat recovery – Condenser				·			
уре				Braz	zed plate		
Quantity	n.				1		
Vater flow	m³/h	7,7	9,4	10,7	12,4	15,3	18,7
Nater flow	l/s	2,1	2,6	3,0	3,5	4,2	5,2
Pressure drop	kPa	45	15	18	17	,	20
Pumps						·	
1 – Available pressure	kPa	144	134	137	130	122	108
P1 – Motor input power	kW		,55),75	
P1H — Available pressure	kPa	184	169	187	185	172	158
P1H – Motor input power	kW		,75	107		1,1	
T – Available pressure	kPa		-	137	140	137	166
T – Motor input power	kW		_	157		1,5	100
apacity of buffer tank				1	180	· /-	
ectrical data	· · ·						
otal input power	kW	15,6	16,8	21,8	23,5	30,6	17,5
otal nominal input current	A	29,0	31,0	41,0	43,6	55,1	34,0
Sound pressure level	Λ	27,0	0,10	ע,וד	υ _ι υ	55,1	U ₁ FC
ound pressure at 1 m	dB(A)		64			65	
Dimensions	UD(A)		τυ 				
ength	mm		000			130	
engtn Vidth	mm					130	
	mm		350			100	
eight	mm		650			770	
ength with MV option	mm		000			130	
In L.L. A.L. A.M.A	mm		350			100	
		1	650			770	
leight with MV option	mm						0.00
Vidth with MV option leight with MV option ransport weight	kg	520	555	745	782	834	885
leight with MV option iransport weight iransport weight with empty buffer tank	kg kg	520 585	620	810	847	899	950
leight with MV option	kg	520					

REMARKS:

 REMARX:

 - Operating conditions:

 Only cooling mode: external air temperature 35°C; water temperature 7/12°C 0% glycol

 Cooling mode: with heat recovery: water temperature 7/12°C 0% glycol; condensing water temperature 40/45°C; external air temperature 40/45°C; water provide with heat recovery: water temperature 40/45°C; external air temperature 10°C 80% r.h.

 - Sound pressure level at 1 m in open field (ISO 3744).



UNITS FOR 4-PIPE SYSTEMS R407C

WITH SCROLL COMPRESSORS



GPE 1402 K



Series GPE ... K

Cooling capacity from 83 to 157 kW - 2 circuits

The units of **GPE.K series** can be installed in all the applications where there is the need to produce at the same time cold and warm water. The peculiarity of this "Polyvalent Groups" is to suit all the needs of the system, independently from weather conditions. These units are 4-pipes heat pumps with separate and not interchangeable circuits, supplied with an additional water/refrigerant condenser/ recovery on each cooling circuit, able to entirely replace the air/refrigerant condensing coil and to produce "free" warm water, when needed.

OPERATION MODES MODE 1: Only Cooling Mode

When warm water production is not required, the unit runs as a water chiller and only produces chilled water. With such a running mode and in order to complete the cooling process, the exchangers in use are the evaporator and the finned air cooled condensing coil.

MODE 2: Cooling Mode with heat recovery

When warm water is required as well, the unit can operate as water chiller with heat recovery and produce warm water at the same time, without additional costs and exploiting the heating power of the condensing process. In this way, in order to complete the cooling process, the evaporator and the water cooled condenser/recovery, where the condensing process takes place, are the exchangers in use.

MODE 3: Heat Pump Mode

The unit runs as an heat pump and therefore produces warm water. With such a running mode and in order to complete the cooling process, the finned condensing coil (as evaporator) and the water cooled condenser/recovery, where the condensing process takes place, are the exchangers in use

Being 2-circuit unit, it is possible to have all the above mentioned running modes at the same time on different circuits (i.e. the circuit 1 can be on Mode 1 and the circuit 2 can be on Mode 2 or 3).

Operation limits (standard units):

SUMMER OPERATION: **air** from 15 to 45° C – **water** (out from evaporator) from 5 to 15° C.

WINTER OPERATION: **air** from 20 to -4°C – **water** (out from evaporator) max 50°C

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are installed. The external panels, easy to be dismantled with a quick ¾ key turn, allow the full access to all components in case of service. When required, the hydraulic kit (buffer tank and pump group) are installed inside the unit.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater, when necessary. Being 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Dry expansion shell and tube evaporator with two refrigerant circuits, in carbon steel and copper tubes, insulated by close-cell polyurethane foam material. It is complete with electric heater and water flow switch.

Shell and tube heat recovery / condenser in carbon steel and copper tubes.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. The fans speed control is standard provided.

Cooling circuit realized with copper or steel pipes, composed of thermostatic expansion valve, solenoid valves for automatic changeover of the different operation modes, dehydrating filter, sight glass, check valves on the liquid line, safety valves, shut off valves, high and low pressure switches and gauges.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external and hinged panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.

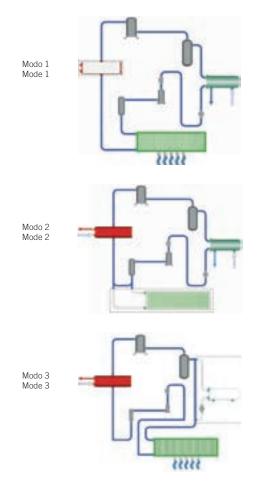


WITH SCROLL COMPRESSORS

Accessories

- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
 CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
 Cooling capacity control with 4 steps (available from size 962)
 Cooling capacity control with 4 steps (available from size 962)
- GPCondensing coil protection grid: metal protection grid against
accidental impacts.IHRS 485 serial interface: electronic card to be connected to mi-
- croprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- **MV Buffer tank** of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PT Twin pump group: chilled water pump group composed of twin pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump, automatic switch in case of failure of the working pump. The pump is of 2 pole centrifugal packaged type.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RM Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- SC Insulated compressors housing with sound proofing material.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.





WITH SCROLL COMPRESSORS

Technical data

GPE		842 K	962 K	1102 K	1402 K	1602 K
Only cooling mode			1			
Cooling capacity	kW	83,5	92,9	105,1	133,2	157,1
Compressors input power	kW	27,1	31,5	37,6	44,0	58,1
Compressors input current	A	45,4	57,0	67,2	78,0	96,0
Cooling mode with heat recovery						
Cooling capacity	kW	83,9	94,6	109,9	135,9	164,4
leating capacity (heat recovery)	kW	110,8	125,1	144,8	178,5	218,5
Compressors input power	kW	26,9	30,6	34,9	42,6	54,1
Compressors input current	A	45,1	55,9	64,0	75,5	90,5
Heat pump mode						
leating capacity	kW	101,4	114,3	121,7	163,1	189,1
ompressors input power	kW	26,8	30,4	34,5	42,1	53,6
ompressors input current	A	44,9	55,7	63,4	74,7	89,6
Axial fans						
Quantity	n.		3			4
Rotation speed	rpm			900		
ir flow	m³/h		35'406		45.	612
ir flow	I/s		9.835		12.	
Aotor input power	kW		2,94		3,	
nput current	A		5,3		7	
Scroll compressors	Λ		J,J			
Juantity	n.			4		
ircuits	n. n.			2		
itandard capacity steps				2		
	n.				4	
Optional capacity steps	n.		150.0			۸ ד רר
nrush current	A	188,0	150,0	162,0	197,0	237,0
Evaporator				C U U U		
ype Duratite				Shell and tube		
Juantity	n.			1		
Vater flow	m³/h	14,4	15,9	18,1	22,9	27,0
Vater flow	l/s	4,0	4,4	5,0	6,4	7,5
ressure drop	kPa	18	19	21	4	7
Heat recovery – Condenser						
уре			Brazed plate		Shell a	nd tube
Quantity	n.			2		
Nater flow	m³/h	14,7	21,5	24,8	30,7	37,4
Water flow	l/s	5,3	5,9	6,9	8,5	10,4
Pressure drop	kPa	60	63	59	37	43
Pumps						
P1 – Available pressure	kPa	124	118	110	116	76
P1 – Motor input power	kW		1,1			,5
P1H — Available pressure	kPa	159	153	145	161	121
P1H – Motor input power	kW		1,5		2	
PT — Available pressure	kPa	149	138	130	131	86
PT – Motor input power	kW		1,5			,2
apacity of buffer tank	1		ورز	720		/-
Electrical data				720		
otal input power	kW	34,1	42,8	46,0	61,4	66,3
otal nominal input current	A	55,3	69,3	74,4	99,2	107,0
Sound pressure level	~	ر, در	C ₁ CU	/ 7,7	, , , , , , , , , , , , , , , , , , ,	107,0
Sound pressure level	dB(A)		68			9
	UD(A)		00		6	7
Dimensions			2.010			160
ength	mm		2.610	1:245	34	460
Vidth	mm			1'245		
leight	mm			2.082		205
ength with MV option	mm		3 460		41	305
Nidth with MV option	mm			1.242		
leight with MV option	mm			2.082		
ransport weight	kg	1.182	1'325	1.410	1.280	1`850
	kg	1.412	1.222	1.640	2.010	2.080
fransport weight with empty buffer tank	ĸy					
	kg	38,0	42,0	46,0	49,0	53,0
ransport weight with empty buffer tank Refrigerant charge per circuit Electrical power supply				46,0	49,0	53,0

REMARKS:

 REMARX:

 - Operating conditions:

 Only cooling mode: external air temperature 35°C; water temperature 7/12°C 0% glycol

 Cooling mode: with heat recovery: water temperature 7/12°C 0% glycol; condensing water temperature 40/45°C

 Heat pump mode: condensing water temperature 40/45°C; external air temperature 10°C 80% r.h.

 - Sound pressure level at 1 m in open field (ISO 3744).



REFRIGERANT R407C - R134A



PWE 111 K



Series PWE ... K

Cooling capacity from 5 to 78 kW - 1 circuit

The water cooled heat pumps of **PWE series** are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. For this reason, they are made of a housing in painted steel plate.

They are all available with 1 refrigerant circuit.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

WARNING: units with inversion on water side (and not on refrigerant side) to be realized at customer's care during installation

The following versions are available: **PWE...K** with R407C ecological refrigerant charge **PWE...Ka** with R134a ecological refrigerant charge

Water operation limits (standard units):

EVAPORATOR (OUT): from 5 to 15°C CONDENSER (OUT): from 30 to 50°C for R407C - from 30 to 55°C for R134a

Main components:

Strong and compact frame, with a housing made of galvanized and RAL 7035 painted steel plate. The front and the access panels to the electrical board are easy to be opened. The main components are installed inside the housing, which can be isolated with standard soundproofing material (option CL) or with bituminous rubber soundproofing material (option CM). When required, the hydraulic kit (buffer tank and hydraulic kit) is installed into an additional section at the bottom of the unit, so not change the overall dimensions.

High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. Higher capacity units are equipped with two scroll compressors in tandem.

Weld-brazed plate **evaporator** and **condenser** in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches.

Electric board in compliance with CE norms, contained in a suitable partition protected by the hinged internal safety panel, provided with protection fuses and safety transformer. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management **microprocessor** installed on the external panel, easily accessible, complete with compressors hour counter.



REFRIGERANT R407C - R134A

Accessories

- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz. CL Soundproofing insulation with standard material: insulation
- CL Soundproofing insulation with standard material: insulation of the compressor housing by means of soundproofing material.
- CM Soundproofing insulation with bituminous rubber material: insulation of the compressor housing by means of bituminous rubber coated material.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- HG Hot gas by-pass: mechanical device for modulating cooling capacity, preventing frequent compressor' stops.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT High and low pressure gauges for measuring circuit pressure.
- MV Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.
- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.

- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
 RL Compressors overload relays: electromechanical protection de-
 - **Compressors overload relays**: electromechanical protection devices against compressor's overload.
 - Personalized frame painting in RAL colour

RV

- SN Main switch: manual switch of lock-door type, switching off the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VP Pressostatic valve: it is placed on condenser and controls the water flow rate according to the unit condensing pressure.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.





REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C

PWE		61 K	111 K	171 K	201 K	221 K	251 K	301 K	381 K	461 K	501 K	571 K	751 K	901 K
Cooling capacity														
Cooling capacity	kW	5,2	9,4	14,6	17,2	18,7	22,3	26,3	33,7	40,4	44,3	51,3	66,7	77,6
Nominal input power	kW	1,5	2,7	3,6	4,3	5,7	6,7	7,9	10,4	12,6	13,9	15,9	21,0	24,8
EER		3,47	3,48	4,05	4,00	3,28	3,	,33	3,24	3,21	3,19	3,23	3,18	3,13
Heating capacity	kW	6,7	12,1	18,2	21,4	24,4	29,3	34,2	44,1	53,0	58,1	67,2	87,7	102,4
Scroll compressors						, .								
Quantity	n.					1							2	
Circuits	n.							1						
Standard capacity steps	%					0/100						0/50	0 / 100	
Nominal input current	A	6,1	14,3	8,2	9,1	12,2	14,4	16,5	19,2	23,8	28,2	32,2	39,5	47,7
Maximum input current	A	11,0	23,0	11,0	13,0	17,0	20,0	22,0	27,0	32,0	40,0	44,0	54,0	64,0
Inrush current	A	47,0	100,0	66,0	72,0	99,0	123,0	127,0	167,0	198,0	143,0	149,0	194,0	230,0
Evaporator			,											
Туре							W	/eld-brazed pl	ate					
Quantity	n.							1						
Circuits	n.							1						
Water flow	m³/h	0.9	1,6	2,5	3,0	3,2	3,8	4,5	5,8	6,9	7,6	8,8	11,5	13,4
Water flow	I/s	0,2	0,4	0,7	0.8	0.9	1,1	1,2	1,6	1,9	2,1	2,4	3,2	3,7
Pressure drop	kPa	22	62	41	,	5	57	51	59	39	20	19	24	25
Water cooled condenser						-								
Туре							W	/eld-brazed pl	ate					
Quantity	n.							1						
Water flow	m³/h	1,2	2,1	3,2	3,7	4,3	5,1	6,0	7,7	9,2	10,1	11,7	15,3	17,9
Water flow	I/s	0.3	0.6	0.9	1,0	1,2	1,4	1,7	2,1	2,6	2,8	3,2	4,2	4,9
Pressure drop	kPa	20	24	30	36	37	43	44	47	68	18	21	19	20
Pumps														
P1 – Available pressure	kPa	64	43	58	79	72	64	94	85	76	85	67	49	37
P1 – Motor input power	kW		18	50	1	55			05		,75	0,		1,1
P1H — Available pressure	kPa	84	70	90	111	104	98	138	128	120	142	123	112	100
P1H — Motor input power	kW		18			75					,1			1,5
Capacity of buffer tank		-,				80						1	10	.,-
Sound pressure level	·													
Sound pressure at 1 m	dB(A)	58	59	58	6	50	f	51	f	52	f	3	f	54
Dimensions	ub(ri)	50	37	50				,						
Length	mm					800						1.	600	
Width	mm					500							50	
Height	mm					500		960				,	50	
Height with MV option	mm					1.430		200				1.	340	
Transport weight	kg	119	126	142	145	189	199	204	231	247	339	345	406	434
Transport weight with empty buffer tank	kg	169	120	192	195	239	249	254	231	247	499	505	566	594
Refrigerant charge per circuit	kg kg	2,4	2,5	2,8	2,9	4,5	4,7	5,6	6,4	8,1	5,8	7,0	8,0	10,1
Electrical power supply	ку	۷,4	2,3	۷,۵	2,3	4,0	4,/	0,0	0,4	0,1	0,0	7,0	0,0	10,1
,	V / ph / Hz	V/ph/Hz 230/1/50+N+T 400/3/50+N+T												
Electrical power supply	v / pn / HZ	230/1/	00 + N + I					40	10/3/30+N	τI				



REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a

PWE		151 Ka	181 Ka	211 Ka	271 Ka	311 Ka	351 Ka	421 Ka	521 Ka	601 Ka
Cooling capacity										
Cooling capacity	kW	13,2	15,9	18,4	24,2	27,3	31,6	37,5	51,6	53,5
Nominal input power	kW	4,0	4,7	5,4	7,3	8,3	9,6	11,3	11,7	17,0
EER		3,30	3,38	3,41	3,31	3,	29	3,32	4,41	3,15
Heating capacity	kW	17,2	20,5	23,8	31,5	35,6	41,2	48,5	61,5	70,4
Scroll compressors	· · · ·									
Quantity	n.			1					2	
Circuits	n.					1				
Standard capacity steps	%			0 / 100				0/50	0/100	
Nominal input current	A	9,6	11,0	12,6	15,3	17,5	22,3	25,8	29,5	35,6
Maximum input current	A	17,0	20,0	22,0	27,0	32,0	40,0	44,0	54,0	64,0
nrush current	A	99,0	123,0	127,0	167,0	198,0	143,0	149,0	194,0	230,0
Evaporator		,					, , ,			
Type						Weld-brazed plate				
Quantity	n.					1				
Circuits	n.					1				
Water flow	m³/h	2,3	2,7	3,2	4,1	4,7	5,4	6,4	8,1	9,2
Water flow	l/s	0,6	0,7	0,9	1,1	1,3	1,5	1,8	2,2	2,6
Pressure drop	kPa	55	49	51	67	56	26		1	26
Water cooled condenser										
Туре						Weld-brazed plate				
Quantity	n.					1				
Water flow	m ³ /h	3,0	3,6	4,1	5,5	6,2	7,2	8,5	10.7	12,3
Water flow	l/s	0,8	1,0	1,1	1,5	1,7	2,0	2,4	2,9	3,4
Pressure drop	kPa	20	31	32	24	21		17	26	22
Pumps		20	5.	52				.,	20	
P1 — Available pressure	kPa	72	87	75	71	110	111	110	96	92
P1 – Motor input power	kW		1	55				0,75		72
P1H — Available pressure	kPa	103	118	107	104	152	164	165	152	150
P1H – Motor input power	kW			75		1,1		,75		1,1
Capacity of buffer tank				80		.,.	•,		10	,.
Sound pressure level								· · ·		•
Sound pressure at 1 m	dB(A)	56	5	57		58	L	59	6	50
Dimensions	ab(n)	50			· ·		-	,,,		
Length	mm			800				1'	600	
Width	mm			500					50	
Height	mm			500		960		, ,		
Height with MV option	mm			1.430		500		1.	340	
Transport weight	kq	175	185	193	212	227	315	312	368	389
Transport weight with empty buffer tank	kg	225	235	243	212	227	475	472	528	549
Refrigerant charge per circuit	kg kg	223	233	245	202	211		472	1	549 1,0
Electrical power supply	ку			2,U			5	1,0	4	r,v
Electrical power supply	V / ph / Hz					400/3/50+N+T				
Electrical power supply	v / pii / nź					1 + N + UC / C / UU+	1			

REFRIGERANT R407C - R134A



PWE 352 Ka+CF



Series PWE ...

Cooling capacity from 32 to 350 kW - 1 and 2 circuits

The water cooled heat pumps of **PWE series** are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications.

They are all available with 1 or 2 refrigerant circuits.

They have been designed to be extremely compact, with an easy access for both ordinary and extraordinary service operations.

Thanks to their dimensions (for the whole range, the width is 750 mm) and to the several options available, these units are particularly easy to install also in small spaces, with no building works.

They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

WARNING: units with inversion on water side (and not on refrigerant side) to be realized at customer's care during installation

The following versions are available: **PWE...K** with R407C ecological refrigerant charge **PWE...Ka** with R134a ecological refrigerant charge

Water operation limits (standard units):

EVAPORATOR (OUT): from 5 to 15°C CONDENSER (OUT): from 30 to 50°C for R407C - from 30 to 55°C for R134a

Main components:

Strong and compact frame, made of bended and RAL 7035 coloured steel profiles, supporting all the main components, installed at sight. On request, the compressors can be isolated by a soundproofing cabinet with standard material (option CF) or with bituminous rubber coated material (option CFU), so to further reduce the overall sound level of the unit itself.

High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. Higher capacity units, with both 1 and 2 cooling circuits, are equipped with two scroll compressors in tandem.

Weld-brazed plate **evaporator** and **condenser** in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges.

Electric board in compliance with CE norms, contained in a suitable partition protected by the hinged internal safety panel, provided with protection fuses and safety transformer.

Unit management **microprocessor** installed on the external panel, easily accessible, complete with compressors hour counter.



REFRIGERANT R407C - R134A

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with soundproofing material and vibration dampers under compressors.
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with bituminous rubber soundproofing material and vibration dampers under compressors, mufflers on compressors discharge pipes.
- CI Soundproofing jacket on compressors: made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- HG Hot gas by-pass: mechanical device for modulating cooling capacity (only for 1-circuit sizes).
- IE Funigated wooden crate packing: available on request for critical transports, so to assure a suitable protection to the unit.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- IR Packing with fumigated wooden pallet and transparent film: minimal packing made of wooden pallet and transparent film wrapped all around the unit.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MP Oversized microprocessor: compared to the standard microprocessor, it allows a multi-language display reading, a more detailed description of parameters, the possibility to manage up to 8 units, to manage non standard communication protocols, a better access to the program.

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- **PF** Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification.
- V Voltmeter: Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 1 circuit - tandem compressors

PWE		541 K	631 K	761 K	931 K	1201 K	1501 K	1901 K
Cooling capacity								
Cooling capacity	kW	48,4	56,0	68,6	84,4	111,0	140,0	175,0
Nominal input power	kW	14,6	16,6	21,2	24,6	33,5	41,8	50,0
EER		3,31	3,37	3,23	3,43	3,31	3,35	3,50
Heating capacity	kW	63,0	72,6	89,8	109,0	144,2	181,8	225,0
Scroll compressors								
Quantity	n.				2 (1 tandem)			
Circuits	n.				1			
Standard capacity steps	%				0 / 50 / 100			
Nominal input current	A	30,5	31,4	36,3	43,8	55,9	71,8	84,3
Maximum input current	A	40,0	44,0	54,0	64,0	82,0	104,0	125,0
Inrush current	A	143,0	149,0	194,0	230,0	266,0	324,0	373,0
Evaporator								
Туре					Weld-brazed plate			
Quantity	n.				1			
Circuits	n.				1			
Water flow	m³/h	8,3	9,6	11,8	14,5	19,1	24,1	30,1
Water flow	l/s	2,3	2,7	3,3	4,0	5,3	6,7	8,4
Pressure drop	kPa	32	34	26	31	30	32	34
Water cooled condenser								
Туре					Weld-brazed plate			
Quantity	n.				1			
Water flow	m³/h	10,8	12,5	15,4	18,7	24,9	31,3	38,7
Water flow	l/s	3,0	3,5	4,3	5,2	6,9	8,7	10,8
Pressure drop	kPa	52	55	43	36	49	53	62
Sound pressure level								
Sound pressure at 1 m	dB(A)	7	0		72	75	77	79
Dimensions								
Length	mm				1.200			
Width	mm				750			
Height	mm			600			1.800	
Transport weight	kg	505	521	555	603	715	795	881
Weight in operation	kg	511	528	565	614	731	815	908
Refrigerant charge per circuit	kg	4,4	5,0	7,0	7,3	10,0	13,0	18,0
Electrical power supply								
Electrical power supply	V / ph / Hz				400 / 3 / 50 + N + T			



REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 2 circuits - single compressors

PWE		442 K	532 K	612 K	762 K	922 K	1262 K	1552 K	1912 K
Cooling capacity									
Cooling capacity	kW	40,3	49,1	55,8	68,9	84,0	112,0	141,0	174,0
Nominal input power	kW	12,0	14,4	16,7	20,9	24,9	33,5	41,7	50,3
EER		3,36	3,41	3,34	3,30	3,37	3,34	3,38	3,46
Heating capacity	kW	52,3	63,5	72,5	89,8	108,9	145,5	182,7	224,3
Scroll compressors									
Quantity	n.					2			
Circuits	n.					2			
Standard capacity steps	%				0 / 50	/ 100			
Nominal input current	A	26,0	30,0	32,0	36,0	44,0	56,0	72,0	85,0
Maximum input current	A	34,0	40,0	44,0	54,0	64,0	82,0	104,0	125,0
Inrush current	A	116,0	143,0	149,0	194,0	230,0	266,0	324,0	373,0
Evaporator									
Туре					Weld-bra	zed plate			
Quantity	n.			2		·		1	
Circuits	n.					2			
Water flow	m³/h	6,9	8,4	9,6	11,8	14,4	19,3	24,2	29,9
Water flow	l/s	1,9	2,3	2,7	3,3	4,0	5,3	6,7	8,3
Pressure drop	kPa	21	23		30	32	30	34	39
Water cooled condenser									
Туре					Weld-bra	ized plate			
Quantity	n.			2				1	
Water flow	m³/h	9,0	10,9	12,5	15,4	18,7	25,0	31,4	38,6
Water flow	l/s	2,5	3,0	3,5	4,3	5,2	6,9	8,7	10,7
Pressure drop	kPa	34	37	4	48	51	41	42	51
Sound pressure level									
Sound pressure at 1 m	dB(A)	7	0	74	76		73		77
Dimensions									
Length	mm				1	500			
Width	mm				7	50			
Height	mm			1.600				1.800	
Transport weight	kg	496	516	525	545	596	721	795	859
Weight in operation	kg	502	523	533	555	608	738	815	883
Refrigerant charge per circuit	kg	2,0		2,4	3,1	3,7	5,5	6,7	7,9
Electrical power supply									
Electrical power supply	V / ph / Hz				400/3/	50 + N + T			



REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 2 circuits - tandem compressors

PWE		892 K	1082 K	1212 K	1512 K	1852 K	2462 K	3102 K	3822 K		
Cooling capacity											
Cooling capacity	kW	80,4	97,0	111,0	138,0	169,0	223,0	281,0	350,0		
Nominal input power	kW	24,0	29,4	33,5	41,9	50,1	67,0	83,6	100,0		
EER		3,35	3,30	3,31	3,29	3,37	3,33	3,36	3,50		
Heating capacity	kW	104,4	125,9	144,5	179,9	219,1	290,0	364,6	450,0		
Scroll compressors											
Quantity	n.				4 (2 ta	indem)					
Circuits	n.					2					
Standard capacity steps	%				0 / 25 / 5) / 75 / 100					
Nominal input current	A	51,0	61,0	63,0	72,0	89,0	112,0	144,0	169,0		
Maximum input current	A	68,0	80,0	88,0	108,0	128,0	164,0	208,0	250,0		
Inrush current	A	150,0	183,0	193,0	244,0	294,0	348,0	428,0	498,0		
Evaporator											
Туре			Weld-brazed plate								
Quantity	n.			1				2			
Circuits	n.					2					
Water flow	m³/h	13,8	16,6	19,1	23,7	29,1	38,4	48,3	60,2		
Water flow	l/s	3,8	4,6	5,3	6,6	8,1	10,6	13,4	16,7		
Pressure drop	kPa	32	35	37	38		30	32	34		
Water cooled condenser											
Туре					Weld-br	azed plate					
Quantity	n.			1				2			
Water flow	m³/h	17,9	21,6	24,8	30,9	37,6	49,9	62,7	77,4		
Water flow	l/s	5,0	6,0	6,9	8,6	10,5	13,9	17,4	21,5		
Pressure drop	kPa	32	37		41	48	49	53	62		
Sound pressure level											
Sound pressure at 1 m	dB(A)	72		73		5	78	80	82		
Dimensions											
Length	mm		2	500			3	000			
Width	mm					50					
Height	mm				1.	800					
Transport weight	kg	862	884	916	956	1.096	1.338	1`498	1.620		
Weight in operation	kg	873	897	931	974	1.154	1'370	1.239	1.725		
Refrigerant charge per circuit	kg	3,7	4,3	4,9	6,1	9,2	10,0	13,0	18,0		
Electrical power supply											
Electrical power supply	V / ph / Hz				400 / 3 /	50 + N + T					



REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 1 circuit - tandem compressors

PWE		341 Ka	401 Ka	491 Ka	591 Ka	711 Ka	971 Ka	1201 Ka
Cooling capacity								
Cooling capacity	kW	32,0	37,4	45,3	54,1	72,3	89,1	112,0
Nominal input power	kW	10,0	11,4	14,1	16,8	21,7	27,3	33,6
EER		3,20	3,29	3,21	3,22	3,33	3,26	3,33
Heating capacity	kW	42,0	48,8	59,4	70,9	94,0	116,4	145,6
Scroll compressors								
Quantity	n.				2 (1 tandem)			
Circuits	n.				1			
Standard capacity steps	%				0 / 50 / 100			
Nominal input current	A	22,0	25,0	30,8	34,8	41,4	52,0	65,2
Maximum input current	A	40,0	44,0	54,0	64,0	82,0	104,0	125,0
Inrush current	A	143,0	149,0	194,0	230,0	266,0	324,0	373,0
Evaporator								
Туре					Weld-brazed plate			
Quantity	n.				1			
Circuits	n.				1			
Water flow	m³/h	5,5	6,4	7,8	9,3	12,4	15,3	19,3
Water flow	l/s	1,5	1,8	2,2	2,6	3,5	4,3	5,4
Pressure drop	kPa	18	19		22	16	19	20
Water cooled condenser								
Туре					Weld-brazed plate			
Quantity	n.				1			
Water flow	m³/h	7,2	8,4	10,2	12,2	16,2	20,0	25,0
Water flow	l/s	2,0	2,3	2,8	3,4	4,5	5,6	7,0
Pressure drop	kPa	65	57	61	66	47	57	65
Sound pressure level								
Sound pressure at 1 m	dB(A)	7	0		72	75	77	79
Dimensions								
Length	mm				1.200			
Width	mm				750			
Height	mm			600			1`800	
Transport weight	kg	498	514	528	579	699	763	833
Weight in operation	kg	504	521	535	588	713	779	854
Refrigerant charge per circuit	kg	3,7	4,4	5,0	6,3	9,0	10,0	13,0
Electrical power supply								
Electrical power supply	V / ph / Hz				400 / 3 / 50 + N + T			



REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 2 circuits - single compressors

PWE		282 Ka	352 Ka	402 Ka	492 Ka	592 Ka	772 Ka	972 Ka	1222 Ka
Cooling capacity									
Cooling capacity	kW	26,2	32,5	37,0	45,6	54,7	71,4	89,6	112,0
Nominal input power	kW	8,3	9,9	11,5	14,0	16,7	21,8	27,0	33,5
EER		3,16	3,28	3,22	3,26	3	3,27	3,32	3,34
Heating capacity	kW	34,5	42,4	48,5	59,6	71,4	93,2	116,6	145,5
Scroll compressors									
Quantity	n.					2			
Circuits	n.					2			
Standard capacity steps	%				0 / 50) / 100			
Nominal input current	A	20,0	22,0	25,0	31,0	35,0	42,0	52,0	65,0
Maximum input current	A	34,0	40,0	44,0	54,0	64,0	82,0	102,0	125,0
Inrush current	A	116,0	143,0	149,0	194,0	230,0	266,0	324,0	373,0
Evaporator									
Туре					Weld-bra	azed plate			
Quantity	n.					2			
Circuits	n.					2			
Water flow	m³/h	4,5	5,6	6,4	7,8	9,4	12,3	15,4	19,3
Water flow	l/s	1,2	1,5	1,8	2,2	2,6	3,4	4,3	5,3
Pressure drop	kPa		14	18	20	19	26	24	25
Water cooled condenser									
Туре					Weld-bra	azed plate			
Quantity	n.					2			
Water flow	m³/h	5,9	7,3	8,3	10,2	12,3	16,0	20,1	25,0
Water flow	l/s	1,6	2,0	2,3	2,8	3,4	4,4	5,6	6,9
Pressure drop	kPa	46	36	47	44	47	42	40	50
Sound pressure level									
Sound pressure at 1 m	dB(A)	69		70	7	2	75	77	79
Dimensions									
Length	mm				1	500			
Width	mm				7	50			
Height	mm			1.600				1.800	
Transport weight	kg	488	500	510	532	584	683	757	821
Weight in operation	kg	492	507	516	570	593	694	772	839
Refrigerant charge per circuit	kg	1,5		2,0	2,4	3,1	3,7	4,9	6,1
Electrical power supply									
Electrical power supply	V / ph / Hz				400/3/	50 + N + T			



REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 2 circuits - tandem compressors

PWE		572 Ka	702 Ka	802 Ka	992 Ka	1192 Ka	1522 Ka	1952 Ka	2442 Ka
Cooling capacity									
Cooling capacity	kW	52,2	64,0	75,0	91,0	109,0	145,0	178,0	225,0
Nominal input power	kW	16,3	20,1	23,0	28,1	33,6	43,4	54,6	66,4
EER		3,20	3,18	3,26	3	3,24	3,34	3,26	3,39
Heating capacity	kW	68,5	84,1	97,8	119,3	142,6	188,4	232,6	291,4
Scroll compressors									
Quantity	n.				4 (2 t	andem)			
Circuits	n.					2			
Standard capacity steps	%				0 / 25 / 5	0 / 75 / 100			
Nominal input current	A	39,0	44,0	50,0	62,0	70,0	83,0	104,0	129,0
Maximum input current	A	68,0	80,0	88,0	108,0	128,0	164,0	208,0	250,0
Inrush current	A	150,0	183,0	193,0	244,0	294,0	348,0	428,0	498,0
Evaporator	· · ·		· · · ·	· · · ·	· · ·	· · · ·			
Туре					Weld-bi	razed plate			
Quantity	n.		2		1			2	
Circuits	n.					2			
Water flow	m³/h	8,9	11,0	12,9	15,7	18,7	24,9	30,6	38,7
Water flow	l/s	2,5	3,1	3,6	4,4	5,2	6,9	8,5	10,7
Pressure drop	kPa	22	18	21	25	24	16	19	21
Water cooled condenser									
Туре					Weld-bi	razed plate			
Quantity	n.		2		1			2	
Water flow	m³/h	11,8	14,5	16,8	20,5	24,5	32,4	40,0	50,1
Water flow	l/s	3,3	4,0	4,7	5,7	6,8	9,0	11,1	13,9
Pressure drop	kPa	43	65	47	41	48	47	57	50
Sound pressure level									
Sound pressure at 1 m	dB(A)	72		73		75	78	80	82
Dimensions									
Length	mm		2	500			3.	000	
Width	mm					750			
Height	mm				1	800			
Transport weight	kg	835	865	903	930	1.033	1'306	1.434	1.222
Weight in operation	kg	843	876	916	945	1.021	1.334	1.466	1.616
Refrigerant charge per circuit	kg	2,7	3,7	4,3	4,9	6,1	9,0	10,0	13,0
Electrical power supply			· · ·						
Electrical power supply	V / ph / Hz				400/3/	50 + N + T			



REFRIGERANT R407C - R134A



Series PWH

Cooling capacity from 74 to 2098 kW - from 1 to 3 circuits

The water cooled heat pumps of **PWH series** are designed for indoor installation and are particularly suitable for industrial processes and air conditioning systems.

Depending on the cooling capacity, they are available with 1, 2 or 3 cooling circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install also in small spaces, with no building works. They are completely assembled and tested in the factory and supplied with refrigerant and non-freezing oil charge. Therefore, once on site, the units only need to be positioned and electrically and hydraulically connected.

WARNING: units with inversion on water side (and not on refrigerant side) to be realized at customer's care during installation

The following versions are available: **PWH...K** with R407C ecological refrigerant charge **PWH...Ka** with R134a ecological refrigerant charge

Water operation limits (standard units):

EVAPORATOR (OUT): from 5 to 15°C CONDENSER (OUT): from 30 to 50°C for R407C - from 30 to 55°C for R134a

Main components:

Strong and compact frame, made of bended and coloured steel profiles (colour RAL 9005-black), supporting the exchangers of the evapo-condensers group and on which all the main components are installed at sight. On request, the compressors can be isolated by a soundproofing cabinet with standard material (option CF) or with bituminous rubber coated material (option CFU), so to further reduce the overall sound level of the unit itself.

Semi-hermetic screw compressors equipped with capacity steps, motor thermal protection, oil crankcase heater and phase monitor. The compressors lubrication is of forced type, with no pump and in order to prevent many oil migrations to the cooling circuit, the compressors are provided with an oil separator, in-built

to the discharge side. The electrical motor is foreseen for lower inrush current and, in this is case, the unit is equipped with an automatic partial load inrush device and mechanical interlock of the inrush control switches, to prevent accidental short circuits (options DS and PW).

Dry expansion **shell and tube evaporator** with two refrigerant circuits and one water circuit, with very low pressure drops. Shell and tubes plate made in carbon steel and copper tubes. Some plastic and corrosion-proof baffles are suitably placed inside the shell, allowing a correct water distribution and making the tube bundle particularly strong and vibration-free, also in case of very high water flows.

Shell and tube condensers with copper pipes, externally grooved to increase the heating exchange coefficient and tube bundle in carbon steel. On request, the condenser is also available in cupro-nichel suitable for sea water use (option CA).

Each compressor works on an independent **cooling circuit**, assuring a remarkable reliability to multi-compressor units. Each circuit, made of copper or carbon steel tube, is composed of thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges, non-return valve on discharge side, shutoff valve on liquid line.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a lock-door main switch. Inside, it is complete with all control and protection switches, the terminal board and auxiliaries. The electrical board also includes the control device for power supply phases, to prevent the compressor to turn in the wrong sense. The micro-processor, complete with display, is also placed inside the electrical board.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the chilled water temperature regulation, the working parameters, auto-detection failure system, remote management and supervision, complete with compressors hour counter.



REFRIGERANT R407C - R134A

Accessories

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- CA Condensers suitable for seawater: made in cupro-nichel or titanium, to be selected on request, suitable for working with seawater.
- CC Insulated condensers: insulation on condensers heads and side (10 mm thickness).
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with soundproofing material and vibration dampers under compressors.
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with bituminous rubber soundproofing material and vibration dampers under compressors, mufflers on compressors discharge pipes.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- DQ Additional box for connection of power supply cables
- **DS Star/delta**: electric device of close transition type to reduce the inrush current, complete with short circuit safety by mechanical interlock.
- IE Fumigated wooden crate packing: available on request for critical transports, so to assure a suitable protection to the unit.
- IG Watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- IR Packing with fumigated wooden pallet and transparent film: minimal packing made of wooden pallet and transparent film wrapped all around the unit.
- LI Liquid injection: mechanical device allowing a better cooling of compressors at very high compression level (standard for R407C).
- KS Lifting kit: made of belts and brackets to be inserted into the holes present in the unit base-frame. It is used for moving and positioning the unit on site.
- M8-M25 Modulating capacity control: by means of some valves installed on compressors, depending on their quantity, the capacity is modulated from 8 to 100%.
- OS Oil flow safety switch: in-built in the compressor oil separator, it indicates the eventual decrease of the oil level.

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PW Part-winding: equipment for step compressors starting, reducing of about 35% the inrush current of each compressor.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RF Power factor correction system cosfi >0,9: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- RH Shut-off valve on suction side: they are use to isolate compressors during service operations.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification.
- TC Victaulic joints and welding coupling for condenser connection to water circuit.
- TE Electronic thermostatic valve: it is requested to make a very accurate regulation of the refrigerant flow and to limit variations of cooling capacity and evaporator leaving temperature water during operation in transitions and for a better performance with fixed superheating.
 - **Voltmeter**: Electrical device measuring the electrical tension in the power supply of the unit.

v

- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 1 circuit

PWH		131 K	161 K	191 K	211 K	241 K	301 K	341 K	391 K	531 K	611 K	691 K	731 K	831 K
Cooling capacity														
Cooling capacity	kW	100,1	125,0	146,0	169,0	193,0	242,0	278,0	319,0	419,0	477,0	546,0	625,0	701,0
Nominal input power	kW	39,0	48,3	56,5	65,3	73,5	88,7	102,0	114,0	151,0	173,0	194,0	222,0	248,0
EER		2,60	2,59	2,58	2,59	2,62	2,73	2,72	2,80	2,77	2,76	2,	81	2,83
Heating capacity	kW	139,0	173,0	202,0	234,0	266,0	331,0	379,0	433,0	569,0	650,0	740,0	847,0	949,0
Screw compressors											, .			
Quantity	n.							1						
Cooling circuits	n.							1						
Standard capacity steps	n.							3						
Modulating capacity steps (option)	%							0-25÷100)					
Nominal input current	A	67,0	82,0	95,0	109,0	119,0	147,0	170,0	190,0	239,0	283,0	315,0	359,0	399,0
Maximum input current	A	86,0	108,0	128,0	144,0	162,0	180,0	216,0	246,0	330,0	370,0	420,0	45	0,0
nrush current	A	411,0	508,0	485,0	585,0	686,0	801,0	943,0	1.023,0	1.442,0	1.853,0	2.029,0	2.2	20,0
nrush current with options PW/DS	A	218,0	269,0	290,0	350,0	423,0	520,0	612,0	665,0	1.009,0	1'297,0	1'420,0	1.2	64,0
Evaporator														
Type								Shell and tub	e					
Quantity	n.							1						
Circuits	n.							1						
Water flow	m³/h	17,2	21,5	25,1	29,1	33,2	41,6	47,8	54,9	72,1	82,0	93,9	107,5	120,6
Water flow	l/s	4,8	6,0	7,0	8,1	9,2	11,6	13,3	15,2	20,0	22,3	26,1	29,9	33,5
Pressure drop	kPa	45	50	43	38	30	53	52	53	39	50	51	53	41
Water volume		44	42	3	9	37	86	82	79	1	85	179	2	94
Water cooled condenser														
Туре								Shell and tub	e					
Quantity	n.							1						
Water flow	m³/h	23,9	29,8	34,7	40,2	45,8	56,9	65,2	74,5	97,9	111,8	127,3	145,7	163,2
Water flow	l/s	6,6	8,3	9,6	11,2	12,7	15,8	18,1	20,7	27,2	31,1	35,4	40,5	45,3
Pressure drop	kPa	71	75	74	76	77	67	70	67	7	/1	68	53	69
Water volume		21	25	29	36	39	45	50	60	76	86	102	113	128
Sound pressure level														
Sound pressure at 1 m	dB(A)	70		76		7	7	80	81	82	83	84	85	87
Dimensions														
Length	mm			2'430			3.	310	3'340			3.200		
Width	mm		800		8	50	8	00	850			1'300		
Height	mm		1.222		11	510	11	525	1.610			1.900		
Length with CF/CFU	mm			2'430			3.	310	3'340			3.200		
Width with CF/CFU	mm		800				850					1'300		
Height with CF/CFU	mm		1.225		1	510	11	525	1.610			1.900		
Transport weight	kg	909	926	1.168	1.262	1.588	1.688	1.716	1.900	3'464	3.203	3.696	3.888	3`979
Weight in operation	kg	974	993	1.232	1'340	1'365	1`819	1`849	2.040	3.724	3.774	3.928	4`304	4`401
Refrigerant charge per circuit	kg	25,0	24,0	23,0	45,0	44,0	50,0	48,0	94,0	91,0	86,0	63,0	77,0	91,0
Electrical power supply														
lectrical power supply	V / ph / Hz							400/3/50+	т					

REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 2 and 3 circuits

PWH		252 K	312 K	372 K	422 K	472 K	592 K	672 K	772 K	1062 K	1222 K	1392 K	1462 K	1652 K	1933 K	2203 K	2493 K
Cooling capacity																	
Cooling capacity	kW	208,0	250,0	294,0	339,0	390,0	483,0	552,0	639,0	835,0	960,0	1`093,0	1.531,0	1`404,0	1`647,0	1`858,0	2.098,0
Nominal input power	kW	77,5	96,6	112,0	130,0	146,0	177,0	203,0	229,0	297,0	347,0	389,0	443,0	497,0	583,0	665,0	745,0
EER		2,68	2,59	2,62	2,61	2,67	2,73	2,72	2,79	2,81	2,77	2,81	2,78	2,	82	2,79	2,82
Heating capacity	kW	285,0	347,0	406,0	469,0	535,0	660,0	755,0	868,0	1`131,0	1`307,0	1'482,0	1`674,0	1 [.] 901,0	2`231,0	2`524,0	2`843,0
Screw compressors																	
Quantity	n.							2								3	
Cooling circuits	n.							2								3	
Standard capacity steps	n.							6								9	
Modulating capacity steps (option)	%						() — 12 ÷ 10	0							0 – 8 ÷ 10	0
Nominal input current	A	133,0	163,0	187,0	217,0	235,0	294,0	339,0	379,0	471,0	566,0	630,0	716,0	797,0	946,0	1`075,0	1.196,0
Maximum input current	A	172,0	216,0	256,0	288,0	324,0	360,0	432,0	492,0	660,0	740,0	840,0	90	0,0	1`260,0	1.3	350,0
Inrush current	A	497,0	616,0	613,0	729,0	848,0	981,0	1`159,0	1`269,0	1.772,0	2`223,0	2`449,0	2.9	70,0	2`869,0	3.4	420,0
Inrush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0	828,0	911,0	1`339,0	1.667,0	1.840,0	2.5	14,0	2`260,0	2.6	664,0
Evaporator																	
Туре									Shell a	nd tube							
Quantity	n.									1							
Circuits	n.							2								3	
Water flow	m³/h	35,8	43,0	50,6	58,3	67,1	83,1	94,9	109,9	143,6	165,1	188,0	211,7	241,5	283,3	319,7	360,9
Water flow	l/s	9,9	11,9	14,0	16,2	18,6	23,1	26,4	30,5	39,9	45,9	52,2	58,8	67,1	78,7	88,8	100,2
Pressure drop	kPa	46	52	49	45	36	51	52	34	39	26	47	33	65	50	64	26
Water volume		1	34	1	29	124	185	179	294	286	271	264	461	444	648	632	615
Water cooled condenser																	
Туре									Shell a	nd tube							
Quantity	n.							2								3	
Water flow	m³/h	49,0	59,7	69,8	80,7	92,0	113,5	129,9	149,3	194,5	224,8	254,9	287,9	327,0	383,7	434,1	489,0
Water flow	l/s	13,6	16,6	19,4	22,4	25,6	31,5	36,1	41,5	54,0	62,4	70,8	80,0	90,8	106,6	120,6	135,8
Pressure drop	kPa	60	69	62	69	65	67	69	68	61	72	68	71	6	9	72	69
Water volume	I	43	49	59	64	75	90	101	121	162	173	205	226	257	307	338	385
Sound pressure level																	
Sound pressure at 1 m	dB(A)	73		79		8	0	83	84	85	86	87	88	90	89	90	92
Dimensions																	
Length	mm	3.	750		3.860			3.800					51	200			
Width	mm	7	50		900			1.000				1.300				2.000	
Height	mm			1.260				1.990					2	370			
Length with CF/CFU	mm	3.	750		3`860			3.990					51	200			
Width with CF/CFU	mm	7	50		900			1.000				1.300				2.000	
Height with CF/CFU	mm	1	790		1.840			1.990					2.4	450			
Transport weight	kg	1.858	1.838	2'348	2:376	2.422	3'376	3'426	3`895	6.056	6 [°] 104	6'483	7.006	7.184	9`834	10 [°] 195	10.23
Weight in operation	kg	2.002	2.050	2.235	2.269	2.623	3`651	3.206	4`309	6'475	6`548	6.92	7.693	7`884	10`789	11.165	11.23
Refrigerant charge per circuit	kg	58,0	57,0	55,0	54,0	52,0	50,0	48,0	96,0	87,0	86,0	63,0	73,0	90,0	69,0	80,0	95,0
Electrical power supply																	
Electrical power supply	V / ph / Hz								400/3	(-

REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 1 circuit

PWH		91 Ka	111 Ka	131 Ka	151 Ka	171 Ka	211 Ka	241 Ka	271 Ka	321 Ka	361 Ka	421 Ka	481 Ka	541 Ka	621 Ka	721 Ka	771 Ka	
Cooling capacity																	-	
Cooling capacity	kW	74,5	92,4	109,0	129,0	142,0	168,0	184,0	239,0	267,0	303,0	353,0	409,0	459,0	506,0	573,0	617,0	
Nominal input power	kW	23,1	28,6	35,4	38,9	43,9	51,4	57,3	70,5	79,0	90,0	103,0	118,0	137,0	150,0	173,0	184,0	
EER		3,22	3,23	3,08	3,32	3,23	3,27	3,21	3,39	3,38	3,37	3,43	3,47	3,35	3,37	3,31	3,35	
Heating capacity	kW	97,6	121,0	144,0	168,0	186,0	219,0	241,0	310,0	346,0	393,0	456,0	528,0	596,0	656,0	746,0	801,0	
Screw compressors														,				
Quantity	n.									1								
Cooling circuits	n.									1								
Standard capacity steps	n.									3								
Modulating capacity steps (option)	%								0 - 25	÷ 100								
Nominal input current	A	43,0	50,0	61,0	69,0	77,0	88,0	95,0	120,0	136,0	154,0	170,0	189,0	227,0	247,0	284,0	310,0	
Maximum input current	A	56,0	65,0	79,0	98,0	124,0	144,0	155,0	182,0	215,0	231,0	280,0	310,0	320,0	360,0	450,0	566,0	
Inrush current	A	305,0	338,0	355,0	449,0	485,0	585,0	675,0	801,0	943,0	1.023,0	1'364,0	1'442,0	1.823,0	2.029,0	2.2520,0	2.820,0	
Inrush current with options PW/DS	A	153,0	169,0	206,0	267,0	290,0	350,0	439,0	520,0	612,0	664,0	955,0	1.009,0	1.297,0	1.420,0	1.764,0	2.009,0	
Evaporator																, <u> </u>	· · ·	
Туре									Shell a	nd tube								
Quantity	n.									1								
Circuits	n.									1								
Water flow	m³/h	12,8	15,9	18,7	22,2	24,4	28,9	31,6	41,1	45,9	52,1	60,7	70,3	78,9	87,0	98,6	106,2	
Water flow	I/s	3,6	4,4	5,2	6,2	6,8	8,0	8,8	11,4	12,8	14,5	16,9	19,5	21,9	24,2		29,5	
Pressure drop	kPa	43	39	48	42	39	40	48	44	42		5	43		4	51	39	
Water volume		42	39	37	8	6	5	6	129	124	119	179	173	294	286	141	262	
Water cooled condenser																		
Туре									Shell a	nd tube								
Quantity	n.									1								
Water flow	m³/h	16,8	20,8	24,8	28,9	32,0	37,7	41,5	53,3	59,5	67,6	78,4	90,8	102,5	112,8	128,2	137,9	
Water flow	l/s	4,7	5,8	6,9	8,0	8,9	10,5	11,5	14,8	16,5	18,8	21,8	25,2	28,5	31,3	35,6	38,3	
Pressure drop	kPa	20	23	25	. 2	27	22	2	20	26	27	26	2	5	24	51	39	
Water volume	1	9	11	13	15	16	19	22	2	7	30	35	40	45	50	83	84	
Sound pressure level				,	,												-	
Sound pressure at 1 m	dB(A)	68		74		75	76	77	79	80	8	1	82	83	84	83	84	
Dimensions																	-	
Length	mm			2'430					3'350					3.	700			
Width	mm					8	00							10	200			
Height	mm					11	525							11	890			
Length with CF/CFU	mm			2'430					3'350					3	700			
Width with CF/CFU	mm			800					850					17	200			
Height with CF/CFU	mm					11	525							11	890			
Transport weight	kg	674	683	1.113	1.187	1.197	1.524	1.264	1.202	1.732	1.755	2.842	3.010	3.133	3.196	3`324	3.223	
Weight in operation	kg	725	733	1.164	1.588	1.299	1.329	1'342	1.863	1.882	1.903	2.996	3.221	3'342	3.411	3.231	3.913	
Refrigerant charge per circuit	kg	15,0	14,0	30,0	31,0	30,0	62,0	60	0,0	6	1,0	41,0	53,0	59,0	60,0	61,0	90,0	
Electrical power supply						· · ·												
																60,0 450,0 60,0 450,0 029,0 2'520,0 420,0 1'764,0 37,0 98,6 124,2 27,4 51 286 141 355,6 24 51 50 83 84 83		



REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 2 circuits

PWH		182 Ka	222 Ka	252 Ka	292 Ka	332 Ka	412 Ka	472 Ka	542 Ka	642 Ka	732 Ka
Cooling capacity											
Cooling capacity	kW	150,0	184,0	218,0	259,0	284,0	331,0	367,0	481,0	535,0	603,0
Nominal input power	kW	46,1	57,3	70,7	77,5	87,8	103,0	115,0	141,0	158,0	180,0
EER		3,25	3,21	3,08	3,34	3,23	3,21	3,19	3,41	3,39	3,35
Heating capacity	kW	196,0	241,0	289,0	337,0	371.0	434,0	482,0	623,0	692,0	784,0
Screw compressors		,	,								
Quantity	n.						2				
Cooling circuits	n.						2				
Standard capacity steps	n.						б				
Modulating capacity steps (option)	%					0 - 12	÷ 100				
Nominal input current	A	85,0	101.0	122,0	137,0	153.0	176.0	189.0	239.0	272,0	307,0
Maximum input current	A	112,0	130,0	158,0	196,0	248,0	288,0	310,0	364,0	430,0	462,0
Inrush current	A	361,0	403,0	434,0	547,0	609.0	729,0	830,0	983,0	1.128,0	1.2254,0
Inrush current with options PW/DS	A	209,0	234,0	285,0	365,0	414,0	578,0	594,0	702,0	827,0	895,0
Evaporator		207,0	25 1/0	20070	505/0	,•	51 6/6	55 1,0	, 02,0	02.70	0,0,0
Type						Shell a	nd tube				
Quantity	n.						1				
Circuits	n.						2				
Water flow	m³/h	25,8	31,6	37,5	44,5	48.8	56,9	63,1	82,7	92,0	103,7
Water flow	/s	7,2	8,8	10,4	12,4	13.6	15,8	17,5	23,0	25,6	28,8
Pressure drop	kPa	35	48	37	40	31	42	38	40	30	41
Nater volume		59	56	129		24	119	113	168	286	279
Water cooled condenser				127			,		100	200	2.77
Гуре						Shell a	nd tube				
Quantity	n.						2				
Water flow	m³/h	33,7	41,5	49,7	58,0	63,8	74,6	82,9	107,2	119,0	134,8
Water flow	/s	9,4	11,5	13,8	16,1	17.7	20.7	23,0	29.8	33.1	37,5
Pressure drop	kPa	15	23	20	18	22	21	20	21	26	27
Water volume			0	25		30	38	43		54	59
Sound pressure level											
Sound pressure at 1 m	dB(A)	71		77		78	79	80	82	83	84
Dimensions	(-)										
Length	mm	3.	750			3.860				3.900	
Width	mm		50			900				1.000	
Height	mm		710			1.790			1.990		030
Length with CF/CFU	mm		750			3.860			1 770	3.990	
Width with CF/CFU	mm		50			900				1.000	
Height with CF/CFU	mm		710		1.260	700	1'	840	1.990		030
Fransport weight	kg	1.525	1.261	1.802	1.851	1.863	2'386	2.414	3.329	3.216	3.222
Weight in operation	kg	1.334	1'337	1.961	2.002	2.016	2.542	2 414	3.551	3.826	3.894
Refrigerant charge per circuit	kg	30,0	31,0	30,0		9,0	61,0		0,0	62,0	61,0
Electrical power supply	ку	20,0	51,0	50,0	2	9,0	01,0	0	0,0	02,0	01,0
Electrical power supply	V / ph / Hz					/00 / 2	/ 50 + T				
lecuical power supply	v / pii / HZ					400/3	1 + 00				

REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 2 and 3 circuits

Cooling capacity Cooling capacity Nominal input power EER Heating capacity Screw compressors Quantity Cooling circuits Standard capacity steps Modulating capacity steps Modulating capacity steps (option) Nominal input current Maximum input current Inrush current Inrush current Inrush current with options PW/DS	kW kW kW n. n. n. 96 A A A A A A A	701,0 206,0 3,40 907,0 339,0 560,0 1 `644,0	814,0 237,0 3,43 1 '051,0 378,0 620,0		÷ 100	1`153,0 345,0 3,34 1`499,0	1`233,0 368,0 3,35 1`602,0	1`369,0 410,0 1`779,0		1'733,0 518,0 2'251,0 3 3	1`853,0 553,0 3,35 2`405,0			
Nominal input power EER Heating capacity Screw compressors Quantity Cooling circuits Standard capacity steps Modulating capacity steps (option) Nominal input current Maximum input current Inrush current Inrush current with options PW/DS	kW kW n. n. n. % A A A A	206,0 3,40 907,0 339,0 560,0	237,0 3,43 1`051,0 378,0	274,0 3,36 1 193,0	299,0 3,37 1:308,0 2 2 6 ÷ 100	345,0 3,34	368,0 3,35	410,0	449,0 3,34 1`951,0	518,0 2`251,0 3	553,0 3,35			
EER Heating capacity Screw compressors Quantity Cooling circuits Standard capacity steps Modulating capacity steps (option) Nominal input current Maximum input current Inrush current Inrush current with options PW/DS	n. n. n. % A A A A	3,40 907,0 339,0 560,0	3,43 1`051,0 378,0	3,36 1 193,0	3,37 1'308,0 2 2 6 ÷ 100	3,34	3,35		3,34 1`951,0	2.2251,0	3,35			
Heating capacity Screw compressors Quantity Cooling circuits Standard capacity steps Modulating capacity steps (option) Nominal input current Maximum input current Inrush current Inrush current with options PW/DS	n. n. % A A A A A	907,0 339,0 560,0	1.021,0	1 193,0	1'308,0 2 2 6 ÷ 100	,		1`779,0	1`951,0	3				
Screw compressors Quantity Cooling circuits Standard capacity steps Modulating capacity steps (option) Nominal input current Maximum input current Inrush current Inrush current with options PW/DS	n. n. % A A A A A	339,0 560,0	378,0	0-12	2 2 6 ÷ 100	1 ⁻ 499,0	1`602,0	1'779,0		3	2`405,0			
Quantity Cooling circuits Standard capacity steps Modulating capacity steps (option) Nominal input current Maximum input current Inrush current Inrush current with options PW/DS	n. n. % A A A A	560,0	· · · · · · · ·	0 – 12	2 6 1 ÷ 100									
Cooling circuits Standard capacity steps Modulating capacity steps (option) Nominal input current Maximum input current Inrush current Inrush current with options PW/DS	n. n. % A A A A	560,0	· · · · · · · ·	0 – 12	2 6 1 ÷ 100									
Standard capacity steps Modulating capacity steps (option) Nominal input current Maximum input current Inrush current Inrush current with options PW/DS	n. % A A A	560,0	· · · · · · · ·	0 – 12	6 .÷ 100					3				
Modulating capacity steps (option) Nominal input current Maximum input current Inrush current Inrush current with options PW/DS	% A A A A	560,0	· · · · · · · ·	0 - 12	÷ 100						3			
Nominal input current Maximum input current Inrush current Inrush current with options PW/DS	A A A	560,0	· · · · · · · ·				6							
Maximum input current Inrush current Inrush current with options PW/DS	A A	560,0	· · · · · · · ·	455,0	1	0 – 12 ÷ 100								
Inrush current Inrush current with options PW/DS	A	,	620.0		493,0	569,0	620,0	682,0	740,0	853,0	930,0			
nrush current nrush current with options PW/DS		1.644,0	020,0	640,0	720,0	900,0	1.132,0	960,0	1.080,0	1.350,0	1.698,0			
	A		1.752,0	2.173,0	2.389,0	2'970,0	3'436,0	2.493,0	2.749,0	3.420,0	4.002,0			
		1.235.0	1:319,0	1.617,0	1.780.0	2.214,0	2.575,0	1.937.0	2.140.0	2.664.0	3.141,0			
Evaporator						,								
Гуре		Shell and tube												
Quantity	n.	1												
Circuits	n.				2					3				
Vater flow	m ³ /h	120,6	140,0	158,2	173,5	198,4	212,1	235,5	258,3	298,1	318,6			
Vater flow	/s	33,5	38,9	44,0	48,2	55,1	58,9	65,4	71,8	82,8	88,5			
Pressure drop	kPa		3	64	37	51	39	38	44	41	46			
Vater volume		271 461 444 435 398						648 632 764						
Water cooled condenser			101		155			010	032	· ·				
lype						Shell a	nd tube							
Quantity	n.	2 3												
Water flow	m ³ /h	156,0	180,8	205,2	225,0	257,8	275,4	306.0	335.6	388,8	414.0			
Water flow	l/s	43,3	50,2	57,0	62,5	71,6	76,5	85,0	93,2	108,0	115.0			
Pressure drop	kPa	10/0	25	57,0	24	51	39	40	42	51	39			
Water volume		69	80	90	101	132	155	135	151	198	232			
Sound pressure level						102	155	155	191		252			
Sound pressure at 1 m	dB(A)	84	85	86	87	86	87	88	89	88	89			
Dimensions	45(1)	01	05		0,		0.							
Length	mm	5'300 5'100												
Width	mm	1`300						2'400						
Height	mm	2.420						2.480						
ength with CF/CFU	mm	5'300						5.100						
Vidth with CF/CFU	mm	1:300						2.400						
leight with CF/CFU	mm	2.500						2 400						
ransport weight	kq	5:327	5.22	5.757	5.898	6.392	6.21	8.860	9.077	9.822	10.049			
Neight in operation	kg	5.679	5 322	6.111	6.2258	6.922	7.074	9.262	9 0/7	10.812	10 049			
Refrigerant charge per circuit		50,0	64,0	70,0	72,0	82.0	107,0	90,0	9788	10 817	132,0			
Refrigerant charge per circuit Electrical power supply	kg	50,0	04,0	/0,0	12,0	٥٢,٥	107,0	90,0	94,0	100,0	132,0			
	1/ mb / 11=					400 / 2	/ EQ + T							
Electrical power supply	V / ph / Hz					400/3	/ 50 + 1							

REFRIGERANT R407C



MCE 181 K



Series MCE ... K

Cooling capacity from 4 to 39 kW - 1 circuit

The air cooled condensing units of **MCE K series**, to be matched to remote evaporating units, are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. Therefore during their design, it has been given a particular care for dimensions and sound level, so to have compact and silent units at the same time.

They are all available with 1 refrigerant circuit.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with nitrogen and oil charge.

The following versions are available: **MCE...K** standard version Horizontal air flow for models from 41 to 101 Vertical air flow for models from 131 to 421 **MCE...U K** ultrasilenced version (from size 201)

Operation limits: (standard units): external air temperature from 15 to 45°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service. For size from 41 to 101, the compressor section is still insulated with close-cell polyurethane foam material. High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. Sizel 41 is provided with hermetic piston compressor.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Cooling circuit composed of dehydrating filter, sight glass, safety device, high and low pressure switches, shut-off valve on discharge side, liquid receiver.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



REFRIGERANT R407C

- Electrical power supply different from standard: mainly, 230V AE three-phase, 460V three-phase. Frequency 50/60 Hz. BT Low temperature operation (-20°C): electronic device for the continuous modulating voltage control of the condensing pres-
- sure through the variation of the fan rotation speed. CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors (from size 201).
- GP Condensing coil protection grid: metal protection grid against accidental impacts
- Hot gas by-pass (from model 131): mechanical device for modu-HG lating cooling capacity.
- RS 485 serial interface: electronic card to be connected to mi-IH croprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.

- МТ High and low pressure gauges (from size 131) for measuring circuit pressure.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ÓN/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- Condensing coil with pre-painted fins: superficial treatment of RM
- the condensing coils with epoxy coating. Copper/copper condensing coils: special execution of the con-RR densing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- SC Insulated compressors housing with sound proofing material (available form size 201 and included on ultrasilenced version).
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data - Standard version

MCE		41 K	71 K	101 K	131 K	151 K	161 K	181 K	201 K	241 K	281 K	361 K	421 K
Cooling capacity													
Cooling capacity	kW	4,4	6,7	7,7	10,3	12,2	15,8	16,6	18,0	21,4	25,4	32,9	39,0
Nominal input power	kW	1,6	2,7	3,2	3,6	4,7	5,6	6,2	6,9	8,9	9,9	11,2	14,2
EER		2,75	2,48	2,41	2,86	2,59	2,82	2,68	2,61	2,40	2,56	2,94	2,75
Axial fans													
Quantity	n.		1						2				
Rotation speed	rpm					9	00					80	60
Air flow	m³/h	3.600	3.	850	7.	500	6.6	984	11	200	10.500	16 ⁻	000
Air flow	l/s	1.000	1.	069	2.	083	119	940	3.	111	2.833	4.7	445
Motor input power	kW		0,15			0	,29			0,74		1,	26
Input current	A		0,6			1	,3			3,4		6	,0
Scroll compressors													
Quantity	n.							1					
Circuits	n.		1										
Standard capacity steps	%						0/	100					
Nominal input current	A	3,0	6,2	5,5	5,4	6,3	9,0	10,3	12,2	14,9	16,7	18,5	23,3
Maximum input current	A	6,0	7,0	10,0	12,0	14,0	16,0	18,0	17,0	20,0	22,0	27,0	32,0
Inrush current	A	18,0	26,0	46,0	56,0	68,0	77,0	81,0	99,0	123,0	127,0	167,0	198,0
Electrical data													
Total input power	kW	1,7	2,8	3,3	3,9	5,0	5,9	6,5	7,6	9,6	10,6	12,5	15,5
Sound pressure level													
Sound pressure at 1 m	dB(A)		50		54	1	55	56		62		6	57
Dimensions													
Length	mm		980			1'	100			1.600		2.(000
Width	mm		325					750				8	50
Height	mm		715		1.100			1.560			650		
Transport weight	kg	122	125	128	205	209	226	228	250	255	295	400	415
Electrical power supply													
Electrical power supply	V / ph / Hz						400/3/5	i0 + N + T					

REMARKS: - Operating conditions: External air temperature 35°C; evaporating temperature 2°C - Sound pressure level at 1 m in open field (ISO 3744).

Technical data - Ultrasilenced version

MCE		201 U K	241 U K	281 U K	361 U K	421 U K
Cooling capacity		· · · ·		·		
Cooling capacity	kW	17,5	21,6	26,4	31,9	38,0
Nominal input power	kW	7,2	8,8	9,3	11,8	14,8
EER		2,43	2,45	2,84	2,70	2,57
Axial fans						
Quantity	n.			2		3
Rotation speed	rpm	68	0		650	
Air flow	m³/h	8.000	7.000	11	200	17.400
Air flow	l/s	2.222	1`944	3.	111	4.833
Motor input power	kW	0,4	4	0	,62	0,93
Input current	A	2,7	2		3,1	4,7
Scroll compressors						
Quantity	n.			1		
Circuits	n.			1		
Standard capacity steps	%			0 / 100		
Nominal input current	A	12,5	14,8	16,0	19,3	24,1
Maximum input current	A	17,0	20,0	22,0	27,0	32,0
nrush current	A	99,0	123,0	127,0	167,0	198,0
Electrical data						
Total input power	kW	7,6	9,2	9,9	12,4	15,7
Sound pressure level						
Sound pressure at 1 m	dB(A)	55	i i i i i i i i i i i i i i i i i i i		59	61
Dimensions						
Length	mm	1.6			000	2.130
Width	mm	750		8	350	1.100
Height	mm	1`260		1	650	1.260
Transport weight	kg	256	261	370	400	570
Electrical power supply						
Electrical power supply	V / ph / Hz			400 / 3 / 50 + N + T		

REMARKS:

- Operating conditions: External air temperature 35°C; evaporating temperature 2°C - Sound pressure level at 1 m in open field (ISO 3744).



REFRIGERANT R407C



Series MCE K

Cooling capacity from 44 to 75 kW - 2 circuits

The air cooled condensing units of **MCE K series**, to be matched to remote evaporating units, are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications.

They are all available with 2 refrigerant circuits.

All sizes are standard provided with an isolated compressors section and the external frame is completely closed.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with nitrogen and oil charge.

The following versions are available: MCE...K standard version MCE...U K ultrasilenced version

Operation limits: (standard units): external air temperature from 15 to 45°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. For ultrasilenced version, it is insulated with soundproofing material. The external panels, easy to be dismantled, allow the full access in case of service.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater, when necessary. Being 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Cooling circuit composed of dehydrating filter, sight glass, safety device, high and low pressure switches, shut-off valve on discharge side, liquid receiver.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



REFRIGERANT R407C

- Electrical power supply different from standard: mainly, 230V AE three-phase, 460V three-phase. Frequency 50/60 Hz. Low temperature operation (-20°C): electronic device for the BT continuous modulating voltage control of the condensing pres-
- sure through the variation of the fan rotation speed. CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts
- of compressors GP Condensing coil protection grid: metal protection grid against
- accidental impacts IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- МΤ High and low pressure gauges for measuring circuit pressure.

- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- Remote microprocessor: remote terminal, allowing to display the PQ temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- Condensing coil with pre-painted fins: superficial treatment of RM the condensing coils with epoxy coating.
- Copper/copper condensing coils: special execution of the con-RR densing coils with copper pipe and fins. Personalized frame painting in RAL colour
- RV
- SC Insulated compressors housing with sound proofing material (included on ultra-silenced version).
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.





REFRIGERANT R407C

Technical data - Standard version

MCE		482 K	562 K	702 K	822 K					
Cooling capacity										
Cooling capacity	kW	43,6	49,1	63,8	75,0					
Nominal input power	kW	17,3	20,8	23,5	29,9					
EER		2,52	2,36	2,71	2,51					
Axial fans										
Quantity	n.		3	•						
Rotation speed	rpm		86	j0						
Air flow	m³/h	25	200	21`300						
Air flow	l/s	7'(000	5'917						
Motor input power	kW		1,	9						
Input current	A		9,	0						
Scroll compressors										
Quantity	n.									
Circuits	n.									
Standard capacity steps	%		0 – 50	- 100						
Nominal input current	A	29,0	35,0	38,0 49,0						
Maximum input current	A	40,0	44,0	54,0	64,0					
Inrush current	A	143,0	149,0	194,0	230,0					
Electrical data										
Total input power	kW	19,2	22,7	25,4	31,8					
Sound pressure level										
Sound pressure at 1 m	dB(A)		6	9						
Dimensions										
Length	mm		2'1							
Width	mm			1.100						
Height	mm		1'7							
Transport weight	kg	607	611	682	693					
Electrical power supply										
Electrical power supply	V / ph / Hz		400 / 3 / 5	400 / 3 / 50 + N + T						

REMARKS: - Operating conditions: External air temperature 35°C; evaporating temperature 2°C - Sound pressure level at 1 m in open field (ISO 3744).

Technical data - Ultrasilenced version

MCE		482 U K	562 U K	702 U K							
Cooling capacity											
Cooling capacity	kW	42,1	51,0	60,2							
Nominal input power	kW	18,2	19,7	22,2							
EER		2,31	2,59	2,71							
Axial fans											
Quantity	n.		3								
Rotation speed	rpm		650								
Air flow	m³/h	17 ⁻ 700	14	200							
Air flow	l/s	4`917	3.	945							
Motor input power	kW		0,93								
Input current	A		4,7								
Scroll compressors											
Quantity	n.		2								
Circuits	n.		2								
Standard capacity steps	%		0 - 50 - 100								
Nominal input current	A	30,0	33,0	41,0							
Maximum input current	A	40,0	44,0	54,0							
nrush current	A	143,0	149,0	194,0							
Electrical data											
Total input power	kW	19,1	20,6	21,9							
Sound pressure level											
Sound pressure at 1 m	dB(A)		61								
Dimensions											
Length	mm		2.130								
Width	mm		1.100								
Height	mm		1 760								
Transport weight	kg	614	618	689							
Electrical power supply											
Electrical power supply	V / ph / Hz		400 / 3 / 50 + N + T								

REMARKS:

- Operating conditions: External air temperature 35°C; evaporating temperature 2°C - Sound pressure level at 1 m in open field (ISO 3744).

REFRIGERANT R407C



Series MCE ... K

Cooling capacity from 73 to 288 kW - 2 circuits

The air cooled condensing units of **MCE K series**, to be matched to remote evaporating units, are designed for outdoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications.

They are all available with 2 refrigerant circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces and easily accessible on all sides for ordinary and extraordinary service operations.

They are completely assembled and tested in the factory and supplied with refrigerant and oil charge.

The following versions are available:

MCE...K standard version

MCE... S.K silenced version with soundproofing insulation of compressors section

MCE... U.K ultrasilenced version with soundproofing insulation of compressors section by means of a bituminous rubber coating

Operation limits: external air temperature from 15 to 45°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section, isolated from the air flow, is completely open; for silenced and ultra-silenced versions, the compressors are protected by a suitable soundproofing cabinet.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater. Being 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Low rpm axial fans, of directly coupled type, with 6-8 pole electrical motor complete with in-built overload protection, electronic balance, low sound level blades with wing profile and safety protection grid. On request, it is available the modulating fans speed regulation (option BT).

Cooling circuit composed of dehydrating filter, sight glass, safety device, high and low pressure switches, shut-off valve on discharge side, liquid receiver.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



REFRIGERANT R407C

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
- **BT Low temperature operation (-20°C)**: electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- **CF** Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (already included in S version).
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a suitably coated cabinet, vibration dampers under compressors, mufflers on compressors discharge pipes (already included in U version).
- CI Soundproofing jacket on compressors made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (not available for S and U versions).
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **GP Condensing coil protection grid**: metal protection grid against accidental impacts.
- GP1 Protection grid for compressors section: metal protection grid against accidental impacts (not available for 2-fan sizes with CF/ CFU option).
- IG Watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.

- MP Oversized microprocessor: compared to the standard microprocessor, it allows a multi-language display reading, a more detailed description of parameters, the possibility to manage up to 8 units, to manage non standard communication protocols, a better access to the program.
- MT High and low pressure gauges for measuring circuit pressure.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- **RF Power factor correction system cosfi >0,9**: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM Condensing coil with pre-painted fins**: superficial treatment of the condensing coils with epoxy coating.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- V Voltmeter: Electrical device measuring the electrical tension in the power supply of the unit.
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data - Standard version

MCE		752 K	892 K	982 K	1062 K	1332 K	1352 K	1482 K	1622 K	1922 K	1972 K	2292 K	2542 K	2702 K	2962 K
Cooling capacity															
Cooling capacity	kW	72,8	85,0	94,1	101,7	128,0	129,0	142,0	156,0	185,0	189,0	220,0	245,0	268,0	288,0
Nominal input power	kW	27,0	29,2	36,2	35,7	44,0	42,0	54,0	54,7	66,6	72,8	81,2	89,4	100,0	116,0
EER		2,69	2,91	2,60	2,85	2,91	3,07	2,59	2,85	2,78	2,60	2,71	2,74	2,68	2,48
Axial fans															
Quantity	n.			2				3			4			5	
Rotation speed	rpm							8	80						
Air flow	m³/h	42`840	38.	880	36.000		59 [°] 040		54.000	79 [.]	920	74.160	99'360	92	520
Air flow	l/s	11.900	10 ⁻	800	10 [.] 000		16.400		15.000	22.	200	20.600	27.600	25	700
Motor input power	kW		4	1				6			8			10	
Input current	A		ł	3			1	2			16			20	
Scroll compressors															
Quantity	n.	2	4	1	2	4	2	4	2	6			4		
Circuits	n.								2						
Standard capacity steps	n.	2	4	1	2	4	2	4	2				4		
Nominal input current	A	48,0	54,0	66,0	61,0	77,0	72,0	96,0	93,0	113,0	123,0	137,0	151,0	171,0	198,0
Maximum input current	A	64,0	80,0	88,0	82,0	108,0	104,0	128,0	125,0	162,0	164,0	20	18,0	25	6,0
Inrush current	A	230,0	183,0	193,0	266,0	248,0	324,0	294,0	373,0	302,0	348,0	42	8,0	49	98,0
Electrical data															
Total input power	kW	31,0	33,2	40,2	39,7	50,2	48,0	6	0,7	74,6	80,8	89,2	99,4	110,0	126,0
Total nominal input current	A	56,0	62,0	74,0	69,0	89,0	84,0	108,0	105,0	129,0	139,0	153,0	171,0	191,0	218,0
Maximum total input current	A	72,0	88,0	96,0	90,0	120,0	116,0	140,0	137,0	178,0	180,0	224,0	228,0	27	0,0
Total inrush current	A	238,0	191,0	201,0	274,4	260,0	336,0	306,0	385,0	318,0	364,0	444,0	448,0	51	8,0
Sound pressure level															
Sound pressure at 1 m	dB(A)	69	7	0	72		74		75	7	6			77	
Dimensions															
Length	mm		2.7	/15			3	740			4'765			5.790	
Width	mm							1	370						
Height	mm							2.	140						
Transport weight	kg	1.144	1`327	1.328	1:356	1.202	1.621	1.753	1.766	2`497	2'410	2.476	2.208	3.032	3.161
Refrigerant charge per circuit	kg	16,0	20),0	23,0		25,0		30,0	39	9,0	46,0	45,0	5	3,0
Electrical power supply															
Electrical power supply	V / ph / Hz							100 / 3 /	50 + T + N						

REMARKS:

Operating conditions: External air temperature 35°C; evaporating temperature 2°C (dew)
 Sound pressure level at 1 m in open field (ISO 3744).



REFRIGERANT R407C

Technical data - Silenced version

MCE		752 S K	892 S K	982 S K	1062 S K	1332 S K	1352 S K	1482 S K	1622 S K	1922 S K	1972 S K	2292 S K	2542 S K
Cooling capacity													
Cooling capacity	kW	69,4	81,0	93,2	97,1	121,9	123,7	140,4	149,1	176,8	186,6	213,6	245,1
Nominal input power	kW	28,7	31,3	36,8	38,1	44,7	47,2	55,4	58,2	71,9	74,4	84,7	89,4
EER		2,42	2,59	2,53	2,55	2,73	2,62	2,53	2,56	2,46	2,51	2,52	2,74
Axial fans													
Quantity	n.			2				3			4		5
Rotation speed	rpm						6	60					
Air flow	m³/h	32.760	29 [·] 520	27	360	44`280	44`200	40	680	59 [°] 040	54.720	74 [°] 160	68 [°] 400
Air flow	l/s	9 [·] 100	8.500	7.	600	12	300	11	300	16 [°] 400	15.500	20.600	19.000
Motor input power	kW		2	,5			3	,7		5	,0	6	,2
Input current	A		4	,6			6	,9		9	,2	1	1,5
Scroll compressors													
Quantity	n.	2		4	2	4	2	4	2	6		4	
Circuits	n.							2					
Standard capacity steps	n.	2		4		4	2	4	2			4	
Nominal input current	A	50,0	57,0	67,0	64,0	81,0	75,0	97	7,0	119,0	125,0	141,0	151,0
Maximum input current	A	64,0	80,0	88,0	82,0	108,0	104,0	128,0	125,0	162,0	164,0	20	8,0
Inrush current	A	230,0	183,0	193,0	266,0	248,0	324,0	294,0	373,0	302,0	348,0	42	8,0
Electrical data													
Total input power	kW	31,2	33,8	39,3	40,6	48,5	51,0	59,2	62,0	76,9	79,4	91,0	95,7
Total nominal input current	A	55,0	61,0	71,0	68,0	88,0	82,0	10	4,0	128,0	134,0	153,0	162,0
Maximum total input current	A	69,0	85,0	93,0	87,0	115,0	111,0	135,0	132,0	171,0	173,0	224,0	220,0
Total inrush current	A	235,0	188,0	198,0	271,0	255,0	331,0	301,0	380,0	311,0	357,0	444,0	440,0
Sound pressure level													
Sound pressure at 1 m	dB(A)		66		69		70		7	'1	7	73	77
Dimensions													
Length	mm		2.7	715				740		4	765	5	790
Width	mm							370					
Height	mm							140					
Transport weight	kg	1.144	1.322 1.430 1.440 1		1`847	1.733	1.971	1.965	3.012	3.060	3.328	3`504	
Refrigerant charge per circuit	kg	16,0	,0 20,0 23,0			25,0 30,0				39,0	46,0	45,0	53,0
Electrical power supply													
Electrical power supply	V / ph / Hz						400/3/5	50 + T + N					

REMARKS:

- Operating conditions: External air temperature 35°C; evaporating temperature 2°C (dew) - Sound pressure level at 1 m in open field (ISO 3744).



REFRIGERANT R407C

Technical data - Ultrasilenced version

MCE		752 U K	892 U K	982 U K	1062 U K	1332 U K	1352 U K	1482 U K	1622 U K	1922 U K	1972 U K	2292 U K
Cooling capacity			·							·		
Cooling capacity	kW	71,8	79,8	91,2	102,5	120,3	124,7	142,8	154,2	181,1	191,3	213,6
Nominal input power	kW	27,5	31,9	37,8	36,9	48,0	49,0	54,2	60,7	68,9	79,5	91,4
EER		2,61	2,50	2,41	2,78	2,51	2,54	2,63	2,54	2,63	2,41	2,34
Axial fans												
Quantity	n.		2			3			4		5	
Rotation speed	rpm						530					
Air flow	m³/h	24.000	22.000	38.880	36.000	33	000	47.	880	60	120	55.080
Air flow	l/s	6`670	6.110	10.800	10.000	9.	170	13	300	16	700	15`300
Motor input power	kW	1	,5		2	,3		3	,1		3,9	
Input current	A	3	3,0		4	,5		6	,0		7,5	
Scroll compressors												
Quantity	n.	2		4	2	4	2	4	2	6		4
Circuits	n.						2					
Standard capacity steps	n.	2		4	2	4	2	4	2		4	
Nominal input current	A	48,0	58,0	68,0	66,0	82,0	86,0	96,0	107,0	116,0	139,0	159,0
Maximum input current	A	64,0	80,0	88,0	82,0	108,0	104,0	128,0	125,0	162,0	164,0	208,0
Inrush current	A	230,0	183,0	193,0	266,0	248,0	324,0	294,0	373,0	302,0	348,0	428,0
Electrical data												
Total input power	kW	29,0	33,4	40,1	39,2	50,3	51,3	57,3	63,8	72,8	83,4	95,3
Total nominal input current	A	51,0	61,0	73,0	70,0	87,0	91,0	102,0	113,0	124,0	146,0	167,0
Maximum total input current	A	67,0	83,0	93,0	87,0	113,0	109,0	134,0	131,0	170,0	172,0	216,0
Total inrush current	A	233,0	186,0	198,0	271,0	253,0	329,0	300,0	379,0	310,0	356,0	436,0
Sound pressure level												
Sound pressure at 1 m	dB(A)		63	_		65		66	(67	6	59
Dimensions												
Length	mm	2.	715		3	740		4.7	765		5.790	
Width	mm			-			1.320					
Height	mm						2.140					
Transport weight	kg	1`167	1`392	1.623	1.689	1`884	1.220	2.202	2.2529	3`290	3`269	3`416
Refrigerant charge per circuit	kg	20,0	23,0	20,0	25,0	3	0,0	39	9,0	45,0 53		
Electrical power supply												
Electrical power supply	V / ph / Hz					4	00 / 3 / 50 + T +	N				

REMARKS:

Operating conditions: External air temperature 35°C; evaporating temperature 2°C (dew)
 Sound pressure level at 1 m in open field (ISO 3744).

REFRIGERANT R407C



Series MCE ... C K

Cooling capacity from 10 to 40 kW - 1 circuit

The air cooled condensing units with centrifugal fans of **MCE C K series**, to be matched to remote evaporating units, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. Therefore during their design, it has been given a particular care for dimensions and sound level, so to have compact and silent units at the same time.

They are all available with 1 refrigerant circuit.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with refrigerant and oil charge.

The following versions are available: Vertical air flow MCE...C K standard version MCE...C U K ultrasilenced version (from size 201) Vertical air flow (from size 201) MCE...C.O K standard version

MCE...C.O U K ultrasilenced version

Operation limits: (standard units): external air temperature from 15 to 45°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are placed so to facilitate also the service operations. The external panels, easy to be dismantled, allow the full access in case of service.

High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Centrifugal fans of double suction type with electrical motor directly joined and balanced blades, suitably isolated with rubber vibration dampers and sealing on discharge. They are provided with short circuit and overload protections and external safety protection grid. The motor is of 4-pole triphase type, with belt transmission and variable pulleys, placed on slide so to speed up the pulley tension. As a standard, the unit has a vertical airflow or, on request, you can ask for an horizontal airflow, coil side (from size 201).

Cooling circuit composed of dehydrating filter, sight glass, safety device, high and low pressure switches, shut-off valve on discharge side, liquid receiver.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



REFRIGERANT R407C

Accessories

- 1M-2M Higher available pressure for fan: bigger electrical motor, so to have a higher available pressure to fans to be ducted (from size 201).
- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
- BF Low temperature operation (-20°C) with inverter fan speed regulation: electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply (from size 201).
- **BFa-BFb** Low temperature operation (-20°C) with inverter fan speed regulation (with option 1M and 2M): electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply (from size 201).
- **BT Low temperature operation (-20°C)**: electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed.
- **BTa-BTb** Low temperature operation (-20°C) (with option 1M-2M): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (from size 201).
- **CF** Soundproofed compressors cabinet: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (from size 201 and included on ultrasilenced version).
- CI Soundproofing jacket on compressors: made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (from size 201 and already included on ultrasilenced version).
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors (from size 201).
- GP Condensing coil protection grid: metal protection grid against accidental impacts. HG Hot gas by-pass: mechanical device for modulating cooling capacity RS 485 serial interface: electronic card to be connected to mi-IH croprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request. Seawood packing: fumigated seawood case and protection bag IM with hygroscopic salts, suitable for long sea transports. MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary. MT High and low pressure gauges for measuring circuit pressure. PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture. PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms. Compressors overload relays: electromechanical protection de-RL vices against compressor's overload. RM Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating. RR
 - R Copper/copper condensing coils: special execution of the condensing coils with copper pipe and fins.
 - RV Personalized frame painting in RAL colour
 - VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.

Technical data

MCE		131 C K	151 C K	161 C K	181 C K				
Cooling capacity			· · · · · ·						
Cooling capacity	kW	10,3	12,2	15,8	16,6				
Nominal input power	kW	3,6	4,7	5,6	6,2				
EER		2,86	2,59	2,82	2,62				
Centrifugal fans									
Quantity	n.		2						
Air flow	m³/h	7	500	6	700				
Air flow	l/s	2.	083	1`861					
Rotation speed	rpm		1.55	1`250					
Motor input power	kW	1	,0		2,2				
Input current	A		13,	6					
Available pressure	Pa	2	40	1	165				
Scroll compressors									
Quantity	n.		1						
Circuits	n.		1						
Standard capacity steps	%		0 – 1	00					
Nominal input current	A	5,4	6,3	9,0	10,3				
Maximum input current	A	12,0	14,0	16,0	18,0				
Inrush current	A	56,0	68,0	77,0	81,0				
Electrical data									
Total input power	kW	4,1	5,2	6,7	7,3				
Sound pressure level									
Sound pressure at 1 m	dB(A)		60						
Dimensions									
Length	mm		1.1(
Width	mm		750	750					
Height	mm		1.10						
Transport weight	kg	217	221	238	240				
Electrical power supply									
Electrical power supply	V / ph / Hz		400 / 3 / 50) + N + T					

REMARKS

Operating conditions: External air temperature 35°C; evaporating temperature 2°C
 Sound pressure level at 1 m in open field (ISO 3744).



REFRIGERANT R407C

Technical data - Standard version

MCE		201 C K	241 C K	281 C K	361 C K	421 C K
Cooling capacity						
Cooling capacity	kW	18,9	23,3	26,9	32,7	40,4
Nominal input power	kW	7,0	8,2	9,4	11,6	14,1
EER		2,70	2,84	2,86	2,82	2,86
Centrifugal fans						
Quantity	n.		1			(*)
Air flow	m³/h	8.800	8.620	9.000	11`200	13`000
Air flow	l/s	2.444	2'403	2.200	3.111	3`611
STD Version						
Available pressure	Pa			80		
Rotation speed	rpm	896	915	975	746	858
Motor input power	kW	2	,2	3,0	2,2	3,0
Vominal input current	A	5	,3	6,7	5,3	6,7
Sound pressure level	dB(A)	6	6	67	64	65
1M Version						
Available pressure	Pa			120		
Rotation speed	rpm	935	955	1.014	811	914
Votor input power	kW		3,0		2,2	3,0
Nominal input current	A		6,7		5,3	6,7
Sound pressure level	dB(A)	(57	68	65	66
2M Version						
Available pressure	Pa			200		
Rotation speed	rpm	1.014	1.036	1.091	938	1.052
Votor input power	kW		3	3,0		4,0
Nominal input current	A		6	5,7		9,4
Sound pressure level	dB(A)	(8	69	66	67
Scroll compressors						
Quantity	n.			1		
Circuits	n.			1		
Standard capacity steps	%			0 - 100		
Nominal input current	A	12,9	15,1	16,0	18,7	22,7
Maximum input current	A	17,0	20,0	22,0	27,0	32,0
Inrush current	A	99,0	123,0	127,0	167,0	198,0
Electrical data						
Total input power	kW	9,2	10,4	12,4	13,8	17,1
Dimensions						
_ength	mm		1'320		1	665
Width	mm			750		
Height	mm		1.520		1	460
Transport weight	kg	395	406	417	499	522
Electrical power supply						
Electrical power supply	V / ph / Hz			400 / 3 / 50 + N + T		

REMARKS: - Operating conditions: External air temperature 35°C; evaporating temperature 2°C - Sound pressure level at 1 min open field (ISO 3744) with ducted air suction and discharge - (*) 2 fans in tandem, driven by 1 motor. - In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-rely



REFRIGERANT R407C

Technical data - Ultrasilenced version

MCE C.U		201 K	241 K	281 K	361 K	421 K
Cooling capacity						
Cooling capacity	kW	19,2	22,8	26,9	33,6	39,8
Nominal input power	kW	6,9	8,5	9,4	11,7	14,3
EER		2,78	2,68	2,86	2,87	2,78
Centrifugal fans						
Quantity	n.		1		2 (*)	2
Air flow	m³/h	6'300	7`200	6`950	9.600	13`900
Air flow	l/s	1.750	2.000	1.930	2.666	3`861
STD Version						
Available pressure	Pa		80	50		80
Rotation speed	rpm	720	818	637	711	696
Motor input power	kW			1,5		3,0
Nominal input current	A			3,7		7,4
Sound pressure level	dB(A)	62	64	61		63
1M Version						
Available pressure	Pa			120		
Rotation speed	rpm	776	866	728	785	752
Motor input power	kW	1,5	2,2		1,5	3,0
Nominal input current	A	3,7	5,3		3,7	7,4
Sound pressure level	dB(A)	62	64	61		64
2M Version						
Available pressure	Pa			200		
Rotation speed	rpm	886	963	891	925	858
Motor input power	kW	1,5	2,2	1,5	2,2	4,4
Nominal input current	A	3,7	5,3	3,7	5,3	10,6
Sound pressure level	dB(A)	63	65	62		64
Scroll compressors						
Quantity	n.			1		
Circuits	n.			1		
Standard capacity steps	%			0 - 100		
Nominal input current	A	12,7	15,4	16,1	18,9	23,0
Maximum input current	A	17,0	20,0	22,0	27,0	32,0
Inrush current	A	99,0	123,0	127,0	167,0	198,0
Electrical data						
Total input power	kW	8,4	10,0	10,9	13,2	17,3
Dimensions						
Length	mm		1`320		1.662	2.120
Width	mm			750		778
Height	mm		1`250		1`460	1.220
Transport weight	kg	396	407	501	511	642
Electrical power supply						
Electrical power supply	V / ph / Hz			400 / 3 / 50 + N + T		

REMARKS: - Operating conditions: External air temperature 35°C; evaporating temperature 2°C - Sound pressure level at 1 m in open field (ISO 3744) with ducted air suction and discharge - (*) 2 fans in tandem, driven by 1 motor. - In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin--lin case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin--lin



REFRIGERANT R407C



Series MCE ... C K

Cooling capacity from 46 to 219 kW - 2 circuits

The air cooled condensing units with centrifugal fans of **MCE C K series**, to be matched to remote evaporating units, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications.

They are all available with 2 refrigerant circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with nitrogen and oil charge.

The following versions are available: Vertical air flow MCE...C K standard version MCE...C U K ultrasilenced version Horizontal air flow MCE...C.O K standard version MCE...C.O U K ultrasilenced version

Operation limits: (standard units): external air temperature from 15 to 45°C.

Main components:

Frame made of galvanized steel plate, suitably treated to resist to external agents and then painted in RAL 7035 colour. The compressor section is completely closed and suitably isolated from the air flow; inside of it, the compressor and the main components are installed. The external panels, easy to be dismantled with a quick ¾ key turn, allow the full access to all components in case of service.

High-efficiency scroll compressor (EER 3,7 at ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater. Being 2 circuit units, in case of problem on one of the circuit, the 50% operation of the unit is anyway granted.

Heat-exchange external coil with copper tube and specially corrugated aluminium fins for a better efficiency. It is suitably sized with a wide exchange surface, so to the allow the unit operation also at very high external air temperatures. On request, in case of installation in aggressive environments, several coil protection treatments are available.

Centrifugal fans of double suction type with electrical motor directly joined and balanced blades, suitably isolated with rubber vibration dampers and sealing on discharge. They are provided with short circuit and overload protections and external safety protection grid. The motor is of 4-pole triphase type, with belt transmission and variable pulleys, placed on slide so to speed up the pulley tension. As a standard, the unit has a vertical airflow or, on request, you can ask for an horizontal airflow (coil side).

Cooling circuit composed of dehydrating filter, sight glass, safety device, high and low pressure switches, shut-off valve on discharge side, liquid receiver.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a main switch and an external panel to be opened. It is complete with remote switches, overload protections, transformer for auxiliaries and terminal board.

Unit management microprocessor installed on the internal safety panel of the electrical board, complete with compressors hour counter.



REFRIGERANT R407C

- 1M-2M Higher available pressure for fans: bigger electrical motor, so to have a higher available pressure to fans to be ducted. AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz. BF Low temperature operation (-20°C) with inverter fan speed regulation: electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply. **BFa-BFb** Low temperature operation (-20°C) with inverter fan speed regulation (with option 1M and 2M): electronic device controlling the condensing pressure through an inverter, modulating the frequency of the fans electrical supply. RT Low temperature operation (-20°C): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (not available for size 822). BTa Low temperature operation (-20°C) (with option 1M): electronic device for the continuous modulating voltage control of the condensing pressure through the variation of the fan rotation speed (not available for size 822). CF Soundproofed compressors cabinet: Insulation of compressors by a cabinet coated with soundproofing material and vibration dampers under compressors (included on ultrasilenced version). CI Soundproofing jacket on compressors: made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit (already included on ultrasilenced
- version).
 Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- G4 Cooling capacity control with 4 steps (available from size 962). GP Condensing coil protection grid: metal protection grid against accidental impacts.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.

- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MP Oversized microprocessor: compared to the standard microprocessor, it allows a multi-language display reading, a more detailed description of parameters, the possibility to manage up to 8 units, to manage non standard communication protocols, a better access to the program (available from size 842).
- MT
 High and low pressure gauges for measuring circuit pressure.

 PA
 Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs (available from size 842).
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- **RM** Condensing coil with pre-painted fins: superficial treatment of the condensing coils with epoxy coating.
- **RR Copper/copper condensing coils**: special execution of the condensing coils with copper pipe and fins.
- RV Personalized frame painting in RAL colour
- VS Solenoid valve: electromagnetic solenoid valve on each cooling circuit to prevent refrigerant migrations and consequent flooding of compressors.



REFRIGERANT R407C

Technical data - Standard version

MCE		482 C K	562 C K	702 C K	822 C K	842 C K	962 C K	1102 C K	1402 C K	1502 C K	1602 C K	2302 C K	2402 C K	2602 C K
Cooling capacity														
Cooling capacity	kW	46,5	53,6	65,4	80,7	78,0	83,1	92,5	121,4	128,3	143,9	191,8	206,5	219,2
Nominal input power	kW	16,4	18,6	23,5	28,4	28,9	33,8	40,4	47,0	53,4	59,7	73,8	78,0	85,0
EER		2,83	2,88	2,78	2,84	2,70	2,46	2,29	2,58	2,40	2,41	2,60	2,65	2,58
Centrifugal fans														
Quantity	n.			2			3			4			6	
Air flow	m³/h	16.200	20'900	24.600	28'400	40.000	37	500	50 ⁻	000	48.000		73'200	
Air flow	l/s	4.639	5`806	6'834	7`889	11 ⁻ 110	10	415	13.	890	13.300		20'330	
STD Version														
Available pressure	Pa		8	80		50		7	70		100		80	
Rotation speed	rpm	782	919	640	745	920	9	00	9	15	935		920	
Motor input power	kW	4,4	8,0	6,0	11,0		12,0			16,0			24,0	
Nominal input current	A	10,6	18,8	13,4	24,0		28,2			37,6			56,4	
Sound pressure level	dB(A)	65	66	6	8		70		7	2	73		74	
1M Version														
Available pressure	Pa		1.	20		100	1	80	1	90	240		220	
Rotation speed	rpm	830	959	669	769	970		1.	030		1.062		1.020	
Motor input power	kW	4,4	8	,0	11,0		12,0			16,0			24,0	
Nominal input current	A	10,6	18	3,8	24,0		28,2			37,6			56,4	
Sound pressure level	dB(A)	66	68	71	7	2	71	72	7	4	75		78	
2M Version														
Available pressure	Pa		2	00		260	2	70	3	50	355		350	
Rotation speed	rpm	923	1.032	725	819	1.110	1.	100			1.	170		
Motor input power	kW	6,0	8	,0	11,0		15,5			22,0			33,0	
Nominal input current	A	13,4	18	3,8	24,0		36,0			48,0			72,0	
Sound pressure level	dB(A)	6	7	71	74		75			76		7	7	78
Scroll compressors														
Quantity	n.			2							4			
Circuits	n.							2						
Standard capacity steps	n.							2						
Optional capacity steps	n.			-							4			
Nominal input current	A	30,0	32,0	38,0	46,0	48,0	57,0	68,0	77,0	89,0	93,0	117,0	126,0	139,0
Maximum input current	A	40,0	44,0	54,0	64	ł,0	80,0	88,0	108,0	118,0	128,0	164,0	186,0	208,0
Inrush current	A	143,0	149,0	194,0	23	0,0	183,0	193,0	248,0	284,0	294,0	348,0	406,0	428,0
Electrical data														
Total input power	kW	20,8	26,6	29,5	39,4	40,9	45,8	52,4	63,0	69,4	75,7	97,8	102,0	109,0
Dimensions														
Length	mm	2	120	2.2	280		2.610			3'460			5.120	
Width	mm	7	78	9	90					1.542				
Height	mm	11	570	1.5	845					1.992				
Transport weight	kg	752	782	856	929	1.334	1.449	1'456	1.800	1.840	1.940	2.400	2.420	2.240
Electrical power supply														
Lieutical power suppry														

REMARKS: - Operating conditions: External air temperature 35^oC, evaporating temperature 2^oC - Sound pressure level at 1 m in open field (ISO 3744) with ducted air suction and discharge - In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-- .



REFRIGERANT R407C

Technical data - Ultrasilenced version

MCE C.U		482 K	562 K	702 K	842 K	962 K	1102 K	1402 K	1502 K	1602 K	2302 K	2402 K	2602 K
Cooling capacity							·				·		
Cooling capacity	kW	46,2	53,5	65,4	72,0	81,0	91,0	122,0	132,0	142,0	196,0	203,4	215,5
Nominal input power	kW	16,5	18,9	23,5	30,1	34,8	40,6	46,3	52,1	61,0	71,7	80,0	86,2
EER		2,80	2,83	2,78	2,39	2,33	2,24	2,63	2,53	2,33	2,73	2,54	2,50
Centrifugal fans													
Quantity	n.		2			3	4		6			8	
Air flow	m³/h	14.700	18.000	20'700	21.300	28	.800		43`800			54.400	
Air flow	l/s	4.083	5.000	5.720	5.920	8.	000		12.120			15.110	
STD Version													
Available pressure	Pa		80		60			70				100	
Rotation speed	rpm	460	509	585	590	760	590		610			650	
Motor input power	kW	3	,0	4,4	3,3	6,6	4,4		6,6			8,8	
Nominal input current	A	7	,4	10,6	8,4	15,9	11,2		16,8			22,4	
Sound pressure level	dB(A)	60	1	8	60	64	60		61			64	
1M Version													
Available pressure	Pa		120		160	190	160			2	50		
Rotation speed	rpm	508	548	616	750	890	720		880			870	
Motor input power	kW	3	,0	4,4	3,3	6,6	4,4		9,0			12,0	
Nominal input current	A	7	,4	10,6	8,4	15,9	11,2		22,2			29,6	
Sound pressure level	dB(A)	61	63	66	6	5	66	6	18	69		74	
2M Version													
Available pressure	Pa		200		250	2	70		360			370	
Rotation speed	rpm	599	626	684	870	975	870			1	015		
Motor input power	kW	3,0	4,4	6,0	4,5	9,0	6,0		13,2			17,6	
Nominal input current	A	7,4	10,6	13,4	11,1	20,1	14,8		31,8		42,4		
Sound pressure level	dB(A)	62	64	66	67	(68		69		7	74	75
Scroll compressors													
Quantity	n.			2						4			
Circuits	n.							2					
Standard capacity steps	n.							2					
Optional capacity steps	n.			_						4			
Nominal input current	A	30,0	32,0	38,0	49,6	59,1	69,8	78,8	89,2	97,2	118,6	132,6	144,6
Maximum input current	A	40,0	44,0	54,0	64,0	80,0	88,0	108,0	118,0	128,0	164,0	186,0	208,0
Inrush current	A	143,0	149,0	194,0	230,0	183,0	193,0	248,0	284,0	294,0	348,0	406,0	428,0
Electrical data													
Total input power	kW	19,5	21,9	27,9	33,4	41,4	45,0	52,9	58,7	67,6	80,5	88,8	95,0
Dimensions													
Length	mm		2.580		2.0	510	3'460		5.120			6.840	
Width	mm		990						1.542				
Height	mm		1.842						1.992				
Transport weight	kg	8	25	869	1.322	1.462	1.757	2.482	2.225	2.235	2.980	3.000	3.050
Electrical power supply							· · ·						
Electrical power supply	V / ph / Hz							50 + N + T					

REMARKS: - Operating conditions: External air temperature 35°C; evaporating temperature 2°C - Sound pressure level at 1 m in open field (ISO 3744) with ducted air suction and discharge - In case of a different available pressure, included between the standard pressure and the values indicated for 1M or 2M options, however not higher 2M, it is necessary to order the higher pressure option, clearly stating the pressure value effectively requested on site. In the factory we will adjust the motor's pulley accordin-gly.



EVAPORATING UNITS WITH HOUSING AND SCROLL COMPRESSORS

REFRIGERANT R407C - R134A





Series MEE ... K / Ka

Cooling capacity from 5 to 81 kW - 1 circuit

The evaporating units of **MEE K/Ka series**, to be matched to remote condensers, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. For this reason, they are made of a housing in painted steel plate. They are all available with 1 refrigerant circuit.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install in small spaces.

They are completely assembled and tested in the factory and supplied with refrigerant and oil charge.

The following versions are available: **MEE...K** with R407C ecological refrigerant charge **MEE...Ka** with R134a ecological refrigerant charge

Water operation limits (standard units):

EVAPORATOR (OUT): from 5 to 15°C

Main components:

Strong and compact frame, with a housing made of galvanized and RAL 7035 painted steel plate. The front and the access panels to the electrical board are easy to be opened. The main components are installed inside the housing, which can be isolated with standard soundproofing material (option CL) or with bituminous rubber soundproofing material (option CM). When required, the hydraulic kit (buffer tank and hydraulic kit) is installed into an additional section at the bottom of the unit, so not change the overall dimensions.

High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. Higher capacity units are equipped with two scroll compressors in tandem.

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, high and low pressure switches, shut-off valve on the liquid line, shut-off valve on compressor discharge, solenoid valve, safety valve.

Electric board in compliance with CE norms, contained in a suitable partition protected by the hinged internal safety panel, provided with protection fuses and safety transformer. In case of hydraulic kit on board, the electrical control of the pump group is provided.

Unit management **microprocessor** installed on the external panel, easily accessible, complete with compressors hour counter.



EVAPORATING UNITS WITH HOUSING AND SCROLL COMPRESSORS

REFRIGERANT R407C - R134A

- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
 AC Electrical control for condensers: in case the remote condenser is included in our supply, its control (regulation and power) is provided in the electrical board of the evaporating unit. On the other hand, if the remote condenser is supplied by the customer, we suggest to inform about the absorbed current of the condenser, so to provide the electric control in the electric board of the indoor unit.
 CL Soundproofing insulation with standard material: insulation of the compressor housing by means of soundproofing material.
 CM Soundproofing insulation with bituminous rubber material:
- CM Soundproofing insulation with bituminous rubber material: insulation of the compressor housing by means of bituminous rubber coated material.
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- **HG Hot gas by-pass**: mechanical device for modulating cooling capacity, preventing frequent compressor' stops.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- LR Liquid receiver suitably sized to contain the exceeding quantity of liquid refrigerant.
- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MT
 High and low pressure gauges for measuring circuit pressure.

 MV
 Buffer tank of suitable capacity complete with expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves.

- P1 Single pump group: chilled water pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- P1H Higher available pressure pump group: chilled water higher available pressure pump group composed of single pump, expansion vessel, safety valve, water gauge, water charge and discharge valves, air purging valves, electrical control of the pump. The pump is of 2 pole centrifugal packaged type.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RV Personalized frame painting in RAL colour
- SN Main switch: manual switch of lock-door type, switching off the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.



EVAPORATING UNITS WITH HOUSING AND SCROLL COMPRESSORS

REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C

MEE		61 K	111 K	171 K	201 K	221 K	251 K	301 K	381 K	461 K	501 K	571 K	751 K	901 K
Cooling capacity														
Cooling capacity	kW	5,5	10,0	15,2	17,9	19,3	23,1	27,2	35,1	42,0	45,5	52,8	69,1	80,9
Nominal input power	kW	1,2	2,1	2,9	3,4	4,6	5,6	6,3	8,5	9,9	11,2	12,8	17,0	19,8
EER		4,58	4,76	5,24	5,26	4,19	4,12	4,32	4,13	4,24	4,06	4,12	4,06	4,08
Scroll compressors														
Quantity	n.					1							2	
Circuits	n.							1						
Standard capacity steps	%					0 / 100						0/5	0 / 100	
Nominal input current	A	5,6	9,9	6	i,6	9,6	11,7	13,4	18,3	19,4	23,4	24,5	36,5	38,7
Maximum input current	A	11,0	23,0	11,0	13,0	17,0	20,0	22,0	27,0	32,0	40,0	44,0	54,0	64,0
Inrush current	A	47,0	100,0	66,0	72,0	99,0	123,0	127,0	167,0	198,0	143,0	149,0	194,0	230,0
Evaporator														
Туре							W	/eld-brazed pl	ate					
Quantity	n.							1						-
Circuits	n.							1						
Water flow	m³/h	0,9 1,7 2,6 3,1 3,3 4,0 4,7 6,0 7,2							7,8	9,1	11,9	13,9		
Water flow	l/s	0,2	0,5 0,7 0,9 1,1 1,3 1,7 2,0						2,2	2,5	3,3	3,9		
Pressure drop	kPa	23	27	32	38	40	4	16	50	73	19	22	20	21
Pumps														
P1 – Available pressure	kPa	64	43	58	79	72	64	94	85	76	85	67	49	37
P1 – Motor input power	kW	0,	.18		0	,55				0	,75			1,1
P1H – Available pressure	kPa	84	70	90	111	104	98	138	128	120	142	123	112	100
P1H – Motor input power	kW	0,	.18		0,	,75				1	,1			1,5
Capacity of buffer tank						80						1	10	-
Sound pressure level														
Sound pressure at 1 m	dB(A)	58	59	58	(50	(51	f	52	6	53	(64
Dimensions														
Length	mm	800 1.600												
Width	mm	500 750							'50					
Height	mm							960						
Height with MV option	mm					1.430						1.	340	
Transport weight	kg	113	120	0 133 135 170 180 181				198	210	2	90	337	358	
Transport weight with empty buffer tank	kg	163	163 170 183 185 220 230 231 248 260 450 497					497	518					
Electrical power supply														
Electrical power supply	V / ph / Hz	/Hz 230/1/50+N+T 400/3/50+N+T												

REMARKS: - Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 49°C (dew) - Sound pressure level at 1 m in open field (SO 3744).



EVAPORATING UNITS WITH HOUSING AND SCROLL COMPRESSORS

REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a

MEE		151 Ka	181 Ka	211 Ka	271 Ka	311 Ka	351 Ka	421 Ka	521 Ka	601 Ka
Cooling capacity										
Cooling capacity	kW	13,5	16,3	18,8	24,7	28,0	31,9	38,3	47,8	54,5
Nominal input power	kW	3,2	3,8	4,4	5,9	6,7	7,7	9,0	11,8	13,8
EER		4,22	4,29	4,27	4,19	4,18	4,14	4,25	4,05	3,95
Scroll compressors										
Quantity	n.			1					2	
Circuits	n.					1				
Standard capacity steps	%			0 / 100				0 / 50) / 100	
Nominal input current	A	8,1	9,9	11,4	13,2	15,7	20,0	19,5	26,5	31,7
Maximum input current	A	17,0	20,0	22,0	27,0	32,0	40,0	44,0	54,0	64,0
Inrush current	A	99,0	123,0	127,0	167,0	198,0	143,0	149,0	194,0	230,0
Evaporator										
Туре						Weld-brazed plate				
Quantity	n.					1				
Circuits	n.					1				
Water flow	m³/h	2,3	2,8	3,2	4,2	4,8	5,5	6,6	8,2	9,4
Water flow	l/s	0,6	0,8	0,9	1,2	1,3	1,5	1,8	2,3	2,6
Pressure drop	kPa	21	32	33	25	22	17	18	27	23
Pumps										
P1 — Available pressure	kPa	72	87	75	71	110	111	110	96	92
P1 — Motor input power	kW		0,	55				0,75		
P1H — Available pressure	kPa	103	118	107	104	152	164	165	152	150
P1H — Motor input power	kW		0,	75		1,1	0	,75		,1
Capacity of buffer tank				80				1	10	
Sound pressure level										
Sound pressure at 1 m	dB(A)	56	5	57		58	-	59	6	50
Dimensions										
Length	mm			800				600		
Width	mm			500		750				
Height	mm					960				
Height with MV option	mm			1.430					340	
Transport weight	kg	170	180	181	198	210	290	287	337	358
Transport weight with empty buffer tank	kg	220	230	231	248	260	450	437	497	518
Electrical power supply										
Electrical power supply	V / ph / Hz					400 / 3 / 50 + N + 1				

REMARKS: - Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 47°C (dew) - Sound pressure level at 1 m in open field (ISO 3744).



EVAPORATING UNITS WITH SCROLL COMPRESSORS (SINGLE AND TANDEM)

REFRIGERANT R407C - R134A



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Series MEE ... K / Ka

Cooling capacity from 27 to 360 kW - 1 and 2 circuits

The evaporating units of **MEE K/Ka series**, to be matched to remote condensers, are designed for indoor installation and are particularly suitable for small and medium sized air conditioning systems, in residential and commercial applications. They are all available with 1 or 2 refrigerant circuits.

They have been designed to be extremely compact, with an easy access for both ordinary and extraordinary service operations.

Thanks to their dimensions (for the whole range, the width is 750 mm) and to the several options available, these units are particularly easy to install also in small spaces, with no building works.

They are completely assembled and tested in the factory and supplied with refrigerant and oil charge.

The following versions are available: **MEE...K** with R407C ecological refrigerant charge **MEE...Ka** with R134a ecological refrigerant charge

Water operation limits (standard units): EVAPORATOR (OUT): from 5 to 15°C

Main components:

Strong and compact frame, made of bended and RAL 7035 coloured steel profiles, supporting all the main components, installed at sight. On request, the compressors can be isolated by a soundproofing cabinet with standard material (option CF) or with bituminous rubber coated material (option CFU), so to further reduce the overall sound level of the unit itself.

High-efficiency **scroll compressor** (EER 3.37 under ARI conditions), with low sound level, internal heat protection, installed on rubber vibration dampers, supplied with crankcase heater when necessary. Higher capacity units, with both 1 and 2 cooling circuits, are equipped with two scroll compressors in tandem.

Weld-brazed plate evaporator in AISI 316 stainless steel, with pipes and patented manifold so to reach a high heat exchange coefficient. Its design allows a uniform water distribution, compatibly with pressure drops. The exchanger is provided with close-cell insulating material.

Cooling circuit composed of thermostatic expansion valve, dehydrating filter, sight glass, high and low pressure switches, high and low pressure gauges, shut-off valve on liquid line, solenoid valve, shut-off valve on compressor discharge side, safety valve.

Electric board in compliance with CE norms, contained in a suitable partition protected by the hinged internal safety panel, provided with protection fuses and safety transformer.

Unit management **microprocessor** installed on the external panel, easily accessible, complete with compressors hour counter.



- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
- AE Electrical power supply different from standard: mainly, 230V three-phase, 460V three-phase. Frequency 50/60 Hz.
- AC Electrical control for condensers: in case the remote condenser is included in our supply, its control (regulation and power) is provided in the electrical board of the evaporating unit. On the other hand, if the remote condenser is supplied by the customer, we suggest to inform about the absorbed current of the condenser, so to provide the electric control in the electric board of the indoor unit.
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with soundproofing material and vibration dampers under compressors.
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with bituminous rubber soundproofing material and vibration dampers under compressors, mufflers on compressors discharge pipes.
- CI Soundproofing jacket on compressors: made of soundproofing material, wrapped all around compressors so to further reduce the overall sound level of the unit.
- CS Compressors inrush counter: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- HG Hot gas by-pass: mechanical device for modulating cooling capacity (only for 1-circuit sizes).
- IE Funigated wooden crate packing: available on request for critical transports, so to assure a suitable protection to the unit.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- IR Packing with fumigated wooden pallet and transparent film: minimal packing made of wooden pallet and transparent film wrapped all around the unit.
- LR Liquid receiver suitably sized to contain the exceeding quantity of liquid refrigerant.

- MF Phase monitor: electronic device controlling the correct sequence and/or the eventual lack of one of the 3 phases, switching off the unit if necessary.
- MP Oversized microprocessor: compared to the standard microprocessor, it allows a multi-language display reading, a more detailed description of parameters, the possibility to manage up to 8 units, to manage non standard communication protocols, a better access to the program.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification.
- V Voltmeter: Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.



EVAPORATING UNITS WITH SCROLL COMPRESSORS (SINGLE AND TANDEM)

REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 1 circuit - tandem compressors

MEE		541 K	631 K	761 K	931 K	1201 K	1501 K	1901 K
Cooling capacity								
Cooling capacity	kW	49,9	57,8	71,2	86,9	115,0	143,0	180,0
Nominal input power	kW	14,0	16,0	20,0	24,0	31,8	39,4	47,0
EER		3,56	3,61	3,56	3,	62	3,63	3,83
Scroll compressors								
Quantity	n.				2 (1 tandem)			
Circuits	n.				1			
Standard capacity steps	%				0/50/100			
Nominal input current	A	28,6	30,0	35,0	42,6	54,4	68,8	82,0
Maximum input current	A	40,0	44,0	54,0	64,0	82,0	104,0	125,0
Inrush current	A	143,0	149,0	194,0	230,0	266,0	324,0	373,0
Evaporator								
Туре					Weld-brazed plate			
Quantity	n.				1			
Circuits	n.				1			
Water flow	m³/h	8,6	9,9	12,2 14,9		19,8	24,6	30,9
Water flow	l/s	2,4	2,8	3,4	4,1	5,5	6,8	8,6
Pressure drop	kPa	34	36	28	33	32	33	36
Water volume		3,3	3,8	5,0	5,7	7,9	10,2	13,6
Sound pressure level								
Sound pressure at 1 m	dB(A)		70		72	75	77	79
Dimensions								
Length	mm	1'500						
Width	mm			750				
Height	mm		11	600			1.800	
Transport weight	kg	478	490	510	553	648	710	770
Electrical power supply								
Electrical power supply	V / ph / Hz				400/3/50+N+T			

REMARKS:

Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 49°C (dew)
 Sound pressure level at 1 m in open field (ISO 3744).

Technical data - Refrigerant R407C - 2 circuits - single compressors

MEE		442 K	532 K	612 K	762 K	922 K	1262 K	1552 K	1912 K			
Cooling capacity			·					143,0 39,4 39,4 3,63 69,0 104,0 324,0 1 24,6 6,8 35 10,0 77				
Cooling capacity	kW	41,3	50,2	57,8	71,1	87,0	116,0	143,0	179,0			
Nominal input power	kW	11,6	14,0	16,0	20,0	24,0	31,8	39,4	47,0			
EER		3,56	3,58	3,61	3,55	3,62	3,65	3,63	3,81			
Scroll compressors												
Quantity	n.					2						
Circuits	n.					2						
Standard capacity steps	%				0/50	0 / 100						
Nominal input current	A	24,0	29,0	30,0	35,0	43,0	54,0	69,0	82,0			
Maximum input current	A	34,0	40,0	44,0	54,0	64,0	82,0	104,0	125,0			
Inrush current	A	116,0	143,0	149,0	194,0	230,0	266,0	324,0	373,0			
Evaporator												
Туре		Weld-brazed plate										
Quantity	n.			2				1				
Circuits	n.					2						
Water flow	m³/h	7,1	8,6	9,9	12,3	14,9	19,9	24,6	30,8			
Water flow	l/s	1,9	2,4	2,8	3,4	4,2	5,5	6,8	8,5			
Pressure drop	kPa	22	24		32	34	32	35	41			
Water volume		3,0	4	,0	5,0	6,0	8,0	10,0	12,0			
Sound pressure level												
Sound pressure at 1 m	dB(A)	7	70	74	76		73	1	77			
Dimensions												
Length	mm	1`500										
Width	mm				7	/50						
Height	mm			1.600				1`800				
Transport weight	kg	471	483	492	505	550	651	710	760			
Electrical power supply												
Electrical power supply	V / ph / Hz				400/3/	50 + N + T						

REMARKS:

Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 49°C (dew)
 Sound pressure level at 1 m in open field (ISO 3744).



REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 2 circuits - tandem compressors

MEE		892 K	1082 K	1212 K	1512 K	1852 K	2462 K	3102 K	3822 K	
Cooling capacity				·	·					
Cooling capacity	kW	82,4	99,7	115,0	141,8	175,0	230,0	287,0	360,0	
Nominal input power	kW	23,2	28,0	32,0	40,0	48,0	63,6	78,8	94,0	
EER		3,55	3,56	3,61	3,54	3,64	3,62	3,64	3,83	
Scroll compressors										
Quantity	n.				4 (2 ta	indem)				
Circuits	n.					2				
Standard capacity steps	%				0 / 25 / 50) / 75 / 100				
Nominal input current	A	48,0	57,0	60,0	70,0	85,0	109,0	138,0	164,0	
Maximum input current	A	68,0	80,0	88,0	108,0	128,0	164,0	208,0	250,0	
Inrush current	A	150,0	183,0	193,0	244,0	294,0	348,0	428,0	498,0	
Evaporator										
Туре		Weld-brazed plate								
Quantity	n.			1			2			
Circuits	n.				2					
Water flow	m³/h	14,2	17,1	19,9	24,4	30,1	39,6	49,3	61,9	
Water flow	l/s	3,9	4,8	5,5	6,8	8,4	11,0	13,7	17,2	
Pressure drop	kPa	34	38	4	10		32	33	36	
Water volume		5,7	6,6	7,5	-	13,8	15,8	20,3	27,1	
Sound pressure level										
Sound pressure at 1 m	dB(A)	72	7	73	7	75	78	80	82	
Dimensions										
Length	mm		21	500	3.000					
Width	mm				7	50				
Height	mm				1`800					
Transport weight	kg	812	827	852	878	984	1`204	1'328	1`448	
Electrical power supply										
Electrical power supply	V / ph / Hz				400/3/	50 + N + T				

REMARKS:

- Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 49°C (dew) - Sound pressure level at 1 m in open field (ISO 3744).

Technical data - Refrigerant R134a - 1 circuit - tandem compressors

MEE		341 Ka	401 Ka	491 Ka	591 Ka	711 Ka	971 Ka	1201 Ka					
Cooling capacity	· · · · · ·												
Cooling capacity	kW	32,9	38,1	46,4	55,5	74,3	91,1	115,7					
Nominal input power	kW	9,6	11,0	13,5	16,1	20,8	26,0	31,8					
EER		3,43	3,46	3,44	3,45	3,57	3,50	3,64					
Scroll compressors													
Quantity	n.				2 (1 tandem)								
Circuits	n.				1								
Standard capacity steps	%				0 / 50 / 100								
Nominal input current	A	21,2	24,2	29,8	33,8	40,8	51,2	64,0					
Maximum input current	A	40,0	44,0	54,0	64,0	82,0	104,0	125,0					
Inrush current	A	143,0	149,0	194,0	230,0	266,0	324,0	373,0					
Evaporator			οιτούο τούο το										
Туре			Weld-brazed plate										
Quantity	n.				1								
Circuits	n.				1								
Water flow	m³/h	5,7	6,5	7,9	9,5	12,8	15,7	19,9					
Water flow	l/s	1,6	1,8	2,2	2,6	3,5	4,3	5,5					
Pressure drop	kPa	19	20	23	24	17	20	22					
Water volume	I	2,9	3,3	3,8	4,8	6,8	7,9	10,2					
Sound pressure level													
Sound pressure at 1 m	dB(A)	7	0		72	75	77	79					
Dimensions													
Length	mm	1`500											
Width	mm				750								
Height	mm		1.	600			1`800						
Transport weight	kg	475	487	497	541	640	696	748					
Electrical power supply													
Electrical power supply	V / ph / Hz				400 / 3 / 50 + N + T								

REMARKS:

- Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 47°C (dew) - Sound pressure level at 1 m in open field (ISO 3744).



EVAPORATING UNITS WITH SCROLL COMPRESSORS (SINGLE AND TANDEM)

REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 2 circuits - single compressors

MEE		282 Ka	352 Ka	402 Ka	492 Ka	592 Ka	772 Ka	972 Ka	1222 Ka				
Cooling capacity													
Cooling capacity	kW	26,8	33,1	37,8	46,6	55,9	73,5	91,2	115,7				
Nominal input power	kW	7,9	9,6	11,0	13,5	16,1	20,8	26,0	31,8				
EER		3,39	3,45	3,44	3,45	3,47	3,53	3,51	3,64				
Scroll compressors													
Quantity	n.				1	2							
Circuits	n.				i	2							
Standard capacity steps	%				0 / 50	/ 100							
Nominal input current	A	19,0	21,0	24,0	30,0	34,0	41,0	51,0	64,0				
Maximum input current	A	34,0	40,0	44,0	54,0	64,0	82,0	102,0	125,0				
Inrush current	A	116,0	143,0	149,0	194,0	230,0	266,0	324,0	373,0				
Evaporator													
Туре		Weld-brazed plate											
Quantity	n.					2							
Circuits	n.					2							
Water flow	m³/h	4,6	5,7	6,5	8,0	9,6	12,6	15,7	19,9				
Water flow	l/s	1,3	1,6	1,8	2,2	2,7	3,5	4,4	5,5				
Pressure drop	kPa	15	14	19	21	19	27	25	27				
Water volume		1,2	1	,5	1,9	2,4	5,7	7,5	9,3				
Sound pressure level													
Sound pressure at 1 m	dB(A)	69	7	70	7	2	75	77	79				
Dimensions													
Length	mm	1'500											
Width	mm				7	50							
Height	mm			1.600				1`800					
Transport weight	kg	459	465	475	486	527	633	693	743				
Electrical power supply													
Electrical power supply	V / ph / Hz				400 / 3 / 5	i0 + N + T							

REMARKS:

- Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 47°C (dew) - Sound pressure level at 1 m in open field (ISO 3744).

Technical data - Refrigerant R134a - 2 circuits - tandem compressors

MEE		572 Ka	702 Ka	802 Ka	992 Ka	1192 Ka	1522 Ka	1952 Ka	2442 Ka			
Cooling capacity												
Cooling capacity	kW	53,1	65,7	76,4	93,2	111,6	148,6	182,3	231,4			
Nominal input power	kW	15,8	19,1	22,0	27,0	32,2	41,6	52,0	63,7			
EER		3,36	3,44	3,47	3,45	3,47	3,57	3,50	3,63			
Scroll compressors												
Quantity	n.				4 (2 t	andem)						
Circuits	n.					2						
Standard capacity steps	%				0 / 25 / 5	0 / 75 / 100						
Nominal input current	A	38,0	42,0	48,0	60,0	68,0	82,0	102,0	128,0			
Maximum input current	A	68,0	80,0	88,0	108,0	128,0	164,0	208,0	250,0			
Inrush current	A	150,0	183,0	193,0	244,0	294,0	348,0	428,0	498,0			
Evaporator												
Туре					Weld-br	azed plate						
Quantity	n.		2		1			2				
Circuits	n.					2						
Water flow	m³/h	9,1	11,3	13,1	16,0	19,2	25,6	31,4	39,8			
Water flow	l/s	2,5	3,1	3,6	4,4	5,3	7,1	8,7	11,1			
Pressure drop	kPa	22	19	22	26	25	17	20	22			
Water volume		2,1	2,9	6,6	7,5	9,3	6,8	7,9	10,2			
Sound pressure level												
Sound pressure at 1 m	dB(A)	72		73		75	78	80	82			
Dimensions												
Length	mm		2.	500			3.	000				
Width	mm				7	/50						
Height	mm					800						
Transport weight	kg	784	798	846	867	955	1.139	1.243	1.334			
Electrical power supply												
Electrical power supply	V / ph / Hz				400/3/	50 + N + T						

REMARKS:

Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 47°C (dew)
 Sound pressure level at 1 m in open field (ISO 3744).



EVAPORATING UNITS WITH SCREW COMPRESSORS

REFRIGERANT R407C - R134A



MEH 161 K + CFU



Series MEH ... K / Ka

Cooling capacity from 76 to 1543 kW - 1 and 2 circuits

The evaporating units of **MEH K/Ka** series, to be matched to remote condensers, are designed for indoor installation and are particularly suitable for industrial processes and air conditioning systems.

They are all available with 1 or 2 refrigerant circuits.

Thanks to their compact dimensions and to the several options available, these units are particularly easy to install also in small spaces, with no building works. They are completely assembled and tested in the factory and supplied with refrigerant and oil charge.

The following versions are available: **MEH...K** with R407C ecological refrigerant charge **MEH...Ka** with R134a ecological refrigerant charge

Water operation limits (standard units):

EVAPORATOR (OUT): from 5 to 15°C

Main components:

Strong and compact frame, made of bended and coloured steel profiles (colour RAL 9005-black), supporting the evaporator and on which all the main components are installed at sight. On request, the compressors can be isolated by a soundproofing cabinet with standard material (option CF) or with bituminous rubber coated material (option CFU), so to further reduce the overall sound level of the unit itself.

Semi-hermetic screw compressors equipped with capacity steps, motor thermal protection, oil crankcase heater and phase monitor. The compressors lubrication is of forced type, with no pump and in order to prevent many oil migrations to the cooling circuit, the compressors are provided with an oil separator, in-built to the discharge side. The electrical motor is foreseen for lower inrush current and, in this is case, the unit is equipped with an automatic partial load inrush device and mechanical interlock of the inrush control switches, to prevent accidental short circuits (options DS and PW). Dry expansion **shell and tube evaporator** with one or two refrigerant circuits and one water circuit, with very low pressure drops. Shell and tubes plate made in carbon steel and copper tubes. Some plastic and corrosion-proof baffles are suitably placed inside the shell, allowing a correct water distribution and making the tube bundle particularly strong and vibration-free, also in case of very high water flows.

Each compressor works on an independent **cooling circuit**, assuring a remarkable reliability to multi-compressor units. Each circuit, made of copper or carbon steel tube, is composed of thermostatic expansion valve, dehydrating filter, sight glass, high pressure safety device, antifreeze thermostat, high and low pressure switches, high and low pressure gauges, non-return valve on discharge side, shutoff valve on liquid line, solenoid valve.

Electric board in compliance with CE norms, contained in a suitable partition protected by the internal safety panel, provided with a lock-door main switch. Inside, it is complete with all control and protection switches, the terminal board and auxiliaries. The electrical board also includes the control device for power supply phases, to prevent the compressor to turn in the wrong sense. The micro-processor, complete with display, is also placed inside the electrical board.

Unit management microprocessor installed on the internal safety panel of the electrical board, controlling the chilled water temperature regulation, the working parameters, auto-detection failure system, remote management and supervision, complete with compressors hour counter.



EVAPORATING UNITS WITH SCREW COMPRESSORS

REFRIGERANT R407C - R134A

- A Amperometer: Electrical device for measuring the intensity of electrical current absorbed by the unit.
 AC Electrical control for condensers: in case the remote condenser
- AC Electrical control for condensers: in case the remote condenser is included in our supply, its control (regulation and power) is provided in the electrical board of the evaporating unit. On the other hand, if the remote condenser is supplied by the customer, we suggest to inform about the absorbed current of the condenser, so to provide the electric control in the electric board of the indoor unit.
 AE Electrical power supply different from standard: mainly, 230V
- AE Electrical power supply different from standard: mainly, 230V triphase, 460V triphase. Frequency 50/60 Hz.
- CF Soundproofed compressors cabinet with standard material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with soundproofing material and vibration dampers under compressors.
- CFU Soundproofed compressors cabinet with bituminous rubber coated material: Insulation of compressors by a cabinet made of extruded anodized aluminium profiles, with panels in aluminium alloy, coated with bituminous rubber soundproofing material and vibration dampers under compressors, mufflers on compressors discharge pipes.
- **CS Compressors inrush counter**: Electromechanical device positioned inside the electrical board, recording the total inrush starts of compressors.
- DQ Additional box for connection of power supply cables.
- **DS Star/delta**: electric device of close transition type to reduce the inrush current, complete with short circuit safety by mechanical interlock.
- IE Fumigated wooden crate packing: available on request for critical transports, so to assure a suitable protection to the unit.
- IG Watch card: Electronic card to program the switch-over and rotation between to units, after a pre-set time.
- IH RS 485 serial interface: electronic card to be connected to microprocessor, to allow communication between the units and a Carel supervision system. It is possible to fully control the unit from remote. For connection to other supervision systems, the protocol of the controlled parameters is available on request.
- IM Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
- IR Packing with fumigated wooden pallet and transparent film: minimal packing made of wooden pallet and transparent film wrapped all around the unit.
- LI Liquid injection: mechanical device allowing a better cooling of compressors at very high compression level (standard for R407C).
- KS Lifting kit: made of belts and brackets to be inserted into the holes present in the unit base-frame. It is used for moving and positioning the unit on site.
- M12-M25 Modulating capacity control: by means of some valves installed on compressors, the capacity is modulated from 12 to 100%.

- **OS Oil flow safety switch**: in-built in the compressor oil separator, it indicates the eventual decrease of the oil level.
- PA Rubber-type vibration dampers: bell-shaped vibration dampers supports for insulating the unit (supplied in kit), made of base and bell in galvanized steel and natural rubber mixture.
- PF Safety water flow switch: installed on evaporator, it switches off the unit in case of lack of water flow rate through the evaporator.
- PM Spring-type vibration dampers: spring-type vibration dampers support, for insulating the unit (supplied in kit), mainly indicated for installation in difficult and aggressive environments. Made of two steel plates containing a suitable quantity of harmonic steel springs.
- PQ Remote microprocessor: remote terminal, allowing to display the temperature and humidity values detected by probes, the alarm digital inputs, the outputs and the remote ON/OFF of the unit, to change and program of the parameters, the sound signal and the display of the present alarms.
- PW Part-winding: equipment for step compressors starting, reducing of about 35% the inrush current of each compressor.
- RA Anti-freeze heater on evaporator: electrical heater installed on the evaporator, in order to prevent freezing and provided with thermostat.
- **RF Power factor correction system cosfi >0,9**: Electrical device made of suitable condensers for compressors rephasing, ensuring a cosfi value ≥0,9, so to reduce the power absorption from the electrical network.
- RH Shut-off valve on suction side: they are use to isolate compressors during service operations.
- RL Compressors overload relays: electromechanical protection devices against compressor's overload.
- RP Partial heat recovery (about 20%) of the condensing heat, by means of a refrigerant/water plate exchanger (desuperheater), always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity.
- **RT** Total heat recovery (100%) of the condensing heat, by means of a refrigerant/water plate exchanger, always in series to the compressors. It is requested when you need to produce sanitary water, by recovering condensing heat capacity, and /or for dehumidification.
- TE Electronic thermostatic valve: it is requested to make a very accurate regulation of the refrigerant flow and to limit variations of cooling capacity and evaporator leaving temperature water during operation in transitions and for a better performance with fixed superheating.
- V Voltmeter: Electrical device measuring the electrical tension in the power supply of the unit.
- VB Brine version: unit suitable for working with evaporator outlet water temperatures lower than 0°C. A 20 mm evaporator insulation will be provided.



REFRIGERANT R407C - R134A

Technical data - Refrigerant R407C - 1 circuit

MEH		131 K	161 K	191 K	211 K	241 K	301 K	341 K	391 K	451 K	521 K	611 K	691 K	781 K
Cooling capacity														
Cooling capacity	kW	108,0	135,0	158,0	183,0	206,0	265,0	297,0	338,0	458,0	519,0	596,0	685,0	770,0
Nominal input power	kW	35,5	43,8	49,3	58,8	66,3	78,0	91,8	103,7	136,0	155,0	176,0	199,0	224,0
EER		3,04	3,08	3,20	3,	11	3,40	3,23	3,26	3,37	3,35	3,39	3,	44
Screw compressors														
Quantity	n.							1						
Cooling circuits	n.							1						
Standard capacity steps	n.							3						
Modulating capacity steps (option)	%							$0 - 25 \div 100$)					
Nominal input current	A	60,8	74,1	83,2	98,4	108	130,0	154,0	173,0	218,0	256,0	287,0	325,0	364,0
Maximum input current	A	86,0	108,0	128,0	144,0	162,0	180,0	216,0	246,0	330,0	370,0	420,0	45	0,0
Inrush current	A	411,0	508,0	485,0	585,0	686,0	801,0	943,0	1`023,0	1`442,0	1`853,0	2`029,0	2.2	20,0
Inrush current with options PW/DS	A	218,0	269,0	290,0	350,0	423,0	520,0	612,0	665,0	1`009,0	1`297,0	1`420,0	1.2	64,0
Evaporator														
Туре		Shell and tube												
Quantity	n.							1						
Circuits	n.							1						
Water flow	m³/h	18,6	23,2	27,2	31,4	35,5	45,5	51,1	58,1	78,8	89,3	102,5	117,8	132,4
Water flow	l/s	5,2	6,4	7,5	8,7	9,9	12,6	14,2	16,1	21,9	24,8	28,5	32,7	36,8
Pressure drop	kPa	42	44	60	46	59	23	30	38	45	58	60	38	48
Water volume		44	4	2	3	9		134		18	35	179	2	94
Sound pressure level														
Sound pressure at 1 m	dB(A)	70		76		7	7	80	81	82	83	84	85	87
Dimensions														
Length	mm	2.3	900		2.920			3'400				3'450		
Width	mm			680				750				800		
Height	mm			1'445				1.282			1.630		11	720
Width with CF/CFU	mm	750						850				920		
Transport weight	kg	6.	50	860	870	880	113	370	1.390	2.005	2.054	2.041	2`211	2.533
Electrical power supply														
Electrical power supply	V / ph / Hz						1	400/3/50+	T					

REMARKS:

Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 49°C (dew)
 Sound pressure level at 1 m in open field (ISO 3744).

Technical data - Refrigerant R407C - 2 circuits

MEH		252 K	312 K	372 K	422 K	472 K	592 K	672 K	772 K	902 K	1062 K	1212 K	1382 K	1562 K
Cooling capacity														
Cooling capacity	kW	214,0	271,0	317,0	358,0	413,0	517,0	588,0	676,0	912,0	1.042	1`194,0	1`362,0	1`543,0
Nominal input power	kW	71,0	87,6	98,8	117,2	132,6	155,2	183,2	207,4	273,0	311,0	351,0	397,0	448,0
EER		3,01	3,09	3,21	3,05	3,11	3,33	3,21	3,26	3,34	3,37	3,40	3,43	3,44
Screw compressors														
Quantity	n.							2						
Cooling circuits	n.							2						
Standard capacity steps	n.							6						
Modulating capacity steps (option)	%							$0-12\div100$)					
Nominal input current	A	122,0	148,0	166,0	196,0	216,0	260,0	307,0	346,0	437,0	513,0	574,0	649,0	728,0
Maximum input current	A	172,0	216,0	256,0	288,0	324,0	360,0	432,0	492,0	660,0	740,0	840,0	90	0,0
Inrush current	A	497,0	616,0	613,0	729,0	848,0	981,0	1`159,0	1`269,0	1`772,0	2`223,0	2`449,0	2.9	70,0
Inrush current with options PW/DS	A	304,0	377,0	418,0	494,0	585,0	700,0	828,0	911,0	1`339,0	1`667,0	1`840,0	2.5	14,0
Evaporator														
Туре		Shell and tube												
Quantity	n.							1						
Circuits	n.							2						
Water flow	m³/h	36,7	46,6	54,5	61,5	71,0	88,9	101,4	116,3	156,9	180,1	205,4	234,3	265,4
Water flow	l/s	10,2	12,9	15,1	17,1	19,7	24,7	28,1	32,3	43,6	50,0	57,0	65,1	73,7
Pressure drop	kPa	43	25	34	43	46	66	48	44	50	71	56	55	77
Water volume	I	63		134		129	124	185	179	279	271	264	452	444
Sound pressure level														
Sound pressure at 1 m	dB(A)	73		79		8	0	83	84	85	86	87	88	90
Dimensions														
Length	mm	3.800	3`850		3.800			3.990				5'200		
Width	mm	6	80		810			1.000				1'200		
Height	mm			1.442			1.642	-	670			2.050		
Width with CF/CFU	mm		50		850			1.000				1.500		
Transport weight	kg	1.100	1.190	1.630	1.640	1.620	2'480	2.620	2.200	4`367	4.412	4`444	4.915	4.961
Electrical power supply														
Electrical power supply	V / ph / Hz							400/3/50+	T					

REMARKS:

numnnə. - Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 49°C (dew) - Sound pressure level at 1 m in open field (ISO 3744).



EVAPORATING UNITS WITH SCREW COMPRESSORS

REFRIGERANT R407C - R134A

Technical data - Refrigerant R134a - 1 circuit

MEH		91 Ka	111 Ka	131 Ka	151 Ka	171 Ka	211 Ka	241 Ka	271 Ka	281 Ka	331 Ka	381 Ka	441 Ka	501 Ka	561 Ka
Cooling capacity															
Cooling capacity	kW	76,2	95,4	111,0	131,0	148,0	175,0	212,0	246,0	283,0	328,0	375,0	439,0	489,0	558,0
Nominal input power	kW	21,9	26,9	33,0	36,8	41,6	47,2	57,5	67,2	74,2	82,5	97,7	114,0	127,0	140,0
EER		3,48	3,55	3,36	3,	56	3,71	3,69	3,66	3,81	3,97	3,84	3,	85	3,98
Screw compressors															
Quantity	n.								1						
Cooling circuits	n.								1						
Standard capacity steps	n.								3						
Modulating capacity steps (option)	%							0 - 25	5 ÷ 100						
Nominal input current	A	40,0	47,0	57,0	65,0	73,0	82,0	94,0	115,0	128,0	142,0	162,0	185,0	214,0	234,0
Maximum input current	A	56,0	65,0	79,0	98,0	124,0	144,0	155,0	182,0	215,0	231,0	280,0	310,0	320,0	360,0
Inrush current	A	305,0	338,0	355,0	449,0	485,0	585,0	675,0	801,0	943,0	1`023,0	1`364,0	1'442,0	1`853,0	2`029,0
Inrush current with options PW/DS	A	153,0	169,0	206,0	267,0	290,0	350,0	439,0	520,0	612,0	664,0	955,0	1`009,0	1`297,0	1'420,0
Evaporator															
Туре		Shell and tube													
Quantity	n.								1						
Circuits	n.								1						
Water flow	m³/h	13,1	16,4	19,0	22,5	25,4	30,0	36,4	42,2	48,6	56,5	64,4	75,6	84,2	96,1
Water flow	l/s	3,6	4,6	5,3	6,2	7,1	8,3	10,1	11,7	13,5	15,7	17,9	21,0	23,4	26,7
Pressure drop	kPa	5	8	59	81	61	45	65	87	44	51	60	4	19	53
Water volume	1	44	42	3	9	37	59	1	56	191	185	179	173	294	286
Sound pressure level															
Sound pressure at 1 m	dB(A)	68		74		75	76	77	79	80	8	31	82	83	84
Dimensions															
Length	mm	2'900 2'950 3'400 3'450													
Width	mm			680				750		6	80		8	00	
Height	mm	1`445						1.202		1	610	1.0	530	17	720
Width with CF/CFU	mm			750					850				920		
Transport weight	kg	6	40	850	860	870	1.580	1'300	1.310	1.218	1.240	1.992	2.013	2.718	2.506
Electrical power supply															
Electrical power supply	V / ph / Hz							400/3	/ 50 + T						

REMARKS:

Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 47°C (dew)
 Sound pressure level at 1 m in open field (ISO 3744).

Technical data - Refrigerant R134a - 2 circuits

MEH		182 Ka	222 Ka	252 Ka	292 Ka	332 Ka	412 Ka	472 Ka	542 Ka	572 Ka	662 Ka	762 Ka	892 Ka	992 Ka	1132 Ka
Cooling capacity															
Cooling capacity	kW	153,0	192,0	223,0	266,0	295,0	347,0	419,0	491,0	569,0	654,0	745,0	873,0	980,0	1`112,0
Nominal input power	kW	43,8	53,8	66,0	73,8	83,2	94,2	114,8	134,4	149,0	165,0	195,0	228,0	225,0	281,0
EER		3,49	3,57	3,38	3,60	3,54	3,68	3,	,65	3,82	3,96	3,82	3,83	3,84	3,96
Screw compressors															
Quantity	n.								2						
Cooling circuits	n.								2						
Standard capacity steps	n.								6						
Modulating capacity steps (option)	%							0 - 12	2 ÷ 100						
Nominal input current	A	81,0	95,0	114,0	129,0	145,0	163,0	188,0	229,0	257,0	283,0	324,0	370,0	428,0	468,0
Maximum input current	A	112,0	130,0	158,0	196,0	248,0	288,0	310,0	364,0	430,0	462,0	560,0	620,0	640,0	720,0
Inrush current	A	361,0	403,0	434,0	547,0	609,0	729,0	830,0	983,0	1`158,0	1`254,0	1`644,0	1`752,0	2`173,0	2`389,0
Inrush current with options PW/DS	A	209,0	234,0	285,0	365,0	414,0	578,0	594,0	702,0	827,0	895,0	1`235,0	1`319,0	1`617,0	1`780,0
Evaporator															
Туре			Shell and tube												
Quantity	n.								1						
Circuits	n.								2						
Water flow	m³/h	26,3	32,9	38,3	45,6	50,6	59,5	71,9	84,2	97,2	112,3	128,2	150,1	168,5	191,2
Water flow	I/s	7,3	9,1	10,6	12,7	14,1	16,5	19,9	23,4	27,2	31,2	35,6	41,7	46,8	53,1
Pressure drop	kPa	57	54	71	45	55	49	51	70	55	48	68	70	72	44
Water volume		63	59	56	1	29	124	119	179	286	279	271	461	444	435
Sound pressure level															
Sound pressure at 1 m	dB(A)	71		77		78	79	80	82	83	8	34	85	86	87
Dimensions															
Length	mm		900	3`850		900			3.990				5.	200	
Width	mm	680 810							1.000				1'	200	
Height	mm	1'445						645		1.620			2.	020	
Width with CF/CFU	mm	7.	50		850				1.000				1.	200	
Transport weight	kg	1.080	1.090	1.20	1.620	1.640	2'460	2'490	2	680	2.838	4`351	4`708	4`851	4.901
Electrical power supply															
Electrical power supply	V / ph / Hz							400/3	/ 50 + T						

REMARKS:

REWARKS: - Operating conditions: Evaporator water temperature 7/12°C; condensing temperature 47°C (dew) - Sound pressure level at 1 m in open field (ISO 3744).





CR... – CRS... – CRU... Series

1 refrigerant circuit - capacities from 6 to 99 kW

Packaged air condensers with axial fans for external installation, especially designed to satisfy many refrigeration and air conditioning applications, so to reduce the overall noise level.

The following versions are available:

CR...K standard suitable for R407C ecological refrigerant (6-pole axial fans) **CRS...K** silenced suitable for R407C ecological refrigerant (6/8-pole axial fans) **CRU...K** ultra silenced suitable for R407C ecological refrigerant (6/8-pole axial fans) fans)

Operation limits: external air temperature from 15 to 42°C.

Main components:

Casing designed to allow an easy access to the internal components, realized from pre-painted galvanized sheet steel. It is particularly resistant to corrosion and is completely covered by a protective plastic film.

High efficiency heat exchange coil, made from aluminium fins and inner grooved copper tube, suitable for new refrigerants.

Axial fans with external rotor motor, with die cast aluminium shaped fan blades, IP 54 protection grade, class F insulation, in-built thermal protection, epoxy coated steel fan guard.

Access	ories
BW	Low temperature operation down to -40 °C: in order to allow operation down to such external air temperature, we install an ad- ditional liquid receiver with pressure control and regulation of the fans.
C2	2 circuits coil
CV	Fans wiring: carried out in junction boxes with access holes equipped with tear-proof cable supports.
FV	Kit of supports for vertical air flow to change the airflow from horizontal to vertical.
IM	Seawood packing: fumigated seawood case and protection bag with hygroscopic salts, suitable for long sea transports.
RM	Condensing coil with pre-painted fins: superficial treatment of the condensing coils realized in epoxy pre-painted aluminium material.
RR	Copper/copper condensing coils: special execution of the con- densing coils with copper pipe and fins.



Standard version - Technical data for R407C

CR K		8	11	14	18	27	30	36	46	49	53	59	71	90	97
Cooling capacity							,								
Cooling capacity	kW	6,5	9,2	12,0	14,9	22,2	24,7	29,9	38,0	41,1	44,2	49,4	59,9	76,0	82,0
Axial fans															
Quantity	n.		l		2			1					2		
Rotation speed	rpm		17	400		1.	210	900			17	210	900		
Air flow	m³/h	2.22	2'300	5.000	4.600	7.200	7:350	10.600	10.400	9.800	15.000	14.200	21.500	20.800	19 ⁻ 600
Air flow	l/s	714	639	1.389	1.5278	2.083	2.045	2.944	2`889	2.252	4`167	4.083	5.889	5`778	5'445
Motor input power	kW	0	,2	0),4			0,8			1	,5	1,6		
Input current	A	0,	0,96 1,92			3	,4		3,5			6,8		7	
Diameter	mm		350			5	00		630		500		630		
Sound pressure level															
Sound pressure at 10 m	dB(A)	4	5	4	48 4		14	46			47		49		
Dimensions															
Length	mm	70	54	1	220	1.	175	1.322			2.125		2.425		
Width	mm		3	14		5	10	630 1.098 630			510		630		
Height	mm		4	10		7	97	1.098 630 1.098			797		1.088		
Length (vertical air flow)	mm	8	808 1.228				175	1'325			2.152		2.422		
Width (vertical air flow)	mm	505				7	97	1.088			797		1`098		
Height (vertical air flow)	mm	534			8	95	1.050			895		1.050			
Weight	kg	13	16	22	24	45	50	74	79	94	78	87	132	145	176
IN/OUT connections	Ø	16/16 18/16				22/16	28/16	28/22			35 / 28		42 / 28		/ 28
Electrical power supply															
Electrical power supply	V / ph / Hz							220 V / 1 Pł	/ 50 Hz + T						

REMARKS: - Capacity referred to DT 16 between inlet coil air temperature and condensing temperature. - Sound pressure level measured at 10 m in open field (ISO 3744).

Silenced Version - Technical data for R407C

CRS K		7	10	13	22	25	29	35	42	57	67	85	99	
Cooling capacity														
Cooling capacity	kW	6,2	9,2	10,9	17,5	20,7	23,9	29,0	35,1	47,6	56,3	71,7	84,7	
Axial fans														
Quantity	n.	1		2		1			2				3	
Rotation speed	rpm		945		8	890 650		50	890	890		650		
Air flow	m³/h	1'400	3.500	2.800	5.200	5.500	6.200	6.000	11.400	13.400	13.000	20.000	19 [°] 500	
Air flow	l/s	389	889	806	1.283	1.444	1.861	1.662	3.162	3.252	3.611	5.226	5`417	
Motor input power	kW	0,1 0,2			0	,3	0	,4	0,6	0,8		1,2		
Input current	A	0,37	0,	.74	1,3 1,8		2,6	3	3,6 5,4		,4			
Diameter	mm		350		5	00	630		500	630				
Sound pressure level														
Sound pressure at 10 m	dB(A)	33	3	36	3	4	37		1		0	4	42	
Dimensions														
Length	mm	764	1.550	1.500	1.122 1.325		325	2.122	2.4	425 3.525		525		
Width	mm		314		5	10	630		510	630				
Height	mm		410		7	97	1.088		797	1		.098		
Length (vertical air flow)	mm	808	17	258	1.172		1'325		2.122	2.425		3.222		
Width (vertical air flow)	mm	505			7	97	1.088		797	1.088				
Height (vertical air flow)	mm	534			8	95	1.050		895	1.050)20		
Weight	kg	13	22	24	45 50 74		74	79	7	78 145		191	205	
IN/OUT connections	Ø	16/16 18/16			22/16 28/22				35/28		42 / 28		54/35	
Electrical power supply														
Electrical power supply	V / ph / Hz						220 V / 1 Pł	n / 50 Hz + T						

REMARKS: - Capacity referred to DT 16 between inlet coil air temperature and condensing temperature. - Sound pressure level measured at 10 m in open field (ISO 3744).



Ultrasilenced version - Technical data for R407C

CRU K		18	20	23	28	32	43	51	68	74	87	98	
Cooling capacity													
Cooling capacity	kW	13,9	16,0	18,6	21,2	27,9	37,5	42,3	56,3	63,7	75,0	85,0	
Axial fans													
Quantity	n.			1			2		3		4		
Rotation speed	rpm	650	890	4	30	650			4	430			
Air flow	m³/h	4.000	5'200	4`750	4'400	8.000	9.200	8.800	14.220	13`200	19.000	17`600	
Air flow	l/s	1.111	1`444	1`319	1.555	2.555	2.639	2.442	3.928	3`667	5`278	4`889	
Motor input power	kW	0,1	0,3	0,3 0,1			0,3		0	,4	0,5		
Input current	A	0,7	1,3	0,36		1,4	0,72		1,08		1,4		
Diameter	mm	5	00	6	30	500		630					
Sound pressure level													
Sound pressure at 10 m	dB(A)	2	25		29		32		34			35	
Dimensions													
Length	mm	11	1.122		1.325		2`425		3.225		4 625		
Width	mm	5	10	630		510	630						
Height	mm	7	97	1.088		797			1.098				
Length (vertical air flow)	mm	1	175	1.325		2.122	2'425		3.5	3.222		4.622	
Width (vertical air flow)	mm	7	97	1.(098	797		1.088					
Height (vertical air flow)	mm	8	895 1.050			895		1.020					
Weight	kg	45	50	74	79	78	132	145	191	205	256	273	
IN/OUT connections	Ø	22/16 28/16		28/22		35 / 28		42/28 54/35		54/35	54 / 42		
Electrical power supply													
Electrical power supply	V / ph / Hz	220 V / 1 Ph / 50 Hz + T		400 V / 3 Ph / 50 Hz + T		220 V / 1 Ph / 50 Hz + T	400 V / 3 Ph / 50 Hz + T						

REMARKS:
 - Capacity referred to DT 16 between inlet coil air temperature and condensing temperature.
 - Sound pressure level measured at 10 m in open field (ISO 3744).





REMOTE AIR CONDENSERS

VERSION WITH CENTRIFUGAL FANS



CRC 75

CRC... Series

1 refrigerant circuit - capacities from 7 to 122 kW

Packaged air condensers with centrifugal fans for internal installation, especially designed for a wide range of applications both in refrigeration and air conditioning, where you need to reduce the overall sound level.

All sizes have been designed for ducted installations for a max available pressure of 150 Pa. In the case the condenser will not be ducted, it is necessary to fit a protection grid on the air discharge, in compliance with the local regulations in force.

The following versions are available:

CRC... K standard version suitable for R407C refrigerant charge

Operation limits: external air temperature from 15 to 42°C.

Main components:

Casing designed to allow an easy access to the internal components, realized from smooth finish aluminium alloy. It is particularly resistant to corrosion and is completely covered by a protective plastic film. In order to modify the air flow and facilitate the service and cleaning operations, the side panels and the fan shroud are removable. All sizes are provided with mobile protective panels on the return curves and manifolds.

High efficiency heat exchange coil, made from aluminium fins and inner grooved copper tube, suitable for new refrigerants.

Centrifugal fans of direct driven type, fixed to the unit by anti-vibration system, IP 44 protection grade, class F insulation, in-built thermal protection. They are designed for ducted installations for a maximum available pressure of 150 Pa.

1M-2M	Higher available pressure to the fans: for an available pressur
	from 50 to 150 Pa maximum
BW	Low temperature operation down to -40 °C: in order to allow operation down to such external air temperature, we install an ac ditional liquid receiver with pressure control and regulation of th fans.
C2	2 circuits coil
FO	Horizontal air flow version: support bracket kit to change th airflow from vertical to horizontal.
РК	On/off pressostatic control kit: installed inside the indoor unit, allows the control of the condensing pressure by a pressure switc controlled by the microprocessor.
RM	Condensing coil with pre-painted fins: superficial treatment of the condensing coils realized in epoxy pre-painted aluminium material.
RR	Copper/copper condensing coils: special execution of the cor densing coils with copper pipe and fins.
SN	Wired main switch: used to cut off the electrical supply and carr out the extraordinary service operations.



CRC - Standard version

CRC K		8	10	12	15	20	24	33	50	62	75	94	125	134
Cooling capacity														
Cooling capacity	kW	6,8	9,3	11,5	13,7	18,6	22,8	30,5	45,7	57,1	68,5	85,8	114,2	122,3
Centrifugal fans														
Quantity	n.		1			2		1		2		3		4
Air flow	m³/h	2.640	2'370	3.860	5'280	4.240	6'315	6.880	12.630	14.080	18`945	21.150	28.160	26.250
Air flow	l/s	733	658	1.025	1.462	1:317	1.754	1.911	3.208	3.911	5'263	5`867	7`822	7'422
Rotation speed	rpm	1.2	200	910	172	200				9	00			
Standard available pressure	Pa							50						
Standard motor input power	kW	0,	6	0,5	1	,1	1,4		2	,8	4,1		5	,5
Standard motor input current	A	4,1		4	8	,2	5	,5	11	1,1	16	5,5	2	22
Sound pressure level														
Sound pressure at 10 m	dB(A)	3	5	36	38		4	5	4	.7	4	19	5	50
Dimensions														
Length	mm	59	90	760	1.()20	760	1.110	1'360	2.060	1.960	3.010	3.9	960
Width	mm	80	00	950	8	00				9	50			
Height	mm	52	20	845	52	20				8	45			
Length (vertical air flow)	mm	59	90	760	1.()20	760	1.110	1.360	2.060	1.960	3.010	3.	960
Width (vertical air flow)	mm	49	90	815	49	90				8	15			
Height (vertical air flow)	mm	1.1	50	1.300	1	150				113	300			
Weight	kg	152	52	80	75	83	98	123	157	188	216	266	344	378
IN/OUT connections	Ø	22 / 16				28	/ 22	35	/ 28	42/35	35 / 28	42 / 35	54	/ 42
Electrical power supply														
Electrical power supply	V / ph / Hz		230	V / 1 Ph / 50 H	z+T					400 V / 3 Pł	n / 50 Hz + T			

REMARKS: - Capacity referred to DT 16 between inlet coil air temperature and condensing temperature. - Sound pressure level measured at 10 m in open field (ISO 3744).

CRC - Version 1M (100 Pa)

CRC K		8 – 1M	10 – 1M	12 – 1M	15 – 1M	20 – 1M	24 – 1M	33 – 1M	50 – 1M	62 – 1M	75 – 1M	94 – 1M	125 – 1M	134 – 1M
Cooling capacity														
Cooling capacity	kW	6,7	9,1	11,3	13,5	18,2	22,4	29,9	44,8	55,9	67,1	84,1	112	119,9
Centrifugal fans														
Quantity	n.		1			2		1		2		3		4
Air flow	m³/h	2.260	2.580	3.250	5.150	4.260	5.830	6.190	11.660	13.120	17.490	19 ⁻ 680	26'240	24.760
Air flow	l/s	711	633	978	1.425	1.562	1.619	1.719	3.538	3.644	4`858	5'467	7`289	6`878
Rotation speed	rpm	17	200	910	17	200				9	00			
1M higher available pressure	Pa							100						
1M motor input power	kW	0	0,6 0,5			,1	1	,4	2	,8	4	,1	5	,5
1M motor input current	A	4,1 4		8	,2	5,5		1	1	16	6,5	2	2	
Sound pressure level			1/1											
Sound pressure at 10 m	dB(A)	3	5	34	3	8	4	13	4	5	4	16	4	7
Dimensions														
Length	mm	5	90	760	1.0)20	760	760 1.110 1.360 2.060		2.060	1.960 3.010		3.	960
Width	mm	8	00	950	8	00	950							
Height	mm	5	20	845	5	20				8	45			
Length (vertical air flow)	mm	5	90	760	1.0)20	760	1.110	1.360	2.060	1.960	3.010	3.	960
Width (vertical air flow)	mm	4	90	815	4	90				8	15			
Height (vertical air flow)	mm	1	150	1.300	1.	150				11	300			
Weight	kg	48 52 80			75	83	98	123	157	188	216	266	344	378
IN/OUT connections	Ø	22 / 16			28/2		/ 22	35	/ 28	42 / 35	35/28	42 / 35	54	/ 42
Electrical power supply														
Electrical power supply	V / ph / Hz	Hz 230 V / 1 Ph / 50 Hz			z + T					400 V / 3 Pł	n / 50 Hz + T			

REMARKS: - Capacity referred to DT 16 between inlet coil air temperature and condensing temperature. - Sound pressure level measured at 10 m in open field (ISO 3744).



REMOTE AIR CONDENSERS

VERSION WITH CENTRIFUGAL FANS

CRC - Version 2M (150 Pa)

CRC K		8 – 2M	10 – 2M	12 – 2M	15 – 2M	20 – 2M	24 – 2M	33 – 2M	50 – 2M	62 – 2M	75 – 2M	94 – 2M	125 – 2M	134 – 2N
Cooling capacity														
Cooling capacity	kW	6,4	8,7	10,8	12,9	17,5	21,5	28,7	42,9	53,7	64,4	80,7	107,4	115
Centrifugal fans														
Quantity	n.		1			2		1		2		3		4
Air flow	m³/h	2'375	2.080	3.080	4.720	4.180	4.060	5.710	8 [°] 120	11.920	12.180	17.880	23.840	22.840
Air flow	l/s	660	581	858	1:319	1.161	1.128	1.286	2.526	3:311	3.383	4.962	6.655	6'344
Rotation speed	rpm	17	200	910	17	200				9	00			-
2M higher available pressure	Pa							150						
2M motor input power	kW	0	,6	0,5	1	,1	1	,4	2	,8	4,1		5,5	
2M motor input current	A	4	4,1		8	,2	5	,5	11	1,1	16,5		2	22
Sound pressure level														
Sound pressure at 10 m	dB(A)	3	5	32	3	8	4	1	4	4	4	15	4	16
Dimensions														
Length	mm	5	90	760	760 1.0		20 760		1.360	2.060	1.960 3.010		3.	960
Width	mm	8	00	950	8	00	950							
Height	mm	5	20	845	5	20				8	45			
Length (vertical air flow)	mm	5	90	760	1	020	760	1.110	1.360	2.060	1.960	3.010	3.	960
Width (vertical air flow)	mm	4	90	815	4	90				8	15			
Height (vertical air flow)	mm	1	150	1'300	1	150				11	300			
Weight	kg	48	52	80	75	83	98	123	157	188	216	266	344	378
IN/OUT connections	Ø	22/16					/ 22	35	/ 28	42/35	35/28	42/35	54	/ 42
Electrical power supply	i i i i i i i i i i i i i i i i i i i													
Electrical power supply	V / ph / Hz	230 V / 1 Ph / 50 Hz			z+T					400 V / 3 Pł	n / 50 Hz + T			

REMARKS: - Capacity referred to DT 16 between inlet coil air temperature and condensing temperature. - Sound pressure level measured at 10 m in open field (ISO 3744).





Series ARW

Capacity from 22 to 663 kW

Packaged dry coolers with axial fans suitable for external installation. To be matched to the units series: RWE – RWH – PWE – PWH – ED.H – EDW.F. These units are used to cool the condensing water and for units EDW.F, they have

a double use, for condensing in the summer period or for free-cooling in the winter period.

Four different versions are available, depending on the sound pressure level: **ARW** standard version

ARW.S silenced version

ARW.U ultrasilenced version

ARW.XU extra-ultrasilenced version

They can be installed both with horizontal and vertical air flow; in this last case option FV must be required.

Main components:

Housing: it is designed to ensure the best acess to the internal components and it is made of pre-painted galvanized steel panels (RAL 9002) of suitable thickness, with plastic protection film.

Fans: Of axial type with external motor, complete with protection grid and manufactured by certified and qualified European companies, in compliance with the most updated safety standards. The motors are 3 Phases, for supply 400V/50Hz, in compliance with VDE 0530/11.84 standards, IP 54 protection according to DIN 400 50 standards and complete with built-in thermostat.

Coils: Made, in the standard version, with copper pipes and special ruled aluminium fins to improve the heat exchange. On request they are available with aluminium fins pre-painted with epoxy powders, suitably resistant to the sea environment, or with copper fins and are complete with purge and draining valves. Each coil is pressure tested at 30 Bar.

In the basic version the fans are not wired.

Accessories

CQ CV	Wired fans and electrical panel Fans wired in a suitable terminal board
EC	Three-phase EC high reliability axial fans with radial fastening guard grill, electronically commutated motor and low electrical absorptions
FV	Kit of supports for vertical air flow
IS	Switches for each fan
RG	Electronic and modulating fans speed regulation so to keep the liquid temperature constant
RM	Epoxy treatments of the coils
RR	Coils with copper/copper fins



DRY COOLERS AXIAL FANS MEDIUM AND HIGH CAPACITY

Technical data - Standard version

ARW		20	35	50	80	90	100	120	150	180	210	230	260	280	300	350	400	450	500	550	600	650
Capacity																						
Power	kW	22,0	37,3	49,0	81,0	94,5	100,5	121,4	149,9	182,5	216,0	235,5	255,0	289,0	309,0	352,0	392,0	442,0	504,0	571,0	590,0	663,0
Axial fans																						
Quantity	n.			2		3	4	3	4		(6		8	1	0	8	1	2	14	1	6
Rotation speed	rpm	1:390		8	80		1.380			880			890		880		890	880		8	95	
Air flow	m³/h	13`380	19`800	40'320	35'960	58`500	50'480	53`940	74`640	115.062	109 ⁻ 620	105.912	171`340	146 [°] 160	191.775	182.200	213`305	219 ⁻ 240	235'200	274'400	328`800	313.600
Motor input power	kW	1,30	1,68	3,	28	4,92	5,76	4,92	6,56		9,84		21,60	13,12	16	i,4	28,8	19	,68	22,96	26	,24
Input current	A	2,82	3,48	7,	80	11,70	12,4	11,70	15,60	23,4	23	,40	43,20	31,20	39	9,0	57,6	46	,80	54,60	62	,40
Diameter	mm	500	710		800		630			800			910		800		910			800		
Coil																						
Water flow	m³/h	4,00	6,95	8,95	15,01	17,61	18,69	22,58	27,94	34,00	40,40	43,82	47,47	53,86	57,63	65,74	72,9	83,17	93,91	106,43	109,95	123,62
Pressure drop	kPa	41	76	41	59	36	22	53	73	40	68	61	48	83	77	37	44	65	76	38	82	54
Water volume	dm ³	11	22	24	58	54	46	86	91	98	129	161	130	172	163	2	18	262	392	448	390	504
Sound pressure level																						
Sound pressure at 10 m	dB(A)	53	48	5	51	53	58	53	54		56		63	57	5	8	64	58	5	59	6	i0
Dimensions																						
Length	mm	2.150	2.960	31	340	4`815	4`360	4`815	6`290		4`815		67	290		7.765		9`240			-	
Width	mm	580	680		965		653						965								-	
Height	mm	814	114		1'328		1.114	11	328					2.383							-	
Length (vertical air flow)	mm	2.150	2.960	31	340	4`815	4`360	4`815	6`290		4`815		6.7	290		7`765		9`240	6'920	8.050	9.1	120
Width (vertical air flow)	mm	764	1.064		1`248		1.062	17	290			2`354				2	361			21	350	
Height (vertical air flow)	mm	954	1.120		1`386		1.123			1.386			1.211		1'386		1.211	1.386		2.4	150	
Weight	kg	111	198	304	394	520	396	574	696	910	960	1.010	1.560	1.324	1.228	1.688	1.724	2`250	3`390	3`890	3.960	4`380
Water connections IN	"	1	1¼	1½	2	21/2	3	2	1/2				4				2	x 4		4 x 3	2 x 4	4 x 3
Water connections OUT	"	1	1¼	1½	2	2 1/2	3	2	1/2				4				2	x 4		4 x 3	2 x 4	4 x 3
Electrical power suppl	у																					
Electrical power supply	V / ph / Hz										400/	3/50+	N + T									

REMARKS: - Nominal conditions referred to: external air temperature 35; water 45/40°C and glycol 35%. - Sound pressure level measured at 10 m in open field (ISO 3744) for fans with 400 V/3 Ph/50 Hz power supply.

Technical data - Silenced version

ARW		35 S	50 S	65 S	100 S	120 S	150 S	180 S	230 S	300 S	350 S	400 S	450 S	500 S	550 S
Capacity															
Power	kW	37,3	55,6	63,7	97,7	126,5	148,6	183,0	244,0	298,0	366,0	401,0	442,0	502,0	547,5
Axial fans															
Quantity	n.			2		4	5	6	8	10		12		14	16
Rotation speed	rpm	880	670	8	80					6	70				
Air flow	m³/h	19.800	30.120	44.700	39'940	59 [°] 080	75`300	85.992	114.660	143`325	171.990	156.750	179.100	208.920	238.800
Motor input power	kW	1,68	1,50	3,	28	3,00	3,75	4,50	6,00	7,50		9,00		10,50	12,00
Input current	A	3,48	3,90		7,80		9,75	11,70	15,60	19,50		23,40		27,30	31,20
Diameter	mm	710							800						
Coil	· ·														
Water flow	m³/h	6,95	10,36	11,95	18,00	23,70	26,06	34,10	45,47	55,58	68,21	74,76	82,26	93,60	101,34
Pressure drop	kPa	76	71	39	35	54	42	50	61	27	45	39	59	30	38
Water volume	dm ³	22	3	6	86	91	87	129	172	218	262	328	392	448	504
Sound pressure level															
Sound pressure at 10 m	dB(A)	48	43	5	51	45	46	47	48		4	19		5	50
Dimensions	· ·														
Length	mm	2.960	3'340	4.8	815	6.290	7.765	-	6.560	7.765	9.	240		-	
Width	mm	680			965			-		90	65			-	
Height	mm	1.114			1'328			-		2.3	393			-	
Length (vertical air flow)	mm	2.960	3'340	4.5	815	6.290	7.765	4`815	6.560	7.765	9.	240	6.920	8.050	9 [°] 120
Width (vertical air flow)	mm	1.062	1.248		1.500		1.292	2.	354		2'361			2.320	
Height (vertical air flow)	mm	1.120					113	386						2.420	
Weight	kg	198	358	408	544	696	734	960	1.324	1.688	2.50	2.2558	3.360	3.890	4.380
Water connections IN	"	1¼	1½		2 1/2		3		4		2	x 4		4	x 3
Water connections OUT	ш	1¼	1½		2 1/2		3		4		2	x 4	4 x 3		
Electrical power suppl	у														
Electrical power supply	V / ph / Hz							400/3/	50 + N + T						

REMARKS: - Nominal conditions referred to: external air temperature 35; water 45/40°C and glycol 35%. - Sound pressure level measured at 10 m in open field (ISO 3744) for fans with 400 V/3 Ph/SO Hz power supply.

DRY COOLERS MEDIUM AND HIGH CAPACITY

Technical data - Ultrasilenced version

ARW		20 U	35 U	50 U	65 U	90 U	100 U	150 U	180 U	260 U	280 U	300 U	350 U
Capacity												1	
Power	kW	19,1	38,9	49,8	63,4	88,5	99,5	150,3	178,5	258,5	278,6	301,0	348,0
Axial fans													
Quantity	n.		2	3	3		4	8	10	1	12	1	16
Rotation speed	rpm	660						435					
Air flow	m³/h	11.200	17.760	28'320	25.050	38'400	36'250	70'300	99`510	98.100	113.400	163.600	151.200
Motor input power	kW	0,58	0,76	1,	14	1,	52	3,04	3,80	4	,56	6,	,08
Input current	A	1,66	2,30	3,	45	4,	60	9,20	11,50	13	6,80	18,40	18,4
Diameter	mm		800										
Coil													
Water flow	m³/h	3,55	7,18	9,08	11,83	16,24	18,48	27,99	32,62	48,41	51,73	55,15	63,77
Pressure drop	kPa	81	36	54	22	18	75	35	45	24	50	52	30
Water volume	dm ³	12	3	6	68	87	116	13	30	262	306	292	390
Sound pressure level													
Sound pressure at 10 m	dB(A)	37	35	3	6	3	7	40		41		4	12
Dimensions													
Length	mm	2'360	3`340	4.8	315	7.	765	6`290	9.2	.40		-	
Width	mm	630				9	65					-	
Height	mm	1.114			1'328				2.383			-	
Length (vertical air flow)	mm	2'360	3`340	4.8	815	7.	765	6'290	9.2	.40	6'920	9.	120
Width (vertical air flow)	mm	1.062	1.248		1.	290			2'354			2'350	
Height (vertical air flow)	mm	1.080				11	386					2'450	
Weight	kg	137	358	438	547	704	744	1.524	1.22	2.50	3.060	3.240	3.960
Water connections IN	Ш	1	1	1/2	2 1⁄2	3	21/2	4	1	2 x 4	2	х 3	2 x 4
Water connections OUT	Ш	1	1	1/2	2 1⁄2	3	21/2	4	1	2 x 4	2	х 3	2 x 4
Electrical power supply													
Electrical power supply	V / ph / Hz						400/3/5	50 + N + T					

REMARKS: - Nominal conditions referred to: external air temperature 35; water 45/40°C and glycol 35%. - Sound pressure level measured at 10 m in open field (ISO 3744) for fans with 400 V/3 Ph/50 Hz power supply.

Technical data - Extra-Ultrasilenced version

ARW		20 XU	35 XU	50 XU	65 XU	80 XU	90 XU	100 XU	120 XU	180 XU	210 XU	230 XU	260 XU
Capacity													
Power	kW	20,9	35,5	53,2	64,1	78,9	89,9	101,0	122,5	180,0	211,0	228,0	258,1
Axial fans													
Quantity	n.		2		3	4		6			12		16
Rotation speed	rpm	500						400					
Air flow	m³/h	11.920	15`880	23`820	26'322	31.760	50.082	45.638	51.642	100 ⁻ 170	91`275	83`262	137.600
Motor input power	kW	0,46	0,50	0,	75	1,00		1,50			3,00		4,00
Input current	A	0,96	1,12	1,	68	2,48		3,36			6,72		8,96
Diameter	mm	710						800					
Coil													
Water flow	m³/h	3,90	6,61	9,91	11,75	14,68	16,87	18,88	22,82	33,74	39,37	42,05	48,58
Pressure drop	kPa	56	31	29	49	74	49	39	65	48	42	69	88
Water volume	dm ³	15	36	54	6	8	65	98	1	30	196	262	390
Sound pressure level													
Sound pressure at 10 m	dB(A)	30	29	3	1	32	3	34	33		36		38
Dimensions													
Length	mm	2.960	3`340	4`815	6.7	290	4.	815	6.560		9.240		-
Width	mm	680					9	65					-
Height	mm	1.114		11	328				2	393			-
Length (vertical air flow)	mm	2.960	3`340	4`815	6.7	290	4.	815	6`290		9.240		9 [°] 120
Width (vertical air flow)	mm	1.062	1.548	1.542	17	290		2`354		2'361	2	61	2.320
Height (vertical air flow)	mm	1.120					1.	386					2.420
Weight	kg	178	358	520	631	661	704	910	1.194	1.615	1.945	2.220	3.960
Water connections IN	и	1	1½		2			2 1/2			4		2 x 3
Water connections OUT	u	1	1½ 2 2½ 4						2 x 3				
Electrical power supply													
Electrical power supply	V / ph / Hz						400/3/	50 + N + T					

REMARKS: - Nominal conditions referred to: external air temperature 35; water 45/40°C and glycol 35%. - Sound pressure level measured at 10 m in open field (ISO 3744) for fans with 400 V/3 Ph/50 Hz power supply.



FANCOILS WITH CENTRIFUGAL FANS



Series VC ... - SC ... Capacity from 0,87 to 11 kW

The wide range of VC and SC series is able to meet the several and different requirements of conditioning market. These units are equipped with centrifugal fans and are planned for on sight

(VC...) or built-in installation (SC...). The following versions are available: VERTICAL, ON SIGHT WITH HOUSING VCL...vertical bottom air intake

VCZ...horizontal air intake with socle VCY...horizontal air intake HORIZONTAL, ON SIGHT WITH HOUSING VCK...rear air intake VCW...horizontal air intake with socle VCH....horizontal air intake VERTICAL, BUILT-IN VERSION WITHOUT HOUSING SCL...vertical air flow SCW....horizontal air flow HORIZONTAL, BUILT-IN VERSION WITHOUT HOUSING SCK...horizontal air intake

Main components: CABINET

Made in galvanized steel plate, covered by a white polyvinyl chloride film, combining an excellent solidity and functionality with a simple but elegant design. The cabinet is internally covered by sound-proofing and thermo protective material of very good quality.

GRID

It is placed on the upper side of the housing, and, thanks to a careful design and innovative fluid dynamic qualities, allows an effective and noiseless air diffusion. It is made up of grey pressure-printed ABS, as well as the panels to enter the control board and the connections room, it is fine fitted to.

HEAT EXCHANGER COIL

With copper pipes and aluminium fins, fixed on pipes through mechanical expansion, with special and innovative profile for a higher exchanging power. Manifolds are on the left side of the unit (considering a frontal point of view) and made up of brass casting with female gas screwed connections and completed with two air vent valves 1/8" gas. If required, it is possible to have the manifolds on the right side. The coil is provided with a drain pan underneath.

FAN

Centrifugal fan with horizontally developed impellers and double intake, 1 Ph direct connected motor with overcharge protection.

AIR FILTER

Made up of honeycomb polypropylene filtering material, supported by a metal frame

REGULATION SYSTEM

In the vertical version with cabinet, the fan coils are supplied with a basic board with ON/OFF switch and switch for the three fan speeds (TA).



Accesso	ries	LP	Painted back closing panel (for fancoil installation on sight, far from
AD	Hydraulic connections / manifolds on the right side		the wall)
BC	Auxiliary hot water coil for 4-pipe installation	MS	Motorized fresh air louver
BR	Additional drain pan	PB	
			Condensing water pump
CPI	Built-in steel plate feet	RCV	Continuous regulation of the fan speed in relation to the tempera-
CPV	On sight, painted steel plate feet		ture
CPZ	Painted steel plate feet for back panel LP	RE	Electric heaters
FR	Spare air filter	SI	Interface card for the control of max 4 units with only one thermo-
GA	Aluminium fixed air inlet grid with filter for SCL, SCW, SCK versions		stat (one card and one thermostat every 4 units)
GB	Griglia di aspirazione fissa in ABS con filtro per versioni SCL, SCW,	SP	Fresh air inlet louver (option CPV already included for VCL version)
	SCK	TA	Base control panel on board with: manual ON/OFF switch, sum-
GC	Aluminium fixed air inlet grid without filter for SCL, SCW, SCK ver-		mer/winter manual switch, 3 speed manual selection switch (al-
	sions		ready included on VCL, VCZ, VCY versions)
GD		ТВ	TA base control panel with additional bulb room thermostat
	ABS fixed air inlet grid without filter for SCL, SCW, SCK versions	T1	TA base control parter with additional electronic thermostat with NTC
GO	Adjustable air discharge grids		
JA	Straight plenum on air discharge		probe for control of room temperature (for VCL, VCZ, VCY versions it
JB	Insulated 90° plenum on air discharge		can replace standard TA)
JC	90° plenum on air inlet	T2	Additional water low temperature thermostat with probe for TA, TB
JD	Telescopic extension for straight and 90° plenums		and T1, in order to permit the starting of the fan only when the hot
JE	Plenum on air inlet with spigots and air filter		water is on the right temperature
JF	Plenum on air discharge with spigots	T3	Remote control with: manual ON/OFF switch, summer/winter
K22	ON/OFF 2-way valves for 2-pipe systems		manual switch, 3 speed manual selection switch (in replacement of
K32	ON/OFF 3-way valves for 2-pipe systems		TA)
K24	ON/OFF 2-way valves for 4-pipe systems	T4	Programmable remote electronic control (in replacement of on-
K34	ON/OFF 3-way valves for 4-pipe systems	17	board control) for control of temperature, fan, valves, electric heat-
LA	White pre-painted steel panel + 90° plenum on air inlet for SCW		er, heat/cool cycle, filter
LA		T5	
	version	15	Programmable electronic control with infrared distant control, not
LB	White pre-painted steel panel 90° plenum on air inlet and dis-		usable with RE (in replacement of on-board control) for control of:
	charge for SCL, SCK versions		temperature, fan, valves, condensing water pump, heat/cool cycle,
LC	White painted wood panel 90° plenum on air inlet for SCW version		fresh air louver, air/water probes, clock, ON/OFF timer)
LD	White painted wood panel 90° plenum on air inlet and discharge	V2	Valvole di intercettazione a sfera per impianti a 2 tubi
	for SCL and SCK versions	V4	Shut-off valves for 4-pipe systems
LE	Painted lower closing panel without grid		· · ·

LF Painted lower closing panel with grid and filter

FANCOILS WITH CENTRIFUGAL FANS

Technical data

VC-SC		12/4	22/4	32/4	42/4	52/4	62/4	72/4	82/4	92/4	102/4 (*)	112/4 (*)	122/4 (*)
2-PIPE Version													
Total cooling capacity (1)	kW	0,87	1,28	2,07	2,53	3,11	3,85	4,69	5,59	6,88	7,98	10,02	11,01
Sensible cooling capacity (1)	kW	0,74	1,02	1,51	2,17	2,18	2,66	3,11	3,96	4,81	6,06	7,91	8,48
Water flow (1)	l/s	0,041	0,061	0,099	0,121	0,149	0,184	0,225	0,268	0,329	0,382	0,480	0,527
Heating capacity (2)	kW	1,25	1,87	2,59	3,28	3,66	4,48	5,13	6,69	8,11	10,66	13,08	14,15
Water flow (2)	l/s	0,041	0,061	0,099	0,121	0,149	0,184	0,225	0,268	0,329	0,382	0,480	0,527
Pressure drop in cooling (1)	kPa	1	2	6	9	16	26	56	28	43	27	21	27
Pressure drop in heating (2)	kPa	1	2	5	7	14	22	48	24	37	23	19	22
Heating capacity (3)	kW	2,12	3,19	4,33	5,51	6,08	7,44	8,47	11,14	13,49	16,87	22,02	23,77
Water flow (3)	l/s	0,051	0,076	0,104	0,132	0,146	0,178	0,203	0,267	0,323	0,413	0,539	0,582
Pressure drop in heating (3)	kPa	1	2	5	8	12	18	35	21	31	24	21	25
Electric heater capacity (4)	kW	-		1			2			3		-	
Input current (4)	A	-		4,35			8,70			3,04		-	
Air flow MAX (5)	m³/h	227	289	404	453	575	685	708	1.028	1.242	1.326	2.015	2.003
Air flow MED (5)	m³/h	189	244	352	344	495		78	950	1.014	1.033	1'370	1.280
Air flow MIN (5)	m³/h	136	209	269	262	362	429	486	788	770	969	988	1.026
Fan speed (5)	rpm	710	671	595	680	646	775	746	920	1.125	820	962	1.082
Sound pressure level – MAX speed (6)	dB(A)	33	36	1	33	37	38	42		51	55	50	51
Sound pressure level – MED speed (6)	dB(A)	41		40		43	47	46	56	58	57	58	61
Sound pressure level – MIN speed (6)	dB(A)	46	4	14		47	-	2	58	64	63	67	66
4-PIPE Version						1				1			
Total cooling capacity (1)	kW	0,84	1,23	2,08	2,38	2,96	3,68	4,47	5,33	6,57	7,71	9,70	10,66
Sensible cooling capacity (1)	kW	0,81	1,12	1,69	1,93	2,49	2,91	3,35	4,32	5,26	5,86	7,67	8,21
Water flow (1)	l/s	0,040	0,059	0,099	0,114	0,142	0,176	0,214	0,255	0,315	0,369	0,465	0,510
Heating capacity (2)	kW	1,26	1,89	2,73	2,89	3,49	4,13	5,04	6,19	7,67	8,39	10,11	11,43
Water flow (2)	l/s	0,030	0,045	0,065	0,069	0,084	0,099	0,121	0,148	0,184	0,205	0,248	0,280
Pressure drop in cooling (1)	kPa	1	2	6	8	14	23	50	24	38	25	22	25
Pressure drop in heating (2)	kPa	0,3		2		3	4	7	14	22	48	27	34
Heating capacity (3)	kW	0,77	1,16	1,67	1,76	2,13	2,52	3,08	3,79	4,68	5,13	6,18	6,99
Water flow (3)	l/s	0,037	0,055	0,080	0,085	0,102	0,121	0,148	0,181	0,225	0,248	0,300	0,339
Pressure drop in heating (3)	kPa 3 (0,5	1		3	6	7	12	23	36	80	45	56
Air flow MAX (5)	m ³ /h	216	275	384	430	546	651	673	1.002	1.180	1.291	1.916	1.908
Air flow MED (5)	m ³ /h	180	232	334	327	470		49	902	963	1.041	1'305	1.214
Air flow MIN (5)	m³/h	129	199	256	249	344	408	462	749	732	928	942	1.006
Fan speed (5)	rpm	720	685	615	700	665	805	730	917	1.020	855	815	1.042
Sound pressure level – MAX speed (6)	dB(A)	34	38	34		35	41	43		51	55	51	52
Sound pressure level – MED speed (6)	dB(A)	40	43	40		42	48	47	57	59		58	62
Sound pressure level – MIN speed (6)	dB(A)	45	47	44	48	46	:	3	59	65	63	(57
General data	W	20	54	(0	(1		0	07	210	207	212	277	272
Fan motor input power (7)	A	38 0,18	54 0,25	60	61 ,28		99 ,45	97 0,44	210 0,96	207	213 0,97	277 1,27	273 1,25
Input current (7) Cooling coil water connections		0,10	0,25	0	,20	U		0, 44 4	0,90	0,95	0,97	1,27	1,23
2	ØgasF ØgasF							4					
Heating coil water connections Cooling coil water volume	Øgasr	0.50	0,93	1	,27	1	,61		2	02	2 20	4	04
Heating coil water volume		0,59 0,19			,27 ,42	l.	0,53	2,42		,93 ,29	3,28 1,09		04 35
Dimensions – VC Versions	1	0,19	0,31	U	,42		0,55		1	,29	1,09	I,	33
Length	mm	660	860	1.	060		1.560		1.	460	1.660	10	960
Width	mm	000	000		000	225	1 200			100	1 000	260	/00
Height (VCL-VCY-VCK-VCH)	mm			1	80	225			580			602	
Height (VCZ-VCW)	mm				10				710			732	
Dimensions – SC Versions				U	NV NV			I	710			1 32	
Length	mm	420	620	8	20		1.050		1	220	1.382	11	685
Width	mm	720	020	0	20	220	1 020			220		252	005
Height	mm				60	220			565			585	
Weight				4	00			I	505			.00	
2-Pipe unit	kg	14	17	22	23	27	28	30	35	36	46	55	57
4-Pipe unit	kg kg	14	17	22	25	27	20	30	33	30	40	58	60
Electrical power supply	Ky	נו	10	23	24	20	27	52	00	37	+7	00	00
Electrical power supply	V / ph / Hz						220 / 1 /	50 + N + T					
accurca power suppry	v/pii/nZ					_	230/1/	NTN TI					

REMARKS: 1) Ambient temperature 27°C hs. and 19°C h.u. - water 7/12°C 2) Ambient temperature 20°C - InI/OUT water 50°C 3) Ambient temperature 20°C - INI/OUT water to the coil 70/60°C 4) Electric heaters are optionals and are not available on 4 pipes version 5) With clean filter 6) Measured according to ISO 23741 7) Maximum absorbed value

* Sizes not available for VCY e VCH series



Series VT ... - **ST** ... *Capacity from 1,05 to 3,88 kW*

The wide range of VT and ST series is able to meet the several and different requirements of conditioning market. These units are equipped with tangential fans and are planned for on sight (VT...) or built-in installation (ST...). The following versions are available: VERTICAL, ON SIGHT WITH HOUSING VTL...vertical bottom air intake VTZ...horizontal air intake with socle VTY...horizontal air intake HORIZONTAL, ON SIGHT WITH HOUSING VTK...rear air intake VTW...horizontal air intake with socle VERTICAL, BUILT-IN VERSION WITHOUT HOUSING STL...vertical air flow STW....horizontal air flow HORIZONTAL, BUILT-IN VERSION WITHOUT HOUSING STK...horizontal air intake

Main components: CABINET

Made in galvanized steel plate, covered by a white polyvinyl chloride film, combining an excellent solidity and functionality with a simple but elegant design. The cabinet is internally covered by sound-proofing and thermo protective material of very good quality.

GRID

It is placed on the upper side of the housing, and, thanks to a careful design and innovative fluid dynamic qualities, allows an effective and noiseless air diffusion. It is made up of grey pressure-printed ABS, as well as the panels to enter the control board and the connections room, it is fine fitted to.

HEAT EXCHANGER COIL

With copper pipes and aluminium fins, fixed on pipes through mechanical expansion, with special and innovative profile for a higher exchanging power. Manifolds are on the left side of the unit (considering a frontal point of view) and made up of brass casting with female gas screwed connections and completed with two air vent valves 1/8" gas. It is not possible to have the manifolds on the right side. The coil is provided with a drain pan underneath.

FAN

Tangential fan with horizontally developed impellers, 1 Ph direct connected motor with overcharge protection.

AIR FILTER

Made up of honeycomb polypropylene filtering material, supported by a metal frame.

REGULATION SYSTEM

In the vertical version with cabinet, the fan coils are supplied with a basic board with ON/OFF switch and switch for the three fan speeds (TA).



Accessories

AD	Hydraulic connections / manifolds on the right side	R
BC	Auxiliary hot water coil for 4-pipe installation	
BR	Additional drain pan	R
CPI	Built-in steel plate feet	S
CPV	On sight, painted steel plate feet	_
CPZ	Painted steel plate feet for back panel LP	Т
FR	Spare air filter	
GB	Griglia di aspirazione fissa in ABS con filtro per versioni STL, STW, STK	т
GD	ABS fixed air inlet grid without filter for STL, STW, STK versions	Т
GO	Adjustable air discharge grids	
JA	Straight plenum on air discharge	
JB	Insulated 90° plenum on air discharge	Т
JC	90° plenum on air inlet	
JD	Telescopic extension for straight and 90° plenums	
K22	ON/OFF 2-way valves for 2-pipe systems	Т
K22 K32	ON/OFF 3-way valves for 2-pipe systems	
K24	ON/OFF 2-way valves for 4-pipe systems	-
K34	ON/OFF 3-way valves for 4-pipe systems	Т
LA	White pre-painted steel panel 90° plenum on air inlet for STW ver- sion	
LB	White pre-painted steel panel 90° plenum on air inlet and dis-	Т
	charge for STL and STK versions	
LC	White painted wood panel 90° plenum on air inlet for STW version	
LD	White painted wood panel 90° plenum on air inlet and discharge	
	for STL and STK versions	V
16	Painted lower closing panel without grid	V

- Painted lower closing panel without grid Painted lower closing panel with grid and filter Painted back closing panel (for fancoil installation on sight, far from the wall) LE LF LP

PB RCV	Condensing water pump Continuous regulation of the fan speed in relation to the tempera-
RE SI	ture Electric heaters Interface card for the control of max 4 units with only one thermo- stat (one card and one thermostat every 4 units)
ТА	Base control panel on board with: manual ON/OFF switch, sum- mer/winter manual switch, 3 speed manual selection switch (al- ready included on VTL, VTZ, VTY versions)
TB T1	TA base control panel with additional bulb room thermostat TA base control with additional electronic thermostat with NTC probe for control of room temperature (for VTL, VTZ, VTY versions it can replace standard TA)
T2	Additional water low temperature thermostat with probe for TA, TB and T1, in order to permit the starting of the fan only when the hot water is on the right temperature
Т3	Remote control with: manual ON/OFF switch, summer/winter manual switch, 3 speed manual selection switch (in replacement of TA)
T4	Programmable remote electronic control (in replacement of on- board control) for control of temperature, fan, valves, electric heat- er, heat/cool cycle, filter
Τ5	Programmable electronic control with infrared distant control, not usable with RE (in replacement of on-board control) for control of: temperature, fan, valves, condensing water pump, heat/cool cycle, fresh air louver, air/water probes, clock, ON/OFF timer)
V2	Valvole di intercettazione a sfera per impianti a 2 tubi
V4	Shut-off valves for 4-pipe systems

Technical data

VT-ST		12/4	22/4	32/4	42/4	62/4
2-PIPE Version						
fotal cooling capacity (1)	kW	1,05	1,40	2,76	3,53	3,88
Sensible cooling capacity (1)	kW	0,86	1,28	2,21	2,73	3,34
Nater flow (1)	l/s	0,050	0,067	0,132	0,169	0,186
Heating capacity (2)	kW	1,75	2,30	3,75	4,47	5,78
Nater flow (2)	l/s	0,050	0,67	0,132	0,169	0,186
Pressure drop in cooling (1)	kPa		2	7	13	4
Pressure drop in heating (2)	kPa		2	6	11	3
Heating capacity (3)	kW	3,06	4,00	6,34	7,50	9,89
Water flow (3)	l/s	0,075	0,098	0,155	0,184	0,242
Pressure drop in heating (3)	kPa	4	3	7	12	5
lectric heater capacity (4)	kW		1		2	3
nput current (4)	A		4,35		8,70	13,04
Air flow MAX (5)	m³/h	255	310	473	621	872
Air flow MED (5)	m³/h	220	258	400	525	707
Air flow MIN (5)	m³/h	185	215	332	422	555
an speed (5)	rpm	747	893	993	973	1.022
ound pressure level — MAX speed (6)	dB(A)	39	45	51	43	47
iound pressure level — MED speed (6)	dB(A)	43	49	55	48	52
Sound pressure level — MID speed (6)	dB(A)	43	53	57	52	57
1-PIPE Version	uU(A)	UT		JI	JL	JI
fotal cooling capacity (1)	kW	1,03	1,30	2,54	3,10	3,19
fotal cooling capacity (1) Sensible cooling capacity (1)	kW	0,83	1,30	2,54	2,36	2,72
Vater flow (1)	I/s	0,83	0,062	0,121		
		,	,	,	0,148	0,153
Heating capacity (2)	kW	2,00	2,15	3,14	3,99	4,98
Nater flow (2)	l/s	0,049	0,053	0,077	0,098	0,122
Pressure drop in cooling (1)	kPa	2,2	2	6	10	3
ressure drop in heating (2)	kPa	6,3	7	13	38	16
leating capacity (3)	kW	1,22	1,32	1,92	2,44	3,04
Vater flow (3)	l/s	0,059	0,064	0,093	0,118	0,147
ressure drop in heating (3)	kPa	10	12	22	62	26
Air flow MAX (5)	m³/h	242	295	449	590	828
ir flow MED (5)	m³/h	209	245	380	498	673
Air flow MIN (5)	m³/h	176	204	315	400	528
an speed (5)	rpm	760	905	1.002	995	1.110
ound pressure level – MAX speed (6)	dB(A)	39	46	51	44	47
Sound pressure level – MED speed (6)	dB(A)	43	50	55	49	52
ound pressure level — MIN speed (6)	dB(A)	48	54	58	53	57
General data						
an motor input power (7)	W	30	45	62	56	66
nput current (7)	A	0,13	0,20	0,28	0,25	0,29
ooling coil water connections	ØgasF		· · · · ·	1/2 "		
leating coil water connections	ØgasF			1/2 "		
Cooling coil water volume	Í	0,56	0,83	1,17	1,51	1,85
leating coil water volume		,),28	0,39	0,50	0,62
Dimensions – VT Versions				, ,	/	-,
ength	mm		760	960	1.160	1`360
Vidth	mm			206	. 100	1 500
leight	mm			477		
Dimensions – ST Versions						
ength	mm		640	840	1.040	1`240
Vidth	mm		ντυ	202	1 040	1 240
	mm					
leight	mm			460		
Weight		15		24	24	20
2-Pipe unit	kg	15	16	21	26	30
-Pipe unit Electrical power supply	kg	15	16	21	26	30

REMARKS: 1) Ambient temperature 27°C bs. and 19°C b.u. - water 7/12°C 2) Ambient temperature 20°C - INI/OUT water 50°C 3) Ambient temperature 20°C - INI/OUT water to the coil 70/60°C 4) Electric heaters are optionals and are not available on 4 pipes version 5) With clean filter 6) Measured according to ISO 3741 7) Maximum absorbed value



WATER CASSETTES FOR CEILING INSTALLATION



Series CWP ... - CWG ...

Capacity from 1,98 to 10,54 kW

The water cassettes of CWP and CWG series are able to meet the several and	Access	ories
different requirements of conditioning and heating market.	JM	Sti
Intended for ceiling installation.	K22	10
The following versions are available:	K32	10
PANEL 60 x 60 cm	K24	10
CWP2T 2 pipes with infrared remote control	K34	10
CWP2P 2 pipes with prearrangement for control on the wall	PR	Fre
CWP4T 4 pipes with infrared remote control	SI	Int
CWP4P 4 pipes with prearrangement for control on the wall		sta
	Т3	Re
PANEL 90 x 90 cm		m
CWG2T 2 pipes with infrared remote control	T4	Pr
CWG2P 2 pipes with prearrangement for control on the wall		tro
CWG4T 4 pipes with infrared remote control	T6	Pro
CWG4P 4 pipes with prearrangement for control on the wall		ve
- · ··· ··· ····· · ···· ·············	V2	Va
Main components	NA.	C L

Main components: FRAME

Made in galvanized steel plate, of high thickness for an excellent solidity and functionality, including external bracket for a safe and simple fixing, prearrangements for possible duct of treated and external air. It is internally covered by soundproofing and thermo- protective material of very good quality.

COVERING PANEL

Made of white die-pressed plastic ABS material, with a simple and elegant design, right for every kind of room. Central intake grid with 4 adjustable fins on the discharge. It is possible to install it on the water cassette in a simple and quick way through a patented device.

HEAT EXCHANGER COIL

With copper pipes and aluminium fins, fixed on pipes through mechanical expansion, with special and innovative profile for a higher exchanging power. Manifolds with male gas screwed connections and air vent valve and of easy way in. Under the coil it is installed the drain pan and the condensing discharge pump. **FAN**

Centrifugal fan with single intake, with impeller of ABS balanced both statically and dynamically, and 1 Ph direct connected motor with overcharge protection. 7 rotation speeds.

AIR FILTER

Made up of honeycomb polypropylene filtering material, supported by a metal frame.

ACCESSO	
JM	Straight plenum on air discharge in another room
K22	ON/OFF 2-way valves for 2-pipe systems
K32	ON/OFF 3-way valves for 2-pipe systems
K24	ON/OFF 2-way valves for 4-pipe systems
K34	ON/OFF 3-way valves for 4-pipe systems
PR	Fresh air inlet
SI	Interface card for the control of max 4 units with only one thermo- stat (one card and one thermostat every 4 units)
Т3	Remote control with: manual ON/OFF switch, summer/winter manual switch, 3 speed manual selection switch
T4	Programmable electronic control for versions without radio con- trol
Т6	Programmable electronic control with infra-red distant control for version with infra-red radio control
V2	Valvole di intercettazione a sfera per impianti a 2 tubi
V4	Shut-off valves for 4-pipe systems



Technical data - 2-PIPE Version

CW		21 P	22 P	23 P	24 P	31 G	32 G	33 G	34 G	
2-PIPE Version										
Total cooling capacity (1)	kW	1,98	2,87	3,26	4,49	5,73	6,76	8,08	10,54	
Sensible cooling capacity (1)	kW	1,50	2,00	2,35	3,23	4,18	4,93	5,98	7,59	
Water flow (1)	l/s	0,095	0,137	0,156	0,215	0,274	0,323	0,386	0,504	
Heating capacity (2)	kW	2,72	3,83	4,94	6,15	6,55	7,79	9,31	12,01	
Water flow (2)	l/s	0,095	0,137	0,156	0,215	0,274	0,323	0,386	0,504	
Pressure drop in cooling (1)	kPa	21	26	40	50	35	34	37	54	
Pressure drop in heating (2)	kPa	17	21	33	41	30	29	32	46	
Heating capacity (3)	kW	4,54	6,39	8,24	10,25	10,79	12,82	15,31	19,89	
Water flow (3)	l/s	0,109	0,153	0,197	0,245	0,258	0,306	0,366	0,475	
Pressure drop in heating (3)	kPa	17	22	34	43	29	28	31	44	
Air flow MAX (5)	m³/h	543	611	680	815	832	1.087 1.		1`274	
Air flow MED (5)	m³/h	348	397	442	530	699	913	935	1.020	
Air flow MIN (5)	m³/h	255	281	299	350	624	772	794	930	
Sound pressure level – MAX speed (6)	dB(A)	51	53	57	62	54	L.	58	62	
Fan motor input power (7)	W	56	70	83	94	58	1	26	124	
Input current (7)	A	0,24	0,30	0,36	0,	0,41 0,57 0,66				
Cooling coil water connections	ØgasF			3/4 "			1"			
Peso unità	kg	23,5		24,5		37	43 45			
Dimensions										
Hole length	mm		5	80		835				
Hole width	mm		5	80		835				
Panel length	mm		7	20		950				
Panel width	mm		7	20		950				
Height	mm		3	20		385				
Electrical power supply										
Electrical power supply	V / ph / Hz				230/1/	50 + N + T				

REMARKS: 1) Ambient temperature 27°C bs. and 19°C bu. - water 7/12°C 2) Ambient temperature 20°C - inlet water 50°C 3) Ambient temperature 20°C - IN/DUT water to the coil 70/60°C 5) With Clean fifter 6) Measured according to ISO 3741 7) Maximum absorbed value

Technical data - 4-PIPE Version

CW		41 P	42 P	43 P	44 P	51 G	52 G	53 G	54 G	
4-PIPE Version						·				
Total cooling capacity (1)	kW	1,45	2,02	2,86	3,46	4,79	5,91	7,04	9,30	
Sensible cooling capacity (1)	kW	1,20	1,51	2,17	2,66	3,50	4,31	5,21	6,69	
Water flow (1)	l/s	0,069	0,097	0,137	0,165	0,229	0,282	0,336	0,445	
Heating capacity (2)	kW	0,97	1,64	1,84	2,31	4,19	5,14	6,13	7,45	
Water flow (2)	l/s	0,023	0,039	0,044	0,055	0,10	0,123	0,146	0,178	
Pressure drop in cooling (1)	kPa	22	26	41	45	27	4	12	49	
Pressure drop in heating (2)	kPa	31	29	34	40	36	22	30	41	
Heating capacity (3)	kW	2,28	2,95	4,36	5,31	6,88	8,48	10,11	12,34	
Water flow (3)	l/s	0,054	0,070	0,104	0,127	0,164	0,203	0,242	0,295	
Pressure drop in heating (3)	kPa	33	31	37	43	38	24	32	44	
Air flow MAX (5)	m³/h	543	543 611 680 815 8		832	1.082		1`274		
Air flow MED (5)	m³/h	342	385	435	513	691	902	924	1.022	
Air flow MIN (5)	m³/h	250	269	286	342	616	761	783	917	
Sound pressure level – MAX speed (6)	dB(A)	51	53	57	62	54	5	58	62	
Fan motor input power (7)	W	56	66	74	94	58	1.	26	124	
Input current (7)	A	0,24	0,29	0,32	0,	,41	0,	.57	0,66	
Cooling coil water connections	ØgasF				3,	4"				
Heating coil water connections	ØgasF				3	2"				
Peso unità	kg	23,5		24,5		37	4	13	45	
Dimensions										
Hole length	mm		5	80		835				
Hole width	mm		5	80		835				
Panel length	mm		7.	20		950				
Panel width	mm	720				950				
Height	mm		3.	20		385				
Electrical power supply										
Electrical nower supply	V / nh / Hz				220/1/1	50 + N + T				

Electrical power supply V / ph / Hz $230\,/\,1\,/\,50 + N + T$

REMARKS: 1) Ambient temperature 27°C bs. and 19°C bu, - water 7/12°C 2) Ambient temperature 20°C - inlet water 50°C 3) Ambient temperature 20°C - IN/OUT water to the coil 70/60°C 5) With clean filter 6) Measured according to ISO 3741 7) Maximum absorbed value



REMARKS:

DUCTABLE AIR HANDLING UNITS

WITH CENTRIFUGAL FANS



ETD 52

Series ETD ...

Capacity from 4 to 51 kW

The ductable air handling units of **ETD series** are able to meet the several and different requirements of conditioning market.

These units are equipped with centrifugal fans and are planned for the direct installation on duct.

The following versions are available: **ETD...**standard version

Main components:

FRAME

Made in galvanized steel plate, of high thickness for an excellent solidity and functionality, including external bracket for a safe and simple fixing. It is internally covered by sound-proofing and thermo- protective material of very good quality.

HEAT EXCHANGER COIL

With copper pipes and aluminium fins, fixed on pipes through mechanical expansion, with special and innovative profile for a higher exchanging power. Manifolds are on the left side of the unit (considering the air discharge side) and made up of copper with male gas screwed connections and completed with two air vent valves. If required, it is possible to have the manifolds on the right side. The coil is provided with a drain pan underneath.

FAN

Centrifugal fan with double intake, horizontally developed impellers of aluminium, balanced both statically and dynamically, and 1 Ph direct connected motor with overcharge protection. 3 rotation speeds.

Accessories

Accesson	
AD	Hydraulic connections / manifolds on the right side
BC	Auxiliary hot water coil for 4-pipe installation
BR	Additional drain pan
FX	Air filter
FXa	Air filter with activated carbon
JA	Straight plenum on air discharge
JB	Insulated 90° plenum on air discharge
JC	90° plenum on air inlet
JE	Plenum on air inlet with spigots and air filter
JF	Plenum on air discharge with spigots
JG	Antivibration joint
JH D	
	Straight plenum on air inlet
JI JI	Connection flange
K22	ON/OFF 2-way valves for 2-pipe systems
K32	ON/OFF 3-way valves for 2-pipe systems
K24	ON/OFF 2-way valves for 4-pipe systems
K34	ON/OFF 3-way valves for 4-pipe systems
PB	Condensing water pump
PR	Fresh air inlet (max 33%)
RE	Electric heaters
SI	Interface card for the control of max 4 units with only one thermo-
	stat (one card and one thermostat every 4 units)
Т0	Water low temperature thermostat
T3	Remote control with: manual ON/OFF switch, summer/winter
	manual switch, 3 speed manual selection switch
T4	Programmable remote electronic control
T5	Programmable electronic control with infra-red remote control
	(not for RE)
V2	Valvole di intercettazione a sfera per impianti a 2 tubi
V4	Shut-off valves for 4-pipe systems
• •	share on varies for a pipe systems



Technical data

ETD		12/4	22/4	32/4	42/4	52/4	62/4	72/4	
2-PIPE Version									
Total cooling capacity (1)	kW	4,01	7,05	9,20	10,56	13,09	27,81	50,64	
Sensible cooling capacity (1)	kW	3,25	5,64	7,36	8,63	11,02	21,13	39,50	
Water flow (1)	l/s	0,192	0,337	0,441	0,508	0,627	1,332	2,425	
Heating capacity (2)	kW	4,97	8,51	11,21	12,80	16,82	32,43	60,11	
Water flow (2)	l/s	0,192	0,337	0,441	0,508	0,627	1,332	2,425	
Pressure drop in cooling (1)	kPa	20	31	34	32	36	34	40	
Pressure drop in heating (2)	kPa	17	27	29	28	31	29	34	
Heating capacity (3)	kW	8,32	14,20	18,72	21,35	28,25	53,88	100,07	
Water flow (3)	I/s	0,199	0,340	0,448	0,511	0,677	1,290	2,396	
Pressure drop in heating (3)	kPa	16	24	27	25	32	24	30	
Electric heater capacity (4)	kW	4,5		.0		12,0	18,0	24,0	
	A	6,84		,67		8,23	27,35	36,46	
Input current (4)	m ³ /h	837						9.220	
Air flow MAX (5)			1'423	1.951	2.131	3:002	4.678		
Air flow MED (5)	m³/h	780	1'214	1.775	1.889	2:394	3.945	7.890	
Air flow MIN (5)	m³/h	678	898	1`346	1`350	1.672	3.212	6`450	
Fan speed (5)	rpm		360	1'200	1'207	1.382	806	822	
Sound pressure level – MAX speed (6)	dB(A)	63	58	61	58	62	69	71	
Sound pressure level – MED speed (6)	dB(A)	67	65	68	65	69	73	76	
Sound pressure level — MIN speed (6)	dB(A)	68	69	70	69	74	78	81	
Available pressure — STD	Pa				0				
Available pressure – 1M	Pa				50				
Available pressure – 2M	Pa				100				
4-PIPE Version									
Total cooling capacity (1)	kW	3,60	6,35	8,29	9,55	12,26	24,99	45,56	
Sensible cooling capacity (1)	kW	3,11	5,33	7,05	8,02	10,56	20,19	37,79	
Water flow (1)	I/s	0,173	0,304	0,397	0,457	0,587	1,197	2,182	
Heating capacity (2)	kW	4,18	7,00	9,15	10,54	13,99	38,83	70,20	
Water flow (2)	I/s	0,100	0,168	0,219	0,252	0,335	0,930	1,681	
Pressure drop in cooling (1)	kPa	16	24	28	25	31	27	32	
Pressure drop in heating (2)	kPa	27	24	36	21	34	33	36	
Heating capacity (3)	kW	2,56	4,28	5,59	6,44	8,55	23,73	42,90	
		,			,				
Water flow (3)	l/s	0,124	0,207	0,271	0,312	0,414	1,150	2,079	
Pressure drop in heating (3)	kPa 34	46	39	62	36	58	56	62	
Air flow MAX (5)	m³/h	795	1'352	1.823	2'024	2.822	4`444	8.788	
Air flow MED (5)	m³/h	741	1.123	1.686	1.795	2`274	3`748	7`496	
Air flow MIN (5)	m³/h	644	853	1`279	1`282	1.261	3.024	6.128	
Fan speed (5)	rpm		365	1'205	1.214	1`387	810	832	
Sound pressure level – MAX speed (6)	dB(A)	63	58	61	59	61	69	71	
Sound pressure level – MED speed (6)	dB(A)	67	65	68	66	68	73	76	
Sound pressure level — MIN speed (6)	dB(A)	68	69	7	0	73	78	81	
Available pressure – STD	Pa				0				
Available pressure – 1M	Pa		50						
Available pressure – 2M	Pa				100				
General data									
Fan motor input power (7)	W	162	218	322	340	582	1.320	2.600	
Input current (7)	A	0,72	0,97	1,43	1,51	2,58	5,86	11,54	
Cooling coil water connections	ØgasF		2"	3/4		1″	1 ¼″	11,54	
Heating coil water connections	ØgasF	,		2		3⁄4 "	1″	1 1/4"	
Cooling coil water volume	1	1,36	2,18	2,63	3,25	3,79	9,38	1 74	
Heating coil water volume		0,45	0,73	0,88	1,08	1,26	4,69	7,22	
5	I	0,40	U,/ S	U,00	1,00	1,20	4,09	1,22	
Dimensions		720	1:000	1:100		:400	1:401	2:470	
Length	mm	738	1.088	1.188	1	428	1.481	2.168	
Width	mm			591				10	
Height	mm	2	99	32	23	373	6	74	
Weight									
2-Pipe unit	kg	28	36	41	46	57	117	192	
4-Pipe unit	kg	30	38	44	49	61	130	210	
Planet dealer and a second second second									
Electrical power supply									

REMARKS: 1) Ambient temperature 27°C b.s. and 19°C b.u. - water 7/12°C 2) Ambient temperature 20°C - IN/OUT water 50°C 3) Ambient temperature 20°C - IN/OUT water to the coil 70/60°C 4) Electric heaters are optionals and are not available on 4 pipes version 5) With clean filter 6) Measured according to ISO 3741 7) Maximum absorbed value

