

RT4D

20 ÷ 380



English

Français

Deutsch

Italiano

Español



16.2
↓
207.8



13.1
↓
166.8



4 DAMpER DuAl FLux AIR c ONDITIONER
cl IMATIsEu R DOu Bl E FLux à 4 R EGIsTREs D'AIR

IOM RT 05-N-1GBF

Part number / Code / Teil Nummer / Codice / Código : **3990523**

Supersedes / Annule et remplace / Annulliert und ersetzt /

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INsTAIL ATION INsTRuc TION

NOTICE D'INSTALLATION

INSTALLATIONSHANDBUCH

ISTRUZIONI INSTALLAZIONE

INSTRUCCIONES DE INSTALACIÓN

English

Français

Deutsch

Italiano

Español

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**POWER supply MUST BE
SWITCHED OFF
BEFORE STARTING TO
WORK IN THE ELECTRICAL
CONTROL BOX**

GENERAL RECOMMENDATIONS

Please read the following safety precautions very carefully before installing the unit.

SAFETY DIRECTIONS

Follow the safety rules in force when you are working on your appliance.

The installation, commissioning and maintenance of these units should be performed by qualified personnel having a good knowledge of standards and local regulations, as well as experience of this type of equipment.

Given the requirements of pressurising the system and the high current draws involved, this roof-mounted air conditioning should only be installed by qualified personnel.

The unit should be handled using lifting and handling equipment appropriate to the unit's size and weight.

Given the high refrigerant temperatures present at certain points in the cooling circuit, access to the area protected by the panels is strictly reserved for qualified personnel only. These panels are easily opened with a special tool. This tool should be kept by the installers or by the maintenance company.

Any wiring produced on site must comply with the corresponding national electrical regulations.

Make sure that the power supply and its frequency are adapted to the required electric current of operation, taking into account specific conditions of the location and the current required for any other appliance connected with the same circuit.

The unit must be EARTHED to avoid any risks caused by insulation defects.

It is forbidden to start any work on the electrical components if water or high humidity is present on the installation site.

WARNING

Cutoff power supply before starting to work on the appliance.

When making the hydraulic connections, ensure that no impurities are introduced into the pipe work.

The manufacturer declines any responsibility and the warranty becomes void if these instructions are not respected.

If you meet a problem, please call the Technical Department of your area.

If possible, assemble the compulsory or optional accessories before placing the appliance on its final location. (see instructions provided with each accessory).

In order to become fully familiar with the appliance, we suggest to read also our Technical Instructions.

-The informations contained in these Instructions are subject to modification without advance notice.

Equ IpMENT sAFETY DATA

Safety Data	R407C
Toxicity	Low
In contact with skin	Liquid splashes or sprays may cause freeze burns. Unlikely to be hazardous by skin absorption. However, R407C may be slightly irritant and, if liquid, it has a strong degreasing effect. Flush contaminated skin areas with running water. If it comes into contact with wet fabrics, the liquid refrigerant will cause them to freeze and adhere to the skin. Carefully remove the contaminated clothing since it might adhere to the skin and cause freeze burns. Contact a doctor if the affected skin areas are reddened or irritated.
In contact with eyes	Vapours have no effect. Liquid splashes or sprays may cause freeze burns. In these cases rinse your eyes with running water or with a solution for eye lavages for at least 10 minutes. Immediately contact a doctor.
Ingestion	Very unlikely to occur. If this should be the case, it may cause freeze burns. Never induce vomiting. Keep the patient awake. Make it rinse its mouth with running water and make it drink about 1/4 of a litre. Immediately contact a doctor.
Inhalation	R407C: High concentration levels of its vapours in the air can produce an anaesthetic effect, including the loss of consciousness. Particularly severe exposures may cause heart arrhythmia and sometimes prove to be also fatal. At high concentrations there is a danger of asphyxia due to a reduced oxygen content in the atmosphere. In these cases take the patient to the open air, in a cool place and keep it at rest. Administer oxygen, if required. Apply artificial respiration if breathing has ceased or if it has become irregular. In case of heart failure immediately apply cardiac massage. Immediately apply to a doctor.
Further Medical Advice	A symptomatic and supportive therapy is generally suitable. A heart sensitisation has been observed in some cases, as a result of exposures to particularly high concentrations. In the presence of catecholamines (such as for example adrenaline) in the blood flow, it has increased the irregularity of the cardiac rhythm and then caused the heart failure.
Long-term exposure	R407C: A lifetime study which has been conducted on the effects inhalation may have on rats at 50,000 ppm has shown the onset of benign tumours of the testicle. These remarks suggest that there is no danger for human beings if they are exposed to concentrations below the occupational limits or equal to them.
Occupational exposure limits	R407C: Recommended limits: 1,000 ppm v/v 8 hours TWA.
Stability	R407C: Not specified.
Conditions to avoid	Use in the presence of exposed flames, red heat surfaces and high humidity levels.
Hazardous reactions	Possibility of violent reactions with sodium, potassium, barium and other alkaline substances. Incompatible materials: magnesium and all the alloys containing over 2% of magnesium.
Hazardous decomposition products	R407 C: Halogen acids deriving from thermal decomposition and hydrolysis.
General precautions	Avoid the inhalation of high concentrations of vapours. The concentration in the atmosphere shall be kept at the minimum value and anyway below the occupational limits. Since vapours are heavier than air and they tend to stagnate and to build up in closed areas, any opening for ventilation shall be made at the lowest level.
Breathing protection	In case of doubt about the actual concentration, wear breathing apparatus. It should be self-contained and approved by the bodies for safety protection.
Storage Preservation	Refrigerant containers shall be stored in a cool place, away from fire risk, direct sunlight and all heat sources, such as radiators. The maximum temperature shall never exceed 45°C in the storage place.
Protection clothes	Wear boots, safety gloves and glasses or masks for facial protection.
Behaviour in case of leaks or escapes	Never forget to wear protection clothes and breathing apparatus. Isolate the source of the leakage, provided that this operation may be performed in safety conditions. Any small quantity of refrigerant which may have escaped in its liquid state may evaporate provided that the room is well ventilated. In case of a large leakage, ventilate the room immediately. Stop the leakage with sand, earth or any suitable absorbing material. Prevent the liquid refrigerant from flowing into drains, sewers, foundations or absorbing wells since its vapours may create an asphyxiating atmosphere.
Disposal	The best procedure involves recovery and recycle. If this is not possible, the refrigerant shall be given to a plant which is well equipped to destroy and neutralise any acid and toxic by-product which may derive from its disposal.
Combustibility features	R407C: Non flammable in the atmosphere.
Containers	If they are exposed to the fire, they shall be constantly cooled down by water sprays. Containers may explode if they are overheated.
Behaviour in case of fire	In case of fire wear protection clothes and self-contained breathing apparatus.

INSPECTION AND STORAGE

At the time of receiving the equipment carefully cross check all the elements against the shipping documents in order to ensure that all the crates and boxes have been received. Confirmation of the type of unit ordered can be obtained by reading the maker's plate (capacity, type and air blowing configuration).

Inspect the units for any visible or hidden damage.

Check the air flow configuration (supply/return).

In the event of shipping damage, write precise details of the damage on the shipper's delivery note and send immediately a registered letter to the shipper within 48 hours, clearly stating the damage caused. Forward a copy of this letter to the manufacturer or their representative.

Never store or transport the unit upside down or side-way. Protect unit at the job site from damages made by others. When unit is stored on the ground, avoid mud store unit leveled.

INSPECTION OF PACKING

Check the content of the cardboard box placed inside the Return Air Section and compare with the features ordered.

Check the content of the documentation bag including:

- Wiring diagram
- Parameter list
- Spare part list
- Instruction concerning the Return Air Pressure sensor
- Installation and Maintenance manual

WARRANTY

The appliances are delivered fully assembled, factory tested and ready to operate.

Any modification to the units without the manufacturer's prior approval, shall automatically render the warranty null and void.

The following conditions must be respected in order to maintain the validity of the warranty:

- Commissioning shall be performed by specialised technicians from technical services approved by the manufacturer.
- Maintenance shall be performed by technicians trained for this purpose.
- Only Original Equipment spare parts shall be used.
- All the operations listed in the present manual shall be performed within the prescribed schedule.

INSTRUCTIONS FOR FILLING IN THE "START-up FORM"

(SEE APPENDIX)

It is the responsibility of the OWNER or contractor to ensure that the "Start-up Form" is fully filled in by the authorized Service Centre and sent by registered mail - notified in advance by fax - to the After-Sales Service of the manufacturer within 8 days of the initial start-up.

Failure to receive the form from the contractor will render the guarantee null and void.

The OWNER must then keep the logbook for at least the duration of the guarantee.

The manufacturer reserves the right to request a copy of the "Machine Logbook" at any moment whatsoever. Failure to fill in the logbook may render the guarantee null and void.



THE WARRANTY SHALL BE NULL AND VOID IN THE EVENT OF NON-COMPLIANCE WITH ANY OF THE ABOVE CONDITIONS.

CONTENTS OF PACKAGE

RT4D

1 Installation and maintenance manual

1 Control manual

PRESENTATION

The machine has been designed for an outdoor mounted application, ensuring perfectly weatherproof circulation of the air within the compartments.

Packaged **RT4D** units are designed to safeguard the environment and reduce building energy consumption by the use of R407C as a refrigerant and double skin 50 mm panels for greater thermal insulation.

The units are factory charged and tested, and ready to install to permit quick and efficient commissioning.

A modular design enables the system to be adapted perfectly to the client's configuration. The present manual defines the characteristics of the basic package.

Note

This manual refers to standard unit configuration. It may not fulfil special configurations. In this case, contact your sales representative.

TECHNICAL SPECIFICATIONS

Models		20	40	60	80	100	140	180	240	280	380
Cooling capacity (1)	kW	16.2	29.2	33.4	50.4	58.4	83.9	103.9	150.7	167.5	207.8
Heating capacity (1)	kW	14.4	26	30.8	45.2	53.2	76.1	91.5	137.3	151.2	183.2
Number of circuit		1							2		
Compressor quantity		1				2			4		
Assembly type		Single				Tandem					
Refrigerant		R-407C									
Charge/circuit	kg	9.5	11.5	14	16	18	22	24	2 x 26	2 x 32	2 x 38
Capacity control	%	0-100			0-50-100				0-25-50-100		
Indoor blower		1							2		
Nominal indoor airflow	m³/h	2 000	4 000	6 000	8 000	10 000	14 000	18 000	24 000	28 000	38 000
Nominal ext. static pressure		250									
Motor power	kW	0.75	1.5	2.2	3	4	5.5	7.5	11	2 x 5.5	2 x 11
Outdoor blower		1	2						4		
Nominal ext. static pressure	Pa	220	170	250	240	250	220	175	185	240	180
Motor power	kW	0.7	2 x 0.7	2 x 1.1	2 x 1.45	2 x 2.7			4 x 2.7		

OPERATION LIMITS

Outdoor Air Temperature:

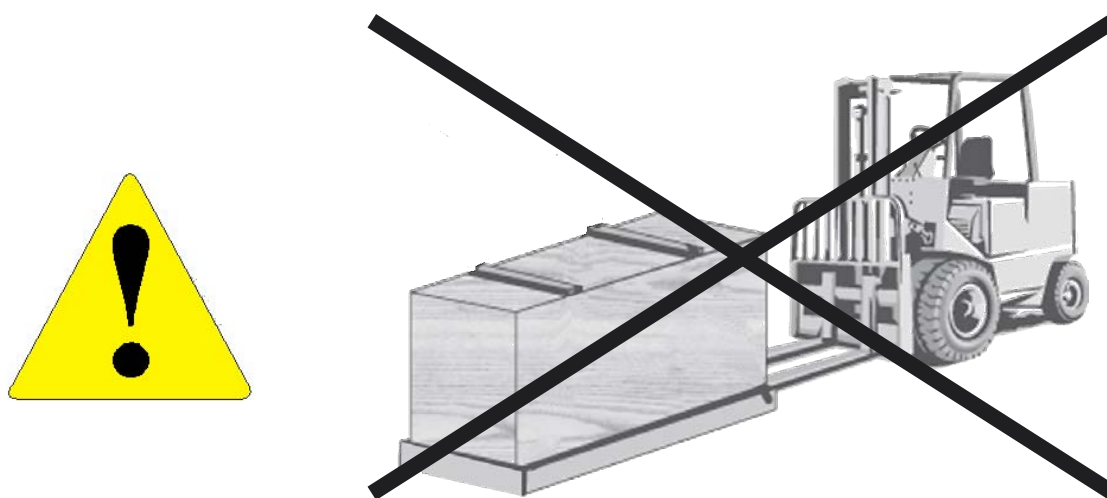
- Cooling mode : +18°C min to +42°C max
- Heating mode : -8°C min to +23°C max

DIMENSIONS

Models		20	40	60	80	100	140	180	240	280	380
Length	mm	3 200		3 940		5 400		6 400		7 750	
Width	mm	1 280		1 750		1 960		2 420			
Height	mm	1 150		1 420		1 880		2 420			

SEE Appendix

HANDLING



HANDLING WITH A FORKLI FT TRUCK PROHIBITED

Sling attachment points are provided for lifting:

- **RT4D** 20 to 80 : 4 slings
- **RT4D** 100 to 380 : 8 slings

Rings attached rigidly to the unit structure are intended for completely safe handling.

A sling spreader is required to avoid damaging the edges of the unit.

The sling spreader is supplied by the installer.

Remove lifting lugs after installation and replace bolts in the base frame of the unit.

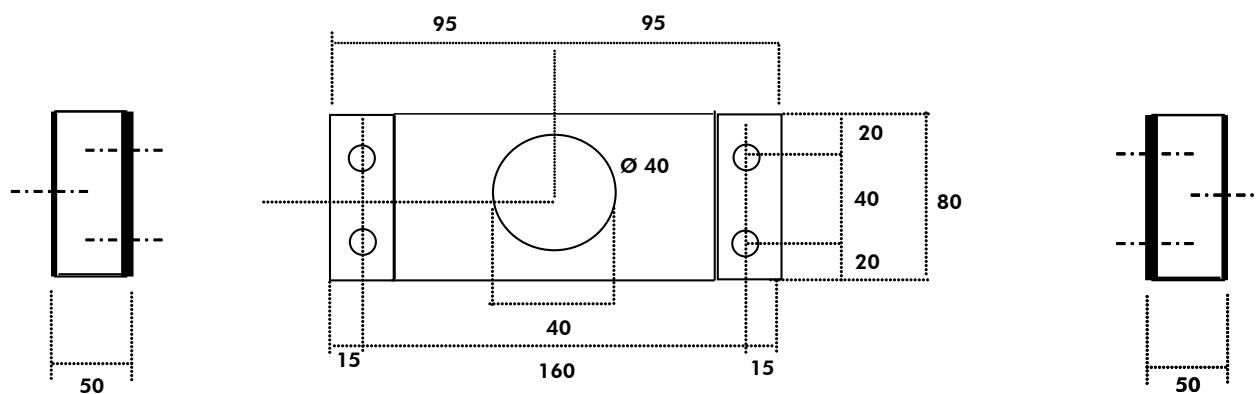
Note

Do not reduce the space H1 (see handling features appendix) between the sling spreader and the roof of the unit to avoid damaging the casing.

Do not open or remove panels or doors before and during the lifting operation.

SEE Appendix

LIFTING LUG DRAWING



HANDLING FEATURES

sEE AppENDIx

NET WEIGHT

Models		20	40	60	80	100	140	180	240	280	380
Weight	Kg	640	780	840	980	1 480	1 840	2 660	2 680	3 380	3 660
Accessories											
2 row hot water coil	Kg	22	64			85		112	155	185	
3 row hot water coil	Kg	29	82			116		162	212	270	
Gas heat	Kg	32	45	70	90		120	150	205		232

INSTALLATION



The unit is not designed to withstand weights or stresses from adjacent equipment, pipe work or constructions. Any foreign weight or stress on the unit structure could lead to a malfunction or a collapse with dangerous consequences for personnel and property. In such an event, the warranty shall be null and void.

PLACEMENT OF INSTALLATION AND REQUIREMENTS

- The building structure must be capable of carrying the weight of the unit during operation.
- The place of installation must not be subject to flooding.
- The **RT4D** should be installed on a flat, clean surface without any obstacles. The surface area must be sufficient to spread the weight of the unit over the building structure.
- Ensure that the recommended free clearances around the unit are maintained to avoid any risk of malfunctions.
- The installer is responsible for providing the waterproof seal between the building and the **RT4D**. The installer must be fully versed in the practice of roof mounted equipments and must comply with the recommendations and rules detailed in the Technical Directives.
- In order to avoid risk of condensation and energy losses, all outdoor ducting and piping must be insulated.
- The unit's tightness must not be deteriorated by power supply connections.

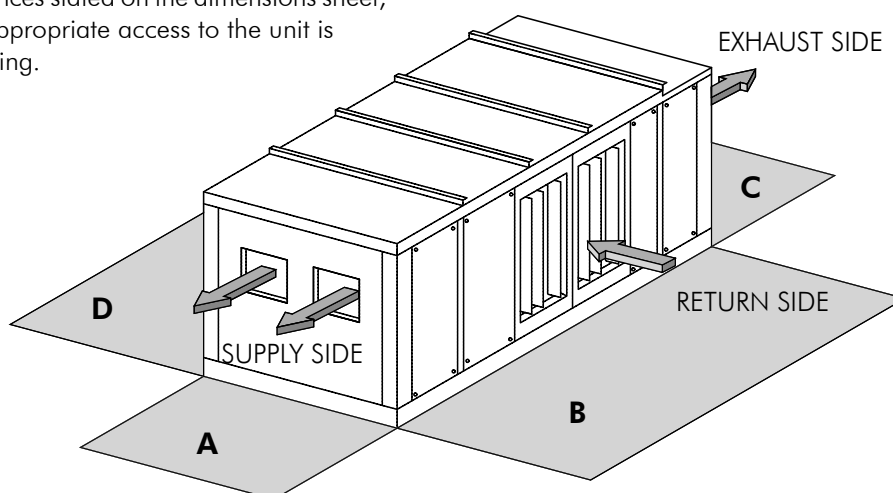


The unit supporting base shall be supplied as indicated in the manual. There could be a risk of personal injury or damage to property in the event of the unit being incorrectly supported.

CLEARANCE

The drawing below illustrates the minimum service clearances to be provided around the unit to ensure access and proper operation. Take particular care not to obstruct the outdoor coil to ensure proper air circulation through the appliance.

In addition to the service clearances stated on the dimensions sheet, it is imperative that safe and appropriate access to the unit is provided for repairs and servicing.



Models		20	40	60	80	100	140	180	240	280	380
A	mm	1 000									
B		1 500					2 000				
C	mm	1 500					2 000				
D	mm	1 500					2 000				

UNIT LOCATION

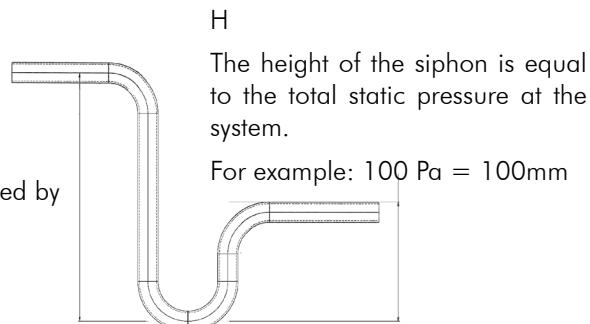
1. It must be high enough above the roof or ground to permit snow allowance and good drainage of water with siphon.
2. Keep duct installation outside the building to a minimum to reduce energy losses.
3. In addition to the service clearances noted above it is essential that provision is made for adequate and safe service access to the appliance.

CONDENSATE DRAIN PAN

There is one siphon for the indoor section and an other one for the outdoor section.

The siphons have to be provided by the installer.

Siphon to be supplied by others



The following heights are based on 250Pa external static pressure at nominal air flow.

We advise the use of ball siphon type TROX.

Models		20	40	60	80	100	140	180	240	280	380
INDOOR DRAIN PANEL											
Height	mm	294	390	345	449	332	447	354	420	439	440
Connection		3/4"			1"						
OUTDOOR DRAIN PANEL											
Height	mm	105	175	140	230	146	285	255	325	221	270
Connection		3/4"			1"						

CAUTION

For Heatpump models, where the outdoor temperature is likely to fall below +1°C, prevent the siphon from freezing (e.g. heating cord).

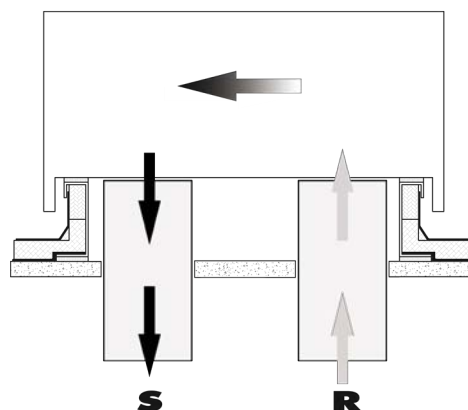
ROOF CURB

The main purpose of the roof curb is to provide weatherproof passage, supply and return air down to the building from the **RT4D**.

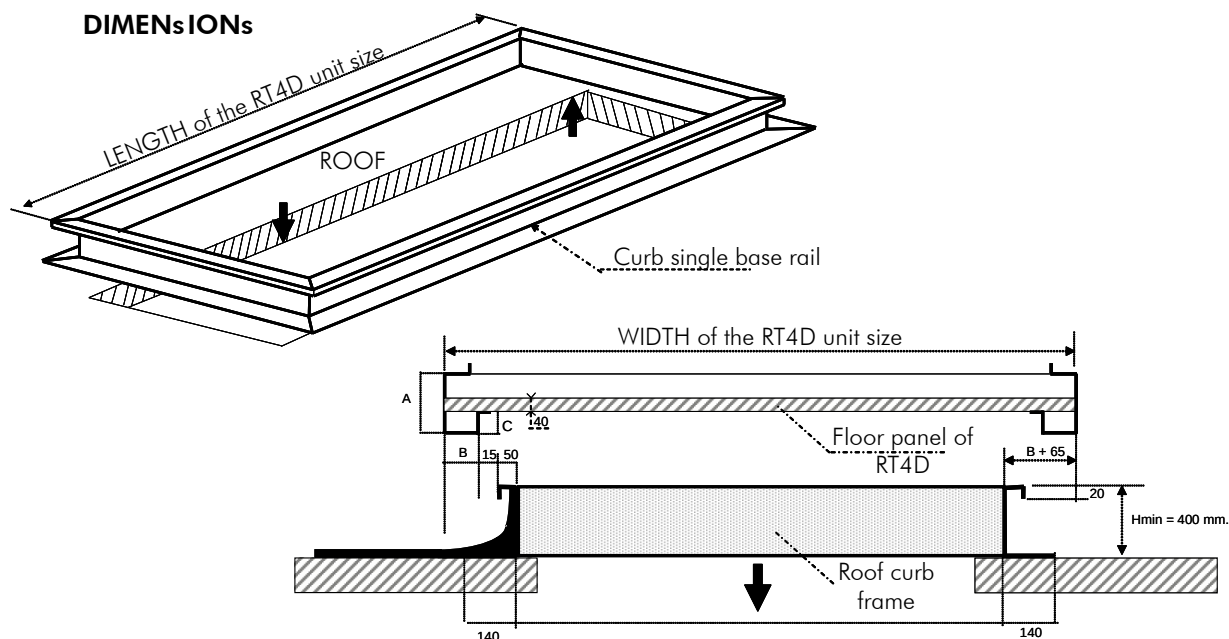
In this way, all connections (air, electricity) to the building are not installed above the roof. The curb provides a perfect roofing thermal insulation and weight distribution between the **RT4D** and the building.

The roof curb should be used for a downward configuration at supply and return air. It guarantees the perfect weathertight sealing between the building structure and the appliance.

The roof curb is supplied in one piece. It must be installed before the **RT4D**.



DIMENSIONS

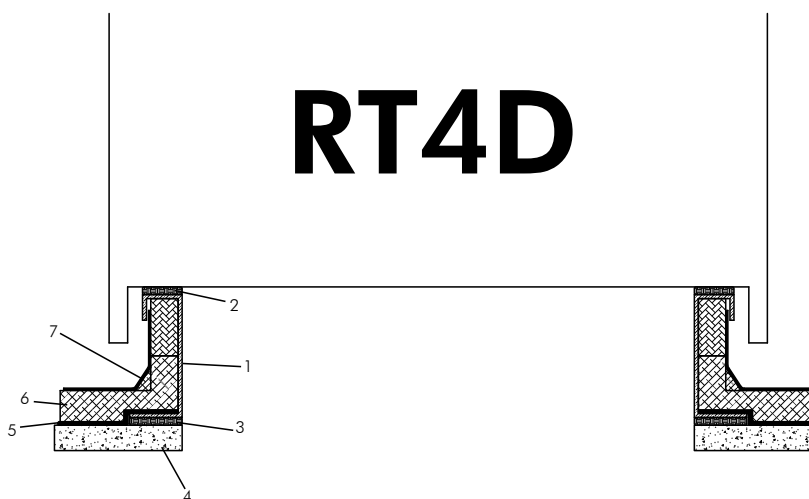


Models		20	40	60	80	100	140	180	240	280	380
Length	mm	3 200		3 940		5 400		6 400		7 750	
Width	mm	1 280		1 750		1 960		2 420			
A	mm	100				180					
B	mm	65				95					
C	mm	40				75					

The frame of the curb receiving the unit must be leveled. The unit must slot perfectly into the roof curb.

POSITIONING OF THE ROOF CURB ON THE ROOF (CUTAWAY VIEW)

1. Roof curb
2. Rubber seal (supplied with the roof curb)
3. Hard vibration-absorbent rubber (supplied by the others)
4. Concrete beam or roof structure
5. Vapour sealing film (supplied by the roofer)
6. Roof insulation (supplied by the roofer)
7. Sealant roofskin (supplied by the roofer)



In order to break thermal bridge between the roof curb and the unit, a seal (N°2) (50 X 5 mm) is supplied with the unit. This seal must be glued by the installer on the roof curb to avoid metal to metal contact and reduce eventual vibration transfer.

Once installed and fastened to the roof structure, the outside wall of the curb must be fully integrated in the roof insulation. (flushing)

The minimum insulation thickness required is 25 mm and the surface must be protected to ensure a perfect weatherproof seal.

Installation instruction are provided with the roof curb.

GUIDE FOR DUCT CONNECTION

GENERALITIES

The unit is designed to be connected to a duct work. The duct network pressure drop must be equal to the static pressure available at the unit outlet.

For each configuration, note the dimensions of the discharge and return air duct to be provided before the unit arrives on site. Make sure that it is fireproof and that it does not produce toxic smoke in the event of a fire in the building. The interior surfaces must be smooth and cleanable to avoid contamination of the circulated air.

Ensure air and water tightness at the air duct connections.

The duct (air velocity) must be sized in accordance to the air flow of the unit and the static pressure available outside the unit.

The pressure drop of the duct system should not be higher than the values (Pa) given in the manual.

Elbow and ramification on the supply air duct leaving the unit should be at a minimum distance of 2 m (from the outlet).

It is necessary to use flexible connections between the duct and the unit.

The outdoor air intake should be free from heat sources (condenser, exhaust fan, chimney) or any contaminated air (kitchen, toilets).

4 DAMPERSYSTEM

One blower extracts the air leaving the building through the outdoor coil to recover the energy.

The air leaving the building is colder than the outdoor air in summer and warmer in winter. The air leaving the building is used to lower the condensation temperature in the outdoor coil in summer and higher the evaporating temperature in winter.

The energy recovered from the building improves the year-round efficiency of the heat-pump.

The second blower supplies the treated air to the building.

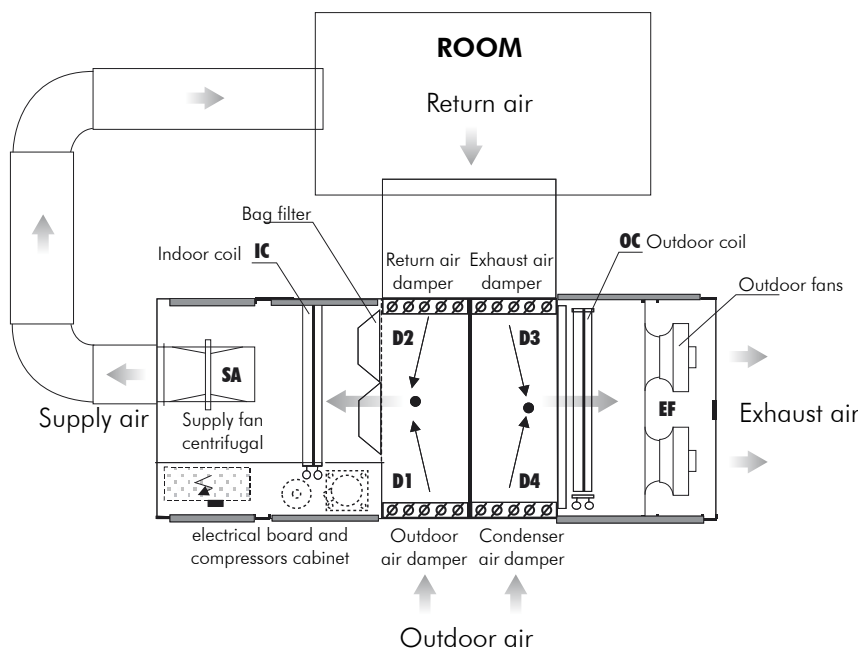
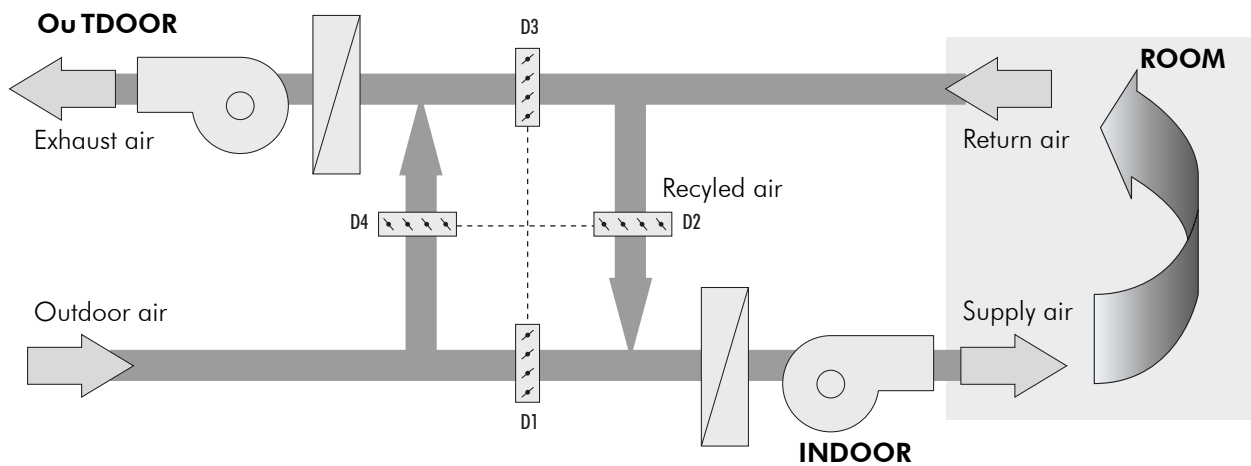
The RT4D is equipped with 4 air dampers (D1, D2, D3 and D4) designed to handle up to 100% of the nominal air volume.

Outdoor air and exhaust air dampers (D4, D3) are counteracting and will permit enough air to enter the outdoor coil.

The danger of uncomfortable over (or under) pressure in the building is eliminated. This feature ensures real energy saving while controlling at the same time the air changes within the building.

- Each one of the 4 counteracting dampers is driven by one actuator. All of them are connected to the controller.
- The damper blades are made of aluminium profile to avoid corrosion. The blades are geared together to improve the transmission from the actuator.
- The two dampers in the outdoor air (D1 and D4) are hinged on sizes 20 to 140. They can be turned opened on one axis to ease the access to the inside of the RT4D.
- The economizer benefits from the 3 dampers D1, D2 and D3 to utilize the greatest possible quantity of outdoor air (for free-cooling or free-heating) without over pressurizing the building.
- The economizer mode improves the unit efficiency on cooling and heating.
- The sensible control is standard. It compares the outdoor air temperature to a reference ambient temperature setting.
- The outdoor air sensor is factory fitted.
- **The return air pressure sensor and the discharge air sensor are field installed (in the return air duct).**

- The enthalpy control is an option. It compares the enthalpy of the outdoor-air to a reference setting. Undesired humidity will be detected before it enters the building.
- The night-free-cooling, to pre-cool the building at low cost during cooler Summer nights (when the outdoor air temperature is lower than the room setting on un-occupied mode) is optional.
- The minimum position of the outdoor air damper (D1) which serves the hygienic ventilation of the building, is adjustable at the controller.
- The ambient air quality control (CO₂) traces high population density in the building and provides sufficient outdoor air to the occupants. The quality controller is optional. It is not available with enthalpy economizer.
- Dampers D1 and D3 are closed on :
 - OFF periods to eliminate unwanted outdoor air.
 - Morning warm-up or start-up until the set-ambient temperature is satisfied.
 - Night-set-back modes, to save heating energy.
- The smoke detector is located downstream of the filter. This feature is optional.



D1	Outdoor air damper (fresh air for ventilation and free-cooling mode)
D2	Return air damper (air recirculated to the building)
D3	Exhaust air damper (air leaving the building)
D4	Auxiliary outdoor air damper (outdoor air added to the exhaust air to optimize the outdoor coil operation)
Oc	Outdoor coil (condenser on cooling, evaporator on heating)
Ic	Indoor coil (evaporator on cooling, condenser on heating)
sA	Supply air blower - Centrifugal
EF	Exhaust plug fan with speed control to keep the return air pressure constant

REFRIGERATION

s EE AppENDIx

The RT4D units are air to air heat pump designed with reversing cycle.

A four way valve ensures the reversing from heating to cooling mode and defrosting.

The unit is fully charged (see § TECHNICAL SPECIFICATIONS).

The following devices are used in the refrigeration circuit.

HERMETIc c OMpREss OR c 1/c 2

It is a scroll type with integrated electric motor - inside winding over loading protection with 5 thermistors in serie. The sensors are connected to an electrical module located on the compressor.

When the temperature of the winding increases above the limit, the electrical module stops the compressor. After 30 min. it is possible to reset manually the compressor. The compressor will start if the temperature has dropped below the limit.

CHECK THE SENSORS : after having stopped the compressor for at least 15 minutes, with the main switch OFF remove the wires between terminals 1 and 2 on the card and between terminals S1 and S2 on the compressor terminal box. For the scroll compressor measure the resistance between terminals S1-S3 and between S2-S4 by means of a tester supplied with a voltage of not higher than 3V. The resistance of each thermistor chain on a cold compressor should be 5 759 Ohm. For higher values check carefully the compressor coils. If both the thermistors chains give a greater resistance, connect the still efficient chain to terminals 1 and 2 of the card and fit two thermal relays :

Each compressor is protected with a crankcase heater to keep refrigerant free from oil. It is important to heat the compressor 8 hours before it goes in operation. The unit should be switched on, without a demand for heating or cooling.

The proper lever of the initial oil charge is between 3 / 4 of the full sight glass.

Models		20	40	60	80	100	140	180	240	280	380
OIL CHARGE (l)											
CIRCUIT N.1	I	1.85	4.1			8.1					
CIRCUIT N.2	I								8.1		

HIGH pREssu RE sWITc H Hp

The HP switch stops the compressors when the discharge pressure rises above 28 bar (R 407C). The controller-display shows high-pressure alarm. It must be manually reset at the controller. The compressor will operate again at discharge pressure below 19 bar (relative).

LOW pREssu RE sWITc H Ip

When the suction pressure drops below the factory setting value (1.5 bar R407 C) the compressors stop. The controller-display shows low-pressure alarm.

When the unit is equipped with low ambient control the factory setting is 0,7 bar.

The reset is automatic.

When the low-pressure alarm happens more than 3 times in one hour, the reset must be achieved manually at the controller-display.

A 120 sec. delay eliminates nuisance alarm on compressor start.

THERMOsTATIC E xpANsION vAlvE Tz

Each heat exchanger is equipped with one thermostatic expansion valve with external equalizer, which controls the liquid refrigerant flow rate.

It is set at the factory to hold a superheat between 4 and 8K depending on the load conditions.

Measure the superheat when unit is working on full load. Read the low-pressure gauge (find the corresponding dew point temp. of refrigerant) and measure the surface temp. of the suction line between evaporator and four way valve.

The difference of the two temp. is the superheat.

If an adjustment of the superheat is needed close or open the adjustment screw.

A clockwise rotation increases the superheat. One 360° rotation equals 0,5K.

The thermostatic valve works as a check valve when reversing the cycle.

sIGHT GLAss spl

The sight glass is located in the liquid line to check the refrigerant charge and the humidity content of the refrigerant. A clear liquid without bubble means correct refrigerant charge. Be careful the circuit can be overcharged (see condenser).

When the indicator is green the refrigerant is dry, yellow indicate the presence of humidity. In this case change the filter dryer cartridge.

On the first start-up the colour indication is relevant only after 4 hours operation.

FILTER DRYER FE

The RT4D is equipped with a molecular sieve filter dryer.

Replace the filter dryer either on temp. drop of 5K or more between entering and leaving refrigerant or on sight-glass indication.

Pump down the refrigerant to replace the filter dryer:

- set unit on cooling mode
- bridge the low-pressure switch
- close the liquid check valve
- start the compressor
- stop the compressor at 0,2 bar suction pressure
- replace the filter dryer

cONDEN sING c OIL

On heating the indoor coil BEV is the condenser. On cooling the outdoor BCO is the condenser.

Check the sub-cooling during the cooling period. Read the pressure on the high pressure gauge and find the corresponding bubble point refrigerant temperature.

Measure the liquid line surface temperature between the condenser and the dryer filter.

The temperature difference is the sub-cooling value of the refrigerant circuit.

At full cooling load the sub-cooling should not be higher than 5K but not lower than 2K.

ExpANsION vEss El/I lqu ID REc Elv ER Rv

The vessel compensates the changing refrigerant charge during the cooling and heating mode and/or part load.

- The vessel is located in the outdoor air to be influenced by the outdoor conditions.
- The outdoor temp. permits a better receival of liquid refrigerant to the system in summer.

suc TION Accu Mul ATOR/Liqu ID sEPARATOR sl

Located in the suction line, its volume is calculated in accordance with the total nominal refrigerant of the circuit, to avoid liquid return to the compressor during defrost.

During normal compressor operation it is possible to control the correct charge of refrigerant in the circuit by checking the level of the liquid in the separator. This is done by knocking the separator in the middle of its height and listen to the quality of the noise. The vessel should sound empty.

pREssu RE TRANsDuc ER TpH

sEE c ONTROL -Displ AY.

pREssu RE sAFETY RElIEF vAlvE sv

It is a pressure safety valve opening at 30 bar (discharge pressure).

When the safety valve opens it is necessary to replace the complete charge of refrigerant (R 407C is a 3 components refrigerant).

To evacuate the refrigerant charge use the Schrader port on the suction line and discharge line.

WARNING



BEFORE CARRYING OUT ANY WORK ON THE EQUIPMENT, MAKE SURE THAT THE ELECTRICAL POWER SUPPLY IS DISCONNECTED AND THAT THERE IS NO POSSIBILITY OF THE UNIT BEING STARTED INADVERTENTLY.

NON-COMPLIANCE WITH THE ABOVE INSTRUCTIONS CAN LEAD TO INJURY OR DEATH BY ELECTROCUTION.

The electrical installation must be performed by a fully qualified electrician, and in accordance with local electrical standards and the wiring diagram corresponding to the unit model.

Any modification performed without our prior authorisation may result in the unit's warranty being declared null and void.

The power supply cable section must be sufficient to provide the appropriate amperage to the unit's main power terminals, at start-up and under full load operating conditions.

The power supply cable shall be selected in accordance with the following criteria:

1. Power supply cable length.
2. Maximum unit starting current draw – the cables shall supply the appropriate amperage to the unit terminals for starting.
3. Power supply cables' installation mode. (do not leave cable weight hang on connecting lugs)
4. Cables' capacity to transport the total system current draw.

Starting current and total current draw are indicated on the unit's wiring diagram.

Short circuit protection shall be provided by others. This protection shall comprise fuses or circuit breakers with high breaking capacity, mounted on the distribution board.

If the remote controls include an ambient temperature sensor and/or a room stat with temperature setting, these shall be connected with shielded cable and shall not be installed in the same conduit as the power supply cable to avoid induced voltages and create faults in the unit's operation.

POWER SUPPLY

This supply is protected upstream by an FFG general supply fuse holder, to be provided by the installer, in accordance with "LOCAL ELECTRICAL DIRECTIVES". The fuse holder shall be mounted close to the unit.

The electrical installation and the wiring of this unit shall comply with local electrical installation standards.

- Three phase 400 V~ + Ground (4 wire power supply):
 - On terminals L1 ; L2 ; L3 on the main supply circuit switch.
 - On the ground screw for the earth cable.



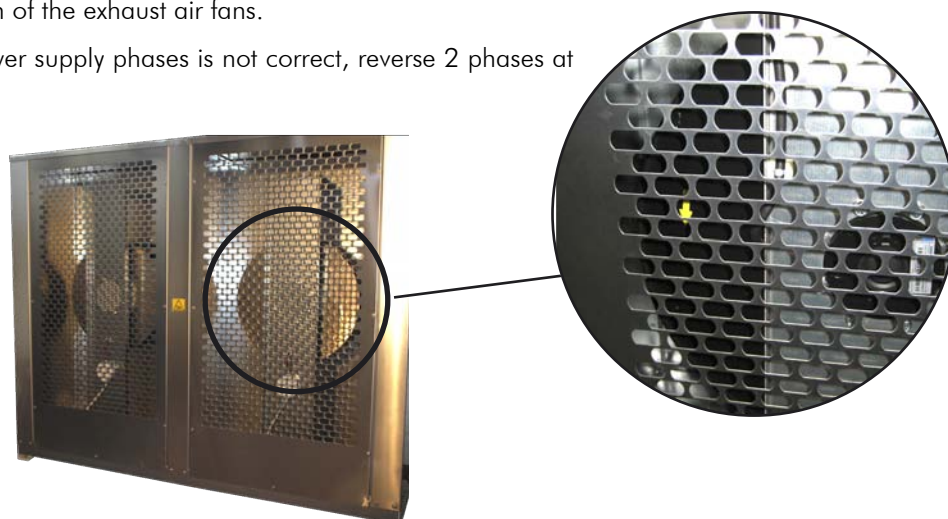
UNIT WITHOUT NEUTRAL

VERY IMPORTANT

Before starting the compressor, open the circuit breaker of the compressors and control the correct rotation of the exhaust air fans.

If the sequence of the power supply phases is not correct, reverse 2 phases at the main power supply.

In case one phase is missing, the inverter of the exhaust fans creates an alarm at the controller display and stops the unit immediately.



ELECTRIC SPECIFICATIONS

UNIT WITHOUT ELECTRIC HEATER

Models		20	40	60	80	100	140	180	240	280	380
Supply voltage		3 Ph / 400V / 50Hz									
Nominal power	kW	5.6	10.2	12.9	18.4	22.1	32.4	39.3	59.3	63.2	83.8
COMPRESSORS											
Maximum current	A	11	20	22	32	40	54	64	98	108	128
INDOOR FAN											
Maximum current	A	1.8	3.6	5.2	6.5	9	11.5	15.4	23	23	46
OUTDOOR FAN											
Maximum current	A	1.66	3.35	6.8	7.2	7.2	15.6	15.6	31.2	31.2	31.2
Total running current	A	14.5	27	34	45.7	56.2	81.1	95	152.2	162.2	205.2
Maximum starting current	A	68	130	139	221	158	218	260	285	298	356
Min. cross section	mm ²	2.5	6	10	16	16	35	35	2 x 35	2 x 50	2 x 50

UNIT WITH ELECTRIC HEATER

Models		20	40	60	80	100	140	180	240	280	380
Supply voltage		3 Ph / 400V / 50Hz									
ELECTRIC HEATER											
Maximum current	A	14.05	21.5	26.2	30.25	34.7	40.5	52.1	52.1	60.9	69.4
Total running current	A	28.55	48.5	60.2	75.95	90.9	121.6	147.1	204.3	223.1	274.6
Maximum starting current	A	82	152	165	251	193	259	312	337	359	425
Min. cross section	mm ²	6	16	16	25	35	2 x 25	2 x 35	2 x 50	2 x 70	2 x 70

OPTIONAL ELECTRIC HEATER DATA

Models		20	40	60	80	100	140	180	240	280	380
Stage 1	kW	4.5	6	9	10.5	12	12	18		21	24
Stage 2	kW	4.5	6	9	10.5	12	16	18		21	24
Total capacity	kW	9	12	18	21	24	28	36		42	48

IMPORTANT

For all other capacities, please consult our representative.

A main fuse must mandatorily be provided on the power supply.

- Fuses are not supplied
- Cables are not supplied

Size fuses and cables according to the minimum value of the cross section of the cable and the maximum running current in accordance with the local directive.

RANGE AND sETTING OF THERMAI pROTEc TION

Models		20	40	60	80	100	140	180	240	280	380
lca1	A	11	20	22	32	20	27	32	27	27	32
lca2	A	/	/	/	/	20	27	32	27	27	32
lca3	A	/	/	/	/	/	/	/	22	27	32
lca4	A	/	/	/	/	/	/	/	22	27	32
lsf1	A	1.8	3.6	5.2	6.5	9	11.5	15.4	23	11.5	23
lsf2	I	/	/	/	/	/	/	/	/	11.5	23

lca1 : Setting Current value Compressor n° 1

lca2 : Setting Current value Compressor n° 2

lca3 : Setting Current value Compressor n° 3

lca4 : Setting Current value Compressor n° 4

lsf1 : Setting Current Value Supply Fan n° 1

lsf2 : Setting Current Value Supply Fan n° 2

El Ec TRic HEATER OF DRAIN pAN (OpTIONAl)

Models		20	40	60	80	100	140	180	240	280	380
POWER INPUT	W	30	30	36	36	42	42	42	2 x 76	2 x 76	2 x 76

The drain pan of the outdoor coil is equipped with an electric heater (230V) for antifreeze protection and guarantee that the water drains during defrost.

The maximum temperature at full current load is 85°C.

El Ec TRic Al c ONNEc TIONs

The electrical connection is provided at one single point (main disconnect switch).

Electrical power supply cable should be inserted on the side of the unit. PG connections are provided. Power supply cable in the base of the unit with roof curb is optional.

These units are equipped with a disconnect switch used as a main terminal.

The disconnect switch can be padlocked for service.

Models		20	40	60	80	100	140	180	240	280	380
PG Size		PG16	PG 29	PG 29	PG 36	PG 36	PG 42	PG 42	PG 50	PG 50	PG 50

c OMMIss IONING

pRE-sTART c HEc K I IsT

El Ec TRl c Al c HE c K

1. Electrical installation has been carried out according to unit wiring diagram and the Electricity Supplier Authority and Regulations.
2. Fuses or circuit breaker have been installed and correctly sized at the main switchboard.
3. Main supply voltages as specified on unit wiring diagram.
4. All cables are properly identified and tight connected at the unit. Check the tightness of all cable connections.
5. The cables and wires are not touching and protected from pipework and sharp edges.

vl su Al c HE c K

1. Clearances around unit including outdoor air entry and discharge openings and service accesses.
2. Unit mounted as specified.
3. No loose or missing bolts or screws.
4. No refrigerant leaks.

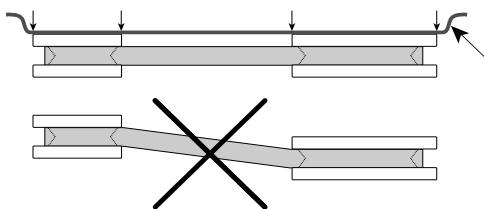
Duc TING

1. Connections flexible types are mounted, secure and detachable for service access.

supl Y AIR BLOWER

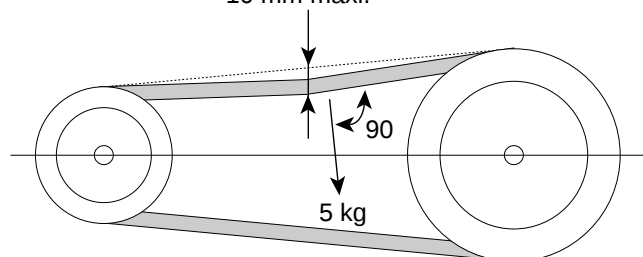
1. Blower drive
 - Pulley adjustment is correct for the designed air quantity and static pressure.
 - Belt tension correct.
2. Check that the pulleys on both the blower shaft and the motor shaft are correctly fitted to the taper bush and rotate without wobbling.
3. Ensure that the motor is securely bolted to the mounting plate parallel to the blower shaft.
4. Using a string line or straight edge ensure that both pulley grooves are correctly aligned.
5. Improper alignment of the pulleys and belt may cause vibration in the blower drive and result in premature wear and noise.

Belt alignment



For a quick check, make sure that the small rope touch each end of the pulleys as shown on upper drawing.

Belt tensioning
10 mm maxi.



s EE AppENDIx

MOTOR AND PULLEYS SELECTION TABLE

AIR BALANCING

Fixed pulleys are fitted to the motor shaft. In order to adjust the main blower performance to the pressure drop of the duct work, change the blower or the motor pulley to adapt the speed of the blower. The pulley must be adjusted when the measured external static pressure and air volume (motor current draw) at the exit of the unit differ from the nominal values at the unit.

CONDITION N°1:

There is less pressure drop in the duct work than available at the unit, i.e. motor current draw is higher than expected. Reduce the speed to lower the air flow.

CONDITION N°2:

In the opposite case, the pressure drop in the duct work is higher than the pressure available at the unit, i.e. the current motor draw is lower than expected. Increase the speed of the blower by changing the pulley either on the motor or on the blower shaft.



EXHAUST AIR FAN

The exhaust air fan is a direct driven plug fan.

The speed of the fan is controlled by an inverter.

AIR FILTER SECTION

The RT4D is equipped with 2 air filter sections.

The supply air filter is placed before the indoor coil.

The exhaust air filter is placed before the outdoor coil.



INDOOR FILTER sTANDARD

G4 pleated filter.

INDOOR FILTER OpTION

The indoor coil has a two stage filter; the G4 pre-filter is pleated and the F7 post filter is a high efficiency rigid bag filter.

OUTDOOR FILTER

G3 pleated filter.

Models	20	40	60	80	100	140	180	240	280	380
Indoor Filter (Qty and Size)	2 592x592	2 592x592	4 490x592	4 490x592	6 490x592	6 490x592	9 490x592	9 490x592	12 490x592	12 490x592
G4 Pressure drop clean Pa	38	70	70	110	68	115	85	132	120	205
F7 Pressure drop clean Pa	65	80	75	90	65	80	70	90	85	120
Outdoor Filter (Qty and Size)	4 500x500	4 500x500	6 490x592	6 490x592	9 490x592	9 490x592	12 490x592	8 400x500 + 8 500x500	8 400x500 + 8 500x500	8 400x500 + 8 500x500
Pressure drop Outdoor Pa	70	80	90	130	80	160	110	135	130	145

The end pressure of the dirty filter switch is set at the factory at 450Pa.

All pressure drops are given at nominal air flow.

FINAL cHECK

1. All panels and fan guards are in place and secured.
2. Unit clean and free of remainder installation material.

FINAL COMMISSIONING

Place the plugs back on the valves and check that they are properly tightened.

If needed, fix cables and pipes with clamping collars outside the unit.

Operate the air conditioner in the presence of the user and explain all functions.

Show him how to remove, clean and place back the filters.

Explain the need for regular maintenance.

Explain that service of repair must be provided by trained specialist.

IN CASE OF WARRANTY - MATERIAL RETURN PROCEDURE

Material must not be returned without permission of our After Sales Department.

To return the material, contact your nearest sales office and ask for a "return voucher". The return voucher shall be sent with the returned material and shall contain all necessary information concerning the problem encountered.

The return of the part is not an order for replacement. Therefore, a purchase order must be entered through your nearest distributor or regional sales office. The order should include part name, part number, model number and serial number of the unit involved.

Following our personal inspection of the returned part, and if it is determined that the failure is due to faulty material or workmanship, and in warranty, credit will be issued on customer's purchase order. All parts shall be returned to our factory, transportation charges prepaid.

ORDERING SERVICE AND SPARE PARTS ORDER

The part number, the order confirmation and the unit serial number indicated on the name plate must be provided whenever service works or spare parts are ordered.

For any spare part order, indicate the date of unit installation and date of failure. Use the part number provided by our service spare parts, if not available, provide full description of the part required.

MAINTENANCE



The user is responsible for ensuring that the unit is in a proper working condition and that technical installation as well as the regular maintenance operations are performed by properly trained technicians and in accordance with the instructions contained in this manual.

REGULAR MAINTENANCE

These units have been designed to require only minimal servicing, thanks to the use of a maximum number of lubricated-for-life components. Nevertheless, regular servicing operations are necessary to ensure optimal system operation.

Servicing must be performed by experienced and qualified personnel only.

GENERAL INSPECTION

Carry out a visual inspection of the complete installation in service.

Check the general cleanness of the installation, and check if the condensate evacuations are free, before the cooling and heating seasons.

Check the condition of the condensate tray.



CAUTION

BEFORE CARRYING OUT ANY OPERATION ON THE EQUIPMENT, CHECK THAT THE ELECTRICAL POWER SUPPLY IS SWITCHED OFF AND THAT IT CANNOT BE SWITCHED ON INADVERTENTLY.

IT IS RECOMMENDED THAT THE DISCONNECT SWITCH BE PADLOCKED

sERvIc ING c HEc K l sT

CASING

1. Clean the outer panels.

When cleaning aluminium, follow the same requirements as for other metallic surfaces:

- Remove any dirt of mineral or organic origin.
- Do not attack the surface of the metal.

Cleaning and maintenance products must be:

- Compatible with aluminium and its alloys.
- Non toxic for users.
- Non polluting or, failing this, treated prior to disposal to comply with current environmental regulations.

CONDENSATE DRAIN PAN

1. Check that the drainage orifices, conduits and siphon are free.
2. Eliminate all accumulated dirt.
3. Check that no traces of rust are present.
4. Desinfect all trace of mould

REFRIGERATION CIRCUIT

1. Check the presence of gas leaks.
2. Check that the copper tube or the capillary tube do not rub against any metal or vibrate.
3. Check that the compressors do not generate any abnormal noises or vibrations.
4. Check the compressor discharge temperature.
5. Check that the crankcase heater is energised during the OFF cycle.

INDOOR COILS

1. Clean the fin surfaces as required.
2. Observe the condition of the blower and motors.
3. Clean or replace the filters.

OUTDOOR COIL

1. Check the cleanliness of the fin surfaces.
2. Check the condition of the fan and the fan motor.
3. Clean or replace the filters.

PROTECTION DEVICES

Check the proper operation of the high and low pressure protection devices.

ELECTRICAL EQUIPMENT

1. Check nominal current draw and the condition of the fuses.
2. Check the tightness of the screw terminals.
3. Perform a visual check of the condition of the contacts.
4. Check the tightness of all cable connections.

Replace the panels and add any missing screws.

TROUBLE SHOOTING

problem	probable cause	solution
Unit operates continuously but without performing	Insufficient refrigerant charge.	Top up the refrigerant fluid charge.
	Clogged filter dryer.	Replace the filter.
	Reduced output from one or both circuits.	Check the 4-ways valves and change them if necessary.
Frozen suction line	The overheating setting on the thermostatic expansion valve is too low.	Increase the setting.
	Refrigerant charge too low.	Check the refrigerant fluid charge.
Evaporator freezing	Filters clogged.	Replace filters.
	Insufficient charge/Insufficient air.	Check the refrigerant fluid charge/air volume.
	Evaporator air intake temperature too low.	Check the economiser setting.
Excessive noise	Vibrating pipe work.	Attach the pipe work correctly. Check the pipe work attachments.
	Whistling noise from the thermostatic expansion valve.	Add refrigerant charge. Check and replace the filter dryer if necessary.
	Noisy compressor.	Check the pressure difference of the 4-ways valves.
	No pressure increase.	Seized bearings. Replace the compressor. Check the tightness of the compressor attachment nuts.
	Noisy blower.	Check bearing.
	Presence of one or several oil or gas leaks in the circuit.	Locate and repair the leaks and add oil.
	Mechanical compressor damage.	Contact an approved Service Centre.
Low oil level in the compressor	Crankcase oil heater resistance fault.	Check the electrical circuit and the condition of the resistance. Replace defective parts if necessary.
One or several compressors do not operate.	No power at compressor.	Check the electrical circuit and seek out any grounding and/or short-circuits. Check the fuses.
	High pressure pressostat activated.	Reset the pressostat from the control panel and restart the unit. Check for dirty condenser coil or defective fan.
	Control circuit fuse blown.	Check the control circuit and look for any grounding and/or short-circuits. Replace the fuses.
	Connection problem.	Check the tightness of all the electrical connection terminals.
	Electrical circuits thermal protection cuts in.	Check the operation of the control and safety devices. Check amperage of compressor and discharge pressure.
	Incorrect wiring.	Check the wiring of the control and safety devices.
	Main voltage too low.	Check the power line. If the problem is due to the network, inform the Electricity Company.
	Compressor motor short-circuited.	Check the continuity of the motor winding.
	Compressor seized.	Replace the compressor.
Low pressure pressostat being activated	Presence of a leak.	Identify and repair the leak.
	Insufficient refrigerant fluid charge.	Add refrigerant charge.
	Low air volume on evaporator.	Check the blower, duct and filter.
High pressure pressostat being activated	Incorrect operation of the high pressure pressostat.	Check the operation of the pressostat. Replace it if required.
	Outlet valve partially closed.	Open the valve. Replace it if required.
	Non-condensable particles in the circuit.	Purge the circuit.
	Condenser fan(s) not operating.	Check the wiring and the motors. Repair and replace if required.
	Outdoor coil dirty.	Clean outdoor coil.
Liquid line too hot	Insufficient refrigerant charge.	Locate and eliminate the causes of charge losses and top up the refrigerant fluid charge.
Liquid line frozen	Clogged filter dryer.	Replace the filter cartridge.

problem	probable cause	solution
Fans do not operate	Electrical circuit problems.	Check the connections.
	Internal circuit thermal cut-out activated.	Contact an approved Service Centre.
Fan surging	Duct network pressure too low.	Generate an additional pressure loss (refer to blower curves.)
Reduced output in both Heating and cooling mode	Compressor operating fault.	Contact an approved Service Centre.
	Low indoor air volume.	Check filter, blower and duct.
	Outdoor coil dirty.	Clean the coil.
	Insufficient refrigerant charge.	Add refrigerant charge.
	Air conditions incorrect.	Measure air temperature and compare to performance table.
Electric heater is not operating	No power supply.	Check the main fuse and the auxiliary fuses.
	Heater circuit open (overheat).	Check the air flow or filter.
Evaporator low temperature (heating, outdoor coil)	Air flow on the indoor coil (condenser) too high.	Reduce the supply blower speed.
	Air temperature indoor coil too low.	Reset controller ambient air.
	Mixed air temperature entering the indoor coil (condenser) too low.	Reduce outdoor air volume.
	Superheat too low.	Adjust the thermostatic expansion valve.
	Low charge.	Evacuate and replace the refrigerant.
Condensing temperature too low (heating)	Low charge.	Evacuate and replace the refrigerant.
	Air volume on the indoor coil too high.	Reduce the speed of the supply air blower.
	Mixed air temperature entering the indoor coil too low.	Reduce outdoor air flow.
	Subcooling too low.	Increase refrigerant charge.
	Return air pressure drop too high.	Increase the speed of the exhaust air fan.
Water from condensation stays in the outdoor drain pan	Return air pressure too high.	Reduce the speed of the exhaust air fan.
	Siphon too short.	Increase the height of the siphon.
	Unit is not level flat.	Correct the installation of the unit.
Outdoor coil refrigerant pressure unstable	Exhaust fan speed too low / pressure sensor broken.	Check the pressure value/replace the return air pressure sensor if broken.
	Outdoor damper D4 unstable.	Check operation of D4 to pressure.
Heating/cooling signal unstable	Return air sensor failure.	Check the real air temperature/replace the sensor if broken.
	Discharge air sensor failure.	Check the real air temperature/replace the sensor if broken.
	Indoor air flow.	Unstable - check for changing pressure drop in ducting.

AppENDIx ANNExE

AppENDIx

DIMENsIONs	III	REFRIGERANT cIRcuIT DIAGRAM	x
RT4D20 - RT4D40	III	MOTOR AND pullEYs sElEcTION TABlE	xII
RT4D60 - RT4D80	IV		
RT4D100 - RT4D140	V		
RT4D180 - RT4D240	VI		
RT4D280 - RT4D380	VII		
HANDLING FEATURES	VIII		
LEXICON	IX		

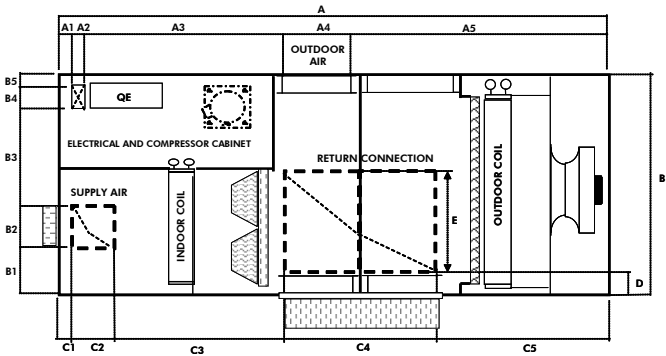
ANNExE

DIMENsIONs	III	scHEMA Du cIRcuIT FRIGORIFIQuE	x
RT4D20 - RT4D40	III	TABlEAU DE sElEcTION Du MOTEuR ET DEs pOulIEs	xII
RT4D60 - RT4D80	IV		
RT4D100 - RT4D140	V		
RT4D180 - RT4D240	VI		
RT4D280 - RT4D380	VII		
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LEXIQUE	IX		

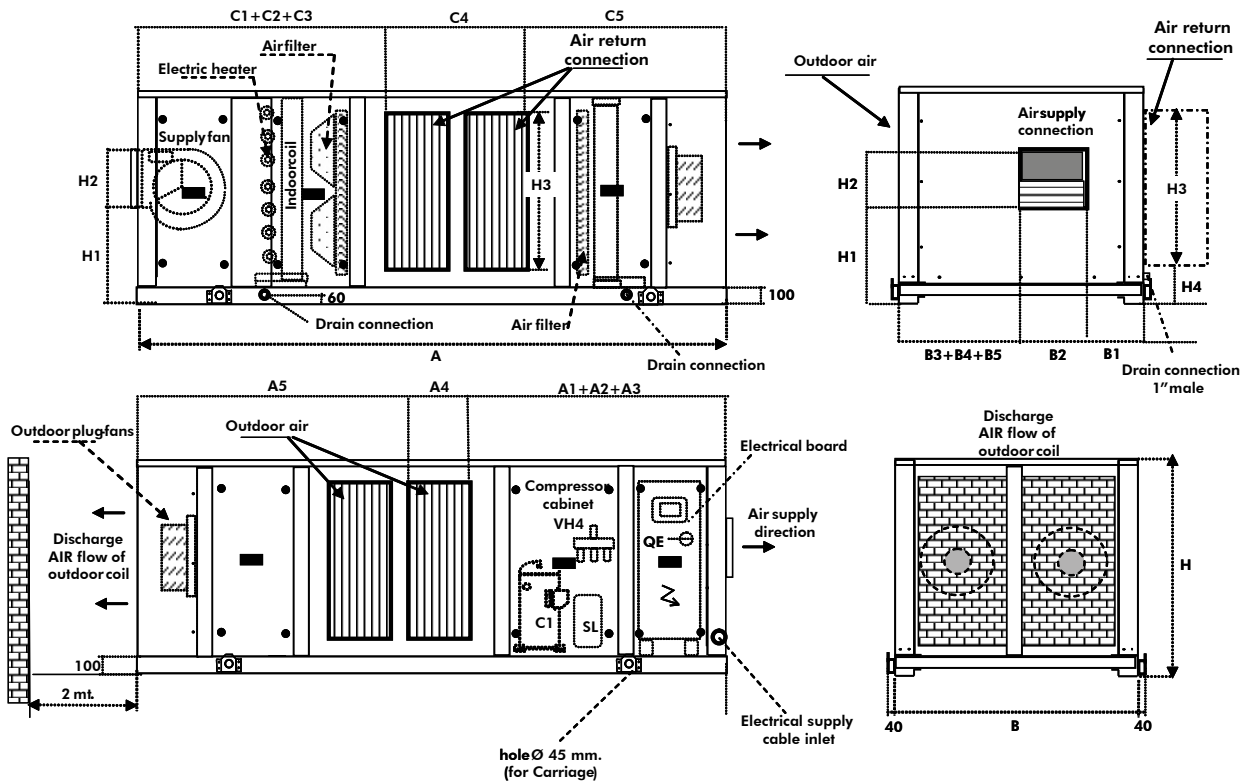
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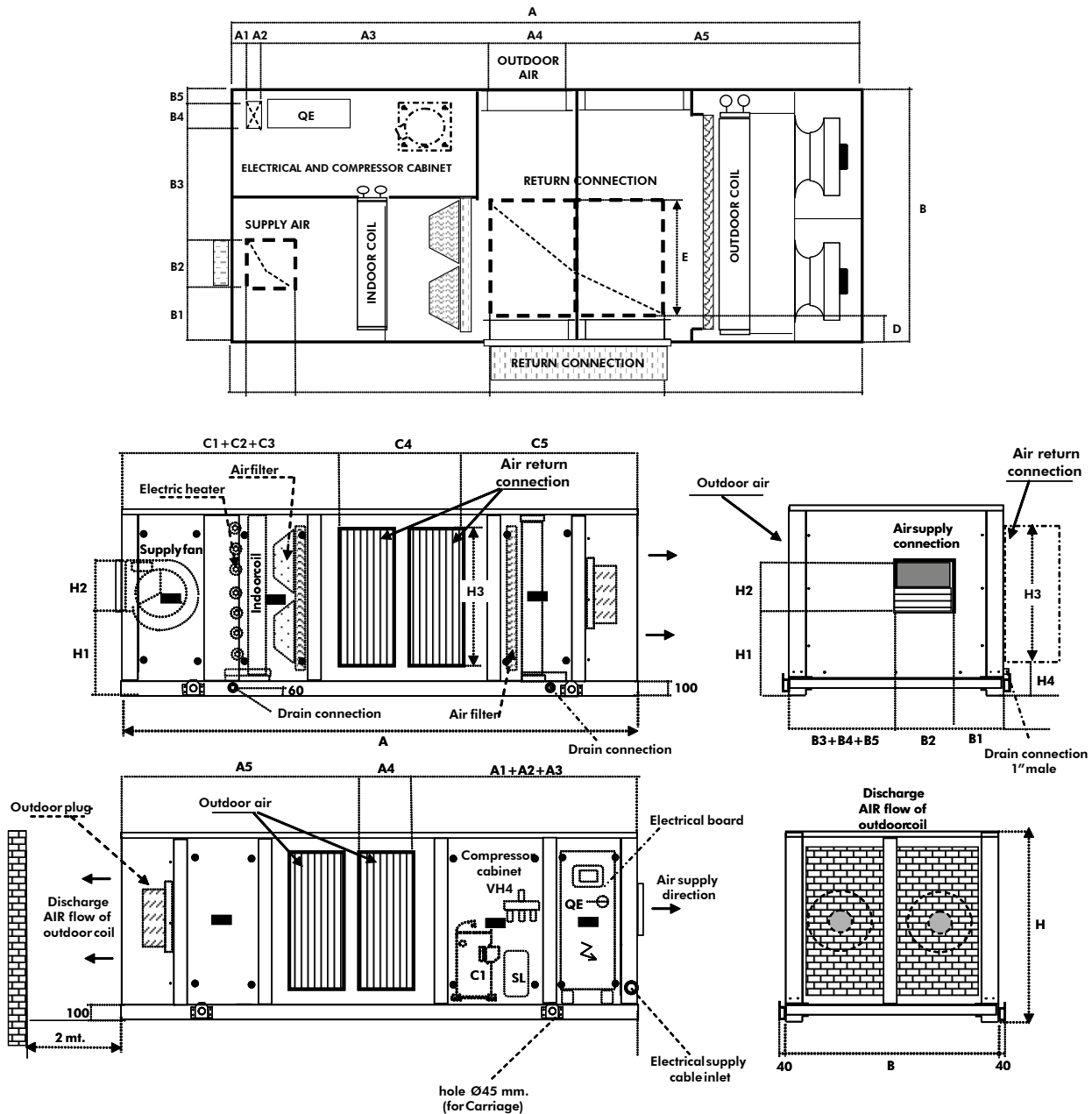
RT4D20 - RT4D40



		20	40
A	mm	3200	3200
A1	mm	80	80
A2	mm	100	100
A3	mm	1120	1120
A4	mm	400	400
A5	mm	1500	1500
B	mm	1280	1280
B1	mm	280	245
B2	mm	240	310
B3	mm	510	475
B4	mm	150	150
B5	mm	100	100
c 1	mm	80	80
c 2	mm	265	345
c 3	mm	955	875
c 4	mm	1100	980
c 5	mm	1540	920
D	mm	120	120
E	mm	600	600
H	mm	1150	1150
H1	mm	490	450
H2	mm	265	345
H3	mm	900	900
H4	mm	130	130



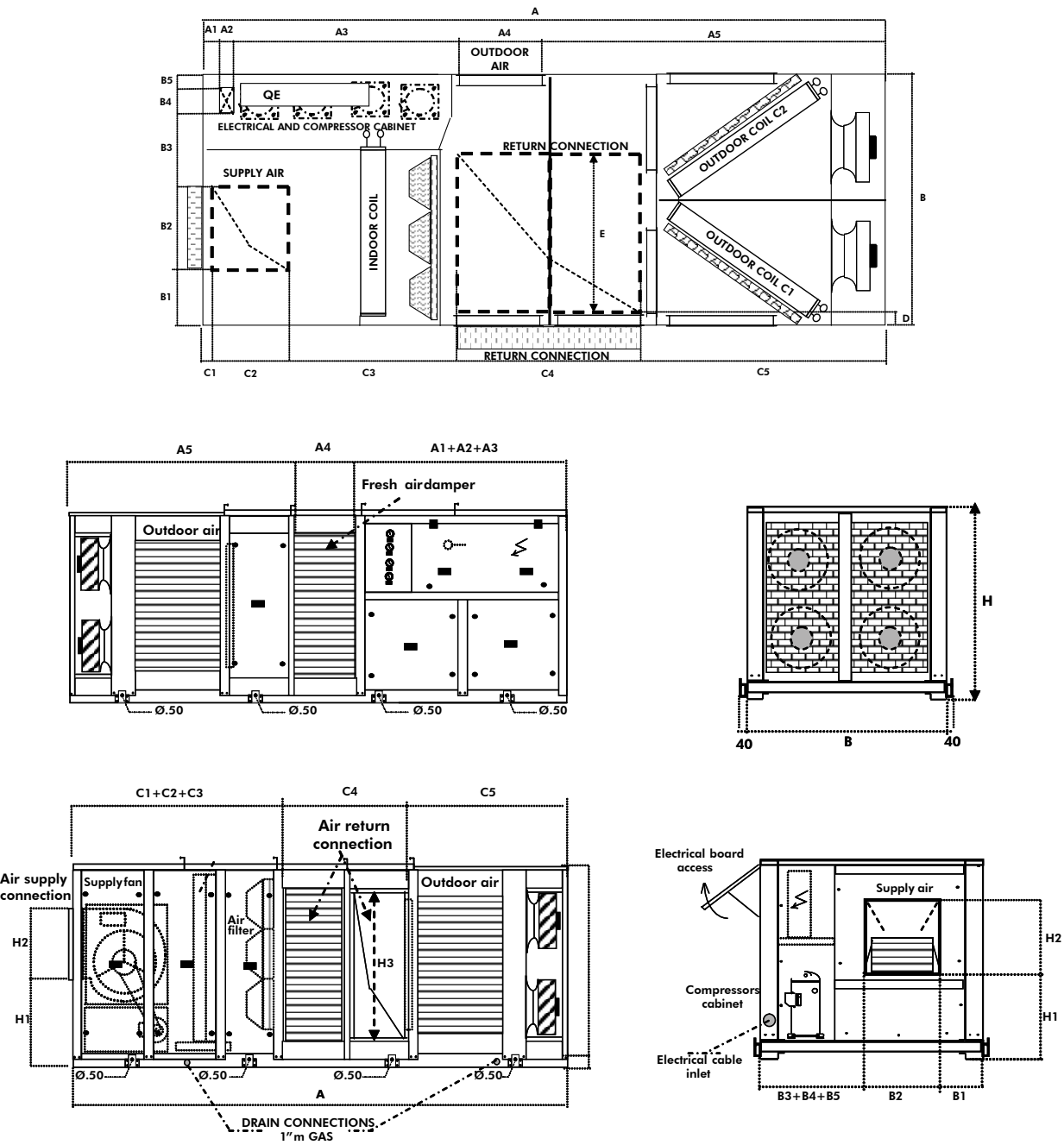
RT4D60 - RT4D80



		60	80
A	mm	3940	3940
A1	mm	80	80
A2	mm	100	100
A3	mm	1380	1380
A4	mm	500	500
A5	mm	1880	1880
B	mm	1750	1750
B1	mm	405	375
B2	mm	375	430
B3	mm	720	695
B4	mm	200	150
B5	mm	100	100

		60	80
c 1	mm	80	80
c 2	mm	405	480
c 3	mm	1215	1140
c 4	mm	1080	980
c 5	mm	1160	1160
D	mm	120	120
E	mm	950	950
H	mm	1420	1420
H1	mm	660	620
H2	mm	405	480
H3	mm	1100	1100
H4	mm	160	160

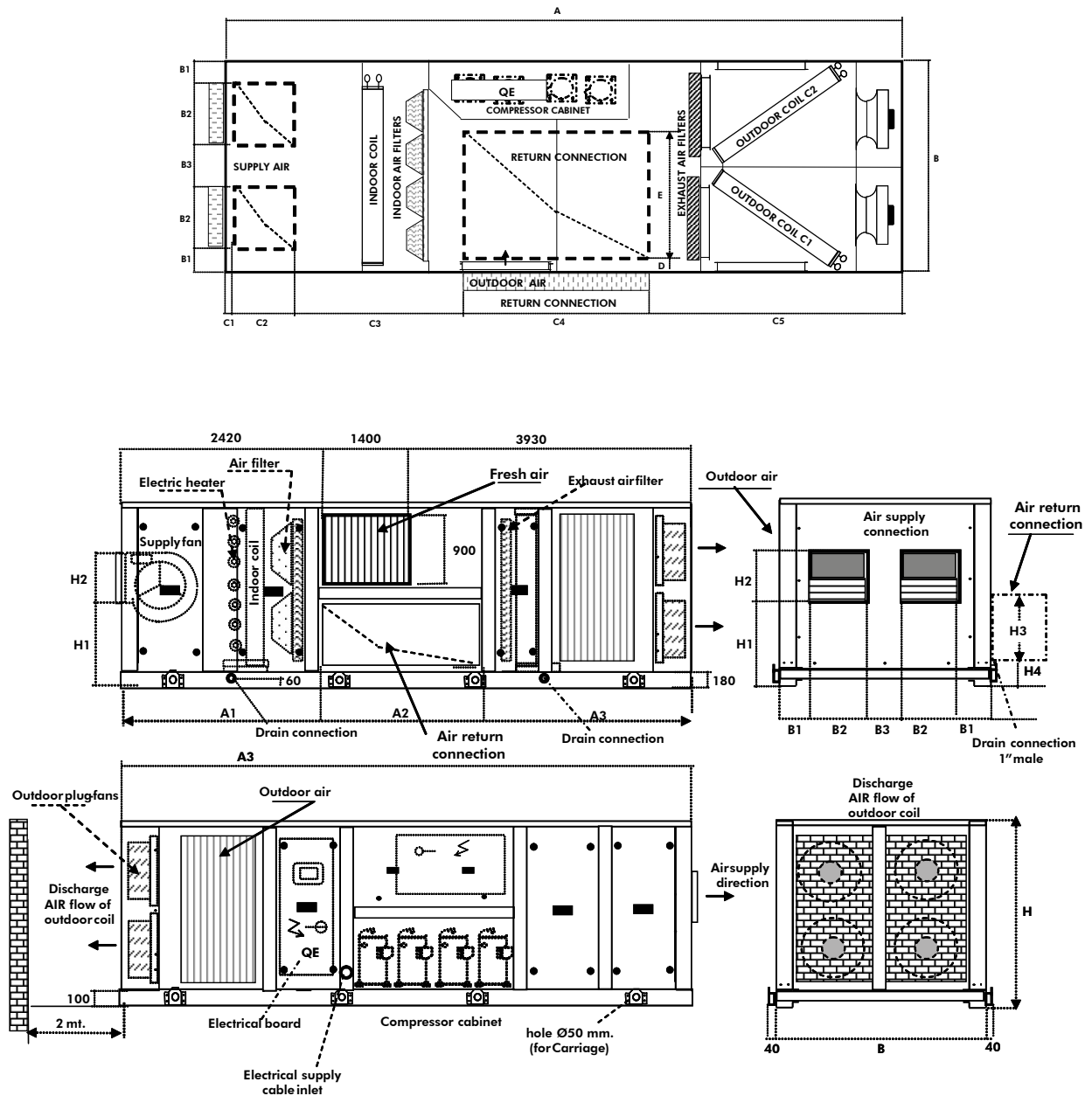
RT4D180 - RT4D240



		180	240
A	mm	6400	6400
A1	mm	100	100
A2	mm	150	150
A3	mm	2120	2120
A4	mm	800	800
A5	mm	3230	3230
B	mm	2420	2420
B1	mm	520	475
B2	mm	715	805
B3	mm	915	840
B4	mm	250	200
B5	mm	120	100

		180	240
c 1	mm	100	100
c 2	mm	715	805
c 3	mm	1555	1465
c 4	mm	1680	1680
c 5	mm	2350	2350
D	mm	140	140
E	mm	1500	1500
H	mm	2440	2440
H1	mm	1150	1110
H2	mm	715	805
H3	mm	1800	1800
H4	mm	310	310

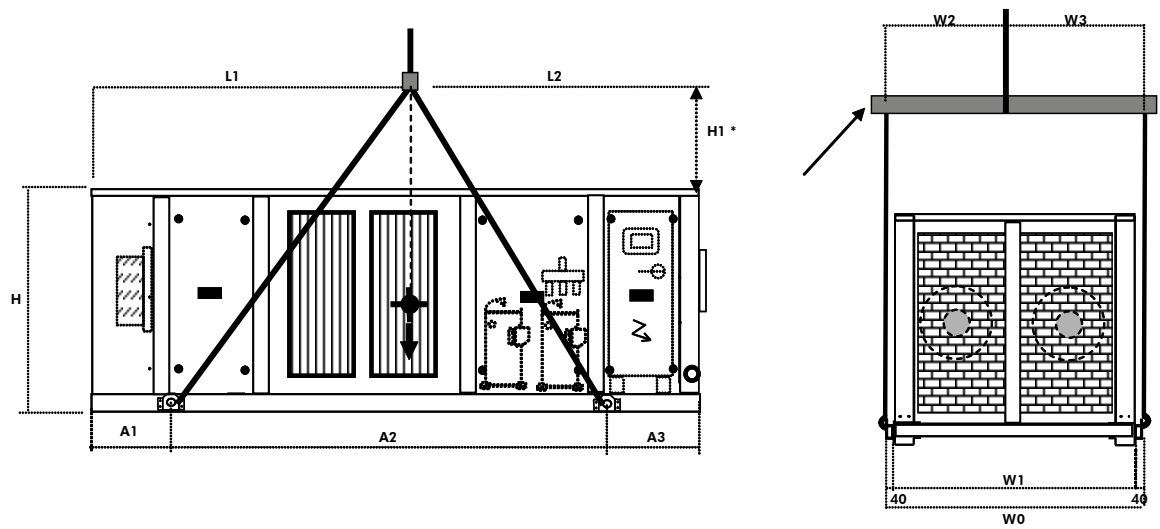
RT4D280 - RT4D380



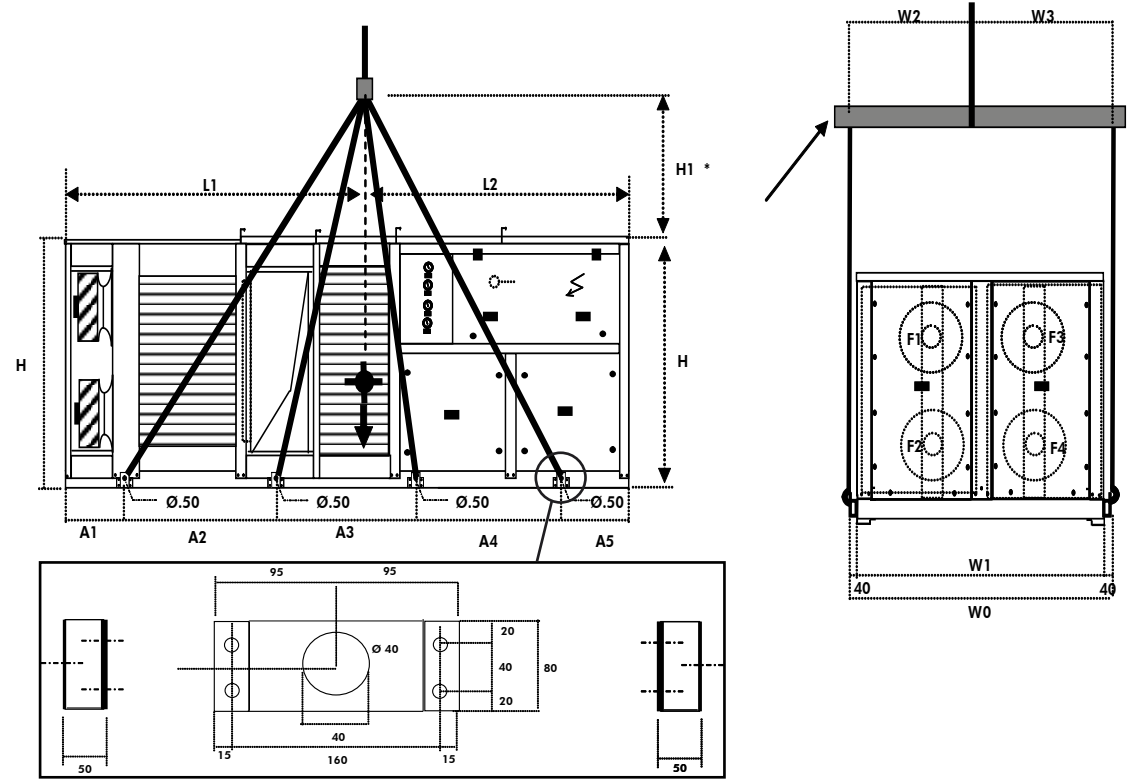
		280	380
A	mm	7750	7750
A1	mm	2420	2420
A2	mm	2660	2660
A3	mm	2670	2670
B	mm	2420	2420
B1	mm	280	280
B2	mm	640	640
B3	mm	580	580

		280	380
c 1	mm	100	100
c 2	mm	640	640
c 3	mm	1680	1680
c 4	mm	2660	2660
c 5	mm	2670	2670
D	mm	180	180
E	mm	1500	1500
H	mm	2440	2440
H1	mm	1190	1190
H2	mm	640	640
H3	mm	1000	1000
H4	mm	240	240

HANDLING FEATURES
DISPOSITIFS DE MANUTENTION



		20	40	60	80	100	140	180	240	280	380
A1	mm	570		420		610		580		1220	
A2	mm	2060		3100		1420		1640		2140	
A3	mm	570		420		1440		1960		100	
A4	mm	1680		2070		1420		1640		2140	
A5	mm	1520		1870		510		580		1220	
L1	mm	1150		1420		2950		3750		4630	
L2	mm	800		1500		2450		2650		3120	
H	mm	1360		1830		1880		2440		2440	
H1	mm	1280		1750		1500		2500		2500	
W0	mm	610		780		2040		2500		2500	
W1	mm	670		970		1960		2420		2420	
W2	mm					920		1110		1110	
W3	mm					1440		1360		1360	



I Exlc ON

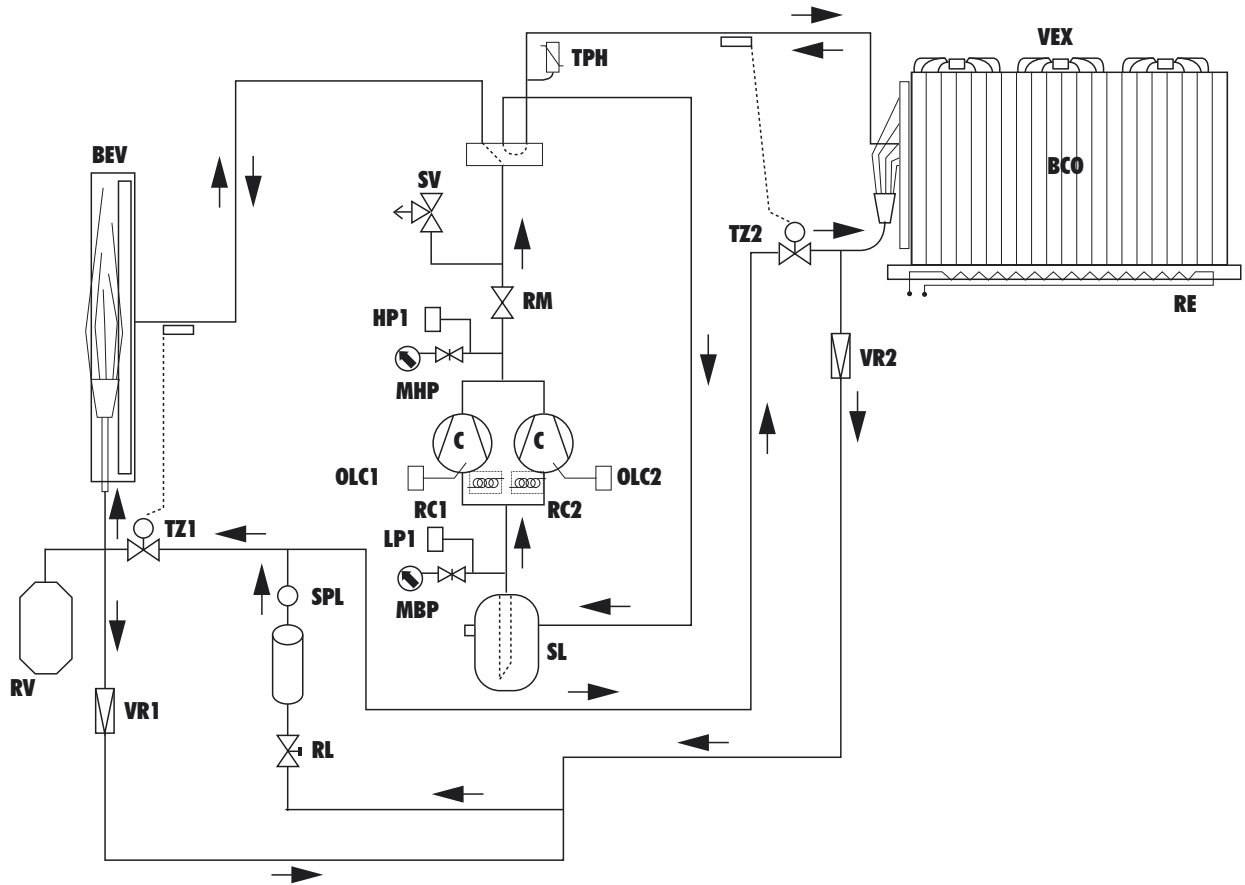
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GB	F
OUTDOOR AIR	AIR EXTERIEUR
ELECTRICAL AND COMPRESSOR CABINET	ARMOIRE ELECTRIQUE ET COMPRESSEUR
RETURN CONNECTION	RACCORD DE LA REPRISE
SUPPLY AIR	SOUFFLAGE D'AIR
INDOOR COIL	ECHANGEUR INTERIEUR
OUTDOOR COIL	ECHANGEUR EXTERIEUR
AIR FILTER	FILTRE À AIR
AIR RETURN CONNECTION	RACCORD DE REPRISE D'AIR
ELECTRIC HEATER	CHAUFFAGE ELECTRIQUE
DRAIN CONNECTION	RACCORD DE VIDANGE
AIR SUPPLY CONNECTION	RACCORD DE SOUFFLAGE D'AIR
DRAIN CONNECTION 1" MALE	RACCORD DE VIDANGE 1" MALE
OUTDOOR PLUG FANS	VENTILATEURS EXTERIEURS A REACTION
COMPRESSOR CABINET	ARMOIRE COMPRESSEUR
ELECTRICAL BOARD	TABEAU ELECTRIQUE
DISCHARGE AIR FLOW OF OUTDOOR COIL	DEBIT D'AIR EXTRAIT DE L'ECHANGEUR EXTERIEUR
HOLE Ø45 (FOR CARRIAGE)	TROU Ø45 (POUR CHARRIOT)
ELECTRICAL SUPPLY CABLE INLET	ENTREE DE CABLE D'ALIMENTATION ELECTRIQUE
FRESH AIR DAMPER	REGISTRE D'AIR NEUF
ELECTRICAL BOARD ACCESS	ACCES AU TABLEAU ELECTRIQUE
EXHAUST AIR FILTER	FILTRE SUR L'AIR EXTRAIT

REFRIGERANT c IRcu IT DIAGRAM

sc HEMA Du c IRcu IT FRIGORIFIQU E

c :	Scroll compressor	c :	Compresseur scroll
Olc 1-Olc 2 :	Overload thermal protection	Olc 1-Olc 2 :	Disjoncteur thermique
Rc 1-Rc 2 :	Crankcase heater	Rc 1-Rc 2 :	Résistance de carter
lp 1 :	Low pressure switch	lp 1 :	Pressostat basse pression
Hp1 :	High pressure switch	Hp1 :	Pressostat haute pression
MBp :	Low pressure manometer	MBp :	Manomètre basse pression
MHp :	High pressure manometer	MHp :	Manomètre haute pression
RM :	Discharge line check valve	RM :	Clapet antiretour de la ligne de refoulement
sl :	Liquid separator in the suction line	sl :	Bouteille anti-coup de liquide
vH1 :	Four way valve for reverse cycle	vH1 :	Vanne 4 voies d'inversion de cycle
TpH :	Pressure transducer 4-20 ma/0-30 bar	TpH :	Capteur de pression 4-20 mA/0-30 bars
Tz 1-Tz 2 :	Dry expansion thermostatic valves	Tz 1-Tz 2 :	Détendeurs thermostatiques
vR1-vR2 :	Refrigerant check valves	vR1-vR2 :	Clapets antiretour du fluide frigorigène
Rv :	Liquid receiver	Rv :	Accumulateur de liquide
RI :	Liquid line check valve	RI :	Clapet antiretour de la ligne liquide
FE :	Drier filter	FE :	Filtre déshydrateur
spl :	Sight glass	spl :	Voyant
sv :	Refrigerant safety valve	sv :	Soupape de sécurité du fluide frigorigène
BEv :	Indoor coil	BEv :	Echangeur intérieur
vEx :	Outdoor axial fans	vEx :	Ventilateurs axiaux extérieurs
Bc O :	Outdoor coil	Bc O :	Echangeur extérieur
RE :	Electric heater for outdoor drain pan	RE :	Résistance chauffante du bac d'évacuation extérieur



MOTOR AND pull EYs sEl Ec TION TABl E

TABl EAu DE sEl Ec TION Du MOTEu R ET DEs pOuI IEs

	Air flow rate Débit d'air m ³ /h.	Inside press. Pression à l'intérieur Pa	Total press. Pression totale Pa	External static press. Pression statique externe Pa	Electrical power consumption Puissance électrique consommée kW	Electrical ampere consumption Intensité extérieure consommée A	Speed Vitesse RPM	Fan pulley outside diam. / diam. shaft Diamètre extérieur de poulie ventilateur / diamètre d'arbre mm	Motor pulley outside diam. / diam. shaft Diamètre extérieur de poulie moteur / diamètre d'arbre mm	Nominal power electrical motor Puissance nominale du moteur électrique kW	Electrical motor type Type de moteur
20	min.	1700	104	504	0.47	0.85	1515	112 / 20	118 / 19	0.55	4 poles - B3
	nominal	2000	144	544	0.58	1.05	1565	100 / 20	112 / 19	0.75	
	max.	2300	190	590	0.72	1.30	1625	112 / 20	132 / 19	0.75	
40	min.	3400	173	573	0.95	1.72	1185	118 / 25	100 / 24	1.1	4 poles - B3
	nominal	4000	240	640	1.26	2.28	1240	112 / 25	100 / 24	1.5	
	max.	4600	317	717	1.65	2.98	1305	132 / 25	118 / 28	2.2	
60	min.	5100	141	541	1.43	2.58	970	150 / 25	100 / 24	1.5	4 poles - B3
	nominal	6000	195	595	1.88	3.40	1005	140 / 25	100 / 28	2.2	
	max.	6900	258	658	2.45	4.43	1052	132 / 25	100 / 28	3.0	
80	min.	6800	216	616	2.12	3.83	845	150 / 25	90 / 28	2.5	4 poles - B3
	nominal	8000	299	699	2.87	5.18	900	140 / 25	90 / 28	3.0	
	max.	9200	395	795	3.79	6.85	960	170 / 25	112 / 28	4.0	

	Air flow rate Débit d'air m ³ /h.	Inside press. Pression à l'intérieur Pa	Total press. Pression totale Pa	External static press. Pression statique externe Pa	Electrical power consumption Puissance électrique consommée kW	Electrical ampere consumption Intensité extérieure consommée A	Speed Vitesse RPM	Fan pulley outside diam. / diam. shaft mm	Motor pulley outside diam. / diam. shaft mm	Nominal power electrical motor Puissance nominale du moteur électrique kW	Electrical motor type Type de moteur
GB F	min.	8500	131	531	2.45	4.43	850	150 / 25	90 / 28	2.5	4 poles - B3
	nominal	10000	182	582	3.11	5.62	885	160 / 25	112 / 28	4.0	
	max.	11500	241	641	3.93	7.10	925	160 / 25	100 / 28	5.5	
100	min.	11900	215	615	4.13	7.46	845	190 / 35	112 / 38	5.5	4 poles - B3
	nominal	14000	297	697	5.42	9.79	895	200 / 35	125 / 38	5.5	
	max.	16100	393	793	7.09	12.81	950	200 / 35	132 / 38	7.5	
140	min.	15300	175	575	4.93	8.91	715	400 / 40	200 / 38	5.5	4 poles - B3
	nominal	18000	242	642	6.4	11.56	750	250 / 40	132 / 38	7.5	
	max.	20700	320	720	8.24	14.88	790	315 / 40	180 / 42	9.5	
180	min.	20400	240	640	7.26	13.11	655	280 -type 2517-d.40	132 / 38	7.5	4 poles - B3
	nominal	24000	332	732	9.68	17.49	695	355 / 40	160 / 42	11.0	
	max.	27600	439	839	12.2	22.04	740	450 -type 2517-d.40	224 -type 2517-d.42	15.0	
240	min.	20400	240	640	7.26	13.11	655	280 -type 2517-d.40	132 / 38	7.5	4 poles - B3
	nominal	24000	332	732	9.68	17.49	695	355 / 40	160 / 42	11.0	
	max.	27600	439	839	12.2	22.04	740	450 -type 2517-d.40	224 -type 2517-d.42	15.0	

	Air flow rate	Inside press.		Total press.		External static press.	Electrical power consumption		Speed	Fan pulley outside diam. / diam. shaft		Motor pulley outside diam. / diam. shaft		Nominal power electrical motor		Electrical motor type
		Pression à l'intérieur	Pa	Pression totale	Pa		Puissance électrique consommée	Intensité extérieure consommée		Diamètre extérieur de poulie ventilateur / diamètre d'arbre	mm	Diamètre extérieur de poulie moteur / diamètre d'arbre	mm	Puissance nominale du moteur électrique	kW	
280	min.	23800	209	609	250		8.77	15.84	882	315 / 35		180 / 42		9.5		4 poles - B3
380	min.	32300	334	734	250		13.5	24.39	815	355 / 40		180 / 38		15.0		4 poles - B3
380	nominal	38000	462	862	250		18.3	33.06	875	355 / 40		224 / 42		22.0		4 poles - B3
380	max.	43700	611	1011	250		23.5	42.45	945	315 / 40		200 / 42		15.0		4 poles - B3

Ec c ompliance declaration

Under our own responsibility, we declare that the product designated in this manual comply with the provisions of the EEC directives listed hereafter and with the national legislation into which these directives have been transposed.

Déclaration c E de conformité

Nous déclarons sous notre responsabilité que les produits désignés dans la présente notice sont conformes aux dispositions des directives c EE énoncées ci-après et aux législations nationales les transposant.

EG-Konformitätserklärung

Wir erklären in eigener Verantwortung, das die in der vorliegenden Beschreibung angegebenen Produkte den Bestimmungen der nachstehend erwähnten EG-Richtlinien und den nationalen Gesetzesvorschriften entsprechen, in denen diese Richtlinien umgesetzt sind.

Dichiarazione c E di conformità

Dichiariamo, assumendone la responsabilità, che i prodotti descritti nel presente manuale sono conformi alle disposizioni delle direttive c EE di cui sotto e alle legislazioni nazionali che li recepiscono.

Declaración c E de conformidad

Declaramos, bajo nuestra responsabilidad, que los productos designados en este manual son conformes a las disposiciones de las directivas c EE enunciadas a continuación, así como a las legislaciones nacionales que las contemplan.

RT4D 20 - 40 - 60 - 80 - 100 - 140 - 180 - 240 - 280 - 380
REF:

MAC HINERY DIREc Tiv E 98 / 37 / EEC
LOW VOLTAGE DIREc Tiv E (DBT) 2006 / 95 / EEC
ELECTROMAGNETIC COMPATIBILITY DIREc Tiv E 89 / 336 / EEC AMENDED BY DIREc Tiv E 92 / 31 / EEC AND 93 / 68 / EEC
PRESSURE EQUIPMENT DIREc Tiv E (DESP) 97 / 23 / EEC
SUB-MODULE A1 CATEGORY II:
NOTIFIED BODY: TÜV RHEINLAND – 6, RUE HALEVY – 75 009 PARIS - FRANCE.
THE PRODUCTS ARE PROVIDED WITH CE 0035 MARKING OF CONFORMITY

DIREc Tiv E MACHINES 98 / 37 c .EE.
DIREc Tiv E BASSE TENSION (DBT) 2006 / 95 / c .EE.
DIREc Tiv E COMPATIBILITE ELECTROMAGNETIQUE 89 / 336 / c .EE. AMENDEE PAR DIREc Tiv E 92 / 31 / c .EE ET 93 / 68 / c .EE.
DIREc Tiv E DES EQUIPEMENTS SOUS PRESSION (DESP) 97 / 23 c .EE.
Sous-MODULE A1, CATEGORIE II :
Avec surveillance par TÜV RHEINLAND 6, RUE HALEVY – 75 009 PARIS - FRANCE.
Les produits sont fournis avec le marquage CE 0035

Richtlinien Maschinen 98 / 37 / EG
Richtlinien Niederspannung (DBT) 2006 / 95 / EG
Richtlinien Elektromagnetische Verträglichkeit 89 / 336 / EG ABGEÄNDERT DURCH DIE RICHTLINIEN 92 / 31 / EG UND 93 / 68 / EG
Richtlinien für Aus Rüstungen unter Druck (DESP) 97 / 23 / EG
Unter-Modul A1, KATEGORIE II :
MIT KONTROLLE DURCH TÜV RHEINLAND 6, RUE HALEVY – 75 009 PARIS - FRANCE.
DIE PRODUKTE WERDEN MIT DER MARKIERUNG CE 0035 GELIEFERT.

DIRETTIVA MACCHINE 98 / 37 / c EE
DIRETTIVA BASSA TENSIONE (DBT) 2006 / 95 / c EE
DIRETTIVA COMPATIBILITA ELETTRONAGNETICA 89 / 336 / c EE EMENDATA DALLA DIRETTIVA 92 / 31 / c EE E 93 / 68 / c EE
DIRETTIVA DEGLI IMPIANTI SOTTO PRESSIONE (DESP) 97 / 23 / c EE
SOTTO-MODULO A1, CATEGORIA II :
CON SUPERVISIONE PER TÜV RHEINLAND 6, RUE HALEVY – 75 009 PARIS - FRANCE.
I PRODOTTI SONO FORNITI CON IL MARCATURA DI CONFORMITA CE 0035.

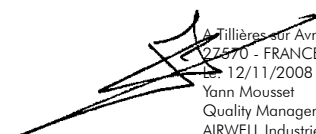
DIREc Tiv A MAQUINAS 98 / 37 / c EE
DIREc Tiv A BAJA TENSION (DBT) 2006 / 95 / c EE
DIREc Tiv A COMPATIBILIDAD ELECTROMAGNETICA 89 / 336 / c EE ENMENDADA POR LA DIREc Tiv A 92 / 31 / c EE Y 93 / 68 / c EE
DIREc Tiv A DE LOS EQUIPOS A PRESION (DESP) 97 / 23 / c EE
BAJA MODULO A1, CATEGORIA II :
CON SUPERVISORIANZA DEL TÜV RHEINLAND 6, RUE HALEVY – 75 009 PARIS - FRANCE.
LOS PRODUCTOS SE PROPORCIONAN CON EL MARCADO DE CONFORMIDAD CE 0035.

And that the following paragraphs of the harmonised standards have been applied.
Et que les paragraphes suivants des normes harmonisées ont été appliqués.
und dass die folgenden paragraphen der vereinheitlichten Normen Angewandt wurden.
E che sono stati applicati i seguenti paragrafi delle norme armonizzate.
Y que se han aplicado los siguientes apartados de las normas armonizadas.

EN 60204-1
EN 61 000-6-2

EN 378-1
EN 61 000-6-4

EN 378-2
EN


A Tillières sur Avre
27570 - FRANCE
Le: 12/11/2008
Yann Mousset
Quality Manager
AIRWELL Industrie France

AIRWEIL INDUSTRIE FRANCE

Route de Verneuil
27570 Tillières-sur-Avre
FRANCE

☎ : +33 (0)2 32 60 61 00

☎ : +33 (0)2 32 32 55 13



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