AERMEC

air conditioning

ROOF-TOP UNITS R410A - Manual selection, installation and maintenence

RTE
240-400

AERMEC
COMPANY QUALITY SYSTEM
ICIM
ISO 9001:2008 - Cert. n° 0128
CISQ IQNet
AERMEC S.P.A.

GB

CE

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CE
1115

DICHIARAZIONE DI CONFORMITA'
DECLARATION OF CONFORMITY
DÉCLARATION DE CONFORMITÉ
KONFORMITÄTSERKLÄRUNG

Tipo macchina / Type of unit / Type de machine / Maschinentyp	Condizionatore d'aria tipo Roof-top, Roof-top air conditioning unit Unité de climatisation Roof-top, Autonome Klimaanlage
Modello / Model / Modèle / Modell	
Matricola / Serial No / Numéro de série / Seriennummer	

La macchina è conforme alle disposizioni contenute nelle seguenti direttive: / The unit complies with the provisions contained in the following directives: / La machine est conforme aux dispositions contenues dans les directives suivantes: / Das Gerät entspricht den Bestimmungen der folgenden Richtlinien enthaltenen:

2006/42/CE Direttiva Macchine / Machine Directive / Machine Directive / Maschinenrichtlinie
2006/95/CE Direttiva Bassa Tensione / Low voltage Directive / Basse Tension / Niederspannungsrichtlinie
2004/108/CE Direttiva EMC / EMC Directive / EMC Directive / EMV-Richtlinie
97/23/CE Direttiva PED / PED Directive / PED Directive / PED-Richtlinie

ed è stato sottoposto alla procedura di valutazione A1 con controlli dell'organismo Società Consortile PASCAL a r.l. (n° 1115) via A. Scarsellini, 13 – 20161 Milano (certificato n° 20 del 10/02/2003)

has been evaluated according to the A1 procedures with controls carried out by PASCAL (n°1115) company, address A. Scarsellini 13, 20126 Milan (certificate n°20 dated 10/02/2003)

et a été vérifiée selon la procédure A1 par l'organism Società Consortile PASCAL a r.l. (n° 1115) via A. Scarsellini, 13 – 20161 Milano (certificat n° 20 date 10/02/2003)

wurde überwacht nach Beobachtung Unternehmen PASCAL (n°1115), Adresse A. Scarsellini 13, 20126 Mailand (Zertifikat n°20 von 10/02/2003

Componente / Component / Élément / Komponente	Modulo / Module / Module / Modul
Pressostato di alta pressione / Pressure switch / Pressostat / Druckschalter	B + D
Valvola di sicurezza / Pressure relief valve / Valve de sécurité / Sicherheitsventil	B + D
Compressore / Compressor / Compresseur / Kompressor	D1
Ricevitore di liquido / Liquid receiver / Flüssigkeitssammler / Boutilles liquide	A
Separatore di liquido / Suction accumulator / Flüssigkeitsabscheider / Boutilles anti-coup	A
Filtro deidratatore / Filter / Filter / Filtres	A
Rubinetti / Ball valve / kleinventile / Vanes	A
Batteria di scambio termico / Coil / Register / Batterie	A

La persona autorizzata a costituire il fascicolo tecnico è: / The person authorized to compile the technical file is: / La personne autorisée à constituer le dossier technique est: / Die Person berechtigt, die technischen Unterlagen zusammenzustellen:

Giampaolo Cardin via Luppia Alberi,170

Bevilacqua, 25/01/2011

Luigi Zucchi

English

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General norms

This manual is an integral part of the documentation enclosed with the unit.
It must be preserved 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 provides all the technical instructions and instructions for the installation of this unit and the main accident prevention regulations.

Read carefully and thoroughly all the information referred to in this manual. Pay particular attention to the usage instructions accompanied by the words "DANGER" or "WARNING" because, if not observed, they can cause damage to the machine and/or property and/or injury to people.

If any malfunctions are not included in this manual, contact the local After Sales Service immediately.

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

- Installation and maintenance must be carried out by trained and qualified personnel, having the requirements laid down by law 46/90 and/or DPR 380/2001 for electric/electronic and air conditioning installations, with consequent registration at the local CHAMBER of COMMERCE. Otherwise AERMEC S.p.A. decline 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.
Even though during the design phase of the RTE unit adequate assessment of the risks was made, pay ATTENTION to the pictograms on the machine that helps the reading the manual by drawing the reader's attention rapidly to the risk situations that cannot be avoided or sufficiently limited by using measures and technical means of protection.

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.

IT IS PROHIBITED TO CLEAN, OIL AND GREASE, repair or manually adjust parts in motion.

INFLAMMABLE MATERIAL.

MAIN WARRANTY CONDITIONS

- The warranty does not include payment for damage due to the incorrect installation of the unit by the installation engineer.
- The warranty does not include payment for damage due to the improper use of the unit by the user.
- The manufacturer does not consider itself liable for accidents to the user or the installer due to the incorrect installation or improper use of the unit.

The warranty is not valid when:
- the services and the repairs have been carried out by non-authorised personnel or companies;
- the unit has been repaired or modified in the past with non OEM spare parts;
- the unit has not been adequately maintained;
- if the instructions described in this manual have not been followed;
- if non-authorised modifications have been made.

Note:
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 that 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.

Units identification and description

The RTE rooftop units are identified by means of a product identification code created by the selection program AERMECPro. A product identification code example is the following:

RTE240F001600000000000

For further information, please refer to the selection program.

Unit description

The " ROOFTOP " units of the RTE series have been designed taking into account the precise requirements in the system necessary for treating large air volumes, typical of supermarket and hypermarket buildings and environments for shows, fairs and industrial uses in general.
These units are usually situated on the roofs or anyway in the open air, offering these main advantages:

- because they are installed on the roof they do not take operational space away from the room;
- they offer the maximum modularity, therefore making it possible to differentiate the treatments in different volumes with different destination characteristics (food, clothing department etc.);
- they offer high levels of environmental comfort by controlling the exchange, filtering and humidification or dehumidification of the air in addition to the temperature;
- the environmental noise level is kept low due to the careful soundproofing of the machine.

Components

The **RTE** Rooftop units are all available in the cooling only version (RTE F) or in heat pump version (RTE H).

RTE units are equipped with an adhesive label that summarizes the main technical data such as model, heat output and cooling capacity, rated capacity of the air in recovery and extraction and electrical data.
For any future reference and for all communication with the AERMEC SpA must indicate the number.
In addition, each piece is accompanied by targhettta with weight and other information traceability.
The rating plate and the plate of the weight of the package are applied outside the main rooftop, on the side panel near the electrical panel inspected the same.
The plate of the weight of each package is applied externally on the panel additional inspections, or packaging.

The rooftop **RTE** units come complete with :

- condenser unit with 6 pole axial fans and scroll compressors;
- complete refrigeration circuit complete with thermostatic valve, filters, sight glass;
- synthetic undulated filter class G4 (EN779);
- direct expansion coil with aluminium condensate drain pan;
- radial supply fan with forward-curved blades with belt and variable pulley transmission;
- microprocessor control complete with sensors and actuators;
- electrical panel;

Sizes

The units in the RTE series are available in four sizes (240-260-300-350 -400) each of which with the possibility of **standard,** low noise **L** (excluding 350 and 400) or high temperature operation mode **A** (excluding 350 and 400). By aptly combining the several available options, it is possible to configure each model in such a way as to meet the specific of system requirements.
The RTE Series rooftop units are identified by a commercial speaker symbol generated directly from the breeding program. An example of an acronym speaker is as follows:
RTE260FA0A000PD00P00000
For more information, refer to the selection program.
The table in fig.01 shows how to make up the commercial code with twenty-four fields, representative of the available options.

Available versions

N.B. the figures shown refer to the dimensional specifications on pages 27-29.
STANDARD CONFIGURATION: consists of the single block rooftop module with G4 flat filters (efficiency according to EN779), direct expansion coil (hot coil optional) (fig.1)

SMP : rooftop with 2-way mixing box rear exhaust[1] **(fig.2)**
SM2: rooftop with 2-way mixing box side/ bottom exhaust[1] **(fig.4)**
SM3: rooftop with 3-way mixing box with temperature free-cooling **(fig. 7)**
FT7: rooftop with panel pre-filters G3 and rigid bag filters F7 (EN779) **(fig.3)**
REC: rooftop with plate type heat recovery section and exhaust fan. The cross-flow heat recuperator allows the sensible heat recovery from the exhaust air with a winter operation efficiency over 50%. The two air flows (supply and exhaust) are completely separated and therefore all types of contamination are avoided. **(fig.13)**
G72, G92, G150: rooftop with condensation heat generator with rated heating capacity of 72 kW [2], 92 kW or 150 kW. The hot air condensation generator is fed by methane gas. The air is heated through the passage over the surface of the combustion chamber and heat exchanger pipes. The combustion chamber is fully made of AISI 430 stainless steel, while the surfaces in contact with the condensate (exchanger, fume hood) are made of AISI 304 L stainless steel to give outstanding resistance to corrosion. It is provided with an automatic reset safety thermostat **(fig.6)**.

Air heater model	Methane gas consumption G20 (15°C - 1013 mbar)
G72	2,3 - 8,3 mc/h
G92	3,2 - 10,4 mc/h
G150	4,7 - 16,4 mc/h

NOTE:
(1) Damper without actuators and recirculation damper upon request.

Version combinations

Version combinations

SM2-FT7: rooftop with 2-way mixing box, side/bottom exhaust and bag filters F7 (1) **(fig.5)**

G72-SMP: rooftop with 72kW heat generator and 2-way mixing box rear exhaust **(fig.8)** (1)(2)

G72-FT7: rooftop with 72 kW heat generator and bag filters F7 **(fig.9)** (2)

G92-SMP: rooftop with 92kW heat generator and 2-way mixing box rear exhaust **(fig.8)**

G92-FT7: rooftop with 92 kW heat generator and bag filters F7 **(fig.9)**

G150-SMP: rooftop with 150kW heat generator and 2-way mixing box rear exhaust **(fig.8)**

G150-FT7: rooftop with 150 kW heat generator and bag filters F7 **(fig.9)**

SM3-FT7: rooftop with 3-way mixing box and bag filters F7 **(fig.10)**

SM2-G72: rooftop with 72kW heat generator and 2-way mixing box **(fig.11)** (1)(2)

SM2-G92: rooftop with 92kW heat generator and 2-way mixing box **(fig.11)** (1)

SM2-G150: rooftop with 150kW heat generator and 2-way mixing box **(fig.11)** (1)

SM2-G72-FT7: rooftop with 72kW heat generator, 2-way mixing box and bag filters F7 **(fig.12)** (1)(2)

SM2-G92-FT7: rooftop with 92kW heat generator, 2-way mixing box and bag filters F7 **(fig.12)** (1)

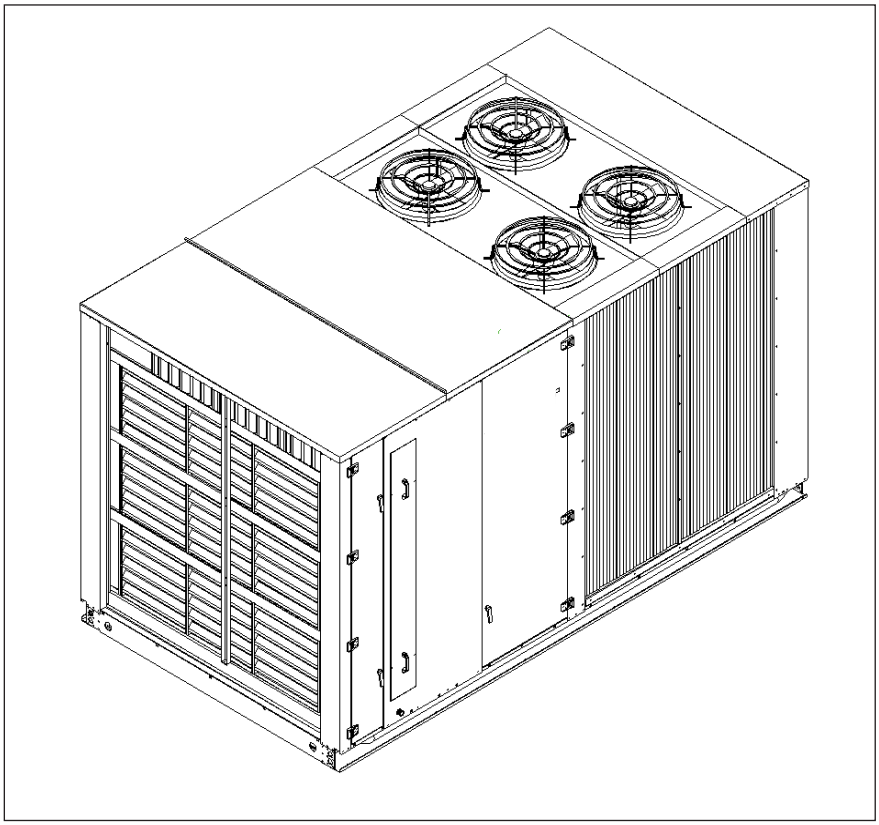
SM2-G150-FT7: rooftop with 150kW heat generator, 2-way mixing box and bag filters F7 **(fig.12)** (1)

REC-FT7: rooftop with static heat recovery unit and bag filters F7 **(fig.14)**

SM3-G72: rooftop with 72kW heat generator and 3-way mixing box **(fig.15)** (2)

SM3-G92: rooftop with 92kW heat generator and 3-way mixing box **(fig.15)**

SM3-G150: rooftop with 150kW heat generator and 3-way mixing box **(fig.15)**



SM3-G72-FT7: rooftop with 72kW heat generator, 3-way mixing box and bag filters F7 **(fig.16)**

SM3-G92-FT7: rooftop with 92kW heat generator, 3-way mixing box and bag filters F7 **(fig.16)**

SM3-G150-FT7: rooftop with 150kW heat generator, 3-way mixing box and bag filters F7 **(fig.16)**

REC-G72: rooftop with static heat recovery unit and 72kW heat generator **(fig.17)** (1)()

REC-G92: rooftop with static heat recovery unit and 92kW heat generator **(fig.17)**

REC-G150: rooftop with static heat recovery unit and 150kW heat generator **(fig.17)**

REC-G72-FT7: rooftop with section with heat recovery unit, 72kW heat generator and bag filters F7 **(fig.18)** (2)

REC-G92-FT7: rooftop with crossflow recovery unit, 92kW heat generator, and bag filters F7 **(fig.18)**

REC-G150-FT7: rooftop with crossflow recovery unit, 150kW heat generator, and bag filters F7 **(fig.18)**

NOTE:
(1) dampers without actuators
(2) not available for sizes 260 - 300 - 350 - 400

e.g.: (REC+G72+FT7) is an example of version combination. To see the sizes, refer to the sizes chapter (page 25).

Unit configuration

Field 1, 2, 3,4	RTE		
Field 5, 6, 7	240 260 300 350 400		
Field 8	Versions		
	F		cooling only
	H		heat pump
Field 9	Operation		
	0		Standard
	L		Low-noise operation (no 350 and 400)
	A		High temperature (no 350 and 400)
Field 10	Power supply		
	O	°	3~ 400 V -50 Hz (standard)
	W	TV2	3~ 230 V -50 Hz
	Z	TV3	3~ 460 V -60 Hz
Field 11	Versions and combinations (THE FIGURES INDICATED REFER TO THE SIZES FROM PAGE 25 TO 28)		
	0	°	Basic configuration (Fig. 1)
	1	SMP	2-way mixing box rear exhaust (Fig.2) (1)
	2	FT7	Bag filters F7 (Fig. 3)
	A	SM2	2-way mixing box side/bottom exhaust (Fig.4) (1)
	B	SM2-FT7	2-way mixing box, side/bottom exhaust and bag filters (Fig.5) (1)
	C	G72	Heat generator 72 kW (Fig. 6) (4)
	D	G92	Heat generator 92 kW (Fig. 6)
	3	G150	Heat generator 150 kW (Fig. 6) (5)
	E	SM3	3-way mixing box with ventilator fan (Fig. 7 on dimensional indications)
	F	G72-SMP	72 kW heat generator and 2-way mixing box rear exhaust (fig.8) (4)
	G	G92-SMP	92 kW heat generator and 2-way mixing box rear exhaust (Fig.8)
	4	G150-SMP	150 kW heat generator and 2-way mixing box rear exhaust (Fig.8) (5)
	H	G72-FT7	72 kW heat generator and bag filters F7 (Fig.9) (4)
	I	G92-FT7	92 kW heat generator and bag filters F7 (Fig.9)
	5	G150-FT7	150 kW heat generator and bag filters F7 (Fig.9) (5)
	J	SM3-FT7	3-way mixing box with bag filters F7 (Fig.10)
	K	SM2-G72	72kW heat generator and two-ways mixing box(Fig.11) (1)(4)
	L	SM2-G92	2-way mixing box with 92kW heat generator (Fig.11) (1)
	6	SM2-G150	2-way mixing box with 150kW heat generator (Fig.11) (1) (5)
	M	SM2-G72-FT7:	2-way mixing box with 72kW heat generator and bag filters F7(Fig.12) (1)(4)
	N	SM2-G92-FT7:	2-way mixing box with 92kW heat generator and bag filters F7 (Fig.12) (1)
	7	SM2-G150-FT7:	2-way mixing box with 150kW heat generator and bag filters F7 (Fig.12) (1) (5)
	P	REC	Section with crossflow plate heat recuperator (Fig. 13)
	Q	REC-FT7	Section with crossflow plate heat recuperator and bag filters F7 (fig.14)
	R	SM3-G72	3-way mixing box with 72kW heat generator (Fig.15) (4)
	S	SM3-G92	3-way mixing box with 92kW heat generator (Fig.15)
	8	SM3-G150	3-way mixing box with 150W heat generator (Fig.15) (5)
	T	SM3-G72-FT7	3-way mixing box with 72kW heat generator and bag filters F7 (Fig.16) (4)
	U	SM3-G92-FT7	3-way mixing box with 92kW heat generator and bag filters F7 (Fig.16)
	9	SM3-G150-FT7	3-way mixing box with 150kW heat generator and bag filters F7 (Fig.16) (5)
	V	REC-G72	Section with crossflow plate heat recuperator and 72kW heat generator (Fig.17) (4)
	Y	REC-G92	Section with crossflow plate heat recuperator and 92kW heat generator (Fig.17)
	Z	REC-G150	Section with crossflow plate heat recuperator and 150kW heat generator (Fig.17) (5)
	X	REC-G72-FT7	Section with crossflow plate heat recuperator, 72kW heat generator, and bag filters F7(fig.18)(4)
	W	REC-G92-FT7	Section with crossflow plate heat recuperator, 92kW heat generator, and bag filters F7(fig.18)
	O	REC-G150-FT7	Section with crossflow plate heat recuperator, 150kW heat generator, and bag filters F7(fig.18) (5)

(1) = Dampers without actuators
(2) = The right or left direction refers to the direction of air flow inside the air handling sections
(3) = The coil to water connection side is always on the left
(4) = 72 kW Generator only available on RTE 240
(5) = No RTE 240 model

Field 12	Filter pressure switch /coil protection grille accessory		
	0	°	No accessory of the PF/GP type
	2	BP	Heat recovery unit with by-pass (option only valid if field 10 = P, Q, V, Y, Z, X, W, O)
	3	PF	Filter pressure switch
	4	GP	Condenser protection grille
	5	PF+GP	
	6	BP+PF	(option only valid if field 10 = P, Q, V, Y, Z, X, W, O)
	7	BP+GP	(option only valid if field 10 = P, Q, V, Y, Z, X, W, O)
	8	BP+PF+GP	(option only valid if field 10 = P, Q, V, Y, Z, X, W, O)
Field 13	Heating coil accessory		
	0	°	No battery
	W	BTR	Two-row hot-water heating coil with three-way modulating valve (3)
	E	BRE 12	Two stages electric heating coil (12 kW)
	F	BRE 18	Two stages electric heating coil (18 kW)
	G	BRE 24	Two stages electric heating coil (24 kW)
	H	BRE 36	Two stages electric heating coil (36 kW)
Field 14	Outside coil treatment accessory		
	0	°	Coils with copper pipes and aluminium fins
	A	BSP	Coil with copper pipes and pre-painted aluminium fins
	B	BSR	Coil with copper pipes and copper fins
	C	BSS	Coil with copper pipes and tin-plated copper fins
Field 15	Air intake accessory		
	0	°	Std. rear return air intake. If there is a return fan, the head is up to 150 Pa (value always 0 when field 10 = 0, 1, 2, C, D, F, G, H, I, P, Q, V, Y, X, W)
	M	T1	Right side return air intake, rear fresh air intake (option only valid if field 10 = A, B, K, L, M, N, 6, 7) (2)
	N	T2	Left side return air intake, rear fresh air intake (option only valid if field 10 = A, B, K, L, M, N, 6, 7) (2)
	P	T3	Rear return and fresh air intake (option only valid if field 10 = A, B, K, L, M, N, 6, 7) (2)
	Q	T4	Bottom return air intake, rear fresh air intake (option only valid if field 10 = A, B, K, L, M, N, 6, 7) (2)
	T	T5	Right side return air intake, left side fresh air intake (option only valid if field 10 = A, B, K, L, M, N, 6, 7) (2)
	U	T6	Left side return air intake, left side fresh air intake (option only valid if field 10 = A, B, K, L, M, N,) (2)
	R	AI	Bottom air intake, return fan available pressure up to 150 Pa (option valid only if field 10 =E, J, R, S, T, U, 8, 9)
	S	AS	Top air intake, return fan available pressure up to 150 Pa (option valid only if field 10 =E, J, R, S, T, U, 8, 9)
	W	PA4	Rear air intake, return fan available pressure up to 300 Pa (option valid only if field 10 = E, J, P, Q, R, S, T, U, V, Y, X, W, O)
	Z	AI+PA4	Bottom air intake, return fan available pressure up to 300 Pa (option valid only if field 10 =E, J, R, S, T, U, 8, 9)
	V	As+PA4	Top air intake, return fan available pressure up to 300 Pa (option valid only if field 10 =E, J, R, S, T, U, 8, 9)
Field 16	Air supply accessory		
	0	°	Bottom air supply, supply fan available pressure up to 200 Pa (standard)
	D	MA	Top air supply, supply fan available pressure up to 200 Pa
	E	MS	Left side air supply, supply fan available pressure up to 200 Pa (2)
	F	MD	Right side air supply, supply fan available pressure up to 200 Pa (2)
	G	PM4	Bottom air supply, supply fan available pressure up to 400 Pa
	H	MA+PM4	Top air supply, supply fan available pressure up to 400 Pa
	I	MS+PM4	Left side air supply, supply fan available pressure up to 400 Pa (2)
	L	MD+PM4	Right side air supply, supply fan available pressure up to 400 Pa (2)

(1) = Dampers without actuators
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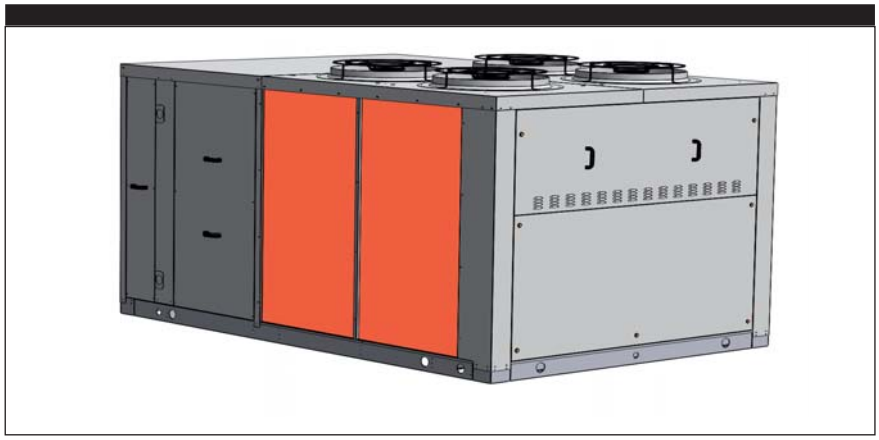
(3) = The coil to water connection side is always on the left
(4) = 72 kW heat generator only available on RTE 240
(5) = No RTE 240 model

Field 17	Refrigeration circuit accessories		
	0	°	No refrigeration circuit accessory
	1	DCPR	Low temperature device (external temperature down to - 20 °C) (standard on the low noise operation units)
	2	TP	Pressure transducers (standard in the heat pump version)
	3	RUB	Discharge and Liquid shut-off valves (for cooling only version)
	4	DCPR+TP	
	5	DCPR+RUB	
	6	TP+RUB	
	7	DCPR+TP+RUB	
Field 18	Enthalpy control accessories		
	0	°	No enthalpy control accessory
	A	PUC	Humidification control provision
	B	FCH	Enthalpic Freecooling
	C	DP	Dehumidification and re-heating management
	D	PUC+FCH	
	E	PUC+DP	
	F	FCH+DP	
	G	PUC+FCH+DP	
Field 19	Electronic accessories		
	0	°	No electronic accessory
	P	PR2	Remote panel
	S	SSV	RS485 interface card for supervision
	Q	SQA	VOC air quality sensor (option only valid if field 10 = E, J, O, P, Q, R, S, T, U, V, Y, Z, W, 8, 9)
	R	PR2+SSV	
	T	PR2+SQA	(option only valid if field 10 = E, J, O, P, Q, R, S, T, U, V, Y, Z, W, 8, 9)
	U	SSV+SQA	(option only valid if field 10 = E, J, O, P, Q, R, S, T, U, V, Y, Z, W, 8, 9)
	V	PR2+SSV+SQA	(option only valid if field 10 = E, J, O, P, Q, R, S, T, U, V, Y, Z, W, 8, 9)
Field 20	Damper actuator accessory		
	0	°	Modulating damper actuator series for versions with SM3 and REC (if field 10 = E, J, R, S, T, U, V, Y, X, W); **no actuators in all the other case**
	1	SCSR	Return air damper for SMP mixing box (if field 10 = 1, 4, F, G)
	2	SCS2	Return air damper for SM2 mixing box (if field 10 = A, B, K, L, 6, M, N, 7)
	3	SCM3	Modulating spring return actuator for versions with 3-way mixing box and heat recovery unit (that contain the code SM3 or REC in the version)
	4	SRP	Return air damper for SMP mixing box and modulating damper actuator (if field 10 = 1, 4, F, G)
	5	SR2	Return air damper for SM2 mixing box and modulating damper actuator (if field 10 = A, B, K, L, 6, M, N, 7)
	6	SCMP	Return air damper for SMP mixing box and modulating spring return actuator (if field 10 = 1, 4, F, G)
	7	SCM2	Return air damper for SM2 mixing box, modulating damper actuator on fresh air and modulating spring damper actuator on return air (if field 10 = A, B, K, L, 6, M, N, 7)
Field 21	Shock absorbing accessory		
	0	°	No shock absorbers
	3	VT3	Rubber shock absorbers for units in basic version
	5	VT5	Rubber shock absorbers for units from the 5m to the 7.1m
	7	VT7	Rubber shock absorbers for units of over the 7.1m
Field 22	Inspection side		
	0	SX	Left-hand supply inspection side (default) (if field 15 = 0, D, F, G, H, L)
	1	DX	Right-hand supply inspection side (if field 15 = 0, D, F, G, H, L)
Field 23	Condensate drain side		
	0	SX	Left-hand condensate drain side (standard)
	D	DX	Right-hand condensate drain side
Field 24	Special requirements		
	0		All according to catalogue
	S		Unit with at least one special requirement

(1) = Dampers without actuators
(2) = The right or left direction refers to the direction of air flow inside the air handling sections
(3) = The water coil connection side is always on the left
(4) = 72 kW Generator only available on RTE 240
(5) = No RTE 240 model

Description of components



Refrigeration circuit

Compressors
Scroll-type hermetic compressors with crankcase heater provided as a standard in the heat pump version (and in the only coolung version, if provided with DCPR accessory)
Provided the unit is under voltage the heating element is automatically switches on when the unit stops.

Internal heat exchanger
Made with copper pipes and aluminium fins locked into place through mechanical expansion of the pipes. The coil is of the high efficiency type; grooved pipes and corrugated fins.

External heat exchanger
Made with copper pipes and aluminium fins locked into place through mechanical expansion of the pipes. The coil is of the high efficiency type; grooved or smooth pipes according to the size.

Liquid receiver
(only for heat pump version)

Thermostatic valve
The valve with external equaliser on the evaporator outlet, modulates the gas flow to the evaporator according to the heat load in such a way as to assure a sufficient degree of overheating at the intake gas.

Drier-filter
Made of ceramics and hygroscopic material it traps impurities and any traces of humidity in the cooling circuit.

Sight glass
To check the refrigerating gas charge and verify presence of humidity in the cooling circuit.

Solenoid valve
Switches on after the compressor has stopped, interrupting the migration of the liquid refrigeration gas to the evaporator.

Liquid and discharge shut-off valves (accessory only available for the cooling only versions).
They stop the refrigerant flow in case of extraordinary maintenance.

4-way valve (only for heat pump version)
To control the refrigerant flow for the summer/ winter mode changeover and to operate the defrosting cycles.

Solenoid by-pass valve
(only for heat pump version)
The valve by-passes the thermostatic valve during the defrosting cycles.

Safety valve
Set to 30 bar, it protects the circuit against excessive pressures.

Check valve (only for heat pump version)
The valve allows the refrigerant to flow in one direction only.

Frame and fans

Condensing section
It is provided with statically and dynamically balanced axial fans. The fans are provided of protection grilles while the electric motors are protected by means of magnetothermal switches.

Air handling section
It is provided with a double intake radial fan with forward curved blades for better performance and quietness. The fan is driven by a three phases electric motor with belts and adjustable pulleys.

Structure
The air handling section is made of 50 mm thick sandwich panels with type of construction for the air treatment side is: external peraluman sandwich-type panelling and galvanised steel 50 mm thick inside with injected polyurethane insulation (thickness 42 kg/m^3). Accessible panels are provided with proper knobs, while the others are set through screws.

Control and safety components

Door lock switch
For safety the electrical panel can only be accessed by cutting off the power using the opening lever on the panel itself. This lever can be locked in place using one or more padlocks, during maintenance in order to prevent the machine being powered up accidentally.

Control keyboard and display on the machine
This allows the complete control of the unit. For a detailed description refer to the user manual.

Electrical panel
Contains the power section and the management of the controls and safety devices. This conforms with standard CEI 60204-1, and electromagnetic compatibility directives EMC 89/336/EEC and 92/31/EEC.

Antifreeze sensor (only with BTR)
When the water temperature is below +5°C, the dedicated software, in the control card, completely opens the three-way valve, thereby circulating hot water through the digital output signal.

Refrigerator circuit pressure switches
These are placed one on the high-pressure side and one on the low pressure side of the refrigeration circuit. They stop compressor from operating in the case of abnormal operating pressures.

Flow switch
This has the task of ensuring that air circulates in the air handling section. If there is no air, it switches off the unit.

High and low pressure transducers
(standard on the heat pump version)
Placed on the high- and low-pressure sides of the refrigerator circuit making it possible to show the value of the pressure on the display. Optional on the cooling only versions.

Regulation system

The architecture of the microprocessor control (fig. 02) provides for:

- a BASE CARD with microprocessor dedicated to the execution of the control program, provided with display, keyboard and LED to allow for the programming of the set-points and the basic user operations (on/off, display of checked values, optional print-out).

- the program is written on the EPROM while the set-points set are memorised permanently on EPROM, so that they can be kept even when there is no power (without the need for a support battery).
  It is possible to connect the basic card with the pLAN local network (pCO Local Area Network) consisting of different basic cards and terminals. Each board can exchange data (any parameter, whether digital or analogue, depending on the program) at high transmission speeds. Up to sixteen units can be connected (between cards and terminals) for a maximum of 5 rooftops in such a way as to share the information quickly. The connection through the serial supervision/remote assistance line in accordance with the RS485 standard, is made through optional serial cards and MODBUS communication protocol.

  Thanks to its versatile software, the user terminal permits:
- to modify the basic set points at any moment which may be protected with a password
- the display of the detected alarms and their acoustic detection by means of a beeper
- the indication of the active functions by means of leds.
- the display of all the measured parameters.

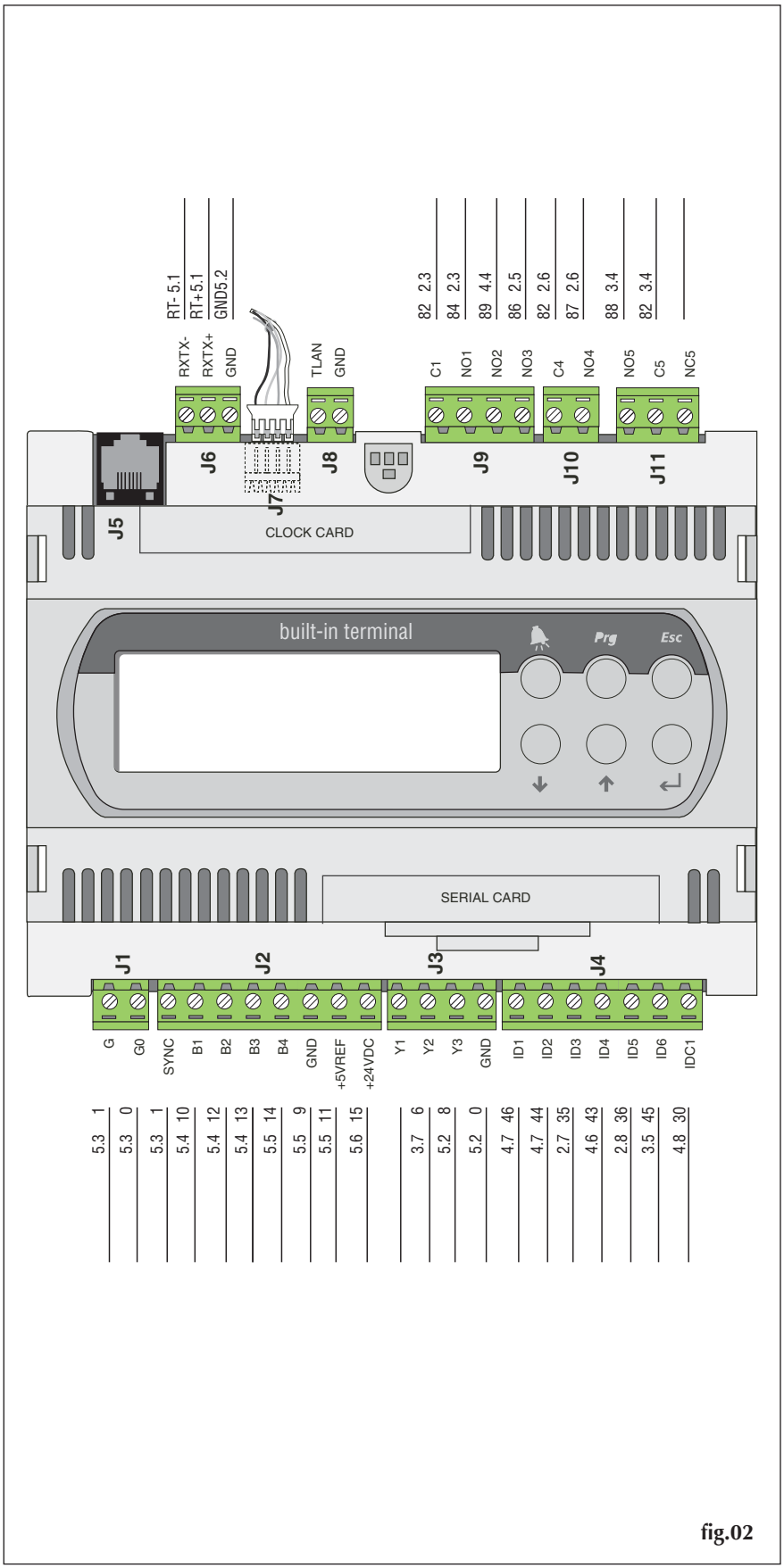


fig.02

Accessories

DCPR - Pressure switch control device
Extends the operating range of the rooftop, both in the summer cycle (minimum outside air temperature to 10 ° C), and in the winter with heat pump (maximum temperature of outside air to 25 ° C). It also makes the operation very quiet at part load. An electronic control varies the speed of the fans depending on the condensing condensing pressure, which has a special transducer, ensuring proper supply to the thermostatic valve.

TP - Pressure transducers (standard on heat pumps)
These show the high and low pressures on a display, manage the compressor and valve activities during defrosting and inhibit their operation when the pressure exceeds the set limits.

Discharge and liquid shut-off valves (only for cooling only version).
Hermetic taps with manual closing on the compressor supply on the circuit liquid side.

GP - Protection grills
They protect the external coils from accidental blows and hail.

T1 - Air intake on the right side (only on the SM2)
See page. 30.

T2 - Air intake on the left side (only on the SM2)
See page. 30.

T3 - Rear air intake (only on the SM2)
See page. 30.

T4 - Bottom air intake (only on the SM2)
See page. 30.

AI - Bottom intake (only on the SM3)
See page. 31.

PA4 - Rear air intake
Return fan available pressure up to 300 Pa for nominal flow rate.

MA - Upper air supply
Top air supply, supply fan available pressure up to 200 Pa at the nominal air flowrate.

MS - Left air supply
Left air supply, supply fan available pressure up to 200 Pa at the nominal air flowrate.

MD - Right air supply
Right air supply, supply fan available pressure up to 200 Pa at the nominal air flowrate.

PM4 - Supply fan available pressure up to 400 Pa
Supply fan available pressure up to 400 Pa for rated flow rate.

BTR- Two-row heating coil
Two-row hot water coil with three way modulating valve. These can only be managed in the post-heating phase with the DP accessory.

BRE- Electrical heating coil
Two-stage heating electric heating battery provided with double safety thermostat, one automatic resetting and the other manual resetting. The capacities proposed are 36, 48, 60 and 72 kW (or in the order phase indicated the capacity required). These can only be managed in the post-heating phase with the DP accessory.

PUC- Provision for humidification control.
ON/OFF Contact (normally open) for humidification enabling. The unit in this case has humidity sensor situated on the ambient air recovery. A humidity valve is also supplied to be positioned down line from the humidification section.

DP - Kit for the management of the humidification and post heating
The control will force the operation of the compressors to dehumidify the air up to the humidity set point set. If there is a water or electric coil, it will also be possible to manage the post heating.
The PUC accessory can be combined (humidification contact).

SCS - Damper actuators for two-way versions
Modulating actuators fitted directly on the exhaust air damper and external damper for the management of the air change.

SCSM damper actuators with spring return for 2-damper-valve versions
Actuators with spring return fitted directly on the recovery air dampers and outside air for the management of the air change, in case of blackout completely close the outside air damper and open the fresh air damper completely.

SCM3 damper actuators with spring return for 3-damper-valve versions
Actuators with spring return mounted directly on the dampers for the management of the freecooling to replace the standard ones ; in case of blackout they close the outside air dampers completely and open the fresh air dampers completely.

FCH - Enthalpic Free-cooling
Only with three damper mixing box.
It manages the outside air flow and recovery referring to their enthalpic values.

PR2 - Remote panel
This enables rooftop control operations to be carried out at a distance.

SSV - RS485 Serial interface for supervision
Serial card necessary for the supervision system interface.

SQA - Air quality sensor
This analyses the quality of the air on the basis of a mixed gas SnO2 VOC sensor by assessing the contamination by polluting gases. The presence of the sensor combined with the rooftop control permits:
- the setting of a sensitivity threshold depending on the maximum contamination of the air predicted.
- the ventilation of the rooms only when necessary so as to ensure energy saving.

TV2 - Power voltage 3~230V - 50HZ.
TV3 - Power voltage 3~ 460V - 60HZ.
VTR (3 - 5 - 7)- Shock absorbers
Rubber antivibration dampers. Select the VTR model from the accessories table (see page 13).

PF - Filter dirtying pressure switch

BSP - Special batteries
Condensing coil with copper pipes and prepainted aluminium fins.

BSR - Special coils
Condensing coil with copper pipes and copper fins.

BSS - Special coils
Condensing coil with copper pipes and tin plated copper fins.

Available accessories table

Size	240 - 260 - 300 - 350 - 400					
Version	cooling only (F)			hot pump (H)		
Operation	std	L (no 350 and 400)	A (no 350 and 400)	std	L (no 350 and 400)	A (no 350 and 400)
DCPR	o	•	o	o	•	o
TP	o	o	o	•	•	•
RUB	o	o	o	-	-	-
GP	o	o	o	o	o	o
T1 (1)	o	o	o	o	o	o
T2 (1)	o	o	o	o	o	o
T3	o	o	o	o	o	o
T4	o	o	o	o	o	o
AI	o	o	o	o	o	o
PA4	o	o	o	o	o	o
MA	o	o	o	o	o	o
MS (1)	o	o	o	o	o	o
MD (1)	o	o	o	o	o	o
PM4	o	o	o	o	o	o
BTR	o	o	o	o	o	o
BRE	o	o	o	o	o	o
PUC	o	o	o	o	o	o
DP	o	o	o	o	o	o
SCS	o	o	o	o	o	o
SCSM	o	o	o	o	o	o
SCM3	o	o	o	o	o	o
FCH	o	o	o	o	o	o
PR2	o	o	o	o	o	o
SSV	o	o	o	o	o	o
SQA	o	o	o	o	o	o
TV2	o	o	o	o	o	o
TV3	o	o	o	o	o	o
VTR3 (for basic version units)	o	o	o	o	o	o
VTR5 (for units from 5 to 7.1 m)	o	o	o	o	o	o
VTR7 (for units over 7.1 m)	o	o	o	o	o	o
PF	o	o	o	o	o	o
BSP	o	o	o	o	o	o
BSR	o	o	o	o	o	o
BSS	o	o	o	o	o	o
BSR	o	o	o	o	o	o
BSS	o	o	o	o	o	o

1) = The right or left direction refers to the direction of air flow inside the air handling sections
• = standard
o = optional
- = not available

Hot water coil data (BTR accessory)

RTE Size	240	260	300	350	400
Heating capacity (kW)	400	179	200	213	219
Rows (number)	2	2	2	2	2

Hot water coil performance referred to : inlet air 20°C; water 80/70 °C;
N.B.: for data about the water flowrate, water side pressure drops and performances with conditions different from the standard please see page. 24

Electrical coil data (BRE accessory)

RTE Size	240				260				300				350				400			
Heating capacity (kW)	12	18	24	36	12	18	24	36	12	18	24	36	12	18	24	36	12	18	24	36
Number of stages	2				2				2				2				2			

Cooling only F (standard)

RTE	Version		240	260	300	350	400
Cooling capacity	F	kW	77.1	88.6	103.0	129.4	142.5
Sensible cooling capacity	F	kW	50.1	61.2	67.0	77.7	92.6
Total input power	F	kW	20.7	25.3	31.8	39.7	44.5

Energy indices

E.E.R. *	F		4.49	4.30	4.01	3.91	3.85

Condensing unit section

Compressors

Type	F		scroll				
Number / circuit	F	n°	2/2	2/2	2/2	2/2	2/2
Capacity step control	F	%	0-50-100	0-50-100	0-50-100	0-50-100	0-50-100
Compressor input power	F	kW	16.04	18.87	23.56	30.13	33.95
L.R.A. (Locked Rotor Amps)	F	A	350	135	175	215	215

Axial Fans

Number / Input power	F	n°/kW	4x0.53	4x0.53	4x0.53	4x0.56	4x0.56
Air flow rate	F	m^3/h	32000	29000	28000	40000	36000

Air handling section

Evaporator

Number of rows	F	n°	4	4	4	4	4

Fan

Type	F		Radial, forward curved blades				
Nominal air flow rate	F	m^3/h	40000	17000	20000	22000	23000
Minimum air flow rate	F	m^3/h	10400	14800	17400	19100	19550
Maximum air flow rate	F	m^3/h	14100	20000	23500	23500	23500
Number	F	n°	1	1	1	1	1
Total installed power	F	kW	2.58	4.37	6.13	7.34	8.35
Available pressure with std motor	F	Pa	200	200	200	200	200

Air filters

Thickness	F	mm	50	50	50	50	50
Efficiency	F	EN779	G4	G4	G4	G4	G4

Operating limits

Max. external air temperature	F	°C	43	43	43	43	43

Base version sizes

Height	F	mm	1.830	1.830	1.830	1.830	1.830
Width	F	mm	2.166	2.166	2.166	2.166	2.166
Lenght	F	mm	3.290	3.290	3.290	3.290	3.290
Weight	F	kg	1.300	1.390	1.480	1.565	1.645

Performances referring to:
Room air 27 °C / 50% r.h.
External air 35 °C
* Energy indices referring to cooling circuit

Heat pump H (standard)

RTE	Version		240	260	300	350	400
Cooling capacity	H	kW	76.3	87.7	104.9	128.2	141.1
Sensible cooling capacity	H	kW	49.6	60.6	66.3	76.9	91.7
Heating capacity	H	kW	73.4	86.3	103.0	127.6	142.2
Total input power in cooling mode	H	kW	20.4	25.0	30.8	38.5	43.1
Total input power in heating mode	H	kW	18.9	21.8	26.1	34.4	38.6

Energy indices

E.E.R.*	H		3.7	3.5	3.4	3.3	3.2
C.O.P.*	H		3.9	3.9	3.9	3.7	3.6

Condensing unit section

Compressors

Type	H		scroll				
Number / circuit	H	n°	2/2	2/2	2/2	2/2	2/2
Capacity step control	H	%	0-50-100	0-50-100	0-50-100	0-50-100	0-50-100
Input power in cooling mode	H	kW	15.7	18.5	23.1	29.5	33.2
Input power in heating mode	H	kW	14.2	15.3	18.4	25.4	28.7
L.R.A. (Locked Rotor Amps)	H	A	350	135	175	215	215

Axial Fans

Number / Input power	H	n°/kW	4x0.53	4x0.53	4x0.53	4x0.56	4X0.56
Air flow rate	H	m³/h	36000	33000	32000	40000	34200

Air handling section

Evaporator

Number of rows	H	n°	4	4	4	4	4

Fan

Type	H		Radial, forward curved blades				
Nominal air flow rate	H	m³/h	14000	17000	20000	22000	23000
Minimum air flow rate	H	m³/h	10400	14800	17400	19100	19550
Maximum air flow rate	H	m³/h	14100	20000	23500	23500	23500
Number	H	n°	1	1	1	1	1
Total installed power	H	kW	2.5	4.3	5.6	6.7	7.6
Available pressure with std motor	H	Pa	200	200	200	200	200

Air filters

Thickness	H	mm	50	50	50	50	50
Efficiency	H	EN779	G4	G4	G4	G4	G4

Operating limits

Max. external air temperature	H	°C	43	43	43	43	43
Min. winter external air temperature	H	°C	-10	-10	-10	-10	-10

Base version sizes

Height	H	mm	1.830	1.830	1.830	1.830	1.830
Width	H	mm	2.166	2.166	2.166	2.166	2.166
Lenght	H	mm	3.290	3.290	3.290	3.290	3.290
Weight	H	kg	1.300	1.390	1.480	1.565	1725

Performances referring to:

Cooling mode: Ambient air 27 °C/50% r.h. External air 35 °C

Heat pump mode: Ambient air 20 °C/50% r.h. External air 7 °C/70% r.h.

* Energy indices referring to cooling circuit

Cooling only F-A (high temperature)

RTE	Version		240	260	300
Cooling capacity	F A	kW	78.0	89.9	105.6
Sensible cooling capacity	F A	kW	50.7	62.1	68.7
Total input power	F A	kW	20.3	24.8	30.7

Energy indices

E.E.R.*	F A		4.68	4.30	4.01

Condensing unit section

Compressors

Type	F A		scroll		
Number / circuit	F A	n°	2/2	2/2	2/2
Capacity step control	F A	%	0-50-100	0-50-100	0-50-100
Compressor input power	F A	kW	15.5	18.2	22.4
L.R.A. (Locked Rotor Amps)	F A	A	350	135	175

Fans

Number / Input power	F A	n°/kW	4x0.53	4x0.53	4x0.53
Air flow rate	F A	m^3/h	14500	14000	16500

Air handling section

Evaporator

Number of rows	F A	n°	4	4	4

Fan

Type	F A		Radial, forward curved blades		
Nominal air flow rate	F A	m^3/h	14000	17000	20000
Minimum air flow rate	F A	m^3/h	10400	14800	17400
Maximum air flow rate	F A	m^3/h	14100	20000	23500
Number	F A	n°	1	1	1
Total installed power	F A	kW	2.58	4.37	6.13
Available pressure with std motor	F A	Pa	200	200	200

Air filters

Thickness	F A	mm	50	50	50
Efficiency	F A	EN779	G4	G4	G4

Operating limits

Max. external air temperature	F A	°C	46	46	46

Base version sizes

Height	F A	mm	1.830	1.830	1.830
Width	F A	mm	2.166	2.166	2.166
Lenght	F A	mm	3.290	3.290	3.290
Weight	F A	kg	1.300	1.390	1.480

Performances referring to:
Room air 27 °C / 50% r.h.
External air 35 °C
* Energy indices referring to cooling circuit

Heat pump H-A (high temperature)

RTE	Version		240	260	300
Cooling capacity	H A	kW	77.2	89.0	104.6
Sensible cooling capacity	H A	kW	50.0	61.1	68.0
Heating capacity	H A	kW	77.1	87.4	101.5
Total input power in cooling mode	H A	kW	20.0	24.4	30.4
Total input power in heating mode	H A	kW	19.2	22.1	26.9

Energy indices

E.E.R.*	H A		4.59	4.51	4.31
C.O.P.*	H A		4.81	5.06	4.98

Condensing unit section

Compressors

Type	H A		scroll		
Number / circuit	H A	n°	2/2	2/2	2/2
Capacity step control	H A	%	0-50-100	0-50-100	0-50-100
Input power in cooling mode	H A	kW	15.3	17.9	22.0
Input power in heating mode	H A	kW	14.5	15.7	18.5
L.R.A. (Locked Rotor Amps)	H A	A	350	135	175

Axial Fans

Number / Input power	H A	n°/kW	4x0.53	4x0.53	4x0.56
Air flow rate	H A	m³/h	14500	14000	16500

Air handling section

Evaporator

Number of rows	H A	n°	4	4	4

Fan

Type	H A		Radial, forward curved blades		
Nominal air flow rate	H A	m³/h	14000	17000	20000
Minimum air flow rate	H A	m³/h	10400	14800	17400
Maximum air flow rate	H A	m³/h	14100	20000	23500
Number	H A	n°	1	1	1
Total installed power	H A	kW	2.58	4.37	6.13
Available pressure with std motor	H A	Pa	200	200	200

Air filters

Thickness	H A	mm	50	50	50
Efficiency	H A	EN779	G4	G4	G4

Operating limits

Max. external air temperature	H A	°C	46	46	46
Min. winter external air temperature.	H A	°C	-10	-10	-10

Base version sizes

Height	H A	mm	1.830	1.830	1.830
Width	H A	mm	2.166	2.166	2.166
Lenght	H A	mm	3.290	3.290	3.290
Weight	H A	kg	1.300	1.390	1.480

Performances referring to:
Cooling mode: Ambient air 27 °C/50% r.h. External air 35 °C
Heat pump mode: Ambient air 20 °C/50% r.h. External air 7 °C/70% r.h.
* Energy indices referring to cooling circuit

Cooling only F-L (low-noise)

RTE	Version		240	260	300
Cooling capacity	F L	kW	68.7	84.5	102.6
Sensible cooling capacity	F L	kW	44.7	58.3	66.7
Total input power	F L	kW	24.8	27.3	32.1

Energy indices

E.E.R.*	F L		3.2	4.3	4.0

Condensing unit section

Compressors

Type	F L		scroll		
Number / circuit	F L	n°	2/2	2/2	2/2
Capacity step control	F L	%	0-50-100	0-50-100	0-50-100
Compressor input power	F L	kW	20.1	20.8	23.8
L.R.A. (Locked Rotor Amps)	F L	A	350	135	175

Fans

Number / Input power	F L	n°/kW	4x0.53	4x0.53	4x0.53
Air flow rate	F L	m^3/h	9500	9000	11000

Air handling section

Evaporator

Number of rows	F L	n°	4	4	4

Fan

Type	F L		Radial, forward curved blades		
Nominal air flow rate	F L	m^3/h	14000	17000	20000
Minimum air flow rate	F L	m^3/h	10400	14800	17400
Maximum air flow rate	H	m^3/h	14100	20000	23500
Number	F L	n°	1	1	1
Total installed power	F L	kW	2.6	4.4	6.1
Available pressure with std motor	F L	Pa	200	200	200

Air filters

Thickness	F L	mm	50	50	50
Efficiency	F L	EN779	G4	G4	G4

Operating limits

Max. external air temperature	F L	°C	39	39	39

Base version sizes

Height	F L	mm	1.830	1.830	1.830
Width	F L	mm	2.166	2.166	2.166
Lenght	F L	mm	3.290	3.290	3.290
Weight	F L	kg	1.300	1.390	1.480

Performances referring to:
Ambient air 27 °C / 50% r.h.
External air 35 °C
* Energy indices referring to cooling circuit

Heat pump H-L (low-noise)

RTE	Version		240	260	300
Cooling capacity	H L	kW	68.0	83.6	101.6
Sensible cooling capacity	H L	kW	44.2	55.6	65.9
Heating capacity	H L	kW	74.5	83.6	98.5
Total input power in cooling mode	H L	kW	24.4	26.8	31.6
Total input power in heating mode	H L	kW	19.0	21.8	26.5

Energy indices

E.E.R.*	H L		3.13	3.72	3.94
C.O.P.*	H L		4.74	4.94	4.89

Condensing unit section

Compressors

Type	H L		scroll		
Number / circuit	H L	n°	2/2	2/2	2/2
Capacity step control	H L	%	0-50-100	0-50-100	0-50-100
Input power in cooling mode	H L	kW	19.7	20.4	23.4
Input power in heating mode	H L	kW	14.3	15.3	18.3
L.R.A. (Locked Rotor Amps)	H L	A	350	135	175

Axial Fans

Number / Input power	H L	n°/kW	4x0.53	4x0.53	4x0.53
Air flow rate	H L	m^3/h	9500	9000	11000

Air handling section

Evaporator

Number of rows	H L	n°	4	4	4

Fan

Type	H L		Radial, forward curved blades		
Nominal air flow rate	H L	m^3/h	14000	17000	20000
Minimum air flow rate	H L	m^3/h	10400	14800	17400
Maximum air flow rate	H L	m^3/h	14100	20000	23500
Number	H L	n°	1	1	1
Total installed power	H L	kW	2.6	4.4	6.1
Available pressure with std motor	H L	Pa	200	200	200

Air filters

Thickness	H L	mm	50	50	50
Efficiency	H L	EN779	G4	G4	G4

Operating limits

Max. external air temperature	H L	°C	39	39	39
Min. winter external air temperature	H L	°C	-10	-10	-10

Base version sizes

Height	H L	mm	1.830	1.830	1.830
Width	H L	mm	2.166	2.166	2.166
Lenght	H L	mm	3.290	3.290	3.290
Weight	H L	kg	1.300	1.390	1.480

Performances referring to:
Cooling mode: Ambient air 27 °C/50% r.h. External air 35 °C
Heat pump mode: Ambient air 20 °C/50% r.h. External air 7 °C/70% r.h.
* Energy indices referring to cooling circuit

Operating limits

The units, in their standard configuration, are not suitable for installation in a salty environment.

N.B: If you wish to operate the machine beyond the limits indicated in the diagram, please contact AERMEC engineering/commercial department.

If the unit is situated in particularly windy environments it is necessary to install a wind break protection to avoid unstable operation of the DCPR device.

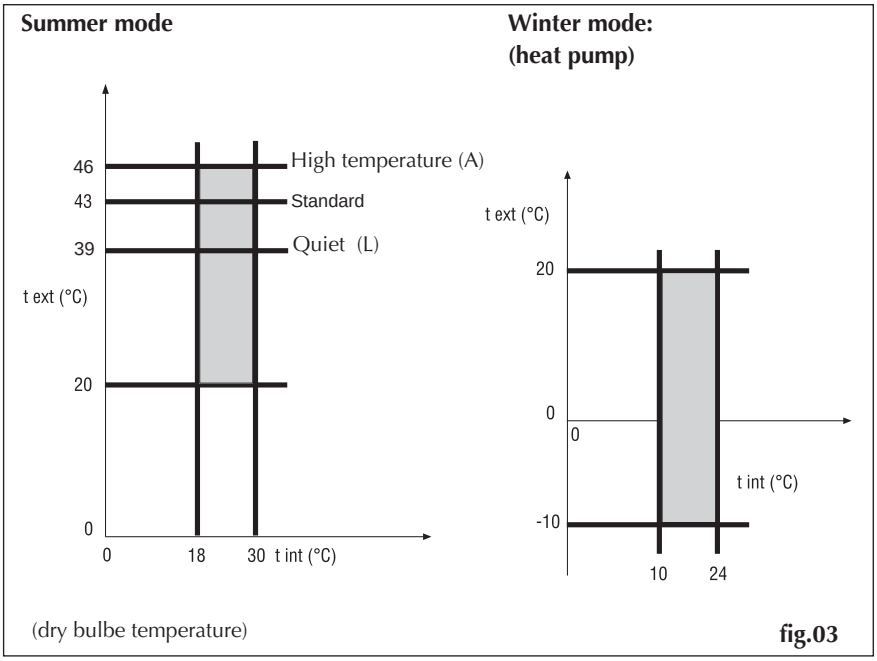


fig.03

Model		240	260	300	350	240	260	300	240	260	300
Version		**Standard Vers.**				**High temp Vers.. (A)**			**Quiet operation vers.(L)**		
Max. external temperature in cooling mode	°C	43				46	46	46	39	39	39
Min. external temperature in cooling mode	°C	20									
Max. input temp. to evaporating coil in cooling mode	°C	30									
Min. input temp. to evaporating coil on cooling mode	°C	18									
Min. external temperature in heat pump mode	°C	-10									
Max. external temperature in heat pump mode	°C	20									
Max. input temp. to evaporator coil in heat pump mode	°C	24									
Min. input temp. to evaporator coil in heat pump mode	°C	10									

Sound data

Lw: sound power level
Lp: sound pressure level

* 1 mt. away from the unit, ducted fan, direction factor Q = 4.

Standard version and High Temperature version(A)									
	Total sound levels		Octave band [Hz]						
	Lw tot	Lp tot *	125	250	500	1000	2000	4000	8000
	[dBA]	[dBA]	Sound power levels Lw [dB]]						
240	80	75	85	78	78	76	72	65	54
260	81	76	86	79	78	76	72	65	54
300	82	78	88	81	79	77	73	66	56
350std	85	79	92	85	82	79	75	68	58

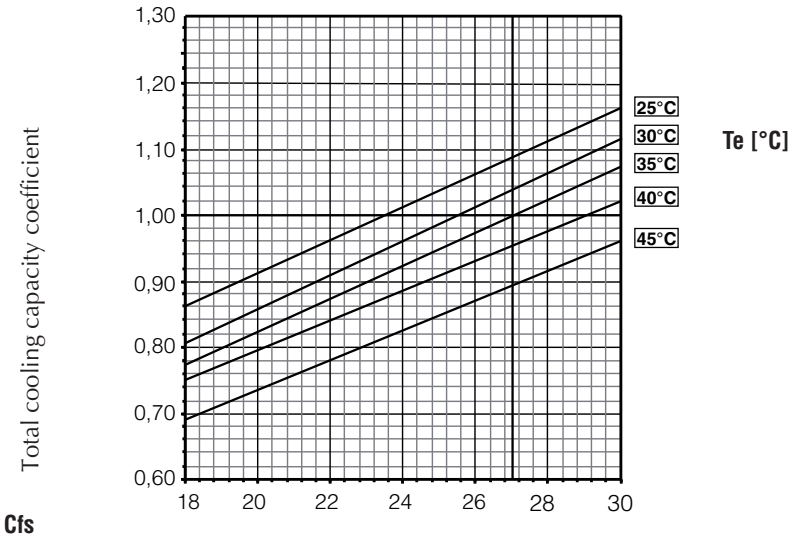
Low Noise version (L)									
	Total sound levels		Octave band [Hz]						
	Lw tot	Lp tot *	125	250	500	1000	2000	4000	8000
	[dBA]	[dBA]	Sound power levels Lw [dB]						
240	77	72	79	75	74	72	71	64	53
260	78	73	80	76	75	72	71	64	53
300	79	74	82	77	76	73	72	65	54

Cooling capacity and input power

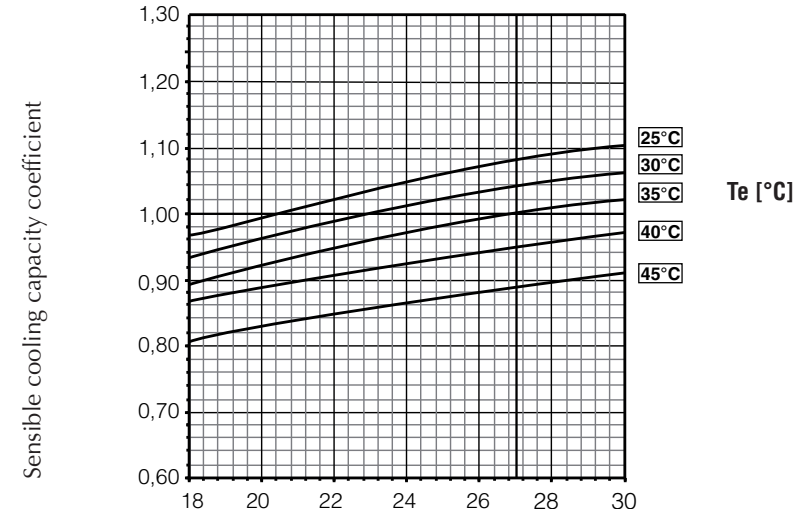
The following diagrams make it possible to obtain the corrective coefficient to be used for the rooftop units in the cooling function. Alongside each curve, the temperature of the outside air it refers to is reported.
The total cooling capacity, the sensible cooling capacity and the electrical input power in conditions other than the nominal ones are obtained by multiplying the nominal values in the technical data table for the respective correction coefficients (Cft, Cfs e Cpa).

Example: if RTE 240F on the technical data sheet capacities with nominal air flow at 27°C and 50% R.H.: tot. refrig. cap. of 66.0 kW and sens. refrig. cap. 45.2 kW with outside air 35°C;
Then at 24°C and 50% H.R. will supply respectively : 66.0x0.92=60.7 kW and 45.2x0.97=43.8 kW.

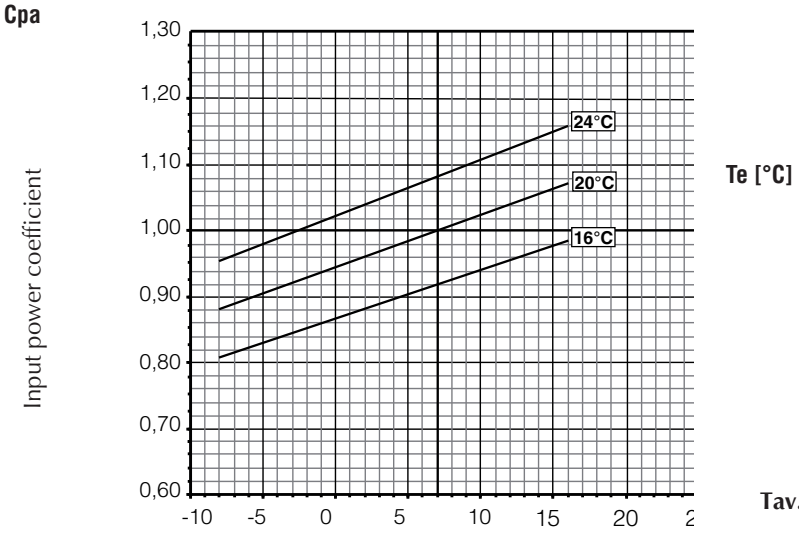
Cft



Cfs



Cpa



Tav.01

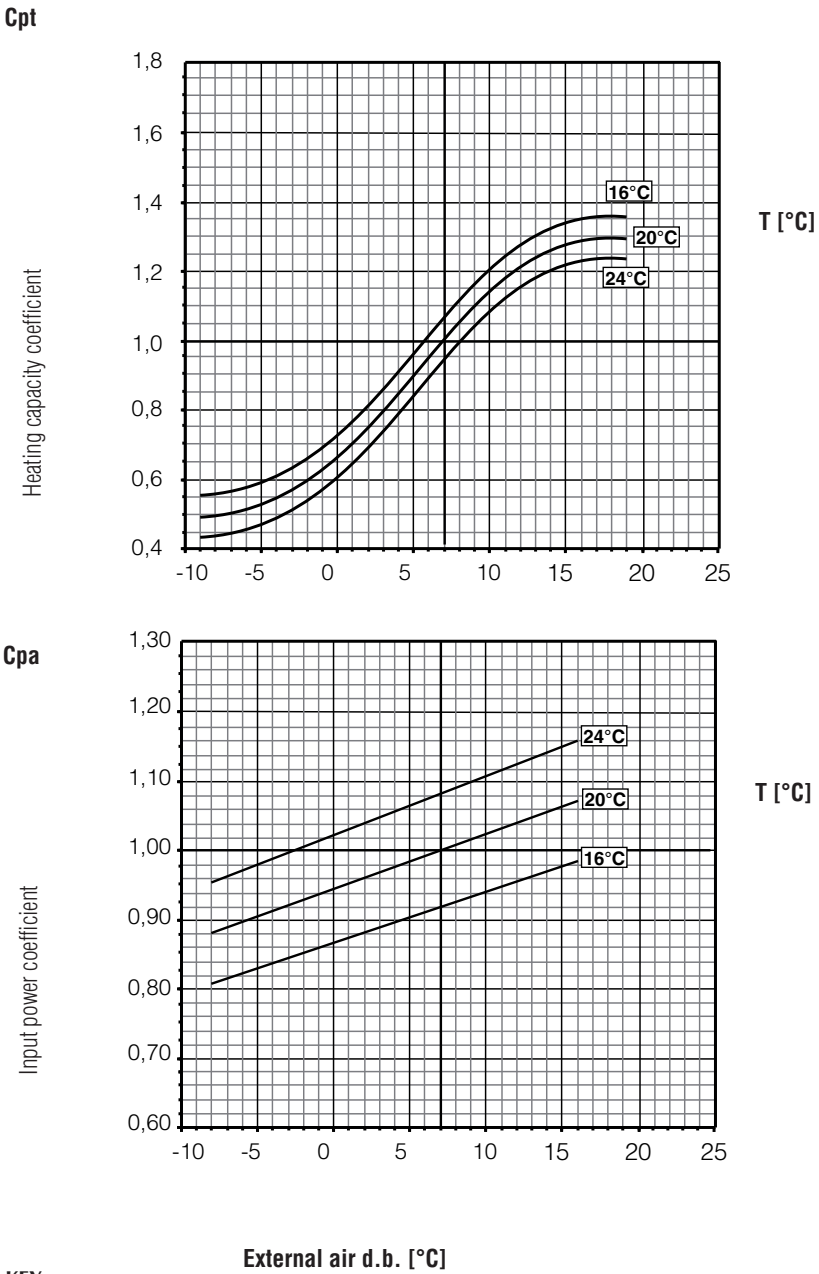
Temperature of the air to be treated b.s. 50% R.H. [°C]

Key

Cft	Coefficient Total cooling capacity	Te	External air temperature °C
Cfs	Sensible cooling capacity coefficient	b.s.	Dry bulb
Cpa	Input power coefficient	R.H.	Relative Humidity

Heating capacity and input power

The following diagrams give the corrective coefficients to be used for the rooftop units operating in heat pump mode. Each curve refers to a specific room temperature (16-20-24°C). The x-axis shows the dry temperature of the external air with variable relative humidity, according to the data shown in the table below.
The performances are given net of the defrosting cycles.
The corrective coefficients (Cpt, Cpa) allow to calculate the heating capacity and the electrical input power at conditions other than the nominal ones.



KEY

Cpt Heating capacity coefficient
Cpa Input power coefficient
d.b. Dry bulb
T [°C] Dry bulb temperature of the handled air.

The x-axes show a temperature which refers to the following humidity conditions:

Temp. in x-axis	°C	-8	-6	-4	-2	0	2	4	6	8	10	12	14	16
Dry bulb temp	°C	-8	-6	-4	-2	0	2	4	6	8	10	12	14	16
Rel. Humid.	%	90	90	85	80	75	75	70	70	70	65	65	65	65

Corrective coefficients for different flow rates

The data given by the diagrams at pg. 21-22 refer to nominal air flowrates (**Wn**).
For different flowrates (**W**) please apply the corrective coefficients shown in the tables on the right.

Correction coefficients for flow rates other than the rated flow rates by total cooling capacity					
W/Wn	0,8	0,9	1	1,1	1,2
Cft	0,974	0,987	1	1,014	1,027

Correction coefficients for flow rates other than the rated flow rates and for sensitive cooling capacity					
W/Wn	0,8	0,9	1	1,1	1,2
Cfs	0,905	0.953	1	1.048	1.095

Correction coefficients for flow rates other than the rated flow rates for heating capacity					
W/Wn	0,8	0,9	1	1,1	1,2
Cpt	0,974	0,987	1	1,014	1,027

KEY

Cft Coefficient Total cooling capacity
Cfs Sensible cooling capacity coefficient
Cpt Heating capacity coefficient

The input power does not vary greatly with the variation in the flow rate of the air to be treated

Total capacities for different relative humidities

The table gives the corrective coefficients to calculate the **TOTAL COOLING CAPACITY** for different relative humidities, dry bulb temperature unchanged.

Correction coefficients for total refrigeration capacities as the relative humidity changes						
R.H.	%	30	40	50	60	70
Coefficient		0.89	0.94	1	1.06	1.12

The table gives the corrective coefficients to calculate the SENSIBLE COOLING CAPACITY for different relative humidities, dry bulb temperature unchanged

Correction coefficients for sensible refrigeration capacities as the relative humidity changes						
R.H.	%	30	40	50	60	70
Coefficient		1.23	1.11	1	0.89	0.79

Example: if RTE 240F on the technical data sheet supplies at 27°C and 50% R.H.: tot. refrig. cap. of 66.0 kW and sens. cooling cap. 45.2 kW with outside air 35°C; Then at 27°C and 70% R. H. supplies respectively: 66.0x1.12=73.9 kW and 45.2x0.79=35.7 kW.

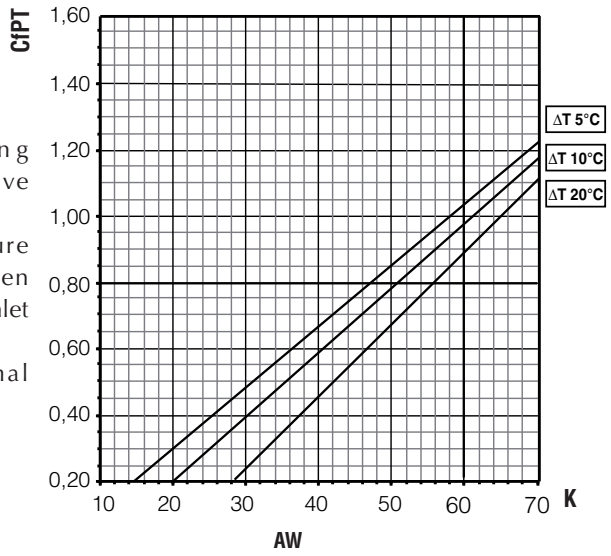
Performance tables for water heating coils

The RTE units may be supplied with a two-row hot water coil (accessory) provided with modulating three-way valve (actuator included).
The first diagram shows the corrective coefficients to be applied to the nominal performances of the hot water coil given on pg. 13.

Example :
Calculate the performances of the hot water coil installed on a RTE 240 at the following design conditions:
- Heating water inlet temperature: 70 °C;
- Room temperature: 22 °C;
- Water thermal drop T20=20 °C.

The coil heating capacity, with air at 20°C and water 80/70°C, is 140 kW according with the technical data sheet at pg. 13.
The temperature difference between the water inlet and the air is DAW=70-22=48°C.
The diagram gives the corrective coefficient Cfpt=0.63. Hence the coil heating capacity at the given condition is 140x0.63=88.2 kW.

key
CfPT Heating capacity corrective coefficient
DAW Temperature difference between water inlet - air inlet [°C]
Δt Water thermal drop [°C]



Water coil pressure drops

Fig.04 shows the heating coil water pressure drops.
The pressure drops due to the three-way valves are included.

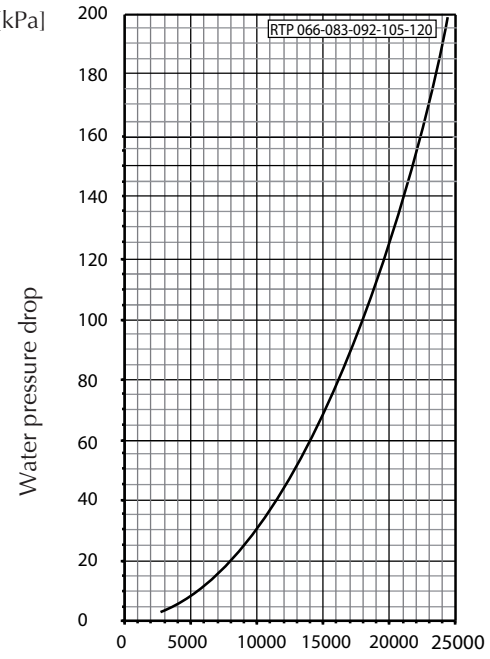
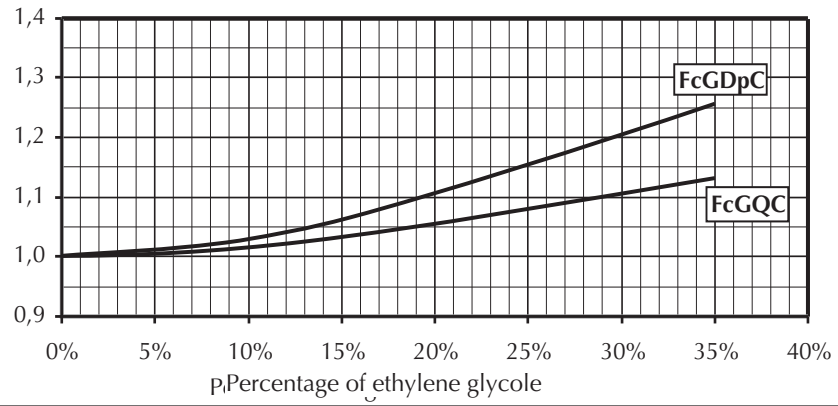


fig.04

Corrective coefficients for pressure drop and flowrate with glycoled water

FcGDpC = Pressure drop corrective coefficient
FcGQC = Flowrate corrective coefficient

The water flowrate and pressure drop corrective coefficients have to be applied directly to the data for normal water.



Technical data generator Gxxx

Gxxx Model		G72	G92					G150			
Matching with sizes RTE	RTE model	RTE240	RTE240	RTE260	RTE300	RTE350	RTE400	RTE260	RTE300	RTE350	RTE400
Combination thermal modules	n° x model	1x72	1x92	1x92	1x92	1x92	1x92	1x150	1x150	1x150	1x150
Temperature rise (at nominal air flow and maximum heat output)	°C	20	25,5	17,9	15,2	13,8	13,2	27,7	23,5	21,4	20,5

Thermal Module		072		092		150	
		min.	max.	min.	max.	min.	max.
Nominal air flow	kW	22	78	30	98	44	155
Efficiency	%	105	93,8	105	95,3	105,2	93,5
Nominal thermal power	kW	23,1	73,2	31,5	93,4	46,3	145
Condensate produced	l/h	2,2		2,6		3,9	
NOx	mg/kWh	35		37		43	
Gas connection diameter		UNI ISO 7/1 - 1" M		UNI ISO 7/1 - 1" M		UNI ISO 7/1 - 1" M	
diameter tube suction / discharge	mm	100 / 100		100 / 100		350 / 350	
Available pressure exhaust fumes	Pa	120		120		100	
Minimum working temperature	°C	-15		-15		-15	
Power supply	V / Hz	230 / 50		230 / 50		230 / 50	
Category		II 2H 3B/P					
G20 natural gas supply pressure	mbar	20 (min. 17; max. 25)					
G20 natural gas consumption (15 ° C - 1013mbar)	m^3/h	2,33 - 8,25		3,18 - 10,38		4,50 - 15,80	
Carbon dioxide gas supply pressure G30CO2 G20	%	8,7 +/- 0,2					
Supply Pressure G30	mbar	37					
Consumption G30 (15 ° C - 1013mbar)	m^3/h	1,42 - 5,02		1,93 - 6,31		2,83 - 9,97	
Carbon dioxide CO2 G30	%	9,5 +/- 0,3					
Supply Pressure G31	mbar	37					
Consumption G31 (15 ° C - 1013mbar)	m^3/h	1,40 - 4,95		1,88 - 6,14		2,76 - 9,71	
Carbon dioxide CO2 G31	%	9,5 +/- 0,3					

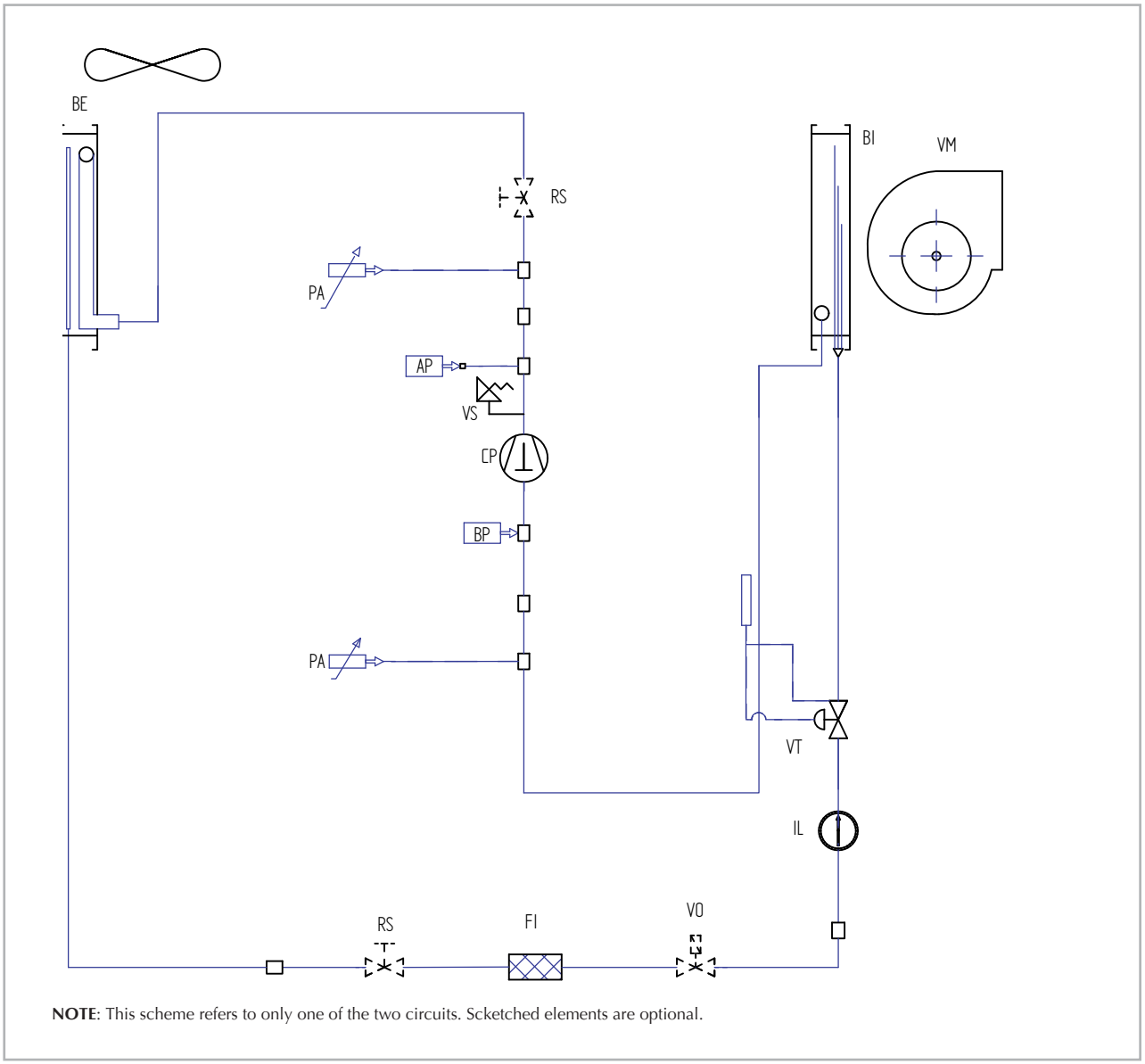
List of pressure equipment - Directive PED 97/23 CE

The table alongside shows the list of pressure equipment and form mounted on the roof-top RTL, according to Directive 97/23 CE PED module A1.

COMPONENT	MODULE
Compressor	D1
Coil	A
Three way valve	esclusa (art. 3.3)
Liquid receiver	D1
High pressure switch	B+D
Safety valve high pressure side	B+D
Safety valve low pressure side	B+D

Refrigerant circuits

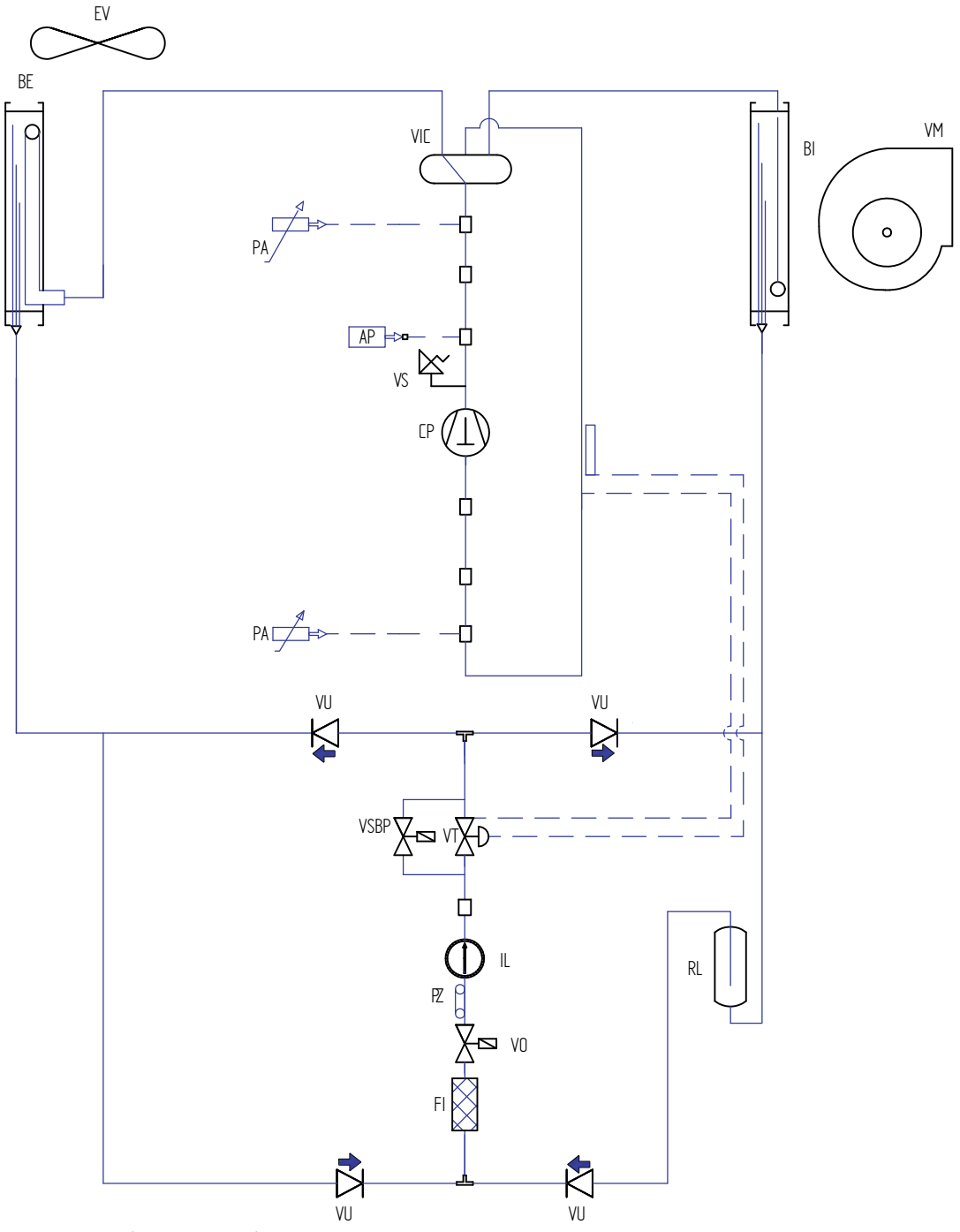
RTE 240 F - 400 F refrigerating circuit



NOTE: This scheme refers to only one of the two circuits. Scketched elements are optional.

CP	compressor	**FI**	filter drier
VS	high pressure safety valve 30 bar	**VO**	solenoid valve (optional)
AP	high pressure switch (27 bar)	**IL**	liquid and humidity indicator
PA	pressure transducer	**VT**	thermostatic expansion valve
RS	ball valve (optional)	**VM**	centrifugal fan
EV	axial fan	**BI**	internal coil
BE	external coil	**BP**	low pressure switch (it stops the compressor at 2 bar and starts it at 2,3 bar)

RTE 240 H - 400 H refrigerating circuit

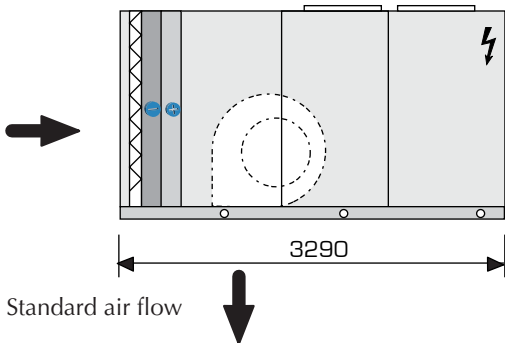


NOTE: This scheme refers to only one of the two circuits.

CP	compressor	**VO**	solenoid valve
VS	high pressure safety valve 30 bar	**PZ**	temperature probe pit
AP	high pressure switch (27 bar)	**IL**	liquid and humidity indicator
PA	pressure transducer	**VT**	thermostatic expansion valve
VIC	refrigerant reversing valve	**VSBP**	by pass solenoid valve
EV	axial fan	**VM**	centrifugal fan
BE	external coil	**BI**	internal coil
FI	filter drier	**RL**	liquid receiver
VU	one way valve		

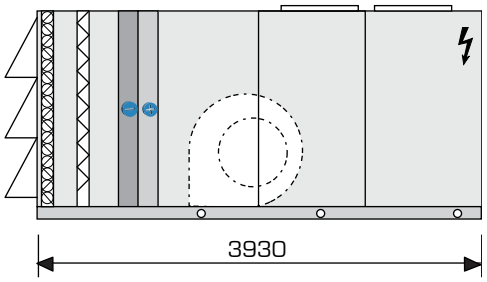
Dimensions

Base versions
Single section rooftop
- front exhaust
- downwards supply
- filters G4
  (optional heating coil)



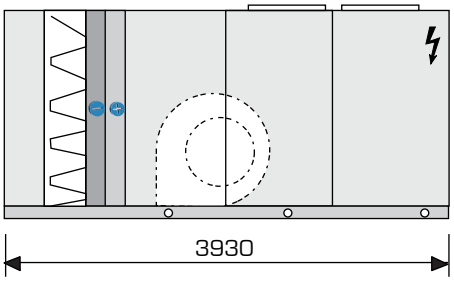
(fig.1)

SMP
Single section rooftop
- two-ways mixing box, rear exhaust intake (actuator as optional)
- filters G4
  (optional heating coil)



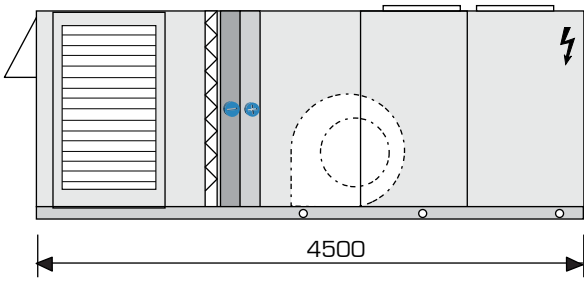
(fig.2)

FT7
Single section rooftop
- prefilter G3
- bag filters F7
  (heating coil as optional)



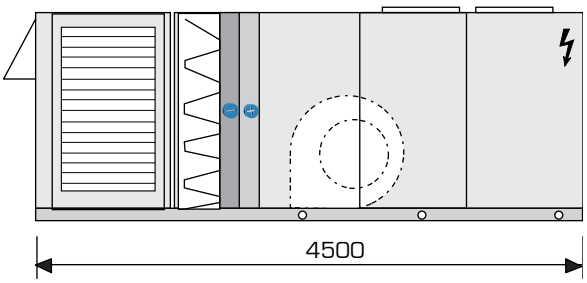
(fig.3)

SM2
Single section rooftop
- two-ways mixing box, side or bottom exhaust intake (actuators as optional)
- filters G4
  (optional heating coil)



(fig.4)

SM2-FT7
Single section rooftop
- two-ways mixing box with side, bottom or front exhaust intake (actuators as optional)
- prefilter G3
- bag filters F7
  (heating coil as optional)

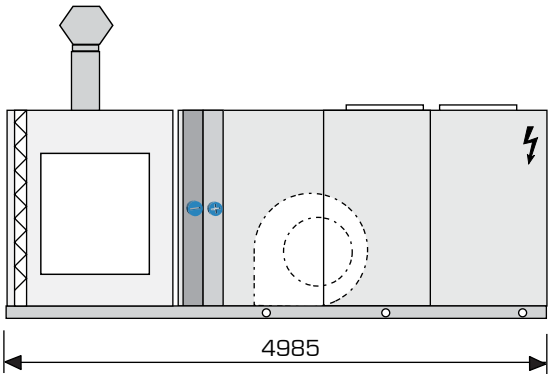


(fig.5)

G72 - G92 - G150

Single section rooftop

- prefilter G3
- hot air condensation type generator with 72 or 92 kW heating capacity according to the selected rooftop version. The generator is installed in a module with sandwich panels with mineral wool insulation (density 100 kg/m^3)

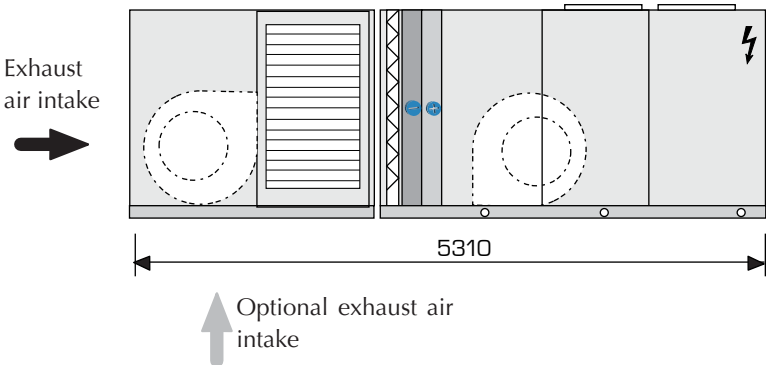


(fig.6)

SM3

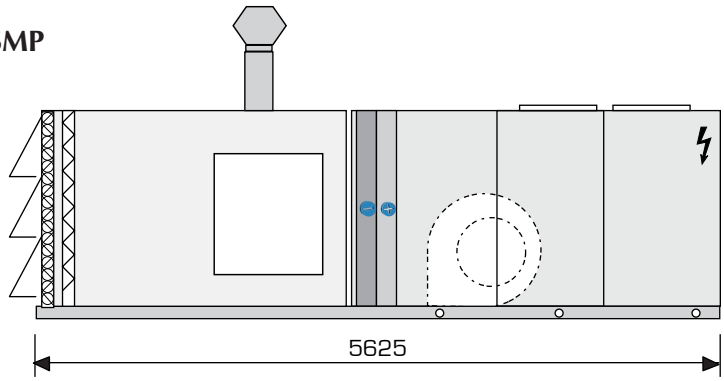
Rooftop

- three-way mixing box with:
  - exhaust fan with variable pitch pulley
  - standard rain hoods
  - modulating actuators for all the dampers (modulating spring return actuators for external damper as optional).



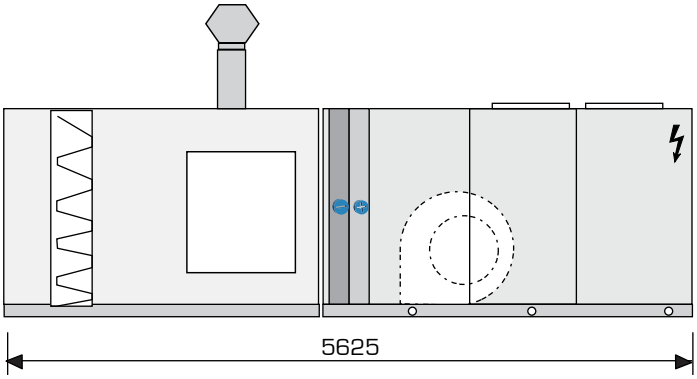
(fig.7)

G72 - SMP / G92 - SMP / G150 - SMP



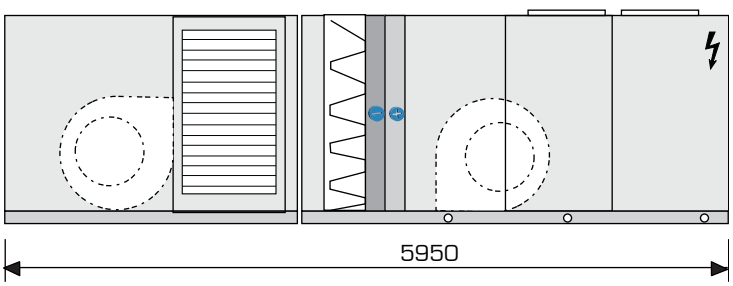
(fig.8)

G72 - F7 / G92 - FT7 / G150 - FT7



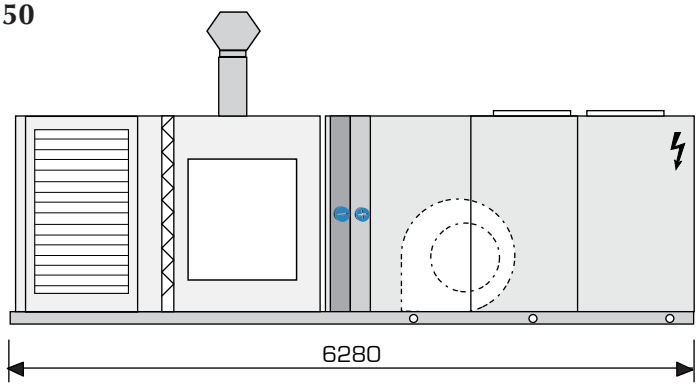
(fig.9)

SM3 - FT7



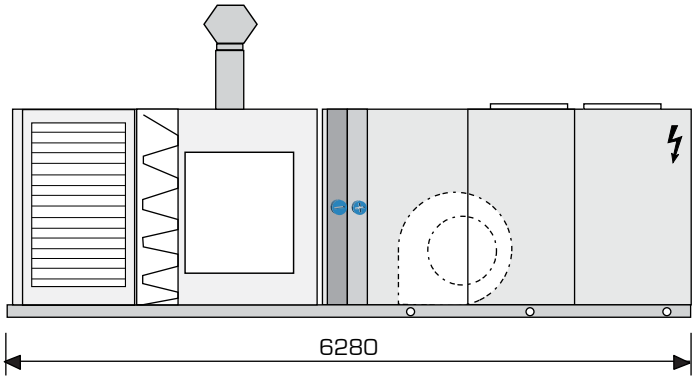
(fig.10)

SM2 - G72 / SM2 - G92 / SM2 - G150



(fig.11)

SM2 - G72 - FT7
SM2 - G92 - FT7
SM2 - G150 - FT7

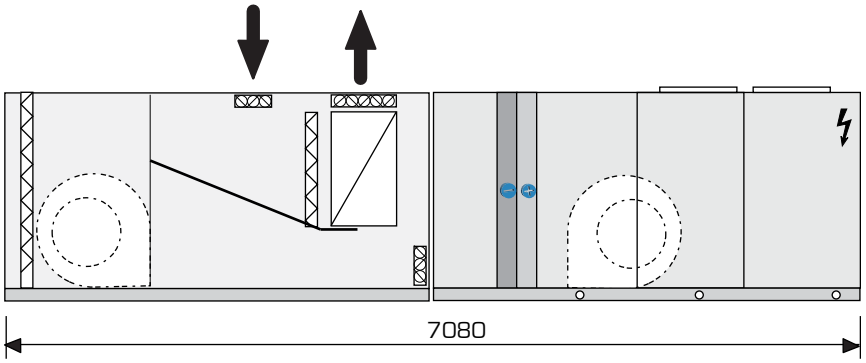


(fig.12)

REC

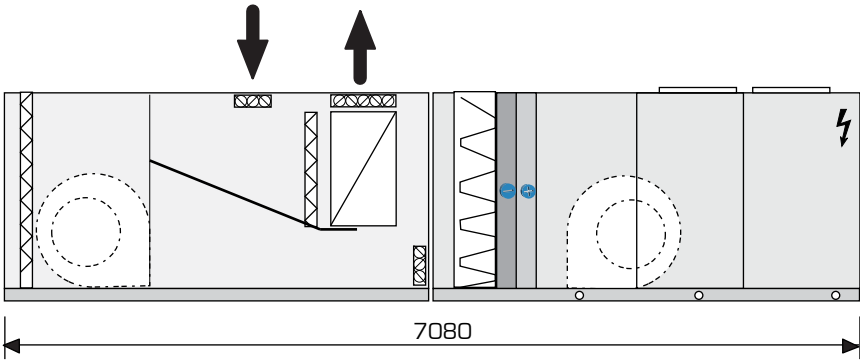
Rooftop:

- Heat recovery unit provided with :
  - exhaust fan with variable pitch pulley
  - panel filters G4 for exhaust air
  - panel filters G4 for fresh air
  - modulating actuators for all the dampers (modulating spring return actuators for external dampers as optinal).
  - double filter differential pressure switch as optional



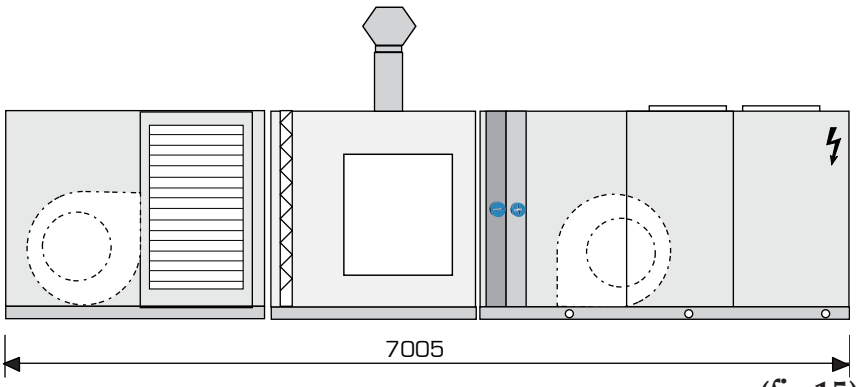
(fig.13)

REC - FT7



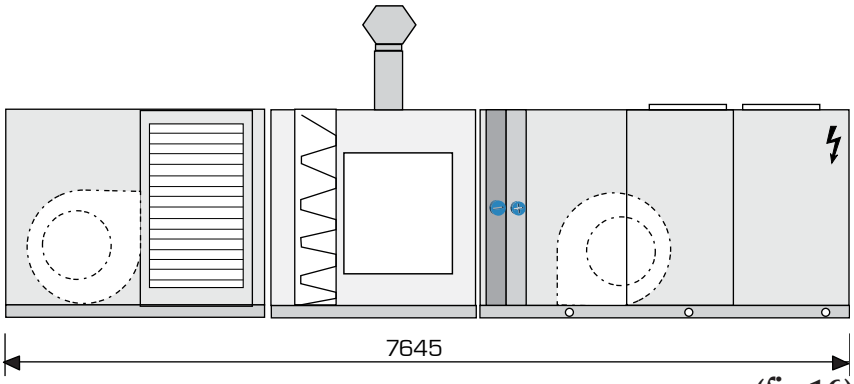
(fig.14)

SM3 - G72
SM3 - G92
SM3 - G150



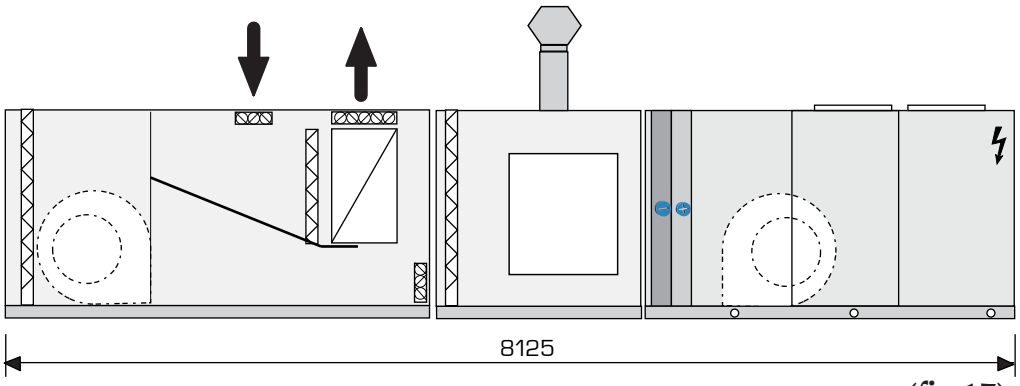
(fig.15)

SM3 - G72 - FT7
SM3 - G92 - FT7
SM3 - G150 - FT7



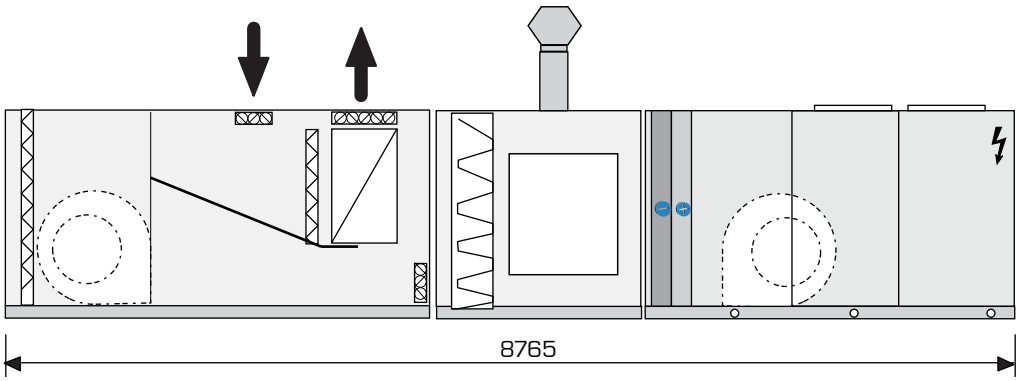
(fig.16)

REC - G72
REC - G92
REC - G150



(fig.17)

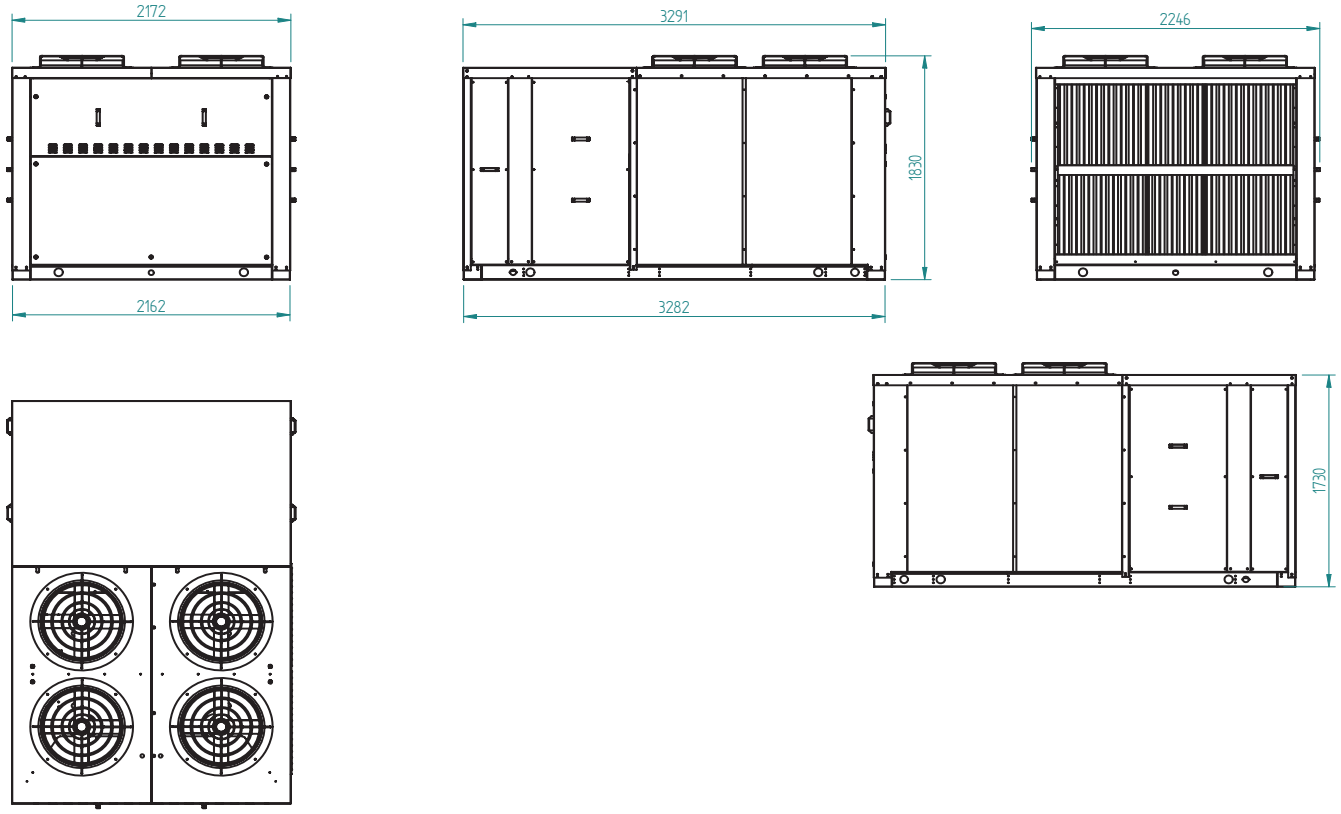
REC - G72 - FT7
REC - G92 - FT7
REC - G150 - FT7



(fig.18)

Nominal dimensions

RTE 240-260-300-350 - 400 standard base version



Refrigerant charge

R410A REFRIGERANT CHARGE -ONLY COOLING VERSION						
Model		**240 F**	**260 F**	**300 F**	**350 F**	**400 F**
Std version	[kg]	**Contact the technical department AERMEC S.p.A.**				
High temperature version	[kg]					
Low noise version	[kg]					

R410A REFRIGERANT CHARGE - HEAT PUMP VERSION						
Model		**240 H**	**260 H**	**300 H**	**350 H**	**400 H**
Std version	[kg]	**Contact the technical department AERMEC S.p.A.**				
High temperature version	[kg]					
Low noise version	[kg]					

Weights

WEIGHTS - ONLY COOLING VERSION						
Model		**240 F**	**260 F**	**300 F**	**350 F**	**400 F**
Std version	[kg]	3500	1420	1460	1610	1695
SMP	[kg]	1460	1590	1630	1770	1855
FT7	[kg]	1532	1660	1700	1840	1925
SM2	[kg]	1600	1640	1770	1910	1995
SM2 - FT7	[kg]	1630	1670	1800	1940	2025
Weight addition for high temperature/low noise versions	[kg]	+ 50	+ 50	+ 50	n.d.	n.d.

WEIGHTS - HEAT PUMP VERSION						
Model		**240 H**	**260 H**	**300 H**	**350 H**	**400 H**
Std version	[kg]	1350	1380	1550	1690	1775
SMP	[kg]	1500	1540	1720	1860	1945
FT7	[kg]	1550	1560	1760	1900	1985
SM2	[kg]	1570	1580	1950	2260	2175
SM2 - FT7	[kg]	1670	1680	2060	2200	2285
Weight addition for high temperature/low noise versions	[kg]	50	50	50	n.d.	n.d.

WEIGHTS VALID FOR BOTH VERSIONS ONLY COOLIG AND HEAT PUMP						
Model		**240 F/H**	**260 F/H**	**300 F/H**	**350 F/H**	**400 F/H**
Two rows water coil	[kg]	55	55	55	55	55
Heat generator 72 kW	[kg]	610	n.d.	n.d.	n.d.	n.d.
Heat generator 92 kW	[kg]	650	650	650	650	650
Heat generator 150 kW	[kg]	n.d.	700	700	700	700
Heat generator 72 kW + two ways mixing box rear exhaust and/or bag filters	[kg]	840	n.d.	n.d.	n.d.	n.d.
Heat generator 92 kW + two ways mixing box rear exhaust and/or bag filters	[kg]	860	860	860	860	860
Heat generator 150 kW + two ways mixing box rear exhaust and/or bag filters	[kg]	n.d.	900	900	900	900
Heat generator 72 kW + two ways mixing box side exhaust and/or bag filters	[kg]	1040	n.d.	n.d.	n.d.	n.d.
Heat generator 92 kW + two ways mixing box side exhaust and/or bag filters	[kg]	1060	1060	1060	1060	1060
Heat generator 150 kW + two ways mixing box side exhaust and/or bag filters	[kg]	n.d.	1100	1100	1100	1100
Three way mixing box	[kg]	560	570	580	600	600
Heat recovery unit	[kg]	890	900	910	940	940

Configurations

RTE 240-260-300-350 with two-ways mixing box SM2

The ROOFTOP units with two-ways mixing box are available in the following different configurations:

T1 - RIGHT SIDE ROOM AIR INTAKE
The damper for the room air intake is on the right side of the unit while the fresh air damper is on the back of the unit.

T2 - LEFT SIDE ROOM AIR INTAKE
The damper for the room air intake is on the left side of the unit while the fresh air damper is on the back of the unit.

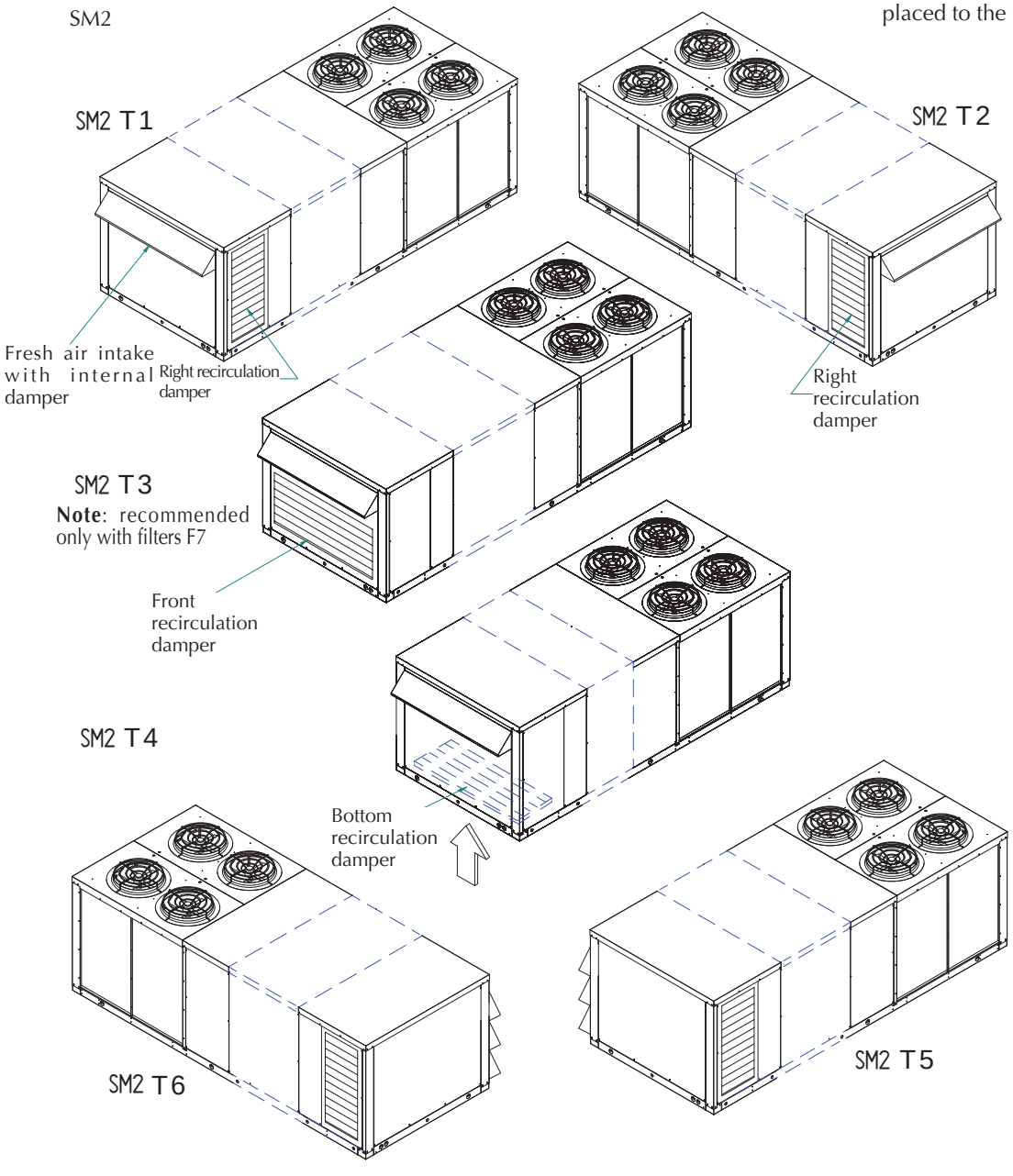
T3 - REAR ROOM AIR INTAKE
The dampers for the room air intake and the fresh air intake are both on the back of the unit. This version is required only when the units is provided also with FT7 bag filters; if there are no bag filters, select the two-ways mixing box 'SMP' type.

T4 - BOTTOM ROOM AIR INTAKE
The damper for the room air intake is at the base of the unit while the fresh air intake is on the back of the unit.

5 - AMBIENT AIR INLET SIDE RIGHT
The air intake damper the environment to conditions and post to the right of following the flow
air, while the air damper External renewal is to the left unit.

T6 - SUCTION AMBIENT AIR LEFT SIDE
The damper air intake from the environment to conditions and to the left of the unit following the flow of air, while the outside air damper for renewal shall be placed to the right of the unit.

VERSIONS MIXING CHAMBER AT 2 DAMPERS SM2



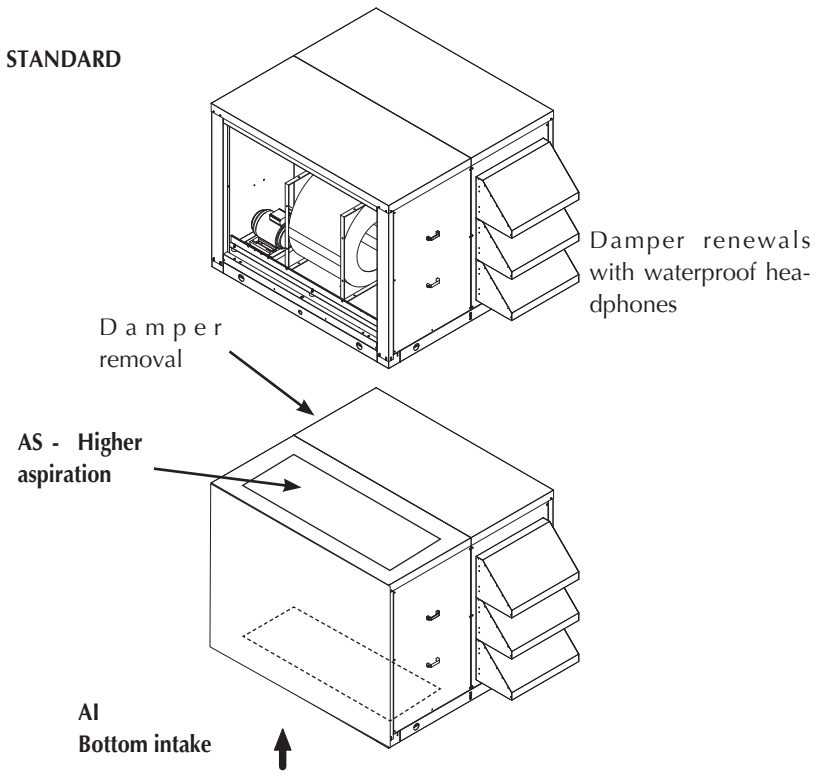
RTE 240-260-300-350 with three-way mixing box

STANDARD - REAR INTAKE
The room air intake is from the back of the unit.

AI - BOTTOM INTAKE
The exhaust air is intaken from the bottom of the vertical exhaust section integrated in the three-way mixing box.

AS - HIGHER ASPIRATION
The exhaust air is intaken from the higher the vertical exhaust section integrated in the three-way mixing box.

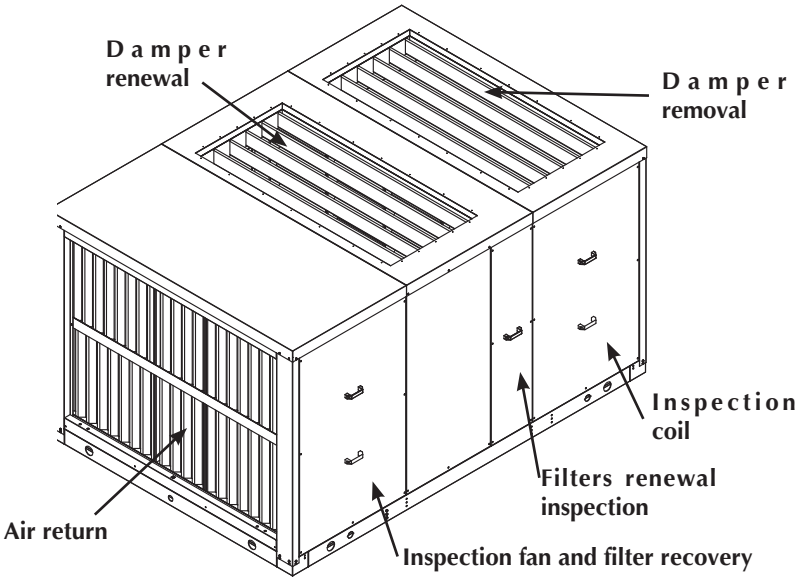
THREE-WAY MIXING BOX



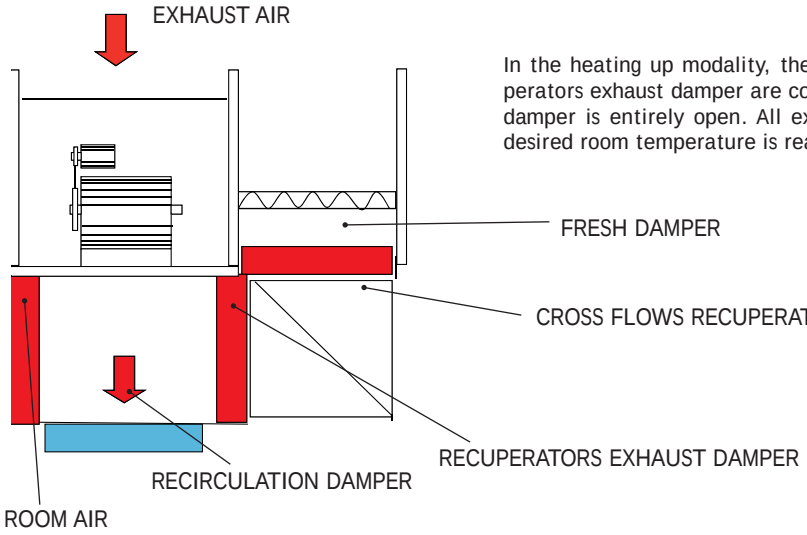
RTE 240-260-300-350 with heat recovery unit

- Heat recovery unit provided with :
  - exhaust fan with variable pitch pulley
  - panel filters G4 for exhaust air
  - panel filters G4 for fresh air
  - modulating actuators for all the dampers (modulating spring return actuators for external damper as optional).
  - double filter differential pressure switch as optional.
  - cross flow heat exchanger sized for the recovery of up to 100% flow

HEAT RECOVERY CROSS FLOW REC
HEAT RECOVERY WITH CROSS-FLOW BYPASS REC BP

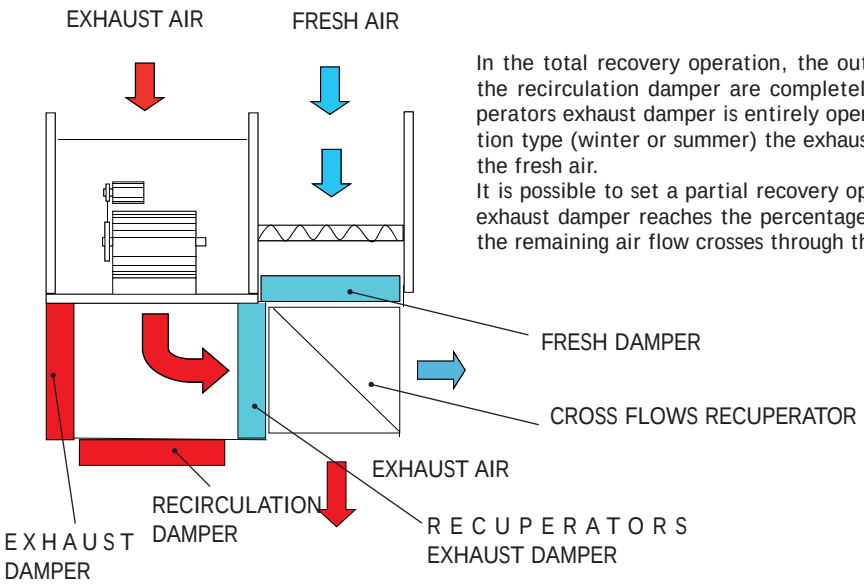


RTE with recuperator
Heating up operation (all fresh air)



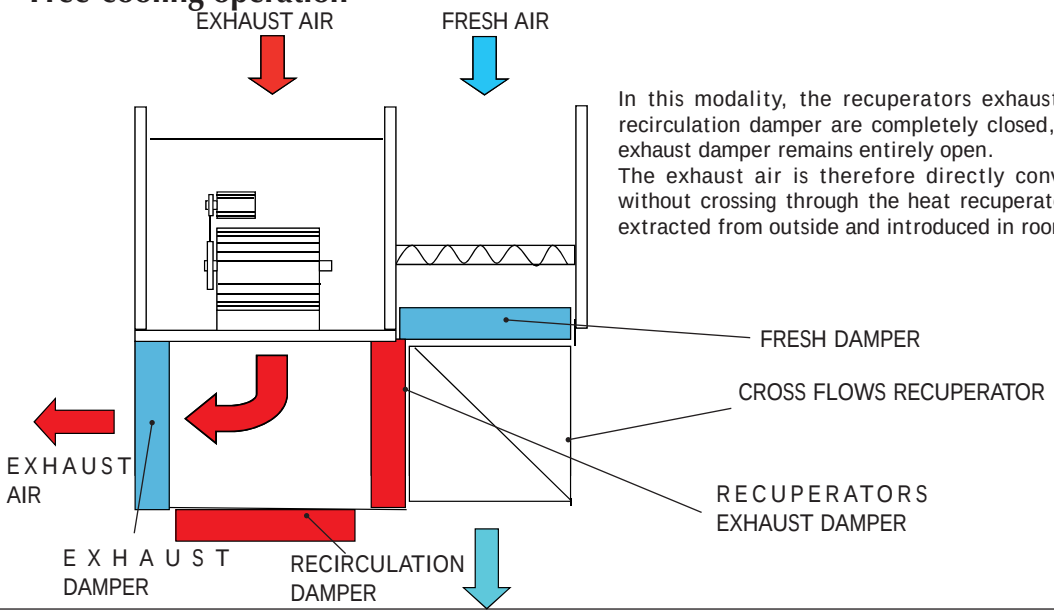
In the heating up modality, the outside exhaust damper and the recuperators exhaust damper are completely closed, while the recirculation damper is entirely open. All exhaust air flow is recirculated until the desired room temperature is reached.

Total recovery operation



In the total recovery operation, the outside exhaust damper and the recirculation damper are completely closed, while the recuperators exhaust damper is entirely open. According to the operation type (winter or summer) the exhaust air exchanges heat with the fresh air.
It is possible to set a partial recovery operation: the recuperators exhaust damper reaches the percentage of the set opening while the remaining air flow crosses through the recirculation damper.

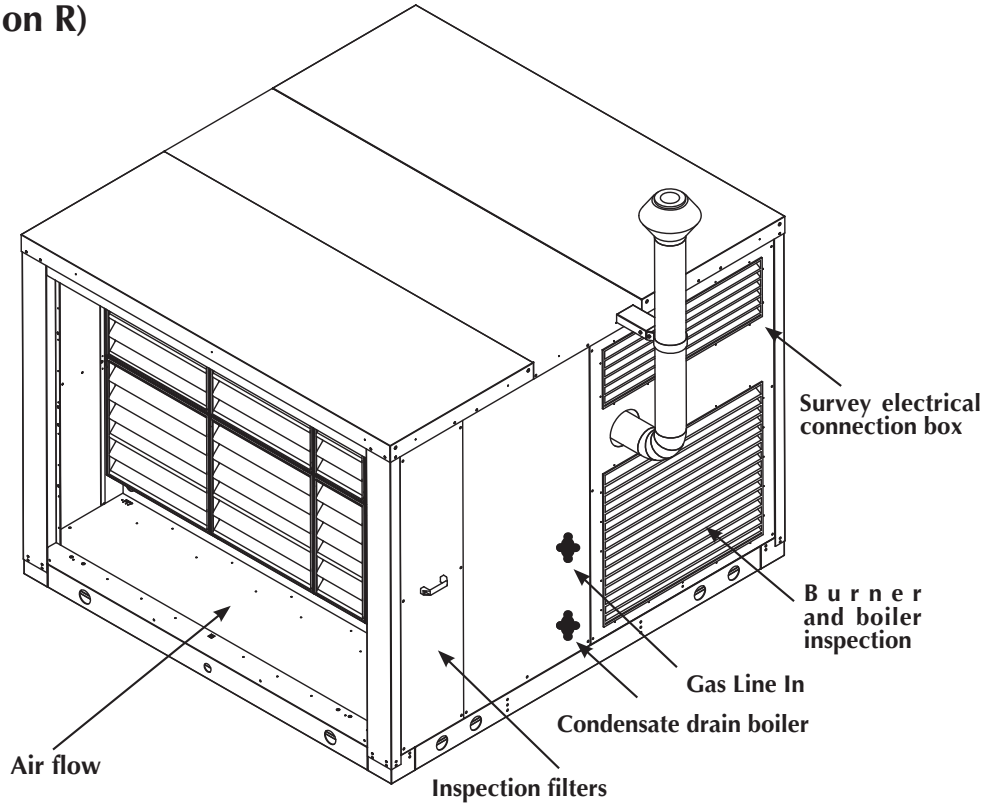
Free-cooling operation



In this modality, the recuperators exhaust damper and the recirculation damper are completely closed, while the outside exhaust damper remains entirely open.
The exhaust air is therefore directly conveyed to outside without crossing through the heat recuperator. The fresh air is extracted from outside and introduced in room.

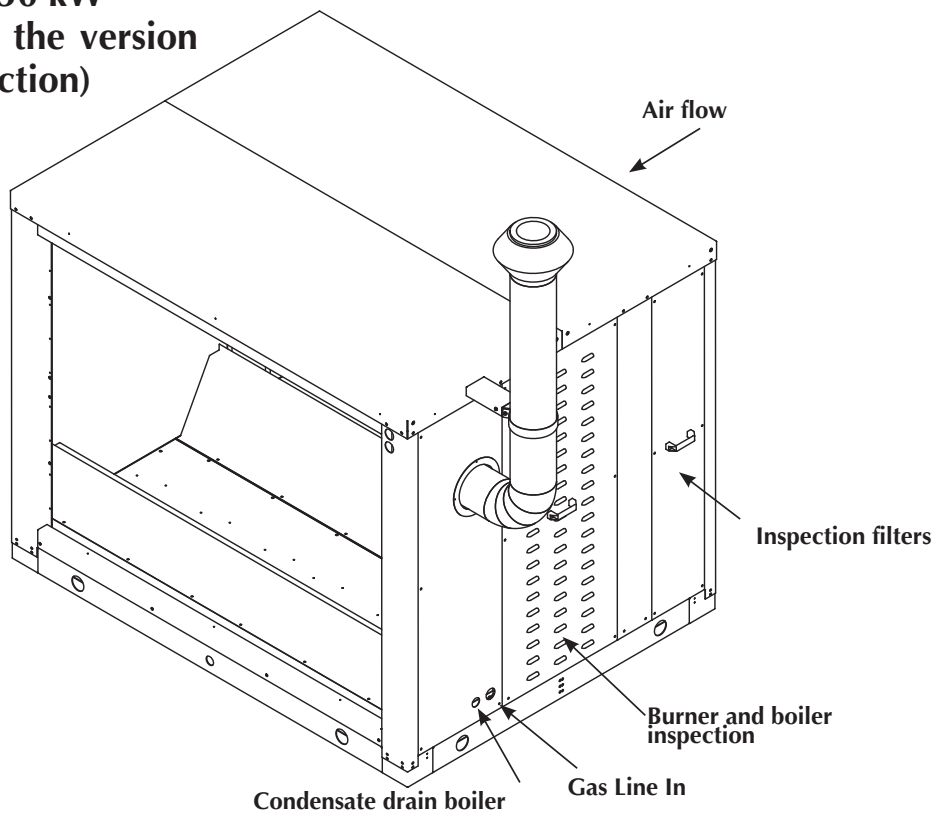
RTE with heat generators G72 - G92 kW (Here is the image of the version with bag filters and edge inspection R)

Form of heat from the generator 72 or 92 kW supplied with:
- Combustion chamber condensing heat exchanger tube boilers;
- Modulating gas burner premixed methane;
- Insulated stainless steel flue terminal anti reflux provided in support;
- Conversion kit to LPG;
- Electronic controller and safety thermostats.



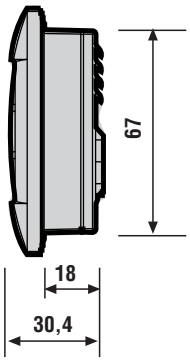
RTE with heat generators G150 kW (In this position is displayed the version with flat filters and left inspection)

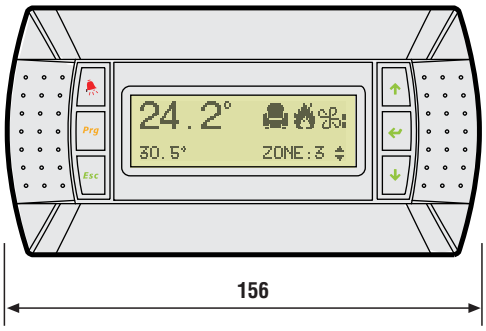
Form 150-kW generator of heat supplied with:
- Combustion chamber condensing heat exchanger tube boilers;
- Modulating gas burner premixed methane;
- Insulated stainless steel flue terminal anti reflux provided in support;
- Conversion kit to LPG;
- Electronic controller and safety thermostats.

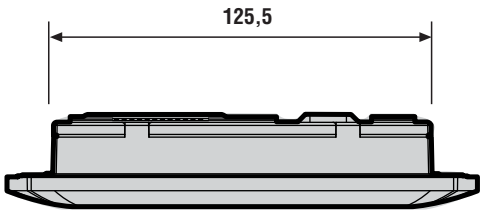


PR2 Remote panel (accessory)

The graphic display is an electronic device that allows for the complete management of the graphics through the display of icons (defined at the level of software application development) and the management of two dimension international fonts: 5x7 e 11x15 pixel. The application software is only resident on the card. The terminal does not need any additional software in the usage phase. In addition, the terminal offers a wide range of operating temperature and in the wall built-in version, the front guarantees a high degree of electrical protection (IP65).







Installing and using the unit

Packaging

The RTE series units are usually supplied without packaging with the exception of high-efficiency filtering cells and assembly accessories, which are supplied in cardboard boxes and have to be installed by the customer. Upon request, the units can be supplied packaged with polyethylene fim on pallets + polyethylene film, in a cage or in a crate.

Handling

Before moving the unit make sure that it has not been damaged during transport and make sure that the equipment to be used for lifting and positioning is adequate in terms of capacity and complies with security regulations currently in force.
Particular attention must be paid to all the loading, unloading and lifting operations so as to avoid dangerous situations for people and damage to the structure and operational parts of the machine.
The holes in the base to be used for lifting are indicated with yellow stickers showing a black arrow.
The iron poles, which must be suitably sized, must protrude from the base unit for a sufficient length so that the lifting straps can be tightened upwards without encountering any interference.
Make sure that the belts have been approved for supporting the weight of the unit, make sure they are properly fixed to the upper frame and to the lifting poles. The safety closures must guarantee that the belts do not come out of their seats.
The hooking point of the lifting frame must be on the vertical of the centre of gravity.
The positioning must be done using two transpallet, one for each side of the section, preferably acting on the longer sides.
Alternatively the positioning can be done by sliding the centre on the tubes that act as rollers.
During lifting operations we recommend to mount the shock absorbers (VT), fixing the holes on the base according to the assembly accompanying the accessories (VT).
Under no circumstance should anybody or anything stay, even for short periods, under the unit.
The machines in the RTE series must be installed externally in an area suitable for this purpose, which has the required technical spaces. This is essential to allow ordinary and extraordinary maintenance and for functioning reasons as the device must gather air from the outside along the perimeter sides and expel it upwards. For the proper functioning of the unit, this must be installed on a perfectly flat surface. Make sure that the resting surface is able to bear the weight of the machine.

Positioning

If the unit is situated in particularly windy environments it is necessary to install a wind break barrier to avoid unstable operation of the DCPR device.

Minimum space requirements

CAUTION:
The equipment must be installed in such a way as to make maintenance and/or repair operations possible, see fig.05. The equipment warranty does not cover costs due to motor ladders, scaffolding or other raising systems made necessary to carry out the operations covered by the guarantee.

Before commissioning the unit

Before starting up the unit you should check that :
– the electrical connections have been made properly;
– the line voltage is within the admitted tolerance limits (±10% of the rated value);

WARNING:
At least twenty-four hours before the unit start-up (or at the end of each period of prolonged stop) power up the compressors crankcase heaters to evaporate any refrigerant in the oil. Without this precaution the compressors could be seriously damaged and the warranty could cease to be valid.

Unit start-up

Commissioning the units must be previously agreed on the basis of the timing for the realisation of the installation.
Before the intervention of AERMEC After Sales Service all the works (aeraulic, hydraulic and electrical connections, loading and blowing out of air from the system) will have to be completed.
For the setting of all the operating parameters and for detailed information regarding the operation of the machine and check list, refer to the user's manual.

System charge/discharge

During the winter period, only in the case of water coils, if the system is left still, the water in the heat exchanger might freeze and damage the heat exchanger irreparably.
To avoid the risk of freezing, there are three possible solutions:
1) The complete drainage of the water from the heat exchanger at the end of the season and refilling at the beginning of the next season.
2) Operation with glycol water with a glycole percentage chosen on the basis of the minimum external temperature expected. In this case, due account must be taken of the heating coil performance and pump scaling.
3) Keeping the temperate of the water above 5°C.

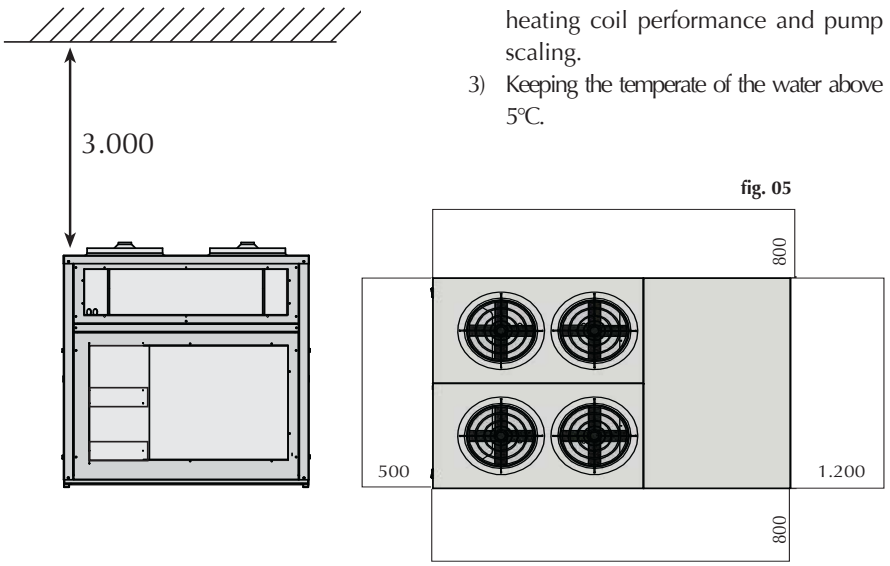


fig. 05

Norms covering the use of R410A gas

Rooftop units functioning with refrigerating R410A gas require particular attention at the assembly stage and during maintenance so as to keep them from malfunctioning.
It is therefore necessary:

- To avoid refilling with oil different from the one specified which is already pre-charge in the compressor.
- If there are gas leaks implying that the Rooftop units are even partially empty, do not refill the refrigerant partly but completely drain the machine and after evacuating it completely fill it again with the amount required.
- **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 case of substitution of the compressor, complete the installation within the above mentioned times after removing the rubber caps.**
- Do not power up the compressor if it is empty; do not compress air inside the compressor.
- If you use R410A gas tanks, please pay attention to the maximum number of withdrawals you can make in order to ensure the correct ratio of the components in the R410A gas mixture.

Hydraulic connections Condensate drain pain

The condensate drain pan has a threaded drain pipe 1" G UNI 338.
The drainage system should feature an adequately sized siphon to:

- allow the free drainage of the condensate;
- prevent the undesired inlet of air in the vacuum systems;
- prevent the undesired air leakage from pressure systems;
- prevent bad smells or insects from infiltrating.

Here below you will find rules to adopt for the dimensioning and creation of syphons in the case of pressure and vacuum tanks fig.06.

Negative pressure:
H1 = 2P
H2= H1 / 2
Positive pressure:

H1 = 2P
H2= H1 / 2

where P is the internal pressure expressed as mm of a water column (approx. 1 mm = 9.81 Pa), This pressure is indicated in the relevant label near the condensate drainage point. The syphon must be equipped with a plug for the cleaning at the bottom or must anyway allow for fast dismantling for cleaning purposes.

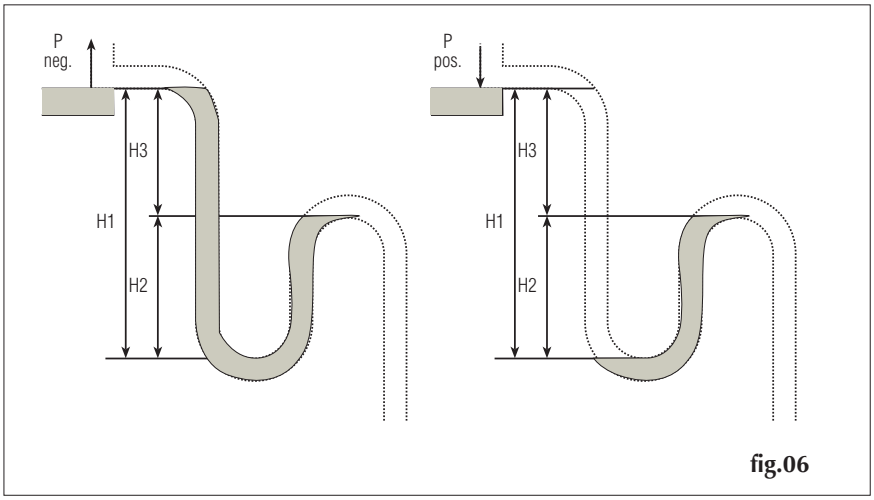


fig.06

G072, G92, G150 gas supply system

For this system, use CE-approved and certified components only.
G072, G105, G150 modules are supplied with:

- a double gas valve;
- a gas filter and stabiliser;

already installed.
All components are assembled into the burner housing.
To complete installation in compliance with the law, the following components have to be installed:

- vibration damping joint;
- gas cock.

We recommend installing a gas filter with a high flow rate and no pressure stabiliser. In fact, the standard filter installed before the gas valve has a limited surface.

To assure efficient maintenance, use a gasket and a swivel joint to connect the G072, G92, G150 module.

Do not directly use threaded joints on gas fitting.
The law allows a maximum pressure of 40 mbar inside the building or thermal plant. Higher pressure values shall be reduced before the room where the G072, G105, G150 module is installed.

KEY	
1	Main burner gas solenoid valve
2	Pilot burner gas solenoid valve valve
3	Pressure stabiliser
4	Safety solenoid valve
5	Gas filter (small section)
6	Vibration damping joint
7	Gas filter (large section)
8	Gas cock

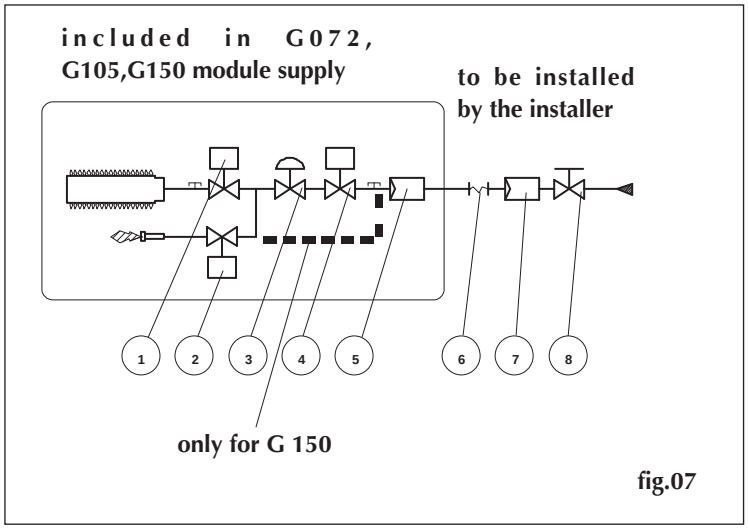


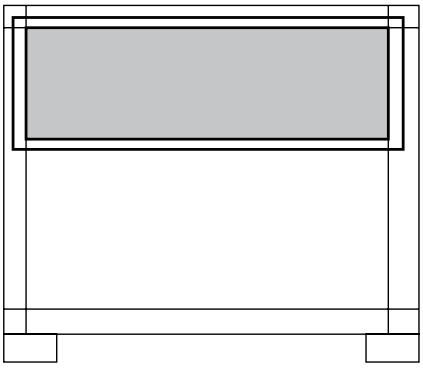
fig.07

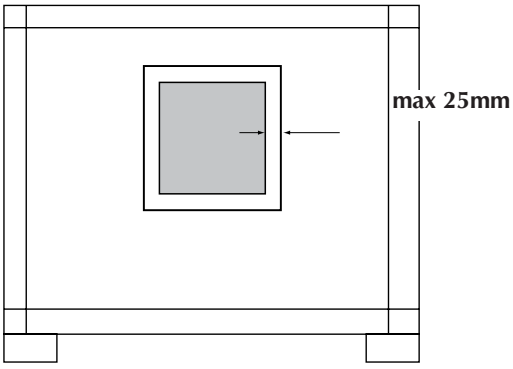
Connection aeraulic

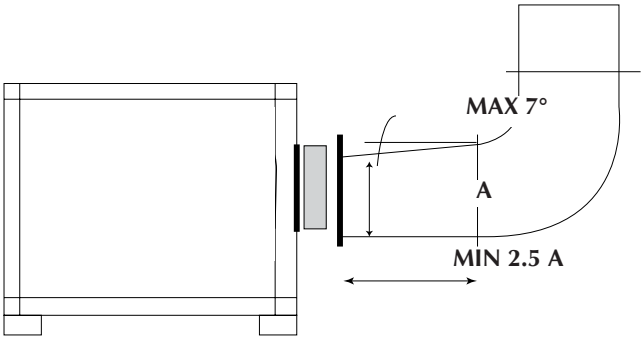
For the installation of the ducts it is recommended to:

- install adequate brackets to support the ducts;
- connect the supply and exhaust vents to the ducts by means of antivibration canvases. The antivibration canvas has to be connected to the unit screwing it to the flange or damper, if present. If the flange or the damper are not present, the antivibration canvas has to be screwed to the frame of the unit using drive screws;
- put in place an electrical earthing cable that acts as a bridge over the shock absorber joint to guarantee electrical equipotentiality between the duct and the unit;
- foresee, before bends, branches, curves, angles etc., the supply duct with a straight stretch at least 2.5 times longer than the smaller side of the duct (A) to avoid a fall off in the performance of the fan;
- avoid the ducts from having stretch inclinations that diverge more 7°C.

The progress of the first curve must conform with the orientation of the fan. it to the flange or damper, if present.

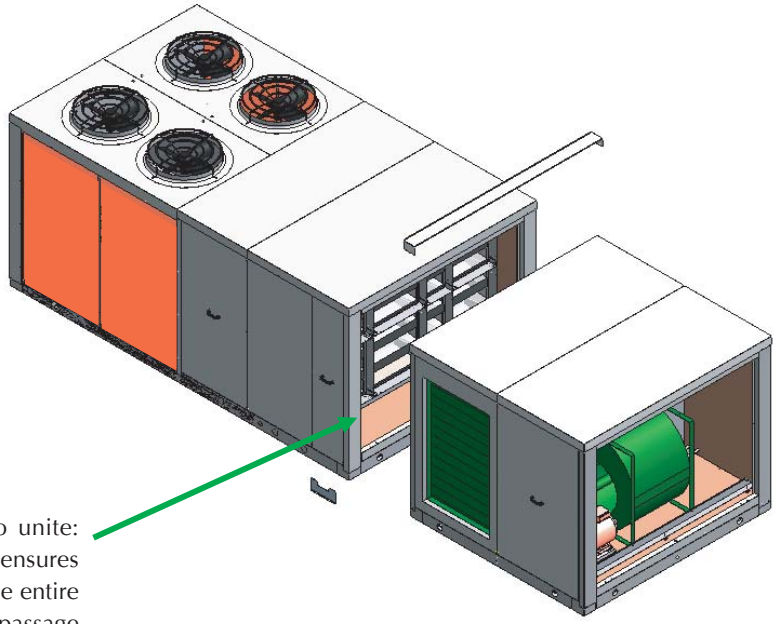






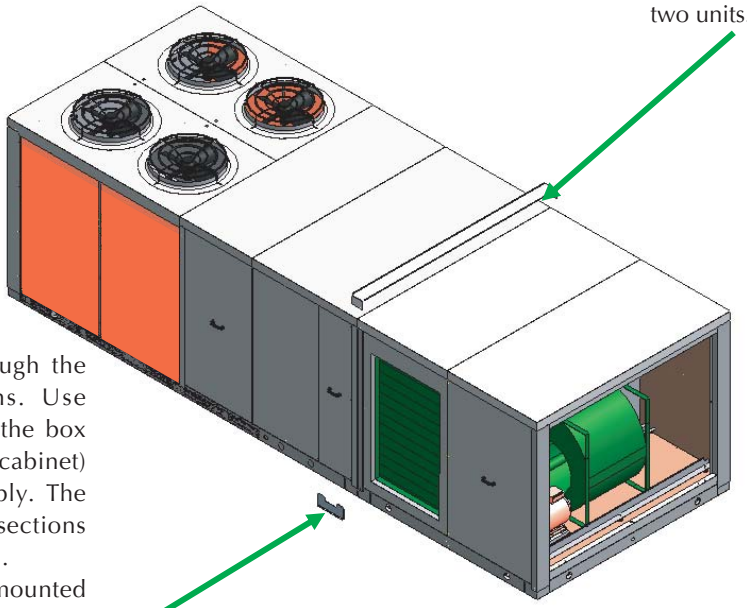
Joining RTE sections

The figure illustrates how joinign two sections. It is referred to a tree way mixing box, but its the same for the recovery unit or the or the condensation heat generator.



Place the sections to unite: the rubber seal that ensures the seal is fit along the entire perimeter of the air passage of the section upstream.

Before placing the Tegolino union sections, apply silicone sealant along the entire length at the bottom where it supports the roofs of the two units.



Be aware to pass through the electrical connections. Use the brakets (placed in the box inside the compressor cabinet) to complete the assembly. The gap between the two sections should be about 10 mm .
Apply the governing (mounted temporarily on the roof of the section upstream) and plates provided in support (in the compressor compartment) at the base.

Improper use

The equipment is designed and constructed to guarantee the maximum security in the immediate proximity as well as to resist atmospheric agents. The fans are protected from undesired intrusion of bodies by protection grilles.
The accidental opening of the electrical panel with the machine in operation is prevented by the door lock sectioning device.
Avoid laying tools or heavy objects on the side heat exchanger coils to avoid ruining the fin pack.

Do not introduce objects or allow them to fall through the grilles of the fan motors.

Do not rest on the heat exchanger coils: sharp surfaces.

Important information

The machine must not exceed the pressure and temperature limits indicated in the table shown in the "Operating limits" section.
Correct functioning is not guaranteed after a fire; before starting up the machine again, contact an authorised after sales centre.

The machine is provided with safety valves that in the case of excessive pressure may discharge hot gases into the atmosphere.

Wind, earthquakes and other natural phenomena of exceptional intensity are not taken into consideration.
If the unit is used in aggressive atmosphere or with aggressive water please consult the head office.

Following extraordinary maintenance carried out on refrigeration circuits, with the replacement of components, carry out the following operations before starting the machine again:

1. Pay the greatest attention when restoring the refrigerating load indicated on the machine nameplate;
2. Open all the taps on the refrigerating circuit;
3. Correctly connect the electrical power and the grounding;
4. Check the plumbing connections;
5. Check that the condenser coils are not dirty or clogged;
6. Check the proper rotation of the fans;

Electrical wiring

The unit is completely wired in the factory and to be set in motion it needs to be powered electrically in accordance with the information on the nameplate, intercepted with on-line protection devices.
It is the responsibility of the installation engineer to dimension the power line adequately in accordance with the length, type of cable, input power and current of the unit and the physical deployment.
All the electrical connections must correspond with the regulations currently in force at the moment of installation.

WARNING:
For installation requirements, please refer to the wiring diagram supplied with the unit.

CAUTION:
Check that all power cables are correctly secured to the terminals when switched on for the first time and after 30 days of use. Then check the tightening of all the power terminals twice a year. Loose terminals could cause the cables and components to overheat.

NOTE:
Input cuttent ivalues n the table are referred to the standard unit. The choice of some accessories could change this value. For the real input current of the unit, please refer to the electrical diagram provided with the unit.

Size		240	260	300	350
Max. compress. absorption	[kW]	12x2	15x2	18x2	18+24
	[A]	20x2	26x2	30x2	30+39
Delivery fan	[A]	8,1	10,9	14,4	18,3
Condensation fan (tot.)	[A]	9,6	9,6	9,6	10,4
Return fan (optional)	[A]	4,8	6,5	10,9	14,4

Size		240	260	300	350
SECT. A	[mm^2]	35	35	50	70
SECT PE	[mm^2]	25	25	25	35
IL	[mm^2]	100	100	125	160

Cross sections recommended for a maximum length of 50m. The cross section of the wires and the scaling of the line cutouts are purely approximate.

Legend:
Cross sect. A = Power line
Cross sect. PE = Ground line
IL = Differential magnetothermal switch
AC23A CEI EN 60947

TAV.3

Security

The machine has been designed so as to reduce to a minimum the risks for the safety of those persons interacting with it. During the design phase, it was not technically possible to completely eliminate the risk causes. Therefore it is imperative to refer to the following instructions.

Access to the unit

Access to the unit once it has been installed must only be permitted to qualified operators and technicians. The operator is a person who has been authorized by the owner of the machine to carry out operations on the machine (in accordance with that indicated in the present manual). The technician is a person authorized by AERMEC or subordinate under their own responsibility by a AERMEC distributor, to carry out operations on the machine. The owner of the machine is the legal representative of the company, entity or individual owner of the system in which the AERMEC machine is installed.
These persons are responsible for the observance of all safety standards indicated in the present manual and the existing. law.
In the event that access by unauthorized persons to the machine cannot be prevented due to the nature of the location in which it is installed, a cordoned area must be defined around the machine and at least 1.5 meters from the external surface, inside of which only operators and technicians are permitted.

Residual risks

The installation, start-up, shutdown and maintenance of the machine must be carried out in accordance with that stipulated in the technical documentation of the product and in such a manner that no hazardous situations are generated.

CONSIDERED PART	RESIDUAL RISK	METHOD	PRECAUTIONS
Heat exchange coil	small cuts	contact	avoid contact with eyes, use protective gloves
Fans grille and fan	injuries	Insert sharp objects through the grille while fan is operating	Insert any objects inside fans grille and not put objects on grilles
Inside the unit: compressor and supply tube	severe burns	contact	avoid contact with eyes, use protective gloves
Inside the unit: metal parts and electrical cables	intoxication, electrocution, severe burns	insulation defect of the power supply cables upstream of the unit's electric panel; metal parts under voltage	suitable electrical protection of the power supply line; maximum care when earthing the metal parts
Outside the unit: area around the unit	intoxication, severe burns	fire due to short circuit or overheating of the power supply line upstream of the unit's electric panel	cable section and power supply line safety system conforming with existing laws.

Unit maintenance

The ordinary maintenance must be performed by qualified people each month and consists in simple operations.

WARNING:

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.

The compressors upper part and the supply tube are at high temperature: pay particular attention when working around them.

Pay particular attention when operating around the fins coils as fins are particularly sharp.

Not extract the fans protection grille before having taken away the voltage to unit; not put foreign objects through the fans protection grille.

After maintenance operations always close the unit by means of the specific panels, fixing them with screws.

The following table illustrates the operations related to monthly maintenance of each component, indicating the control type to carry out. The month frequency is indicative and can change according to work and environmental conditions in which the roof top unit operates

MONTHLY MAINTENANCE PROGRAM	
FANS	Check the input. Check that the fans motor free rotate without abnormal noises. Make sure that the bearings do not heat too much. Check the fans screws fastening to grille and structure grille.
Check that the fans motor free rotate without abnormal noises.	Verify the condensate coils. To grant a correct heat exchange, coils must be cleaned. It is necessary to provide for the removal of possible dust collected on the surface due to airflow. Take away paper, leaves etc.. and clean fins with air jet. To avoid damages to aluminum fins it is necessary that the air jet is direct perpendicularly to coil surface. The cleaning operation must be performed by particular attention as the coil fin is easy to damage (aluminum from 0,12 mm). If fins are damaged, it is necessary to provide for a suitable arrangement with a specific tool. Before performing operations on the coils it is necessary to use protective gloves as the possible contact with fins can cause small cuts.
Make sure that the bearings do not heat too much.	Check the evaporation and condensate pressures (by a specialized technician). It is necessary to remove compressors panels and to connect with pressure gauges on the suitable pressure sockets placed in the cooling circuits. Check the compressor absorbed current, the supply temperature and the presence of possible noises. Check the proper refrigerant charge by means of the liquid light. Verify the correct setting of the expansion valve (overheating 5 ÷ 8°C). Verify that the oil level indicated in the compressor light is not lower than the minimum. Check the use of the safety devices (pressure switches).
Check the fans screws fastening to grille and structure grille.	Check the electric supply on all phases. Make sure that electrical connections are adequately closed. Verify that the supply electric cable of the unit does not present alterations which can harm the insulation. Verify the proper screws blocking which fix the conductors to the electrical components present in the electric panel in order to grant a proper electrical connection; the same is for the earthing connections.
CONDENSATE	• Check the operation of the control device, LEDs and display.
COILS	Verify the condensate coils. To grant a correct heat exchange, coils must be cleaned. It is necessary to provide for the removal of possible dust collected on the surface due to airflow. Take away paper, leaves etc. and clean fins with air jet. To avoid damages to aluminum fins it is necessary that the air jet is direct perpendicularly to coil surface.
	The cleaning operation must be performed by particular attention as the coil fin is easy to damage (aluminum from 0,12 mm). If fins are damaged, it is necessary to provide for a suitable arrangement with a specific tool.
	Before performing operations on the coils it is necessary to use protective gloves as the possible contact with fins can cause small cuts.
C O O L I N G CIRCUIT	Check the evaporation and condensate pressures (by a specialized technician).
	It is necessary to remove compressors panels and to connect with pressure gauges on the suitable pressure sockets placed in the cooling circuits.
	Check the compressor absorbed current, the supply temperature and the presence of possible noises.
	Check the proper refrigerant charge by means of the liquid light.
	Verify the correct setting of the expansion valve (overheating 5 ÷ 8°C).
	Verify that the oil level indicated in the compressor light is not lower than the minimum.
	Check the use of the safety devices (pressure switches).
E L E C T R I C A L CIRCUIT	Check the electric supply on all phases.
	Make sure that electrical connections are adequately closed.
	Verify that the supply electric cable of the unit does not present alterations which can harm the insulation.
	Verify the proper screws blocking which fix the conductors to the electrical components present in the electric panel in order to grant a proper electrical connection; the same is for the earthing connections.
CONTROL	Check the operation of the control device, LEDs and display.

Diagnosis and fault solving

PROBLEM	CAUSE	SYMPTOM	SOLUTION
1. SUPPLY AIR TEMPERATURTE HIGHER THAN FORESEEN	1. Heat power too high	- The air temperature on supply is higher than the foreseen value	- Decrease the heat power, decreasing the flow rate or the air inlet temperature
	2. Room temperature too high	See 2.1.	- Avoid air recirculation on condenser. Facilitate the fresh air flow.
	3. Condensers fins clogged	See 1.1.	- Clean the condensers fins
	4. Condensers front surface obstructed	See 1.1.	- Liberare la superficie frontale del condensatore ostruita
	5. Fan rotates in the opposite direction	See 1.1.	- Invert the position of two fans phases
	6. No refrigerant in the cooling circuit	- Low evaporation pressure - Presence of air bubbles in the liquid lights	- Search the refrigerant leakages (by a specialized technician) and avoid them. - Realize the recharge (by a specialized technician)
2. INSUFFICIENT COOLING CAPACITY	1. Insufficient refrigerant charge	- The cooling circuit operates properly, but with insufficient capacity	See 1.6.
	2. Room temperature too high	See 2.1.	- Avoid air recirculation on condenser. Facilitate the fresh air flow.
3. ABNORMAL NOISE	1. Vibrations in the ducts	- The unit noise is higher than normal	- Properly fix the ducts with brackets
	2. Loud compressor	See 3.1	- Verify and eventually replace
	3. Loud expansion valve	See 3.1	- Verify. Add refrigerant if necessary. Replace it if necessary.
4.INTERVENTION OF THE LOW PRESSURE SWITCH	1. Pressure switch out of use	- The compressors stop	- Verify and replace the pressure switch.
	2. Unit completely empty	See 4.1.	See 1.6.
	3. Refrigerant filter clogged	See 4.1.	- Verify and replace the filter
	4. The expansion valve does not operate properly	See 4.1.	- Verify, clean, eventually replace
	5. Room temperature too low	See 4.1.	- Install the condensate control kit

PROBLEM	CAUSE	SYMPTOM	SOLUTION
5. INTERVENTION OF THE HIGH PRESSURE SWITCH	1. One or many fans can't operate	- The compressor does stop - Intervention of the general alarm	- Repair or replace fans/ fan
	2. Pressure switch out of use	See 5.1.	-Verify and replace the pressure switch
	3. Excessive refrigerant charge	See 5.1.	- Discharge the gas in excess
	4. Gas presence impossible to condensate in the cooling circuit	See 5.1.	- Recharge it after the unit discharge
	5. Condensate coil not sufficiently run over the from air	See 5.1.	- See 1.3, 1.4, 1.5
	6. Clogged refrigerant filte	See 5.1.	- Verificare e sostituire il filtro
	7. Room air temperature too high	See 5.1.	- Verify and replace the filter
	8. Hot air recirculation caused by wrong installation	- Air outlet temperature from coil higher than max. values permitted	- Avoid the recirculation causes respecting the minimal distances to wall as indicated in the imensional schemes or avoid that the condensate coils are run over the hot air.
6. COMPRESSORS FAULTS	1. Defective compressor	-The compressor does not restart	- Replace the compressor
	2. Absence of a safety device	See 6.1	-See par. 5 and 6
	3. Defective connection or open contacts	See 6.1	- Verify the voltage and close the contacts
	4. Power circuit open	See 6.1	- Find the intervention cause of protection, close the compressor automatic
	5. Compressors not under voltage	See 6.1	- Check the voltage. Close the compressors
	6. Compressors defective actuator	- The compressor starts and stops	- Verify and eventually replace
7. EXPANSION VALVE FAULTS	1. Expansion valve too closed: excessive gas overheating at evaporator outlet	- Compressor too hot	- Open the expansion valve to decrease the overheating
	2. Expansion valve too open: the system operates with overheating too low. Compressors liquid return.	- Compressor too cool and loud	- Close the expansion valve to increase the overheating
	3. Expansion valve broken: discharged bulb or blocked stem	- Low evaporation pressure	- Replace the valve
8. DRIER FILTER FAULTS	1. Drier filter clogged	- Compressors suction pipe frosted - Bubbles in the flow light - Liquid pipe more cool at drier filter outlet	- Clean or replace the filter

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