Kälte Klima

MMAEY

Air cooled condensing units
Reversible heat pumps
from 16 kW to 64 kW

R 410A

Compressors Scroll

Series:	**MMAEY**	Leaflet:	**DE 69**
Issue:	**05/12**	Supersedes:	**–**

Index

Identification code

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

1	**M**	mini series < 50 kW
2	**M**	Condensing unit
3	**A**	Air cooled
4	**E**	Axial fans
5	**Y**	Refrigerant R410A
6	**15**	Power factor
7	**1**	Number of circuits
8	**–**	Cooling only version
	H	Heating pump version
9	**DS**	Desuperheater
	RCS	Heat recovery fitted series (70 – 90 %)
	RCP	Heat recovery fitted parallel (100 %)
	LN	Low noise

MMAEY air cooled condensing unit
MMAEY...H reversible heat pump

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.

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 complete with 2 service valves (one on the suction line and one on the discharge line).
To protect the refrigerant circuit the following devices are installed: manual reset high pressure switch and automatic reset low pressure switch. The heat pump units version (MMAEY…H) contain, in addition: safety thermostat on compressor discharge line, 4-ways valve, check valve, solenoid valve.

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.

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

VLN
On request.

Options

- Liquid line kit (not mounted): dryer, sight glass, solenoid valve, shut off valve.
- Suction/liquid line shut off valves.
- Liquid receiver.
- Solenoid valve
- T-connections for HGBP-valve.
- Electronic Thermostatic valve (not mounted).
- Electronic Thermostatic valve + Non-return valve, (not mounted).
- Hot gas by-pass valve
- Power factor condensing capacitors.
- Automatic breakers
- Numbered electrical wires
- Fans speed regulator.
- Cu/Cu condensing coils.
- Coil protection grid.
- Gauges.
- Rs 485 Mod bus , Lon Work , bacnet protocol.
- Programmer clock.
- Remote control panel.
- Rubber antivibrators.
- High sensibility AV mounts.
- Wooden crate packing.

MMAEY Technical data

SIZE			15/1	17/1	19/1	21/1	25/1
COOLING MODE MMAEY							
Cooling capacity	(1)	kW	16,5	19,2	22,3	24,5	28
Abs. Power	(2)	kW	4.8	5.6	6.3	6.8	7.6
EER			3.43	3.42	3.53	3.6	3.68
HEATING MODE MMAEY…H							
Heating capacity	(1)	kW	16	18,5	21,5	23	26
Abs. Power	(2)	kW	4,9	5.6	6.3	6.8	7.7
COP			3.26	3.3	3.41	3.38	3.37
Compressors (scroll type)							
Quantity		n°	1				
Refrigerant circuits		n°	1				
Capacity steps		n°	1				
Refrigerant			R410A				
Condenser (STD/LN version)	(3)						
Refrigerant	(4)	kg	5	5	5	6	6
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							
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				
Sound pressure level at 1 m	(5)						
STD version		dB(A)	60	60	60	60	60
LN version		dB(A)	57	57	57	57	57
VLN version		dB(A)	(9)				

Performances in cooling mode:

- Evaporating temp. 7 °C
- Ambient air temp. 35 °C
- Subcooling 5K

Performances in heating mode:

- Condensing temp. 45 °C
- Ambient air temp. 7 °C db / 6 wb
- Subcooling 5K

The performances don't consider the outside pipes pressure drop.

Note:

1) Compressors + fans.
2) As version MMAEY….H (heat pump) it works as evaporating unit.
3) Max air flow in case of LN version.
4) This data has only to be considered to charge the system as the unit leaves the factory charged with nitrogen.
5) Compressor site and according to ISO 3744.

MMAEY Technical data

SIZE			30/1	35/1	40/1	45/1	50/1
COOLING MODE MMAEY							
Cooling capacity	(1)	kW	33,5	37,6	42	49,5	63,5
Abs. Power	(2)	kW	9.1	10.3	11.3	13.4	16,9
EER		–	3.68	3.65	3.71	3.69	3.75
HEATING MODE MMAEY…H							
Heating capacity	(1)	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				
Condenser (STD/LN version)	(3)						
Refrigerant	(4)	kG.	8	8	10	10	10
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	(4)						
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				
Sound pressure level at 1 m	(5)						
STD version		dB(A)	62	62	62	62	62
LN version		dB(A)	59	59	59	59	59
VLN version		dB(A)	(9)				

Performances in cooling mode:

- Evaporating temp. 7 °C
- Ambient air temp. 35 °C
- Subcooling 5K

Performances in heating mode:

- Condensing temp. 45 °C
- Ambient air temp. 7 °C db / 6 wb
- Subcooling 5K

The performances don't consider the outside pipes pressure drop.

Note:

1) Compressors + fans.
2) As version MMAEY….H (heat pump) it works as evaporating unit.
3) Max air flow in case of LN version.
4) This data has only to be considered to charge the system as the unit leaves the factory charged with nitrogen.
5) Compressor site and according to ISO 3744.

MMAEY: 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	17,8	3,5	17,0	3,7	16,3	4,0	15,5	4,2	14,6	4,5	13,7	4,7	12,8	5,0
	6	18,4	3,6	17,6	3,8	16,8	4,0	16,0	4,2	15,1	4,5	14,2	4,8	13,2	5,1
	7	18,9	3,6	18,1	3,8	17,3	4,1	**16,5**	***4,3***	15,5	4,6	14,6	4,9	13,6	5,1
	8	19,5	3,6	18,7	3,9	17,8	4,1	17,0	4,3	16,0	4,6	15,1	4,9	14,1	5,2
	9	20,1	3,7	19,2	3,9	18,4	4,1	17,5	4,4	16,5	4,7	15,5	4,9	14,5	5,2
	10	20,7	3,7	19,8	3,9	18,9	4,2	18,1	4,4	17,0	4,7	16,0	5,0	-	-
17/1	5	20,7	4,2	19,8	4,4	18,9	4,7	18,1	5,0	17,0	5,3	16,0	5,6	14,9	5,9
	6	21,4	4,2	20,4	4,5	19,5	4,8	18,6	5,0	17,5	5,4	16,5	5,7	15,4	6,0
	7	22,0	4,3	21,1	4,5	20,1	4,8	**19,2**	***5,1***	18,1	5,4	17,0	5,8	15,9	6,1
	8	22,7	4,3	21,7	4,6	20,8	4,9	19,8	5,2	18,7	5,5	17,5	5,8	16,4	6,1
	9	23,4	4,3	22,4	4,6	21,4	4,9	20,4	5,2	19,2	5,5	18,1	5,9	-	-
	10	24,1	4,4	23,1	4,7	22,0	5,0	21,0	5,2	19,8	5,6	18,6	5,9	-	-
19/1	5	24,1	4,7	23,0	5,0	22,0	5,3	21,0	5,7	19,8	6,0	18,6	6,4	17,4	6,7
	6	24,8	4,8	23,7	5,1	22,7	5,4	21,6	5,7	20,4	6,1	19,1	6,5	17,9	6,8
	7	25,6	4,8	24,5	5,2	23,4	5,5	**22,3**	***5,8***	21,0	6,2	19,7	6,5	18,4	6,9
	8	26,4	4,9	25,2	5,2	24,1	5,5	23,0	5,9	21,7	6,2	20,4	6,6	19,0	7,0
	9	27,2	4,9	26,0	5,3	24,8	5,6	23,7	5,9	22,3	6,3	21,0	6,7	-	-
	10	28,0	5,0	26,8	5,3	25,6	5,6	24,4	6,0	23,0	6,4	21,6	6,7	-	-
21/1	5	26,4	5,1	25,3	5,5	24,2	5,8	23,1	6,1	21,7	6,5	20,4	6,9	19,1	7,3
	6	27,3	5,2	26,1	5,5	24,9	5,9	23,8	6,2	22,4	6,6	21,0	7,0	19,7	7,4
	7	28,1	5,3	26,9	5,6	25,7	6,0	**24,5**	***6,3***	23,1	6,7	21,7	7,1	20,3	7,5
	8	29,0	5,3	27,7	5,7	26,5	6,0	25,3	6,4	23,8	6,8	22,4	7,2	20,9	7,6
	9	29,9	5,4	28,6	5,7	27,3	6,1	26,0	6,4	24,5	6,8	23,0	7,2	-	-
	10	30,8	5,4	29,4	5,8	28,1	6,1	26,8	6,5	25,3	6,9	23,7	7,3	-	-
25/1	5	30,2	5,8	28,9	6,2	27,6	6,5	26,3	6,9	24,8	7,4	23,3	7,8	21,8	8,3
	6	31,2	5,9	29,8	6,2	28,5	6,6	27,2	7,0	25,6	7,5	24,0	7,9	22,5	8,4
	7	32,1	5,9	30,7	6,3	29,3	6,7	**28,0**	***7,1***	26,4	7,6	24,8	8,0	23,2	8,5
	8	33,1	6,0	31,7	6,4	30,3	6,8	28,9	7,2	27,2	7,6	25,6	8,1	23,9	8,5
	9	34,1	6,1	32,7	6,4	31,2	6,8	29,8	7,2	28,0	7,7	26,3	8,2	-	-
	10	35,2	6,1	33,6	6,5	32,1	6,9	30,7	7,3	28,9	7,8	27,1	8,2	-	-

Note:

Te – Evaporating temperature
kWf – Cooling capacity
kWa – Abs. power

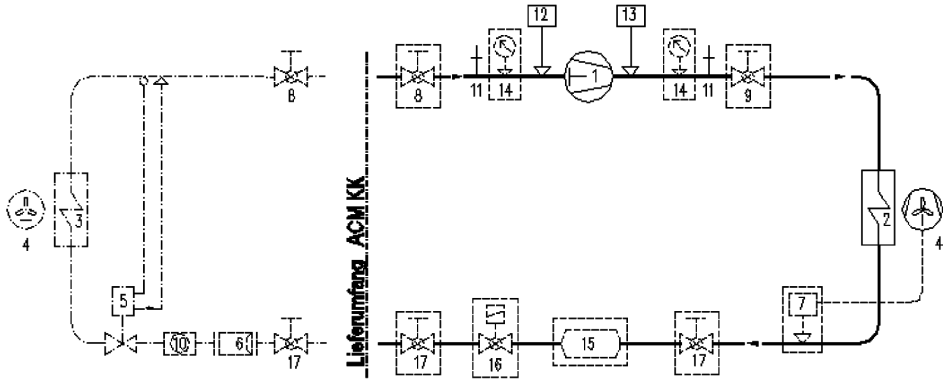
MMAEY: Performances

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	36,2	6,6	34,6	7,0	33,0	7,5	31,5	7,9	29,7	8,4	27,9	8,9	26,1	9,4
	6	37,3	6,7	35,6	7,1	34,1	7,6	32,5	8,0	30,6	8,5	28,8	9,0	26,9	9,5
	7	38,4	6,8	36,7	7,2	35,1	7,7	**33,5**	***8,1***	31,6	8,6	29,6	9,1	27,7	9,7
	8	39,7	6,8	37,9	7,3	36,2	7,7	34,6	8,2	32,6	8,7	30,6	9,2	28,6	9,8
	9	40,8	6,9	39,1	7,4	37,3	7,8	35,6	8,3	33,5	8,8	31,5	9,3	29,4	9,8
	10	42,1	7,0	40,2	7,4	38,4	7,9	36,7	8,3	34,6	8,9	32,5	9,4	-	-
35/1	5	40,6	7,6	38,8	8,1	37,1	8,6	35,4	9,1	33,3	9,7	31,3	10,2	29,3	10,8
	6	41,8	7,7	40,0	8,2	38,2	8,7	36,5	9,2	34,4	9,8	32,3	10,4	30,2	11,0
	7	43,1	7,8	41,2	8,3	39,4	8,8	**37,6**	***9,3***	35,4	9,9	33,3	10,5	31,1	11,1
	8	44,5	7,9	42,6	8,4	40,7	8,9	38,8	9,4	36,6	10,0	34,3	10,6	32,1	11,2
	9	45,8	7,9	43,8	8,4	41,9	9,0	40,0	9,5	37,7	10,1	35,4	10,7	-	-
	10	47,2	8,0	45,2	8,5	43,1	9,0	41,2	9,6	38,8	10,2	36,4	10,8	-	-
40/1	5	45,3	8,4	43,4	8,9	41,4	9,5	39,5	10,1	37,2	10,7	35,0	11,3	32,7	12,0
	6	46,7	8,5	44,7	9,1	42,7	9,6	40,7	10,2	38,4	10,8	36,1	11,5	33,7	12,1
	7	48,2	8,6	46,1	9,2	44,0	9,7	**42,0**	***10,3***	39,6	11,0	37,2	11,6	34,7	12,3
	8	49,7	8,7	47,5	9,3	45,4	9,8	43,3	10,4	40,8	11,1	38,4	11,7	35,8	12,4
	9	51,2	8,8	49,0	9,4	46,8	9,9	44,6	10,5	42,1	11,2	39,5	11,9	-	-
	10	52,8	8,9	50,5	9,4	48,2	10,0	46,0	10,6	43,3	11,3	40,7	12,0	-	-
45/1	5	53,4	10,1	51,1	10,8	48,8	11,4	46,6	12,1	43,9	12,9	41,2	13,7	38,5	14,4
	6	55,1	10,2	52,7	10,9	50,3	11,6	48,0	12,3	45,2	13,0	42,5	13,8	39,7	14,6
	7	56,8	10,4	54,3	11,0	51,9	11,7	**49,5**	***12,4***	46,6	13,2	43,8	14,0	40,9	14,8
	8	58,6	10,5	56,0	11,1	53,5	11,8	51,1	12,5	48,1	13,3	45,2	14,1	42,2	14,9
	9	60,4	10,6	57,7	11,3	55,1	12,0	52,6	12,6	49,6	13,5	46,6	14,3	-	-
	10	62,2	10,7	59,5	11,4	56,8	12,1	54,2	12,8	51,1	13,6	48,0	14,4	-	-
50/1	5	68,5	13,0	65,5	13,8	62,6	14,7	59,8	15,5	56,3	16,5	52,9	17,5	49,4	18,5
	6	70,6	13,1	67,6	14,0	64,6	14,8	61,6	15,7	58,0	16,7	54,5	17,7	50,9	18,7
	7	72,8	13,3	69,7	14,2	66,5	15,0	**63,5**	***15,9***	59,8	16,9	56,2	17,9	52,5	19,0
	8	75,2	13,4	71,9	14,3	68,7	15,2	65,5	16,1	61,7	17,1	58,0	18,1	54,2	19,1
	9	77,4	13,6	74,0	14,4	70,7	15,3	67,5	16,2	63,6	17,3	59,7	18,3	-	-
	10	79,8	13,7	76,3	14,6	72,9	15,5	69,5	16,4	65,5	17,4	61,5	18,5	-	-

Note:
Te – Evaporating temperature
kWf – Cooling capacity
kWa – Abs. power

Refrigerant Circuit **MMAEY**



1 = Compressor
2 = Condenser
3 = Evaporator
4 = Fan
5 = Thermal expansion valve
6 = Refrigerant filter
7 = Fan speed regulator **
8 = Suction line valve **
9 = Supply cock **
10 = Humidity indicator
11 = Schrader service valve
12 = Low pressure switch
13 = High pressure switch
14 = Gauge **
15 = Liquid receiver **
16 = Solenoid valve **
17 = Liquid line cock **
18 = Relief Valve (if necessary)

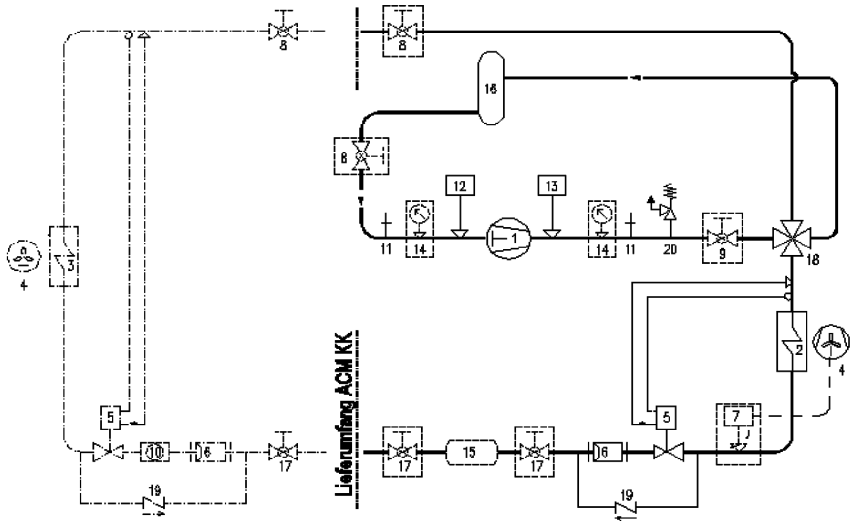
** The outlined components are optional

Operatine range

EVAPORATING RANGE	Max °C	10
	Min °C	-2
AMBIENT AIR TEMPERATURE	Max °C	44 (1)
	Min °C	10

(1) Except what indicated in the sheet pages 6 and 7

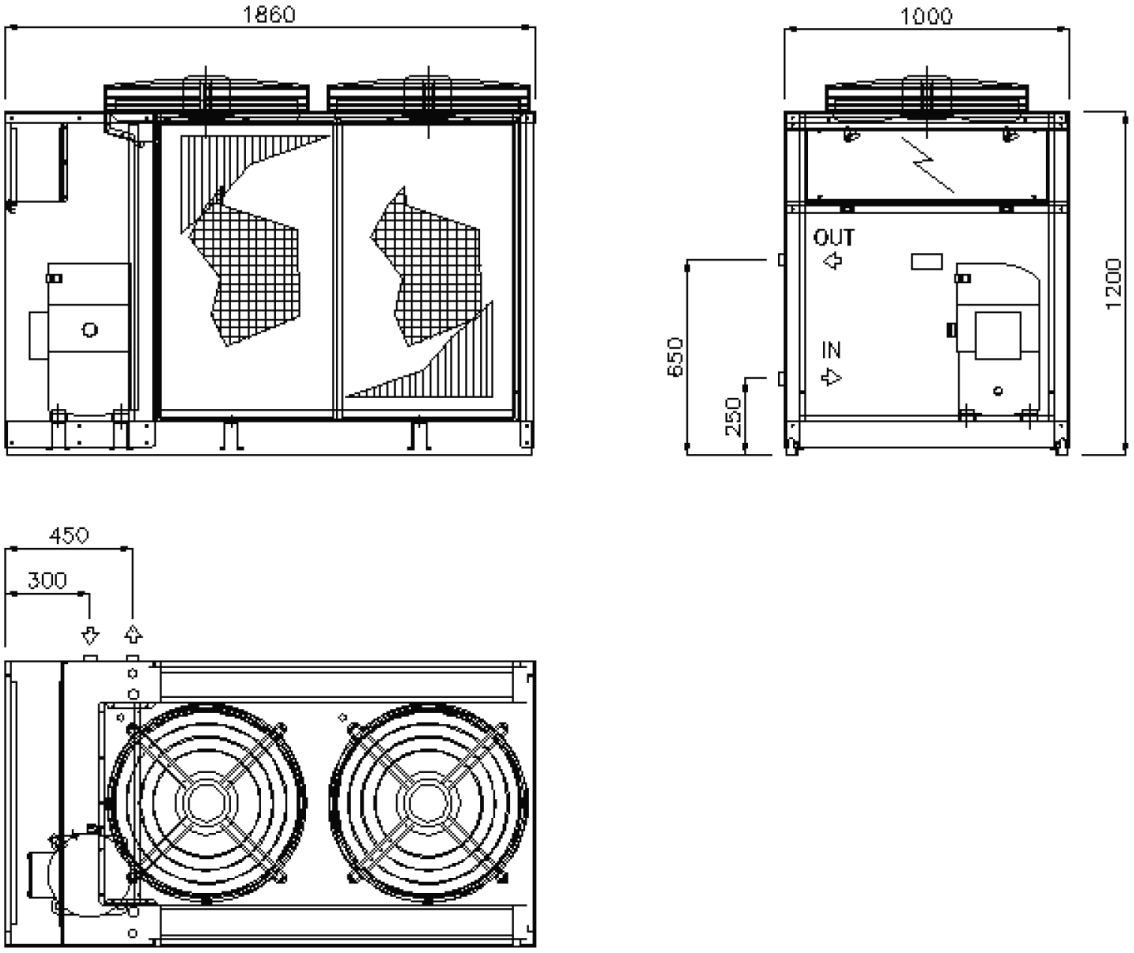
Refrigerant Circuit **MMAEY....H**



1 = Compressor
2 = Outdoor exchanger
3 = Indoor exchanger
4 = Fan
5 = Thermal expansion valve
6 = Refrigerant filter
7 = Fan speed regulator
8 = Suction line valve **
9 = Supply cock **
10 = Humidity indicator
11 = Schrader service valve
12 = Low pressure switch
13 = High pressure switch
14 = Gauge **
15 = Liquid receiver **
16 = Suction separator **
17 = Liquid line cock **
18 = 4way solenoid valve
19 = Check valve
20 = Relief valve (if necessary)

** The outlined components are optional

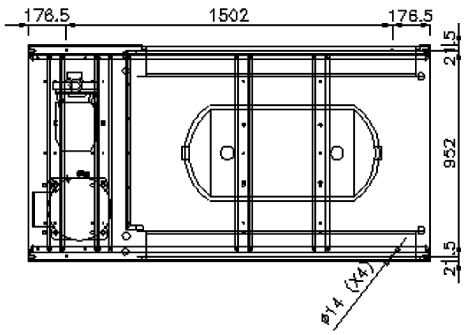
DIMENSIONS (mm)

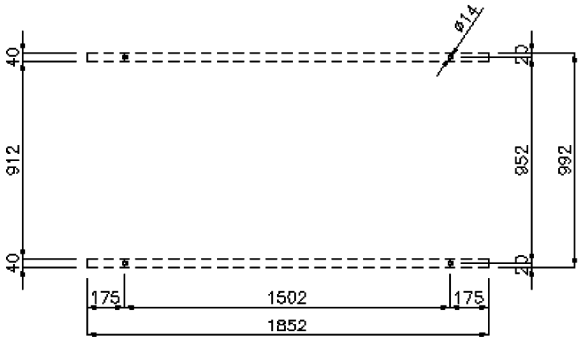


FREON CONNECTIONS (mm)

MMAEY	**VERSIONS**									
Size	15/1	17/1	19/1	21/1	25/1	30/1	35/1	40/1	45/1	50/1
Ø IN - OUT	22 - 18	22 - 18	22 - 18	28 - 22	28 - 22	35 - 28	35 - 28	35 - 28	42 - 35	42 - 35

SUPPORT POINTS





WEIGHTS (Kg)

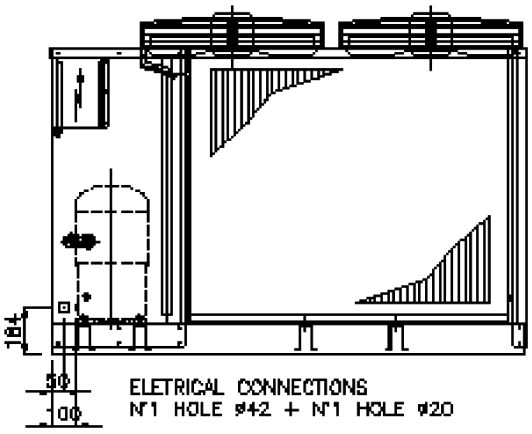
VERSIONS	STD					LN				
Size	15/1	17/1	19/1	21/1	25/1	15/1	17/1	19/1	21/1	25/1
Transport	395	410	435	450	505	405	420	455	465	520

VERSIONS	STD					LN				
Size	30/1	35/1	40/1	45/1	50/1	30/1	35/1	40/1	45/1	50/1
Transport	515	540	585	620	660	530	555	600	635	675

The data are referred to MMAE cooling only; for MMAE….H increase the value of 5%.

(1) **OPERATING** WEIGHT: add to the transport weight the refrigerant charge and the accessories.

ELECTRICAL CONNECTIONS



Technical data shown in this booklet are not binding. **ACM Kälte Klima Srl** reserves the right to modify data without any prior notices.

NOTE:

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