



MCAEY

**Air cooled water chillers
Air cooled reversible heat pumps
from 13 kW to 50 kW**



R 410A
Compressors Scroll

Series: MCAEY	Leaflet: DE 83
Issue: 03/12	Supersedes: 02/11

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Identification code

M C A E Y – 15/1 – PAC
1 2 3 4 5 6 7 8 9

1	M	mini series < 50 kW
2	C	Chiller unit
3	A	Air cooled
4	E	Axial fans
5	Y	Refrigerant R410a
6	15	Power factor
7	1	Number of circuits
8	– H	Cooling only version Heating pump version
9	PAC1	Storage tank + Pump
	P1	1 pump
	P2	2 pumps
	DS	Desuperheater
	LN	Low noise

MCAEY

General features

FRAME

Self-supporting galvanized steel frame protected with polyester powder painting. Panels are easily removable for maintenance and service activities.

COMPRESSORS

Hermetic «scroll» type with overload protection by a klixon and complete with oil sight glass. They are installed on vibrations absorbing rubber and *placed within a closed compartment to reduce sound level and to allow service and maintenance activities while unit is in operation.*

EVAPORATOR

Brazewelded plate type. The circuit is made to guarantee an homogeneous cooling of all the water flow even during partial load. The insulation is made of flexible closed-cells lining. It is advisable to fit a *differential pressure switch* which will stop the unit in case there is no water circulation on the plate to plate evaporator.

CONDENSER

Copper tube and aluminium finned coil. As option a protection grid is available.

FANS

Axial fans with aerodynamic outline blade section made of Al/Mg, directly coupled to a single-phase electric motor with external rotor. A safety fan guard is fitted on air flow discharge.

REFRIGERANT CIRCUIT

Each unit is supplied with: filter dryer, sight glass, thermostatic expansion valve, service valve.

To protect the refrigerant circuit the following devices are installed: manual reset high pressure switch and automatic reset low pressure switch, antifreeze thermostat.

The heat pump units version (MCAEY...H) contain, in addition: safety thermostat on compressor discharge line, 4-ways valve, check valve, solenoid valve, liquid receiver.

ELECTRICAL BOARD

Weather proof type with protection grade IP54 installed in the compressor box to enable service and maintenance activities while unit is in operation.

It includes:

- Main circuit automatic breaker with locking door device, main fuses, compressor contactor, fans fuses and contactors, auxiliary circuits trafo. Microprocessor to control automatically the unit with a visual system to display the function as well as failures.

Versions

DS

Partial condensing heat recovery. It includes a desuperheater insulated and installed in series between the compressor and the condenser.

RCS - RCP

On request.

P

Hydraulic kit version. It includes: one pump, expansion vessel, safety valve, hydraulic circuit insulated and flowswitch. Relevant electrical circuit. As option, pumps with higher ESP are available.

PAC

Version with hydraulic kit and storage tank. It includes, further to what included in the P version, a storage tank installed on the return line.

LN

Low noise version, it includes: pressostatic fan speed control, compressor insulated with a high sound absorbing layer.

VLN

On request.

Options

- Fans speed regulator
- Remote control panel
- Programmer clock
- RS 485 card
- Evaporator electric heater
- Evaporator electric heater for PAC version
- Compressor suction and liquid line shut-off valves
- Gauges with shut-off valves
- Cu/Cu condensing coils
- Differential pressure switch (standard mounted on P and PAC versions)
- Pump shut off valve
- Water pumps with higher ESP
- Protection grid/filter condenser (protection grid only in H-units)
- Rubber AV mounts
- Spring AV mounts
- Wooden crate packing

MCAEY Technical data

SIZE		15/1	17/1	19/1	21/1	25/1
COOLING MODE MCAEY						
Cooling capacity (1)	kW	14	16	17.5	20	22.5
Abs. Power (2)	kW	4.7	5.7	6.6	6.7	7.9
EER		2.9	2.8	2.6	3	2.8
HEATING MODE MCAEY...H						
Heating capacity (1) (5)	kW	16	18	21	23	26
Abs. Power (2)	kW	4.9	5.6	6.3	6.8	7.7
COP		3.2	3.2	3.3	3.3	3.3
Compressors (scroll type)						
Quantity	n°	1				
Refrigerant circuits	n°	1				
Capacity steps	n°	1				
Refrigerant		R410A				
Evaporator plate-to-plate type (3)						
Water flow	m ³ /h	2.4	2.7	3	3.4	3.8
Pressure drop	kPa	28	35	43	53	54
Water volume	l	0.5	0.6	0.7	0.8	0.9
Water connections	Ø	1¼	1¼	1¼	1¼	1¼
Condenser (STD/LN version) (4)						
Axial fans	n°	1	1	1	1	1
Max abs. power	kW	0.5	0.5	0.5	0.5	0.5
Max abs. current	A	2.5	2.5	2.5	2.5	2.5
Condenser (VLN version)						
	-	(9)				
Unit electrical data (6)						
Max abs. current	A	19	23	23	24	29
LRC	A	72	83	109	103	119
Electrical supply	V/f/Hz	400/3+N/50				
PAC version						
Storage tank water volume	l	100	100	100	100	100
Water pump nominal power	kW	0.37	0.37	0.37	0.37	0.37
Water pump nominal current	A	1.5	1.5	1.5	1.5	1.5
ESP	kPa	130	130	130	110	110
DS version (7)						
Heating capacity	kW	4	4	4	5	5
Water flow	m ³ /h	0.7	0.7	0.7	0.9	0.9
Pressure drop	kPa	18	18	18	20	20
Sound pressure level at 1 m (6) (8)						
STD version	dB(A)	60	60	60	60	60
LN version	dB(A)	57	57	57	57	57
VLN version	dB(A)	(9)				

Notes:

- 1) Cooling mode: water temperature 12/7 °C; air temperature 35 °C;
Heating mode: water temperature 40/45 °C; air temperature 7 °C db, 6 °C wb.
- 2) Compressors + fans only. No water pump.
- 3) It becomes condenser in MCAEY...H (heat pump) version.
- 4) It becomes evaporator in MCAEY...H (heat pump) version.
- 5) Max. air flow in case of LN and heat pump version.
- 6) Without water pump.
- 7) Water temperature from 40 °C to 50 °C.
- 8) Compressors site and according to ISO 3744.
- 9) Available on request.

MCAEY Technical data

SIZE		30/1	35/1	40/1	45/1	50/1
COOLING MODE MCAEY						
Cooling capacity (1)	kW	28	31	36	41	48
Abs. Power (2)	kW	8.9	10.3	10.9	13.2	18
EER	-	3.1	3	3.3	3.1	2.6
HEATING MODE MCAEY...H						
Heating capacity (1) (5)	kW	31.5	34	39	46	55
Abs. Power (2)	kW	9.4	10.4	11.4	13.2	16.9
COP	-	3.3	3.2	3.4	3.5	3.2
Compressors (scroll type)						
Quantity	n°	1				
Refrigerant circuits	n°	1				
Capacity steps	n°	1				
Refrigerant		R410A				
Evaporator plate-to-plate type (3)						
Water flow	m ³ /h	4.8	5.3	6.1	7	8.2
Pressure drop	kPa	50	50	48	65	78
Water volume	l	1	1.1	1.3	1.3	1.6
Water connections	Ø	1¼	1¼	1¼	1¼	1¼
Condenser (STD/LN version) (4) (5)						
Axial fans	n°	2	2	2	2	2
Max abs. power	kW	1	1	1	1	1
Max abs. current	A	5	5	5	5	5
Condenser (VLN version)						
	-	(9)				
Unit electrical data (6)						
Max abs. current	A	32	35	41	44	50
LRC	A	128	128	150	184	235
Electrical supply	V/f/Hz	400/3+N/50				
PAC version						
Storage tank water volume	l	100	100	100	100	100
Water pump nominal power	kW	0.55	0.55	0.55	0.55	0.55
Water pump nominal current	A	1.7	1.7	1.7	1.7	1.7
ESP	kPa	130	110	105	80	60
DS version (7)						
Heating capacity	kW	7	7	9	10	12
Water flow	m ³ /h	1.2	1.2	1.5	1.7	2
Pressure drop	kPa	22	22	24	25	27
Sound pressure level at 1 m (6) (8)						
STD version	dB(A)	62	62	62	62	62
LN version	dB(A)	59	59	59	59	59
VLN version	dB(A)	(9)				

Notes:

- 1) Cooling mode: water temperature 12/7 °C; air temperature 35 °C;
Heating mode: water temperature 40/45 °C; air temperature 7 °C db, 6 °C wb.
- 2) Compressors + fans only. No water pump.
- 3) It becomes condenser in MCAEY...H (heat pump) version.
- 4) It becomes evaporator in MCAEY...H (heat pump) version.
- 5) Max. air flow in case of LN and heat pump version.
- 6) Without water pump.
- 7) Water temperature from 40 °C to 50 °C.
- 8) Compressors site and according to ISO 3744.
- 9) Available on request.

MCAEY: Performances

COOLING CAPACITY AND ABSORBED POWER

MOD.	EVAP.	CONDENSER - Ambient air temperature °C													
	Tw °C OUT.	26		29		32		35		38		41		44	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
15/1	5	14,60	3,39	14,15	3,64	13,69	3,89	13,24	4,15	12,63	4,49	12,03	4,84	11,41	5,18
	6	15,02	3,42	14,56	3,67	14,08	3,67	13,62	4,17	13,01	4,52	12,39	4,87	11,77	5,21
	7	15,44	3,45	14,97	3,70	14,48	3,70	14,00	4,20	13,52	4,55	12,75	4,90	12,14	5,24
	8	15,88	3,49	15,39	3,74	14,90	3,74	14,41	4,23	13,78	4,58	13,13	4,93	12,50	5,28
	9	16,31	3,52	15,81	3,77	15,32	3,77	14,81	4,27	14,17	4,62	13,52	4,96	12,87	5,31
	10	16,74	3,56	16,23	3,81	15,72	3,81	15,22	4,30	14,56	4,65	13,90	5,00	13,24	5,34
17/1	5	16,69	4,20	16,18	4,51	15,65	4,82	15,14	5,13	14,43	5,56	13,74	5,99	13,04	6,42
	6	17,17	4,24	16,64	4,54	16,10	4,54	15,57	5,17	14,86	5,60	14,16	6,03	13,46	6,45
	7	17,65	4,27	17,10	4,58	16,54	4,58	16,00	5,20	15,46	5,63	14,58	6,06	13,87	6,49
	8	18,14	4,32	17,58	4,63	17,02	4,63	16,46	5,24	15,74	5,67	15,01	6,10	14,29	6,53
	9	18,64	4,36	18,06	4,67	17,50	4,67	16,93	5,28	16,19	5,71	15,46	6,15	14,70	6,57
	10	19,14	4,41	18,54	4,71	17,97	4,71	17,39	5,32	16,64	5,76	15,89	6,19	15,14	6,61
19/1	5	18,25	4,93	17,69	5,29	17,12	5,65	16,56	6,02	15,79	6,52	15,03	7,03	14,26	7,53
	6	18,78	4,97	18,20	5,33	17,61	5,33	17,03	6,06	16,26	6,56	15,49	7,07	14,72	7,57
	7	19,30	5,01	18,71	5,37	18,10	5,37	17,50	6,10	16,91	6,61	15,94	7,11	15,17	7,61
	8	19,85	5,07	19,23	5,43	18,62	5,43	18,01	6,15	17,22	6,66	16,42	7,16	15,63	7,66
	9	20,39	5,12	19,76	5,48	19,15	5,48	18,52	6,20	17,71	6,70	16,91	7,21	16,08	7,71
	10	20,93	5,17	20,28	5,53	19,65	5,53	19,02	6,25	18,20	6,75	17,38	7,26	16,56	7,76
21/1	5	20,86	5,01	20,22	5,38	19,56	5,75	18,92	6,12	18,04	6,63	17,18	7,14	16,30	7,65
	6	21,46	5,05	20,80	5,42	20,12	5,42	19,46	6,16	18,58	6,67	17,70	7,19	16,82	7,69
	7	22,06	5,10	21,38	5,46	20,68	5,46	20,00	6,20	19,32	6,71	18,22	7,23	17,34	7,74
	8	22,68	5,15	21,98	5,52	21,28	5,52	20,58	6,25	19,68	6,76	18,76	7,28	17,86	7,79
	9	23,30	5,20	22,58	5,57	21,88	5,57	21,16	6,30	20,24	6,81	19,32	7,33	18,38	7,84
	10	23,92	5,26	23,18	5,62	22,46	5,62	21,74	6,35	20,80	6,86	19,86	7,38	18,92	7,89
25/1	5	23,47	5,98	22,75	6,42	22,01	6,86	21,29	7,30	20,30	7,91	19,33	8,52	18,34	9,13
	6	24,14	6,03	23,40	6,47	22,64	6,47	21,89	7,36	20,90	7,96	19,91	8,58	18,92	9,18
	7	24,82	6,08	24,05	6,52	23,27	6,52	22,50	7,40	21,74	8,01	20,50	8,63	19,51	9,24
	8	25,52	6,15	24,73	6,59	23,94	6,59	23,15	7,46	22,14	8,07	21,11	8,69	20,09	9,29
	9	26,21	6,21	25,40	6,65	24,62	6,65	23,81	7,52	22,77	8,13	21,74	8,75	20,68	9,35
	10	26,91	6,28	26,08	6,70	25,27	6,70	24,46	7,58	23,40	8,19	22,34	8,81	21,29	9,41

Notes:

Tw - Outlet water temperature evaporator (delta T 5 °C)

kWf - Cooling capacity

kWa - Abs. power

MCAEY: Performances

COOLING CAPACITY AND ABSORBED POWER

MOD.	EVAP.	CONDENSER - Ambient air temperature °C													
	Tw °C OUT.	26		29		32		35		38		41		44	
		kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa	kWf	kWa
30/1	5	29,20	6,38	28,31	6,85	27,38	7,32	26,49	7,80	25,26	8,45	24,05	9,10	22,82	9,75
	6	30,04	6,44	29,12	6,90	28,17	6,90	27,24	7,85	26,01	8,50	24,78	9,16	23,55	9,80
	7	30,88	6,49	29,93	6,96	28,95	6,96	28,00	7,90	27,05	8,56	25,51	9,21	24,28	9,86
	8	31,75	6,56	30,77	7,03	29,79	7,03	28,81	7,96	27,55	8,62	26,26	9,27	25,00	9,92
	9	32,62	6,63	31,61	7,09	30,63	7,09	29,62	8,03	28,34	8,68	27,05	9,34	25,73	9,99
	10	33,49	6,70	32,45	7,16	31,44	7,16	30,44	8,09	29,12	8,75	27,80	9,40	26,49	10,05
35/1	5	32,33	7,51	31,34	8,06	30,32	8,62	29,33	9,18	27,96	9,94	26,63	10,71	25,27	11,48
	6	33,26	7,58	32,24	8,13	31,19	8,13	30,16	9,24	28,80	10,01	27,44	10,78	26,07	11,54
	7	34,19	7,64	33,14	8,19	32,05	8,19	31,00	9,30	29,95	10,07	28,24	10,84	26,88	11,61
	8	35,15	7,73	34,07	8,28	32,98	8,28	31,90	9,37	30,50	10,15	29,08	10,92	27,68	11,68
	9	36,12	7,80	35,00	8,35	33,91	8,35	32,80	9,45	31,37	10,22	29,95	10,99	28,49	11,76
	10	37,08	7,89	35,93	8,43	34,81	8,43	33,70	9,52	32,24	10,30	30,78	11,07	29,33	11,83
40/1	5	37,55	8,00	36,40	8,58	35,21	9,18	34,06	9,77	32,47	10,58	30,92	11,40	29,34	12,22
	6	38,63	8,07	37,44	8,65	36,22	8,65	35,03	9,84	33,44	10,65	31,86	11,47	30,28	12,29
	7	39,71	8,14	38,48	8,72	37,22	8,72	36,00	9,90	34,78	10,72	32,80	11,54	31,21	12,36
	8	40,82	8,23	39,56	8,81	38,30	8,81	37,04	9,98	35,42	10,80	33,77	11,62	32,15	12,43
	9	41,94	8,31	40,64	8,89	39,38	8,89	38,09	10,06	36,43	10,88	34,78	11,70	33,08	12,51
	10	43,06	8,40	41,72	8,97	40,43	8,97	39,13	10,14	37,44	10,96	35,75	11,78	34,06	12,59
45/1	5	42,76	9,86	41,45	10,58	40,10	11,31	38,79	12,04	36,98	13,04	35,22	14,05	33,42	15,05
	6	43,99	9,94	42,64	10,66	41,25	10,66	39,89	12,13	38,09	13,13	36,29	14,14	34,48	15,14
	7	45,22	10,03	43,83	10,75	42,39	10,75	41,00	12,20	39,61	13,21	37,35	14,23	35,55	15,23
	8	46,49	10,14	45,06	10,86	43,62	10,86	42,19	12,30	40,34	13,31	38,46	14,32	36,61	15,32
	9	47,77	10,24	46,29	10,96	44,85	10,96	43,38	12,40	41,49	13,41	39,61	14,42	37,68	15,42
	10	49,04	10,35	47,52	11,05	46,04	11,05	44,57	12,49	42,64	13,51	40,71	14,52	38,79	15,52
50/1	5	50,06	13,74	48,53	14,74	46,94	15,76	45,41	16,78	43,30	18,17	41,23	19,58	39,12	20,98
	6	51,50	13,86	49,92	14,86	48,29	14,86	46,70	16,90	44,59	18,29	42,48	19,70	40,37	21,10
	7	52,94	13,97	51,31	14,98	49,63	14,98	48,00	17,00	46,37	18,41	43,73	19,82	41,62	21,22
	8	54,43	14,13	52,75	15,13	51,07	15,13	49,39	17,14	47,23	18,55	45,02	19,96	42,86	21,35
	9	55,92	14,26	54,19	15,27	52,51	15,27	50,78	17,27	48,58	18,68	46,37	20,09	44,11	21,49
	10	57,41	14,42	55,63	15,40	53,90	15,40	52,18	17,41	49,92	18,82	47,66	20,23	45,41	21,62

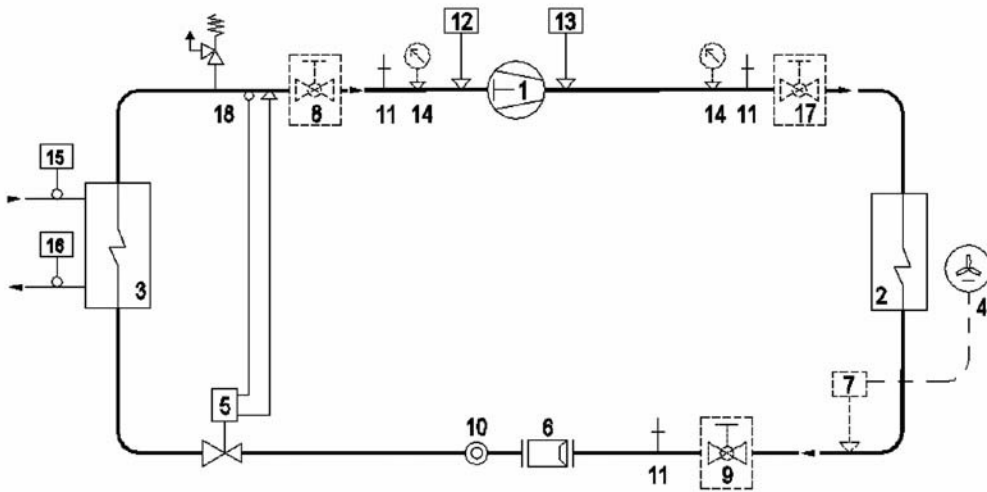
Notes:

Tw - Outlet water temperature evaporator (delta T 5 °C)

kWf - Cooling capacity

kWa - Abs. power

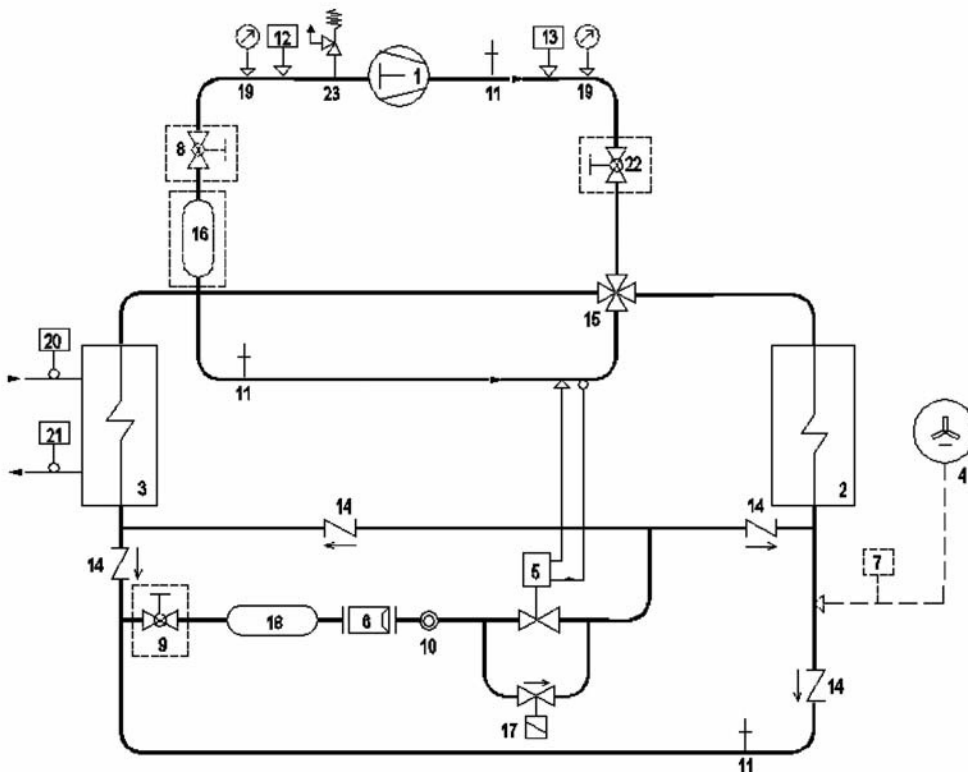
Refrigerant Circuit MCAEY



- 1 = Compressor
- 2 = Condenser
- 3 = Evaporator
- 4 = Fan
- 5 = Expansion valve
- 6 = Dryer
- 7 = Fan speed rec **
- 8 = Suction line valve **
- 9 = Liquid line cock **
- 10 = Sight glass
- 11 = Schrader service valve
- 12 = Low pressure switch
- 13 = High pressure switch
- 14 = Gauge **
- 15 = Temperature probe
- 16 = Antifreeze probe
- 17 = Supply cock **
- 18 = Relief valve

** The outlined components are optional

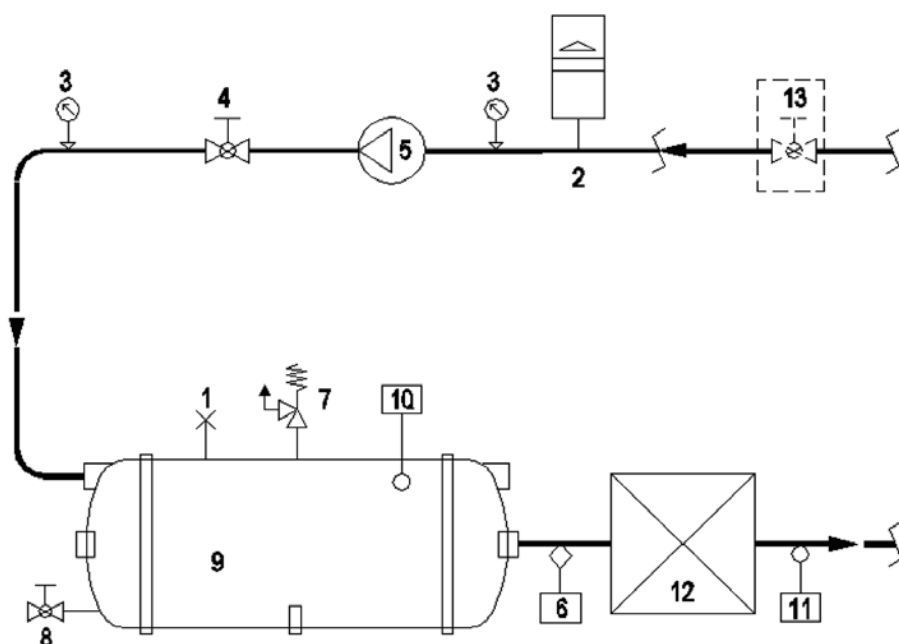
Refrigerant Circuit MCAEY....H



- 1 = Compressor
- 2 = Outdoor exchanger
- 3 = Indoor exchanger
- 4 = Fan
- 5 = Expansion valve
- 6 = Dryer
- 7 = Fan **
- 8 = Suction line valve **
- 9 = Liquid line cock **
- 10 = Sight glass
- 11 = Schrader service valve
- 12 = Low pressure switch
- 13 = High pressure switch
- 14 = Check valve
- 15 = 4 way valve
- 16 = Suction separator **
- 17 = Solenoid valve
- 18 = Liquid receiver
- 19 = Gauge **
- 20 = Temperature probe
- 21 = Antifreeze probe
- 22 = Supply cock **
- 23 = Relief valve

** The outlined components are optional

Hydraulic Circuit MCAEY....PAC 1



- 1 = Bleed valve
- 2 = Exp. vessel
- 3 = Gauge
- 4 = Setting valve
- 5 = Water pump
- 6 = Flow switch
- 7 = Relief valve
- 8 = Drain/fill up valve
- 9 = Water tank
- 10 = Temperature probe
- 11 = Antifreeze probe
- 12 = Evaporator
- 13 = Shut off valve **

** The outlined components are optional

• PAC 1: n° 1 off pump

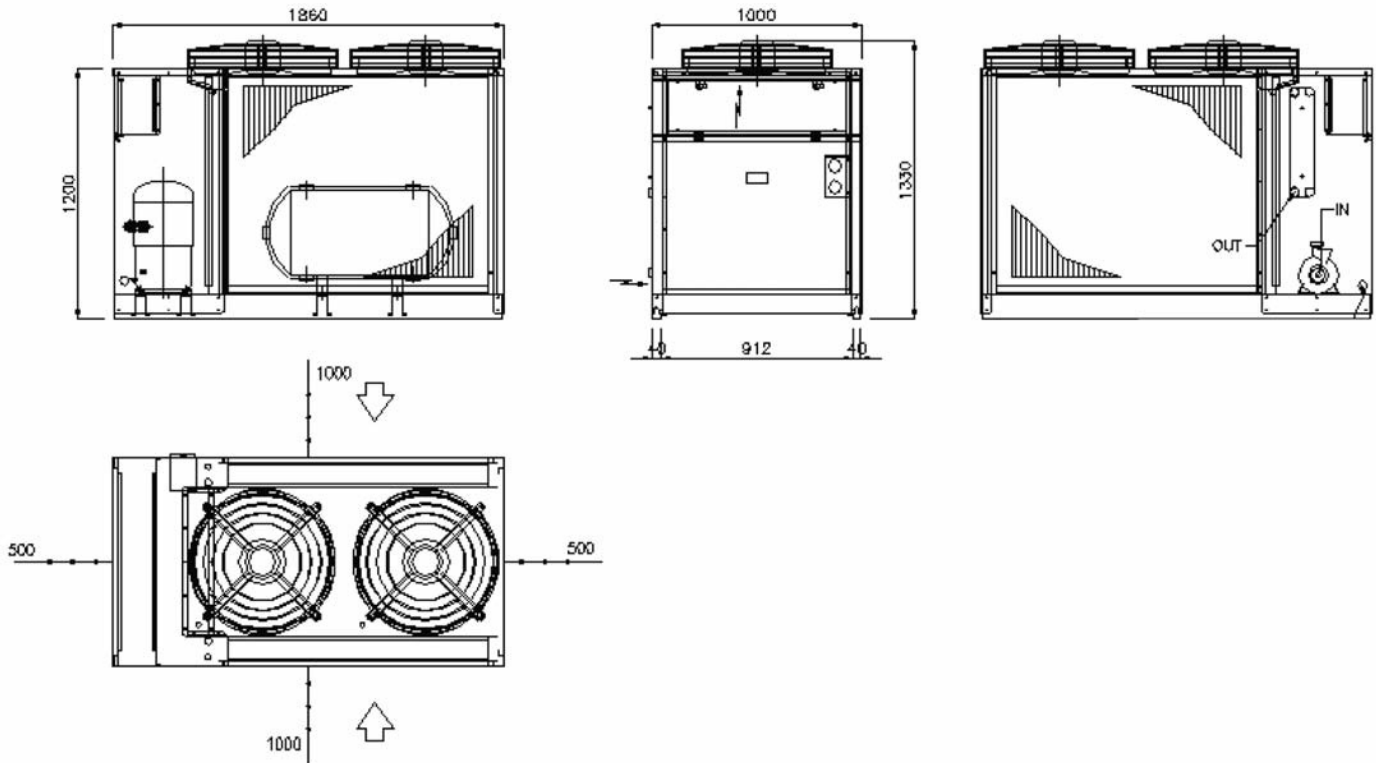
Operatine range		Cooling	Heating
INLET WATER TEMP. EVAPORATOR	Max °C	17	45
	Min °C	9	30
OUTLET WATER TEMP. EVAPORATOR	Max °C	10	50
	Min °C	5	35
EXETERNAL AIR TEMPERATURE	Max °C	46	20
	Min °C	15 (1)	-5

(1) This value can go down to -15 °C only if the appropriate kit has been installed

CORRECTION FACTORS

Ethylene glycol percentage by weight (%)	10	20	30	40	50
Freezing point (°C)	-3,6	-8,7	-15,3	-23,5	-35,5
Cooling capacity	0,986	0,980	0,973	0,966	0,960
Power input	1,000	0,995	0,990	0,985	0,975
Mixture flow	1,023	1,054	1,092	1,140	1,200
Pressure drop	1,061	1,114	1,190	1,244	1,310

DIMENSIONS



WEIGHTS Kg

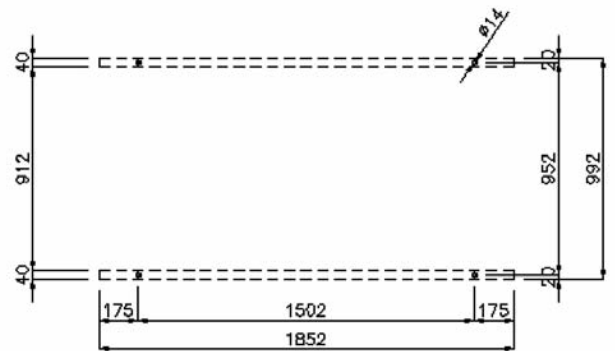
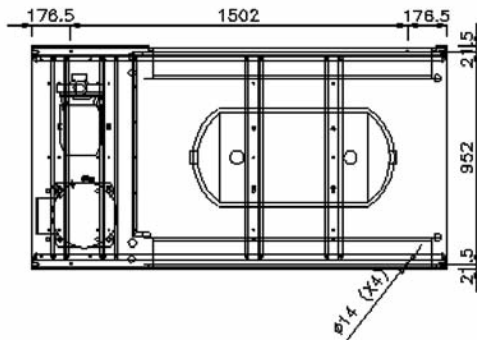
VERSIONS	STD					LN				
	15/1	17/1	19/1	21/1	25/1	15/1	17/1	19/1	21/1	25/1
Operation (1)	380	390	420	450	480	390	400	430	470	500
Transport	380	390	420	450	480	390	400	430	470	500
"P" Version										
Operation (1)	400	415	430	460	500	410	425	440	490	520
Transport	400	415	430	460	500	410	425	440	490	520
"PAC" Version										
Operation	550	570	600	660	660	560	580	610	690	700
Transport	430	450	480	510	550	440	460	490	540	570

1) The data has to be added to the evaporator water volume with regard to the selected model.

VERSIONS	STD					LN				
	30/1	35/1	40/1	45/1	50/1	30/1	35/1	40/1	45/1	50/1
Operation (1)	510	540	570	590	620	530	560	590	610	640
Transport	510	540	570	590	620	530	560	590	610	640
"P" Version										
Operation (1)	540	570	600	620	650	560	590	620	640	670
Transport	540	570	600	620	650	560	590	620	640	670
"PAC" Version										
Operation	710	740	770	790	820	730	760	790	810	840
Transport	590	620	650	670	700	610	640	670	690	720

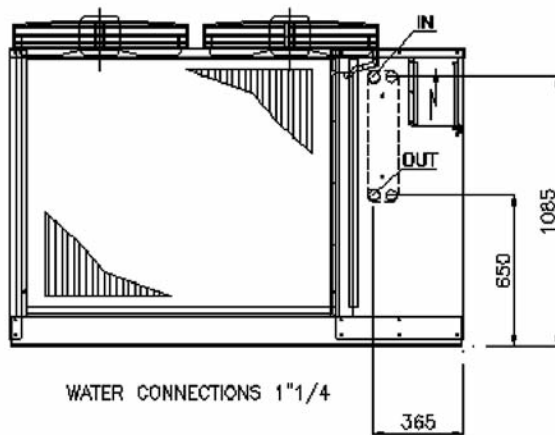
1) The data has to be added to the evaporator water volume with regard to the selected model.

SUPPORT POINTS

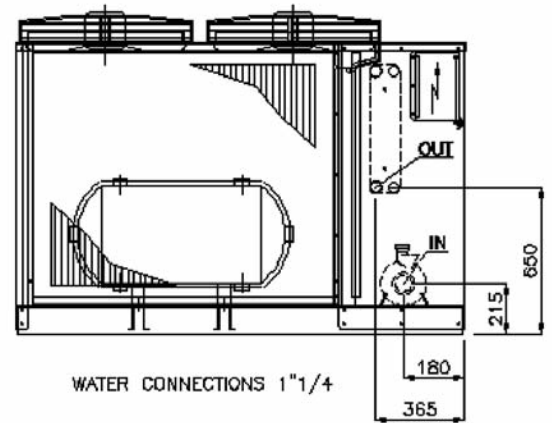


HYDRAULIC CONNECTIONS

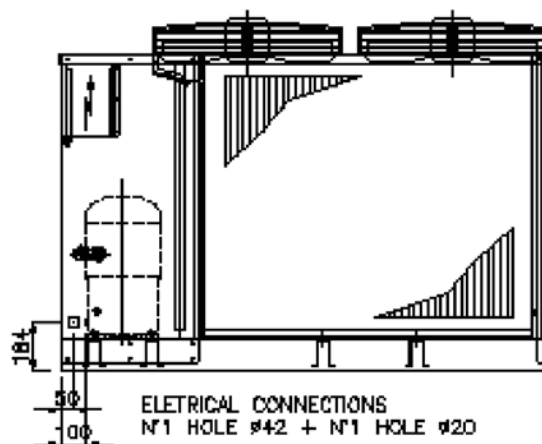
VERSION "STANDARD"



VERSION "PAC1" e "P1"



ELECTRICAL CONNECTIONS



Technical data shown in this booklet are not binding.

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