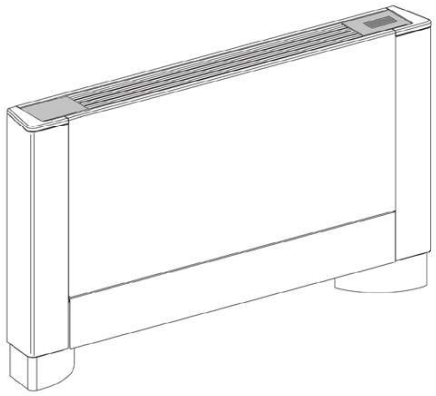
# JOLLY Plus 2

Ventilconvettori tangenziali con motore brushless

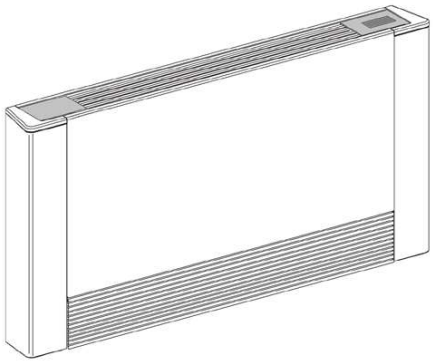
*Tangential fan coil units with brushless motos*

*Fan coils tangenciales con motores sin escobillas*

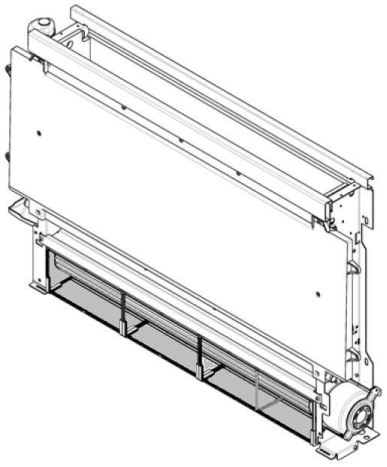
**VERSIONE VM-F**



**VERSIONE VM-G**



**VERSIONE VN**



CE

(I) **MANUALE INSTALLAZIONE**

(EN) **INSTALLATION MANUAL**

(ES) **MANUAL INSTALACIÓN**

# SUMMARY

# GENERAL INSTRUCTIONS

## General information

Read this use and maintenance manual carefully before installing and using the unit. Following the advice given will ensure efficient operation of the unit over time. In conformity with European directive 99/44/EEC, the manufacturer guarantees the machine for 24 months from the date of purchase (subject to any commercial warranty extensions) for manufacturing defects. Any other problem related to incorrect installation, extraordinary atmospheric events, non-conforming sizing and unauthorised tampering, is excluded.

## Conformity

The fan coil unit complies with the European Directives:
• Low voltage directive **2006/95/EC**
• Electromagnetic compatibility directive **2004/108/EC**.

## General instructions

After removing the packaging, check the integrity and completeness of the contents. In case of non-compliance, contact the Agency that sold the unit.

The units must be installed by a qualified firm that, at the end of the work, issues the person in charge of the system a declaration of conformity in compliance with the current regulations and the indications provided by the Agency in the instruction manual supplied with the unit.

These units are manufactured for air conditioning and/or heating of rooms and should be used for this purpose consistent with their performance characteristics.
The Agency has no contractual or non-contractual liability for any damage to persons, animals or property, caused by improper installation, adjustment and maintenance or improper use.

In case of water leakage, turn the system main switch off and close the water taps. Promptly call the After-Sales Service or professionally qualified personnel and do not intervene personally on the unit.

The units in the VN built-in version do not have grilles and covering cabinet. Provide for protection elements and air inlet/outlet grilles able to prevent accidental contact with the unit.

If the unit is not used for a long period carry out the following operations:
- Turn the system main switch off
- Close the water taps
- If there is risk of frost, make sure antifreeze has been added in system, otherwise drain the system.

Too low a temperature is harmful to health and is a pointless waste of energy.
Avoid prolonged direct contact with the air flow.
The room should not remain closed for a long time. Periodically open the windows to ensure proper air circulation.

This instruction manual is an integral part of the unit and therefore must be kept with care and must ALWAYS accompany the unit in the event of its sale to another owner or user or a transfer to another system. If it is damaged or lost, request another copy from the Local After-Sales Service.

Any repairs or maintenance must be carried out by the After-Sales Service or by qualified personnel in accordance with this manual. Do not modify or tamper with the unit as this may create a hazard and the manufacturer will not be liable for any damage caused.

# GENERAL INSTRUCTIONS

## Basic safety rules

Products that use electricity and water require the observance of some basic safety rules such as:

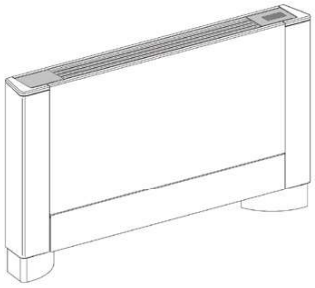
- The unit must not be used by unassisted incapable persons and children.
- Do not touch the unit when barefoot or with wet or damp parts of the body.
- Do not carry out any cleaning before disconnecting the unit from the mains by turning the system main switch off.
- Do not modify the safety or adjustment devices without authorisation and instructions from the manufacturer.
- Do not pull, detach or twist the electrical cables coming from the unit, even if it is disconnected from the mains.
- Do not put any objects and substances in the air inlet and outlet grilles.
- Do not open the doors accessing the inside of the unit without first turning the system main switch off.
- The packaging material is potentially hazardous and must not be dispersed or left within the reach of children.
- Do not climb on and/or place anything against the unit.
- The unit's external components can reach temperatures above 70°C.

**RISK OF BURNS IN CASE OF CONTACT.**

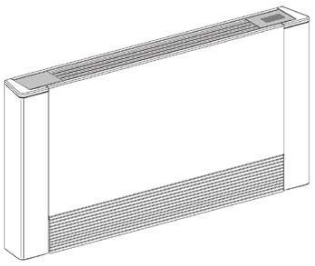
## Product range

The fan coil units of the range comprise 3 basic types, VM-F, VM-G and VN each of which is made in four sizes with different performance and dimensions.

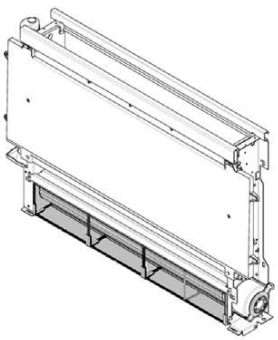
**VM-F**
Fan coil unit with casing (suitable for floor vertical installation or wall mounting).



**VM-G**
Fan coil unit with casing and fixed grille (suitable for floor vertical or horizontal installation or wall mounting).



**VN**
Built-in fan coil unit without panels (suitable for horizontal or vertical installation).



# DESCRIPTION OF UNIT

## Description of unit

**A - Supporting structure** in high-strength galvanised sheet.

**B - Heat exchange coil with cold water** in copper piping and aluminium fin pack, with high efficiency turbulence. Eurokonus 3/4 threaded fittings complying with the new EC standardisation requirements. The coil is equipped with a sensor holder for detecting the temperature of the water, to be utilised according to the type of control used.

**C - Fan group** comprising a tangential fan in synthetic material with offset blades (low noise) fitted on EPDM anti-vibration mountings, statically and dynamically balanced, keyed directly onto the motor shaft.

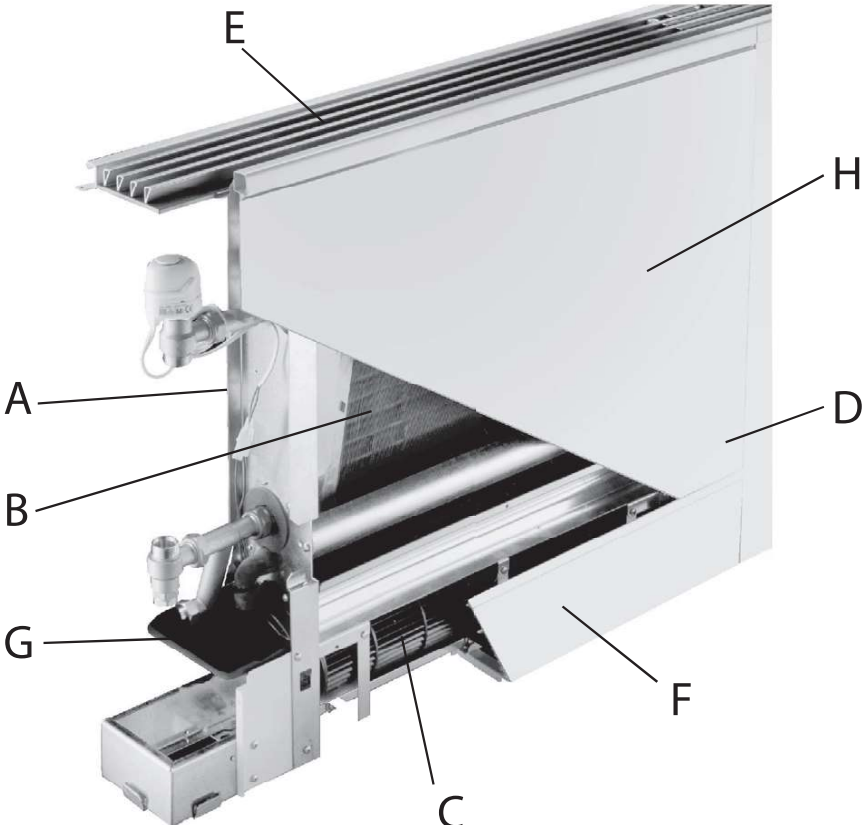
**D - Electric motor**, high efficiency brushless type with Hall cell for controlling the speed. It is fitted on rubber mountings to reduce the transmission of noise to the frame. The adjustment allows a continuous control of speed.

**E- Reversible outlet air grille** (series VM-F / VM-G) in aluminium, stove dried epoxy powder coated.

**F - Inlet air grille**
**Series VM-F**: in galvanised sheet, stove dried epoxy powder coated in the same RAL 9003 as the casing, it has two thermal actuators that open it in parallel with activation of the fan. Equipped with a quick-release device for filter cleaning and safety microswitch.
**Series VM-G:** in galvanised sheet, stove dried epoxy powder coated, with fixed vanes.

**G - Condensate tray** for vertical installation, in ABS, easily removed for cleaning operations.

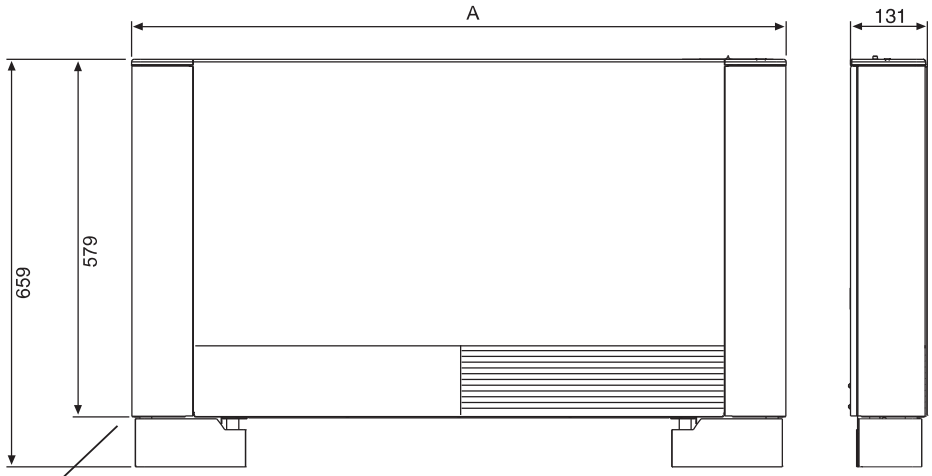
**H - Front casing** (series VM-F / VM-G) and removable side panels in galvanised sheet, stove dried epoxy powder coated RAL 9003.
**Structural back**, soundproofed, in high strength compressed yarn (FIMBORD GR900).



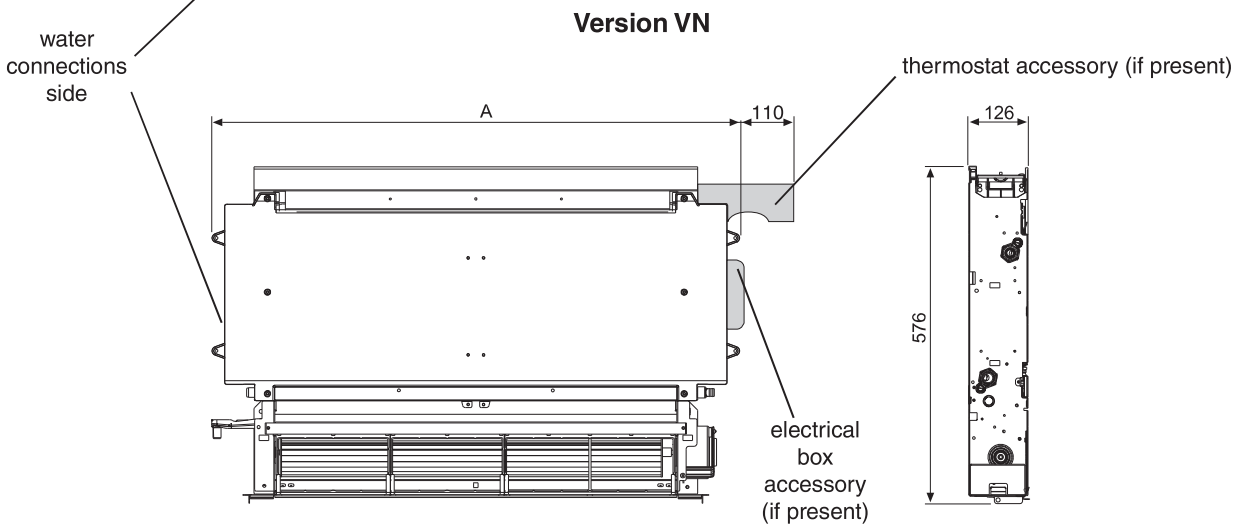
# TECHNICAL DATA

## Overall dimensions

**Version VM-F / VM-G**




**Version VN**




| A | 20 | 40 | 60 | 80 | U.M |
|---|---|---|---|---|---|
| VM-F / VM-G | 735 | 935 | 1135 | 1335 | mm |
| VN | 479 | 679 | 879 | 1079 | mm |

## Nominal technical characteristics

The table below gives the characteristic data of the units.

| Model | 20 | 40 | 60 | 80 | U.M |
|---|---|---|---|---|---|
| Coil water content | 0.47 | 0.8 | 1.13 | 1.46 | l |
| Maximum working pressure | 10 | | | | bar |
| Maximum water inlet temperature | 80 | | | | °C |
| Minimum water inlet temperature | 4 | | | | °C |
| Plumbing connections | Eurokonus ¾ | | | | “ |
| Power supply voltage | 230/1/50 | | | | V/ph/Hz |
| Maximum current absorption | 0.11 | 0.16 | 0.18 | 0.26 | A |
| Maximum power absorption | 12 | 18 | 20 | 26 | W |
| Weight VM-F | 17 | 20 | 23 | 26 | kg |
| Weight VN | 9 | 12 | 15 | 18 | kg |

# INSTALLATION

## Unit positioning

**Avoid installing the unit near**:
- places subject to exposure to direct sunlight;
- in the vicinity of heat sources;
- in damp places and areas with likely contact with water;
- in places with oil vapours
- in places subject to high frequencies.

**Make sure:**
- the wall where the unit is to be installed has an adequate structure and load bearing capacity;
- the part of the wall concerned is not crossed by pipes or power lines
- the wall concerned is perfectly flat;
- there is an area free from obstacles that could compromise the circulation of inlet and outlet air;
- the installation wall is possibly an outer wall to allow the condensate to be discharged outside;
- in case of ceiling installation, the air flow is not directly towards people.

## Installation procedure

The following descriptions of the various installation phases and the relevant drawings refer to a version of the unit with connections on the left. The descriptions for installation of units with connections on the right are the same. Only the images are to be considered as represented specularly.
For best installation results and optimum performance, carefully follow the instructions given in this manual.
Failure to apply the regulations indicated, which can cause malfunction of the unit, relieves the manufacturer from any form of guarantee and liability for damage to persons, animals or property.
The electrical system must be executed in compliance with the regulations, respecting the data given in the technical sheet, and must have good earthing.
The unit must be installed in a place facilitating routine maintenance (filter cleaning) and extraordinary maintenance, as well as access to air vent valves reachable from the upper grille, connections side.

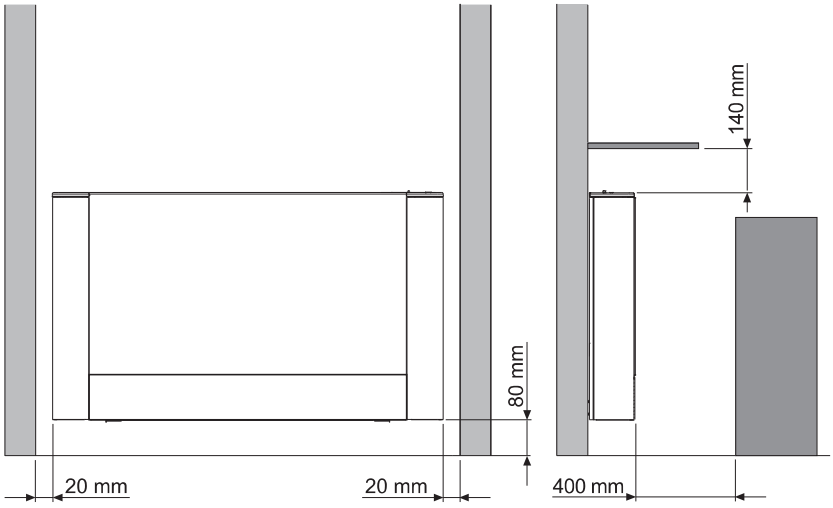
# INSTALLATION

## Minimum installation distances

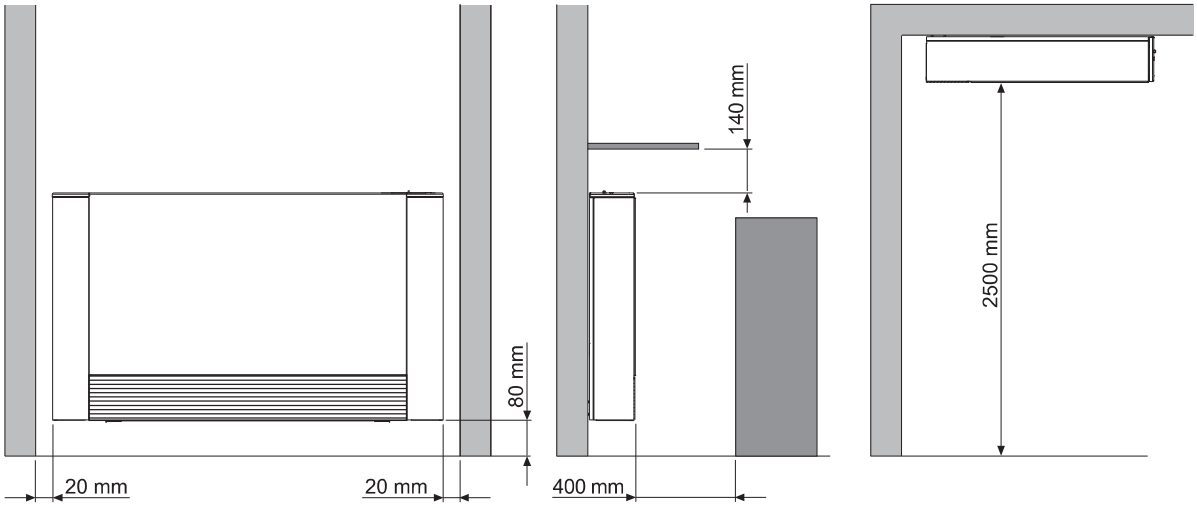
Fig.1 shows the minimum installation distances of the fan coil unit from walls and furniture in the room.

Fig.1

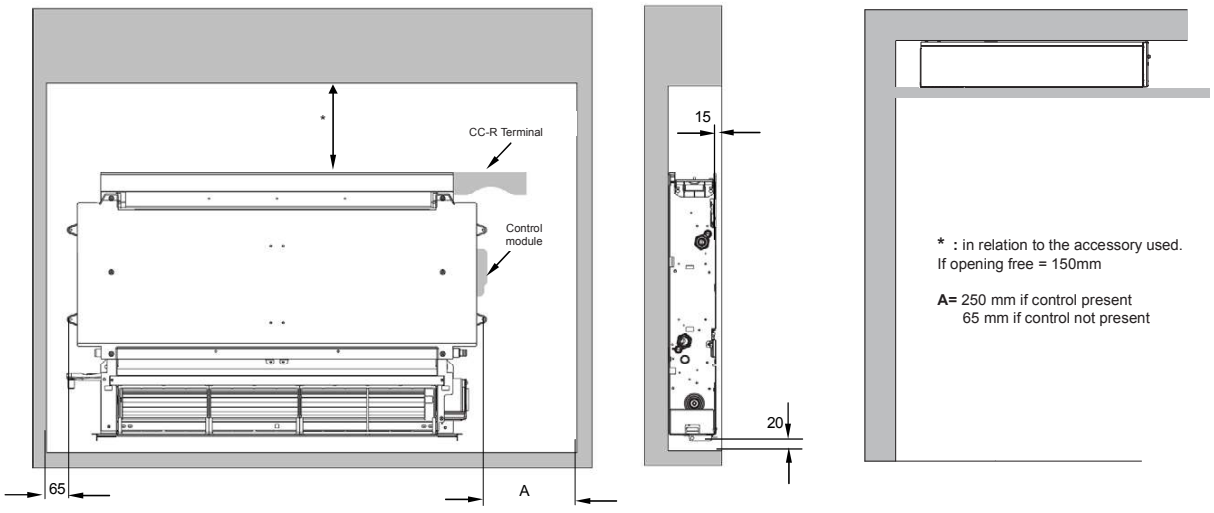
**Version VM-F**




**Version VM-G**



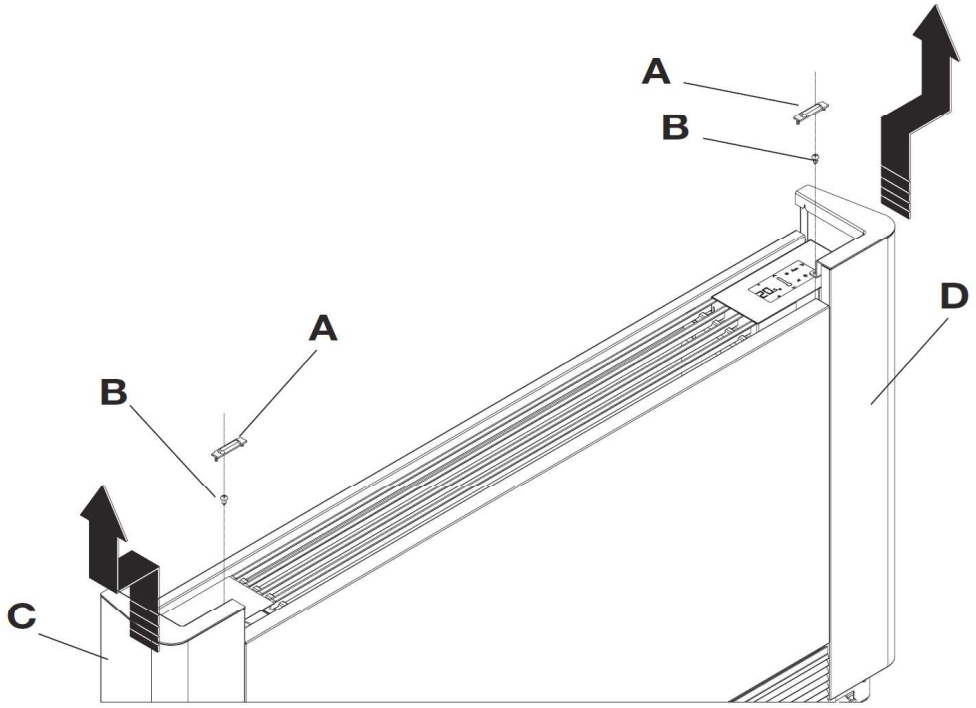

**Version VN**



## Side panel opening

On the left side lift the cap of screw A, undo screw B securing the left side panel C, move it slightly to the left and lift.
- On the opposite side lift the cap of screw A and undo it.
- Move the side panel D slightly to the right and lift

Fig.1



# INSTALLATION

## Floor vertical installation

In case of floor installation with plinths, for these refer to the individual instruction sheets provided and the relevant manual. Use the paper template, and mark on the wall the position of the two fixing brackets (Fig.1) Drill using a suitable bit and insert the plugs (2 per bracket) (Fig.2 ref. A); fix the two brackets (Fig.2 ref. B). Do not overtighten the screws, so as to be able to adjust the brackets with a spirit level (Fig.3). Secure the two brackets by tightening the four screws. Check the stability by manually moving the brackets to the right and left, up and down. Fit the unit, ensuring correct hooking on the brackets and its stability (Fig.4).

Fig. 1

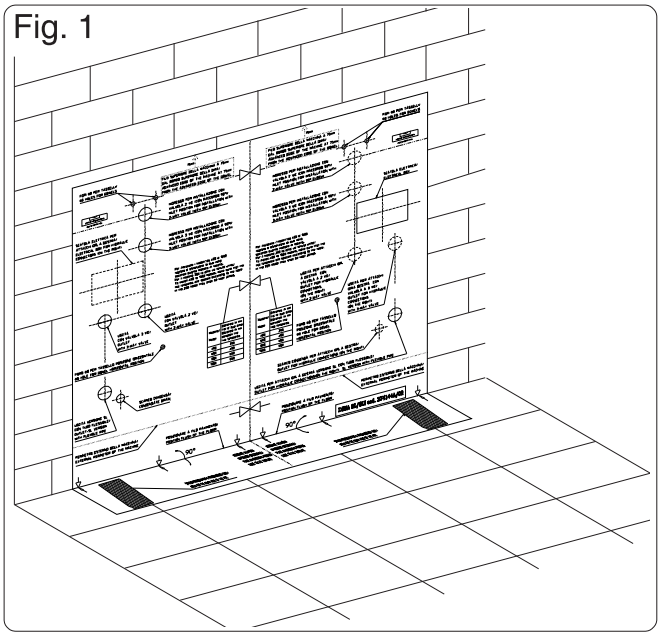


Fig. 2

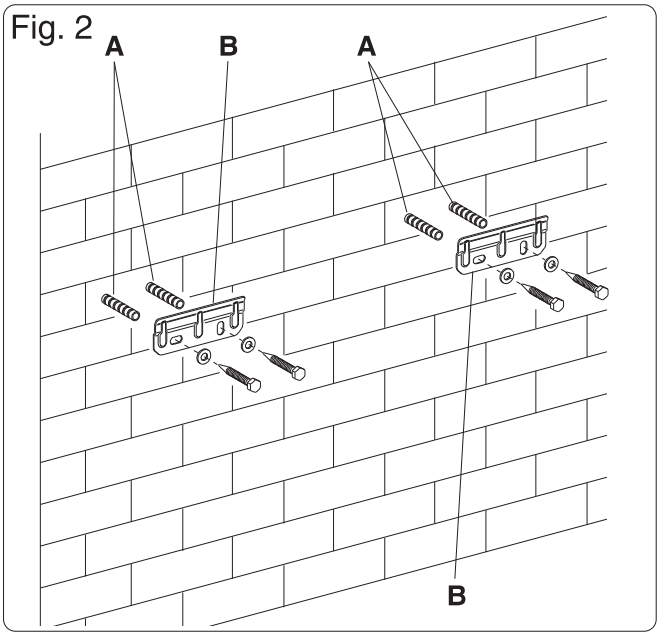



Fig. 3

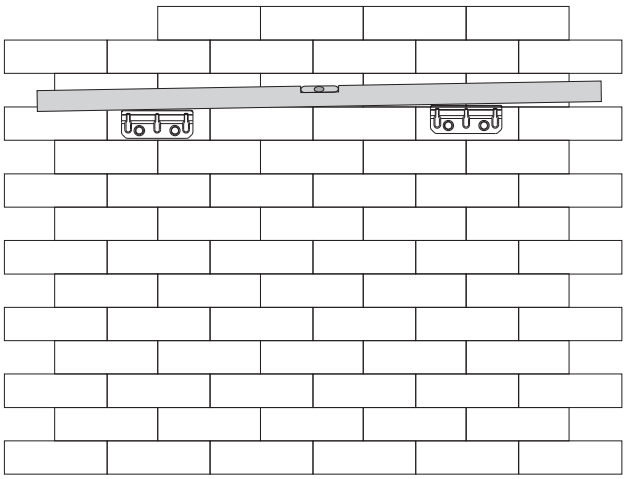
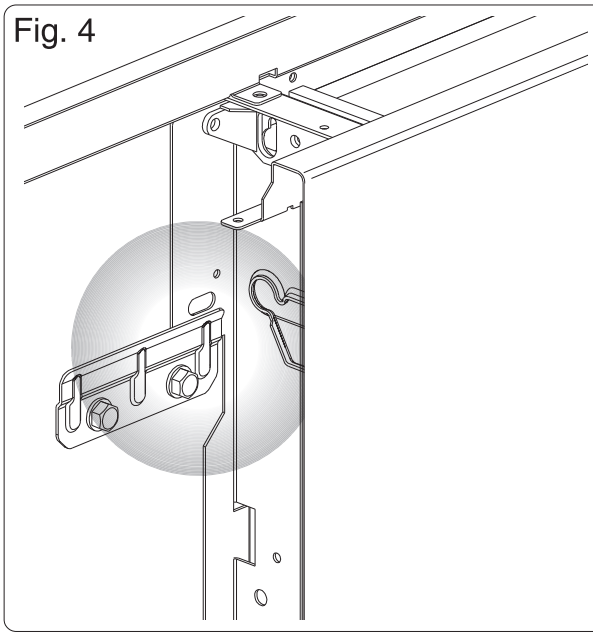


Fig. 4

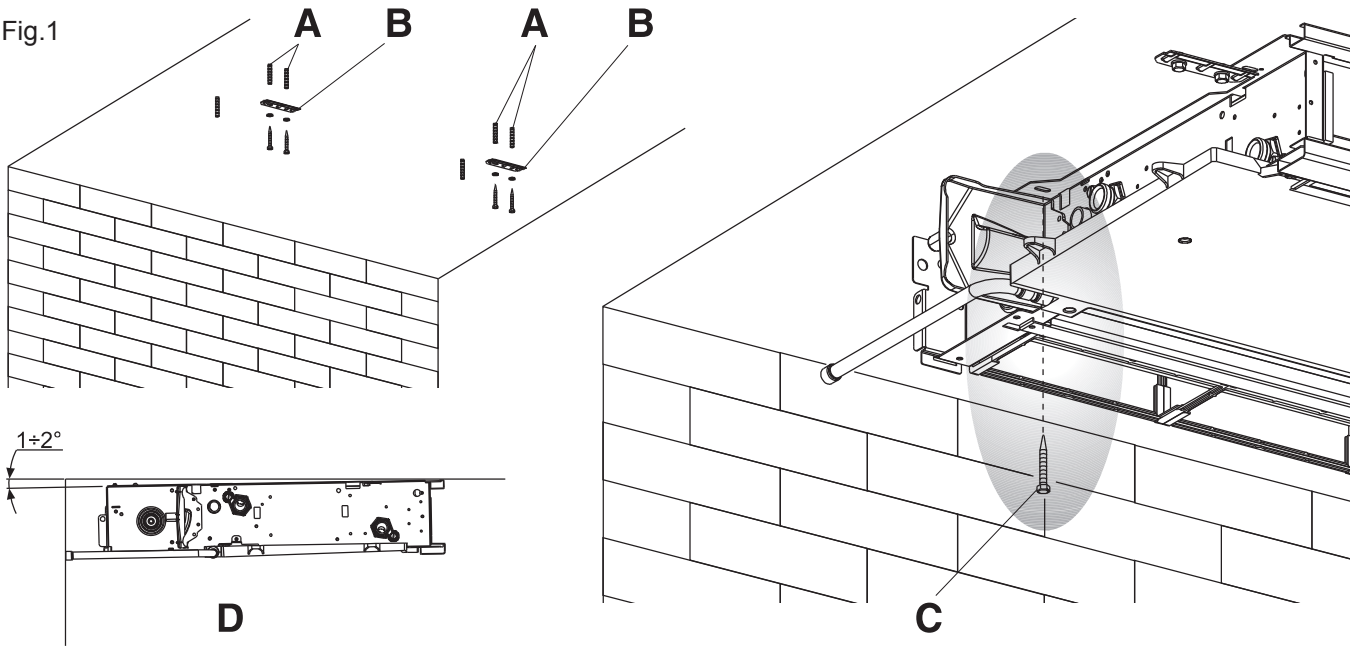


# INSTALLATION

## Ceiling horizontal installation

Use the paper template, and mark on the ceiling the position of the two fixing brackets and the two rear screws. Drill using a suitable bit and insert the plugs (2 per bracket) (Fig.1 ref. A); fix the two brackets(Fig.1 ref. B). Do not overtighten the screws. Fit the unit on the two brackets, keeping it in place and then tighten the two screws in the rear plugs (Fig.1 ref. C), one on each side. Tilt the unit sufficiently towards the drainage pipe to facilitate the flow of water (Fig.1 ref. D).
Tighten all 6 screws.

Fig.1

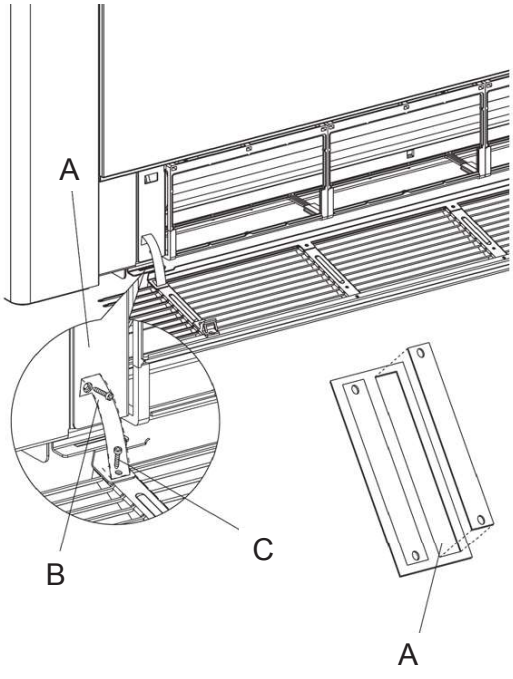



## Front grille safety support assembly

If the fan coil unit is installed in a horizontal position, to ensure the safety of filter change/cleaning operations, the installer MUST fit the two safety clamps included in the bag supplied together with the instruction manual and the accessories.

- Separate the two clamps (Fig.2-A);
- open the front grille and completely undo the spring fixing screws (Fig.2-B,C);
- fix the two clamps, retightening the screws;
- fix the other part of the clamps to the grille with the screws supplied;
- close the grill

Fig.2



# PLUMBING CONNECTIONS

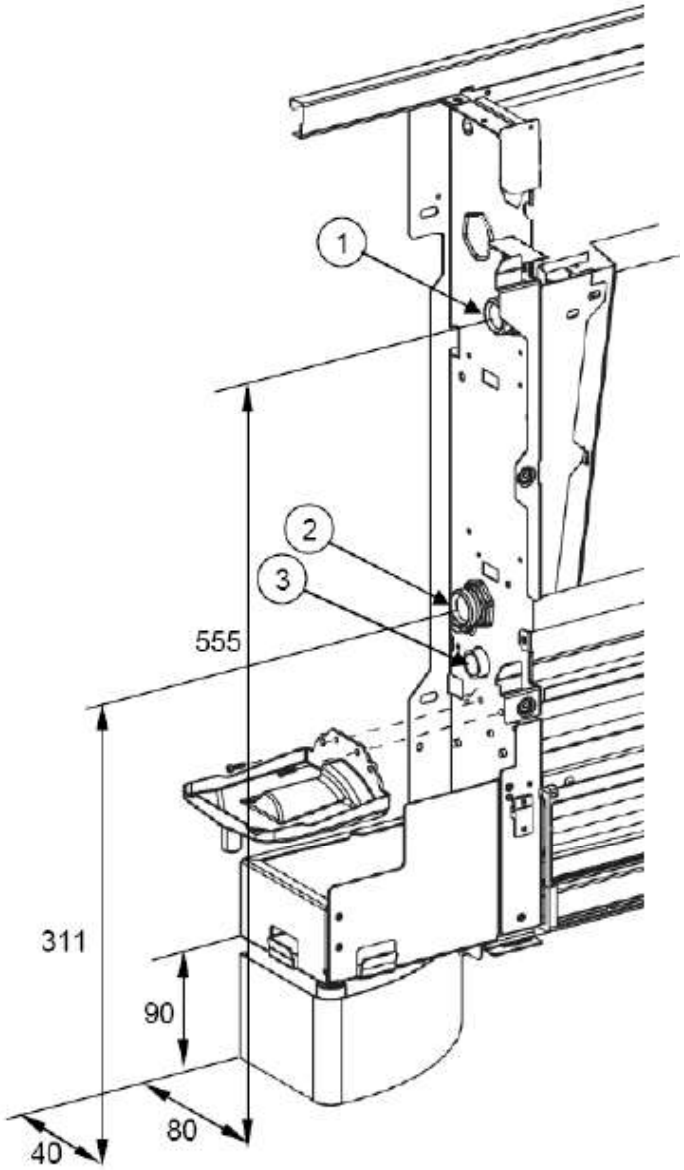
## Pipe diameters

The minimum inside diameter to respect for the pipes of the plumbing connections varies depending on the model:

| Model | 20 | 40 | 60 | 80 | U.M |
|---|---|---|---|---|---|
| Minimum diameter | 12 | 14 | 16 | 18 | mm |

**For the position of the pipes for the wall connections refer to the drawings given in the following sections, according to the specific configuration.**

**For units without valves**



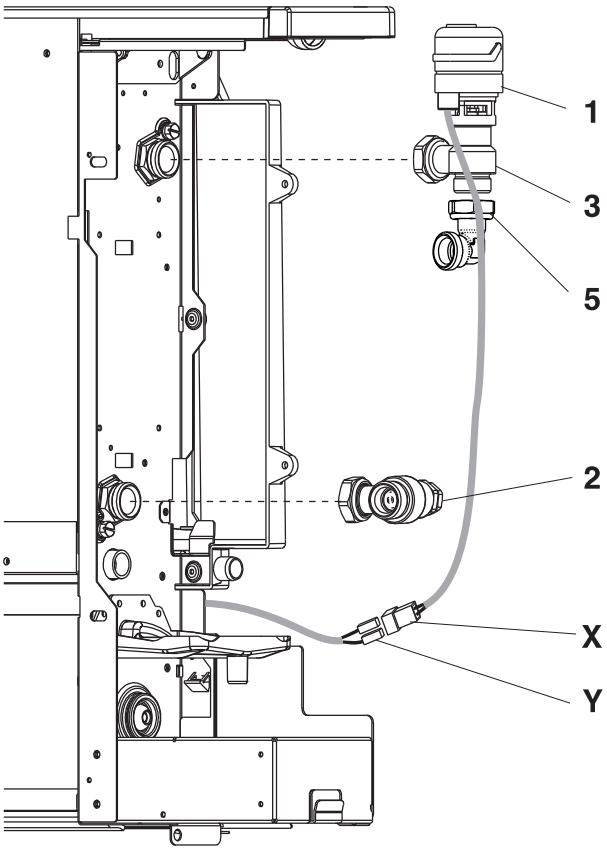

**1)** Water inlet 3/4” Eurokonus

**2)** Water outlet 3/4” Eurokonus

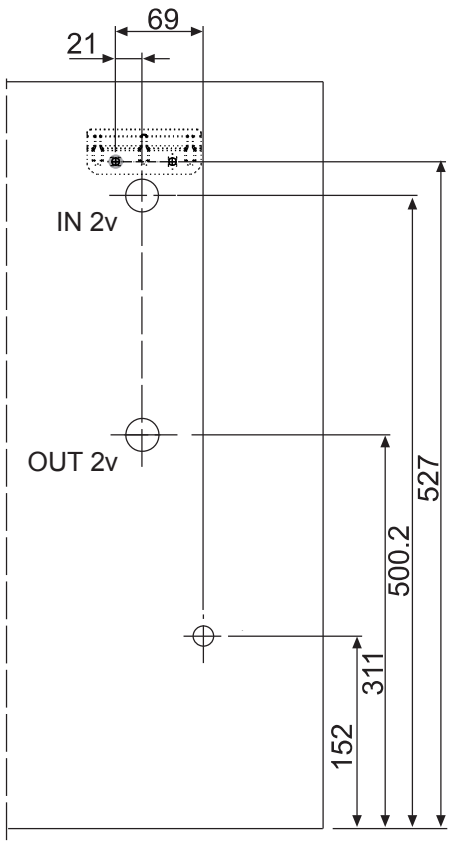
**3)** Condensate drain outlet Ø 14mm

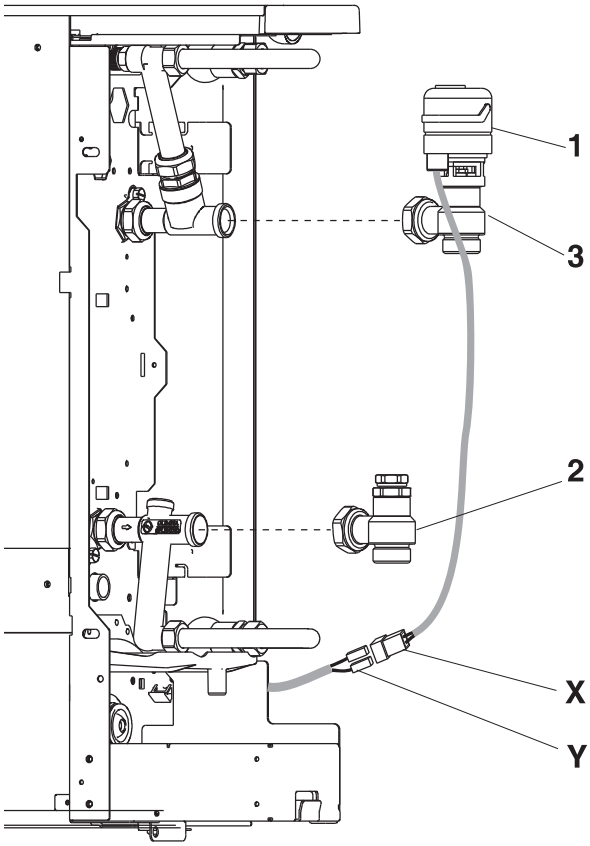
# PLUMBING CONNECTIONS

**For units with 2-way valve kit**



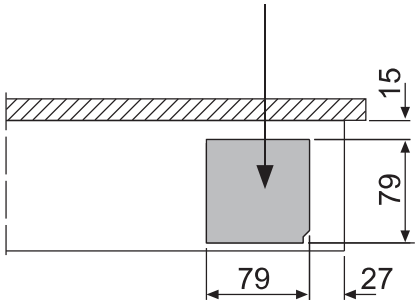

**Wall connections outlet**



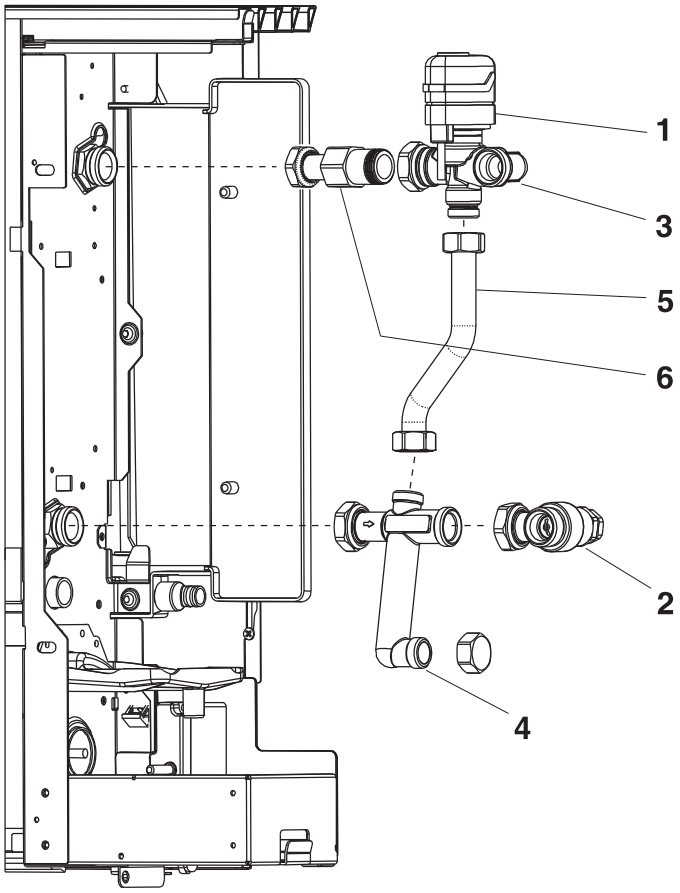

**Floor connections outlet**

**Available space in plinth**

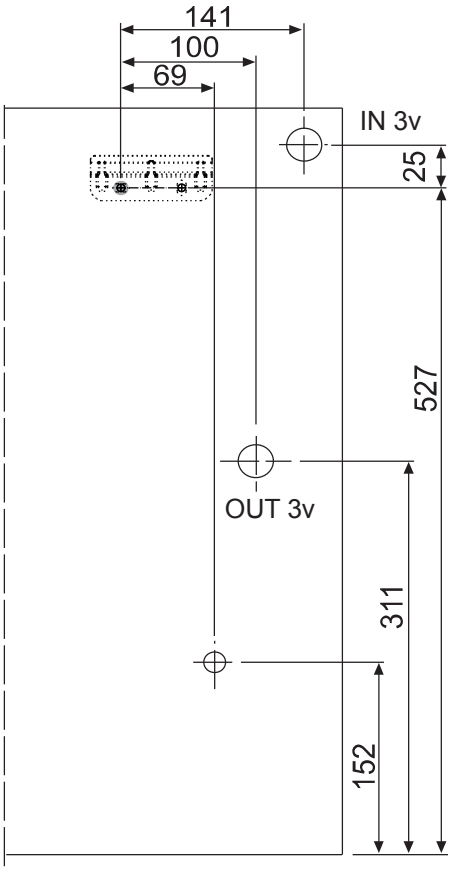


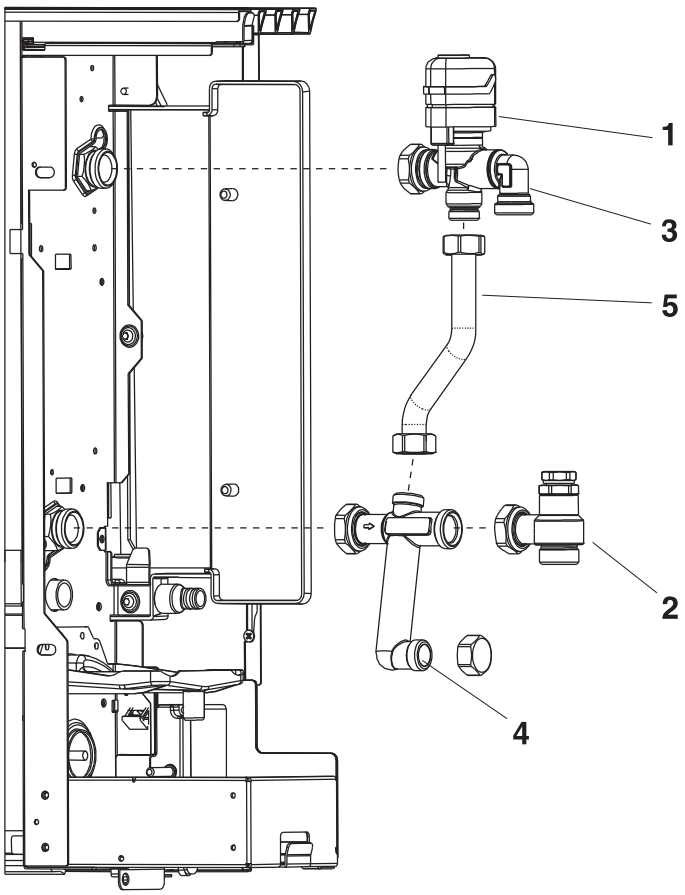
# PLUMBING CONNECTIONS

**For units with 3-way valve kit**



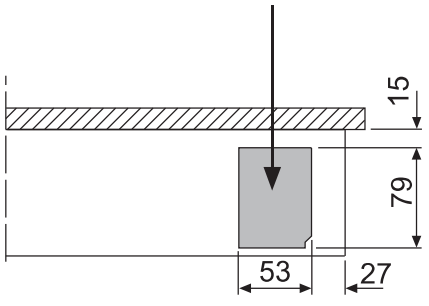

**Wall connections outlet**




**Floor connections outlet**

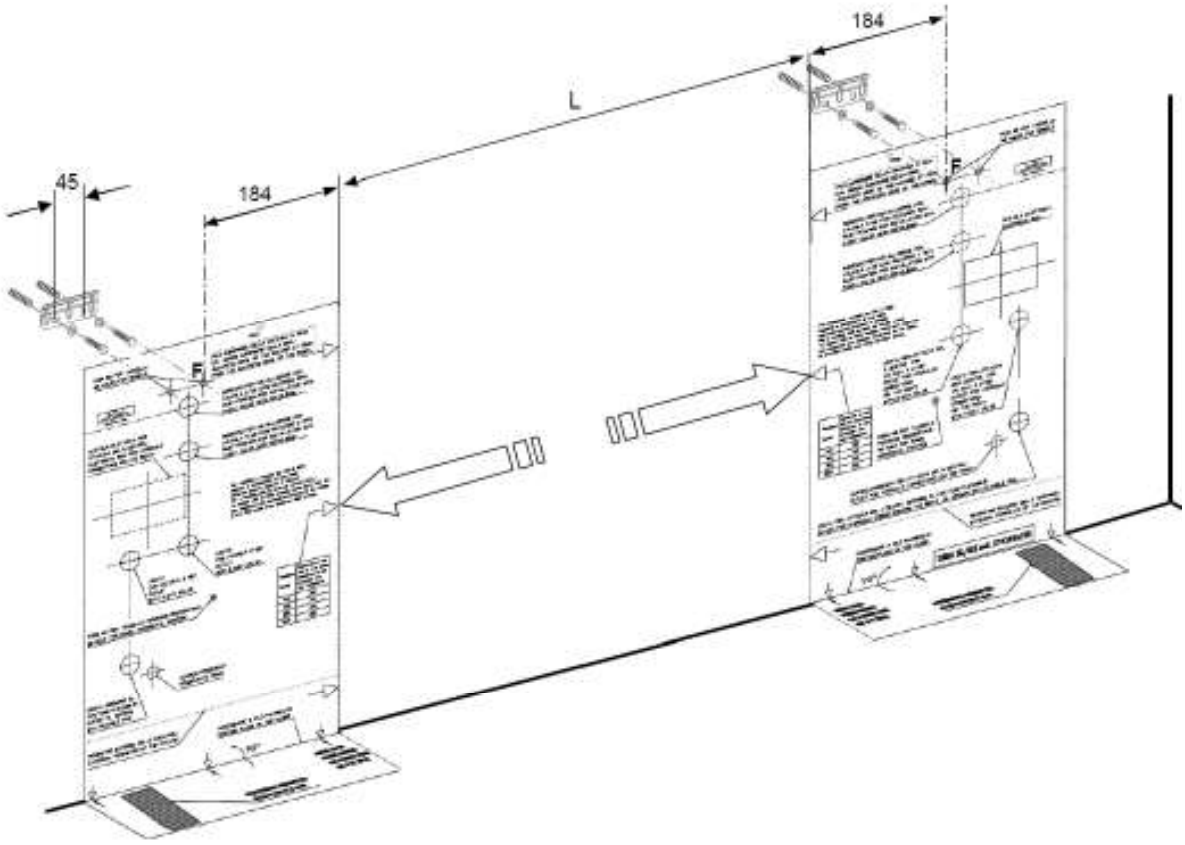
**Available space in plinth**



# PLUMBING CONNECTIONS

**Template dimensions**

In relation to the model selected, cut the template and position the two parts at a distance “L” as indicated in the table and figure.




| Model | 20 | 40 | 60 | 80 | U.M |
|---|---|---|---|---|---|
| L | 0 | 200 | 400 | 600 | mm |

# PLUMBING CONNECTIONS

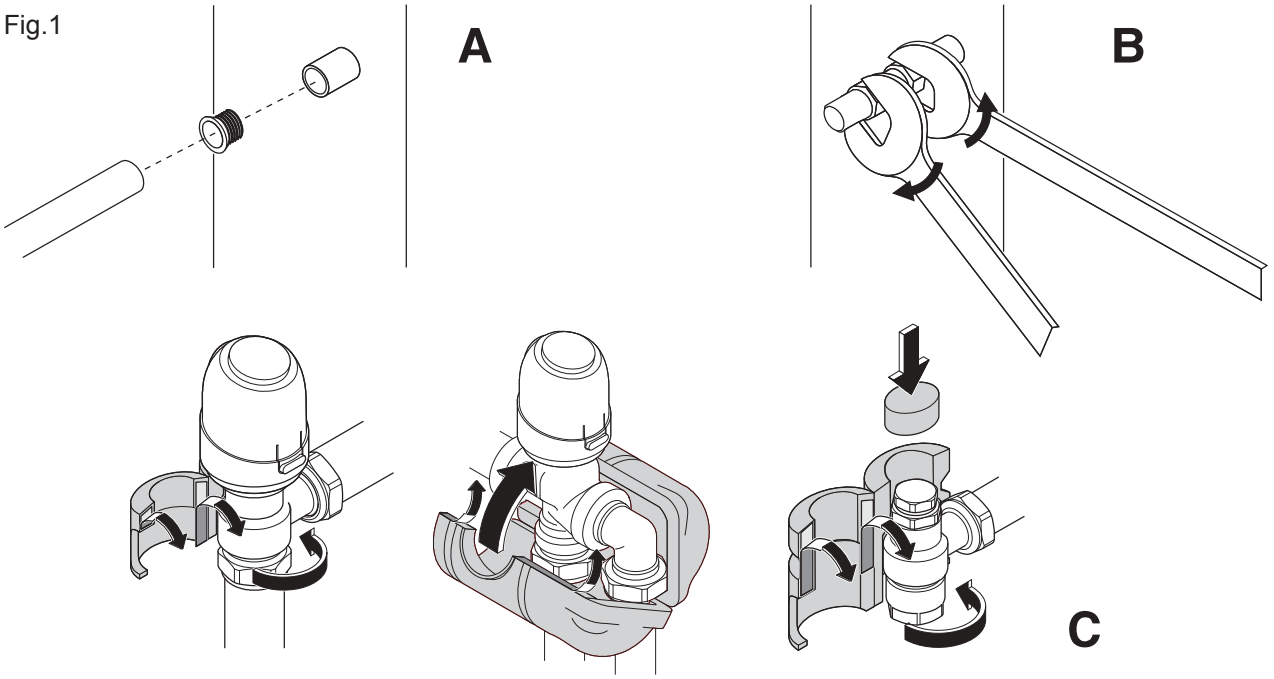
## Connections

The choice and size of the hydraulic lines is left to the designer, who must operate according to the rules of good workmanship and the current regulations.

To carry out the connections:
- position the hydraulic lines
- tighten the connections using the “wrench against wrench” method (Fig.1 ref. B)
- check for any leakage of liquid
- cover the connections with insulating material (Fig.1 ref. C).

The hydraulic lines and joins must be thermally insulated. Avoid partial insulation of pipes.
Overtightening can damage the insulation.
For the water seal of threaded connections use hemp and green paste; the use of Teflon tape is recommended in the presence of antifreeze in the hydraulic circuit.

Fig.1




The units and any plumbing accessories are provided with a Eurokonos 3/4” connection. If connections with flat seals are to be used, 2 conversion unions are supplied with the unit (fig.2).

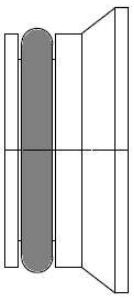


Fig.2

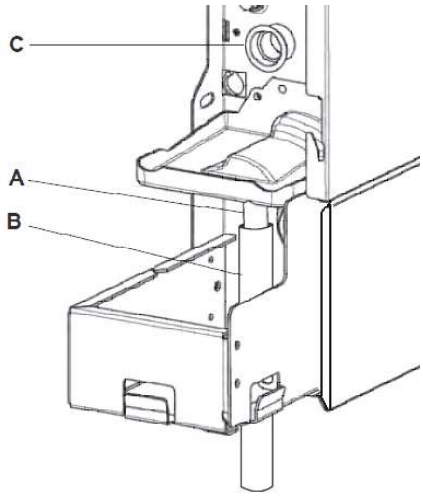
# INSTALLATION

## Condensate drain

The condensate drain system must be appropriately sized (pipe internal diameter min. 16 mm) and the pipe positioned so as to always maintain a certain slope of never less than 1%.
With vertical installation the discharge pipe is connected directly to the drain tray, placed at the bottom on the side shoulder, under the plumbing connections.
With horizontal installation the discharge pipe is connected to the one already present on the unit.
- If possible, run the condensate directly into a gutter or into a “white water” drain.
- When discharging into the drainage system, it is advisable to create a trap to prevent bad odours rising up into the room. The curve of the trap must be lower than the condensate tray.
- When discharging the condensate into a container, it must remain open to the atmosphere and the pipe must not be immersed in water, avoiding adhesion and back pressure which would hinder the free flow.
- A pump must be fitted if a height difference, which would hinder the flow of condensate, has to be overcome:
- for vertical installation fit the pump under the side drainage tray;
- for the horizontal installation position of the pump must be decided according to the specific needs.
In any case, refer to the specific instructions included in the condensate elimination pump kit.

**After installation, it is advisable to check the proper flow of condensate by pouring very slowly (about 1/2 litre of water in about 5-10 minutes) in the collection tray.**

Fig.1

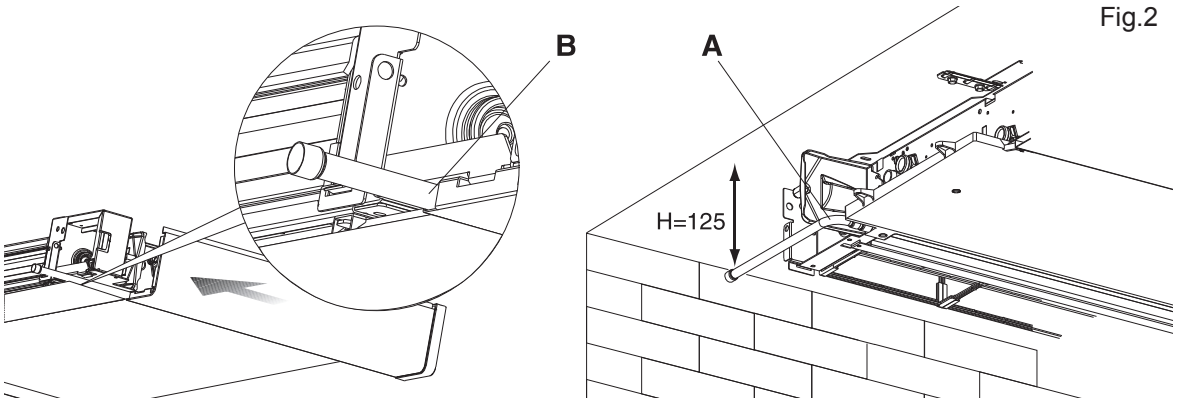



**Fitting the condensate drain device in vertical version**
Connect to the condensate tray drain union (Fig.1 ref. A) a tube for outflow of the liquid (Fig.1 ref. B), adequately securing it. Check that the drip guard extension (Fig.1 ref. C) is present and correctly installed.

**Fitting the condensate drain device in horizontal version**
- make sure the “L” pipe and the rubber hose are properly connected to the tray (Fig. 2 ref. A).
- insert the side of the unit holding the pipe to the front grille.
- permanently close the side, making sure the pipe is secured in the recess on the side (Fig.2 ref. B).

**N.B. For horizontal installation, observe the following instructions:**
**- make sure the unit is installed perfectly level, or slightly inclined towards the condensate discharge;**
**- properly insulate the flow and return pipes up to the mouth of the unit, so as to prevent dripping of condensate outside of the tray;**
**- insulate the entire length of the condensate tray drain pipe.**

Fig.2



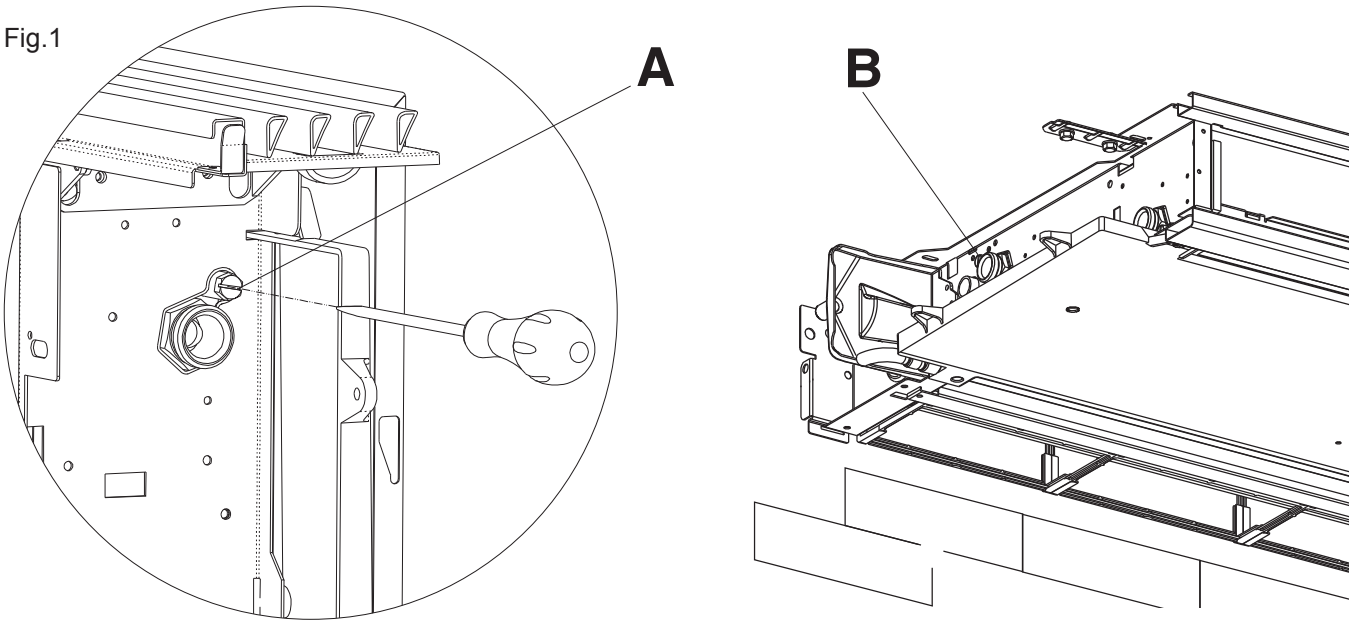
## System filling

During system start-up make sure the holder of the hydraulic unit is open. In case of a power failure and the thermal valve has already been previously fed, the special cap must be used to press the valve shutter to open it.

## Evacuation of air during system filling

- Open all system shutoff devices (manual or automatic);
- Start filling by slowly opening the system water filling tap;
- For models installed in a vertical position, operate (using a screwdriver) on the highest coil vent (Fig.1 ref. A); for units installed in a horizontal position, operate on the highest vent (Fig.1 ref. B).
- When water starts coming out of the unit's vent valves, close them and continue filling up to the nominal value foreseen for the system. Check the tightness of the seals. It is advisable to repeat this operation after the unit has been operating for a few hours and to periodically check the system pressure.

Fig.1



## Movable suction panel servomotor connection - version VM-F

In this version, the servomechanisms for moving the grille are pre-wired. Using a special connector they can be connected to the 230V / 50Hz power supply present on the electronic kits available as optional. If an electromechanical thermostat or a non-original control is used, connect the two terminals directly to the 230V / 50Hz power supply intended for the solenoid valve.

**1 -** to the control solenoid valve connector

**2 -** to the head of the solenoid valve

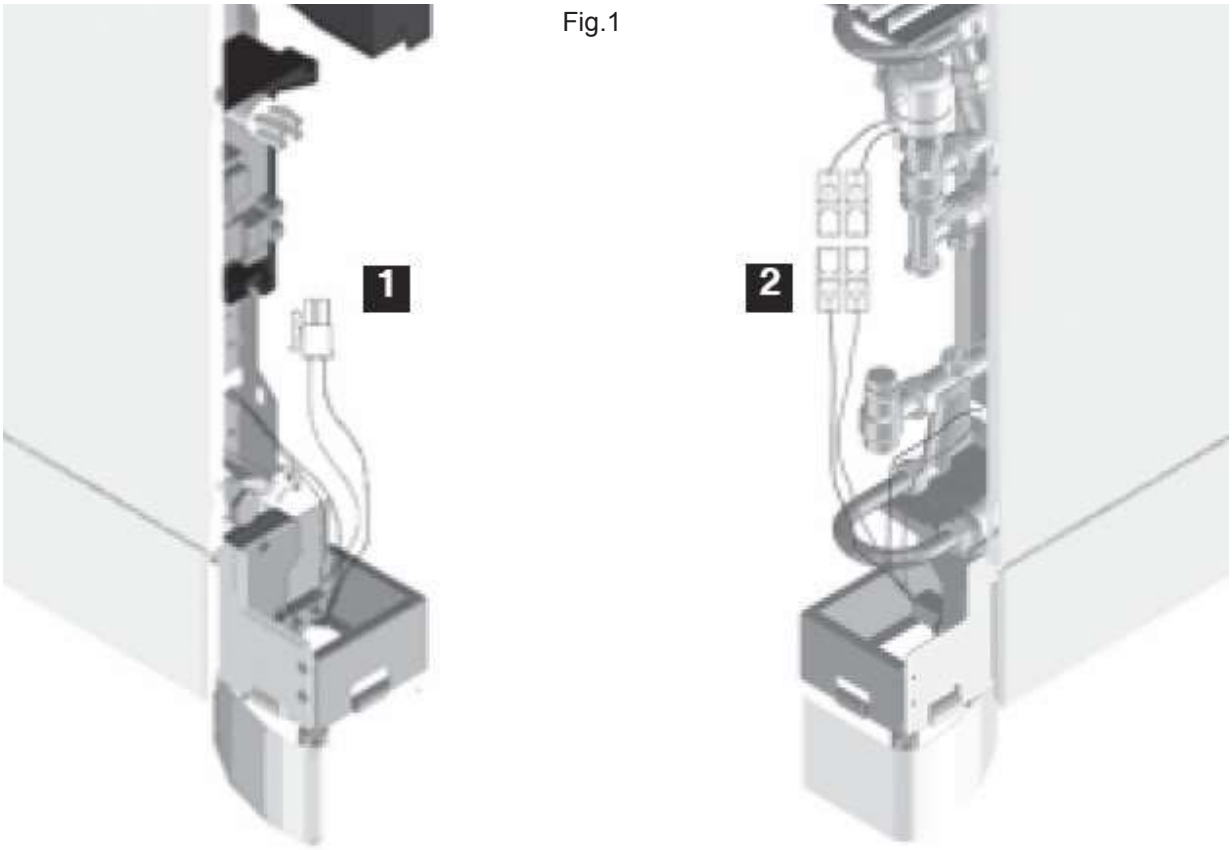



Fig.1

# INSTALLATION

## Electrical connections

Carry out the electrical connections as given in the general instructions section and referring to the wiring diagrams on the unit or in the specific instructions of the electrical accessories.

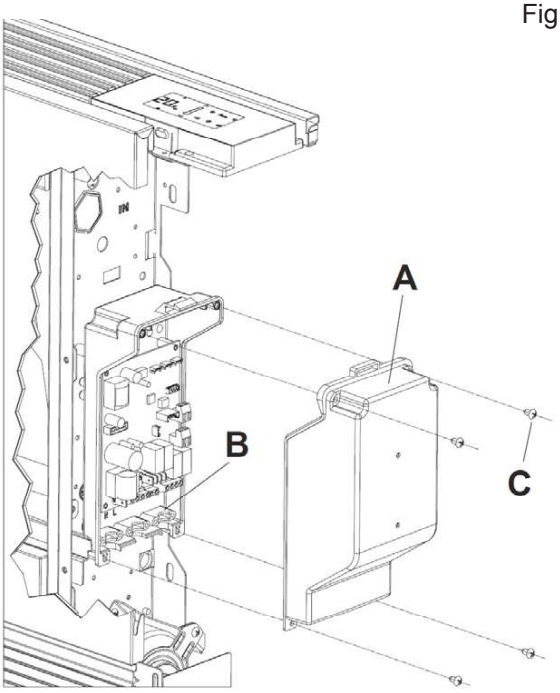
**ATTENTION:** Before carrying out any work, make sure the power supply is disconnected.
For the electrical connections, refer to the section “wiring diagrams”. The unit must be connected to the power supply by means of an omnipolar switch with contact opening gap of at least 3mm.
Make sure the system is equipped with safety valves against the risk of excessive pressures. To protect the unit against short circuits, install a fuse F 2A 250V on the power line.

All the units are supplied with an electrical box for arranging the connection to the mains, which differs according to the control model required.

The instructions below are general. Depending on the selected control model, refer to the various diagrams or the specific instructions given on controllers.

For the electrical connection, proceed as follows:
-disconnect the power supply and make sure that under no circumstances can it be
restored.
- remove the side according to the procedure described in the section “side opening”;
- open the box (Fig.1 ref. A); - carry out the electrical connections, arrange the wiring, fix the cables using the 3 clamps supplied (Fig.1 ref. B);
- close the box, fixing the 4 screws (Fig.1 ref. C);
- refit the side panel of the fan coil unit.
- restore the power

Fig.1



# WIRING DIAGRAMS

**For all units with remote interface**

Before closing the electrical box remember to carry out the connection to the remote interface according to the specific instructions supplied.

**Control TC PLUS**

| | |
|---|---|
| H2* | water temperature probe 10 kΩ |
| AIR | air temperature probe 10 kΩ |
| M1 | fan motor DC inverter |
| S1 | grill safety micro-switch |
| Y1 | water solenoid valve (230V/50Hz 1A powered output) |
| L-N | 230V/50Hz electrical power supply connection |

| | |
|---|---|
| BO | boiler go-ahead output (free contact max 1A) |
| CH | chiller go-ahead output (free contact max 1A) |
| CP | presence sensor input (if closed, the fan coil goes into stand-by.) |
| * | If after powering the equipment the board detects the probe, the start-up will take place under normal conditions with minimum water temperature in heating (30 °C) and maximum water temperature in cooling (20 °C) functions.<br>The board can also operate without probe, case in which the minimum and maximum thresholds will be ignored. |

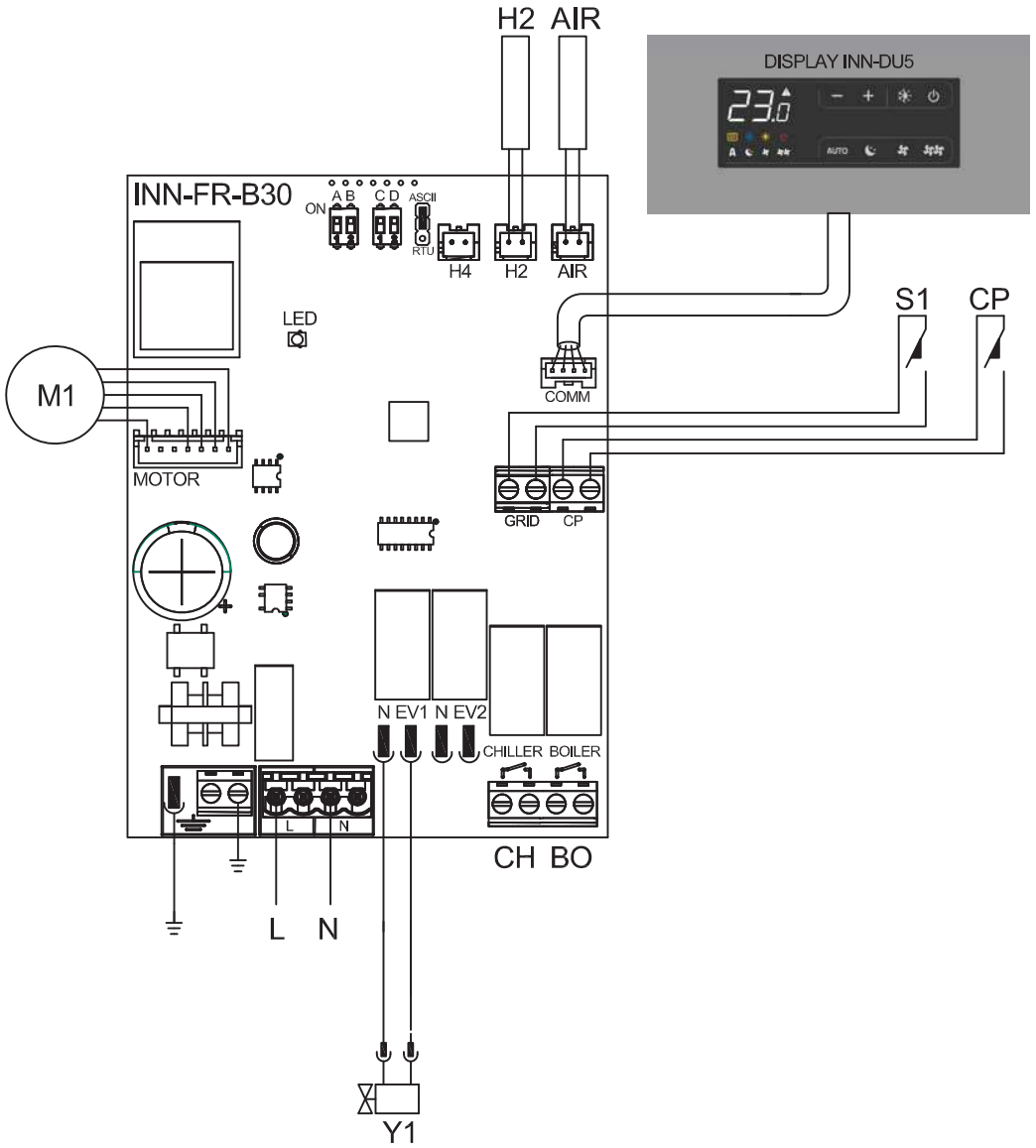


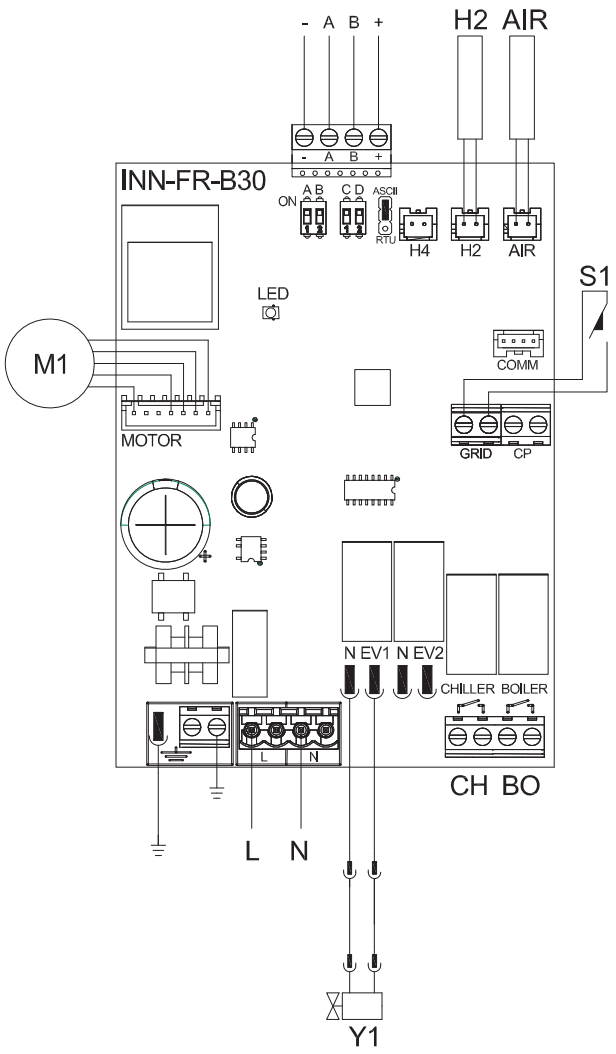

Fig.1

# WIRING DIAGRAMS

## Control CC-R plus + Continuous thermostat terminal TC-R plus

| | |
|---|---|
| -AB+ | serial connection for wall-mounted remote control (respect the AB polarisation) |
| H2** | hot water temperature probe 10 kΩ |
| M1 | fan motor DC inverter |
| S1 | grill safety micro-switch |
| Y1 | hot water solenoid valve (230V/50Hz 1A powered output) |
| L-N | 230V/50Hz electrical power supply connection |
| BO | boiler go-ahead output (free contact max 1A) |
| CH | chiller go-ahead output (free contact max 1A) |
| * | Connect as an alternative to the air probe of the wall-mounted control panel |
| ** | If after powering the equipment the board detects the probe, the start-up will take place under normal conditions with minimum water temperature in heating (30 °C) and maximum water temperature in cooling (20 °C) functions.<br>The board can also operate without a water probe, case in which the fan stop thresholds will be ignored |

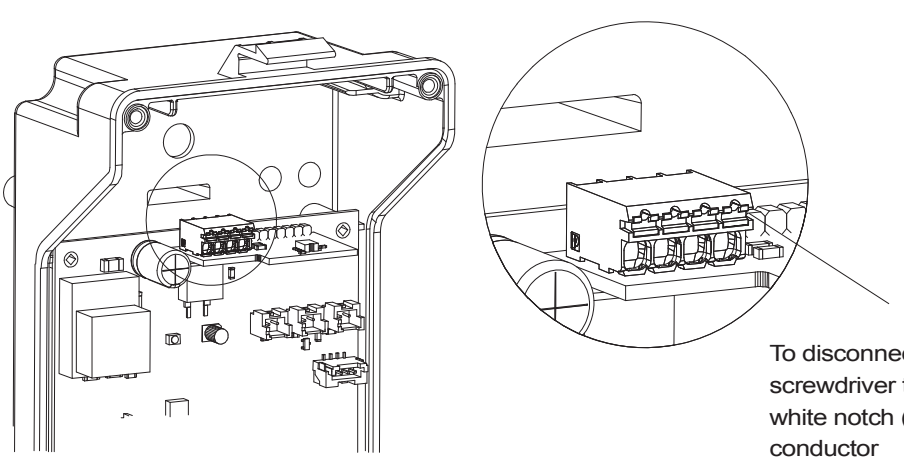
Fig.1




The 4 spring terminals (ref. A) intended for the connection of the wall-mounted TC-R Plus control panel are compatible with 0.2 to 1.5 mm² section (0.75 mm² if connecting 2 conductors to the same terminal) rigid or flexible cables, while if they are provided with lugs with plastic collar, their maximum section should be of 0.75 mm².

Strip the cable by 8 mm and then if the cable is rigid you should be able to insert it easily while if it is flexible you will need to use some nose pliers.

Insert the cables completely and make sure they are properly fixed by pulling them slightly.



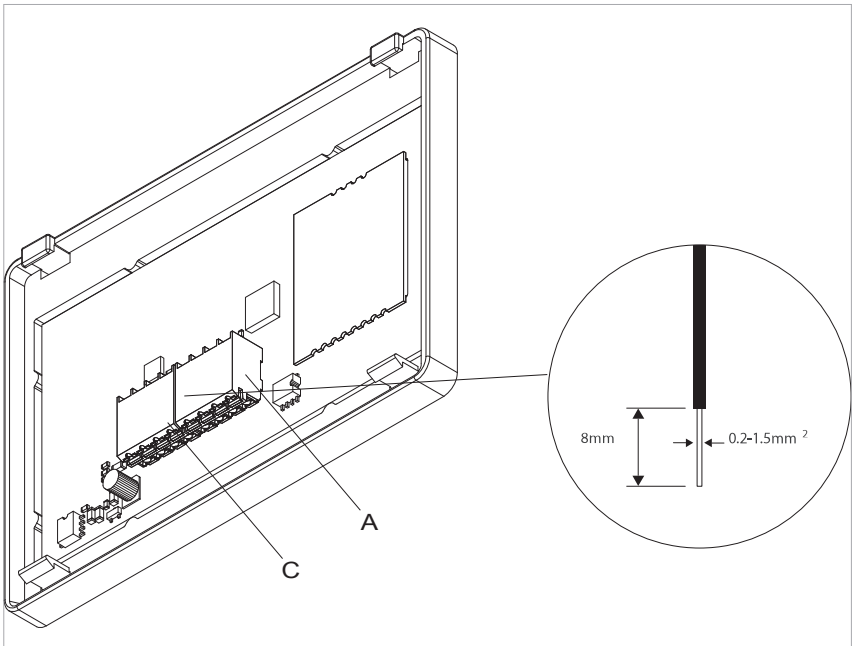

To disconnect the cables use a screwdriver to press the corresponding white notch (ref.A) and remove the conductor

# WIRING DIAGRAMS

## Control configuration

### Spring clamps -AB+ and CP connection

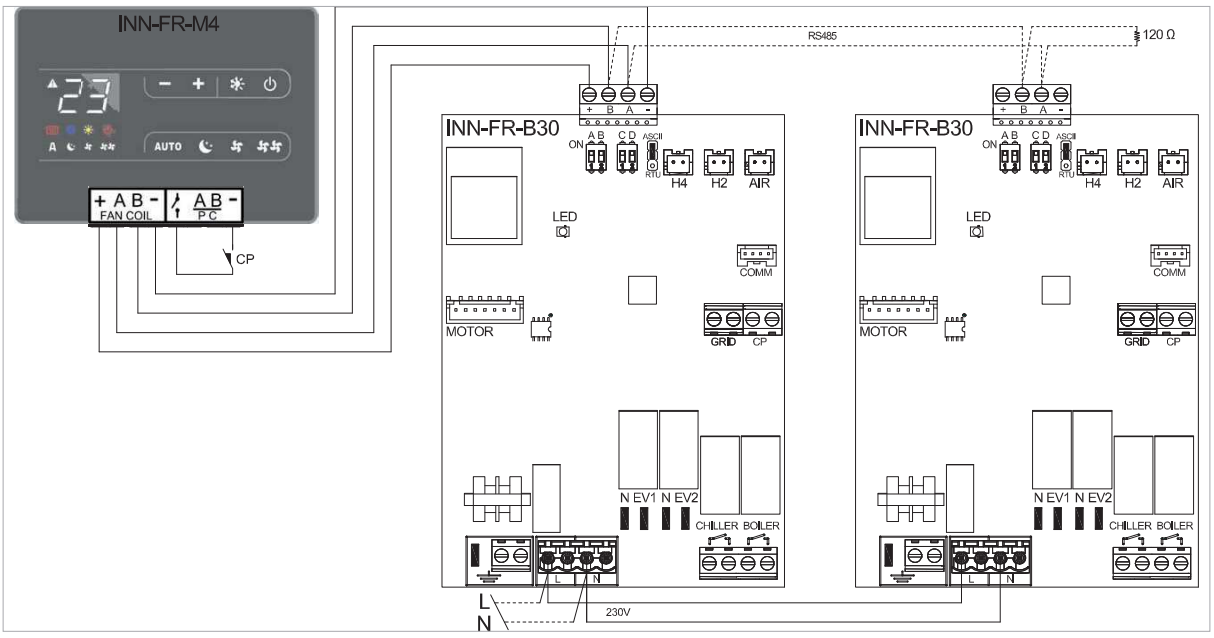
The spring terminals intended for the electrical connections are compatible with 0.2 to 1.5 mm² section rigid or flexible cables, while if they are provided with lugs with plastic collar, their maximum section is reduced to 0.75 mm².
For correct and secure connection follow the operations below:
- strip the cable by 8 mm as shown below;
- if the cable is rigid you should be able to insert its end easily, while if it is flexible you should use a pair of nose grippers;
- insert the cables completely and make sure they are properly fixed by pulling them slightly;
- to disconnect the cables use a screwdriver to press the corresponding white notch (ref.C) and remove the conductor.




## Group configuration for control CC-R PLUS

Connect the RS485 line of the wall-mounted remote control to one or more (up to a maximum of 30) units equipped with electronic remote control CC-R Plus through a bipolar cable suitable for RS485 serial connection, keeping it separate from power supply cables.
- Chase out the wall in order to minimise the length of the leads;
- complete the line with the 120 Ω resistance supplied;
- do not make "star" connections;
- the connection with cable RS485 is polarised, observe the indications “A” and “B” on each peripheral device connected (for the connection it is preferable to use a bipolar shielded cable with a minimum section of 0.35 mm²); connect the + and - power supply terminals of the wall-mounted terminal, 5 V DC voltage, on one of the TC-R Plus boards, respecting the polarities.

Fig.1



# FAULTS

## Troubleshooting

The operations must be carried out by a qualified installer or by a specialised service centre.

| Effect | Cause | Cure |
|---|---|---|
| The ventilation is activated later than the new temperature or function settings. | The circuit valve takes time to open and therefore to circulate the hot or cold water in the unit. | Wait 2 or 3 minutes for the circuit valve to open. |
| The fan speed increases or or decreases automatically. | - The electronic control works in a way to adjust the best comfort level | - Wait for temperature adjustment or, in case of need, select the silent function. |
| The unit does not activate the ventilation. | - No hot or cold water in the system. | - Make sure the boiler or the water chiller are operating. |
| The ventilation is not activated even if there is hot or cold water in the hydraulic circuit. | - The hydraulic valve remains closed<br>- The ventilation motor is blocked or burnt out.<br>- The microswitch that stops the fan on opening of the filter grille does not close properly.<br>- The electrical connections are not correct. | - Remove the valve body and check if the circulation of water is restored.<br>- Check the operation of the valve, powering it separately at 220 V. If it activates, the problem may be in the electronic control.<br>- Check the motor windings and the free rotation of the fan.<br>- Check that closing of the grille causes activation of the microswitch contact.<br>- Check the electrical connections. |
| The unit leaks water in heating mode. | - Leakage in the system plumbing connection.<br>- Leakage in the valve group. | - Check the leakage and tighten the connections.<br>- Check the seals. |
| Dew on the front panel. | - The thermostatic valve incorporated in the connection assembly between the plate and coil does not close the flow towards the wall.<br>- Thermal insulation detached. | - Replace the union that integrates the thermostatic valve in the water inlet upper group.<br>- Check the correct positioning of the thermal-acoustic insulation with particular attention to that of the front over the finned finned coil. |
| Water droplets on the air outlet grille. | - In situations of high ambient relative humidity (> 60%) condensation may occur, especially at the minimum fan speeds. | - As soon as the relative humidity tends to fall the condensation phenomenon disappears. In any case, a few drops of water falling inside the unit does not indicate a fault. |
| The unit only leaks water in cooling mode. | - The condensate tray is clogged.<br>- The condensate drain does not have the required slope for proper drainage.<br>- The connection pipes and the valve group are not properly insulated. | - Pour a bottle of water slowly in the lower part of the coil to check drainage; if necessary, clean the tray and/or improve the slope of the drainage pipe.<br>- Check the insulation of pipes. |
| The unit is too noisy | - The fan touches the structure.<br>- The fan is unbalanced. | - Check any interference by turning the fan manually.<br>- The lack of balance causes excessive vibration of the unit: replace the fan. |
| All the LEDs blink together. | - Dirty filters. | - Clean the filters and reset the signalling by pressing the MODE button for at least 5 seconds. |