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 water-water heat pump that you have purchased will operate without problems giving you optimum room temperatures with minimum energy costs.

Innova S.r.l

Symbols
The pictograms in the next chapter provide the necessary information for correct, safe use of the machine in a rapid, unmistakable way

Editorial pictograms

U User
- Refers to pages containing instructions or information for the user.

I Installer
- Refers to pages containing instructions or information for the installer

Safety pictograms

⚠ Generic danger
- Signals to the personnel that the operation described could cause physical injury if not performed according to the safety rules.

⚠ Danger due to heat
- Signals to the personnel that the operation described could cause burns if not performed according to the safety rules.

⚠ Danger of high voltage
- Signals to the personnel that the operation described could cause electrocution if not performed according to the safety rules.

⚠ Do Not
- Refers to actions that absolutely must not be performed.
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1.1 General warnings

⚠️ These instructions are an integral part of the booklet of the device on which the kit will be installed. Refer to the booklet for general warnings and fundamental safety rules.

⚠️ This manual is dedicated exclusively for the qualified, authorised installation technician who must be adequately trained and possess all the necessary psychophysical requirements requested by law. All the operations must be performed with care and good workmanship in compliance with the safety at work regulations in force.

⚠️ After unpacking, make sure that all the components are present. If not, contact the INNOVA agent who sold the appliance to you.

⚠️ It is forbidden to modify the safety or adjustment devices or adjust without authorisation 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.

⚠️ All repair or maintenance interventions must be performed by the technical service department or by professionally qualified personnel as foreseen in this booklet. Do not modify or intervene on the appliance as this could create dangerous situations and the manufacturer will not be responsible for any damage caused.
Mounting, setting and connection of on-board machine control panels EB0644, ER0645, EB0647, ER0648

The controls have two independent free contacts to control a chiller and a boiler and a presence input. The 2-pipe versions have a 230V output for powering the summer and winter solenoid valve while the 4-pipe versions have 2 independent 230V outputs to power a summer solenoid valve and a winter solenoid valve.

2.2 Mounting

Place the control panel into its housing in the upper part of the cooler-convector/cooler-radiator and fix it with the two supplied screws (ref. A).

To install the connection box:
- open the box (ref. B);
- insert the lower lug into the special slot (ref. C) on the side of the appliance;
- hook the upper part of the box to the side (ref. D);
- fix it with the two supplied screws (ref. E);
- fix the earth wire to the cooler-convector/cooler-radiator structure using the supplied screws (the minimum force of about 2N must be used when screwing-up);
- connect the rapid connector on the motor (MOTOR) to that on the board (ref. I) *;
- the 2 terminals of the SW GRL clamp (ref. L) feature a jumper that ensures the operation of the SLI and RSI versions without microswitch.

For the other versions remove the jumper and connect the two terminals from the grid safety microswitch. *

- connect the water probe connector (ref. F) on the Cooler-convector/cooler-radiator;
- the water temperature probe checks the temperature inside the batteries and determines the start of the fan based on the set parameters (minimum winter and maximum summer functions). Check that it is inserted correctly in the well on the battery.
- make the electrical connections, order the wiring and fix the wires using the 3 supplied clamps (ref. G);
- close the box and fix with the 4 screws (ref. H);
- mount the aesthetic side panel on the Cooler-convector/cooler-radiator;
- tighten the upper screw on the control panel;

* For versions with hydraulic connections on the right refer to the relevant paragraph.
### 2.3 Setting auxiliary functions dip-switches A and B

There are two dip-switches on the electronic control panel for setting the functions of the appliance as required.

- Use cursor A to modify the night function logic:
  - In the ON position the ventilation is inhibited thus letting the machine heat the room through natural radiation or convection as happens with traditional radiators; in the OFF position the fan functions normally.
  - Set cursor B to ON (in cooling only) to enable the continual ventilation at the minimum speed, even after the set point has been reached to ensure a more regular functioning of the temperature probe. Passing to heating will cancel this condition; set the cursor set to OFF to disable this function.

### 2.4 CP presence contact input connection

When the contact connected to the SW2 (ref. C) input is closed all the users connected will be switched off.

⚠️ The input cannot be connected in parallel to one of another electronic board (use separate contacts).
2.5 Mounting air temperature probe (only for models EB0644 and EB0647)

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

2.6 Setting automatic cooling/heating regulation system

When set to this condition the control can automatically choose between cooling or heating, excluding the normal manual selection. This setting is particularly useful for the 4-pipe versions. This regulation system can only be activated by an authorised installer or qualified technician.

To activate this function, keep the sum/win button (ref. A) pressed for 10 seconds until the blue and red LEDs light up simultaneously. To return again to the manual cooling only or heating only condition press the sum/win button (ref. A) for 10 seconds until the blue and red LEDs switch off. Press the button again to select the winter function.

Check the functioning of the Red LED (alight when the setpoint is higher than the room temperature, both switched off when the setpoint is lower). Press the sum/win button once to select the summer function. Check the functioning of the Blue LED (alight when the setpoint is lower than the room temperature, both switched off when the setpoint is higher). This selection will be maintained even if there is a power black-out.
## 2.7 EB0644 and EB0647 connections

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2</td>
<td>hot water temperature probe</td>
</tr>
<tr>
<td>H4</td>
<td>cold water temperature probe (*)</td>
</tr>
<tr>
<td>AIR</td>
<td>air temperature probe</td>
</tr>
<tr>
<td>M1</td>
<td>fan motor DC inverter</td>
</tr>
<tr>
<td>S1</td>
<td>grill safety micro-switch (SL versions only)</td>
</tr>
<tr>
<td>Y1</td>
<td>hot water solenoid valve (230V/50Hz 1A powered output)</td>
</tr>
<tr>
<td>Y2</td>
<td>cold water solenoid valve (230V/50Hz 1A powered output) (*)</td>
</tr>
<tr>
<td>L-N</td>
<td>230V/50Hz electrical power supply connection</td>
</tr>
<tr>
<td>BO</td>
<td>boiler go-ahead output (free contact max 1A)</td>
</tr>
<tr>
<td>CH</td>
<td>chiller go-ahead output (free contact max 1A)</td>
</tr>
<tr>
<td>FF</td>
<td>output for servomotor mobile aspiration panel (230V/50Hz 1A powered output)</td>
</tr>
<tr>
<td>CP</td>
<td>presence sensor input (if closed, the fan coil goes into stand-by)</td>
</tr>
<tr>
<td>RS</td>
<td>RS version wiring</td>
</tr>
</tbody>
</table>

* Only present in the EB0647 panel for 4-pipe versions.

**Diagram:**

**EB0644**

- M1 (fan motor DC inverter)
- S1 (grill safety micro-switch)
- Y1 (hot water solenoid valve)
- Y2 (cold water solenoid valve)
- L-N (230V/50Hz electrical power supply connection)
- H2 (hot water temperature probe)
- AIR (air temperature probe)

**EB0647**

- M1 (fan motor DC inverter)
- S1 (grill safety micro-switch)
- Y1 (hot water solenoid valve)
- Y2 (cold water solenoid valve)
- L-N (230V/50Hz electrical power supply connection)
- H2 (hot water temperature probe)
- AIR (air temperature probe)
2.8 ER0645 and ER0648 connections

<table>
<thead>
<tr>
<th>A-B</th>
<th>Serial connection for wall-mounted remote control EM0649 (respect the A-B polarisation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2</td>
<td>hot water temperature probe</td>
</tr>
<tr>
<td>H4</td>
<td>cold water temperature probe (*)</td>
</tr>
<tr>
<td>M1</td>
<td>fan motor DC inverter</td>
</tr>
<tr>
<td>S1</td>
<td>grill safety micro-switch</td>
</tr>
<tr>
<td>Y1</td>
<td>hot water solenoid valve (230V/50Hz 1A powered output)</td>
</tr>
<tr>
<td>Y2</td>
<td>cold water solenoid valve (230V/50Hz 1A powered output) (*)</td>
</tr>
<tr>
<td>L-N</td>
<td>230V/50Hz electrical power supply connection</td>
</tr>
<tr>
<td>BO</td>
<td>boiler go-ahead output (free contact max 1A)</td>
</tr>
</tbody>
</table>

- **CH**: chiller go-ahead output (free contact max 1A)
- **FF**: output for servomotor mobile aspiration panel (230V/50Hz 1A powered output)
- **CP**: presence sensor input (if closed, the fan coil goes into stand-by.)
- **RS**: RS version connection

*Only present in the ER0648 panel for 4-pipe versions.*

⚠️ The control panel can be operated even if without INN-DU2 interface.

---

**ER0645**

---

**ER0648**
3.1 Fitting and connecting the wall-mounted remote control panel EM0649

The wall-mounted EM0649 is an electronic thermostat (fitted with temperature probe) with the possibility of controlling one or more cooler-convector/cooler-radiators (up to a maximum of 30) equipped with electronic control for allowing remote control ER0645 or ER0648.

- Install the wall-mounted remote control EM0649 away from doors or windows and sources of heat (heaters, convectors, stoves, direct sunlight), on internal walls at a height of about 1.5 m from the floor.

The wall-mounted remote control is already assembled in the package so follow the following mounting instructions:

- open the cover by levering the two lower lugs with a screwdriver (ref. E and F);
- unscrew the two fixing screws on the electronic boards at the base of the control (ref. D);
- use the base of the control (ref. A) to trace the fixing point on the wall (use the two opposite holes);
- drill the holes in the wall;
- route the electric wires through the windows on the base;
- fix the base of the control to the wall using suitable plugs (ref. B).

A 230/12 VDC PCB transformer (ref. H) is supplied for the electric power supply of the control that should be installed in the connection box (ref. G) on board of one of the devices equipped with electronic control for allowing remote control ER0645 or ER0648.
3.2 EM0649 connections

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 ER0645 or ER0648 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 ohm 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 terminals of the 230V power supply of power supply board 230/12VDC INN-FR-B3 to clamps L and N of board INN-FR-41 of control ER0645 or ER0648;
- Connect the power SUPPLY terminals + and - of the wall-mounted control EM0649 to the 230/12VDC power supply board, observing the polarity.

⚠️ Power the remote control solely with the 230/12 VDC power supply board provided.

---

3.3 CP presence contact input connection

The SW2 input must be connected to a free contact (not powered) and, when the contact is closed the remote control panel EM0649 and all the electronic control for allowing remote control ER0645 or ER0648 connected will be switched off.
4.1 EB0643 machine onboard control assembly and connecting

The on-board machine control with speed selector and ON/OFF button, thermostat adjustable between 5 and 40°C, summer/winter selector and minimum winter temperature (30°C) and maximum summer temperature function (20°C) is suitable for installation onboard and has a 230 V output for solenoid valve control.

4.2 Mounting

Place the control panel into its housing in the upper part of the cooler-convектор/cooler-radiator and fix it with the two supplied screws (ref. A).

To install the connection box:
- open the box (ref. B);
- insert the lower lug into the special slot (ref. C) on the side of the appliance;
- hook the upper part of the box to the side (ref. D);
- fix it with the two supplied screws (ref. E);
- fix the earth wire to the cooler-convектор/cooler-radiator structure using the supplied screws (the minimum force of about 2N must be used when screwing-up);
- connect the rapid connector on the motor (FAN_COIL) to that on the board (ref. I) *;
- the 2 terminals of the LOCK clamp (ref. L) feature a jumper that ensures the operation of the SU and RSI versions without microswitch.

For the other versions remove the jumper and connect the two terminals from the grid safety microswitch. * ;
- connect the water probe connector (ref. F) on the Cooler-convектор/cooler-radiator;
- the water temperature probe checks the temperature inside the batteries and determines the start of the fan based on the set parameters (minimum winter and maximum summer functions). Check that it is inserted correctly in the well on the battery;
- make the electrical connections, order the wiring and fix the wires using the 3 supplied clamps (ref. G);
- close the box and fix with the 4 screws (ref. H);
- mount the aesthetic side panel on the Cooler-convектор/cooler-radiator;
- tighten the upper screw on the control panel;
- For versions with hydraulic connections on the right refer to the relevant paragraph.
### 4.3 Mounting air temperature probe

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

![Diagram of probe positioning](image)

### 4.4 EB0643 connections

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2</td>
<td>water temperature probe</td>
</tr>
<tr>
<td>M1</td>
<td>fan motor DC inverter</td>
</tr>
<tr>
<td>S1</td>
<td>grill safety micro-switch</td>
</tr>
<tr>
<td>Y1</td>
<td>water solenoid valve (230V/50Hz 1A powered output)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-N</td>
<td>230V/50Hz electrical power supply connection</td>
</tr>
<tr>
<td>RS</td>
<td>RS version connection</td>
</tr>
<tr>
<td>AIR</td>
<td>air temperature probe</td>
</tr>
</tbody>
</table>

- **EB0643 connections**

### 4.5 Water probe management kit EB0643

If the board detects the water temperature probe, in the battery pocket on the appliance, start-up takes place normally. If the probe is not connected, its absence is signalled with the red and blue LEDs flashing simultaneously and the appliance will not start.

To confirm operations without the probe, press the summer/winter button for 5 seconds (ref A). This condition is stored by the board for all subsequent start-ups.

In any case, once the probe is connected normal operations are restored with temperature thresholds.

If the machine runs with the probe connected and the water temperature is not suitable for active operations (above 20°C in cooling or below 30°C in heating), ventilation is stopped and the fault is signalled by the flashing of the corresponding LED of the selected function (blue cooling C or red heating D).
5.1 Mounting and connecting the fan control for remote adjustment BB0642

Mounted on board the machine, it manages the motor with fixed speed; it can only be installed on the AIR LEAF SL and SLI versions and can be connected to controls with an INNOVA thermostat or any other controls available on the market.

5.2 Mounting

Place the control panel into its housing in the upper part of the cooler-convecto/cooler-radiator and fix it with the two supplied screws (ref. A).

To install the connection box:
- open the box (ref. B);
- insert the lower lug into the special slot (ref. C) on the side of the appliance;
- hook the upper part of the box to the side (ref. D);
- fix it with the two supplied screws (ref. E);
- fix the earth wire to the cooler-convecto/cooler-radiator structure using the supplied screws (the minimum force of about 2N must be used when screwing-up);
- the 2 terminals of the LOCK clamp (ref. I) feature a jumper that ensures the operation of the SLI and RSI versions without microswitch.

For the other versions remove the jumper and connect the two terminals from the grid safety microswitch, *;
- connect the rapid connector on the motor (FAN_COIL) to that on the board;
- make the electrical connections, order the wiring and fix the wires using the 3 supplied clamps (ref. F);
- close the box and fix with the 4 screws (ref. G);
- mount the aesthetic side panel on the Cooler-convecto/cooler-radiator;
- tighten the upper screw on the control panel;
* For versions with hydraulic connections on the right refer to the relevant paragraph.
5.3 Diagram for BB0642 connections with 3-speed thermostats

Make the electrical connections to a thermostat that is suitable for the purpose, according to the diagram in the picture.

- **L-N**: 230V-50Hz electric power supply
- **COM**: common neutral for the inputs
- **EV**: electrovalve consent input
- **V1**: maximum fan speed
- **V2**: medium fan speed
- **V3**: minimum fan speed
- **V4**: supersilent speed
- **E/I**: heating, cooling selection input. See Water probe management paragraph

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y1</td>
<td>hot water electrovalve (outlet with a voltage of 230V/50Hz 1A)</td>
</tr>
<tr>
<td>RS</td>
<td>RS version wiring</td>
</tr>
<tr>
<td>M1</td>
<td>inverter DC fan motor</td>
</tr>
<tr>
<td>S1</td>
<td>grid safety microswitch</td>
</tr>
<tr>
<td>CV</td>
<td>thermostat consent</td>
</tr>
<tr>
<td>SV</td>
<td>speed selector</td>
</tr>
<tr>
<td>H2*</td>
<td>water temperature probe (2kΩ) located in the battery on the machine. See the Water probe management paragraph</td>
</tr>
</tbody>
</table>

5.4 BB0642 connection with 3-speed thermostats

The COM connector on the corner of the board is the common to be bridged to neutral N of the 230V power supply. The CV input is the ON/OFF of the board, which goes into stand-by with the input open. It must be bridged to connector L of the 230V electric power supply to activate the electrovalve.

The 4 inputs of speeds V1, V2, V3 and V4, when bridged to connector L of the 230V electric power supply, activate the fan, if input S1 to which the grid safety microswitch is connected is closed. The sequence is at maximum speed, equal to 1400rpm on connector V1, medium speed, 1100rpm on connector V2, minimum speed, 680rpm on connector V3 and supersilent speed, 450rpm on connector V4.

In the event of simultaneous closure of several inputs, the motor will run at a number of revolutions equal to that set by the connection with the highest speed.

One can connect several boards in parallel to a single thermostat, even using several speeds.
5.5 Diagram for BB0642 connections with 0-10V thermostats

Make the electrical connections to a thermostat that is suitable for the purpose, according to the diagram in the picture.

| L-N | 230V-50Hz electric power supply |
| COM | common neutral for the inputs |
| EV  | electrovalve consent input |
| 10V | device pilot input 0±10V |
| E/I | heating, cooling selection input |
| Y1  | hot water electrovalve (outlet with a voltage of 230V/50Hz 1A) |

The COM connector on the corner of the board is the common to be bridged to neutral N of the 230V power supply. The CV input is the ON/OFF of the board, which goes into stand-by with the input open. It must be bridged to connector L of the 230V electric power supply to activate the electrovalve. The 10V input is also subjected to the action of this input. The 10V input, if input S1 to which the grid safety microswitch is connected is closed, adjusts the number of fan revolutions alternatively to the 4 inputs, when a jumper is fitted between the two PINs of the SPARE port. The speed “ramp” provides a linear adjustment from the minimum value (450rpm) to the maximum value (1400rpm) for voltage values ≥ 1V-10V DC. The motor is off with values below 1V DC.

5.6 BB0642 connections with 0-10V thermostats
### 5.7 LED signals

The LED (ref. A) is off if input CV is not closed (stand-by condition). It is switched on upon closure of contact CV and signals standard operation. It emits a single flash + pause for fan stop alarm due to unsuitable water (with H2 water probe connected). 2 flashes + pause for motor alarm (for example, jamming due to foreign bodies; fault in the rotation sensor, activation of the protective microswitch due to the filter cleaning operation). 3 flashes + pause for water probe alarm disconnected or faulty.

### 5.8 Water probe management BB0642

If the water temperature detection probe is not connected the fan starts immediately.

If the water temperature detection probe is not connected the fan starts immediately. If the probe fitted on the device and positioned in the relevant battery well is connected to the T_ACQUA (ref. B) connector, the board runs the minimum water temperature functions for the heating mode and the maximum water temperature functions in the cooling mode; therefore if the water temperature is not suitable for active operation (above 20°C during the cooling mode, under 30°C in the heating mode) ventilation is stopped and the anomaly is signalled by a single flash + pause of the LED (ref. A).

The heating/cooling discriminant is implemented through the E/I input (ref. C) of the board: by leaving the input open, the board goes into heating mode; by closing it, it goes into cooling mode. If after having connected the probe it is disconnected, its absence is signalled with 3 flashes + 1 pause of the LED (ref. A) and by the operation block.

To confirm operation without the board disconnect and reconnect the board power. This condition will be stored by the board for all subsequent start-ups. In any case, when the probe is connected, normal operation is resumed with temperature thresholds.
6.1 BB0642 + BM1151 connections diagram

The wall-mounted control BM1151II is an electronic thermostat with ON/OFF switch, a three-speed switch and a summer/winter switch. The control must be combined with the remote adjustment control BB0642. It is equipped with a live output for powering an electrovalve and a presence sensor input (if closed, the fan coil goes into stand-by).

- **L-N**: 230V-50 Hz electrical supply
- **CP**: Presence contact input (if closed, the fan coil goes into stand-by.)
- **COM**: Common inlet neutral
- **EV**: Enable input
- **V1**: Max fan speed (1400rpm)
- **V2**: Med fan speed (1100rpm)
- **V3**: Min fan speed (680rpm)
- **V4**: Supersilent speed (450rpm)
- **Y1**: water electrovalve (outlet with a voltage of 230V/50Hz 1A)
- **RS**: Rs version connection
- **M1**: DC inverter fan motor
- **S1**: Microswitch

---

![BB0642 + BM1151 connections diagram](image-url)
The built-in control kit BM0152 allows to adjust all the functions of the fan coil. It is equipped with a live output for powering an electrovalve. Via the incorporated probe, it adjusts the room temperature by acting on the three speeds of the fan coil. If it is connected to the water probe located in the device battery well, it controls the minimum functions during the heating mode (42°C) and maximum functions during the cooling mode (17°C). It must be fitted in combination with the remote adjustment control BB0642.

### BB0642 + BM1152 connections diagram

- **L-N**: 230V-50Hz electrical supply
- **COM**: Common inlet neutral
- **EV**: Enable input
- **V1**: Max fan speed (1400rpm)
- **V2**: Med fan speed (1100rpm)
- **V3**: Min fan speed (680rpm)
- **V4**: Supersilent speed (450rpm)
- **Y1**: water electrovalve (outlet with a voltage of 230V/50Hz 1A)*
- **RS**: RS version connection
- **M1**: DC inverter fan motor
- **S1**: Microswitch
- **H2**: Water temperature probe (2kohm)
  
  * Into the coil on the unit
8.1 Full flat versions connection
In this version, the servomechanisms for the grill movement are pre-wired. They can be connected, with the special connector, to the FF output of the EB0644 and ER0645 control panels. If an electromechanical thermostat or a non original control are used, connect the two terminals directly to the 230V / 50 Hz power supply for the solenoid valve. A - to the control solenoid valve connector
B - to the solenoid valve head

8.2 RS versions connection
In the RS versions, connect the relevant quick connector to the output of electrovalve Y1 provided on the electronic board (see Connections paragraph).

8.3 Water connection on the right side versions motor connection
In the event one needs to invert the position of the hydraulic battery connections from the left side to the right side of the device, the electric connections box is also inverted, but since the fan motor and the grid safety microswitch are constrained in the original position, one must use the special kit BB0646, available as an accessory.
The cable, equipped with male/female connectors, must be connected on the right side to the motor and on the left side to the quick connector of the motor present on the board (ref.D).
Also, the two terminals from the grid safety microswitch must be extended and connected on the left side to contact S1 present on the board (ref.E).
The cables are fed through the back of the device through the specific hole (ref.C).
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