

MEX EA 150 Z C



Pictures are not binding, may be depicted accessories on request.
For further information please contact our sales offices.



STANDARD CONFIGURATION

The units belonging to MEX EA family are air cooled packaged water chillers, for outdoor installation, equipped with hermetic scroll compressors and axial fans, available in 9 sizes and in the following versions: - MEX EA: water chiller- MEX EA: B1 water chillers with hydraulic module;- MEX EA: B1+SB water chillers with hydraulic module and built in buffer tank.

HYDRAULIC VERSION

The units of the MEX EA family are available in multiple hydraulic versions, characterized by complete kits of all major hydraulic components for an easier installation, with reduced time, cost and space. In addition they can also be equipped with an optional water tank complete with a base frame that can be placed underneath the unit, provided together with water gauges and a connection kit. The installation of the water tank is at customer care. VERSION CODE B1: Water pump, expansion tank, relief valve, safety valve, drain valve, differential pressure switch, temperature probes. B1+SB: Water pump, expansion tank, relief valve, safety valve, drain valve, differential pressure switch, temperature probes, water tank with pressure gauge, relief valve and drain valve.

ACOUSTIC VERSION

LN: low noise version equipped with sound compressor jackets. It allows a reduction in the sound power level down to -4 dB (A).

CASING

Casing made with galvanized base and pre-painted metal sheet with epoxy powder. This treatment provides long lasting resistance for outdoor installation, even in aggressive environmental conditions. Easily removable panels providing total access to components inside the machine for service and maintenance purposes.

COMPRESSOR

Compressor of scroll hermetic type. These compressors are featured from high performance with low noise and vibration levels. The high values of COP are obtained:

-By means of high volumetric efficiency in the whole operating range obtained through the continuous contact between the fix and rotating spirals which avoids the bad space and the re-expansion of the refrigerant;

-By means of low pressure losses due to the absence of suction and discharge valves and to the continuous compression;

-By means of the reduction of the heat exchanging between the suction and discharge refrigerant, thank to the complete separation of the refrigerant paths.

The acoustic features are obtained:- For the absence of the suction and discharge valves;

-For the continuous and progressive compression process;

-For the absence of pistons which ensures the low vibrations level and pulsation of the refrigerant.

The electric motor is suction cooled and equipped with automatic reset thermal protection and electric heater to prevent the dilution of the refrigerant in the oil during the periods when the unit is stopped. The terminals are contained into a box IP 54 protected.

FANS

Direct drive propeller type fans, protected to IP 54, with blades statically and dynamically balanced. The electric motors are closed type with external rotor, equipped with built-in thermal overload and suitable for outdoor installation. Insulation class F, internal protection according to VDE, suitable for a temperature operating range from -40 to +80°C. Models from 125 ZC to 139 ZC are equipped with 2 steps fan speed regulation for condensing control. Models 145 ZC and 150 ZC are equipped with EC axial fans allowing continuous fans speed regulation. The air flow regulation allows the units to work with low outdoor temperature (in cooling mode only) down to 5°C and to reduce considerably the noise level.

USER HEAT EXCHANGER

Direct expansion, stainless steel brazed plate type, insulated externally with closed cell anti condensation material and equipped with water pressure differential switch and antifreeze protection electric heater.

REFRIGERANT CIRCUIT

The units are equipped with one refrigerant circuit entirely constructed with copper tubes, each with:

-electronic expansion valve;

-filter dryer;

-sight glass;

-liquid line solenoid valve;

-high pressure switches;

-low pressure switches;

AIR SIDE HEAT EXCHANGER

Air-cooled microchannel condensing coils with aluminum fins. The coil is made up of three components: the multichannel tubes, the fins which are placed between the microchannels and the two refrigerant headers. The use of microchannel condensing coils represents the optimal solution and offers many advantages, such as:- Reduced refrigerant charge: thanks to new Microchannel technology (heat exchanger) the refrigerant charge is reduced by up to 37% compared to equivalent units with Al-Cu fin & tube condensers;- Compact: The heat transfer surface in contact with the refrigerant is greatly increased, so these heat exchangers are more compact and provide higher performance compared to the tube & fin;- Reduced emissions of refrigerant into the atmosphere: lower emissions of refrigerant into the atmosphere with considerable benefits in terms of environmental protection.- Significant reductions in weight which is a double advantage, a significant reduction of costs and maintenance time, and at the same time lower CO₂ emissions in transport.- Entirely made of 100% recyclable aluminum, and so fully in line with the policies of respect and protection of the environment. Optional coatings are available to protect the coils and to increase the corrosion resistance and for the use in chemical risk environment.

ELECTRICAL PANEL

Electrical control panel made in accordance with CEI 44-5/IEC 204-2 standards, with short circuit current of 10kA, mounted inside the unit, includes:

- safety-locked main switch;
- fuses and contactors for compressor;
- fuses and contactors for the fans;
- fuses 220V auxiliary circuit;
- fuses 24V auxiliary circuit;
- transformer for 24Vac auxiliary circuit power supply;
- low-voltage user terminals board.

ELECTRONIC CONTROLS

The control of the unit is performed by an electronic card for dynamic parameters control, able to control independently the functionalities and to adjust the operating cycles of the unit. The controller interface consists of a 2 line LED display and of several icons for quick interaction, interaction with the control is possible with six buttons on the sides of the display. Through the monitoring system the user can intervene and regulate through the setting of appropriate parameters, the following settings:

- selection of the cooling fluid temperature control. This is proportional type;
- temperature set point of the cooling fluid entering the evaporator and relevant differential, for controlling the ramp of the cooled fluid;
- setting the machine and compressor counter;
- setting the minimum time to re-start a compressor;
- setting the minimum compressor on/off time schedule;
- enabling the compressor start up sequence;
- management of the on/off period of the pump on starting up and shut down of the unit;
- setting the delay time on the water differential pressure switch;
- setting the set point and differential for the management of the card controlling the speed of the connected fans.

Safety features include:

- high and low pressure switches;
- compressor, fans thermal protection;
- electric pump thermal protection;
- protection against a lack of low flow in the heat exchangers;
- freeze protection;
- modification of the operating time of the individual compressors;
- EPROM not correctly connected or not operating correctly self diagnosis;

-probe failure or not connected self diagnosis.

The alphanumerical LED display allows the parameters to be easily entered. Alarms and the functional parameters are displayed immediately.

The control interface provides:

- Monitor the analog state variables of the system (in/out water temperature, pressures on each circuit);
- Monitor the state of the compressors, capacity control valves, heaters etc.;
- Read the text and the code of the occurred alarm;
- Activation of the machine in the desired operating mode;
- Modify operating parameters by inserting the right password;
- Defrost timings;
- Antifreeze threshold

Using the terminal with 6 keys and LED graphic display one can manage:

- change the set point of the whole unit:
- monitor the analog state variables of the system (in/out water temperature, pressures on each circuit);
- monitor the state of the compressors, capacity control valves, heaters etc.;
- read the code of the occurred alarm;
- turn on/off the whole unit and change its mode (summer/winter for the heat pumps);
- modify the following parameters by inserting the right password:- high/low pressure;- on/off compressors timings;- defrost timings (for the heat pumps);- antifreeze threshold;- condensation control law as a function of the instantaneous high pressure;- water pump pre-starting time.

There are two types of alarm:

- serious alarms that deactivate the unit, give a text alarm on the display, activate the buzzer and the general alarm output relay fitted. They are:- no water flow across the evaporator;- high/low pressure;- compressor thermal protection;- fans thermal protection;- temperature or pressure probe failure;
- signal-only alarms: they only give a signal text on the display and activate the buzzer and the general alarm output relay fitted on the master card. They are:- compressor maintenance time over limits;- water pump maintenance time over limits.

By contacts (included) in the control panel you can manage the unit in its basic functions in BMS:

- remote on/off selection;
- remote summer/winter selection (for the heat pump versions);
- additional water flow control (external flow switch);
- on/off compressors status.

The electronic controller can be interfaced with a supervision software on a local or remote PC that uses a manufacturer: communication protocol, or with complex BMS systems using ModBus.

DYNAMIC LOGIC CONTROL

Thanks to the function DYNAMIC LOGIC CONTROL, the electronic controller can manage the differential of the inlet water temperature on the basis of the speed of its variation. The function dLC works partially as a simulator of a water tank: in fact it allows to reduce the number of the compressor's starts. The main advantage of the function dLC is during the conditions of low load, that is:

-the compressor is switched off and the water temperature increases very slowly; in this situation the dLC is able to delay the start of the compressor by replacing itself to the thermal inertia that would be obtained from the water tank.

-the compressor is switched on and the water temperature decreases very quickly; in this situation the dLC is able to delay the compressor's switching off. In this way it is reached the same result that would be obtained from the water tank's thermal inertia.

As result the function dLC makes possible to reduce the dimensions of the water tank, with huge advantages for the footprint of the unit.

DYNAMIC SET POINT

The function DYNAMIC SET POINT allows to change simultaneously the set point to achieve always the conditions of best comfort and, above all, the maximum energy saving. In fact if the outdoor temperature increases, through the function DSP it is possible:

-To increase of a certain value the set point in case it is necessary to reduce the power consumption and it is needed to ensure a difference between the indoor and outdoor temperature such to avoid health problems due to the excessive changes of temperature.

-To reduce of a certain value the set point in case it is required to compensate in such a way the excess of thermal load of course this is a function to be used with precaution because it generates higher power consumptions and a big difference in temperature between inside and outside that could be dangerous for the health of the people that is forced for any reason to get in and out from the air conditioned room.

ACCORDING TO EN14511

Unit

Model		150
Refrigerant fluid		R410A
Minimum partialization of the unit	%	39

Compressors

Type		Scroll
Number		2
Refrigerant circuits		1
Capacity steps		3
Total oil charge	kg	6.3
Total refrigerant charge	kg	8.0

Fans

Type		SRC
Number		2
Rated absorbed power	kW	0.36
Rated absorbed current	A	1.57

Heat exchanger - User side

Type		PL
Number		1
Water content	l	4.3

Dimensions

Length	mm	2061
Width	mm	778.5
Height	mm	1687

Weight

Net weight	kg	540.0
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Cooling conditions

Fluid - User side		Ethilene Glycol 25%
Fouling factor - User side	m ² °C/kW	0.000000
Inlet water temperature - User side	°C	15.0
Outlet water temperature - User side	°C	10.0
External air temperature	°C	27.0
Height asl	m	0

Cooling performances

Cooling capacity	kW	59.79
Compressors absorbed power	kW	15.03
Total absorbed power (A1)	kW	15.74
Flow rate - User side	m ³ /h	11.15
Pressure drops - User side	kPa	66

EER		3.80
ESEER (basic unit)		0.00
Air flow rate	m3/h	17000
Available pressure	Pa	0
Fans absorbed power	kW	0.36
Fans absorbed current	A	1.57

Sound levels

Sound power (ISO 9614)	dB(A)	79
Sound Level pressure at 1 m	dB(A)	62.18
Sound Level pressure at 5 m	dB(A)	52.61
Sound Level pressure at 10 m	dB(A)	47.36
Sound Level pressure at 20 m	dB(A)	41.75

ELECTRICAL DATA (Theoretical calculations)

Power supply	V/ph/Hz	400/3+n/50
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Electrical performances

FLI	kW	15.7
Full load current - FLA	A	31.9
SA	A	161.8
Maximum starting current - LRA	A	147.0
FLI Max	kW	30.4
FLA Max	A	55.1
SA Max	A	172.1

Sound Level	63 [Hz]	125 [Hz]	250 [Hz]	500 [Hz]	1000 [Hz]	2000 [Hz]	4000 [Hz]	8000 [Hz]		
Lw [dB]	88	84	80	76	73	71	65	60	Lw_tot dB(A)	79
Lp [dB]	57	53	48	44	42	39	33	28	Lp_tot dB(A)	47

Technical data and dimensions are not binding. Thermocold reserves the right to make necessary changes without notice.

Technical data are referred to clean coils without fouling and do not consider the defrost cycles duty.

The minimum and maximum water flow admitted to the heat exchanger can be checked in the technical literature on Thermocold website.

The declared performance refers to basic units at an altitude of 0 meter above sea level; some options may affect the performance of the unit.

The use of appropriate correction factors is required to calculate performance if the following options are selected:

- hydraulic kits;
- special coils and/or special coating on coils;
- condensing/evaporating control devices;
- EC fans;
- Low ambient temperature kit;
- Low water temperature kit;
- Additional refrigerant circuit components (e.g. compressor suction service valve);
- High leaving hot water temperature module.

Standard hydraulic versions can operate with a maximum glycol percentage of 25%. Please contact the Thermocold sales support for the quotation of hydraulic kits suitable for operation with a glycol percentage higher than 25%. If the hydraulic versions are selected, the following additional water pressure values of the water circuit shall be considered, calculated in accordance to the water flow at nominal conditions (in chiller mode with T_w in/out 12/7°C – T_{air} +35°C for the air cooled units; T_{evap} in/out 12/7°C – T_{cond} in/out 30/35°C for the water cooled unit).

Double pump --> 70kPa

Single pump + water tank --> 30kPa

Double pump + water tank --> 90kPa

Performance tolerances at other conditions from the full load test conditions, as defined in EN Standard 14511-3:2013, are different and need to be checked. Please contact Thermocold, also in case a performance test is needed at different conditions than those defined in EN Standard 14511-3:2013 (valid for chillers, heat pumps and multi-pipe units).

Hydraulic and electrical data shown are calculated in cooling only mode.

FLI = Full load power input at the conditions of the selection

FLA = Full load current at the conditions of the selection

SA = Inrush current (sum of LRA of the largest compressor, current of the other compressors, total current of the fans)

LRA = Locked rotor amperes for the largest compressor

FLImax= Full load power input at the worst conditions for compressors and fans (at the limit of the unit operating envelope)

FLAmax= Full load current at the worst conditions for compressors and fans (at the limit of the unit operating envelope)

Samax= Inrush current (sum of LRA of the largest compressor, current of the other compressors calculated at the worst conditions, total current of the fans).

Acoustic data referred to the following operating conditions: evaporator water temp. In/out 12°/7°C - outdoor temp. 35°C.

Acoustic data refer to basic unit without hydraulic version and EC fans. Correction factors of sound power and sound pressure levels are available on the technical bulletin.

The sound pressure levels are average values calculated in free field with a reflective surface and are indicative.

The sound power and sound pressure values are weighted (dBa).

The values shown in each octave band are indicative and represent sound pressure levels at 10 m unweighted (dB).

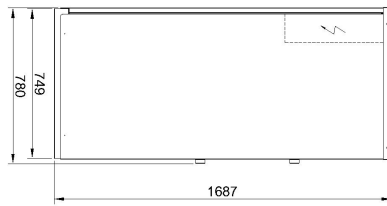
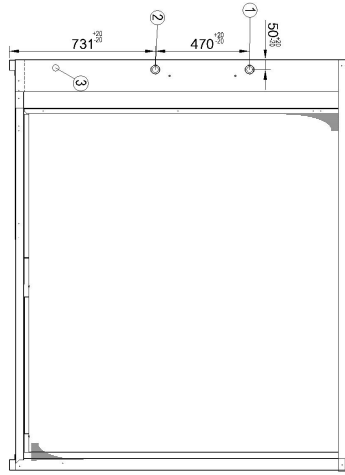
The water flows refers to the delta T shown in the datasheet.

FOR HEAT PUMPS: the selection of the fixed speed water pump shall be made in accordance to the water flow in cooling mode. In heating mode the unit will work with the same water flow as in cooling but with consequent variation of the delta T respect to the one of the datasheet.

FOR MULTI-PIPE UNITS:

The selection of the fixed speed water pump on the cooling side shall be made in accordance to the water flow in cooling only mode. In chiller + total recovery mode (cooling + heating) the unit will work with the same water flow as in cooling only mode but with consequent variation of the delta T respect to the one of the datasheet. Unit controls on the entering cold water temperature.

The selection of the fixed speed water pump on the heating side shall be made in accordance to the water flow in heating only mode. In chiller + total recovery mode (cooling + heating) the unit will work with the same water flow as in heating only mode but with consequent variation of the delta T respect to the one of the datasheet. Unit controls on the entering hot water temperature.



- 1 - ENTRATA ACQUA EVAPORATORE
EVAPORATOR WATER INLET
- 2 - USCITA ACQUA EVAPORATORE
EVAPORATOR WATER OUTLET
- 3 - ALIMENTAZIONE ELETTRICA
ELECTRIC POWER SUPPLY
- 4 - FORI DI FISSAGGIO
FIXING HOLES

Connessori idraulici - Hydraulic connectors

Dimensione - Size	1"	1 1/2"	2"
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

