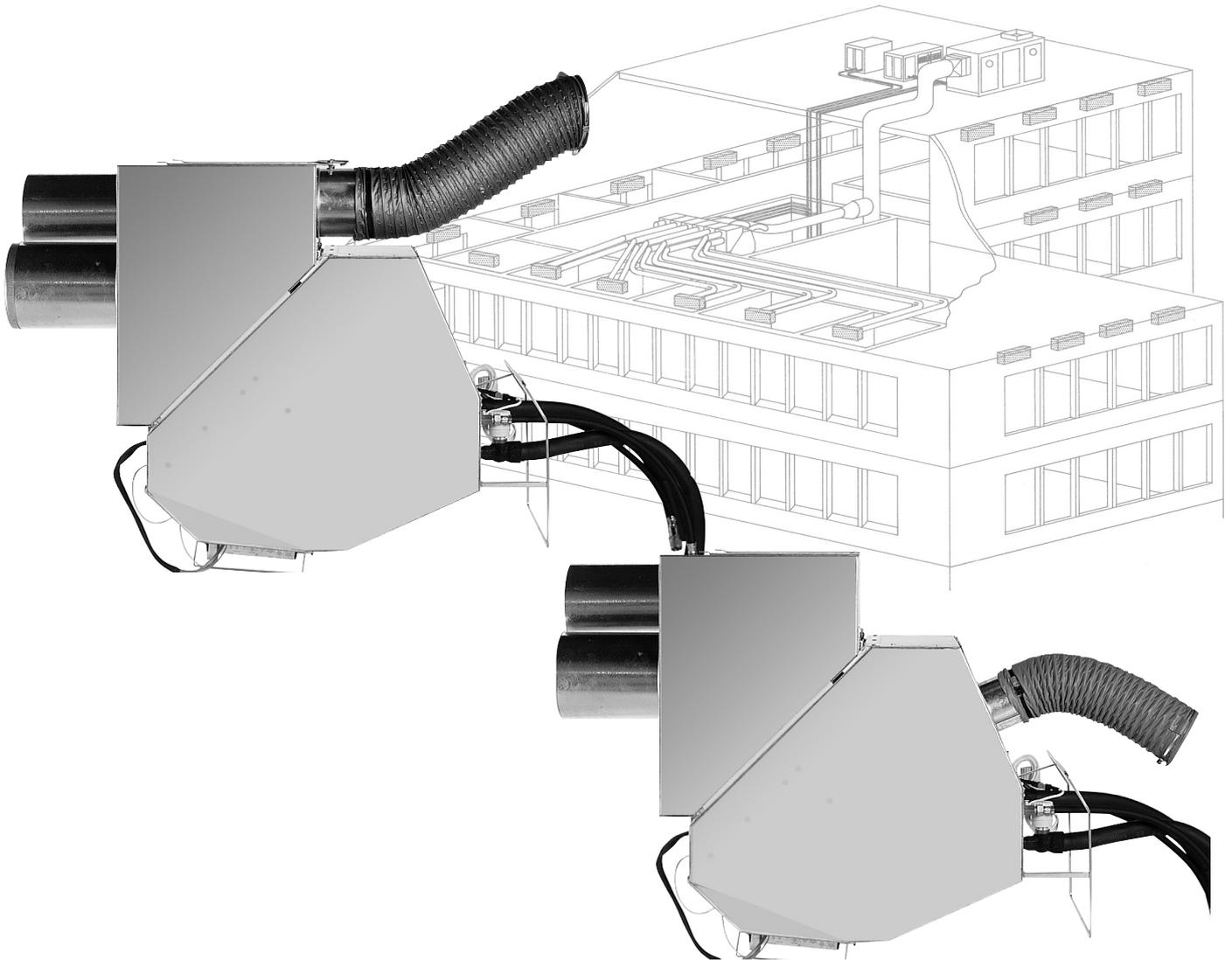




42GR ATM

Air Treatment Module

Nominal air flow, size 1: 97 l/s - 350 m³/h
size 2: 139 l/s - 500 m³/h



Selection manual



Quality Management System Approval

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1 - INTRODUCTION

The 42GR Air Treatment Module (ATM) is something more than a simple air conditioner which enables room air temperature to be controlled. It is a total, integrated comfort system in the building.

The Carrier 42GR is a compact central station air handler in two sizes able to supply conditioned air at rates from 97 l/s to 139 l/s to rooms with floor areas from 25 to 40 m². The main components of the unit are a centrifugal fan, an air filter, a hot water heating coil or an electric resistance heater and a chilled water cooling coil. The unit is controlled by a Carrier numeric controller or similar.

The 42GR is connected, on site, through two flexible ducts (low thermal conductivity, low noise transmission supplied by others) to one or more high induction plenums fitted with Carrier linear diffusers in the false ceiling. Typically, these will be Carrier Moduboot 35BD/35SR units with each one serving an individual room or zone and providing both supply air and return air paths according to diffuser model.



The total air conditioning system comprises one or more Carrier air- or water-cooled chillers connected to a number of air handlers supplying fresh air to the Carrier 42GR Air Treatment Modules. The number of Air Treatment Modules permissible is virtually unlimited. They are usually installed in floor by floor machine rooms where they are easily connected to hot water and chilled water circuits and to the fresh air supply. These circuits, installed in corridors, hallways and other unoccupied areas, never pass through the conditioned spaces. Only the passive elements of the system, the 35BD/35SR diffusers are within the space which they serve.

Noise levels, or more exactly the absence of noise, are a critical factor in the selection of an air conditioning system.

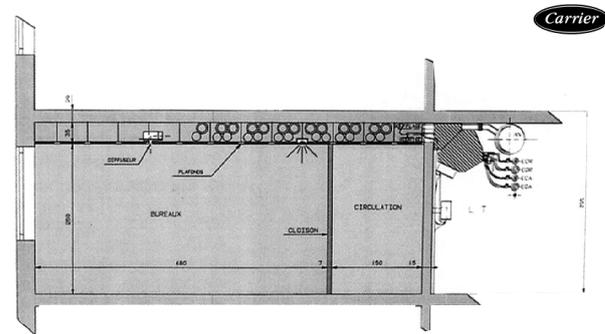
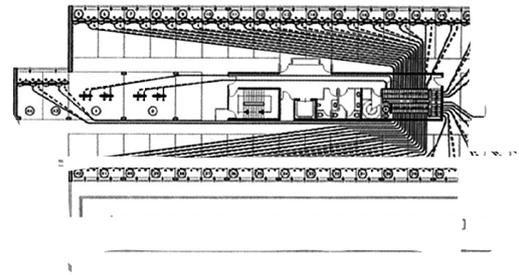
Low noise was a key design objective for the 42GR. In addition its high available static pressure allows it to be installed well away from the area to be air conditioned.

Low noise, remoteness from the space which it serves and easy servicing are key attributes which influence the selection of an air conditioning system.

1.1 - 42GR: a new way in air conditioning

The Air Treatment Module can be viewed as a system in which each component and function is viewed from the point of view of the building. Its integration into the system will be around the central service core in which all building service supplies and equipment will be grouped.

This of course presupposes prior consideration and co-operation between the building owner, the architect and the mechanical and electrical service system designers. For the 42GR to be totally integrated into the building, the building itself must offer the possibility of integration. The units can then be gathered in the floor by floor machine rooms with the sanitary services, electrical services, telephone etc. Here, installed at high level the 42GR creates usable space below.



1.2 - Comfort

Within the conditioned space, a linear diffuser integrated into the ceiling is the only clue to the presence of the system. There will be no noise, no drafts, no vibration, just an empty space allowing free reign to the imagination of the architect in designing his interiors.

The modular concept gives freedom to rearrange partitions and reallocate space later.

The top of the range 42GR can have a Carrier numeric controller. Each room occupant then has his or her own Zone User Interface, on a wall (with a mounting base) or desk, with which to select the preferred comfort level:

- Room ambient temperature
- Select Occupied or Unoccupied mode at each 42GR to control energy usage
- Ventilation air (the rate of air replacement)
- Lighting on or off
- Blinds raised or lowered and their inclination.

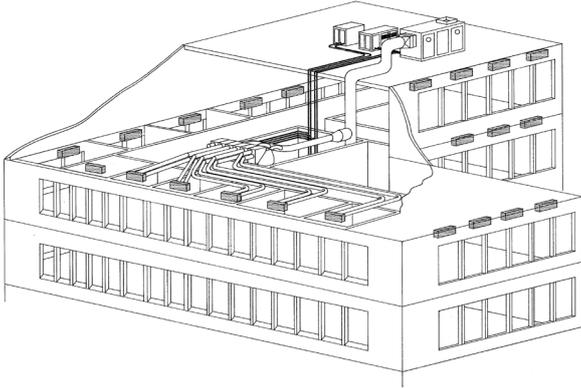
In addition, connection to a central Building Management System allows units to be controlled individually to satisfy overriding criteria or to respond to local regulations.

The Building Management System monitors, continuously, the comfort level in each zone and reacts instantly to the inputs received to achieve optimum energy usage without overriding individual comfort level selections.

1.3 - The levels of air conditioning

Central systems

The ATM can be used in conjunction with any type of chiller, reciprocating, centrifugal, screw, absorption etc.



ATM units enable central systems to be designed to take greater advantage of diversity in the cooling and heating loads to bring about significant reductions in the size of the central plant specified.

During the intermediate seasons all components of the system operate at less than full load. Numeric controllers in conjunction with Pro-Dialog control on the chiller creates the ability to optimise the use of all units under part load conditions.

Further, the communications abilities of the external networks with their diagnostic, reporting and alarm capabilities through the BMS, greatly simplify servicing and maintenance.

Centralisation of the control of both cooling and heating at once simplifies servicing and maintenance.

Floor by floor systems

For rental properties, the ability to introduce services progressively only as space is let is an attractive financial advantage.

In addition to the financial advantages such systems are generally very flexible which is a very important advantage as tenancies and occupant's requirements change.

Ice storage reduces the capacity needed in the chillers on each floor in turn reducing their cost and space usage.

Heat recovery systems can be installed in the fresh air and exhaust air streams and capture and recycle waste heat to bring about yet another reduction in energy usage and operating cost.

With floor by floor systems using the ATM, the chiller and the ATM can be concentrated together in the machine room. Maintenance and service operations are easier and less likely to disrupt normal working.

1.4 - Air quality

Fresh air

Every 42GR or suspension casing has a fresh air inlet with a fresh air volume controller giving precise control of the fresh air ventilation and refresh rate to comply with local health codes. The fresh air ventilation and refresh rates must be set to take account of room occupancy.

Air filtration

The cleanliness of the supply air is one of the primary functions of air treatment. It gives the most basic and important measure of 'air quality' essential to our health. The air we breathe contains a wide diversity of particles, pollens and dusts, all potential allergens, which have different effects upon the health of different people.

They come from many sources both within and outside the building. Air filtration protects people against the health hazards of these pollutants and safeguards furnishings and equipment against potential damage from the contamination which they can cause.

42GR Air Treatment Modules have high efficiency throw-away filters (F5). As an option F6 filters can be fitted.

Indoor Air Quality (IAQ)

In the last ten years Carrier has been committed to developing an Indoor Air Quality (IAQ) control system that is integrated into the air conditioning units. This is a major innovation, and the beginning of a new era in air conditioning.

It means that each air treatment module (ATM) is equipped with a high-tech fresh air intake and filtration control system to effectively combat any type of pollutant. This guarantees optimised indoor air quality in three stages, as described below:

1. **High-efficiency filtration** with filter type F6
2. **Air purification:** Purification or elimination of contaminants is achieved by degradation of the gases present and deactivation of potentially irritating airborne substances.
3. **Modulation of the fresh air flow.** In order to control the air flow supplied to a room, Carrier air conditioners can be equipped with a fresh air flow modulation system.

Three objectives:

- **To adjust the ventilation rate** to the actual occupation in the rooms
- **To maintain good indoor air quality** in order to ensure comfort and hygiene for the occupants.
- **To control energy consumption** due to the air renewal in the rooms and adjust it to avoid "overventilation" of the building, and to minimise the operating costs especially during unoccupied periods.

Operating principles

The occupants of a room release on average 0.0045 l/s (16,2 l/h) CO₂. A CO₂ sensor, placed in the return air duct of the terminal, checks the concentration in the air conditioned room. The measured concentration indicates the actual occupation of the room. The sensor sends a signal to the numerical Carrier controller which in turn passes an action signal to the fresh air valve:

- if the CO₂ concentration is below a threshold value: the fresh air flow is minimal or zero,
- if it is above: the fresh air flow is increased up to the specified maximum.

1.5 - Total quality

The Carrier total quality philosophy extends from the conception of a product through its design, the selection of components, the product itself and the production processes.

All units are tested either at the Carrier research and development test laboratory or at the Centre Technique des Industries Aérouniques et Thermiques (CETIAT) to guarantee the integrity of declared performance data. Carrier has held LRQA quality certification to ISO 9001 since 1989.

The certification embraces the conception, production and delivery of the product as well as the after-sales service provided by Carrier.

2 - FEATURES

2.1 - Main characteristics

The modular design of the 42GR allows it to be applied efficiently, singly or in multiples, as master/slave (several slave units for one master) to heat or cool alone or heat and cool, as required for small to medium size rooms. 42GR units are built to be installed into local floor machine rooms quickly and easily. A simple suspension system has been adopted and quick connect couplings are used for power and water supplies and supply and return air ducts.

The total system comprises:

- A suspension rail fixed directly to the concrete slab
- A 42GR with its suspension casing.

This two-piece construction enables the suspension casings alone to be installed while building proceeds. The operating element need not be installed, or even delivered until just before the tenants take up occupation. Financial resources are not tied up in idle equipment.

Other components are:

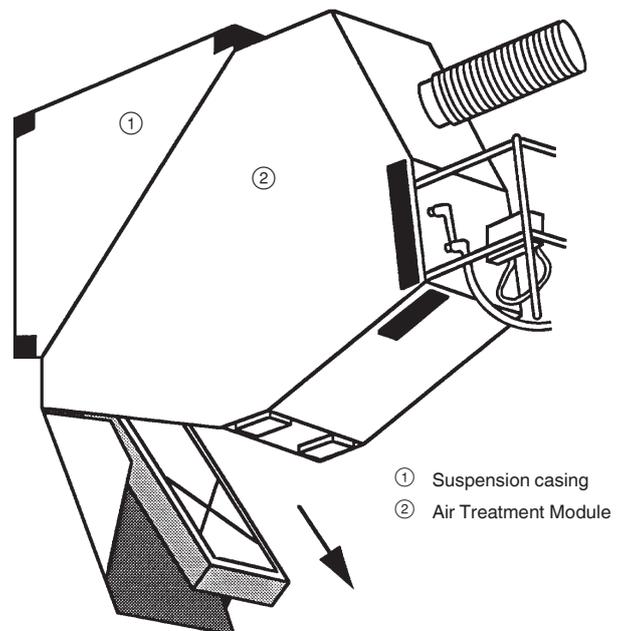
- Two- or three-way hot or cold water valves.
- Flexible water pipes with 1/2" BSP threaded nut. The chilled water pipe is already insulated.
- F5 throwaway filters.
- A constant volume fresh air controller, installed either on the suspension casing (the fresh air is treated by the coil) or on the 42GR itself (the fresh air is not treated by the coil).

- A single, directly-driven centrifugal fan. For 42GR units size 1 the fan is backward-curved and has one inlet. For size 2 it is a forward-curved double inlet fan. Fan speed is controlled by phase splitting.
- A PTC electric heater (as an option) may be used in place of the hot water coil. PTC (Positive Temperature Coefficient) electric resistance heaters are high performance devices with two characteristics: heating and inherent limiting of the surface temperature. The self-regulating characteristic ensures total and reliable control over the heat dissipated which is always proportional to the volume and temperature of the incoming air flow.
- A Carrier numeric controller. In effect this provides each user with a wall-mounted or desktop Zone User Interface controller which can be used to display the preferred individual comfort level. A Zone User Interface is optional, depending on whether the ATM is configured as a master or a slave.
- A fan speed controller (as an option) to be used when a specific control is required (fan coil type control for example). This fan speed controller is the essential interface between the 42GR and standard commercial controls.

IMPORTANT: When applied as conceived, in a machine room, the 42GR needs no insulation. Condensation may form on the unit casing if the chilled water temperature and ambient temperature and relative humidity create the right conditions.

A floor drain with a siphon is recommended for each machine room.

Internal 5 mm thick insulation (M1 fire rating) can be fitted in the factory. Discuss with your Carrier representative.



NOTE: Operating limit: air discharge temperature 12°C when the unit is installed where room temperature is 25°C dry bulb and rh 45%.

2.2 - Physical and electrical data

42GR ATM		Size 1	Size 2
Nominal air flow	l/s (m ³ /h)	97 (350)	139 (500)
Total cooling capacity (at nominal air flow)*	kW	2.8	4.1
Sensible cooling capacity (at nominal air flow)*	kW	1.9	2.7
Heating capacity (at nominal air flow)**	kW	1.2	2.2
Power supply 230 V-1 ph- 50 Hz	U%	± 15	± 15
Operating weight (6-row coil)	kg	35	50
Water coil		3/8" copper tubes, aluminium fins at 1.8 mm spacing, test pressure 24 bar, operating pressure 16 bar	
• 6-row coil: 5 cooling rows, 1 heating row			
• 5-row cooling coil			
• Cooling water volume	l	0.83	1.5
• Heating water volume	l	0.17	0.3
PTC electric heater (Positive Temperature Coefficient)			
• Max. capacity at nominal air flow	kW	1.7	1.8
• Current draw ± 15%	A	11	11
• Power input at zero flow	W	80	80
• VDE, CE, UL and CSA codes approved			
Fan			
• Centrifugal fan, single wheel		Single inlet	Double inlet
- Nominal air flow	l/s (m ³ /h)	97 (350)	139 (500)
- Static pressure at nominal air flow	Pa	310	320
Fan motor		230 V-1 ph-50 Hz, 2-pole open asynchronous, permanent capacitor, inherent overload protection, class B insulation, varnish class F, connected to a speed controller.	
• Protection index	IP	44	44
• Max. power input at 230 VAC ⁺	W	143	208
• Min. output from electronic speed controller (RMS)	V	80	80
• Nominal current ⁺	A	0.64	0.91
• Starting current	A	2.56	3.64
Air filter		Throwaway, 55 mm thick, type F5, fire rating medium M1, metal frame	
• Dimensions	mm	225 x 350	395 x 350
• Pressure drop, clean			
- air flow 97 l/s	Pa	35	-
- air flow 139 l/s	Pa	-	35
Fresh air connection on ATM***			
• External diameter	mm	75	125
• Constant air flow (-10%, + 20%)	l/s (m ³ /h)	8.3 (30)	16.6 (60)
• ΔP (upstream/downstream)	Pa	50/200	70/200

42GR modules are designed and tested for 16 bar operating pressure. The total operating circuit of the ATM is guaranteed for an operating pressure of 10 bar. Contact your local Carrier representative for advice when an application calls for an operating pressure of 16 bar.

Notes:

* Based upon water entering at 6°C, room air at 25°C dry bulb, 50% relative humidity, 5 K Δt and nominal air flow.

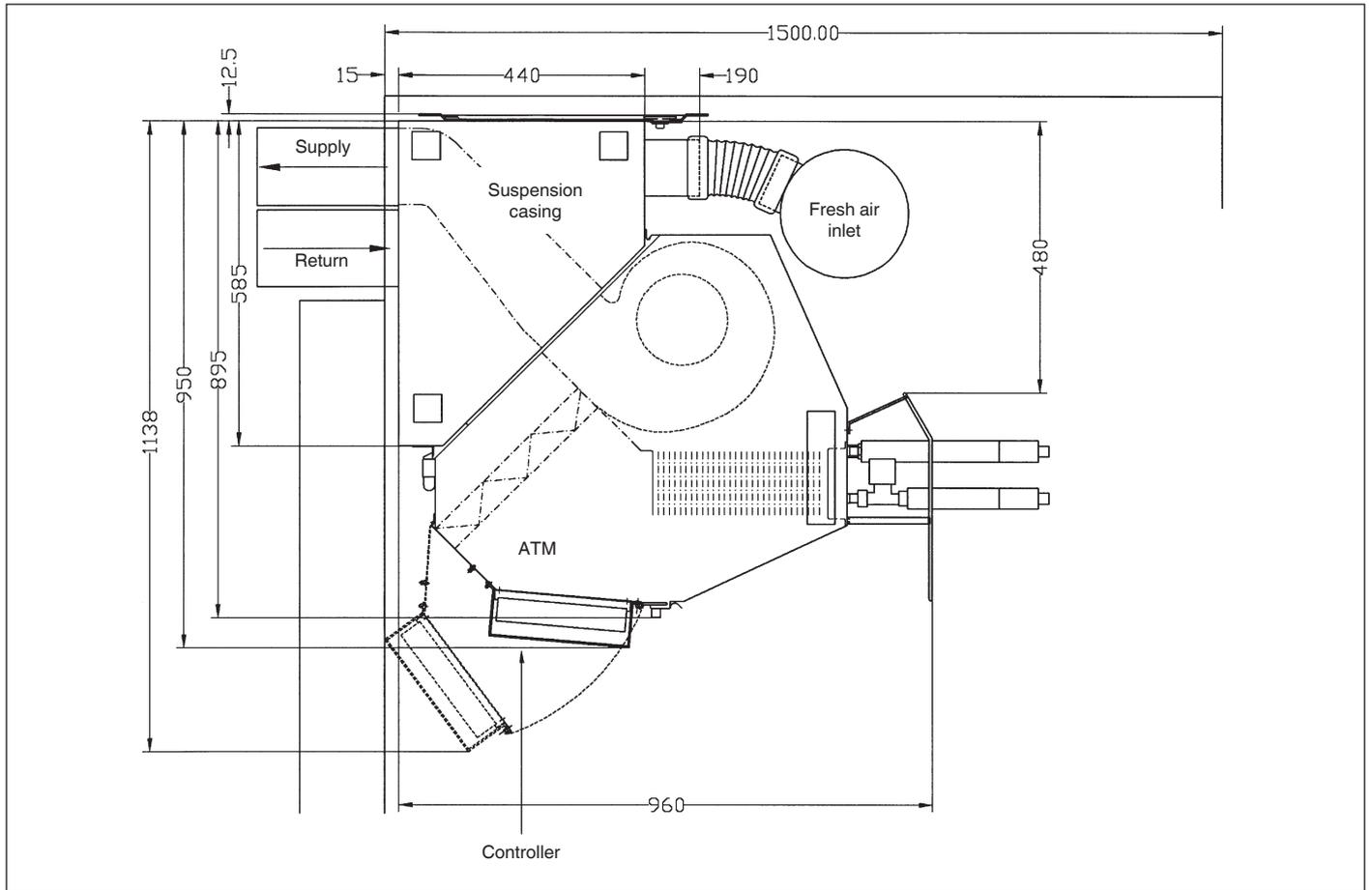
** Based upon water entering at 50°C, room air at 19°C, 10 K Δt and nominal air flow.

*** In the case of the size 2 ATM, the fresh air controller may be modified on site by relocating or removing two plastic restricters in order to increase its constant fresh air flow capacity to 20,8 (75), 27,7 (100), 36,1 (130), 44,4 l/s (160 m³/h)

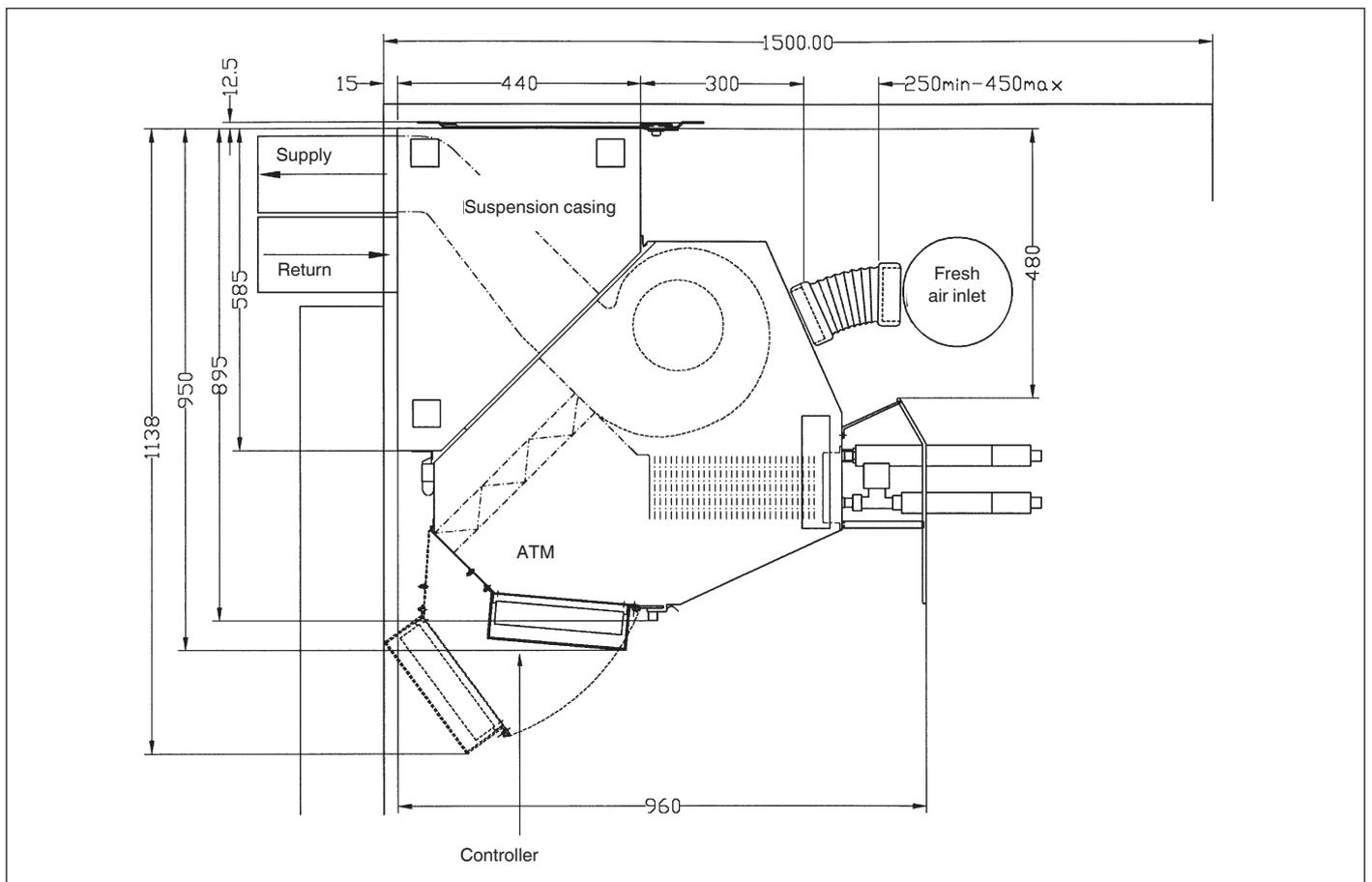
+ Refer to extended electrical data table

2.3 - Dimensional drawings

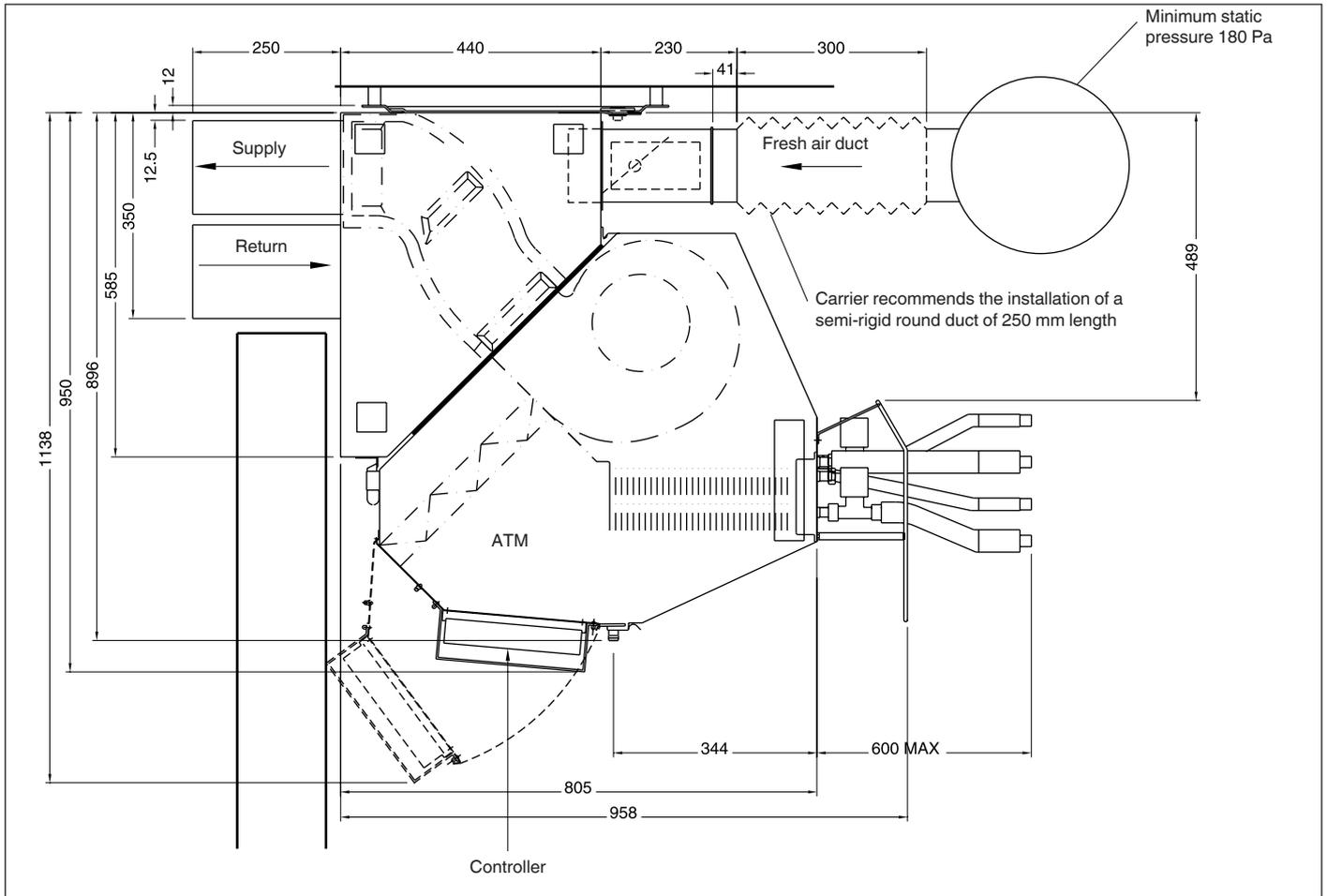
2.3.1 - ATM with all fresh air or constant fresh air volume suspension casing, mm



2.3.2 - ATM with standard suspension casing, mm



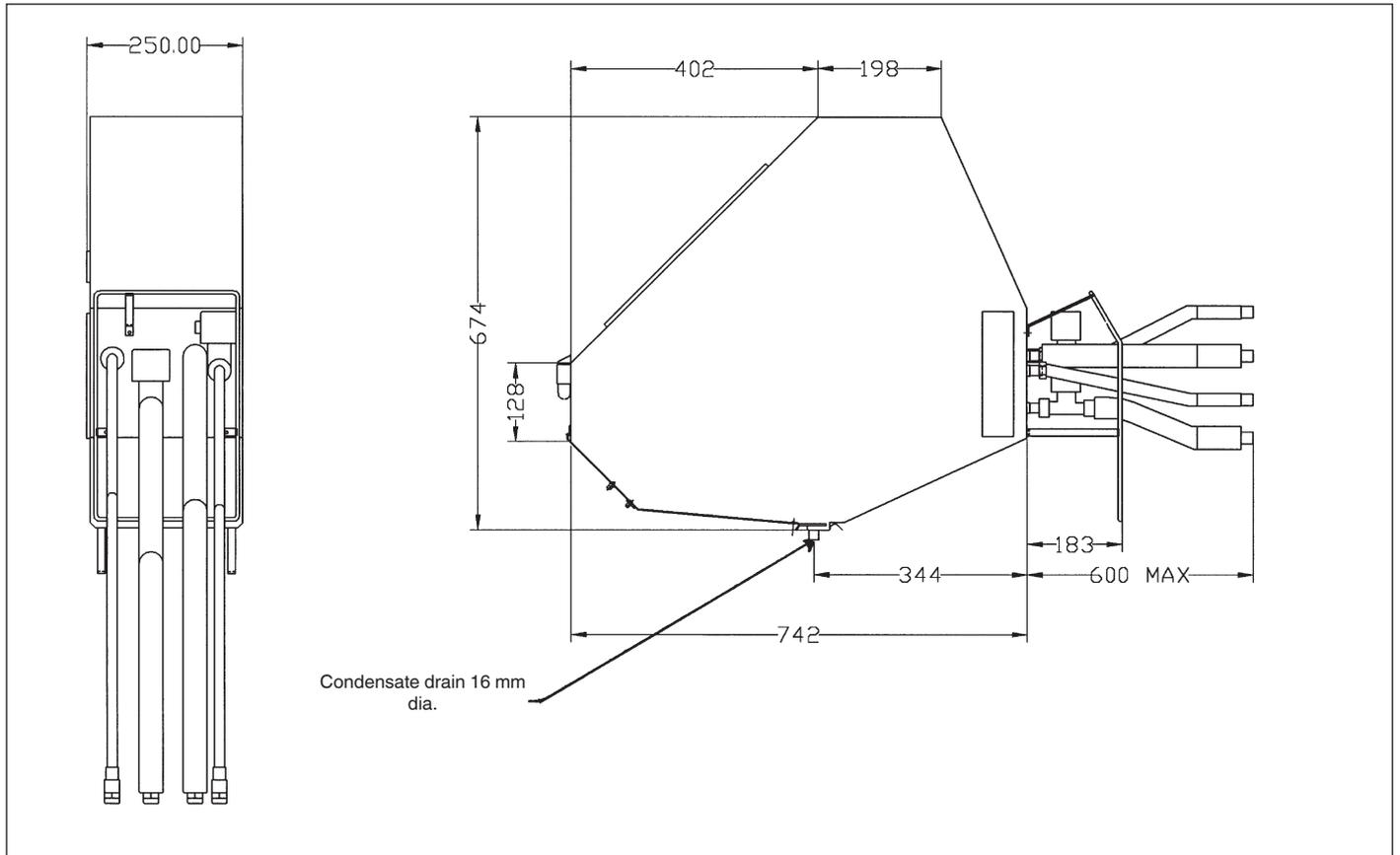
2.3.3 - ATM with variable fresh air volume suspension casing, mm



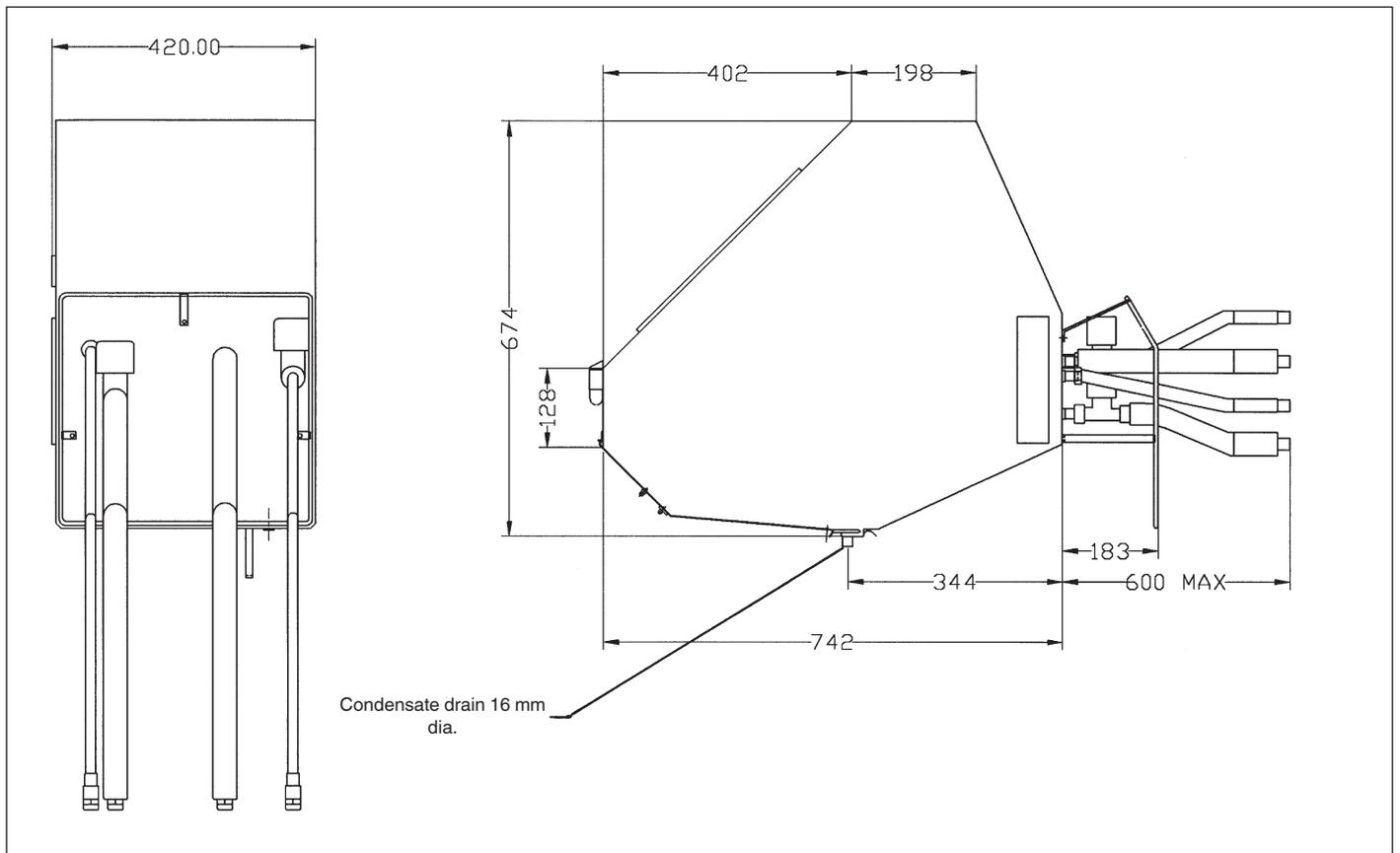
NOTE: The semi-rigid duct is not supplied by Carrier, and must be installed in the straightest line possible to prevent any air flow problems (maximum length without bends).

2.3.4 - ATM with no fresh air inlet

42GR size 1, mm

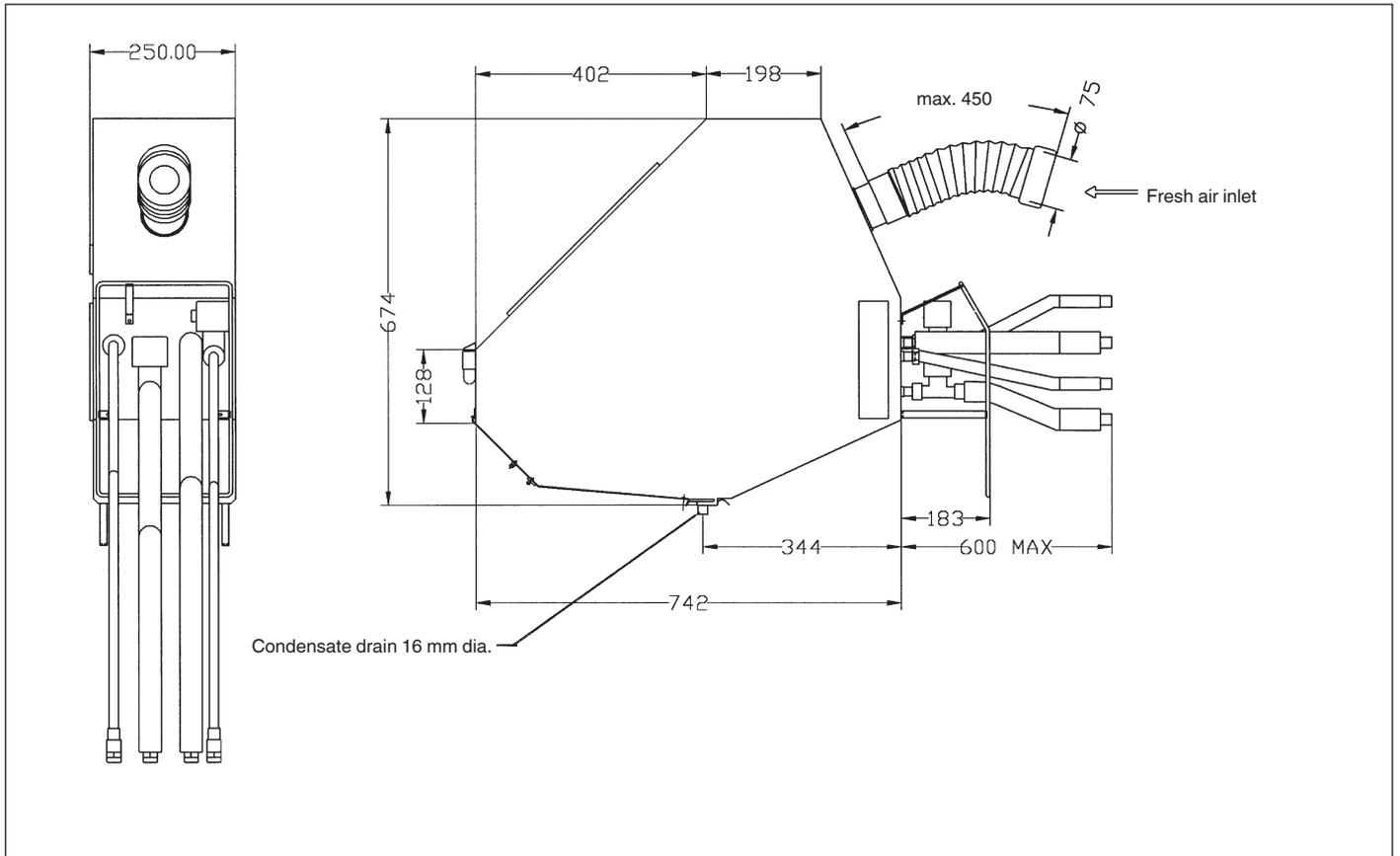


42GR size 2, mm

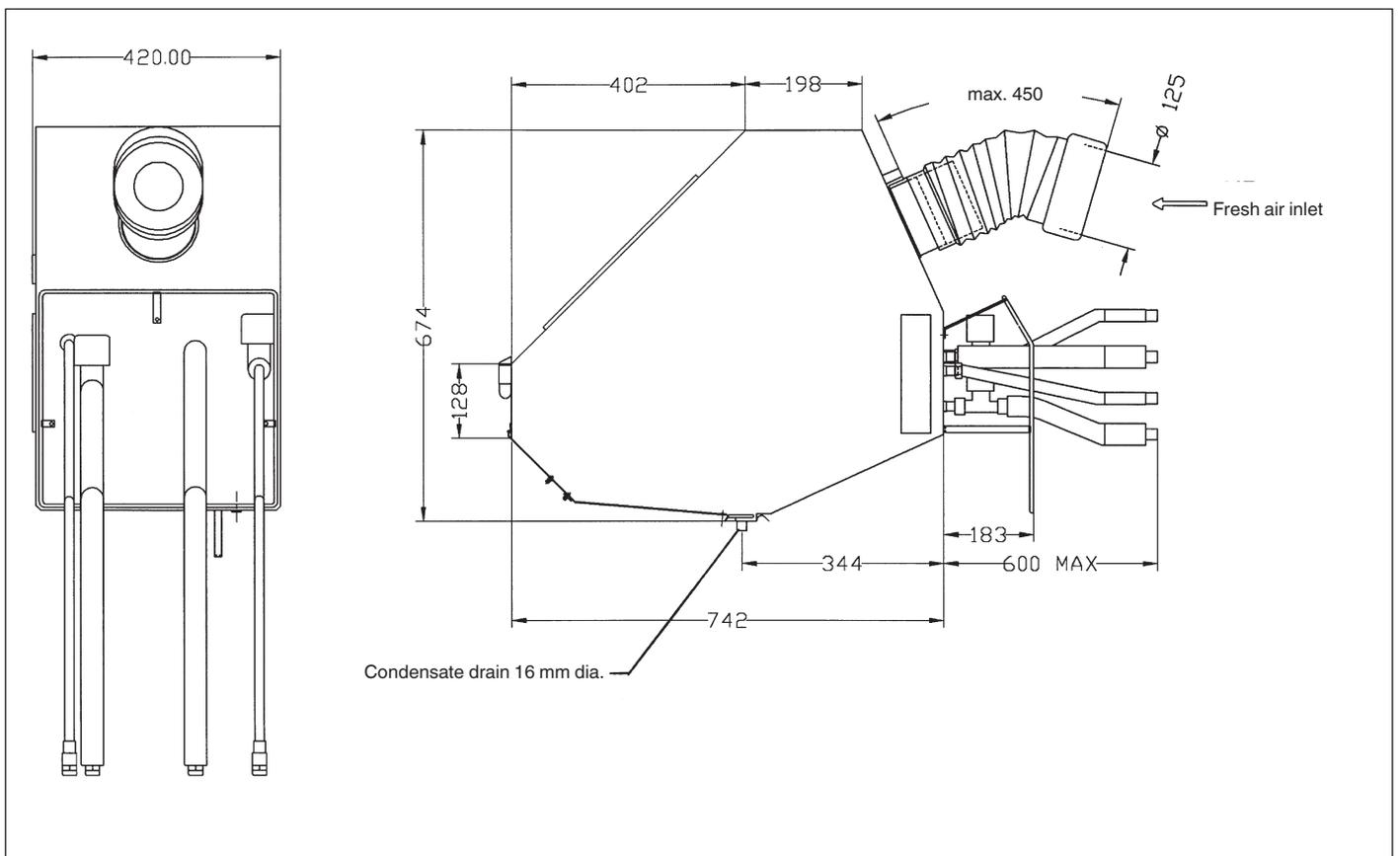


2.3.5 - ATM with fresh air inlet

42GR size 1, mm

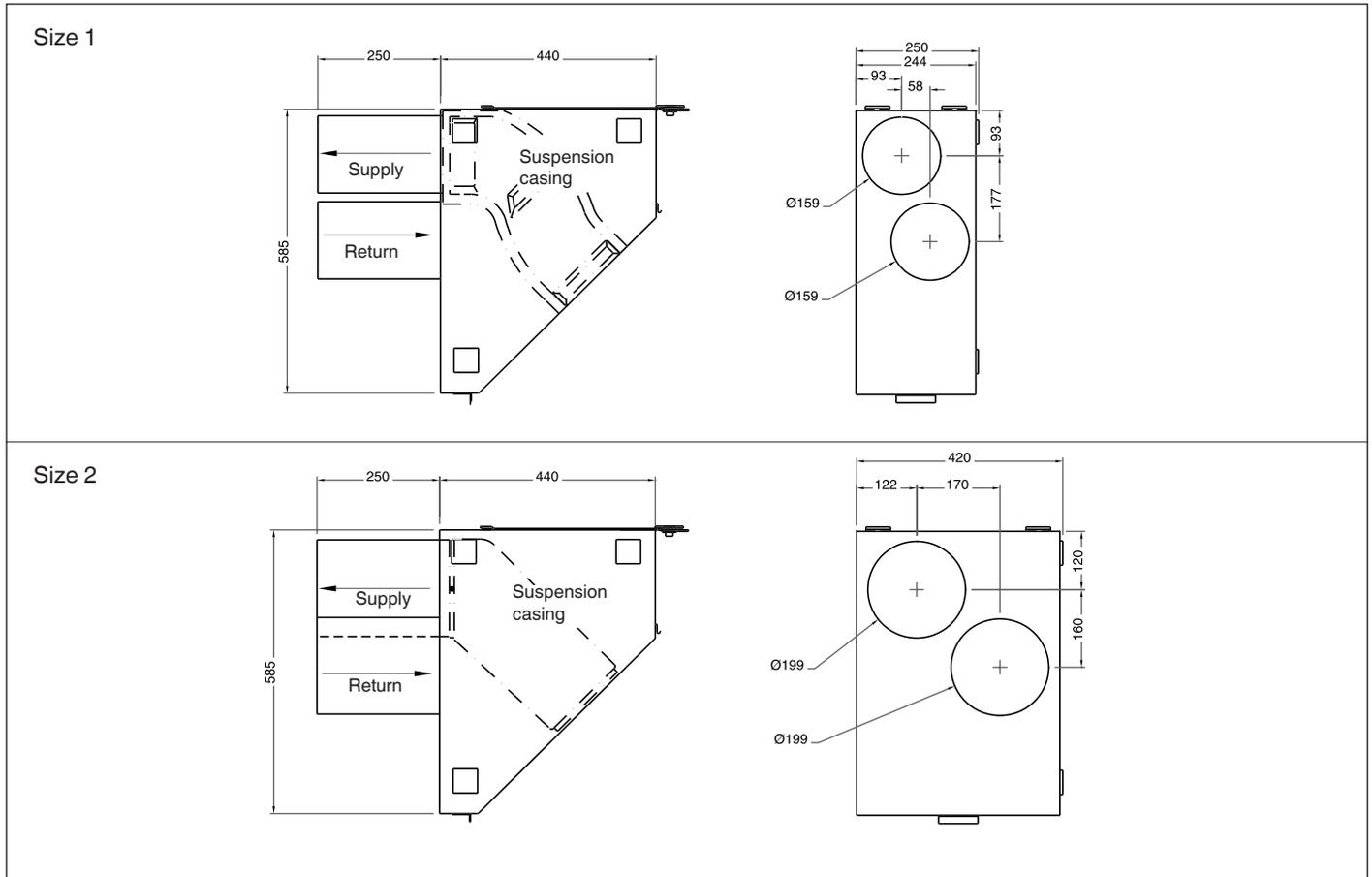


42GR size 2, mm

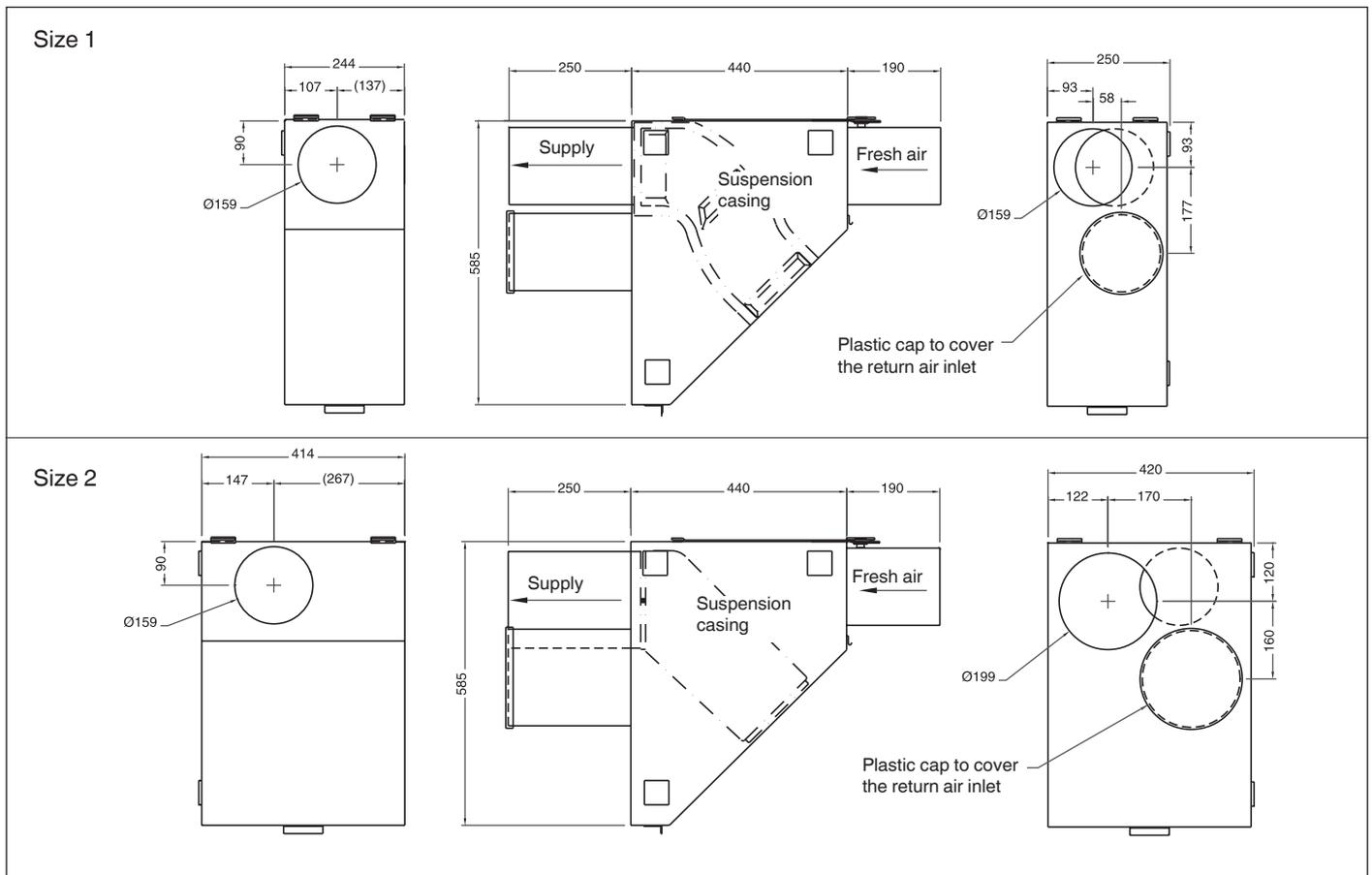


2.3.6 - Suspension casing drawings

Standard suspension casing, mm

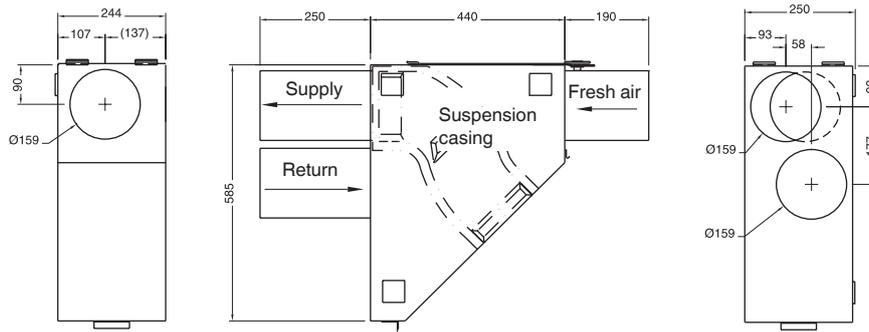


All fresh air suspension casing, mm

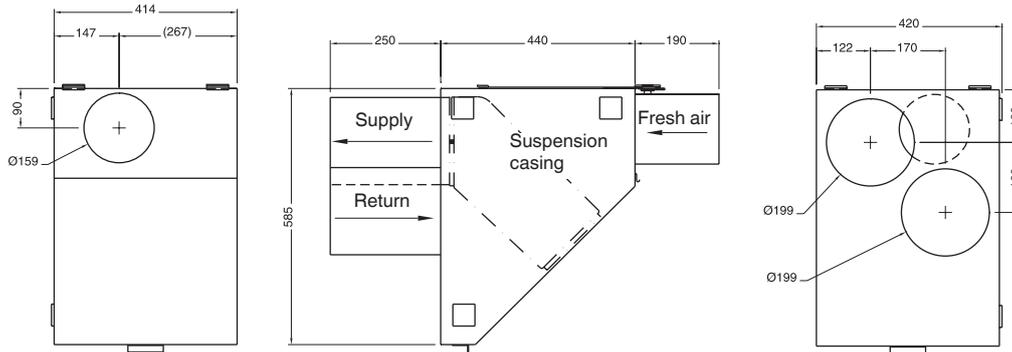


Constant fresh air volume suspension casing, mm

Size 1

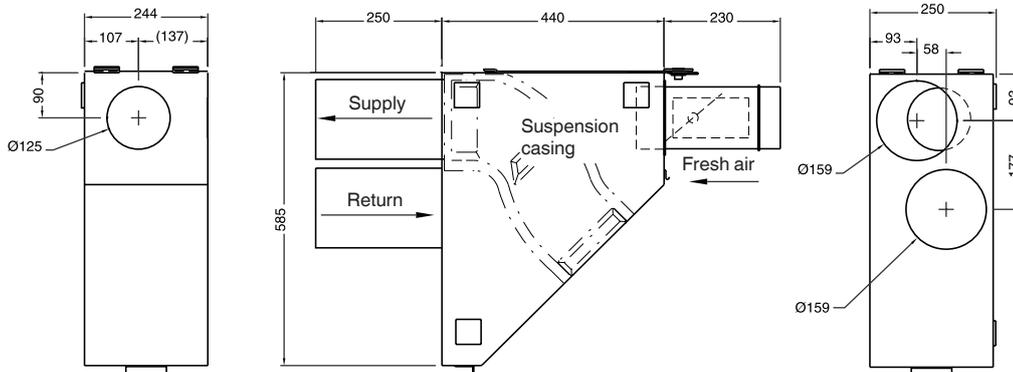


Size 2

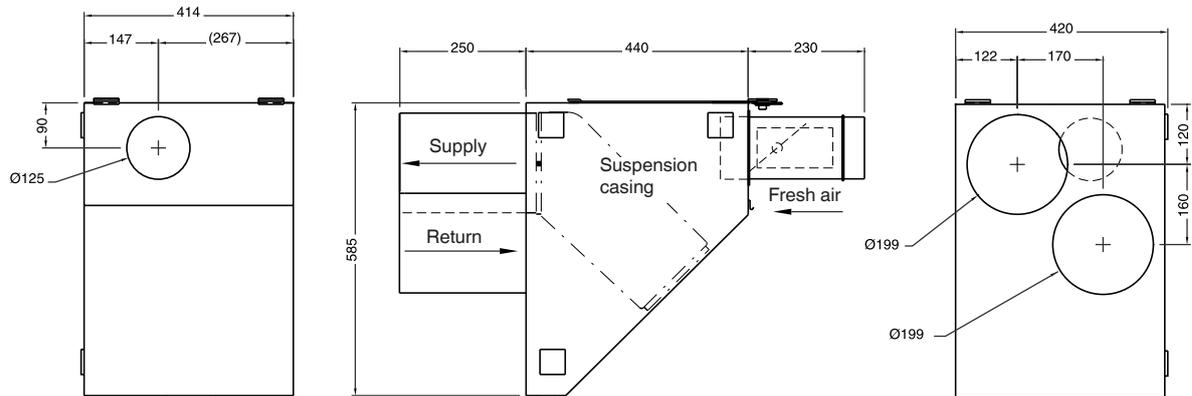


Variable fresh air volume suspension casing, mm

Size 1



Size 2



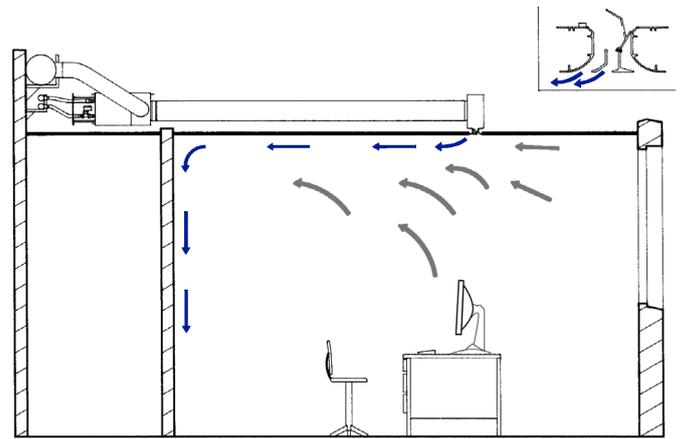
2.4 - Air distribution

Carrier Optimix linear diffusers are recommended to be used with the 42GR. They have an internal movable damper controlled by an internal thermostat (calorstat). Movement of the damper changes the direction of the air flow from the diffuser. When the temperature of the air from the diffuser is higher than 24°C the air flow is directed towards the window. When it is lower than 20°C the air flow is directed towards the interior of the space.

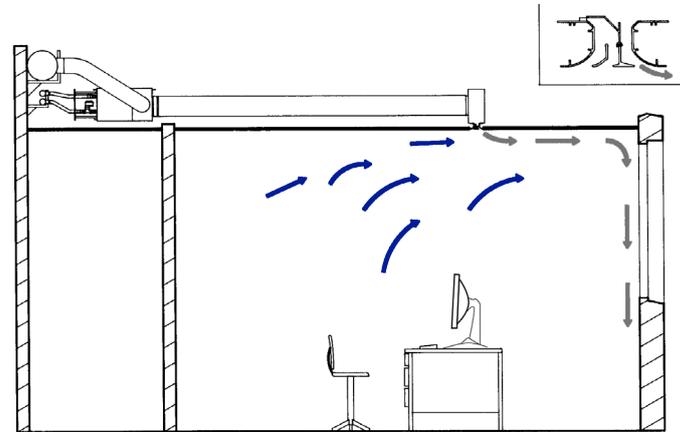
In the example shown, the diffuser has three air delivery slots, one discharges warm air towards the window, the others direct cold air towards the interior of the room. ATM provides warm or cold air supply paths and a return air path. Carrier recommends a double plenum in galvanised steel insulated on the inside with a 13 mm glass fibre blanket which itself is protected against erosion by the air flow with a neoprene skin. Both compartments of the plenum have a round lateral connection spigot to which the supply and return air ducts are connected. The ducts may be flexible or semi-rigid and are insulated to prevent thermal gains and losses within the ceiling void and to attenuate any noise which could be distributed around the building from their surface. Duct runs through the ceiling void should be as short and as straight as possible to reduce pressure losses, heat gains and losses and to minimise the risk of noise generation from the air flows.

NOTE: Other Carrier linear diffusers can be used. Refer to the 35BD/35SR Product Data. When considering diffusers from other manufacturers remember that Carrier diffusers maintain the Coanda effect with as little as 15% of the nominal air flow.

Cooling air flow

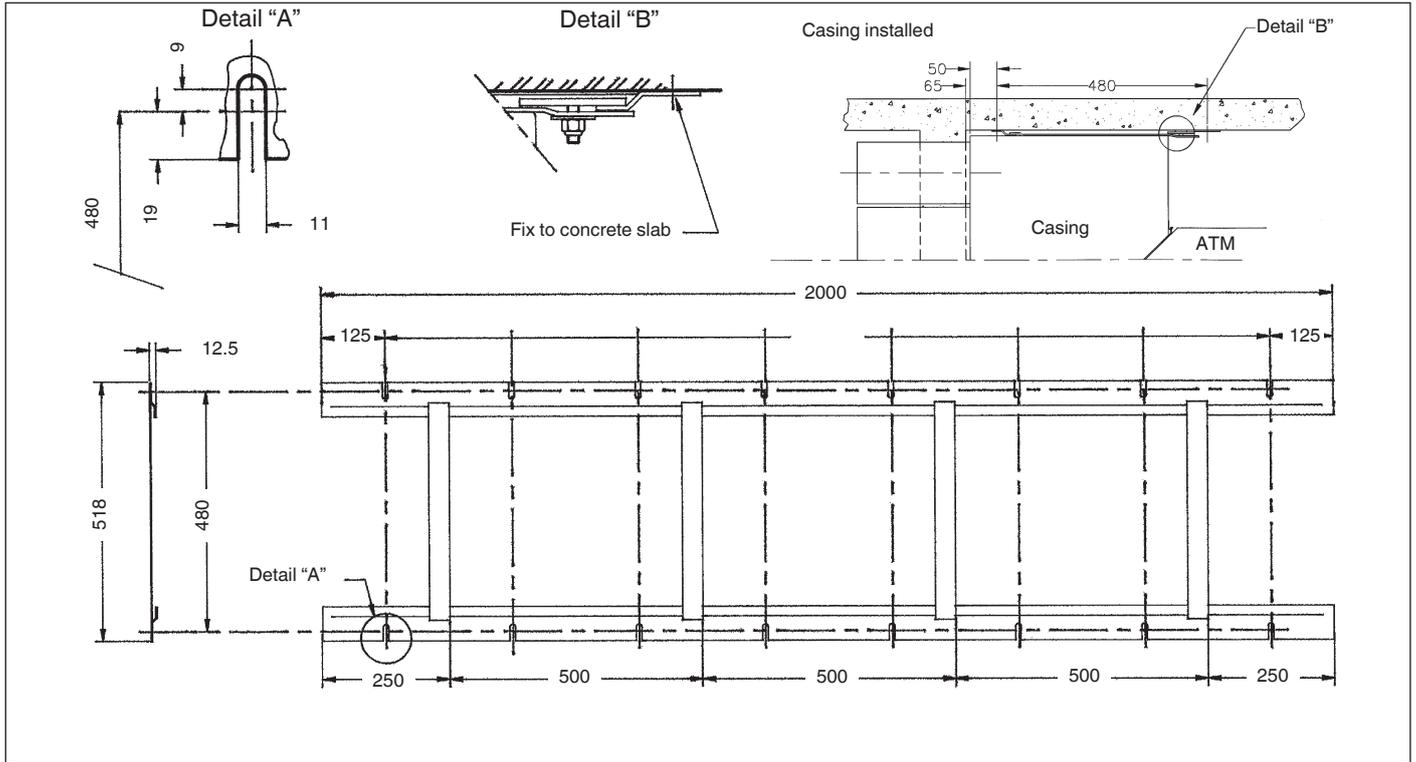


Heating air flow



2.5 - System components

2.5.1 - Suspension rail, mm



The suspension rail fixed to the concrete slab is ready to receive the ATM suspension casings. Rails are available in kits of 5 rails 2 m long, sufficient to hang up to 40 size 1 units or 23 size 2 units.

2.5.2 - Suspension casing

This carries the ATM itself and provides the means for traversing the machine room partition. It comprises a non-insulated plenum within which an insulated duct carries the supply air.

The modular design allows these units to be installed while building proceeds so that air ducts and the false ceiling can be installed much sooner than is usual. The operative section of the ATM need not be installed until just before the

tenants arrive. They can be ordered for delivery very late in the building cycle - a very important financial consideration where major installations are involved.

There are 4 types of suspension casing. The selection parameters are explained:

2.5.2.1 - Standard suspension casing

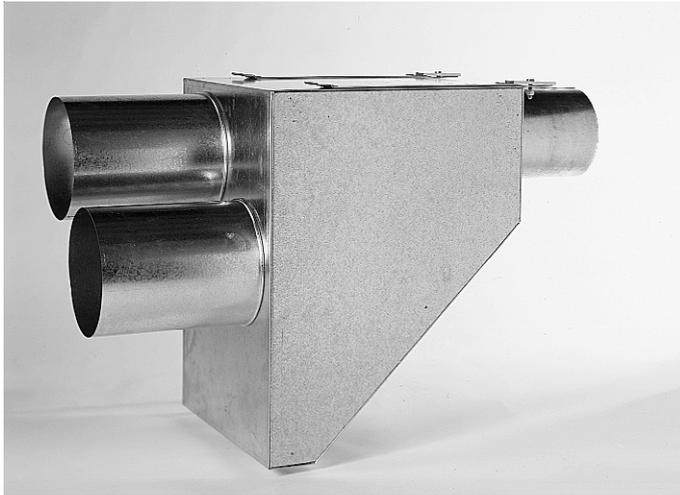
ATM supplied with a constant fresh air volume controller.



In the latter case the fresh air is introduced downstream from the coil and so is neither heated nor cooled.

2.5.2.2 - All fresh air suspension casing

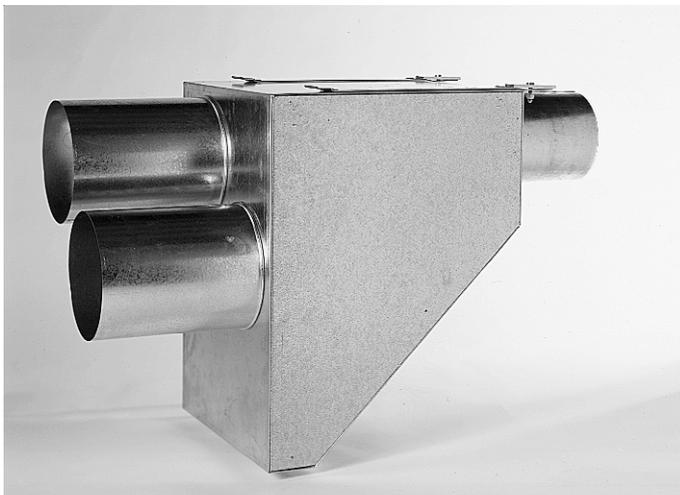
ATM for all fresh air operation (conference room, for example), in this case ATM unit has no fresh air inlet.



This casing is shipped with a plastic cap enabling the return air spigot to be shut off. It can be removed at any time, for example when a change of use calls for a change of arrangement and air distribution. A 160 mm connection spigot is provided for the fresh air inlet. In this case the full fresh air flow passes through the coil. A 160 mm flexible connection duct, 700 mm long and with a metal collar is shipped with this casing.

2.5.2.3 - Constant fresh air volume suspension casing

ATM supplied with a constant fresh air volume controller.



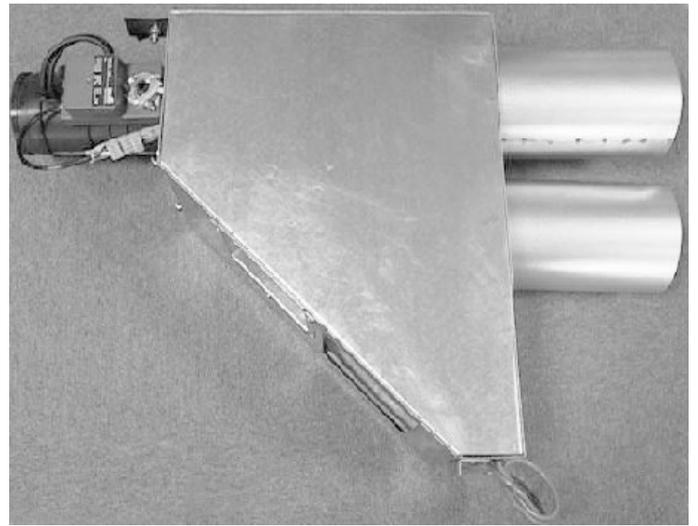
The constant fresh air volume suspension casing can accept the constant fresh air volume controller. Using this casing enables fresh air to be drawn across the ATM coil. It gives the opportunity to select from a wide range of constant air flow controllers:

- Size 1 ATM: 8.3 (30), 16.6-44.4 (60-160) and 58.3 l/s (210 m³/h)
- Size 2 ATM: 16.6-44.4 (60-160), 58.3 (210) and 69.4 l/s (250 m³/h).

A 160 mm flexible connection duct, 700 mm long, with a metal collar is shipped with this casing.

2.5.2.4 - Variable fresh air volume suspension casing

The 42GR does not include fresh air supply.



General

This variable fresh air volume suspension casing is equipped with an electronic fresh air flow control module, permitting precise control of the introduction and renewal of air in a wide range from 30 m³/h (8.3 l/s) to 200 m³/h (56 l/s), and in conformance with hygiene standards. Depending on the occupation of the rooms and future hygiene regulations, the fresh air flow can be modified via the central Building Management System. This facility permits control of the fresh air flow without physical intervention at the air conditioning terminal, if the partitioning is changed or the office space is rearranged.

Description



The electronic control module is directly controlled by the numeric controller.

This module consists of the following elements:

- A round duct equipped with an elliptical polyamide damper. Fire rating M1, diameter 125 mm.
- A moulded diaphragm in the round duct that permits correct reading of the differential pressure at low flow, 30 m³/h (8.3 l/s).
- An electronic BELIMO flow controller, linearised as a function of the differential pressure measuring element. This controller is equipped with a cable with a WAGO quick connector, facilitating possible maintenance operations. The fresh air flow control module installation on the suspension box is made with a turn and locking screw system.

The variable fresh air volume suspension casing includes a built-in power supply set, permitting connection of the electronic control module to the numeric controller.

Technical specifications

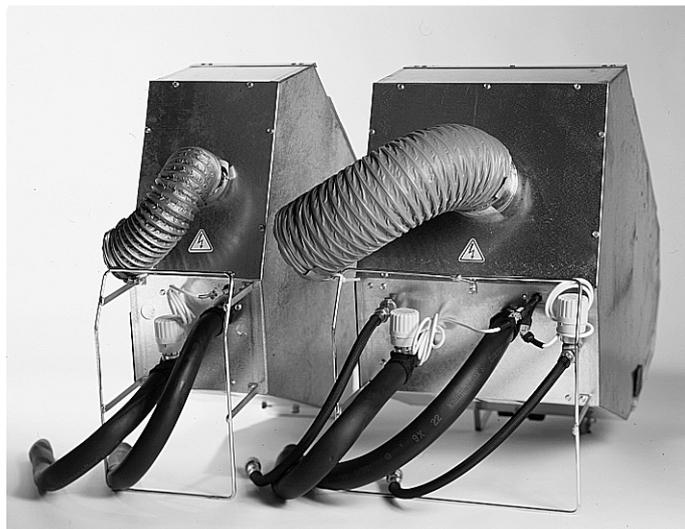
- The global tolerance of the fresh air flow control module must include the intrinsic module tolerance ± 1.4 l/s (5 m³/h) and the additional tolerance of $\pm 5\%$, depending largely on the duct system upstream (bends or T-pieces generating turbulence).
- The pressure upstream in the primary air tank must be maintained at a value that is higher than or equal to 180 Pa.
- In order to obtain a correct reading of the differential pressure and consequently of the fresh air flow, a straight duct length of 250 mm must be installed between the primary duct and the air flow control module.

NOTE: The electronic controller has no memory facility in case of power supply disruption, and the damper will remain in the last requested position (damper will not close automatically). Therefore, this system is in no way a substitution for a fire damper.

- Supply of the electronic fresh air flow management module from the numeric controller (24 V d.c.).
- Command or input signal from the numeric controller – 0-10 V d.c. for an air flow range of 0 to 56 l/s (200 m³/h). This signal is the representation of the flow set point to be maintained in the defined range, based on the control mode (occupied/unoccupied).
- Output signal supplied by the flow controller (0-10 V d.c.). This signal is the representation of the flow measured by the differential pressure measuring device, if a diaphragm is present. The output signal is directly proportional to the measured flow. The numeric controller will capture this signal, so that it can be used by the BMS network.

2.5.3 - Air treatment module ATM

With important static pressure available at nominal air flow the ATM allows long runs of small diameter duct to be used (160 mm for size 1 and 200 mm for size 2).



2.5.3.1 - Main components

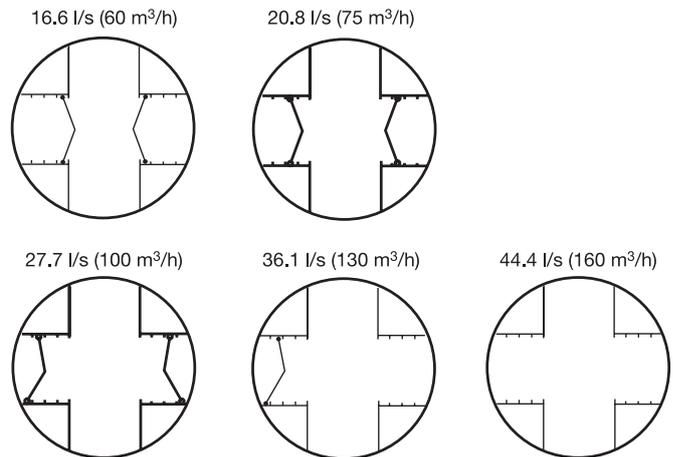
Fresh air controller (optional)

The fresh air controller for the ATM gives precise control of the rate at which fresh air ventilation air is introduced and the supply air refresh rate. Selection of the fresh air controller bearing in mind the occupancy of each room or zone is critical. ATM size 1 when equipped with a 8.3 l/s or 30 m³/h (-10%; +20%) fresh air controller is shipped with a flexible connection duct, with a length of 450 mm maximum and 80 mm diameter. ATM size 2 when equipped with a 16.7 l/s or 60 m³/h (-10%; +20%) fresh air controller is shipped with a flexible connection duct, with a length of 450 mm maximum and 125 mm diameter.

NOTE: A metal collar is also shipped with each unit to connect the flexible duct to the main supply duct.

The 16.7 l/s or 60 m³/h fresh air controller may be modified on site by relocating or removing two plastic restricters in order to increase its constant fresh air flow capacity to a maximum of 44.4 l/s or 160 m³/h.

A label on the 42GR shows how to readjust the two plastic restricters.



Filter and filter access

The ATM is fitted with a high efficiency (F5 type) throw-away filter. It is accessed through a door in the underside of the unit. Changing the filter is a quick and easy task - an important consideration with a unit which is more likely to be used in large multiples rather than singly. As an option an F6 type (allowing high-tech filtration) filter can be supplied. Consult your Carrier representative.

Water coil

The coil is built of 3/8" copper tubes mechanically expanded into aluminium plate fins.

Connections are 1/2" threaded gas male/female. A bleed valve is fitted as standard. The coil can be removed from the unit.

Two coil configurations are available:

- 5-row coils for two-pipe changeover systems or systems with an electric heater.
- 6-row coils with one row for heating duty and five rows for cooling duty.

Water flow control valve and flexible water pipes

At the top end of the range the ATM is fitted with a numeric controller enabling the water flow control valves to be controlled remotely. These are two- or three-way valves with bodies built to withstand a 16 bar operating pressure at a maximum differential pressure of 1.5 bar for the 3-way valves, and 2.5 bar for the 2-way valves.

Flexible water pipes, insulated for the cold water pipe only, connect the unit to the hot and chilled water supplies. The supply pipes must be fitted with shut-off valves.

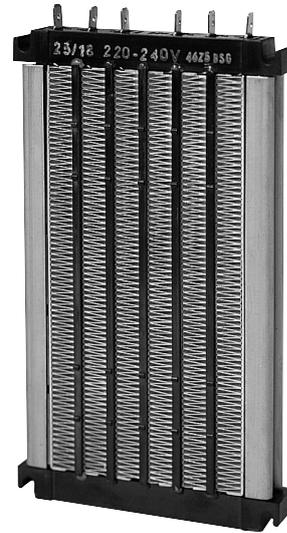
PTC electric heater

These are high-performance PTC electrical resistance heaters which make use of two technologies: electric heating and surface temperature limitation (a state-of-the-art technology based on the use of ceramics).

The true dissipated power is then dependent on the temperature and flow rate of the incoming air.

The technology ensures totally safe self-regulation of the dissipated power. In addition, each heater coil is fitted with a self-resetting safety thermostat of the normally closed variety which cuts out when the temperature rises to 70°C with an average differential of 20°C.

CAUTION: It is vital to disconnect the 42GR from the general power supply before carrying out any work on the electric heater.



3 - SAFETY CONSIDERATIONS

3.1 - General

Installing, commissioning and servicing of the various components which make up the different control loops can be dangerous unless certain aspects of the installation, such as the presence of mains electricity and hot or chilled-water in the air conditioning equipment, are taken into account.

Only specially trained and qualified technicians and installers who have been fully trained on the product concerned are authorised to install, commission and service this equipment.

During servicing work, it is essential to apply all recommendations and instructions given in service leaflets, on labels or in the instructions delivered with the equipment, and to comply with any other relevant instructions.

Definition of the pictograms used



Electrical Danger



Caution hand hazard



General Danger



UV-C light: do not look directly at this light without protective glasses.

Comply with all the safety rules and regulations currently in force.

Wear eye protectors and work gloves.

Take care when moving or positioning equipment.

3.2 - Precautions against electrocution

Only electricians who are qualified to the level recommended by the IEC (International Electrotechnical Commission) in its standard IEC 364, corresponding to Europe HD 384, France NFC 15 100 and UK IEE Wiring Regulations, may have access to electrical components. In particular it is obligatory to disconnect all electrical power supplies to the unit and its accessories before carrying out any work. Disconnect the main power supply with an isolating device (not supplied by Carrier).

IMPORTANT: The components, which make up the different control loops described in this manual include electronic items. As such, they may generate or be harmed by electromagnetic interference unless they are installed and used in accordance with these instructions. The components making up these control systems conform to the requirements of electromagnetic compatibility in residential and industrial areas. They also comply with the low-voltage directive.

3.3 - General installation recommendations

IMPORTANT: The numeric controller, power module, controls loops with speed controllers or in general units fitted with controls loops must have an isolating device upstream (for example a double-pole circuit breaker). If necessary, an easily operated emergency stop device (such as a punch-button switch) must cut off the power to all equipment. These safety devices shall be sized and installed in accordance with IEC Recommendation 364, corresponding to Europe HD 384, France NFC 15 100 and UK IEE Wiring Regulations. These devices are not supplied by Carrier.

In general terms the following rules must be applied:

- Units must be provided with over-voltage protection upstream (not supplied by Carrier).

	Upstream over-voltage protection
Unit without electric heater	T2A
Unit with electric heater	T16A

- Units must be protected by a differential type earth leakage current device (not supplied by Carrier).
- The power disconnection device must be clearly labelled to identify which items of equipment are connected to it.
- The wiring of the components which make up the different control systems and the communication buses must be carried out in accordance with the latest rules and regulations by professional installers.
- The power supply cable must be doubly insulated and fixed using an appropriate cable clamp or the cable clamp supplied with the numeric controller. The cable must be clamped on the outer insulation.
- The control loop components must be installed in an environment, which conforms to their index of protection (IP).

The maximum level of pollution is normally pollutant (level 2) and installation category II.

- The low-voltage wiring (communication bus) must be kept physically separate from the power wiring.
- In order to avoid interference with the communication links:
 - Keep low-voltage wiring away from power cables and avoid using the same cable run (a maximum of 300 mm in common with the 230 VAC, 30 A cable)
 - Do not pass low-voltage wires through loops in the power cables
 - Do not connect heavy inductive loads to the same electrical supply (circuit breaker) used by the controllers, power modules or speed controllers.
 - Use the screened cable type recommended by Carrier and make sure all cables are connected to the controllers and power modules.

3.4 - Conformity

This equipment has been declared to be in conformity with the main requirements of the directive by virtue of using the following standards:

- Electromagnetic compatibility: 89/336/EEC
- Low-voltage directive: 73/23/EEC

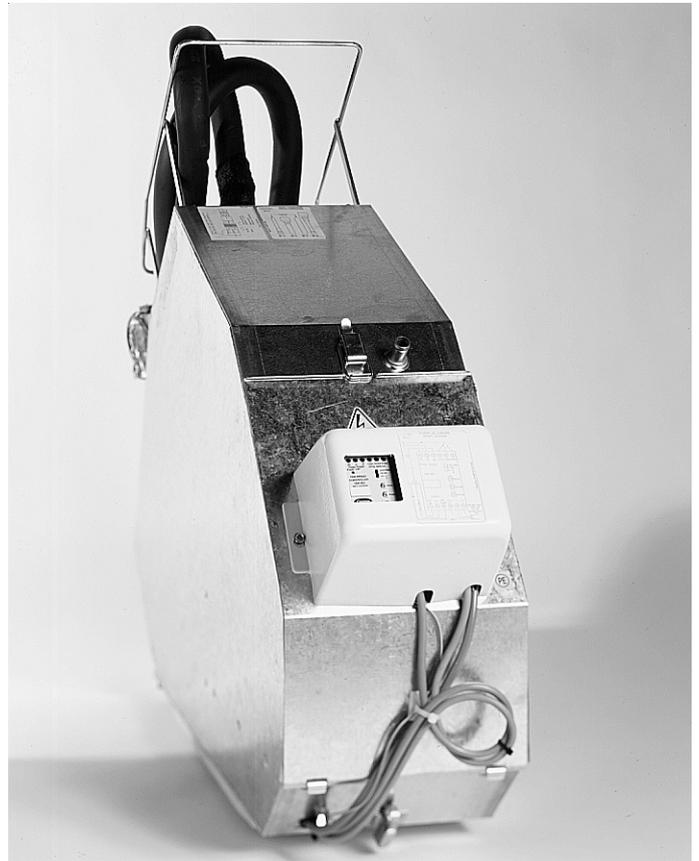
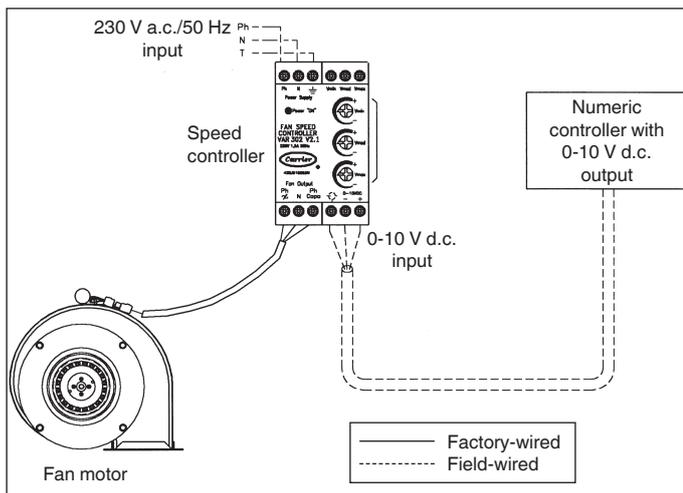
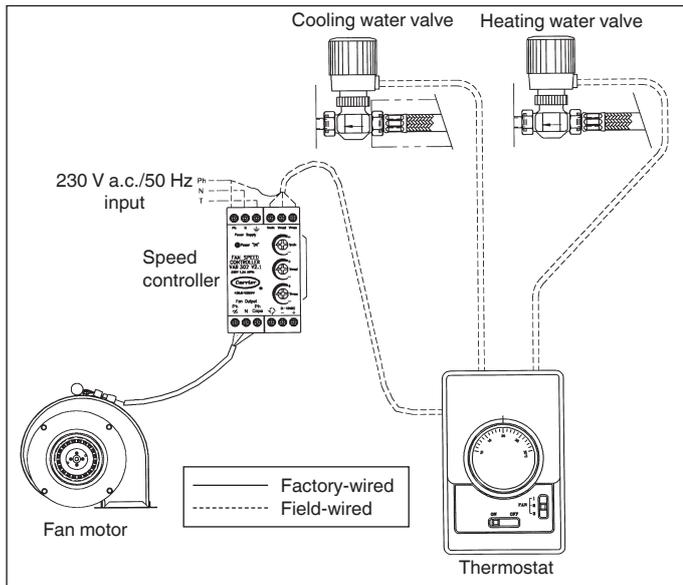
4 - CARRIER ELECTROMECHANICAL CONTROLLER WITH FAN SPEED CONTROLLER

4.1 - Description

The basic version of the ATM is fitted with an electro-mechanical controller with a fan speed controller developed by Carrier. This speed controller has two different control inputs (preselected speed or 0-10 V d.c. according to choice), making it highly flexible and fully responsive.

Each 42GR has a water flow control valve or valves of the “on/off” type, flexible water pipes to simplify the connection of units to the primary hot and/or chilled water circuits, and in appropriate cases a power relay for controlling the electric heater.

Wiring diagrams



The optional electromechanical controller also includes a male-female quick connect terminal block for connecting the various cables that come from the three-speed fan motor, the valve actuators, the electric heater power relay and, if appropriate, from the heating/cooling changeover configuration switch for 42GR ATMs fitted with a single “hot or cold” coil.

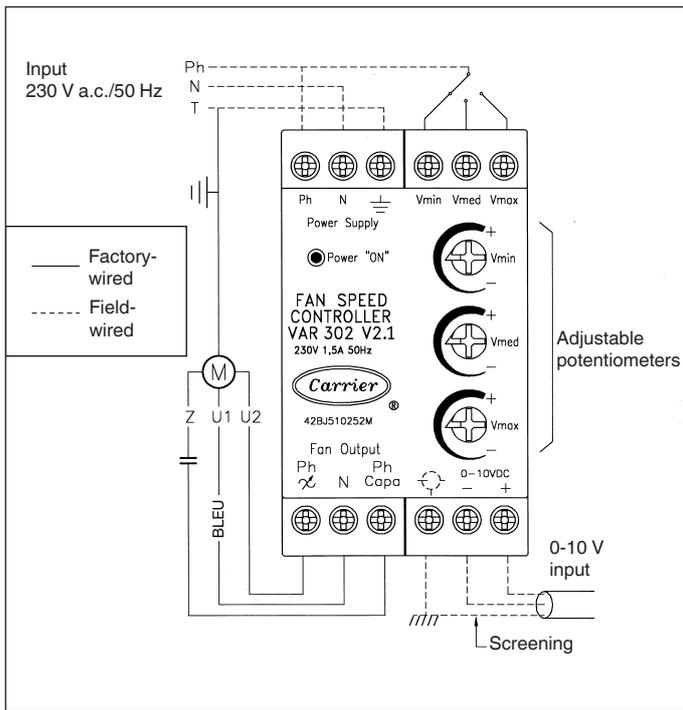
The male-female quick connect terminal block and the electric heater power relay are mounted on a DIN rail and protected by a recyclable, self-extinguishing plastic cover.

The DIN rail is made large enough to accept a bipolar disconnecting switch and integral fuse holder, not supplied by Carrier (contact your Carrier representative).

The quick connect terminal block and flexible water pipes will be appreciated when servicing work is being carried out, since they enable service times to be significantly reduced. Replacing or moving a unit becomes a simple matter.

A wall-mounted room thermostat can be supplied with the ATM as an accessory. This thermostat will be connected directly to the female side of the quick connect terminal block (see section describing room thermostats).

4.2 - Speed controller



4.2.1 - Inputting a preselected speed

This input gives three speed settings to the speed controller. The speeds are each adjustable by a potentiometer on the face of the controller.

Setting the speed is achieved when the supply power is applied to one of the 3 input pre-selections.

Speed control potentiometer ranges are:

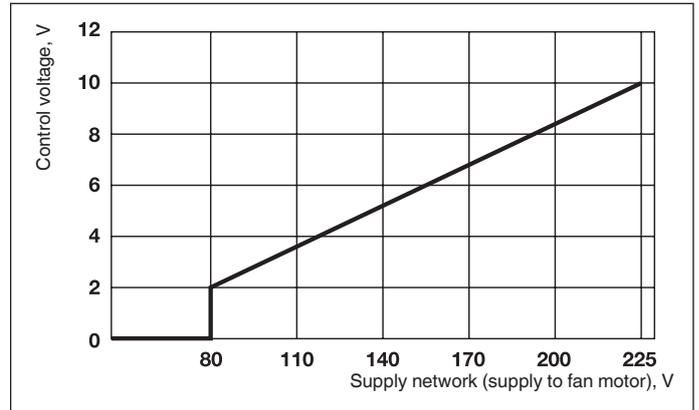
- low speed 80 to 120 V (± 15 V)
- medium speed 110 to 170 V (± 15 V)
- high speed 160 to 225 V (± 15 V)

The output ranges are given for a supply network input voltage of 230 V a.c. (RMS).

4.2.2 - Control input 0-10 V d.c.

This signal has two operating bands:

- between 0 and 2 V (± 150 mV), the output is zero
- between 2 V (± 150 mV) and 10 V, the output ranges from 80 V (± 15 V) to 225 V (± 15 V), for an input voltage of 230 V a.c.



WARNING: Only one of the 2 different control inputs should be selected, otherwise the fan speed controller will be damaged.

4.3 - General characteristics

Selection of inputting a 230 V a.c. or 0 to 10 V control input is automatic. An LED on the face of the controller shows when it is on.

NOTE: Note that the controller has a circuit which forces the selection of high speed for 2 seconds when:

- power is switched on
 - an input control signal from 0 to 10 V at a level higher than 2 V is established
 - a speed is selected
- Power supply: 230 V $\pm 15\%$
 - Output voltage range: 80 to 225 V (± 15 V)
 - Screw terminal connections: size 2 x 1.5 mm²
 - Full load starting capability
 - Overload capacity: + 50% of maximum power for one minute
 - DIN enclosure, 12 screw terminals
 - IP 201 protection
 - Operating environment: + 5°C to + 40°C, 85% to 40% RH
 - Power input 2.5 VA
 - CE compliance:
 - in accordance with EMC directive 89/336/EEC,
 - in accordance with low-voltage directive 73/23/EEC dated 19/02/73 as amended by directive 93/68/EEC dated 22/07/93.

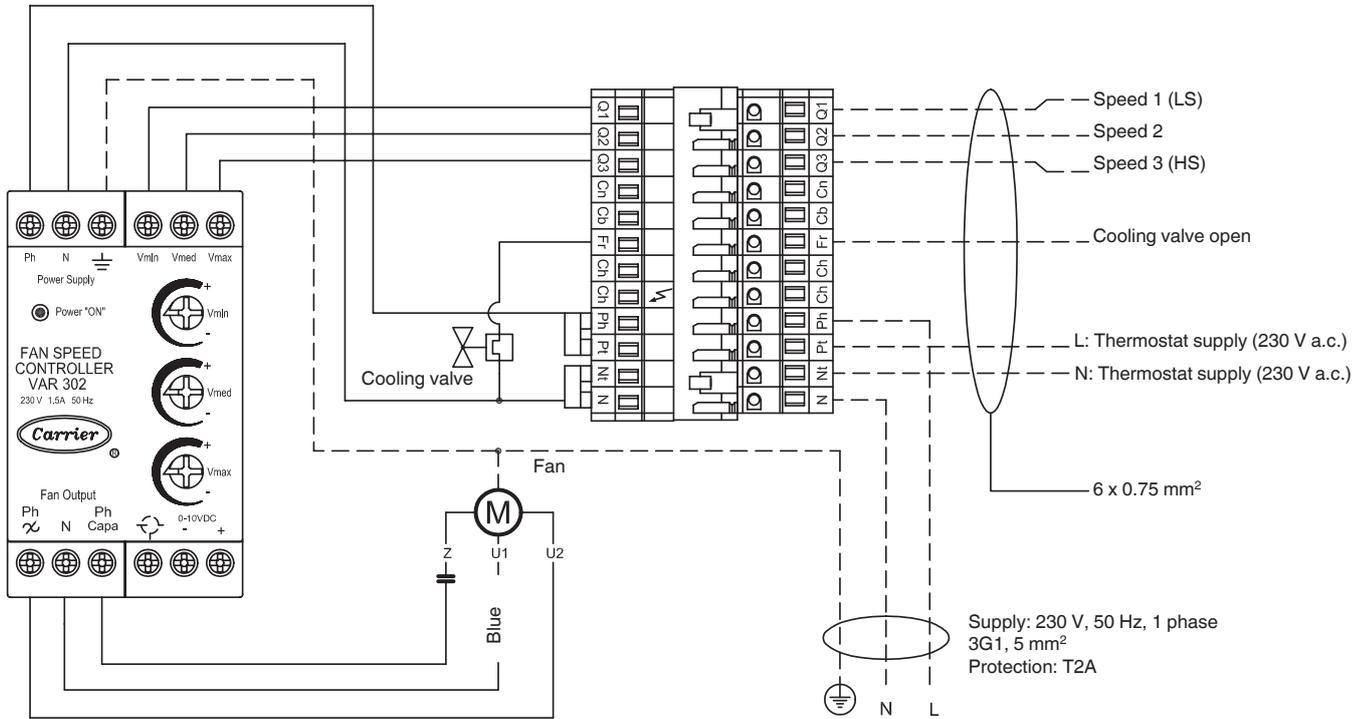
4.4 - The various ATM configurations available

Each ATM can be fitted with one or two on/off valves, two or three ports and flexible water pipes, depending how the unit is configured.

NOTE: The features of the valves and flexible pipes are given in the chapter called “Technical specifications”.

4.4.1 - The ATM is fitted with a 5-row cooling coil which operates in cooling mode only (2 pipes)

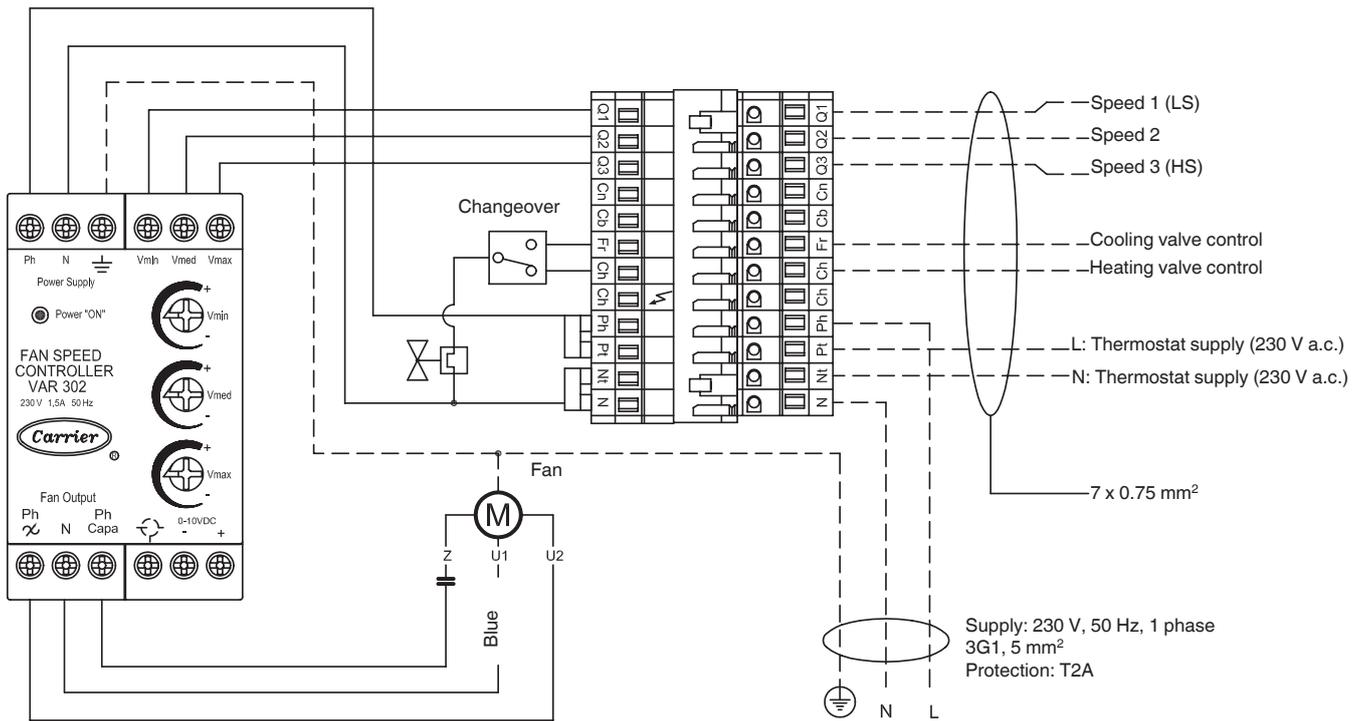
Operates in “cooling” mode only. This option includes a speed controller, a 2-port on/off valve and two insulated flexible water pipes.



4.4.2 - The ATM is fitted with a 5-row cooling or heating coil (2 pipes with changeover)

Operates in cooling or heating mode. This application is of the heat pump type.

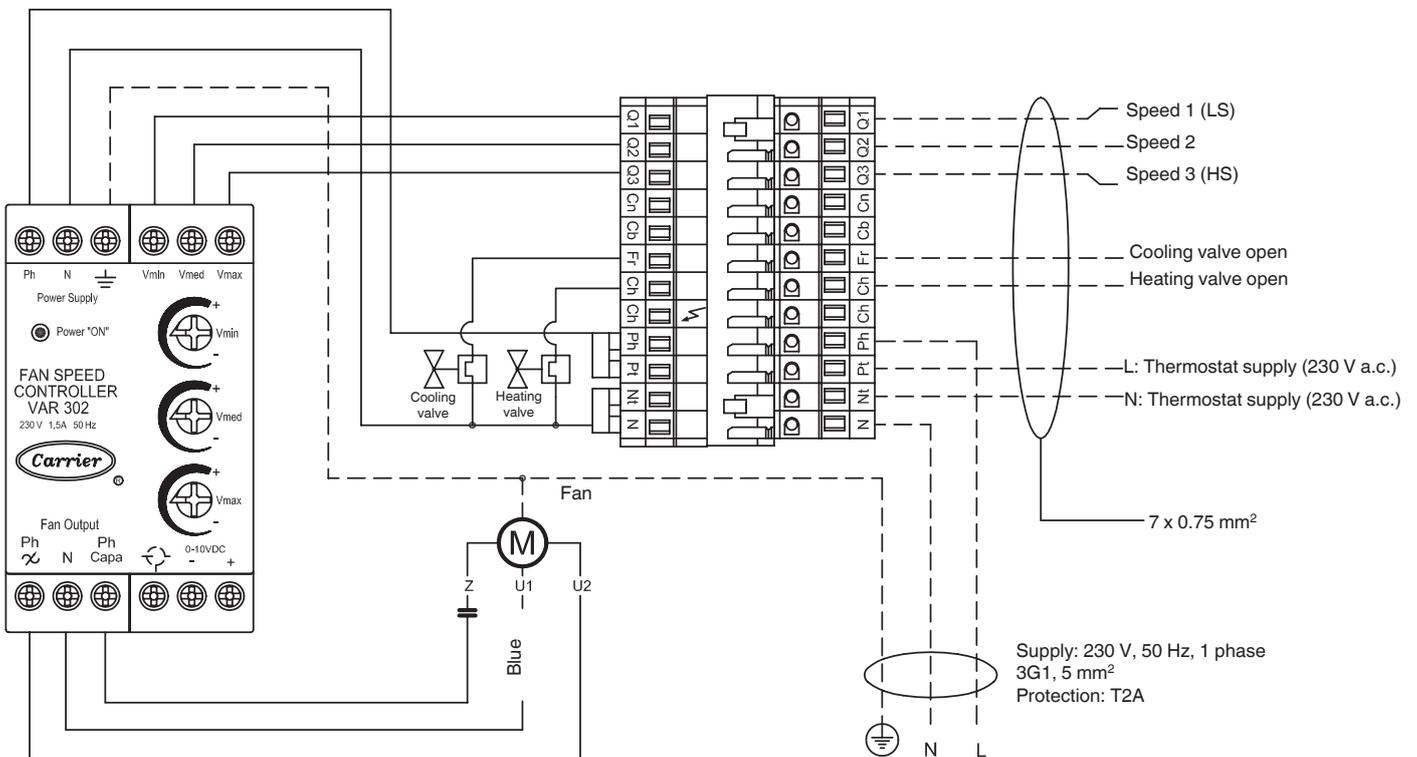
This option includes a speed controller, a 3-port on/off valve, a heating/cooling changeover switch and two insulated flexible water pipes.



4.4.3 - The ATM is fitted with a 5-row cooling coil and a 1-row heating coil (4 pipes)

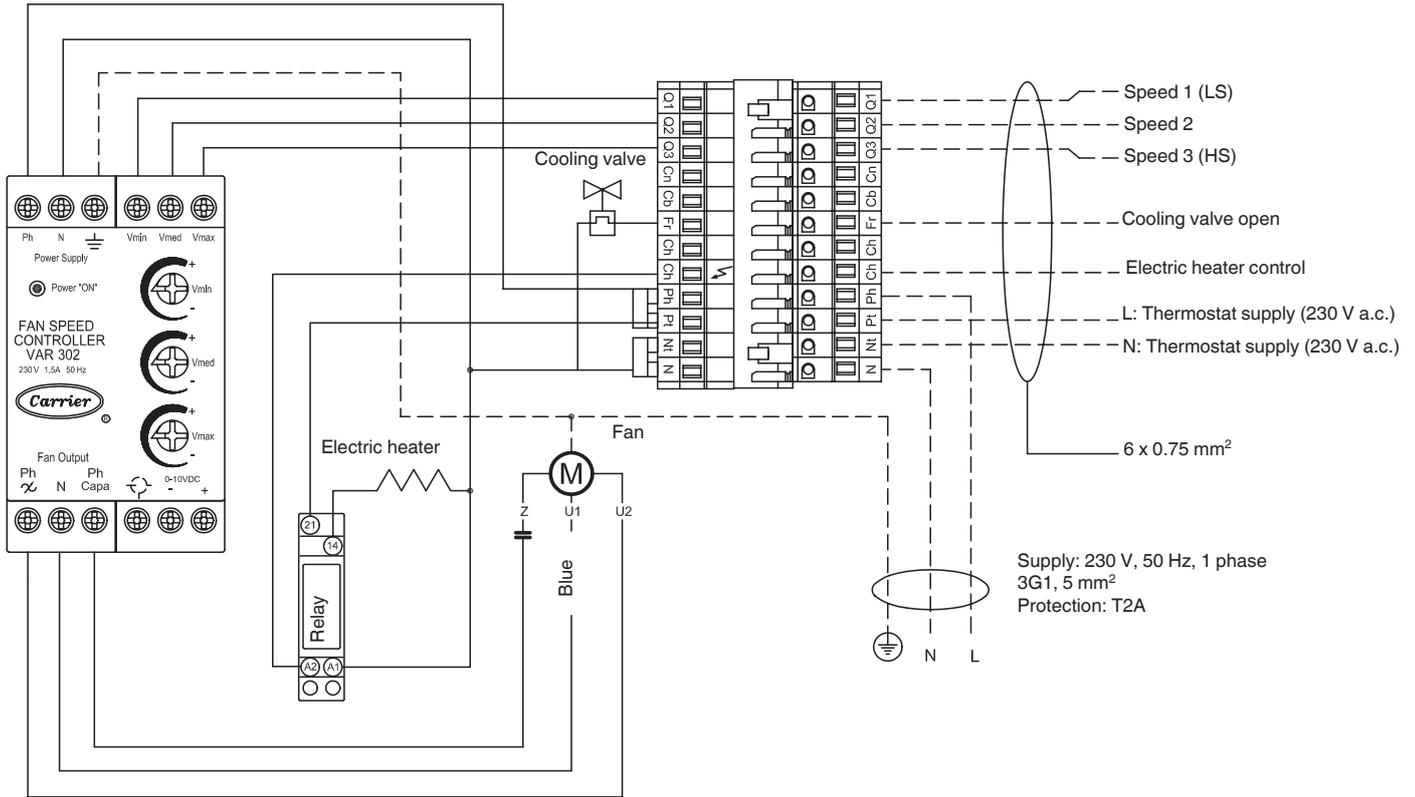
Operates in cooling and heating mode in sequence.

This option includes a speed controller, 2 on/off valves with 2 ports, and 4 flexible water pipes, 2 of which are insulated and 2 uninsulated.



4.4.4 - The ATM is fitted with a 5-row cooling coil and an electric heater (2 pipes and 2 wires)

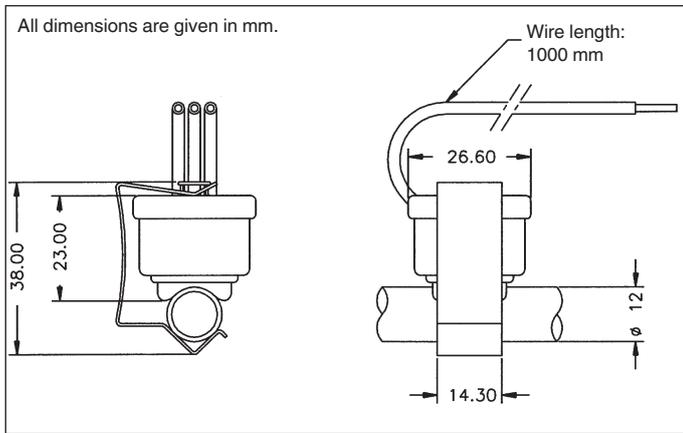
Operates in cooling mode or heating mode with electric heater in sequence. This option includes a speed controller, a 2-port on/off valve, 2 insulated flexible water pipes and 1 power relay for controlling the electric heater.



NOTE: The speed controller, the electric heater contactor and the connection terminals are protected by a plastic cover.

4.5 - Heating/cooling changeover switch

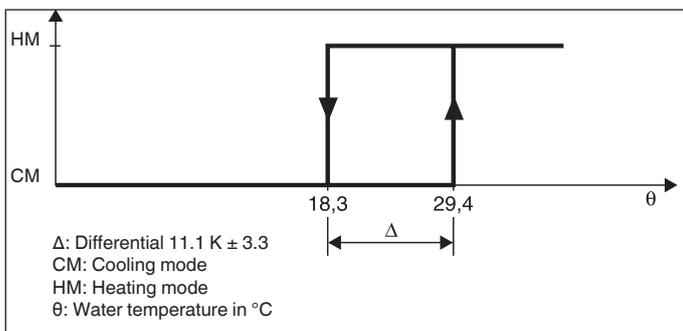
The heating/cooling changeover switch is designed to be installed straight onto the couplings of the 3-port valves on the ATM. It detects temperature changes in the fluid circulating in the primary water circuit. A changeover switch operates according to the water temperature in accordance with the diagram below.



Features:

- steel body and clip
- leak proof
- interrupting current
 - 5 A at 230 V a.c., 50 Hz with resistive load
 - 2.9 A at 230 V a.c., 50 Hz with inductive load
- temperature range 18.3 - 29.4°C
- differential 11.1 K ± 3.3

When a heating/cooling changeover switch is connected between the room thermostat and the water flow control valve, the changeover between heating and cooling modes takes place automatically in accordance with the following diagram.



4.6 - Room thermostats

The 42GR can be controlled by a Carrier or other compatible room thermostat.

5 - CARRIER NUMERIC CONTROLLER

At the top of the range, ATMs will be fitted with a Carrier communicating numeric controller with programmable parameters. The controller will be attached directly to each ATM.

The control system will then consist of the following:

- a Carrier numeric controller,
- one or two water flow control valves, depending how the ATM is configured, complete with their flexible water pipes,
- a user interface or wall-mounted thermostat located in the air conditioned zone from which commands can be sent to the controller (available as accessories),
- a Power Module (Pm) for controlling lights and window blinds in the air conditioned zone (available as an accessory) can be added to the system to further enhance comfort.

Depending on the required configuration, a room temperature sensor (available as an accessory) and/or a changeover sensor (optional) may be supplied.

Most of electrical connections use quick connectors to simplify maintenance work and reduce servicing costs.

The Zone Controller is available with the following functions:

- Two pipes
- Two pipes with changeover
- Four pipes
- Two pipes/two wires
- Two pipes/two wires with changeover (please consult your Carrier representative for this application)

The main functions of the controller are:

- Controlling room temperature. Temperature is measured either by the temperature sensor incorporated in the user interface or wall-mounted thermostat, or by a room temperature sensor.
- Selecting occupied or unoccupied mode through the user interface or wall-mounted thermostat.
- Controlling the occupied setpoint through the user interface or wall-mounted thermostat.
- Controlling room air renewal (available through the user interface only).
- Halting the control function if an open window is detected (the parameters for this function are programmable).

If a Power Module is associated with the controller, the following additional functions are accessible from the user interface:

- Turning a lighting source on or off,
- Turning a controlled output on or off,
- Raising, lowering and adjusting the angle of window blinds.

For complete information on the numeric controller consult the specific documentation.

6 - TECHNICAL SPECIFICATIONS

6.1 - Valves

Note that whether the type of controller used is electro-mechanical or numerical, the valve body + actuator assembly is identical.

6.1.1 - Electrothermal actuator (on/off type)

This on/off type of actuator is used with the electromechanical controller and with the Carrier numeric controller.

6.1.1.1 - Features

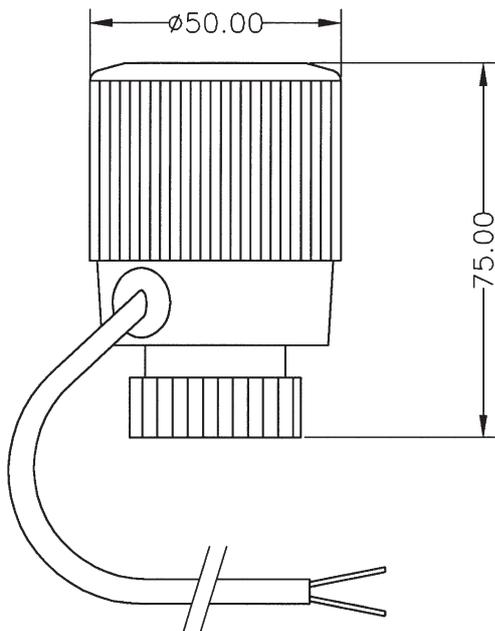
- Compact design
- Long lasting
- Easy installation without toolkit
- Completely silent in operation
- Complete with connector cable

6.1.1.2 - Operation

Linear movement is controlled by expansion and contraction of a wax element heated by an electrical resistor.

6.1.1.3 - Specifications

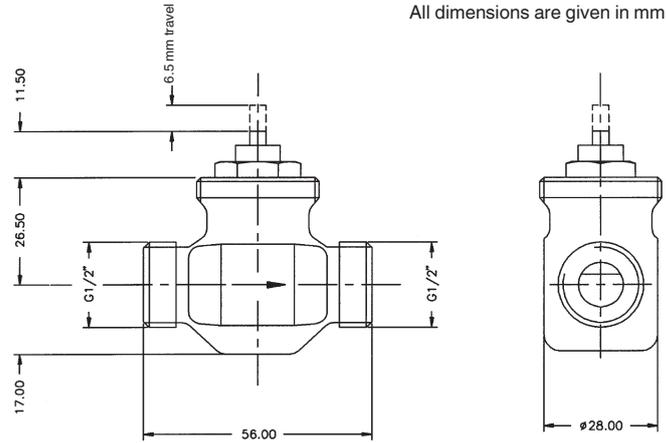
Power supply	230 V a.c. ($\pm 15\%$) - 1 ph-50 Hz)
Inrush current	0.7 A
Holding current	0.013 A
Power	3 W
Maximum travel	8 mm
Operating temperature	0 to 50°C
Degree of protection	IP43 if installed vertically IP40 if installed horizontally
Opening time	4 min.
Closing time	Maximum 7 min. depending on actuator heating-up time (ambient temperature 20°C)
Connection cable	1 m, 2 x 0.75 mm ²
Dimensions	Diameter 50 mm Height 68.5 mm
Permitted differential pressure	1.5 bar (3-way valve) 2.5 bar (2-way valve)



All dimensions are given in mm.

6.1.2 - Two-way valve body

All dimensions are given in mm.



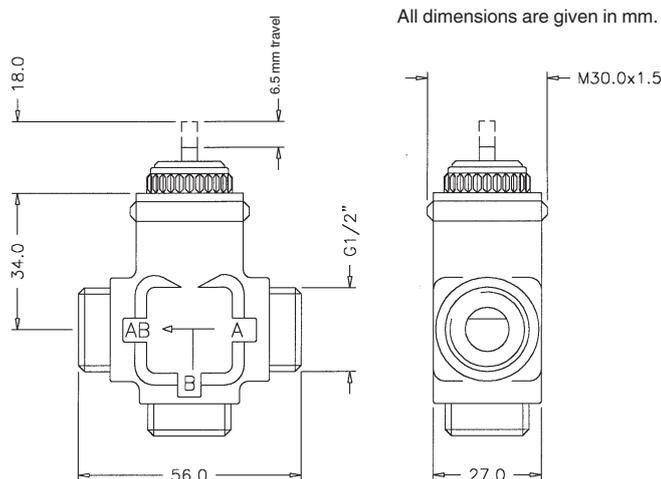
6.1.2.1 - Features

- G1/2" flat-joint thread
- Straight valve body in non-nickel plated Rg5 bronze with arrow indicating direction of flow embossed on valve body.
- Stainless steel stem
- Brass valve
- MEPD seating joint (modified ethylene-propylene-diene)
- Nominal size 15
- Kvs value: 1
- Fluid: water and water glycolated to max. 40%
- Temperature: 2-90°C
- Leak rate: 0.02% of Kvs
- Travel: 6.5 mm
- Closing height: 18 mm
- Flow curve: linear
- Maximum pressure: PN 16 bar

6.1.2.2 - Pressure drop

See chapter 8.4.1.

6.1.3 - Three-way valve body



6.1.3.1 - Features

- G1/2" flat-joint thread
- Valve body in non-nickel plated Rg5 bronze with arrow indicating direction of flow engraved on valve body.
- Stainless steel stem
- Brass valve
- MEPD seating joint
- Nominal size 15
- Kvs value: flow A-AB = 1, bypass B-AB = 0.63
- Fluid: water and water glycolated to max. 40%
- Temperature: 2-90°C
- Leak rate: 0.02% of Kvs
- Travel: 6.5 mm
- Closing height: 18 mm
- Flow curve: percentage A-AB, linear for bypass B-AB
- Nominal pressure: PN 16 bar

6.1.3.2 - Pressure drop

See chapter 8.4.2.

6.2 - Flexible water pipes

6.2.1 - Materials

- Pipes: MEPD-based elastomer (modified ethylene-propylene-diene)
- Braid: 304L stainless steel
- Insulation: cell foam rubber to M1 fire rating (chilled water pipes only, 9 mm thick).

6.2.2 - Features

- Minimum bending radius: 72 mm non-insulated, 106 mm insulated
- The flexible water pipes are designed to carry treated or untreated water (maximum 40% concentration of ethylene glycol or propylene glycol).
- Maximum hot water temperature 90°C
- Operating pressure: 16 bar
- Test pressure: 24 bar
- Connections: 1/2" BSP threaded nut
- Length: 650 mm.

7 - ACCESSORIES

A broad range of accessories is available to allow the 42GR to be installed in a wide range of applications.

7.1 - Electromechanical controller accessories

7.1.1 - Electromechanical room thermostat for operating in heating mode only or cooling mode only

With setback for two-pipe systems with three-speed fan control and on/off switch.

7.1.2 - Electromechanical room thermostat for operating in heating mode and cooling mode (manual)

With setback for two-pipe systems with changeover, four-pipe systems or two- or four-pipe systems with electric heater, it has a two-position manual switch for summer/winter setting, three-speed fan control and on/off switch.

7.1.3 - Electromechanical room thermostat for operating in heating mode and cooling mode (automatic)

With setback for two-pipe systems with changeover, four-pipe systems or two- or four-pipe systems with electric heater, it has a three-speed fan control and on/off switch. There is a 1 K dead band between the heating stage and the cooling stage.

7.2 - Carrier numeric controller

For thermostats and/or accessories for the Carrier remote controller please refer to the specific documentation.

8 - PERFORMANCES

8.1 - Cooling capacities - cold water coil, kW

8.1.1 - Size 1

Water temp. (°C) inlet-outlet		Relative humidity 40%											
		Air flow l/s (m³/h)											
		55.56 (200)			69.44 (250)			83.33 (300)			97.22 (350)		
		Dry bulb temperature at coil inlet (°C)											
		25	22	19	25	22	19	25	22	19	25	22	19
6-11	TC	1.28	0.99	0.79	1.54	1.20	0.95	1.80	1.41	1.10	2.06	1.61	1.25
	SHC	1.09	0.96	0.79	1.33	1.18	0.95	1.58	1.41	1.10	1.82	1.61	1.25
	TSA	8.6	7.6	7.3	8.9	7.8	7.8	9.1	7.9	8.1	9.3	8.2	8.4
	WF	0.061	0.047	0.038	0.074	0.058	0.045	0.086	0.067	0.053	0.098	0.077	0.060
7-12	TC	1.11	0.92	0.72	1.31	1.12	0.86	1.52	1.31	1.00	1.72	1.49	1.13
	SHC	1.01	0.92	0.72	1.24	1.12	0.86	1.45	1.31	1.00	1.67	1.49	1.13
	TSA	9.7	8.3	8.4	10.1	8.6	8.8	10.4	9.0	9.2	10.6	9.2	9.5
	WF	0.053	0.044	0.034	0.063	0.053	0.041	0.073	0.063	0.048	0.082	0.071	0.054
8-13	TC	1.05	0.85	0.65	1.28	1.03	0.78	1.51	1.20	0.89	1.73	1.37	1.00
	SHC	0.99	0.85	0.65	1.23	1.03	0.78	1.46	1.20	0.89	1.69	1.37	1.00
	TSA	10.0	9.3	9.4	10.2	9.7	9.8	10.3	10.0	10.2	10.4	10.3	10.5
	WF	0.050	0.041	0.031	0.061	0.049	0.037	0.072	0.058	0.043	0.083	0.066	0.048
10-15	TC	0.91	0.71	0.50	1.11	0.86	0.60	1.30	0.99	0.68	1.49	1.13	0.76
	SHC	0.91	0.71	0.50	1.11	0.86	0.60	1.30	0.99	0.68	1.49	1.13	0.76
	TSA	11.2	11.3	11.5	11.6	11.7	11.9	11.9	12.1	12.2	12.1	12.4	12.6
	WF	0.044	0.034	0.024	0.053	0.041	0.029	0.062	0.048	0.033	0.071	0.054	0.036
		Relative humidity 50%											
6-11	TC	1.66	1.13	0.79	2.04	1.34	0.95	2.42	1.54	1.10	2.81	1.71	1.25
	SHC	1.11	0.89	0.74	1.37	1.08	0.91	1.63	1.27	1.08	1.90	1.44	1.24
	TSA	8.2	8.7	8.0	8.4	9.0	8.2	8.6	9.3	8.3	8.6	9.7	8.5
	WF	0.079	0.054	0.038	0.098	0.064	0.045	0.116	0.074	0.053	0.134	0.082	0.060
7-12	TC	1.49	0.95	0.72	1.82	1.11	0.86	2.14	1.27	1.00	2.48	1.41	1.13
	SHC	1.03	0.81	0.71	1.27	0.98	0.86	1.51	1.15	1.00	1.75	1.31	1.13
	TSA	9.4	9.9	8.5	9.6	10.3	8.8	9.8	10.5	9.2	9.9	10.8	9.5
	WF	0.071	0.046	0.034	0.087	0.053	0.041	0.103	0.061	0.048	0.119	0.068	0.054
8-13	TC	1.31	0.78	0.65	1.58	1.03	0.78	1.85	1.20	0.89	2.13	1.37	1.00
	SHC	0.95	0.74	0.65	1.17	0.95	0.78	1.38	1.13	0.89	1.60	1.30	1.00
	TSA	10.6	11.0	9.4	10.9	10.6	9.8	11.1	10.8	10.2	11.2	10.9	10.5
	WF	0.063	0.037	0.031	0.075	0.049	0.037	0.088	0.058	0.043	0.102	0.066	0.048
10-15	TC	0.92	0.71	0.50	1.07	0.86	0.60	1.21	0.99	0.68	1.36	1.13	0.76
	SHC	0.79	0.71	0.50	0.96	0.86	0.60	1.13	0.99	0.68	1.29	1.13	0.76
	TSA	13.0	11.3	11.5	13.4	11.7	11.9	13.7	12.1	12.2	13.9	12.4	12.6
	WF	0.044	0.034	0.024	0.051	0.041	0.029	0.058	0.048	0.033	0.065	0.054	0.036
		Relative humidity 60%											
6-11	TC	2.05	1.45	0.91	2.54	1.75	1.05	3.03	2.06	1.19	3.52	2.38	1.32
	SHC	1.13	0.91	0.68	1.41	1.11	0.82	1.68	1.31	0.95	1.96	1.52	1.08
	TSA	7.9	8.5	8.9	8.0	8.7	9.3	8.1	8.9	9.6	8.1	9.0	9.8
	WF	0.098	0.069	0.043	0.121	0.084	0.050	0.145	0.099	0.057	0.168	0.114	0.063
7-12	TC	1.88	1.27	0.73	2.32	1.52	0.84	2.77	1.78	0.92	3.23	2.04	1.01
	SHC	1.06	0.83	0.61	1.31	1.01	0.72	1.56	1.19	0.84	1.82	1.37	0.95
	TSA	9.0	9.6	10.0	9.2	10.0	10.4	9.2	10.1	10.8	9.3	10.3	11.0
	WF	0.090	0.061	0.035	0.111	0.073	0.040	0.133	0.085	0.044	0.154	0.098	0.048
8-13	TC	1.70	1.09	0.54	2.10	1.29	0.78	2.50	1.48	0.89	2.90	1.68	1.00
	SHC	0.98	0.75	0.53	1.21	0.90	0.70	1.44	1.06	0.83	1.68	1.22	0.95
	TSA	10.2	10.8	11.2	10.4	11.2	10.7	10.5	11.4	10.8	10.5	11.6	11.0
	WF	0.081	0.052	0.026	0.100	0.061	0.037	0.119	0.071	0.043	0.138	0.080	0.048
10-15	TC	1.32	0.70	0.50	1.59	0.79	0.60	1.87	0.86	0.68	2.16	0.95	0.76
	SHC	0.82	0.59	0.50	1.00	0.71	0.60	1.18	0.82	0.68	1.37	0.93	0.76
	TSA	12.6	13.1	11.5	12.9	13.5	11.9	13.1	13.9	12.2	13.2	14.1	12.6
	WF	0.063	0.033	0.024	0.076	0.038	0.029	0.089	0.041	0.033	0.103	0.045	0.036

Legend:

TC - Total cooling capacity, kW
 SHC - Sensible heat capacity, kW
 TSA - Air discharge temperature, °C
 WF - Water flow, l/s

NOTE: Operating limit: air discharge temperature 12°C when the unit is installed where room temperature is 25°C dry bulb and rh 45%.

8.1 - Cooling capacity - cold water coil, kW (continued)

8.1.2 - Size 2

Water temp. (°C) inlet-outlet		Relative humidity 40%											
		Air flow l/s (m³/h)									138.89 (500)		
		97.22 (350)			111.11 (400)			125 (450)					
		Dry bulb temperature at coil inlet (°C)											
		25	22	19	25	22	19	25	22	19	25	22	19
6-11	TC	2.27	1.71	1.36	2.55	1.93	1.53	2.83	2.14	1.69	3.11	2.36	1.85
	SHC	1.92	1.67	1.36	2.17	1.90	1.53	2.43	2.13	1.69	2.68	2.35	1.85
	TSA	8.5	7.7	7.5	8.6	7.8	7.7	8.7	7.9	7.9	8.8	8.0	8.1
	WF	0.108	0.082	0.065	0.122	0.092	0.073	0.135	0.103	0.081	0.149	0.113	0.088
7-12	TC	1.96	1.59	1.24	2.20	1.79	1.39	2.41	1.99	1.53	2.64	2.18	1.67
	SHC	1.78	1.59	1.24	2.01	1.79	1.39	2.24	1.99	1.53	2.47	2.18	1.67
	TSA	9.7	8.4	8.5	9.8	8.6	8.7	9.9	8.8	8.9	10.0	8.9	9.1
	WF	0.094	0.076	0.059	0.105	0.086	0.066	0.115	0.095	0.073	0.126	0.104	0.080
8-13	TC	1.81	1.47	1.12	2.05	1.66	1.25	2.29	1.84	1.37	2.52	2.01	1.50
	SHC	1.73	1.47	1.12	1.97	1.66	1.25	2.20	1.84	1.37	2.44	2.01	1.50
	TSA	10.1	9.4	9.5	10.2	9.6	9.7	10.2	9.8	10.0	10.3	10.0	10.1
	WF	0.087	0.070	0.054	0.098	0.079	0.060	0.109	0.088	0.066	0.120	0.096	0.071
10-15	TC	1.58	1.23	0.87	1.78	1.38	0.97	1.98	1.53	1.06	2.18	1.67	1.15
	SHC	1.58	1.23	0.87	1.78	1.38	0.97	1.98	1.53	1.06	2.18	1.67	1.15
	TSA	11.4	11.5	11.6	11.5	11.7	11.8	11.7	11.9	12.0	11.8	12.0	12.2
	WF	0.076	0.059	0.042	0.085	0.066	0.046	0.095	0.073	0.051	0.104	0.080	0.055
		Relative humidity 50%											
6-11	TC	2.94	1.99	1.36	3.33	2.22	1.53	3.73	2.45	1.69	4.13	2.68	1.85
	SHC	1.96	1.56	1.30	2.23	1.76	1.47	2.50	1.97	1.63	2.77	2.17	1.80
	TSA	8.1	8.6	8.0	8.2	8.8	8.1	8.2	8.9	8.2	8.3	9.0	8.3
	WF	0.141	0.095	0.065	0.159	0.106	0.073	0.178	0.117	0.081	0.197	0.128	0.088
7-12	TC	2.64	1.68	1.24	2.99	1.86	1.39	3.34	2.03	1.53	3.69	2.20	1.67
	SHC	1.82	1.43	1.24	2.07	1.60	1.39	2.32	1.78	1.53	2.57	1.96	1.67
	TSA	9.3	9.8	8.5	9.4	10.0	8.7	9.4	10.2	8.9	9.5	10.3	9.1
	WF	0.126	0.080	0.059	0.143	0.089	0.066	0.160	0.097	0.073	0.176	0.105	0.080
8-13	TC	2.33	1.35	1.12	2.62	1.48	1.25	2.92	1.84	1.37	3.22	2.01	1.50
	SHC	1.68	1.29	1.12	1.91	1.44	1.25	2.13	1.71	1.37	2.36	1.89	1.50
	TSA	10.5	11.0	9.5	10.6	11.2	9.7	10.7	10.6	10.0	10.7	10.7	10.1
	WF	0.111	0.065	0.054	0.125	0.071	0.060	0.139	0.088	0.066	0.154	0.096	0.071
10-15	TC	1.63	1.23	0.87	1.80	1.38	0.97	1.97	1.53	1.06	2.13	1.67	1.15
	SHC	1.40	1.23	0.87	1.57	1.38	0.97	1.75	1.53	1.06	1.92	1.67	1.15
	TSA	12.9	11.5	11.6	13.1	11.7	11.8	13.3	11.9	12.0	13.4	12.0	12.2
	WF	0.078	0.059	0.042	0.086	0.066	0.046	0.094	0.073	0.051	0.102	0.080	0.055
		Relative humidity 60%											
6-11	TC	3.60	2.56	1.59	4.10	2.89	1.75	4.60	3.22	1.91	5.10	3.56	2.06
	SHC	1.99	1.60	1.20	2.27	1.81	1.34	2.55	2.03	1.48	2.83	2.24	1.63
	TSA	7.8	8.3	8.8	7.9	8.5	9.1	7.9	8.5	9.3	7.9	8.6	9.4
	WF	0.172	0.122	0.076	0.196	0.138	0.084	0.220	0.154	0.090	0.244	0.170	0.099
7-12	TC	3.32	2.25	1.28	3.78	2.53	1.39	4.24	2.81	1.49	4.70	3.09	1.59
	SHC	1.86	1.46	1.06	2.12	1.65	1.18	2.38	1.84	1.30	2.64	2.04	1.42
	TSA	8.9	9.5	10.0	9.0	9.7	10.3	9.0	9.8	10.4	9.0	9.8	10.6
	WF	0.159	0.108	0.061	0.181	0.121	0.066	0.203	0.134	0.071	0.225	0.148	0.076
8-13	TC	2.98	1.93	1.12	3.43	2.15	1.25	3.85	2.37	1.37	4.26	2.59	1.50
	SHC	1.71	1.32	1.00	1.97	1.48	1.14	2.20	1.65	1.26	2.44	1.82	1.39
	TSA	10.2	10.7	10.5	10.1	10.9	10.6	10.2	11.0	10.7	10.2	11.1	10.8
	WF	0.143	0.092	0.054	0.164	0.103	0.060	0.184	0.113	0.066	0.204	0.124	0.071
10-15	TC	2.35	1.22	0.87	2.65	1.32	0.97	2.95	1.42	1.06	3.26	1.56	1.15
	SHC	1.45	1.03	0.87	1.64	1.15	0.97	1.84	1.27	1.06	2.03	1.41	1.15
	TSA	12.5	13.2	11.6	12.6	13.4	11.8	12.7	13.6	12.0	12.7	13.6	12.2
	WF	0.112	0.058	0.042	0.127	0.063	0.046	0.141	0.068	0.051	0.156	0.075	0.055

Legend:
 TC - Total cooling capacity, kW
 SHC - Sensible heat capacity, kW
 TSA - Air discharge temperature, °C
 WF - Water flow, l/s

NOTE: Operating limit: air discharge temperature 12°C when the unit is installed where room temperature is 25°C dry bulb and rh 45%.

8.2 - Heating capacities - hot water coil, kW

8.2.1 - Size 1, 1-row heating

Water temp. (°C)	inlet-	outlet	Air flow l/s (m³/h)																							
			22.22 (80)			33.33 (120)			44.44 (160)			55.56 (200)			66.67 (240)			77.78 (280)			88.89 (320)			97.22 (350)		
			Dry bulb temperature at coil inlet (°C)																							
			19	16	13	19	16	13	19	16	13	19	16	13	19	16	13	19	16	13	19	16	13	19	16	13
40-25	HC		0.22	0.29	0.35	0.26	0.34	0.42	0.29	0.38	0.47	0.31	0.41	0.51	0.32	0.43	0.54	0.33	0.45	0.56	0.34	0.46	0.58	0.35	0.47	0.59
	TSA		27.2	26.6	25.9	25.4	24.3	23.2	24.3	22.9	21.5	23.5	22.0	20.3	23.0	21.2	19.5	22.5	20.7	18.8	22.2	20.2	18.3	22.0	20.0	17.9
	WF		0.004	0.005	0.006	0.004	0.006	0.007	0.004	0.006	0.008	0.005	0.006	0.008	0.005	0.007	0.009	0.005	0.007	0.009	0.006	0.008	0.009	0.006	0.008	0.009
40-30	HC		0.48	0.36	0.43	0.36	0.44	0.52	0.40	0.49	0.60	0.44	0.54	0.66	0.46	0.58	0.71	0.49	0.61	0.76	0.51	0.64	0.80	0.52	0.67	0.84
	TSA		26.8	29.2	28.5	27.9	26.7	25.6	26.5	25.1	23.8	25.5	23.9	22.5	24.7	23.1	21.6	24.1	22.4	20.9	23.7	21.9	20.3	23.4	21.6	19.9
	WF		0.011	0.009	0.010	0.009	0.011	0.013	0.010	0.012	0.014	0.011	0.013	0.016	0.011	0.014	0.017	0.012	0.015	0.018	0.012	0.016	0.019	0.013	0.016	0.020
40-35	HC		0.38	0.46	0.54	0.50	0.61	0.73	0.61	0.75	0.89	0.70	0.87	1.04	0.79	0.98	1.15	0.88	1.08	1.25	0.95	1.16	1.34	1.01	1.21	1.41
	TSA		33.1	32.8	32.5	31.4	31.0	30.6	30.2	29.7	29.2	29.4	28.8	28.1	28.8	28.0	27.0	28.3	27.3	26.0	27.8	26.6	25.2	27.5	26.1	24.7
	WF		0.018	0.022	0.026	0.024	0.029	0.035	0.029	0.036	0.043	0.034	0.042	0.050	0.038	0.047	0.056	0.042	0.052	0.060	0.046	0.056	0.065	0.048	0.058	0.068
50-35	HC		0.44	0.50	0.57	0.53	0.61	0.69	0.59	0.69	0.79	0.64	0.75	0.88	0.68	0.81	0.95	0.72	0.86	1.01	0.76	0.91	1.08	0.78	0.94	1.12
	TSA		35.2	34.4	33.6	32.0	30.9	29.8	30.0	28.6	27.4	28.5	27.0	25.7	27.4	25.9	24.5	26.6	25.0	23.5	26.0	24.3	22.7	25.6	23.9	22.3
	WF		0.007	0.008	0.009	0.008	0.010	0.011	0.009	0.011	0.013	0.010	0.012	0.014	0.011	0.013	0.015	0.012	0.014	0.016	0.012	0.014	0.017	0.013	0.015	0.018
50-40	HC		0.52	0.59	0.67	0.66	0.76	0.87	0.78	0.91	1.06	0.89	1.05	1.23	0.99	1.18	1.38	1.09	1.30	1.52	1.18	1.42	1.66	1.25	1.50	1.75
	TSA		38.1	37.6	37.1	35.2	34.6	34.1	33.4	32.7	32.2	32.2	31.4	30.8	31.2	30.4	29.7	30.5	29.6	28.8	29.9	29.0	28.0	29.5	28.5	27.5
	WF		0.013	0.014	0.016	0.016	0.018	0.021	0.019	0.022	0.026	0.021	0.025	0.029	0.024	0.029	0.033	0.026	0.031	0.037	0.028	0.034	0.040	0.030	0.036	0.042
50-45	HC		0.66	0.74	0.83	0.90	1.00	1.11	1.08	1.21	1.34	1.24	1.38	1.53	1.38	1.54	1.70	1.50	1.68	1.85	1.61	1.80	1.99	1.68	1.88	2.09
	TSA		43.3	43.2	43.0	41.1	40.4	39.8	39.0	38.1	37.2	37.3	36.3	35.2	36.0	34.8	33.6	34.8	33.5	32.2	33.9	32.5	31.0	33.2	31.8	30.3
	WF		0.032	0.036	0.040	0.043	0.049	0.053	0.052	0.058	0.064	0.060	0.067	0.074	0.066	0.074	0.082	0.072	0.081	0.089	0.078	0.087	0.096	0.081	0.091	0.101
60-45	HC		0.66	0.73	0.81	0.84	0.94	1.05	0.99	1.12	1.27	1.13	1.29	1.47	1.25	1.45	1.65	1.38	1.60	1.82	1.49	1.73	1.98	1.57	1.83	2.09
	TSA		43.4	42.9	42.4	39.6	39.0	38.5	37.3	36.6	36.0	35.7	34.9	34.3	34.5	33.7	32.9	33.5	32.7	31.9	32.8	31.9	30.9	32.3	31.3	30.3
	WF		0.011	0.012	0.013	0.014	0.015	0.017	0.016	0.018	0.021	0.018	0.021	0.024	0.020	0.023	0.027	0.022	0.026	0.029	0.024	0.028	0.032	0.025	0.029	0.034
60-50	HC		0.79	0.87	0.96	1.07	1.19	1.31	1.31	1.46	1.59	1.52	1.67	1.82	1.68	1.85	2.01	1.83	2.01	2.19	1.96	2.15	2.34	2.05	2.25	2.45
	TSA		48.2	48.0	47.8	45.3	45.0	44.6	43.3	42.7	41.8	41.5	40.4	39.3	39.8	38.5	37.3	38.3	37.0	35.6	37.1	35.7	34.2	36.3	34.8	33.3
	WF		0.019	0.021	0.023	0.026	0.029	0.032	0.032	0.035	0.039	0.037	0.040	0.044	0.041	0.045	0.049	0.044	0.049	0.053	0.048	0.052	0.057	0.049	0.054	0.059
60-55	HC		0.92	1.00	1.08	1.24	1.34	1.45	1.50	1.63	1.76	1.72	1.87	2.02	1.92	2.08	2.25	2.09	2.27	2.45	2.25	2.44	2.64	2.36	2.56	2.77
	TSA		53.1	52.6	52.2	49.5	48.8	48.1	46.7	45.8	44.9	44.5	43.4	42.3	42.7	41.4	40.2	41.1	39.8	38.4	39.8	38.4	36.9	38.9	37.4	35.9
	WF		0.045	0.048	0.052	0.060	0.065	0.070	0.073	0.079	0.085	0.083	0.091	0.098	0.093	0.101	0.109	0.101	0.110	0.119	0.109	0.118	0.128	0.114	0.124	0.134

Legend:

- HC - Heating capacity, kW
- TSA - Air discharge temperature, °C
- WF - Water flow, l/s

NOTE: To avoid any risk of stratification, Carrier recommends to keep discharge air temperature below 35°C.

ATTENTION: The discharge temperature must not exceed 55°C to avoid damage to the unit fan motor.

8.2 - Heating capacities - hot water coil, kW (continued)

8.2.2 - Size 1, 5-rows heating

Water temp. (°C) inlet- outlet	Air flow l/s (m³/h)																							
	22.22 (80)			33.33 (120)			44.44 (160)			55.56 (200)			66.67 (240)			77.78 (280)			88.89 (320)			97.22 (350)		
	Dry bulb temperature at coil inlet (°C)																							
	19	16	13	19	16	13	19	16	13	19	16	13	19	16	13	19	16	13	19	16	13	19	16	13
40-25 HC	0.51	0.61	0.71	0.71	0.86	1.01	0.89	1.09	1.29	1.05	1.30	1.54	1.20	1.49	1.78	1.33	1.66	2.01	1.45	1.83	2.23	1.53	1.96	2.39
TSA	37.8	38.3	38.6	36.6	37.1	37.4	35.5	36.0	36.3	34.6	35.1	35.3	33.8	34.2	34.5	33.1	33.4	33.8	32.4	32.8	33.2	32.0	32.4	32.8
WF	0.008	0.010	0.011	0.011	0.014	0.016	0.014	0.018	0.021	0.017	0.021	0.025	0.019	0.024	0.028	0.021	0.027	0.032	0.023	0.029	0.036	0.024	0.031	0.038
40-30 HC	0.55	0.64	0.73	0.79	0.93	1.07	1.02	1.21	1.39	1.24	1.47	1.71	1.44	1.73	2.02	1.65	1.99	2.33	1.85	2.24	2.64	2.00	2.43	2.87
TSA	39.3	39.4	39.5	38.6	38.7	38.8	37.9	38.1	38.2	37.3	37.5	37.8	36.8	37.1	37.4	36.4	36.8	37.1	36.1	36.5	36.9	35.9	36.4	36.7
WF	0.013	0.015	0.018	0.019	0.022	0.026	0.024	0.029	0.033	0.030	0.035	0.041	0.035	0.041	0.048	0.039	0.048	0.058	0.044	0.054	0.063	0.048	0.058	0.069
40-35 HC	0.56	0.65	0.74	0.84	0.97	1.11	1.11	1.29	1.47	1.38	1.60	1.83	1.65	1.92	2.19	1.91	2.22	2.54	2.17	2.52	2.88	2.36	2.74	3.13
TSA	39.9	39.9	39.9	39.7	39.7	39.8	39.5	39.6	39.7	39.4	39.5	39.6	39.3	39.4	39.4	39.2	39.3	39.3	39.1	39.1	39.1	39.0	39.0	39.0
WF	0.027	0.031	0.036	0.040	0.047	0.053	0.053	0.062	0.071	0.066	0.077	0.088	0.079	0.092	0.105	0.092	0.107	0.122	0.104	0.121	0.138	0.113	0.132	0.151
45-30 HC	0.66	0.76	0.85	0.95	1.09	1.24	1.21	1.40	1.59	1.45	1.69	1.93	1.67	1.96	2.26	1.89	2.23	2.58	2.10	2.50	2.91	2.25	2.70	3.15
TSA	43.6	43.8	43.9	42.4	42.7	42.9	41.4	41.6	41.8	40.4	40.7	41.0	39.6	40.0	40.3	39.0	39.4	39.8	38.4	38.9	39.3	38.1	38.6	39.1
WF	0.011	0.012	0.014	0.015	0.018	0.020	0.019	0.023	0.026	0.023	0.027	0.031	0.027	0.031	0.036	0.030	0.036	0.041	0.034	0.040	0.047	0.036	0.043	0.050
45-35 HC	0.69	0.78	0.87	1.01	1.15	1.29	1.31	1.50	1.69	1.62	1.85	2.09	1.91	2.20	2.49	2.21	2.55	2.89	2.50	2.89	3.28	2.72	3.15	3.57
TSA	44.5	44.5	44.6	43.9	44.0	44.1	43.3	43.5	43.6	42.9	43.1	43.3	42.6	42.9	43.1	42.3	42.6	42.9	42.2	42.5	42.7	42.0	42.3	42.6
WF	0.017	0.019	0.021	0.024	0.028	0.031	0.032	0.036	0.041	0.039	0.044	0.050	0.046	0.053	0.060	0.053	0.061	0.069	0.060	0.069	0.079	0.066	0.076	0.086
45-40 HC	0.70	0.79	0.88	1.05	1.18	1.32	1.39	1.57	1.75	1.73	1.96	2.18	2.07	2.33	2.61	2.40	2.71	3.02	2.72	3.07	3.44	2.96	3.35	3.74
TSA	44.9	44.9	44.9	44.8	44.8	44.9	44.7	44.7	44.8	44.6	44.6	44.6	44.5	44.5	44.5	44.3	44.3	44.3	44.2	44.2	44.1	44.1	44.0	44.0
WF	0.034	0.038	0.043	0.050	0.057	0.063	0.067	0.076	0.084	0.083	0.094	0.105	0.099	0.112	0.126	0.115	0.130	0.146	0.131	0.148	0.165	0.143	0.161	0.180
50-35 HC	0.81	0.90	1.00	1.17	1.31	1.45	1.51	1.70	1.89	1.83	2.08	2.32	2.15	2.45	2.75	2.47	2.82	3.17	2.78	3.19	3.60	3.01	3.46	3.91
TSA	48.9	49.0	49.1	47.9	48.0	48.2	46.9	47.2	47.3	46.2	46.5	46.7	45.6	45.9	46.2	45.1	45.5	45.9	44.7	45.2	45.6	44.5	45.0	45.4
WF	0.013	0.014	0.016	0.019	0.021	0.023	0.024	0.027	0.030	0.029	0.033	0.037	0.034	0.039	0.044	0.039	0.045	0.051	0.044	0.051	0.058	0.048	0.056	0.063
50-40 HC	0.83	0.92	1.01	1.22	1.36	1.50	1.61	1.80	1.99	1.99	2.23	2.47	2.37	2.66	2.95	2.75	3.09	3.42	3.13	3.51	3.88	3.41	3.81	4.21
TSA	49.6	49.6	49.7	49.1	49.2	49.3	48.8	48.9	49.0	48.5	48.7	48.8	48.3	48.5	48.6	48.1	48.3	48.4	47.9	48.1	48.2	47.8	47.9	47.9
WF	0.020	0.022	0.024	0.029	0.033	0.036	0.039	0.043	0.048	0.048	0.054	0.059	0.057	0.064	0.071	0.066	0.074	0.083	0.075	0.084	0.093	0.082	0.092	0.102
50-45 HC	0.84	0.93	1.02	1.25	1.39	1.53	1.66	1.85	2.03	2.07	2.30	2.53	2.48	2.75	3.02	2.87	3.19	3.51	3.27	3.62	3.99	3.56	3.95	4.35
TSA	49.9	49.9	50.0	49.9	49.9	49.9	49.8	49.8	49.8	49.7	49.7	49.7	49.5	49.5	49.5	49.4	49.4	49.3	49.2	49.2	49.2	49.1	49.1	49.0
WF	0.040	0.045	0.049	0.060	0.067	0.074	0.080	0.089	0.098	0.100	0.111	0.122	0.119	0.133	0.146	0.139	0.154	0.169	0.158	0.175	0.193	0.171	0.191	0.209
55-40 HC	0.95	1.04	1.14	1.39	1.53	1.68	1.81	2.00	2.20	2.23	2.47	2.72	2.64	2.94	3.24	3.05	3.40	3.75	3.46	3.86	4.26	3.76	4.20	4.64
TSA	54.2	54.2	54.3	53.3	53.4	53.5	52.5	52.7	52.9	52.0	52.2	52.5	51.5	51.9	52.1	51.2	51.6	51.8	51.0	51.3	51.6	50.8	51.2	51.4
WF	0.015	0.017	0.018	0.022	0.025	0.027	0.029	0.032	0.035	0.036	0.040	0.044	0.043	0.047	0.052	0.049	0.055	0.060	0.056	0.062	0.069	0.061	0.068	0.075
55-45 HC	0.96	1.06	1.15	1.43	1.57	1.72	1.90	2.09	2.28	2.36	2.60	2.84	2.82	3.10	3.39	3.27	3.59	3.92	3.71	4.07	4.45	4.03	4.43	4.83
TSA	54.7	54.7	54.7	54.4	54.4	54.5	54.1	54.2	54.3	53.9	54.0	54.1	53.8	53.9	53.9	53.6	53.6	53.6	53.3	53.3	53.3	53.1	53.1	53.1
WF	0.023	0.026	0.028	0.035	0.038	0.041	0.046	0.050	0.055	0.057	0.063	0.068	0.068	0.075	0.082	0.079	0.087	0.095	0.089	0.098	0.107	0.097	0.107	0.117

Legend:

HC - Heating capacity, kW
TSA - Air discharge temperature, °C
WF - Water flow, l/s

NOTE: To avoid any risk of stratification, Carrier recommends to keep discharge air temperature below 35°C.

ATTENTION: The discharge temperature must not exceed 55°C to avoid damage to the unit fan motor.

8.2 - Heating capacities - hot water coil, kW (continued)

8.2.3 - Size 2, 1-row heating

Water temp. (°C)	inlet-outlet	Air flow l/s (m³/h)																																																					
		55.56 (200)						66.67 (240)						77.78 (280)						88.89 (320)						100 (360)						111.11 (400)						122.22 (440)						133.33 (480)						138.89 (500)					
		Dry bulb temperature at coil inlet (°C)																																																					
40-25	HC	0.47	0.61	0.76	0.50	0.66	0.82	0.53	0.70	0.87	0.55	0.73	0.92	0.57	0.76	0.96	0.59	0.79	1.00	0.60	0.81	1.04	0.62	0.83	1.08	0.63	0.84	1.09																											
	TSA	25.9	25.0	24.0	25.2	24.0	22.9	24.6	23.3	22.0	24.1	22.7	21.3	23.7	22.2	20.8	23.4	21.8	20.3	23.1	21.4	19.9	22.8	21.1	19.5	22.7	20.9	19.3																											
	WF	0.008	0.010	0.012	0.008	0.011	0.013	0.008	0.011	0.014	0.009	0.012	0.015	0.009	0.012	0.015	0.009	0.013	0.016	0.010	0.013	0.017	0.010	0.013	0.017	0.010	0.014	0.018																											
40-30	HC	0.65	0.82	1.00	0.72	0.91	1.12	0.78	0.99	1.23	0.83	1.08	1.34	0.88	1.15	1.45	0.93	1.23	1.55	0.97	1.30	1.64	1.02	1.36	1.73	1.04	1.40	1.78																											
	TSA	28.7	28.0	27.4	27.8	27.1	26.5	27.2	26.4	25.8	26.7	25.8	25.2	26.2	25.4	24.7	25.9	25.0	24.2	25.6	24.6	23.8	25.3	24.3	23.5	25.2	24.2	23.3																											
	WF	0.016	0.020	0.024	0.017	0.022	0.027	0.019	0.024	0.030	0.020	0.026	0.032	0.021	0.028	0.035	0.022	0.029	0.037	0.023	0.031	0.039	0.024	0.033	0.042	0.025	0.034	0.043																											
40-35	HC	0.96	1.14	1.31	1.09	1.28	1.48	1.20	1.42	1.63	1.30	1.54	1.77	1.39	1.65	1.90	1.48	1.75	2.02	1.56	1.84	2.13	1.64	1.93	2.23	1.67	1.97	2.28																											
	TSA	33.2	32.7	32.0	32.5	31.7	30.9	31.7	30.8	29.9	31.0	30.1	29.1	30.5	29.4	28.3	30.0	28.8	27.6	29.5	28.3	27.0	29.1	27.8	26.5	28.9	27.6	26.2																											
	WF	0.046	0.055	0.063	0.053	0.062	0.071	0.058	0.068	0.078	0.063	0.074	0.085	0.067	0.079	0.091	0.071	0.084	0.097	0.075	0.089	0.102	0.079	0.093	0.107	0.080	0.095	0.109																											
50-35	HC	0.98	1.16	1.34	1.08	1.29	1.51	1.18	1.42	1.67	1.27	1.54	1.82	1.36	1.65	1.96	1.44	1.76	2.10	1.52	1.87	2.23	1.60	1.97	2.35	1.64	2.02	2.41																											
	TSA	33.5	32.9	32.5	32.4	31.8	31.3	31.5	30.8	30.3	30.8	30.1	29.5	30.2	29.5	28.8	29.7	28.9	28.2	29.2	28.5	27.7	28.9	28.0	27.2	28.7	27.8	27.0																											
	WF	0.016	0.019	0.022	0.018	0.021	0.024	0.019	0.023	0.027	0.021	0.025	0.029	0.022	0.027	0.031	0.023	0.028	0.034	0.024	0.030	0.036	0.026	0.032	0.038	0.026	0.033	0.039																											
50-40	HC	1.30	1.49	1.69	1.48	1.70	1.91	1.64	1.88	2.10	1.80	2.03	2.27	1.92	2.18	2.43	2.04	2.31	2.58	2.14	2.43	2.72	2.24	2.54	2.84	2.29	2.60	2.91																											
	TSA	38.2	37.9	37.5	37.2	36.8	36.1	36.4	35.7	34.8	35.6	34.6	34.8	33.7	32.6	34.1	32.9	31.7	33.4	32.2	30.9	32.8	31.5	30.2	32.6	31.2	29.9																												
	WF	0.031	0.036	0.041	0.036	0.041	0.046	0.040	0.045	0.051	0.043	0.049	0.055	0.046	0.053	0.059	0.049	0.056	0.062	0.052	0.059	0.066	0.054	0.061	0.069	0.055	0.063	0.070																											
50-45	HC	1.53	1.70	1.88	1.73	1.93	2.13	1.91	2.13	2.35	2.08	2.31	2.55	2.23	2.49	2.74	2.37	2.64	2.92	2.50	2.79	3.08	2.63	2.93	3.23	2.69	3.00	3.31																											
	TSA	41.6	40.9	40.2	40.3	39.5	38.7	39.2	38.3	37.3	38.2	37.2	36.2	37.3	36.2	35.1	36.6	35.4	34.2	35.9	34.6	33.3	35.2	33.9	32.5	34.9	33.6	32.2																											
	WF	0.027	0.032	0.037	0.032	0.037	0.042	0.035	0.040	0.045	0.037	0.042	0.047	0.039	0.044	0.049	0.041	0.046	0.051	0.043	0.048	0.053	0.045	0.050	0.055	0.047	0.052	0.057																											
60-50	HC	1.92	2.10	2.28	2.17	2.37	2.57	2.39	2.61	2.83	2.59	2.83	3.07	2.77	3.03	3.29	2.95	3.22	3.50	3.11	3.40	3.69	3.26	3.56	3.87	3.33	3.64	3.95																											
	TSA	47.4	46.7	46.0	45.7	44.9	44.0	44.2	43.3	42.3	43.0	41.9	40.8	41.8	40.7	39.5	40.8	39.6	38.4	39.9	38.6	37.3	39.1	37.7	36.4	38.7	37.3	35.9																											
	WF	0.046	0.051	0.055	0.053	0.057	0.062	0.058	0.063	0.069	0.063	0.069	0.074	0.067	0.073	0.080	0.071	0.078	0.085	0.075	0.082	0.089	0.079	0.086	0.094	0.081	0.088	0.096																											
60-55	HC	2.08	2.26	2.44	2.36	2.57	2.77	2.62	2.84	3.07	2.85	3.09	3.34	3.06	3.32	3.59	3.26	3.54	3.82	3.45	3.74	4.03	3.62	3.93	4.24	3.70	4.02	4.33																											
	TSA	49.9	49.1	48.4	48.2	47.3	46.5	46.7	45.7	44.8	45.4	44.3	43.2	44.2	43.1	41.9	43.1	41.9	40.7	42.2	40.9	39.6	41.3	40.0	38.6	40.9	39.5	38.1																											
	WF	0.101	0.109	0.118	0.114	0.124	0.134	0.127	0.138	0.149	0.138	0.150	0.162	0.149	0.161	0.174	0.158	0.171	0.185	0.167	0.181	0.196	0.176	0.190	0.205	0.178	0.195	0.210																											

Legend:

HC - Heating capacity, kW
TSA - Air discharge temperature, °C
WF - Water flow, l/s

NOTE: To avoid any risk of stratification, Carrier recommends to keep discharge air temperature below 35°C.

ATTENTION: The discharge temperature must not exceed 55°C to avoid damage to the unit fan motor.

8.2 - Heating capacities - hot water coil, kW (continued)

8.2.4 - Size 2, 5-rows heating

Water temp. (°C) inlet-outlet		Air flow l/s (m³/h)																																																																																
		55.56 (200)									66.67 (240)									77.78 (280)									88.89 (320)									100 (360)									111.11 (400)									122.22 (440)									133.33 (480)									138.89 (500)								
		Dry bulb temperature at coil inlet (°C)																																																																																
40-25	HC	1.21	1.47	1.71	1.41	1.71	2.00	1.59	1.94	2.28	1.76	2.16	2.55	1.92	2.37	2.81	2.07	2.57	3.07	2.21	2.76	3.32	2.35	2.96	3.56	2.42	3.05	3.68																																																						
	TSA	37.0	37.5	37.8	36.4	36.9	37.2	35.8	36.3	36.6	35.3	35.8	36.1	34.8	35.3	35.6	34.3	34.8	35.2	33.9	34.4	34.9	33.5	34.1	34.5	33.3	33.9	34.4																																																						
	WF	0.019	0.023	0.028	0.023	0.028	0.032	0.025	0.031	0.036	0.028	0.034	0.041	0.031	0.038	0.045	0.033	0.041	0.049	0.035	0.044	0.053	0.038	0.047	0.057	0.039	0.049	0.059																																																						
40-30	HC	1.34	1.57	1.80	1.58	1.85	2.13	1.81	2.14	2.46	2.04	2.41	2.79	2.26	2.69	3.12	2.48	2.96	3.44	2.70	3.23	3.77	2.92	3.50	4.09	3.03	3.64	4.25																																																						
	TSA	38.8	39.0	39.1	38.5	38.6	38.8	38.1	38.4	38.5	37.9	38.1	38.3	37.6	37.9	38.1	37.4	37.7	38.0	37.2	37.5	37.8	37.0	37.4	37.7	36.9	37.3	37.7																																																						
	WF	0.032	0.038	0.043	0.038	0.044	0.051	0.043	0.051	0.059	0.049	0.058	0.067	0.054	0.064	0.075	0.059	0.071	0.083	0.065	0.078	0.091	0.070	0.084	0.098	0.073	0.088	0.102																																																						
40-35	HC	1.40	1.63	1.85	1.68	1.95	2.22	1.95	2.27	2.58	2.23	2.58	2.95	2.50	2.90	3.31	2.77	3.22	3.66	3.04	3.52	4.02	3.30	3.83	4.37	3.43	3.98	4.54																																																						
	TSA	39.8	39.8	39.8	39.7	39.8	39.8	39.6	39.7	39.8	39.6	39.7	39.7	39.5	39.6	39.6	39.5	39.6	39.6	39.4	39.5	39.5	39.4	39.4	39.4	39.3	39.3	39.3																																																						
	WF	0.068	0.078	0.089	0.081	0.094	0.107	0.094	0.109	0.124	0.107	0.124	0.142	0.120	0.139	0.159	0.133	0.154	0.176	0.146	0.169	0.193	0.159	0.184	0.210	0.165	0.191	0.218																																																						
45-30	HC	1.61	1.85	2.08	1.88	2.17	2.46	2.14	2.48	2.82	2.40	2.79	3.18	2.64	3.09	3.53	2.88	3.38	3.88	3.12	3.68	4.23	3.36	3.97	4.58	3.47	4.11	4.75																																																						
	TSA	42.8	43.1	43.2	42.2	42.5	42.7	41.7	42.0	42.2	41.2	41.5	41.8	40.7	41.1	41.5	40.4	40.8	41.2	40.0	40.5	40.9	39.7	40.2	40.7	39.6	40.1	40.6																																																						
	WF	0.026	0.029	0.033	0.030	0.035	0.039	0.034	0.040	0.045	0.038	0.045	0.051	0.042	0.049	0.057	0.046	0.054	0.062	0.050	0.059	0.068	0.054	0.064	0.073	0.056	0.066	0.076																																																						
45-35	HC	1.70	1.93	2.16	2.01	2.29	2.57	2.33	2.66	2.99	2.64	3.02	3.40	2.95	3.38	3.81	3.26	3.74	4.22	3.57	4.09	4.62	3.88	4.45	5.03	4.03	4.63	5.23																																																						
	TSA	44.1	44.2	44.3	43.9	44.0	44.1	43.6	43.8	43.9	43.4	43.6	43.8	43.3	43.5	43.7	43.1	43.4	43.6	43.0	43.3	43.5	42.9	43.2	43.4	42.9	43.1	43.3																																																						
	WF	0.041	0.046	0.052	0.048	0.055	0.062	0.056	0.064	0.072	0.064	0.073	0.082	0.071	0.081	0.092	0.078	0.090	0.101	0.086	0.098	0.111	0.093	0.107	0.121	0.097	0.111	0.126																																																						
45-40	HC	1.75	1.97	2.20	2.09	2.36	2.64	2.44	2.75	3.07	2.78	3.14	3.50	3.12	3.52	3.93	3.46	3.90	4.36	3.79	4.28	4.78	4.12	4.66	5.20	4.29	4.84	5.41																																																						
	TSA	44.9	44.9	44.9	44.8	44.9	44.9	44.8	44.8	44.8	44.7	44.8	44.8	44.7	44.7	44.6	44.6	44.6	44.5	44.5	44.5	44.4	44.4	44.4	44.4	44.4	44.4	44.4																																																						
	WF	0.084	0.095	0.106	0.101	0.114	0.027	0.118	0.133	0.148	0.134	0.151	0.169	0.150	0.170	0.189	0.166	0.188	0.210	0.183	0.206	0.230	0.199	0.224	0.250	0.206	0.233	0.260																																																						
50-35	HC	1.98	2.21	2.45	2.33	2.62	2.91	2.68	3.02	3.36	3.02	3.41	3.81	3.36	3.81	4.25	3.70	4.20	4.70	4.04	4.59	5.14	4.37	4.98	5.58	4.54	5.17	5.80																																																						
	TSA	48.2	48.4	48.5	47.8	48.0	48.2	47.3	47.6	47.8	47.0	47.3	47.5	46.7	47.0	47.3	46.4	46.8	47.1	46.2	46.6	46.9	46.0	46.4	46.7	45.9	46.3	46.7																																																						
	WF	0.032	0.036	0.039	0.038	0.042	0.047	0.043	0.048	0.054	0.049	0.055	0.061	0.054	0.061	0.068	0.059	0.067	0.075	0.065	0.074	0.083	0.070	0.080	0.090	0.073	0.083	0.093																																																						
50-40	HC	2.05	2.28	2.52	2.45	2.73	3.01	2.84	3.17	3.50	3.23	3.61	3.99	3.63	4.05	4.48	4.02	4.49	4.96	4.40	4.92	5.44	4.79	5.35	5.91	4.98	5.56	6.14																																																						
	TSA	49.4	49.4	49.5	49.2	49.3	49.4	49.1	49.2	49.3	48.9	49.1	49.2	48.8	49.0	49.1	48.7	48.9	49.0	48.6	48.8	48.9	48.5	48.7	48.7	48.5	48.6	48.6																																																						
	WF	0.049	0.055	0.061	0.059	0.066	0.073	0.068	0.076	0.084	0.078	0.087	0.096	0.087	0.098	0.108	0.097	0.108	0.119	0.106	0.119	0.131	0.115	0.129	0.142	0.120	0.134	0.148																																																						
50-45	HC	2.09	2.32	2.55	2.50	2.78	3.05	2.92	3.23	3.56	3.33	3.69	4.06	3.73	4.14	4.56	4.14	4.59	5.05	4.54	5.04	5.54	4.94	5.48	6.03	5.14	5.70	6.27																																																						
	TSA	49.9	49.9	49.9	49.9	49.9	49.9	49.8	49.8	49.8	49.8	49.8	49.8	49.8	49.7	49.7	49.6	49.6	49.6	49.6	49.5	49.5	49.5	49.5	49.4	49.4	49.4	49.4																																																						
	WF	0.101	0.112	0.123	0.121	0.134	0.147	0.141	0.156	0.172	0.161	0.178	0.196	0.180	0.200	0.220	0.200	0.221	0.244	0.219	0.243	0.267	0.238	0.264	0.291	0.248	0.275	0.303																																																						
55-40	HC	2.34	2.58	2.82	2.78	3.07	3.36	3.21	3.55	3.90	3.64	4.04	4.43	4.07	4.52	4.96	4.50	5.00	5.49	4.93	5.47	6.02	5.36	5.95	6.55	5.57	6.19	6.81																																																						
	TSA	53.6	53.8	53.9	53.3	53.4	53.6	53.0	53.2	53.4	52.7	53.0	53.2	52.5	52.8	53.0	52.3	52.6	52.8	52.2	52.5	52.7	52.0	52.3	52.6	52.0	52.3	52.5																																																						
	WF	0.038	0.041	0.045	0.045	0.049	0.054	0.052	0.057	0.063	0.059	0.065	0.071	0.066	0.073	0.080	0.073	0.080	0.088	0.079	0.088	0.097	0.086	0.096	0.105	0.089	0.099	0.109																																																						
55-45	HC	2.40	2.64	2.87	2.87	3.15	3.44	3.34	3.67	4.01	3.81	4.19	4.57	4.28	4.70	5.12	4.74	5.20	5.67	5.19	5.70	6.22	5.64	6.19	6.76	5.86	6.44	7.02																																																						
	TSA	54.6	54.6	54.7	54.5	54.5	54.6	54.4	54.4	54.5	54.3	54.3	54.4	54.2	54.3	54.3	54.1	54.1	54.1	54.0	54.0	54.0	53.8	53.8	53.8	53.7	53.7	53.7																																																						
	WF	0.058	0.064	0.069	0.069	0.076	0.083	0.081	0.089	0.097	0.092	0.101	0.110	0.103	0.113	0.124	0.114	0.126	0.137	0.126	0.138	0.150	0.136	0.149	0.163	0.142	0.156	0.169																																																						

Legend:

HC - Heating capacity, kW
TSA - Air discharge temperature, °C
WF - Water flow, l/s

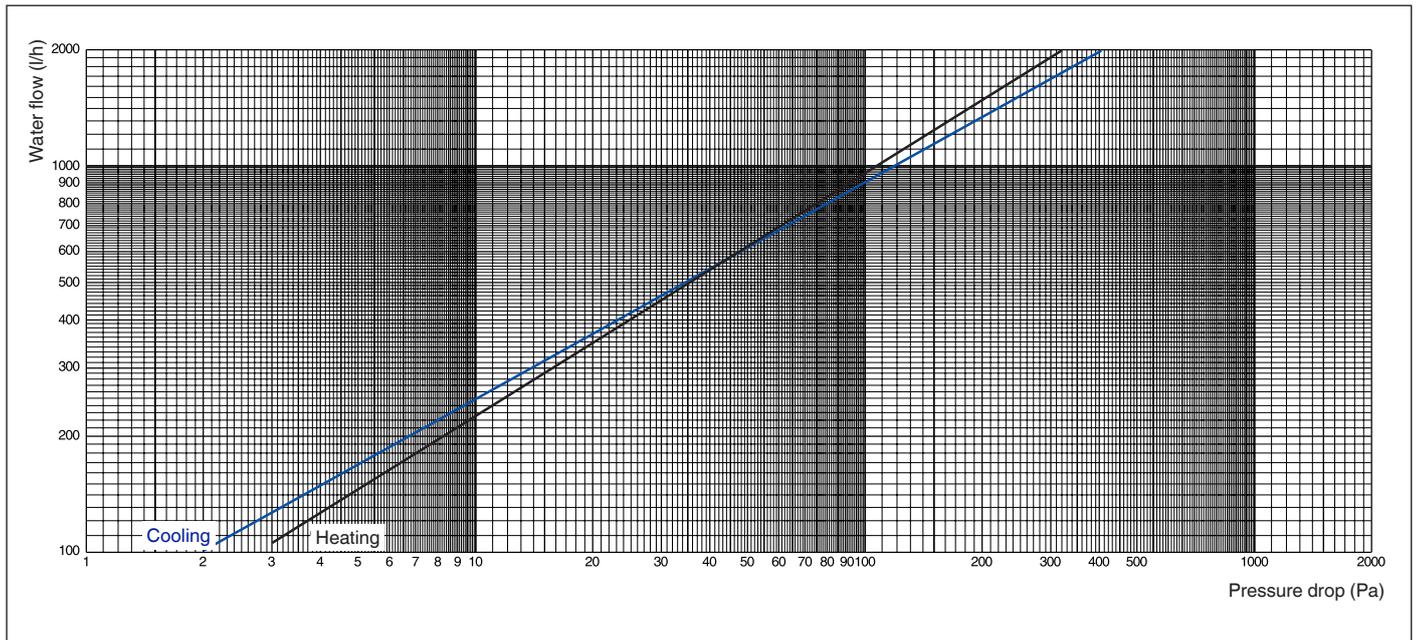
NOTE: To avoid any risk of stratification, Carrier recommends to keep discharge air temperature below 35°C.

ATTENTION: The discharge temperature must not exceed 55°C to avoid damage to the unit fan motor.

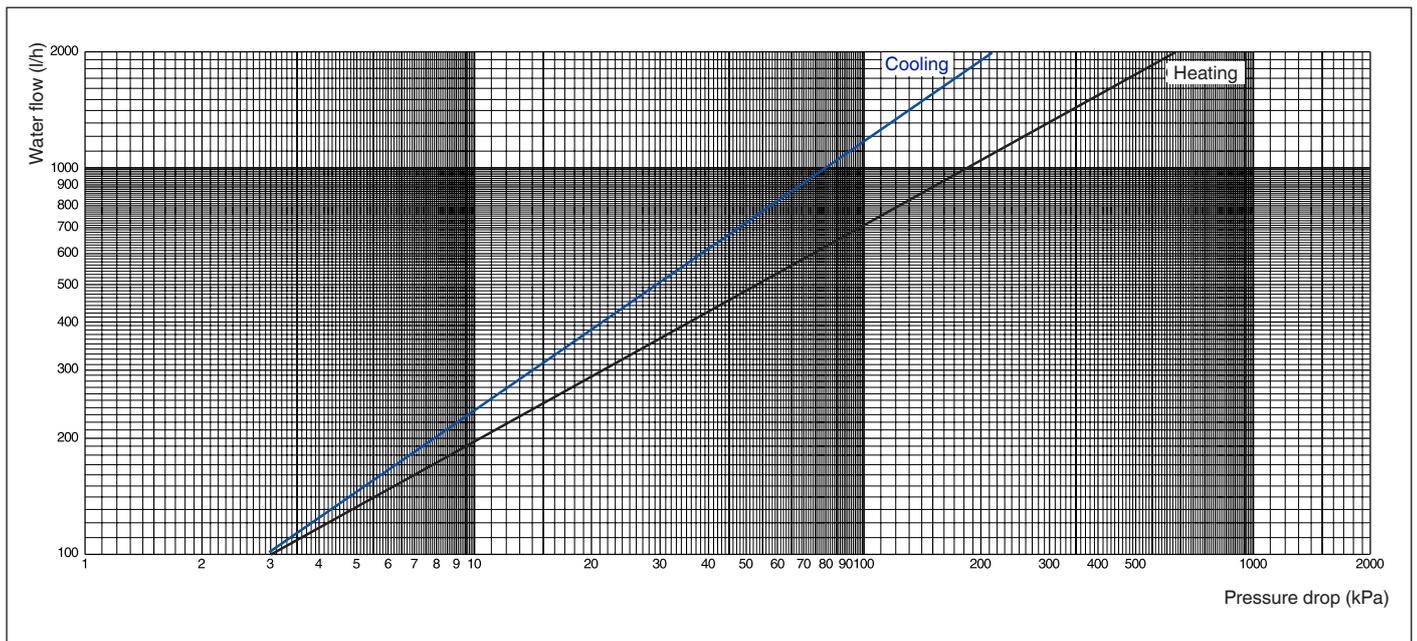
8.3 - Coil pressure drop

8.3.1 - Water pressure drop curves

Size 1



Size 2

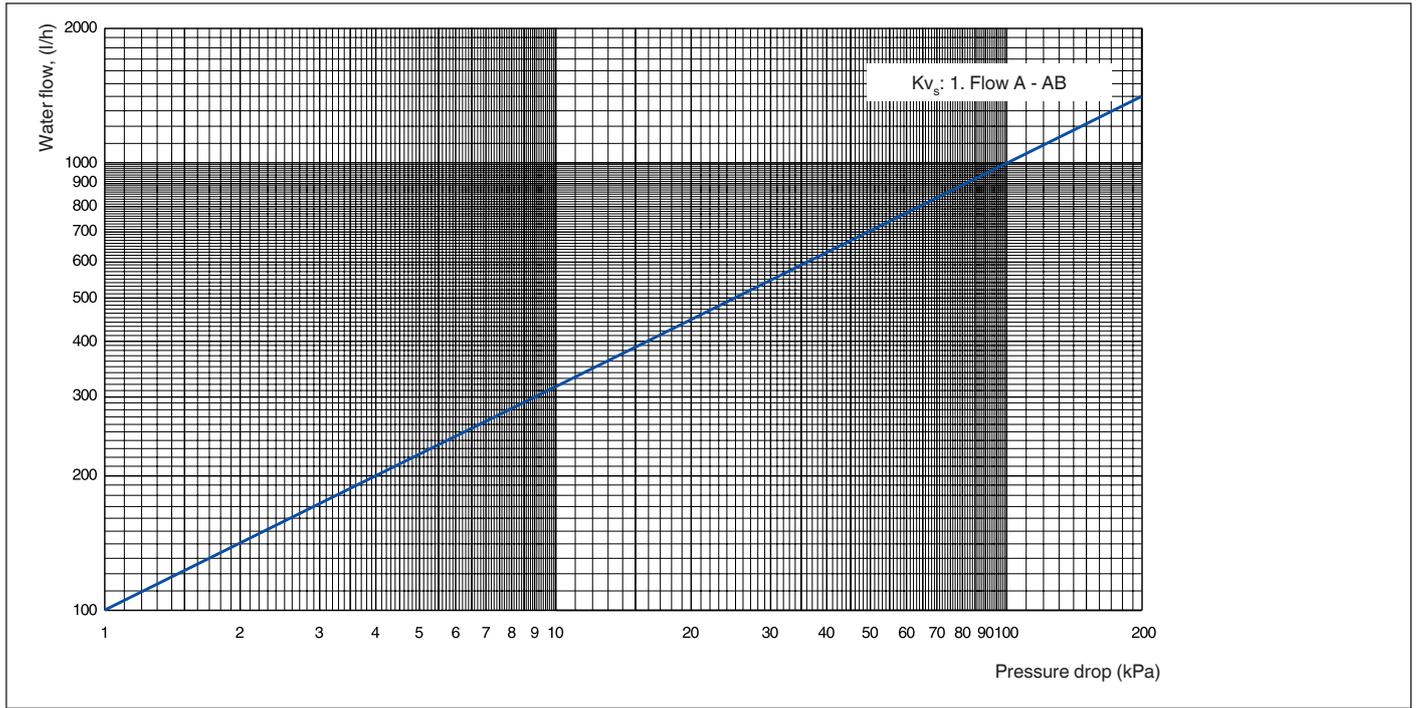


NOTES:

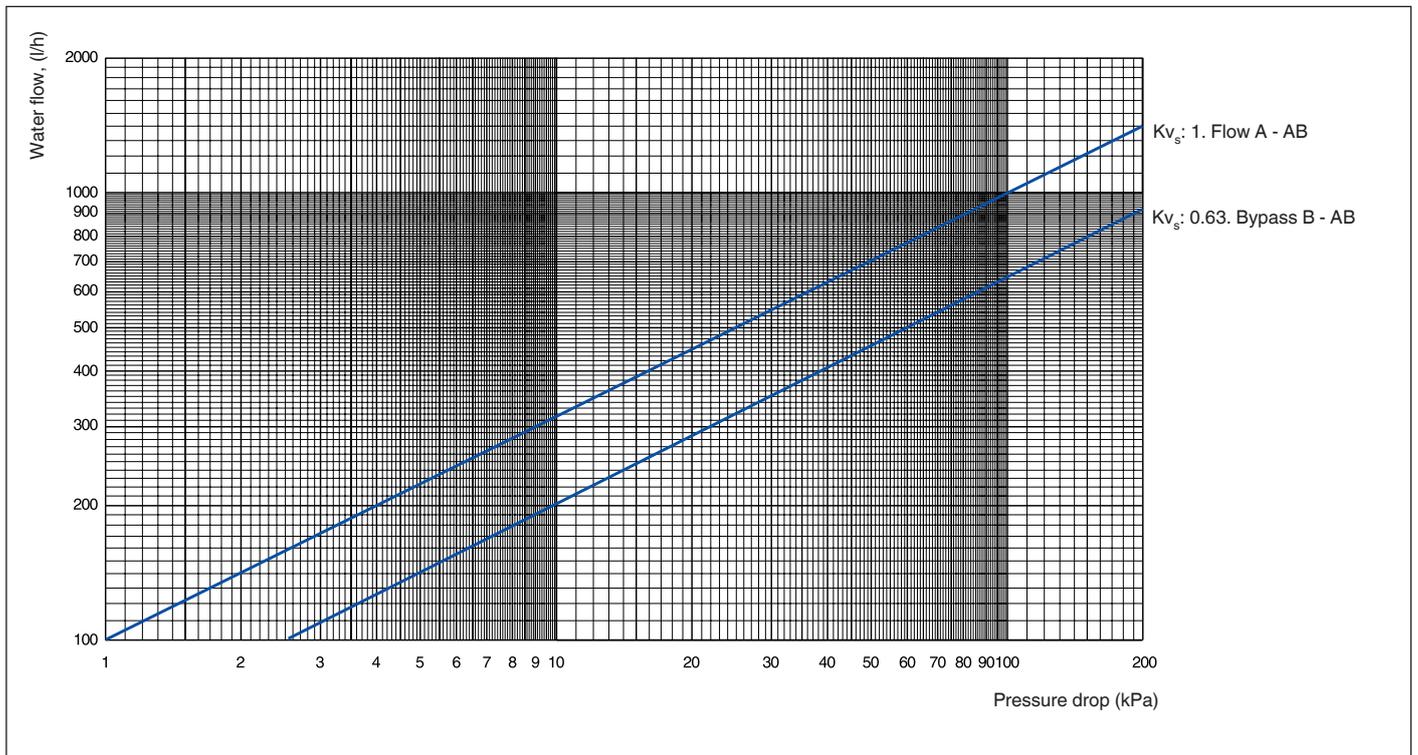
- The curves are plotted for the following conditions:*
 - entering hot water temperature 50°C
 - entering chilled water temperature 6°C
- To convert the water flow rates from l/h to l/s please divide the values by 3600.*

8.4 - Valve pressure drop

8.4.1 - Water pressure drop across the 2-way valve



8.4.2 - Water pressure drop across the 3-way valve



NOTE: To convert the water flow rates from l/h to l/s please divide the values by 3600.

8.5 - Sound power level

ATM size 1

U (V)	Qv-P l/s (m³/h)-Pa	Type	Octave band frequency, Hz					A
			125	250	500	1 K	2 K	
230	97.2 (350)-310	SUP	67.7	70.8	71.9	66.0	58.0	71.4
		RET	60.7	61.4	63.9	50.2	44.2	61.8
		RAD	62.8	60.0	60.2	47.7	43.5	58.9
	69.4 (250)-439	SUP	69.0	71.7	71.0	65.2	57.3	70.8
		RET	61.7	62.6	66.3	49.4	43.5	63.6
		RAD	63.5	60.6	62.9	48.3	43.6	60.9
	41.7 (150)-550	SUP	69.9	71.8	73.2	65.0	57.3	71.9
		RET	61.5	62.6	68.8	49.4	44.0	66
		RAD	64.7	61.1	64.3	48.8	44.0	62.1
200	91.7 (330)-268	SUP	66.5	69.1	69.2	63.7	55.9	69
		RET	59.9	59.8	60.6	48.4	42.4	58.7
		RAD	63.4	60.0	57.7	47.2	42.2	57.2
	66.7 (240)-400	SUP	68.4	70.9	70.8	64.5	55.9	70.4
		RET	59.6	61.6	63.6	48.6	42.4	61.5
		RAD	63.0	59.9	60.1	47.8	42.6	58.6
	40.3 (145)-519	SUP	69.0	70.8	71.4	64.1	56.3	70.7
		RET	62.9	61.8	68.7	48.8	43.3	65.9
		RAD	63.9	60.6	63.4	48.1	43.1	61.3
170	77.8 (280)-214	SUP	64.3	64.9	62.8	59.2	51.1	63.7
		RET	57.8	55.9	57.3	44.1	37.6	55.5
		RAD	61.3	57.5	54.7	42.8	37.0	54.3
	59.7 (215)-327	SUP	66.4	68.0	64.1	60.7	52.5	65.5
		RET	59.1	58.7	58.8	45.7	39.1	57.9
		RAD	61.3	58.0	57.1	43.7	39.1	56
	37.5 (135)-451	SUP	67.8	69.0	71.5	63.0	54.0	69.9
		RET	61.2	59.9	64.1	48.1	41.3	61.3
		RAD	63.2	59.2	60.1	46.0	41.2	58.5
140	58.3 (210)-138	SUP	58.9	60.7	53.4	50.7	42.1	56.3
		RET	54.3	49.8	48.3	35.8	28.6	47.5
		RAD	56.8	52.0	45.8	35.5	27.3	47.1
	47.2 (170)-200	SUP	61.9	62.5	55.5	52.4	44.6	58.2
		RET	56.2	53.9	51.2	37.9	31.9	50.6
		RAD	58.4	54.4	47.5	36.8	30.7	49.4
	30.6 (110)-334	SUP	63.3	64.2	61.2	56.1	48.3	61.8
		RET	56.7	56.0	56.7	42.0	36.5	55
		RAD	59.4	56.0	54.4	42.6	36.7	53.5
110	44.4 (160)-21	SUP	51.0	48.9	43.9	40.4	29.0	45.6
		RET	46.1	40.8	39.1	24.1	12.3	38.1
		RAD	50.0	46.2	39.8	30.0	*	41.4
	33.3 (120)-102	SUP	53.6	50.7	45.4	41.8	32.1	47.4
		RET	51.5	50.7	42.7	28.0	19.7	44.5
		RAD	49.5	47.2	38.0	31.2	*	41.4
	22.2 (80)-179	SUP	56.1	57.8	48.4	45.1	37.6	52
		RET	51.1	50.3	45.2	32.1	26.9	45.5
		RAD	51.9	47.8	40.3	36.7	*	43.4

NOTE:

* Value too low for conversion to sound power level.

In the case of size 1 ATMs fitted with electric heaters (suction side), the values are identical for the same air flow.

In the case of size 2 ATMs fitted with electric heaters (discharge side), for the same air flow, use the following correction factors.

Measurements are based on the usual ISO standards.

Any calculation of sound pressure level within a room must take account of the sound deadening effect (absorption) in the duct, diffuser plenum, room and ceiling.

Frequency (Hz)	125	250	500	1 k	2 k	A
Correction	+2	+2	+1	0	+0.5	+0.5

ATM size 2

U (V)	Qv-P l/s (m³/h)-Pa	Type	Octave band frequency, Hz					A
			125	250	500	1 K	2 K	
230	138.9 (500)-321	SUP	68.1	64.1	54.9	49.8	42.5	58.8
		RET	63.5	51.7	47.7	49.7	46.1	54.0
		RAD	65.8	53.5	50.1	47.5	43.8	54.2
	100 (360)-435	SUP	73.8	68.1	58.1	49.1	47.7	62.9
		RET	68.7	55.4	50.5	50.3	49.7	57.1
		RAD	70.9	57.1	52.9	47.6	44.0	57.5
	61.1 (220)-513	SUP	75.3	69.5	60.2	49.5	43.9	64.1
		RET	70.4	57.3	53.7	51.3	48.9	58.4
		RAD	72.0	59.1	55.7	49.0	45.0	59.0
200	122.2 (440)-250	SUP	65.5	60.1	51.2	47.5	37.3	55.4
		RET	61.1	48.7	44.5	47.3	41.2	51.0
		RAD	63.0	49.8	47.2	44.9	39.0	51.1
	93.1 (335)-380	SUP	71.0	65.3	55.2	47.9	39.8	60.0
		RET	66.8	52.9	48.4	48.8	43.8	54.5
		RAD	68.7	55.1	51.0	46.3	41.3	55.2
	58.3 (210)-459	SUP	73.9	68.5	59.1	48.6	46.2	63.2
		RET	69.2	56.1	52.5	50.4	49.7	57.6
		RAD	71.0	57.8	55.1	48.4	44.2	58.1
170	100 (360)-180	SUP	60.7	54.5	46.4	41.8	31.1	50.1
		RET	56.9	43.5	40.3	42.8	35.5	46.4
		RAD	58.6	45.7	43.6	41.4	34.7	47.1
	79.2 (285)-298	SUP	66.7	60.1	50.7	43.5	34.7	55.2
		RET	63.9	49.4	45.3	44.7	39.8	51.1
		RAD	65.9	51.2	47.5	42.9	37.1	52.0
	52.8 (190)-380	SUP	71.3	65.4	56.5	46.5	38.2	60.3
		RET	67.7	53.9	50.3	48.5	43.8	55.2
		RAD	68.4	56.8	53.6	47.7	42.5	56.3
140	73.6 (265)-93	SUP	53.7	47.7	40.8	32.5	21.3	43.3
		RET	50.6	36.6	34.3	34.0	26.8	39.0
		RAD	54.9	41.5	41.9	37.8	25.2	43.6
	59.7 (215)-190	SUP	59.5	52.6	44.5	36.9	26.1	48.1
		RET	57.4	42.6	39.3	38.7	33.4	44.8
		RAD	60.6	45.6	44.5	39.3	31.0	47.4
	41.7 (150)-322	SUP	65.6	59.5	51.0	41.4	32.1	54.6
		RET	62.3	47.7	44.6	42.6	37.8	49.5
		RAD	65.0	52.1	49.4	42.9	36.3	52.1
110	55.6 (200)-37	SUP	47.1	42.1	36.0	25.9	15.4	37.6
		RET	43.4	29.7	30.8	26.4	*	32.3
		RAD	47.5	36.4	38.6	32.2	*	38.5
	41.7 (150)-90	SUP	51.8	45.7	38.4	28.5	17.1	41.1
		RET	48.2	33.8	32.3	29.7	20.5	35.7
		RAD	51.2	38.6	40.1	33.1	*	40.5
	29.2 (105)-141	SUP	55.6	50.1	42.0	30.3	14.5	44.9
		RET	51.9	38.0	35.5	33.4	26.5	39.6
		RAD	52.3	43.9	42.3	35.7	21.9	42.9

Legend:

- U - Fan motor power supply
- Qv-P - Air flow/available static pressure
- SUP - Supply (dB re = 10⁻¹² W)
- RET - Return (dB re = 10⁻¹² W)
- RAD - Radiated (dB re = 10⁻¹² W)

8.6 - Electrical data

ATM size 1 without electric heater

U (V)	I (A)	P (W)	Fan motor speed (r/s)	Qv (m ³ /h)	Qv (l/s)	Pressure (Pa)
230	0.66	147	41.8	390	108.3	250
230	0.64	143	42.3	350	97.5	310
230	0.63	140	42.8	320	88.9	349
230	0.62	137	43.3	290	80.6	391
230	0.6	133	43.7	255	70.8	433
230	0.59	128	44.1	222	61.7	469
230	0.58	124	44.6	182	50.6	516
230	0.56	119	45.1	140	38.9	562
230	0.55	116	45.5	102	28.3	598
230	0.54	111	46.0	63	17.5	629
200	0.61	122	39.8	330	91.7	268
200	0.59	119	40.4	301	83.6	311
200	0.58	116	41.1	277	76.9	348
200	0.56	112	41.7	247	68.6	391
200	0.54	108	42.3	220	61.1	425
200	0.52	104	43.0	184	51.1	473
200	0.5	99	43.5	154	42.8	508
200	0.47	93	44.3	102	28.3	562
200	0.45	88	45.0	66	18.3	602
170	0.59	104	34.9	286	79.4	206
170	0.57	101	35.8	262	72.8	243
170	0.55	98	36.9	237	65.8	286
170	0.53	95	37.8	214	59.4	328
170	0.51	91	38.9	185	51.4	373
170	0.49	87	40.2	152	42.2	427
170	0.47	84	41.3	124	34.4	469
170	0.44	79	42.4	85	23.6	521
170	0.41	73	43.5	52	14.4	561
140	0.57	81	27.2	219	60.8	120
140	0.56	78	29.3	189	52.5	175
140	0.54	75	31.3	162	45.0	228
140	0.52	73	33.2	138	38.3	279
140	0.49	70	35.3	107	29.7	341
140	0.47	67	37.1	78	21.7	396
140	0.45	64	38.7	55	15.3	440
110	0.49	55	21.0	129	35.8	88
110	0.48	54	23.3	103	28.6	130
110	0.47	53	25.2	88	24.4	165
110	0.46	52	27.2	67	18.6	203
80	0.36	30	14.0	82	22.8	37
80	0.36	29	15.3	61	16.9	55
80	0.35	29	16.7	43	11.9	76
80	0.34	28	18.3	29	8.1	89

Legend:

U	Fan motor power supply
I	Current draw
P	Power input to the fan motor, numeric controller or speed controller
r/s	Fan motor rotation speed
Qv	Air flow
Pressure	Available static pressure

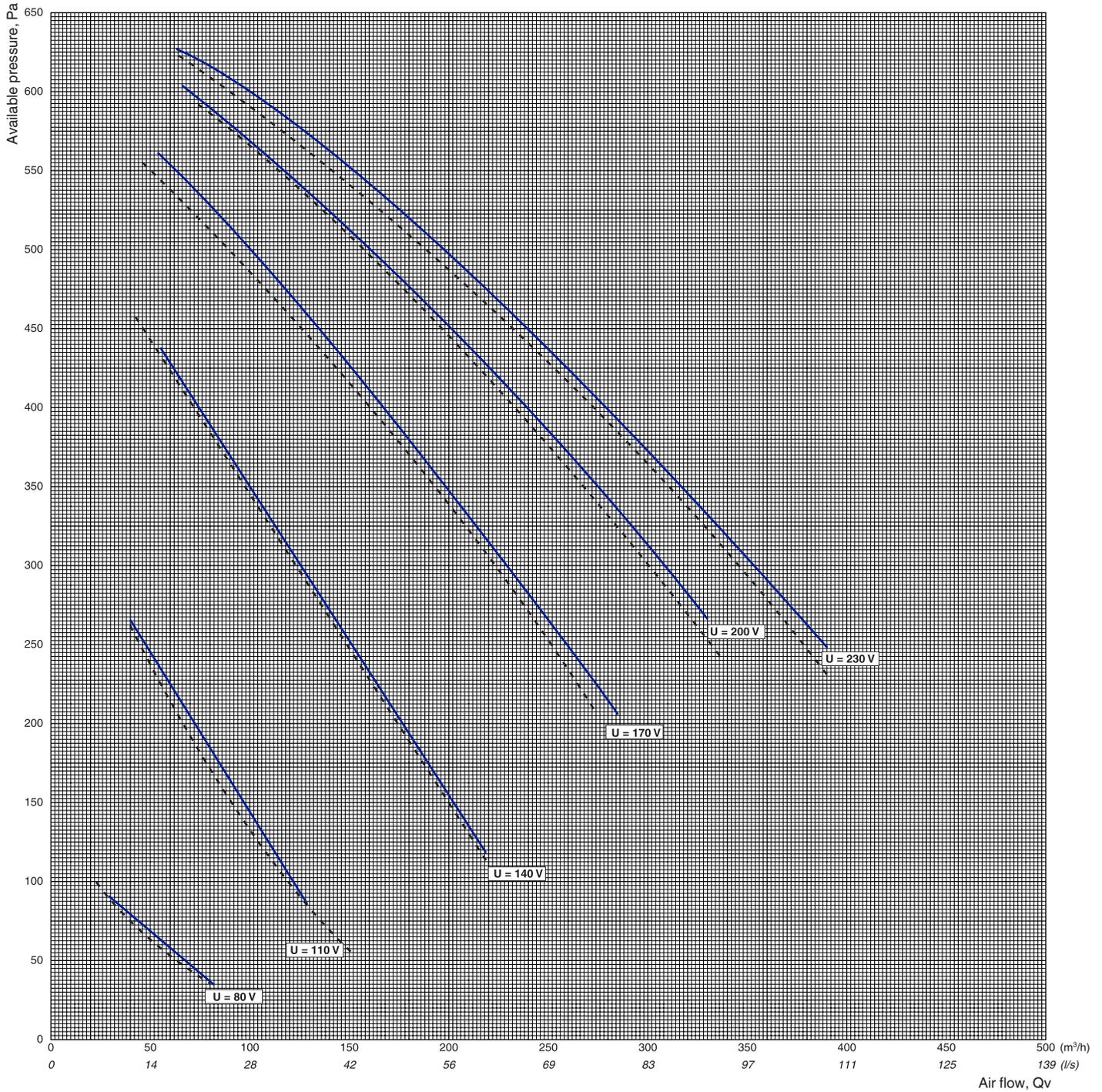
ATM size 2 without electric heater

U (V)	I (A)	P (W)	Fan motor speed (r/s)	Qv (m ³ /h)	Qv (l/s)	Pressure (Pa)
230	0.91	208	38.3	500	138.9	320
230	0.87	195	39.4	449	124.7	364
230	0.83	184	40.8	403	111.9	408
230	0.8	175	41.8	360	100.0	435
230	0.77	168	42.4	323	89.7	460
230	0.75	162	43.0	287	79.7	479
230	0.74	157	43.5	247	68.6	499
230	0.72	153	43.8	216	60.0	516
200	0.88	176	34.3	440	122.2	250
200	0.84	166	36.4	398	110.6	311
200	0.8	158	38.1	359	99.7	359
200	0.77	150	39.3	322	89.4	389
200	0.74	142	40.5	277	76.9	421
200	0.72	138	41.2	248	68.9	440
200	0.7	132	41.8	204	56.7	461
170	0.82	140	28.8	367	101.8	167
170	0.78	135	32.0	329	91.4	243
170	0.75	127	34.5	289	80.3	292
170	0.72	122	36.2	258	71.7	325
170	0.7	117	37.2	227	63.1	354
170	0.68	114	38.0	195	54.2	377
170	0.67	112	38.5	172	47.8	397
140	0.71	100	22.1	266	73.9	93
140	0.7	98	25.8	237	65.8	153
140	0.68	97	27.8	217	60.3	188
140	0.66	94	30.0	190	52.8	225
140	0.65	92	31.1	168	46.7	255
140	0.64	90	32.3	144	40.0	279
110	0.57	64	16.3	190	52.8	47
110	0.58	64	19.1	160	44.4	80
110	0.57	64	20.4	140	38.9	99
110	0.57	64	22.3	120	33.3	99
110	0.56	63	24.3	90	25.0	155
80	0.43	35	11.1	121	33.6	20
80	0.42	35	13.3	83	23.1	39
80	0.42	35	14.8	52	14.4	55

8.7 - Air flow/available static pressure data

8.7.1 - ATM Size 1

Available static pressure curve (Pa) as a function of air flow (m³/h or l/s)



Legend:

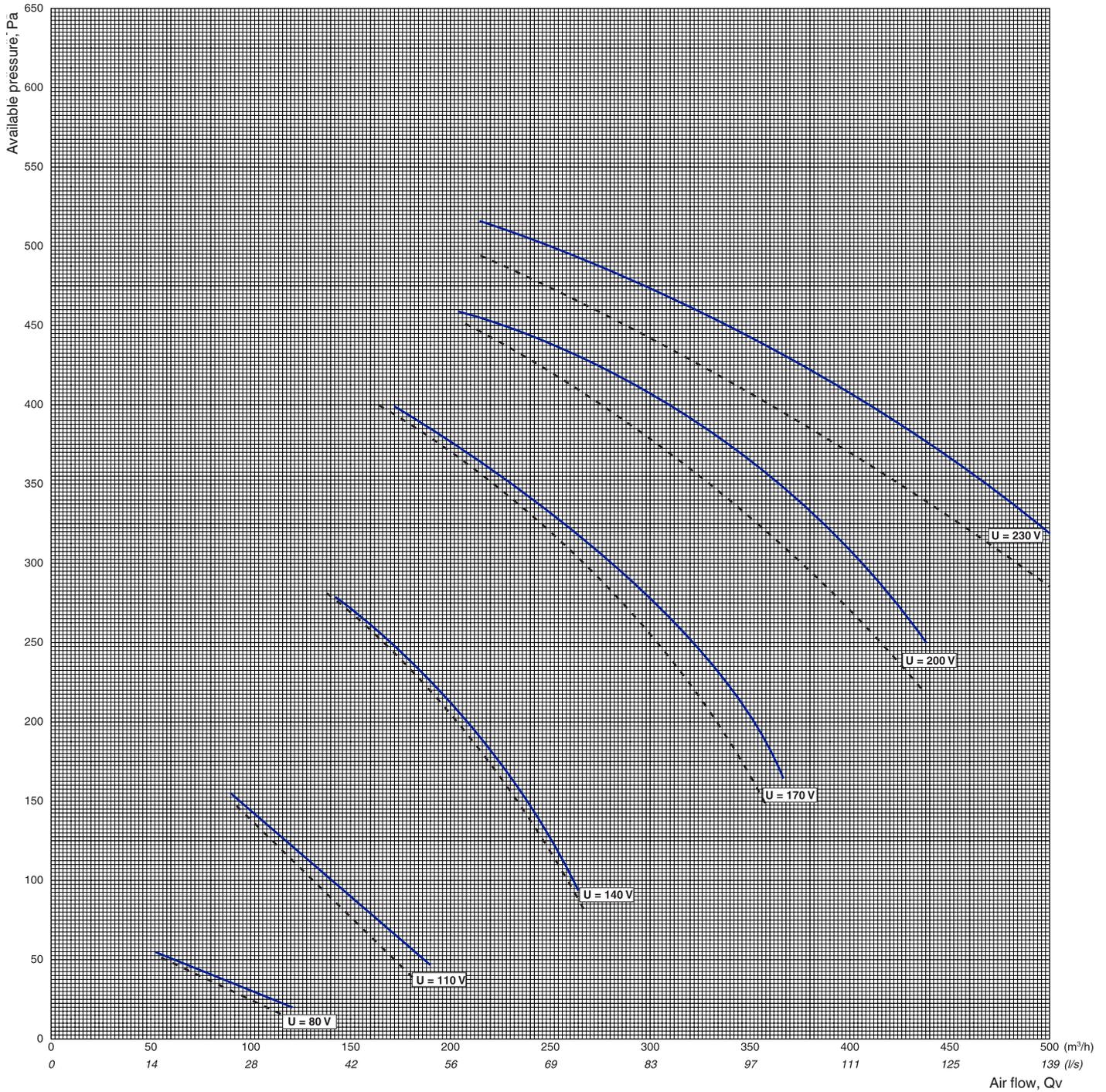
- Without electric heater (with 6-row water coil)
- - - With electric heater (with 5-row water coil)
- U Fan motor power supply

IMPORTANT: The curves were derived by smoothing, based on the information contained in the electrical data table.

8.7 - Air flow/available static pressure data (continued)

8.7.2 - ATM Size 2

Available static pressure curve (Pa) as a function of air flow (m³/h or l/s)



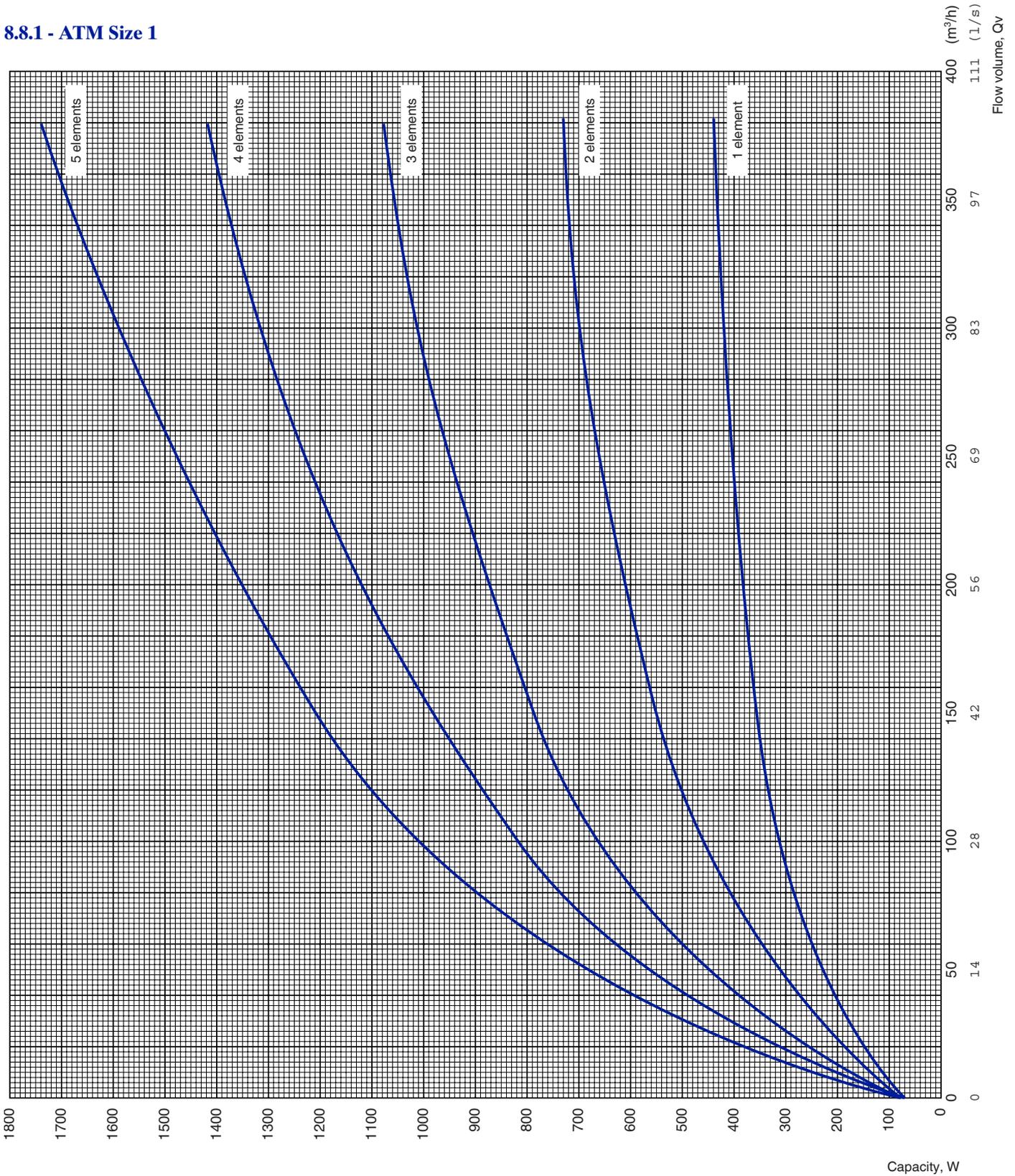
Legend:

- Without electric heater (with 6-row water coil)
- - - With electric heater (with 5-row water coil)
- U Fan motor power supply

IMPORTANT: The curves were derived by smoothing, based on the information contained in the electrical data table.

8.8 - Electric heater performance

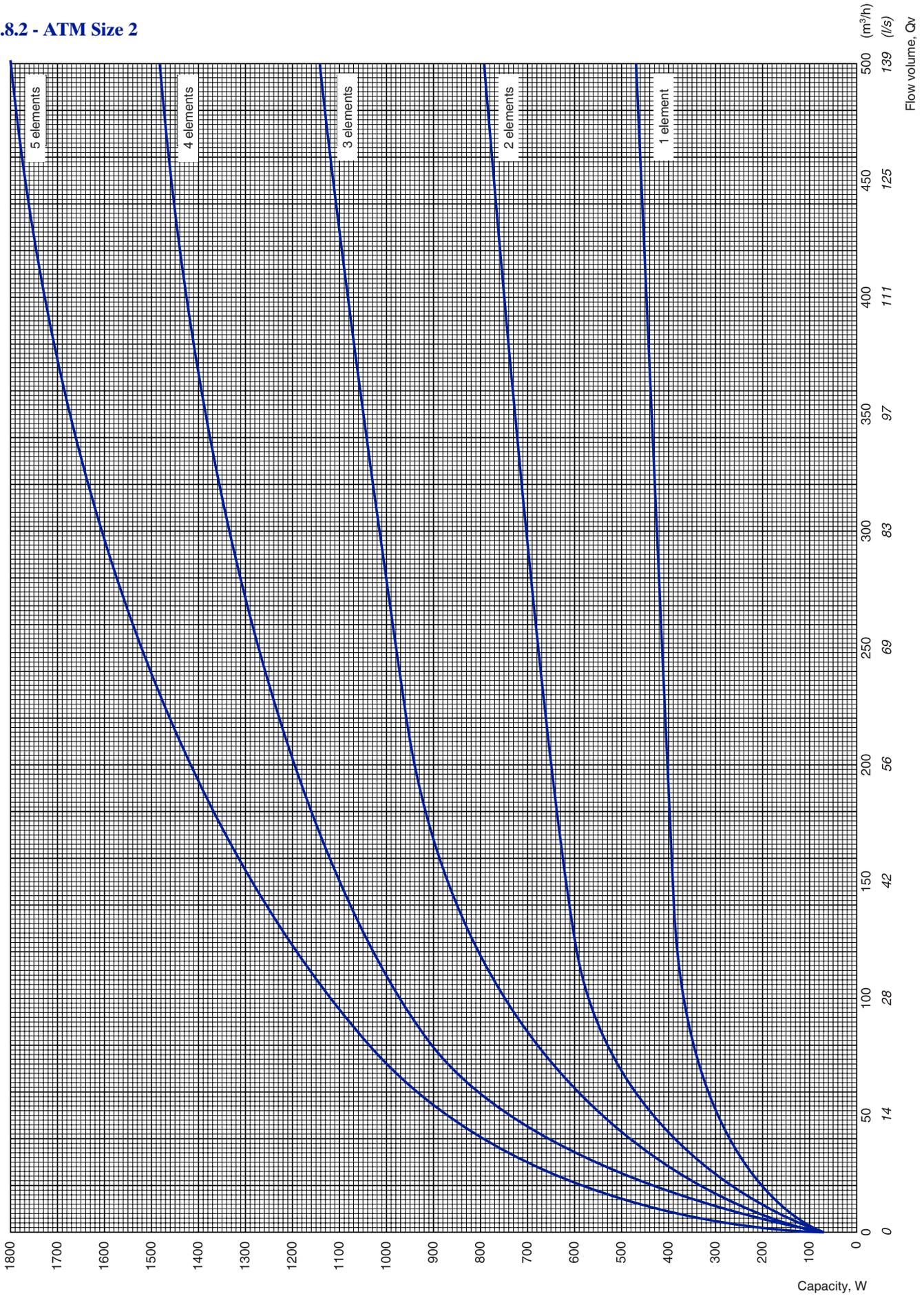
8.8.1 - ATM Size 1



NOTE:
Data obtained with an entering air temperature of 19°C.
Supply voltage: 230 V.

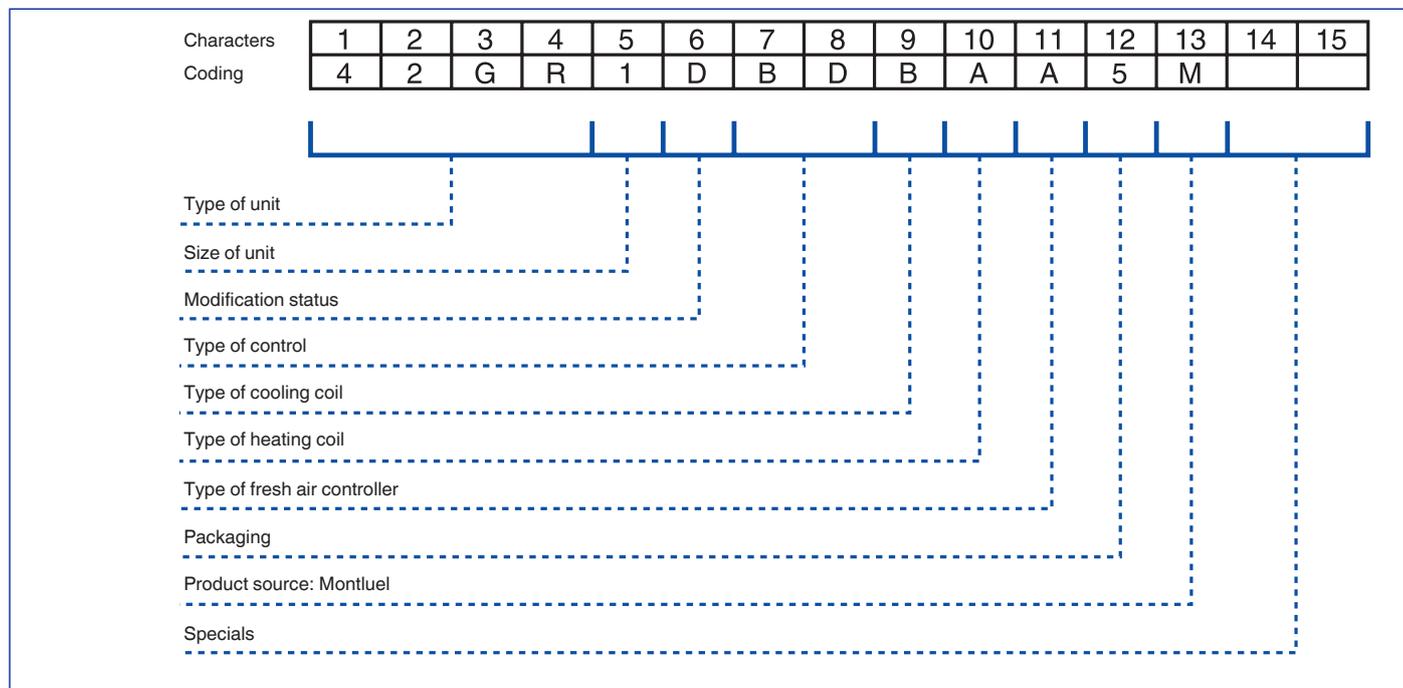
8.8 - Electric heater performance (continued)

8.8.2 - ATM Size 2



NOTE:
Data obtained with an entering air temperature of 19°C.
Supply voltage: 230 V.

9 - 42GR CODIFICATION



Digit	Codification	Designation
1, 2, 3, 4	42GR	Type of unit
5		Size of unit
	1	97 l/s (350 m ³ /h), size 1
	2	139 l/s (500 m ³ /h), size 2
6	D	Modification status
7,8		Units with electromechanical controller (fan speed controller)
	GC	Unit with speed controller, without control valve for two-pipe or four-pipe configuration with fan cable bundle connected to a terminal strip under a protective cover.
	GD	Unit with speed controller, without control valve for two-pipe plus two-wire configuration with fan cable bundle and electric heater (including relay) connected to a terminal strip under a protective cover.
	AG	Unit with speed controller, 1 two-way on/off valve plus flexible water pipes, cable bundles connected to a terminal strip under a protective cover.
	AH	Unit with speed controller, 2 two-way on/off valves plus flexible water pipes, cable bundles connected to a terminal strip under a protective cover.

Digit	Codification	Designation
7,8		Units with electromechanical controller (fan speed controller)
	AJ	Unit with speed controller, 1 two-way on/off valve plus flexible water pipes, one electric heater relay, cable bundles connected to a terminal strip under a protective cover.
	AN	Unit with speed controller, 1 three-way on/off valve complete with flexible water pipes, cable bundles connected to a terminal strip under a protective cover.
	AP	Unit with speed controller, 2 three-way on/off valves complete with flexible water pipes, cable bundles connected to a terminal strip under a protective cover.
	AQ	Unit with speed controller, 1 three-way on/off valve complete with flexible water pipes, one electric heater relay, cable bundles connected to a terminal strip under a protective cover.
	AS	Unit with speed controller, 1 three-way on/off valve complete with changeover switch and flexible water pipes, cable bundles connected to a terminal strip under a protective cover.

Digit	Codification	Designation
7, 8		Units with Carrier communicating numeric controller
	BD	Unit with Carrier communicating numeric controller, fitted with 1 two-way on/off valve and flexible water pipes.
	BE	Unit with Carrier communicating numeric controller, fitted with 2 two-way on/off valves and flexible water pipes.
	BF	Unit with Carrier communicating numeric controller, fitted with 1 two-way on/off valve and flexible water pipes, with electric heater control.
	CD	Unit with Carrier communicating numeric controller, fitted with 1 three-way on/off valve and flexible water pipes.
	CE	Unit with Carrier communicating numeric controller, fitted with 2 three-way on/off valves and flexible water pipes.
	CF	Unit with Carrier communicating numeric controller, fitted with 1 three-way on/off valve and flexible water pipes, with electric heater control.
	DB	Unit with Carrier communicating numeric controller, fitted with a three-way on/off valve, a change-over sensor and flexible water pipes.
	XX	Unit with special control system.

Digit	Codification	Designation
9		Cooling coil type
	B	Five-row coil
10		Heating coil type
	N	None
	A	One-row coil
	E	PTC electric heater, five wired elements
11		Fresh air controller
	N	Basic unit with no fresh air inlet
	A	Fresh air controller. Constant air flow: 8.3 l/s (30 m ³ /h)
	B	Fresh air controller. Constant air flow: 16.7 (60 m ³ /h), field-modifiable to 20.8 (75), 27.8 (100), 36.1 (130) or 44.4 l/s (160 m ³ /h)
	X	Special fresh air controller
12		Packaging
	5	Palletised (10 size 1; 6 size 2)
13	M	Montluel factory
14, 15		Specials

10 - GUIDE SPECIFICATION

- Supply 42GR fan coil units for VAV systems in accordance with the certified drawings.
- The performance of each 42GR unit supplied shall conform to the published technical and performance data.
- Each 42GR unit supplied shall comprise a combined heating and cooling coil or a cooling coil and an electric heater and a variable speed centrifugal fan. The water coils shall have manual purge valves. Fan speed shall be controlled by an external controller or by a numerical controller matched to the characteristics of the fan motor. A disposable air filter type F5 shall be supplied with each unit.
- 42GR casings shall be made of 1 mm galvanized steel and shall provide adequate access to all components for maintenance and repair.
- Cooling coils (five rows) and heating coils (one or five rows) shall be made of 3/8" external diameter copper tubes and shall have aluminium fins. Maximum operating pressure shall be 10 bar (100 kPa). The coils shall be easily removable from the unit and fitted with manually operated purge valves.
- The motorised, two or three-way water flow control valves shall be supplied with flexible water pipes. Actuators shall be of the electrothermal, on/off type.
- The 42GR modules shall be fitted with a disposable, high efficiency, filter type F5 to M1 fire rating.
- Access to the filter shall be through a filter access door on the underside of the unit.
- Connection spigots for supply and return air shall be integral with the 42GR casing. They shall comprise two spigots 160 mm in diameter and 250 mm long on size 1 units and two spigots 199 mm in diameter and 250 mm long on size 2 units.
- On the ATM, the fresh air connection spigot shall have a nominal diameter of 75 or 125 mm and be 60 mm long. The spigot shall be integral with the 42GR unit. This shall be connected to the main fresh air supply by means of a built-in duct, 80 or 125 mm in diameter, which can extend from 150 to 450 mm in length. The fresh air flow must be controllable between 8.3 and 44.4 l/s (30 to 160 m³/h).
- On the all fresh air or constant fresh air volume suspension casing, the fresh air connection spigot shall have a nominal diameter of 159 mm and be 190 mm long. The spigot shall be integral with the 42GR casing. This shall be connected to the main fresh air supply by means of a built-in duct, 160 mm in diameter, which can extend from 150 to 700 mm in length. The fresh air flow must be controllable between 8.3 and 69.7 l/s (30 to 250 m³/h).
- On the variable fresh air volume suspension casing, the electronic fresh air flow control module shall be integral with the 42GR casing. This shall be connected to the main fresh air supply by means of a semi-rigid round duct of 250 mm minimum length. This semi-rigid duct (Ø 125 mm) is not supplied by Carrier and must be installed in the straightest line possible to prevent any air flow problems. The fresh air flow must be controllable between 8.3 and 56 l/s (30 to 200 m³/h).
- The backward curved centrifugal fan unit for the size 1 ATM, and the forward curved fan unit for the size 2 ATM, shall be connected to a speed controller. Available static pressure shall be 310 Pa for the size 1 ATM and 320 Pa for the size 2 ATM at nominal air flow.
- The fan motor shall be single-phase, variable-speed, with internal overload protection. Connections shall comply with Class B for insulation and Class F for varnish, and shall have IP 44 electrical protection.
- The speed controller shall be compatible with the majority of common control systems.
- Electrical connections on 42GR units shall be of the quick connect type as an aid to maintenance and servicing. The terminal block shall be protected by a self-extinguishing ABS plastic cover.
- The communicating numeric controller shall use Carrier Comfort Network (CCN) communication protocol. This controller shall provide the following functions:
 - Control fan speed on the ATM between a configured minimum and maximum hot or cold air flow;
 - Control the flow of water through the two or three-way, on/off type valves by reference to internal and external loads to maintain a constant ambient temperature in the air conditioned space;
 - Control the capacity of the PTC electric heater by operating in on/off mode;
 - Turn lighting sources on and off;
 - Adjust window blinds (raise/lower/angle);
 - Be controlled by a wall-mounted thermostat or a Zone User Interface fitted with a digital display.
- The power supply to the controller shall be 230 V a.c. ± 15%, single-phase, 50 Hz, to avoid the need for a transformer. The electric heater shall be controlled directly by the numeric controller to avoid the need for a power triac.

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Environmental Management System Approval

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