

COOLSIDE ROW DX

14 – 42 kW

FULL INVERTER direct expansion air conditioners for IT Cooling.
To be matched with remote air-cooled condenser.



The picture of the unit is indicative and may vary depending on the model

- IN-ROW INSTALLATION
- FOR HIGH DENSITY RACK AND BLADE SERVER
- FULLY HERMETIC BLDC INVERTER COMPRESSORS
- SINGLE REFRIGERANT CIRCUIT
- FRONTAL AIR DELIVERY, BACK SIDE AIR SUCTION
- PLUG FANS WITH EC ELECTRIC MOTOR
- ELECTRONIC EXPANSION VALVE

Data Book: T_COOLSIDEROW_1118_EN

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MEHITS CERTIFICATIONS

SYSTEM CERTIFICATIONS



ISO 9001 CERTIFICATION – MEHITS S.p.A.
Quality Management System



ISO 14001 CERTIFICATION – MEHITS S.p.A.
Environmental Management System



BS OHSAS 18001 CERTIFICATION – MEHITS S.p.A.
Occupational Health and Safety Management System

PRODUCT CERTIFICATIONS BY COUNTRY



CE MARKING

MEHITS units are in compliance with the European Directives in force.



CCC – CQC CERTIFICATION
(People's Republic of China)



EAC CERTIFICATION
(Russian Federation, Belarus, Kazakhstan)



GENERAL CHARACTERISTICS



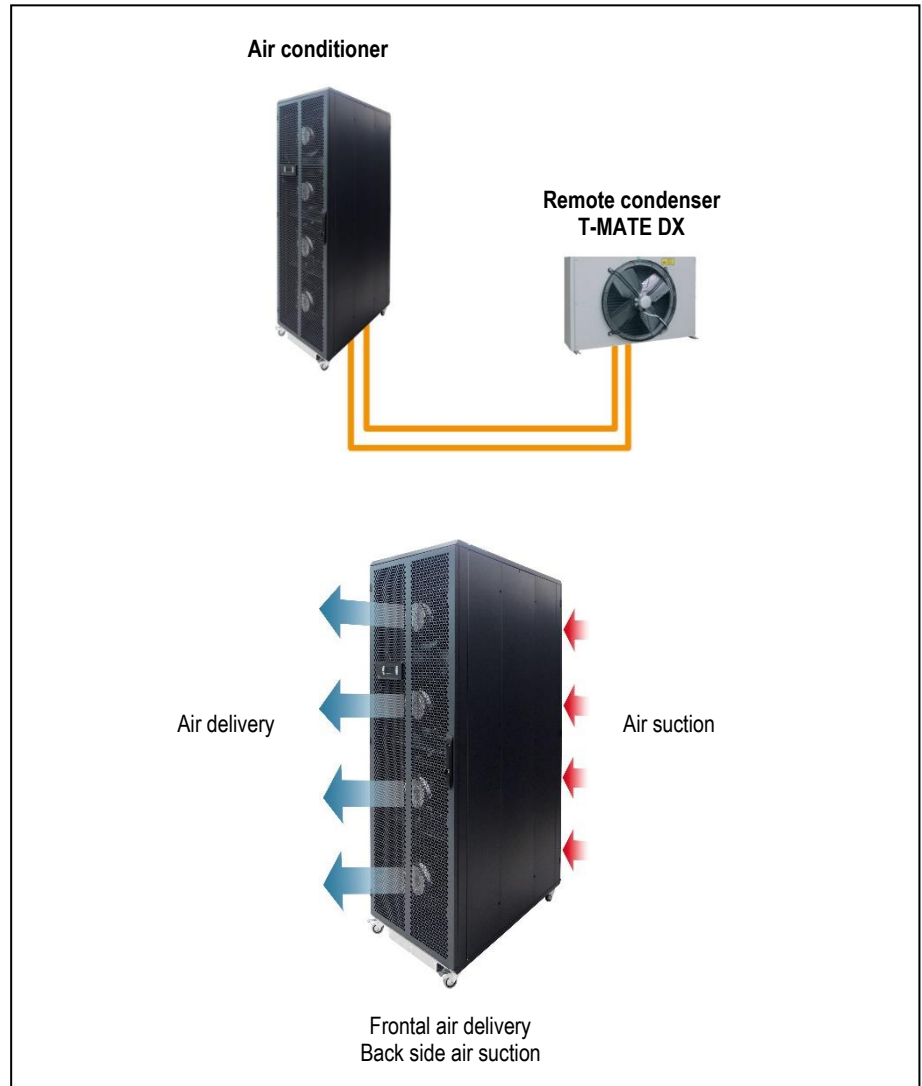
FULL INVERTER Air Conditioners for IT Cooling.

- Direct expansion, air cooled.
- For matching with remote air-cooled condenser.
- BLDC inverter compressors.
- Plug fans with EC electric motor.
- Single refrigerant circuit.

This series, for in-row installation, is offered in 2 models available in the following version:

- Frontal air delivery, back side air suction

Cooling capacity: 14 ÷ 42 kW



The machines are made for indoor installation.

The constructive solutions and the internal lay-out allow high application flexibility and the frontal access to the main components for the inspection and routine maintenance.

The installation requires electrical and hydraulic connections.

Final assembly on all machines before shipment including running test, reading and monitoring of operating parameters, alarms simulation and visual check.

COOLSIDE ROW DX

INSTALLATION



The series is particularly suitable for installation in Data Center with hot spot for high density racks and blade server cooling. It is able to cope the high density of the thermal load in a small space, **up to 58,8kW on 0,7 m² floor space.**

For installation are not required underfloor plenum, ducts or false-ceilings; the installation foresees the direct insertion within the rows of racks to cool.

This allows to contrast the localized heat sources (hot spot) tailoring the installation to the actual situation of the plant. Another big advantage is the modularity and scalability of the system, characteristics that allow for quick adjustment and economic development of plant layout, according to the changing needs of the infrastructure.

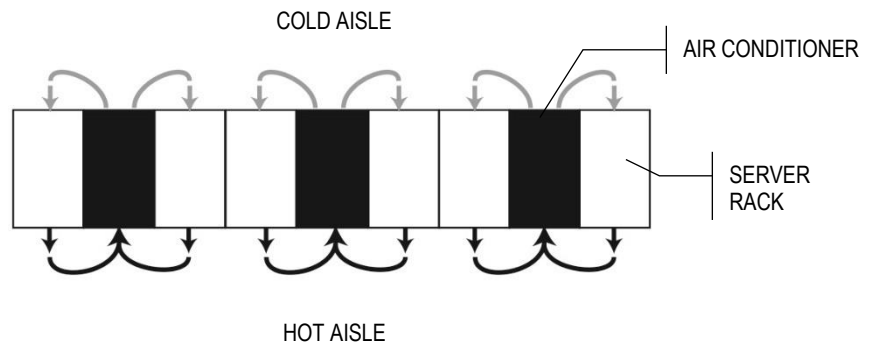
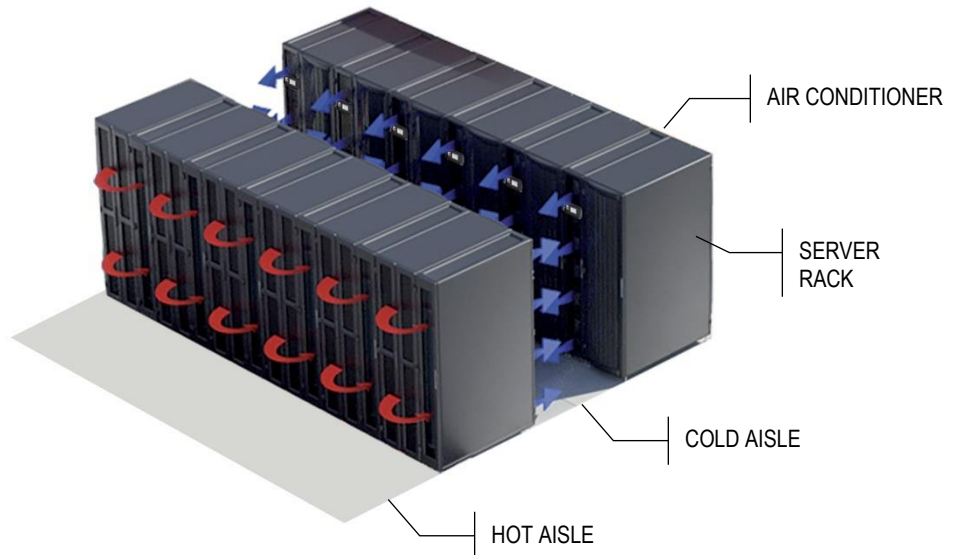
IN ROW COOLING SYSTEM FOR ROWS OF RACKS (hot/cold aisles)

Units are placed in the rows of racks that are arranged so as to obtain alternate cold and hot aisles.

Electronic equipment contained in racks independently provide to aspire the necessary air for cooling.

- In the hot aisle rack expels the hot air used to cool the electronic components while the air conditioner draws the hot air to be cooled.
- In the cold aisle the air conditioner blows the filtered and cooled air while the rack draws cold air to cool the electronic components.

The series is suitable for application in modern IT infrastructure as telephone exchange, data bank, internet hotel and server rooms, all characterized by high thermal loads.



OPTIONAL

An extensive list of accessories allows the unit to adapt effectively to the real needs of the system, reducing the time and cost of installation.

COOLSIDE ROW DX

PRODUCT FEATURES AND BENEFITS

The series represents the state of the art of the air conditioning of Data Center with hot spots for high density racks and blade server cooling. The modularity of the system together with the adaptive logic of microprocessor control, make it the best solution for racks and the latest generation equipment cooling.

- EER up to 6,81 at partial load condition;
- High cooling density, **up to 58,8kW on 0,7 m² floor space.**
- BLDC hermetic inverter compressor in order to provide always the best efficiency;
- New plug fans with EC electric motors and impeller in composite material, which guarantees a reduction of power consumption;
- New fans electric motor that do not require maintenance;
- Total modulating, FULL INVERTER;
- Improvement of the control software with advanced control logic;
- Single refrigerant circuit;
- Total frontal access and lateral panels fully removable to facilitate the operations of extraordinary maintenance;

F-GAS DIRECTIVE

These units contain <HFC R410A [GWP₁₀₀ 2088]> fluorinated greenhouse gases.

MODEL IDENTIFICATION

model: COOLSIDE ROW DX 25 B 6 BF

COOLSIDE ROW DX Series direct expansion, air cooled with BLDC hermetic inverter compressor

25 Model / Cooling capacity (kW) at nominal conditions

B Cabinet length 1200 mm

6 Cabinet width 600 mm

BF Frontal air delivery

WORKING LIMITS

ROOM AIR CONDITIONS

Room air temperature:

- 14°C minimum temperature with wet bulb.
- 26°C maximum temperature with wet bulb.
- 40°C maximum temperature with dry bulb.

Room air humidity:

- 20%RH minimum relative humidity.
- 60%RH maximum relative humidity.

AMBIENT AIR TEMPERATURE

- 45°C Maximum ambient air temperature

All the values are indicative. The working temperatures are influenced by a series of variables as:

- Working conditions;
- Thermal load;
- Set of the microprocessor control.

POWER SUPPLY

- ± 10% Maximum tolerance of the supply voltage (V)
- ± 2% Maximum unbalancing of the phases.

STORING TEMPERATURE

If the machine is not installed on receipt and is stored for a long time, store it in a protected place, at temperatures ranging between -30°C and 50°C in absence of superficial condensation and direct sun light.



MAIN COMPONENTS



FRAMEWORK

- Framework and base in galvanized steel sheet externally painted with epoxy powders.
- Panels in galvanized steel sheet externally painted with epoxy powders and internally insulated with noise absorption material.
- Total front and rear access for routine maintenance.
- Hinged front and rear panels with handle and security lock.
- Removable panels on lateral side.
- Holders for unit height adjusting.
- Colour RAL 7016 textured (anthracite grey).

AIR FLOW

- Horizontal air flow for IN ROW cooling system application (for rows of racks). Air intake from the back side and frontal air delivery through honeycomb type grilles.

FILTER SECTION

- Washable air filters with COARSE 40% efficiency (according to ISO EN 16890) efficiency, with cells in synthetic fibre, on air suction panel.

FANS SECTION

- Centrifugal fans with backward curved blades, single suction and without scroll housings (Plug-fans), directly coupled to electric motor.
 - Impeller in composite material exempt from rust formation.
 - Brushless type synchronous EC motor with integrated electronic commutated system and continuous variation of the rotation speed. The motor rotation control is obtained with the EC system (Electronic Commutation) that manage the motor according to signal coming from the microprocessor control.
- Fans control through ModBus. In case of failure, the control stops the fan indicating the type of fault. The machine is not stopped.
- Temperature sensor on air delivery.
- Temperature sensor on air intake.
- Fan guard.

EVAPORATING SECTION

- Heat exchanger coil with copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops.
- Finned pack with hydrophilic treatment that assure the condensate water drop, high thermal conductivity and does not favour the growth of micro-organisms.
- Frame in galvanized steel.
- Condensate tray in peraluman with connection (external diameter Ø16) for a discharge tube or for a pump for condensate drain (option).

COMPRESSORS

Model 25 B6 BF:

- Rotary BLDC inverter compressor for R410A refrigerant.

Model 40 B6 BF:

- Scroll BLDC inverter compressors with spiral profile optimized for R410A refrigerant.
- Synchronous brushless inverter driven motor.
- Inverter for modulating capacity control.
- Filter for the reduction of electromagnetic noise and interference.
- Crankcase heater.
- Lubricant oil charge type PVE (Polyvinyl ether).
- Compressor soundproof cap.
- Rubber supports.



REFRIGERANT CIRCUIT

- Electronic expansion valve. The valve allows high performance and system efficiency thanks to a timely and accurate response to changes in temperature and pressure
- Sight glass.
- Filter dryer on liquid line.
- Pressure transducers with indication, control and protection functions, on low and high refrigerant pressure.
- High pressure safety switch with manual reset.
- Liquid receiver with accessories.
- Refrigerant circuit with copper tubing with anticondensate insulation of the suction line.
- Lubricant oil charge.
- Valves on gas delivery and liquid return placed on the bottom side of the unit for coupling to remote air cooled condenser.
- 0÷10V proportional signal to manage the condensing control system of the remote air cooled condenser.
- Oil separator on gas discharge.

ELECTRICAL PANEL

Extractable electrical panel, in accordance with EN60204-1 norms, complete with:

- Magnetothermic switch for fans electric motor protection
- Magnetothermic switch for compressor inverter protection
- Inverter to drive the compressor motor.
- Transformer for auxiliary circuit and microprocessor supply.
- Terminals:
 - OUTLETS
 - Voltage free deviating contact for General Alarm.
 - Voltage free contact for machine operating status.
 - INLETS
 - Emergency unit stop with signalling on display (external alarm).
 - External enabling.
- Power supply 400/3+N/50

CONTROL SYSTEM

- Microprocessor control system with graphic display for control and monitor of operating and alarms status. The system includes:
 - Built-in clock for alarms date and time displaying and storing;
 - Built-in memory for the storing of the intervened events (up to 100 events recorded);
 - Integrated connectivity port MBUS RS485/JBUS;
 - Predisposition for additional connectivity board housing (MBUS RS485/JBUS, LON, BACnet for Ethernet (SNMP- TCP/IP), BACnet for MS/TP). The electronic cards are optional accessories.
 - Main components hour-meter;
 - Non-volatile "Flash" memory for data storage in case of power supply faulty;
 - Menu with protection password;

OPTIONAL ACCESSORIES

The descriptions of these additional components can be found in Chapter OPTIONAL ACCESSORIES.

- Remote air cooled condensers:
 - with AC axial fans series T-MATE DX-A;
 - with EC axial fans series T-MATE DX-E.
- DUAL FLUID system. The installation of the system on the machine allows to obtain two independent cooling systems. Restriction: The accessory is not compatible with "Refrigerant connection on the upper side of the unit" and "Modulating steam humidifier" optional accessories.
- Condensate drain system that includes pump with activation float, 4 linear meters long discharge rubber pipe (internal diameter Ø6mm) and high water level alarm.
- Modulating steam humidifier with immersed electrodes fitted with safety and running accessories (temperature and humidity sensor on air intake is included). The optional foresee the combined Temperature / Humidity sensor on return air. Restriction: not compatible with "DUAL FLUID system" and "Double power supply with automatic change over" optional accessories.
- Dehumidification system. The optional foresee the combined Temperature / Humidity sensor on return air and the electronic control system of the dew point temperature for the combined intervention of cooling capacity and air flow.
- Electric heating system consisting of aluminium armoured elements with integral fins. Restrictions: Not compatible with double power supply with automatic change over.
- CLOUD PLATFORM: Web services based on cloud technology for remote monitoring and management.

OTHER ACCESSORIES

- Air filter with COARSE 60% efficiency (according to ISO EN 16890).
- Refrigerant connection on the upper side of the unit. Restriction: not compatible with "DUAL FLUID system" optional accessory.
- Double power supply with automatic change-over. Allows to manage a dual power supply to ensure continuity of operation of the air-conditioning equipment. Restrictions: Not compatible with Electric heating system, Modulating steam humidifier, Electrical power supply for remote condenser from the indoor machine electrical board. The system is electromechanical type with automatic timed switching.
- Kit for unit moving. The kit includes support wheels with safety brake and wheels cover (Baseboard).
- Differential pressure switch on the air side for clogged filters alarm signal.
- Under floor water alarm through sensor to be placed on the floor.
- Additional underfloor water sensor kit.
- Automatic system for the air pressure control in the hot or cold aisle.
The system controls the supply fans rotation speed in order to keep constant the air pressure via a differential pressure transmitter connected to the microprocessor control.
- Combined Temperature / Humidity sensor on return air.
- Combined Temperature / Humidity sensor for remote installation. The optional is added to the standard sensor on machine air suction.
- Electrical power supply for remote condenser from the indoor machine electrical board. The optional includes magnetothermic switches for condenser fans.
Limitations: Not compatible with Electric heating system, Modulating steam humidifier, Double power supply with automatic change-over
- Microprocessor control accessories:
 - Remote terminal.
 - Serial card MBUS RS485/JBUS.
 - Serial card LON.
 - Serial card BACnet for Ethernet – SNMP – TCP/IP.
 - Serial card BACnet for MS/TP.
 - Temporary microprocessor power supply. The system guarantees the microprocessor power supply for a few minutes, in case of supply voltage failure.

WARNING

The manufacturer reserves the right to accept the matching of the optional installed on the machine.

COOLSIDE ROW DX

TECHNICAL DATA

MODEL		25			40		
SIZE		B6 BF			B6 BF		
COOLING CAPACITY (1)		Min	Nom	Max	Min	Nom	Max
Total	kW	14,1	23,5	30,2	17,8	37,1	42,3
Sensible	kW	14,1	23,3	29,6	17,8	36,7	41,4
SHR (2)		1,00	0,99	0,98	1,00	0,99	0,98
SUPPLY FANS		n.	4	-	-	4	-
Total air flow	m ³ /h	-	5800	-	-	9400	-
External static pressure	Pa	-	0	-	-	0	-
Fans power input (3)	kW	-	0,23	-	-	0,75	-
BLDC INVERTER COMPRESSOR							
Quantity	n.		1			1	
Proportional cooling capacity	%		30...100			30...100	
Compressor power input	kW		4,52			8,93	
AIR FILTERS		n.	1			1	
Efficiency			COARSE 40%			COARSE 40%	
REFRIGERANT			R410A			R410A	
Gas circuits	n.		1			1	
POWER SUPPLY		V/Ph/Hz	400/3+N/50			400/3+N/50	
ENERGY EFFICIENCY INDEXES (4)							
EER – Energy Efficiency Ratio	kW/kW	-	4,46	-	-	3,67	-
DIMENSIONS							
Length	mm		1200			1200	
Width	mm		600			600	
Height	mm		2000			2000	
NET WEIGHT		kg	290			290	
REFRIGERANT CONNECTIONS							
Gas delivery	ODS Ø		16			18	
Liquid line	ODS Ø		16			16	
HYDRAULIC CONNECTIONS							
Condensate discharge – OD (5)	Ø mm		16			16	
REMOTE CONDENSER (6)							
T-MATE DX-A series	Mod.		M 35			M 45	

THE COOLING CAPACITY DOES NOT CONSIDER THE SUPPLY FANS MOTOR THERMAL LOAD

1. Gross value. Characteristics referred to entering air at 35°C with 27% rH, air to the condenser 35°C. ESP=0Pa.
 2. SHR = Sensible cooling capacity / Total cooling capacity.
 3. Corresponding to the external nominal static pressure.
 4. The Energy Efficiency Index consider the remote air-cooled condenser indicated in table.
 5. Condensate discharge of the condensate tray. External diameter.
 6. For matching to other remote air-cooled condensers please refer to ELCA WORLD selection program.
- The units highlighted in this publication contain <HFC R410A [GWP₁₀₀ 2088]> fluorinated greenhouse gas.

REFRIGERANT CHARGE

The air conditioner is supplied with a minimum R410A refrigerant charge. **Refrigerant must be charged.** The following table shows the refrigerant charge that must be introduced for the air conditioner only. Remote condenser, connections pipes and optional are excluded.

MODEL		25	40
SIZE		B6 BF	B6 BF
REFRIGERANT		R410A	R410A
Refrigerant circuits x Refrigerant charge (1)	n x kg	1 x 4,5	1 x 4,6
HFC R410A - F Gas - CO ₂ equivalent	t	9,39	9,60

1. Refrigerant charge required for the air conditioner only operation. Remote condenser, connections pipes and optional are excluded.

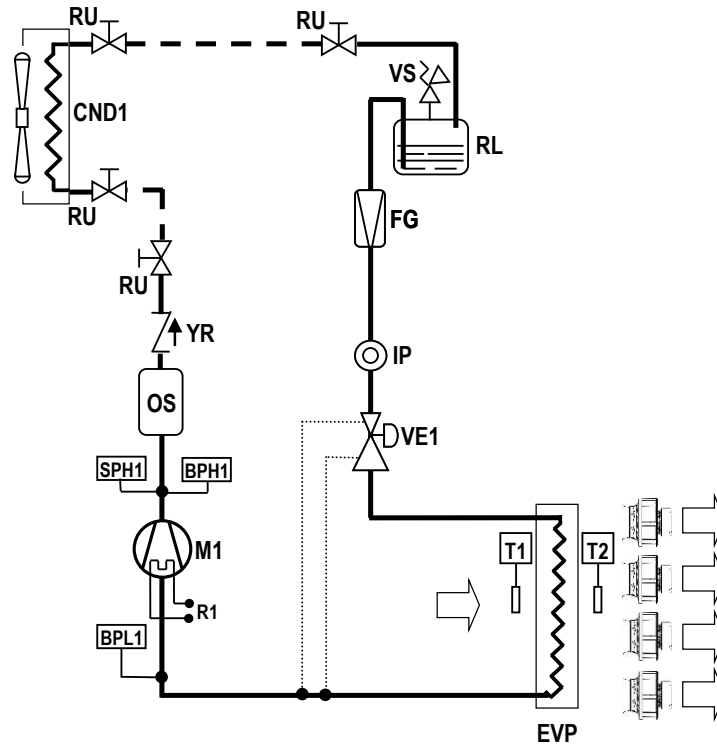


COOLSIDE ROW DX

REFRIGERANT CIRCUIT

Below refrigerant diagrams for version with single or double refrigerant circuit. The diagrams refer to the standard configuration, without optional.

SINGLE REFRIGERANT CIRCUIT



LEGENDA

M1	BLDC inverter compressor	BPL	Low pressure transducer.	IP	Sight glass.
R1	Crankcase heater	SPH	High pressure switch	VE	Expansion valve.
CND	Condenser.	OS	Oil separator	T	Temperature probes.
EVP	Evaporator.	YR	Non return valve	RU	Valves
BPH	High pressure transducer.	VS	Safety valve.	RL	Liquid receiver
		FG	Refrigerant filter.		

RECOMMENDED REFRIGERANT LINES

Values are referred to "EQUIVALENT LENGTH" of the piping.

You are kindly requested to always refer to the "INSTALLATION DIAGRAM" for the allowable height difference and to properly select all necessary components

Verify the need to use pressure limiting devices (safety valves) where not already provided for by Directive 2014/68 / EU.

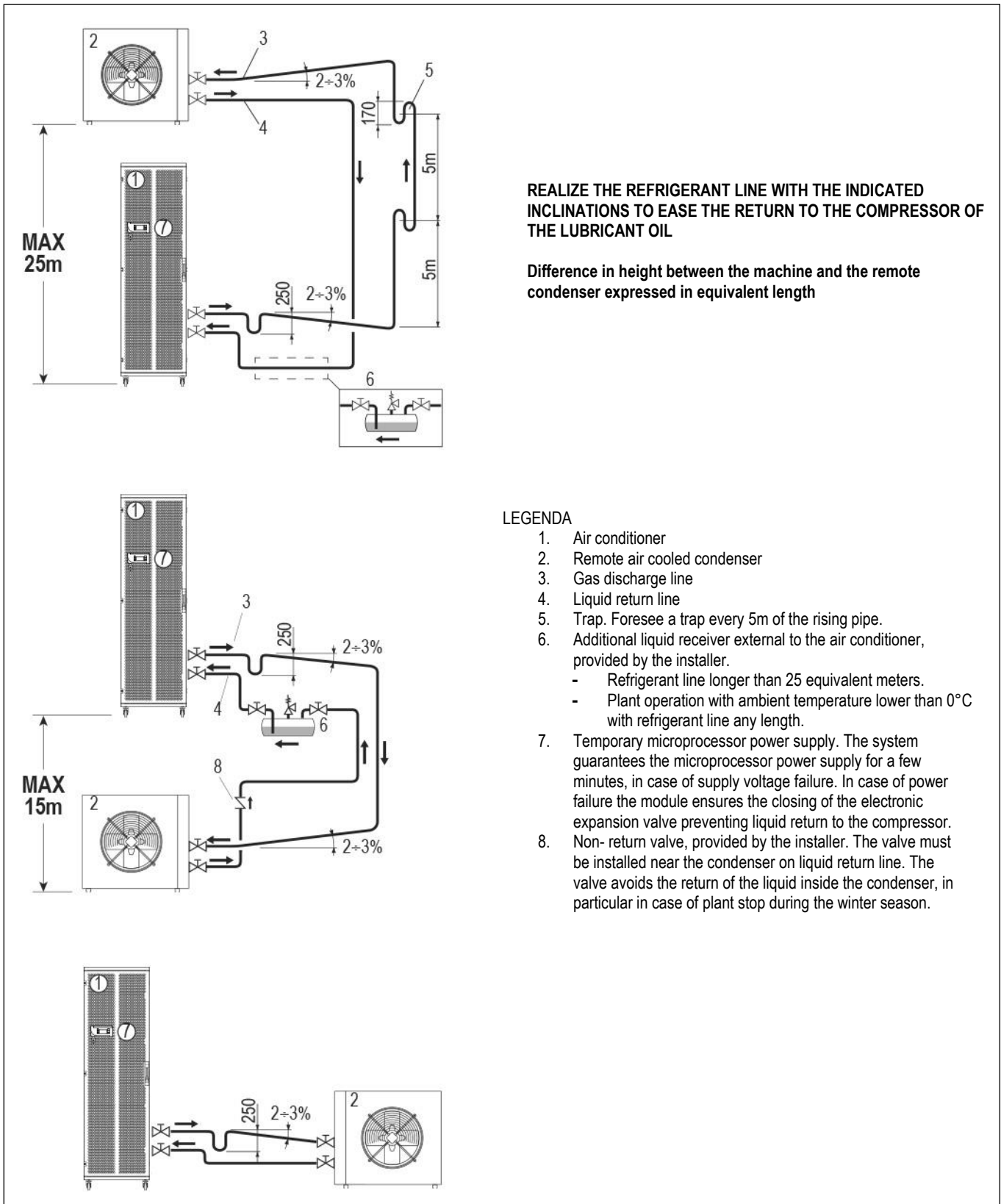
MODEL	Nominal capacity of circuit [kW]	Line	Ø nominal [mm]	EQUIVALENT LENGHT [m]									
				5	10	15	20	25	30	35	40	45	50
25 B6 BF	23,5	Gas delivery	16	16 mm						18 mm			
		Liquid return	16	16 mm									
40 B6 BF	37,1	Gas delivery	18	18 mm						22 mm			
		Liquid return	16	16 mm						18 mm			

For equivalent lengths over 50m please contact the Manufacturer's Sales Office.



COOLSIDE ROW DX

TYPICAL INSTALLATION DIAGRAM



WARNING

It is necessary to provide the refrigerant charge for the connection pipes and for the remote air-cooled condenser. Charge refrigerant in the suitable quantity and lubricant oil in 10% ratio of charged refrigerant. Lubricant oil must be the same type as the charged one as shown on the compressor plate.



COOLSIDE ROW DX

ACOUSTIC DATA

Acoustic data of the standard machine at full load working conditions.

WARNING:

In a closed room the noise produced by a sound source reaches the listener in two different ways:

- Directly
- Reflected from the surrounding walls, floor, ceiling, from furniture.

With the same sound source, the noise produced in a closed room is greater than that produced outdoors. In fact, the sound pressure level generated by the source, must be added to the one reflected from the room. Also, the shape of the room affects the sound.

MODEL	25				40		
SIZE	B6 BF				B6 BF		
COOLING CAPACITY	cps	Min	Nom	Max	Min	Nom	Max
SOUND LEVEL ISO 3744 (1)							
On air delivery	dB(A)	43,6	54,9	60,2	48,9	65,4	65,4
On air intake	dB(A)	40,6	51,9	57,2	45,9	62,4	62,4

1. Noise pressure level at 1 meter in free field – ISO 3744

ELECTRICAL DATA

MODEL	25		40	
SIZE	B6 BF		B6 BF	
Power supply	V/ph/Hz	400/3+N/50	400/3+N/50	
Maximum current input (FLA)	A	20,6	29,3	
Start-up current (SA)	A	4,0	5,0	

WARNING:

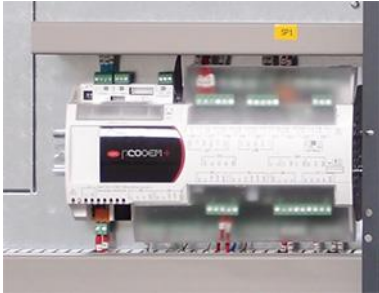
The electric data indicated refer only to the indoor unit.

Optional accessory electric data are included within the dedicated chapters and must be added.

Please refer to ELCA WORLD selection program to calculate the electrical data of the air conditioner according to the requested optional accessories.

The remote air-cooled condenser is not included because it has independent power supply.

MICROPROCESSOR CONTROL SYSTEM



The microprocessor control system is equipped with 6 keys terminal and back lighted graphic display on which all information in different languages or easily identifiable symbols are displayed. The system disposes of a "flash" memory that preserves the information even in absence of power supply. Part of memory is dedicated to the registration of intervened events - up to 100 events.

CHARACTERISTICS OF THE CONTROLLER:

- CPU: 32 bit – 100 MHz
- 4 Mbyte FLASH memory that preserves the information even in absence of power supply
 - 2Mbyte dedicated to the recording of intervened events (records up to 100 events)
- Acoustic and optical signal of alarms
- Integrated LAN connection that does not require additional hardware

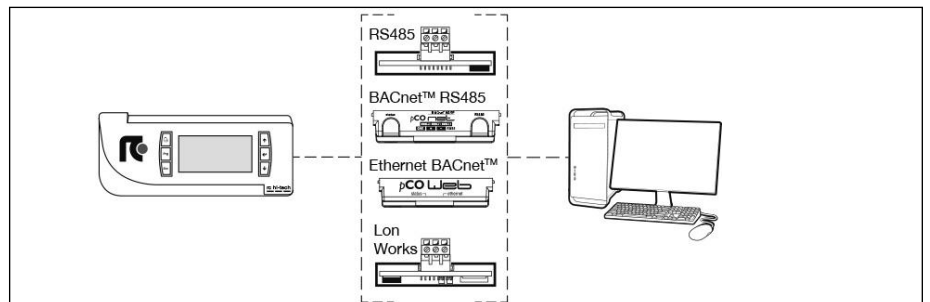
KEYBOARD FUNCTIONS

	ALARM	Alarm, Back-red light active – alarm presence, push to silence and to have alarm description. If more than one alarm(s), the others can be scrolled by Key UP / DOWN
	PRG	Menu list, scrolled by key UP/DOWN: Status; Set-point; Reset Alarm; Service set; Memo; Manual; Clock set; Communication; Switch unit (in LAN mode); Unit ON/OFF using the ENTER to execute the mode.
	ESC	Home, main screen displayed
	UP DOWN	Used to change the pages and values of sets. When display is in main screen (HOME), pressing one of them (UP/DOWN) will display the synoptic of the main controls.
	ENTER	Moving the cursor on adjustable Program(s) fields, to confirm the changes, press the key (ENTER) to get out of the fields.

CONNECTIVITY

Through the integrated serial port MBUS/JBUS (RS485) and optional serial port, the microprocessor control enables communication with the modern buildings BMS systems with the following protocols:

- MBUS/JBUS (RS485) serial card;
- LON Works serial card;
- BACnet per Ethernet – SNMP – TCP/IP serial card;
- BACnet per MS/TP serial card;



PASSWORD

- Level 1: On request of the End User. Allowing the changes of SETPOINT, RESET ALARM, SEASON, UNIT ON/OFF and COMMUNICATION.
- Level 2: Asks to Service: Allowing the changes of SERVICE SET and MANUAL
- Level 3: Asks to Service: Allowing the changes of MANUFACTURER SET.
- No passwords request to enter into: STATUS, MEMO, CLOCK SET, SWITCH UNIT (LAN)

REMOTE CONTROLS/ALARMS

- 1 INLETS: External enabling •
 - 2 INLETS: Smoke/Fire alarm •
 - 1 OUTLETS: General alarm 1 – programmable deviating contact ••
 - 2 OUTLETS: General alarm 2 – programmable deviating contact ••
- controls/alarms for remotization
- voltage free controls/alarms for remotization



OPTIONAL ACCESSORIES – REMOTE AIR-COOLED CONDENSER

Remote air cooled condensers for matching to air conditioners for IT Cooling.

The constructive solutions allow high application flexibility.

The series has an independent power supply from the indoor unit. Among the indoor unit and the condenser is necessary the refrigerant and the electrical connection of the condensing proportional control signal and of the alarms.

Is available the optional "Electrical power supply for remote condenser from the indoor machine electrical board".

The optional includes magnetothermic switches for condenser fans.

SERIES IDENTIFICATION



T-MATE DX-A

T-MATE DX-A: Remote air cooled condensers equipped with AC axial fans with horizontal air flow, from coil to fans.

T-MATE DX-E: Remote air cooled condensers equipped with EC axial fans with horizontal air flow, from coil to fans.

The machines are made with weather resistant materials and suitable for outdoor installation.

Optional accessories:

- Support legs for vertical air flow
- Coil with Blygold treatment
- Coil with Cataphoresis treatment

The series are available in 3 versions:

- STD - No air flow and sound level reduction
- LNO – Air flow reduction at 85% with consequent sound level reduction.
- ELN – Air flow reduction at 70% with further sound level reduction

T-MATE DX-A MATCHING

Remote air-cooled condensers equipped with AC axial fans. **For outdoor installation.**

Single phase power supply (V/ph/Hz 230/1/50).

MODEL		25	40
SIZE		B6 BF	B6 BF
REMOTE CONDENSER	n	1	1
STD Version	Mod.	M 35	M 45
LNO Version	Mod.	M 35	M 45
ELN Version	Mod.	M 35	M 50

WARNING:

Please refer to ELCA WORLD selection program to calculate the cooling capacity of the air conditioner according to the selected remote condenser.

The remote air cooled condenser has independent power supply from the indoor unit.

IMPORTANT

For further information about the units, please refer to "T-MATE" technical bulletins

OPTIONAL ACCESSORIES – DUAL FLUID SYSTEM

The optional is not compatible with “Refrigerant connection on the upper side of the unit” and “Modulating steam humidifier”.

WORKING LOGIC

The installation of the system on the machine allows to obtain two independent cooling systems. The microprocessor control system automatically manages the system, by activating the cooling circuit more convenient according to the parameters set.

With this system it is possible, with a limited use of space, to solve several plant problems such as:

- Circuit fed with chilled water or mains water as a stand-by of the main cooling circuit.
- Double feeding with two independent circuit. This solution is used when you need to ensure redundancy of the cooling system.

The temperature control is performed with the same logic of the main coil (see chapter AIR TEMPERATURE CONTROL LOGIC).

Components:

- Chilled water 4 rows cooling coil with copper tubes, aluminium fins and galvanized steel frame.
- 2-way motorized valve with 0÷10 VDC control actuator and emergency manual control.
- Temperature probes on water inlet / outlet.
- Hydraulic pipes in copper with anticondensate insulation.

TECHNICAL DATA DUAL FLUID SYSTEM

MODEL		007 P1	009 P1
SIZE		E1	E1
COOLING CAPACITY (1)		Max	Max
Total	kW	47,5	47,5
Sensible	kW	47,5	47,5
COOLING COIL			
Water flow rate (1)	m ³ /h	8,16	8,16
dP coil + valve (1)	kPa	31	31
Water volume	l	6,2	6,2
NET WEIGHT (2)	kg	50	50
HYDRAULIC CONNECTIONS			
WATER INLET / OUTLET	ISO 7/1 - R	Ø	1 1/2"

THE COOLING CAPACITY DOES NOT CONSIDER THE SUPPLY FAN MOTOR THERMAL LOAD

1. Characteristics referred to entering air at 35°C-25%UR with chilled water temperature 10-15°C - 0% glycol
2. Value to be added to the weight of the standard unit. Does not include the weight of the cooling fluid.

2-WAY VALVE FOR WATER FLOW CONTROL



The water flow control in the finned coil is achieved through a **2-way modulating ball valve with equal percentage flow control** ensured by the integrated characterizing disc.

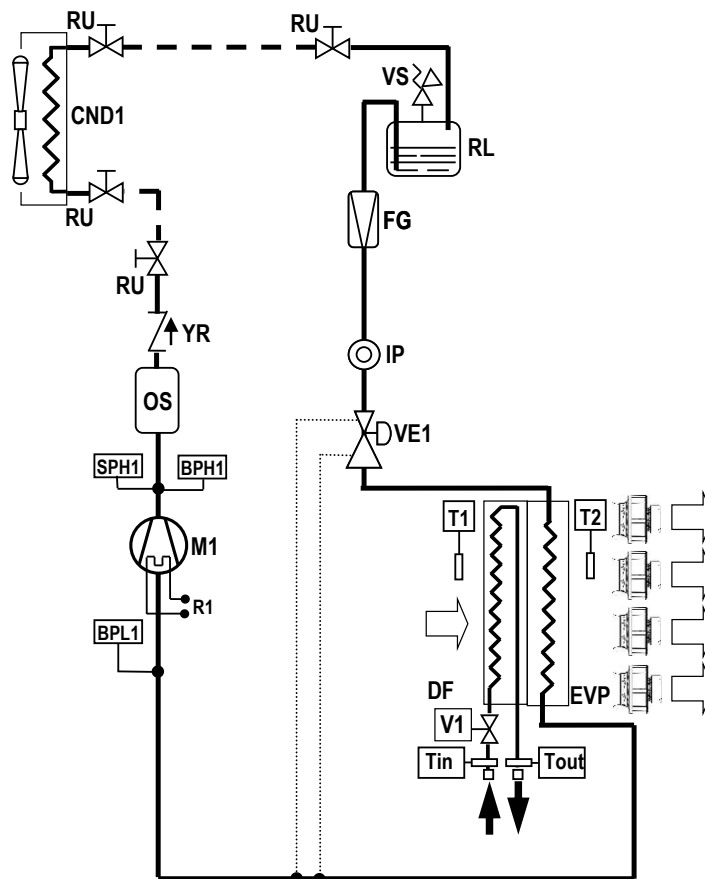
This type of valve offers the following series of benefits:

- Equal percentage flow control.
- Closing seal with leakage rate in Class A (EN 12266-1)
- No peaks initial flow.
- Excellent stability control thanks to the integrated characterizing disc.
- Closing pressure very high.
- Excellent characteristic in partialisation.
- Stability in control.
- Wide operating pressures which provide an optimal adjustment of the water flow even under extreme conditions.
- Maintenance free.
- Self-cleaning.

The rotative actuator is controlled by a signal 0 ... 10VDC from the microprocessor controller. The actuator is equipped with an emergency button for manual operation and is maintenance-free.

REFRIGERANT CIRCUIT – DUAL FLUID SYSTEM

DUAL FLUID SYSTEM



LEGENDA

M1 BLDC inverter compressor
 R1 Crankcase heater
 CND Condenser.
 EVP Evaporator.
 BPH High pressure transducer.

BPL Low pressure transducer.
 SPH High pressure switch
 OS Oil separator
 YR Non return valve
 FG Refrigerant filter.

IP Sight glass.
 VE Expansion valve.
 T Temperature probes.
 RU Valves
 RL Liquid receiver
 DF Dual Fluid Chilled water coil
 V1 2-way Dual Fluid valve



WATER QUALITY

For a correct and optimal functioning of the hydraulic circuits a water quality must be guaranteed as indicated in the table below. The values shown in the table must be guaranteed during the entire life cycle of the machine.

	Description	Symbol	Range
1	Hydrogen ions	pH	7.5 ÷ 9
2	Presence of calcium (Ca) and magnesium (Mg)	Hardness	4 ÷ 8.5 °D
3	Chlorine ions	Cl ⁻	< 150 ppm
4	Iron ions	Fe ³⁺	< 0.5 ppm
5	Manganese ions	Mn ²⁺	< 0.05 ppm
6	Carbon dioxide	CO ₂	< 10 ppm
7	Hydrogen sulphide	H ₂ S	< 50 ppb
8	Oxygen	O ₂	< 0.1 ppm
9	Chlorine	Cl ₂	< 0.5 ppm
10	Ammonia	NH ₃	< 0.5 ppm
11	Ratio between carbonates and sulphates	HCO ₃ ⁻ /SO ₄ ²⁻	> 1
12	Sulphate ions	SO ₄ ⁻	< 100 ppm
13	Phosphate ions	PO ₄ ³⁻	< 2.0 ppm

where: 1/1.78°D = 1°Fr with 1°Fr = 10 gr CaCO₃ / m³
 ppm = parts for millions
 ppb = part for billion

Explanatory notes:

- ref.1: A greater concentration of hydrogen ions (pH) than 9 implies a high risk of deposits, whereas a lower pH than 7 implies a high risk of corrosion.
- ref.2: The hardness measures the amount of Ca and Mg carbonate dissolved in the water with a temperature lower than 100°C (temporary hardness). A high hardness implies a high risk of deposits.
- ref.3: The concentration of chloride ions with higher values than those indicated causes corrosion.
- ref. 4 - 5 - 8: The presence of iron and manganese ions and oxygen leads to corrosion.
- ref.6 - 7: Carbon dioxide and hydrogen sulphide are impurities that promote corrosion.
- ref.9: Usually in water from the waterworks it is a value of between 0.2 and 0.3 ppm. High values cause corrosion.
- ref.10: The presence of ammonia reinforces the oxidising power of oxygen
- ref.11: Below the value shown in the table, there is a risk of corrosion due to the trigger of galvanic currents between copper and other less noble metals.
- ref.12: The presence of sulphates ions triggers corrosion phenomenon.
- ref.13: The presence of phosphates ions triggers corrosion phenomenon.

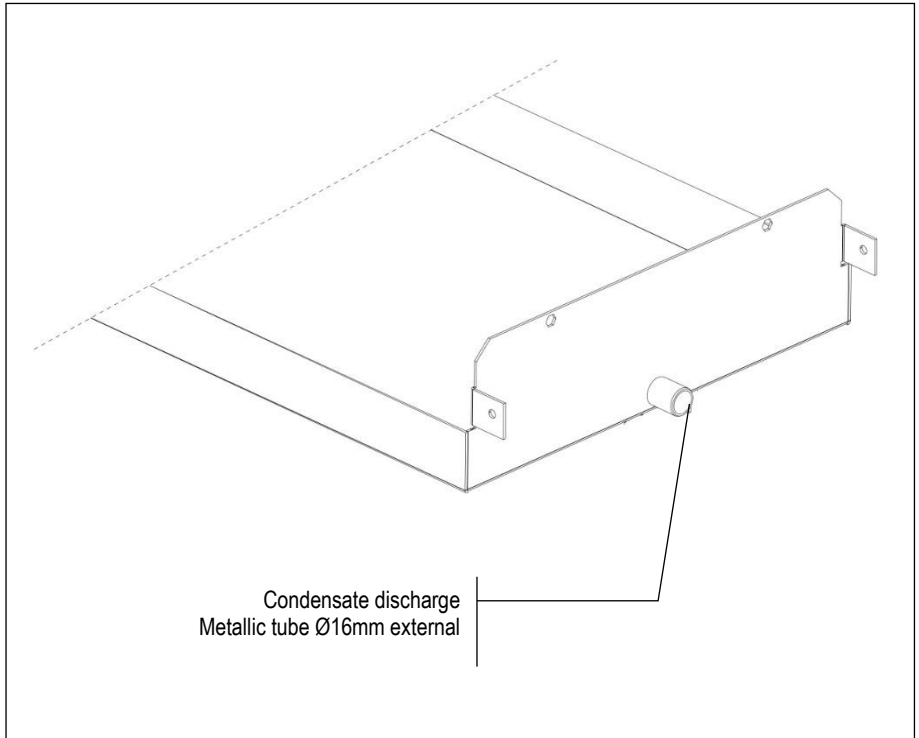
It is necessary to carry out periodic checks, with withdrawals at different points of the hydraulic system. During the first year of operation, checks are recommended every 4 months which can be reduced every 6 months starting from the second year of operation.

WARNING:

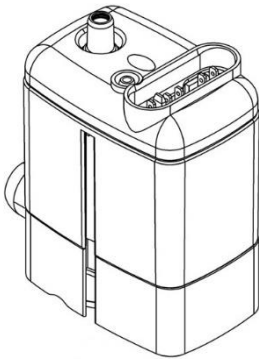
It is necessary that, in the presence of dirty and / or aggressive waters, an intermediate heat exchanger is installed upstream of the heat exchangers

CONDENSATE DISCHARGE

The connection for the condensate discharge tube is on the lowest part of the machine and can be identified by the relative plates affixed on the machine.
The external diameter of the connection is 16mm wide.



OPTIONAL ACCESSORIES - CONDENSATE DISCHARGE PUMP



A plastic case contains the pump motor, the thermal protection with automatic reset, the float with the trigger threshold and alarm threshold overflow and hydraulic and electric connection.
Together the pump 4 linear meters of rubber discharge tube is supplied.
Wiring includes power supply and an alarm signal displayed on microprocessor.
The condensate discharge pump operation is fully automatic.

The pump is placed in the condensate tray on the bottom unit side.

TECHNICAL DATA

Power supply		230/1/50
Power input	W	14
Discharge pipe	Ø mm	6x9
Maximum water flow	l/h	20
Discharge head:		
- With minimum water flow		mH ₂ O 14(*)

(*) with water flow 0 l/h

CONDENSATE DISCHARGE PUMP PERFORMANCE

Vertical discharge tube length	Water flow rate (l/h)
0m	20
2m	16
4m	11,5

OPTIONAL ACCESSORIES – MODULATING STEAM HUMIDIFIER



The optional is not compatible with "DUAL FLUID System" and with "Double power supply with automatic change-over" optional accessories.

The optional includes the combined temperature / humidity sensor on unit air intake.

The accessory is factory installed and requires only water filling connection.

It is recommended to install a filter and a shut-off valve on the pipe to the water inlet.

This humidifier produces non pressurized steam by electrodes immersed in the water inside the cylinder: they bring the electric phase in the water that works as an electrical resistance and overheats. The steam so produced is distributed with dedicated distributors and used for ambient humidification or for industrial processes.

CHARACTERISTICS OF THE SUPPLY WATER

The quality of the used water influences the evaporation process, so the humidifier can be fed with **not-treated water, only when potable and non-demineralised**.

LIMIT VALUES

		Min	Max
Hydrogen ions	pH	7	8,5
Specific conductivity at 20°C	$\sigma_{R, 20^\circ C}$ $\mu S/cm$	300	1250
Total dissolved solids	TDS mg/l	(1)	(1)
Dry residue at 180°C	R ₁₈₀ mg/l	(1)	(1)
Total hardness	TH mg/l CaCO ₃	100 (2)	400
Temporary hardness	mg/l CaCO ₃	60 (3)	300
Iron + Manganese	mg/l Fe + Mn	0	0,2
Chlorides	ppm Cl	0	30
Silica	mg/l SiO ₂	0	20
Residual chlorine	mg/l Cl ⁻	0	0,2
Calcium sulphate	mg/l CaSO ₄	0	100
Metallic impurities	mg/l	0	0
Solvents, diluents, soaps, lubricants	mg/l	0	0

(1) Values depending on specific conductivity;

in general: TDS $\cong 0,93 * \sigma_{R, 20^\circ C}$; R₁₈₀ $\cong 0,65 * \sigma_{R}$

(2) Not lower than 200% of the chloride content in mg/l di Cl⁻

(3) Not lower than 300% of the chloride content in mg/l di Cl⁻

WARNING:

- No relation can be demonstrated between water hardness and conductivity.
- **Do not treat water with softeners!** This could cause corrosion of the electrodes or the formation of foam, leading to potential operating problems or failures.
- Do not add disinfectants or corrosion inhibitors to water, as these substances are potentially irritant.
- Is absolutely forbidden to use well water, industrial water or water drawn from cooling circuits; in general, avoid using potentially contaminated water, either from a chemical or bacteriological point of view

TECHNICAL DATA

MODEL		25	40
SIZE		B6 BF	B6 BF
VAPOUR PRODUCTION	kg/h	2,0	2,0
Power input	kW	1,4	1,4
Absorbed current (OA)	A	6,1	6,1
Max absorbed current (OA)	A	8,8	8,8
Water content	l	3,9	3,9
Max water supply pressure	Bar	1÷8	1÷8
NET WEIGHT (1)	kg	3	3
HYDRAULIC CONNECTION			
WATER INLET - ISO 228/1 – G M	Ø	3/4"	3/4"
WATER OUTLET – external diameter	Ø mm	19	19

1. Value to be added to the weight of the standard unit. Does not include the weight of the water content.



OPTIONAL ACCESSORIES – DEHUMIDIFICATION SYSTEM

Components:

- Temperature / Humidity sensor on the air intake.
- Electronic control system of the dew point temperature for the combined intervention of cooling capacity and air flow.

OPTIONAL ACCESSORIES – ELECTRIC HEATERS



The optional is not compatible with “Double power supply with automatic change-over” optional accessory.

Electric heater consisting of finned aluminum elements, ensuring low surface temperature and deleting the air ionization problems. The optional is installed downstream the main cooling coil.

In electric heaters with two working steps the activation is binary type.

Components:

- Electric heater in aluminium armoured elements with integral fins
- Electrical control
- Safety thermostat.

TECHNICAL DATA

MODEL		25	40
SIZE		B6 BF	B6 BF
THERMAL CAPACITY	kW	1,7	1,7
Absorbed current (OA)	A	3,0	3,0
First working step	kW	0,85	0,85
Second working step	kW	0,85 + 0,85	0,85 + 0,85
NET WEIGHT (1)	kg	5	5

1. Value to be added to the weight of the standard unit.

OPTIONAL ACCESSORIES – CLOUD PLATFORM: WEB SERVICES BASED ON CLOUD TECHNOLOGY FOR REMOTE MONITORING AND MANAGEMENT OF AIR CONDITIONING PLANTS.



CLOUD PLATFORM is an ecosystem of web services for remote monitoring and management of air conditioning plants; specifically designed for mobile usage on tablets and smartphones, it allows to access plant data everywhere on the go so saving time, money and delivering a higher service level to the customer.

TECHNOLOGY

Based on cloud technology it allows, through machines data telemetry, to monitor and control units on the field, process data and perform proactive maintenance.

The hardware heart of the system is the Cloud box that can collect plant data (up to 31 devices and up to 1000 registers).

Connectivity between monitored devices and Cloud box may be wired in Ethernet, RS485, RS232 and must be in MODBUS protocol.

Cloud Platform then send these data to dedicated server in cloud in through the mobile (GPRS or 3G) network or ADSL.

Information security; each communication channel can be encrypted in VPN, ensuring data privacy.

USER SIDE

Cloud Platform is designed for mobile communication. So, the user just need a tablet or a smartphone to access the RC Cloud Platform and check his plant.

Cloud Platform App is available both on Android and iOS operating systems so the environment may be accessed directly from them beyond company site and platform site. Access through pc is available too.

FUNCTIONS

Telemetry & Data Export

Data polling and history of all data (1 year).
Export diagram and table (csv). **Your data always on the go.**

Multi Device

Many type of devices can be connected to the same box (chillers, close control, energy meters, flow meters, pumps,...).
Only a request: MODBUS protocol. Electrical connection in Ethernet, RS 485 or RS 232.

Multi Language

English native, Cloud Platform language pack is available for the main markets.

Virtual Display

Monitoring and control (on/off, alerts reset, main parameters change) as being beside the unit, in an augmented reality way.

Designed for Mobile.

Same as standing in front of the unit, when in your office or in any other place.

Internet Connectivity

ETHERNET + GPRS + 3G connection capability on Public and Virtual Private Network (VPN).

Alerts Warning through:

- Push notification
- e-mail
- Voice calls
- SMS

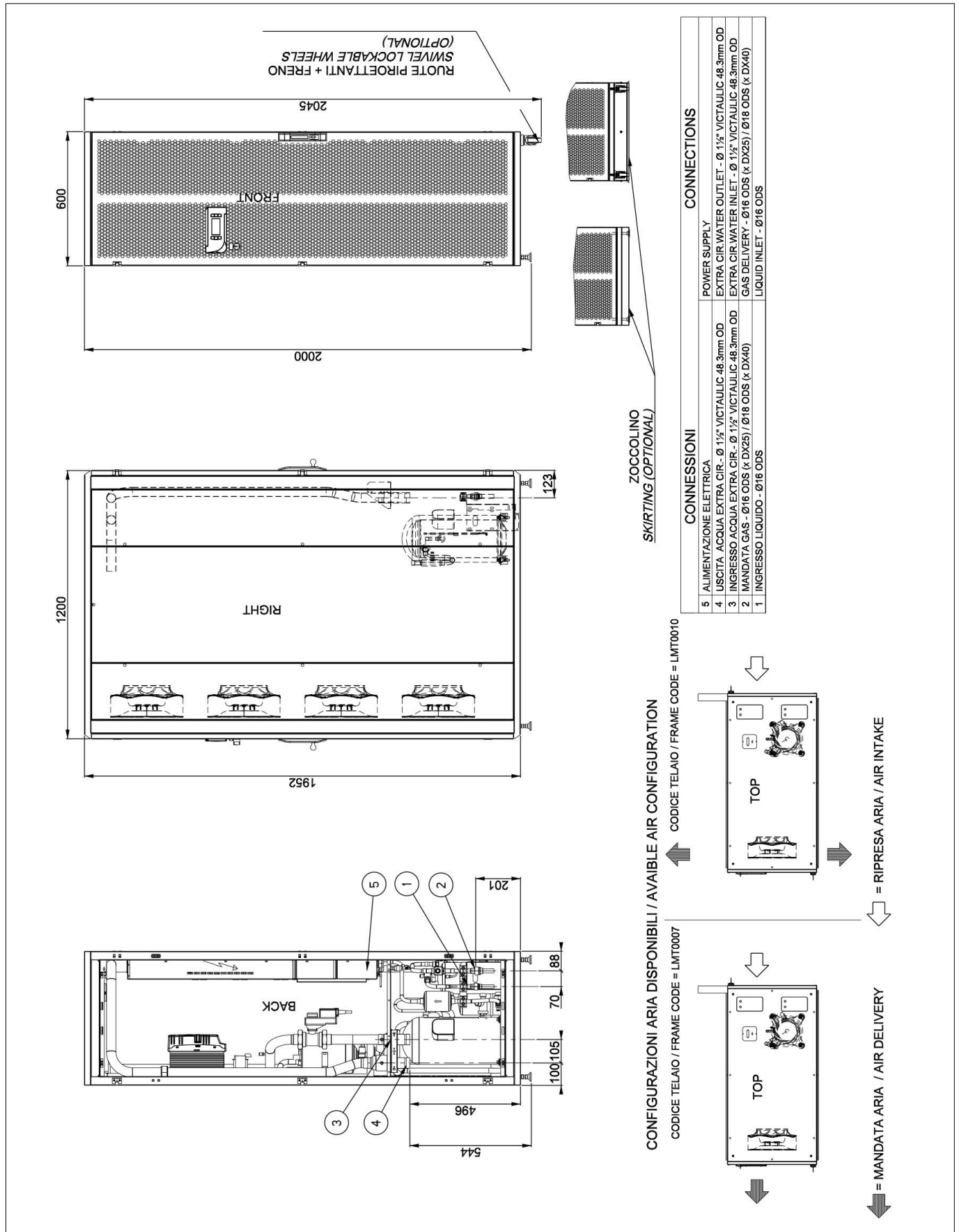
Processing of specialized plant KPI to get:

- Energy performance (gross instant EER)
- Components Failure Forecast (coming soon)
- Unit diagnosis

COOLSIDE ROW DX

MACHINE DRAWINGS

Dimensions in mm





for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.



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