



 United Technologies

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS



Indoor units

40SZ/SF

Nominal cooling capacity 20 - 135 kW
Nominal heating capacity 20 - 145 kW
50 Hz



Indoor units

Contents

1. Description	3
2. Unit identification.....	3
3. Available assemblies.....	4
4. Safety advice.....	5
5. Transport and handling	5
Transport	5
Discharging of the unit	5
6. Location and assembling	7
Choice of location.....	7
Sound level	7
Anchorage for silent-blocks.....	8
Minimum free space for commissioning and maintenance operations	8
7. Checking before commissioning	9
Electrical connections	9
Checks in the centrifugal fans	9
Checks in plug-fans (optional).....	10
Air ducts connections	10
Condensate drain connection	11
8. Safety elements	12
9. Optional.....	12
Mixing box.....	12
Electrical heaters.....	13
Hot water coil	16
Stop-drop	16
Filters	17
10. Maintenance.....	18



1. DESCRIPTION

Indoor units with horizontal construction designed for installation indoors, connected to a network of ducts.

They are equipped with centrifugal fan (EC plug-fan also available in models 90 to 360), and expansion valve.

A vast number of options meet numerous operating demands.

All of the units are tested and checked in the factory.

- **1 circuit:**

Models: 90 / 100 / 120 / 160 / 180 / 182

- **2 circuits:**

Models: 200 / 240 / 320 / 360 / 420 / 485 / 540 / 600

The units comply with standards: EN 60-204 - EN 378-2, and directives: Machinery 2006/42/EC - EMC 2004/108/EC - LVD 2006/95/EC - PED 2014/68/EC (Category 2).

Those in charge of the installation, commissioning, operation and maintenance of the unit must know the instructions contained in this brochure and the specific technical characteristics of the installation place.

2. UNIT IDENTIFICATION

Check the condition of the equipment upon delivery.

Check that the details on the label, the packing and the data plate match the order.

If equipment has been damaged, or there is a shortfall in delivery, notify accordingly.

All units bear, legibly and indelibly, a data plate located in a prime space, as appears in the attached image: Check that this plate matches the correct model.

Año/An. Year	Ref/Reference	No Serie/serial Nbr.		
1	2	3		
Product/Product/Produit				
4				
Ref. Produit/Item Nbr				
5	6	7		
Tension/Voltage	Kit Elec.	Max.Intensidad/Intensité/Current		
8	9	10		
Refrigerant	Refrig.KG (Fábrica/Factory/Usine)/Co2 Teq.			
11	12			
PSmax(API/HP)	PSmax(BP/LP)	Temp. Max. / IP	Peso/Poids/Weight	NoBo
13	14	15	16	17
 CARRIER SCS Route de Thil 01122 Montluel-FRANCE		Fabricante/Fabricant/Manufacturer: Compañía Industrial de Aplicaciones Térmicas, S.A. P. Ind. Llanos de Jarata s/n. 14550 Montilla-SPAIN		 
Contient des gaz à effet de serre fluorés \ Contains fluorinated greenhouse gases regulated by the Kyoto protocol Contiene gases fluorados de efecto invernadero regulados por el protocolo de Kyoto				

Legend

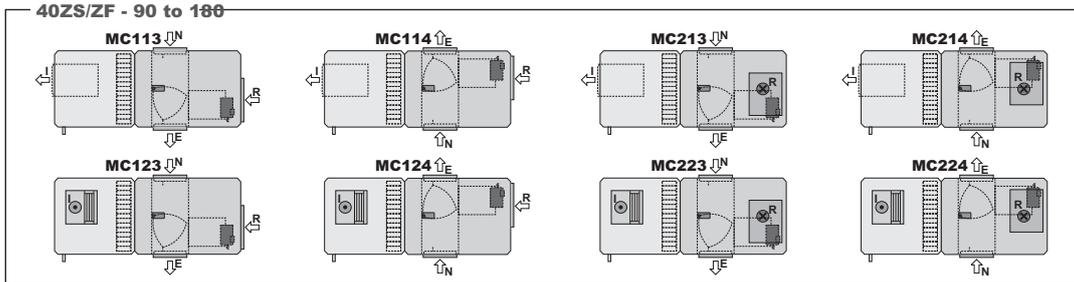
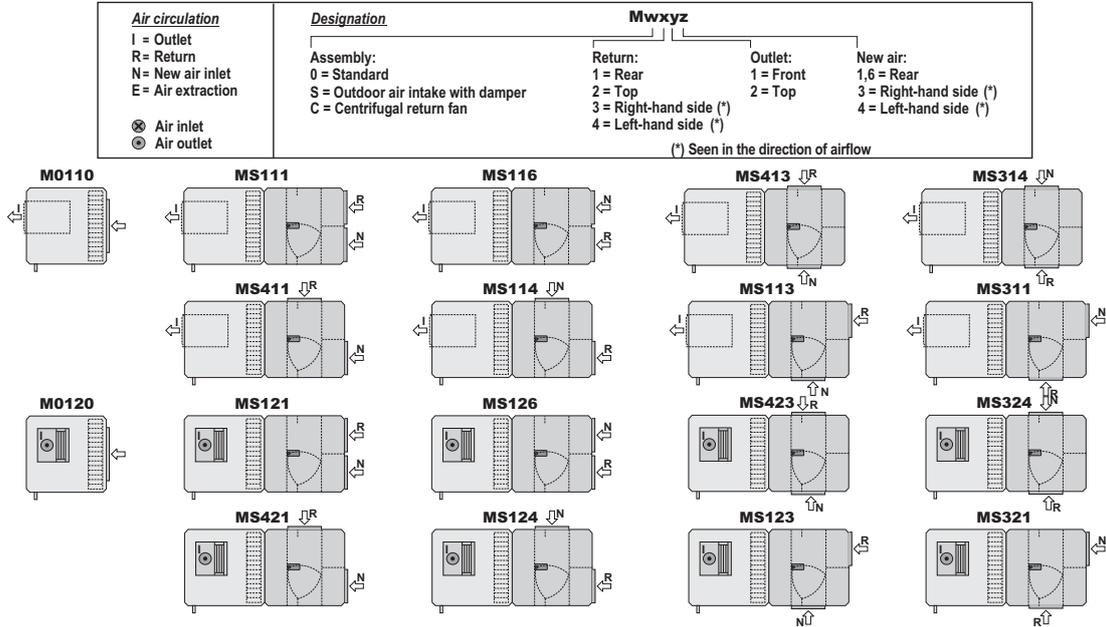
- 1 Year of manufacture
- 2 Commercial product name
- 3 Serial number
- 4 Description of the product
- 5 Purchase order number
- 6 Sales order number
- 7 Work order number
- 8 Power supply
- 9 Power output of the auxiliary electrical heaters kit (optional) (kW)
- 10 Maximum absorbed current under full load (A) (including the electrical kit)
- 11 Type of refrigerant
- 12 Refrigerant content (kg) and Environment impact (CO₂ Teq.)
- 13 Maximum service pressure in the high pressure side (R-410A = 42 bar)
- 14 Maximum service pressure in the low pressure side (R-410A = 24 bar)
- 15 Maximum operating temperature (refer to "Operation limits")
Maximum shipment and storage temperature: +50°C
Electrical protection rating: IP54
- 16 Operation weight (kg) (empty weight + fluid + refrigerant)
- 17 Notified Body number for surveillance of the Pressure Equipment Directive



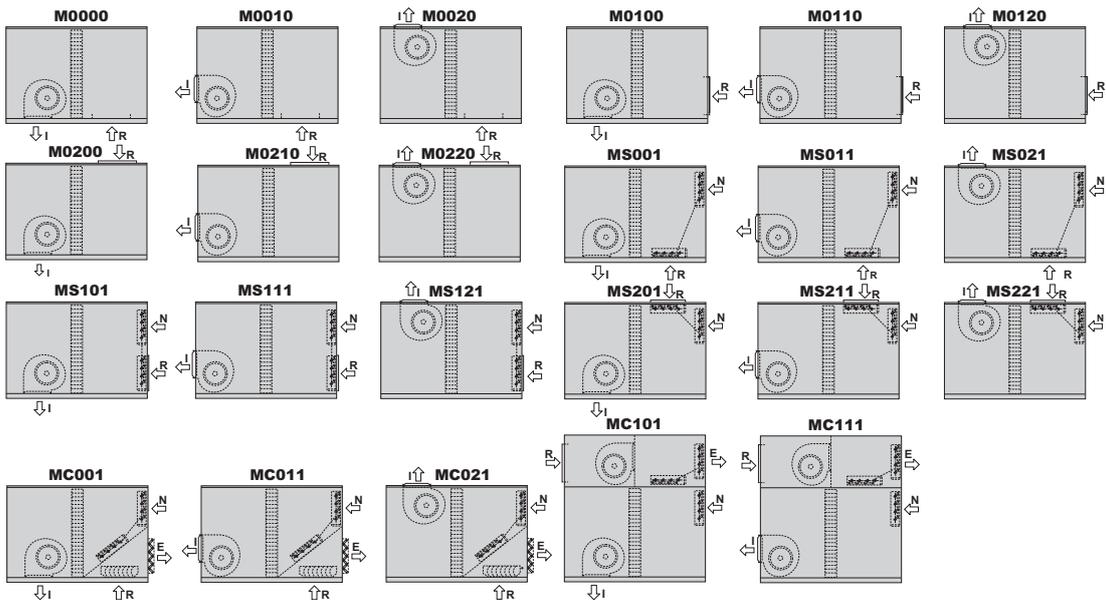
Note: The serial number must be used in all communications regarding the unit.

3. AVAILABLE ASSEMBLIES

40ZS/ZF - 90 to 360: assemblies with mixing box (plan view)



40ZS/ZF - 420 to 600: assemblies with mixing box (raised view)



Air circulation I = Outlet R = Return N = New air inlet E = Air extraction		Designation Assembly: 0 = Standard S = Outdoor air intake with damper C0 = Lower return plug-fan C1 = Centrifugal return fan in top box		Mwxyz Return: 0 = Bottom 1 = Side 2 = Top		Supply: 0 = Bottom 1 = Side 2 = Top		New air: 0 = No inlet 1 = Side	
---	--	---	--	--	--	--	--	--------------------------------------	--

4. SAFETY ADVICE

To avoid any risk of accident during installation, commissioning or maintenance, it is obligatory to take into consideration the following specifications for the units: refrigerated circuits under pressure, refrigerant presence, electrical voltage presence and implantation place.

Because of all of this, only qualified and experienced personnel can perform maintenance tasks or unit repairs.



It is required to follow the recommendations and instructions in the maintenance brochures, the labels, and the specific instructions.

It is necessary to comply with the norms and regulations in effect. It is recommended to consult the competent authorities regarding the applicable regulations for users of units or components under pressure. The characteristics of these units or components are included on the plates of characteristics or in the regulatory documentation provided with the product.



The compressor and line surfaces can reach temperatures above 100°C causing burns to the body. In the same fashion, under certain conditions these surfaces can reach very cold temperatures that can cause freezing risks.



Use safety goggles and gloves on the job. Be careful with sharp parts or elements in the unit.



Caution: Before intervening in the unit, verify that the main power to the unit is cut off. An electric shock can cause personal damage.



Note: In order to recycle these units follow the stipulations of Directives 2002/96/EC and 2003/108/EC regarding electrical and electronic equipment and the management of the resulting waste.

5. TRANSPORT AND HANDLING

Transport

The unit must be handled with care to avoid transport damage. Thus we recommend:

- Do not dispose of the transport supports or the packaging materials until the unit is in its final location.
- For transport in a container, one must be selected that has an easy load and unload to the installation location.

Discharging of the unit

The unit can be discharged using a forklift truck or a crane with a rocker arm and cloth slings in models 40ZS/ZF-420 to 630.

When using any of the two above methods, it is always mandatory to grasp the unit by the points intended for that purpose, as described in this chapter.

Any handling of the unit by other means or by gripping points different from those described here may be dangerous for both the unit and the personnel who are carrying out the discharging or transport work.

Always check the weight of the set and verify that the discharging method used is approved for handling that weight.



Note: please see the weight and the gravity centre coordinates of each model stated in the following section.

- Discharge via forklift truck:

The unit is designed to be transported safely by using a forklift truck.

Refrigerant leaks:

A periodical check must be performed for refrigerant gas leaks as per Regulation (CE) N°517/2014 over **certain greenhouse effect fluoride gases**. Please, consult the frequency of checks in chapter of "Maintenance".

These units work with refrigerant gas **R-410A**. This fluid is used up to a maximum service pressure of 42 bar.

Components of the R-410A	R-32	R-125
Chemical formula	CH ₂ F ₂	CHF ₂ CF ₃
Weight ratio	50%	50%
Unitary global warming potential (GWP)	675	3.500
Global warming potential (GWP)	2.088	

In case of a leak:

- Toxicity: According to ASHRAE 34, R-410A belongs to the A1/A1 group, i.e. with high safety both in the mix and also in the case of a leak.
- Although it is not toxic, in case of a leak to atmospheric pressure the liquid phase evaporates. The resulting vapours are heavier than air and can displace the technician local air. In case of an accidental discharge in a closed enclosure, fans must be used to eliminate said vapours.
- Although the R-410A is not flammable, when in contact with a flame or hot spot it can decompose in fluorhydric acid HF and fluophosgene COF₂ wich aire highly toxic and corrosive.
- To detect leaks, an electronic leak detector, an ultraviolet lamp or soapy water must be used . Flame detectors do not help.



Important: Immediately repair any refrigerant leak, using a recovery unit specific for R-410A that avoids a possible mixture of refrigerants and/or oils.

The forks of the forklift truck must come in on the side of the unit, ensuring that the centre of gravity of the unit remains within the forks, because a misbalance in the transport may cause the unit to turn over and fall from the forklift truck.

The recommended length for the forks will be bigger than the unit width, so that the entire weight-bearing structure can be supported on the forklift truck. This also prevents the possible introduction of the truck's fork into functional parts of the unit that may cause damage to the unit.

The standards and recommendations of the forklift truck must also be respected with regards to the maximum load, inclination of the fork carriage, elevation of the load for transport, and, in particular, the maximum speed.

- Discharge via crane:

A rocker arm, as well as approved cloth slings, both suitable for the dimensions and weight of the unit, must be used in order to carry out the work safely and without causing damage to the units or to workers.

These slings will be hooked to the two mounting holes located on each crossbar (in models 90 to 360) or to the two grips screwed on each crossbar in models 420 to 600.

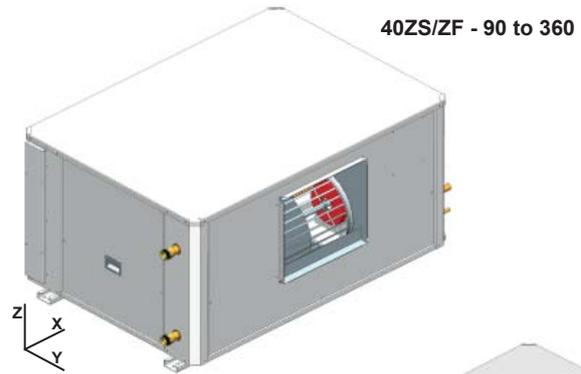
Make sure that the unit is protected from contact with the hooks to prevent damage to the housing.



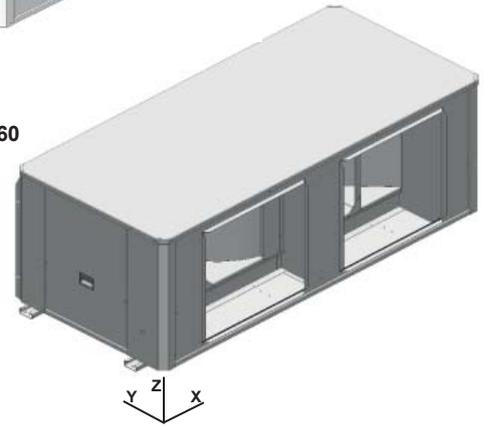
The unit must be lifted and fixed with care, with maximum inclination of 15°, since it could harm its operation. Do not raise by points outside of those specified here.

Indoor units

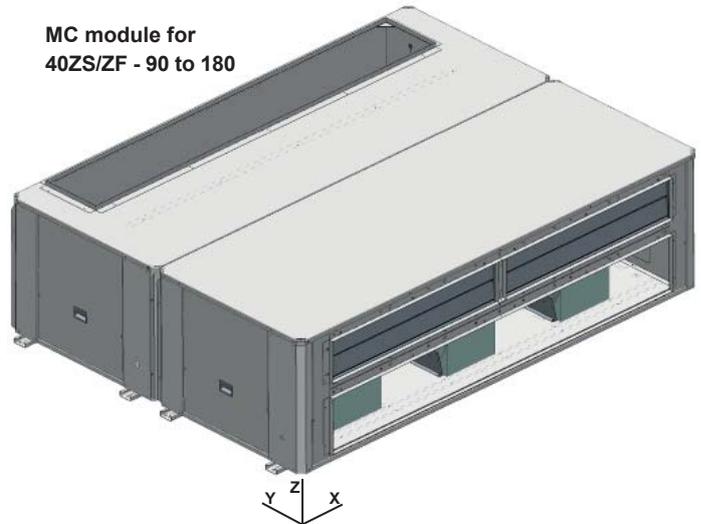
40ZS/ZF	Centre of gravity (mm)			Weight (kg)
	X	Y	Z	
90	539	327	391	147
100	539	327	391	147
120	539	327	391	190
160	757	346	387	199
180	757	346	387	199
182	1.048	333	390	262
200	1.048	333	390	262
240	1.048	333	390	262
320	1.384	330	416	365
360	1.384	330	416	365
420	924	1.346	676	920
485	924	1.346	676	920
540	931	1.348	682	963
600	931	1.350	682	964



MS module for 40ZS/ZF - 90 to 360



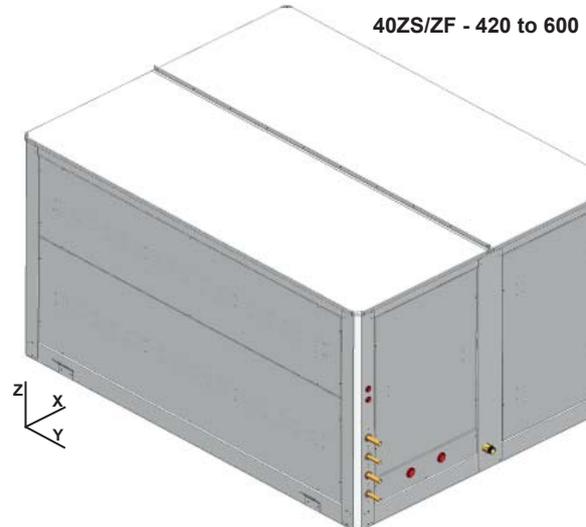
MC module for 40ZS/ZF - 90 to 180



MS module	40ZS/ZF	Centre of gravity (mm)			Weight (kg)
		X	Y	Z	
Asemblies - 111, 116, 413, 314, 411, 114, 113, 311, 121, 126, 423, 324, 421, 124, 123, 321	90 / 100 / 120	558	459	330	98
	160 / 180	723	465	327	118
	182 / 200 / 240	1.030	436	327	152
	320 / 360	1.360	471	360	200

MC module	40ZS/ZF	Centre of gravity (mm)			Weight (kg)
		X	Y	Z	
Asemblies - 113, 114, 123, 124	90 / 100 / 120	455	513	418	223
	160 / 180	620	650	418	267
Asemblies - 213, 214, 223, 224	90 / 100 / 120	664	513	418	223
	160 / 180	879	650	418	267

40ZS/ZF	Assembly	Centre of gravity (mm)			Weight (kg)
		X	Y	Z	
420	MS	1.104	1.346	699	1.000
	MC0	1.081	1.346	654	1.180
	MC1	1.156	1.346	933	1.626
485	MS	1.106	1.346	699	1.000
	MC0	1.085	1.346	654	1.180
	MC1	1.158	1.346	937	1.626
540	MS	1.106	1.346	699	1.000
	MC0	1.088	1.348	660	1.223
	MC1	1.158	1.348	938	1.669
600	MS	1.107	1.350	705	1.044
	MC0	1.088	1.350	660	1.224
	MC1	1.148	1.350	930	1.697



6. LOCATION AND ASSEMBLING

Choice of location

When choosing the location, whatever may be the selected fashion, the following precautions have to be taken into consideration:

- It is mandatory to comply with norm EN 378-3 on Safety and Environmental Requirements. Part 3: "In situ" installation and protection to people.
- The area where the unit will be located must be perfectly accessible for cleaning and maintenance operations (check minimum free space for maintenance). Leave enough space for air circulation around the unit.
- It is necessary to check that the surface of the floor or the structure supports the weight of the unit (please, consult the weight of the unit in the section "Centre of gravity coordinates").
- It is necessary to ensure that the surface where the unit is going to be installed is completely flat. Any defect in the preparation of the unit support surface translates into stresses on the structure, which may result in its deformation.
- These units can be installed on the floor or on a brick frame or steel profile. Based on the fixing solution defined in the installation project, it will be necessary to plan the placement in the base of threaded rods in the expectation that the unit supports can be fixed later on. To do so, it is recommended that a template be made with the heights corresponding to the fixings.

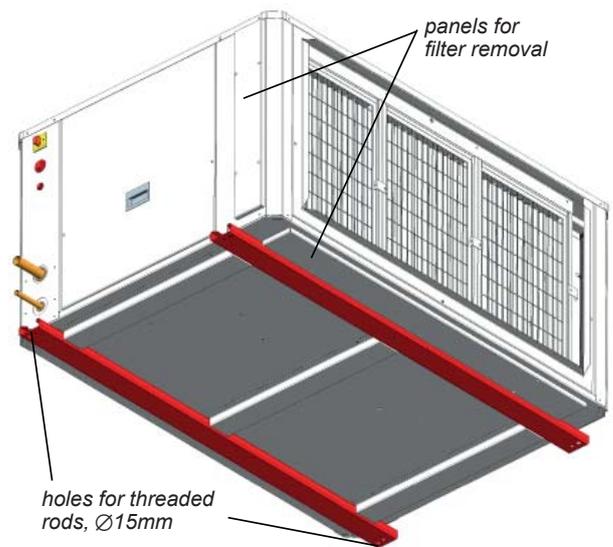


Foresee appropriate damping devices in these fixings to ensure that noise and vibration transmission is avoided (refer to the section "Anchorage for silent-blocks").

- In the event of assembling directly on silent-blocks to the ground, it is recommended that a template of the unit's footprint with the anchoring points of the silent-blocks be made, as described in the previous section.
- With the help of the crane or the forklift truck, the unit will be raised to a sufficient height that the silent-blocks can be screwed into its base. The 4 silent-blocks of the corners must remain oblique and the interiors (if these exist) perpendicular to the unit.
- For each one of the units, certain installation norms must be followed as well:
All indoor units are designed for their indoor installation, connected to a duct network.
Necessary precautions must be taken to prevent the recirculation of air as well as obstructions.
- Models 90 through 360 can be attached to the ceiling using the threaded rod:
 - Insert in the framework ceiling 4 threaded rods.
 - Insert the rods through the holes the unit has in its base.
 - Place the antivibration mounts, insert a washer and turn the nuts until the unit is well secured.
 - If there is enough space between the framework and the unit, a rubber or neoprene plate can be squeezed in.

- Once these operations are finished, a false ceiling can be mounted to hide the unit, leaving a register cover to perform the maintenance and filter cleaning operations.

The filter is mounted on a rail that can be removed from the side or from the base, to replace or clean it.



- Also, in case the installation has an air return which is not ducted, appropriately-sized grids must be foreseen in the space formed by the ceiling, the framework and the walls so that the unit aspires the return air from the air conditioned spaces.

Sound level

These units have been designed to operate with a low sound level. In any case, in the design of the installation, it must be taken into consideration:

- the outdoor environment for the acoustic radiation,
- the type of building for the noise transmitted in the air and the solid elements for the vibration transmission.

If necessary, a study must be commissioned to an acoustic technician.

Sound power level on the indoor unit

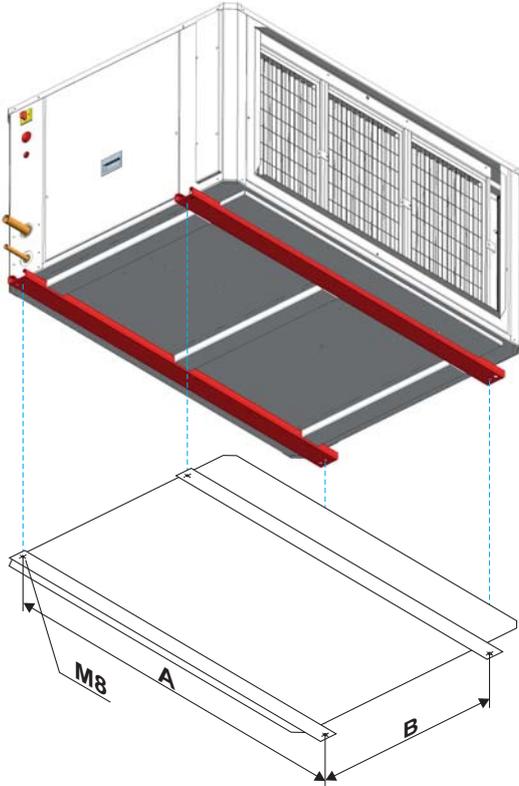
Sound power level in the indoor fan outlet to be taken into account for the silencer calculation:

40ZS/ZF	90	100	120	160	180	182	200
Total dB(A)	79	82	80	80	80	82	85

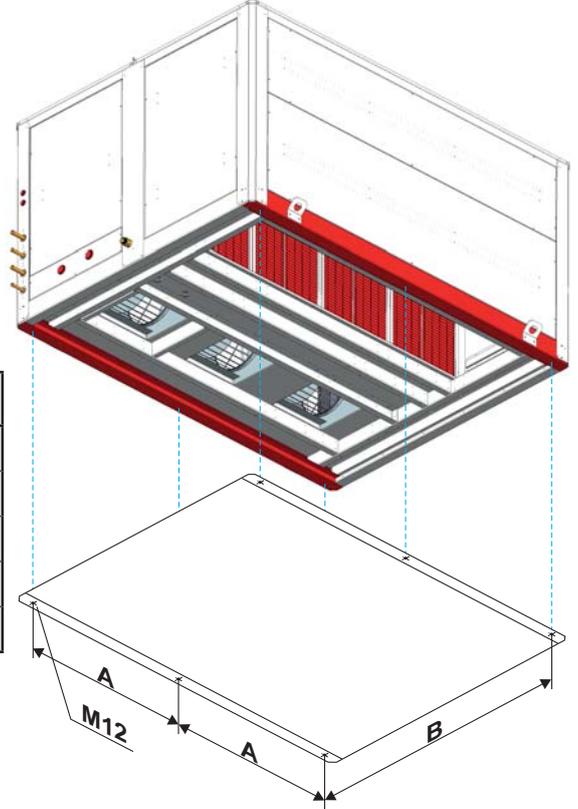
40ZS/ZF	240	320	360	420	485	540	600
Total dB(A)	82	83	85	86	87	89	92

Anchorage for silent-blocks

40ZS/ZF - 90 to 360



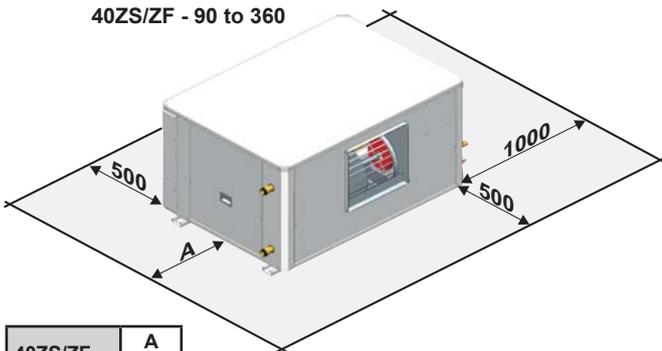
40ZS/ZF - 420 to 600



40ZS/ZF	A (mm)	B (mm)
90 to 120	1.146	657
160 and 180	1.476	735
182 to 240	2.100	657
320 and 360	2.760	735
420 to 600	1.300	2.061

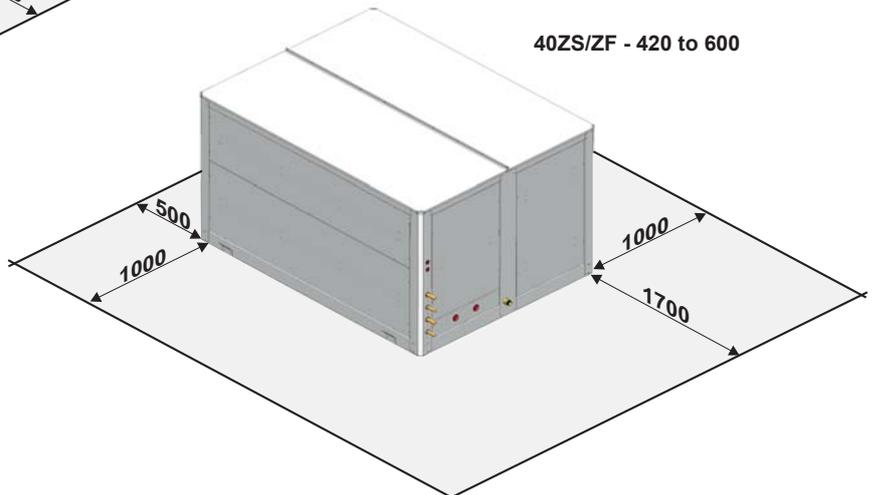
Minimum free space for commissioning and maintenance operations

40ZS/ZF - 90 to 360



40ZS/ZF	A (mm)
90 to 180	250
182 to 360	1000

40ZS/ZF - 420 to 600



7. CHECKING BEFORE COMMISSIONING



NOTE: Under no circumstance should the unit be started without having read the brochure completely.

Electrical connections

Installation norms

To perform the electric installation of the unit (cable glands, conductor section and their calculations, protections, etc.), refer to the information provided in this document (see the technical characteristic table), the electrical scheme included with the unit and norms in effect that regulate the installation of air conditioning units and electrical receivers.

The electric power supply of the unit must be sized in accordance with the maximum power input by the unit taking into account all the options it features (if necessary, refer to the technical brochure).

Verify that electrical power corresponds to the one on the data plate and that the voltage remains constant.



Check that the electrical connections are correct and tight (an electrical diagram is included with each unit, along with its legend).



Note: All connections in the site are the responsibility of the installer. These connections are always made as per the current regulation.



To prevent electrical shocks, make all electrical connections before energizing the unit. Check that the automatic switch is closed. Omitting this can cause personal damage. Make the ground connection before any other electrical connection.

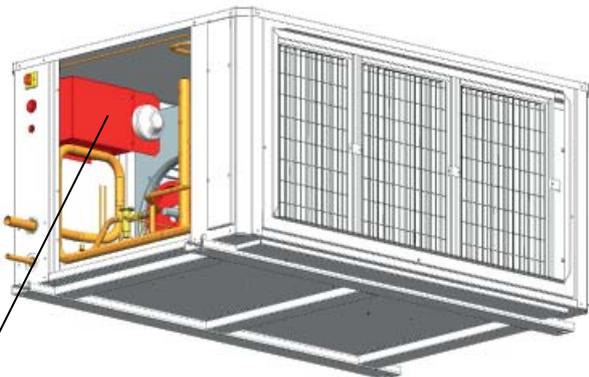


The installer must fix line protection elements according to the effective legislation.

Connecting optional devices

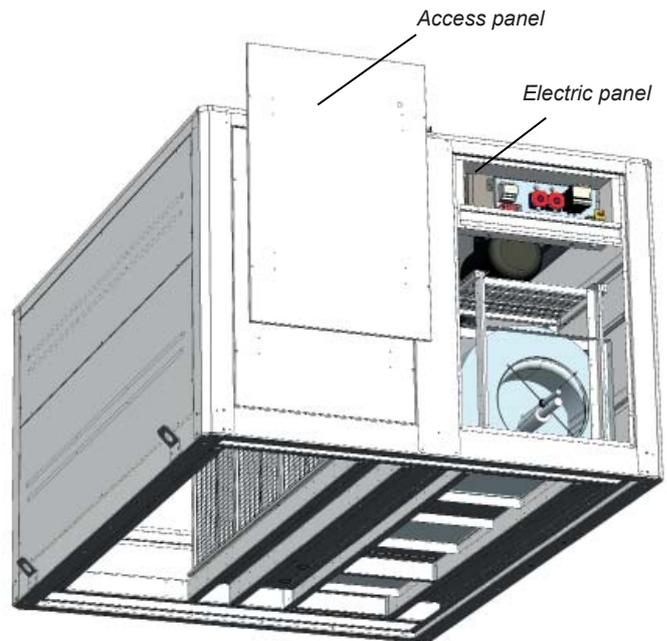
Indoor units 40ZS/ZF have an auxiliary electric panel for the connection of optional elements in the indoor circuit such as the soft starter, dirty filter pressostat, etc.

40ZS/ZF units : models 90 to 360



Terminal box or electric panel
(depending on the options installed)

40ZS/ZF units : models 420 to 600



Checks in the centrifugal fans

- Before commissioning, check the blade rotation direction and that the axis turns without strokes nor vibrations
- Once running, check the operation conditions: pressures, flows and consumptions.
- The overlapping of characteristic curves of the fan and the room is very important, so that the flows and pressures provided to the duct network are as required.




ACHTUNG: VOR DER ÖFFNUNG DIESER PANEEL STROM ABSCHALTEN UND 2 MIN. WARTEN.

WARNING: BEFORE OPENING THIS PANEL SWITCH OFF THE ELECTRIC SUPPLY AND WAIT FOR 2 MIN.

ATTENTION: AVANT L'OUVERTURE DE CE PANNEAU COUPER L'ALIMENTATION ÉLECTRIQUE ET ATTENDRE 2 MIN.

ATTENZIONE: PRIMA DE APRIRE QUESTA PARETE INTERROMPERE L'ALIMENTAZIONE ELETTRICA E ASPETTARE 2 MIN.

ATENCIÓN: ANTES DE ABRIR LA PUERTA CORTAR LA ALIMENTACIÓN ELÉCTRICA Y ESPERAR 2 MIN.

V220086

• **Soft starter detail (optional):**

Soft starter of the supply and/or return centrifugal fans which prolongs the set time mainly aimed at installations with cloth ducts. Compulsory for motors with an output of 15 kW and above.

For motors up to 15kW it is installed in the factory in the auxiliary electric panel. For larger motors it is installed next to the ventilation group.

Motor output up to 15 kW



Motor greater than 15 kW



Pulley and belt calibration

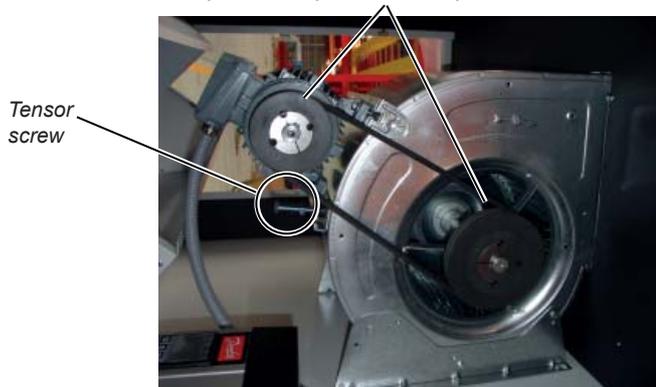
Attention: Before performing these operations, it is necessary to verify that the unit is disconnected from mains.

Centrifugal motorfans are coupled with pulleys and belts.

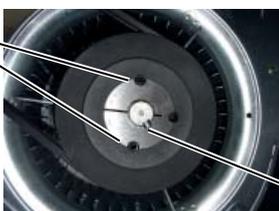
In this type of fans, the following must be taken into consideration:

- The pulleys must be on the same plane, so it is important to check them with the help of a ruler or a laser aligner.
- In case they are not aligned, remove the pulley screws, remove the pulley and, after removing the taper pin, it can be slid over the axle (this action can be performed both in the motor as well as in the fan).
- After fixing the pulleys on the same plane, the belt tension is made by tightening the tensor screw.
- The belt tension must be checked after 24 hours of motor operation.

Pulleys must stay on the same plane



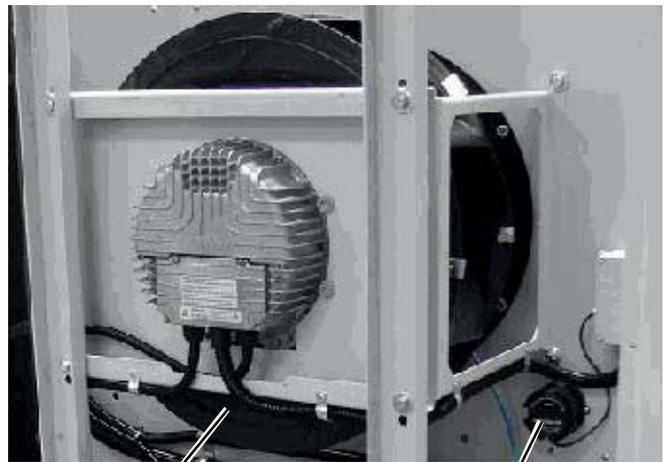
Pulley screws



Taper pin

Checks in plug-fans (optional)

- Electronic plug-fans with variable speed and flow sensor that can be incorporated in supply (all models) and return (models 420 to 600):.
- The coupling of characteristic curves of the fan and the room is very important, so that the flows and pressures provided to the duct network are as required.
- The variable-speed plug-fans have a flow control pressostat. This pressostat comes from the factory adjusted to the indicated flow.
- It is possible to readjust the flow for different conditions, on site, by means of the on the pGD1 terminal (see the specific brochure of the CARRIERrtc control, mandatory with this type of fans).



Plug-fan

Flow control pressostat

Air ducts connections

The air supply and return ducts must be calculated in accordance with the rated flow and the unit's available pressure (refer to the technical characteristics table). The duct calculation and design must be made by qualified technical personnel.

It is advisable to take into consideration the following recommendations:

- Curves in the fan supply outlet(s) must be avoided. It is recommendable to have a straight section of duct measuring approximately 1 metre. If it is not possible, they must be as smooth as possible, using indoor deflectors when the duct is of large dimensions.
- When making the ducts, direction sharp changes must be avoided since they can generate occasional pressure drops, which affect the available pressure and the flow. The location of discharge and aspiration grilles must be studied carefully to avoid the air recirculation and the transmission and generation of noises to the interior.
- Flexible connections must be made between the ducts and the unit that avoid the noise and vibration transmission.
- No matter the type of ducts type to use, these must be insulated and not be composed of materials that propagate fire nor expel toxic gases in the event of a fire. The internal surfaces must be smooth and should not pollute the air that circulates within them. In any case, the effective legislation about this issue must be respected.

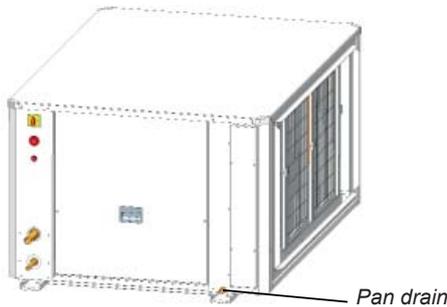


Caution: These units are designed to be connected to a duct network. In the event that the outlet fan of the indoor circuit is accessible from a particular point in the duct network, the installer must install a protection mesh in the discharge as per the current regulation.

Condensate drain connection

Models 90 to 360

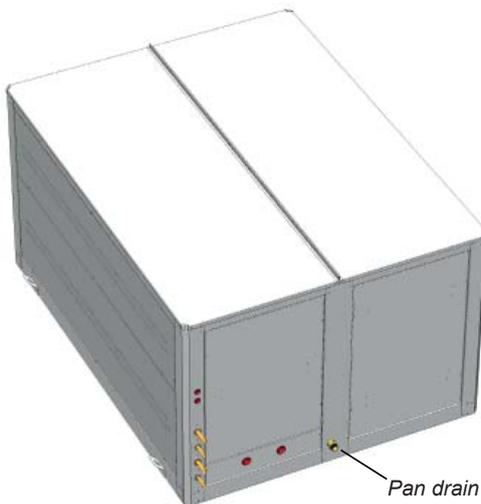
These indoor units are equipped with a condensate drain pan, with a bronze, gas threaded 3/4" M drain junction.



**CONNECT SIPHON
METTRE SIPHON
PONER SIFON**

Models 420 to 600

These indoor units are equipped with a junction for the draining of the condensate drain pan, made of bronze, gas thread 1 1/4" M.



**CONNECT SIPHON
METTRE SIPHON
PONER SIFON**

Siphon installation norms

All water drain tubes must be provided with a siphon to avoid bad smell and water spills.

Pan in overpressure:

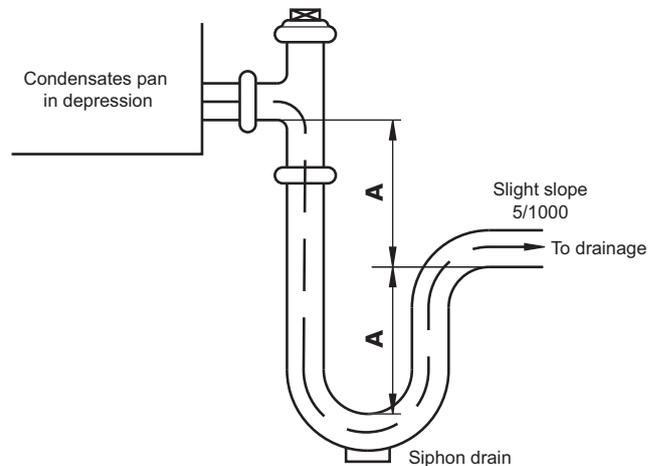
It's installed to avoid the access through the drain piping of bad smells.

Pan in underpressure:

Besides the above application, water must be suctioned from the pan because of the depression with respect to the motorfan assembly.

- Perform the siphon assembly as per the scheme of the attached starting diagram:

- For the correct siphon design, the "A" height must be at least twice that of the underpressure (mm.w.c) where the condensate pan is placed.
- Check that the condensate outlet is not clogged.
- The drain piping must be slightly sloped to ease circulation towards the drain.
- The original diameter of the piping must be respected. No reduction can be made.
- In the case of units installed outdoors, with outdoor temperatures which are lower than 0°C the necessary precautions must be taken to prevent the water in the drain piping from freezing.

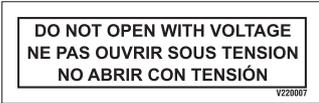


Check the watertightness of the connection.

8. SAFETY ELEMENTS

Main door switch

By using a mechanical device, it impedes access to the electric panel when the unit is with voltage.



Control of air flow (optional)

- For those units with centrifugal supply fans (standard), a differential pressostat can be incorporated in order to measure the variation in air flow. This pressostat allows the detection of fan belt breakages, since the fan relay only detects operating faults that have arisen in the motor. This safety device is included in units with electrical heaters. This pressostat is installed in the factory in the auxiliary electric panel of the indoor unit.
- The supply plug-fans (optional) adapt their speed to the average flow measured by the differential pressure sensor and the value set as a setpoint in the electronic control.

Clogged filter detector (optional)

Differential pressostat for indication, through an automatic reset alarm, of a level of dirtiness of the filters greater than the established level. Automatic reset.

Pressure reading is done thanks to two intakes within the air flow before and after the filter, such that a comparison is made between the pressure of the inlet air to the filter (positive) and the outlet air of the same to the other side of the evaporating coil (negative).



Smoke detector (optional)

In accordance with standard NF S 61-961, this smoke detection station uses a LED to indicate the installation status, and if the probe detects the presence of smoke in the installation, it stops the operation of the unit.



Smoke detecting probe

Refrigerant leak detector (optional)

The gas detector sensor is a device that signals leaks in refrigerant. When the loss of a certain concentration is detected, the sensor sends the alarm to the control, which stops the unit and locally activates a acoustic and visual signal.

This offers the advantage of acting immediately to gas leaks, guaranteeing the safety of persons who are in the proximity thereof. Its installation complies with European regulations F-GAS, EN378, and ASHRAE 15.

This sensor is installed next to the supply fan. In case of alarm, it is reset manually.



9. OPTIONAL



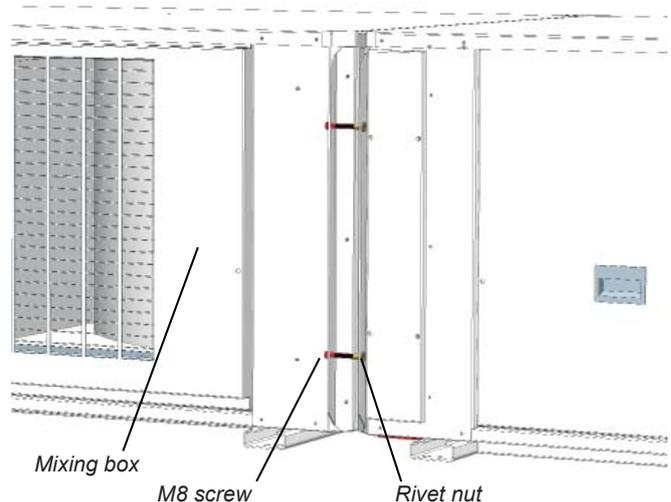
The installation of some of these options brings in pressure drops at air level therefore this must be considered when selecting fans. the pressure drop graphs in the options, can be seen in the technical brochure.

Mixing box

In models 90 to 360 of the 40ZS/ZF unit the mixing box is a separate module. The link between them is made with the M8 screws and rivet nuts provided from factory.

Note: all available assemblies indoor units with mixing boxes can be found in Chapter 4.

Note: the electrical connection of the mixing box (MS or MC) is performed from the electric panel of the condensing unit. Please, refer to the corresponding "Chart of electrical connection" in section "Electrical connection".



Electrical heaters

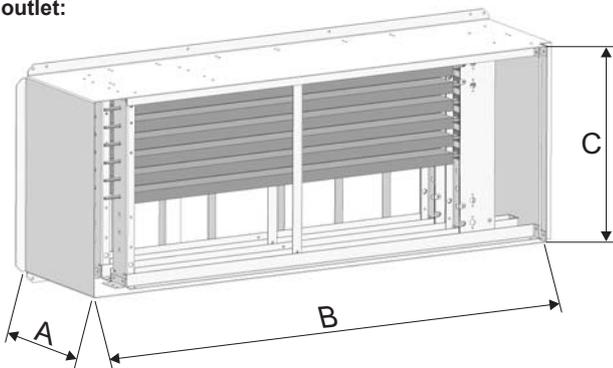
- The auxiliary electrical heaters are ready for operation in two power stages.
- The electrical heaters acquired with the unit will be incorporated to it modifying the electric panel in the factory, so that it is compatible with the electronic control.
- The electrical heaters requested for units already shipped will be sent in a kit, and the installer will need to assemble the elements required for the operation of the unit and for compliance with the legal regulations that are applied to the modified unit with regard to safety.

Electrical heaters in models 90 to 360 of indoor unit 40ZS/ZF

In these models, the connection is made at the fan outlet:

- In models 90 to 120 each of the rows of electrical heaters has an output of 1 kW. As from model 160, the output of each row will be 2 or 3 kW according to the total output.
- In models with two supply fan outlets (two frames), as well as in the case of 1 supply outlet with 2 rails, the electrical heaters are distributed as symmetrically as possible between both frames.

Frame for assembly of the auxiliary heater in the supply fan outlet:



40ZS/ZF	Total output (kW)	Dimensions (mm)		
		A	B	C
90 / 100 / 120 (1 supply outlet)	6 / 9 (1 row)	150	482	443
	12 (2 rows)	262	482	443
160 / 180 (1 supply outlet)	12 / 15 / 18 (1 row)	189	1.142	443
182 / 200 / 240 (2 supply outlets)	15 / 18 (1 row)	189	1.142	443
	24 / 30 / 36 (2 rows)	297	1.142	443
320 / 360 (2 supply outlets)	15 / 18 / 24 / 30 / 36 (1 row)	189	1.142	443

Note: in models with centrifugal return fan it is not possible to assemble electrical heaters with outputs of 30 and 36 kW.

Access for maintenance:

The frame has access designed from the right side for maintenance. In the case of 2 frames (2 supply outlets) are placed symmetrically so that the electrical heaters can be taken out without problems, that is, one will be accessed from the right and the other one from the left.

To access the electrical heaters, the 2 screws that fasten the frame side panel must be unscrewed as shown in the following image:



Access panel

In order to remove the electrical heaters the power supply cables must be disconnected from the terminal board and the hose taken out.

Safety thermistors

Electrical heaters

Hose



Then, unscrew the screw that fastens the electrical heaters' frame and take out by the rail, as shown in the following images.



Rail



Kit assembly:

When the frame with the electrical heaters is provided in a kit, follow the steps below for connecting it:

Step 1: lay down the frame on the panel to set the hole locations that will fix said frame to the panel. Another hole must also be drilled to connect the hose to the electric power supply.



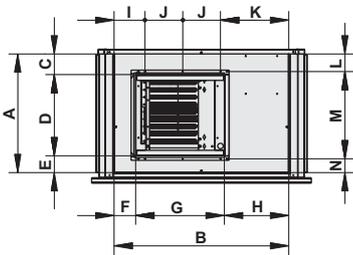
40ZS/ZF	A	B	C	D	E	F	G	H	I	J	K	L	M	N
90 / 100	648	946	145	443	60	165	482	299	217	204	320	128	476	43
120	648	946	113	443	92	115	482	349	167	204	370	96	476	75
160 / 180	648	1276	46	443	158	81	1142	53	133	356	75	30	476	142
182 / 200	648	1900	161	443	44	379	1142	379	430	356	400	146	476	27
240	648	1900	133	443	72	379	1142	379	430	356	400	116	476	55
320 / 360	711	2560	108	443	160	58	1142	160	79	356	264	91	476	143

Step 2: fasten the frame to the panel with self-tapping screws.

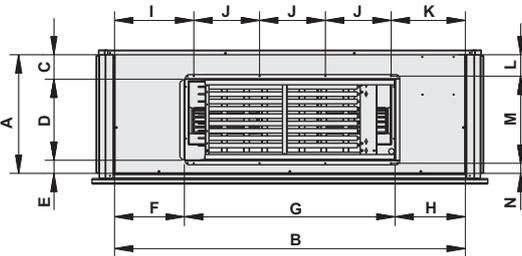


If it is not possible to perform the previous step, the distance between holes, as well as the frame dimensions, are displayed in the following schemes:

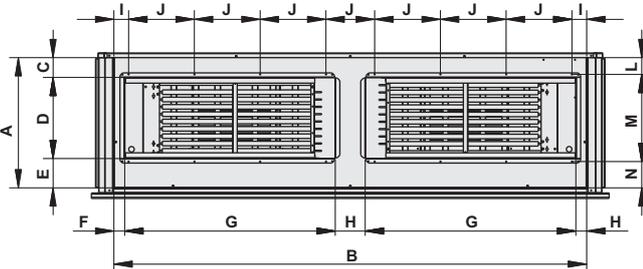
40ZS/ZF - 90 / 100 / 120



40ZS/ZF - 160 / 180 / 182 / 200 / 240



40ZS/ZF - 320 / 360

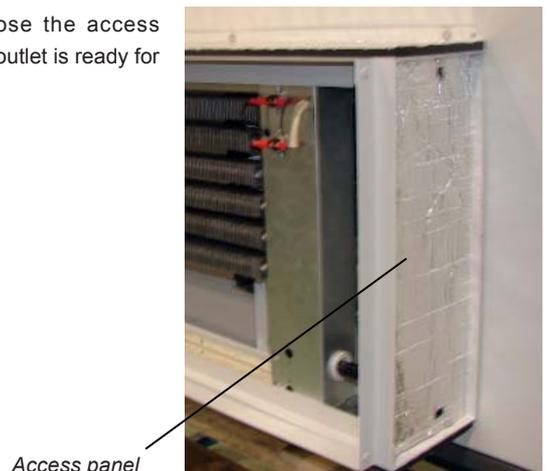


Step 3: insert the hose through the drill made for the connection to the indoor electric panel of the unit.

Note: The connection of the necessary elements for the adequacy to the handling of the unit must be performed by the installer.



Step 4: close the access panel. The outlet is ready for ducting.



Electrical heaters in models 420 to 600 of indoor unit 40ZS/ZF

Assembly and connection inside the unit.

Kit assembly:

When the frame with the electrical heaters is provided in a kit, follow the steps below for connecting it:

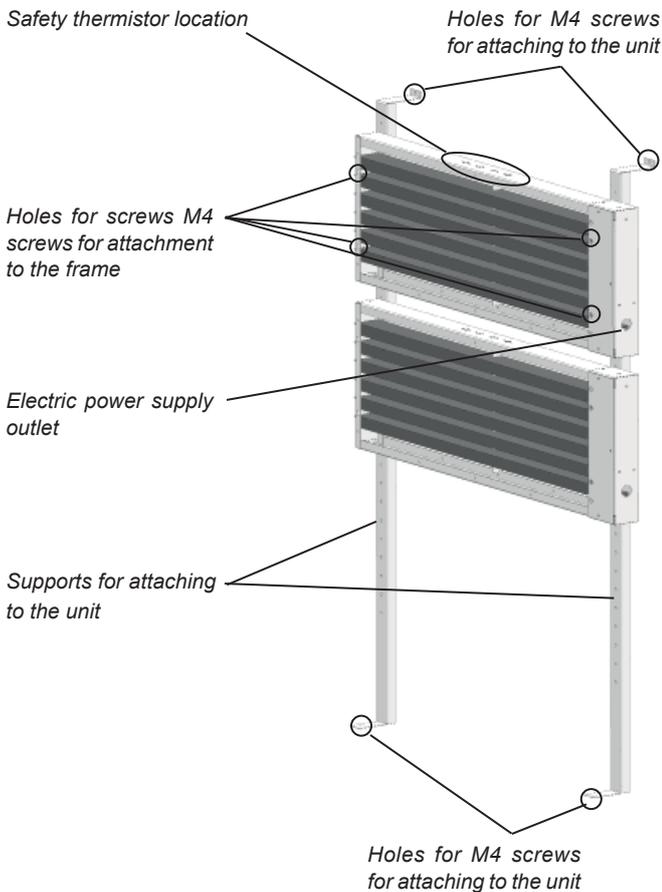
Step 1: the electrical heaters are sent divided into 2 or 4 frames, depending on the required power, as shown in the following table:

Total output (kW)	36	45	54	72
Stage power (kW)	18 + 18	18 + 27	27 + 27	36 + 36
40ZS/ZF - 420 / 485	2 frames			--
40ZS/ZF - 540 / 600	--	2 frames		4 frames

To attach these frames to the unit, four supports are provided. In the case of 2 frames, screw each one of them to 2 supports with the four M4 screws included in the kit.

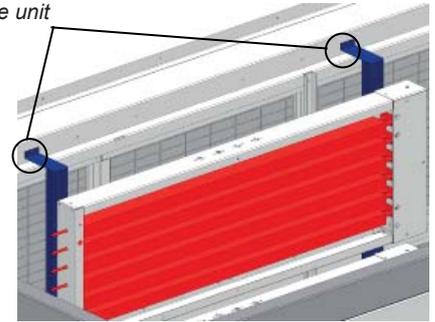
The height of the frame on the support will depend on the position of the supply fan, since it should never be behind the fan volute.

For example, in the following diagram, the frame location will be valid for lower and side supply.

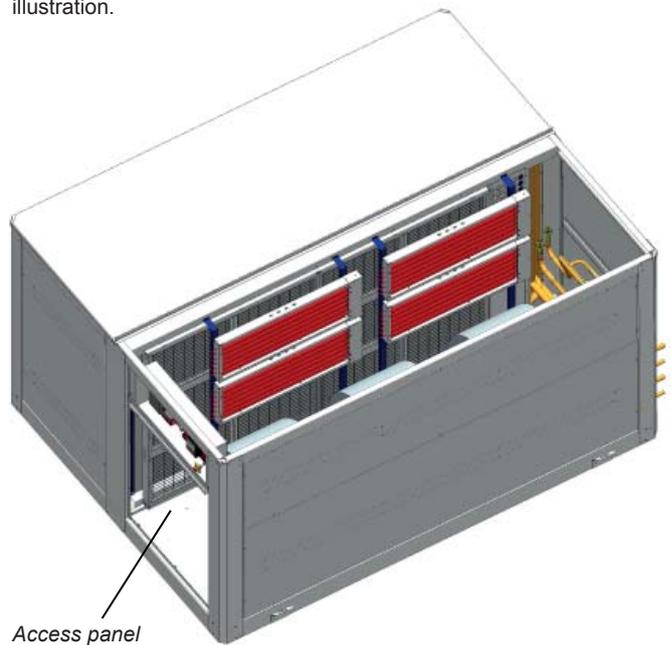


Step 2: attach the supports with the frames linked inside the unit. To that extent, drills have been made in the unit to which the supports must be screwed.

Supports attached to the unit



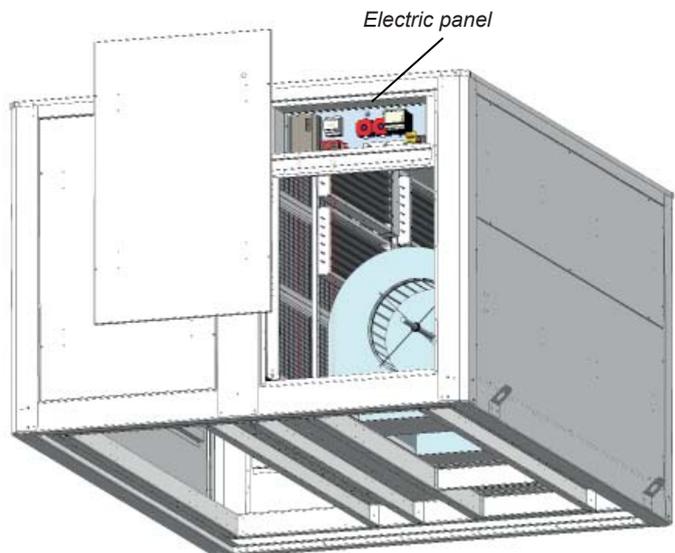
The supports attached to the unit can be seen in the following illustration.



Access panel

Step 3: take the hoses with the electric power supplies to the indoor electric panel of the unit.

Note: The connection of the necessary elements for the adequacy to the handling of the unit must be performed by the installer.



Electric panel

Hot water coil

Hot water coil for mounting inside the unit, with a 3-way valve managed by the unit's electronic control. In the case of 40ZS/ZF unit, this valve will be mounted outside of the unit.

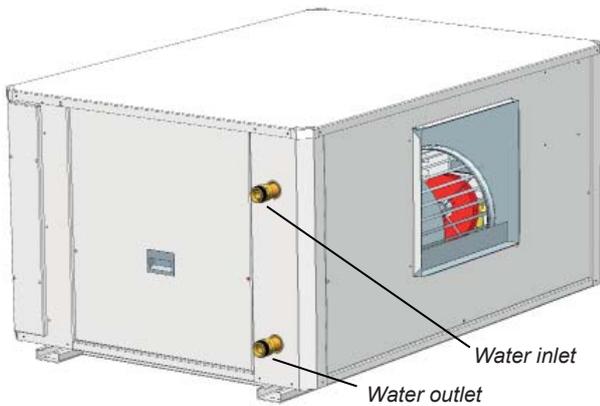
Two types of water coils are availables:

- Nominal coil for heating in cooling-only units.
- Auxiliary coil for heating in heat pump units. In this case the air inlet temperature matches the air outlet temperature of the indoor coil.

Note: With stop-drop in the indoor air coil it is not possible to assemble the hot water coil

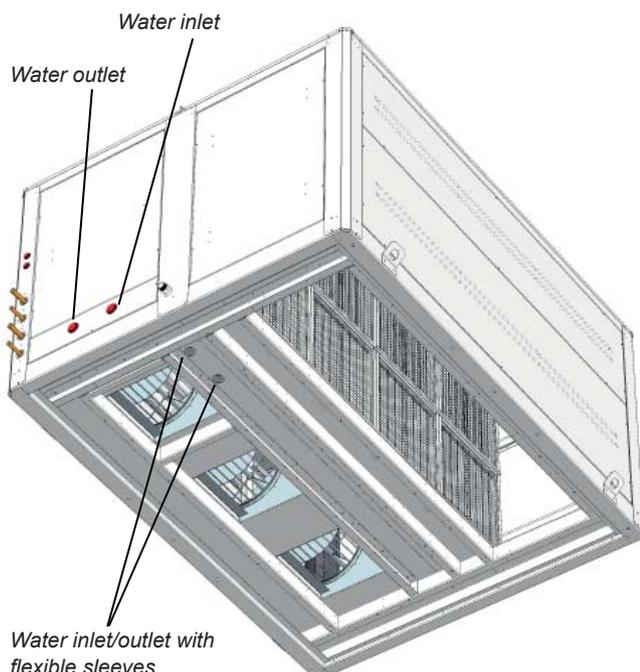
Note: check position and dimensions of input/output of the coil in the technical brochure of this series.

Models 90 to 360 of 40ZS/ZF units



Models 420 to 600 of 40ZS/ZF units

The inlet/outlet connections of the hot water coil are located inside the unit. The connection can be established via the unit base using flexible sleeves or via the side panel. The sheet precut positions are indicated in the below drawing.

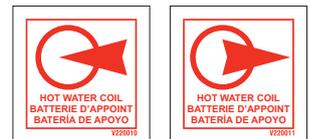


Recommendations:

- Coil filling:
 - The coil filling must be made with the bleeder valve open until water runs through it, which is when it is time to close it.
 - Cut off the water supply and let the bubbles generated go up to the highest coil point, which is the same as the bleeder valve, and eliminate by opening the purger.
 - Pour more water into the circuit and repeat the previous steps.
 - Activate the water pump (to be foreseen by the installer) and repeat the previous steps until no air noises are heard in the piping, which is when the filling of the installation will have been finished successfully.
- In case of long unit stops, and forcibly if they happen in the winter season, the coil must be emptied.
- Possible water freezing must be avoided: glycoling water or by using anti-freeze thermostat that triggers the 3-way valve.

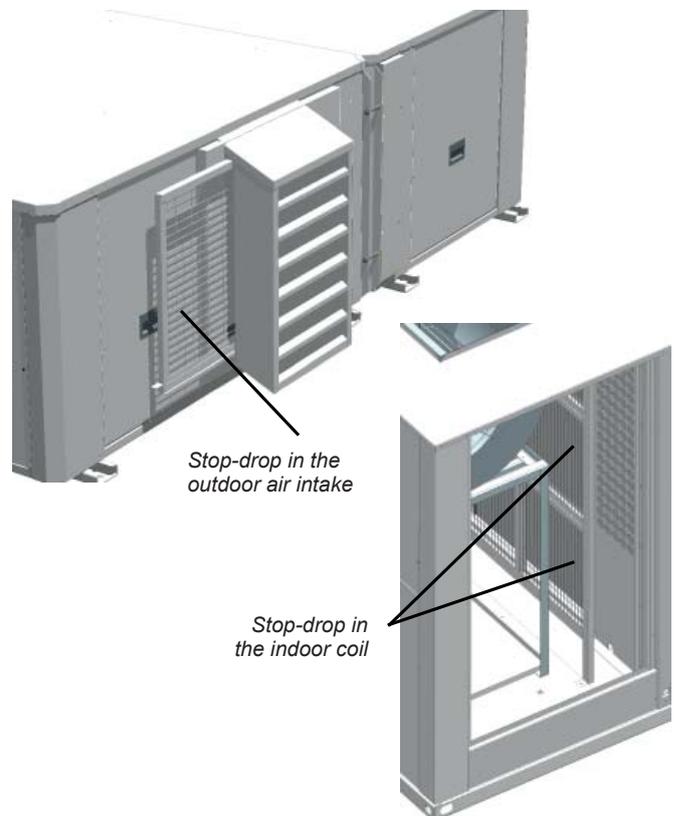
Note: this thermostat is mandatory if the unit is installed outdoors, as well as in cases in which it uses free-cooling and works outside at negative temperatures.

- The direction of the water flow must be correct and so the following indications must be observed:



Stop-drop

Stop-drop in the indoor air coil and at the outdoor air intake.



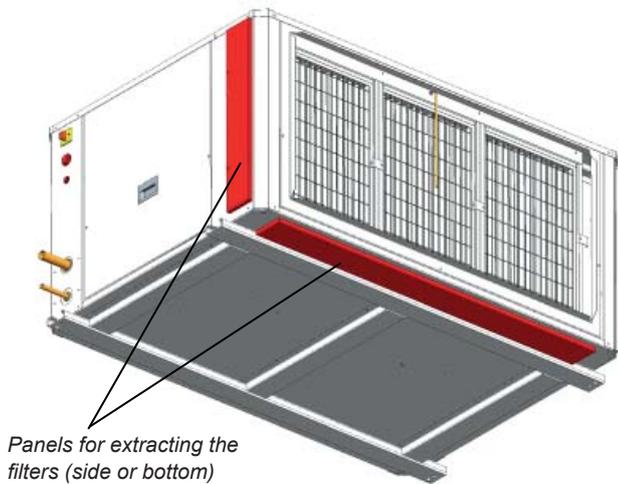
Note: with hot water coil (nominal or heater) it is not possible to assemble the stop-drop.

Filters

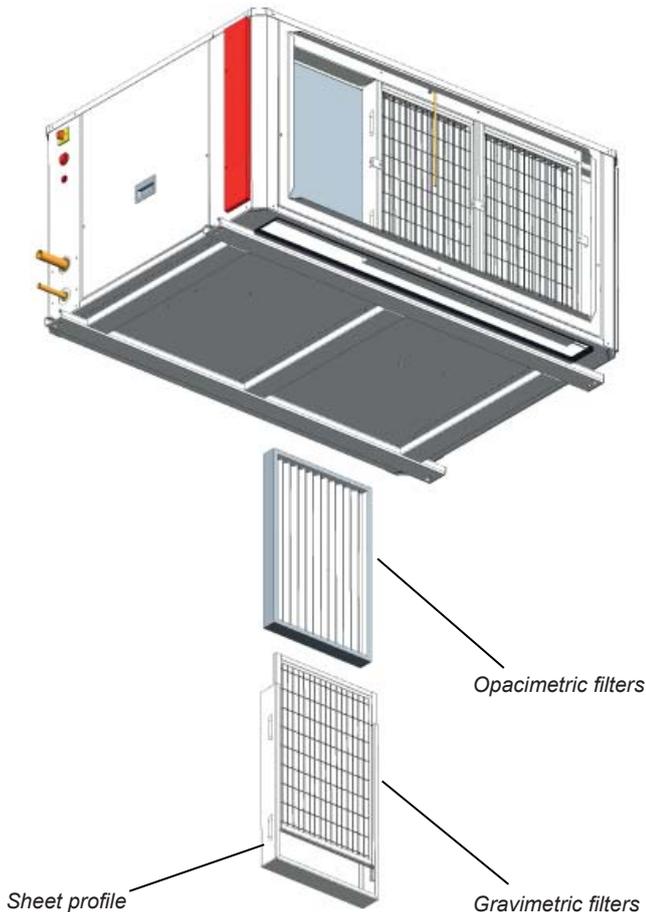
All model types can substitute the filtering mesh that the units include regularly with G4 rating, mounted on the same frames. Creased opacimetric filters classified F6 to F9 can also be added.

For taking out the filters, both the frames with the gravimetric filters as well as opacimetric frames (if the unit has includes them) are assembled over a sheet steel profile.

Models 90 to 360 of 40ZS/ZF units



Panels for extracting the filters (side or bottom)

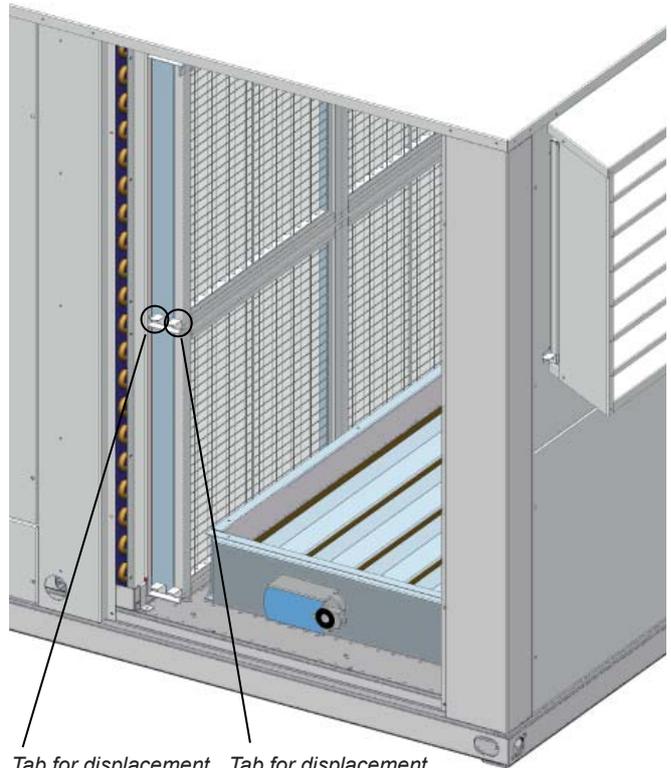


Opacimetric filters

Gravimetric filters

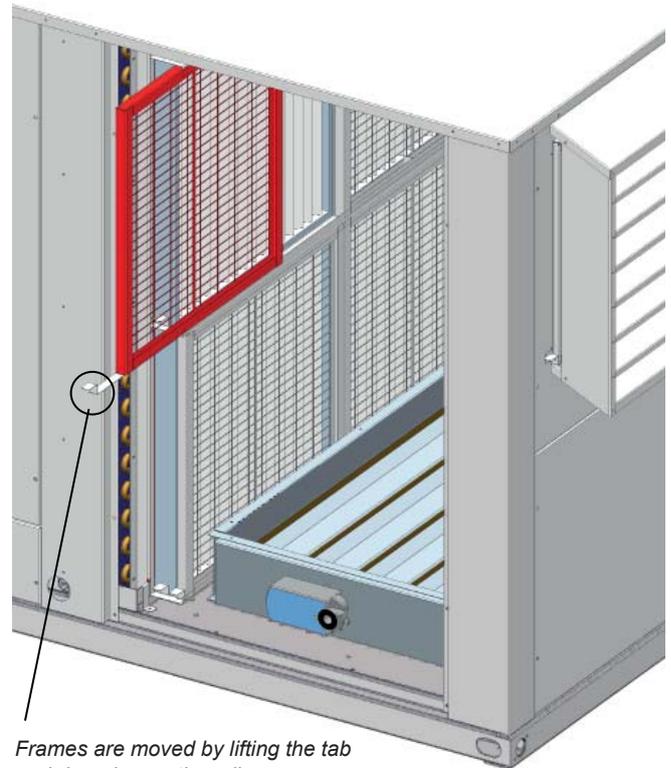
Sheet profile

Models 420 to 600 of 40ZS/ZF units



Tab for displacement of opacimetric filters

Tab for displacement of gravimetric filters



Frames are moved by lifting the tab and dragging on the rail

Note: assemblies with centrifugal return fan can also have filtration at the air return (please, consult).

The available options are:

- Gravimetric filter G4.
- Opacimetric creased filters F6 + gravimetric G4.

10. MAINTENANCE

The minimal maintenance operations and their periodicity will be made according to the national regulations.

Any intervention on the electric cooling components must be made by a qualified and authorized technician.

Technicians who intervene with the unit must use the necessary safety equipment (gloves, goggles, insulating clothing, safety shoes, etc.).

Furthermore, if working around sources of significant noise, we recommend the use of noise-dampening headgear.



Caution: Before intervening in the unit, cut off main power.

General recommendations:

- Do not lean on the unit. A platform must be used to work on a level.
- Do not lean on the copper refrigerant tubes.
- Keep the unit clean.
- Keep the space surrounding the unit clean and cleared in order to avoid accidents and ensure the proper ventilation of the coil.
- Perform a visual (remains of water or oil below or around the unit) and auditory inspection of the entire installation.
- In general, a corrosion control must be performed on the metallic parts of the unit (frame, bodywork, exchangers, electric panel, etc.).
- Check that the insulation foam is not unstuck or torn.
- All the electric connection states must be checked as well, as well as the air tightness of the different circuits.

Next, some recommendations are stated to perform the cleaning of the unit's components:

Condensate drain pan

- Check that the condensate pan is clean. There should be no stagnant water.
- Check that the drain is not clogged.
- Cleaning of the pan can be done with water and non-abrasive detergent.

Note: in the section "Condensate drain connection" are images with the position of the drain.

Centrifugal fan

- Verify that the turbine and the motor remain clean.
- Foresee having a spare belt set for the fans.
- The motors and the fans have bearings that have been lubricated and sealed and, thus, do not need further lubrication (except in the case of fans with a reinforced shaft).

Servomotor (optional)

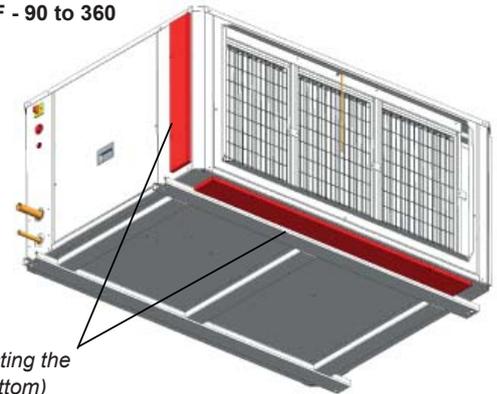
In indoor with motorized mixing boxes, it is advisable to check the condition of the servomotors.

Note: The available assemblies can be consulted in chapter 4 "Available assemblies".

Air filters

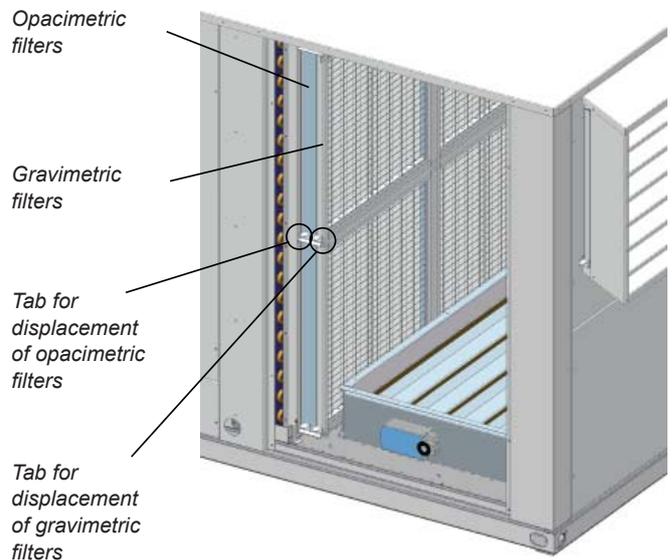
- Clean regularly. Depending on the installation conditions, the filter aspect must be examined to define the cleaning periodicity.
- Gravimetric filters. Cleaning the filtering mesh can be done with a household vacuum cleaner, or else by submerging it in water.
- Creased opacimetric filters. It is necessary to replace them. Foresee replacement.

Models 40ZS/ZF - 90 to 360



Panels for extracting the filters (side or bottom)

Models 40ZS/ZF- 420 to 600



Opacimetric filters

Gravimetric filters

Tab for displacement of opacimetric filters

Tab for displacement of gravimetric filters

Refrigerant leak detector (optional)

Maintenance:

- Annual testing: it is necessary to carry out testing every year to comply with the EN378 and F-GAS regulations.
- Every 3 years: a taring test is recommended.
- Every 5/6 years: it is recommended that the gas detection element be replaced and calibration performed.



Note: Check the documentation attached to the leak detector for taring and calibration testing.

