



# INSTALLATION MANUAL

## Daikin Altherma heat pump convector options

EKRTCTRL1  
EKRTCTRL2  
EKWHCTRL0  
EKWHCTRL1  
EKPCBO

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*We would first of all like to thank you for having chosen one of our products.*

*We are sure you will be happy with it because it represents the state of the art in the technology of home air conditioning.*

*By following the suggestions contained in this manual, the product you have purchased will operate without problems, giving you optimum room temperatures with minimum energy costs.*

DAIKIN EUROPE N.V.

## Symbols

The pictograms in the next chapter provide the necessary information for correct, safe use of the appliance in a rapid,

unmistakable way.

## Editorial pictograms



User

Refers to pages containing instructions or information for the user.



Installer

Refers to pages containing instructions or information for the installer.



Service

Refers to pages containing instructions or information for the CUSTOMER TECHNICAL ASSISTANCE SERVICE installer.

## Safety pictograms



Warning

The operation described may cause physical harm if not carried out in accordance with safety regulations.



Dangerous electrical current

Make personnel aware that the operation described may lead to electrical shocks if not carried out in accordance with safety regulations.



High temperature danger

Of safety regulations, the risk of burns caused by contact with components with high temperatures.



Prohibition







Refers to prohibited actions.

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## GENERAL

### 1.1 General warnings

-  This instruction is an integral part of the booklet of the appliance on which the kit is installed. Please consult this booklet for general warnings and fundamental safety rules.
-  This manual is designed only for the qualified and authorised installation technician, who must be sufficiently trained and in possession of all psycho-physical requirements as per the law.
- All operations must be carried out with care and according to best practices, and in compliance with workplace safety regulations.
-  After unpacking, check that the contents are intact and that all parts are included. If not, contact the agent who sold the appliance to you.
-  It is forbidden to modify the safety or adjustment devices without authorisation from and indications of the manufacturer.
-  It is forbidden to dispose of, or leave in the reach of children, the packaging materials which could become a source of danger.
-  Repairs or maintenance must be performed by the Technical Assistance Service or by qualified personnel in accordance with this manual. Do not modify or tamper with the appliance as this could create dangerous situations and the manufacturer will not be liable for any damage caused.

## EKRTCTRL1

## 2.1 Assembly, set-up and connection of on-board control panels

The controllers have two independent clean contacts for controlling a refrigerator unit, a boiler and a presence input. The 2 tube versions have a 230V output to power the summer and winter solenoid valve. The 10 k $\Omega$  water temperature probe positioned in the

compartment on the battery regulations the minimum level when heating (30°C) and the maximum level when cooling (20°C).

The board also has a function when there is no water probe, in such cases the fan stop thresholds are ignored.

## 2.2 Assembly

Slide the control panel into its housing in the upper part of the device and fix it with the two fixing screws (ref. A).

To install the connection box:

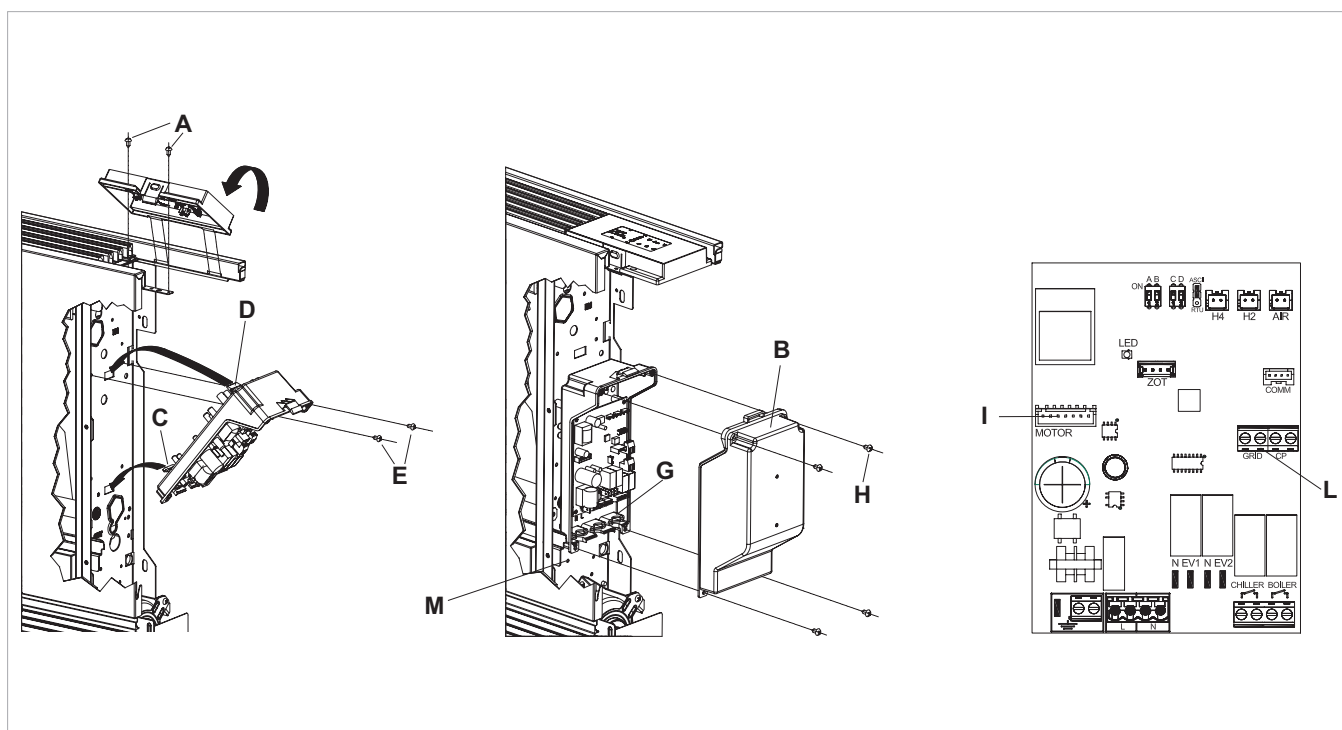
- open the box (ref. B);
- lock the lower tooth into its hole (ref. C) on the side of the device;
- hook the upper part of the box to the side (ref. D);
- fix it with the two fixing screws (ref. E);
- connect the grounding cable to the fan coil body (ref. M) using the fixing screws (the minimum force that must be applied for tightening screws must be around 2N);
- connect the fast connector of the MOTOR to the other on the board (ref. I) \*;
- on the two GRID block terminals (ref. L) there is a bridge that allows the FWXM-series to work without a microswitch.
- For other versions, remove the bridge and connect the two terminals originating on the grill safety microswitch\*;
- connect the water probe to the H2 connector on the device.

The water temperature probe controls the temperature inside the batteries and determines when the fan starts according to pre-set parameters (minimum operation in winter and maximum in summer).\*\* Check that they are correctly inserted into the compartment on the battery.

- Connect the electrics, tidy cables and fix them with the three clevises supplied (ref. G);
- close the box with the 4 screws (ref. H);
- refit the vanity plate on the side of the unit;
- tighten the upper screws on the control panel;
- place the screw head covers in their housing on the control panel;

\* For versions with hydraulic connections on the right, refer to the relevant paragraph

\*\* The regulation also works without a water probe connected



## 2.3 Set-up of auxiliary dip-switch functions B and C


There are two dip switches on the controller circuit board for configuring unit operation as per requirements.

- The night-time heating operation logic is modified by using dip switch C:
- in the ON position, the fan is always off, and heats the room using radiation and natural convection, as with traditional radiators; in the off position it operates as a normal fan.
- By positioning dip switch B to ON, when cooling, the fan operates at the minimum speed even after having

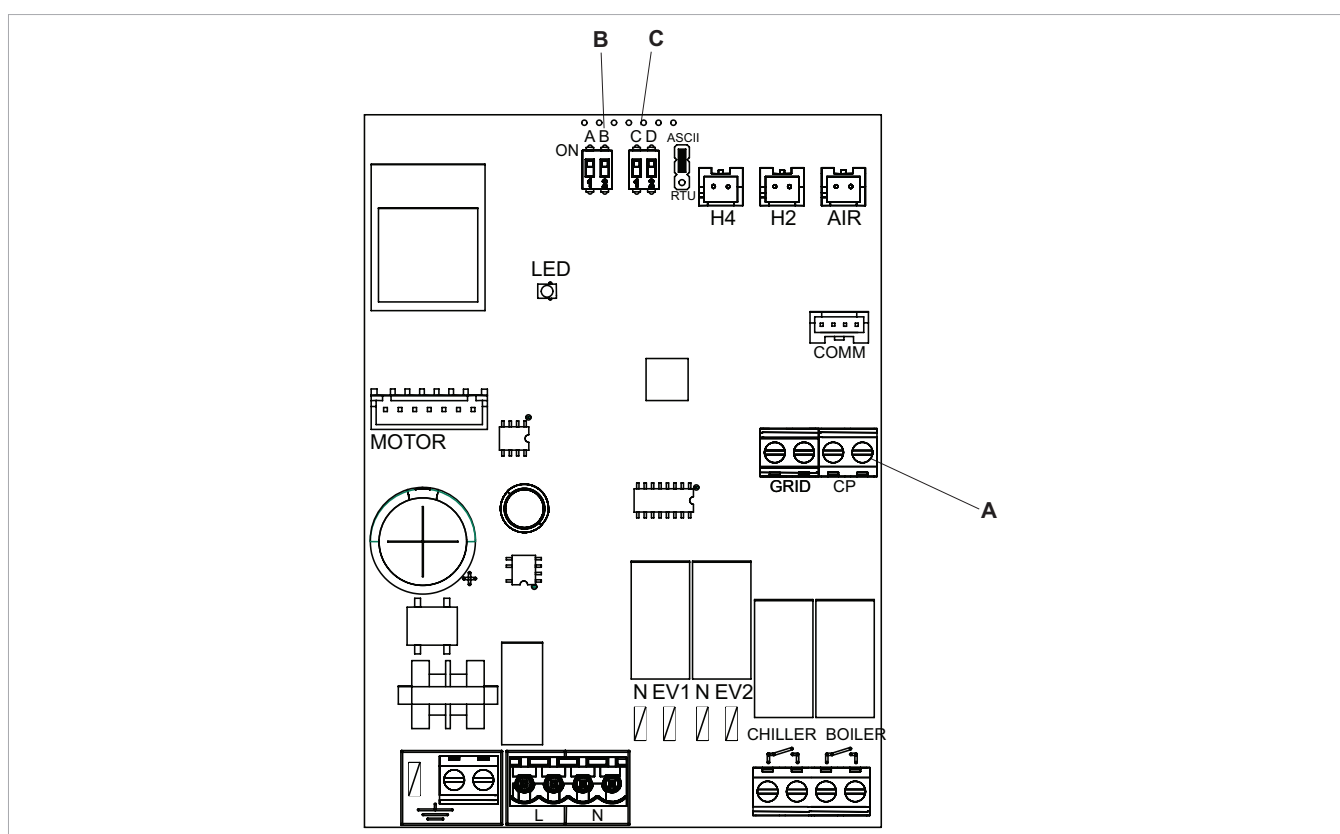
reached the set point, to allow for more uniform operation of the temperature probe and to avoid layering in the air. With the cursor in the OFF position, the functions are cycled (4 minutes ON, 10 minutes OFF).

## 2.4 CP presence contact input connection (only for EKRTCTRL1)

On closing the contact connected to the CP input (ref. A) the panel is placed in stand-by mode.

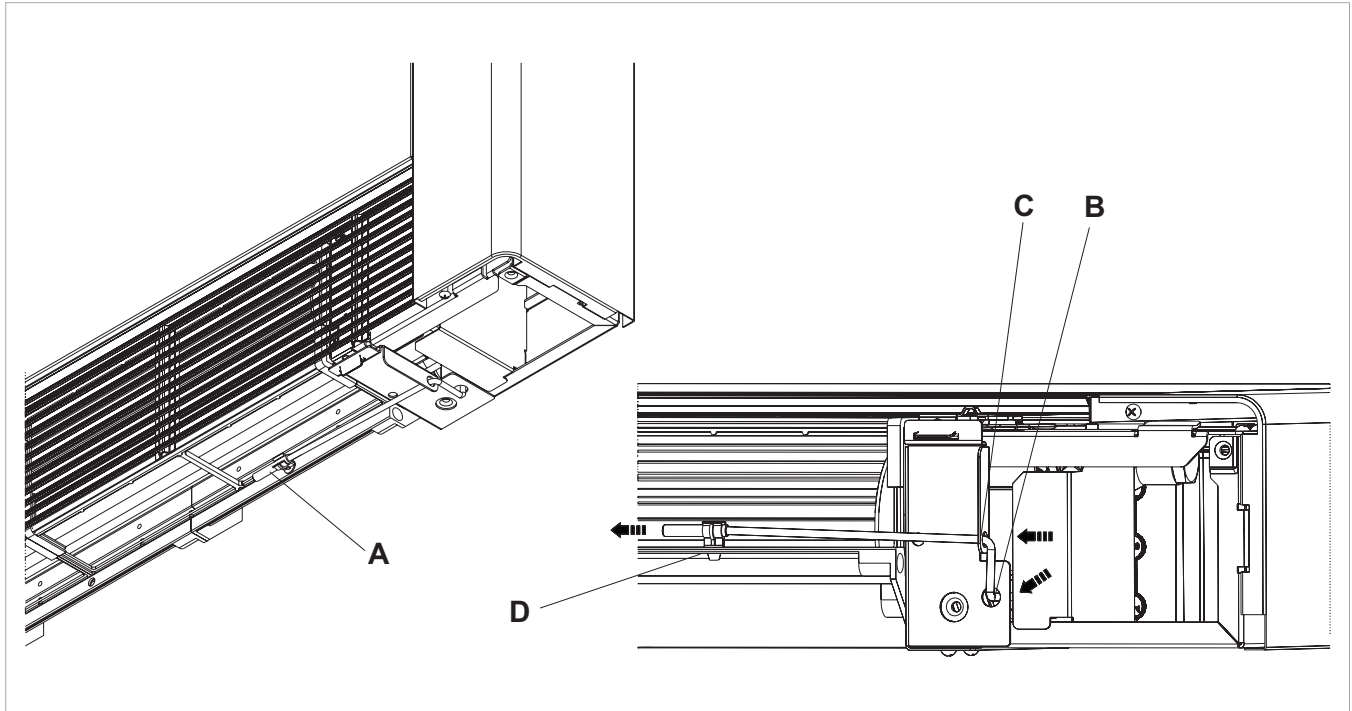
If the contact is open the unit is active, if the contact is closed it is deactivated when a key is pressed the  symbol flashes.

The input cannot be connected in parallel to that of other electronic boards (use separate contacts).



## 2.5 Air temperature probe assembly (only for EKRTCTRL1)

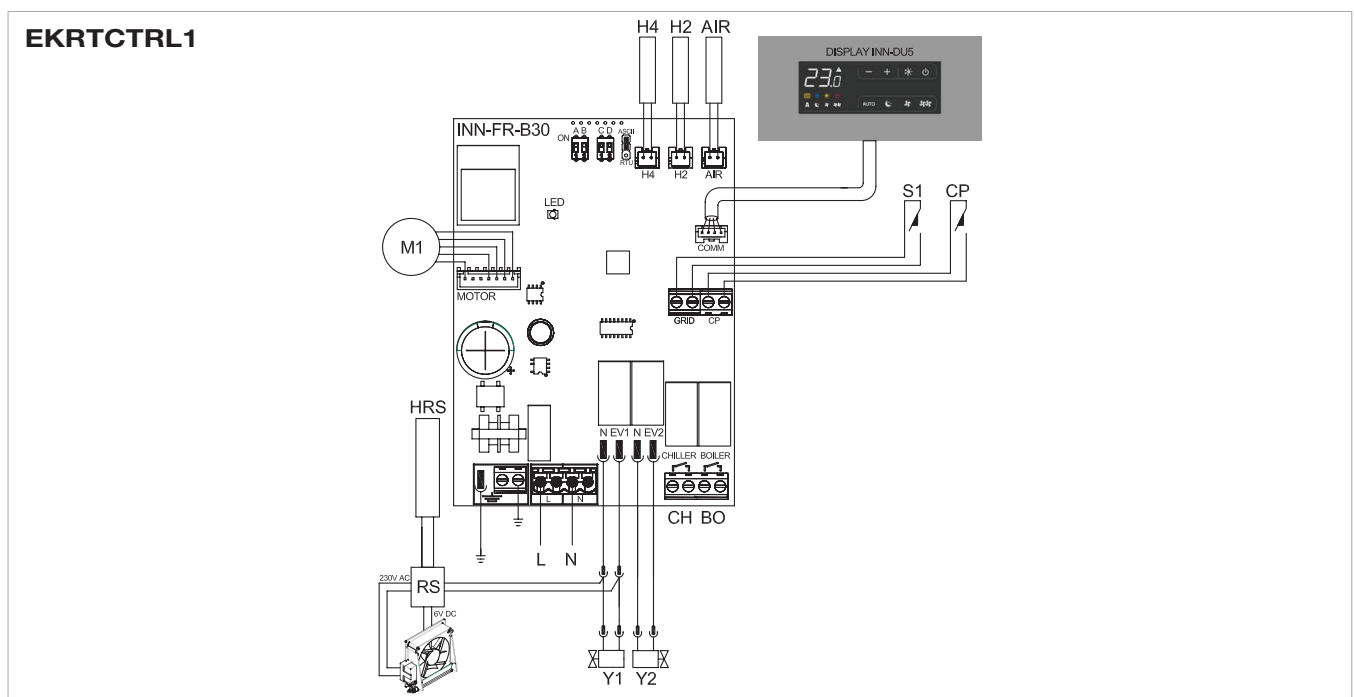
- To position the temperature probe (ref. A):
- pass the probe through the hole on the shoulder (ref. B)
- insert the probe into the lower hole (ref. C)
- fix the probe on the relevant hook (ref. D)



**2.6 EKRTCTRL1 connections**

<b>H2*</b>	water temperature probe (10 kΩ)
<b>AIR</b>	air temperature probe (10 kΩ)
<b>M1</b>	DC inverter fan motor
<b>S1</b>	grill safety micro-switch
<b>Y1</b>	water solenoid valve (230V/ 50Hz 1A output voltage)
<b>Y2</b>	mobile flap connection 230V/ 50Hz 1A output voltage.
<b>L-N</b>	230V/50Hz electrical power supply

<b>BO</b>	boiler consent output (free contact max 1A)
<b>CH</b>	chiller consent output (free contact max 1A)
<b>CP</b>	presence input sensor (if closed, the fan coil unit is placed in standby).
<b>*</b>	If after switching the power on the board detects the H2 probe, start-up occurs in normal conditions with the minimum water temperature when heating (30°C) and maximum when cooling (20°C). The board also has a function when there is no probe, in such cases the fan stop minimum and maximum thresholds are ignored.





## EKWHCTRL0

### 3.1 Continuous modulation circuit board for connecting remote thermostat

The circuit board for remote control is for all functions of the fan coil system from the wall-mounted remote control EKWHCTRL0.

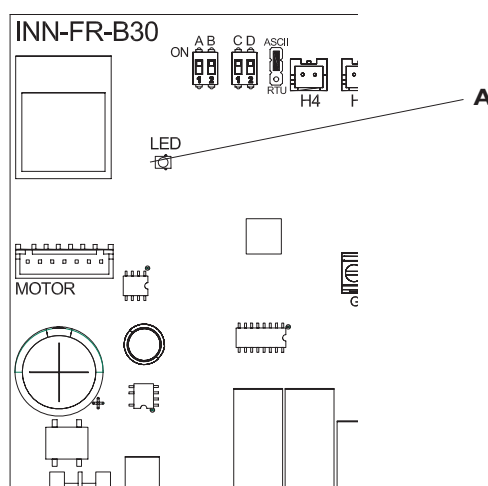
A remote control can be connected to a maximum of 30 fan coils that will be controlled in broadcast mode (simultaneous commands to all fan coils).

It can be installed on all versions, the board has a green LED that indicates the operational state and any anomalies.

The main operational parameters, the set point and the room temperature are transmitted from the wall-mounted remote control EKWHCTRL0 to all terminals connected to the network, allowing unified operation.

Refer to the instructions for this control for use of the fan coils.

The 10 kΩ water temperature probe positioned in the device battery regulations the minimum level when heating (30°C) and the maximum level when cooling (20°C).



### 3.2 LED Indications (Ref. A)

	Green LED: Indicates that the unit is operational. Flashing indicates an anomaly.		LED off: unit is off or has no power.
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#### Error signals

Error	Display
Communication error. The circuit board expects continuous information exchange on the serial line with the wall-mounted control EKWHCTRL1. If this exchange is lost for more than 5 minutes, an error warning is displayed and the unit deactivated.	6 flashes + pause
Problem with fan motor (e.g. blockage caused by foreign objects, faulty rotation sensor).	2 flashes + pause
Water temperature probe fault (H2). In this case, ensure that the probe installed is 10 kΩ.	3 flashes + pause
Engaging of grille microswitch S1 due to filter cleaning operation.	Continuous rapid flashing
Water demand detected by probe H2 insufficient (above 20°C when cooling, below 30°C when heating). Stops the fan until the temperature returns to a suitable level to satisfy the demand*.	1 flashes + pause

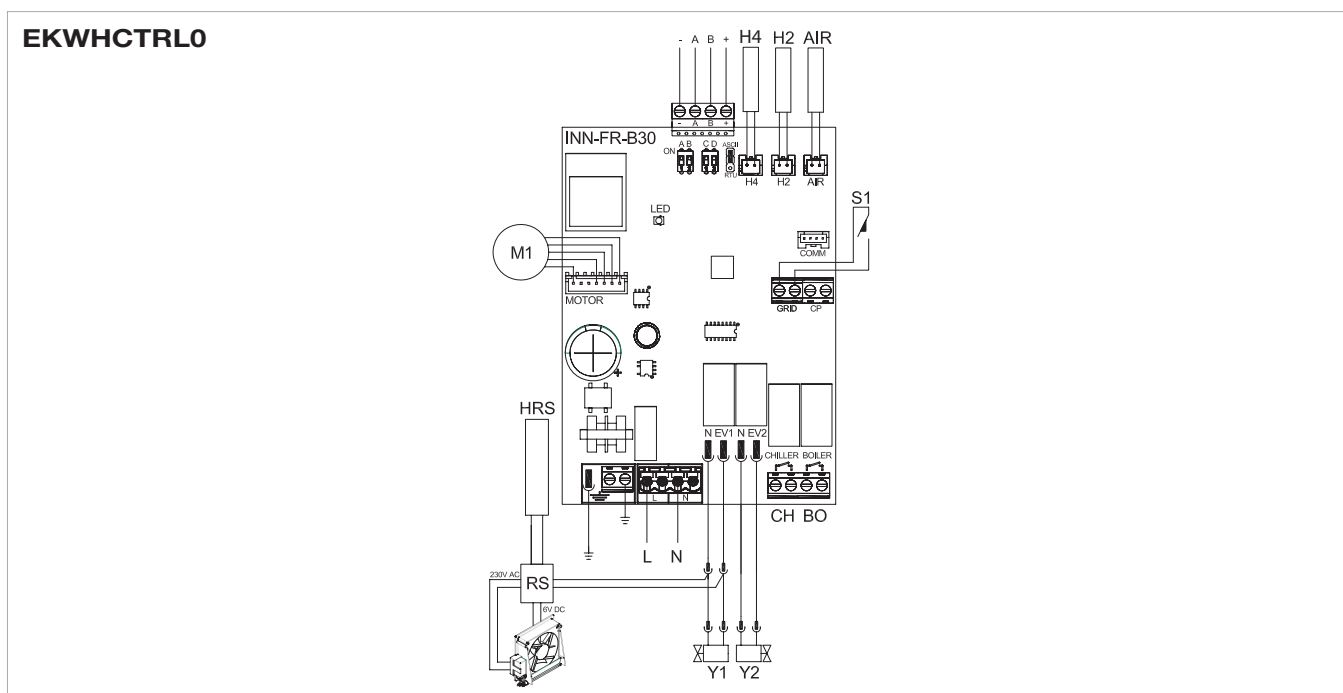
\* If after having powered the board the water probe is detected, start-up takes place with the minimum and maximum water temperature thresholds.

The board also has a function when there is no probe, in such cases the fan stop thresholds are ignored.

### 3.3 EKWCTRL0 connections

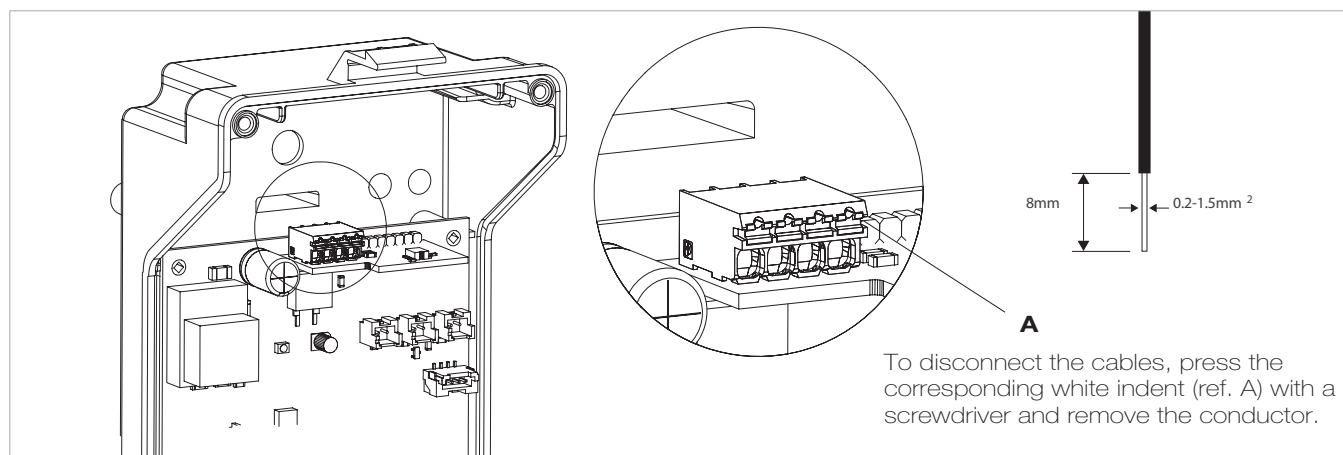
<b>-AB+</b>	serial connection for wall-mounted remote control EKWCTRL1 (respect AB polarity)
<b>H2**</b>	hot water temperature probe (10 kΩ)
<b>M1</b>	DC inverter fan motor
<b>S1</b>	grill safety micro-switch
<b>Y1</b>	hot water solenoid valve (230V/ 50Hz 1A output voltage)
<b>Y2</b>	mobile flap (230V/ 50Hz 1A output voltage)
<b>L-N</b>	230V/50Hz electrical power supply
<b>BO</b>	boiler consent output (free contact max 1A)
<b>CH</b>	chiller consent output (free contact max 1A)

<b>CP</b>	not used in this version
<b>AIR</b>	Air probe optional (*)
<b>*</b>	Alternatively, connect the wall-mounted controller EKWCTRL1 to the air probe
<b>**</b>	If after switching the power on the board detects the H2 probe, start-up occurs in normal conditions with the minimum water temperature when heating (30°C) and maximum when cooling (20°C). The board also has a function when there is no probe, in such cases the fan stop minimum and maximum thresholds are ignored.



Rigid or flexible wires with a 0.2 to 1.5 mm<sup>2</sup> cross-section (0.75 mm<sup>2</sup> if two wires are connected to the same terminal block) can be inserted in the 4 spring-loaded terminal blocks (ref. A) for connection of the wall-mounted controller EKWCTRL1. If the wires have wire end ferules with a plastic collar, the maximum cross-section is 0.75 mm<sup>2</sup>.

Strip 8 mm of the wire, then if the wire is rigid, you can insert it easily whereas, if it is flexible, it is advisable to use long nose pliers. Push the wire completely in and check that it is anchored by pulling it gently.



## EKWHCTRL1

### 4.1 Wall-mounted remote control panel assembly EKWHCTRL1

The wall-mounted remote control EKWHCTRL1 is an electronic thermostat (fitted with an optional temperature probe which can be remotely installed in one of the fan coils connected to it) with the possibility to control one or more units (up to max. 30) fitted with an electronic controller for remote control EKWHCTRL0.

- Install the wall-mounted remote control EKWHCTRL1 away from doors and/or windows and from heat sources (radiators, fan coils, hobs, direct sunlight), on internal walls and around 1.5m from the floor.

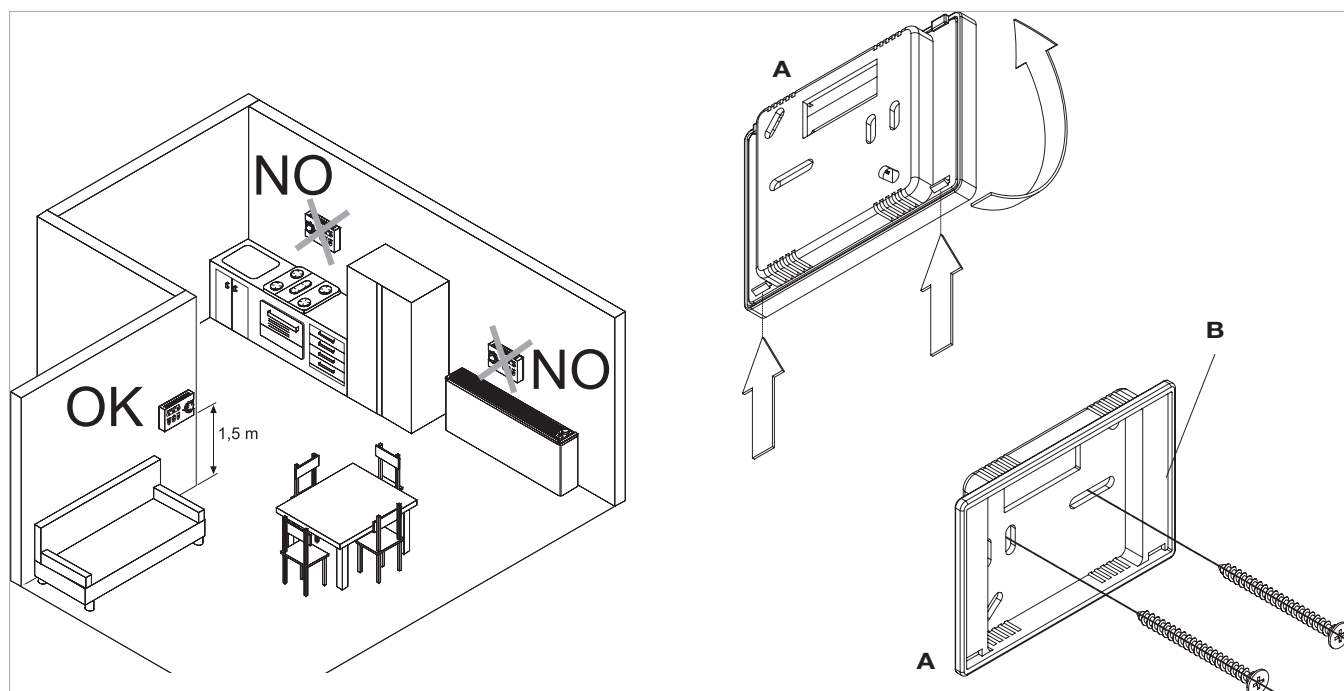
The wall-mounted remote control is inside the pre-assembled package, therefore prior to affixing to the wall, the two parts should be separated by unhooking the two

protruding teeth on the rear (A).

Use the base of the controller (ref. B in diagram) to trace the fixing points on to the wall (use two opposing holes).

Then proceed with the following operations:

- drill holes in the wall;
- pass the cables through the window on the base;
- fix the base of the controller to the wall using suitable screws and wall plugs;
- make the electrical connections then close the controller taking care not to crush the conducting wires.



### 4.2 Spring-loaded terminal connections -AB+ and CP

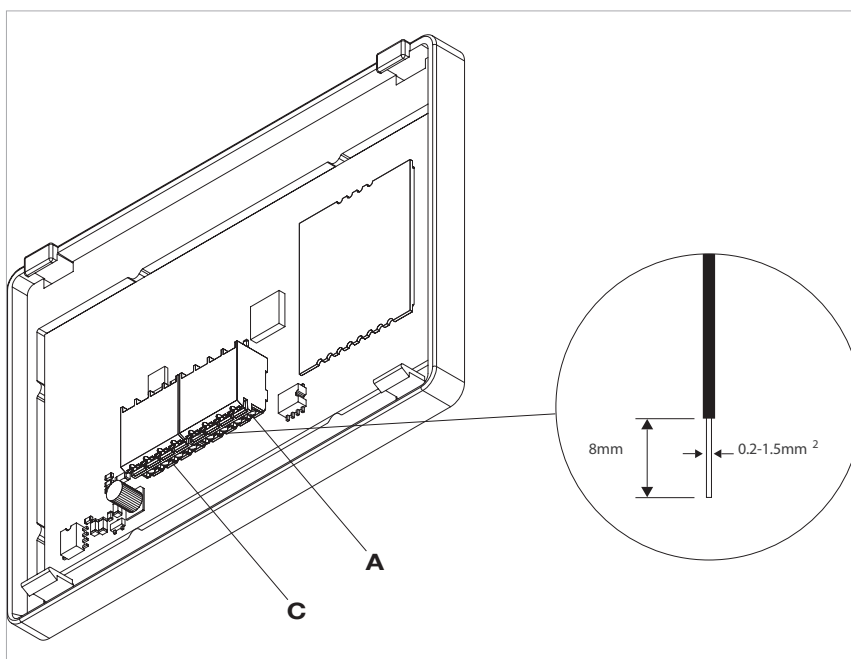
Rigid or flexible wires with a 0.2 to 1.5 mm<sup>2</sup> cross-section can be inserted in the spring-loaded terminal blocks for the serial connection. If the wires have wire end ferrules with a plastic collar, the maximum cross-section reduced to 0.75 mm<sup>2</sup>.

For correct and safe connection, carry out the following operations:


- Strip back the wires by 8mm as shown below;
- if the cable is rigid the end of the wire can be inserted


easily, whereas with flexible cable it may be easier to use a long pointed pair of pliers to insert correctly.


- Push the wire completely in and check that it is anchored by pulling it gently.
- To disconnect the cables, press the corresponding white indent (ref. C) with a screwdriver and remove the conductor.



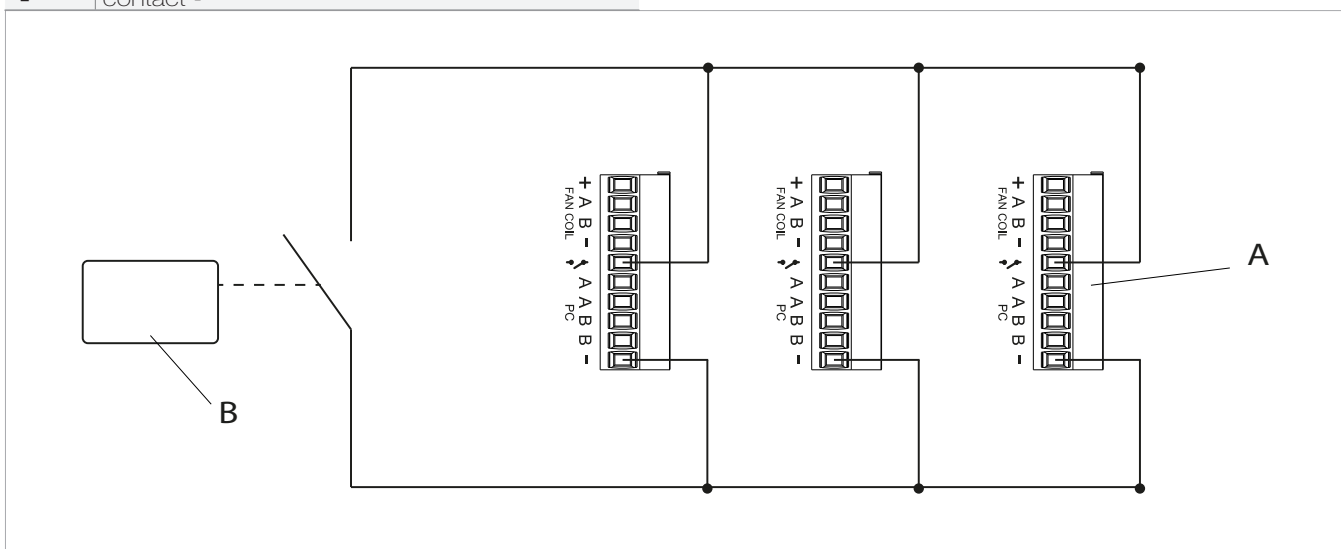
### 4.3 CP occupancy contact input connection

On closing the contact connected to the CP input (ref. A) the panels are placed into stand-by. If the contact is open the units are active, if the contact is closed they are deactivated when a key is pressed the  symbol flashes.

-  To connect the CP input in more than one PCB, observe the polarity between external relay contact and CP contacts as shown in the figure.

	contact CP
-	contact -

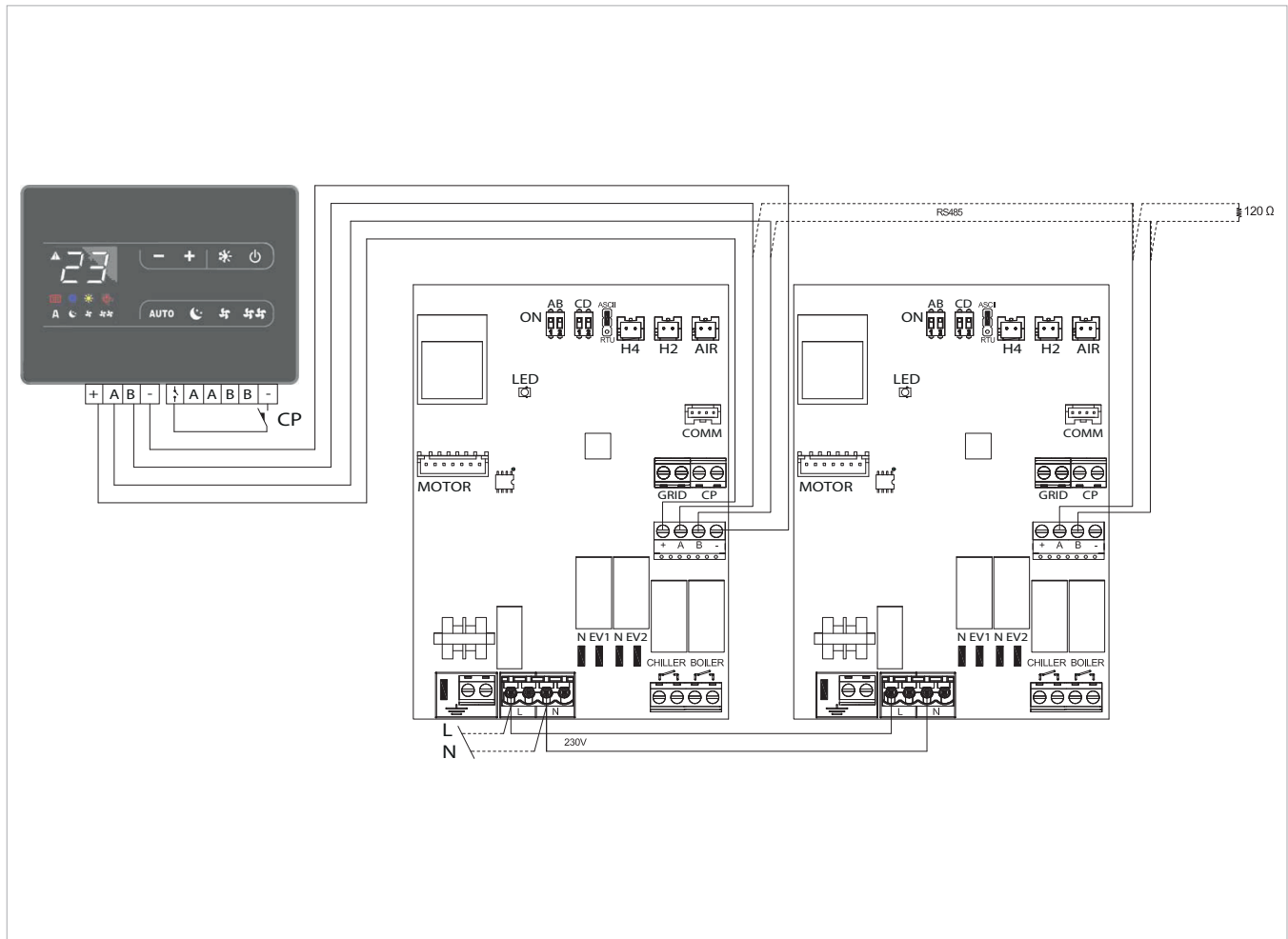
<b>A</b>	remote control terminal block
<b>B</b>	auxiliary relay



#### 4.4 EKWCTRL1 Connections

Connect the RS485 line of the wall-mounted remote control to one or more (up to a maximum of 30) devices fitted with electronics for remote control EKWCTRL0 using a suitable two-core cable for serial connections RS485 keeping the power supply cables separate.

- Chase out the wall in order to minimise the length of the leads;
- complete the line with the supplied 120 Ω heating element;
- do not make "star" connections;
- The RS485 cable connection is polarised, respect the "A" and "B" indications on every periphery connected (for connecting, it is preferable to use a shielded two-core cable with a minimum thickness of 0.35 mm<sup>2</sup>);
- connect the + and - power terminals on the wall mounted terminal block, 5V DC, to one of the boards EKWCTRL0, respecting polarity.



## EKRTCTRL2

### 5.1 Assembly and connections for on-board control panel EKRTCTRL2

The on-board controller is a panel with 8 capacitive keys and amber display that contains the AUTO function (step ventilation adjustment).

The EKRTCTRL2 thermostat can be set from 5 to 40°C, has a winter and summer selector and the 10 kΩ water temperature probe positioned in the compartment on the battery regulations the minimum level when heating (30°C) and the maximum level when cooling (20°C). It is suitable

for installing on board and has a 230V output for controlling a solenoid valve.

The board also has a function when there is no H2 probe, in such cases the fan stop thresholds are ignored.

### 5.2 Assembly

Slide the control panel into its housing in the upper part of the device and fix it with the two fixing screws (ref. A).

To install the connection box:

- open the box (ref. B);
- lock the lower tooth into its hole (ref. C) on the side of the device;
- hook the upper part of the box to the side (ref. D);
- fix it with the two fixing screws (ref. E);
- connect the grounding cable to the unit structure (ref. M) using the fixing screws (the minimum force that must be applied for tightening screws must be around 2N);
- connect the fast connector of the MOTOR to the other on the board (ref. I) \*;
- on the two GRID block terminals (ref. L) there is a bridge that allows FWXM-series to work without a microswitch.

For versions in-built into the formwork, follow the microswitch connection instructions on the instruction sheet of the vanity panel.

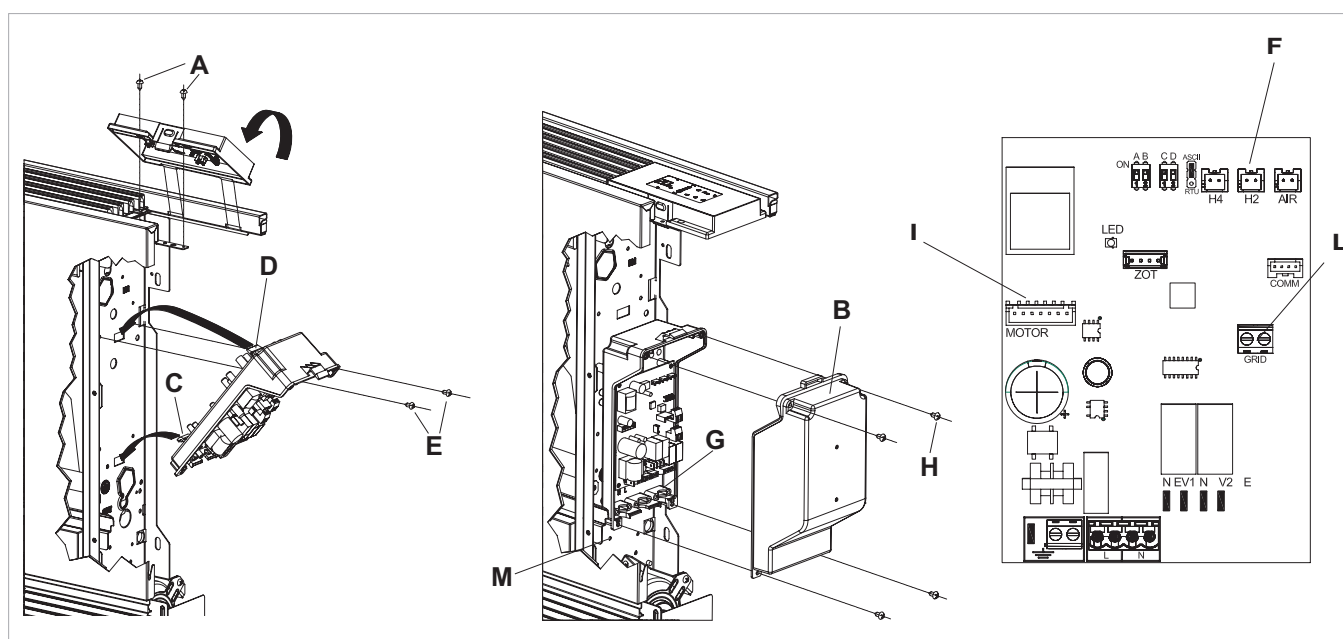
For other versions, remove the bridge and connect the two terminals originating on the grill safety microswitch\*;

- connect the water probe connector (ref. F) on the unit. The water temperature probe controls the temperature inside the batteries and determines when the fan starts according to pre-set parameters (minimum operation in winter and maximum in summer).\*\*
- Check that they are correctly inserted into the compartment on the battery.
- Connect the electrics, tidy cables and fix them with the three clevises supplied (ref. G);
- close the box with the 4 screws (ref. H);
- refit the vanity plate on the side of the unit;
- tighten the upper screws on the control panel;
- place the screw head covers in their housing on the control panel;

**\*N.B.:** \* For versions with hydraulic connections on the right, refer to the relevant paragraph

\*\* If after switching the power on the board detects the H2 probe, start-up occurs in normal conditions with the minimum and maximum functions.

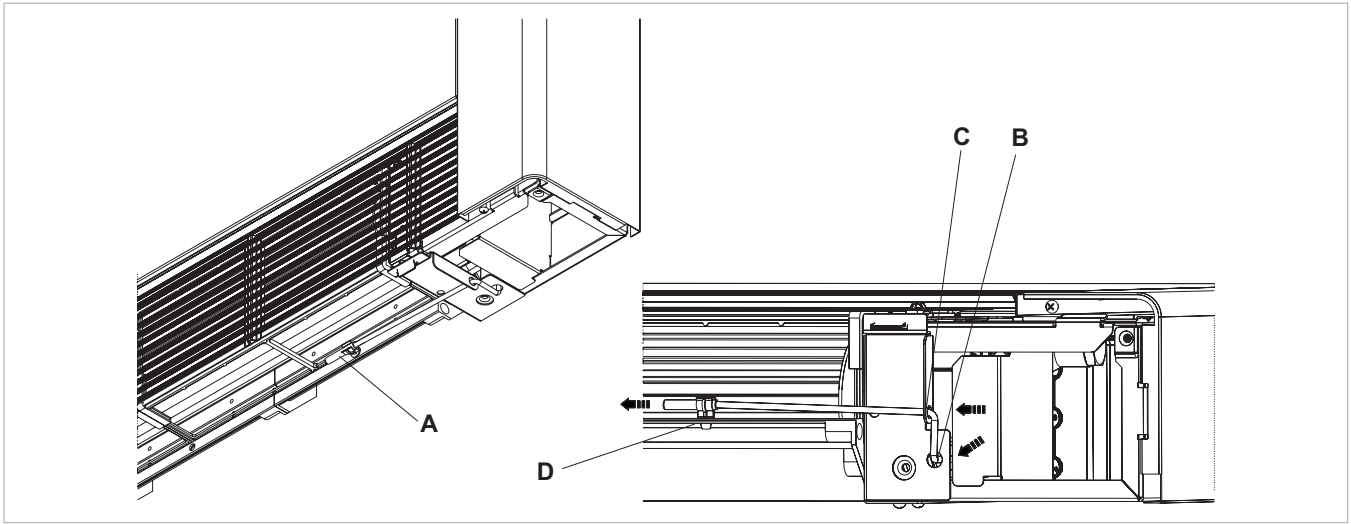
The board also has a function when there is no H2 probe, in such cases the fan stop thresholds are ignored.



### 5.3 Air temperature probe assembly

To position the temperature probe (ref. A):

- pass the probe through the hole on the shoulder (ref. B)
- insert the probe into the lower hole (ref. C)
- fix the probe on the relevant hook (ref. D)



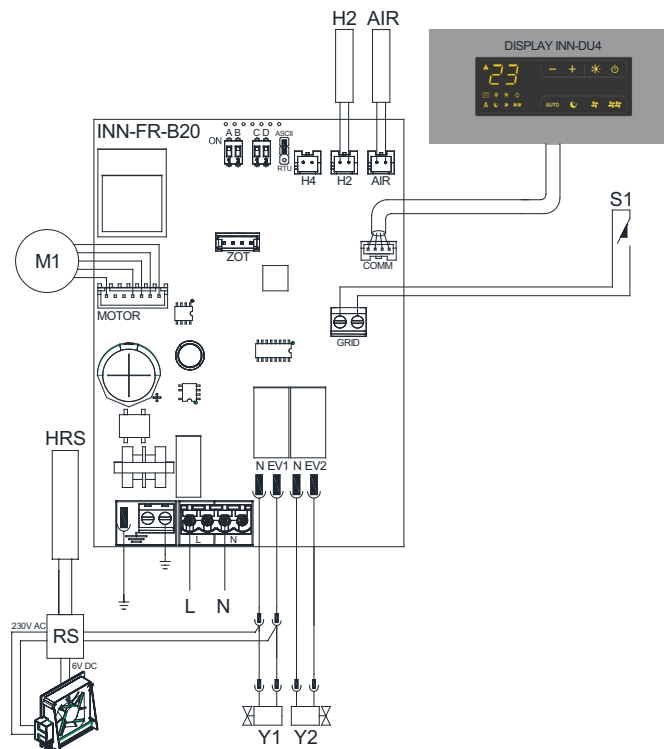
### 5.4 EKRTCTRL2 Connections

<b>H2*</b>	water temperature probe (10 kΩ)
<b>AIR</b>	air temperature probe (10 kΩ)
<b>M1</b>	DC inverter fan motor
<b>S1</b>	grill safety micro-switch
<b>Y1</b>	water solenoid valve (230V/ 50Hz 1A output voltage)
<b>Y2</b>	Mobile flap connection. 230V/ 50Hz 1A output voltage.
<b>L-N</b>	230V/50Hz electrical power supply

\* If after switching the power on the board detects the H2 probe, start-up occurs in normal conditions with the minimum water temperature when heating (30°C) and maximum when cooling (20°C).  
The board also has a function when there is no probe, in such cases the fan stop minimum and maximum thresholds are ignored.

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### EKRTCTRL2




## SETUP MENU FOR EKRTCTRL1 - EKWHCTRL1 - EKRTCTRL2

### 6.1 Setup menu

Through the remote control, the access to Setup menu will be available from display off:

Key	Operation	Display
	<ul style="list-style-type: none"> <li>- press the key "ON" for 10 sec.</li> <li>- the device turns on and the temperature appears</li> <li>- continue to press until "Ad" appears</li> </ul>	<b>Ad</b>


Use the icons **- +** to move inside the menu.

Use the icon  to select menu items and to confirm changes made.

Pressing  and confirming the change will switch to the next item.

To exit from menu:

- press the icon  for 10 sec.
- or wait 30 sec. for automatic shutdown

 After 30 seconds from the last action, the control goes off and the settings is memorised.

#### Menu items

<b>Ad</b>	Reserved ("01" default)	<b>rb</b>	Reserved ("no" default)
<b>uu</b>	Reserved ("no" default)	<b>Fr</b>	Factory reset
<b>Ub</b>	Adjust buzzer volume	<b>ot</b>	Offset probe T
<b>br</b>	Adjust the brightness	<b>oh</b>	Offset probe HR
<b>di</b>	Digital input	<b>Sc</b>	Scale
<b>rZ</b>	Reserved ("no" default)	<b>rE</b>	Reserved ("no" default)

#### Adjusting buzzer volume

To change the volume:

Display	Operation
<b>Ub</b>	<ul style="list-style-type: none"> <li>- the volume setting range is from 00 (min) to 03 (max)</li> <li>- Increase or decrease the volume with the icons <b>- +</b></li> </ul>

 The volume changes after you confirm the modification.



### Adjusting the brightness of the display

To adjust the brightness:

Display	Operation
br	- the brightness adjustment range is from 00 to 01 - increase and decrease the brightness with the icons <b>--+</b>

⚠ The brightness changes after confirming the modification.

20 sec. The message "01" will appear. Press **--** to decrease brightness "00". Wait 30 sec. for the correct settings to be verified.

⚠ You can also reduce the brightness of the display through the control's key. From the display off, press the icon **+** for


### Settings of the digital input

To change the digital input, select "di" menu:

Display	Operation
di	- CP / clean contact (default) - CO / cooling open - CC / cooling close

⚠ By default, digital input is set to CP.

⚠ For return to the default settings, set the digital input to "CP".

⚠ By selecting one of the other inputs (CO,CC) the seasonality is locked. It is not possible to modify it through the key  of the control.

### Factory reset

To reset the control to factory settings:

Display	Operation
Fr	- select "YS" to reset the settings - select "no" to keep the current settings

### Probe T regulation offset (room temperature probe)

Display	Operation
ot	- the adjustment range is from -9 to 12

⚠ Use this adjustment carefully.

⚠ Adjust the value in a range of - 9 °C to + 12 °C, at variations of 0,1 °C.

⚠ Use this adjustment only after having actually detected a discrepancy compared with the actual room temperature using a reliable device.

⚠ After 30 seconds from the last action, the control goes off and the settings is memorised.

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### Sensor offset settings (humidity probe)

Display	Operation
oh	- the adjustment range is from -9 to 9

⚠ Use this adjustment carefully.

⚠ Use this adjustment only after having actually detected a discrepancy compared with the actual room humidity using a reliable device.

⚠ Adjust the value in a range of - 9 °C to + 9 °C, at variations of 1 °C.

⚠ After 30 seconds from the last action, the control goes off and the settings is memorised.

### Scale

To change the temperature unit:

Display	Operation
Sc	- select °C o °F

## EKPCBO

## 7.1 Assembly and connections for on-board control panel EKPCBO

The on-board controller with speed selector and ON/OFF key and TERM room thermostat is suitable for fitting on board the

unit and has a 230V output for controlling a solenoid valve.

## 7.2 Assembly

Slide the control panel into its housing in the upper part of the device and fix it with the two fixing screws (ref. A).

To install the board on the fan coil:

- connect the grounding cable to the unit structure (ref. M) using the fixing screws (the minimum force that must be applied for tightening screws must be around 2N);

- connect the fast connector of the MOTOR to the other on the board (ref. I) \*;

**N.B.:** should the board not be fitted in the factory, the fan motor must be rotated 180° due to the length of the standard fan coil cable.

- on the two GRID block terminals (ref. L) there is a bridge that allows FWXM-series to work without a microswitch.

- For other versions, remove the bridge and connect the two terminals originating on the grill safety microswitch\*.

- **N.B.:** should the two brown terminals on the unit be too short, replace them with those included in the kit packaging.

- make the electrical connections, tidy the cabling;

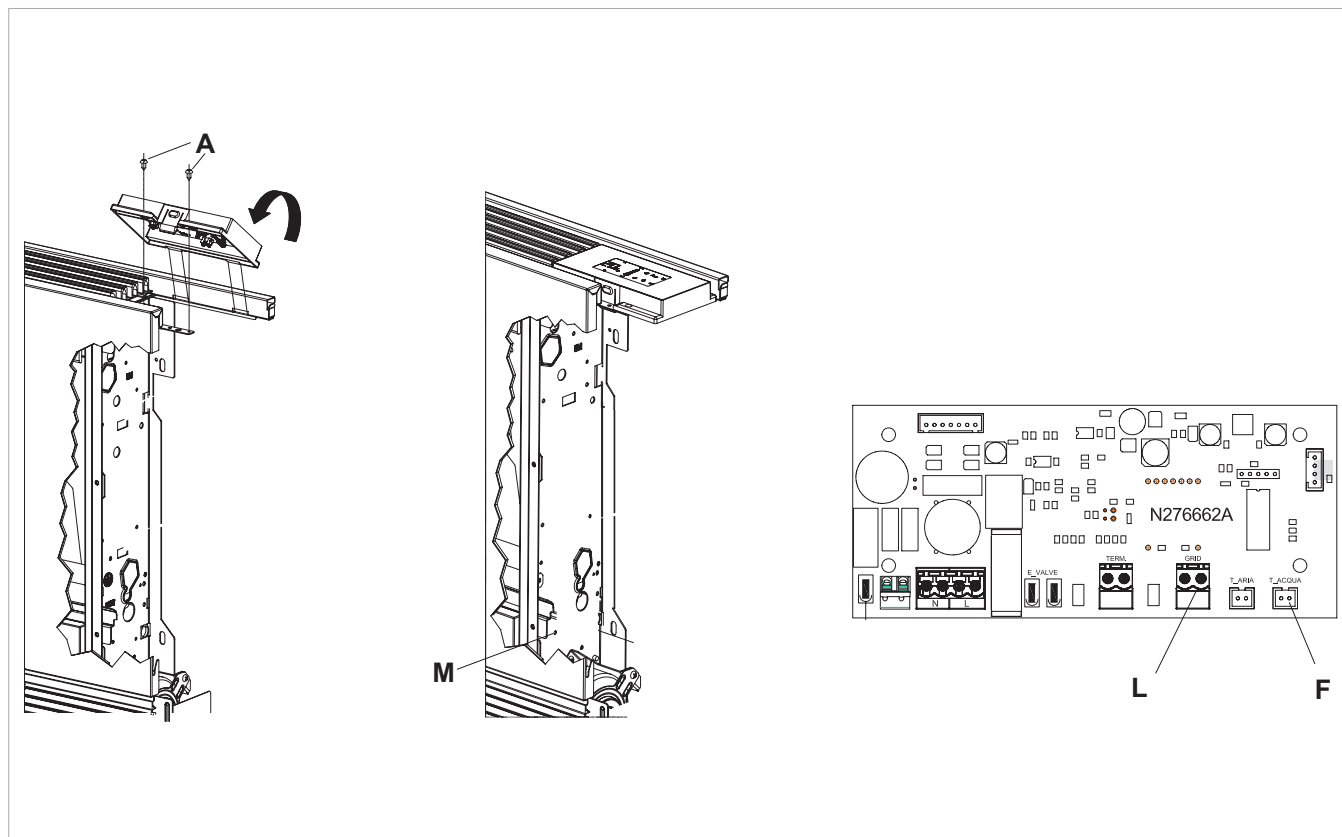
- refit the vanity plate on the side of the unit;

- tighten the upper screws on the control panel;

- place the screw head covers in their housing on the control panel;

\* For versions with hydraulic connections on the right, refer to the relevant paragraph

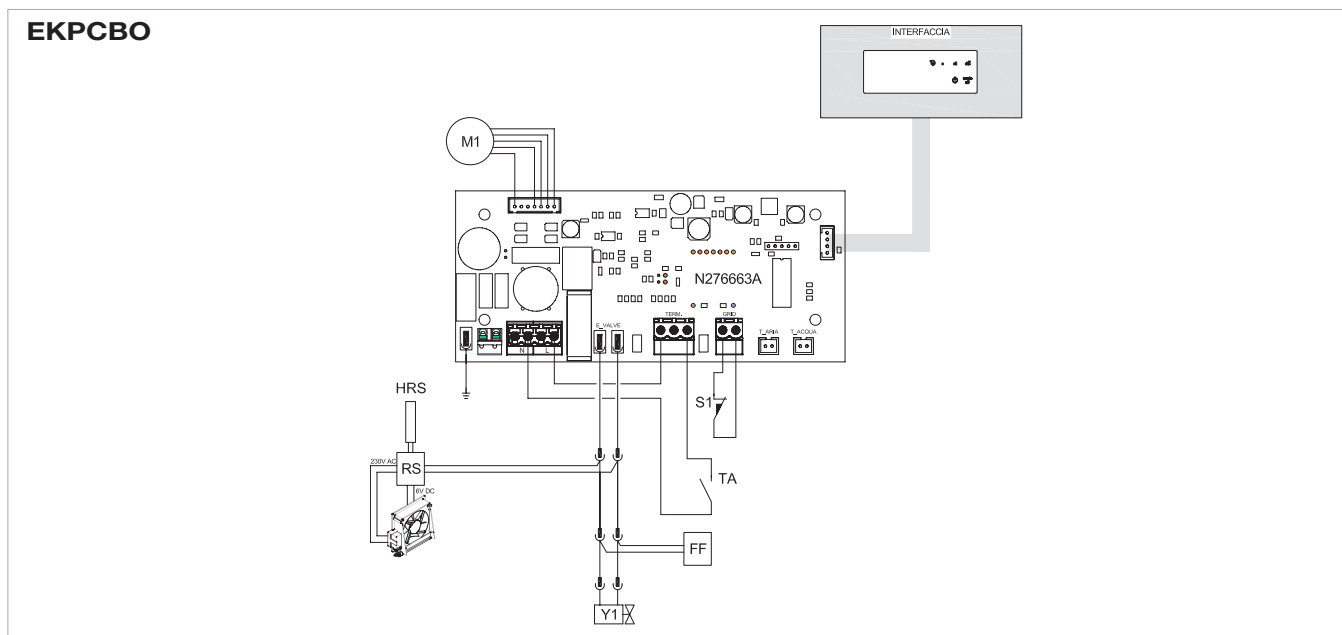
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### 7.3 EKPCBO Connections







<b>TA</b>	230V connection permission from room thermostat
<b>M1</b>	DC inverter fan motor
<b>S1</b>	grill safety micro-switch
<b>Y1</b>	water solenoid valve (230V/ 50Hz 1A output voltage)

<b>L-N</b>	230V/50Hz electrical power supply
<b>FF</b>	output for mobile suction panel servo (power output 230V/ 50Hz 1A)



### 7.4 Warnings table

The board provides diagnostics in the event of anomalies, which can be interpreted from combinations of LEDs. The following table summarises the warnings.

- Flashing LED : TA contact open
- Flashing LED : TA contact closed;
- 4 flashing LEDs: S1 contact open;
-  LED on: supersilent speed active (400 rpm).
-  LED on: minimum speed active (680 rpm).
-  LED on: medium speed active (1,100 rpm).
-  LED on: maximum speed active (1,500 rpm).

## VERSIONS WITH CONNECTIONS ON THE RIGHT

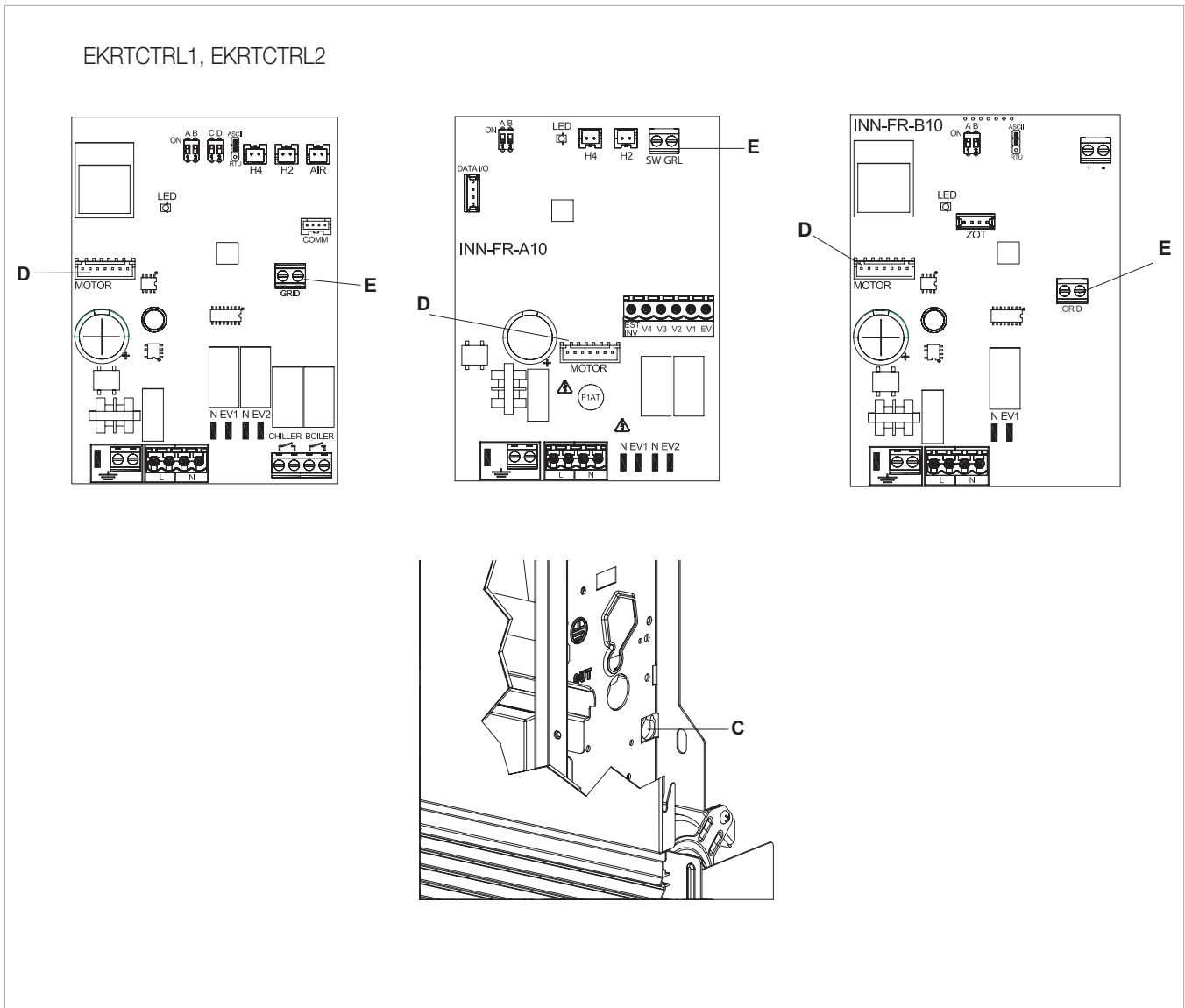
### 8.1 Motor connection in versions with hydraulic connections on the right EKREPLH

Should the battery hydraulic connection positions need to be inverted from the left to the right hand side of the unit, the electrical connection box is also inverted, but as the fan motor and the grill safety micro switch must stay in position, the EKREPLH kit must be used as an accessory.

The cable, with male/female connectors, is connected to the motor on the right and to the quick connector on the left (MOTOR) on the board (ref. D).

Furthermore, the two terminals connected to the grill safety micro switch are extended and connected on the left hand side to contact S1 on the board (ref. E).

The cables should be passed behind the unit through the dedicated hole (ref. C).



EN





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