



Data Book

I-MTR2-G02-M0_0521_EN

Elca Engine ver.

 EEV ELEC. EXP. VALVE

 INV. DRIVEN COMP.

 VAR. AIR FLOW

i-MTR2-G02-M0

11-16 kW

FULL INVERTER direct expansion air conditioners. Ideal for metrological rooms and laboratories, combined with remote air-cooled condenser.



 R HFC R-410A

 HUMIDIFICATION

 DEUMIDIFICATION

 RE-HEATING

(The photo of the unit is indicative and may vary depending on the model)

- ✓ HERMETIC BLCD INVERTER COMPRESSORS
- ✓ AIR DELIVERY FROM THE BOTTOM OR FROM THE TOP

- ✓ PLUG FANS WITH EC ELECTRIC MOTOR
- ✓ MODULATING POST-HEATING COIL

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DETAILS**

i-MTR2-G02-M0

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Company certifications



ISO 9001 CERTIFICATION
Quality Management System



ISO 14001 CERTIFICATION
Environmental Management System



BS OHSAS 18001 CERTIFICATION
Occupational Health and
Safety Management System

Product certifications by country



CE MARKING



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



**DECLARATION
OF CONFORMITY**
(Russian Federation,
Belarus, Kazakhstan)

2. PRODUCT DESCRIPTION

2.1. GENERAL CHARACTERISTICS

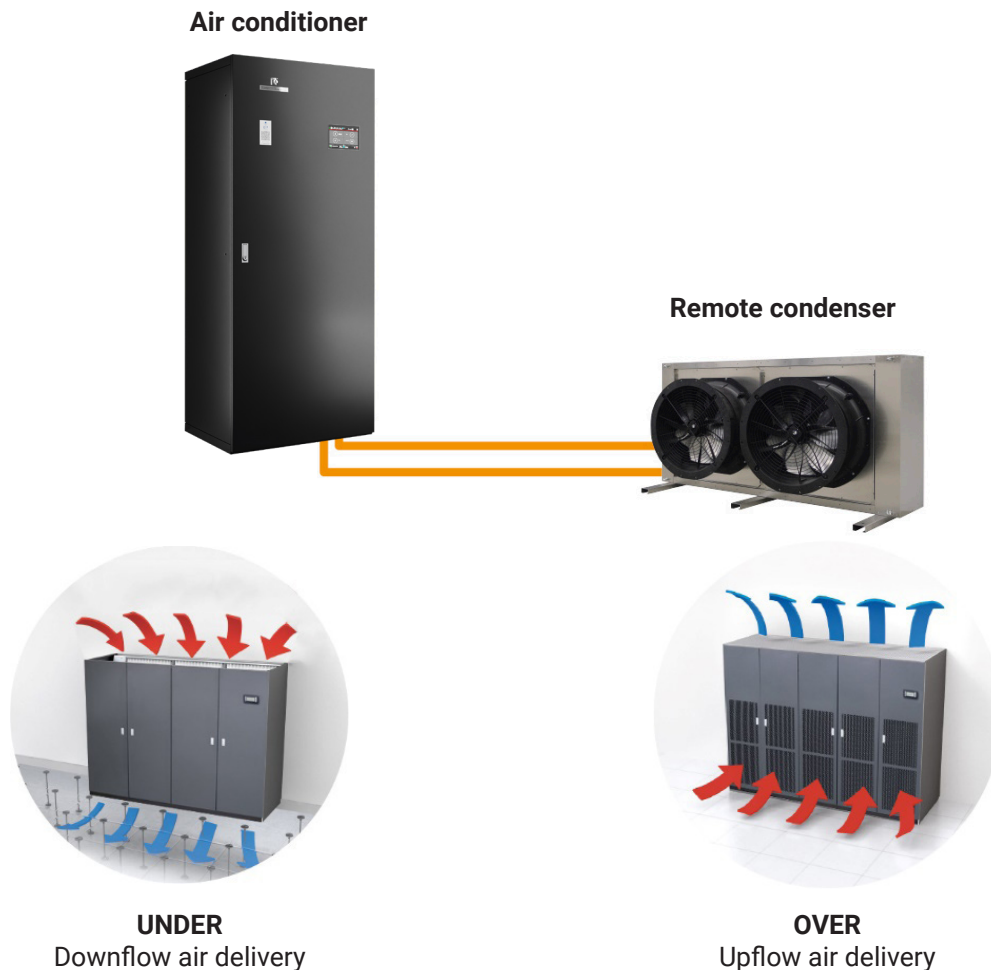
FULL INVERTER air conditioners ideal for metrological rooms and laboratories.

- Direct expansion, air cooled
- Prepared for coupling to remote air-cooled condenser
- BLDC inverter compressors
- Plug fans with EC electric motor
- Single refrigerant circuit

This series, for perimeter installation, is offered in 2 models available in the following versions:

- The downflow version (**UNDER**) is characterized by air intake from the top and air delivery from the bottom of the unit.
- The upflow version (**OVER**) is characterized by air intake from the front through honeycomb grille and air delivery from the top of the unit.

Cooling capacity: **11-16 kW**



The units are designed 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 units require the refrigerant gas charge and electrical and hydraulic connections.

The end-of-line test consists of a functional test with reading and monitoring of operating parameters, alarm simulation and visual examination.

2.2. INSTALLATION

The series is especially suitable for the installation in **laboratories, archives, museums, and for tobacco, textile and pharmaceutical processing plants** where the parameters of temperature and humidity influences measurement, test and stockage of sensitive goods.

The combination of modulating hot gas reheating, modulation of cooling capacity by the inverter compressor, and accurate and continuous adjustment of steam production, the unit ensures precise temperature and humidity control (± 0.3 °C and ± 2 % RH).

In order to achieve this extraordinary performance, several important conditions are required:

- Heat load must be constant or stable, with variations no greater than 25% per hour
- The unit must be properly installed and ducted
- The space needs to be suitably insulated against outside loads (especially doors, windows, etc.)
- The conditions of the intake air are covered in the paragraph on "Operating limits".

NOTE:

The immersed electrode humidifier periodically activates flushing cycles to reduce the salt concentration of the water. During this short period of time, the humidifier cannot guarantee the humidification functions so it is possible that the humidity control exceeds the set point.

OPTIONAL ACCESSORIES

There is a complete range of accessories for adapting the unit effectively to the real needs of the system, **reducing the time and cost of installation.**

2.3. PRODUCT FEATURES AND BENEFITS

- EER up to 4.88 at partial load
- BLDC inverter compressor for each refrigerant circuit to ensure the ultimate in energy efficiency
- New Plug Fan with EC electric motor for lower power consumption
- Maintenance-free fan motor
- Continuous modulation of air flow and cooling capacity
- Dedicated control software for applications where extremely precise adjustment is required
- Single refrigerant circuit

2.4. F-GAS DIRECTIVE

The units highlighted in this publication contain <HFC R410A [GWP₁₀₀ 2088]> fluorinated greenhouse gases.

2.5. MODEL IDENTIFICATION

Air conditioners for IT Cooling

Model i-MTR2-G02-M0 U 018 E2

i-MTR2	Series
G02	R410A refrigerant
M0	Target market
U	Air discharge O = OVER- upflow air delivery U = UNDER- downflow air delivery
018	Model / Cooling capacity (kW) at nominal conditions
E2	Size

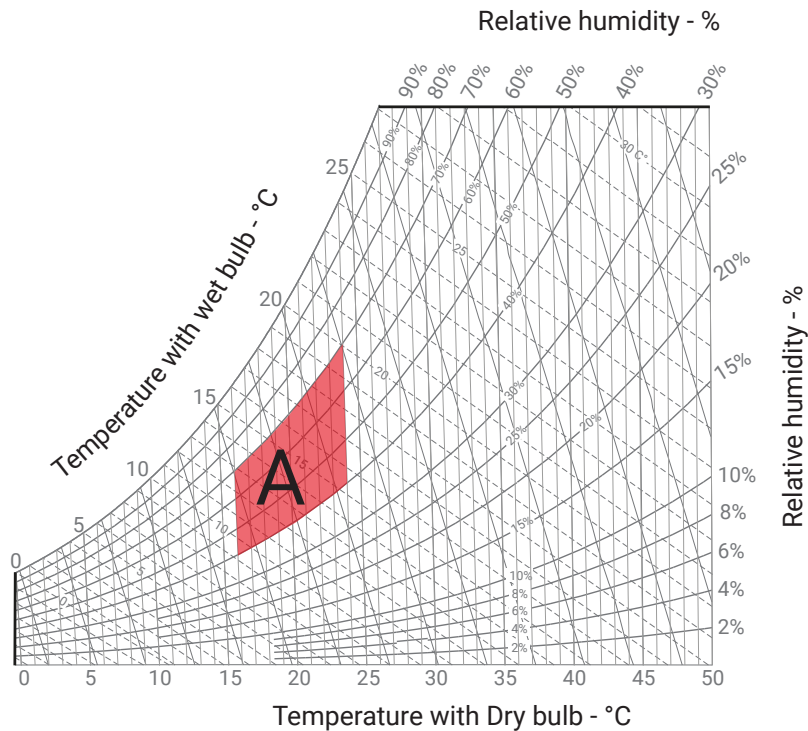
2.6. TRANSPORT AND STORAGE TEMPERATURE

During transport and if the unit is not installed upon receipt, it must be placed in its packaging in a closed, dry environment protected from sunlight at a temperature between -30 °C and 50 °C in the absence of surface condensation.

3. WORKING LIMITS

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AREA "A". Operating area of the unit

ROOM AIR CONDITIONS

Room air temperature:

16°C Minimum temperature with dry bulb

24°C Maximum temperature with dry bulb

Room air humidity:

40% RH Minimum relative humidity

70% RH Maximum relative humidity

OUTDOOR AIR TEMPERATURE

46°C Maximum ambient air temperature

-35°C Minimum ambient air temperature

LT VERSION TO OPERATE AT LOW OUTDOOR AIR TEMPERATURES

-45°C Minimum ambient air temperature for remote condensers with AC fans and LT kit

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

- Working conditions
- Cooling load
- Set of the microprocessor control

POWER SUPPLY

± 10% Maximum tolerance of the supply voltage (V)

± 2% Maximum unbalancing of the phases

4. COMPONENTS OF THE UNIT

4.1. MAIN COMPONENTS

FRAMEWORK



- Frame in extruded aluminium, hot-coated with epoxy powder. Colour RAL 9005;
- Base and frame in galvanized steel with epoxy powder coating. Colour RAL 7016. The internal frame is equipped with gaskets for the panels.
- Panels in galvanized steel sheet with protective surface treatment in compliance with UNI ISO 9227/ASTMB117 and ISO 7253, and with epoxy powder coating. Colour RAL 7016 hammered.
- Panels insulated with polyurethane foam based on polyester polyol with fused protective film and gaskets to ensure airtightness. Thickness 15 mm. Fire resistance HF1 - UL94.
- Hinged front panels with key lock and removable side and rear panels.
- All routine maintenance from the front.
- Front compartment for electrical panel for direct access to control and adjustment devices.
- Metal brackets for fixing the unit to the wall.
- Air flow UNDER version: Air intake from the top and air delivery from the bottom.
- Air flow OVER version: Air intake from the front through a honeycomb grille and upward air delivery with protective mesh.

FILTER SECTION



- Washable air filters with COARSE 60% efficiency (according to ISO EN 16890), with cells in synthetic fibre and metallic frame.
- Air filters access:
 - frontal access for all units.
- Dirty filter sensor connected to air side differential pressure switch.

BLDC INVERTER COMPRESSORS SECTION

Model 012:

- Rotary BLDC inverter compressor for R410A refrigerant.

Model 018:

- Scroll BLDC inverter compressors with spiral profile optimized for R410A refrigerant.

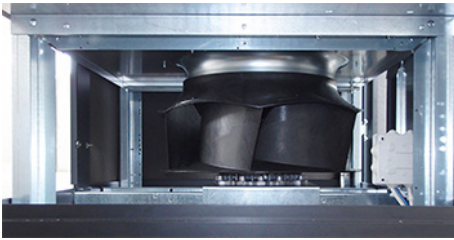
FOR ALL COMPRESSORS:

- Synchronous brushless inverter driven motor.
- Inverter for modulating capacity control.
- Reactance for the reduction of electromagnetic noise and interference.
- Crankcase heater.
- Rubber vibration damper supports.

FAN SECTION

The fan section is inside the unit and includes:

- Centrifugal fan with backward curved blades with wing profile, single suction and without scroll housings (Plug-fans), directly coupled to external rotor electric motor.

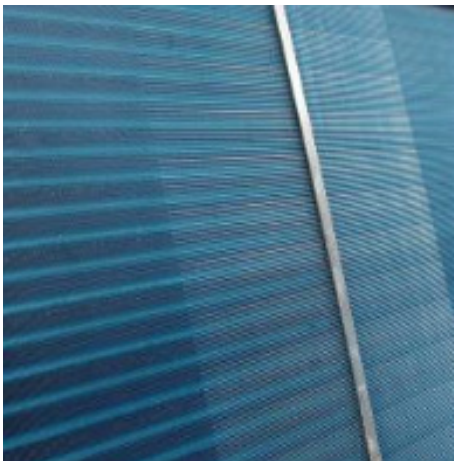


- Impeller in corrosion-resistant composite material.
- Brushless type synchronous EC motor with integrated electronic commutated system and continuous variation of the rotation speed. The microprocessor control sends a signal to change the revolutions of the motor.
- Adjustable head.

COOLING SECTION

Heat exchanger coil with internally corrugated copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops.

- Finned pack with hydrophilic treatment that ensures optimal draining of the condensate water and high thermal conductivity, and does not favour the growth of micro-organisms.
- Condensate tray in aluminium with PVC flexible discharge pipe.
- Combined temperature and humidity sensor on air intake with function of control and adjustment.
- Temperature sensor on air delivery with function of temperature display.



POST-HEATING WITH MODULATING HOT GAS COIL

- Micro-channel exchanger entirely in Long Life Alloy 9153 aluminium alloy with high resistance to galvanic corrosion and of high efficiency, specifically developed to guarantee a high heat exchange coefficient, a low refrigerant content and low pressure drops.
- Modulating motorized diverter valve for continuous post-heating adjustment.
The modulating hot gas coil is installed downstream of the evaporator coil and it is used together with the inverter compressor to ensure accurate and continuous unit cooling capacity modulation thus precisely controlling temperature and humidity.

REFRIGERANT CIRCUIT

The air conditioner is supplied with a minimum charge of R410A refrigerant.

Components for each refrigerant circuit:

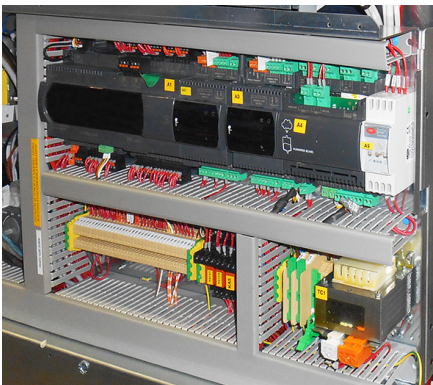
- Electronic expansion valve. The valve allows high performance and system efficiency thanks to a timely and accurate response to changes in temperature and pressure.
- Liquid and humidity sight glass.
- Filter dryer on liquid line.
- Pressure transducers with indication, control and protection functions, on low and high refrigerant pressure. High pressure safety switch with manual reset.
- Liquid receiver.
- Pressure relief valve on liquid receiver.
- Copper cooling pipes with anti-condensation insulation.
- Charge of lubricating oil.
- Oil separator on gas discharge.
- Taps on gas delivery and liquid return for connection to remote air-cooled condenser.

- 0-10V proportional signal to command the condensing control system of the remote air-cooled condenser.
- Modulating motorized diverter valve for control of post-heating coil.

ELECTRICAL PANEL

In accordance with EN60204-1 norms, suitable for indoor installation, complete with:

- Main door-lock disconnecter switch on containment panel.
- Magnetothermic switches for the compressor and fan.
- Transformer for auxiliary circuit and microprocessor supply.
- Numbered wirings.
- Terminals for remote condenser power supply, with magnetothermic switch, (optional).
- Terminals:
 - OUTLETS
 - Voltage free deviating contact for General Alarm 1-2.
 - Voltage free contact for supply fans status.
 - Voltage free contact for compressor operating signal (optional).
 - INLETS
 - External enabling.
 - Smoke/fire sensors (the sensors are accessories).
- Power supply:
 - 400/3+N/50.



4.2. MICROPROCESSOR CONTROL SYSTEM

The unit is equipped with the controller connected to a 6 keys keyboard with graphic display on which all information in English language or easily identifiable symbols are displayed.

The controller 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 200 events.



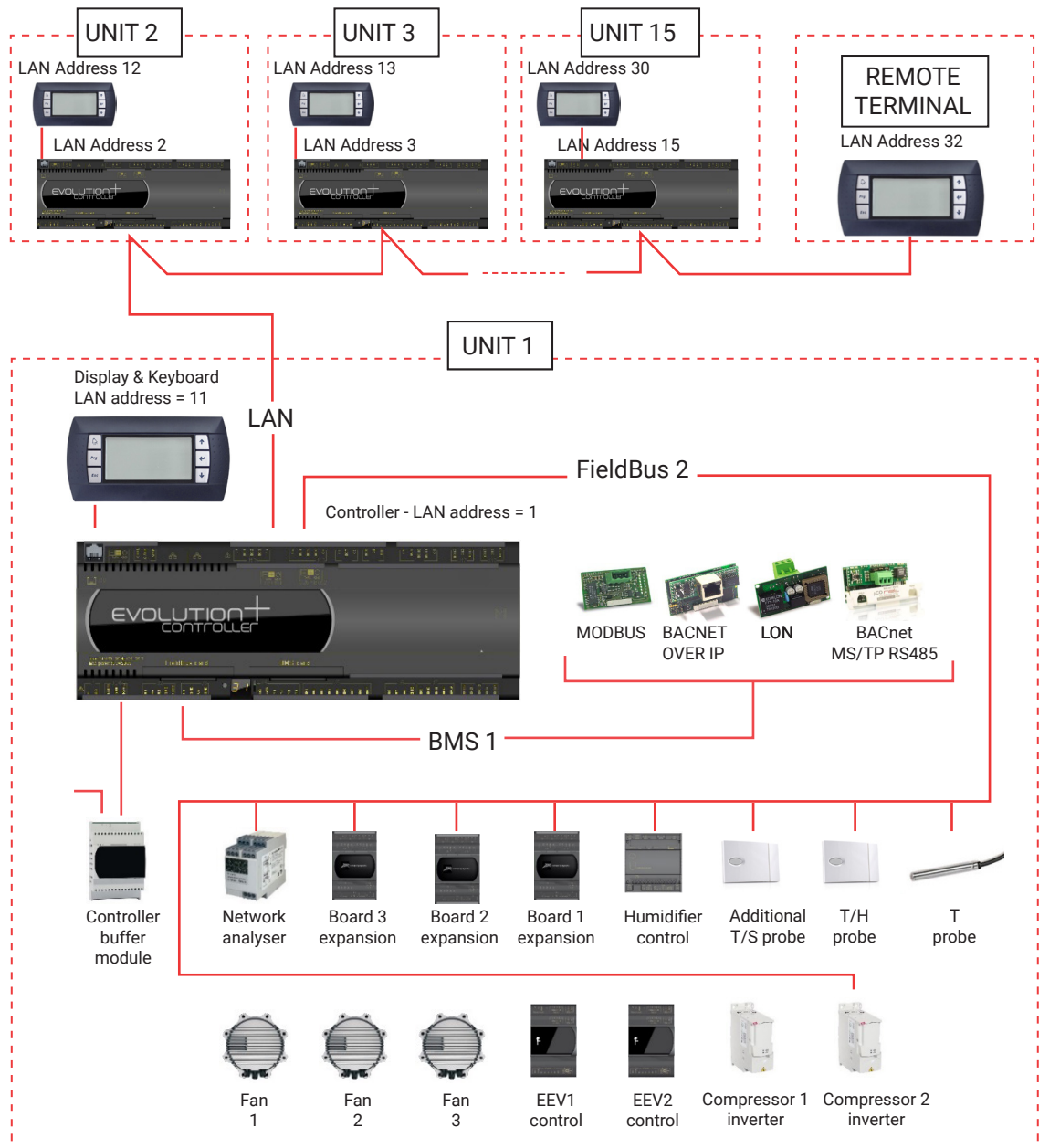
CONNECTIVITY

Through the optional serial port, the microprocessor control enables communication with the modern buildings BMS systems with the following protocols: MODBUS; LON; BACNET MS/TP RS485; BACNET OVER IP.

4. COMPONENTS OF THE UNIT

PASSWORD

Level 1: On request of the End User. Allowing to reach USER menu
 Level 2: Asks to Service: Allowing to reach SERVICE menu
 Level 3: Asks to Service: Allowing to reach FACTORY menu
 No passwords request to enter: UNIT, SETPOINT, IN/OUT, CLOCK, HISTORY menu



4. COMPONENTS OF THE UNIT

LAN NETWORK

The LAN is part of the control software and it is possible to connect up to 15 units. This type of connection allows to control the units in coherent way, moreover the units can be controlled and managed from a shared remote terminal.

Units n.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Remote terminal
Motherboard address	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	---
Terminal address	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	32

The unit connection to the local network (LAN) allows to perform the following functions:

- Balancing the operating hours among the different units by rotating the reserve units (Stand-by)
- Turning on the reserve units in case other units should turn off due to an alarm, maintenance or power feed interruption
- Turning on reserve units to offset the excessive thermal load
- Checking up to 10 units with a single user terminal (shared user terminal).

4.3. STANDARD EQUIPMENT

ELECTRONIC EXPANSION VALVE

The electronic expansion valve is for precise control of overheating in the various environmental conditions



AIR INTAKE AND DELIVERY PROBES

The unit is equipped with a combined temperature / humidity probe on the air intake, used for unit adjustment, and a NTC probe on the air deliver.



CLOGGED FILTER SENSOR

The system includes a differential pressure switch installed in the electrical panel or in the front of the indoor unit and the plastic hoses for the relief of the pressure upstream and downstream the air filters.

Control range: 0,3 ... 4,0 mbar (30 ... 400 Pa)

Differential for intervention: 0,15 mbar (15 Pa)



WATER LEAKAGE DETECTOR

The system includes an electronic relay installed in the electrical panel of the unit and a water detector.

The electrical connections for the probe and the alarm contact are present in the unit's terminal board.

The water sensor is supplied in a mounting kit.

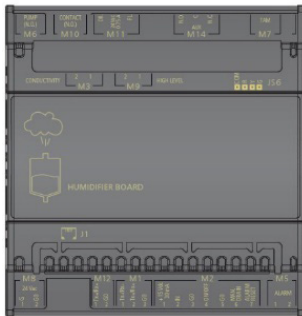


COMPRESSOR SOUNDPROOF JACKET

The system consists of a soundproof jacket for each compressor to reduce the sound level of the unit.

4. COMPONENTS OF THE UNIT

HUMIDIFIER VAP 5KG/H



Modulating steam humidifier with immersed electrodes fitted with safety and running accessories.

The optional includes the control board.

The optional is factory installed and requires only water filling connection. Humidifier water charge and discharge pipes are not supplied. 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	$\sigma_R, 20\text{ °C}$ $\mu\text{S/cm}$	350	750
Total dissolved solids	TDS mg/l	(1)	(1)
Dry residue at 180 °C	R180 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 $\cong 0,93 * \sigma_R, 20\text{ °C}$; R180 $\cong 0,65 * \sigma_R$
- (2) Not lower than 200% of the chloride content in mg/l of Cl⁻
- (3) Not lower than 300% of the chloride content in mg/l of Cl⁻

4. COMPONENTS OF THE UNIT

- **WARNING:**
- Use only with drinking water.
- There is no reliable relationship between hardness and water 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.

DATI TECNICI

MODEL		012-018
POWER SUPPLY		400/3/50
VAPOUR PRODUCTION	kg/h	5
Power input	kW	3,75
Max current input (FLA)	A	5,5
Water content	l	3,9
HYDRAULIC CONNECTION		
WATER INLET - ISO 228/1 – G M (1)	Ø	3/4"
WATER OUTLED – external diameter	Ø mm	32
MODEL		012-018
POWER SUPPLY		400/3/50
VAPOUR PRODUCTION	kg/h	5
Power input	kW	3,75



ELECTRIC HEATERS

Electric heater consisting of finned aluminium elements, ensuring low surface temperature and deleting the air ionization problems. The optional is installed downstream the main cooling coil. In electric heaters with three working steps the activation is binary type.

Components:

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



Remote air condensers for matching to air conditioners for IT Cooling. They are designed to offer a high degree of application flexibility.

The air flow is horizontal, from coil to fan.

The series has an independent power supply from the indoor unit.

Between the internal unit and the remote condenser, it is necessary to make the cooling and electrical connection of the condensation control proportional signal and of the alarms.

For all PRECISE units it is possible to supply power to the dry-cooler from the electrical panel of the indoor unit that includes magnetothermic switches for condenser fans.

The units are made of Peraluman aluminium alloy which make them suitable for outdoor installation.

GR-Z A B 50: Remote air cooled condensers equipped with AC axial fans, micro-channel condensing coil and Standard soundproofing.

GR-Z A L 50: Remote air cooled condensers equipped with AC axial fans, micro-channel condensing coil and Ultra-Silent soundproofing.

GR-Z E B 50: Remote air cooled condensers equipped with EC axial fans, micro-channel condensing coil and Standard soundproofing.

GR-Z E L 50: Remote air cooled condensers equipped with EC axial fans, micro-channel condensing coil and Ultra-Silent soundproofing.

IMPORTANT

For further information about the units, please refer to "GR-Z" Data Book

WARNING:

Use the ELCA WORLD selection program to calculate the cooling capacity of the air conditioner according to the desired combination.

6. TECHNICAL DATA

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i-MTR2-G02-M0_0521_EN

MODEL		012					018				
SIZE		E2					E2				
POWER SUPPLY	V/Ph/Hz	400/3+N/50					400/3+N/50				
COOLING CAPACITY (1)		100%	80%	60%	40%	30%	100%	80%	60%	40%	30%
Total	kW	11.10	8.88	6.66	4.44	3.34	15.80	12.64	9.48	6.32	4.74
Sensible	kW	11.10	8.88	6.66	4.44	3.34	14.55	12.19	9.48	6.32	4.74
SHR (2)		1.00	1.00	1.00	1.00	1.00	0.92	0.96	1.00	1.00	1.00
Total power input (Comp. + Fans)	kW	2.94	2.12	1.39	0.75	0.57	4.84	3.57	2.51	1.65	1.29
THERMAL CAPACITY in total DEHUMIDIFICATION (3)	kW	2.94	2.12	1.39	0.75	0.57	4.84	3.57	2.51	1.65	1.29
THERMAL CAPACITY in HEATING ONLY (4) (optional)	kW	6.41	6.26	6.15	6.08	6.05	6.65	6.44	6.28	6.16	6.12
HUMIDIFIER (optional)											
Vapour production	kg/h	5					5				
Power input	kW	3,75					3,75				
Max current input (FLA)	A	5,5					5,5				
Water content	l	3,9					3,9				
ELECTRIC HEATERS											
Power	kW	6					6				
Current Draw	A	8.7					8.7				
Steps	no.	2					2				
"EC" SUPPLY FANS	no.	1					1				
Air flow	Hours	3500	2997	2494	1991	1740	4100	3596	3093	2590	2340
Nominal external static pressure	Pa	20	--	--	--	--	--	--	--	--	--
Maximum external static pressure	Pa	340	--	--	--	--	180	--	--	--	--
Power input (5)	kW	0.41	0.26	0.15	0.08	0.05	0.65	0.44	0.28	0.16	0.12
COMPRESSORS		Rotary					Scroll				
BLDC compressors	no.	1					1				
Cooling capacity control		Modulating					Modulating				
Compressors power input	kW	2.53	1.86	1.24	0.67	0.52	4.19	3.13	2.23	1.49	1.17
HOT GAS POST-HEATING											
Heating Capacity Control		Modulating					Modulating				
AIR FILTERS	no.	1					1				
Efficiency (ISO EN 16890)	COARSE	60%					60%				
GAS CIRCUITS	no.	1					1				
ENERGY EFFICIENCY INDEXES (1)											
EER - Energy Efficiency Ratio (6)	kW/kW	3.78	4.19	4.80	5.96	5.86	3.26	3.54	3.78	3.82	3.67
DIMENSIONS											
Length	mm	785					785				
Width - Depth	mm	675					675				
Height	mm	1925					1925				
NET WEIGHT	kg	278					280				
COOLING CONNECTIONS											
Gas delivery	ODS Ø	12					16				
Liquid return	ODS Ø	12					12				
REMOTE CONDENSER		GR-Z A B 50 - 015					GR-Z A B 50 - 024				
HYDRAULIC CONNECTION											
Condensate discharge											
Rubber pipe – internal diameter	Ø mm	20					20				
Humidifier connections											
Water inlet - ISO 228/1 – G M	Ø	3/4"					3/4"				
Water outlet – internal diameter	Ø mm	32					32				

6. TECHNICAL DATA

- (1) Gross value in cooling only configuration. Characteristics referred to incoming air 24 °C-50% RH; condensing temperature 45 °C; EXP = 20Pa.
- (2) Gross sensible capacity in cooling only, reference conditions as in point 1. SHR = Sensible cooling capacity / Total cooling capacity.
- (3) Heating capacity resulting from operation in total dehumidification with active compressor and by-pass on post-heating.
- (4) Heating capacity resulting from operation of the electric heaters (optional) with the compressor off and the ventilation running.
- (5) Corresponding to the nominal external static pressure.
- (6) The energy index does not consider the remote condenser and the reference conditions are the same as those in point 1.

The cooling capacity does not consider the supply fan motor thermal load.

Note: below 30% of cooling capacity, the inverter compressor enters the "cycling" area in which the compressor operates with ON / OFF cycles below the minimum modulation frequency (operation only for short periods).

SELECT THE UNIT IN THE MODULATION FIELD.

REFRIGERANT CHARGE

The air conditioner is supplied with a minimum charge of R410A refrigerant. **The cooling gas must be charged.** The tables show the refrigerant charge for the condenser only; the remote condenser, the connection pipes and any accessories are excluded.

MODEL		012	018
REFRIGERANT		R410A	R410A
Gas circuits x Refrigerant charge (1)	n x kg	1 x 4.5	1 x 4.5
HFC R410A - F Gas - equivalent CO ₂	t	9,5	9.5

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

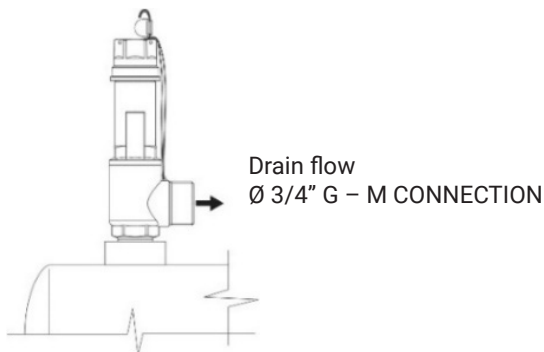
PRESSURE RELIEF VALVE

The valve has the purpose of protecting the circuit from overpressure.

It is the installer's responsibility to check whether the system complies with the 2014/68/EU standard regarding the installation of the safety valve.

By the system we mean the complete system that includes the internal unit, the remote condenser and the connection pipes.

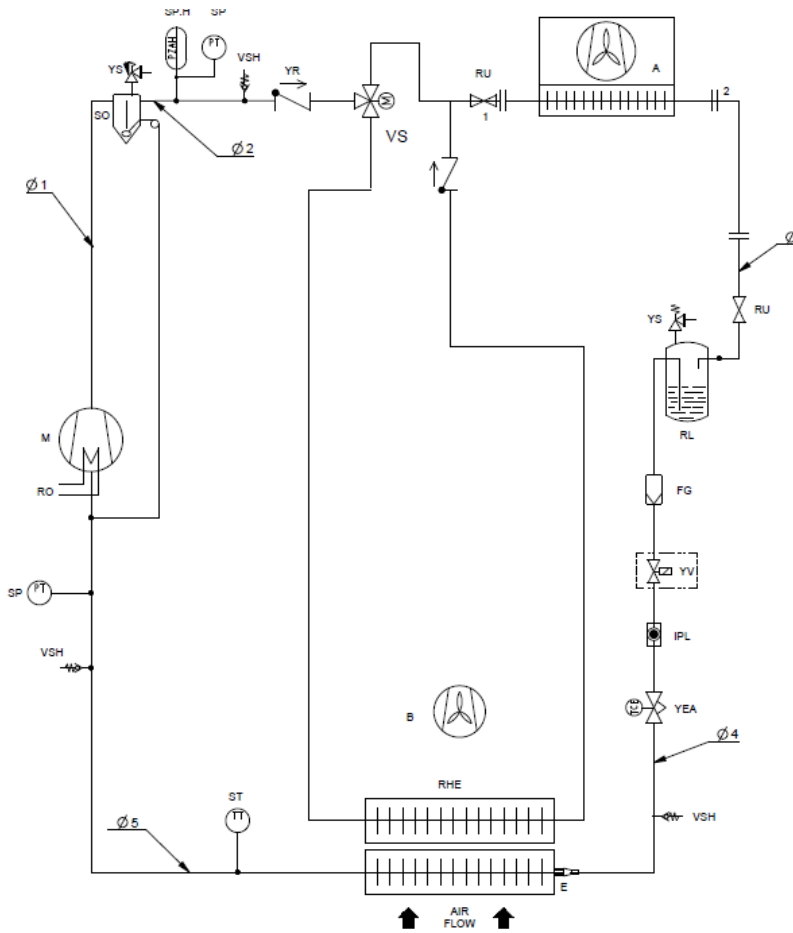
The installer must calculate the quantity of refrigerant contained in the system and, if the refrigerant charge is greater than 10 kg, he must install the safety valve.



Factory installed components	
Pressure relief valve on liquid receiver	
Model	[bar]
012	41.5
018	41.5

6. TECHNICAL DATA

DIAGRAM OF REFRIGERANT CIRCUIT



ID	Description
1	GAS DELIVERY
2	LIQUID RETURN
A	REMOTE CONDENSER
B	PLUG FAN
E	EVAPORATING COIL
FG	DEHYDRATOR FILTER
IPL	LIQUID FLOW SIGHT GLASS
M	COMPRESSOR
RHE	HOT GAS POST-HEATING COIL
RL	LIQUID RECEIVER
RO	OIL HEATER
RU	TAP
SO	OIL SEPARATOR
SP	PRESSURE SENSOR
SP.H	HIGH PRESSURE SWITCH
ST	TEMPERATURE PROBE
VS	THREE-WAY BALL VALVE
VSH	PRESSURE PORT (SCHRADER VALVE)
YEA	ELECTRONIC EXPANSION VALVE
Yr	CHECK VALVE
YS	SAFETY VALVE
YV	SOLENOID VALVE

6. TECHNICAL DATA

RECOMMENDED COOLING LINES

Diameters of cooling lines recommended for connection to MEHITS S.p.A. air conditioners and referred to the "EQUIVALENT LENGTH".

Please always refer to the "INSTALLATION DIAGRAM" to select all the necessary components correctly.

Check the need to use pressure relief devices (safety valves) where not already provided for in Directive 2014/68/EU.

Nominal diameter: Cooling connection of the indoor unit. In some cases the diameter of the cooling lines may not correspond with the nominal diameter. This is entirely normal; it is sufficient to use an adapter to adjust the diameter.

PIPE DIAMETERS ACCORDING TO THE INTERNATIONAL SYSTEM

International System	Diameter	mm	6	8	10	12	16	18	22	28	35
	Thickness	mm	1	1	1	1	1	1	1	1.5	1.5

Model	Line	Nominal diameter Ø [mm]	EQUIVALENT LENGTH [m] FOR R410A INVERTER COMPRESSORS																			
			5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
12	Gas	12	12	12	12	12	12	12	16	16	16	16	16	16	16	16	16	16	16	16	16	16
	Liquid	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
18	Gas	16	16	16	16	16	16	16	18	18	18	18	18	18	18	18	18	18	18	18	18	18
	Liquid	12	12	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16

For equivalent pipe lengths over 100 m, please contact the manufacturer's sales office.

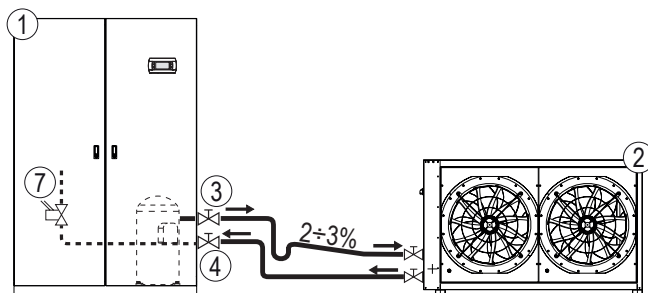
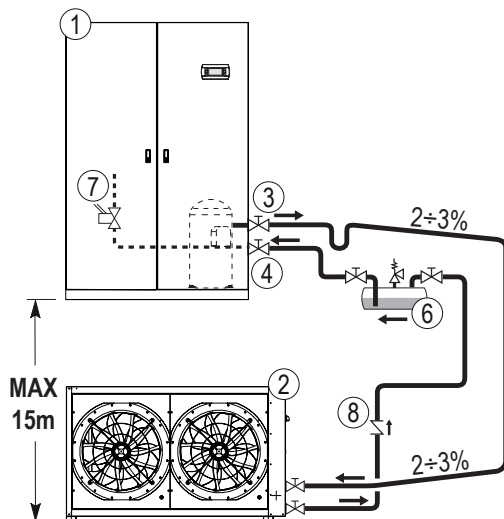
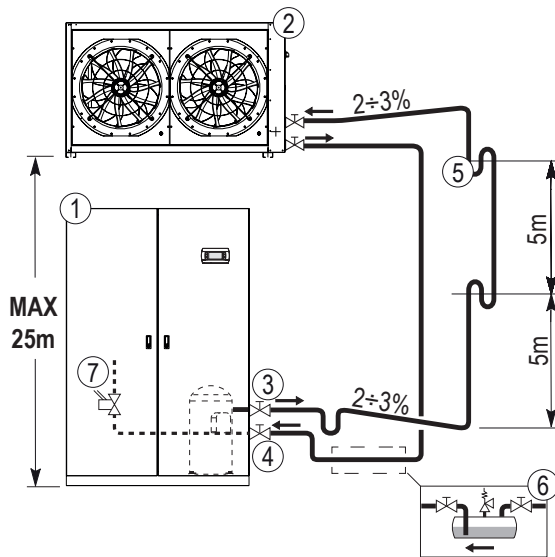
PIPE DIAMETERS ACCORDING TO THE "IMPERIAL" SYSTEM

IMPERIAL system	Diameter	Inches	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 3/8"
		mm	6.35	9.52	12.7	15.87	19.05	22.22	25.4	28.57	34.92
	Thickness	mm	1	1	1	1	1	1	1	1.25	1.25

Model	Line	Nominal diameter Ø [mm]	EQUIVALENT LENGTH [m] FOR R410A INVERTER COMPRESSORS																			
			15	35	50	65	80	100	115	130	150	165	180	195	215	230	245	260	280	295	310	330
12	Gas	12	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"
	Liquid	12	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
18	Gas	16	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
	Liquid	12	1/2"	1/2"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"	5/8"

6. TECHNICAL DATA

INSTALLATION DIAGRAM



Apply the diagram to each refrigerant circuit of the unit.

Difference in height between the units as an absolute value.

Maximum equivalent length of the connection pipes:
100 m

LEGEND

1. Conditioner
2. Remote air-cooled condenser
3. Gas delivery line
4. Liquid return line.
5. Siphon. Provide a siphon for every 5 m of pipeline in the vertical sections
6. Additional liquid receiver, external to the air conditioner - Supplied by the installer. It is recommended for:
 - systems with cooling lines of an equivalent length of more than 25 metres
 - systems with cooling lines of any length and operating with external temperatures below 0°C.
7. Liquid line solenoid valve. Unit accessory recommended for cooling systems with lines over 10 m.
8. Check valve - Supplied by the installer. The valve must be installed on the liquid line near the condenser. The valve prevents liquid from returning to the condenser, particularly in the event of system downtime during the winter season.

WARNING

It is necessary to integrate the refrigerant and lubricating oil charge for the connection pipes and for the remote air-cooled condenser.

Proceed with the operations of charging refrigerant in the appropriate quantities and charging lubricating oil in the proportion of 10% of the additional refrigerant introduced. The oil must be of the same type as that already present in the unit as indicated on the compressor data plate.

Acoustic data of the standard unit working at full load.

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		012	018
SIZE		E2	E2
COOLING CAPACITY		100%	100%
SOUND LEVEL ISO 3744 (1)			
On the Under delivery line	dB(A)	68.0	71.4
On the Under return line	dB(A)	53.7	57.1
On the Under front	dB(A)	47	48
On the Over delivery line	dB(A)	68.0	71.4
On the Over return line (2)	dB(A)	46	47
On the Over front (3)	dB(A)	40.0	40.2

1. Noise pressure level at 1 meter in free field – ISO 3744
2. Intake from front
3. Intake from bottom

8. ELECTRICAL DATA

ELCAdoc 19/05/2021

Data Book
i-MTR2-G02-M0_0521_EN

Electrical data of the system at full load working conditions.

MODEL		012	018
POWER SUPPLY	V/ph/Hz	400/3+N/50	400/3+N/50
MAXIMUM CURRENT INPUT (FLA)	A	20.7	20.7

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.

If the power supply of the remote air-cooled condenser comes from the electrical panel of the indoor unit, add the electric consumption of the air-cooled condenser to that of the indoor unit. For the electrical data of the remote dry-cooler please refer to the Data Book of the series.

9. OPTIONAL ACCESSORIES

ELCAdoc 19/05/2021

Data Book
i-MTR2-G02-M0_0521_EN

P121	Front intake + bottom panel. Containment panel for soundproofing of the base of the OVER unit
P122	Bottom intake + solid panels. Solid front panels for OVER units. The accessory draws air from the bottom of the unit.
601	Solenoid valve on the liquid line.
P091	Controller buffer module. The system powers the microprocessor for a few minutes in absence of power supply (size E1 excluded).
P171	AC axial MCH -45°C air kit. (GR-Z A series condensers) Kit for operation at low ambient air temperatures down to -45 °C. For starting and operating the unit with very low ambient air temperatures (between -20 °C and -45 °C).
P191	Remote condenser power supply. Remote powering of the air-cooled condenser from the electrical panel of the indoor unit. The accessory includes the magnetothermic switches for condenser fans and the control/alarm signals.
383	Numbered wirings + UK requests
4181/4182/4184/4185	Serial card: 4181 – MODBUS protocol card; 4182 – LON protocol card; 4184 – BACNET MS/TP RS485 card; 4185 – BACNET OVER IP card.
A351 / A352 / A35B	GRAPHICAL DISPLAY / WITHOUT USER DISPLAY / TOUCH GRAPHICAL DISPLAY
5891	Control unit via kiplink.
P151	Lowered display for UNDER - only UNDER units with plenum mounted under the unit.
B912	Remote keyboard K200
A492	Water leakage detector + additional detector. Supplied in mounting kit
A511	Smoke detector Supplied in mounting kit.
A521	Fire detector. Supplied in mounting kit.
P183	Network analyser kit (standard unit) Multifunctional instrument for calculating and displaying the electrical measurements of the unit. Supplied in mounting kit.
P184	Network analyser kit + optional (full optional unit). Multifunctional instrument for calculating and displaying the electrical measurements of the unit. Supplied in mounting kit.
P071/P072/P073/P074	Remote T/rH probe. Combined Temperature / Relative Humidity probe for remote installation, in addition to the combined probe on the air intake of the unit.
P113 / P114	P113 - Dual supply kit. Supplied in mounting kit. P114 - Dual supply kit + optional. Supplied in mounting kit.
A381	Condensate drain pump. Supplied in mounting kit. The kit includes a pump with activation float and 10 linear metres of drainage pipe.
P084	ePM10 50% air filter. High efficiency regenerable air filter (according to ISO EN 16890). Not compatible with "P017 / P018 / P019 Plenum + ePM2.5 50%, ePM1 50%, ePM1 85% filter (according to ISO EN 16890".
A531 (1)	On-off damper. Non-return air damper with frame installed over the air outlet of the unit.
P011	Vacuum plenum.
P012	Vacuum plenum CL.A1. Plenum with fire reaction in class "0" or "A1.
P013	Plenum + 3 grilles with double row of adjustable fins on three sides.
P014	Plenum + 3 grilles CL.A1. Plenum with ports with double row of adjustable fins on three sides, with fire reaction in class "0" or "A1".
P015	Silent plenum not compatible with P084 ePM10 50% air filter.
P016	Silent plenum + 1 grille. Grille with double row of adjustable fins and sound absorbers on the front side.

9. OPTIONAL ACCESSORIES

ELCAdoc 19/05/2021

Data Book
i-MTR2-G02-M0_0521_EN

P017	Plenum + ePM2.5 50% filter. Plenum with high efficiency air filter (according to ISO EN 16890). Not compatible with P084 ePM10 50% air filter.
P018	Plenum + ePM1 50% filter. Plenum with high efficiency air filter (according to ISO EN 16890). Not compatible with P084 ePM10 50% air filter.
P019	Plenum + ePM1 85% filter. Plenum with high efficiency air filter (according to ISO EN 16890). Not compatible with P084 ePM10 50% air filter.
P031 (2)	Vacuum intake plenum.
P032 (2)	Vacuum intake plenum CL.A1. Plenum with fire reaction in class "0" or "A1".
P041 / P042 / P043	Floor stand with height-adjustable rubber supports. Supplied in mounting kit. It is not possible to install the floor stand together with the plenums under the unit. P041 - Floor stand h 255-350mm P042 - Floor stand h 355-450mm P043 - Floor stand h 400-510mm
3601	Compressors operating signal. Voltage free contact for compressors operating signal.
2411	Phase sequence control. Phase sequence control relay of the unit.
A272	CL.0 or A1 (EN 13501-1) insulation: Panelling with fire reaction in class "0" or "A1";
9973	Wooden cage packing. The units are delivered on a wooden pallet, shrink-wrapped in a wooden crate.

WARNING

The Manufacturer reserves the right to accept any combinations of accessories installed on the unit.

MANDATORY COMBINATIONS OF ACCESSORIES

1. The presence of the accessory "A531 On-off damper" requires the presence of the accessory "9973 Packing with wooden crate"
2. The presence of the accessories "P031 Vacuum intake plenum, for OVER version" and "P032 Vacuum intake plenum CL.A1, for OVER version" requires the presence of the accessory "P122 Bottom intake + solid panels, only for OVER version"
3. When accessory A352 "NO DISPLAY" is present, it requires mandatory accessory 5891 "Unit control via Kiplink"

OPTIONAL ACCESSORIES: P121 - FRONT INTAKE + BOTTOM PANEL

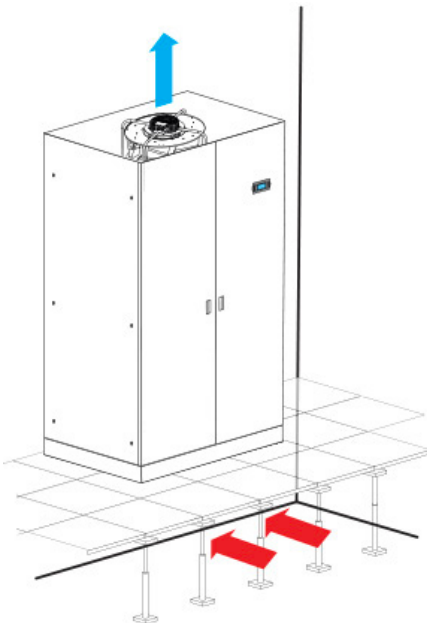
Available for OVER unit.

The accessory is not compatible with the "P122 Bottom intake + solid panels" for OVER units.

The accessory is designed to soundproof the base of the unit in those installations where the unit is placed directly on certain floors (raised floors, wooden floors, etc.). The accessory includes:

- Containment panel in hot-galvanized shaped sheet steel.
- Insulation with special soundproof material.

The base containment panel is supplied assembled inside the base and does not change the dimensions of the unit.



OPTIONAL ACCESSORIES: P122 - BOTTOM INTAKE + SOLID PANELS

Available for OVER unit.

The accessory is not compatible with the "P121 Front intake + solid panel" for OVER units.

The base is specially designed for intake from the bottom of the unit. The air flow is the nominal one.

The accessory envisages solid panelling at the front.

OPTIONAL ACCESSORIES: 601 - LIQUID LINE SOLENOID

The accessory has the function of closing the liquid line in the event of shutdown of the indoor unit or a blackout, avoiding the risk of migration of liquid refrigerant into the evaporator.

Accessory recommended for:

- Cooling lines over 10m of equivalent length.
- Units equipped with electronic expansion valve



OPTIONAL ACCESSORIES: P091 - CONTROLLER BUFFER MODULE

The accessory is installed in the electrical panel.

The system powers the microprocessor for a few minutes in absence of power supply or voltage fluctuations, to avoid restarting of the controller.



OPTIONAL ACCESSORIES: P171 - AC AXIAL MCH -45°C AIR KIT (GR-Z A B 50)

P171 - AC AXIAL MCH -45°C AIR KIT (GR-Z A B 50)

The accessory is available only for air conditioners combined with remote air-cooled condensers with axial fans with AC electric motors:

- **GR-Z A B 50.** Micro-channel condensing coil. Standard soundproofing.

The system is necessary for start-up and operation of the unit with very low ambient air temperatures: between -20 °C and -45 °C.

Components for each refrigerant circuit:

- A check valve (YR₁), supplied in a kit, to be installed inside the room near the unit, on the liquid line leaving the outdoor remote condenser. It avoids the migration of the refrigerant in the liquid state in conditions of low ambient air temperature.
- A check valve (YR₂) with controlled opening, installed on the unit at the factory. Limits pressure rises in the section of the liquid pipe between the expansion valve and the check valve (YR₁).

OPTIONAL ACCESSORIES: P191 - REMOTE CONDENSER POWER SUPPLY

The accessory is for powering the remote condenser directly from the internal unit.

The electrical panel of the internal unit is set up with the electrical control components and terminal board for electrical connection to the condenser.

OPTIONAL ACCESSORIES: 383 - NUMBERED WIRINGS + UK REQUESTS

The unit's electrical cables are all numbered for ease of identification. For the power section it is possible to change the colour for the UK market.

CABLE	383 – COLOUR FOR UK
EARTH	YELLOW / GREEN
NEUTRAL	BLUE SKY
PHASE 1 (L1)	BROWN
PHASE 2 (L2)	BLACK
PHASE 3 (L3)	GREY
AUXILIARIES	RED



OPTIONAL ACCESSORIES: 4181 - MODBUS PROTOCOL SERIAL CARD

The card is factory installed.
Consult the Interface Manual for all technical information



OPTIONAL ACCESSORIES: 4182 - LON PROTOCOL SERIAL CARD

The card is factory installed. The manufacturer will supply the serial card and .NXE file and a .XIF files necessary for LonWorks technicians to configure the network. The board is programmed by the technician in charge of the integration.
Consult the Interface Manual for all technical information



OPTIONAL ACCESSORIES: 4184 - BACNET MS/TP RS485 SERIAL CARD

The card is factory installed. The supervision network is set up by the technicians developing the BACnet interface.
The Modbus protocol database is used for interfacing.
Consult the Interface Manual for all technical information



OPTIONAL ACCESSORIES: 4185 - BACNET OVER IP SERIAL CARD

The card is factory installed. The supervision network is set up by the technicians developing the BACnet interface. The Modbus protocol database is used for interfacing. The manufacturer will supply the cards and .MIB file necessary for the technicians to configure the network.
The board is programmed by the technician in charge of the integration.
Consult the Interface Manual for all the technical information and what is necessary for the Internet connection to view and modify the variables.

9. OPTIONAL ACCESSORIES



A351 ACCESSORIES - GRAPHIC DISPLAY

132x64 pixel backlit standard graphic display with 6 physical buttons for navigating the menus.

	ALARM	Alarm presence with red light. Push for alarm description. In case of more alarms scroll by UP / DOWN.
	PRG	Menu list, scrolled by UP/DOWN: Unit; Set-point; In/Out; Clock; History; User; Service; Factory. ENTER to execute.
	ESC	Home. Used to come back to the previous menu level or to the main screen.
	UP DOWN	Changes pages and values of sets. By pressing in HOME mask, the synoptic of the main controls is displayed.
	ENTER	Moves the cursor over the editable fields of the program. Press to confirm the changes. Press ENTER to get out the fields.

area 11	area 1	area 12	HH	:	MM	DD	/	MM	/	YY
	area 2		-	9	9	.	9	°C		
	area 3		-	9	9	.	9	%		
	area 3_4							area 8		
	area 4	area 5	area 6	area 7				area 9		
								area 10		

The main mask shows time, date, room temperature and humidity values (if the relative probe is present) and areas for displaying operating and alarm status with dedicated icons:

Area 1: Status of the unit: on/off
 Area 2: Status detail
 Area 3: Type of event (only in case of an event)
 Area 3_A: Code and type of event
 Area 4: Active cooling devices
 Area 5: Active free-cooling devices
 Area 6: Active humidity devices

Area 7: Active heating devices
 Area 8: on/off parameters
 Area 9: BMS address
 Area 10: LAN address
 Area 11: Schematic representation of units
 Area 12: Active function presence icon

OPTIONAL ACCESSORIES: A352 - NO DISPLAY

The unit is supplied without display and adjustment is only possible with the KipLink accessory

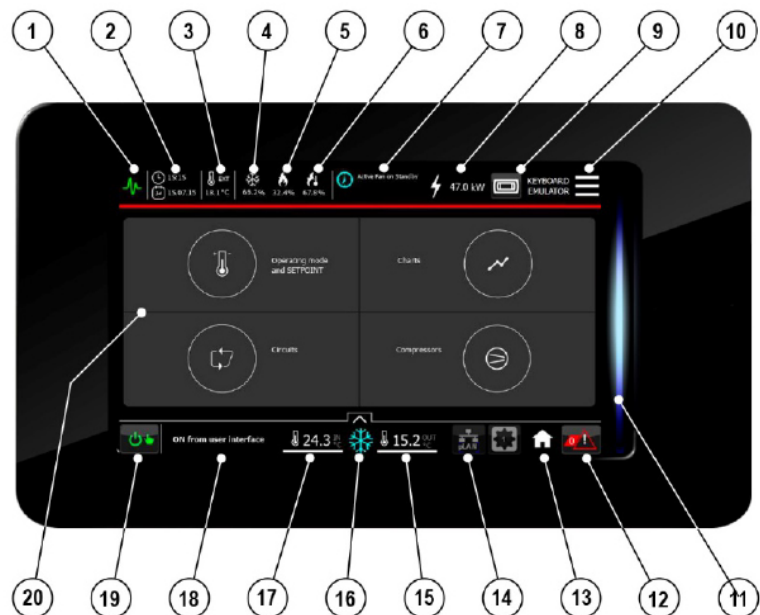


OPTIONAL ACCESSORIES: A35B - "EVOLUTION TOUCH" GRAPHIC DISPLAY

7" Touch-Screen graphic display with 16.7 million colours for the management and monitoring of operating and alarm states.

The Display is equipped with a MicroUSB port for the service connection.

The navigation bars are always present on the display for the purpose of quick and intuitive navigation.



BOTTOM NAVIGATION BAR

1. Controller Connection status:
Green: OK / Red: error
2. Date and Time
3. Ambient air temperature from dedicated probe
4. Percentage active in cooling mode
5. Percentage active in heating mode
6. Percentage active in post-heating mode
7. Unit active functions
8. Energy meter
9. Standard 6-key display simulator
10. Rapid access to the menu

TOP NAVIGATION BAR

11. Illuminated unit status bar
12. Signalling and management of alarms
13. Home button
14. pLAN network
15. Delivery of air into room: air temperature or relative humidity value
16. Operating mode of the unit
17. Intake of air from room: air temperature value
18. Unit status
19. Unit on/off

WORKING AREA

20. Main menus
 - a. Operating mode and Setpoint
 - b. Circuits
 - c. Graphs
 - d. Compressors

For complete information on the Graphic Display, please consult the relative technical documentation.

OPTIONAL ACCESSORIES: P151 - LOWERED DISPLAY FOR UNDER

For units installed above the delivery plenum.

The display/keyboard on the front panel of the machine is installed lowered by about 50cm to facilitate consultation and use.

OPTIONAL ACCESSORIES: B912 - REMOTE KEYBOARD K200

Kit consisting of a diverter and an additional standard graphic display prepared for wall mounting. It is used to replicate the display in the unit with a remote control up to 200m

OPTIONAL ACCESSORIES: 5891 - CONTROL UNIT VIA KIPLINK

The optional is factory installed. KIPLink is an innovative system based on Wi-Fi technology that allows to operate on a unit directly from Smartphone or Tablet via an APP.



WI-FI MODULE:

- Standard: IEEE 802.11n – 802.11g
- Frequencies: 2.4 – 2.4835 GHz
- Output power: <20 dBm (equivalent to <100mW)
- Safety: WPA2
- Flow: < 20m

APP MEHITS

- Operating System: Android 5® or higher, IOS 8® or higher, Windows 10® or higher
- Download: Google Play®, Apple Store® and Microsoft Store®.

HOW TO USE KIPLINK

KIPLink can be used in two ways:

1. Proximity keyboard:

Approaching the machine with a Smartphone or a Tablet with the MEHITS APP installed, you can connect to the unit via Wi-Fi and you can control it as you would from the standard controller keyboard. It is possible to switch the unit on and off, change the sets and reset alarms. Knowing the relative passwords, you access the parameters of the USER, SERVICE and MANUFACTURER menus.

2. Local Monitoring:

Using a Smartphone, a Tablet or PC connected to the LAN of the building where the unit is also connected. Access is via WEB via a browser. The system has two access profiles: ONLY READ and READ & WRITE. ONLY READ allows only the visualization of the parameters and it is not possible to control the unit. READ & WRITE allows you to switch the unit on and off, change the sets and reset alarms. Knowing the relative passwords, you access the parameters of the USER, SERVICE and MANUFACTURER menus.

3. Remote Monitoring:

Using a Smartphone, Tablet or PC connected to the VPN of the building where the machine is also connected, it is possible to operate and control from any geographical location where there is an internet connection. Use a secure VPN to avoid access by third parties that could compromise the operation of the machine. The cyber security is in charge of customer.



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STORING DATA

The system can store some data on a 1GB MicroSD card to be installed on the device. The data can be used for Service diagnostics. The card is not provided.

KIPLINK NETWORK

It is possible to set up mixed networks consisting of several KIPLink devices (10 maximum), to display information from different devices (called Client KIPLink) on one single device (called Master KIPLink).

The information is collected from the various Client KIPLink devices connected to EVOLUTION+ / W3000 TE/ CX-4 controllers and sent through the Wi-Fi or Ethernet network to the Master KIPLink device, which stores them and makes them available through an appropriate user interface.

The connection with the Master KIPLink can take place via Wi-Fi, via Ethernet or a combination of the two.

For complete information on the KIPLink system, please consult the relative technical documentation.



OPTIONAL ACCESSORIES: A492 - WATER LEAKAGE DETECTOR + ADDITIONAL DETECTOR

The system includes an electronic relay installed in the electrical panel of the indoor unit, and 2 detectors to be connected in series.

The electrical connections for the probe and the alarm contact are present in the terminal board of the indoor unit.

The sensors are supplied in a mounting kit.

OPTIONAL ACCESSORIES: A511 - SMOKE DETECTOR

OPTIONAL ACCESSORIES: A521 - FIRE DETECTOR

It is possible to install one or both of the following sensors.

Sensors are supplied in mounting kit. Installation within the room at customer care

A511 - SMOKE DETECTOR

The device is supplied in mounting kit.

The optical smoke detector senses the presence of combustion by-products (visible smoke) and activates an alarm.

The operating principle is based on the light scattering technique (Tyndall effect). The device is in conformity to EN 54-7 standard.

Supplied with unit to be connected and installed at customer care close to the unit.



Technical features

Material	ABS	Relative humidity	<93% non-condensing
Power supply	12...28 Vdc	Index of protection	IP 20
Normal current	50µA at 24 Vdc	Testing by magnet	Yes
Alarm current	25µA at 24 Vdc	Relay	max. 1A 30Vdc
LED visibility	360° (double LED)	Signal repeater	14mA a 24 Vdc
Storage temperature	-10...+70°C	Covered area	40m ² max.
Operating temperature	-10...+70°C	Shielded connection	Min. 0.5 mm ²
Max. speed air	0,2 m/s	Colour	White

Supplied with unit to be connected and installed at customer care close to the unit.

9. OPTIONAL ACCESSORIES



A521 - FIRE DETECTOR

The device is supplied in mounting kit.

The fire detector has been designed to identify temperatures at which fires may start. When the temperature exceeds the set threshold or when there is a rapid variation in temperature, the relay is activated to signal an alarm. The device is in conformity to EN 54-5 standard.

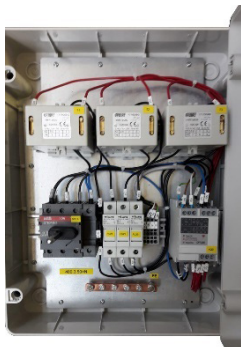
Supplied with unit to be connected and installed at customer care close to the unit.

Technical features

Material	ABS	Index of protection	IP 20
Power supply	12...28 Vdc	Testing by magnet	Yes
Normal current	50µA at 24 Vdc	Relay	max. 1A 30Vdc
Alarm current	25µA at 24 Vdc	Signal repeater	14mA a 24 Vdc
LED visibility	360° (double LED)	Alarm threshold temperature	62°C
Storage temperature	-10...+70°C	Covered area	40m2 max.
Operating temperature	-10...+70°C	Shielded connection	Min. 0.5 mm2
Relative humidity	<93% non-condensing	Colour	White

OPTIONAL ACCESSORIES: P183 - NETWORK ANALYSER KIT

OPTIONAL ACCESSORIES: P183 - NETWORK ANALYSER KIT + OPTIONAL



The system allows the continuous detection of electrical consumptions, split into current, voltage and power. The values are made available to the microprocessor of the unit through an RS485 serial line cable connection, as indicated in the wiring diagram on board of the unit.

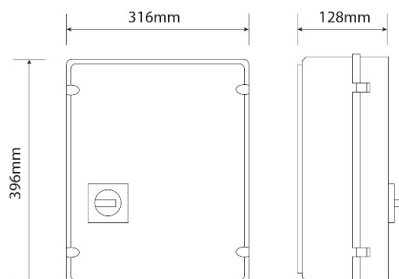
The displayed variables are:

- Phase to phase voltage, only for three-phase
- Phase voltage (phase-neutral)
- Phase current
- Neutral current only for three-phase units
- Active phase power, only for three-phase units
- Total active power
- Active energy
- Hour counts

MOUNTING KIT

The accessory is supplied in a box for installation outside the unit the dimensions of which are shown in the figure below, and includes:

- Main switch with door lock safety
- Fuse
- Network transducer
- Current transformers, one for each power supply phase cable
- Terminals



OPTIONAL ACCESSORIES: P071/P072/P073/P074 - REMOTE T/RH PROBE



P071 / P072 / P073 / P074: REMOTE T/RH PROBES

In addition to the on-board temperature probes, the unit's control can manage up to 4 remote T/RH probes (optional), to measure the return and the delivery air temperature in different positions.

Depending on the individual characteristics of the room and the cooling equipment, the customer can choose where to install the additional probes to achieve best measurement results (N. add. return probes + N. add. delivery probes \leq 4). The probes can be configured from the Service menu of the controller.

The probes that are enabled, contribute to the calculation of the return and delivery temperature used for capacity adjustment purposes.

The customer can choose between different types of calculation:

- Temperature of the first probe enabled
- Average temperature of the probes
- Highest temperature of the probes
- Lowest temperature of the probes.

Notes:

If a probe is connected but not enabled, its measurement can still be read on the display and by the BMS, but it is not used to calculate the adjustment temperature. It is possible to disable the probe on the unit and use only the remote probes for capacity adjustment purpose.

- **P071:** One Temperature/Humidity sensor for remote installation.
- **P072:** Two Temperature/Humidity sensors for remote installation.
- **P073:** Three Temperature/Humidity sensors for remote installation.
- **P074:** Four Temperature/Humidity sensors for remote installation.

9. OPTIONAL ACCESSORIES

OPTIONAL ACCESSORIES: P113 - DUAL SUPPLY KIT

OPTIONAL ACCESSORIES: P114 - DUAL SUPPLY KIT + OPTIONAL

The motorised changeover switches automatically manage changeover under load between two three-phase power supplies, or manually for emergency operations.

These devices are suitable for low voltage systems with interruption of the supply to the load during transfer.

The model supplied in the automatic version checks the source and switches over automatically, based on configurable parameters.



OPEN TRANSITION TYPE TRANSFER SWITCH WITH A MINIMUM INTERRUPTION OF THE SUPPLY DURING TRANSFER.

It is recommended to use the accessory "P091 Controller buffer module" to keep the microprocessor powered and avoid restarting it. The buffer module powers the microprocessor for a few minutes in absence of power supply.

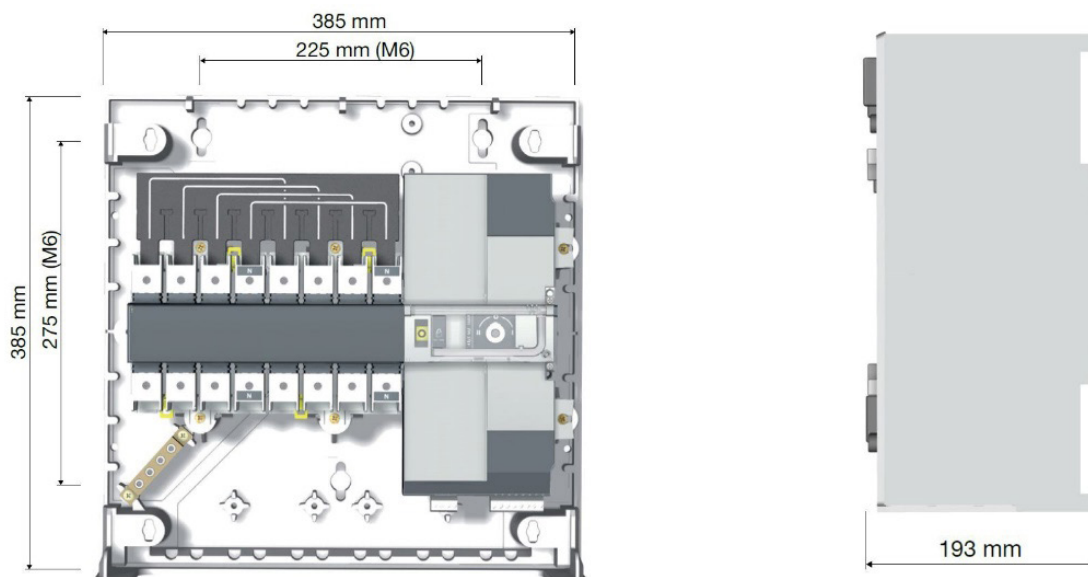
The remote condenser must be powered by the automatic transfer switch.

It is recommended to use the accessory: "P191 Remote condenser power supply" from the electrical panel of the indoor unit.

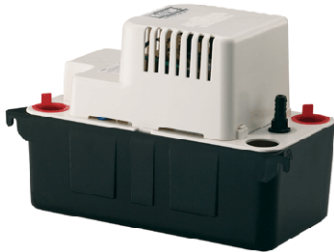


MOUNTING KIT

For EXTERNAL installation, the optional accessory is supplied in special box with IP 3X ingress protection, with the dimensions shown in the figure below.



OPTIONAL ACCESSORIES: A381 - CONDENSATE DISCHARGE PUMP



A plastic case contains the vertical type pump, the water tank with float plus safety switch and hydraulic and electric connection.

A 10-metre crush-resistant spiral drain pipe is provided with the pump.

The optional has to be installed as shown in the documentation delivered together with the unit.

Wiring includes power supply and an alarm, displayed on microprocessor, that includes motor pump thermal protection and tank overflow.

The condensate discharge pump operation is fully automatic.

WARNING

For all the units, the pump is not installed on board but is supplied in a mounting kit.

TECHNICAL DATA

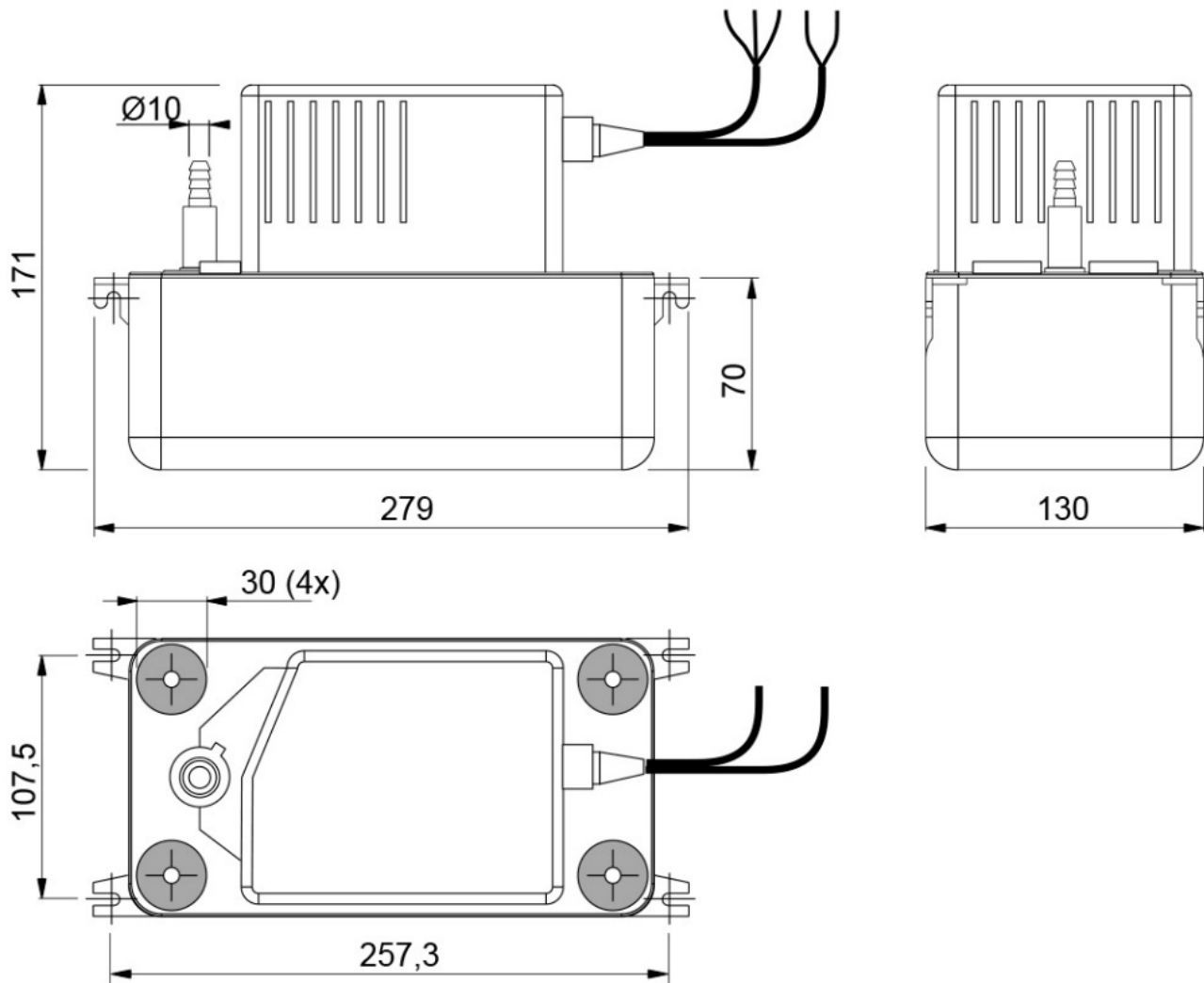
Power supply	230V~ 50Hz
Electrical data	70W – 0,67A
Maximum flow	500 l/h
Maximum delivery height	5.0 m
Sound level	45dBA at 1 m
Maximum water temperature	70°C
Water acidity	pH>2.5
Tray volume	2.0 l
Protection	IP 20

9. OPTIONAL ACCESSORIES

ELCA doc 19/05/2021

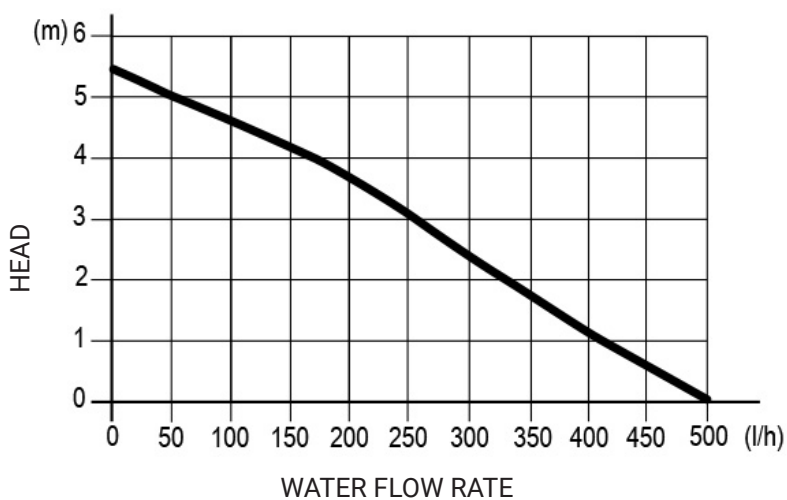
Data Book
i-MTR2-G02-M0_0521_EN

CONDENSATE DRAIN PUMP



(Sizes in millimetres)

OPERATING DATA



Head	Total length of drain pipe (internal Ø of 10 mm)			
	5 m	10 m	20 m	30 m
1 m	380	300	240	190
2 m	310	260	200	150
3 m	240	200	145	110
4 m	150	130	80	60
5 m	30	20	0	0

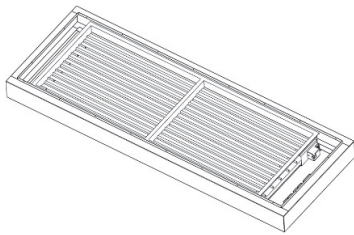
OPTIONAL ACCESSORIES: P084 - ePM₁₀ 50% AIR FILTERS

The air filters with ePM₁₀ 50% efficiency (according to ISO EN 16890) replace the standard ones. The filters generate a higher than standard pressure drop. The filters are made of glass microfibre and are disposable.

VERSION (1)		U / O
MODEL		018
SIZE		E2
Additional pressure drop (2)	Pa	68

1. U = Under, delivery air flow down / O = Over, delivery air flow up
2. Additional pressure drop referred to nominal air flow and clean air filter.

OPTIONAL ACCESSORIES: A531 - ON-OFF DAMPER



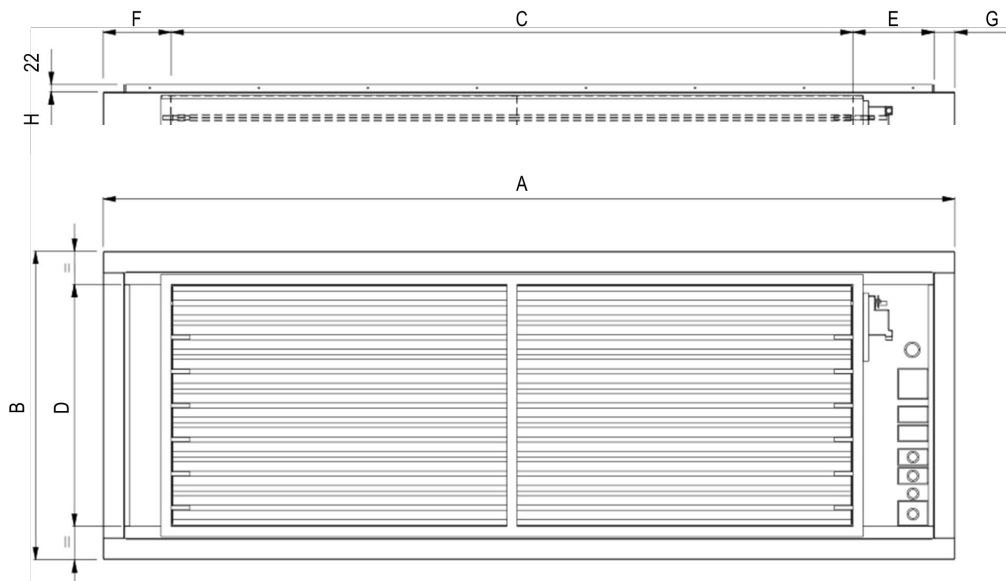
Motorized non-return air damper in the frame.

The accessory is installed on the air delivery of the unit and can be combined with the plenums and the floor stand.

The accessory requires the presence of the accessory "9973 Packing with wooden crate"

FRAMEWORK

- Frame in galvanized steel sheet with protective surface treatment in compliance with UNI ISO 9227/ASTMB117 and ISO 7253, and with epoxy powder coating. Colour RAL 9005
- Opposed blade damper in sheet steel
- Servomotor for damper control
- Terminal board for electrical connection with the unit

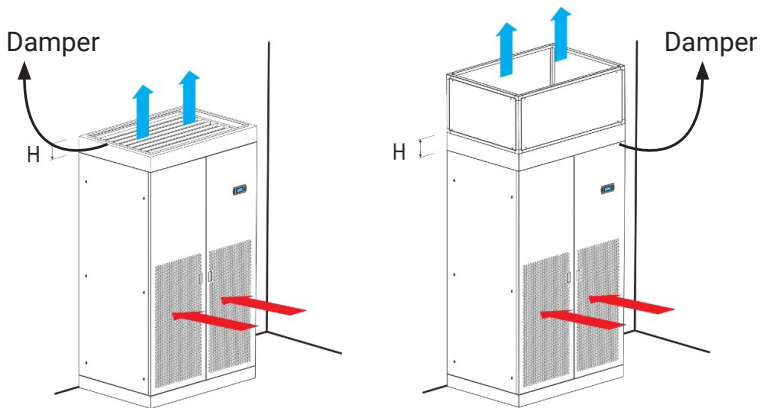


9. OPTIONAL ACCESSORIES

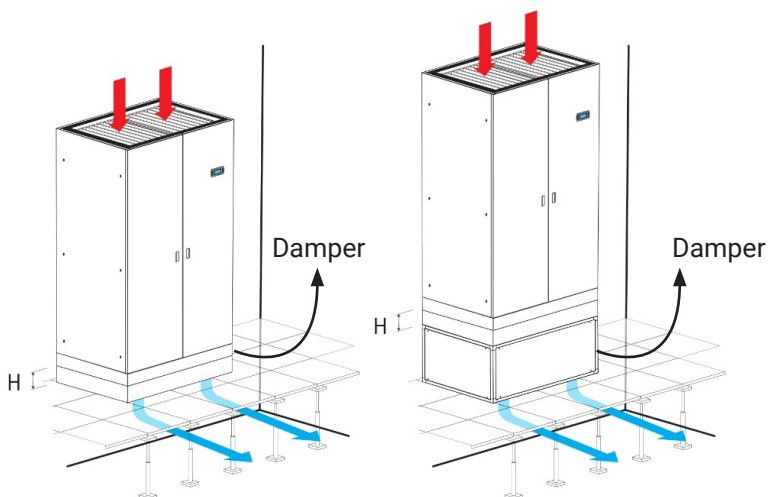
VERSION (1)	U / O	
SIZE	E2	
A	mm	785
B	mm	650
C	mm	450
D	mm	510
E	mm	216
F	mm	73
G	mm	46
H	mm	170
Weight (2)	kg	23

1. U = Under, delivery air flow down / O = Over, delivery air flow up
2. Value to be added to the total weight of the unit

EXAMPLES OF INSTALLATION



A531: UNDER



WORKING LOGIC

The damper opens at supply fans activation to allow air flow.

When the fans stop due to failure or a stop command, the damper closes, preventing the flow of air into the unit.

9. OPTIONAL ACCESSORIES

OPTIONAL ACCESSORIES: P011 - VACUUM PLENUM

OPTIONAL ACCESSORIES: P012 - CL.A1 VACUUM PLENUM

OPTIONAL ACCESSORIES: P031 - VACUUM INTAKE PLENUM

OPTIONAL ACCESSORIES: P032 - CL.A1 VACUUM INTAKE PLENUM

OPTIONAL ACCESSORIES: P013 - PLENUM + 3 GRILLES

OPTIONAL ACCESSORIES: P014 - CL.A1 PLENUM + 3 GRILLES

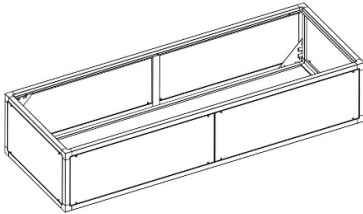
OPTIONAL ACCESSORIES: P015 - SILENT PLENUM

OPTIONAL ACCESSORIES: P016 - SILENT PLENUM + 1 GRILLE

OPTIONAL ACCESSORIES: P017 - PLENUM + EPM2.5 50% FILTER

OPTIONAL ACCESSORIES: P018 - PLENUM + EPM1 50% FILTER

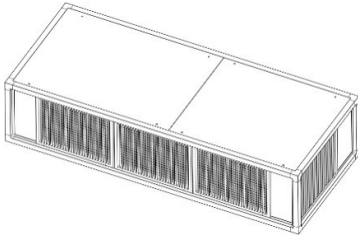
OPTIONAL ACCESSORIES: P019 - PLENUM + EPM1 85% FILTER



The optional is supplied separately and the installation on the unit is at Customer care.

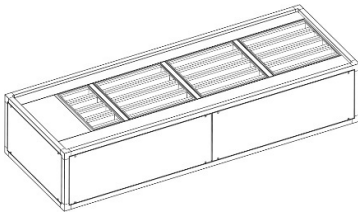
The plenums have same technical characteristics and basic dimensions of the unit cabinets.

It is possible to install only a single plenum to ensure stability to the unit.



FRAMEWORK

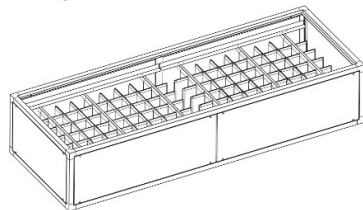
- Frame in extruded aluminium, hot-coated with epoxy powder. Colour RAL 9005;
- Panels in galvanized steel sheet with protective surface treatment in compliance with UNI ISO 9227/ASTMB117 and ISO 7253, and with epoxy powder coating. Colour RAL 9005;
- Panels insulated with polyurethane foam and seals to ensure air tight.
- Panels fastened with screws;
- Removable panels;
- Set for fixing to the unit



WARNING

The pipes of the UNDER units terminate inside the unit.

Plenums installed on air delivery do not always allow these pipes to be extended downwards. In particular cases, to keep the connections inside the unit, a plenum with an increased height of approximately 200 mm is required.

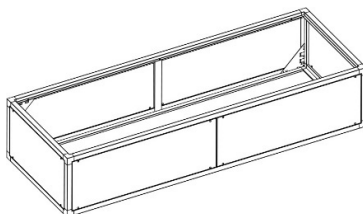


P011 / P012 – P031 / P032: VACUUM PLENUM

The plenum is void and can be used to rise the intake/delivery air inlet/outlet. Remove the frontal panels for inspection.

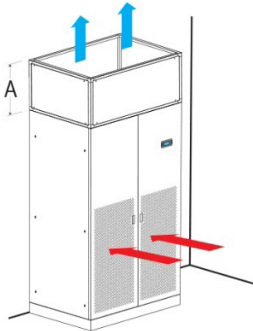
Also available with fire reaction in class "0" or "A1" (EN 13501-1).

The accessories "P031 Vacuum intake plenum, for OVER version" and "P032 CL.A1 Vacuum intake plenum, for OVER version" require the presence of the accessory "P122 Bottom intake + solid panels, only for OVER version".

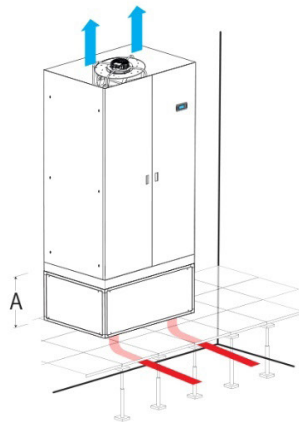


9. OPTIONAL ACCESSORIES

P011 / P012 OVER

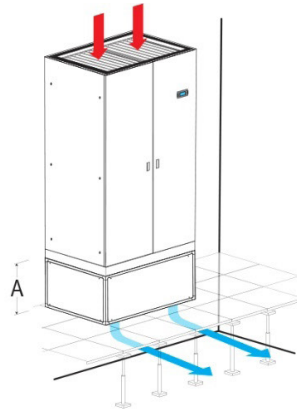


P031 / P032 OVER

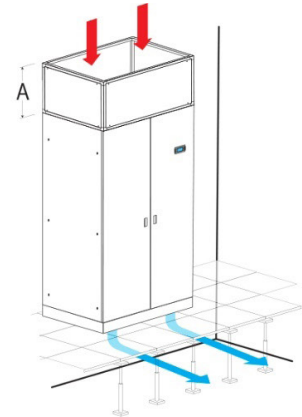


P122 Bottom intake + solid panels

P011 / P012 UNDER

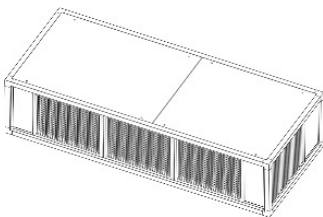


P031 / P032 UNDER



VERSION (1)		U / O
SIZE		E2
A	mm	490
Weight (2)	kg	21
Weight of CL.0 or "A1" (EN 13501-1) (2)	kg	27

1. U = Under, delivery air flow down / O = Over, delivery air flow up
2. Value to be added to the total weight of the unit



P013 / P014: PLENUM + 3 GRILLES

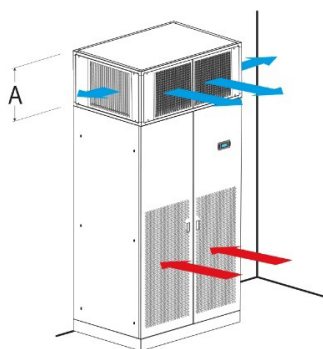
The plenum must be installed on air delivery.

The plenum allows the air distribution directly into the room.

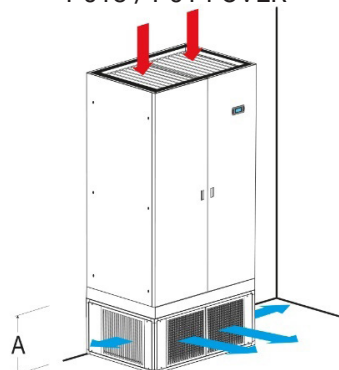
The plenum is supplied with grilles with double row of adjustable fins on the front and sides.

Also available with fire reaction in class "0" or "A1" (EN 13501-1).

P013 / P014 OVER



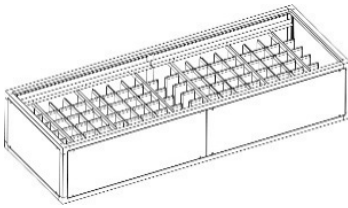
P013 / P014 UNDER



VERSION (1)		U / O
SIZE		E2
A	mm	490
Weight (2)	kg	23
Weight of CL.0 or "A1" (EN 13501-1) (2)	kg	28

1. U = Under, delivery air flow down / O = Over, delivery air flow up
2. Value to be added to the total weight of the unit

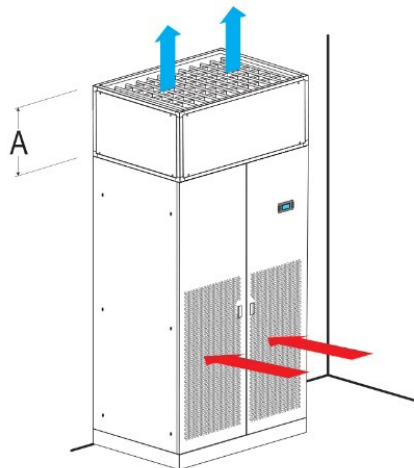
9. OPTIONAL ACCESSORIES



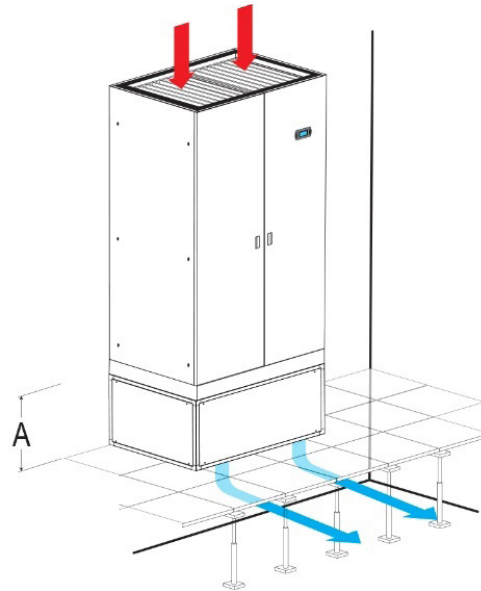
P015: SILENT PLENUM

The plenum must be installed on air delivery.
 The plenum has sound absorbers for noise reduction.
 Remove the frontal panels for inspection.

P015 OVER



P015 UNDER



VERSION (1)		U / O
SIZE		E2
A	mm	490
Weight (2)	kg	27

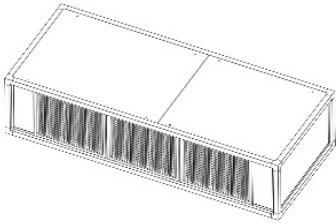
1. U = Under, delivery air flow down / O = Over, delivery air flow up
2. Value to be added to the total weight of the unit

ACOUSTIC DATA

VERSION (1)		U / O
MODEL		012-018
SIZE		E2
SOUND LEVEL ISO 3744 (2)		
On air delivery Under	dB(A)	67.3
On the Under return line	dB(A)	57.6
On the Under front	dB(A)	48.1
On air delivery Over	dB(A)	60.6
On the Over return line (3)	dB(A)	47.5
On the Over front (4)	dB(A)	41.4

1. U = Under, delivery air flow down / O = Over, delivery air flow up
2. Noise pressure level at 1 meter in free field – ISO 3744
3. Intake from front
4. Intake from bottom

9. OPTIONAL ACCESSORIES



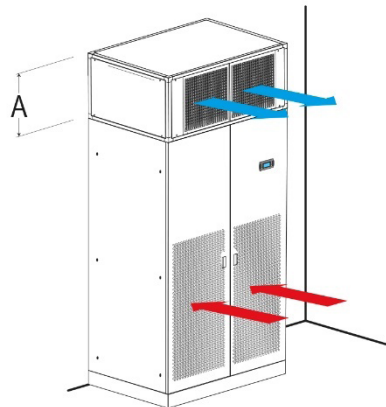
P016: SILENT PLENUM + 1 GRILLE

The plenum must be installed on air delivery.

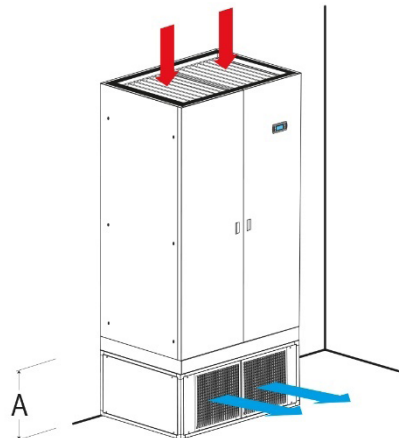
The plenum distributes air directly from the front into the environment and reduces the noise of air delivery

The plenum is supplied with a grille with double row of adjustable fins and sound absorbers on front side.

P016 OVER



P016 UNDER



VERSION (1)		U / O
SIZE		E2
A	mm	490
Weight (2)	kg	30

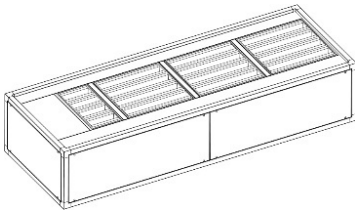
1. U = Under, delivery air flow down / O = Over, delivery air flow up
2. Value to be added to the total weight of the unit

ACOUSTIC DATA

VERSION (1)		U / O
MODEL		012 - 018
SIZE		E2
SOUND LEVEL ISO 3744 (2)		
On air delivery Under	dB(A)	62.1
On the Under return line	dB(A)	58.8
On the Under front	dB(A)	50.9
On air delivery Over	dB(A)	62.1
On the Over return line (3)	dB(A)	48.7
On the Over front (4)	dB(A)	43.1
ADDITIONAL PRESSURE DROP (5)	Pa	83

1. U = Under, delivery air flow down / O = Over, delivery air flow up
2. Noise pressure level at 1 meter in free field – ISO 3744
3. Intake from front
4. Intake from bottom
5. Value to be deducted from the useful static pressure of the unit

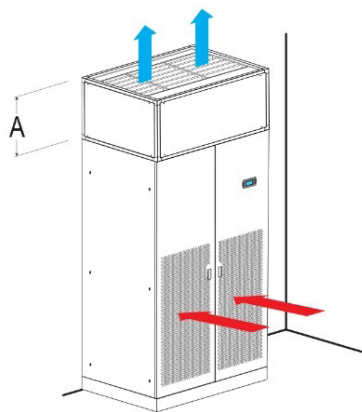
9. OPTIONAL ACCESSORIES



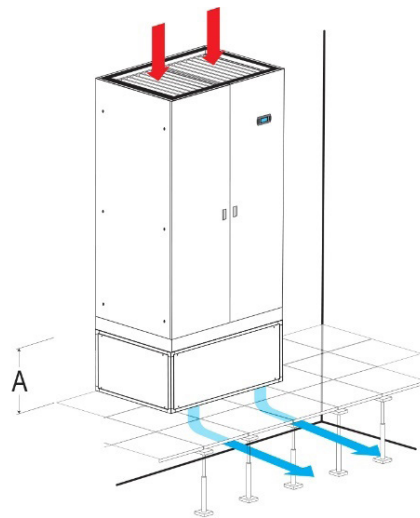
P017 / P018 / P019: PLENUM + FILTER

The plenum must be installed on air delivery. The accessory is not compatible with "P084 ePM10 50% air filter". The plenum is supplied with high efficiency rigid filters. The filters are made of glass microfibre and are disposable. Remove the frontal panels to replace the filters.

P017 / P018 / P019
OVER



P017 / P018 / P019
UNDER



VERSION (1)		U / O
SIZE		E2
A	mm	490
Weight (2)	kg	27

1. U = Under, delivery air flow down / O = Over, delivery air flow up
2. Value to be added to the total weight of the unit

ACOUSTIC DATA

VERSION (1)		U / O
MODEL		012-018
SIZE		E2
PRESSURE DROP (2)		
ePM2.5 50% filters	Pa	113
ePM1 50% filters	Pa	115
ePM1 85% filters	Pa	138

1. U = Under, delivery air flow down / O = Over, delivery air flow up
2. Data referred to nominal flow rate and clean filter. Value to be deducted from the maximum useful static pressure of the unit.

9. OPTIONAL ACCESSORIES

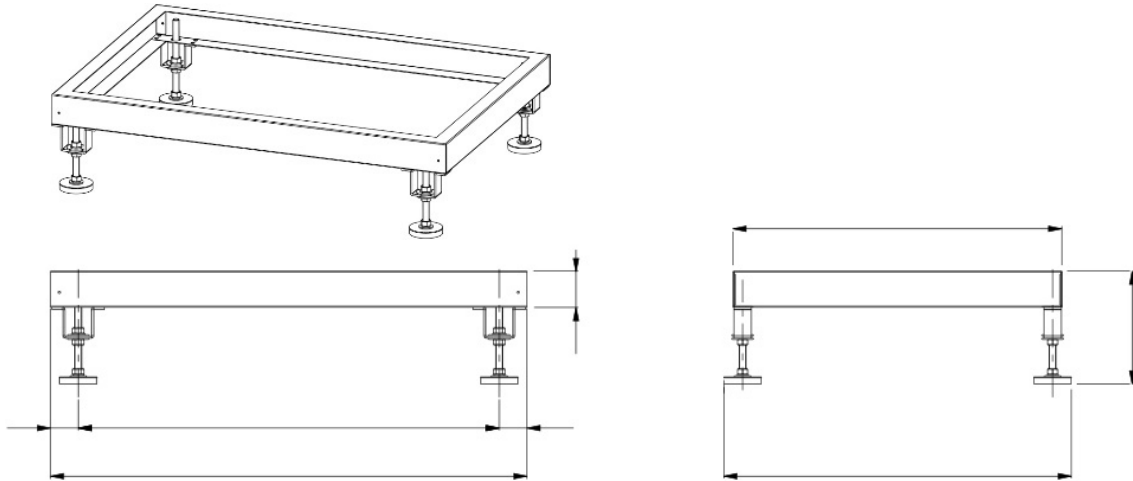
OPTIONAL ACCESSORIES: P041 - FLOOR STAND H 255-350MM

OPTIONAL ACCESSORIES: P042 - FLOOR STAND H 355-450MM

OPTIONAL ACCESSORIES: P043 - FLOOR STAND H 400-510MM

The accessory is supplied in a mounting kit.

It is not possible to install the floor stand together with the plenums under the unit.
The floor stand is available in 3 different heights.



VERSION (1)		U / O		
SIZE		E2		
A	mm	785		
B	mm	650		
C	mm	659		
D	mm	691		

MODEL		P041 - Hmax350	P042 - Hmax450	P043 - Hmax510
Min height	mm	255	355	400
Max height	mm	350	450	510

1. U = Under, delivery air flow down / O = Over, delivery air flow up

OPTIONAL ACCESSORIES: 3601 – COMPRESSORS OPERATING SIGNAL

A voltage free electrical contact is provided for the remote "Compressors operating" signal.
The electrical connection is shown on the terminal board of the unit.

OPTIONAL ACCESSORIES: 2411 – PHASE SEQUENCE CONTROL

The system checks that the sequence of the electrical supply phases is correct to avoid reverse rotation of the three-phase electric motors of the unit such as the compressor motors.

The accessory is installed in the electrical panel downstream of the main door lock switch and in the event of an incorrect phase sequence it prevents the unit from starting.



OPTIONAL ACCESSORIES: A272 – CL.0 or A1 (EN13501-1) INSULATION

The accessory is designed FOR THE SUPPLY OF ONLY PANELS WITH FIRE REACTION IN CLASS “0” OR “A1 (EN 13501-1)”; it also allows for soundproofing of the air conditioner.

The pressure level reduction of the unit is about 2 dB(A). The reduction refers ONLY to the sound level radiated from the unit or in front of the unit. The noise level data on return and delivery air do not undergo reductions.

The accessory includes:

- External part as standard panel.
- Internal part in galvanized steel sheet.
- The inside noise insulation with special soundproof material.

REACTION TO FIRE CLASSIFICATION

On Italian territory, the classification is per the D.M. of June 26, 1984 and subsequent amendments, providing for a sort in "Classes" from 0 (non-combustible material) to 5 (extremely flammable material). The EN 13501-1 regulation is ordered in classes from A1 (non-combustible material) to F (extremely flammable material).

A comparison of the classes is not possible because the methods and evaluation criteria are completely different. The comparison table below is being considered purely indicative.

Definition	Italian classes	EN 13501-1
Non-combustible material	Class 0	A1
Combustible material, very limited contribution to fire	Class 1	A2 – B
Combustible material, limited contribution to fire	Class 2	A2 – B - C
Combustible material, medium contribution to fire	Class 3	C – D
Combustible material, highly contribution to fire	Class 4	E
Combustible material, easily flammable	Class 5	F

Sandwich panels can also be provided for OVER units with upwards air delivery. This means that the air intake must be from the base of the unit with solid front panels.

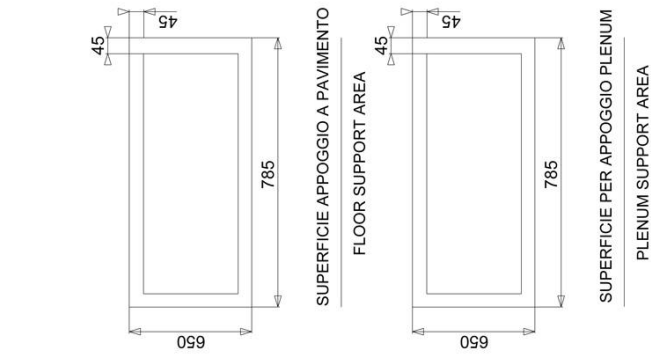
The accessory increases the weight of the unit. It increases its weight by 42 kg for the OVER model and by 48 kg for the UNDER model.

10. UNIT DRAWINGS

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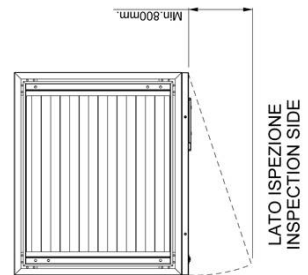
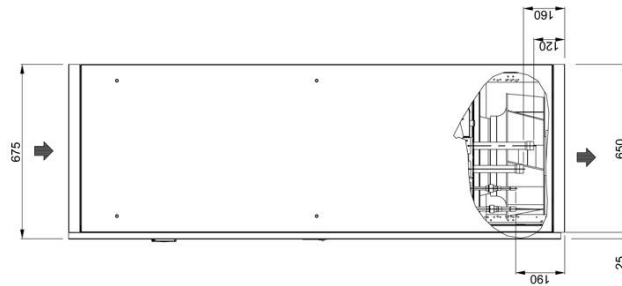
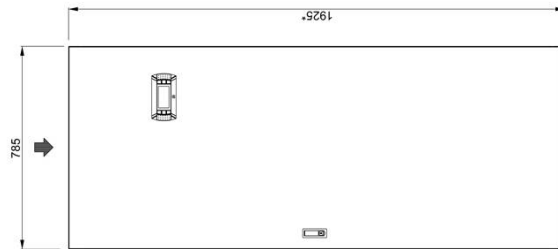
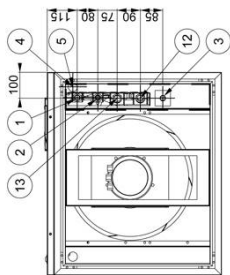
UNIT DRAWINGS - Dimensions in mm - UNDER E2



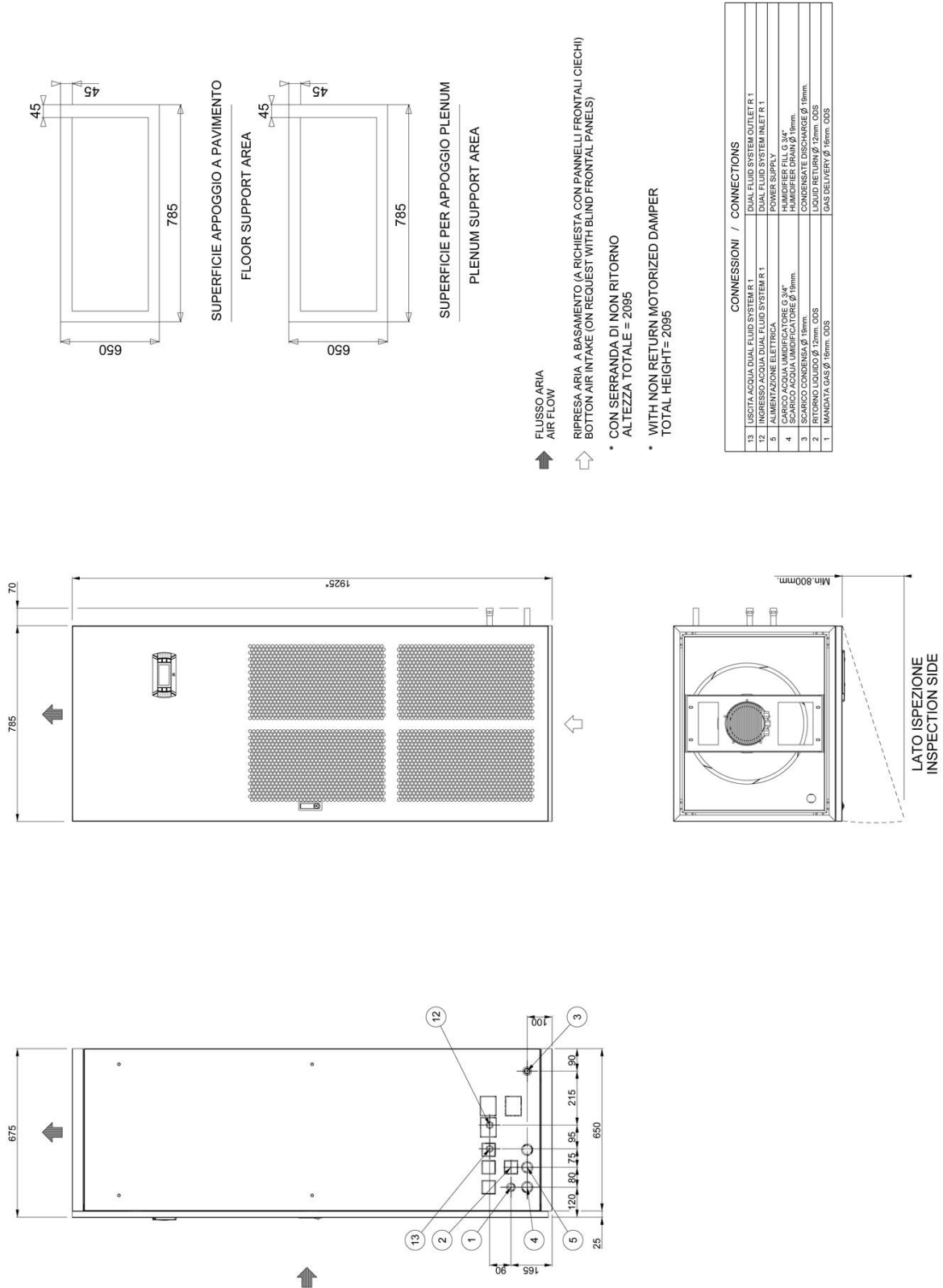
* CON SERRANDA DI NON RITORNO
ALTEZZA TOTALE = 2095

* WITH NON RETURN MOTORIZED DAMPER
TOTAL HEIGHT = 2095

CONNESSIONI / CONNECTIONS	
13	USCITA ACQUA DUAL FLUID SYSTEM R1
12	INLET DUAL FLUID SYSTEM R1
11	INLET DUAL FLUID SYSTEM R1
10	POWER SUPPLY
9	ALIMENTAZIONE ELETTRICA
8	POWER SUPPLY
7	CARICO ACQUA UMIDIFICATORE Ø 3/4"
6	HUMIDIFIER FILL G. 3/4"
5	SCARICO ACQUA UMIDIFICATORE Ø 19mm
4	HUMIDIFIER DRAIN Ø 19mm
3	SCARICO CONDENSA Ø 19mm
2	CONDENSATE DISCHARGE Ø 19mm
1	RITORNO LIQUIDO Ø 12mm ODS
	LIQUID RETURN Ø 12mm ODS
	MANDATA GAS Ø 16mm ODS
	GAS DELIVERY Ø 16mm ODS



UNIT DRAWINGS - Dimensions in mm - OVER E2

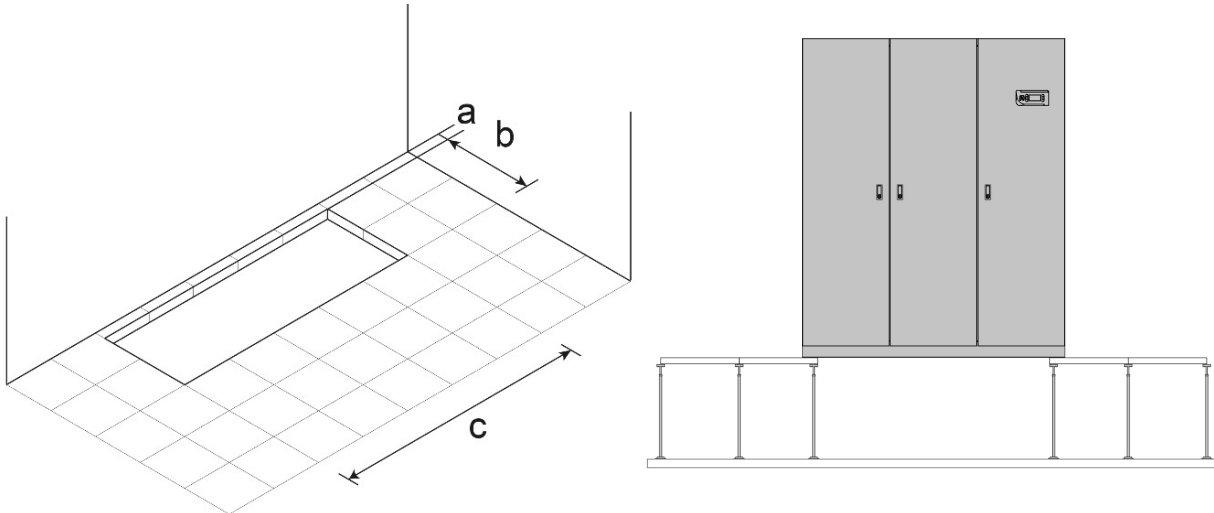


11. HOLE IN THE RAISED FLOOR FOR DOWNFLOW VERSION

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HOLE IN THE RAISED FLOOR FOR DOWNFLOW VERSION

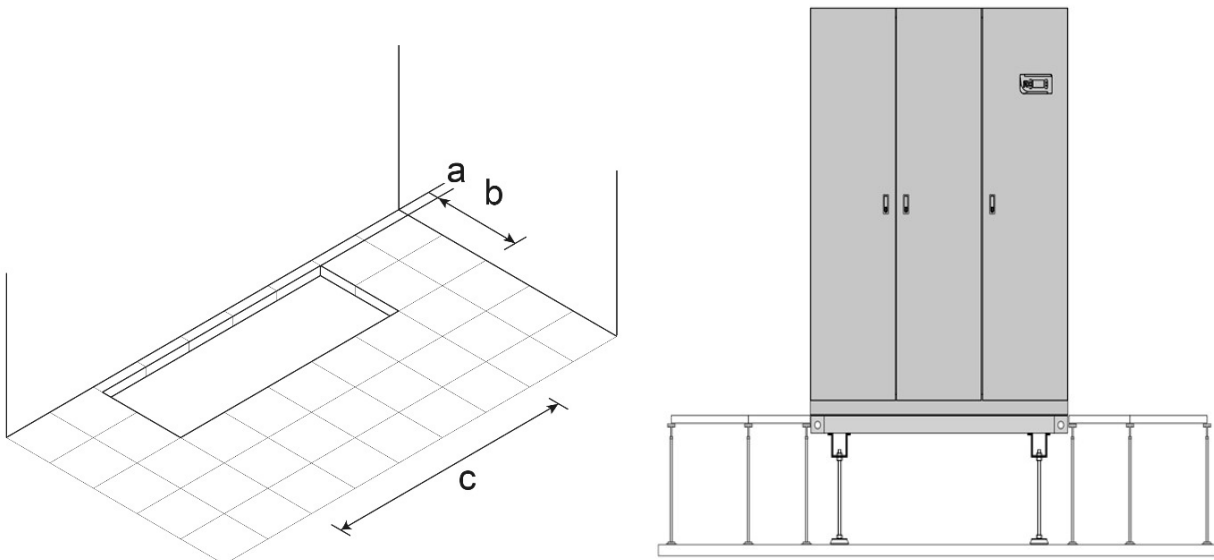
HOLE IN THE RAISED FLOOR WITHOUT FLOOR STAND



Foresee a hole in the floor with the following dimensions:

SIZE		E2
a	mm	95
b	mm	560
c	mm	695

HOLE IN THE RAISED FLOOR WITH FLOOR STAND (OPTION)



Foresee a hole in the floor with the following dimensions:

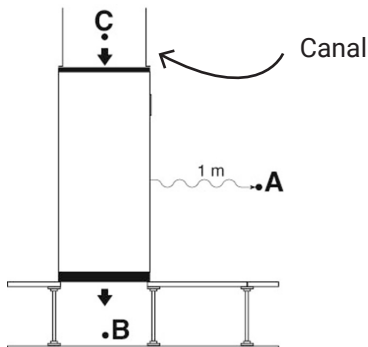
SIZE		E2
a	mm	50
b	mm	670
c	mm	805

12. EXAMPLES OF CALCULATION OF THE SOUND EMISSION OF UNITS

ELCA doc 19/05/2021

Data Book
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UNDER UNIT WITH DUCTING ON INTAKE



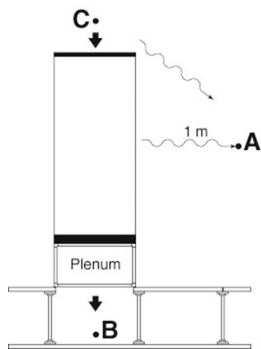
Lp **A** = Design value on front of Under

Lp **B** = Design value on delivery of Under

Lp **C** = Design value on intake of Under

Points **B** and **C** do not influence point **A**

UNDER UNIT WITH PLENUM ON DELIVERY



Lp **A** = Design value on front of Under

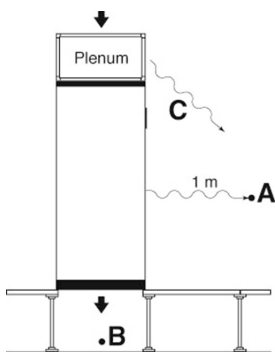
Lp **B** = Design value on delivery of Under – attenuation of plenum

Lp **C** = Design value on intake of Under

Lp **A+C** = $10 \log_{10} \left(10^{\frac{LpA}{10}} + 10^{\frac{LpC}{10}} \right)$

Point **B** does not influence point **A**

UNDER UNIT WITH PLENUM ON INTAKE



Lp **A** = Design value on front of Under

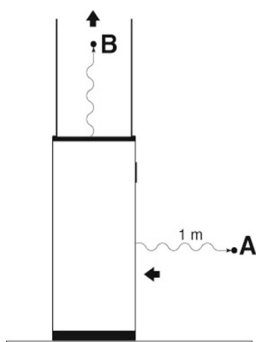
Lp **B** = Design value on delivery of Under

Lp **C** = Design value on intake of Under – attenuation of plenum

Lp **A+C** = $10 \log_{10} \left(10^{\frac{LpA}{10}} + 10^{\frac{LpC}{10}} \right)$

Point **B** does not influence point **A**

OVER UNIT WITH DUCTING



Lp **A** = Design value on intake of Over

Lp **B** = Design value on delivery of Over

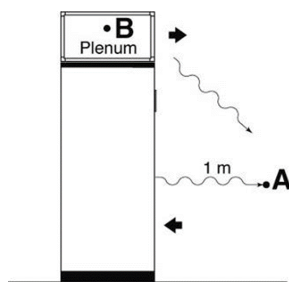
Point **B** does not influence point **A**

12. EXAMPLES OF CALCULATION OF THE SOUND EMISSION OF UNITS

ELCAdoc 19/05/2021

Data Book
i-MTR2-G02-M0_0521_EN

UNDER UNIT WITH PLENUM ON DELIVERY

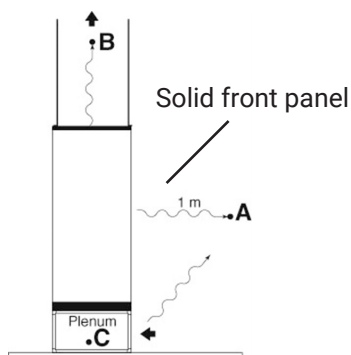


Lp **A** = Design value on intake of Over

Lp **B** = Design value on delivery of Over – attenuation of plenum

$$Lp \mathbf{A+B} = 10 \log_{10} \left(10^{\frac{LpA}{10}} + 10^{\frac{LpC}{10}} \right)$$

OVER UNIT WITH PLENUM ON INTAKE AND DUCTED DELIVERY



Lp **A** = Design value on front of Over

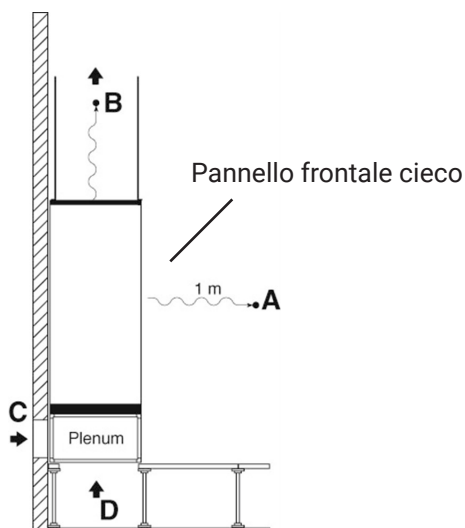
Lp **B** = Design value on delivery of Over

Lp **C** = Lp **A** + 6dB(A) – attenuation of plenum

$$Lp \mathbf{A+C} = 10 \log_{10} \left(10^{\frac{LpA}{10}} + 10^{\frac{LpC}{10}} \right)$$

Point **B** does not influence point **A+C**

OVER UNIT WITH PLENUM ON INTAKE AND DUCTED DELIVERY



Lp **A** = Design value on front of Over

Lp **B** = Design value on delivery of Over

Lp **C** = Lp **D** = Lp **A** + 6 dB(A) – attenuation of plenum

Points **B**, **C** and **D** do not influence point **A**

IMPORTANT

The declared noise values refer to free field conditions.

The sound pressure level of an installed unit depends on the acoustic characteristics of the environment.

Indicatively, the increase in noise varies from +4 to +6 dB (A).

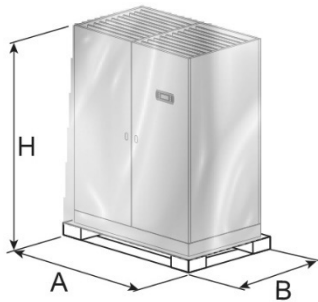
13. INFORMATION ON SHIPPING

13.1. PACKING DIMENSIONS

Values referred to basic unit. The presence of some accessories increases the weight of the unit.
 The units are shrink-wrapped on a pallet for shipping.

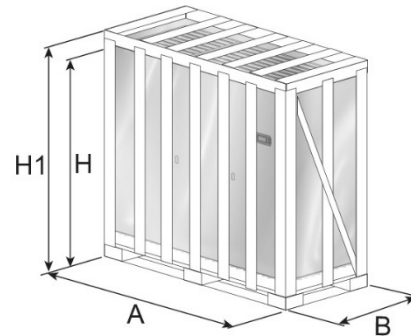
On request, the unit can be packed on a pallet, shrink-wrapped and in a wooden crate.

STANDARD
DIMENSIONS OF PACK



Size	A (mm)	B (mm)	H (mm)
E2	900	750	2080

OPTIONAL 9973: DIMENSIONS
OF PACK IN CRATE



Size	A (mm)	B (mm)	H (mm)	H1 (*) (mm)
E2	940	790	2150	2350

H1 (*) = Height of pack with accessory A531
 On-off damper

13.2. SHIPPING WEIGHT

STANDARD PACKING

Model		012
Size		E2
Weight of UNDER	kg	265.2
Weight of OVER	kg	255.2

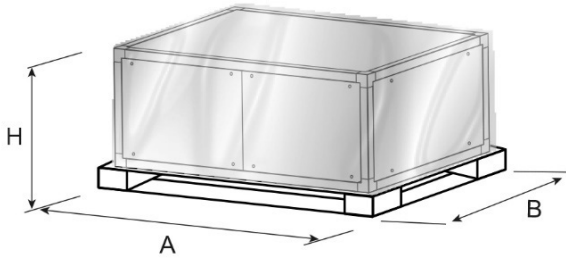
OPTIONAL 9973: PACKING WITH WOODEN CRATE: SHIPPING WEIGHT

STANDARD PACKING

Model		018
Size		E2
Weight of UNDER	kg	293.2
Peso UNDER (1)	kg	318.2
Weight of OVER	kg	283.2
Peso OVER (1)	kg	308.2

(1) Unit with OPTIONAL ACCESSORIES: A531 - ON-OFF damper

13.3. DIMENSIONS OF PACK OF ACCESSORIES AND SHIPPING WEIGHT



- P011 - VACUUM PLENUM**
 - P012 - CL.A1 VACUUM PLENUM**
 - P031 - VACUUM INTAKE PLENUM**
 - P032 - CL.A1 VACUUM INTAKE PLENUM**
 - P013 - PLENUM + 3 GRILLES**
 - P014 - CL.A1 PLENUM + 3 GRILLES**
 - P015 - SILENT PLENUM**
 - P016 - SILENT PLENUM + 1 GRILLE**
 - P017 - PLENUM + EPM2.5 50% FILTER**
 - P018 - PLENUM + EPM1 50% FILTER**
 - P019 - PLENUM + EPM1 85% FILTER**
- The plenums are shipped on a pallet and shrink-wrapped.

Size		E2
DIMENSIONS		
A	mm	900
B	mm	750
H	mm	630
SHIPPING WEIGHT		
P011 - "O" / "U" vacuum plenum	kg	34
P012 - "O" / "U" CL.A1 vacuum plenum	kg	39
P031 - "O" / "U" vacuum intake plenum	kg	34
P032 - "O" / "U" vacuum intake plenum	kg	39
P013 - "O" / "U" plenum + 3 grilles	kg	35
P014 - "O" / "U" CL.A1 plenum + 3 grilles	kg	40
P015 - "O" / "U" silent plenum	kg	39
P013 - "O" / "U" silent plenum + 1 grille	kg	44
P017 - P018 - P019 - "O" / "U" Plenum + filter	kg	39

"O" Over / "U" Under

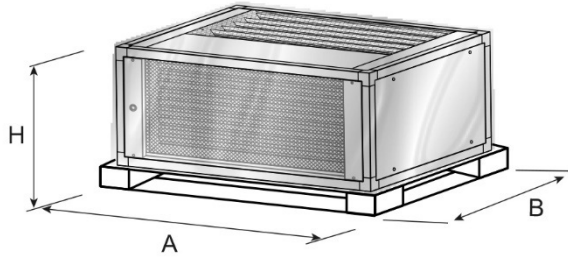
13. INFORMATION ON SHIPPING

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P034: FREE-COOLING INTAKE PLENUM

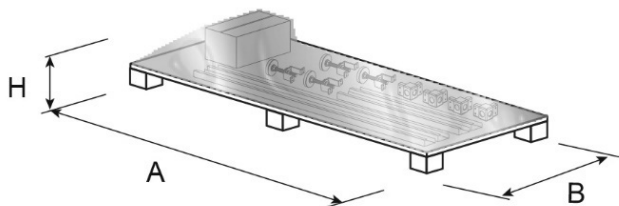
The plenums are shipped on a pallet and shrink-wrapped.



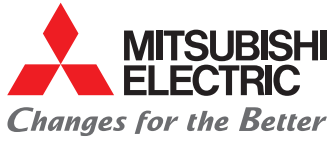
Size		E2
DIMENSIONS		
A	mm	900
B	mm	750
H	mm	630
SHIPPING WEIGHT		
P034 - "U" freecooling intake plenum	kg	39
P034 - "O" freecooling intake plenum	kg	39
"O" Over / "U" Under		

P041 / P042 / P043: FLOOR STAND

The plenums are shipped on a pallet and shrink-wrapped.



Size		E2
DIMENSIONS		
A	mm	1200
B	mm	900
H	mm	500
SHIPPING WEIGHT		
	kg	27



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