Maintenance documentation

PPE4

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Kospel sp. z o.o. ul. Olchowa 1

Opracowanie: Jakub Jażdżewski

Contents

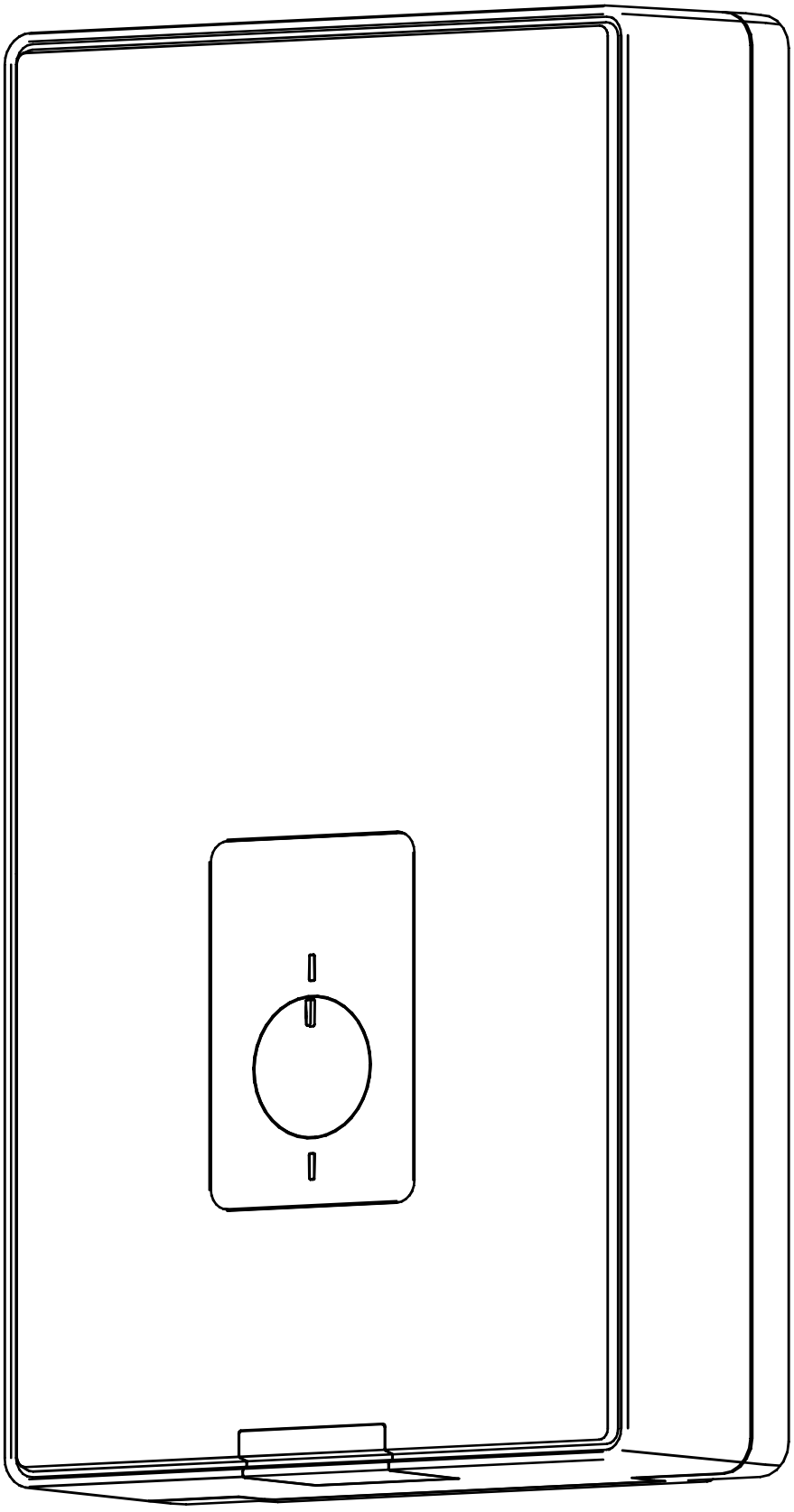


Fig. 1. General View (basic)

XX	Part number in the list table
XXX	Service code

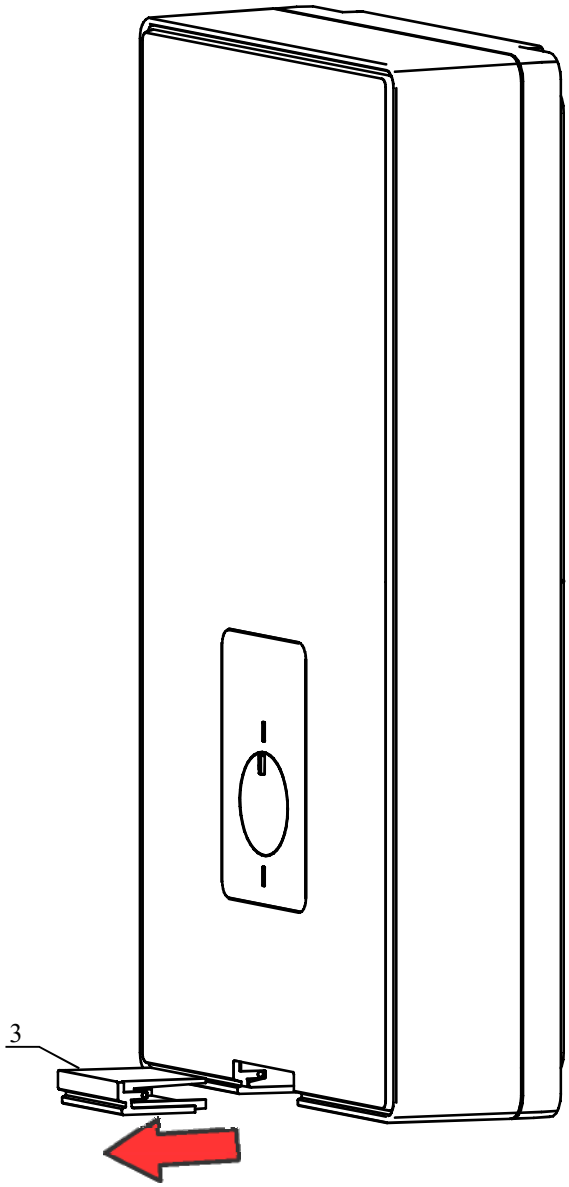


Fig. 2. Removal of the insert

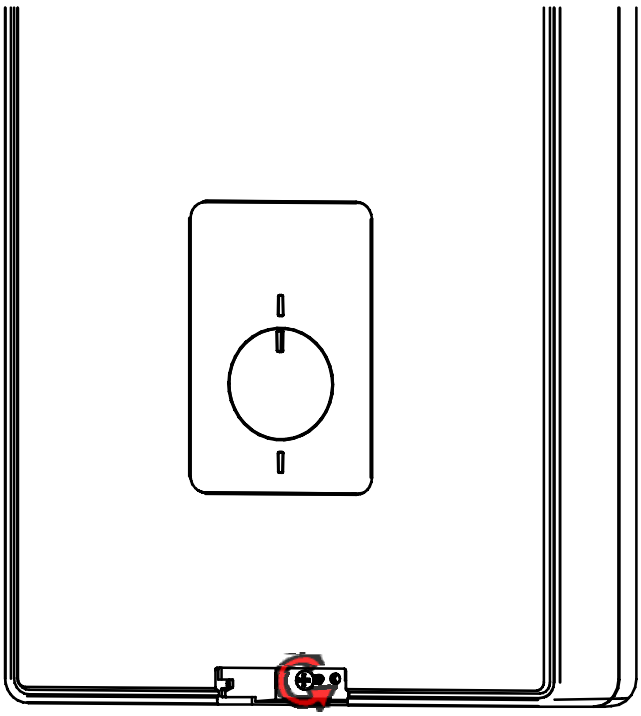


Fig. 3. Unscrewing the TW bolt 4,1x16

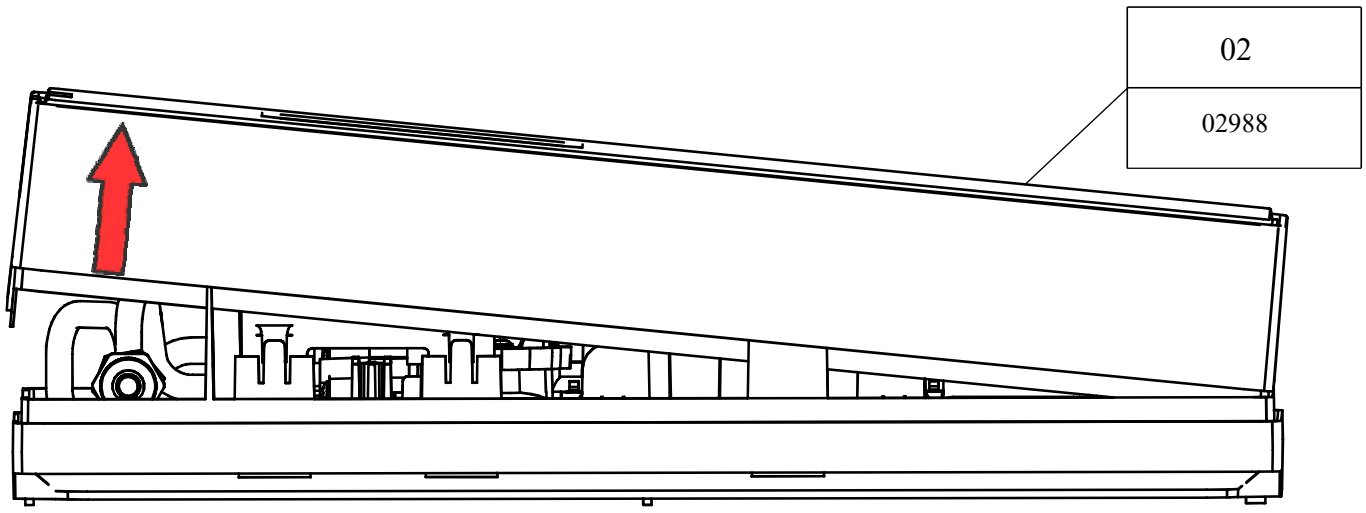


Fig. 4. Pulling the case from the bottom

Fig. 5. Pulling off the clamps

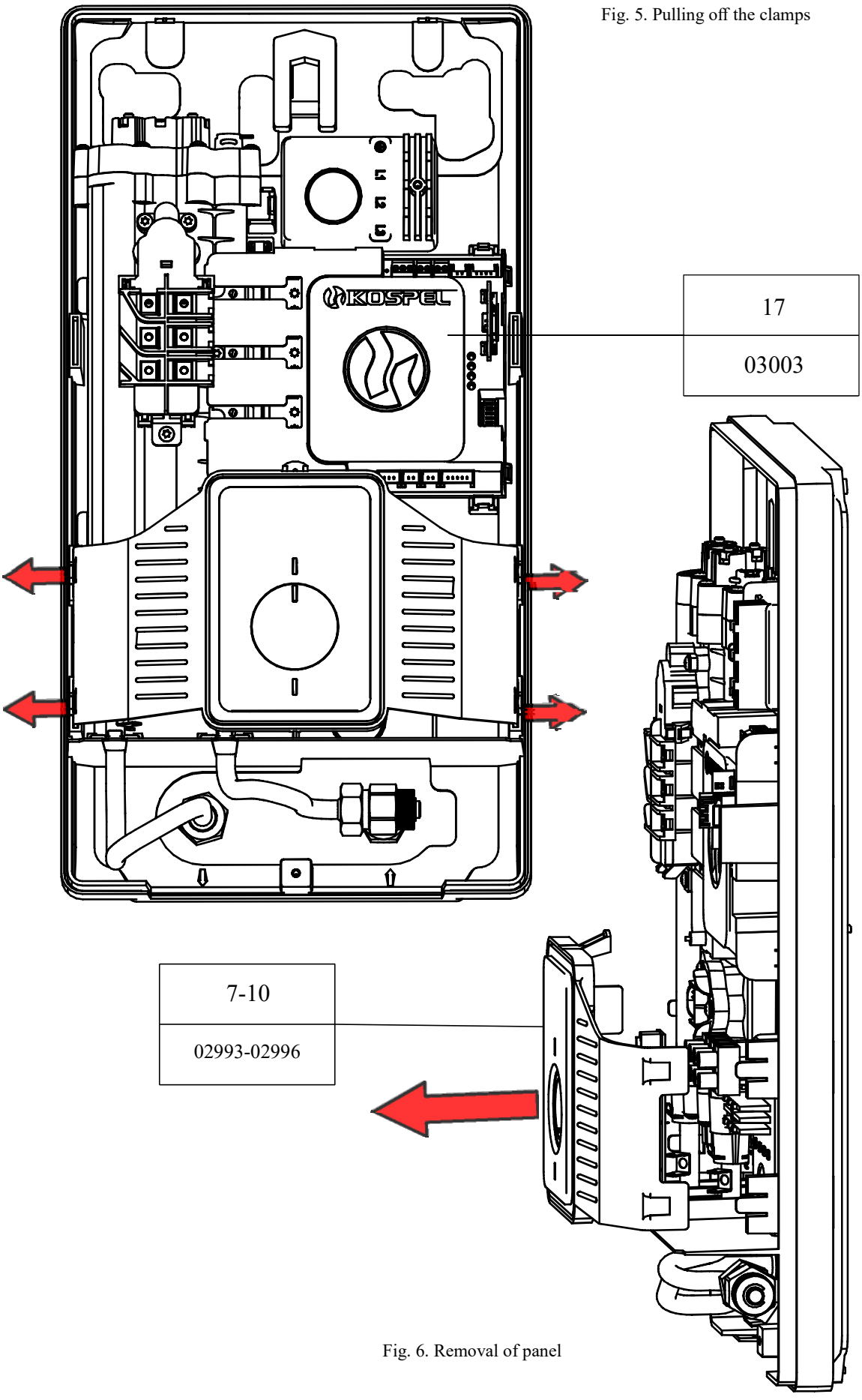


Fig. 6. Removal of panel

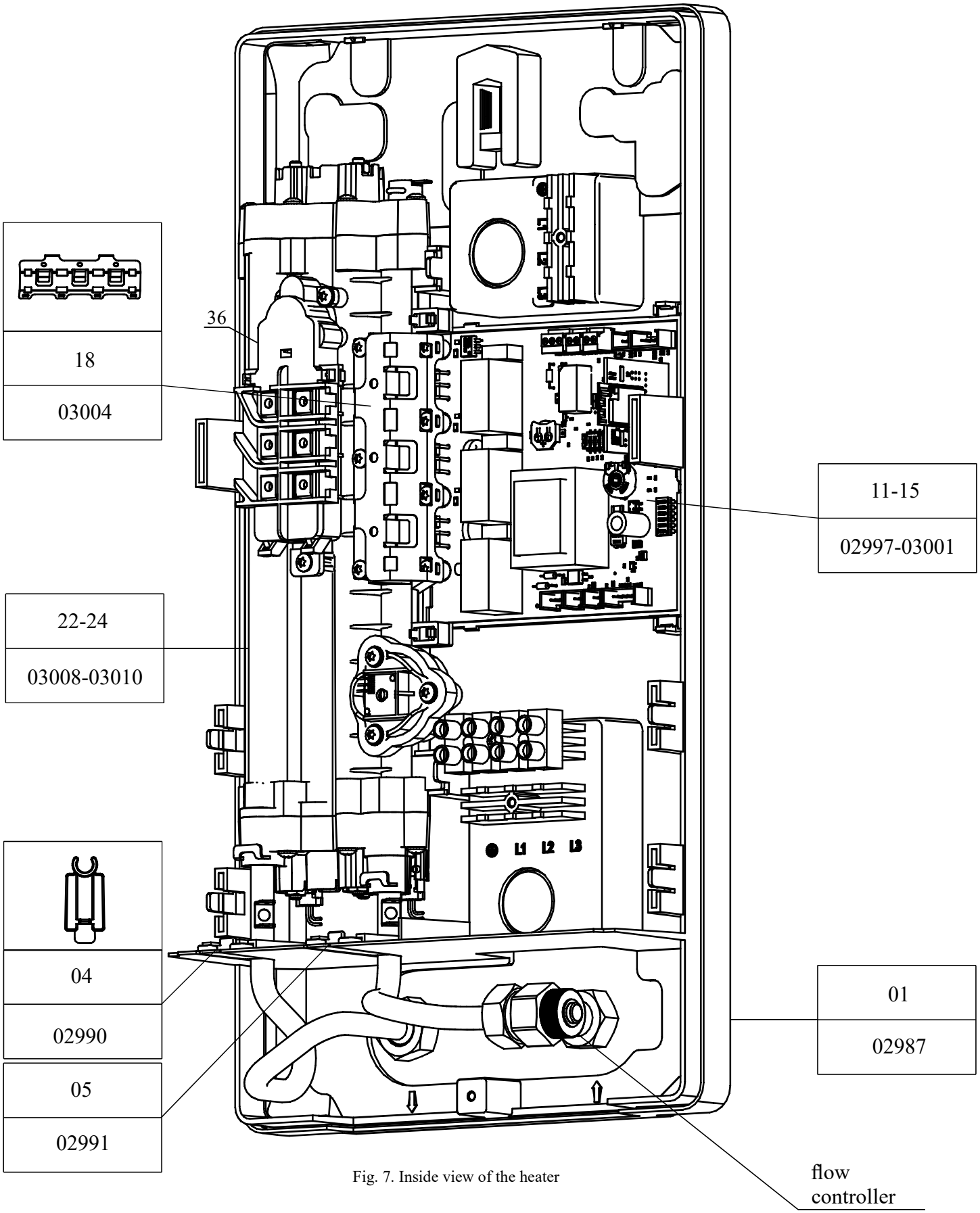


Fig. 7. Inside view of the heater

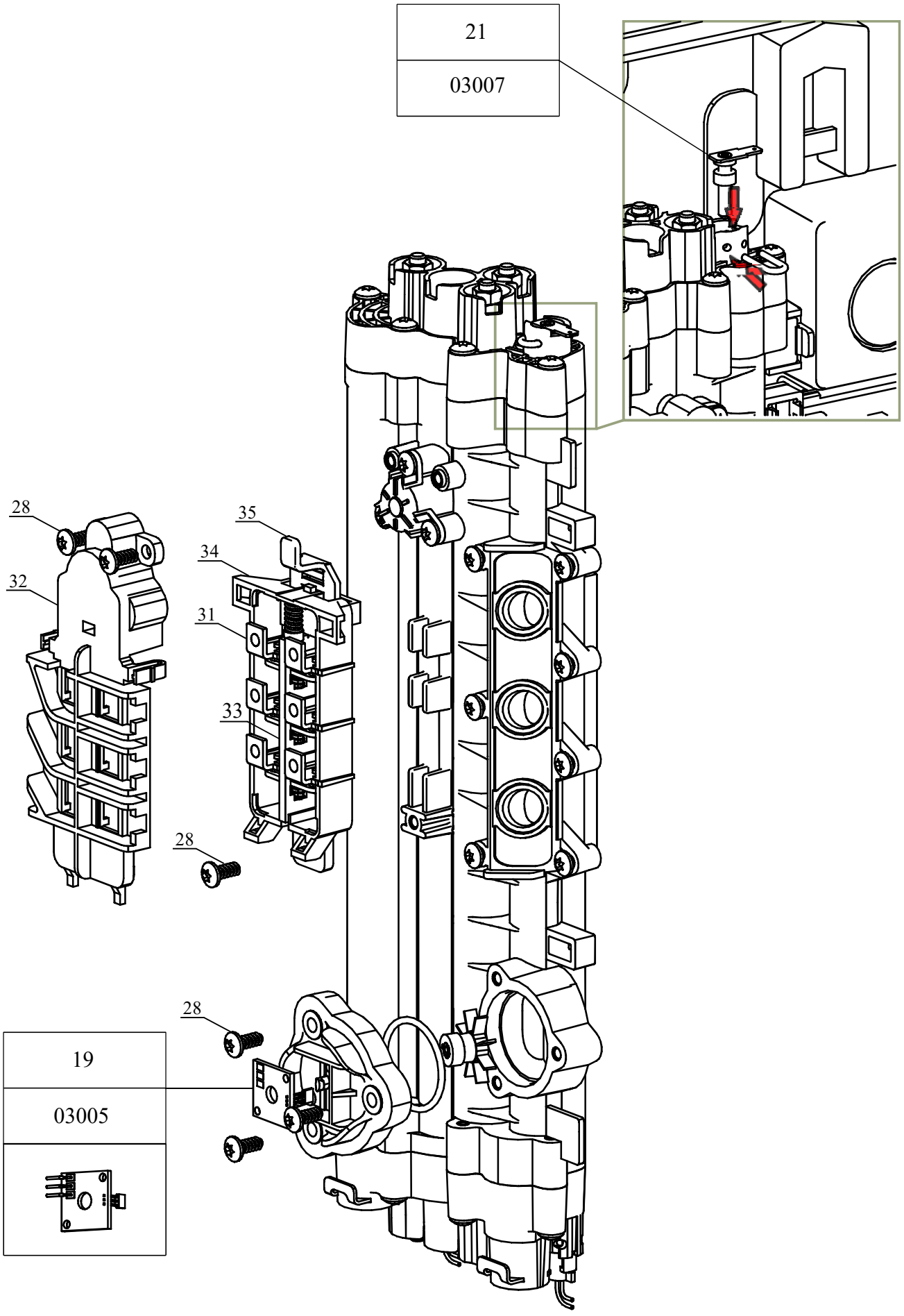


Fig. 8. Heating module

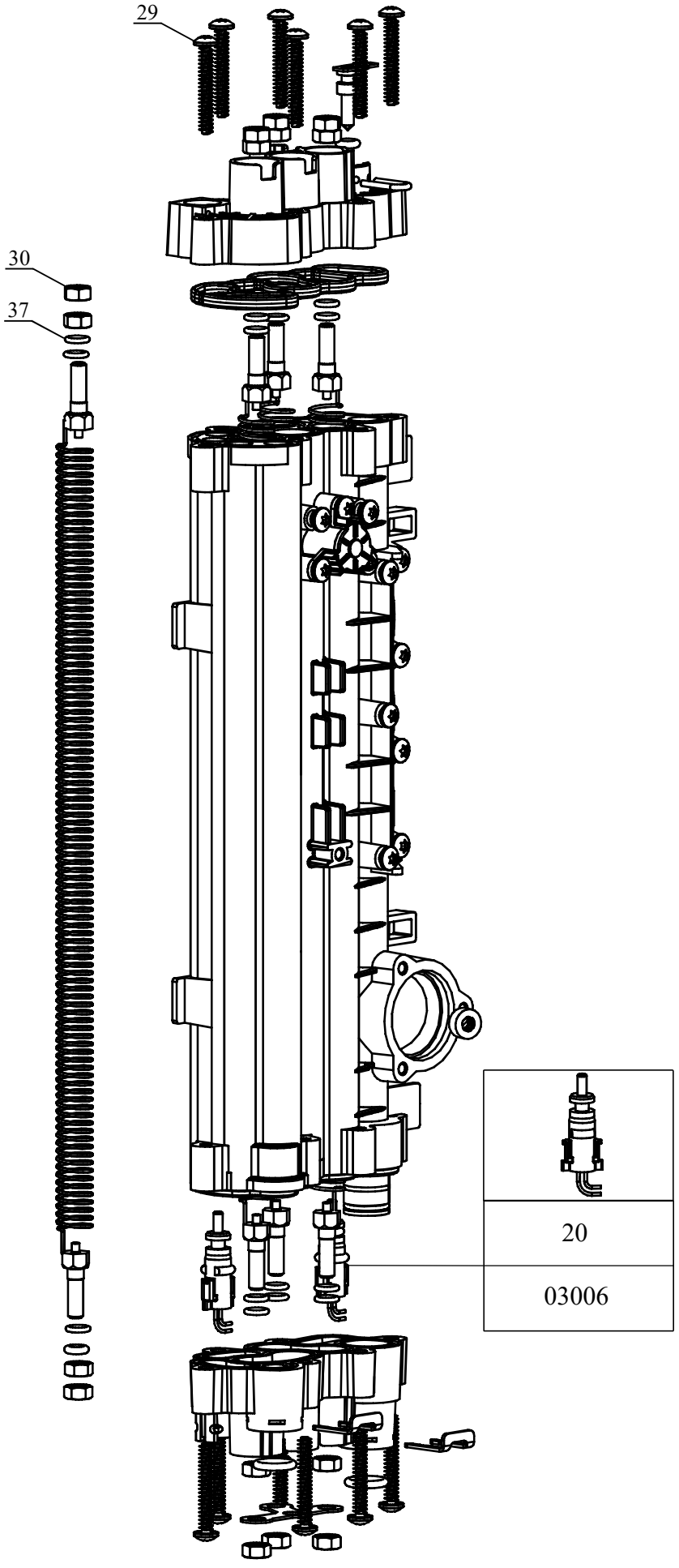
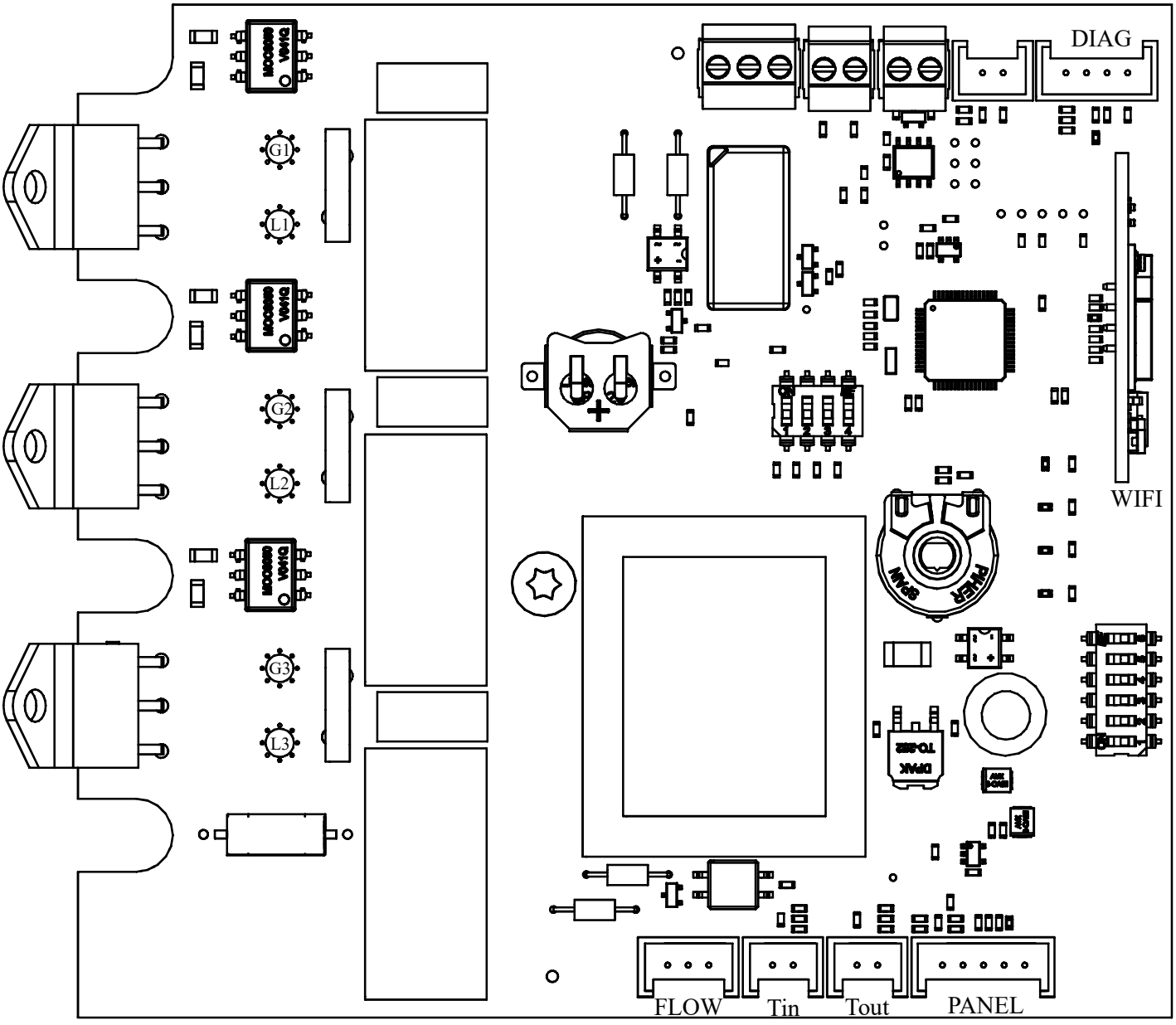
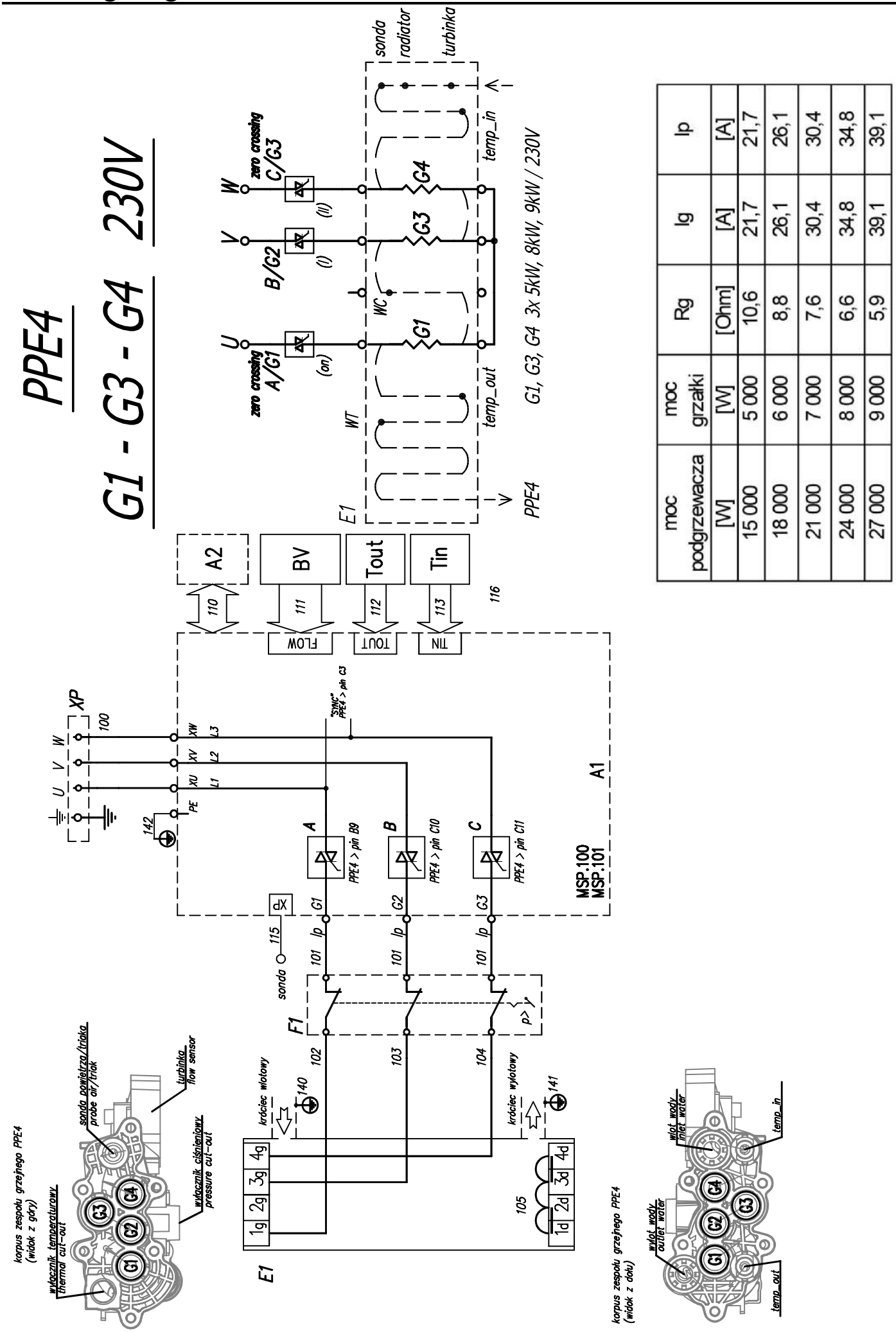


Fig. 9. Heater exploded view



Rys. 10. Panel MSPC

FLOW - flow sensor
Tin - inlet temperature
Tout - inlet temperature



moc podgrzewacza	moc grzałki	Rg	Ig	Ip
[W]	[W]	[Ohm]	[A]	[A]
15 000	5 000	10,6	21,7	21,7
18 000	6 000	8,8	26,1	26,1
21 000	7 000	7,6	30,4	30,4
24 000	8 000	6,6	34,8	34,8
27 000	9 000	5,9	39,1	39,1

8. List of parts

Tab. 1. List of parts

Number	Service code	Picture no	Description	Qt
1	02987	PPE4-01.00.00	Complete foundation	1
2	02988	WP-307	PPE4 cover	1
3	02989	WP-309	Screw socket cap PPE4	1
4	02990	WP-305	PPE4 outlet plug	1
5	02991	WP-306	PPE4 inlet cap	1
6	02992	PPE4-05.00.00	Control valve PPE4	1
7	02993	PPE4-03.00.00	PPE4.L control panel	1
8	02994	PPE4-06.00.00	PPE4.B control panel	1
9	02995	PPE4-07.00.00	PPE4.M control panel	1
10	02996	PPE4-08.00.00	PPE4.P control panel	1
11	02997	PCP-PPE4/05	PPE4.L controller	1
12	02998	PCP-PPE4/06	PPE4.B controller	1
13	02999	PCP-PPE4/07	PPE4.M controller	1
14	03000	PCP-PPE4/08	PPE4.M+ controller	1
15	03001	PCP-PPE4/10	PPE4.P controller	1
16	03002	WP-310	PPE4 controller base	1
17	03003	WP-311	PPE4 controller cover	1
18	03004	WM-338	PPE4 triac clamp	1
19	03005	CZP-02.01.00/11	Flow sensor board PPE4	1
20	03006	01.118.0036.0	Temperature sensor PPE4	1
21	03007	PPE4-02.08.00	Air sensor PPE4	1
22	03008	PPE4-02.01.00/01 PPE4-02.02.00	Heating unit PPE4-15	1
23	03009	PPE4-02.01.00/02 PPE4-02.02.00	Heating unit PPE4-24	1
24	03010	PPE4-02.01.00/03 PPE4-02.02.00	Heating unit PPE4-27	1
25	03011	PPE4-02.04.00 WM-337 01.233.0002.0	Outlet connection PPE4	1
26	03012	PPE4-02.03.00 WM-337 01.233.0002.0	Outlet connection 1 PPE4	1
27	03013	PPE4-02.09.00 WM-337 01.233.0002.0	Outlet connection 2 PPE4	1
28	-	-	Screw TW 4,1x10 TX	13
29	-	-	Screw UW 4,5x30 TBH/1	12
30	-	-	Cap M5.0-5-A-Fe/Zn5	12
31	-	-	Fixed contact complete	5
32	-	WP-301	Cover	1
33	-	WP-303	Slider	1
34	-	WP-300	Body	1
35	-	WP-302	Lever	1
36	-	-	Pressure switch	1
37	-	-	Sealing ring 5.0x1.6	16

PPE4 water heater (all options)		**10/11/12/15**				**17/18/21/24**				**27**
Power supply		380V 3~								
Rated power	kW	9,1	10	11	13,7	15,6	16,5	19,2	22	24,7
Nominal input current	A	3x13,8	3x15,1	3x16,7	3x20,7	3x23,6	3x25	3x29,1	3x33,3	3x37,4
Power supply		400V 3~								
Rated power	kW	10	11	12	15	17	18	21	24	27
Nominal input current	A	3x14,5	3x15,9	3x17,3	3x21,7	3x24,7	3x26,0	3x30,3	3x34,6	3x39,0
Power supply	V	415V 3~								
Rated power	kW	21-:	12	13	16,3	18,5	19,6	22,9	26,2	29,4
Nominal input current	A	3 x 15,1	3 x 16,7	3 x 18	3 x 22,6	3 x 25,7	3 x 27,2	3 x 31,8	3 x 36,4	3 x 40,8
DHW output (at inlet water temperature of 30°C and pressure of 0.45 MPa)	l/min	4,3	5,2	5,8	7,2	8,1	8,7	10,1	11,6	13
Power supply wiring conductor minimum size	mm^2	4 x 2,5				4 x 6				
Power supply wiring conductor maximum size	mm^2	4 x 16								
Power mains system maximum impedance	Ÿ							0,43	0,37	0,30
Declared load profile		XS				S				S
Daily power input	Q_{elec}	2,135				2,144				2,147
Protection rating		IP25								

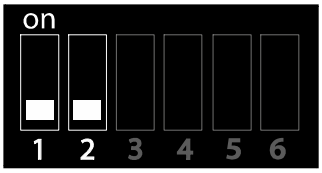
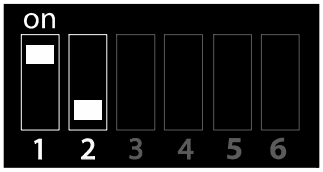
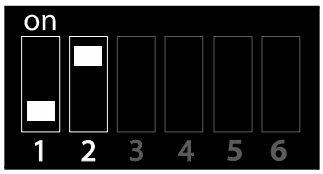
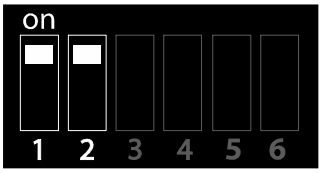
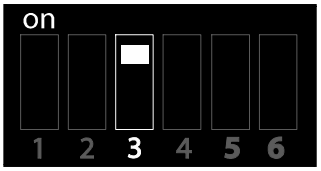
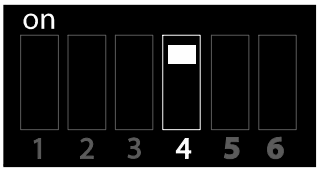
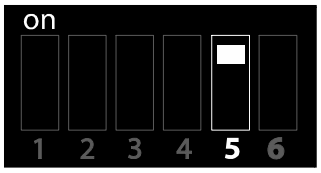
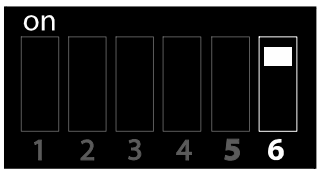
The minimum water resistivity at 15°C for the PPE4 heater shall be 900 Ωcm

Supply water pressure		MPa	0,1 ÷ 1,0
Heating start threshold (minimum flow rate)		l/min	1,8
Control range for water temperature	NORMAL mode	°C	60
	SHOWER mode		55
Water connection ports			G 1/2" (port distance 100mm)
Sound power level L_{WA}		dB	15
Overall dimensions (height x width x depth)		mm	478 x 250 x 99
Weight		kg	~4,8

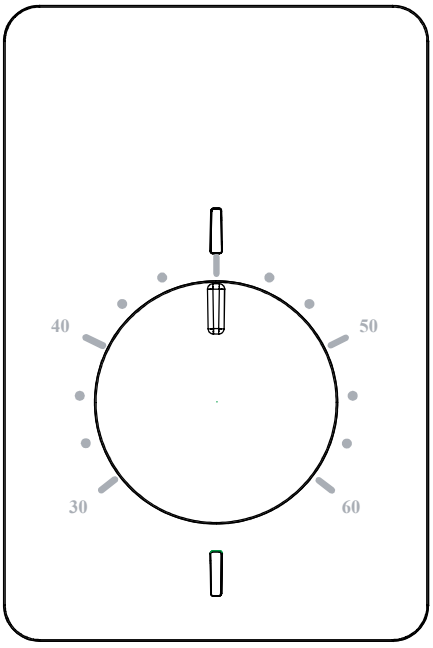
WiFi interface specifications	**PPE4.M**
Mode	AP/Client 802.11b/g/n.
Security	WPA/WPA2 (personal)
IP address assignment	DHCP
Frequency	2412-2484 MHz
Transmission power	<19,5 dBm

Product disassembly

Disassemble the product in the reverse order of the installation procedure

	10kW setting for PPE4 - 10/11/12/15 17kW setting for PPE4 -17/18/21/24
	11kW setting for PPE4 - 10/11/12/15 18kW setting for PPE4 -17/18/21/24
	12kW setting for PPE4 - 10/11/12/15 21kW setting for PPE4-17/18/21/24
	15kW setting for PPE4 - 10/11/12/15 24kW setting for PPE4 - 17/18/21/24
	Maximum DHW outlet temperature setting at 55°C (SHOWER)
	Locking out the DHW outlet temperature setting to prevent tampering
	Air clogging (dry run) sensor disabled
	Power triac failure detection disabled

Note
The heater is has a factory setting to NORMAL 60°C mode. Changing the operating mode to SHOWER 55°C is done only by an authorized service.



The heater turns on to heat automatically when the sensed water low rate exceeds 1.8 l/min. The control system manages the heat output according to the setting by monitoring the DHW low rate, the water temperature setting, and the cold water temperature. Closing the hot water tap turns off the heater.

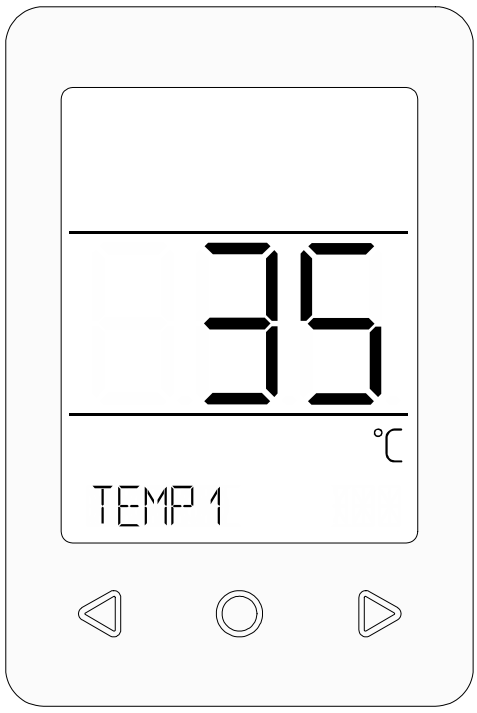
The water heater enclosure features LED indicators:

- the green LED comes on with the mains power supply,
- the red LED comes on with the heater output that produces DHW.

Fault conditions which lock out the heater from operation are indicated with a speciic lashing pattern of the green LED indicator (interpretation, see the reference table below).

Danger
If the red and green LED indicators are lashing at the same time, immediately isolate the power supply from the heater (the resistive heater system has failed). Failure to comply is a hazard of injury or severe property damage.

Green LED lash count	Status
1	- Inlet temperature sensor failure - Outlet temperature sensor failure - Temperature sensor connections reversed
2	- Air clog detected in the resistive heater system; heat output disabled
3	- Outlet water overtemperature - Outlet low rate too high
4	- Power supply grid sync failure - Hardware coniguration error
5	Information / warning : - Actual heat output is not as set - Temperature sensor response altered - Actual temperature of a sensor too low or too high



After turning on the power supply, the panel software version will appear on the display, followed by the controller software version along with the set heater power.
Before the irst heating, the control system waits for stabilisation of the parameters, which is indicated by ⧗ and a WAIT message.
The heater is switched on automatically after the low reaches 1.8 l/min. The control system selects the appropriate power of the heater, depending on the set point, water intake and inlet water temperature. When on, the heat output is indicated by the LCD panel coming on and displaying the ≋ icon. The LCD panel comes on when the user begins to interact with it. The LCD panel reverts to the sleep mode when the heat output is turned off or when there is no user interaction for 1 minute.

Icons	
!	An event which affects the operating comfort of the heater
E	An error which locks out the heat output.
💧	Water low rate/consumption display
📶	Heater WiFi connection established
🔧	Service menu mode enabled
⧗	Pause forced by the control system
☝	Access to heater parameter settings enabled
ϟ	Electric power input display
≋	Heating on display; if lashing, the temperature setting cannot be achieved even with the maximum heat output
🔒	The parameter setting input is out of range or the command input attempted is locked out

Main menu	
TEMP 1 TEMP2 TEMP3	Temperature setting mode ◎ Subsequent pressing is the choice of three recorded temperatures ◁ ▷ Change in the set value ◎ Hold to open the parameter setting overview

Parameter setting overview	
POWER	Actual heat output
TEMP IN	Cold water inlet temperature
TEMP OUT	Hot water outlet temperature
SET TEMP	DHW temperature setting
FLOW	Actual water low rate
SET POWER	Heat output setting
ENERGY	Electrical power input: ◎ Opens the overview ◁ ▷ Modiies the input range DAY, WEEK, MONTH, YEAR END Returns to the overview menu
WATER	Water consumption: ◎ Opens the overview ◁ ▷ Modiies the input range DAY, WEEK, MONTH, YEAR END Returns to the overview menu
WIFI	WIFI signal level, WiFi module number
INFO	[Service access only] Displays the control logic status and the heat output lockout password
WARNINGS	[Displayed whenever present] ◎ Displays the active warnings ◁ ▷ Cycles through the next active warnings END Returns to the overview menu
ERRORS	[Displayed whenever present] ◎ Displays the active failures which lock out the heat output ◁ ▷ Cycles through the next active errors END Returns to the overview menu
SYSTEM	Current irmware versions of the LCD panel, the control unit, and the WiFi module
CONFIG	◎ Opens the coniguration menu
END	Leaves the overview menu and opens the main menu

Coniguration	
TEMP 1 TEMP2 TEMP3	Selects one of the three most often used temperature settings ◯ Opens the setting mode ◁ ▷ Modiies the setting value ◯ Set saved and return to the coniguration menu
LCD MIN	◯ Opens the LCD backlight level setting for the sleep mode ◁ ▷ Changes the setting value ◯ Returns to the coniguration menu
LCD MAX	◯ Opens the LCD backlight level for the active mode and the heat output on mode ◁ ▷ Changes the setting value ◯ Returns to the coniguration menu
ENGLISH	Changes the interface language ◯ Activates the change ◁ ▷ Changes the language ◯ Exits the submenu
TEMP MAX	Maximum DHW outlet temperature setting ◯ Opens the setting mode ◁ ▷ Changes the setting value ◯ Exits the submenu
DATE TIME	DATE TIME System date and time settings ◯ Opens the setting mode ◁ ▷ Selects the parameter setting to be modiied YEAR, MONTH, DAY, HOUR ◯ - Opens the parameter setting mode ◁ ▷ - Changes the setting value ◯ - Returns to the parameter setting selection END Returns to the coniguration menu
WIFI	WiFi connectivity menu ◯ - Opens the menu WIFI CONFIG ◯ - Start of the connection pairing (the LCD screen displays the conigured timeout countdown; if the connection is successful, the connection signal strength is displayed; if unsuccessful, the display reads – –) END Returns to the coniguration menu
SYSTEM	◯ Opens the command selection menu ◁ ▷ Possible selections: RESET - Restarts the controls FACTORY SET - Restores the factory default settings END Returns to the coniguration menu

DISINFECT	Opens the disinfection menu, which is password-protected [23] Change of the item DISINFECT - Disinfection heating temperature setting - Opens the setting mode Changes the setting value - Return DESIN START - Enables the disinfection function - Activation start (the heater will heat the water to the set temperature DISINFECT value in one, the nearest heating cycle, but not later than 15 minutes from setting) DESIN STOP - Exits activation - if the function is active - Stops activation END - Exits the submenu
SERVICE	Access to the service mode: for qualiied service technicians only
END	Leaves the coniguration menu and opens the main menu

Information messages	
LOW FLOW	Information about too low low to turn on the heating
WAIT	System during coniguration
COM MSP	No connection to the controller

Error display

kod	Possible causes	Solutions
E01 Power Off	- One or more triacs have failed	ISOLATE THE PRODUCT FROM THE POWER SUPPLY and contact the technical service
E02 TIN	- Tin sensor failure; - Tin sensor missing; - Tin sensor connection short to ground	Verify that the harness connector is in the correct receptacle; if it is, contact the technical service
E03 TOUT	- Tout sensor failure; - Tout sensor missing; - Sensor connection short to ground - Tout	Verify that the harness connector is in the correct receptacle; if OK, contact the technical service

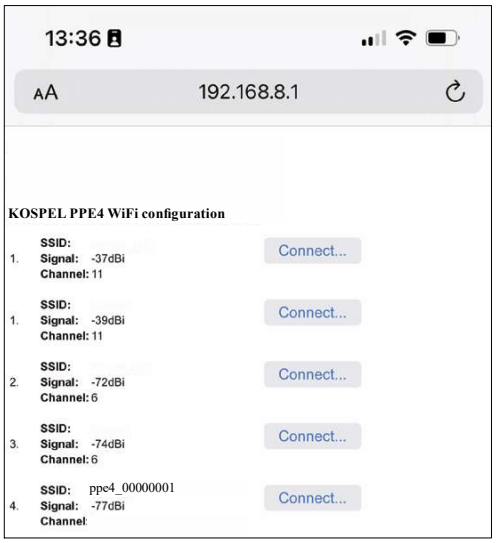
E04 OUT/IN	- Tin and Tout sensor connections reversed; - Altered response of one or both temperature sensors;	Verify the temperature sensor connections are as assigned; if OK, contact the technical service
E05 AIR2	- Air clog in the water circuit - Vane low meter dirty; - Vane low meter failure;	if the problem persists, contact the technical service
E06 AIR	- Air clog in the water circuit; - Pressure switch triggered; - Voltage lost on one supply phase	Verify all supply phase voltages are correct; if the problem persists, contact the technical service
E07 T MAX	- ransient low rate luctuations; - High/sudden setting changes; - Control system failure	if the problem persists, contact the technical service
E08 FLOW	- Air clog in the water circuit; - Water supply system pressure too high	if the water supply system pressure is within speciication limits and the problem persists, contact the technical service
E09 3F	- No mains grid sync signal input - Supply phase voltage lost	If the mains parameters to which the heater is connected are correct, contact the service
E10 CONFIG	- Illegal hardware coniguration	Contact the technical service
E11 Power Off	- Control system failure	ISOLATE THE PRODUCT FROM THE POWER SUPPLY and contact the technical service

Warning display		
Code	**Possible causes**	**Solutions**
W01	- E06 AIR1 error while heating	if the problem persists, contact the technical service
W02	- E05 AIR2 error while heating	if the problem persists, contact the technical service
W03	- E08 FLOW error while heating	if the problem persists, contact the technical service
W04	- E07 T MAX error while heating	if the problem persists, contact the technical service
W05	- Pressure switch tripped - Incorrect DIP switch settings for the heating system - Resistive heater failure - Supply phase voltage lost - Triac failure	If the parameters of the power supply grid wired to the heater are within speciication limits, contact the technical service
W06	- Low battery	Replace the battery or contact the technical service

W07	- Battery drained	Replace the battery or contact the technical service
W08	- Altered response of one or both temperature sensors	Contact the technical service
W09	- Control PCB failure	Contact the technical service
W10	- Control PCB failure	Contact the technical service
W11	- WiFi module failure	Contact the technical service
W12	- Control PCB failure	Contact the technical service
W13	- Operation environment conditions out of limits - Inlet temperature sensor failure	- Verify the heater installation location is correct - Verify the cold water supply temperature - Inspect/replace the inlet temperature sensor or contact the technical service
W14	- If W13 and W15 are active at the same time, the installation location conditions are incorrect - If W13 is active only, the cold water supply temperature is too low - If W14 is active only, the outlet temperature sensor has failed	Replace the outlet temperature sensor (only if W13 and/or W15 are not active at the same time)
W15	- Operation environment conditions out of limits - Control PCB failure	- Verify the heater installation location conditions are within speciication - Contact the technical service
W16	- Operation environment conditions out of limits - Inlet temperature sensor failure	- Verify the heater installation location is correct - Verify the cold water supply temperature - Replace the inlet temperature sensor
W17	- Operation environment conditions out of limits - Control PCB failure	- Verify the heater installation location conditions are within speciication - Contact the technical service

Hint
If the module is not connected to the heater controller, the WiFi-related fields will not be available on the panel.

- Enter the CONFIG menu and after selecting the WIFI, when the CONFIG WIFI message appears, press the ◎) key to start setting up the WiFi connection. A message WAIT will appear on the display and the time left to conigure the connection using a phone or tablet is counting down.
- Start searching the network on your phone, tablet or computer, and then select the heater from the list of found devices (ppe4_0000xxxx). The module number can be read in the menu View > WIFI XXX parameters. After selecting the heater from the list, select the option to use the security key and enter the password 12345678. After establishing a connection, a message about unavailability of the Internet may appear on the screen of the device, please ignore it and maintain the connection.



- Launch the web browser, enter the address 192.168.8.1, the coniguration page should be displayed in the window. If, after establishing connection with the module, you cannot open the coniguration page, check whether other connections to the Internet are active (LTE, GPRS, etc.). In this case, temporarily disconnect your phone or tablet from the Internet and try to connect to the WiFi module again.
- In order to properly conigure the connection, select the access point from the list displayed under the inscription „KOSPEL PPE4 Wi-Fi coniguration."

  Under the SSID of the network, its signal strength is displayed.

  If there are several access points in the network, choose the one with the best performance (that is, the lowest negative dBi value).

  After pressing „Connect...", a window will be displayed in which you should enter the password of the WiFi access point to which the heater is to be connected (e.g. WiFi router), and conirm it with the „OK" button.

- If after the coniguration time (5 min.) appears on the heater panel, the connection has not been established. In this case, you can repeat the setup process by repeating the procedure from the beginning.

- If the WIFI signal level (1..100%) appears on the display, the connection to the WiFi network has been established and the procedure has been completed. You can download the free “Kospel PPE4” software from the app store (Android, iOS) and start remote work with the heater.

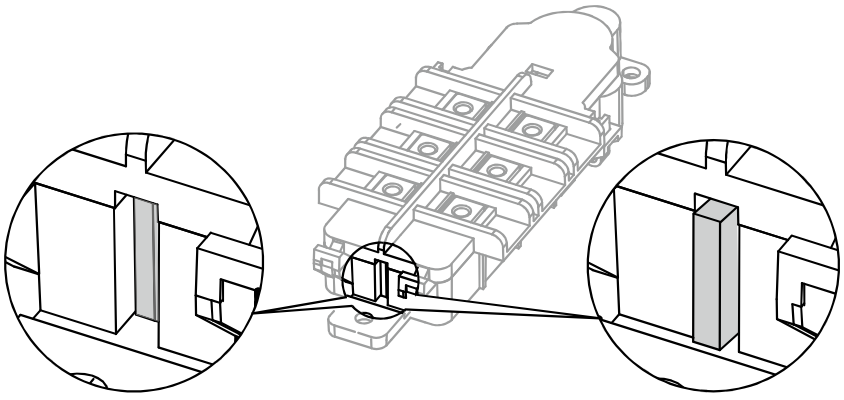
Terminal block safety trip

Note

The terminal block safety trip can be tripped by pressure shocks or failure of the heater.

Danger

If the terminal block safety trip cuts out, contact the technical service.



Safety trip enabled Safety trip cut out