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reventon

INDUSTRIAL SOLUTIONS

Technical documentation

DTR

Farmer HCF in EPP casing



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1. INTRODUCTION

Thank you very much for purchasing Reventon Group device. We would like to congratulate you on excellent choice.

1.1 PRECAUTIONS

The buyer and the user of the device should read carefully the following instructions and proceed to the content recommendations. Proceeding due to the following instruction guarantees the correct usage and safety. In case of any doubts please contact the producer. The producer reserves the rights to make changes to the technical documentation without previous notice. The producer is not responsible for the damages which occur due to improper installation, not keeping the device in repair or using the device out of line. The installation should be carried out by the professional installers, who possess the qualifications to install these types of devices. The installers are responsible for making the installation as instructed in the technical data. Regulations and safety rules must be followed. During the installation, use, service and periodical inspections all regulations and safety rules must be followed. In case of unserviceable please plug out the device and contact with the authorized person or the producer.

1.2 TRANSPORT

During the acceptance of goods, it is needed to check the device to exclude any damages. During the transport, it is needed to use the proper equipment, it is necessary to carry the device by two people. In case of any damages please fill in the damage report in presence of the supplier.

1.3 PACKAGE CONTENT

- Heater
- Operation and maintenance manual and warranty card

1.4 USE AND PRINCIPLE OF OPERATION

Devices Reventon Group Farmer are used to heat large-size rooms. These units are suitable to work in aggressive environments, with high dustiness, humidity and concentration of ammonia in the air. Because of the LCE coating, the devices are fully covered with the protective layer. The deposit which occurs in aggressive environments does not stick to the units. Additionally, air water heaters Farmer have antibacterial layer. Air water heaters must be connected to central heating system. Application of modern technologies in Reventon Group devices guarantees high effectiveness and comfort of the consumption. Original colors of the devices match to every interior. The device is made very precisely and will work smoothly for many years.

*The product has got the two years of warranty.

2. DEVICE CONSTRUCTION, DIMENSIONS, TECHNICAL DATA**2.1. CONSTRUCTION**

- Casing
- Air stators
- Heating coil
- Axial blowing fan
- Rotating mounting bracket

Casing: of expanded polypropylene EPP, resistant, light and reliable. The material can carry considerable loads without deforming. It does not degrade under the influence of a lubricant, oil, crude oil and most chemicals. It has an excellent sound insulation property, that is why it is used as casings, material is environmentally friendly and "green", i.e. 100% recyclable. Aesthetic design gives new nature to the device.

Air stators: of polypropylene PP. It is possible to adjust manually the air stators to achieve the needed direction of the air flow.

Heating coil: made of aluminum and copper. The temperature of the heating factor is 120°C; maximum pressure 1,6 MPa; headers diameter ¾". Air water heaters Farmer have 2 row heating coils, they are covered with the LCE coating, which is a protective barrier for aggressive environment.

Axial blowing fan: protective grid made of steel wire galvanized, metal blades. Model HCF-IP54-3S: motor IP 54, rated current 1,08A. Single phase, three-stage fan. Fan's size 450mm. Model HCF-IP65: motor IP65, rated current 2A. Single phase, one-stage fan. Fan's size 450mm.

Meaning of individual characters IP: Solid particle protection

- **The first digit indicates** - the level of protection that the enclosure provides against access to hazardous parts (e.g., electrical conductors, moving parts) and the ingress of solid foreign objects. Liquid ingress protection.
- **The second digit indicates** - the level of protection that the enclosure provides against harmful ingress of water.

Farmer HCF IP54 47kW

- 5- Dust protected - Ingress of dust is not entirely prevented, but it must not enter in sufficient quantity to interfere with the satisfactory operation of the equipment.
- 4- Splashing of water - Water splashing against the enclosure from any direction shall have no harmful effect. (Test duration: 5 minutes, Water volume: 10 liters per minute, Pressure: 50-150 kPa).

Farmer HCF IP65 53kW

- 6- Dust digit -No ingress of dust; complete protection against contact (dust tight).
- 5- Water jets - Water projected by a nozzle (6.3 mm) against enclosure from any direction shall have no harmful effects. (Test duration: at least 3 minutes, Water volume: 12.5 liters per minute Pressure: 30 kPa at distance of 3 m).

Rotating mounting bracket: made of steel, element for mounting the device on the wall or ceiling. Solid and durable construction, possible to assemble device in parallel on the angle 60°. Possible rotation horizontally.

3. DESCRIPTION OF THE MODERN TECHNOLOGY LCE COATING
3.1. ADVANTAGES OF LCE COATING

- increase lifetime of air water heaters in aggressive environments;
- antibacterial layer, which prevents development of bacteria inside the heating coils;
- LCE coating has no influence on capacity;
- LCE coating is spread on the air water heater by deep immersion, because of it LCE coating reaches each slit of the coils;
- hydrophobic surface;
- LCE coating has strong bond to the air water heater's surface.

Anti-corrosion solution, which really works:

LCE coating gives elastic layer on the whole surface of the coil. This layer can last thermal dilatation of the coil without cracking.

The end with corrosion:

Air water heaters very often work in aggressive environments such as: ocean coast, food production lines, animal shelters, piggery, chicken farms and so one where standard protection is not enough. LCE coating offers perfect solution for heaters in such environments.

3.2 CERTIFICATES

- ASTM B1 17** salt spray test 1 0000 hours in heating/cooling cycles changing temperatures between 60°C and 5°C;
- ASTM G 85 A1** Acetic Acid-Salt spray test to prove positive impact on coils used in food industry;
- ASTM G87** Same as G85 utilizing acidic SO₂ electrolyte;
- ASTM D552** Flexibility test, which investigates flexibility of coating to bond to the substrate surface of coil;
- ASTM G85 A5** Indirect spraying of dilute salt and ammonium sulphate at 23°C and followed by 1-hour exposure of dry air at 35°C. Test proving resistance in salt containing environment and industrial applications;

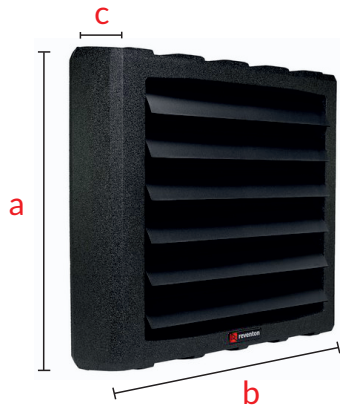
ASTMG21 that examines resistance to fungi. Important aspect for evaporators.

Modern technology called LCE coating protects the air water heaters from corrosion, mould and bacteria's in a very efficient way.

LCE coating is based on water, and it brings additional effects as: antibacterial and waterproof effects. Total immersion application, while LCE coating fills into all spaces in the coil.

4. DIMENSIONS

Height: 698mm (a)
Width: 739mm (b)
Depth: 340mm (c)



5. TECHNICAL DATA

TECHNICAL DATA	UNIT OF MEASURE	FARMER HCF IP54-3S	FARMER HCF IP65
Nominal heating capacity water 90/70°C and inlet air temperature 0°C	kW	46,7	53
Heating power range	kW	20,6-46,7	24-52,8
Maximum airflow	m³/h	III stage 4600 II stage 3800 I stage 2900	5500
Maximum range of air stream	m	26	25
Number of rows	pcs	2	2
Capacity of water	dm³	1,95	2,0
Air temperature rise	°C	29	29,6
Maximum temperature of heating agent	°C	120	120
Maximum operating pressure	MPa	1,6	1,6
Rated current	A	1,08	2
Power supply voltage	V~Hz	230-50	230-50
Motor speed	Rev./min	1360	1380
Motor power	W	240	471
IP silnika	-	54	65
Connection diameter	"	3/4	3/4
Weight with/without water	kg	19,5/17,5	21,5/19,5
Noise	dB	III stage 57 II stage 52 I stage 44	65

Parameters	HCF IP 65 5 stage 5500 m³/h				
Inlet and outlet water temperature [°C]	90/70				
Inlet air temperature [°C]	0	5	10	15	20
Heating capacity [kW]	52,8	48,8	44,9	41,0	37,2
Outlet air temperature [°C]	26,7	30,1	33,5	36,9	40,2
Water flow [m³/h]	2,33	2,15	1,98	1,8	1,64
Pressure drop in the heat exchanger [kPa]	18	15	13	11	9

Parameters	HCF IP 65 5 stage 5500 m³/h				
Inlet and outlet water temperature [°C]	80/60				
Inlet air temperature [°C]	0	5	10	15	20
Heating capacity [kW]	45,3	41,3	37,5	33,7	30,0
Outlet air temperature [°C]	22,9	26,3	29,7	33,0	36,3
Water flow [m³/h]	1,99	1,82	1,65	1,48	1,32
Pressure drop in the heat exchanger [kPa]	13	11	9	8	6

Parameters	HCF IP 65 5 stage 5500 m³/h				
Inlet and outlet water temperature [°C]	70/50				
Inlet air temperature [°C]	0	5	10	15	20
Heating capacity [kW]	37,8	33,9	30,1	26,4	22,7
Outlet air temperature [°C]	19,1	22,5	25,8	29,1	32,3
Water flow [m³/h]	1,65	1,48	1,32	1,15	0,99
Pressure drop in the heat exchanger [kPa]	10	8	6	5	4

Parameters	HCF IP 65 5 stage 5500 m³/h				
Inlet and outlet water temperature [°C]	50/30				
Inlet air temperature [°C]	0	5	10	15	20
Heating capacity [kW]	22,6	18,9	15,2	11,7	8,08
Outlet air temperature [°C]	11,4	14,7	18,0	21,2	24,4
Water flow [m³/h]	0,98	0,82	0,66	0,51	0,35
Pressure drop in the heat exchanger [kPa]	4	3	2	1	1

Parameters	HCF IP 54-3S 3 stage 4600 m³/h				
Inlet and outlet water temperature [°C]	90/70				
Inlet air temperature [°C]	0	5	10	15	20
Heating capacity [kW]	46,7	44,3	40,7	37,1	33,7
Outlet air temperature [°C]	29	32,3	35,5	38,7	41,9
Water flow [m³/h]	2,11	1,95	1,79	1,64	1,49
Pressure drop in the heat exchanger [kPa]	11	10	8	7	8

Parameters	HCF IP 54-3S 3 stage 4600 m³/h				
Inlet and outlet water temperature [°C]	80/60				
Inlet air temperature [°C]	0	5	10	15	20
Heating capacity [kW]	41,1	37,5	34,0	30,6	27,2
Outlet air temperature [°C]	24,9	28,1	31,3	34,5	37,7
Water flow [m³/h]	1,38	1,65	1,5	1,34	1,2
Pressure drop in the heat exchanger [kPa]	9	7	8	6	5

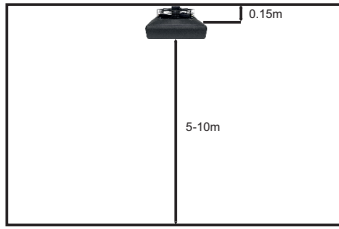
Parameters	HCF IP 54-3S 3 stage 4600 m³/h				
Inlet and outlet water temperature [°C]	70/50				
Inlet air temperature [°C]	0	5	10	15	20
Heating capacity [kW]	34,3	30,8	27,4	24,0	20,7
Outlet air temperature [°C]	20,8	24	27,2	30,3	33,4
Water flow [m³/h]	1,5	1,35	1,2	1,05	0,9
Pressure drop in the heat exchanger [kPa]	8	7	5	6	4

Parameters	HCF IP 54-3S 3 stage 4600 m³/h				
Inlet and outlet water temperature [°C]	50/30				
Inlet air temperature [°C]	0	5	10	15	20
Heating capacity [kW]	20,6	17,2	13,9	10,7	7,41
Outlet air temperature [°C]	12,5	15,6	18,7	21,8	24,8
Water flow [m³/h]	0,89	0,75	0,6	0,46	0,32
Pressure drop in the heat exchanger [kPa]	4	5	3	5	2

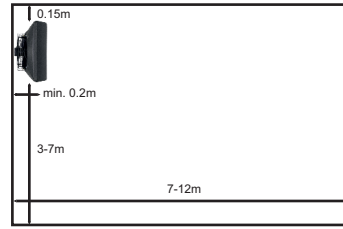
6. ASSEMBLY

Air water heaters Reventon Group Farmer can be assembled on the wall or ceiling via rotating mounting bracket. The drawings below show the ways of assembly. In the bigger accommodation, it is recommended to assemble more than one device. Follow the parameters which are provided on the drawings.

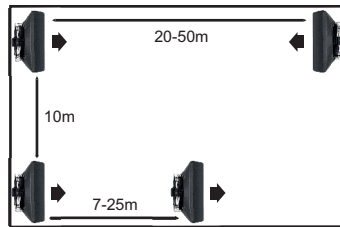
ASSEMBLY ON THE CEILING



ASSEMBLY ON THE WALL



EXAMPLE ARRANGEMENT FOR FEW DEVICES IN THE ROOM



Reventon Group devices can be assembled on the wall or ceiling via rotating mounting bracket. It is possible to assemble the device in parallel on the angle 60°. Please follow the parameters as shown below.

MOUNTING ON A TURNABLE



7. INSTALLATION INSTRUCTIONS

The installation should be made by the qualified staff, who possess the needed rights to install electrical devices, as instructed in the following documentation. The duct size for air water heaters Reventon Group Farmer HCF should be chosen by the designer.

8. PRECAUTIONS & WARNINGS

All works concerning electrical installation should be made by the qualified staff, who possess the qualifications due to the domestic and local norms. These recommendations include service and disassembly as well. Not following to the recommendations may cause electrocution, device damages or its incorrect work.

- Before service or exchange of the device it is obligatory.
- Do not cover the inlet and outlet of the device.
- Do not use the device in room with high moisture or close to the water basin, due to the 2.1. of this documentation.
- Do not install, service the device with wet hands or barefoot.
- Do not use the device in room with flammable fumes, gas and high concentration of dust.
- The device should be kept out of reach of children and animals.
- During the assembly use the filter on the hydraulic supply:
 - vent valve in the highest place on the hydraulic installation,
 - cut off valve on the supply and return of the device.
- The device should be secured against pressure increase in the water installation.
- Before plugging the electric supply check the leak tightness.

- The device does not consist of the anti-frost protection. The temperature in the room should not go below 0°C. In such case please empty the device out of water.

- It is recommended to check the electric installation before the first start.

- It is recommended to use the external current differential protection.

- After the turn off, the elements of device may be warm.

- After operating time of the device, please utilize it concerning the local norms and regulations..

- **It is recommended to clean the device periodically:**

- heating coil: blow through by compressed air,
- fan casing and blades: clean form the dirt.

- If the device is not used for a longer time disconnect the voltage supply.

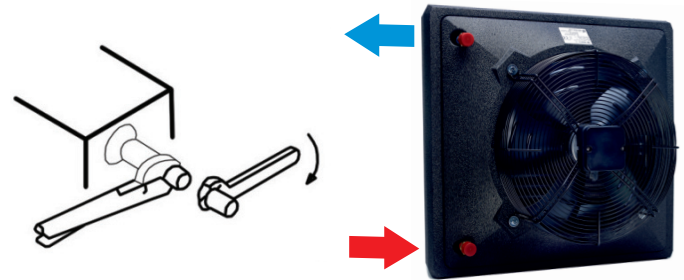
- The device is transported with the closed air stators. It is essential to open them in 30 % before the first start. Not keeping to the following recommendation may cause the damages of the fan.

PRECAUTIONS & WARNINGS

- **Opening the air stators must be made by two hands in parallel. Not keeping to the following recommendation may cause the damages of the air stators.**



- **While plugging the device to the water installation do remember to hold its stub pipes by pipes spanner, not keeping to the recommendation may cause the damages of the heating coil.**



9. CONTROLS

To make easier the usage of the Reventon Group devices we also offer the additional controls:

3-stage speed controllers with thermostat

Controller is used to regulate devices equipped with 3-stage fans. It has 3-stage speed control and thermostat built in. In addition, the unit controls the operation of the actuators installed on the control valve. Works in both heating and cooling modes.



Independent control switch system
3-stage fan adjustment
Electric valve and thermostat controlled fan
HEAT / COOL switch
ON / OFF switch
Temperature range: 10°C-30 °C
Control accuracy: <1 °C
Dimensions: 130x85x40 mm
Voltage: 230V / 50-60Hz
Rated current: 3A
Degree of casing's protection: IP30
Weight: 0,21kg

Fan speed controller HC 1,2A

designed to change the single-phase fan's speed voltage controlled in industrial supply and heating systems



5 control levels: 0-70-85-105- 145-230V
Power supply voltage: 230V AC/50-60Hz
Allowable current output: 1,2 A
Protection: thermal switch
Dimensions: 126mm x 176mm x 56mm
Weight: 1,3kg
Degree of protection: IP 54

Fan speed controller HC 3A

designed to change the single-phase fan's speed voltage controlled in industrial supply and heating systems



5 control levels: 0-70-85-105- 145-230V
Power supply voltage: 230V AC/50-60Hz
Allowable current output: 3 A
Protection: thermal switch
Dimensions: 126mm x 176mm x 56mm
Weight: 1,3kg
Casing's protection degree: IP 54

Fan speed controller HC 5A

designed to change the single-phase fan's speed voltage controlled in industrial supply and heating systems



5 control levels: 0-80-120-140-170-230V
Power supply voltage: 230V AC/50-60Hz
Allowable current output: 5 A
Maximum ambient temperature 40°C
Maximum temperature controller 70°C,
limited motor protection.
Dimensions: 125 mm x 175 mm x 100 mm
Weight: 3,8 kg
Degree of protection: IP 54

Fan speed controller HC 7A

designed to change the single-phase fan's speed voltage controlled in industrial supply and heating system



5 control levels: 0-80-120-140-170-230V
Power supply voltage: 230V AC/50-60Hz
Allowable current output: 7 A
Maximum ambient temperature 40°C
Maximum temperature controller 70°C,
limited motor protection.
Dimensions: 240 mm x 190 mm x 125 mm
Weight: 6,4 kg
Degree of protection: IP 54

Fan speed controller HC 11A

designed to change the single-phase fan's speed voltage controlled in industrial supply and heating systems



5 control levels: 0-80-120-140-170-230V
Power supply voltage: 230V AC/50-60Hz
Allowable current output: 11 A
Maximum ambient temperature 40°C
Maximum temperature controller 70°C,
limited motor protection.
Dimensions: 240 mm x 190 mm x 125 mm
Weight: 8,1 kg
Degree of protection: IP 54

Fan speed controller HC 14A

designed to change the single-phase fan's speed voltage controlled in industrial supply and heating systems



5 control levels: 0-80-120-140-170-230V
Power supply voltage: 230V AC/50-60Hz
Allowable current output: 14 A
Maximum ambient temperature 40°C
Maximum temperature controller 70°C,
limited motor protection.
Dimensions: 240mm x 190 mm x 125 mm
Weight: 10,2kg
Degree of protection: IP 54

Two-way valve with actuator 3/4"

The two-way valve with actuator is used to automatically regulate the flow of the heating medium. Works with Reventon HC devices with 3/4" connection diameters. The kit consists of a two-way valve and a double-open / open actuator.



Power: 230V 50/60 Hz
Total current: <0,25A
Input: <0,015 (3,35VA)
Auxiliary microswitch: 5A
Maximum operating temperature: 60°C
Class of insulation: double
Degree of protection: IP40
Closing time: 5-6 min
Adjustment stroke: 3,6 mm

Module relay RM-16A

Relay module RM-16A opens and closes the circuit to affect the work of other devices. It can be used to connect a receiver with higher power than the relay in the controller allows. Maximum rated current is 16A.



Power supply: 230 V AC
Maximum rated current: 16 A
Input NO/COM
Input SL Connection of a regulator
with the voltage relay 230 V
Dimension [mm] W-47 H-47 D-2

Programmable room thermostat HC



Number of temperature levels: 1
Hysteresis: 0,50 /1°C
Power: 2 batterie AA
Switching: 230 VAC/50Hz 5(3) A
Operating temperature range: 0-40°C
Temperature control range: 5-30°C
Accuracy of temperature: 0,2°C
Number of programs: 9

Manual thermostat HC

Thermostat is a device that is designed to maintain a pre-set room temperature.



Operating temperature: 0-40°C
Temperature control range: 10-30°C
Accuracy of temperature: 1°C
Number of programs: 1
Rated current: 3A

CONTROLLERS

COOPERATION WITH EQUIPMENT

Model	HC 1,2 A	HC 3 A	HC 5 A	HC 7 A	HC 11 A	HC 14 A	RM-16A	HC3S
Code	FSHC-1520	FS3HX-1521	FS5HC-1607	FS7HC-1608	FS11HC-1609	FS14HC-1610	RM16A-1786	RTHC3S-1779
HC20-3S	1	3	5	8	13	16	19	3
HC30-3S	1	3	5	8	13	16	19	3
HC35-3S	1	3	5	8	13	16	19	3
HC45-3S	1	2	5	8	13	16	19	3
HC50-3S	1	2	4	6	10	12	14	2
HC70-3S	1	2	4	6	10	11	14	2
Farmer IP54-3S	1	2	4	6	10	12	14	2
Farmer IP65	0	1	2	3	5	6	7	-

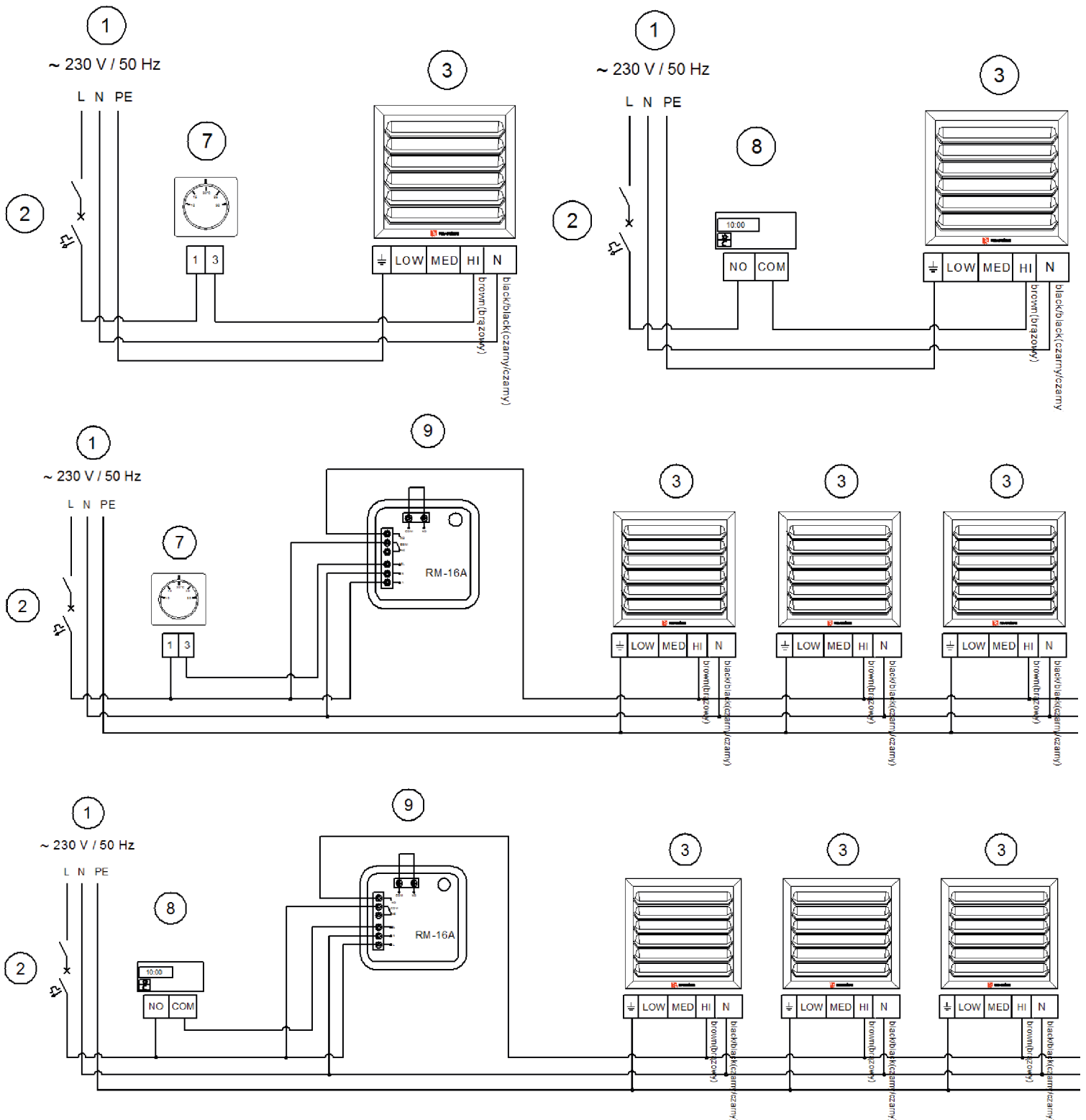
7. CONNECTION SCHEMES

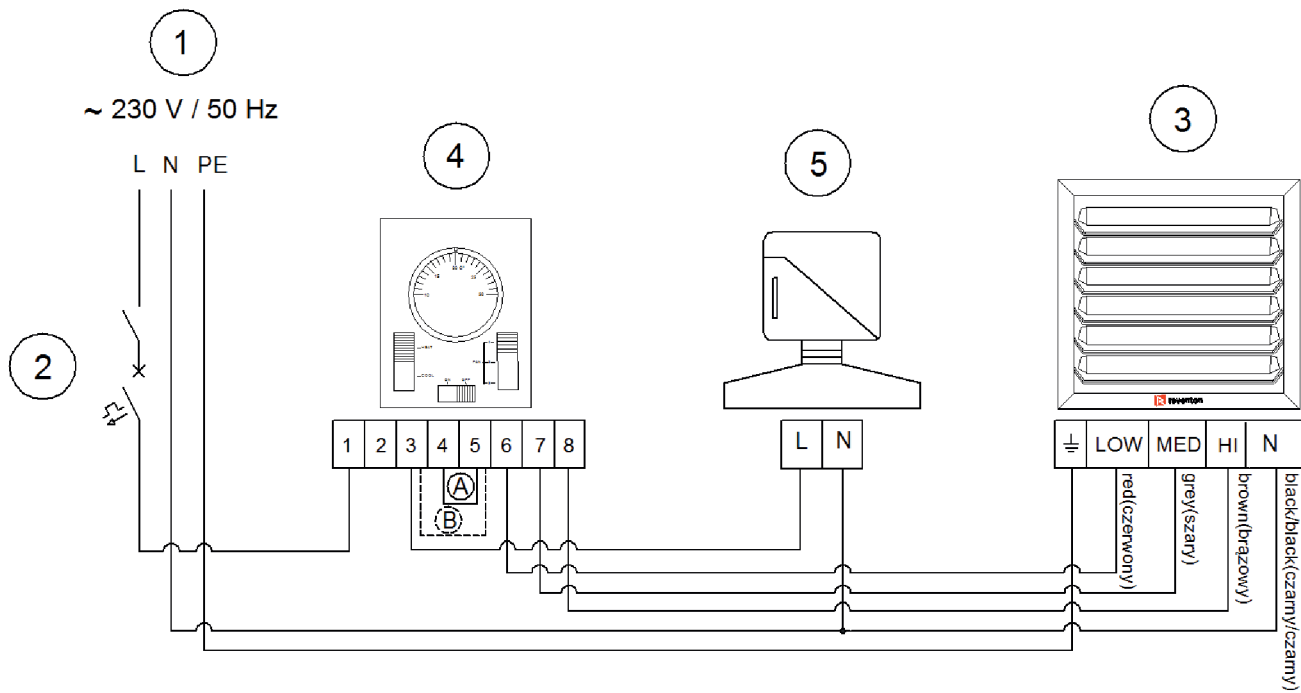
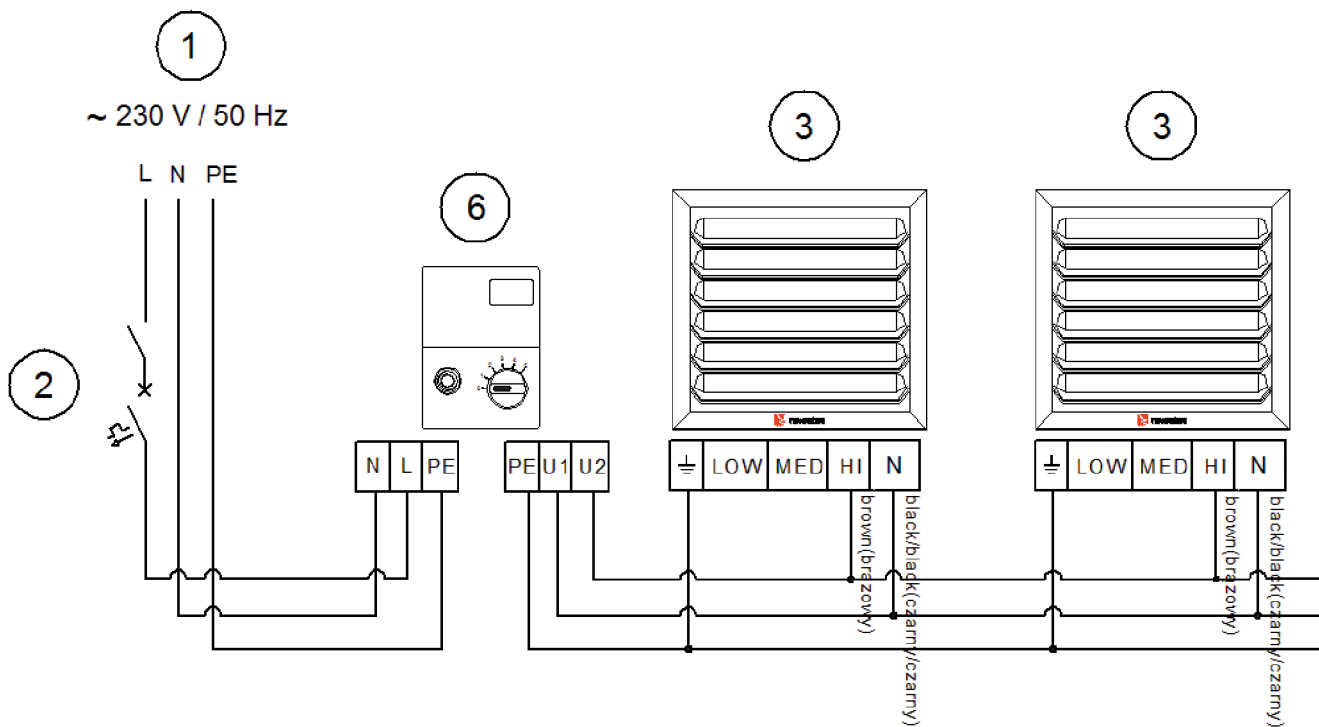
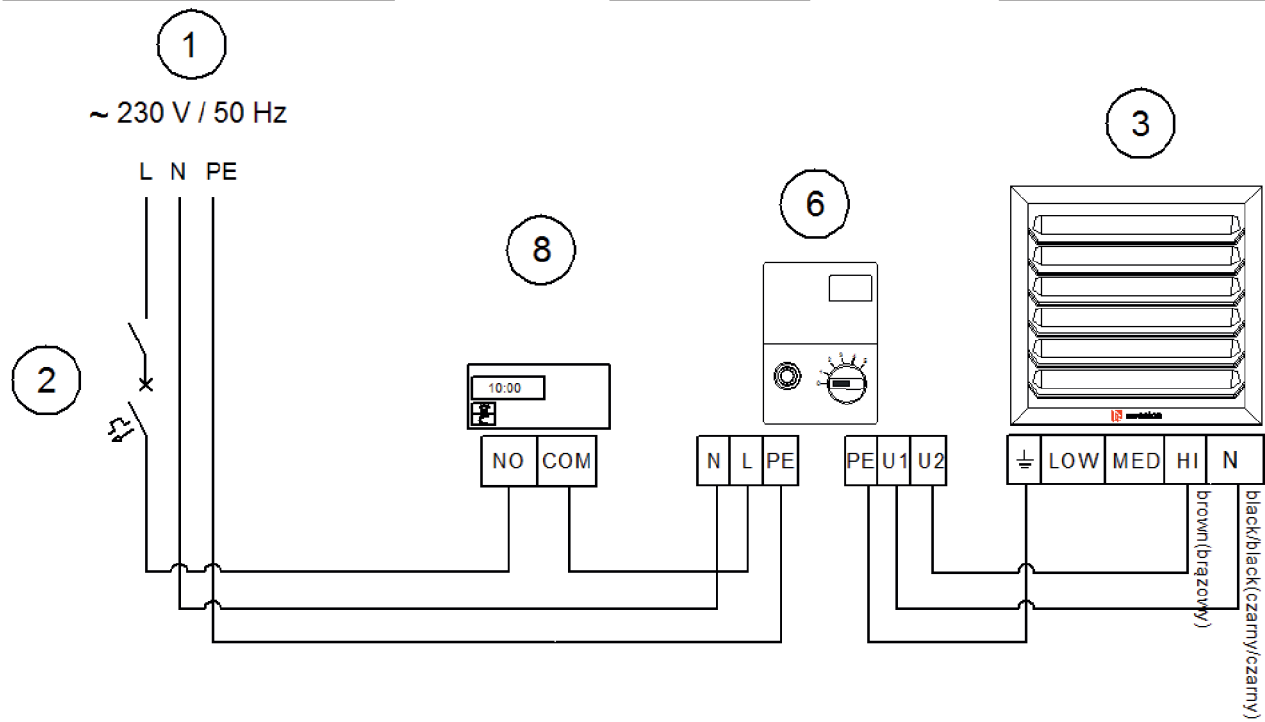
LEGEND:

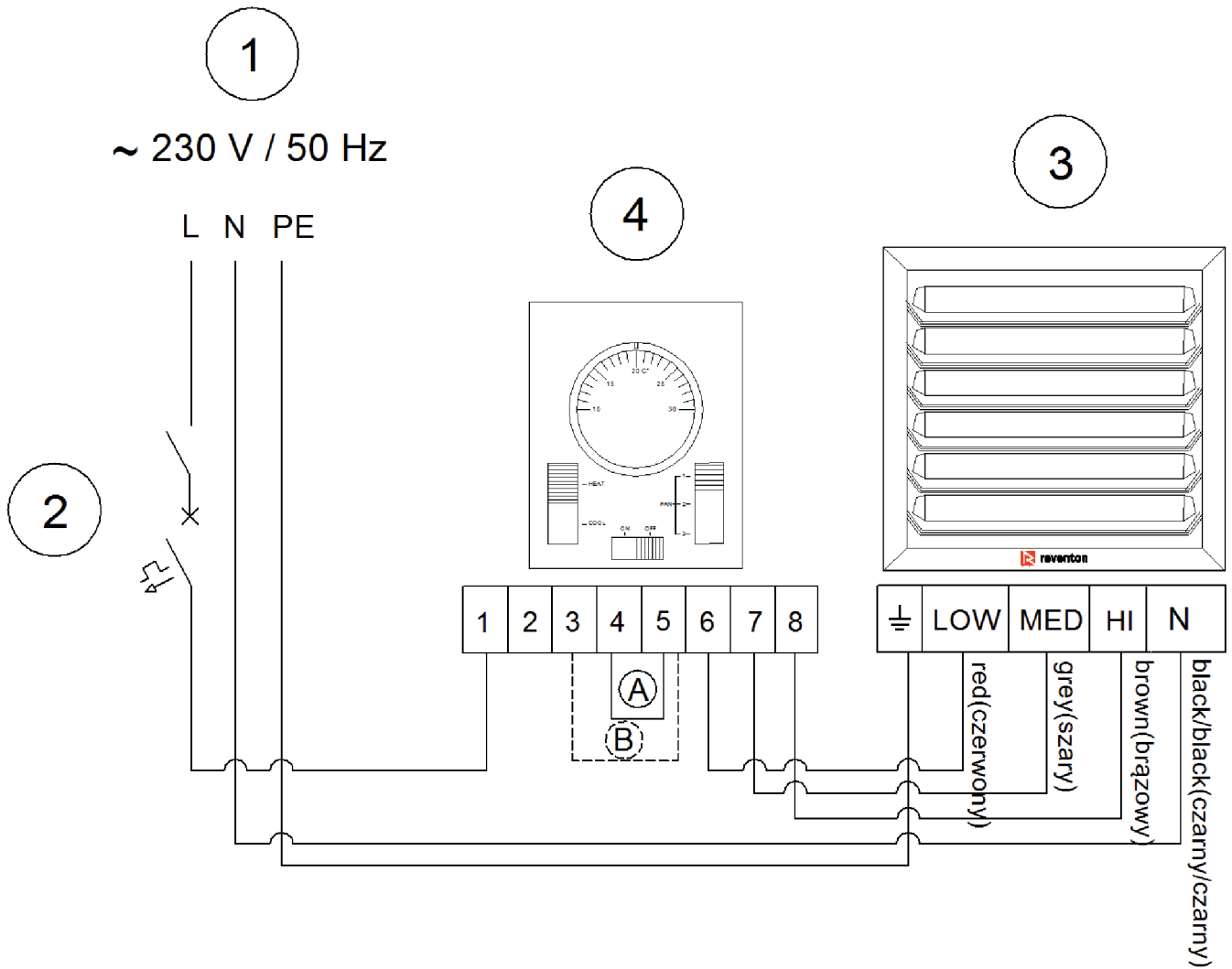
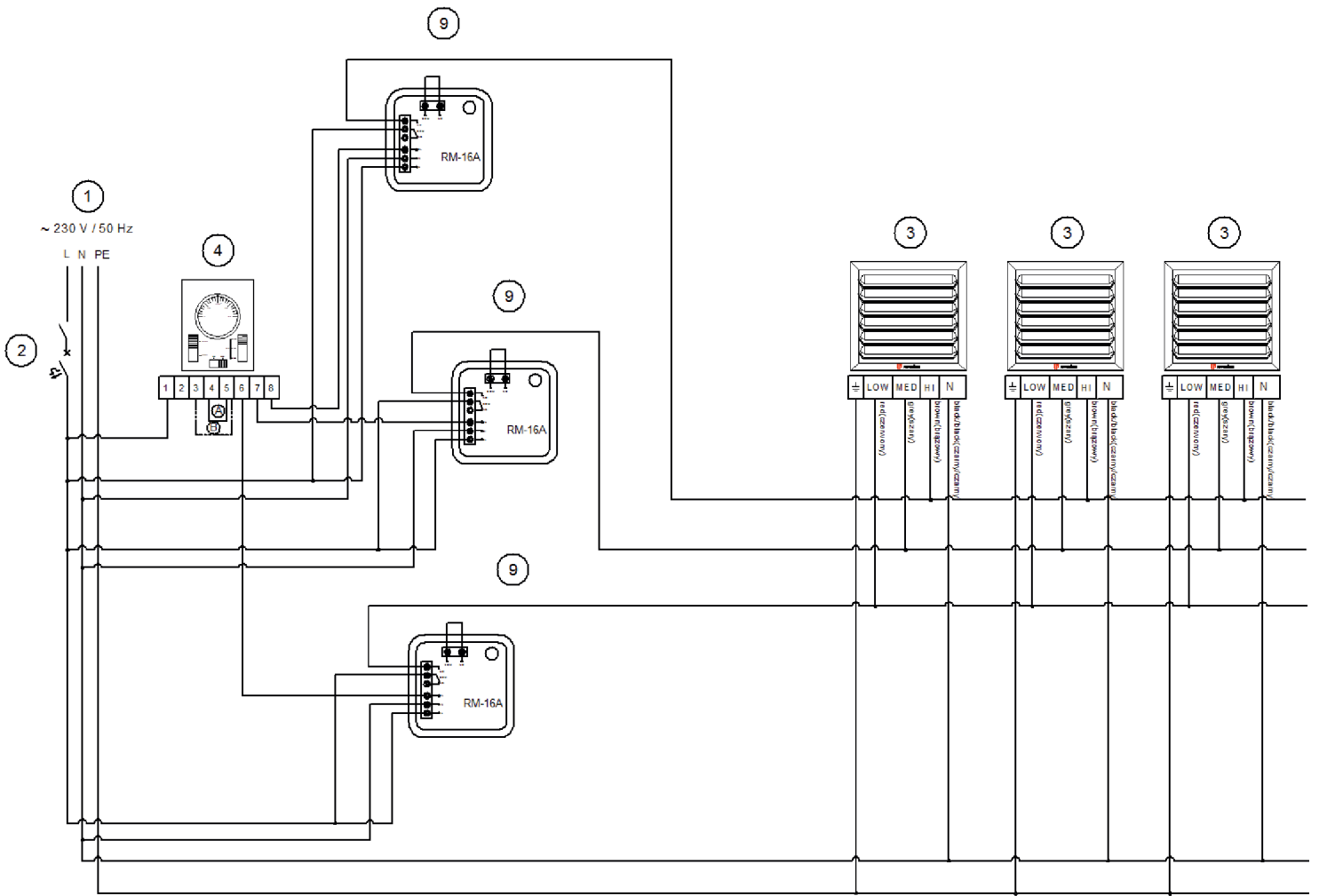
1. Power
2. Main switch, overcurrent circuit breaker *
3. Air water heater Reventon HC
4. 3-stage speed controllers with thermostat
- A-work in continuous mode
- B-operation in thermostatic mode
5. Two-way valve with actuator HC ¾ "
6. Fan speed controller HC
7. Manual thermostat HC
8. Digital programmable thermostat HC
9. Relay module RM-16A

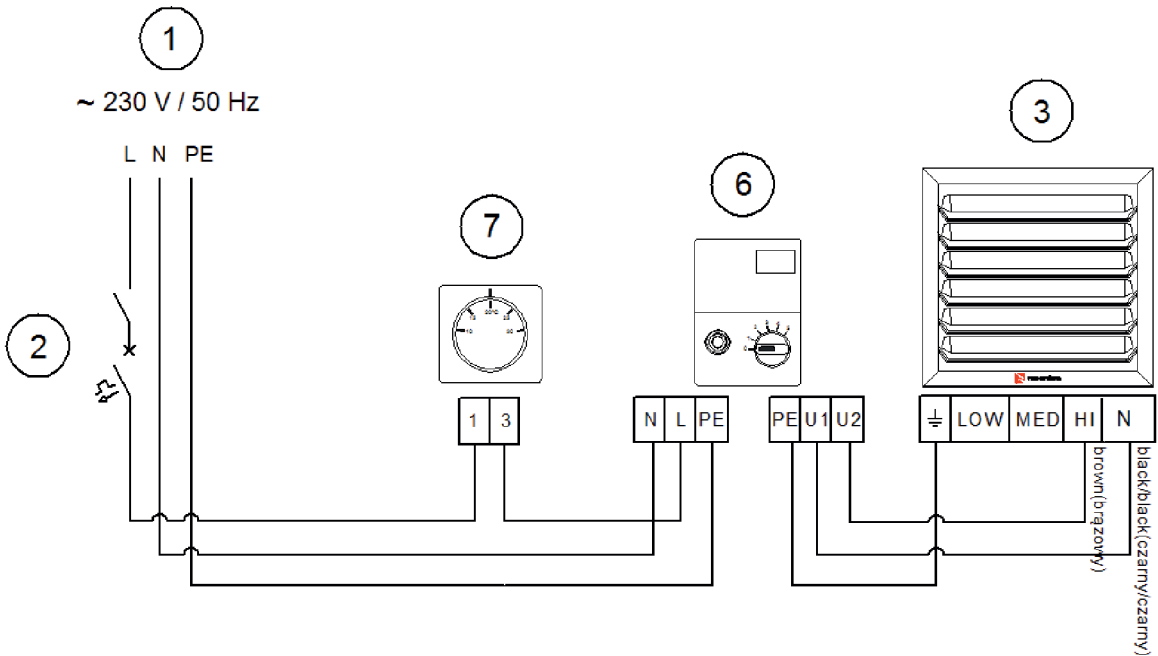
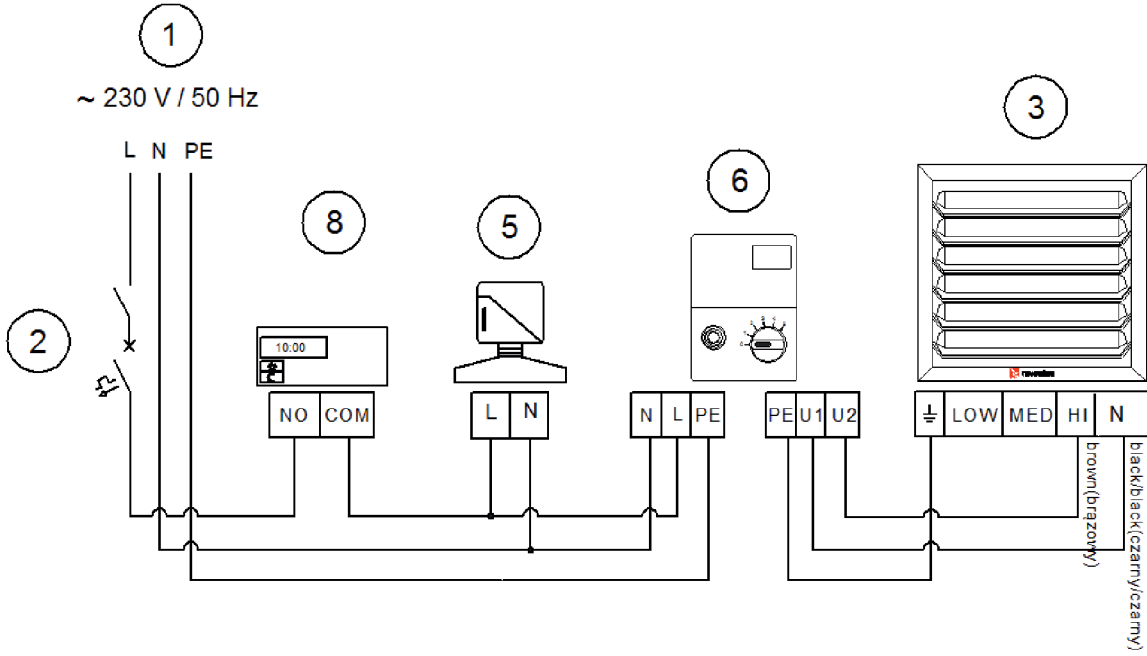
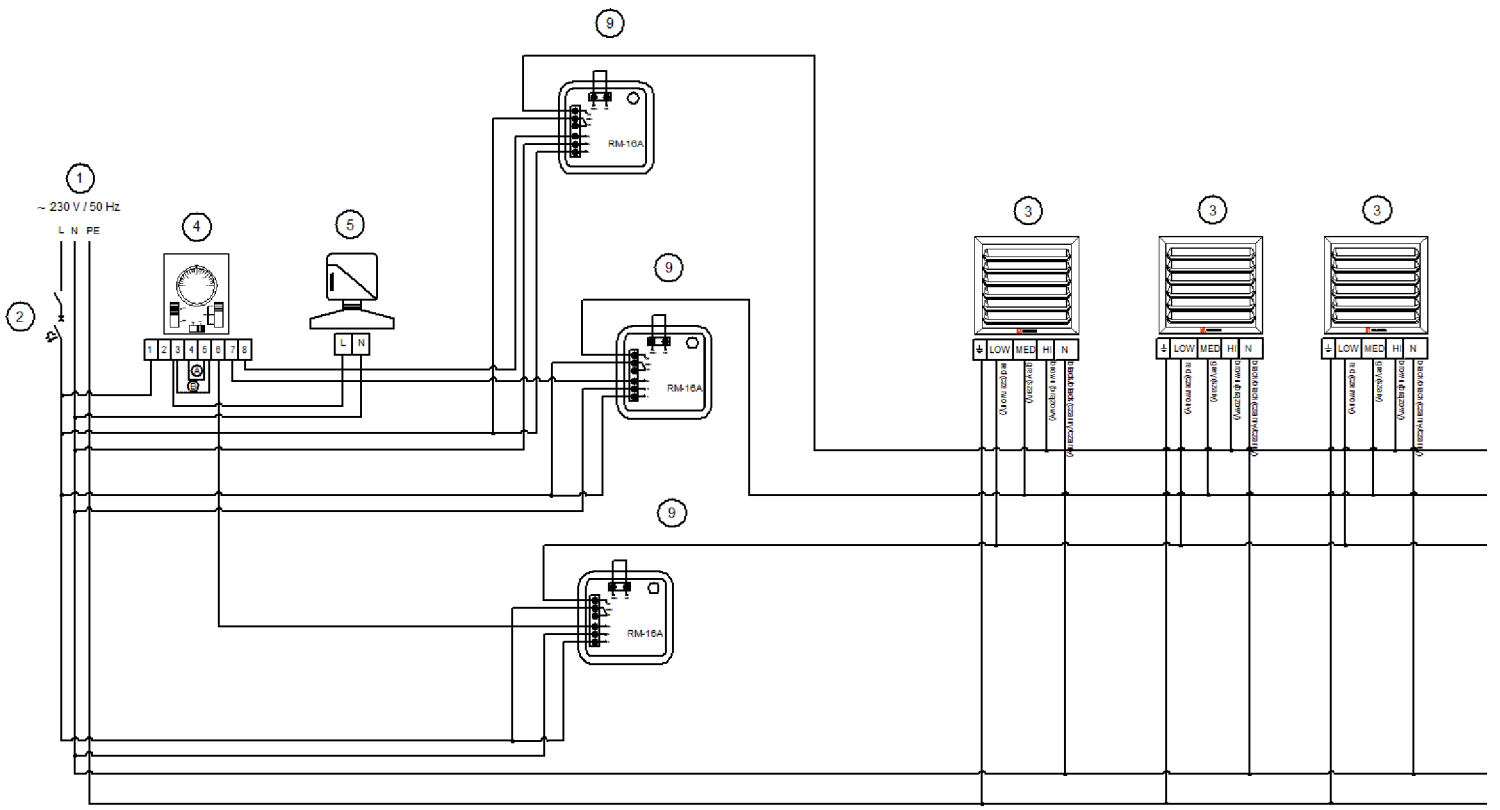
* main switch and safety fuses are not included in the set

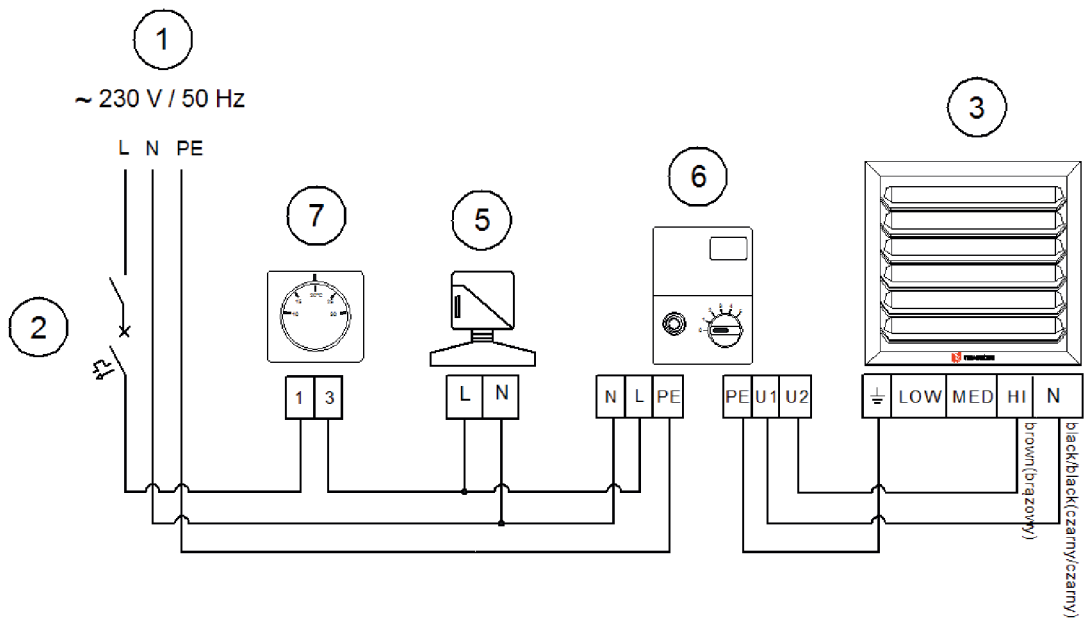
HCF-IP53-3S



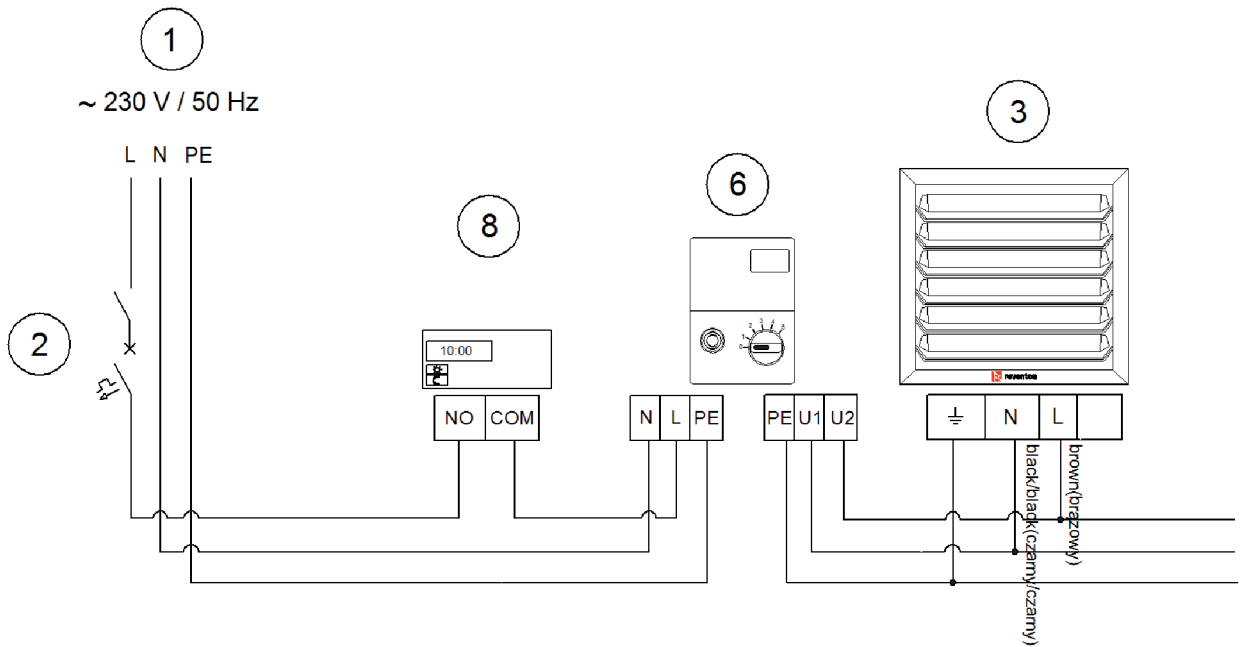
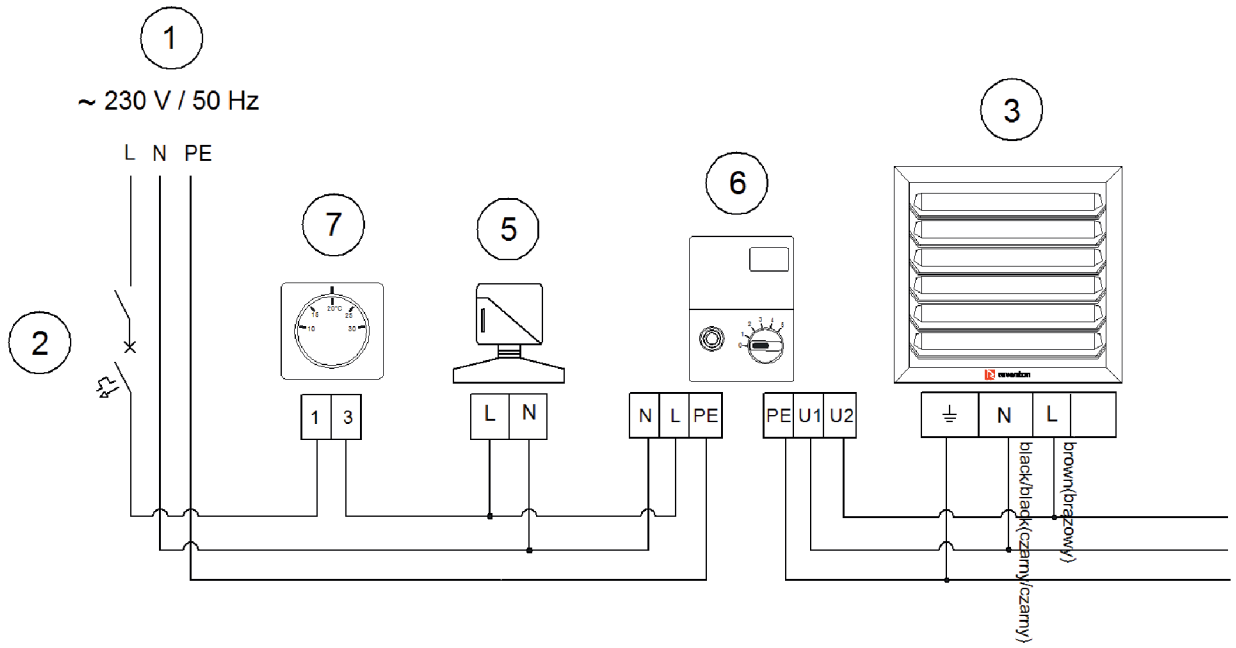


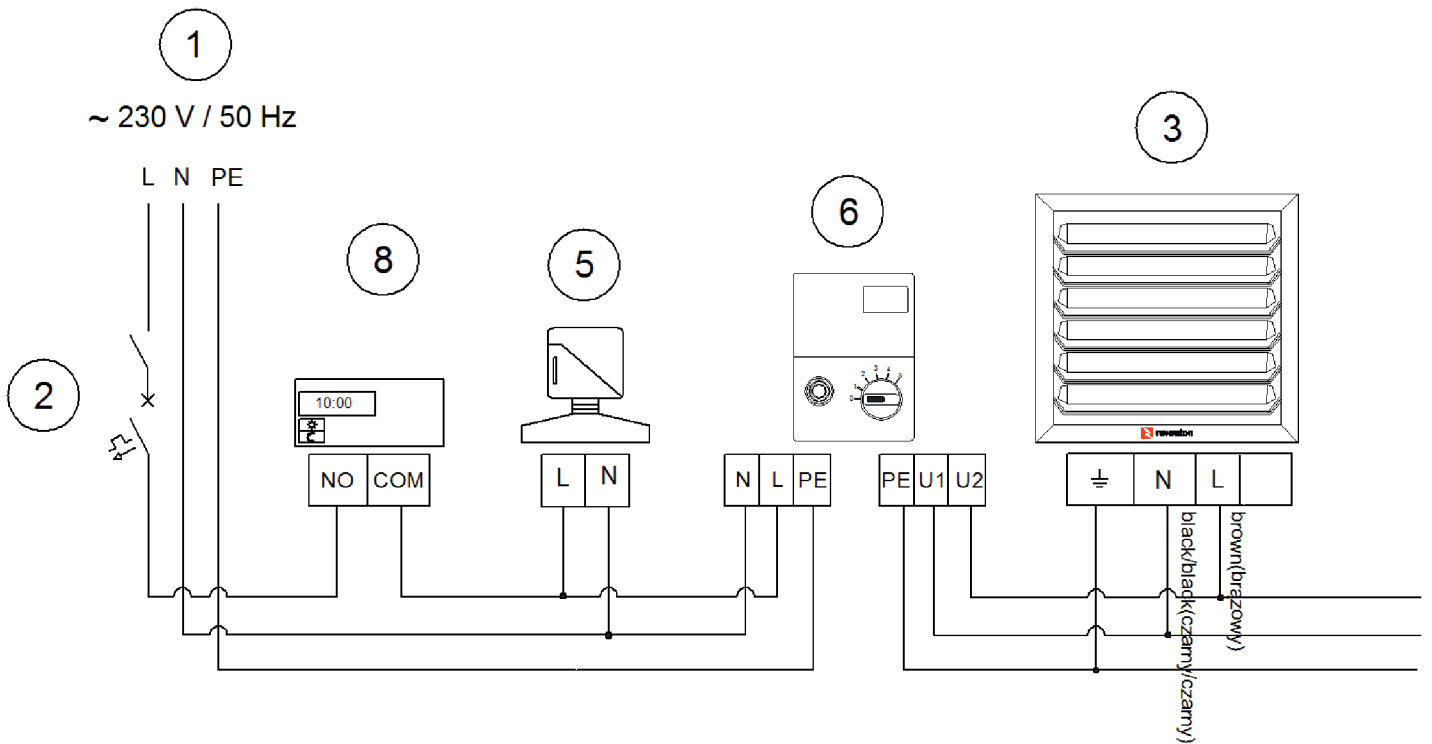
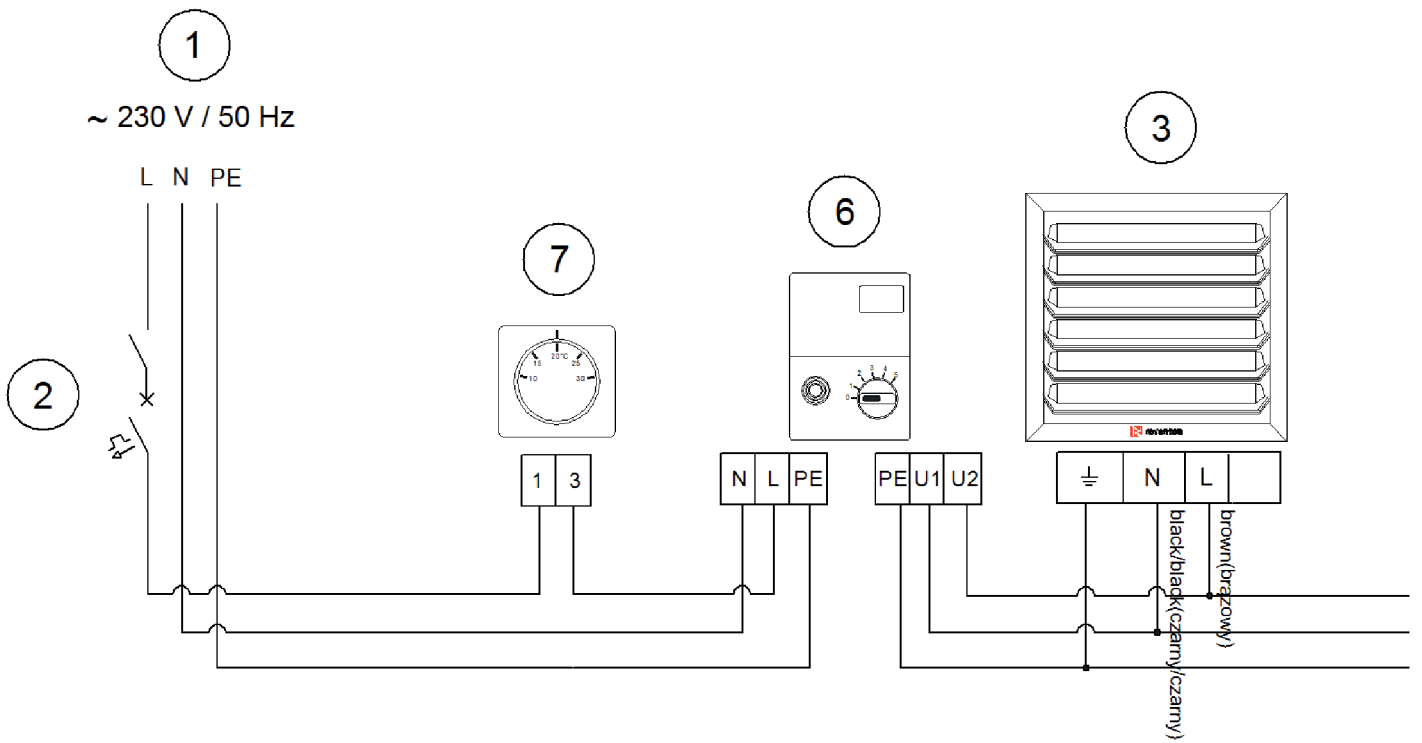


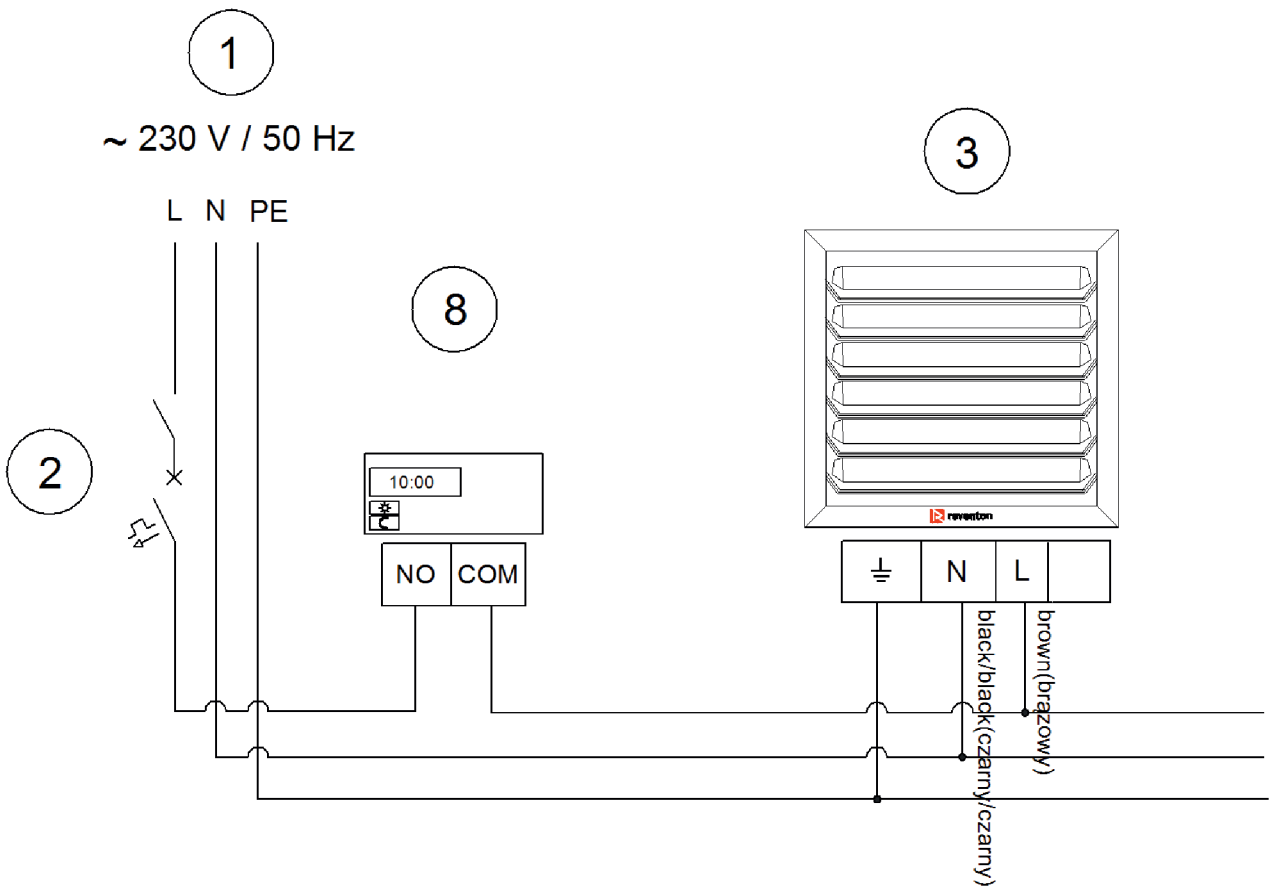
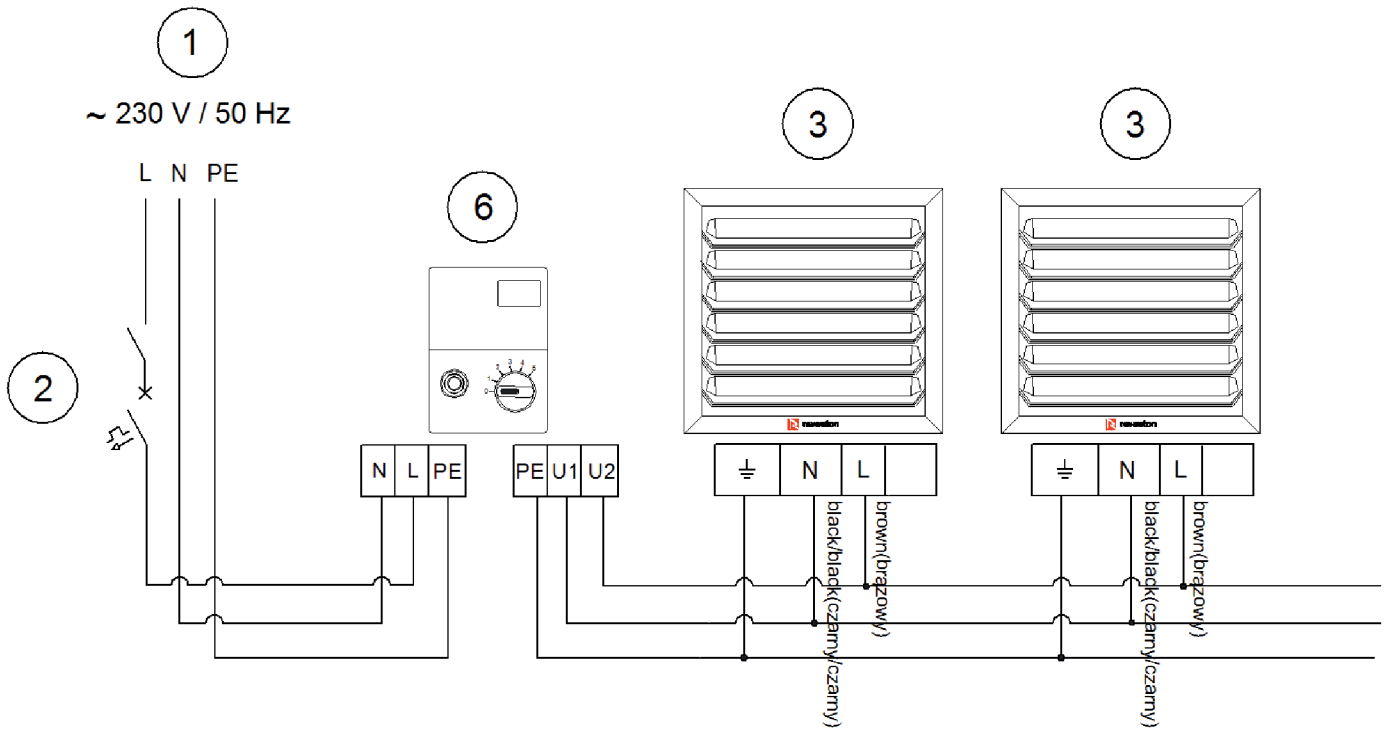




HCF-IP65







11. TERMS OF WARRANTY

I. Reventon Group Sp. z o.o. [Ltd.] 3B Montazowa Street, 43-300 Bielsko-Biała, Poland, is the producer of the Reventon Group brand. The warranty concerns the following devices and it is valid for 2 (two) years:

- air water heater Reventon Group HCF IP54-3S
- air water heater Reventon Group HCF-IP65

II. Warranty is valid in the European Union.

III. The terms of warranty are valid from purchasing the device (the date issuing a document confirming the purchase of the device) but not further than 30 (thirty) months from leaving the producer's warehouse.

IV. The defects revealed during the warranty period will be removed free of charge in 14 working days. The service will be done by the installation company due to the terms included in warranty card. The elements will be supplied by the Reventon Group Sp. z o.o. during the warranty period.

V. Warranty does not cover the parts of the device subject to normal maintenance and the cases as below:

a) Mechanical defects, damages from the impact of the improper transportation or damages through improper storage.

b) Defects through:

- improper usage and service;
- using the device in the improper conditions (too high humidity, too high or too low temperature, impact of the surrounding, sun etc.);
- modified equipment that has been modified or repaired without written agreement of the producer;
- connecting additional equipment, which is not recommended by the producer or inconsistent with the technical documentation;
- improper power supply.

c) Elements which wear and tear such as discolor or using.

VI. All changes in record in the warranty terms or any constructive modifications, independent service outside the Reventon Group Sp. z o.o. service or use, uncaring, makes the warranty not valid.

VII. To obtain the service it is needed to send to the producer warranty card with the signature, document confirming the purchase, (copy of the invoice) and correctly filled the warranty form.

VIII. Not following to any of warranty regulations makes the warranty not valid.

IX. All correspondence, returns, complains should be send to the following address: Reventon Group Sp. z o.o. 3B Montazowa Street, 43-300 Bielsko-Biała, Poland or e-mail: serwis@reventongroup.eu

The producer reserves the rights to make changes to the technical documentation without previous notice.

Warranty card

Factory number of the device:	Address and place of assembly
Stamp and signature of the installation company:	

Warranty form

The company reporting the complaint:	Date of assembly:	Address and place of assembly the device:
The company installing the device:	Date and circumstances of noticing the defect:	
	Factory number of the device:	Date of declaration the complaint:
Description of the defect:		
Contact Name and Surname, telephone number/ e-mail address:		

Service card

Date of declaration the complaint:	Description of the repair:	Service stamp:
Date of repair:		



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