

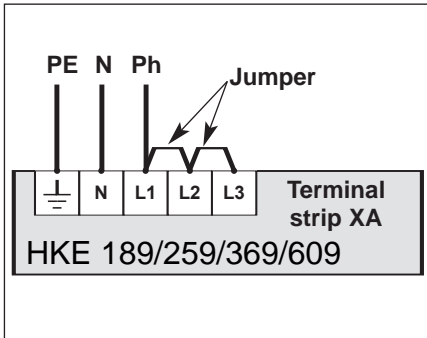


INSTALLASJONSMANUAL FOR ELEKTRIKER

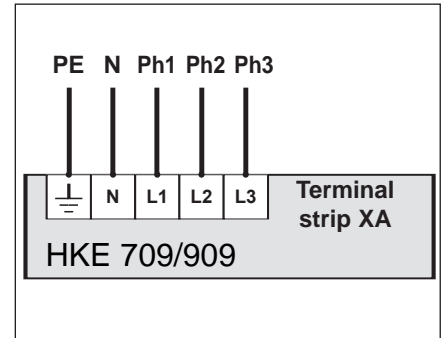
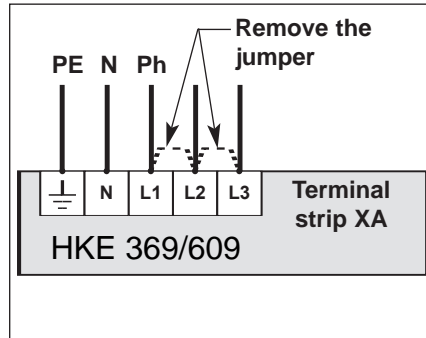
**230/1/50
400/3+N/50**

PSHRI

Single-phase power supply
230V / 1+T / 50Hz



Single-phase power supply
400V / 3+N+T / 50Hz



POWER SUPPLY CABLE

- **Section:** see amperage table.
- The sections are given as an indication only. They have to be verified and adapted, if necessary, according to the installation conditions and the standards in force.

CURRENTS AND CROSS-SECTIONS

Model	HKE-189 R 230/1/50	HKE-259 R 230/1/50	HKE-369 R 230/1/50	HKE-369 R 400/3N/50	HKE-489 R 230/1/50	HKE-489 R 400/3N/50	HKE-609 R 230/1/50 (*)	HKE-609 R 400/3N/50	HKE-709 R 400/3N/50	HKE-909 R 400/3N/50
Rated input amperage A	20.5	20.5	27	9.5	27	9.5	27	14	19	19
Protection rating A	25	25	32	12	32	12	32	16	25	25
Power supply cable size	3G4mm ²	3G4mm ²	3G6mm ²	5G2.5mm ²	3G6mm ²	5G2.5mm ²	3G6mm ²	5G2.5mm ²	5G4mm ²	5G4mm ²

(*) With 6 kW electric heating module only.

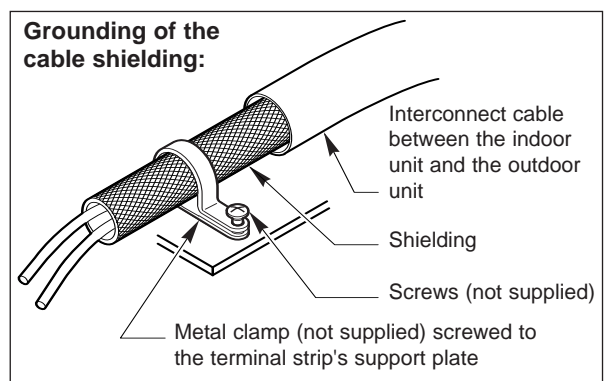
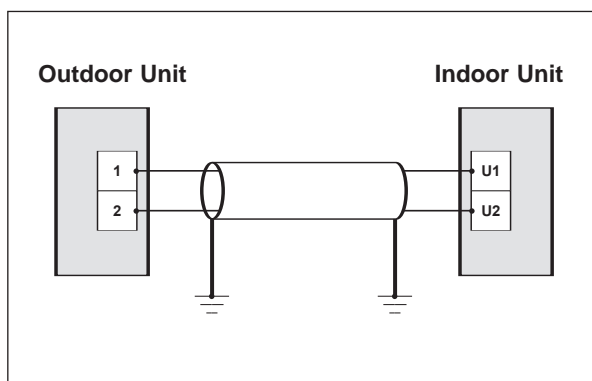
SELECTION OF ELECTRIC HEATING MODULE POWERS

- To obtain the maximum electric heating module power ratings, the jumper must be installed between 22 and 23 on terminal strip XA (jumper included).

Model	HKE-189 R		HKE-256 R		HKE-366R		HKE-486R		HKE-606R single		HKE-606R three		HKE-706R		HKE-906R	
Jumper between 22 and 23 of terminal strip XA	no	yes	no	yes	no	yes	no	yes	no	no	yes	no	yes	no	yes	
Electric heating module powers kW	3 (1.5+1.5)	4,5 (3+1.5)	3 (1.5+1.5)	4,5 (3+1.5)	4 (2+2)	6 (4+2)	4 (2+2)	6 (4+2)	6 only (3+3)	6 (3+3)	9 (6+3)	8 (4+4)	12 (8+4)	8 (4+4)	12 (8+4)	

4.3.3 - CONNECTION WITH THE OUTDOOR UNIT

- The control connection between the indoor unit and the outdoor unit is made by a shielded 0.75 mm² cable (AWG #18), with the shielding grounded at both the indoor unit and outdoor unit side.
- Maximum length 70 meters.
- The cable's shielding must be grounded at both ends by means of a metal clamp (not supplied) screwed onto the terminal strip support plate.
- To avoid problems related to electromagnetic disturbances, do not route this cable near power cables.

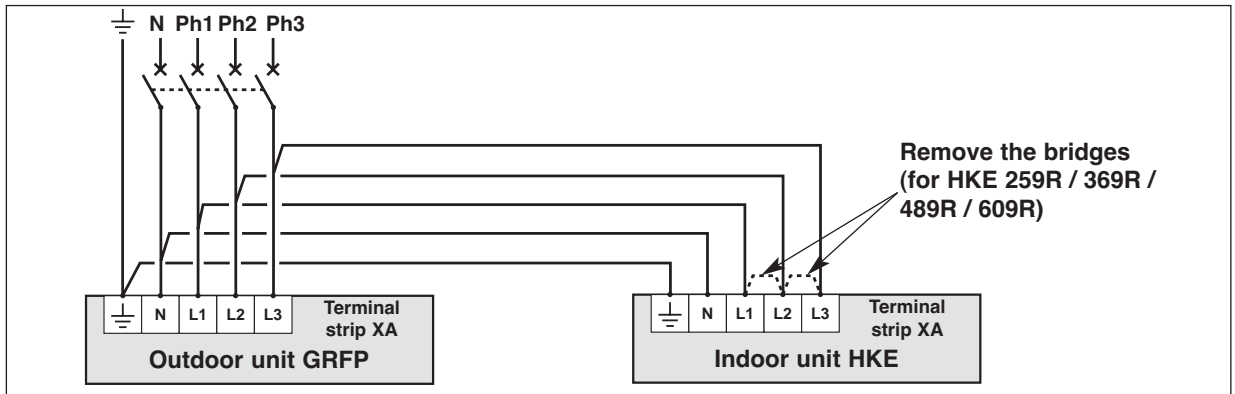


4.3.2.2 - 400 V three-phase power supply

- Provide a common power supply for both the outdoor unit and the indoor unit.
- The indoor unit power cable is connected to the outdoor unit's terminal strip. See diagram below.

Note: the indoor unit's power cable must be the same size as the general power supply cable.

Single-phase power supply
400 V / 3 + N + T / 50 Hz



Power supply amperages and cable sizes

- The sections are given as an indication only. They have to be verified and adapted, if necessary, according to the installation conditions and the standards in force.

Model		259R	369R	489R	609R	709R	909R
Maximum input amperage (A)	Indoor unit HKE (*)	9.5	9.5	9.5	14	19	19
	Outdoor unit GRFP	8.2	9	12.5	14	12.5	15
	Total	17.7	18.5	22	28	31.5	34
Protection rating (A)		20	20	25	32	40	40
Power supply cable size		5 G 4 mm ²	5 G 4 mm ²	5 G 4 mm ²	5 G 6 mm ²	5 G 6 mm ²	5 G 6 mm ²

(*) With maximum electric heating module power (see below).

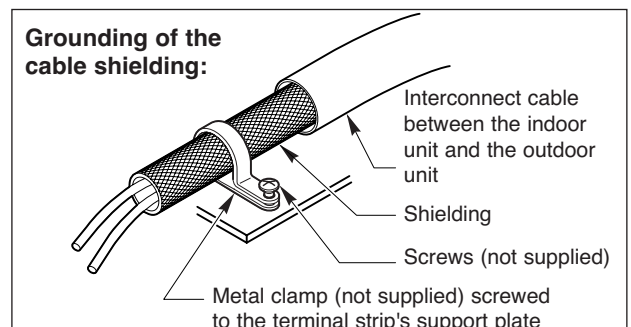
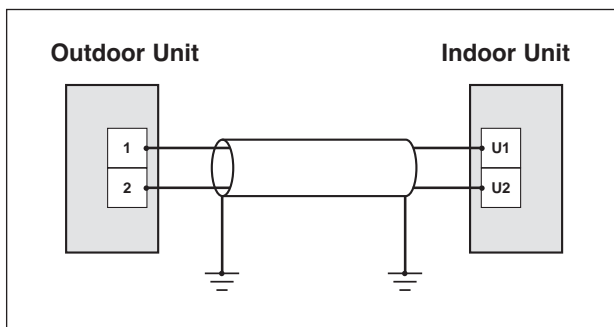
4.3.2.3 - Selection of electric heating module powers

- To obtain the maximum electric heating module power ratings, the bridge must be installed between 22 and 23 on terminal strip XA (bridge included).

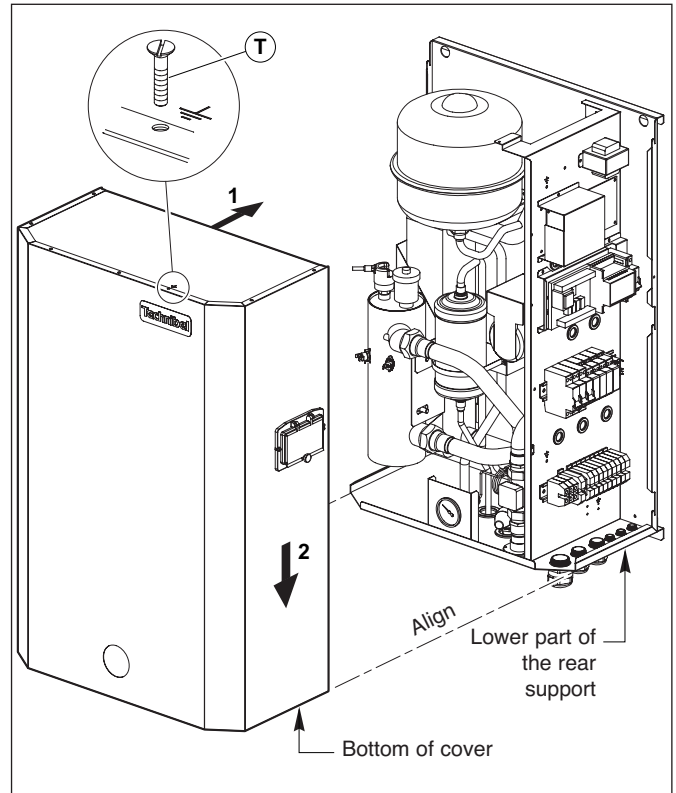
Model	HKE 189R		HKE 259R		HKE 369R		HKE 489R		HKE 609R single		HKE 609R three		HKE 709R		HKE 909R	
Bridge between 22 and 23 of terminal strip XA	no	yes	no	yes	no	yes	no	yes	no	no	yes	no	yes	no	yes	
Electric heating module powers kW	3 (1.5+1.5)	4,5 (3+1.5)	4 (2+2)	6 (4+2)	4 (2+2)	6 (4+2)	4 (2+2)	6 (4+2)	6 only (3+3)	6 (3+3)	9 (6+3)	8 (4+4)	12 (8+4)	8 (4+4)	12 (8+4)	

4.3.3 - CONNECTION WITH THE OUTDOOR UNIT

- The control connection between the indoor unit and the outdoor unit is made by a shielded 0.75 mm² cable (AWG #18), with the shielding grounded at both the indoor unit and outdoor unit side.
- Maximum length 70 meters.
- The cable's shielding must be grounded at both ends by means of a metal clamp (not supplied) screwed onto the terminal strip support plate.
- To avoid problems related to electromagnetic disturbances, do not route this cable near power cables.

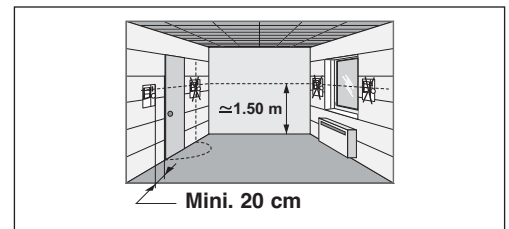


- Replacing the cover.
 - Present the cover on the unit while aligning the lower edge with the lower part of the rear support.
 - Fit the cover against the rear support to engage the hooks in the notches (1).
 - Slide the cover downward fully into place (2).
 - Replace the retaining screws.
 - **Note:** the screw (T) on top of the unit ensures the cover's ground continuity. This is a special screw and only this model should be used.
 - The screw on the left-hand side is used primarily for transport. In the case of insufficient clearance (too close to a wall), this screw need not be replaced.

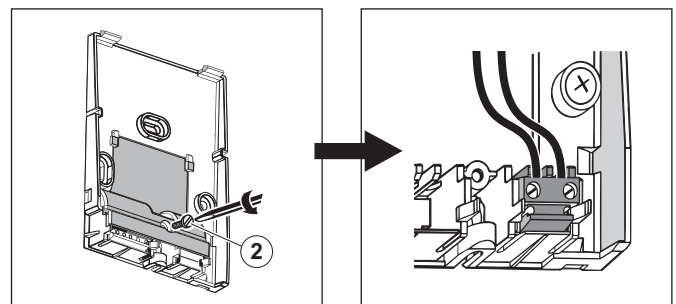


3.3 - CONTROL UNIT INSTALLATION

- As the control unit is equipped with a temperature sensor, it must be installed in a location that is representative of the temperature in zone 1.
- **Note:** For 2-zone applications, an ambient temperature sensor (zone 1) (accessory) can be connected on the 2-zone module thus doing away with the need to install the control unit in zone 1.
- Wall mounting: the unit must not be installed in corners, on shelves or behind curtains, near sources or heat or directly exposed to sunlight. The unit should be installed approximately 1.5 m above the floor.
- Open the box by removing the lower screw and secure the base to the wall (mounting holes, item (1)).

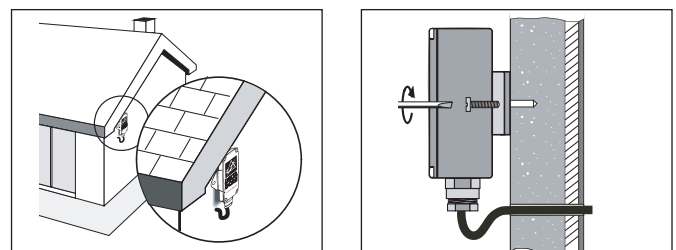


- Open the protective cover (screw (2)) and connect the BUS link to the control board (see diagram in paragraph 4.3.4.).
- Fit the control unit back on its base.



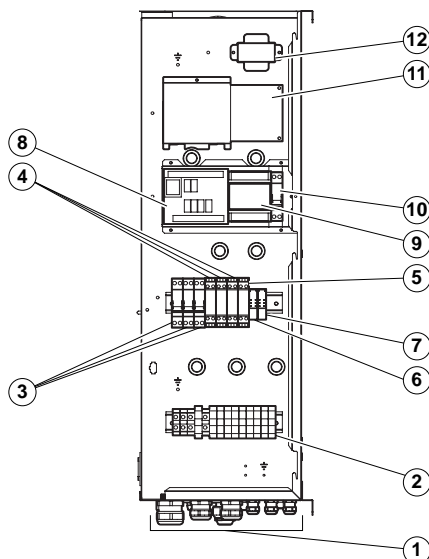
3.4 - INSTALLATION OF THE OUTDOOR TEMPERATURE SENSOR

- This sensor must be located outside in a location that is representative of the temperature to be measured (on a wall facing North / North-west) and located away from parasitic heat sources (chimney, thermal bridge, etc..) and sheltered from inclement weather (under a roof overhand, for example).
- Connection as per paragraph 4.3.4.



2.1.2 - ELECTRICAL BOX

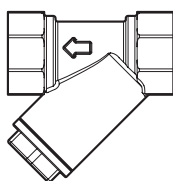
- 1 - Electrical cable passage.
- 2 - Terminal strip.
- 3 - Heating element circuit breakers.
- 4 - Heating element contactors.
- 5 - Circulator contactors.
- 6 - Fault relays.
- 7 - Water flow rate relay.
- 8 - Heating control board.
- 9 - Communication module CC1.
- 10 - Control circuit circuit-breaker.
- 11 - Indoor unit board.
- 12 - Transformer.



2.1.3 - ACCESSORIES INCLUDED WITH THE APPARATUS

• **Hydraulic filter:**

- 3/4" FF for HKE 189R and 259R.
- 1" FF for HKE 369R, 489R and 609R.
- 1 1/4" for HKE 709R and 909R.



• **Control unit:**

- Plastic wall-mounted control unit.
- Dimensions:

height	=	128 mm
width	=	86 mm
depth	=	34 mm
- Colour: White
- Class III
- IP 30



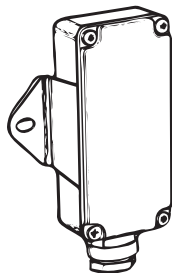
• **Outside temperature sensor:**

- Installed in a box with cable gland.

Note:

This sensor must be installed in a location that is sheltered from inclement weather.

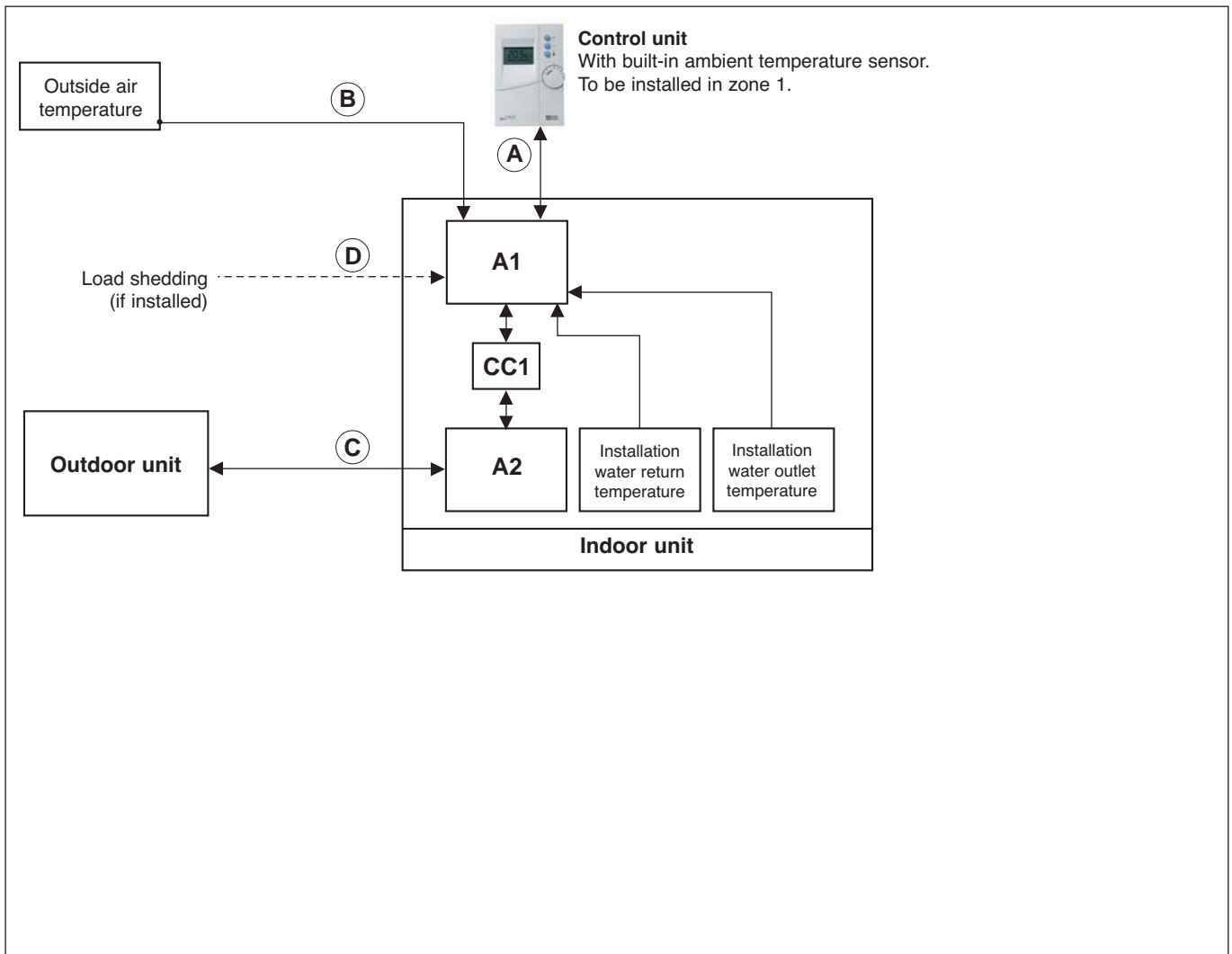
See details in paragraph 3.4.



4.3.4 - OTHER CONTROL CONNECTIONS

Caution:

To avoid problems related to electromagnetic disturbances, do not route these cables near power cables.



A) BUS

- 2-conductor shielded cable, minimum size 1 mm² with shielding grounded on indoor unit side (*).
- **Total** length of the BUS connection: 40 meters (indoor unit / control box connection + indoor unit / 2-zone module connection, if any or possible DHW tank).
- To be connected to the (+) and (-) terminals if terminal strip XB.
- (*). Refer to the ground shielding principle in paragraph 4.3.3.

B) Outside temperature sensor

- 2-conductor cable, min. size 0.5 mm².
- Maximum length 25 meters.
- To be connected to the heating board **A1**.
- **Note:**
This sensor must be located outside in a location that is representative of the temperature to be measured (on a wall facing North / North-west) and located away from parasitic heat sources (chimney, thermal bridge, etc..) and sheltered from inclement weather (under a roof overhand, for example).

C) Outdoor unit control connection

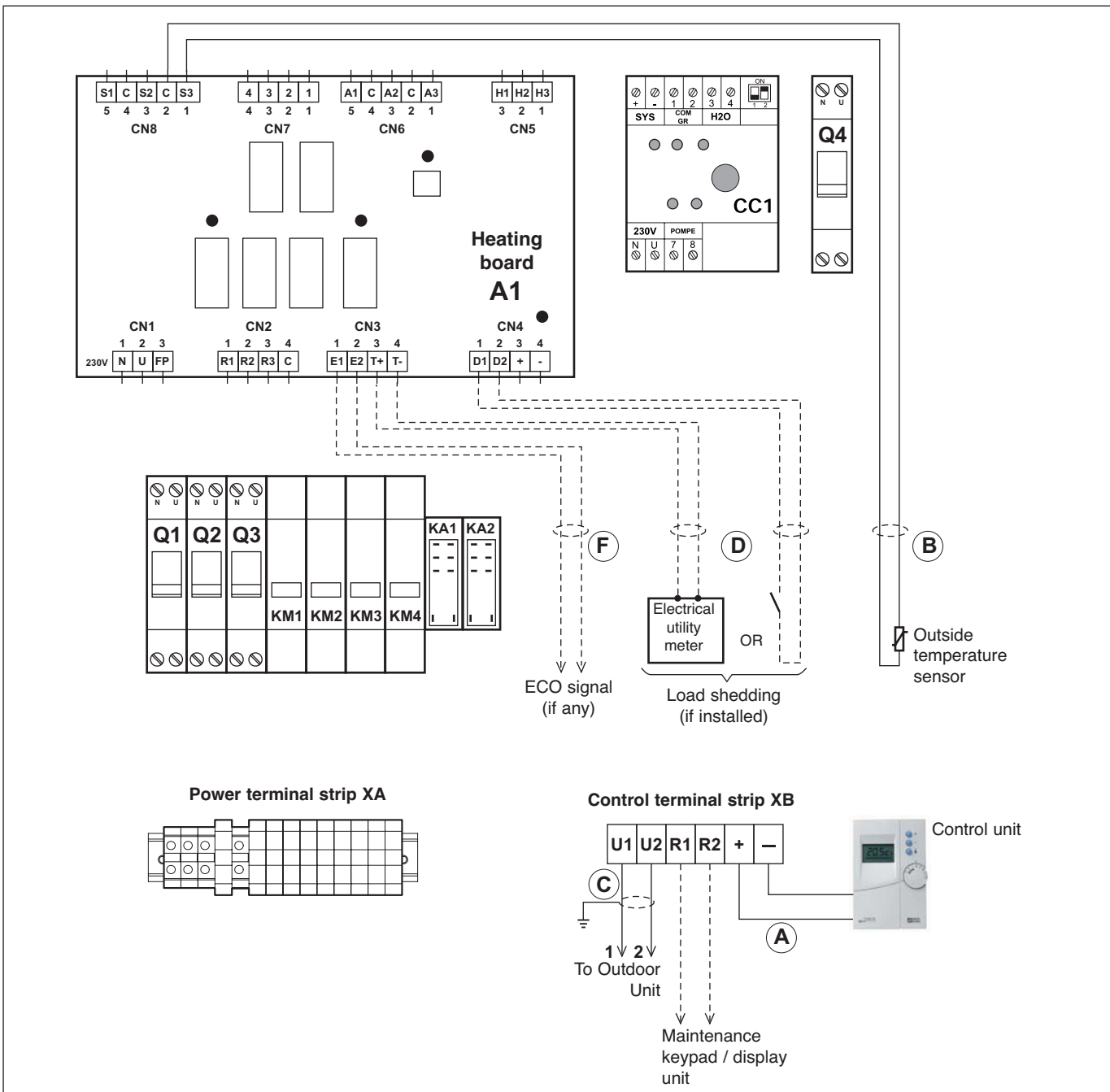
- 2-conductor shielded cable with shielding grounded on both the outdoor unit and indoor unit side.
- Minimum cable size: 0.75 mm².
- Maximum length 70 meters.
- Connection as per paragraph 4.3.3.

D) Module additional heating load shedding signal (if installed)

- Two possibilities:
 - 1) By a "remote info" signal coming from the electrical utility meter: 1 twisted pair (6/10) cable with shielding (shielding grounded on module side).
 - 2) By a good quality, potential-free external contact.
 - Contact closed = load shedding of the additional electric heating.
 - 2-conductor cable, min. size 0.5mm².
 - Maximum length 25 meters.
- To be connected to the heating board **A1**.

CONTROL PART CONNECTION DIAGRAM

- Route the control cables on the right side of the board.
- Pass the pilot wire (230 V) on the left side of the board.



- If tripped:
 - **Turn off and lock out the unit.**
 - Correct the fault.
 - Reset the circuit breaker.

Note:

The opening of circuit breaker **Q4** disconnects only the control part. In the event of maintenance / servicing, all circuits must be disconnected by opening the main circuit breaker.

7.5 - TROUBLESHOOTING RECOMMENDATIONS

- All maintenance and servicing operations on the refrigerating circuit must be conducted in accordance with standard trade practices and safety rules: recovery of the refrigerant, inert shielded (nitrogen) brazing, etc...
- All brazing operations must be conducted by qualified welders.
- For equipment charged with R 410 A, refer to the specific instructions in paragraph 4.1 and in the outdoor unit's manual.
- This unit is equipped with pressurised equipment, for example piping.
Use only genuine parts listed in the spare parts list for replacing defective refrigeration components.
- Pipes may only be replaced by copper tubing in compliance with standard NF EN 12735-1.
- Leak detection, in the case of pressure testing:
 - Never use oxygen or dry air, as the risk of fire or explosion is present.
 - Use dehydrated nitrogen or a nitrogen and refrigerant mix indicated on the manufacturer's plate.
 - For units equipped with pressure gauges, the test pressure must not exceed the gauges' maximum allowable pressure rating.
- All part replacement with other than genuine parts, all modifications of the refrigerating circuit, all replacement of refrigerant by a fluid other than that indicated on the manufacturer's plate, all use of the unit outside the application limits defined in the documentation, shall result in the cancellation of PED EC marking compliance which shall fall under the liability of the individual who carried out these modifications.
- The technical information, relative to the safety requirements of the various applicable directives, is indicated on the manufacturer's plate of the unit and mentioned on the 1st page of this manual.

8 - WIRING DIAGRAM

Symbols of the components

A1	Heating control PCB
A2	Indoor unit PCB
CC1	Communication and control module
E1	Water pressostat
F1	Automatic - heater safety thermostat
F2	Manual - heater safety thermostat
J1	Water flow switch
KA1	Heater fault relay
KA2	Water flow relay
KM1	R1 contactor
KM2	R2 contactor
KM3	R3 contactor
KM4	M1 contactor
M1	Water circulator pump
Q1	R1 circuit breaker
Q2	R2 circuit breaker
Q3	R3 circuit breaker
Q4	Control circuit breaker
R1	Support heating element
R2	Support heating element
R3	Support heating element
S1	Water inlet temperature sensor (system)
S2	Water outlet temperature sensor
S3	Outdoor air temperature sensor
S4	Heat pump exchanger temperature sensor (E2)
S5	Liquid line temperature sensor (E1)
S6	Water return temperature sensor (Heat pump) (TA)
TR	Indoor unit board power supply transformer

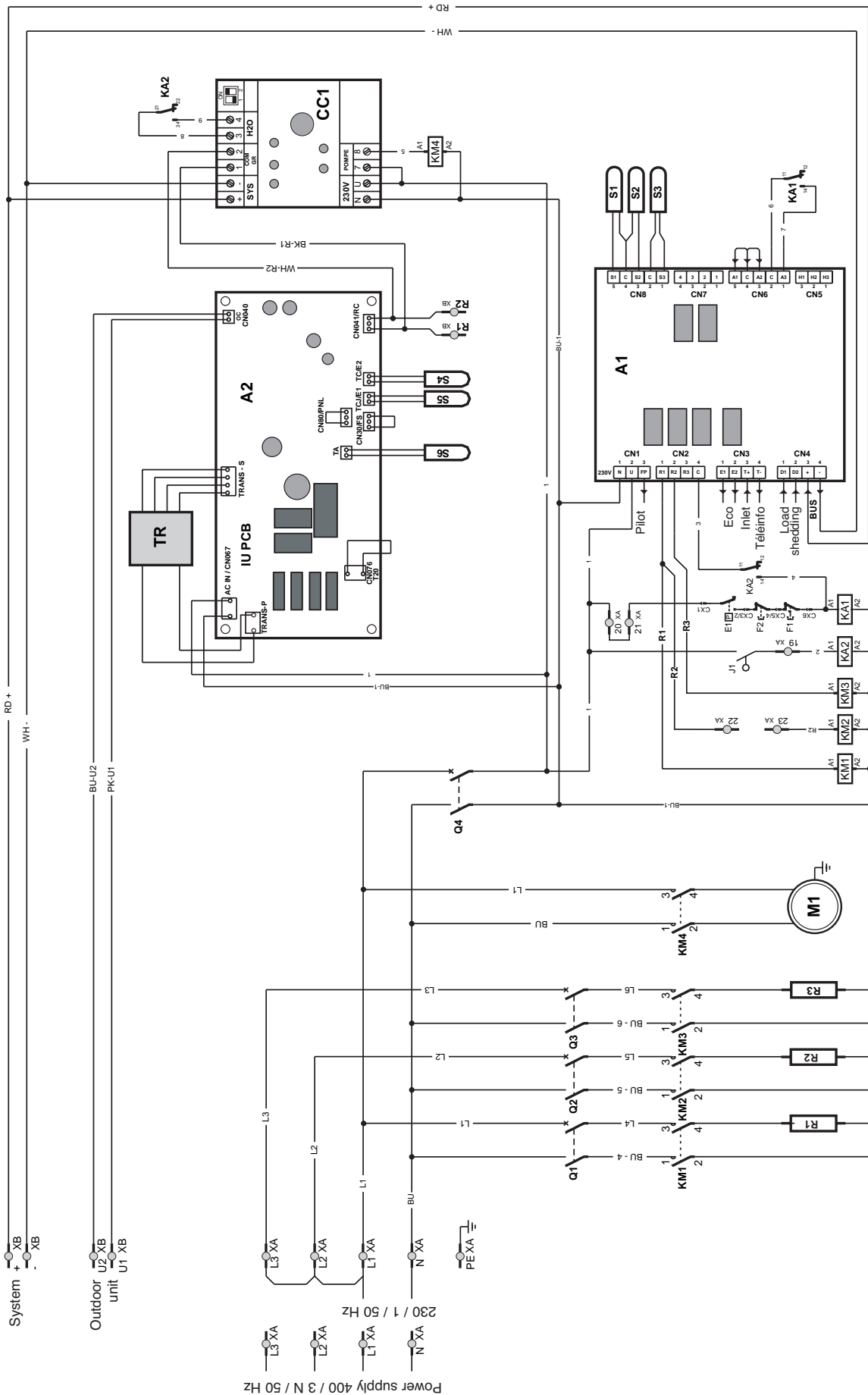
Colours of the wires

BU	Blue
BK	Black
PK	Pink
RD	Red
WT	White

ELECTRICAL DIAGRAM - HKE 189R / 259R / 369R / 489R / 609R / 709R / 909R - 230 / 1 / 50 - 400 / 3 N / 50

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■ Electrical Wiring

● General Precautions on Wiring

- (1) Before wiring, confirm the rated voltage of the unit as shown on its nameplate, then carry out the wiring closely following the wiring diagram.
- (2) Provide a power outlet to be used exclusively for each unit, and a power supply disconnect and circuit breaker for overcurrent protection should be provided in the exclusive line.
- (3) To prevent possible hazards from insulation failure, the unit must be grounded.
- (4) Each wiring connection must be done in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.
- (5) Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.
- (6) Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.
- (7) Regulations on wire diameters differ from locality to locality. For field wiring rules, please refer to your LOCAL ELECTRICAL CODES before beginning. You must ensure that installation complies with all relevant rules and regulations.
- (8) To prevent malfunction of the air conditioner caused by electrical noise, care must be taken when wiring as follows:
 - The remote control wiring and the inter-unit control wiring should be wired apart from the inter-unit power wiring.
 - Use shielded wires for inter-unit control wiring between units and ground the shield on both sides.
- (9) If the power supply cord of this appliance is damaged, it must be replaced by a repair shop appointed by the manufacture, because special-purpose tools are required.

Recommended Wire Length and Wire Diameter for Power Supply System

Outdoor unit (Single-Phase)

	(A) Power supply		Time delay fuse or circuit capacity
	Wire size	Max. length	
GRFP-189R5I	2.5 mm ²	19 m	16 A
GRFP-259R5I	2.5 mm ²	14 m	20 A
GRFP-369R5I	2.5 mm ²	14 m	20 A
GRFP-489R5I	4 mm ²	16 m	25 A
GRFP-609R5I	6 mm ²	21 m	30 A

Outdoor unit (3-Phase)

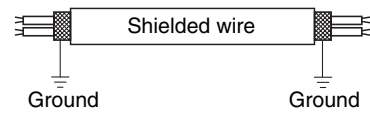
	(A) Power supply		Time delay fuse or circuit capacity
	Wire size	Max. length	
GRFP-259R7I	2.5 mm ²	58 m	16 A
GRFP-366R7I	2.5 mm ²	44 m	16 A
GRFP-486R7I	2.5 mm ²	32 m	16 A
GRFP-606R7I	2.5 mm ²	28 m	20 A

- (5) Use shielded wires for inter-unit control wiring (C) and ground the shield on both sides, otherwise malfunction from noise may occur. Connect wiring as shown in the section “Wiring System Diagrams”.



WARNING

Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also occur. Therefore, ensure that all wiring is tightly connected.



When connecting each power wire to the terminal, follow the instructions on “How to connect wiring to the terminal” and fasten the wire securely with the fixing screw of the terminal plate.

How to connect wiring to the terminal

■ **For stranded wiring**

- (1) Cut the wire end with cutting pliers, then strip the insulation to expose the stranded wiring about 10 mm and tightly twist the wire ends.
- (2) Using a Phillips head screwdriver, remove the terminal screw(s) on the terminal plate.
- (3) Using a ring connector fastener or pliers, securely clamp each stripped wire end with a ring pressure terminal.
- (4) Put the removed terminal screw through the ring pressure terminal and then replace and tighten the terminal screw using a screwdriver.

