AERMEC

la prima per il clima

HEAT RECOVERY UNITS WITH REFRIGERATION CIRCUIT

SELECTION AND INSTALLATION MANUAL

URX_CF

AERMEC

COMPANY QUALITY SYSTEM

ICIM

ISO 9001:2000 - Cert. n° 0128/5

CISQ IQNet

AERMEC S.P.A.

EN

0313. 6180417_03

English

Index

Remarks

This manual is an integral part of the documentation enclosed with the unit. It must be kept for future reference and must accompany the machine throughout its life.

The manual defines the purpose for which the machine has been built and establishes its correct installation and the limits of its use.

- This manual describes all the use, installation and maintenance instructions of the subject unit and the main accident prevention standards.

- Carefully and thoroughly read all the information referred to in this manual. Pay particular attention to the norms accompanied by the indication "DANGER" or "ATTENTION" since, if not observed, may cause damage to the unit or to people.

If any malfunctions are found out, whciha are not included in this manual, please contact the local After-Sales Service immediately.

- Aermec S.p.A. declines all liability for any damage caused by the improper use of the machine or the partial or superficial reading of the information contained in this manual.

- **Installation and maintenance must be performed by qualified and experienced personnel, having the requirements that are foreseen by law 46/90 and/or the DL 380/2001 for the electrical/electronic and air-conditioning installation, with consequent registration at the local CHAMBER OF COMMERCE, if this is not so, Aermec S.p.A. declines all responsibility regarding the safety of the product.**

THE MANUFACTURER DECLINES ALL LIABILITY FOR DAMAGE TO THINGS OR INJURY TO PERSONS AND ANIMALS CAUSED BY THE FAILURE TO OBSERVE THE INSTRUCTIONS AND STANDARDS IN THIS MANUAL.

Although suitable risk analysis have been performed during the design of the URX_ CF unit, PAY ATTENTION to the pictograms on the machine which help understand the manual better, rapidly catching the attention of the reader concerning the risks which can not be avoided or sufficiently limited through the use of technical protection means and measures.

GENERAL HAZARD SIGNAL

Carefully adhere to all the indications next to the icon.

Failure to comply with the instructions may generate hazardous situations with possible damage to the health of the operator and user in general.

DANGEROUS ELECTRICAL VOLTAGE SIGNAL

Carefully adhere to all the indications next to the icon.

The signal indicates components of the unit or, in this manual, specifies actions that could generate electrically-related risks.

GENERAL PROHIBITION SIGNAL

Carefully adhere to all the indications next to the icon that limit actions in order to guarantee better operator safety.

MAIN WARRANTY CONDITIONS

- The warranty does not cover payment for damages cause by the incorrect installation of the unit by the installer.
- The warranty does not cover payment for damages cause by the improper use of the unit by the user.
- The manufacturer is not responsible for accidents to the installer or user that are due to the improper use and incorrect installation of the unit.

The warranty is not valid when:

- the maintenance and repairs have been performed by unauthorised persons or companies;
- the unit has been previously repaired or modified with spare parts that are not original;
- the unit has not undergone suitable maintenance;
- the instructions described in the present manual have not been followed correctly;
- unauthorised modifications have been made.

N.B.:

The Manufacturer reserves the right at all times to make any modification for the improvement of its product and is not obliged to add these modification to machines of previous manufacture, which have already been delivered or are being built.

The warranty conditions are any subject to the general sales conditions at the moment the contract is finalised.

Description of the unit

The URX_CF series is the mono-damper solution to the needs of systems normally used in bars, restaurants, offices, meeting rooms. The URX_CF units, which are divided into five sizes with a rated airflow from 750 to 3300 m^3/h, have been designed to guarantee a healthy thermo-humidity condition allowing a suitable change of air in order to reduce the build-up of gas and unwanted particles present in the environment to be treated (cigarette smoke, unpleasant odours, sweat, dust,.).
The URX_CF unit, in addition to the ventilation, filtration and recovery of heat, also includes, in a mono-bdamper unit, a heat pump refrigerating circuit. This allows to obtain a complete machine which operates independently in all seasons and which is capable of combining the necessary renewal of air with an efficient recovery of heat.
The accurate design of the machine combines the extremely compact size, which makes installation on suspended ceilings easier, with easy accessibility for the maintenance of all internal parts. This gives the opportunity, also thanks to the management and installation simplicity, to satisfy many system requirements.

WARNING
The URX_CF series is made to guarantee indoor air supply and extraction. The refrigerating circuit is calculated not only for giving supply air characteristics near to that of the indoor air, with the aim of avoiding disease conditions near vents, but also for covering in part ambient thermal loads. Thermal and refrigerating capacities, which carry air conditions from the indoor air ones to those who cover in part ambient thermal loads, are referred to as Thermal Available Capacity and Refrigerating Available Capacity. These capacities are only an integration of those guaranted by a conditioning unit.
The URX_CF series is not a conditioning unit, and it cannot be set apart from a conditioning unit if prefixed indoor air conditions (temperature and humidity) have to be guaranteed.

Available versions

The URX_CF units are available in 5 sizes:
Each model can be configured in such a manner to satisfy the system requirements by suitable combining the available options.

The table in fig. 01 shows the procedure of the commercial acronym in the 7 fields from which it is made, which represent the options present.

Field 1, 2, 3:	**URX**
Field 4, 5:	**07 - 10 - 15 - 21 - 33**
Field 6, 7:	**CF**

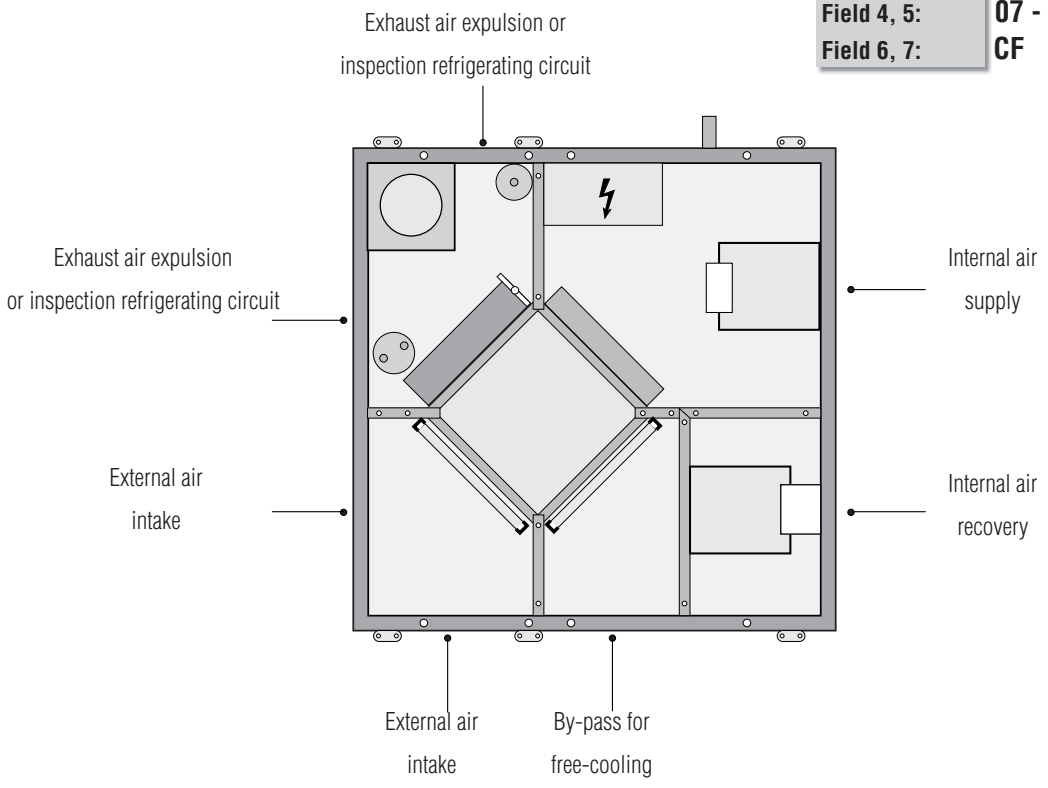


fig.01

Description of the components

Panels and structure:
the structure is made up of 20 mm thick galvanised self-supporting sandwich panels with injected polyurethane insulation (density of 40 kg/m^3). The construction of the casing simplifies installation and maintenance.

Fans:
double intake centrifugal fans with forward-curved blades and with directly connected motor. The 230V - 50 Hz single-phase motor has one speed. The airflow is controlled by an electronic regulator at phase cut. The two regulators are set in the factory so as to supply the nominal performance; **the air volume may be varied by +/- 15% to the nominal airflow, not to endanger the correct operation of the unit.**

Refrigerating circuit:
this is a highly efficient and silent heat pump with scroll compressor, four-way valve for cycle inversion, evaporating coil, condensing coil, liquid receiver, liquid separator, thermostatic valve, liquid indicator, filter drier, high/low pressure switch and the pressure / charge connections with access from the outside of the units.

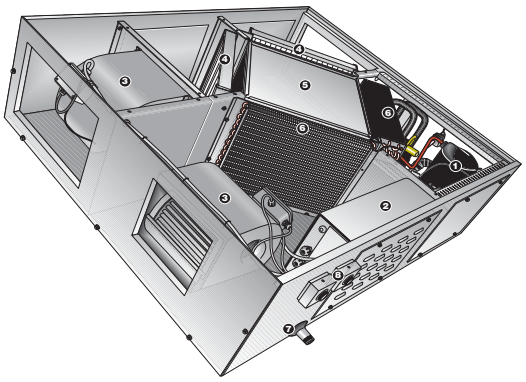
Condensate drain pan:
made of aluminium alloy, easily detachable.

Evaporating/condensating coil:
with Cu grooved tube and high efficiency Al fins.

Filters:
these are cell type with an corrugated septum positioned before the recovery unit on airflow supply and return. The standard filters are class G3 type in accordance with classification UNI EN 779 with weighted efficiency of 80%. They are 48 mm thick and are easily withdrawn for cleaning and replacement.

Dirty filters pressure switch:
a differential pressure switch is present, placed close to the electronic controllers, for the detection of the choking of the supply filter. It is possible to set the intervention value. Thre pressure switch includes clean contacts (NA, NC) to remote the alarm.

Heat recovery unit:
this is static with crossflow made of aluminium sheets. During winter operation, the average efficiency is above 50% ensuring first-class energy recovery from the air expelled from the room.



URX_CF

Legenda	
1	Compressor
2	Electric panel
3	Centrifugal fan
4	G3 filter
5	Heat recuperator
6	Heat exchanger
7	Condensate drain
8	Electronic regulators

Support brackets:
allow the unit to be rapidly and securely fixed to the false ceiling.

Accessibility:
The unit may be inspected from below. The heat recovery unit, filters, condensate drain pan and fans can be easily removed from below by removing the lower two panels.

Control system

The unit is equipped with an electrical panel with power and regulation section (including the three-way valve for the additional hot water coil and related servomotor), aimed at guaranteeing the management of all refrigerating circuit functions. Also present: NTC temperature probe on the internal air recovery, external air temperature probe, air damper and related servomotor in the free-cooling version, pressure probe on the recovery filter. A remote control terminal is also supplied for the automatic management of the unit, remotable up to 150 meter (cable not supplied).
The unit is equipped for the management of a luminous sign (230V) which switches on in case of generic alarm or unit OFF, in conformity with the norms in force for rooms for smokers.
The following operations can be performed on the microprocessor: switching on and off of the unit, summer/winter changeover, setting of set-point parameters, reading of room temperature.

N.B. For further information refer to the User manual.

Accessories

MBC Hot water coil module
This is an external module that can be installed downstream from the motor fan assembly on the fresh air flow, fitted with: Two-row water heating coil with copper pipes and aluminium fins with P2519 geometry. The manifold collectors are equipped with a ½" G UNI 338 threaded connector for the water inlet and outlet. The three-way valves and related ON/OFF actuator are also included.

MBX Module with electric heating battery
This is an outside module that can be installed downstream from the motor fan assembly on the fresh air flow, fitted with: Electric heating element with armoured finned elements equipped with double safety thermostat with automatic and manual reset.

RBX Module with electric heating battery
This is an outside module that can be installed upstream from the motor fan assembly on the fresh air flow, fitted with: Electrical resistance in two-stage finned armored elements with double safety thermostat with automatic reset and manual.

G4F G4 efficiency filters
The units can be fitted with two cell-type filters with corrugated septum in class G4 according to the UNI EN 779 classification (weighted efficiency of 90%) which can be placed as a replacement of the G3 filters. The filtrating cell is 48 mm thick.

SUF Module with silencers
The accessory is made up of two modules that are equipped with silencer baffles positioned on the supply and exhaust.
They are made of rockwool panels with the surfaces in contact with the air and protected by a polyester film held between two galvanised and micro-perforated laths.

FGC circular flanges
The accessory is supplied as a single unit.
The accessory is made up of flanges which connect to the rectangular port of the unit so as to allow the use of circular ducts.
The accessory is not available for size 33.
N.B. for further information, see the tables in this manual and the various accessories kits; see fig. 02 below regarding compatibility

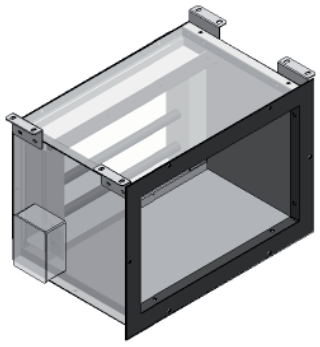
FCE Free-cooling
The "free-cooling kit " includes 2 dampers with related ON/OFF 230V servomotors.
For further information refer to the Use manual.

RS485 Interface card
Interface card necessary for the interface to supervisione systems according to the MOD-BUS protocol.

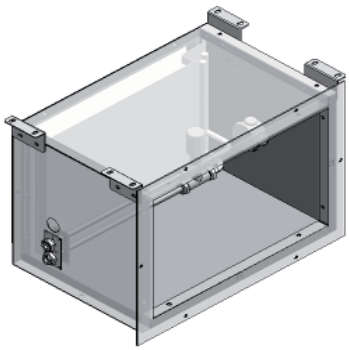
Available accessories

Mod.	07	10	15	21	33
MBC	MBC07	MBC10	MBC15	MBC21	MBC33
MBX	MBX07	MBX10	MBX15	MBX21	MBX33
G4F	G4F07	G4F10	G4F15	G4F21	G4F33
SUF	SUF07	SUF10	SUF15	SUF21	SUF33
FGC	FGC07	FGC10	FGC15	FGC21	-
FCE	FCE07	FCE10	FCE15	FCE21	FCE33
RBX	RBX 07	RBX10	RBX15	RBX21	RBH33

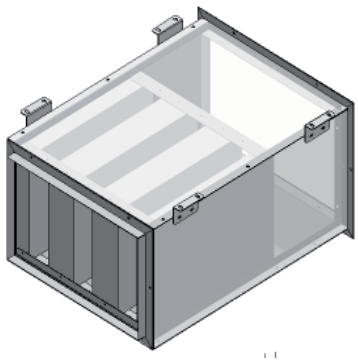
MBX - RBX



MBC



SUF



FGC

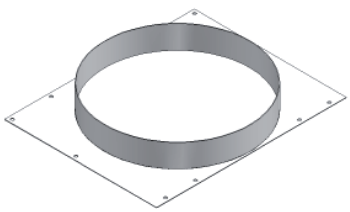


fig.02

Technical data

URX_CF MODEL			07	10	15	21	33
External and Recovery air nominal flow rate		[m³/h]	750	1000	1500	2100	3300
Minimun air flow rate		[m³/h]	640	850	1275	1785	2800
Available supply static pressure	(1)	[Pa]	278	233	239	166	289
Available exhaust static pressure	(1)	[Pa]	248	218	233	163	273
Total heating capacity (rec. + compr.)	(3)	[kW]	8,8	10,8	15,8	22,8	33,3
Total refrigerating capacity (rec. + compr.)	(2)	[kW]	6,1	7,3	10,2	15,0	23,0
Heating available capacity	(3)	[kW]	2,4	2,3	3,0	4,8	5,2
Refrigerating available capacity	(2)	[kW]	1,4	1,7	2,2	3,4	5,1
Recovered heating capacity	(3)	[kW]	2,9	4,3	7,1	10,1	14,3
Recovered refrigerating capacity	(2)	[kW]	0,9	1,3	2,0	2,8	4,2
Compressor heating capacity	(3)	[kW]	5,9	6,5	8,7	12,7	19,0
Compressor refrigerating capacity	(2)	[kW]	5,2	6,0	8,2	12,2	18,8
Total input power (Heating mode)	(3)	[kW]	2,0	2,0	3,3	4,0	5,5
Total input power (Cooling mode)	(2)	[kW]	2,6	2,8	3,8	5,0	6,9
Sound pressure level at 1 m	(4)	[dB(A)]	53	55	57	59	62
Electric supply			1-230-50	1-230-50	3+N-400-50	3+N-400-50	3+N-400-50
HEAT RECUPERATOR							
Efficiency		[%]	46,2	51,2	53,2	53,6	53,6
FANS							
Number of fans			2	2	2	2	2
Fans total nominal input poweri		[kW]	0,75	0,84	1,02	1,24	2,5
Fans total maximum input current		[A]	4,8	4,8	7,2	7,2	13,2
Fan speed (+/- 15 %)			impostable	impostable	impostable	impostable	impostable
Protection class		IP	55	55	55	55	55
FILTERS							
Classification according to EN779			G3	G3	G3	G3	G3
Quantitative efficiency		[%]	80	80	80	80	80
REFRIGERATING CIRCUIT (COMPRESSOR)							
Refrigerant			R410A	R410A	R410A	R410A	R410A
Quantity refrigerant		[Kg]	Consult AERMEC Technical Departiment.				
Winter mode compressor input power	(3)	[kW]	1,3	1,3	1,8	2,5	3,0
Summer mode compressor input power	(2)	[kW]	1,8	2,1	2,3	3,5	4,4
Compressor maximum current input		[A]	8,2	12,5	7	11,1	19,7

Caution: the electronic regulators that are incorporated in the machine allow to regulate the air flow in the limits indicated in the previous table in order to set the system. Once setting has been completed, the regulators no longer need to be touched.

(1) Fan power supply: 230 V; nominal airflow rate; without accessories;
(2) Operating conditions: return air 26°C 50%, external air 34°C 50%;
(3) Operating conditions: return air 20°C 50%, external air -5°C 80%;
(4) At a free field distance of 1 m with ports canalized.

ACCESSORIES

MBC - Water heating coil			**07**	**10**	**15**	**21**	**33**
Rows		[n]	2	2	2	2	2
Front surfaces		[m²]	0,13	0,13	0,24	0,24	0,29
Air side pressure drop at nominal flow rate		[Pa]	11	18	23	42	78
Heating capacity	(1)	[kW]	5,0	6,0	8,7	10,3	16,8
Heating capacity	(2)	[kW]	1,9	2,2	3,4	3,7	7,5
Water flow rate	(1)	[l/h]	442	523	763	902	1475
Water side pressure drop	(1)	[kPa]	16	22	9	12	31
Water flow rate	(2)	[l/h]	336	382	584	638	1306
Water side pressure drop	(2)	[kPa]	11	14	6	7	28
MBX - Electric heating coil							
Alimentation			3 ph - 400 V - 50 Hz (separate power supply from the unit)				
Heating capacity		[kW]	3,0	4,5	6,0	9,0	12,0
Air side pressure drop at nominal flow rate		[Pa]	10	10	10	10	10
Stages		[n]	1	1	1	1	1
Electric heating element current input		[A]	4,6	6,8	9,1	13,7	18,2
RBX - Electric preheating coil							
Alimentation			3 ph - 400 V - 50 Hz (separate power supply from the unit)				
Heating capacity		[kW]	4,0	6,0	8,0	12,0	18,0
Air side pressure drop at nominal flow rate		[Pa]	10	10	10	10	10
Stages		[n]	2	2	2	2	2
Electric heating element current input		[A]	5,8	8,6	11,4	17,2	26
Manifold diameters							
Condensate drain pan discharge diameter		[in]	1"	1"	1"	1"	1"
Water coil manifold diameter		[in]	3/4"	3/4"	3/4"	3/4"	3/4"

(1) Inlet/outlet water temperature 70/60°C. Compressor running. Operating conditions: return air 26°C 50%, external air 34°C 50%;

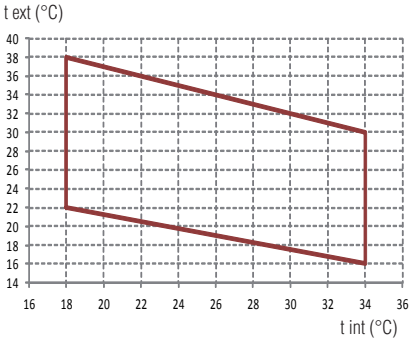
(2) Inlet/outlet water temperature 45/40°C. Compressor running. Operating conditions: return air 26°C 50%, external air 34°C 50%;

Operation limits

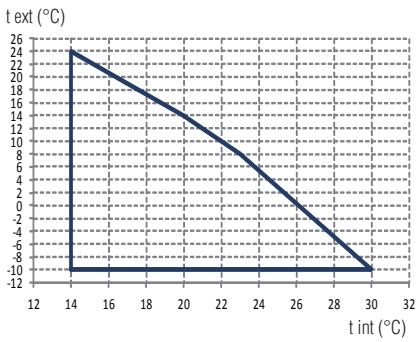
In their standard set-up, the equipment is not suitable for installation in a saline environment. The maximum and minimum limits of the airflow rate to the exchanger are indicated by the curve of the pressure drops diagram. Refer to fig. 043 for the operating limits.

N.B: Please contact Aermec technical sales office in the event it is necessary to operate the machine outside the limits indicated in the diagram.

Summer mode:



Winter mode: (heat pump)



		07	10	15	21	33
Max external temperature during cooling	°C	38	38	38	38	38
Min external temperature during cooling	°C	16	16	16	16	16
Max internal temperature during cooling	°C	34	34	34	34	34
Min internal temperature during cooling	°C	18	18	18	18	18
Min external temp with heat pump operating	°C	-10	-10	-10	-10	-10
Max external temp with heat pump operating	°C	24	24	24	24	24
Max internal temp with heat pump operating	°C	30	30	30	30	30
Min internal temp with heat pump operating	°C	14	14	14	14	14

fig.03

Sound data

• **Data outside the panel:** (the data are calculated at the following conditions: 1 m. distance from the unit, ducted supply vent and in free field)

	Sound pressure by band central frequence (Hz)								Sound pre.	Sound Pre.	Sound Pow.
	63 dB	125 dB	250 dB	500 dB	1000 dB	2000 dB	4000 dB	8000 dB	Total dB	Total dB (A)	Total dB (A)
07	56	55	51	50	49	44	40	33	60	**53**	**64**
10	59	60	54	52	50	45	41	35	64	**55**	**66**
15	62	65	57	54	51	47	42	36	68	**57**	**68**
21	64	69	60	55	52	48	43	38	71	**59**	**70**
33	67	74	63	57	53	49	44	39	75	**62**	**73**

• **Sound data on the supply fan vent**

Sound pressure measured at 3m distance from the free vent of the supply fan:

	63 dB	125 dB	250 dB	500 dB	1000 dB	2000 dB	4000 dB	8000 dB	Sound pressure dB	dB (A)
07	65	57	54	57	54	50	53	48	67,0	60
10	66	58	56	60	57	57	57	52	68,8	64
15	67	59	58	62	60	61	63	57	71,1	68
21	66	61	58	67	62	65	68	63	73,8	72,5
33	69	61	59	64	71	71	63	58	76,1	75,5

Sound power level from the supply vent:

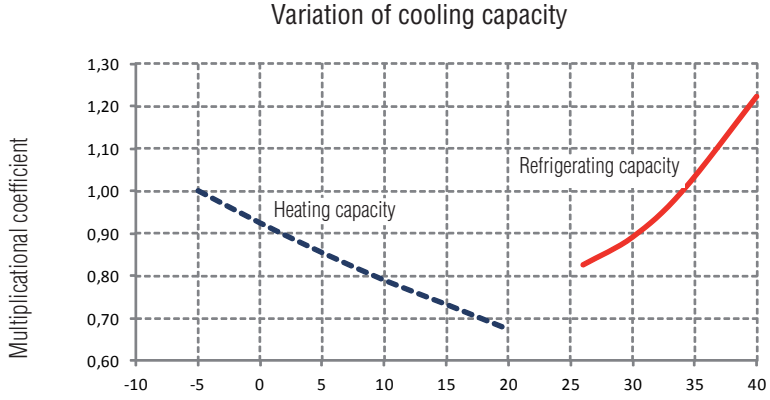
	63 dB	125 dB	250 dB	500 dB	1000 dB	2000 dB	4000 dB	8000 dB	Sound power dB	dB (A)
07	57	64	59	61	62	58	51	44	68,7	65,3
10	59	69	63	66	66	63	57	50	73,3	70
15	57	68	63	65	66	64	59	52	72,9	70,3
21	53	65	60	66	66	65	61	54	72,3	70,8
33	61	71	68	71	71	71	68	62	78,2	76,6

• **Attenuation of sounda data with SUF - Module with silencers (accessory)**

	63 dB	125 dB	250 dB	500 dB	1000 dB	2000 dB	4000 dB	8000 dB
SUF	9	0	2	5	5	9	14	11

Performance variations cooling and heating

The URX_CF series heat recovery unit with refrigerating circuit allow the renewal of the internal air giving the necessary hourly change in order to obtain the ideal comfort conditions.
The use of a high efficiency cross-flow heat recovery unit and a heat pump refrigerating circuit allows, in most applications and in the most common external air temperature conditions, in addition to the neutralisation of the heating load of the external air, to supply an adequate heating and cooling capacity to compensate the internal heating loads. Fig. 4 illustrates the graph from which it is possible to take the coefficients to be multiplied by the nominal values which are present in the technical data table so as to be able to determine the total refrigerating and heating performance based on the outside conditions.



Key
Internal air temperature
Summer operation: 26 °C 50% RH

Internal air temperature
Winter functioning: 20 °C 50% RH

fig.04

Corrective coefficient for the cooling capacity according to the variation of the room temperature in summer and winter mode:

SUMMER MODE:
Room air temperature 22°C, 50% RH --> corrective coefficient = 1,109
Room air temperature 24°C, 50% RH --> corrective coefficient = 1,033
Room air temperature 26°C, 50% RH --> corrective coefficient = 1
Room air temperature 28°C, 50% RH --> corrective coefficient = 0,963

WINTER MODE:
Room air temperature 18°C, 50% RH --> corrective coefficient = 0,945
Room air temperature 20°C, 50% RH --> corrective coefficient = 1
Room air temperature 22°C, 50% RH --> corrective coefficient = 1,056
Room air temperature 24°C, 50% RH --> corrective coefficient = 1,133

Fans available static pressure

The variations of the static pressure used by the fans to change the air flow (which can be set by means of the electronic regulators during the setting phase) in relation to the nominal values present in the technical data table, are represented in the graph of fig. 5.
The curve is valid for all sizes of the URX_CF series. Keep the feed to the fans at the maximum value.
As an example, a unit of the URX_CF 15 series is considered.
The following performances are taken from the technical data table:

nominal delivery flow rate 1500 m^3/h;
nominal recovery flow rate 1500 m^3/h;
available delivery static head = 223 Pa;
available recovery
static head = 206 Pa.
It is supposed that the pressure drops of the air distribution system on the supply side are equal to 210 Pa, while the pressure drops of the air distribution system on the exhaust side are equal to 180 Pa.

The "Effective useful pressure/Nominal useful pressure" reports are 210/223 = 0.94 and 180/206 = 0.87 respectively. The coefficients that can be taken from the graph are 1.08 and 1.18.

Therefore the effective flow rate on the supply side is 1500 x 1.08 = 1620 mc/h; the effective flow rate on the exhaust side is 1500 x 1.18 = 1770 mc/h.

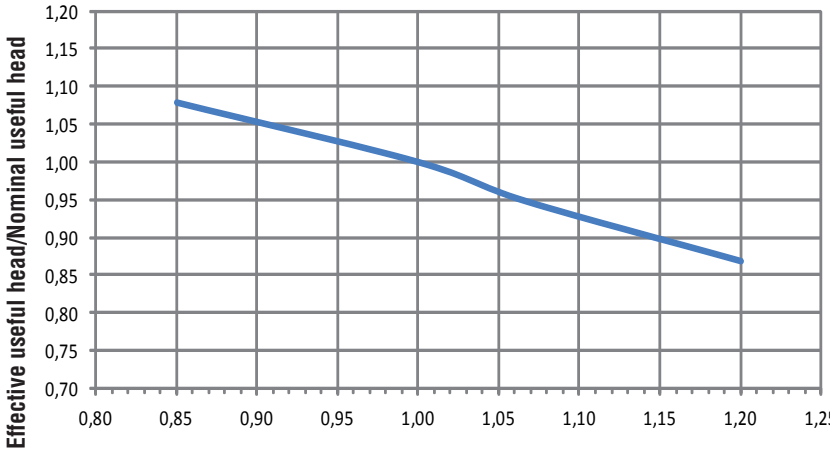


fig.05

Fresh air temperature variations on the change of the external air temperature

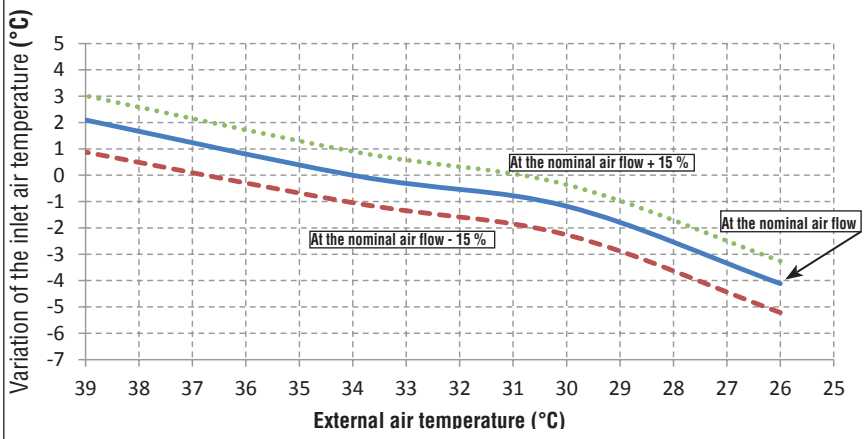
The following charts allow to determine the variation of the temperature within the room on the variation of the external conditions. The variability of the air flow is that allowed to guarantee that the refrigerating circuit operates correctly.

N.B.
The following diagrams are typical for all sizes, but without accessories

Summer use			
X= T ext	Y = media ΔT		
	Q nom	Q nom-15%	Q nom+15%
26	-4,20	-5,21	-3,26
30	-1,18	-2,26	-0,36
34	0,00	-1,05	0,90
40	2,53	1,26	3,44

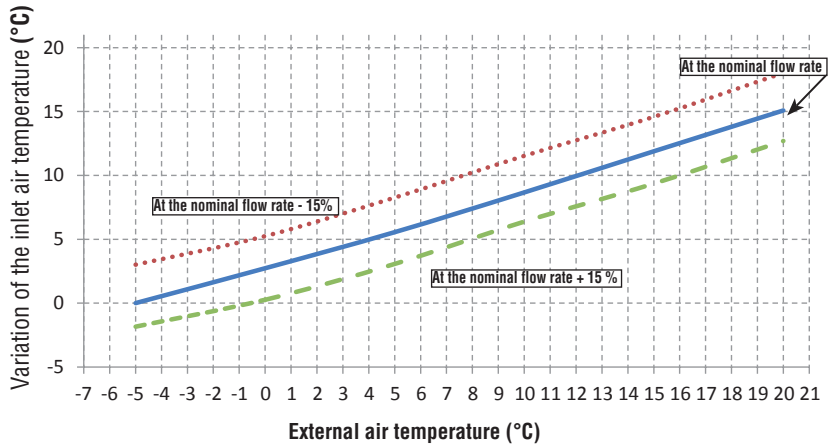
Winter use			
X= T ext	Y = media ΔT		
	Q nom	Q nom-15%	Q nom+15%
-5	0,00	3,02	-1,84
0	2,73	5,25	0,26
5	5,56	8,27	3,07
10	8,67	11,53	6,38
15	11,89	14,58	9,36
20	15,09	18,03	12,70

Summer use



Conditions: exhaust air 26°, 50% R.H.

Winter use



Conditions: exhaust air 26°, 50% R.H.

Thermal efficiency, Pressure drop air side for accessories MBC, SUF

The diagram in fig. 06 allows to determine the coil thermal efficiency of the **MBC** accessory for each model based on the Td of the inlet water and Td of the inlet water air. The corrective factor to multiply for the nominal capacity value are present in the technical data table.

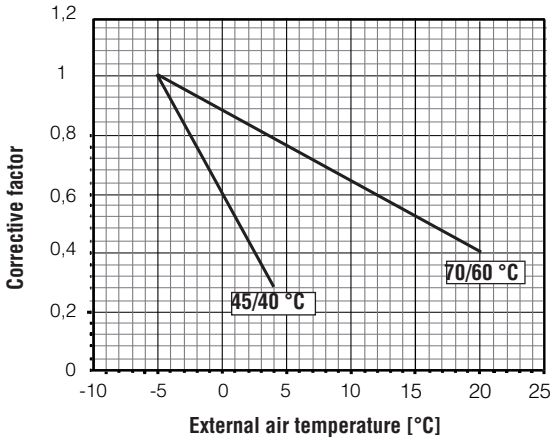


fig.06

Fig. 07 illustrates the pressure drops **(Pa)** on the air side based on the flow rate for the MBC and SUF accessories

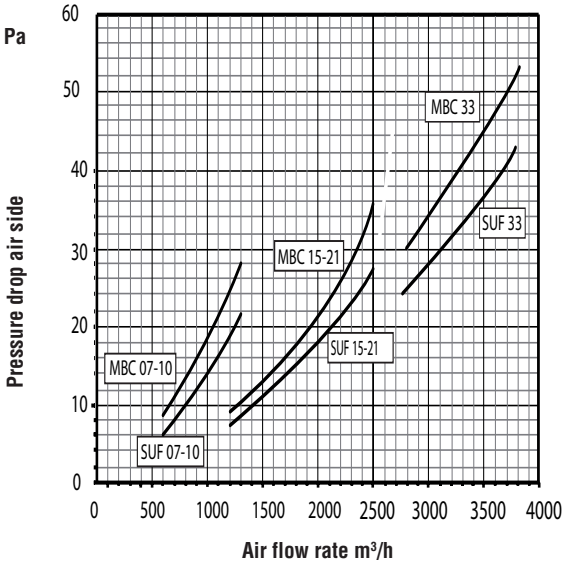


fig.07

Fig. 08 illustrates the pressure drops **(kPa)** water side of the **MBC** accessory coil.

N.B.:
The pressure drops illustrated in the diagram also include those of the three-way valve.

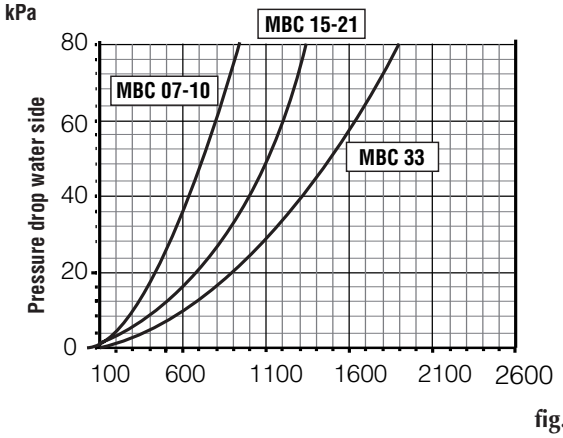
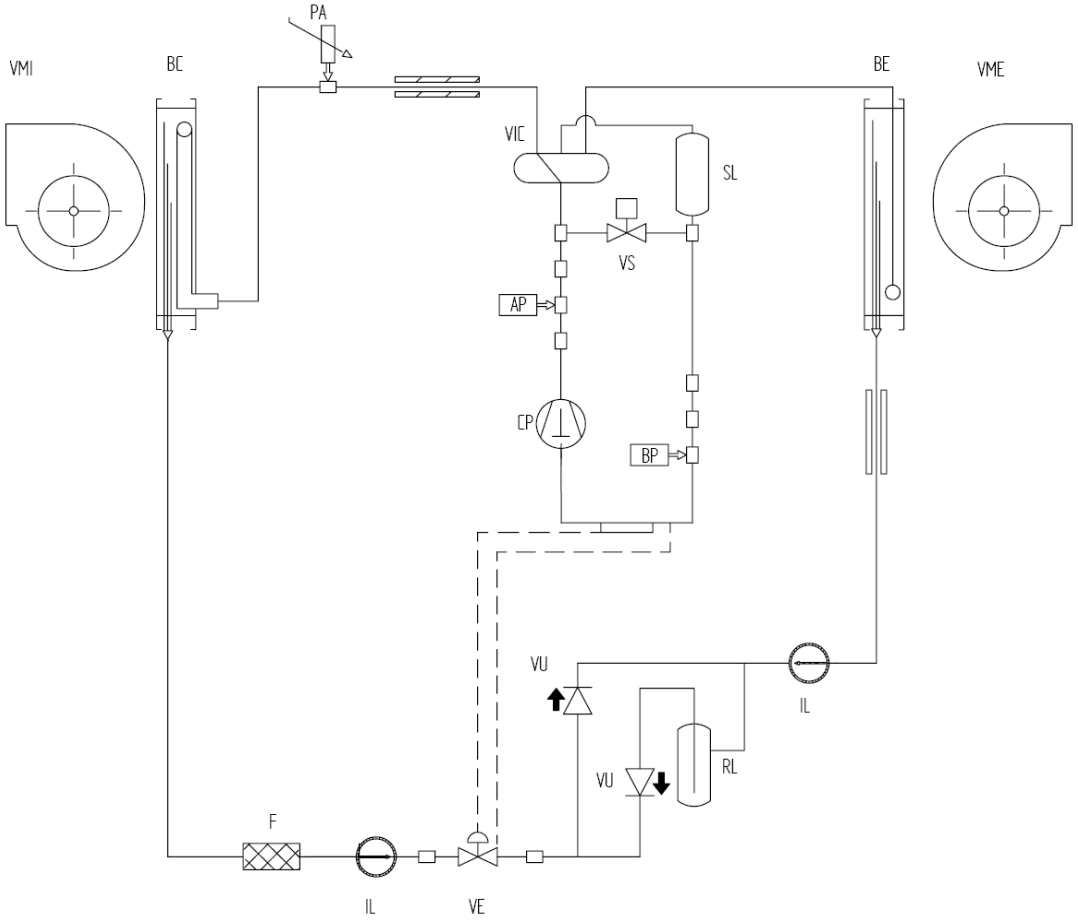


fig.08

Refrigerating circuit

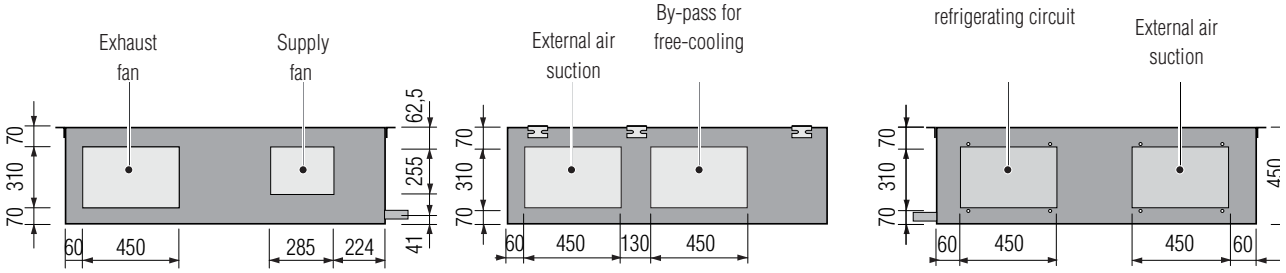


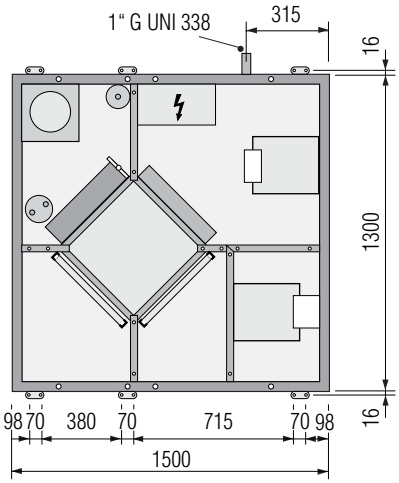
KEY	
CP	Compressor
BC	Condensing coil
BE	Evaporating coil
VME	Summer supply fan
VMI	Winter supply fan
SL	Liquid separator(*)
VU	One way valve
IL	Liquid indicator
F	Filter
VE	Thermostatic valve
RL	Liquid receiver
PA	High pressure probe
VIC	Valvola inversione di ciclo
AP	High pressure switch
BP	Low pressure switch
SV	Solenoid valve(**)

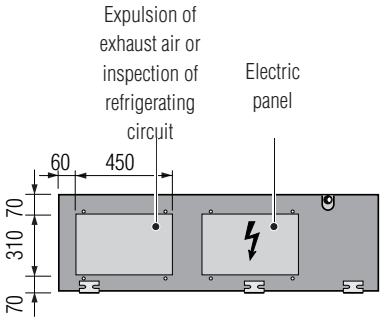
(*) **Only present in 07 and 10 models.**
(**) **Only present in 07 model.**

Dimensions

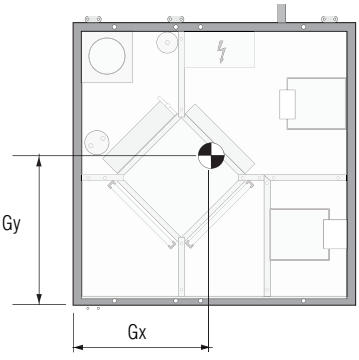
URX07CF - URX10CF



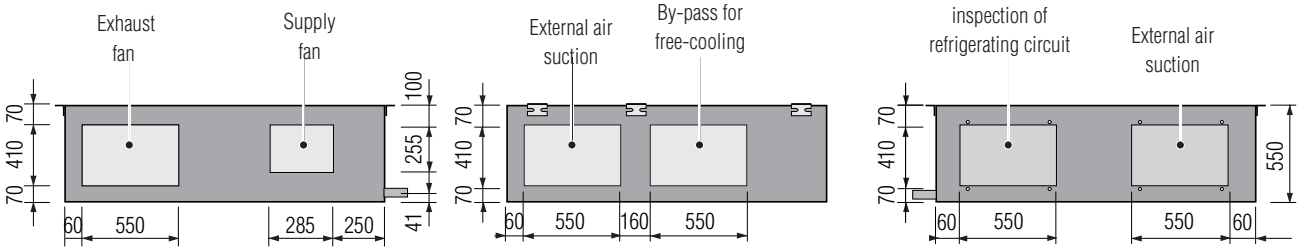


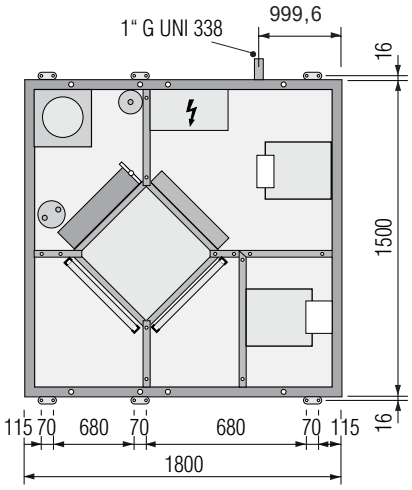


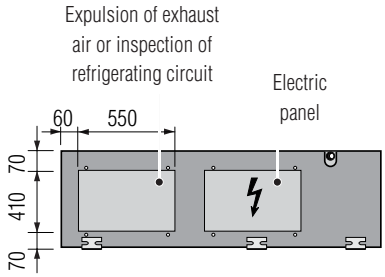
Weights and centres of mass	kg	Gx	Gy
URX07CF	205	700	650
URX10CF	218	700	650



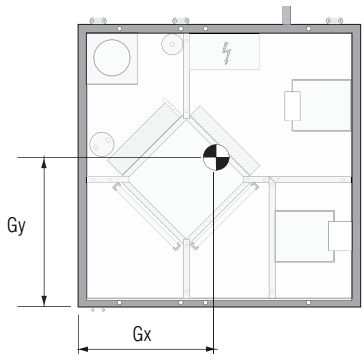
URX15CF - URX21CF



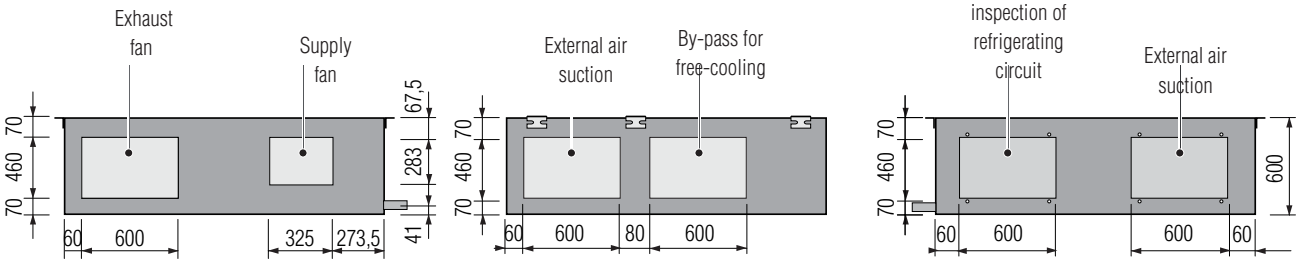


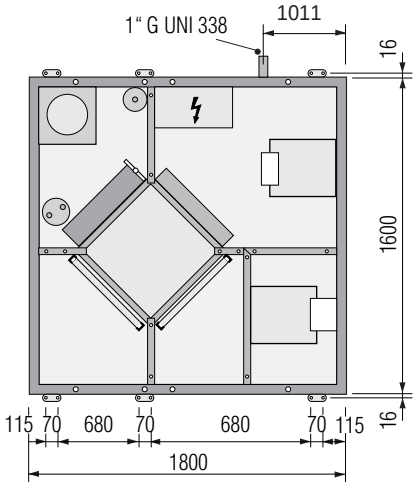


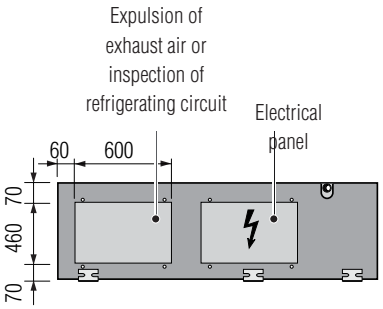
Weights and centres of mass	kg	Gx	Gy
URX15CF	272	800	750
URX21CF	298	760	750



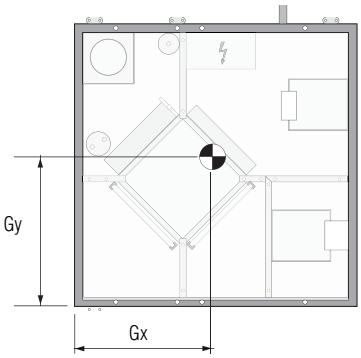
URX33CF





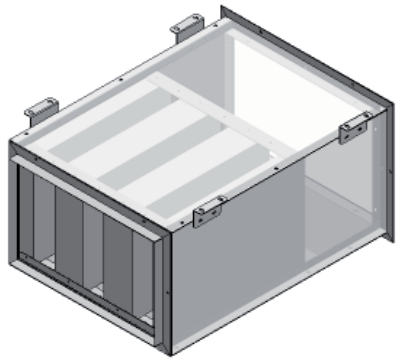


Weights and centres of mass	kg	Gx	Gy
URX33CF	328	850	800

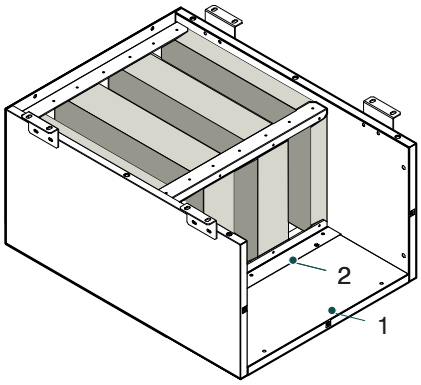


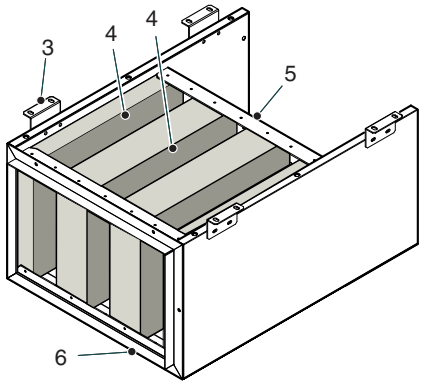
Accessories Dimensions

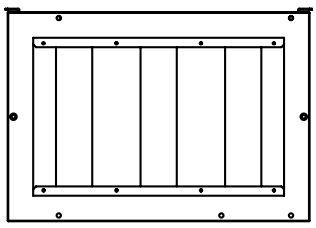
SUF - Silencer baffle modules

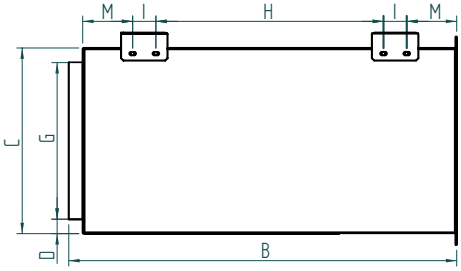


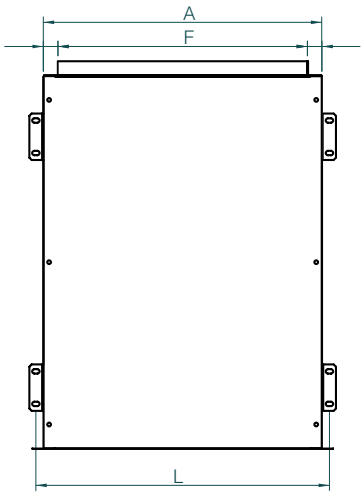
Key	
1.	Inspection panel set
2.	Lower panel bdampering profile
3.	Upper fixing bracket
4.	Silencer
5.	Baffles fixing bracket
6.	Duct accessories connection flange







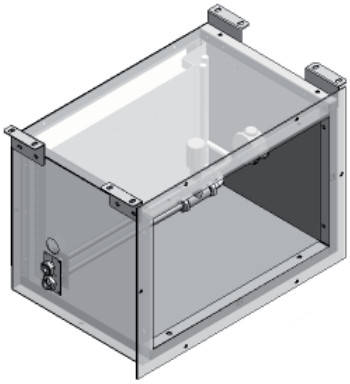


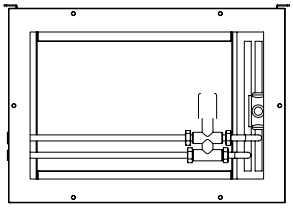


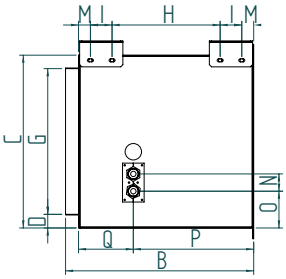
Mod. [mm]	URX_CF 07-10	URX_CF 15-21	URX33CF
A	600	600	600
B	835	835	835
C	400	500	550
D	30	30	30
E	31,5	31,5	31,5
F	537	537	537
G	337	437	487
H	490	490	490
I	50	50	50
L	632	632	632
M	108	108	108

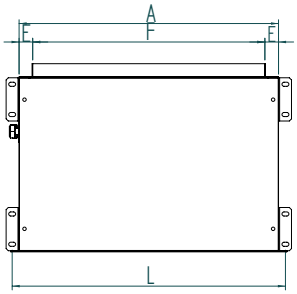
MBC - Water coil modules

MBC





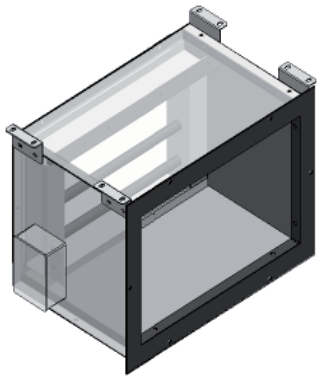


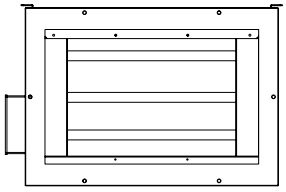


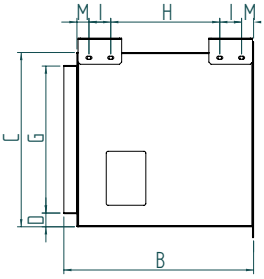
MBX - Electrical coil modules

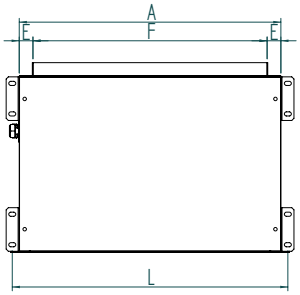
RBX - Preheating Electrical coil modules

MBX - RBX







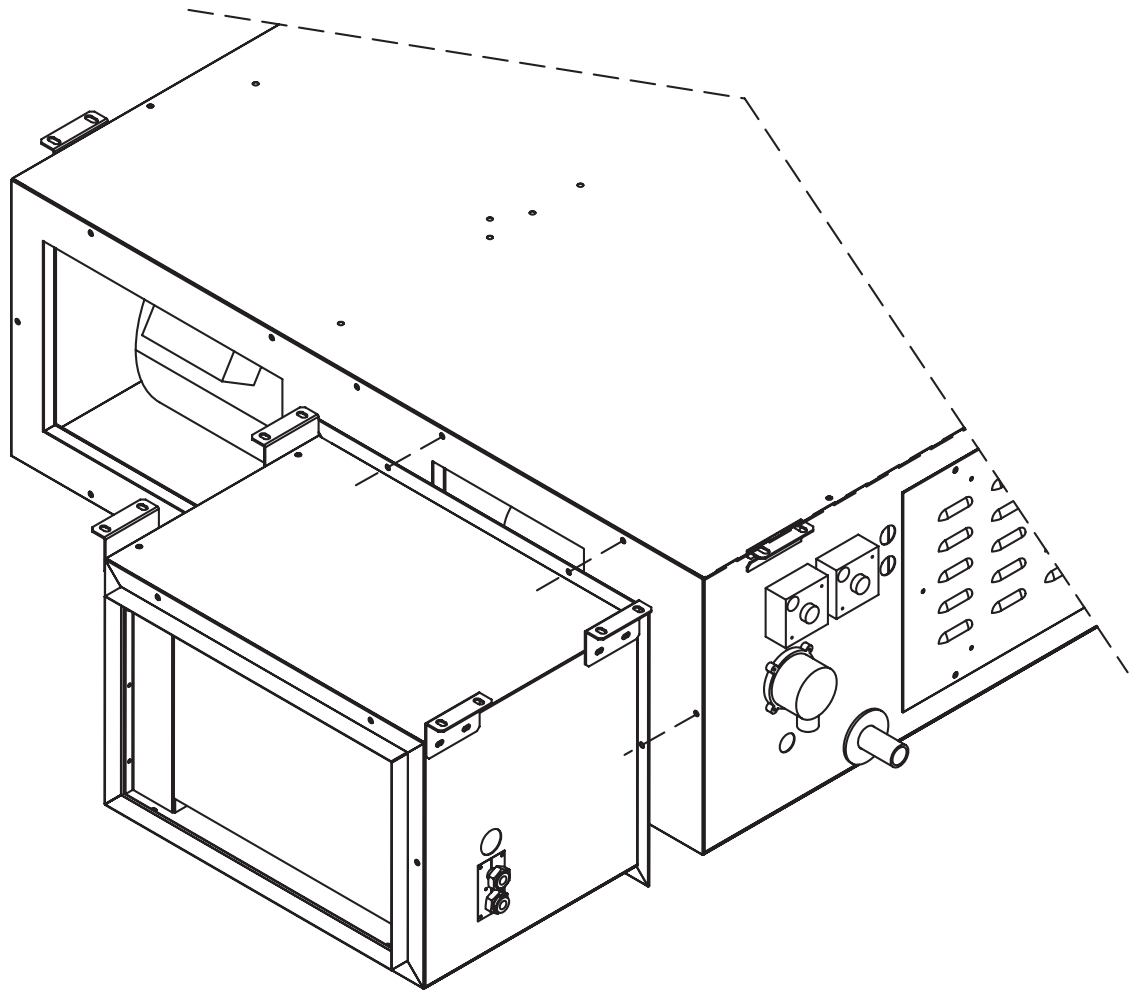


Mod. [mm]	URX_CF 07-10	URX_CF 15-21	URX33CF
A	600	600	600
B	435	435	435
C	400	500	550
D	30	30	30
E	31,5	31,5	31,5
F	537	537	537
G	337	437	487
H	250	250	250
I	50	50	50
L	632	632	632
M	28	28	28
N	40	40	40
O	85	85	85
P	278	278	278
Q	127	127	127

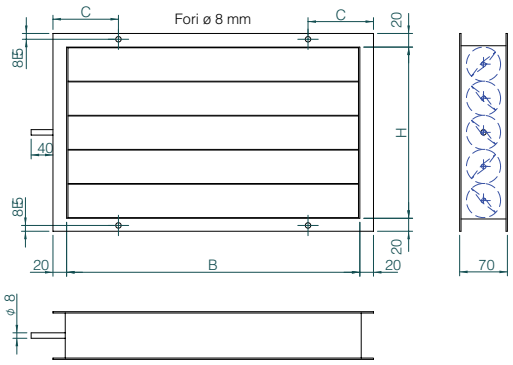
SUF, MBC, MBX and RBX assembly

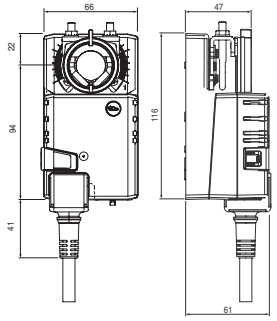
Accessories MBC, MBX, RBX and SUF are equipped with:
- "L" supporting brackets;
- a flange for the accessory connection to the unit;
- a flange for the accessory connection to the ducts.
- viti M6 screws to tighten the accessory to the unit;
- only for MBX and RBX: electrical box put outside the accessory;
- only for MBC: electrical cables for connection between three way valve servocontrol (230V, ON/OFF running) and electrical box and between electrical box and unit electrical panel;
- only for MBX and RBX: electrical cables for connection between coil and electrical box and between electrical box and unit electrical panel (electrical cables for coil electrical supply and protection differential magnetic switch are not supplied).

Fot accessories installation on the ceiling and their connection to the unit please refer to the following instructions:
- position the support brackets on the wall following the instructions at page 24;
- unscrew totally the screws form the unit in correspondance of the holes which couples with accessory flange;
- draw the accessory MBC, MBX, RBX and SUF to the unit;
- screw the screws previously unscrewed and by screws equipped with the accessory, the accessory and its flange to the unit prepared with threaded hexagonal inserts;
- connect electrical cables coming from the accessory electrical box to the unit electrical panel (please refer to electrical schemes equipped with the unit).



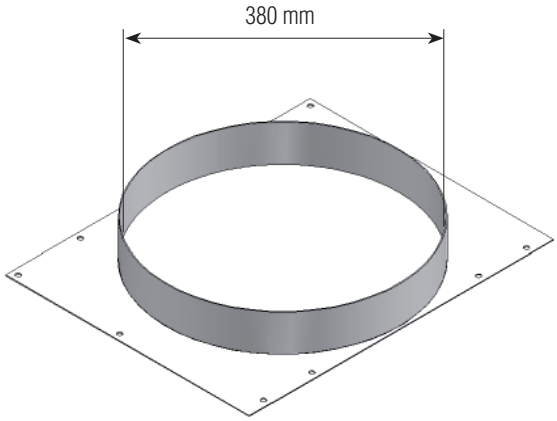
Dampers and actuators (included in the free-cooling kit)



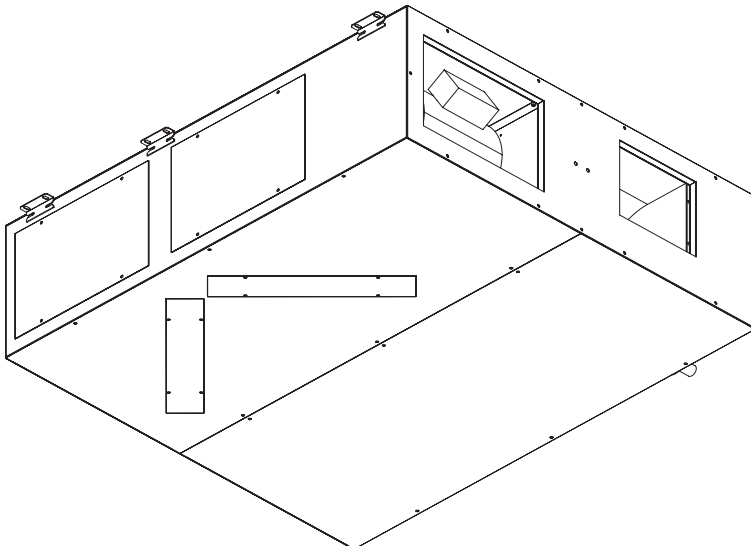


Mod. [mm]	URX_CF 07-10	URX_CF 15-21	URX_CF 33
B	450	550	600
H	310	410	460

Circular flanges (FGC accessory)



Unit accessibility



Installation and use of the unit

General safety requirements

WARNING!
The URX_CF series units are destined for civil and tertiary use: for all other applications (in highly corrosive environments, in potentially explosive atmospheres etc.) its use is not permitted.

- Make sure that the unit has not been damaged during transportation before installation: The use of the damaged machine might be dangerous;
- Installation and extraordinary maintenance must be performed by qualified people in accordance with the present standards;
- The unit must not be used to recover equipment, spare parts. Any use other than those indicated in this manual may generate hazards and is therefore prohibited;
- Before performing maintenance or cleaning operations, make sure that the unit is disconnected and ensure that it is not reconnected without informing the person who is presently working on the unit;
- During maintenance and cleaning, pay attention to possible burning of the heating coils;
- Before starting the unit make sure that the electrical parts have been connected to the earth system of the building;
- Before starting the unit make sure that the fan vents have been ducted or include safety meshes;
- The unit is not designed for external installation: external installations require particular technical characteristics and devices which these units cannot guarantee;
- During installation, maintenance and cleaning, wear suitable Individual Protection Devices (IPD).

The units are fitted with:

- an adhesive label (fig. 07a) which indicates the model, the gross weight and the customer
- an adhesive label (fig. 07b) which indicates the main technical data such as the model, nominal air volume, efficiency of the heat recovery unit, electrical data and performance of the coils.
- Each URX_CF unit is identified by means of a serial number on the plate

N.B.:
The serial number must be indicated for future reference when contacting Aermec S.p.A.

Handling

CAUTION!
During the handling phase, wear proper individual protection devices (IPD)

Before installation and use you are recommended to fully unpack the base unit and the all the components that come with it.
The units are supplied packed with polythene film and, as a standard, on wooden pallets.

For transport reasons, some accessories travel separately from the standard unit and are to be reassembled by the installer following the instructions in this manual

Transport

Refer to the weight indications on the plate on each unit in order to transport the unit safely.
In any case, the following precautions must be taken when transporting the unit:

- The unit and its accessories, if any, must not be subject to intense knocks which could compromise the integrity of the structure and internal parts;
- The unit and possible accessories must be suitably secured to the platform of the transportation by means of cables or similar in order to prevent its movement;
- the unit and accessories must be protected in order to prevent protruding parts such as the coil connections, condensate drain, electrical components, etc., from being knocked during transport;
- the items must be protected against bad weather during transport.

Checks at material receipt

When the unit is received it is necessary to carry out an initial inspection to make sure that:

- all parts are present ;
- the unit and accessories are not damaged.

If there are signs of damage it is necessary to specify it on the carriage note.

The controls are the following:

- integrity of the finned coil manifolds and condensate trays;
- water connections (that these are protected with the rubber plugs). If they are not provide suitable closure devices;
- integrity of the panels;
- integrity of the electrical panel and electrical/electronic parts

Installation

You are recommended to carefully follow the indications in the sections below when installing the equipment. The sections are in chronological order in order to make each phase of the installation easier.
The necessary technical space must be verified before installation fig.08:

- for the arrangement of the supply and exhaust ducts as well as those for the free-cooling;
- for the dampers with free-cooling function;
- for the passage of the power supply cables;

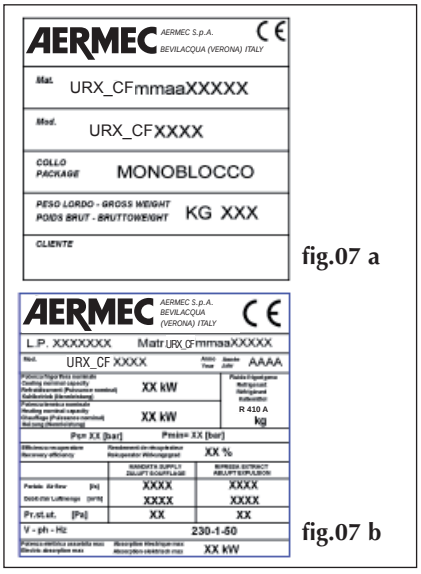


fig.07 a

fig.07 b

- for the components (three-way valves, condensate drainage traps, etc.) without which the correct functioning of the unit can not be guaranteed;
- for the correct cleaning and maintenance operations (in the bottom of the unit leave half of the overall width of the unit plus 100 mm).

In particular:

- a space of at least 200 mm must be available for the trap in correspondence with the condensate drain (fig. 11).

Positioning of the supporting brackets

The unit must be positioned on a flat surface to avoid:

- the drainage of the motor fan assemblies caused by weight imbalance
- the incorrect functioning of the condensate drain.

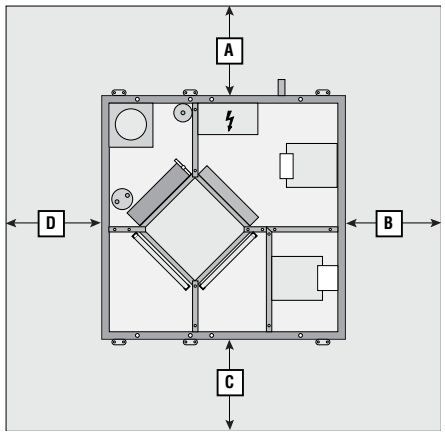
The unit and the coil and silencer module are equipped with "L" supporting brackets for horizontal installation.

N.B.: You are recommended to place rubber dampers between the brackets and the walls to decrease the vibrations generated by the unit.

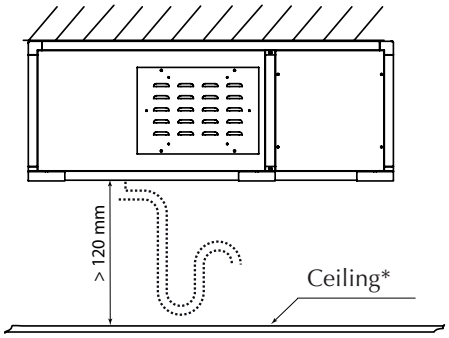
Check the dimensional layout in this manual for the correct positioning of the brackets:

- drill the wall in correspondence with the points indicated in fig.09 (point 1);
- disassemble the brackets from the unit or from the coil or silencer module by unscrewing the screws in correspondence with the holes (point 2);
- screw the brackets to the wall (screws not supplied) in correspondence with the holes (point 3);
- in correspondence with the holes (point 4), partially tighten one screw for each bracket to the unit or to the coil or silencer module.

N.B.: Aermec recommends to use spring dampers for those units set on the floor.



Key
A = 800 mm
B = 200 mm
C = 200 mm
D = 200 mm



The ceiling MUST BE REMOVABLE-TYPE (it must not be fixed-type), to give the possibility to do the ordinary and extraordinary maintenance.

The unit must be slightly tilted towards the water discharge (about 2-3°) to allow the correct draining of the condensate drain pan.

fig.08

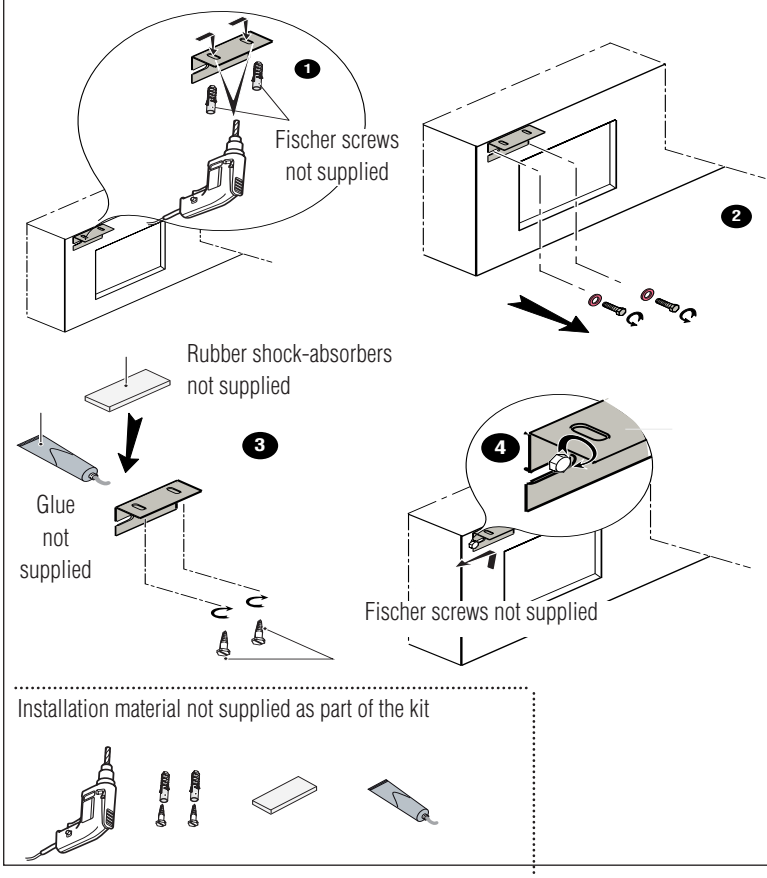


fig.09

Connection of ducts

CAUTION!
never start up the unit when the fan ports are not ducted or covered by protective mesh.

See fig. 10 for the installation of the ducts:
- use adequate brackets to sustain the ducts in order to avoid that the recovery unit is overloaded by their weight;
- in order to prevent the transmission of vibrations and noise, Aermec S.p.A. suggests the use of ducts with a frontal mass higher than 10 kg/m^{2};
- connect the supply and exhaust ports to the ducts using vibration-damping joints (olona cloth). The vibration-damping joint must be screwed to the panel with self-tapping screws, positioning the screws inside the border highlighted in the following layout avoiding that the olona cloth joints are over stretched (point 1);
- connect a earth wire to the vibration-damping joint to act as a jumper to guarantee the unipotentiality between the ducts and the recovery unit;
- place the supply duct with a straight section of at least one meter, before the bends, branches, etc., and make sure that the ductling does not have inclinations of the divergent sections greater than 7°.

Hydraulic connections of the condensate drain

The condensate drain pan is provided with a 1" diameter threaded discharge pipe G UNI 338.
The drainage system should feature an adequately sized trap to:
- freely discharge the condensate;
- prevent the undesired entry of air into the vacuum systems;
- prevent the undesired exit of air from the pressure systems;
- prevent the infiltration of odours or insects.

In the lower part of the syphon must have a bleed cap or must anyway permit Aermec dismantling for its cleaning.
Rules to follow for the scaling and production of the syphon are given below.

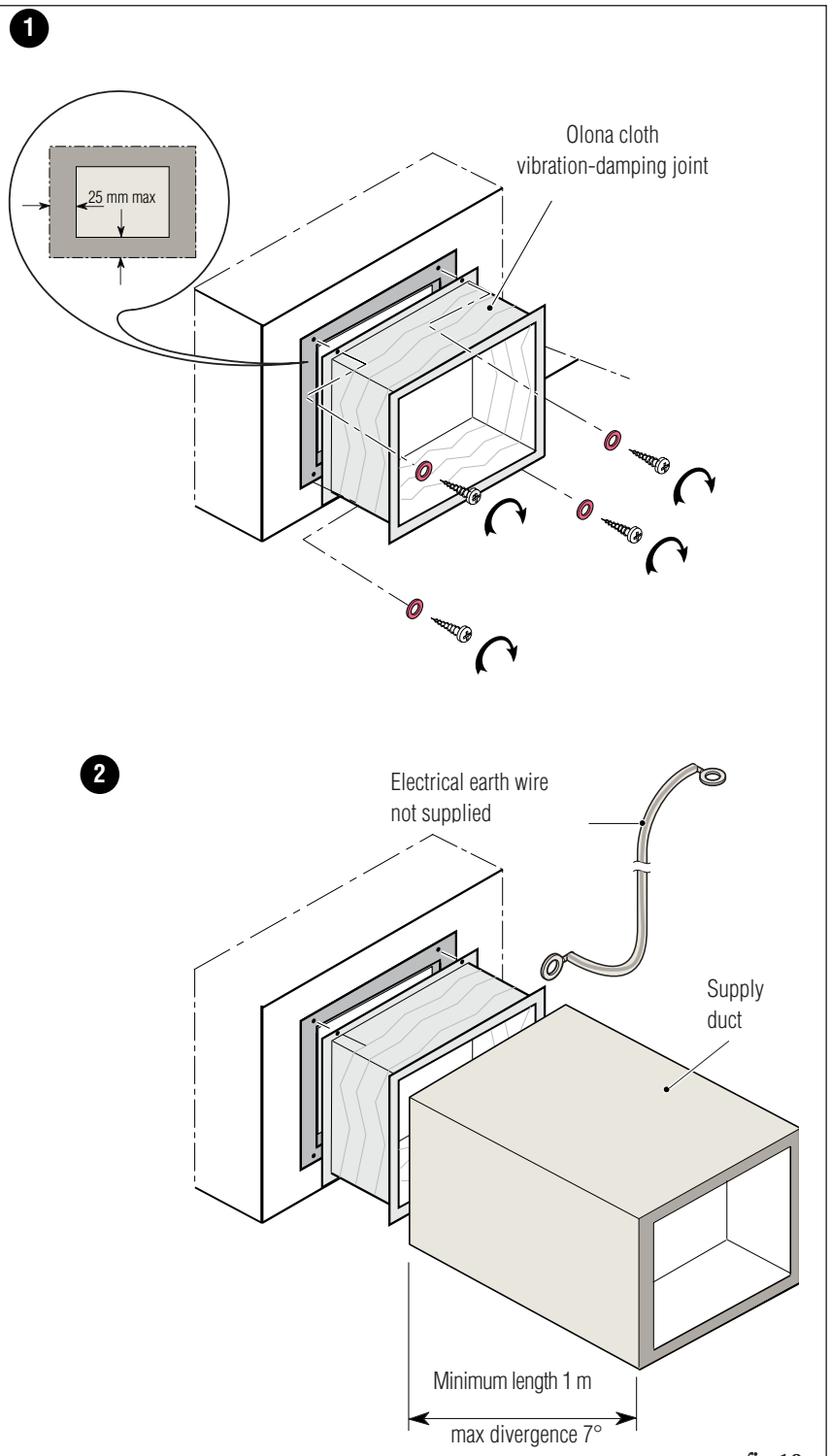
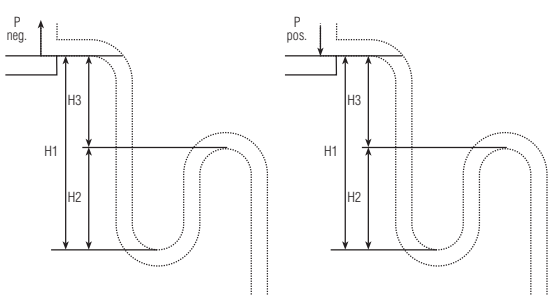


fig.10



H1 = 2P
H2= H1 / 2

where P is the pressure expressed in mm of the water column (1 mm c.a. = 9.81 Pa).

fig.11

FCE free-cooling accessory

The assembly of the "free-cooling kit" accessory must be performed by qualified personnel in accordance with the present standards and must be made following the indications in the electrical layout supplied with the unit.
The compressor is off during the functioning of the unit in the free-cooling mode. The temperature settings are pre-set at fixed values (on request these values can be changed by contacting the After-Sales office).
See the indications in fig. 12 for the installation of the free-cooling kit.

Operation

The free-cooling function foresees that the air expelled from the room does not affect the heat recovery unit, passing directly to the outside through a duct connected to the damper B.
Thus, the fresh air flow passes through the filter and the heat recovery unit without being touched by the heat recuperator.
In order to use the free-cooling function a duct is required to connect to damper A and another to connect to damper B. The two dampers A and B have an opposing function.
When the outside temperature is close to the ideal temperature of the room, damper A is closed while damper B is open.
Damper A can be positioned on the side as indicated in the line diagram.
The compressor is off when the unit is operating in free-cooling.

Assembly of the accessory

For the assembly of the free-cooling accessory please refer to fig. 12 and 13

- place the two dampers with servomotors MES and MESF as in the previous diagram;
- make sure that the damper with the MES servomotor is closed during the free-cooling function while the damper with the MEFS servomotor is open (opposing functions);
- connect the damper servomotors;

CAUTION!
Before assembling the free-cooling kit, make sure that the power is not connected to the unit.

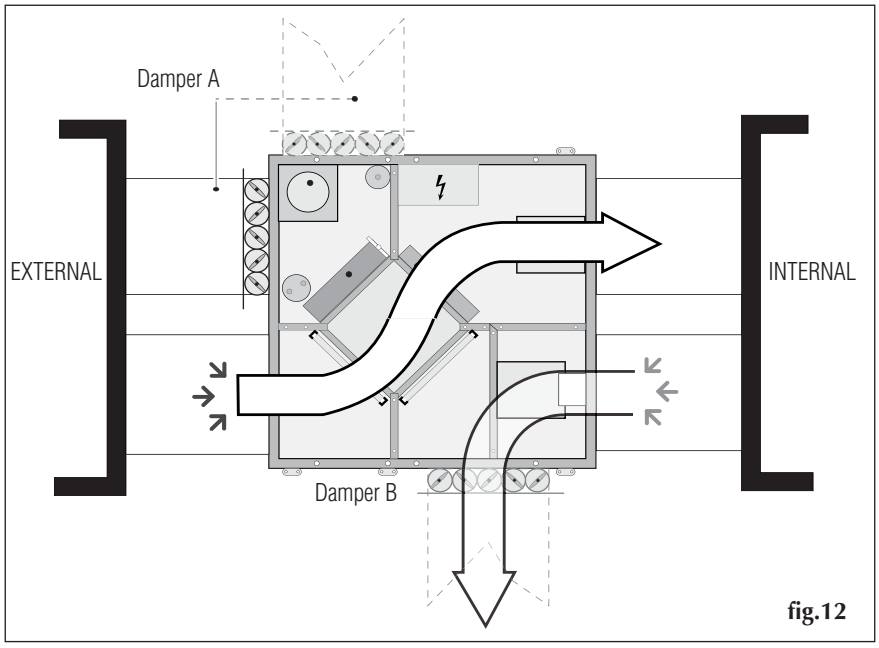


fig.12

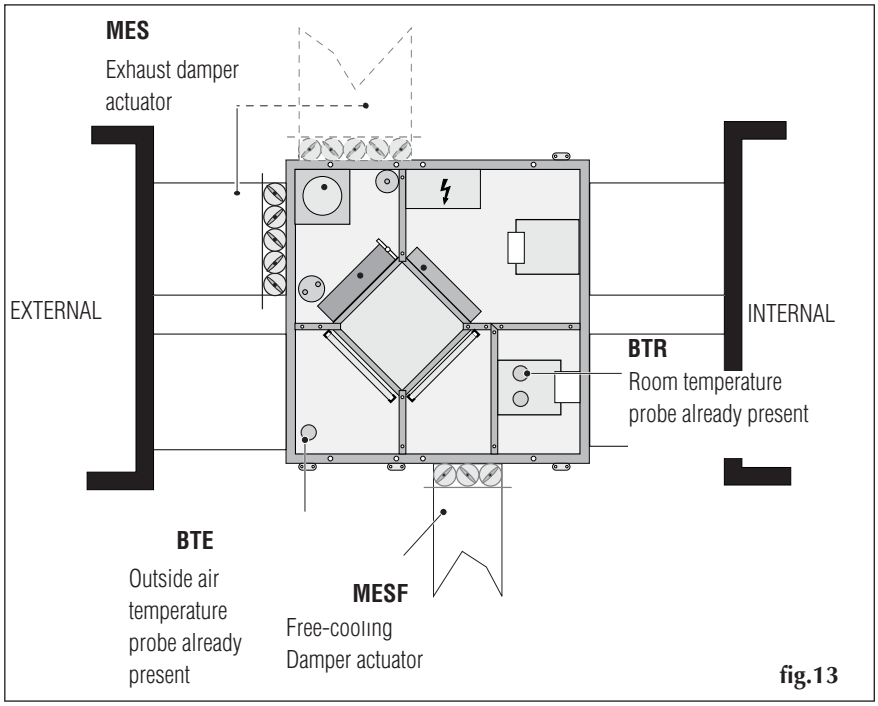


fig.13

Electrical connections

The unit is completely wired in the factory and requires the power supply, intercepted with inline protections, indicated on the unit specification plate in order to be started.
The installer should define the power supply line based on the length, the type of cable, the absorption of the unit and the displacement. TAB.3
All electrical connections must be in accordance with the present standard at the moment of installation.

CAUTION:
Refer to the electrical layout supplied with the equipment for installation needs.

Check that all power cables are correctly secured to the terminals when switched on for the first time and after 30 days of use. Afterwards, check the connection of the power cables every six months. Slack terminals could cause the cables and components to overheat.
The electrical wiring and connections must be done persons qualified to do so in accordance with regulations currently in force.
Every electrical user must be connected to the system's earthing system.

Use the connectors with the earth symbol to connect the earthing of the unit and possible accessories to the earthing of the building.
Respect the installation power supply and environment conditions

Keep the panel and wiring away from electric and magnetic fields that could disturb, such as inverters, high voltage power supply lines,etc.

CAUTION!
Once the connections have been made, check that:
all the cables have been correctly connected, and that there are no short circuits between terminals and the terminals and ground.
the electrical terminals both within the electrical panel as well as in the terminal board of the compressor are secured and that the mobile and fixed contacts of the remote control switches do not show signs of wear.
Do not block the air intake of the panel.
Never connect or disconnect the remote terminal with energised main board.

TAB.3

Operating voltage	± 10% of the rated voltage (EN60204)
Frequency	± 1% of the continuous frequency
	± 2% for short periods
Operating room umidity	from 30% to 95%, without condensate
	or the formation of ice (EN60204)
Altitude up to 1000 m a.s.l. (EN60204)	
Operating room temperature	from +5°C to 40°C

Before start-up

Before start-up check that:
– the system has been charged and the air has been blown out;
– the electrical connections have been made correctly;
– the line voltage is within the permitted allowance (±10% of the rated value);

Unit start-up

For detailed information regarding the operating parameter settings and all other machine or control card operations, consults the user manual.

CAUTION!
Make sure that all the instructions have been complied with before carrying out the commissioning checks.

Before the first start-up of the heat recovery unit check the following points:
- the exact positioning of the panels in correspondence with the motor ventilating assembly that require opening by means of a screw-driver;
- the fixing of the unit to the wall;
- the earthing of the unit to the buildings earth system;
- the connection to the ducts;
- the condensate drain connection to the trap;
- the insulation of the tubes to the coils ;
- the ground wires of the electrical components;
- the absence of air in the water coils.

In particular check that:
- the electrical connection has been performed correctly and that all terminals have been sufficiently tightened;
- the voltage on the terminals is 230 V ± 5% (for units with single-phase power) or 400 V ± 5% (for units with three-phase power): If the voltage is subject to frequent change, contact our Technical department in order to select the necessary protection;
- there are no leaks of refrigerant through the use of a leak detector.

CAUTION!
Before start-up, check that all the panels of the unit are in place and secured with the screws.

WARNING!
If, at the time of the first start, the compressor don' t start, the cause can be attributed to a wrong wiring of the sequence of the phases L1-L2-L3 or to the interruption of one of them, resulting in the intervention of the relay of the phase sequence.

Checks during operation

The air flow rate values must not be lower than 15% of the nominal values indicated in the technical specifications table.

If an electrical resistance is present, check the cut-in by measuring its electrical absorption.

Requirements of gas R410A

The circuit chillers that work on R410a cooling gas require particular attention during assembly and maintenance, to prevent operating faults.
Therefore it is necessary to:

- Avoid refilling with oil different from the one specified and already used in the compressor.
- If there are gas leaks causing the unit to be even partially empty, do not refill with refrigerant, but empty the unit completely and refill it with the foreseen amount.
- **In the event of replacement of one of the refrigerating circuit parts, do not leave the circuit open for more than 15 minutes.**
- **In particular, in the event of replacing the compressor, complete the installation within the above-mentioned time after the rubber plugs have been removed.**
- When empty, do not switch on the compressor; do not compress the air within the compressor.

REFRIGERANT LOAD					
SIZES URX_CF	**07**	**10**	**15**	**21**	**33**
kg	**Consult AERMEC Technical Departiment**				

Maintenance of the unit

CAUTION!
During the maintenance phase, wear proper individual protection devices (IPD)

- **Before performing maintenance and/or cleaning operations on the unit, make sure the unit is disconnected from the power supply and that it can not be turned back on without the knowledge of the person performing maintenance, and that the heat exchanger coils are not working.**

- **During maintenance the weight of the inspection panelling could hinder the work**

The URX_CF series recovery units have been designed to require very little maintenance and to make every operation easy. Some simple pieces of advice follow for the proper maintenance of the unit.

Filters

Filter cleaning is imperative to maintain high air quality in the room. The synthetic filters installed in the URX_CF unit can be regenerated with compressed air or can be washed with cold water. To disassemble the filters:

- remove the inspection panel with knobs;
- remove the filters;
- clean the filters;
- replace all parts in reverse order.

Condensate drain pan

Dirt can hoard up in the condensate drain pan. You are therefore recommended to clean the pan regularly and check that the discharge pipe is not clogged.
To remove the condensate drain pan of the heat recovery unit:

- remove all bottom panels;
- disassemble the cross bar;
- disconnect the pan from the condensate drain pipes;
- disassemble the pan supporting brackets;
- clean the pan;
- replace all parts in reverse order.

In order to access the condensate drain pan on the coil module, detach the module from the unit and disassemble it.

Heat recovery

The heat recovery unit can be cleaned with a jet of compressed air or cold water. To disassemble the heat recovery unit:

- remove the condensate drain pan;
- remove the heat recovery unit supporting brackets;
- clean the heat recovery unit;
- replace all parts in reverse order.

Motor ventilating assembly

The motor ventilating assembly needs to be checked to see how clean the rotor is, whether there is corrosion or damage, and whether there are abnormal noises. If necessary disassemble the motor fan assembly as follows:

- remove all inspection panels;
- disconnect the power supply cable;
- unscrew the four screws that hold each of the motor fan assemblies to the frame;
- check the motor fan assemblies and replace them if necessary;
- replace all parts in reverse order.

Heat exchanger coil

To maintain an efficient heat exchange the coils must be cleaned with a jet of compressed air and the circuit (water coil) must be free from air.
To access the heat exchanger coil of the MBC accessory, disconnect the module from the unit and disassemble it .

PERIODIC COMPONENT OPERATIONS	
Filters	Check their cleanliness twice a week
Heat exchanger coil	Check integrity of pack each year
Condensate pan	Check cleanliness each year
Heat recovery unit	Check integrity of the deck each year

The table indicates the maintenance operations concerning each component, indicating the type of check to perform and when it should be performed. The frequency is approximate and varies depending on the working and environmental conditions in which the heat recovery unit operates.

Decommissioning

Disconnect the unit

All decommissioning operations must be performed by authorized personnel in accordance with the national legislation in force in the country where the unit is located.

- Avoid spills or leaks into the environment.
- Before disconnecting the machine please recover:
  - the refrigerant gas;
  - Glycol mixture in the hydraulic circuit;
  - the compressor lubricating oil.

Before decommissioning the machine can be stored outdoors, providing that it has the electrical box, refrigerant circuit and hydraulic circuit intact and closed.

Disposal, recovery and recycling

The frame and components, if unusable, should be taken apart and sorted by type, especially copper and aluminum that are present in large quantities in the machine.
All materials must be recovered or disposed in accordance with national regulations.

RAEE Directive (only UE)

- The RAEE Directive requires that the disposal and recycling of electrical and electronic equipment must be handled through a special collection, in appropriate centers, separate from that used for the disposal of mixed urban waste.
- The user has the obligation not to dispose of the equipment at the end of the useful life as municipal waste, but to send it to a special collection center.
- The units covered by the RAEE Directive are marked with the symbol shown above.
- The potential effects on the environment and human health are detailed in this manual.

Additional information can be obtained from the manufacturer.

DIAGNOSIS AND TROUBLE-SHOOTING

Fault finding

All units are checked and tested at the factory before shipment, however, during operation an anomaly or failure can occur.

BE SURE TO RESET AN ALARM ONLY AFTER YOU HAVE REMOVED THE CAUSE OF THE FAULT; REPEATED RESET MAY RESULT IN IRREVOCABLE DAMAGE TO THE UNIT.

At the end of their operating life, the URX_CF units must be disposed of according to the present laws.
The main components including the unit of the URX_CF series are made from:

- Galvanised sheet steel (panels , condensate drain pan, fans);
- aluminium sheet metal (coil fins, dampers, electrical motor casing);
- copper (coil tubes, electric motor winding);
- polyurethane foam (insulation of the sandwich panels);
- rock wool (silencers);
- the cooling gas is recuperated by specialised personnel and forwarded to the disposal centre;
- the compressor lubrication oil is also recuperated and forwarded for disposal.

Diagnosis and trouble-shooting

1. Insufficient air flow rate	• Fans rotation speed too low • Pressure drop of the distribution system underestimated • Blocked filters • Blocked intake grating • Coil incrustation	• Clean the components increase the fan speed
2. Excessive air flow rate	• Fans rotation speed too high • Pressure drop of the distribution system overestimated • Filters not fitted	• reduce the fan speed • Fit filters
3. No air flow rate	• Power supply off • Electric motor burnt out	• Make sure power supply is available • Replace the electric motor
4. Abnormal noise	• Excessive flow rate • Bearings worn or defective • Foreign objects on the fan blades	• Reduce flow rate • Replace bearings • Clean blades
5. Water movement	• Trap Blocked • No trap or incorrectly carried out	• Clean trap • Use an adequate trap
6. The compressor does not start	• Defective connection or contacts open • Thermostat does not respond • Safety device does not respond • Defective compressor	• Check the voltage and close the contact • System at temperature, no request; check the setting and the functioning • See point 9) and 10) • Replace compressor
7. The compressor does not start	• Compressor burnt out or seized • Compressor remote control switch de-energised • Power circuit open	• Replace compressor • Check the voltage across the operating time of the protection; automatic compressor shutdown • Check why the protection cut in compressor; automatic shutdown
8. The compressor starts and then stops	• Defective compressor remote control switch • Defective compressor	• Check and if necessary replace it • Check and if necessary replace it
9. The compressor does not start due to the intervention of the high pressure switch	• Pressure switch out or order • Excessive refrigerant • Presence of incondensable gas in the refrigerating circuit • The condensate coil is not sufficiently covered in air • Blocked refrigerant filter	• Check and replace • Discharge excess gas • Refill the circuit after having discharged and placed in vacuum. • See point 1) • Check and replace

10. The compressor does not start due to the intervention of the low pressure switch	• Pressure switch out of order • Machine completely empty • Poor air flow • Blocked refrigerant filter • The thermal expansion valve does not function correctly	• Check and replace • See point 11) • Check the air duct and the state of the filters. • Check and replace • Check, clean or if necessary replace it.
11. Lack of gas	• Leak in the refrigerating circuit	• Check the refrigerating circuit with a leak detector
12. Hot liquid pipe	• Lack of refrigerant	• See point 11)
13. The refrigerating circuit functions correctly but with insufficient proficiency	• Lack of refrigerant • Presence of humidity or incondensable in the refrigerating circuit	• See point 11) • Replace the filter and if necessary drain and refill the circuit
14. Compressor suction tube frosted	• Thermal expansion valve • Poor air flow • Lack of refrigerant • Blocked liquid filter	• Check the valve and if it is not working correctly replace it • Check filters, fans and ducts. • See point 11) • Clean or replace
15. Abnormal noise in the system	• Vibrations in the pipes • Noisy compressor • Noisy thermostatic valve	• Secure the pipes • Check electrical phases connection • Check and add refrigerant
16. Evaporator coil	• Lack of refrigerant in the circuit: before bubbles visible in the indicator. • Thermostatic expansion valve over . closed: suction pipe too hot • Thermostatic expansion valve over . closed: expansion valve bulb partially blocked or pressure intake pipe blocked • Filter-drier blocked: bubbles in the flow indicator and liquid pipe colder at the filter drier outlet • The manifold feed pipes are blocked or oil has accumulated in the coil: not all of the evaporator circuits are working	• Check for leaks and eliminate them topping up with refrigerant . • Reduce the overheating of the thermostatic expansion valve turn the valve stem and check the suction pressure . • Change the valve or free the control pipe. • Change the filter-drier. • Remove the obstruction; clean or change the evaporator.
17. Compressor too hot	• Thermostatic expansion valve over closed: excessive overheating of the evaporator discharge gas	• Reduce the overheating of the thermostatic valve
18. Compressor to cold and noisy	• Expansion valve over open: the system works with the overheating to low (return of liquid to the compressor). • Thermostatic valve out of order: the stem or the seat of the expansion valve is corroded. Pressure inlet pipe blocked. • Foreign objects between the stem and the seat of the thermostatic valve: abnormal function of the thermostatic valve	• Measure and reset the overheating by closing the valve • Replace the valve or free the pressure inlet pipe • Clean the stem and the holes of the thermostatic valve

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AERMEC
la prima per il clima

35040 Bevilacqua (Vr) - Italy
Via Roma, 996
Tel. (+39) 0442 633111
Fax (+39) 0442 93730 - (+39) 0442 93566
http://www.aermec.com

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