

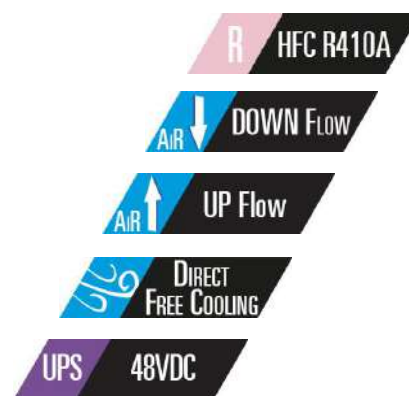
Data Book

T_MID_0120_EN - HFC R410A

MID

2-15 kW

Packaged air conditioners for Telecom applications.
Indoor Installation.



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

- Version with on/off compressor
- Air delivery from top side, downside or floor level
- LT version for outdoor temperature down to -35°C
- Direct free cooling on request
- Power supply from UPS 48VDC on request
- Additional free cooler on request

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CERTIFICATIONS



ISO 9001 CERTIFICATION
Quality Management System



ISO 14001 CERTIFICATION
Environmental Management System



BS OHSAS 18001 CERTIFICATION
Occupational Health and Safety Management System



CE MARKING



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



EAC CERTIFICATION
(Russian Federation, Belarus, Kazakhstan)

GENERAL CHARACTERISTICS



Packaged direct expansion close control air conditioners with built-in air cooled condenser

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.

Machines supply fully assembled with control systems. The installation requires electrical, hydraulic connections and the realization of wall holes for the condenser air inlet and discharge. The same holes are used by the free-cooling system for the fresh air intake.

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

The series is equipped with on/off type refrigerant compressor and consists of 10 models with cooling capacities from 2 to 15 kW

The series are particularly suitable for the conditioning of shelters for mobile telecommunication, telephone exchanges, or in all other critical applications with high technological content.

The units may have upflow, downflow or at floor level air supply. Air suction from front, up or down side of the unit, according to the model.

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.

- Double power supply (network + UPS 48VDC)
- Direct Free-Cooling with proportional action
- Additional Free-Cooling system (external free-cooler)
- Electric heaters

PRODUCT FEATURES AND BENEFITS

- Wide operating range in mechanical cooling with outdoor air temperatures from 48°C to -20°C (up to -35°C with LT version)
- Adaptable to any type of plant thanks to the multiple alternatives of ambient air discharge and suction.
- Improvement of the control software with advanced control logic
- Up to 10 units connected in LAN with the possibility of remote control from a single shared terminal
- Quiet operation particularly suitable for applications in urban areas.
- Operating life of the project exceeding 10 years

F-GAS DIRECTIVE

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

MODEL IDENTIFICATION

Packaged air conditioners for Telecom applications
MID BASIC 0031

MID	Series with on/off compressor
BASIC	Version BASIC = Basic version LT = Version for low ambient temperature
0031	Model

WORKING LIMITS

OUTDOOR AIR CONDITIONS

-20°C	minimum temperature with dry bulb
48°C	maximum temperature with dry bulb

LT version for low outdoor temperature (only MID)

-35°C	minimum temperature with dry bulb
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ROOM TEMPERATURE

15,5°C	minimum temperature with wet bulb.
22°C	minimum temperature with dry bulb
23,5°C	maximum temperature with wet bulb.
32°C	maximum temperature with dry bulb.

POWER SUPPLY

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

PROTECTIONS

3,0 Bar ± 0,2	Low pressure switch intervention (open) for all models
3,9 bar ± 0,3	Low pressure switch restore (close) for all models
41,5 Bar +0 / -1,4	High pressure switch intervention (open) models 0001 / 0003 / 0004 / 0011
42,0 Bar +0 / -1,4	High pressure switch intervention (open) from model 0021 to model 0061
33,0 Bar ± 2,0	High pressure switch restore (close) for all models

TRANSPORT AND STORAGE TEMPERATURE

During transport and if the machine is not installed at the reception, do not remove the packaging and place the machine in an enclosed, dry and protected from sunlight site at temperatures ranging between -30°C and 50°C in absence of superficial condensation.

TYPES OF INSTALLATION

The units have been designed to perfectly fit the different installation requirements. Typical installation is on the perimeter of the room, with the unit adjacent to the wall of the room to be conditioned. Two openings in the wall allows the intake and exhaust air of the condenser; the air intake is also used for the free-cooling system. In case it is not possible to lay the units adjacent to the wall, a kit is available with flexible pipes to duct the air intake and discharge of the condenser / free-cooling system. The air handling section is suitable for any type of plant with air return / delivery form the upper side, bottom side or frontal.

AVAILABLE AIR FLOW:

UNDER air flow: return air form the upper side of the unit and air delivery the bottom side.

OVER air flow: air return form the front side of the unit and air delivery from the upper side.

Types of installation:

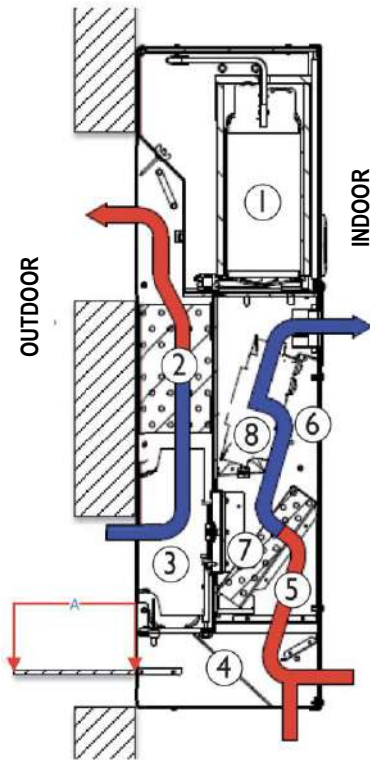
	OVER	UNDER	OVER	OVER	UNDER	UNDER	UNDER	UNDER
0001	✓	✗	✗	✗	✗	✗	✗	✗
0003	✗	✓	✗	✗	✗	✗	✗	✗
0004	✗	✓	✗	✗	✗	✗	✗	✗
0011	✗	✗	✓	✓	✓	✓	✓	✓
0021	✗	✗	✓	✓	✓	✓	✓	✓
0031	✗	✗	✓	✓	✓	✓	✓	✓
0041	✗	✗	✓	✓	✓	✓	✓	✓
0051	✗	✗	✓	✓	✓	✓	✓	✓
0056	✗	✗	✓	✓	✓	✓	✓	✓
0061	✗	✗	✓	✓	✓	✓	✓	✓

Models

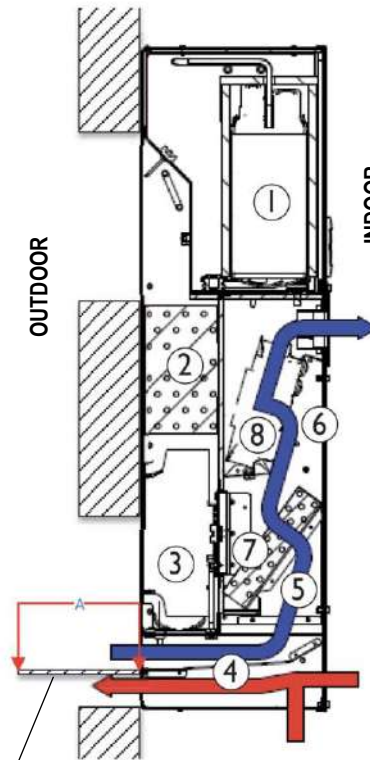
WORKING PRINCIPLE

OVER - Model 0001

MECHANICAL COOLING



FREE COOLING

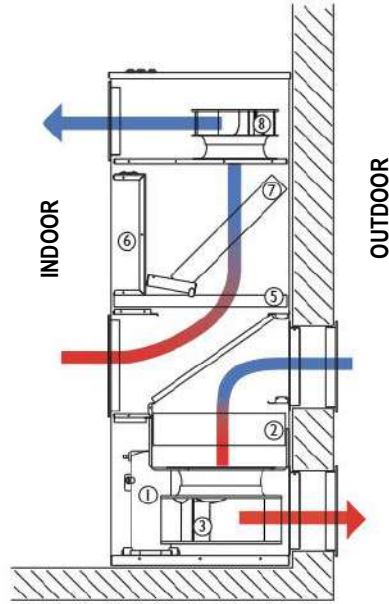


- 1. Compressor
- 2. Condenser
- 3. Condenser fan
- 4. Free-cooling system
- 5. Air filter
- 6. Electrical box
- 7. Evaporator
- 8. Supply fan

In case of unit with free-cooling damper, provide a partition to separate the air suction and discharge.

OVER – STANDARD UNIT

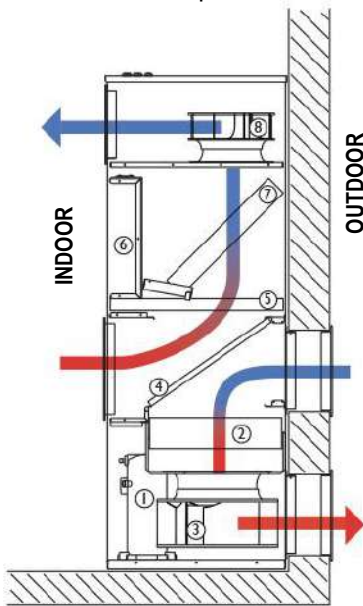
From model 0011 up to model 0061



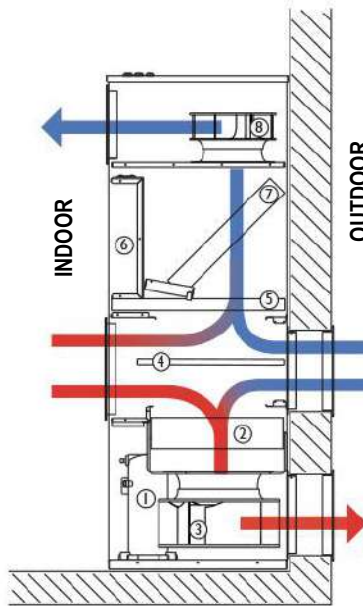
MECHANICAL COOLING

OVER – UNIT WITH FREE-COOLING SYSTEM

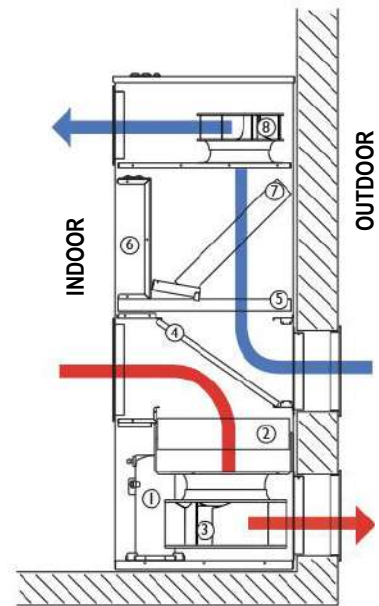
From model 0011 up to model 0061



MECHANICAL COOLING



PARTIAL FREE-COOLING

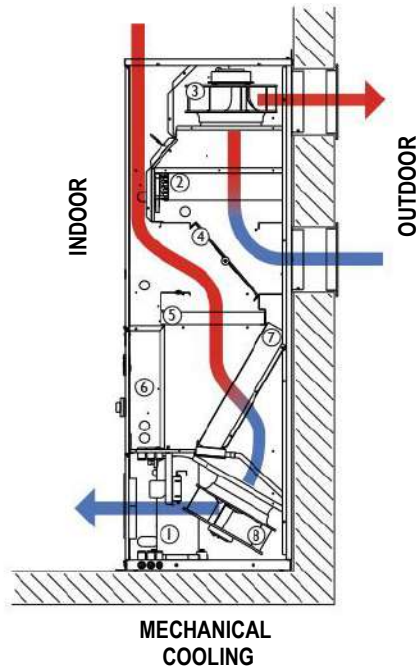


TOTAL FREE-COOLING

- 1 Compressor
- 2 Condenser
- 3 Condenser fan
- 4 Free-cooling system
- 5 Air filter
- 6 Electrical box
- 7 Evaporator
- 8 Supply fan

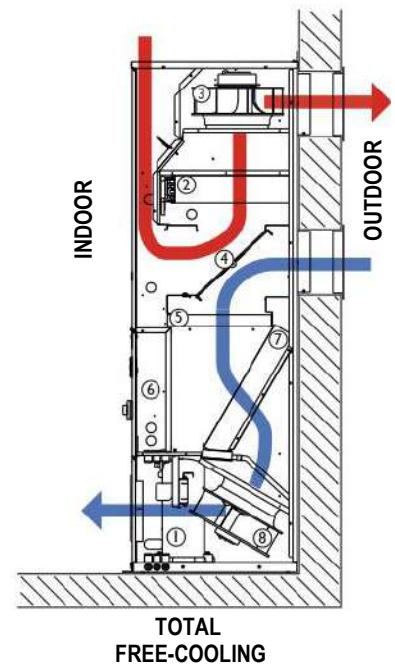
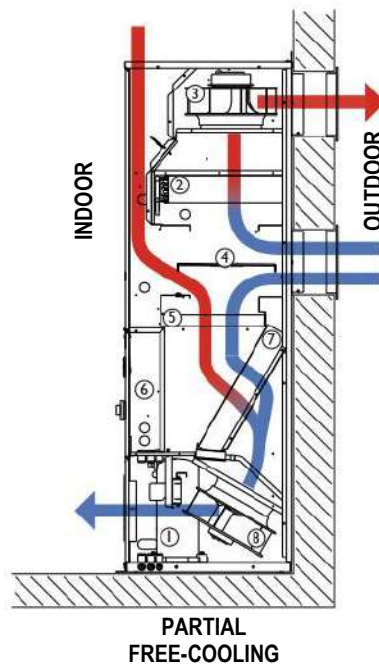
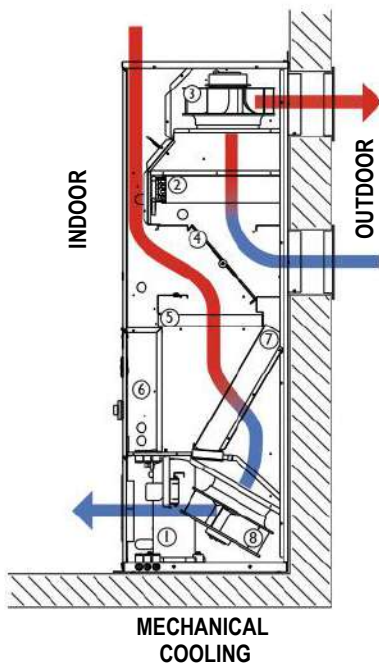
UNDER – STANDARD UNIT

From model 0003 up to model 0061



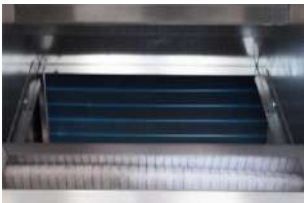
UNDER – UNIT WITH FREE-COOLING SYSTEM

From model 0003 up to model 0061



- 1. Compressor
- 2. Condenser
- 3. Condenser fan
- 4. Free-cooling system
- 5. Air filter
- 6. Electrical box
- 7. Evaporator
- 8. Supply fan

MAIN COMPONENTS



FRAMEWORK

- Base, frame and panels in galvanized steel sheet and painted with epoxy powders. Colour RAL 9010;
- Non-flammable closed cell polyethylene foam thermal insulation and soundproofing on the inside
- Room air intake and delivery protect with grilles formed on the panelling.
- Hinged front panels.
- Total front access for routine maintenance.
- Compartment for electrical panel on unit front for direct access to control and regulation devices;
- Power supply input from top and bottom the unit.

FILTER SECTION

- Fire-resistant washable air filters with COARSE 50% efficiency (according to ISO EN 16890), with cells in synthetic fibre and metallic frame (EN 779-2012).

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 or peralluman.
- Condensate tray in stainless steel or peralluman with PVC flexible discharge pipe. The condensate drains by gravity.
- Temperature sensors on air intake with control and regulation functions.

SUPPLY FAN SECTION

- Centrifugal fans with backward curved blades with wing profile, single suction and without scroll housings (Plug-fans), directly coupled to external rotor electric motor;
- Impeller in composite material exempt from rust formation.
- Electric motor:
- EC type for model 0001 and model 0061
- AC type for model 0003, 0004, 0011 0021, 0031, 0041, 0051, 0056
- Rubber support
- Differential pressure switch on the air side for air flow loss alarm signal.

CONDENSING SECTION

- Heat exchanger coil with copper tubes and high efficiency aluminium fins, specifically developed to provide high heat transfer and lower pressure drops.
- Frame in galvanized steel or peralluman.

CONDENSER FAN SECTION

Model: 0001, 0003, 0004:

- Centrifugal fans with backward curved blades with wing profile, single suction and without scroll housings (Plug-fans), directly coupled to external rotor electric motor;
- Impeller in composite material exempt from rust formation.
- AC electric motor:
- Condensing control system with variation of fan speed through phase-cut electronic regulator directly driven by the condensing pressure proportional signal.
- Rubber support

Model: 0011, 0021, 0031:

- Double suction centrifugal fan directly coupled to external rotor electric motor;
- AC electric motor:
- Condensing control system with variation of fan speed through phase-cut electronic regulator directly driven by the condensing pressure proportional signal.
- Rubber support

Model: 0041, 0051 0056, 0061:

- Centrifugal fans with backward curved blades with wing profile, single suction and without scroll housings (Plug-fans), directly coupled to external rotor electric motor;
- Impeller in composite material exempt from rust formation.
- EC electric motor
- Condensing control system with variation of fan speed through 0-10Vdc signal.
- Rubber support



COMPRESSOR SECTION

Model: 0001, 0003, 0004, 0011:

- Rotary vane compressors for R410A refrigerant
- 2-pole electric motor with direct on line starting.
- Crankcase heater.
- Rubber supports.

Model: 0021, 0031, 0041, 0051, 0056, 0061

- Scroll rotary compressors with spiral profile optimized for R410A refrigerant.
- 2-pole electric motor with direct on line starting.
- Crankcase heater.
- Rubber supports.

REFRIGERANT CIRCUIT

- Calibrated capillary (from model 0001 up to model 0011 included)
- Mechanical expansion valve (from model 0021 up to model 0061 included)
- Sight glass.
- Filter dryer on liquid line.
- Liquid receiver (only OVER version up to model 0031 included)
- High pressure safety switch with automatic reset.
- Low pressure safety switch with automatic reset.
- High pressure transducer for condensing control:
Condenser fan with AC motor:
 - Condensing control system with variation of fan speed through phase-cut electronic regulator.
- Condenser fan with EC motor:
 - Condensing control system with variation of fan speed through 0-10Vdc signal.
- Refrigerant circuit with copper tubing with anticondensate insulation of the suction line.
- R410A refrigerant charge and lubricant oil.



ELECTRICAL PANEL

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

- Main switch with door lock safety on frontal panel.
- Magnetothermic switches for fans and compressor.
- Contactors for each load. The EC electric motor and don't requires contactor.
- Transformer for auxiliary circuit and microprocessor supply.
- Terminals for inlets / outlets.
- Power supply: 230/1/50 or 400/3+N/50 according to the model (see TECHNICAL DATA)



CONTROL SYSTEM

Microprocessor control system with graphic display for control and monitor of operating and alarms status. The system includes:

- Built-in memory for the storing of the intervened events (up to 100 events recorded);
- Predisposition for connectivity board housing (RS485, LON, Ethernet. The electronic cards are optional accessories;
- Non-volatile "Flash" memory for data storage in case of power supply faulty;
- Menu with protection password;
- LAN connection (max 10 units).

OPTIONAL ACCESSORIES

A551.....	400/3+N/50 power supply for model 0021
A552.....	230/1/50 power supply for model 0031
B082.....	With UPS 48 Vdc: The accessory includes two main switches with door lock single command on the switchboard panel. The power supply of UPS is also available with other voltages - please contact the sales department for more information.
1511 – 1512	Soft-Start: Start system for compressor motor (not available for model 0001, 0003, 0004, 0011).
881	Copper/Copper external coil: Condensing coil Cu/Cu execution
893	Epoxy coated external coil: Condensing coil with epoxy paint protection
896	Cataphoresis coated external coil: Condensing coil with cataphoresis paint protection.
A724.....	EC fan: Supply fan with power supply from network: <ul style="list-style-type: none"> - Centrifugal fans with backward curved blades with wing profile, single suction and without scroll housings (Plug-fans), directly coupled to external rotor electric motor; - Impeller in composite material exempt from rust formation. - EC type electric motor: - Rubber support
A727.....	EC fan with UPS VDC: Supply fan with power supply from UPS: <ul style="list-style-type: none"> - Centrifugal fans with backward curved blades with wing profile, single suction and without scroll housings (Plug-fans), directly coupled to external rotor electric motor; - Impeller in composite material exempt from rust formation. - EC type electric motor: - Rubber support
A181.....	Soundproof jacket: Compressor soundproof cap for a sound level reduction of 2 dB(A).
A431.....	Electric heater: Electric heating system
A352.....	No display: Unit supplied without controller display.
A481.....	Clock card: Clock card for controller.
A471 – A473 - A474	Serial card: <ul style="list-style-type: none"> - A471 RS485 serial card - A473 Ethernet card - A474 LON card
A501.....	Clogged filter sensor: Differential pressure switch for clogged filters signalling.
B174.....	0-10V Free-Cooling damper: Direct free-cooling system. The system is available for power supply from network or double power supply from network + 48Vdc from UPS.
B175.....	0-10V Free-Cooling damper+spring return: Direct free-cooling system. The system is available for power supply from network or double power supply from network + 48Vdc from UPS. Servomotor with spring return. (not available for model 0001, 0003, 0004). In the event of a power failure, the spring system completely closes the damper (Free-Cooling OFF).
A801.....	Temperature/Humidity sensor only: Combined room temperature / humidity probe. Only visualization of room humidity.
A803.....	Dehumidification only: Dehumidification system with humidity probe. For the control of the room humidity.
B103.....	Adjustable horizontal air grille: Grille on room air delivery with a single row manually adjustable fin - only horizontal.
B104.....	Adjustable horizontal/vertical air grille: Grille on room air delivery with a double row manually adjustable fins – horizontal and vertical.
A212.....	COARSE 60% air filter: Washable air filter with COARSE 60% efficiency (according to ISO EN 16890), (not available for model 0001, 0003, 0004).
B121.....	Metal mesh air filter: Metal mesh filter on outdoor air suction grille. The optional accessory is available only with free cooling damper on unit.
B181.....	External Free Cooler management: Power supply and control of the external Free Cooler. The accessory is available only with double power supply Network + 48Vdc from UPS system.
7387012600	Remote Terminal display EVOLUTION (for wall installation): Remote terminal for connecting and managing multiple units connected in LAN.
7396023600	Free cooler indoor installation 0021 48vdc RAL 9010: External Free-Cooler. The accessory is available only with double power supply Network + 48Vdc from UPS system (not available for model 0001, 0003, 0004).

7396023700	Free cooler indoor installation 0041 48vdc RAL 9010: External Free-Cooler. The accessory is available only with double power supply Network + 48Vdc from UPS system (not available for model 0001, 0003, 0004).
7396023800	Free cooler outdoor installation 0021 48vdc RAL 9010: External Free-Cooler. The accessory is available only with double power supply Network + 48Vdc from UPS system (not available for model 0001, 0003, 0004).
7396023900	Free cooler outdoor installation 0041 48vdc RAL 9010: External Free-Cooler. The accessory is available only with double power supply Network + 48Vdc from UPS system (not available for model 0001, 0003, 0004).
7396023400	Air connection kit (models 0011-0031): Circular air connections and flexible ducts for condenser air suction and discharge.
7396024900	Air connection kit (models 0041-0061): Circular air connections and flexible ducts for condenser air suction and discharge.
7396020700	Fresh air suction and delivery grilles – OVER models 0011-0031: Air grilles kit for condenser air suction and discharge. The air suction grille can be supplied with metal mesh air filter (not available for model 0001, 0003, 0004).
7396020800	Fresh air suction and delivery grilles – OVER models 0041-0061: Air grilles kit for condenser air suction and discharge. The air suction grille can be supplied with metal mesh air filter (not available for model 0001, 0003, 0004).
7396020900	Fresh air suction and delivery grilles – UNDER models 0011-0031: Air grilles kit for condenser air suction and discharge. The air suction grille can be supplied with metal mesh air filter (not available for model 0001, 0003, 0004).
7396021000	Fresh air suction and delivery grilles – UNDER models 0041-0061: Air grilles kit for condenser air suction and discharge. The air suction grille can be supplied with metal mesh air filter (not available for model 0001, 0003, 0004).
7369009900	Overpressure damper: Overpressure damper (not available for model 0001, 0003, 0004). The optional accessory is useful for balancing the excess of pressurization in the indoor environment and is suggested when free-cooling damper (optional accessory) or external free-cooler (optional accessory) are foreseen.
5596034800	Base frame kit – models 0011-0031: Base frame with adjustable height between 200 and 600 mm. (not available for model 0001, 0003, 0004).
5596034900	Base frame kit – models 0041-0061: Base frame with adjustable height between 200 and 600 mm. (not available for model 0001, 0003, 0004).
7396019400	Coupling frame for 0011-0031: Dima kit to adapt the existing holes of the wall with the condenser air suction and discharge (not available for model 0001, 0003, 0004).
7396019500	Coupling frame for 0041-0061: Dima kit to adapt the existing holes of the wall with the condenser air suction and discharge (not available for model 0001, 0003, 0004).
9973	Wooden cage packing: Unit packing in wooden cage

WARNING

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

TECHNICAL DATA – POWER SUPPLY FROM NETWORK

MODEL		0001	0003	0004	0011	0021
AIR FLOW (1)		O	U	U/O	U/O	U/O
COOLING CAPACITY (2)						
Total	kW	1,95	2,91	3,45	4,94	6,09
Sensible	kW	1,42	2,67	2,88	4,94	5,49
SHR (3)		0,73	0,92	0,83	1,00	0,90
Total power input (Comp. + Fans)	kW	0,80	1,19	1,36	2,17	2,68
SUPPLY FAN	n.	1	1	1	1	1
Fan type		Radial EC	Radial AC	Radial AC	Radial AC	Radial AC
Air flow	m³/h	300	990	990	1450	1450
Nominal external static pressure	Pa	20	20	20	20	20
Maximum external static pressure	Pa	188	168	168	65	65
Power input (4)	kW	0,06	0,15	0,15	0,26	0,26
ON/OFF COMPRESSOR		Rotary	Rotary	Rotary	Rotary	Scroll
Quantity	n.	1	1	1	1	1
Capacity steps	n.	1	1	1	1	1
Power input	kW	0,60	0,81	0,98	1,18	1,69
CONDENSER FAN	n.	1	1	1	1	1
Fan type		Radial AC	Radial AC	Radial AC	Centrifugal AC	Centrifugal AC
Air flow	m³/h	500	1210	1210	2600	2600
Power input (4)	kW	0,14	0,23	0,23	0,73	0,73
AIR FILTERS	n.	1	1	1	1	1
Efficiency (ISO EN 16890)	COARSE	50%	50%	50%	50%	50%
REFRIGERANT		R410A	R410A	R410A	R410A	R410A
Gas circuit	n.	1	1	1	1	1
POWER SUPPLY	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
ENERGY INDEX (2)						
EER = Energy Efficiency Ratio	kW/kW	2,44	2,45	2,54	2,28	2,27
DIMENSIONS						
OVER Length	mm	394	--	--	650	650
OVER Width	mm	250	--	--	650	650
OVER Height	mm	900	--	--	2075	2075
UNDER Length	mm	--	505	505	650	650
UNDER Width	mm	--	395	395	650	650
UNDER Height	mm	--	1265	1265	2000	2000
NET WEIGHT OVER	kg	40	--	--	163	176
NET WEIGHT UNDER	kg	--	85	85	180	193
CONDENSATE DISCHARGE	F Ø	1/2"	1/2"	1/2"	1/2"	1/2"

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

1. U = Under / O = Over
2. Gross Value. Characteristics referred to entering air at 27°C with 50%RH and ambient air temperature 35°C. ESP=20Pa.
3. SHR = Sensible cooling capacity / Total cooling capacity.
4. Corresponding to the nominal external static pressure.

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

TECHNICAL DATA – POWER SUPPLY FROM NETWORK

MODEL		0031	0041	0051	0056	0061
AIR FLOW (1)		U/O	U/O	U/O	U/O	U/O
COOLING CAPACITY (2)						
Total	kW	8,14	9,52	10,60	13,80	14,80
Sensible	kW	6,72	8,64	9,07	12,50	12,90
SHR (3)		0,83	0,91	0,86	0,91	0,87
Total power input (Comp. + Fans)	kW	3,32	3,62	4,05	4,86	5,90
SUPPLY FAN	n.	1	2	2	2	2
Fan type		Radial AC	Radial AC	Radial AC	Radial AC	Radial EC
Air flow	m³/h	1600	2200	2200	3200	3200
Nominal external static pressure	Pa	20	20	20	20	20
Maximum external static pressure	Pa	68	76	76	67	72
Power input (4)	kW	0,26	0,48	0,48	0,52	0,98
ON/OFF COMPRESSOR		Scroll	Scroll	Scroll	Scroll	Scroll
Quantity	n.	1	1	1	1	1
Capacity steps	n.	1	1	1	1	1
Power input	kW	2,33	2,35	2,78	3,51	4,09
CONDENSER FAN	n.	1	1	1	1	1
Fan type		Centrifugal AC	Radial EC	Radial EC	Radial EC	Radial EC
Air flow	m³/h	2600	3700	3700	4500	4500
Power input (4)	kW	0,73	0,79	0,79	0,83	0,83
AIR FILTERS	n.	1	1	1	1	1
Efficiency (ISO EN 16890)	COARSE	50%	50%	50%	50%	50%
REFRIGERANT		R410A	R410A	R410A	R410A	R410A
Gas circuit	n.	1	1	1	1	1
POWER SUPPLY	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
ENERGY INDEX (2)						
EER = Energy Efficiency Ratio	kW/kW	2,45	2,63	2,62	2,84	2,51
DIMENSIONS						
OVER Length	mm	650	895	895	895	895
OVER Width	mm	650	750	750	750	750
OVER Height	mm	2075	2050	2050	2050	2050
UNDER Length	mm	650	895	895	895	895
UNDER Width	mm	650	750	750	750	750
UNDER Height	mm	2000	2050	2050	2050	2050
NET WEIGHT OVER	kg	172	262	270	275	290
NET WEIGHT UNDER	kg	189	252	260	265	280
CONDENSATE DISCHARGE	F Ø	1/2"	1/2"	1/2"	1/2"	1/2"

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

1. U = Under / O = Over
2. Gross Value. Characteristics referred to entering air at 27°C with 50%RH and ambient air temperature 35°C. ESP=20Pa.
3. SHR = Sensible cooling capacity / Total cooling capacity.
4. Corresponding to the nominal external static pressure.

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

“LT” VERSION FOR OPERATION WITH OUTDOOR TEMPERATURES DOWN TO -35°C

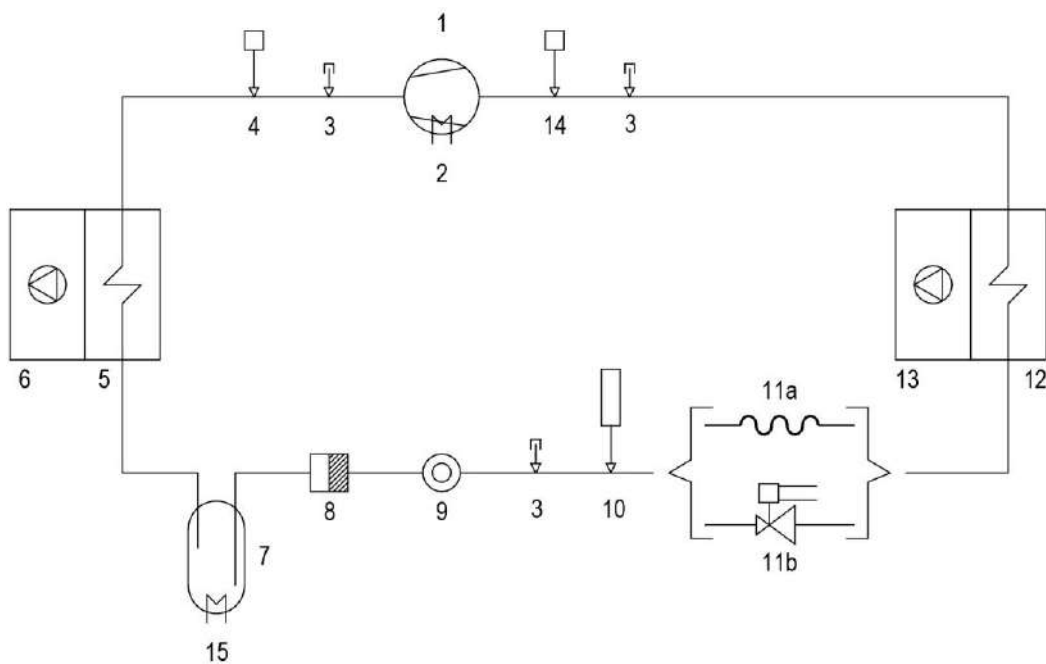
The version allows the mechanical cooling operation of the air conditioner with outdoor temperatures down to -35°C.

Not available for model 0001, 0003, 0004

Additional components to the standard refrigerant circuit:

- Oversized liquid receiver
- Self-regulation heating cable for liquid receiver

REFRIGERANT CIRCUIT



- 1 Compressor
- 2 Crankcase heater
- 3 Pressure gate
- 4 High pressure switch – automatic reset
- 5 Condenser
- 6 Fan condenser
- 7 Liquid receiver (only for LT version and up to model 0031 OVER for BASIC version)
- 8 Filter drier
- 9 Sight glass
- 10 High pressure transducer
- 11a Calibrated capillary (up to model 0011 included)
- 11b Mechanical expansion valve (other models)
- 12 Evaporator
- 13 Supply fan
- 14 Low pressure switch – automatic reset
- 15 Liquid receiver heater (only LT version)

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		0001	0003	0004	0011	0021
SOUND LEVEL ISO 3744 (1)		230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
Indoor sound pressure	dB(A)	49	52	52	53	53

MODEL		0031	0041	0051	0056	0061
SOUND LEVEL ISO 3744 (1)		400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Indoor sound pressure	dB(A)	54	56	56	60	61

1. Sound pressure level at 1meter in free field - ISO 3744

ELECTRICAL DATA

SINGLE POWER SUPPLY

POWER SUPPLY FROM NETWORK

MODEL		0001	0003	0004	0011	0021	0021 (1)
POWER SUPPLY		230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	400/3+N/50 (1)
STANDARD UNIT							
Max power input (FLI)	kW	1,12	1,49	1,59	2,98	3,70	3,80
Max current input (FLA)	A	5,48	6,50	7,60	14,50	21,40	10,90
Start up current (SA)	A	15,70	22,00	34,00	41,40	63,40	31,40
Power input (OI)	kW	0,80	1,19	1,36	2,17	2,68	2,68

MODEL		0031 (1)	0031	0041	0051	0056	0061
POWER SUPPLY		230/1/50 (1)	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
STANDARD UNIT							
Max power input (FLI)	kW	4,65	4,50	5,25	5,63	7,27	8,55
Max current input (FLA)	A	22,50	11,40	10,80	11,80	13,80	18,70
Start up current (SA)	A	72,40	40,40	49,80	51,80	67,80	74,80
Power input (OI)	kW	3,32	3,32	3,62	4,05	4,86	5,90

(1) Power supply available as option

WARNING:

The electrical data indicated are referred to standard units, without optional accessories.
Optional accessory electric data are included within the dedicated chapters and must be added.

DOUBLE POWER SUPPLY

POWER SUPPLY FROM NETWORK:

Powered from the network: the compressor, the condenser fan and the eventual electric heater.

POWER SUPPLY FROM UPS:

Powered from UPS: supply fan, the auxiliary of electrical box, the microprocessor control, the eventual free-cooling damper servomotor and the eventual external free-cooler.

POWER SUPPLY FROM NETWORK + UPS 48Vdc

MODEL		0001	0003	0004	0011	0021	0021 (1)
POWER SUPPLY FROM NETWORK		230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	400/3+N/50 (1)
STANDARD UNIT							
Max power input (FLI)	kW	1,04	1,33	1,43	2,71	3,43	3,53
Max current input (FLA)	A	4,68	5,82	6,92	13,30	20,20	9,70
Start up current (SA)	A	15,70	22,00	34,00	40,20	62,20	30,20
Power input (OI)	kW	0,74	1,04	1,21	1,91	2,42	2,42
POWER SUPPLY FROM UPS		48Vdc	48Vdc	48Vdc	48Vdc	48Vdc	48Vdc
Max power input (FLI)	kW	0,05	0,18	0,18	0,38	0,38	0,38
Max current input (FLA)	A	1,01	3,71	3,71	6,72	6,72	6,72
Start up current (SA)	A	1,01	3,70	3,70	6,72	6,72	6,72
Power input (OI)	kW	0,04	0,18	0,18	0,24	0,24	0,24

MODEL		0031 (1)	0031	0041	0051	0056	0061
POWER SUPPLY FROM NETWORK		230/1/50 (1)	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
STANDARD UNIT							
Max power input (FLI)	kW	4,38	4,23	4,71	5,09	6,73	7,55
Max current input (FLA)	A	21,30	10,20	8,40	9,40	11,40	12,40
Start up current (SA)	A	71,20	39,20	47,40	49,40	65,40	68,50
Power input (OI)	kW	3,06	3,06	3,14	3,57	4,34	4,92
POWER SUPPLY FROM UPS		48Vdc	48Vdc	48Vdc	48Vdc	48Vdc	48Vdc
Max power input (FLI)	kW	0,38	0,38	0,76	0,76	0,76	0,76
Max current input (FLA)	A	6,72	6,72	13,40	13,40	13,40	13,40
Start up current (SA)	A	6,72	6,72	13,40	13,40	13,40	13,40
Power input (OI)	kW	0,25	0,25	0,45	0,45	0,49	0,49

(1) Power supply available as option

WARNING:

The electrical data indicated are referred to standard units, without optional accessories.




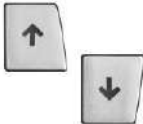

Optional accessory electric data are included within the dedicated chapters and must be added.

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.

KEYBOARD FUNCTIONS

	ALARM	Alarm, Back-red light active – alarm presence, push 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; Alarm log; Graphs, Clock, User, Maintenance. Use the ENTER key to execute the mode.
	ESC	Home. Used to come back to the previous menu level or to the main screen.
	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 optional serial port, the microprocessor control enables communication with the modern buildings BMS systems with the following protocols:

- RS485 serial card;
- LON Works serial card;
- Ethernet serial card;

PASSWORD

No password is required to access: STATUS, ALARM HISTORY, GRAPHICS

Level 1: Access to STATUS, ALARM HISTORY, GRAPHICS, CLOCK, USER

Level 2: Contact MEHITS Service: Access to STATUS, ALARM HISTORY, GRAPHICS, CLOCK, USER, MANITENANCE

LAN NETWORK

The LAN is part of the control software and it is possible to connect 10 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.

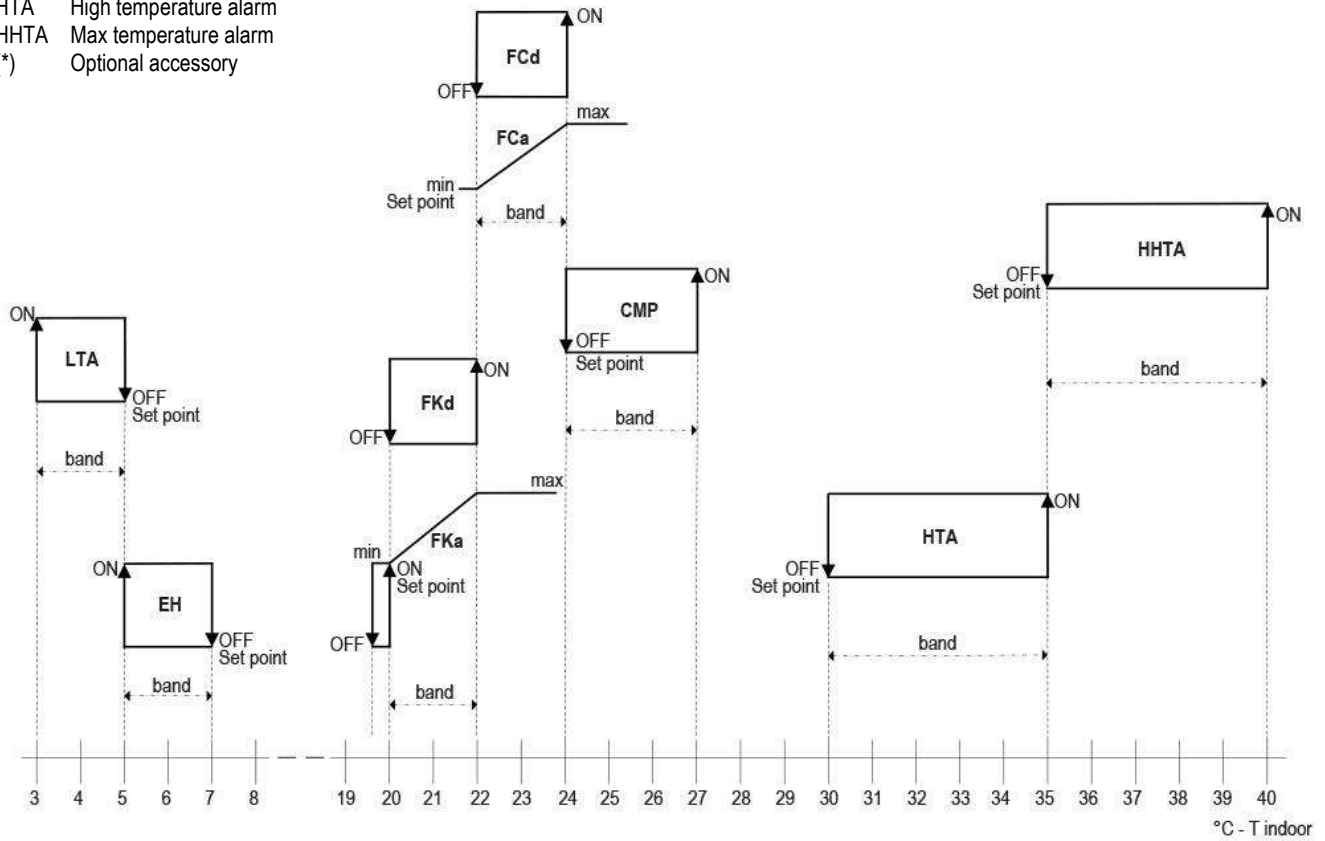
LAN ADDRESS LIST

Unit #	1	2	3	4	5	6	7	8	9	10	Remote Terminal
Terminal address	11	12	13	14	15	16	17	18	19	20	32
Mother board address	1	2	3	4	5	6	7	8	9	10	-

AIR TEMPERATURE CONTROL LOGIC

EXAMPLE - CONTROL LOGIC
Temperatures are indicative

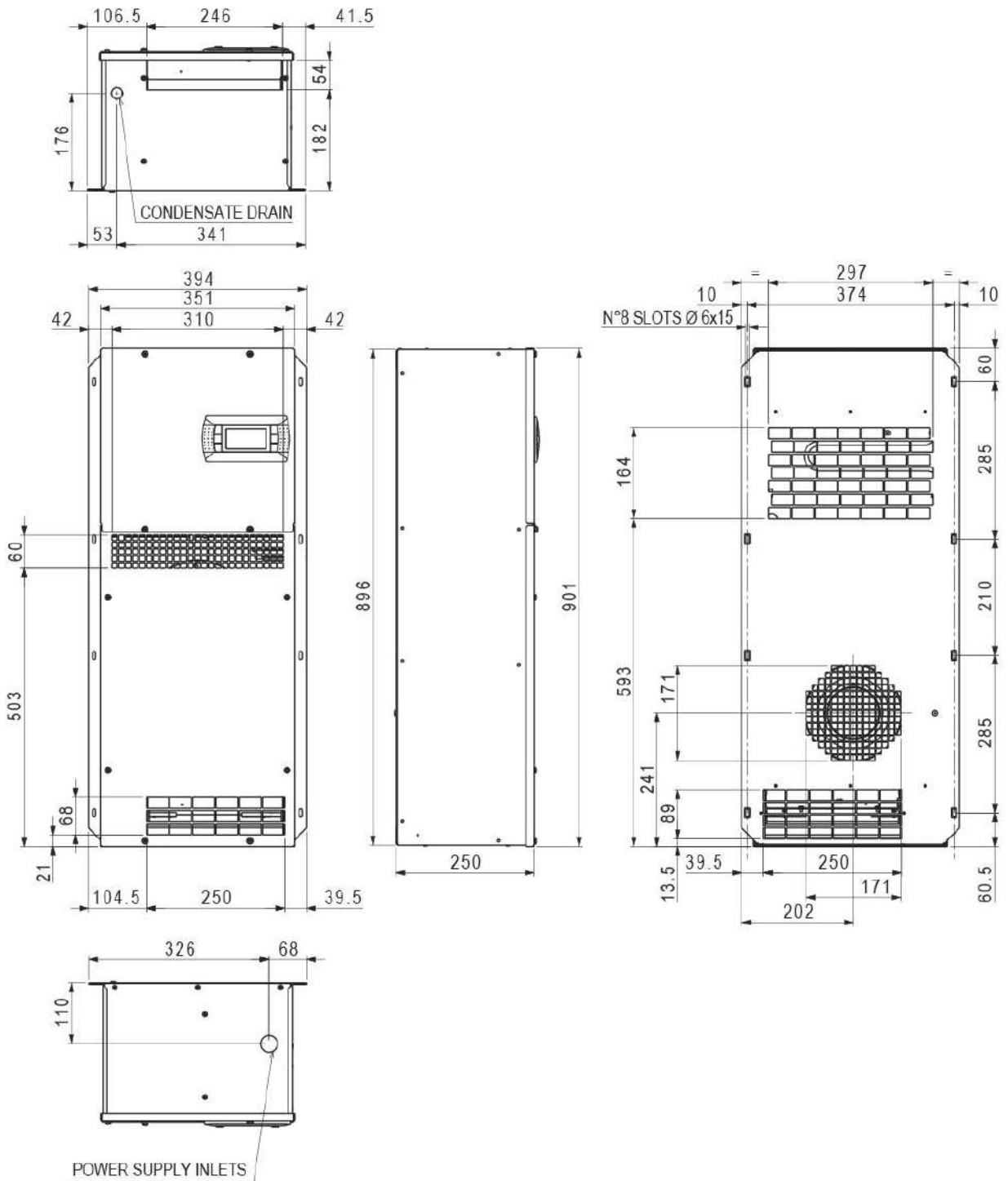
- LTA Low temperature alarm
- EH electric heater (*)
- FKd External Free Cooler digital control (*)
- FKa External Free Cooler analogue control (*)
- FCd Free-cooling damper digital control (*)
- FCa Free-cooling damper analogue control (*)
- CMP On/off compressor
- HTA High temperature alarm
- HHTA Max temperature alarm
- (*) Optional accessory



UNITS DRAWINGS

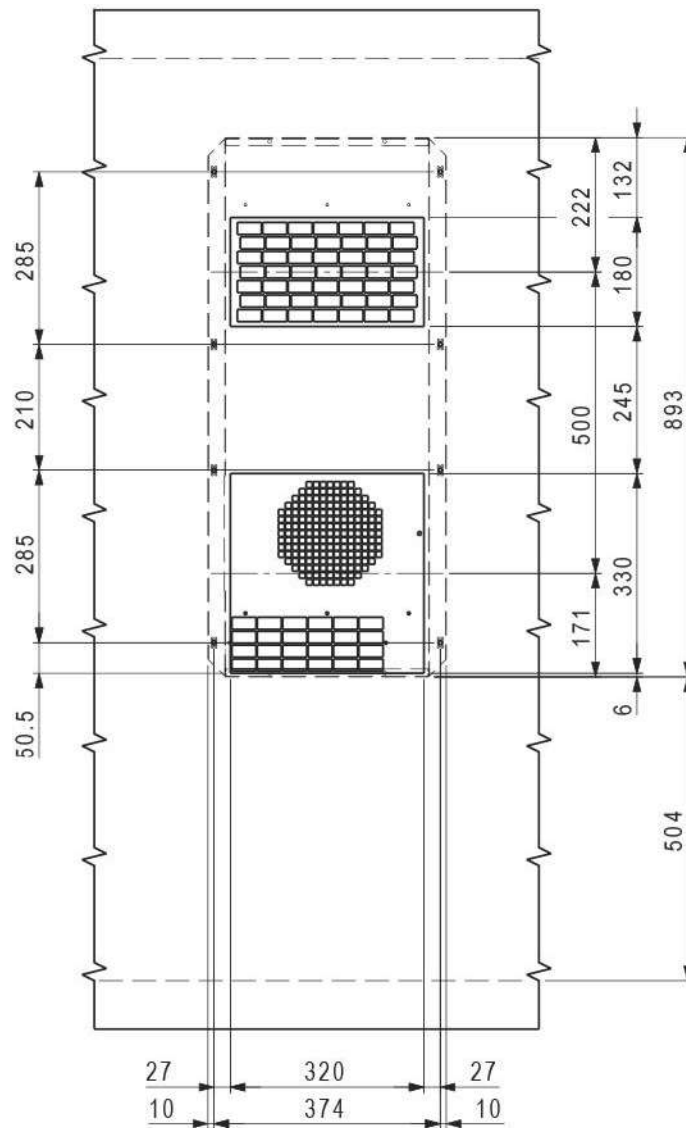
Dimensions in mm

Model 0001 OVER



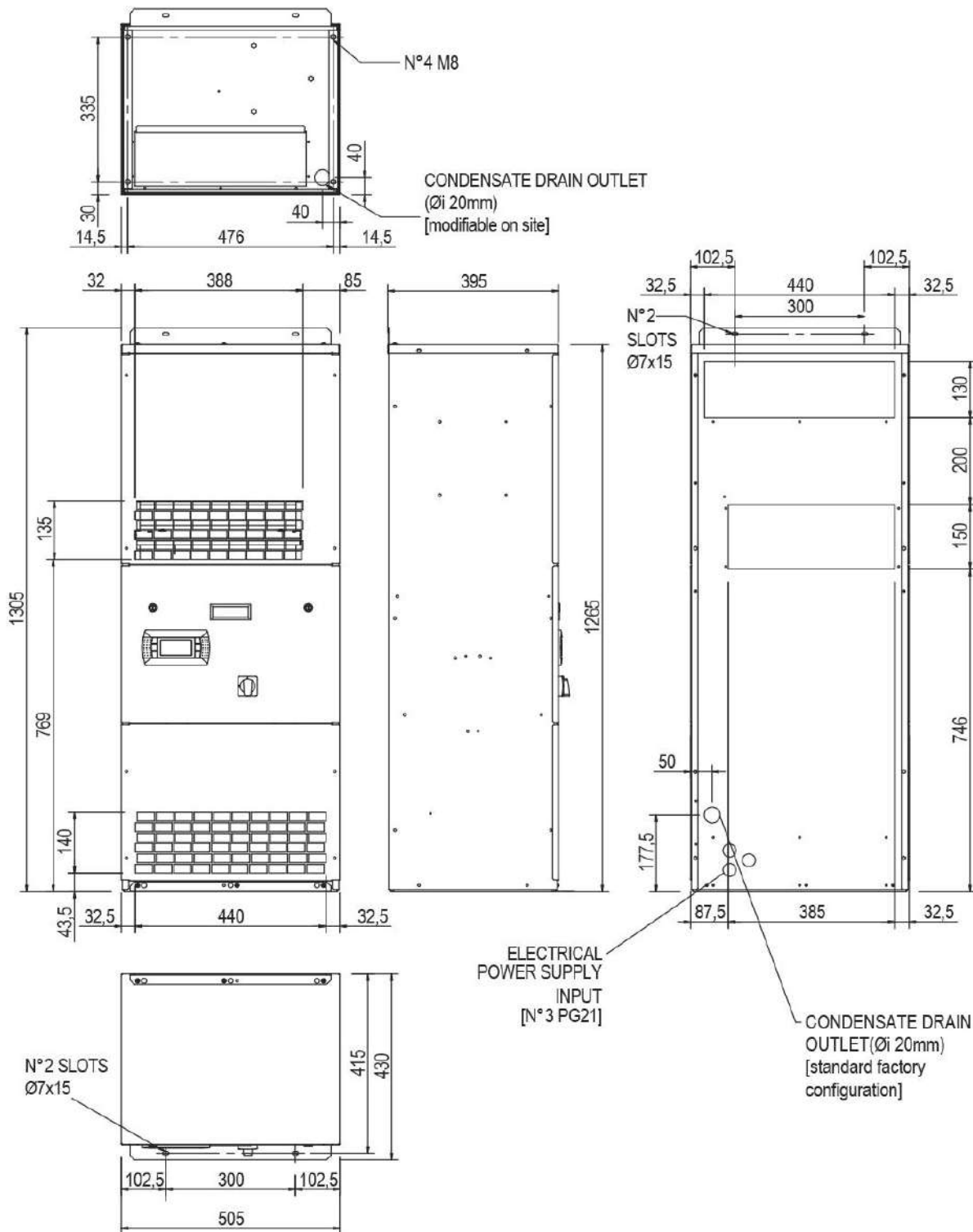
UNITS DRAWING
Dimensions in mm

Model 0001 OVER
WALL DRILLING TEMPLATE



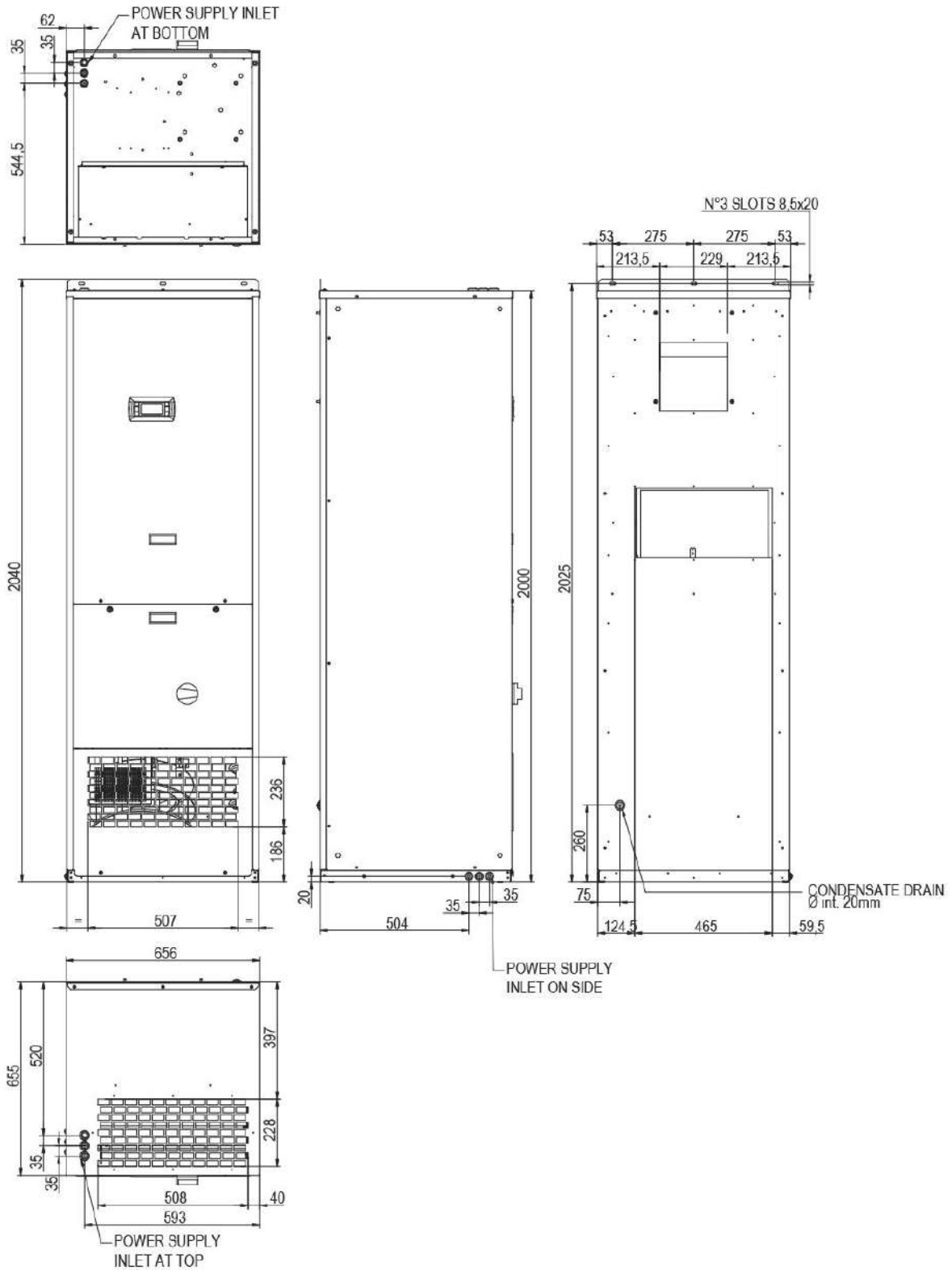
UNITS DRAWING
Dimensions in mm

Model 0003 - 0004 UNDER



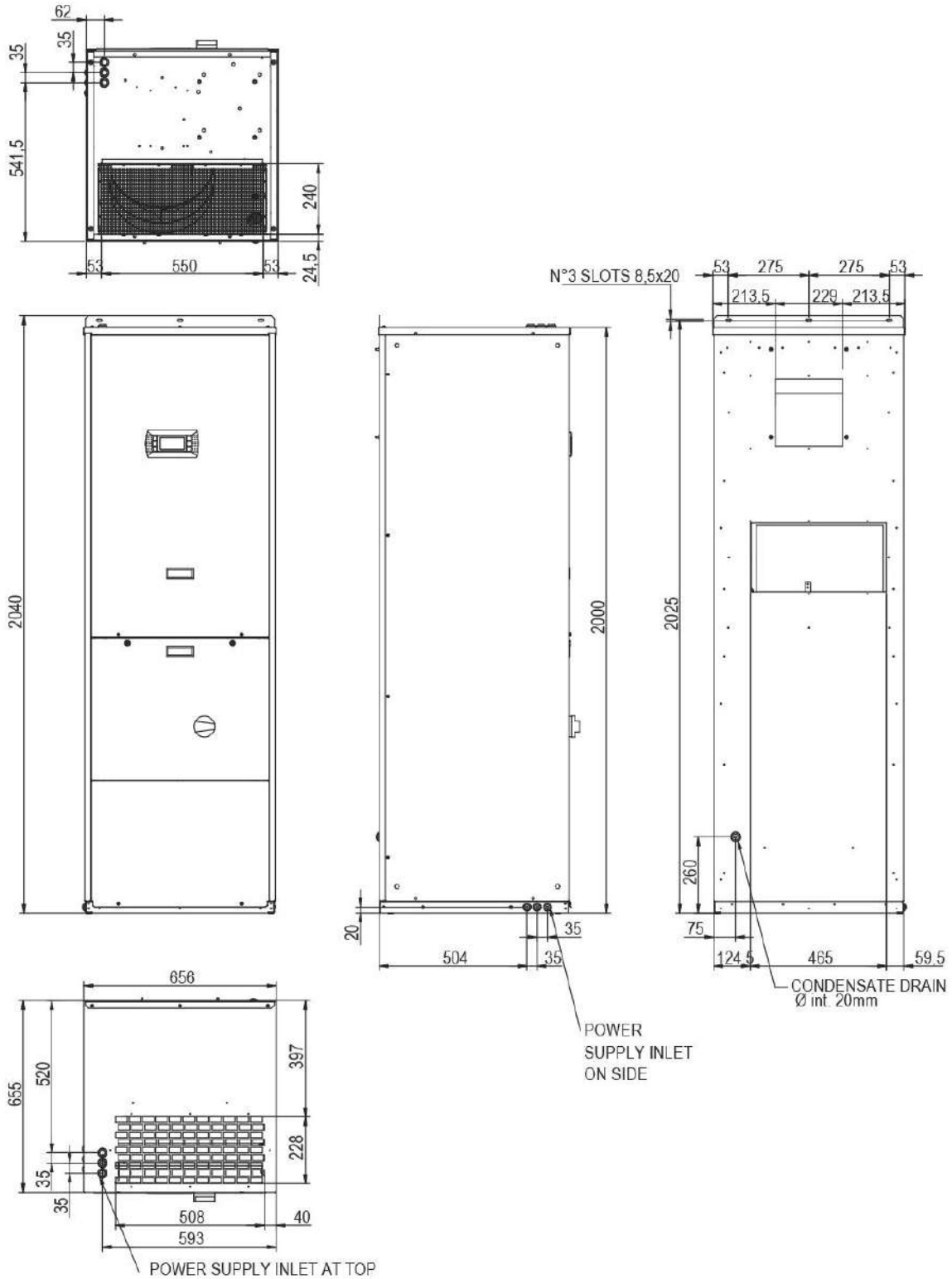
UNITS DRAWING
Dimensions in mm

Model 0011 - 0031 UNDER
Air intake from the top and air delivery at floor level



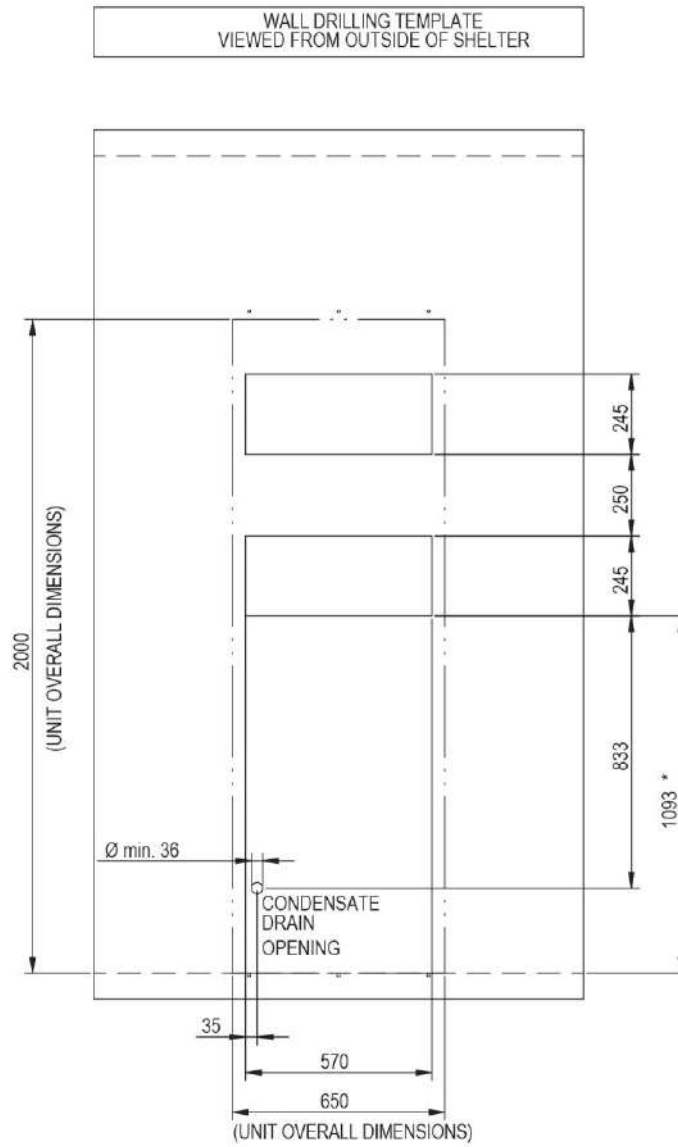
UNITS DRAWING
 Dimensions in mm

Model 0011 - 0031 UNDER
 Air intake from the top and air delivery in raised floor



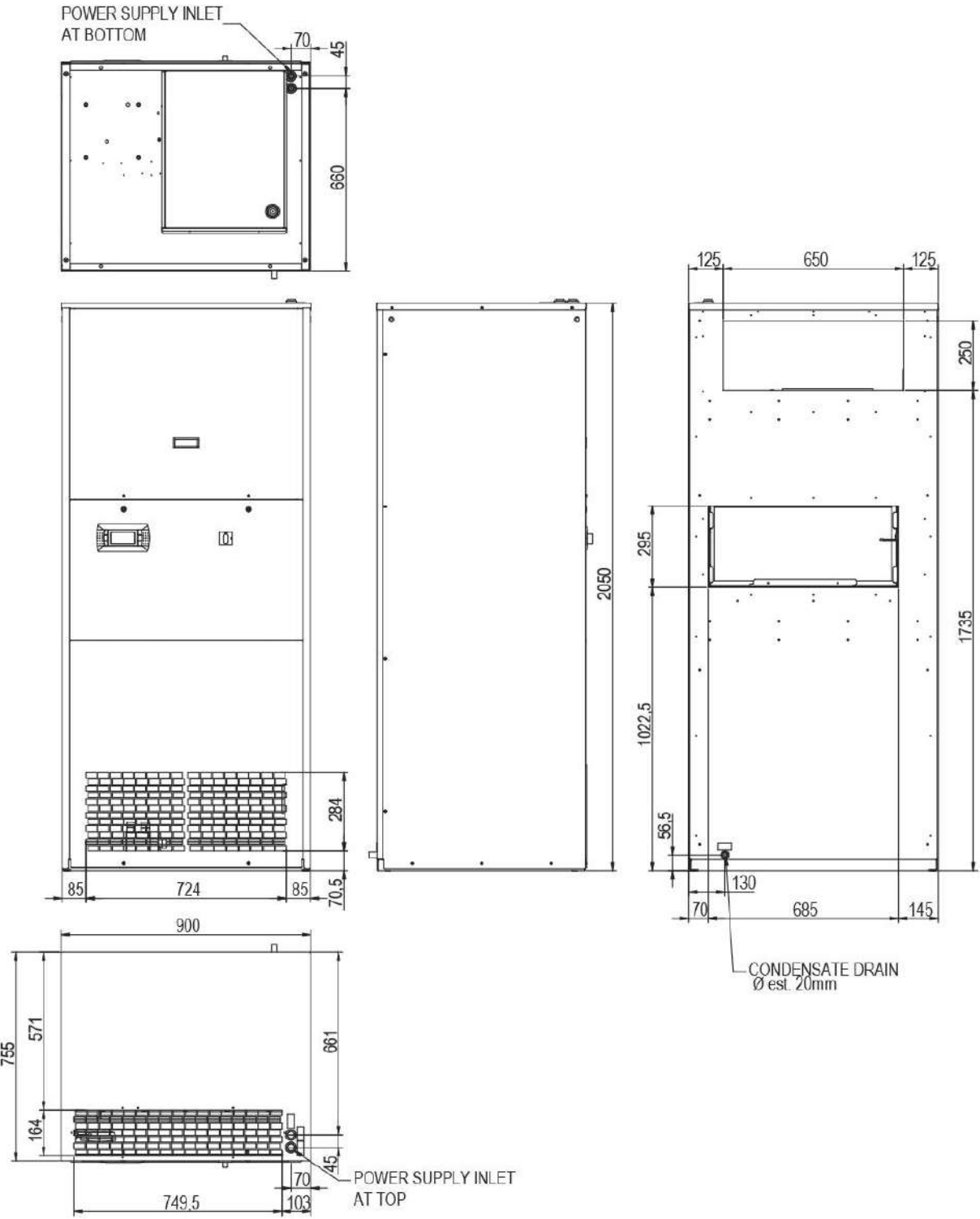
UNITS DRAWING
Dimensions in mm

Model 0011 - 0031 UNDER
Wall drilling template



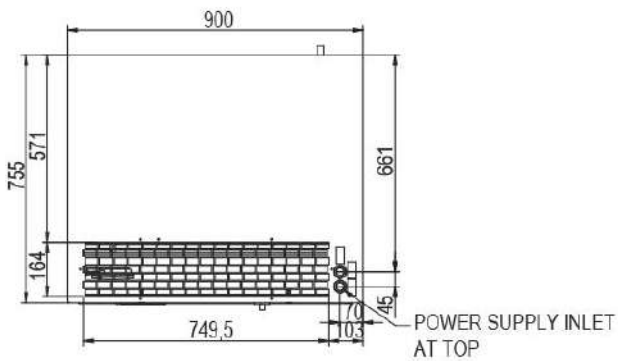
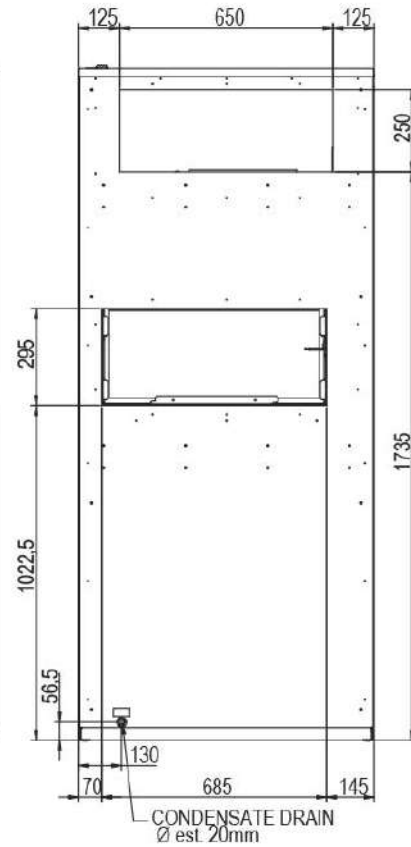
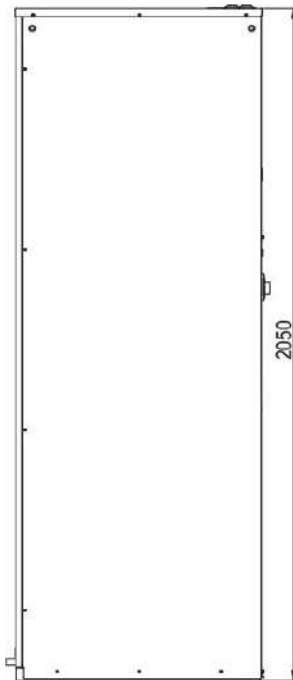
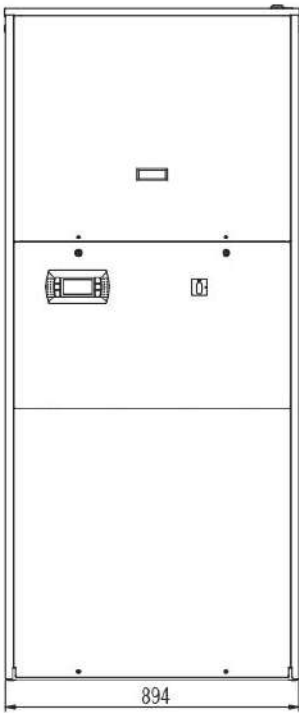
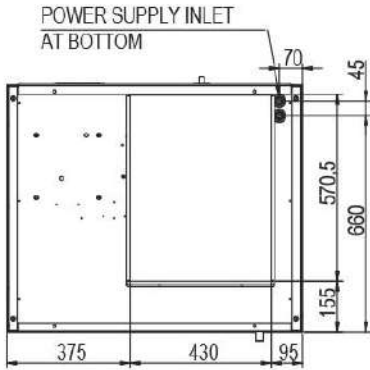
UNITS DRAWING
Dimensions in mm

Model 0041 - 0061 UNDER
Air intake from the top and air delivery at floor level



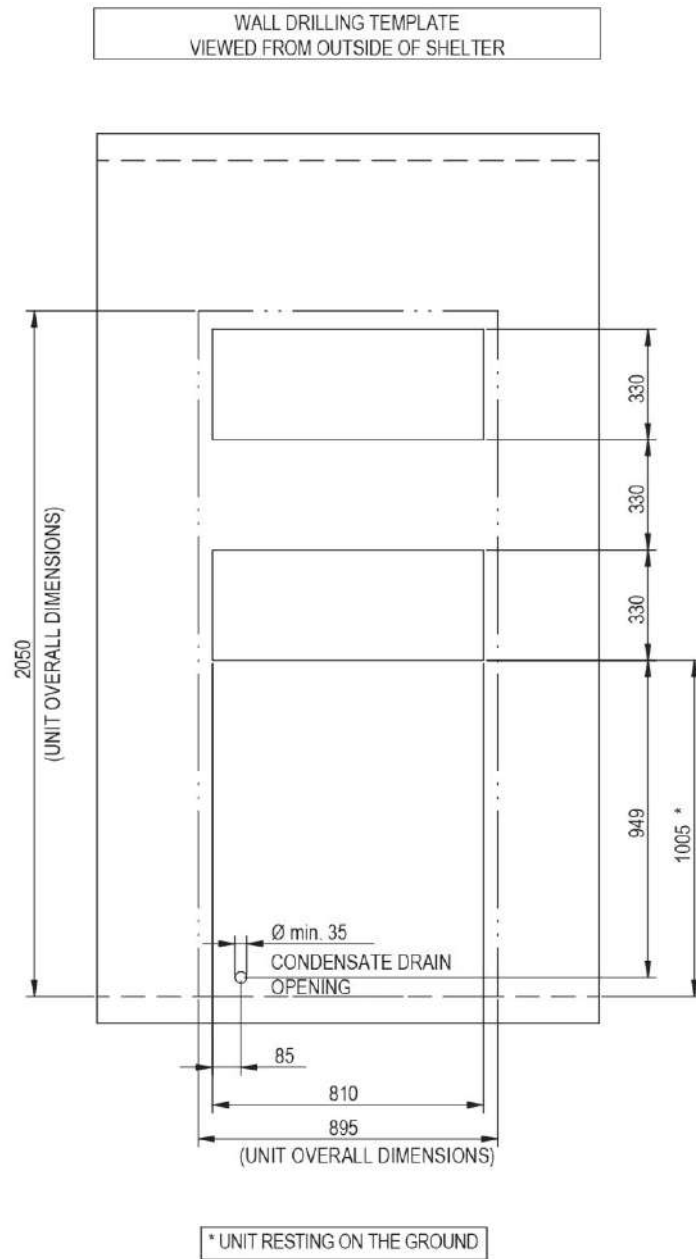
UNITS DRAWING
Dimensions in mm

Model 0041 - 0061 UNDER
Air intake from the top and air delivery in raised floor



UNITS DRAWING
Dimensions in mm

Model 0041 - 0061 UNDER
Wall drilling template



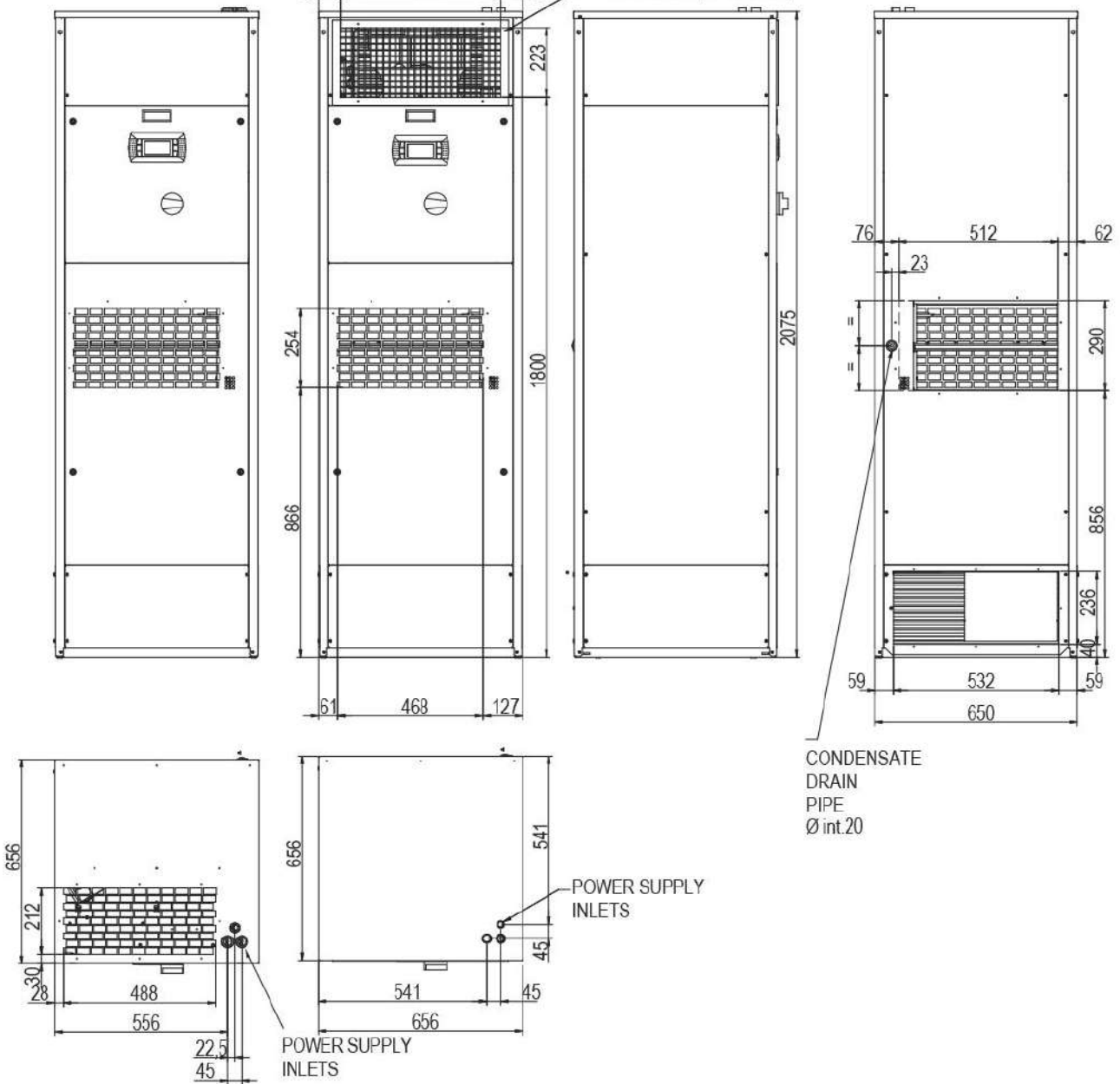
UNITS DRAWING
Dimensions in mm

Model 0011 - 0031 OVER

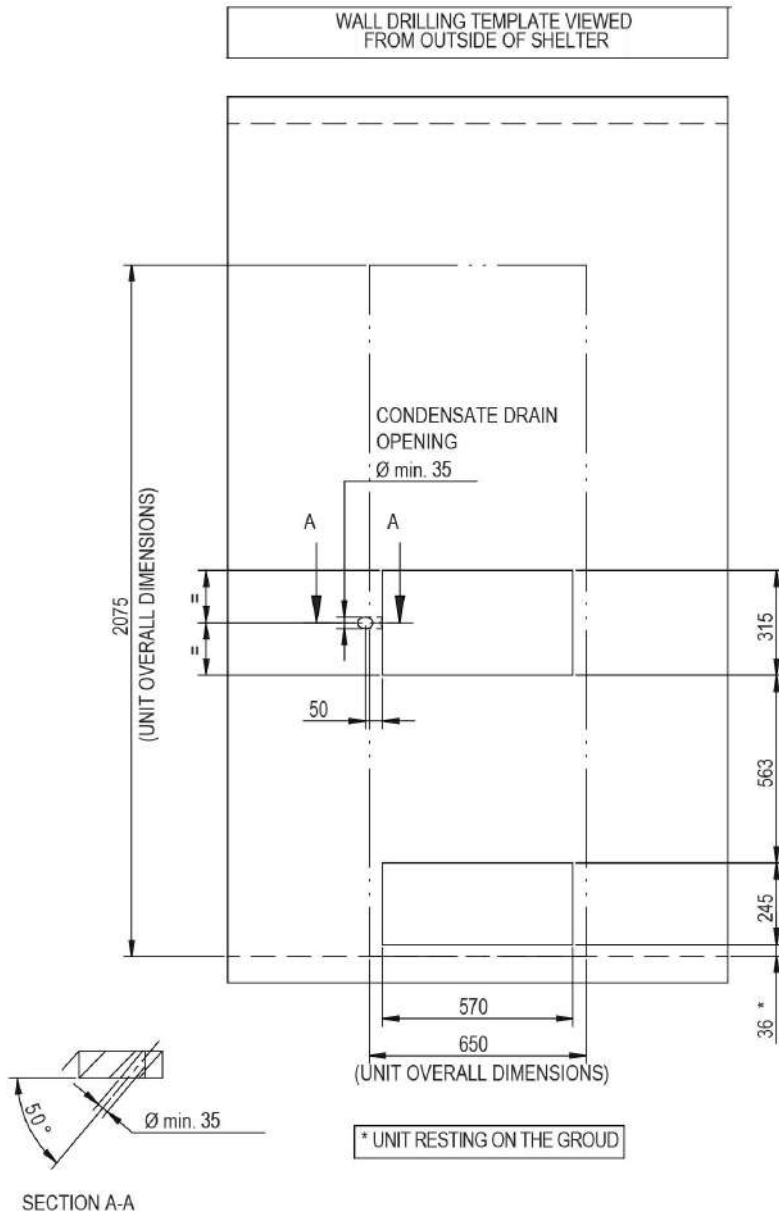
OVER VERSION
DUCTABLE AIR
OUTLET AT TOP

OVER VERSION
FRONT OUTLET

GRILL WITH ADJUSTABLE
LOUVERS (OPTIONAL)

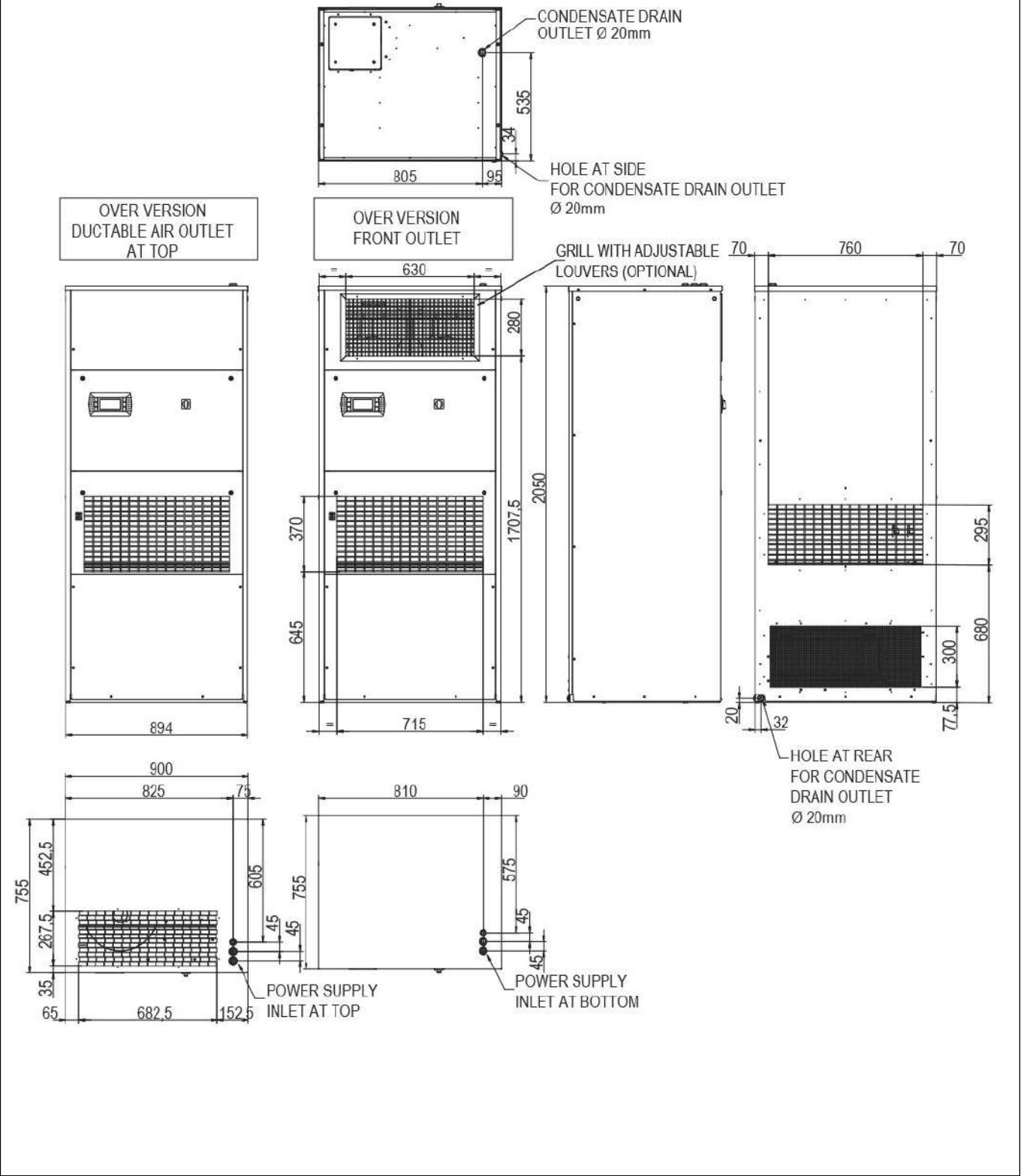


Model 0011 - 0031 OVER
Wall drilling template



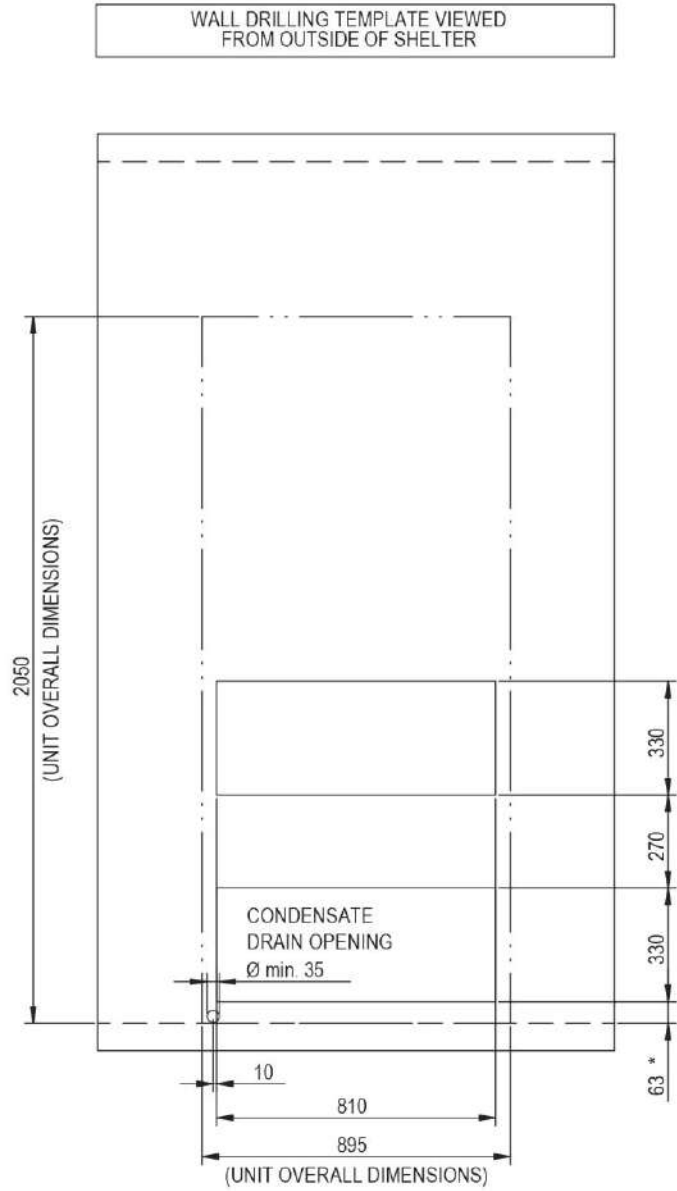
UNITS DRAWING
Dimensions in mm

Model 0041 - 0061 OVER



UNITS DRAWING
Dimensions in mm

Model 0041 - 0061 OVER
Wall drilling template



* UNIT RESTING ON THE GROUND

OPTIONAL ACCESSORIES: A551 – 400/3+N/50 POWER SUPPLY FOR MODEL 0021

| 400/3+N/50 power supply for model 0021.

OPTIONAL ACCESSORIES: A552 – 230/1/50 POWER SUPPLY FOR MODEL 0031

| 230/1/50 power supply for model 0031.

OPTIONAL ACCESSORIES: B082 – WITH UPS 48 VDC

| The machine is designed for dual power supply from the mains and 48 Vdc from the UPS.
 The accessory has a double general disconnecter with a single door lock command on the panel of the electrical board.
 The 48Vdc line supplies the microprocessor control, the supply fan and the free-cooling damper (accessory).

OPTIONAL ACCESSORIES: 1511 / 1512 - SOFT-START

| Not available for model 0001, 0003, 0004, 0011.
 The system is contained in the electrical box.
 Its function is to reduce the starting current of the motor with a monitored start.

 The reduction of the starting current produced by soft starter optional accessory reduces the stress on the power line and on the compressors contributing to increase the components lifetime.

 1511: Soft Star for 400/3+N/50 power supply
 1512: Soft Star for 230/1/50 power supply

MODEL		0001	0003	0004	0011	0021	0031	0041	0051	0056	0061
Compressor starting current [LRA]	A	---	---	---	---	26	19	25	26	35	37

OPTIONAL ACCESSORIES: 881 – CU/CU CONDENSING COIL

| Finned pack and tubes made of copper.
 This type of heat exchanger is free from galvanic corrosion thanks to the use of a single material used for its construction.
 Advantages of the Cu/Cu heat exchanger:

- High thermal conductivity;
- High corrosion resistance;

 To ensure correct machine operation and the best operating conditions, it is important to keep the exchangers clean and efficient as indicated in the Installation, Use and Maintenance manuals.
 The special Cu/Cu execution does not exclude maintenance and cleaning operations of the exchangers.

OPTIONAL ACCESSORIES: 893 – EPOXY PAINTED CONDENSING COIL

| Process with epoxy paint.
 Advantages of the protective treatment:

- 100% coating of the exchanger;
- 1-2% exchanger efficiency loss
- Thick protective film thickness at each point of the exchanger;
- Flexible and resistant protective film;

 To ensure correct machine operation and the best operating conditions, it is important to keep the exchangers clean and efficient as indicated in the Installation, Use and Maintenance manuals.
 The protective treatment does not exclude maintenance and cleaning operations of the exchangers.



OPTIONAL ACCESSORIES: 896 - CATAPHORESIS CONDENSING COIL

The coating is applied through a complete immersion in the tank, in which the coil behaves like a magnet, attracting the coating on every point of its surface.

Advantages of the protective treatment:

- 100% coating of the exchanger;
- 1-2%; exchanger efficiency loss
- Thick protective film thickness at each point of the exchanger;
- Flexible and resistant protective film;

To ensure correct machine operation and the best operating conditions, it is important to keep the exchangers clean and efficient as indicated in the Installation, Use and Maintenance manuals. The protective treatment does not exclude maintenance and cleaning operations of the exchangers.

OPTIONAL ACCESSORIES: A724 – EC FAN

Supply fan with power supply from network:

- Centrifugal fans with backward curved blades with wing profile, single suction and without scroll housings (Plug-fans), directly coupled to external rotor electric motor;
- Impeller in composite material exempt from rust formation.
- EC type electric motor:
- Rubber support

OPTIONAL ACCESSORIES: A727 – EC FAN WITH UPS VDC

Supply fan with power supply from UPS:

- Centrifugal fans with backward curved blades with wing profile, single suction and without scroll housings (Plug-fans), directly coupled to external rotor electric motor;
- Impeller in composite material exempt from rust formation.
- EC type electric motor:
- Rubber support

OPTIONAL ACCESSORIES: A181 - COMPRESSOR SOUNDPROOF JACKET



The system includes a soundproof jacket for each compressor to obtain a reduction of the sound level of the unit.

OPTIONAL ACCESSORIES: A431 - ELECTRIC HEATER



Electric heater ensuring low surface temperature and deleting the air ionization problems. The optional is installed downstream the main cooling coil. Components:

- Electric heater
- Electrical control
- Safety thermostat

MODEL		0001	0003	0004	0011	0021	0031	0041	0051	0056	0061
THERMAL POWER (1)	kW	1,0	1,0	1,0	1,7	1,7	1,7	3,4	3,4	3,4	3,4
Operating current [OA] (1)	A	4,3	4,3	4,3	7,4	7,4	7,4	14,8	14,8	14,8	14,8
Capacity step	n.	1	1	1	1	1	1	2	2	2	2

1. Value to be added to the engaged power (kW) and absorbed current (A) of standard unit according to the operating conditions.

OPTIONAL ACCESSORIES: A352 – NO DISPLAY

The machine is supplied without microprocessor display

OPTIONAL ACCESSORIES: A481 – CLOCK CARD



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

OPTIONAL ACCESSORIES: A471 – SERIAL CARD RS485



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

OPTIONAL ACCESSORIES: A473 - CARD ETHERNET



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

OPTIONAL ACCESSORIES: A474 – SERIAL CARD LON



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: A501 – 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: 0,5 ... 6,0 mbar (50 ... 600 Pa)
Differential for intervention: 0,30 mbar (30 Pa)

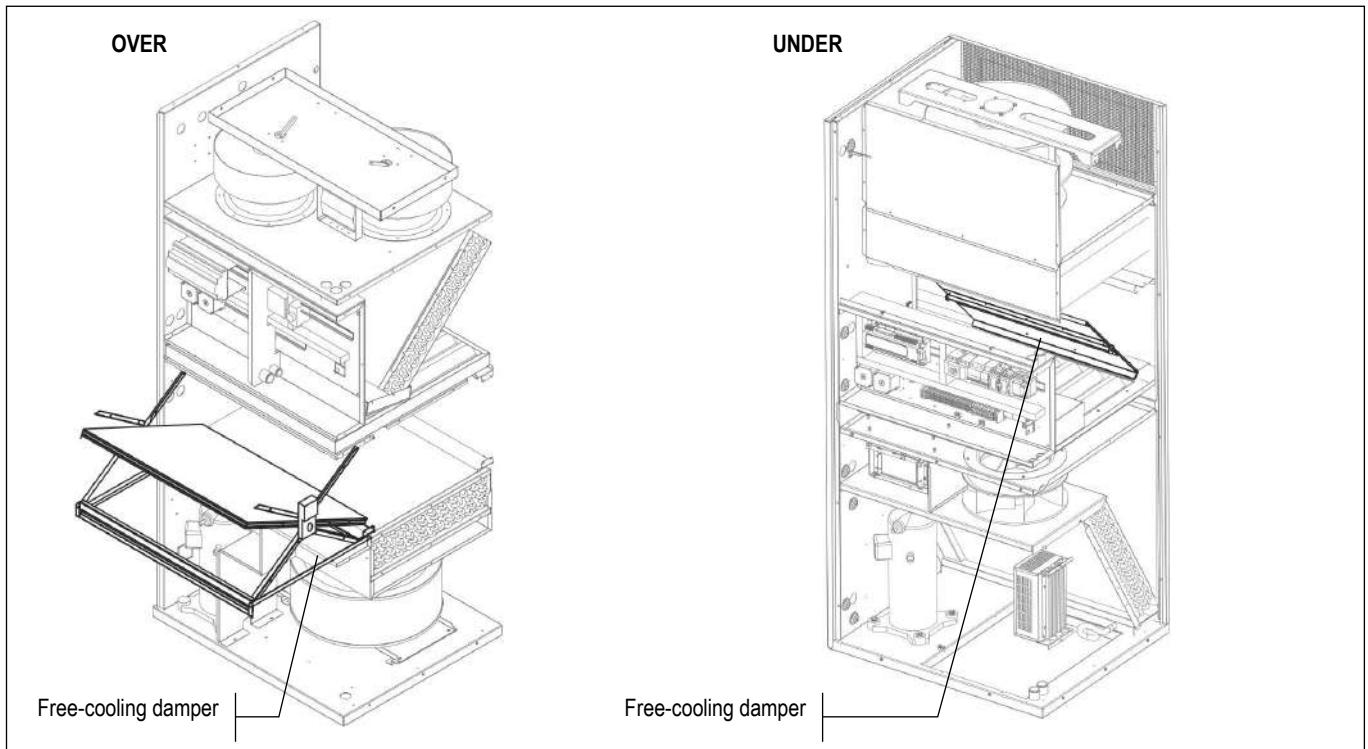
OPTIONAL ACCESSORIES: B174 – B175 - 0-10V FREE-COOLING DAMPER



The optional allow to obtain free-cooling by direct ambient air intake into the room.
The damper is contained within the air conditioner and does not change the overall dimensions.
The damper is proportionally managed by the microprocessor control, that regulates the quantity of the ambient air to put in the room according to the set-point.
The Free-Cooling damper always have priority on the compressor. In case the free-cooling is not sufficient to satisfy the thermal load, the compressor is activated.

Components:

- B174 Damper made of sheet steel with actuator with power supply from network or 48Vdc
Alternatively:
- B175 Damper made of sheet steel with spring-return actuator with power supply from network or 48Vdc. In the event of power failure, the damper is completely closed by the spring system (Free-Cooling OFF).



MODEL		0001	0003	0004	0011	0021	0031	0041	0051	0056	0061
Air flow	m ³ /h	300	990	990	1450	1450	1600	2200	2200	3200	3200

OPTIONAL ACCESSORIES: A801 - TEMPERATURE / HUMIDITY SENSOR ONLY



The accessory replaces the temperature sensor installed on the air intake in the unit and allows the displaying of the relative humidity room value

OPTIONAL ACCESSORIES: A803 – DEHUMIDIFICATION ONLY

The optional requires mandatory accessory “A801 Temperature / humidity sensor only”. For the control of the room humidity in dehumidification.

OPTIONAL ACCESSORIES: B103 – ADJUSTABLE HORIZONTAL AIR GRILLE



Grille on room air delivery with single row manually adjustable fin – only horizontal.

OPTIONAL ACCESSORIES: B104 – ADJUSTABLE HORIZONTAL/VERTICAL AIR GRILLE



Grille on room air delivery with double row manually adjustable fins –horizontal and vertical.

OPTIONAL ACCESSORIES: A212 – COARSE 60% AIR FILTER

The optional is not available for models 0001, 0003 and 0004. Air filters with efficiency COARSE 60% (according to ISO EN 16890); the filter replaces the standard one.

OPTIONAL ACCESSORIES: B121 – METAL MESH AIR FILTER

Metal mesh filter on outdoor air suction grille. The optional accessory is available only with free cooling damper on unit.

OPTIONAL ACCESSORIES: B181 – EXTERNAL FREE COOLER MANAGEMENT

Power supply and control of the external Free Cooler. The accessory is available only with double power supply Network + 48Vdc from UPS system.

OPTIONAL ACCESSORIES: 7387012600 – REMOTE TERMINAL DISPLAY PGD1

Wall mounting remote display.

OPTIONAL ACCESSORIES: 7396023600 / 7396023700 / 7396023800 / 7396023900: FREE COOLER



The accessory is an additional unit that allows input in the local of a greater amount of external air during the operation in the free-cooling. The Free Cooler is available for indoor (FKI) or outdoor (FKO) installation and is directly managed by the microprocessor control of the air conditioner. The Free Cooler is available only for 48Vdc power supply from UPS.

Components:

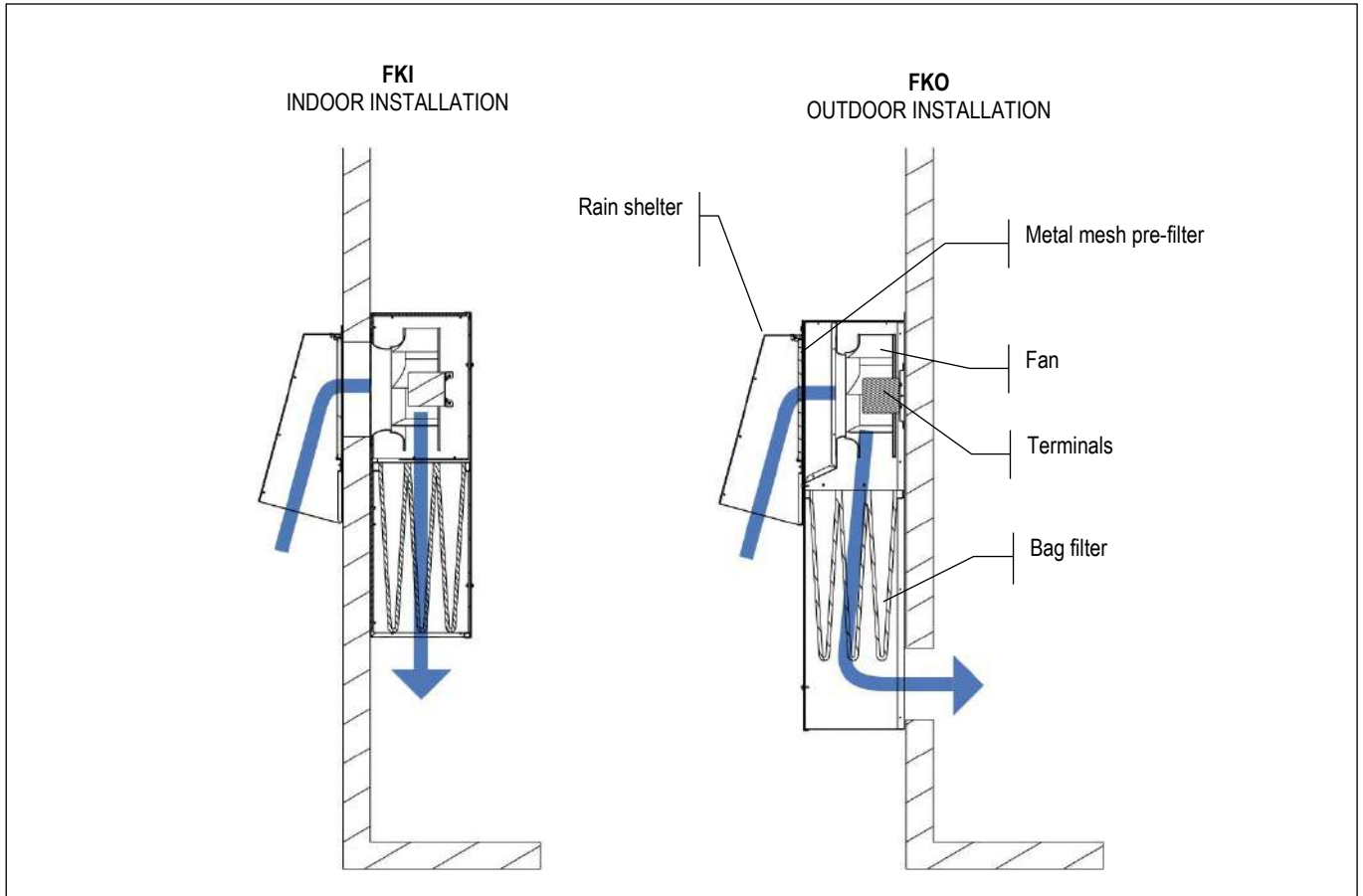
- Frame and panels in galvanized steel sheet and painted with epoxy powders. Colour RAL 9010;
- Metal mesh pre-filter on outdoor air suction.
- Centrifugal fans with backward curved blades with wing profile, single suction and without scroll housings (Plug-fans), directly coupled to external rotor electric motor. Impeller in composite material exempt from rust formation. EC electric motor 48Vdc. Rubber support.
- Bag filter with COARSE 50% efficiency (according to ISO EN 16890).
- Terminal for electrical connection to main air conditioner.
- The accessory is supplied as standard with rain shelter on air intake.

TECHNICAL DATA

MODEL		0021	0041
COOLING CAPACITY (1)	kW	7,67	8,17
FAN 48 Vdc	n.	1	1
Air flow	m ³ /h	2300	2450
Engaged power 48Vdc (3)	W	248	234
Absorbed current 48Vdc (3)	A	5,24	4,93
ENERGY INDEX (1)			
EER = Energy Efficiency Ratio		34,85	35,51
DIMENSIONS			
FKI - Length	mm	646	646
FKI - Width	mm	296	296
FKI - Height	mm	955	955
FKO - Length	mm	648	648
FKO - Width	mm	296	296
FKO – Width with rain shelter	mm	542	542
FKO - Height	mm	1227	1227
NET WEIGHT FKI	kg	30	31
NET WEIGHT FKO	kg	45	46
SOUND PRESSURE (2)	dB(A)	62	65

1. Referred to ambient temperature 17°C and room temperature 27°C
2. Sound pressure value at 1 meter from unit front in free filed
3. Value to be added to the engaged power (kW) and absorbed current (A) of standard unit according to the operating conditions.

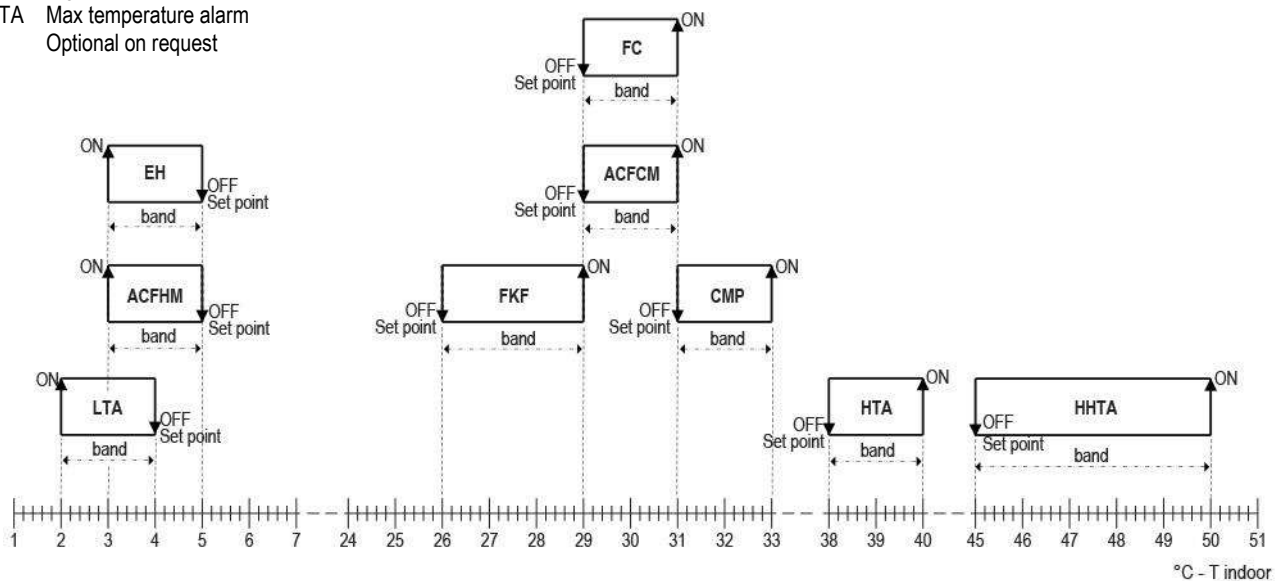
INSTALLATION EXAMPLE



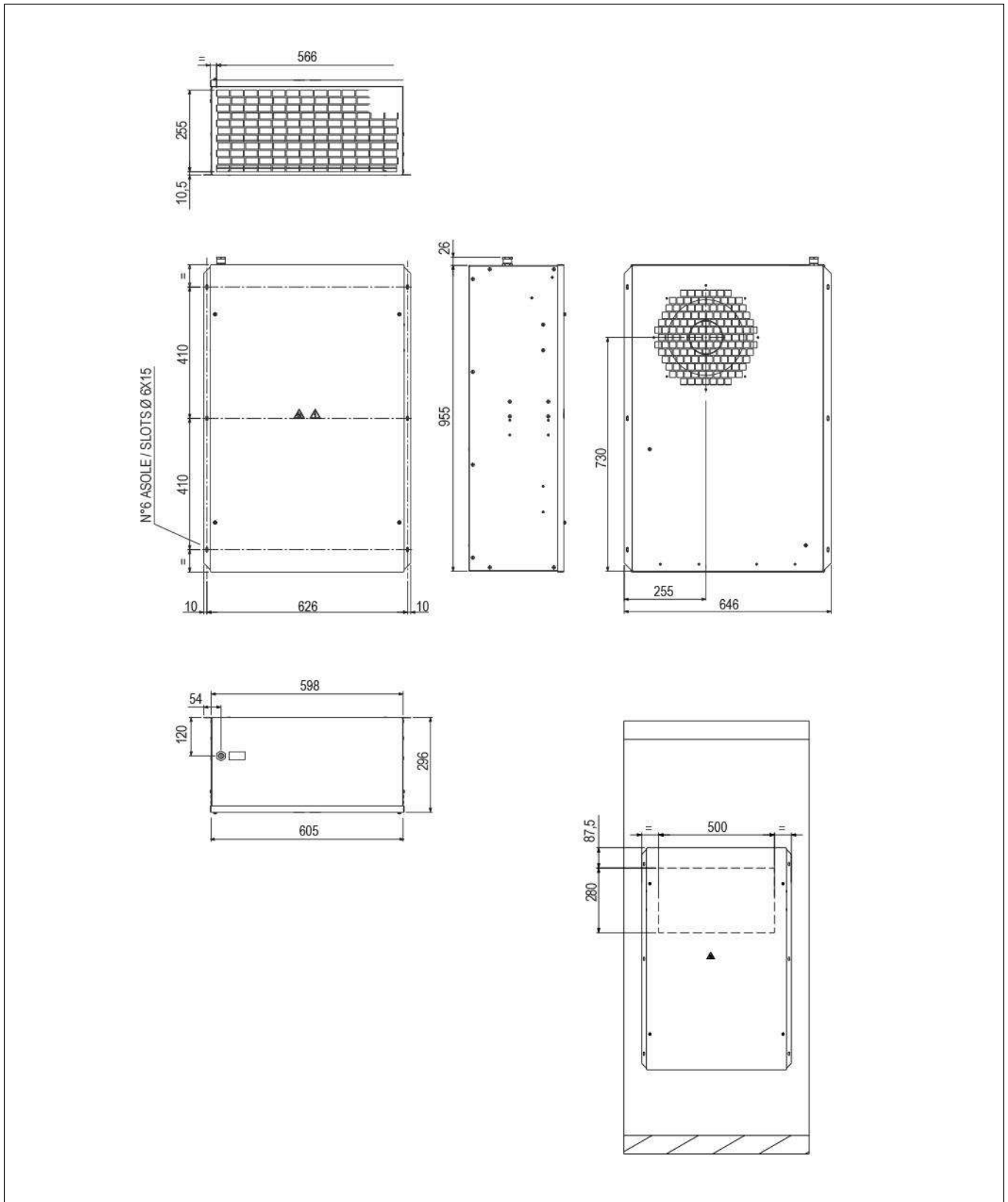
WORKING LOGIC

EXAMPLE – WORKING LOGIC
Temperatures are indicative

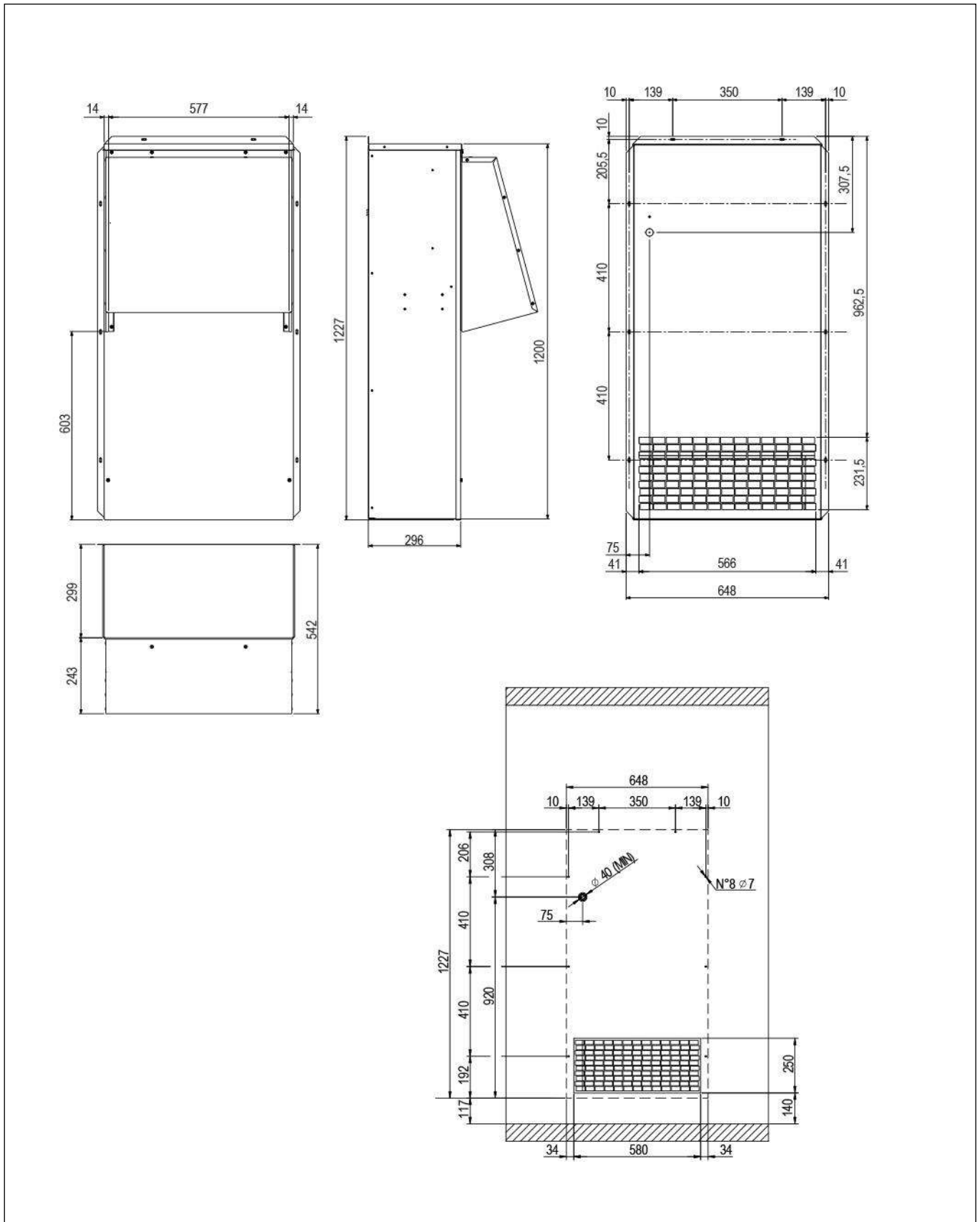
- LTA Low temperature alarm
- EH Electric heater (*)
- ACFHM Supply fan in heating mode
- FKF Free Cooler (*)
- ACFCM Supply fan in cooling mode
- FC Free-cooling damper
- CMP Compressor
- HTA High temperature alarm
- HHTA Max temperature alarm
- (*) Optional on request



DRAWING FKI UNIT – Dimensions in mm



DRAWING FKO UNIT – Dimensions in mm



OPTIONAL ACCESSORIES: 7396023400 / 7396024900 - AIR CONNECTION KIT

Not available for model 0001, 0003, 0004

The kit comprises three flanges, one to be installed on the unit and two on the wall.

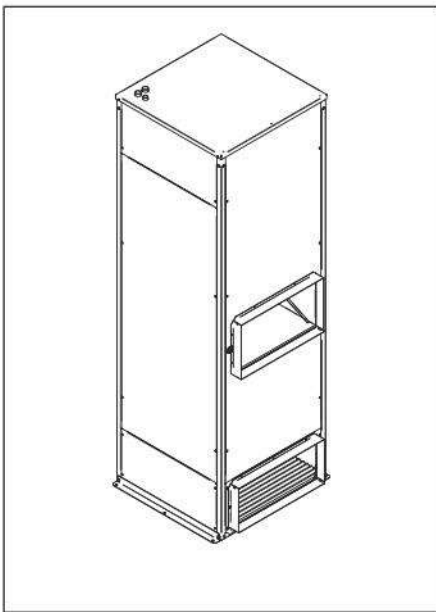
The air suction flange is fitted with a metal mesh filter.

The flexible connection pipes are 1.1 m long as standard. Other lengths are available on request.

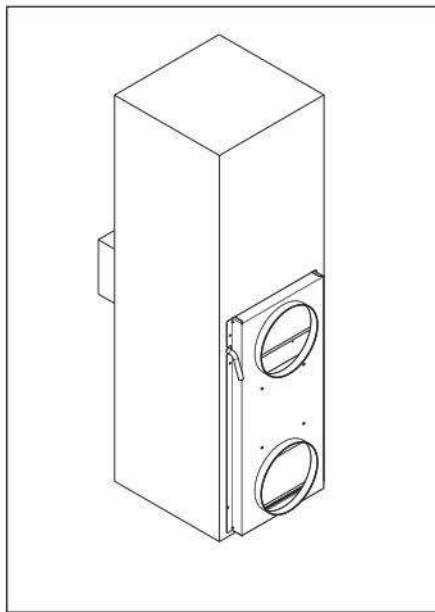
The flanges are sized so as to cover a hole measuring the sizes shown on the installation templates contained in the dimensional drawings for each individual unit.

The accessory is not compatible with kit dima.

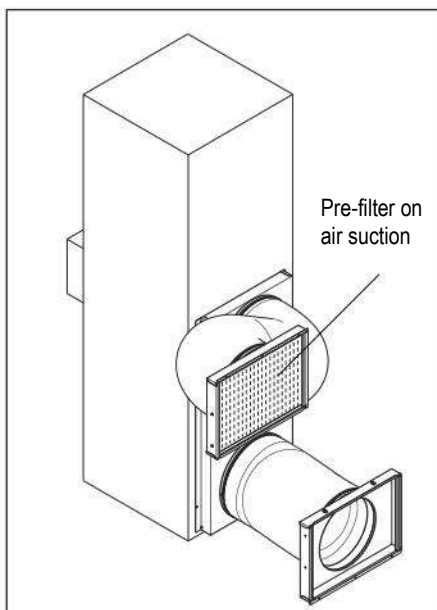
STANDARD UNIT



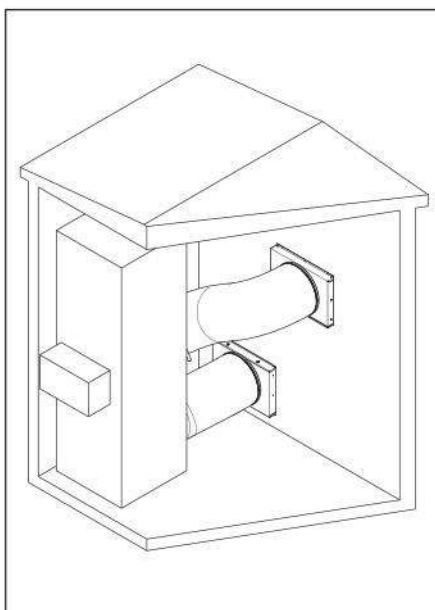
FLANGE OF UNIT

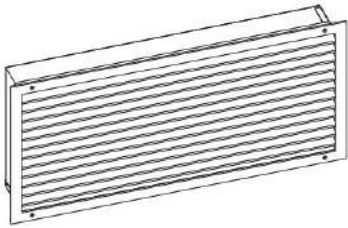


AIR SUCTION AND DISCHARGE FLANGES



INSTALLED UNIT



OPTIONAL ACCESSORIES: 7396020700 / 7396020800 / 7396020900 / 7396021000 – FRESH AIR SUCTION AND DELIVERY GRILLES

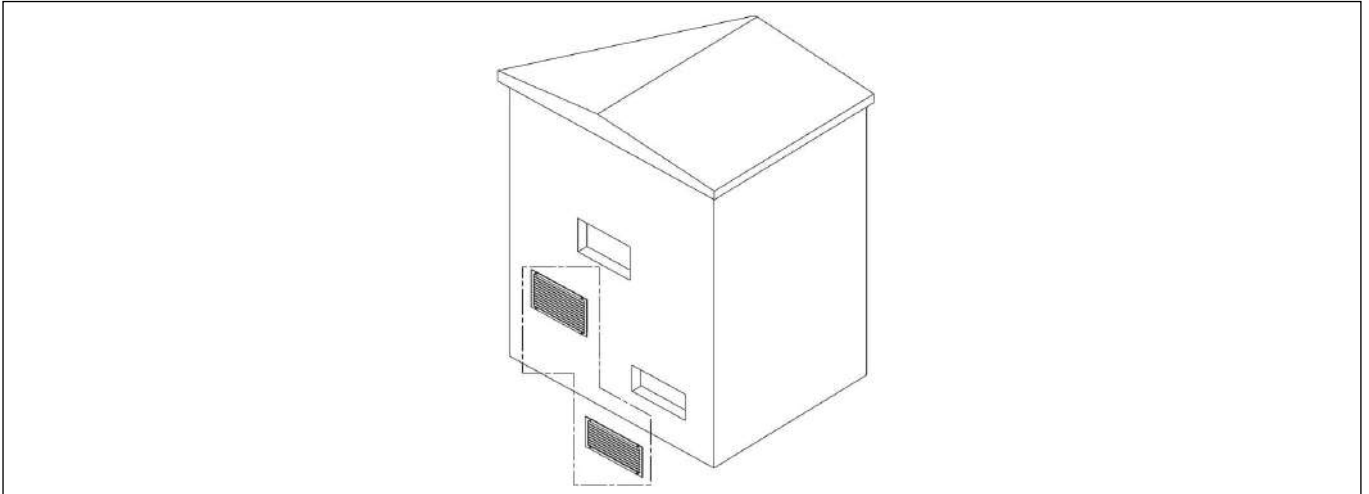
Not available for model 0001, 0003, 0004

Air grilles kit for ambient air suction and discharge.

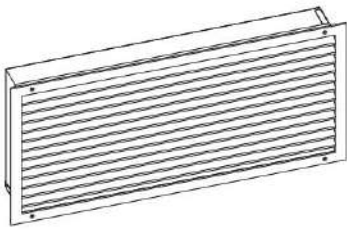
The airfoil profile of the louvers prevents rain from entering and recirculation of hot air between the two grilles, even if aligned vertically.

For the dimensions of the holes on the wall that are compatible with the grilles supplied, see the installation templates included in the dimensional drawings.

The air suction grille can be fitted with a metal mesh filter.



OPTIONAL ACCESSORIES: 7369009900 - OVERPRESSURE DAMPER



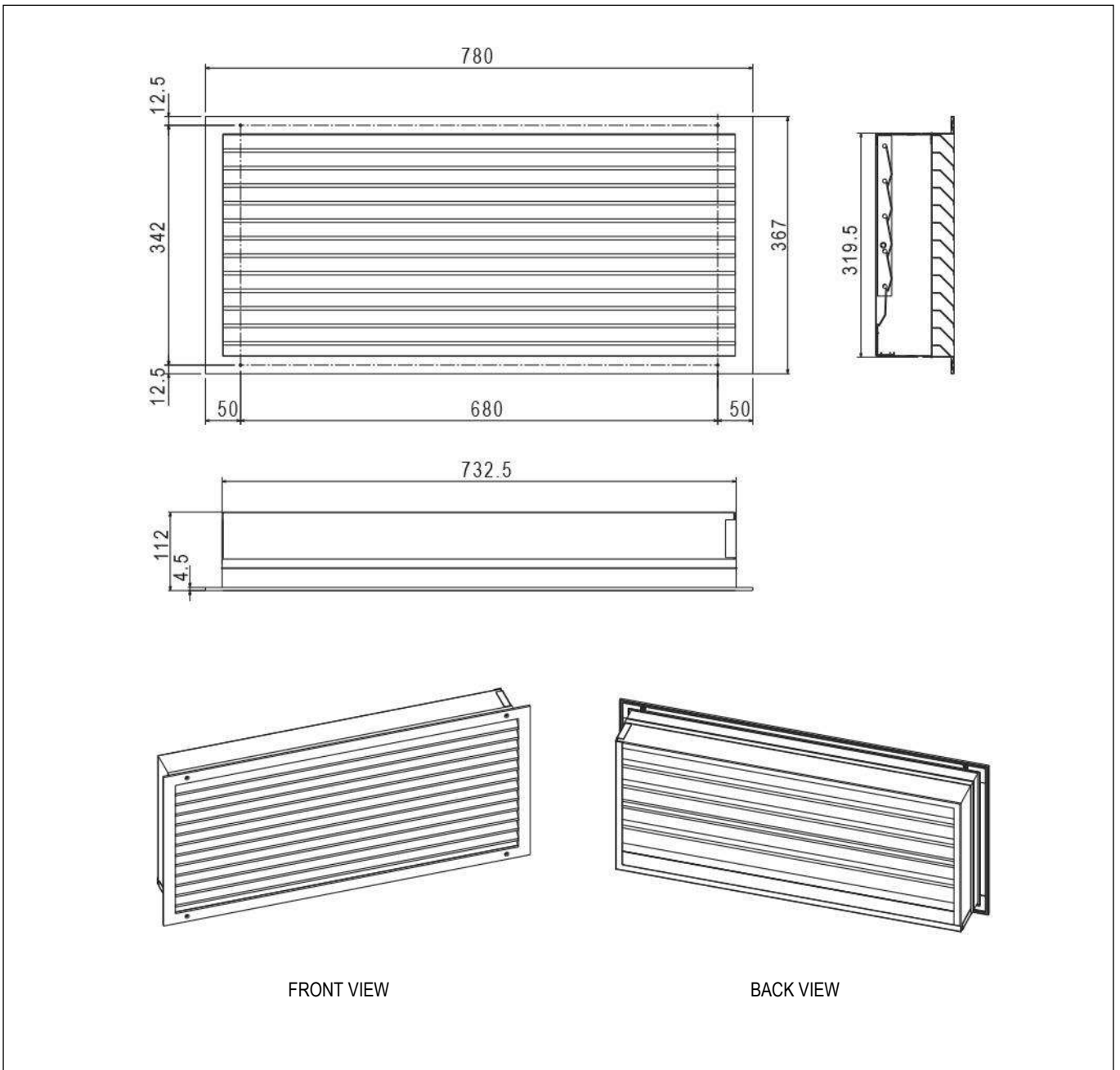
Not available for model 0001, 0003, 0004

The optional accessory is useful for balancing the excess of pressurization in the indoor environment and is suggested when free-cooling damper (optional accessory) or external free-cooler (optional accessory) are foreseen.

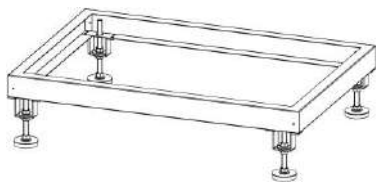
The overpressure relief allows to eject excess air blown into the room during operation in free-cooling or with the use of free-cooler external

The damper is made totally in aluminum.

The damper must be mounted by the installer highest possible point of the room.



OPTIONAL ACCESSORIES: 5596034800 / 5596034900 – BASE FRAME KIT



Not available for model 0001, 0003, 0004

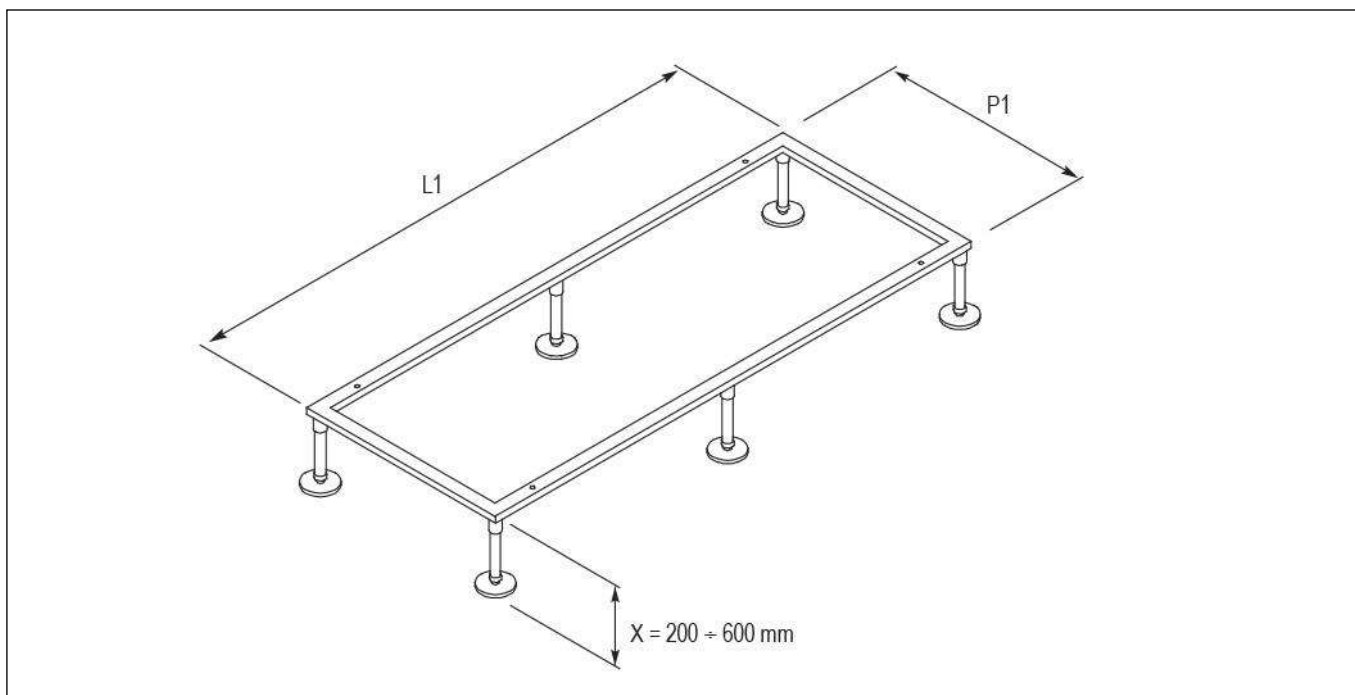
The base frame is recommended for:

- To allow the air-conditioner to be installed before assembling the raised floor
- Totally damp out mechanical vibrations
- Easing the passage of pipes and cables

The base frame is available as an accessory and is adjustable in height, indicated in the figure by the distance X, between 200 and 600 mm.

To prevent the transmission of noise and vibrations, an elastic gasket, at least 5 mm thick, should be inserted between the panels of the raised floor and the frame, which must also be insulated from the metallic structure of the floor.

The accessory is supplied in kit. The frame must be fitted by the installer following the instructions shown inside the packaging.



MODEL		0001	0003	0004	0011	0021
L1	mm	--	--	--	660	660
P1	mm	--	--	--	620	620

MODEL		0031	0041	0051	0056	0061
L1	mm	660	610	610	610	610
P1	mm	620	715	715	715	715

OPTIONAL ACCESSORIES: 7396019400 / 7396019500 – COUPLING FRAME

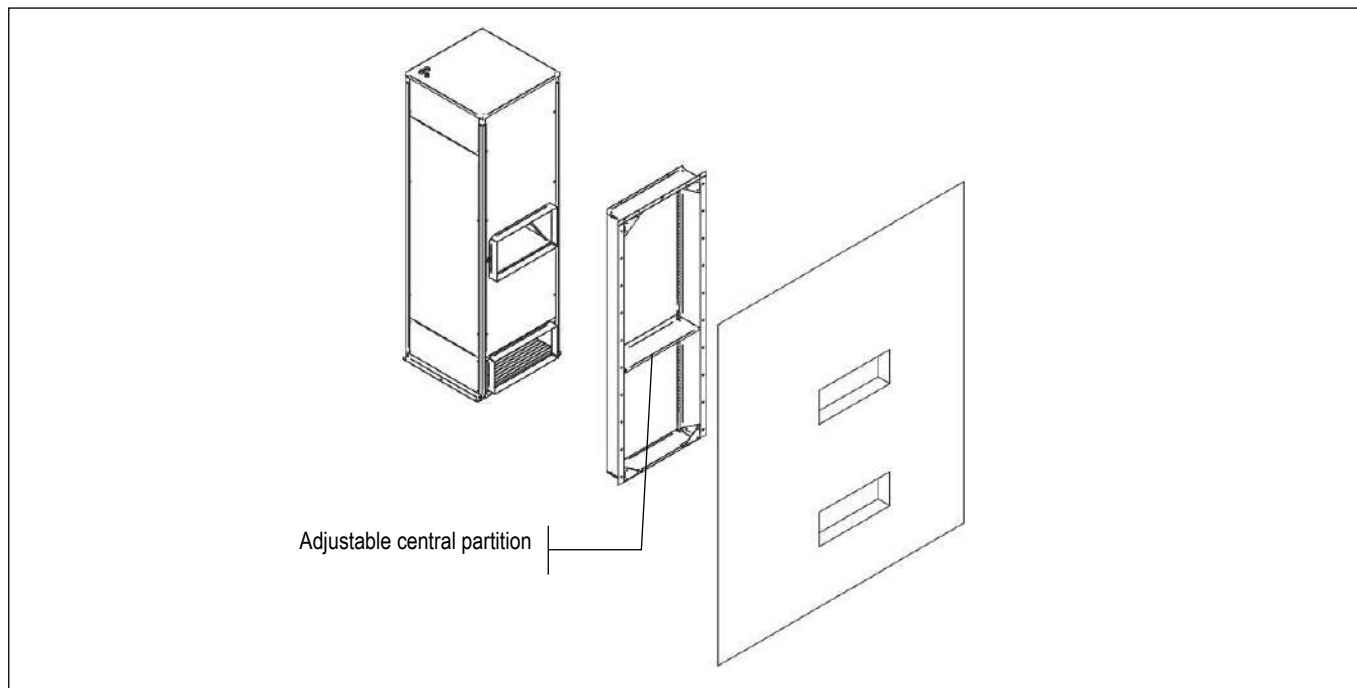


Not available for model 0001, 0003, 0004

To connect the units to existing holes on the walls that do not match those required for the unit.

The frame has a central partition adjustable in height.

The accessory is not compatible with air connection kit.





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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