

Data Book

T_MED_0120_EN - HFC R410A

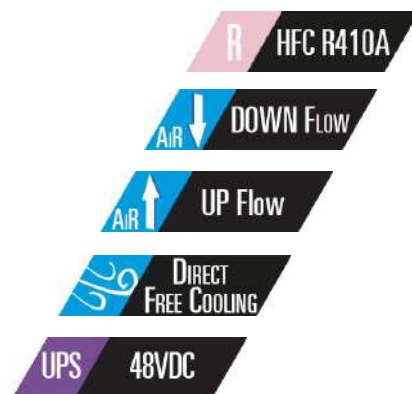
MED

2-20 kW

Packaged air conditioners for Telecom applications.
Outdoor 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 or down side at 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 outdoor 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 room air suction and delivery.

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 12 models with cooling capacities from 2 to 20 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 side.

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
- 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

Model: MED BASIC 0031

MED	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

-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)
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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 outside, on the wall of the room to be conditioned.
 Two openings in the wall allows the air suction and delivery of the room.

AVAILABLE AIR FLOW:

UNDER air flow: return air from the front side of the unit and air delivery the bottom side.

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

Types of installation:

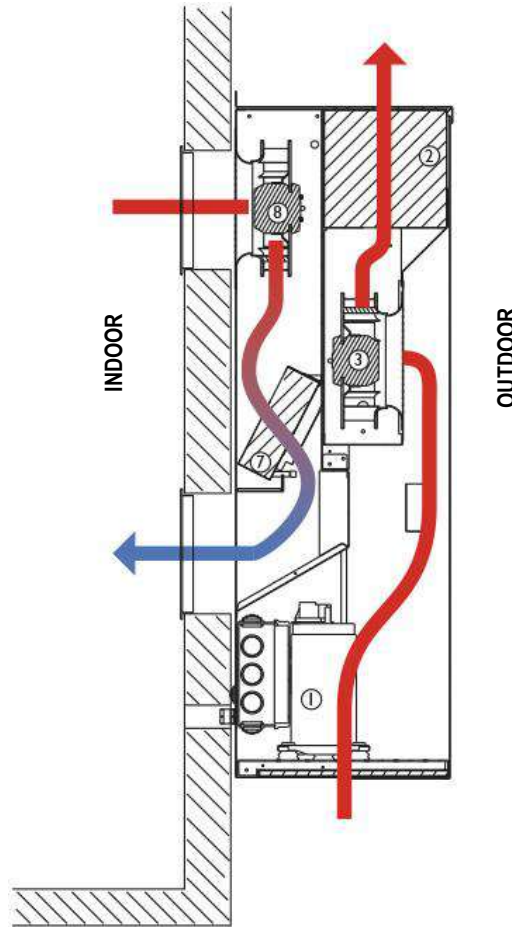
	UNDER	OVER	UNDER
0001	✓	✗	✗
0003	✓	✗	✗
0004	✓	✗	✗
0011	✗	✓	✓
0021	✗	✓	✓
0031	✗	✓	✓
0041	✗	✓	✓
0051	✗	✓	✓
0056	✗	✓	✓
0061	✗	✓	✓
0071	✗	✓	✓
0091	✗	✓	✓

Models

WORKING PRINCIPLE

UNDER - Model 0003 - 0004

MECHANICAL COOLING

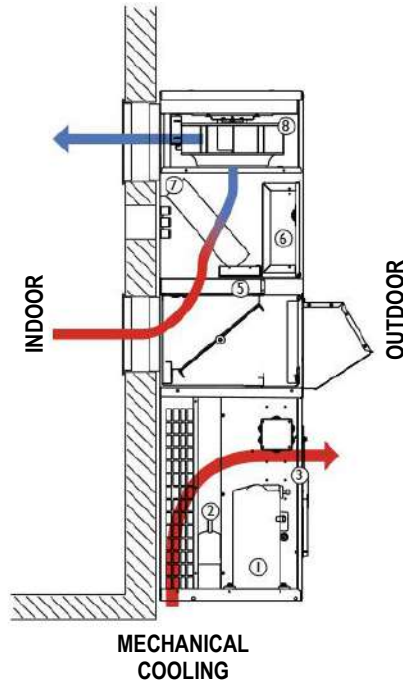


- 1. Compressor
- 2. Condenser
- 3. Condenser fan
- 4. ---
- 5. ---
- 6. ---
- 7. Evaporator
- 8. Supply fan

OPERATION IN FREE COOLING IS POSSIBLE ONLY WITH THE EXTERNAL FREE COOLER OPTIONAL

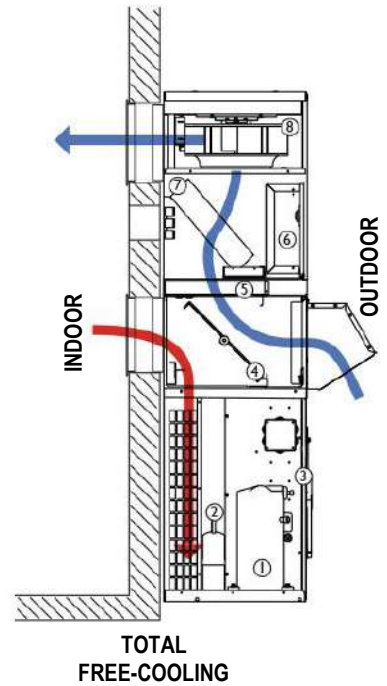
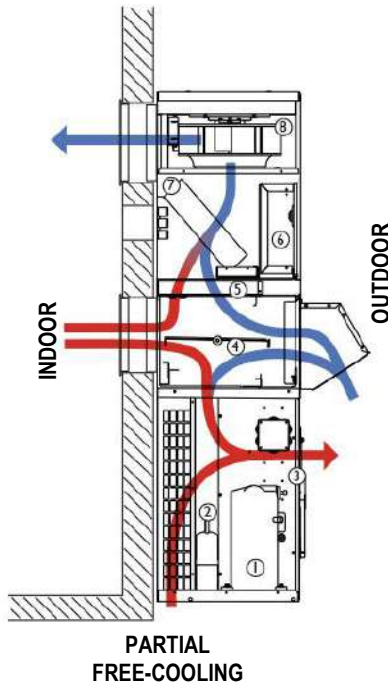
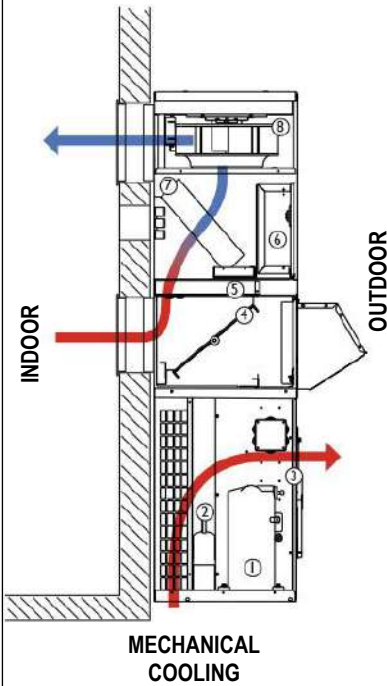
OVER – STANDARD UNIT

From model 0011 up to model 0091



OVER – UNIT WITH FREE-COOLING SYSTEM

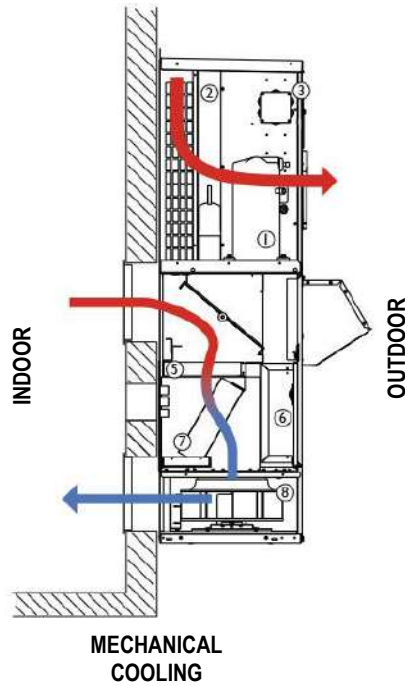
From model 0011 up to model 0091



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

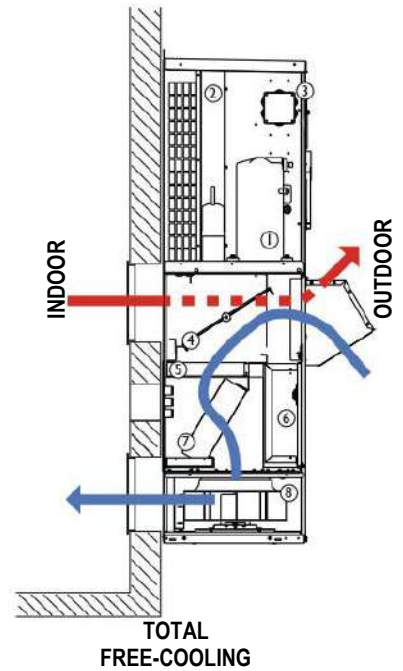
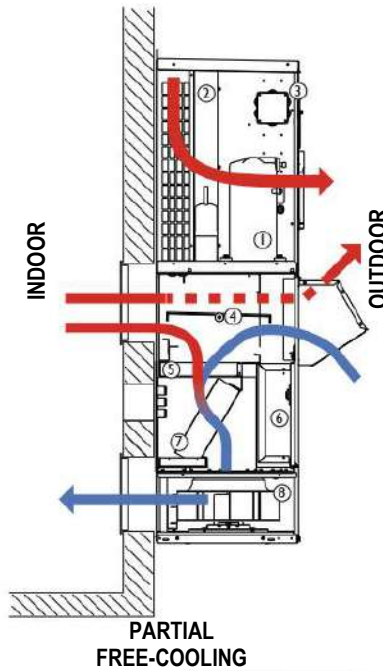
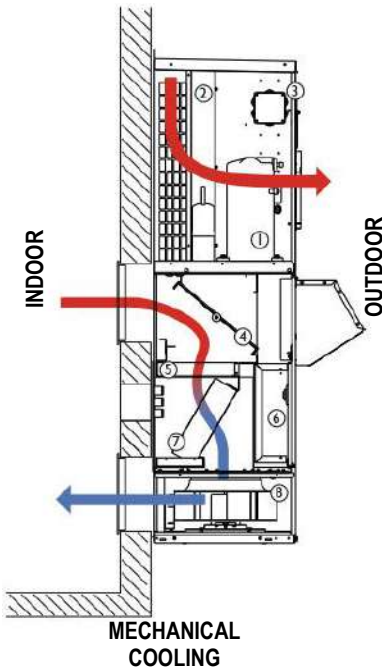
UNDER –STANDARD UNIT

From model 0011 up to model 0091

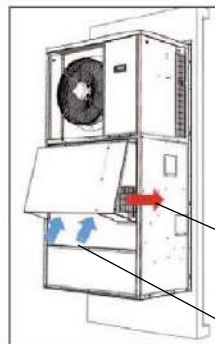


UNDER – UNIT WITH FREE-COOLING SYSTEM

From model 0011 up to model 0091



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

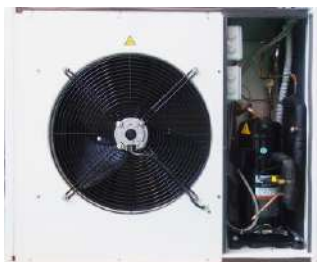


FOR UNDER UNIT IN FREE-COOLING MODE, THE ROOM AIR DISCHARGE IS ON THE SIDE OF THE AMBIENT AIR INTAKE

Room air discharge

Ambient air intake

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 in front of 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). Available as optional accessory for model 0001, 0003, 0004.

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 drain 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.
 - AC type for model 0003, 0004, 0011, 0021, 0031, 0041, 0051, 0056, 0061, 0071, 0091.
- 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, 0041, 0051, 0056, 0061, 0071, 0091:

- Axial fans with sickle-shaped blades, fan guard and optimized for low noise levels.
- AC electric motor
- Condensing control system with variation of fan speed through phase-cut electronic regulator directly driven by the condensing pressure proportional signal.
- IP54 enclosure class.
- 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, 0071, 0091:

- 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 0091 included)
- Sight glass.
- Filter dryer on liquid line.
- Liquid receiver (only 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.
- Refrigerant circuit with copper tubing with anticondensate insulation of the suction line.
- R410A refrigerant charge and lubricant oil.

ELECTRICAL PANEL

Available as mandatory optional accessory for model 0001, 0003, 0004.

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).

Display is supplied in mounting kit.



“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

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.
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.
B113	Return air grille adjustable horizontal: Grilles on room air suction air suction with a single row manually adjustable fins only horizontal.
A217	COARSE 50% air filter: Washable air filter with COARSE 50% efficiency (according to ISO EN 16890), for model 0001, 0003, 0004.
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 (not available for model 0001, 0003, 0004). 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.
C90051871G	Electrical panel for 0001-0003-0004: Electrical panel for unit command 0001, 0003, 0004. The option is mandatory because it's not installed in the unit.
7387012600	Remote Terminal display EVOLUTION (for wall installation): Remote terminal for connecting and managing multiple units connected in LAN.
7373021900	Free cooler for 0001-0003-0004: External Free-Cooler. The accessory is available only with double power supply Network + 48Vdc from UPS system.

- 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.
- 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.
- 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.
- 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.
- 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.
- 7396019600 **Coupling frame for 0011-0031:** Dima kit to adapt the existing holes of the wall with the condenser air suction and discharge.
- 7396019700 **Coupling frame for 0041-0056:** Dima kit to adapt the existing holes of the wall with the condenser air suction and discharge.
- 7396022200 **Coupling frame for 0061-0091:** Dima kit to adapt the existing holes of the wall with the condenser air suction and discharge.
- 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	0031
AIR FLOW (1)		O	U	U/O	U/O	U/O	U/O
COOLING CAPACITY (2)							
Total	kW	1,95	2,91	3,45	4,94	6,36	8,43
Sensible	kW	1,42	2,67	2,88	4,94	5,65	6,77
SHR (3)		0,73	0,92	0,83	1,00	0,89	0,80
Total power input (Comp. + Fans)	kW	0,76	1,19	1,36	1,57	2,01	2,66
SUPPLY FAN	n.	1	1	1	1	1	1
Fan type		Radial EC	Radial AC	Radial AC	Radial AC	Radial AC	Radial AC
Air flow	m³/h	300	990	990	1450	1450	1600
Nominal external static pressure	Pa	20	20	20	20	20	20
Maximum external static pressure	Pa	188	168	168	59	59	69
Power input (4)	kW	0,06	0,15	0,15	0,26	0,26	0,26
ON/OFF COMPRESSOR		Rotary	Rotary	Rotary	Rotary	Scroll	Scroll
Quantity	n.	1	1	1	1	1	1
Capacity steps	n.	1	1	1	1	1	1
Power input	kW	0,60	0,81	0,98	1,18	1,62	2,27
CONDENSER FAN	n.	1	1	1	1	1	1
Fan type		Radial AC	Radial AC	Radial AC	Axial AC	Axial AC	Axial AC
Air flow	m³/h	500	1210	1210	2500	2500	2500
Nominal external static pressure	Pa	0	0	0	0	0	0
Power input (4)	kW	0,10	0,23	0,23	0,13	0,13	0,13
AIR FILTERS	n.	1	1	1	1	1	1
Efficiency (ISO EN 16890)	COARSE	50%	50%	50%	50%	50%	50%
REFRIGERANT		R410A	R410A	R410A	R410A	R410A	R410A
Gas circuit	n.	1	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	400/3+N/50
ENERGY INDEX (2)							
EER = Energy Efficiency Ratio	kW/kW	2,57	2,45	2,54	3,15	3,16	3,17
DIMENSIONS							
OVER Length	mm	394	--	--	970	970	970
OVER Width	mm	250	--	--	500	500	500
OVER Width with rain shelter (5)	mm	--	--	--	745	745	745
OVER Height	mm	900	--	--	1814	1814	1814
UNDER Length	mm	--	505	505	976	976	976
UNDER Width	mm	--	394	394	500	500	500
UNDER Width with rain shelter (5)	mm	--	--	--	745	745	745
UNDER Height	mm	--	1236	1236	1735	1735	1735
NET WEIGHT OVER	kg	50	--	--	160	175	180
NET WEIGHT UNDER	kg	--	75	75	165	180	175
CONDENSATE DISCHARGE	F Ø	1/2"	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.
5. Rain shelter (supplied in mounting kit) is supplied only with direct free-cooling system (optional accessory)

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

TECHNICAL DATA – POWER SUPPLY FROM NETWORK

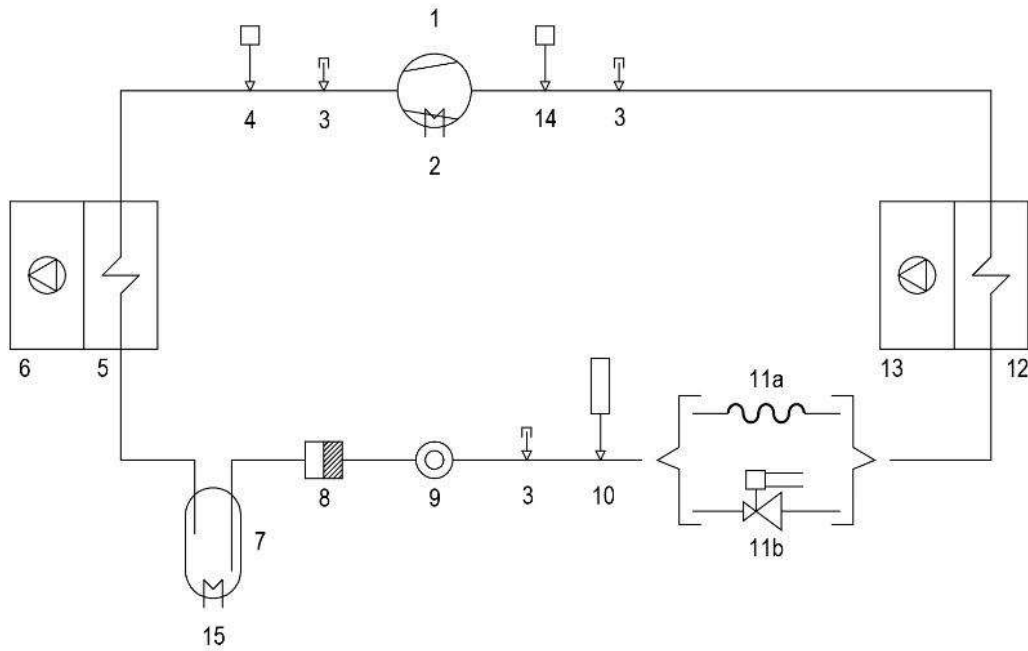
MODEL		0041	0051	0056	0061	0071	0091
AIR FLOW (1)		U/O	U/O	U/O	U/O	U/O	U/O
COOLING CAPACITY (2)							
Total	kW	9,72	10,70	14,30	16,80	18,40	20,60
Sensible	kW	9,18	9,53	12,50	14,20	14,80	16,60
SHR (3)		0,94	0,89	0,87	0,85	0,80	0,81
Total power input (Comp. + Fans)	kW	3,08	3,44	4,57	5,21	6,16	6,90
SUPPLY FAN	n.	1	1	1	2	2	2
Fan type		Radial AC	Radial AC	Radial AC	Radial AC	Radial AC	Radial AC
Air flow	m ³ /h	2450	2450	3200	3500	3500	3900
Nominal external static pressure	Pa	20	20	20	20	20	20
Maximum external static pressure	Pa	68	68	67	50	50	78
Power input (4)	kW	0,48	0,48	0,48	0,93	0,93	0,91
ON/OFF COMPRESSOR		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Quantity	n.	1	1	1	1	1	1
Capacity steps	n.	1	1	1	1	1	1
Power input	kW	2,38	2,74	3,41	3,90	4,85	5,61
CONDENSER FAN	n.	1	1	1	1	1	1
Fan type		Axial AC	Axial AC	Axial AC	Axial AC	Axial AC	Axial AC
Air flow	m ³ /h	4000	4000	4900	5900	5900	5900
Nominal external static pressure	Pa	0	0	0	0	0	0
Power input (4)	kW	0,22	0,22	0,68	0,38	0,38	0,38
AIR FILTERS	n.	1	1	1	1	1	1
Efficiency (ISO EN 16890)	COARSE	50%	50%	50%	50%	50%	50%
REFRIGERANT		R410A	R410A	R410A	R410A	R410A	R410A
Gas circuit	n.	1	1	1	1	1	1
POWER SUPPLY		400/3+N/50	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	3,16	3,11	3,13	3,22	2,99	2,99
DIMENSIONS							
OVER Length	mm	1011	1011	1011	1178	1178	1178
OVER Width	mm	600	600	600	777	777	777
OVER Width with rain shelter (5)	mm	850	850	850	856	856	856
OVER Height	mm	2115	2115	2115	2240	2240	2240
UNDER Length	mm	1016	1016	1016	1196	1196	1196
UNDER Width	mm	600	600	600	780	780	780
UNDER Width with rain shelter (5)	mm	840	840	840	1025	1025	1025
UNDER Height	mm	1935	1935	1935	2280	2280	2280
NET WEIGHT OVER	kg	205	215	220	290	295	300
NET WEIGHT UNDER	kg	265	270	275	300	310	325
CONDENSATE DISCHARGE	F Ø	1/2"	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.
5. Rain shelter (supplied in mounting kit) is supplied only with direct free-cooling system (optional accessory)

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

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 LT version and up to model 0031 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.

MODEL		0001	0003	0004	0011	0021	0031
SOUND LEVEL ISO 3744 (1)							
Indoor pressure level	dB(A)	49	52	52	52	52	52

MODEL		0041	0051	0056	0061	0071	0091
SOUND LEVEL ISO 3744 (1)							
Indoor pressure level	dB(A)	54	54	58	62	62	62

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)	0031 (1)
POWER SUPPLY		230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	400/3+N/50 (1)	230/1/50 (1)
STANDARD UNIT								
Max power input (FLI)	kW	1,08	1,49	1,59	2,38	3,10	3,20	3,61
Max current input (FLA)	A	4,80	6,16	7,26	10,80	17,70	7,23	17,70
Start up current (SA)	A	15,00	21,70	33,70	37,70	59,70	27,70	68,70
Power input (OI)	kW	0,76	1,19	1,36	1,57	2,01	2,01	2,66

MODEL		0031	0041	0051	0056	0061	0071	0091
POWER SUPPLY		400/3+N/50	400/3+N/50	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	3,59	4,63	5,01	7,07	8,08	8,66	9,66
Max current input (FLA)	A	7,73	10,30	11,30	15,40	17,50	21,50	21,50
Start up current (SA)	A	39,70	49,30	51,30	69,40	73,60	81,50	108,00
Power input (OI)	kW	2,66	3,08	3,44	4,57	5,21	6,16	6,90

(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)	0031 (1)
POWER SUPPLY FROM NETWORK		230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	400/3/50+N (1)	230/1/50 (1)
STANDARD UNIT								
Max power input (FLI)	kW	1,00	1,33	1,43	2,11	2,83	2,93	3,32
Max current input (FLA)	A	4,00	5,48	6,58	9,65	16,50	6,05	6,55
Start up current (SA)	A	15,00	21,70	33,70	36,50	58,50	26,50	38,50
Power input (OI)	kW	0,70	1,04	1,21	1,31	1,75	1,75	2,40
POWER SUPPLY FROM UPS		48Vdc	48Vdc	48Vdc	48Vdc	48Vdc	48Vdc	48Vdc
Max power input (FLI)	kW	0,05	0,18	0,18	0,38	0,38	0,38	0,38
Max current input (FLA)	A	1,01	3,71	3,71	6,72	6,72	6,72	6,72
Start up current (SA)	A	1,01	3,70	3,70	6,72	6,72	6,72	6,72
Power input (OI)	kW	0,04	0,18	0,18	0,24	0,24	0,24	0,25

MODEL		0031	0041	0051	0056	0061	0071	0091
POWER SUPPLY FROM NETWORK		400/3+N/50	400/3+N/50	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	3,34	4,14	4,52	6,58	7,10	7,68	8,68
Max current input (FLA)	A	16,50	7,97	8,97	13,00	12,80	16,80	16,80
Start up current (SA)	A	67,60	47,00	49,00	67,00	68,90	76,80	103,00
Power input (OI)	kW	2,40	2,60	2,96	4,09	4,28	5,23	5,99
POWER SUPPLY FROM UPS		48Vdc	48Vdc	48Vdc	48Vdc	48Vdc	48Vdc	48Vdc
Max power input (FLI)	kW	0,38	0,70	0,70	0,70	1,40	1,40	1,40
Max current input (FLA)	A	6,72	12,70	12,70	12,70	25,40	25,40	25,40
Start up current (SA)	A	6,72	12,70	12,70	12,70	25,40	25,40	25,40
Power input (OI)	kW	0,25	0,50	0,50	0,48	0,94	0,94	0,99

(1) Power supply available as option

WARNING:

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




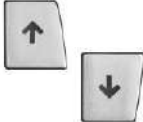

Optional accessory electric data are included within the dedicated chapters and must be added.

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 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.

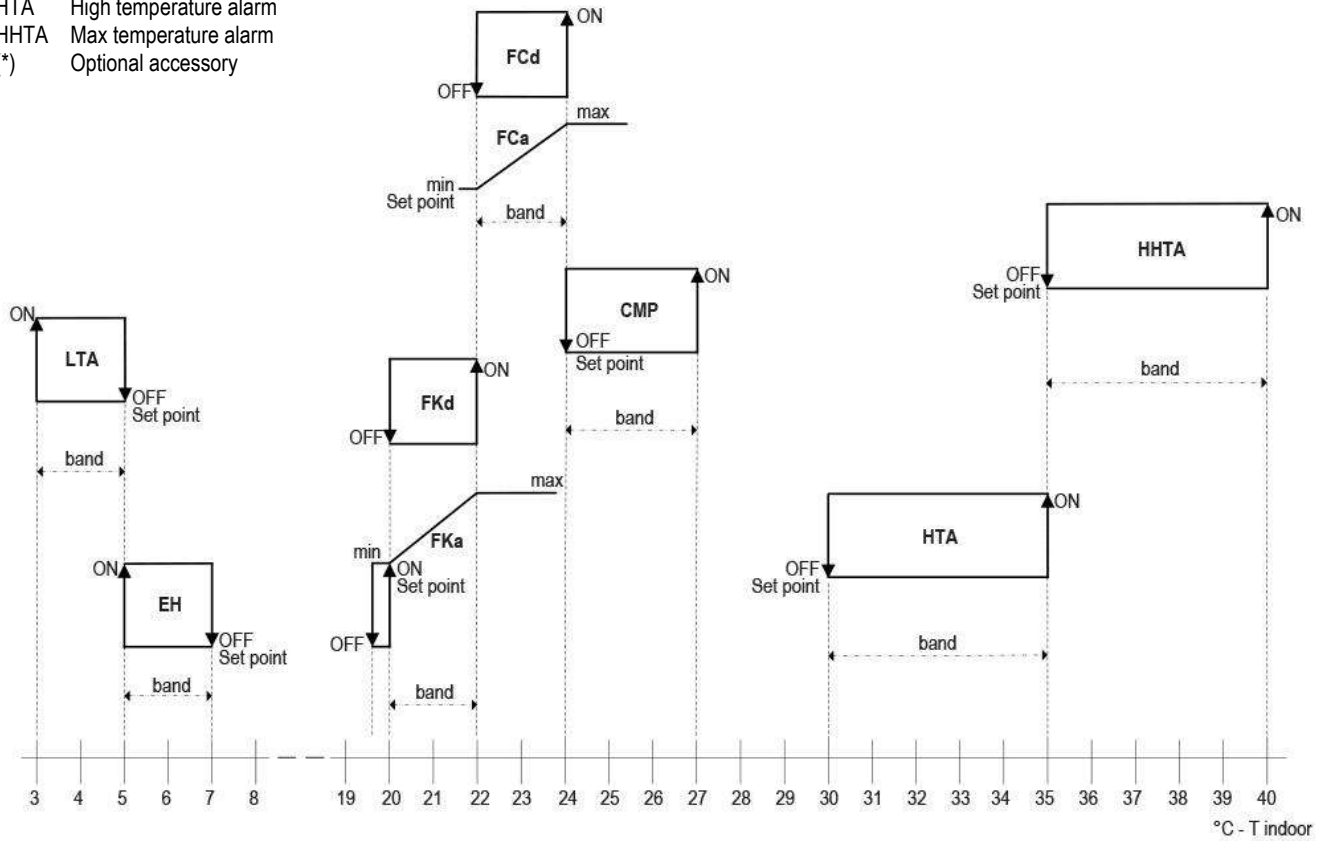
LAN ADDRESS LIST

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

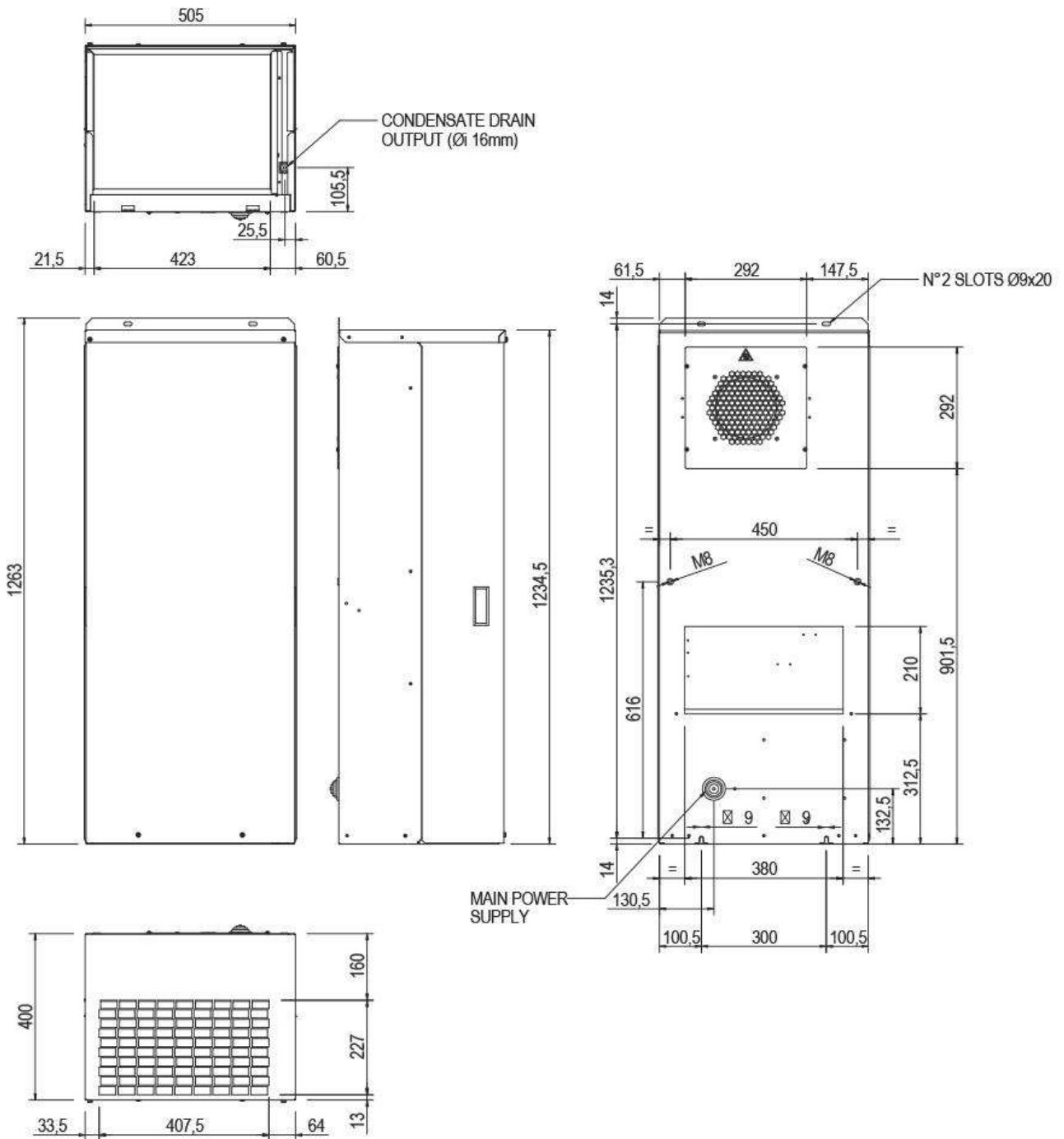
- LTA Low temperature alarm
- EH electric heater (*)
- FKd External Free Cooler digital control (*)
- FKa External Free Cooler analogue control (*)
- FCd Free-cooling damper digital control (*)
- FCa Free-cooling damper analogue control (*)
- CMP On/off compressor
- HTA High temperature alarm
- HHTA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



UNITS DRAWINGS

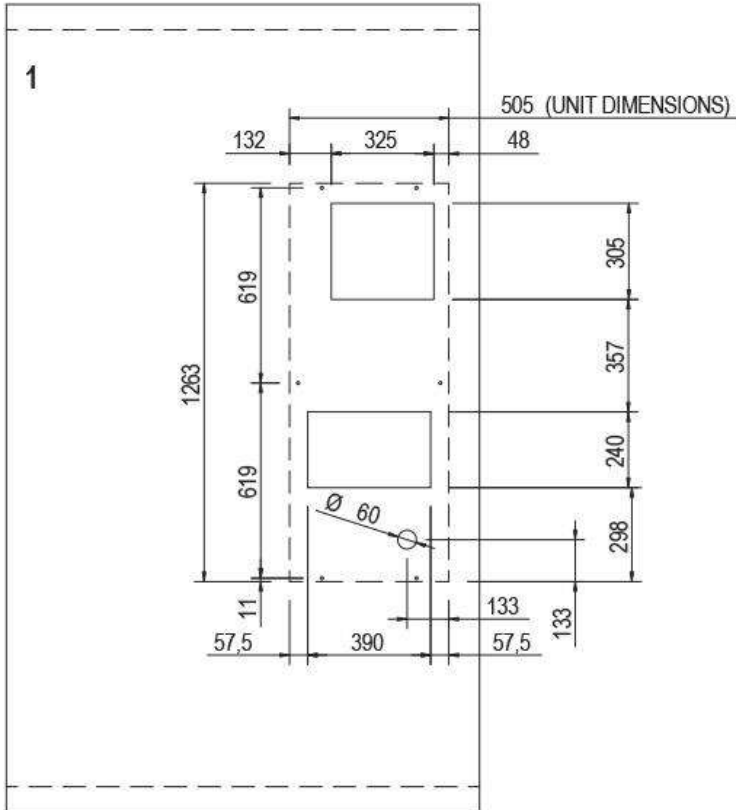
Dimensions in mm

Model 0003 – 004 UNDER

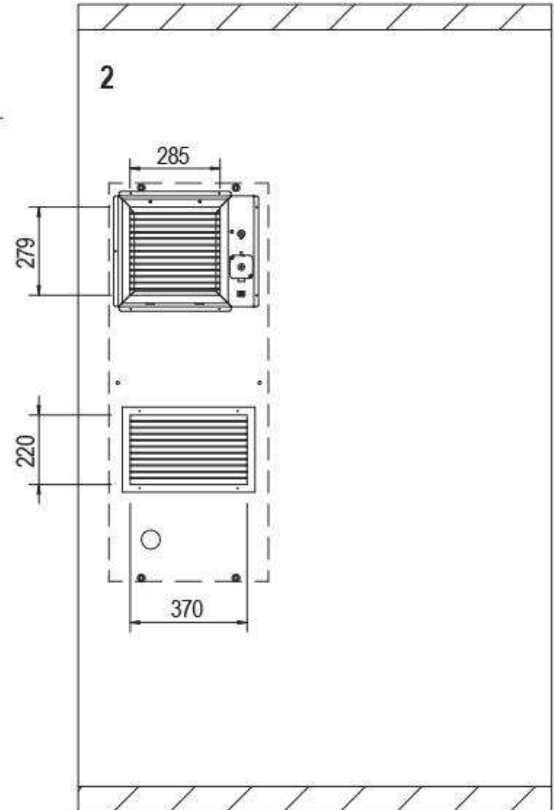


Model 0004 – 0004 UNDER
WALL DRILLING TEMPLATE

EXTERNAL VIEW OF THE SHELTER



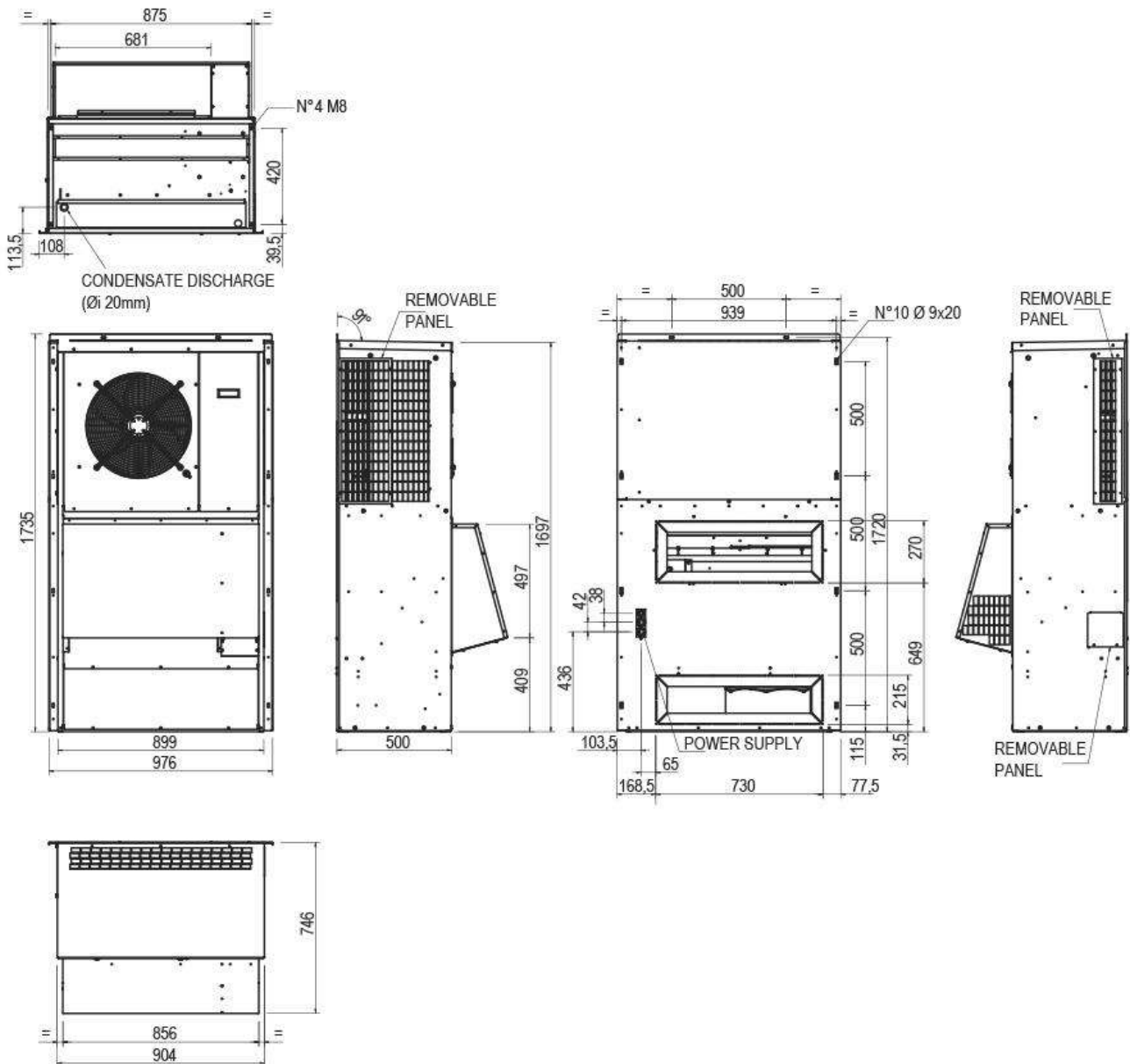
INTERNAL VIEW OF THE SHELTER



Air delivery and return grilles are optional

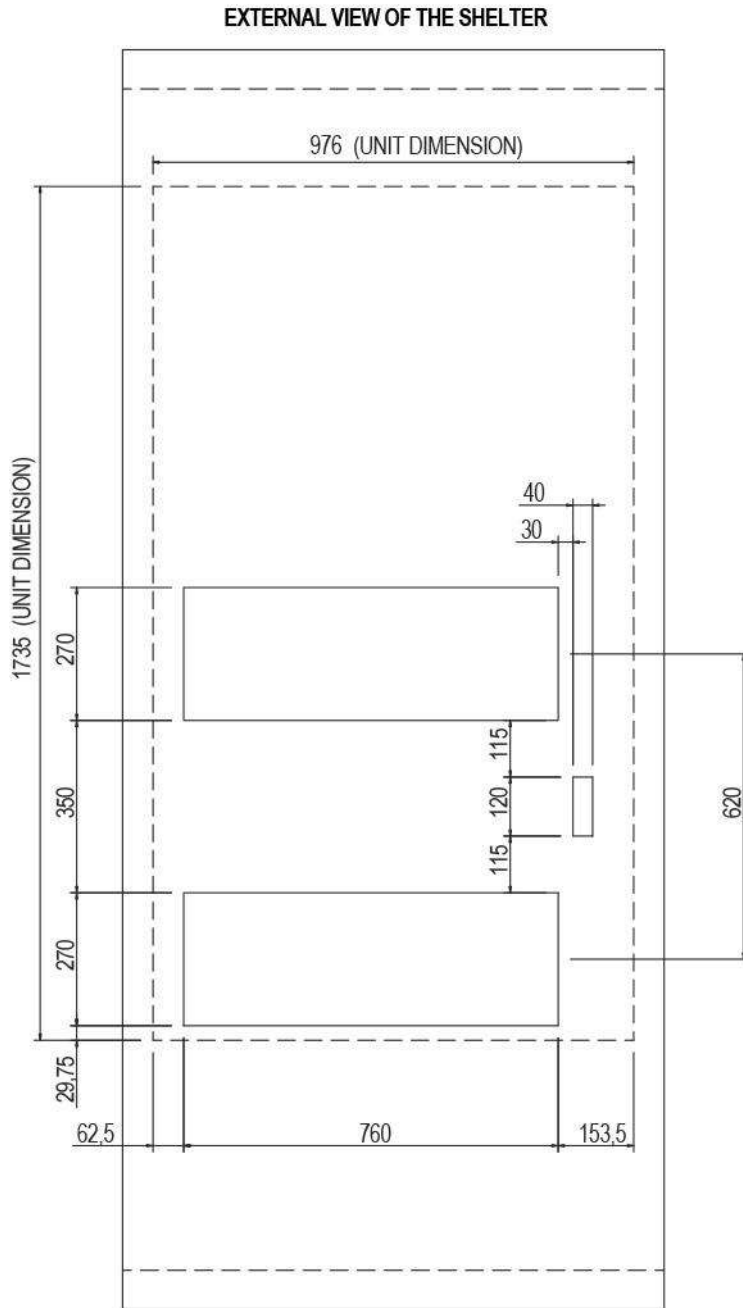
UNITS DRAWING
Dimensions in mm

Model 0011 - 0031 UNDER



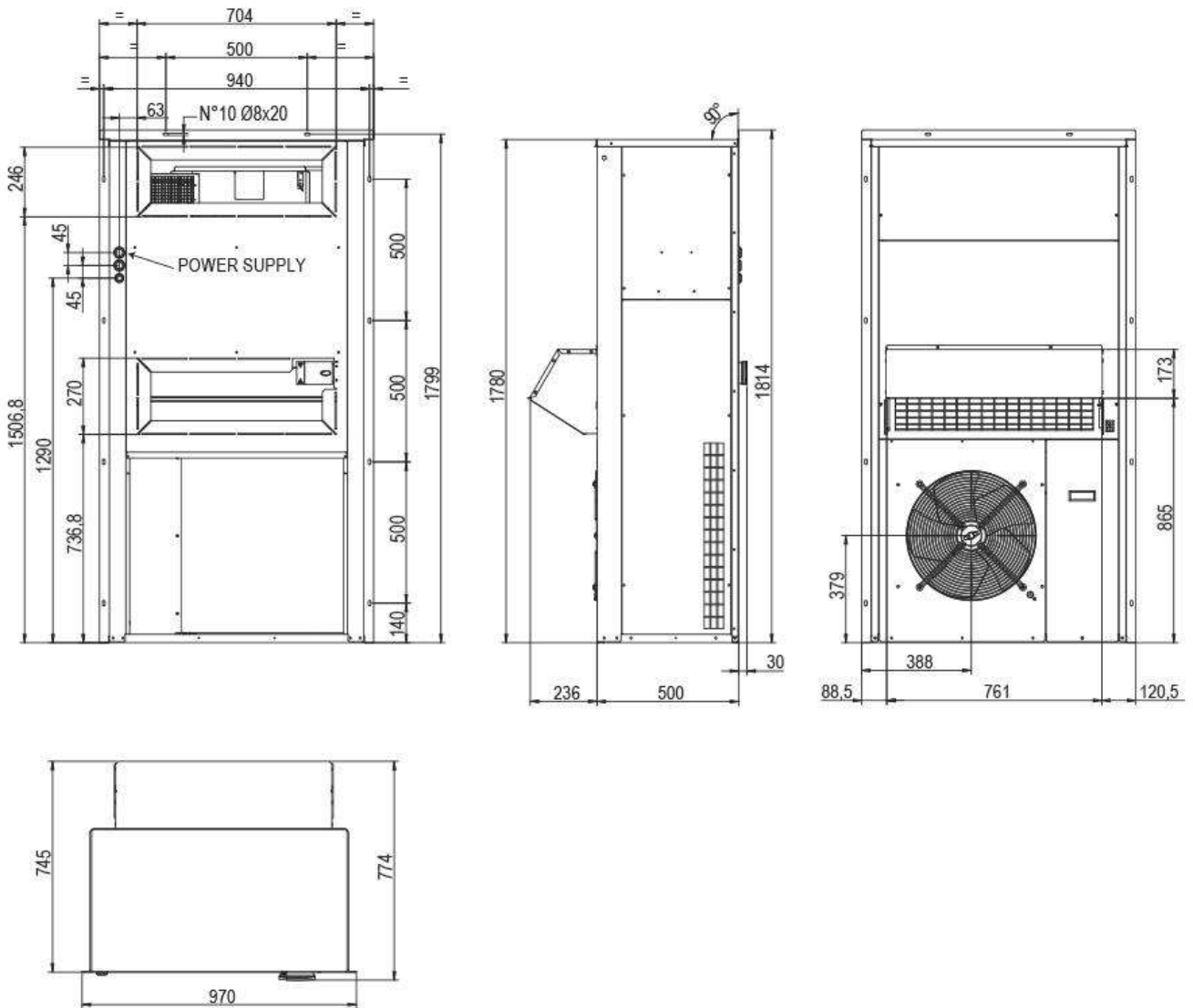
Rain shelter (supplied in mounting kit) and outdoor air intake are supplied only with direct free-cooling system (optional accessory)

Model 0011 - 0031 UNDER
Wall drilling template



UNITS DRAWING
Dimensions in mm

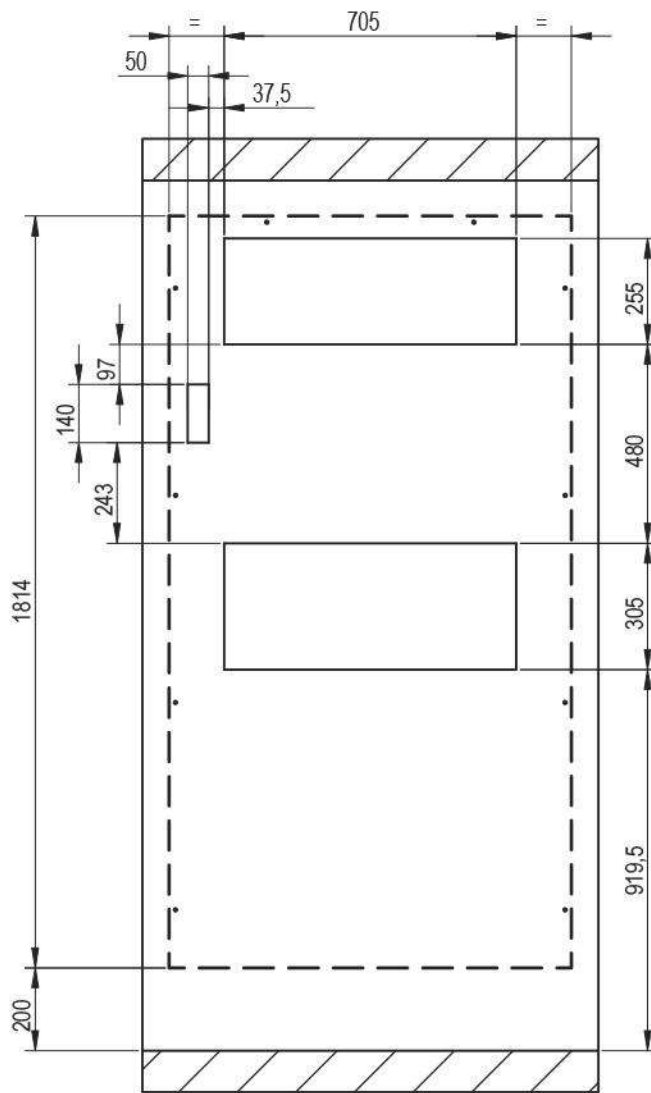
Model 0011 - 0031 OVER



Rain shelter (supplied in mounting kit) and outdoor air intake are supplied only with direct free-cooling system (optional accessory)

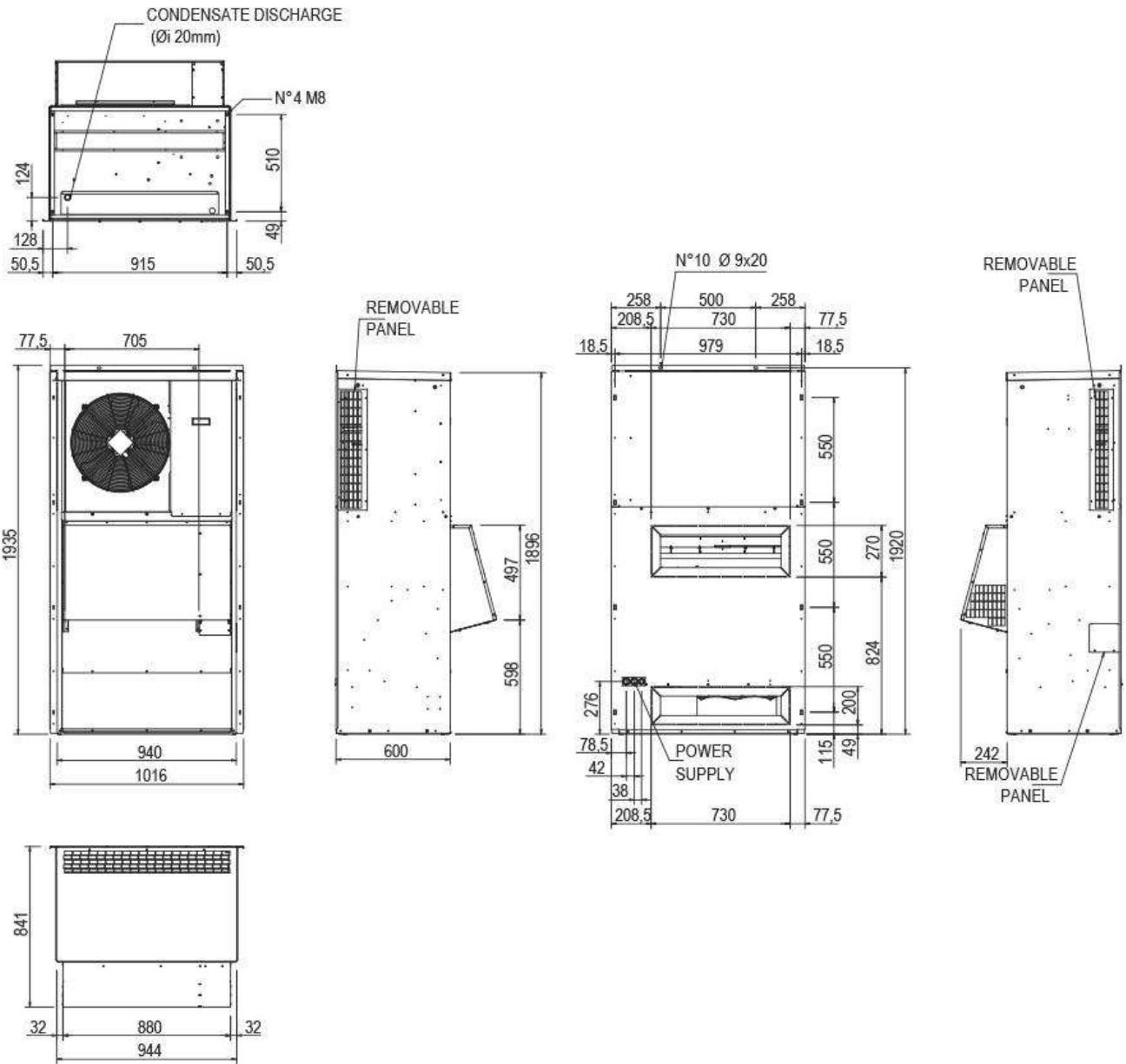
UNITS DRAWING
Dimensions in mm

Model 0011 - 0031 OVER
Wall drilling template



UNITS DRAWING
Dimensions in mm

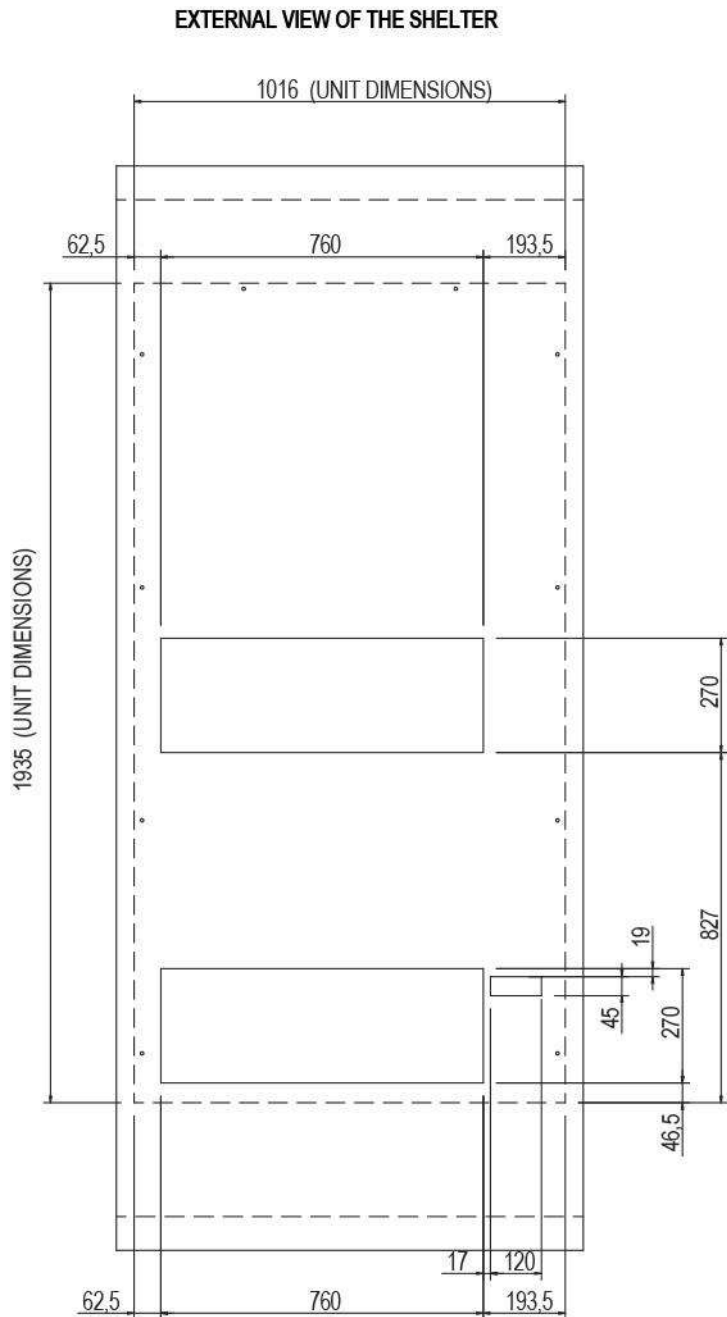
Modello 0041 - 0056 UNDER



Rain shelter (supplied in mounting kit) and outdoor air intake are supplied only with direct free-cooling system (optional accessory)

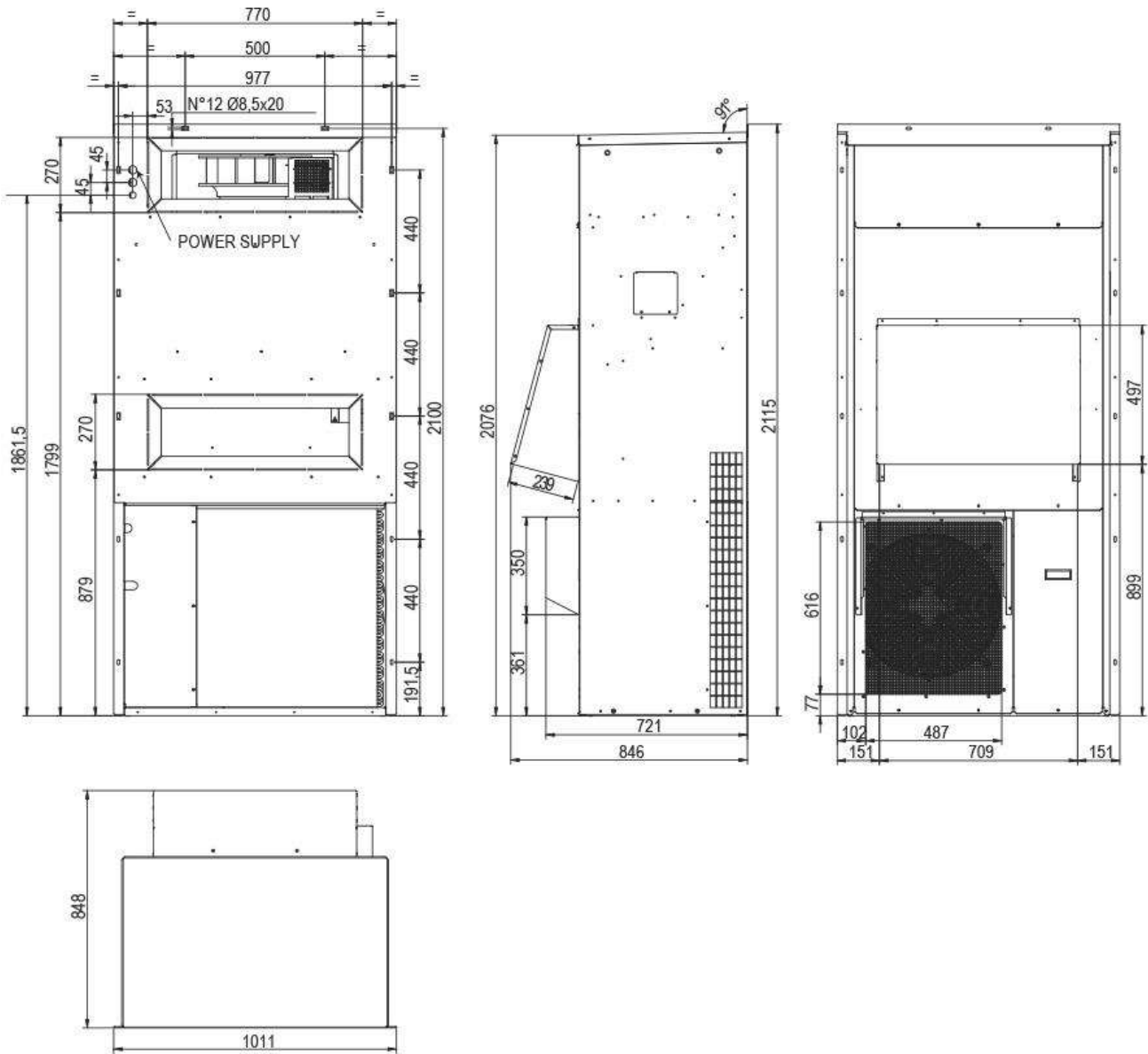
UNITS DRAWING
Dimensions in mm

Model 0041 - 0056 UNDER
Wall drilling template



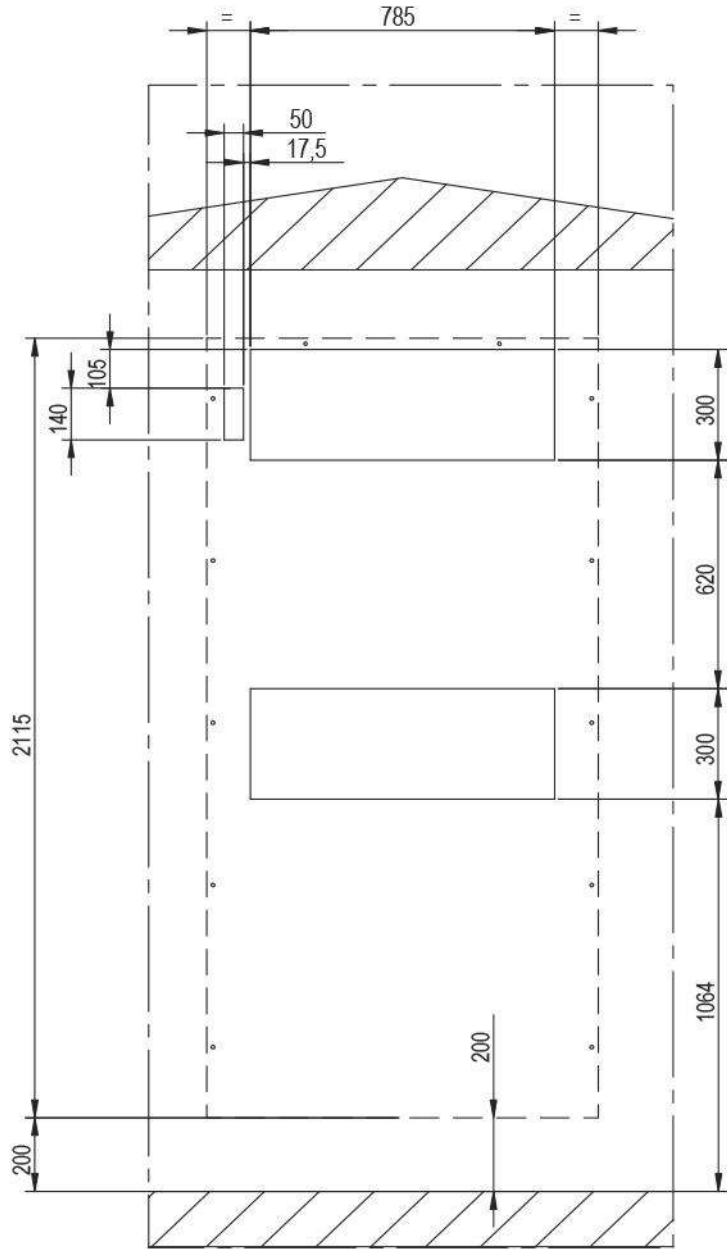
UNITS DRAWING
Dimensions in mm

Model 0041 – 0056 OVER



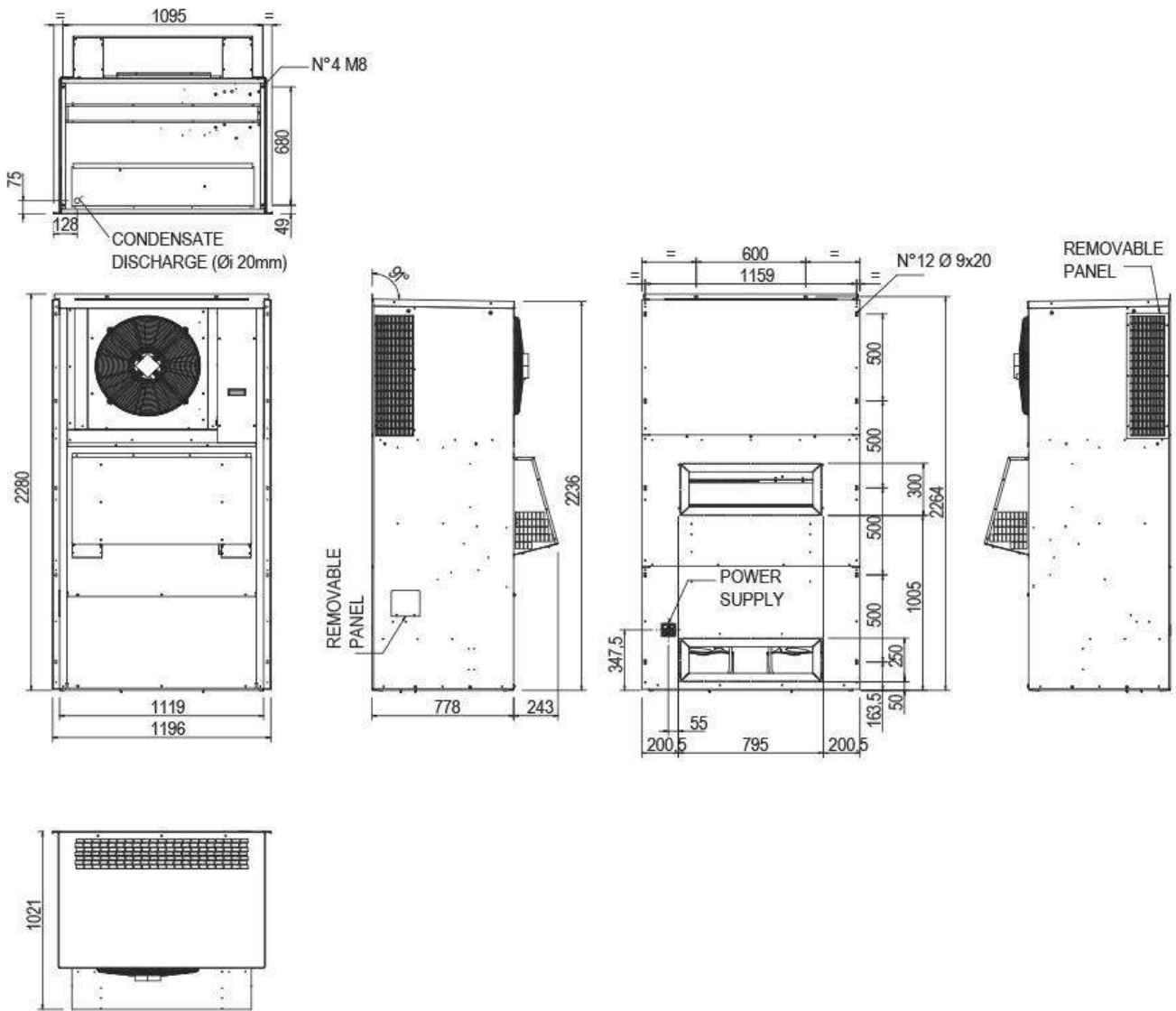
Rain shelter (supplied in mounting kit) and outdoor air intake are supplied only with direct free-cooling system (optional accessory)

Model 0041 - 0056 OVER
Wall drilling template



UNITS DRAWING
 Dimensions in mm

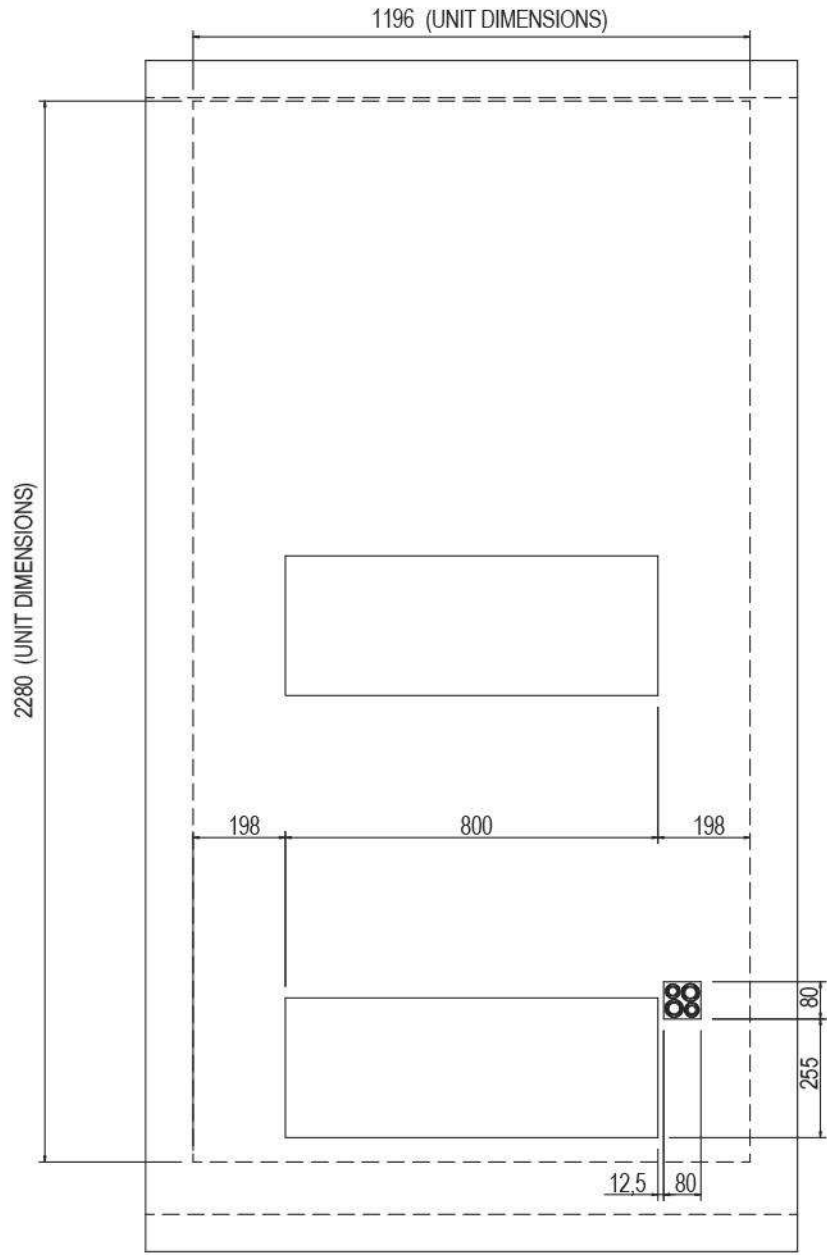
Model 0061 - 0091 UNDER



Rain shelter (supplied in mounting kit) and outdoor air intake are supplied only with direct free-cooling system (optional accessory)

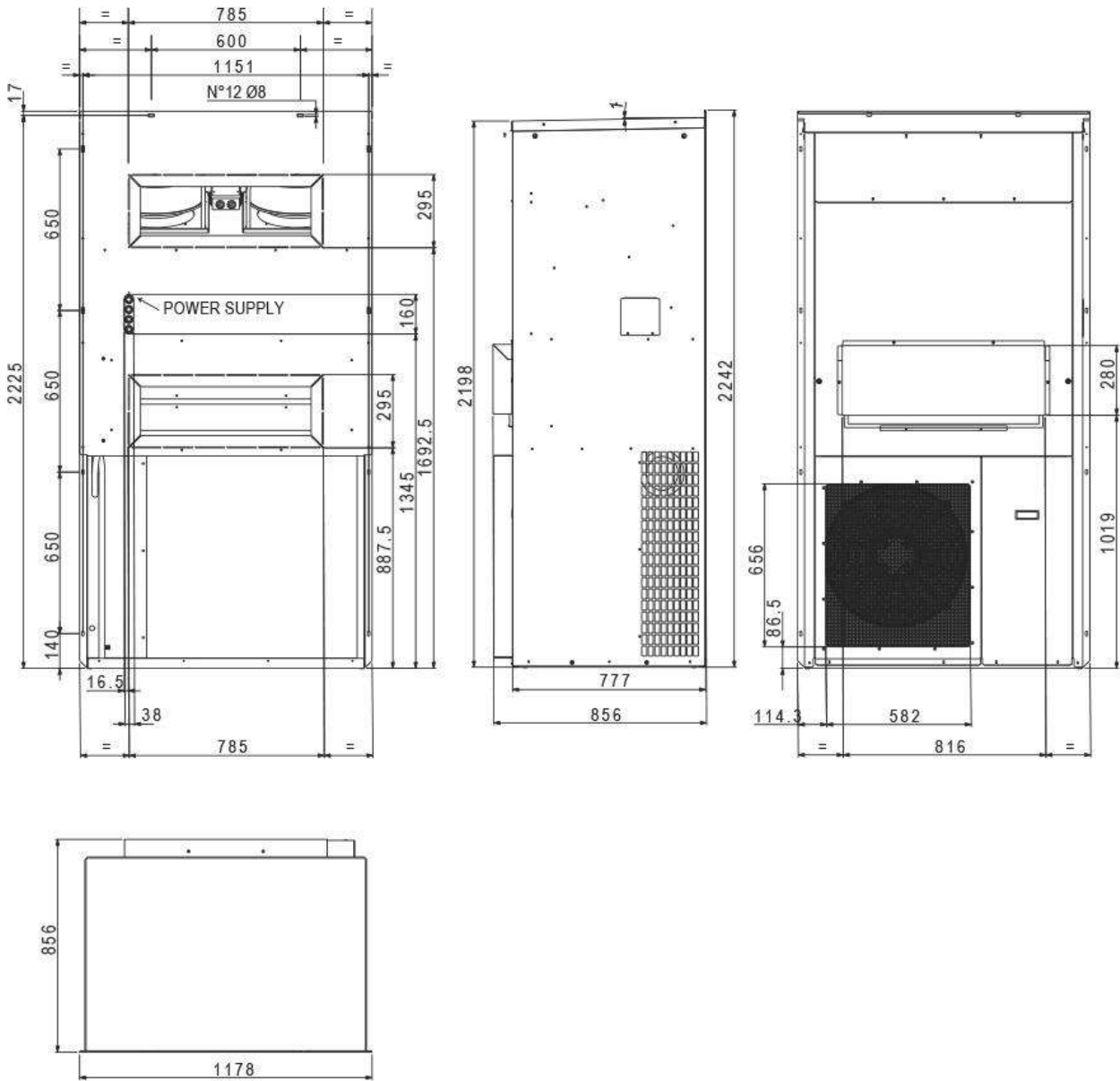
UNITS DRAWING
Dimensions in mm

Model 0061 - 0091 UNDER
Wall drilling template



UNITS DRAWING
Dimensions in mm

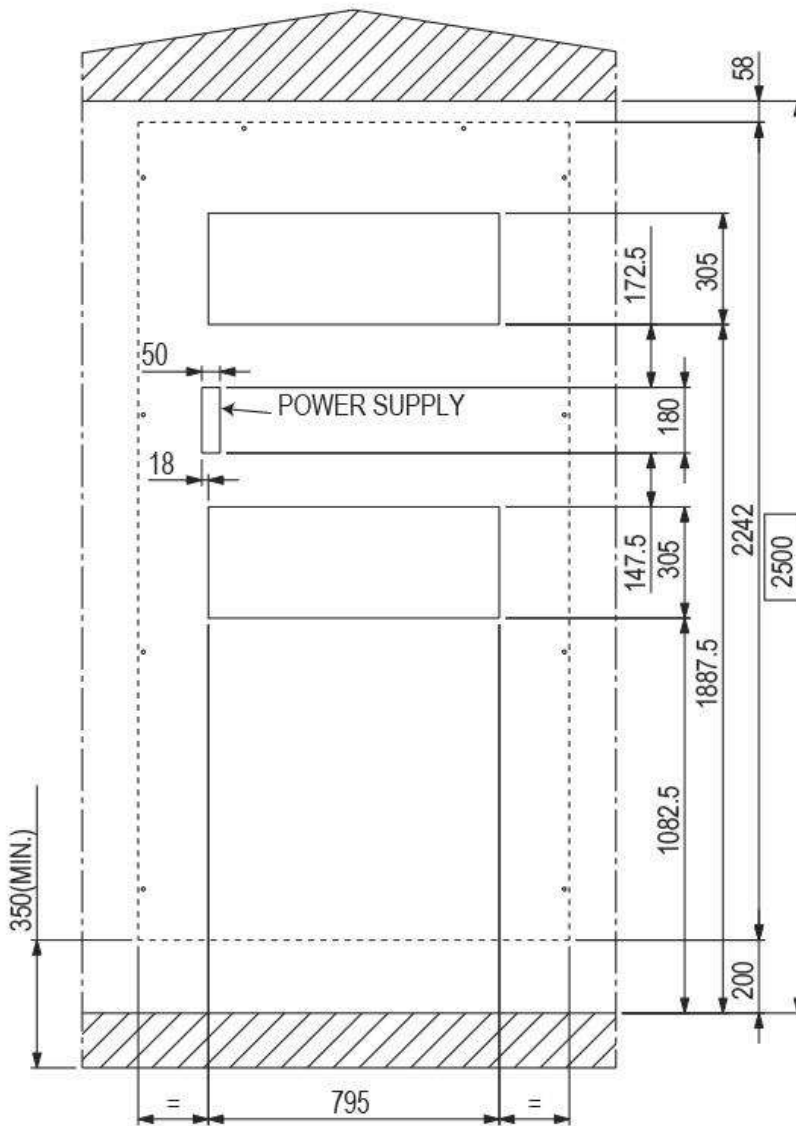
Model 0061 - 0091 OVER



Rain shelter and outdoor air intake are supplied only with direct free-cooling system (optional accessory)

Model 0061 - 0091 OVER
Wall drilling template

INTERNAL VIEW OF THE SHELTER



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.

MODEL		0001	0003	0004	0011	0021	0031
Compressor starting current [LRA]	A	---	---	---	---	26	21

MODELLO		0041	0051	0056	0061	0071	0091
Compressor starting current [LRA]	A	25	26	35	37	41	56

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 (model 0001 excluded):

- 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.

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

Components:

- Electric heater
- Electrical control
- Safety thermostat.

MODEL		0001	0003	0004	0011	0021	0031	0041	0051	0056	0061	0071	0091
THERMAL POWER (1)	kW	1,0	1,0	1,0	1,7	1,7	1,7	3,4	3,4	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	14,8	14,8
Capacity step	n.	1	1	1	1	1	1	2	2	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 - 0-10V FREE-COOLING DAMPER

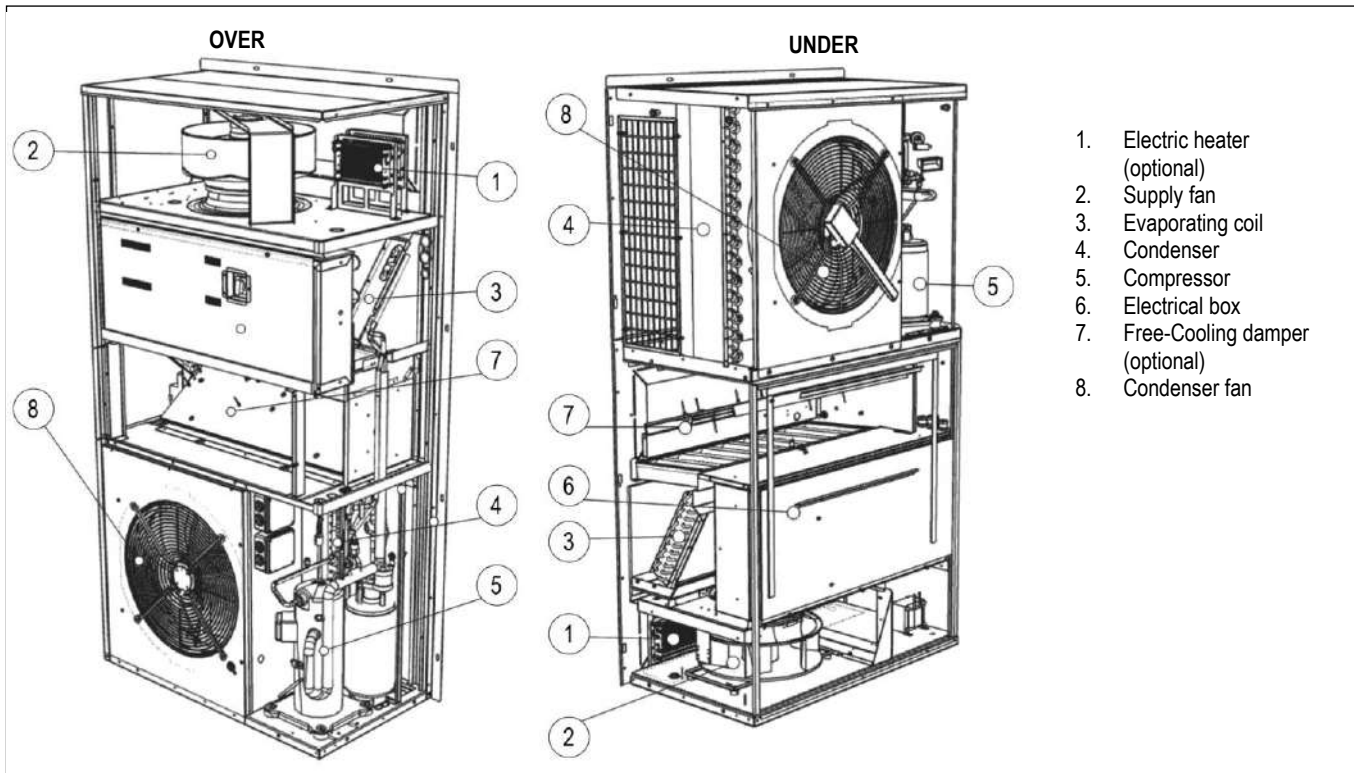


Not available for model 0001, 0003, 0004.
The optional allow to obtain free-cooling by direct ambient air intake into the room.
The damper is contained within the air conditioner and does not change the overall dimensions.
The damper is proportionally managed by the microprocessor control, that regulates 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:

- Damper made of sheet steel;
- Actuator with power supply from network or 48Vdc

With the damper is supplied a rain shelter. The rain shelter modifies the overall dimensions of the air conditioner. It is supplied in mounting kit for all units, except for models 0061, 0071, 0091 with OVER air delivery for which is supplied mounted.



- 1. Electric heater (optional)
- 2. Supply fan
- 3. Evaporating coil
- 4. Condenser
- 5. Compressor
- 6. Electrical box
- 7. Free-Cooling damper (optional)
- 8. Condenser fan

MODEL		0001	0003	0004	0011	0021	0031	0041	0051	0056	0061	0071	0091
Air flow	m ³ /h	----	----	----	1450	1450	1600	2450	2450	3200	3500	3500	3900

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: B113 – ADJUSTABLE HORIZONTAL AIR SUCTION GRILLE



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

OPTIONAL ACCESSORIES: A212 – COARSE 50% AIR FILTER

The optional is available only 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: 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

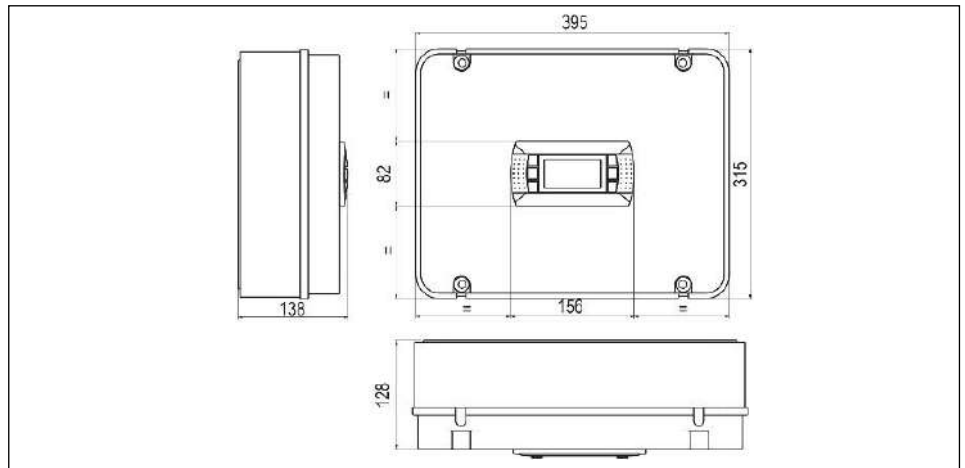
Metal mesh filter on outdoor air suction grille. The optional accessory is available only with free cooling damper on unit.

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: C90051871G: KIT ELECTRICAL PANEL FOR 0001-0003-0004

Kit electrical panel for unit command 0001, 0003, 0004. The option is mandatory because it's not installed in the unit.

**OPTIONAL ACCESSORIES: 7387012600 – REMOTE TERMINAL DISPLAY PGD1**

Wall mounting remote display.

OPTIONAL ACCESSORIES: 7373021900 / 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:

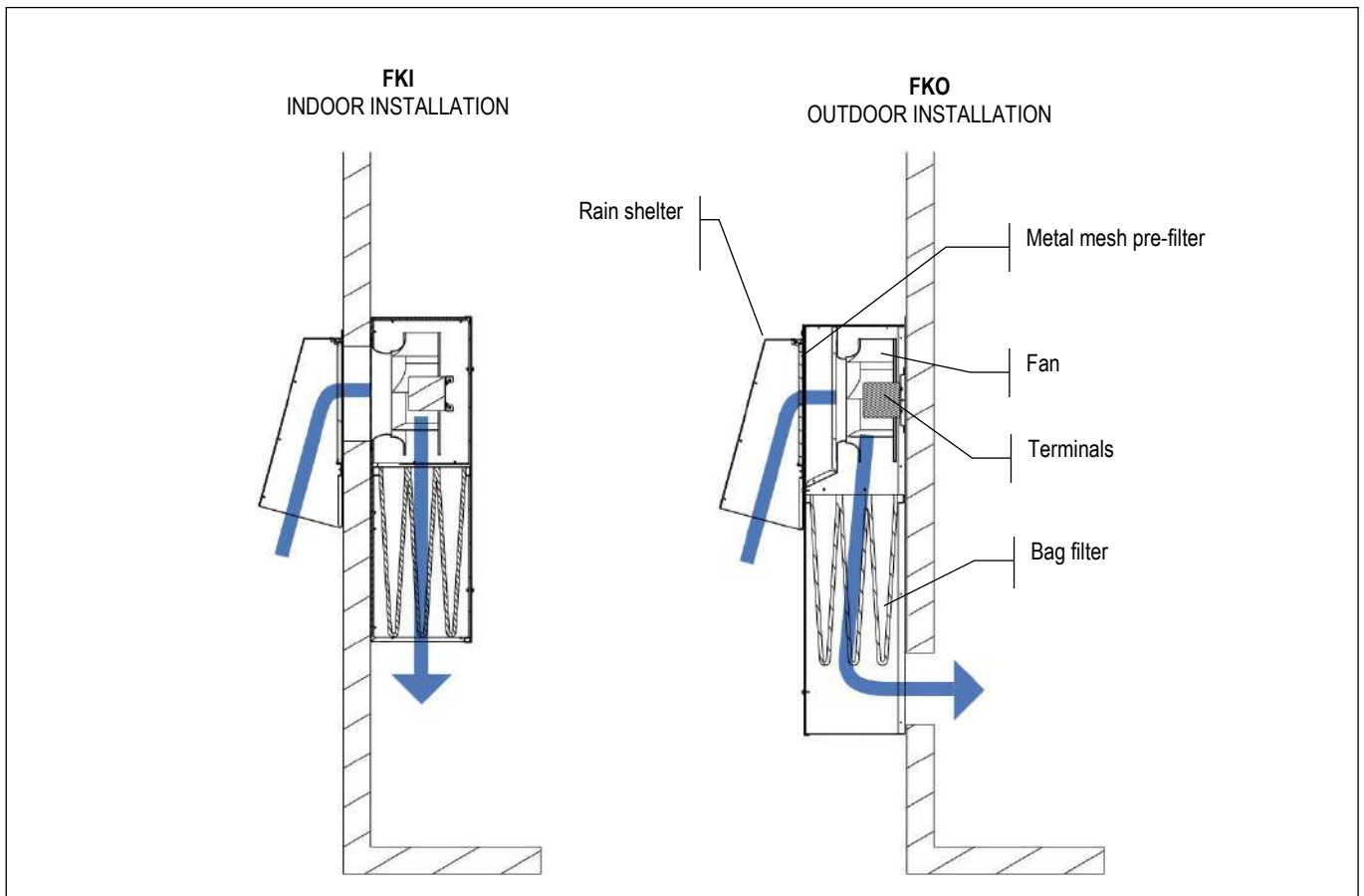
- Frame and panels in galvanized steel sheet and painted with epoxy powders. Colour RAL 9010;
- Metal mesh pre-filter on outdoor air suction.
- Centrifugal fans with backward curved blades with wing profile, single suction and without scroll housings (Plug-fans), directly coupled to external rotor electric 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	0051
COOLING CAPACITY (1)	kW	7,67	8,17	10,13
FAN 48 Vdc	n.	1	1	1
Air flow	m ³ /h	2300	2450	3040
Engaged power 48Vdc (3)	W	248	234	497
Absorbed current 48Vdc (3)	A	5,24	4,93	10,6
ENERGY INDEX (1)				
EER = Energy Efficiency Ratio		34,85	35,51	22,03
DIMENSIONS				
FKI - Length	mm	646	646	646
FKI - Width	mm	296	296	296
FKI - Height	mm	955	955	955
FKO - Length	mm	648	648	648
FKO - Width	mm	296	296	296
FKO - Width with rain shelter	mm	542	542	542
FKO - Height	mm	1227	1227	1227
NET WEIGHT FKI	kg	30	31	40
NET WEIGHT FKO	kg	45	46	46
SOUND PRESSURE (2)	dB(A)	62	65	66

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.

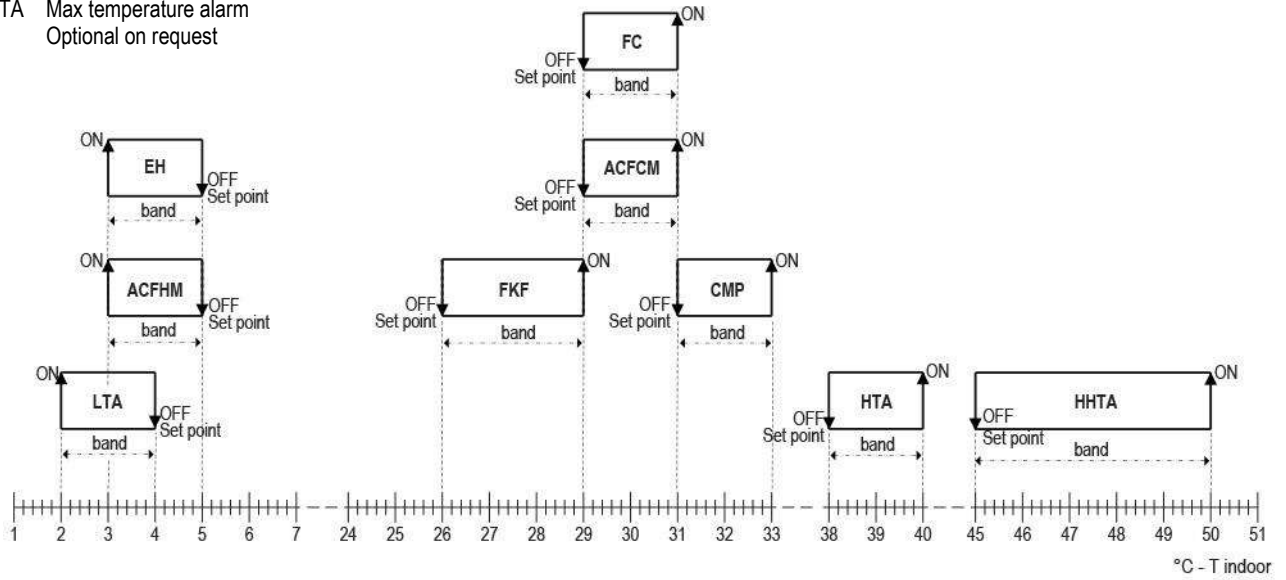
INSTALLATION EXAMPLE



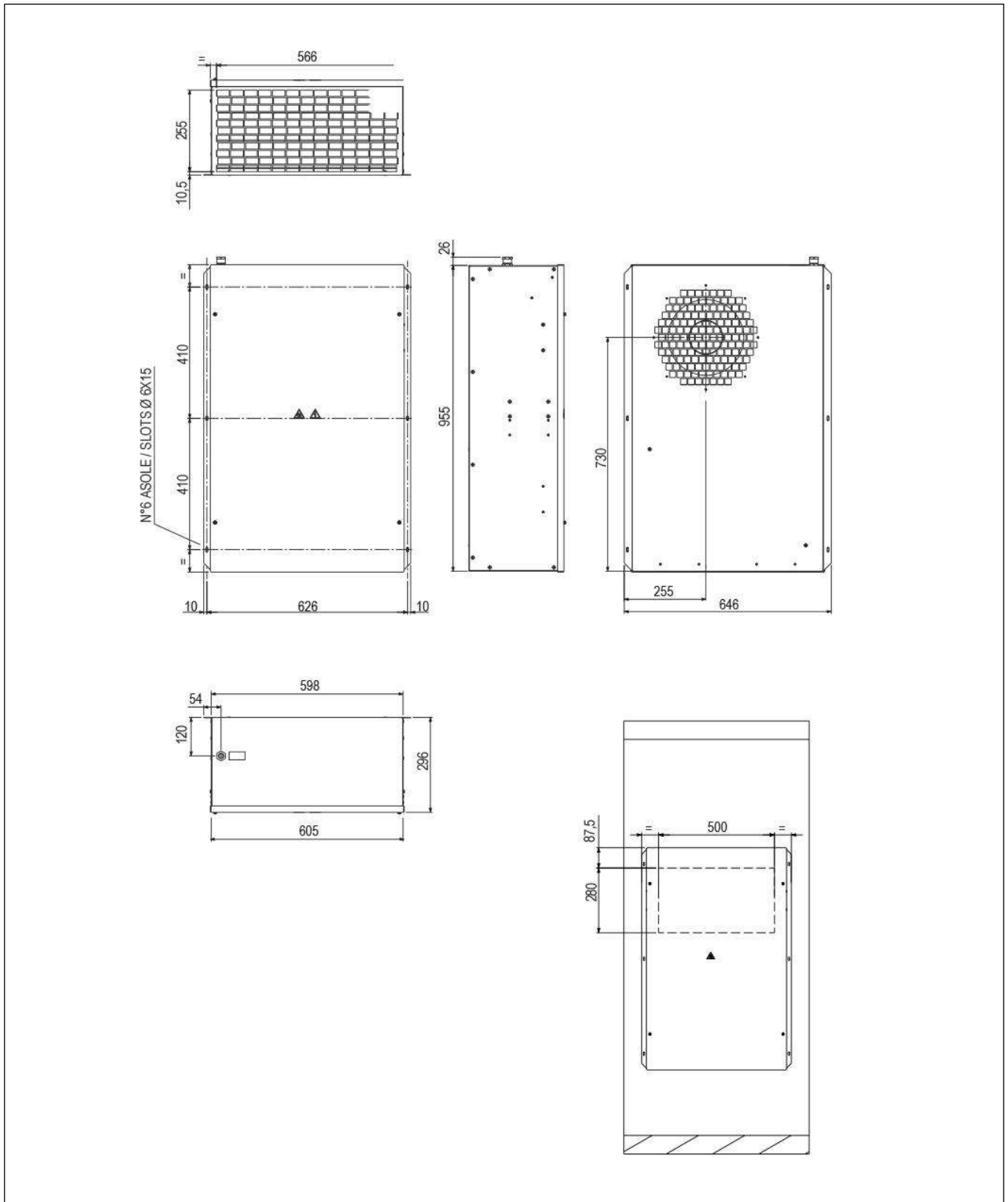
WORKING LOGIC

- 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

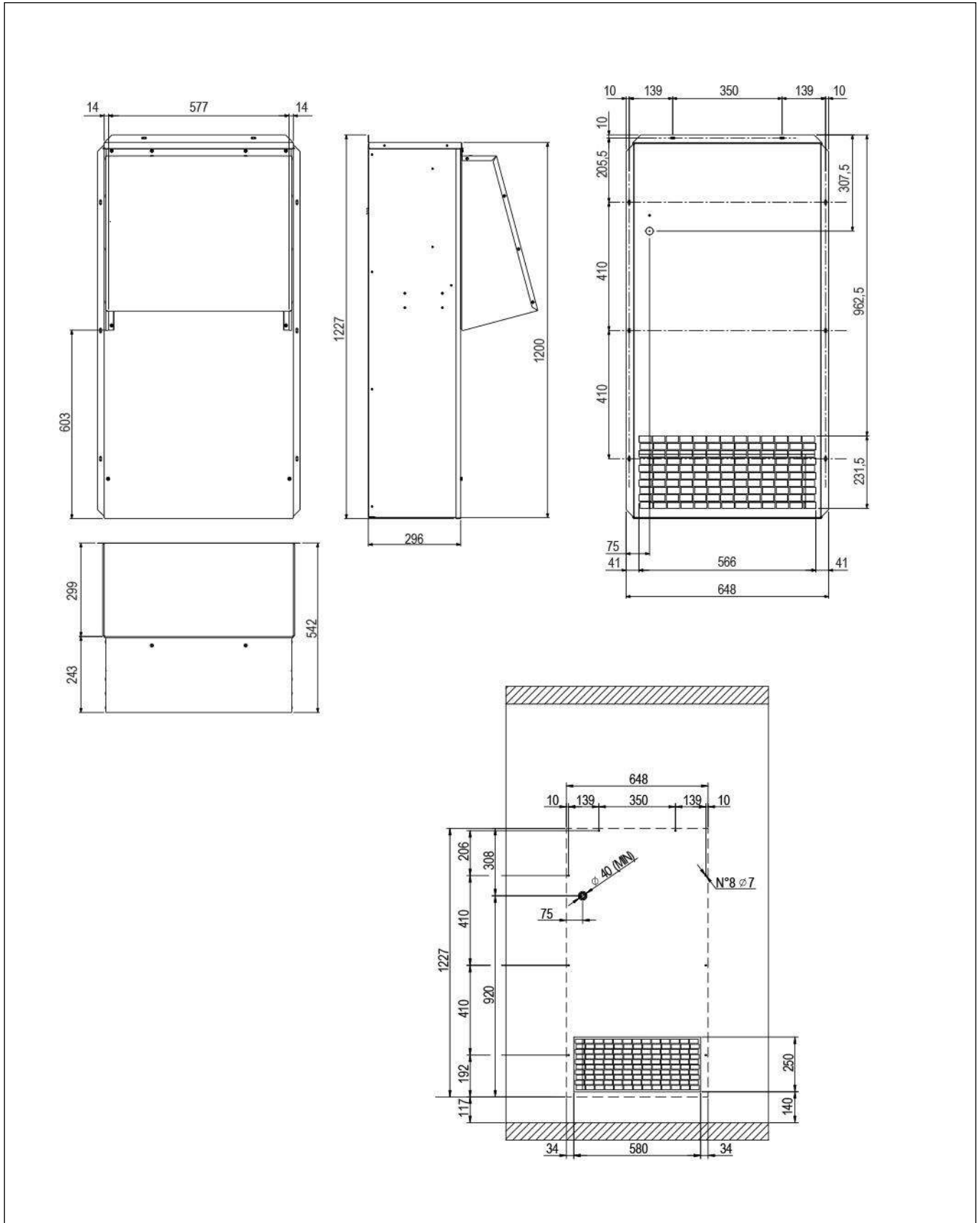
EXAMPLE - WORKING LOGIC
Temperatures are indicative



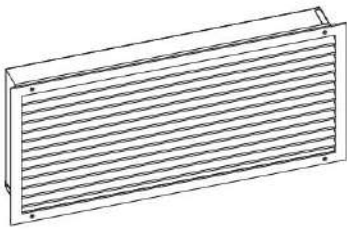
DRAWING FKI UNIT – Dimensions in mm



DRAWING FKO UNIT – Dimensions in mm



OPTIONAL ACCESSORIES: 7369009900 - OVERPRESSURE DAMPER

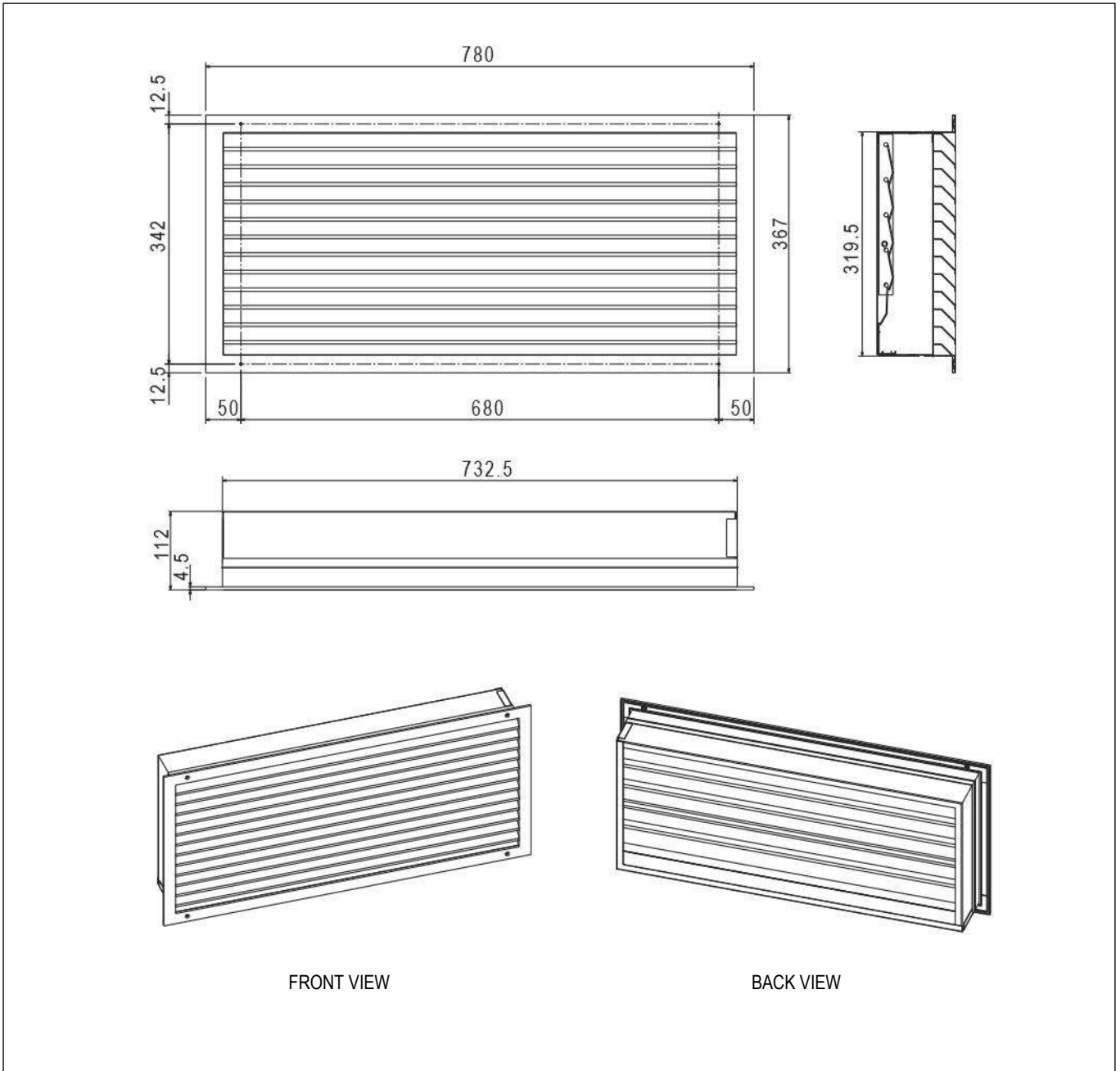


Not available for model 0001, 0003, 0004

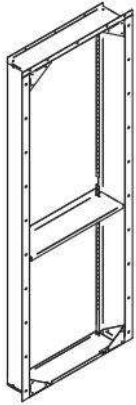
The optional accessory is useful for balancing the excess of pressurization in the indoor environment and is suggested when free-cooling damper (optional accessory) or external free-cooler (optional accessory) are foreseen.

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.



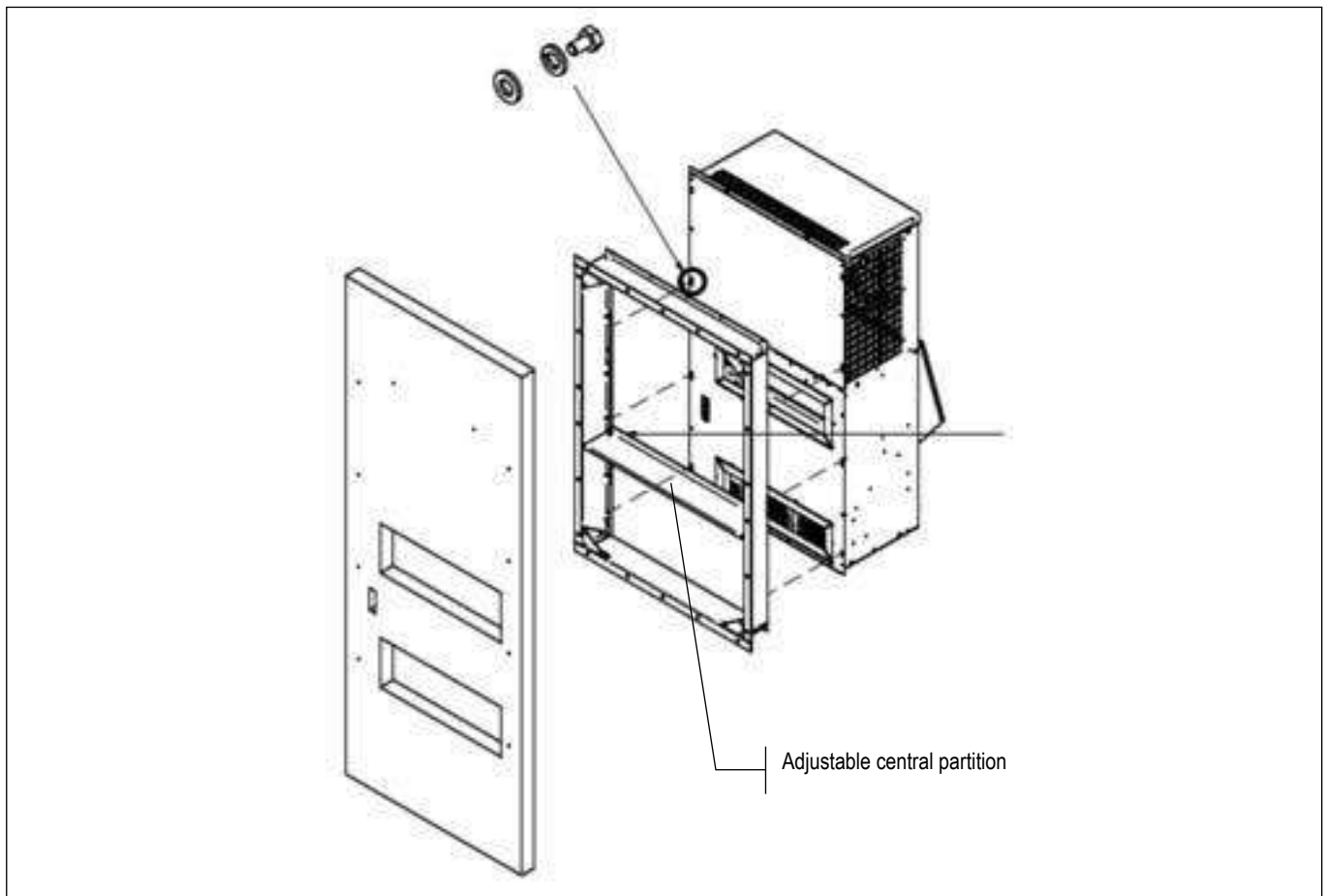
OPTIONAL ACCESSORIES: 7396019600 / 7396019700 / 7396022200 - KIT DIMA



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 dima has a central partition adjustable in height.





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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