KOSPEL

SERVICE MANUAL

PPE2

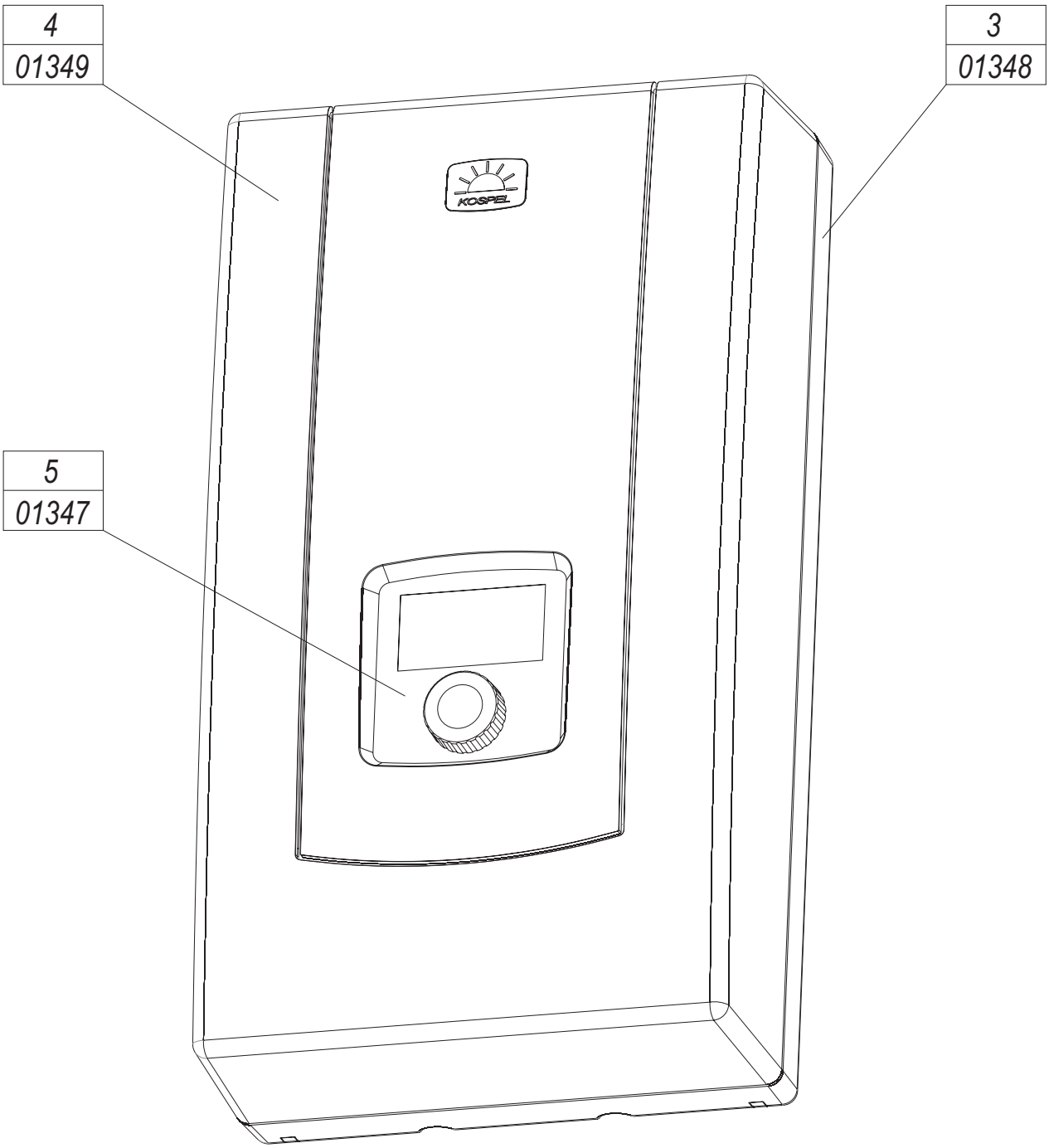
11.06.2015

KOSPEL S.A. KOSZALIN ul. Olchowa 1

Contens

1. Exterior view of water heater PPE2.

Pic.1. Water heater PPE2.



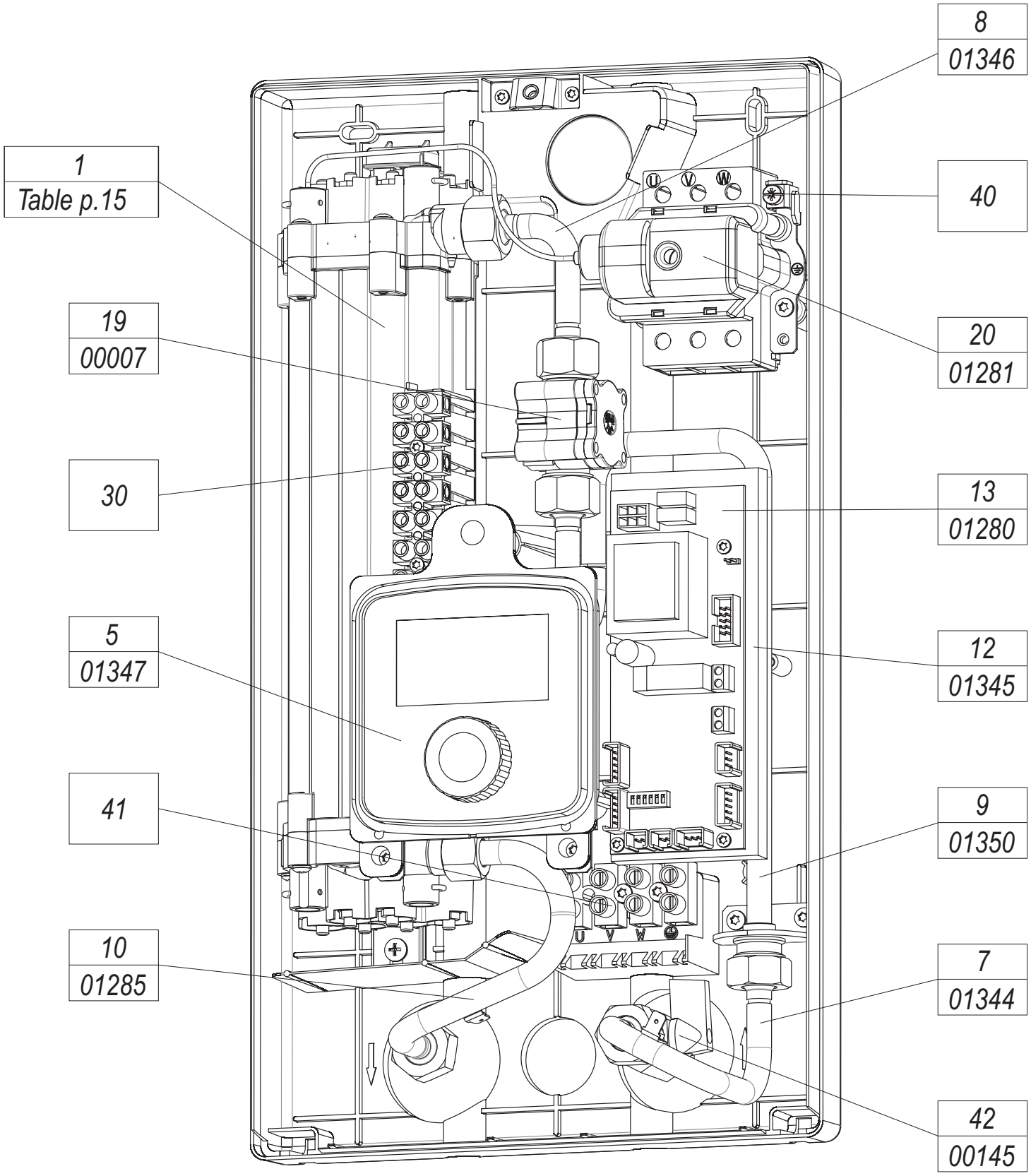
Part number in table of parts

14
01168

Service code

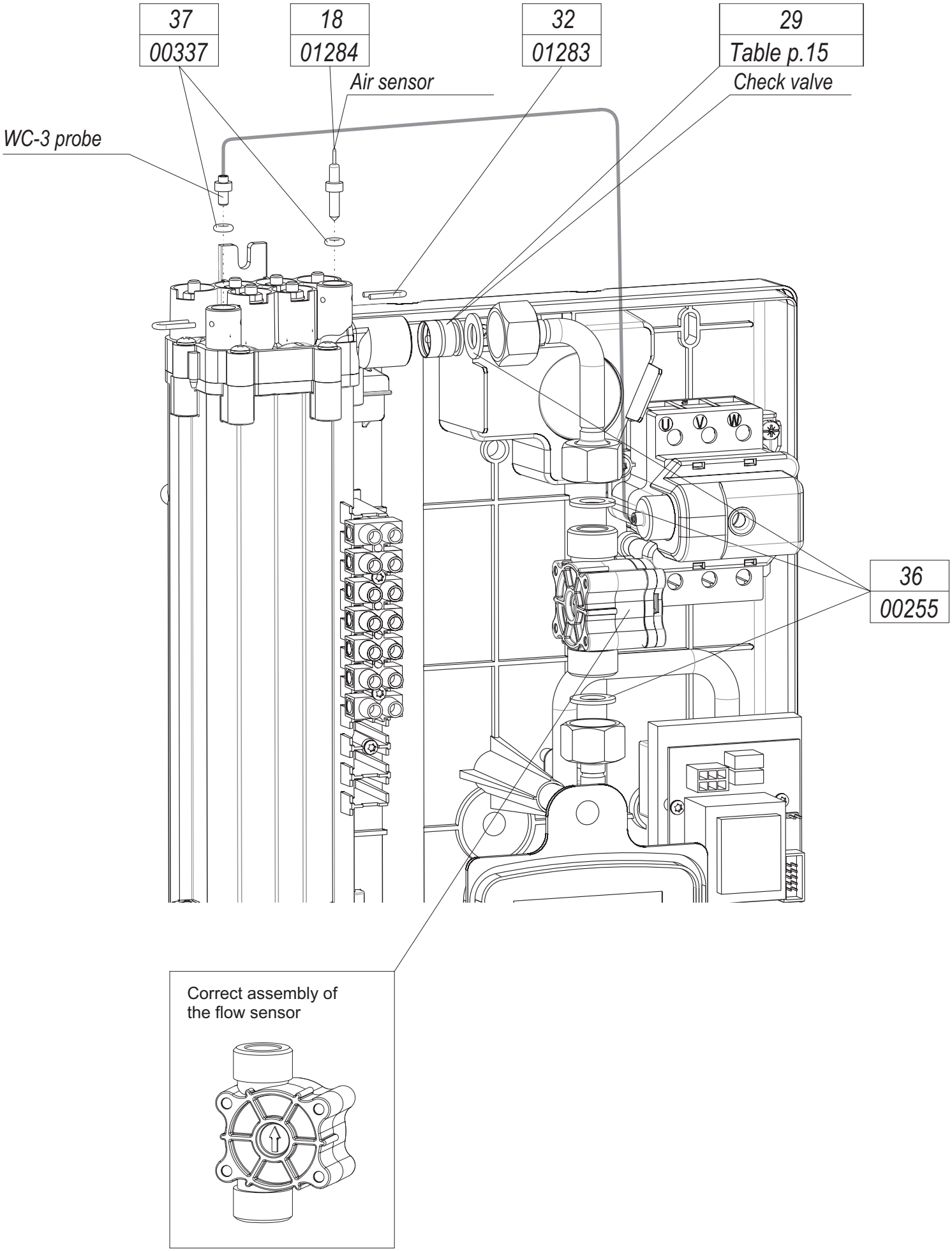
2. Construction of water heater PPE2.

Pic.2. Interior view.



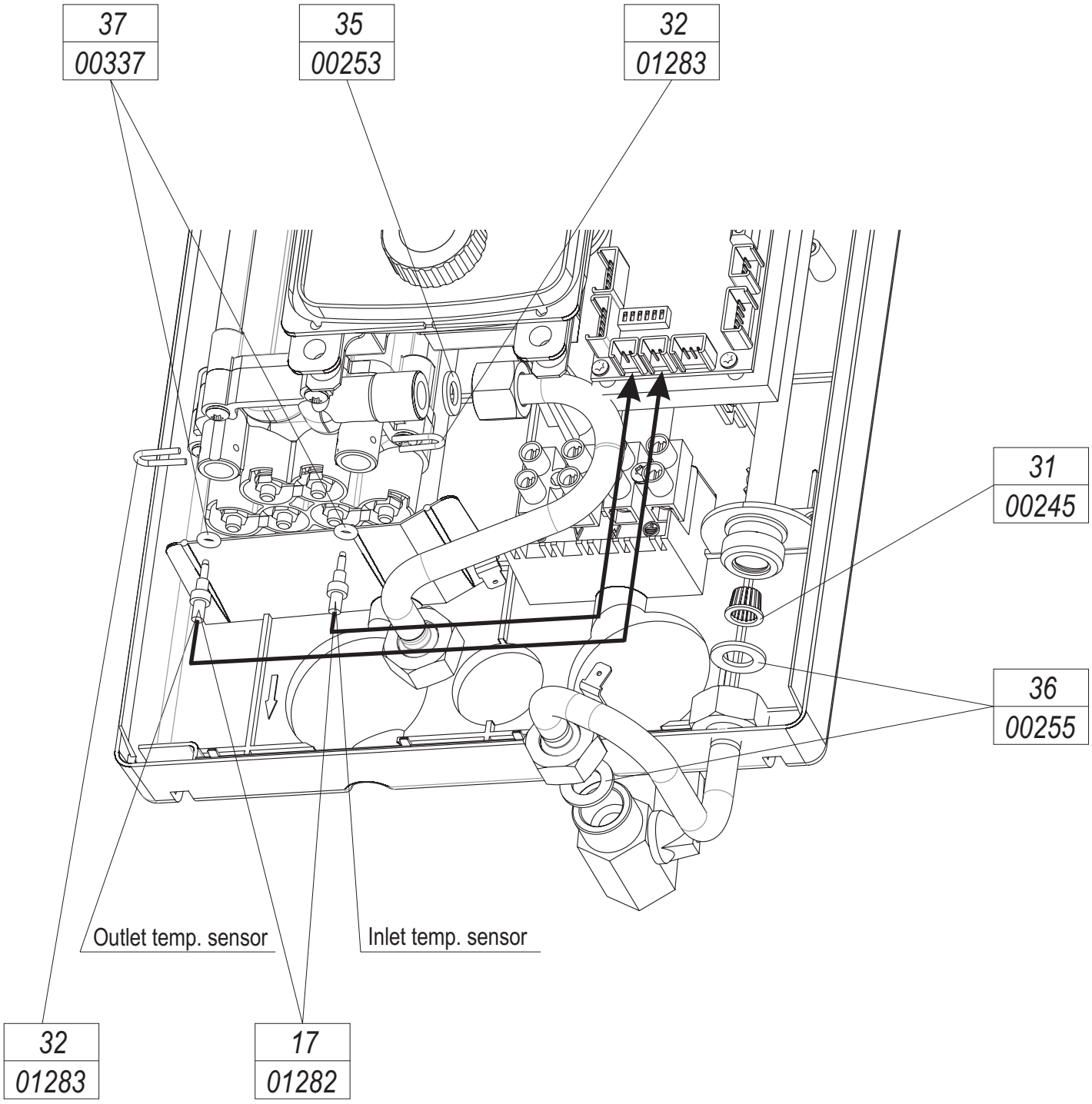
2.1. Assembly of flow sensor and air sensor.

Pic.2a. Flow sensor and air sensor.



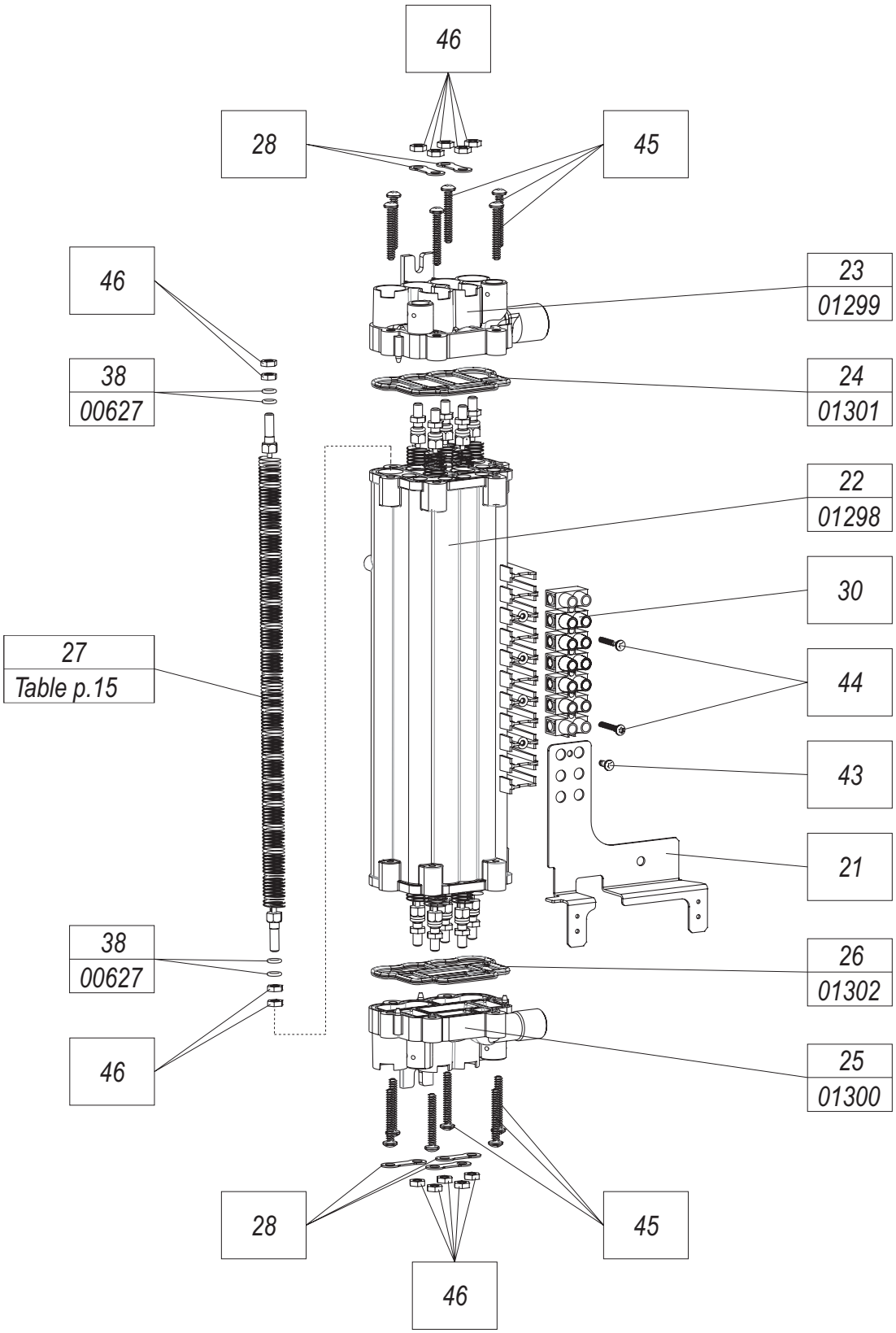
2.2. Assembly of temperature sensors.

Pic.2b. Temperature sensors.



3. Parameters and construction of heating box.

Pic.3. Heating box



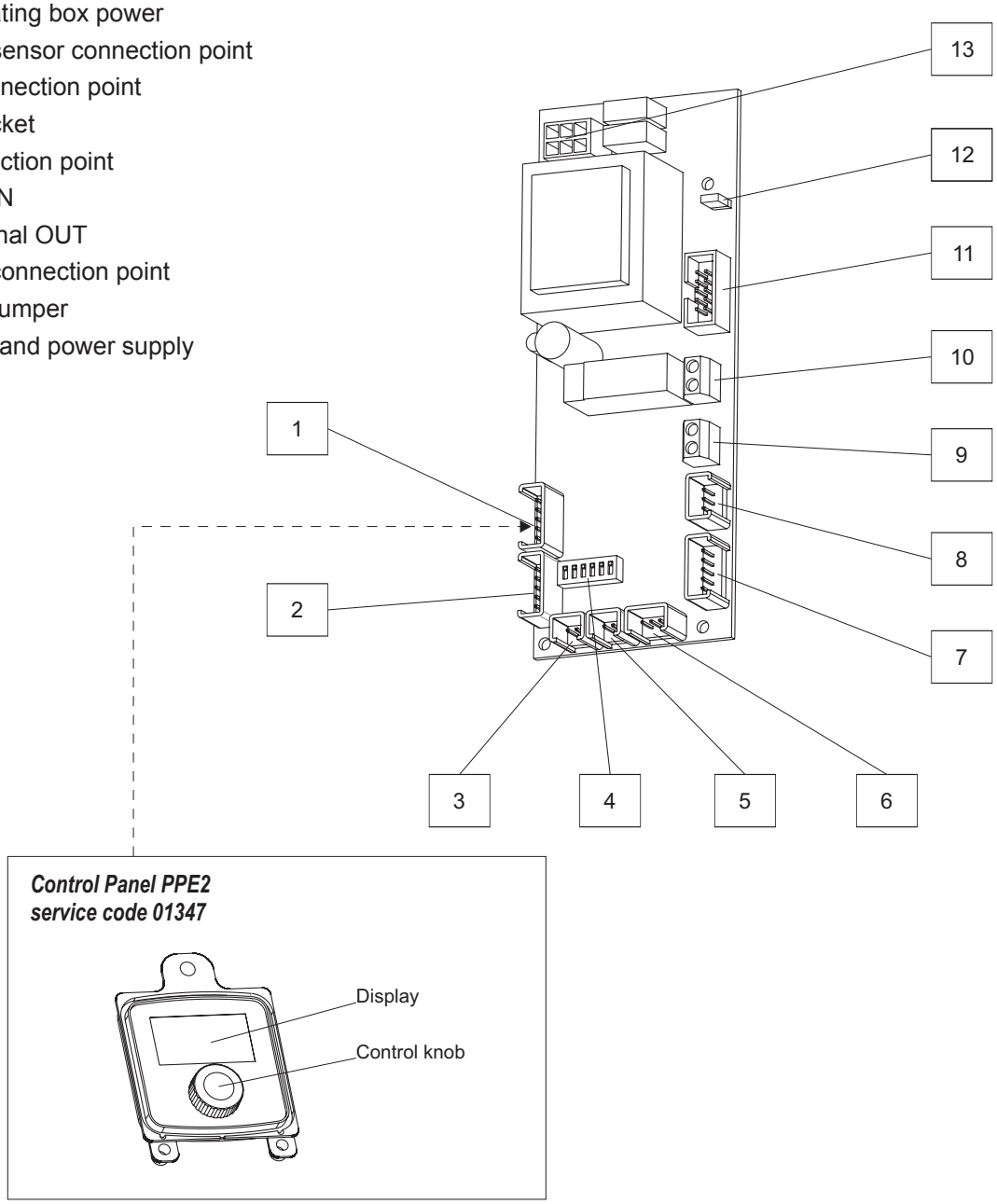
Tab.1. Parameters of heating box

Heating power	***[kW]***	***15***	***24***	***27***
Power of heating box	[W]	2500	4000	4500
Rated voltage	[V]	400	400	400
Rated current	[A]	6,3	10,0	11,3
Heating element resistance	[Ω]	64,00	40,00	35,56

4. Description of MSP-80 board.

Pic.4. MSP-80 Board.

1 - *NAST2* - Control panel PPE2 connection point
2 - *NAST1* - non-use socket
3 - *Tin* - inlet temp sensor connection point
4 - Configuration of heating box power
5 - *Tout* - Outlet temp. sensor connection point
6 - *Q* - Flow sensor connection point
7 - *PROG* - Service socket
8 - *TEST* - tester connection point
9 - *NA* - master signal IN
10 - *BLOK* - master signal OUT
11 - *ZM* -Power board connection point
12 - *JP2*- air detection jumper
13 - Air sensor, ground and power supply connection point



Tab.2. Table of power configuration for heating boxes 15/24/27 kW.

Heating box 15kW	Heating box 24kW	Heating box 27kW
9kW	18kW	27kW
12kW	21kW	
15kW	24kW	

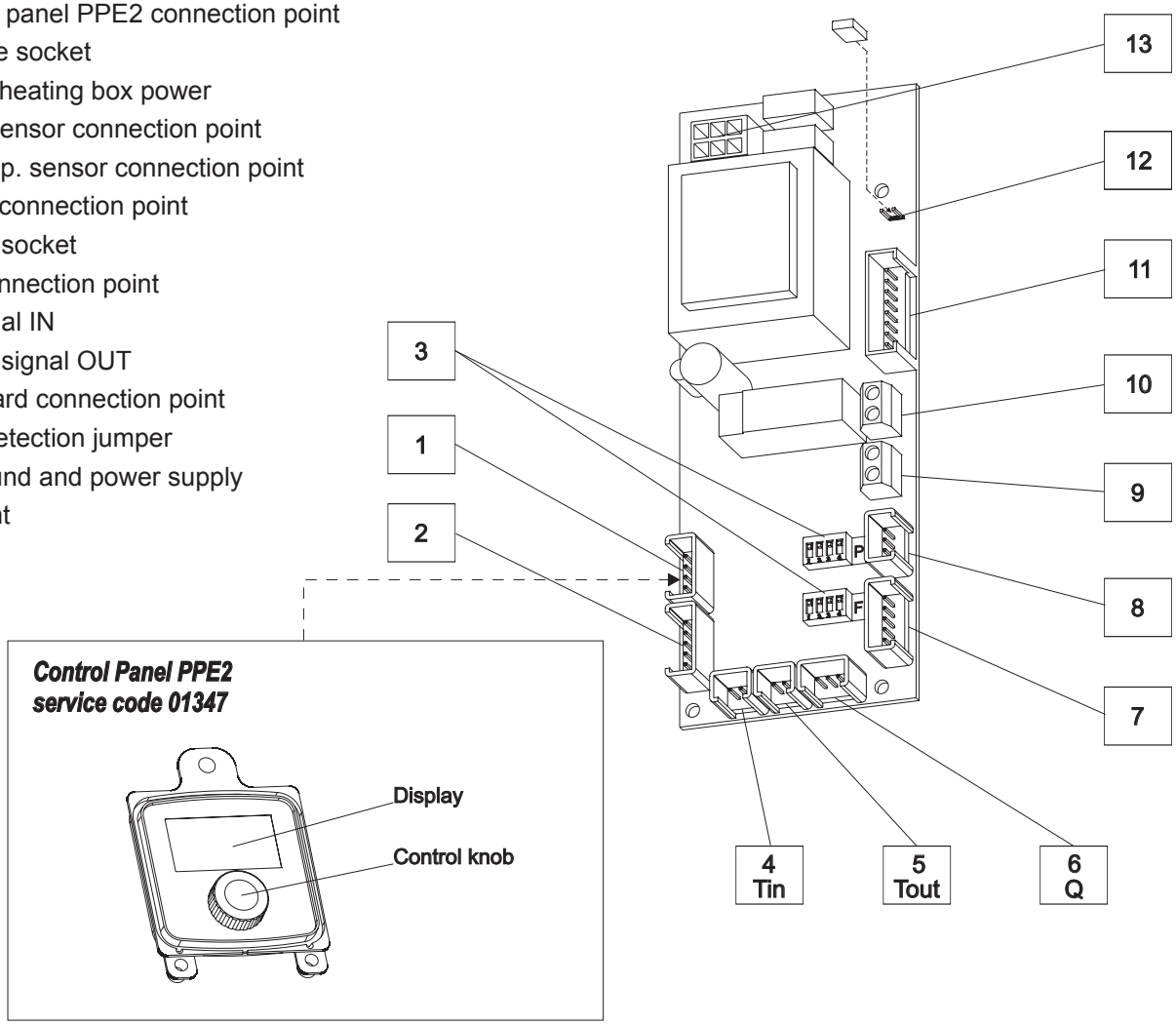
Switch no. 5- ON - switch position that activates the air control at the heating box.

Switch no. 6- in „ON" position blocks access to the unit's setting (this realtes to PPE2 and PPVE only). In this case, the LED display shows the desired temperature value (which has been adjusted before the unit start-up), the heating icon and other possible working characteristics

4.1. Description of MSP-81 board.

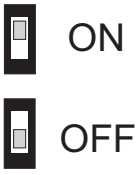
Rys.4.1. Płytka MSP-81.

1 - *NAST2* - Control panel PPE2 connection point
2 - *NAST1* - non-use socket
3 - Configuration of heating box power
4 - *Tin* - inlet temp sensor connection point
5 - *Tout* - Outlet temp. sensor connection point
6 - *Q* - Flow sensor connection point
7 - *PROG* - Service socket
8 - *TEST* - tester connection point
9 - *NA* - master signal IN
10 - *BLOK* - master signal OUT
11 - *ZM* - Power board connection point
12 - *JP2- JP2*- air detection jumper
13 - Air sensor, ground and power supply connection point



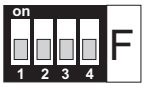
Tab.2.1. Configuration of switches P and F.

Switches settings P - Table of power configuration for heating boxes 15/24/27 kW.



Heating box 15kW	Heating box 24kW	Heating box 27kW
9kW	18kW	27kW
12kW	21kW	
15kW	24kW	

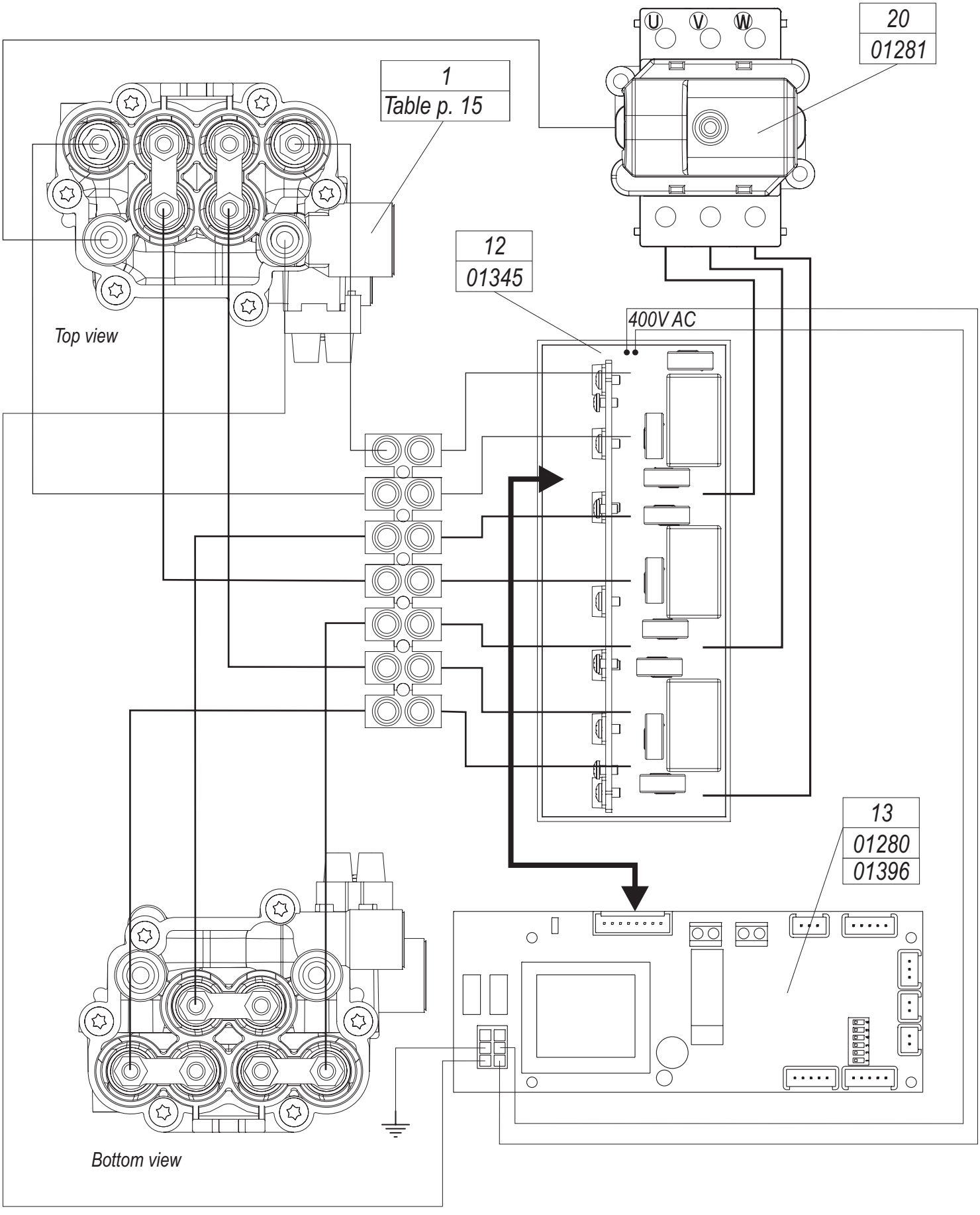
Switches settings F.



1 - do not change! keep factory settings intact OFF,
2 - do not change! keep factory settings intact OFF
3 - ON - activates the air control at the heating box,
4 - ON - blocks access to the heater's settings

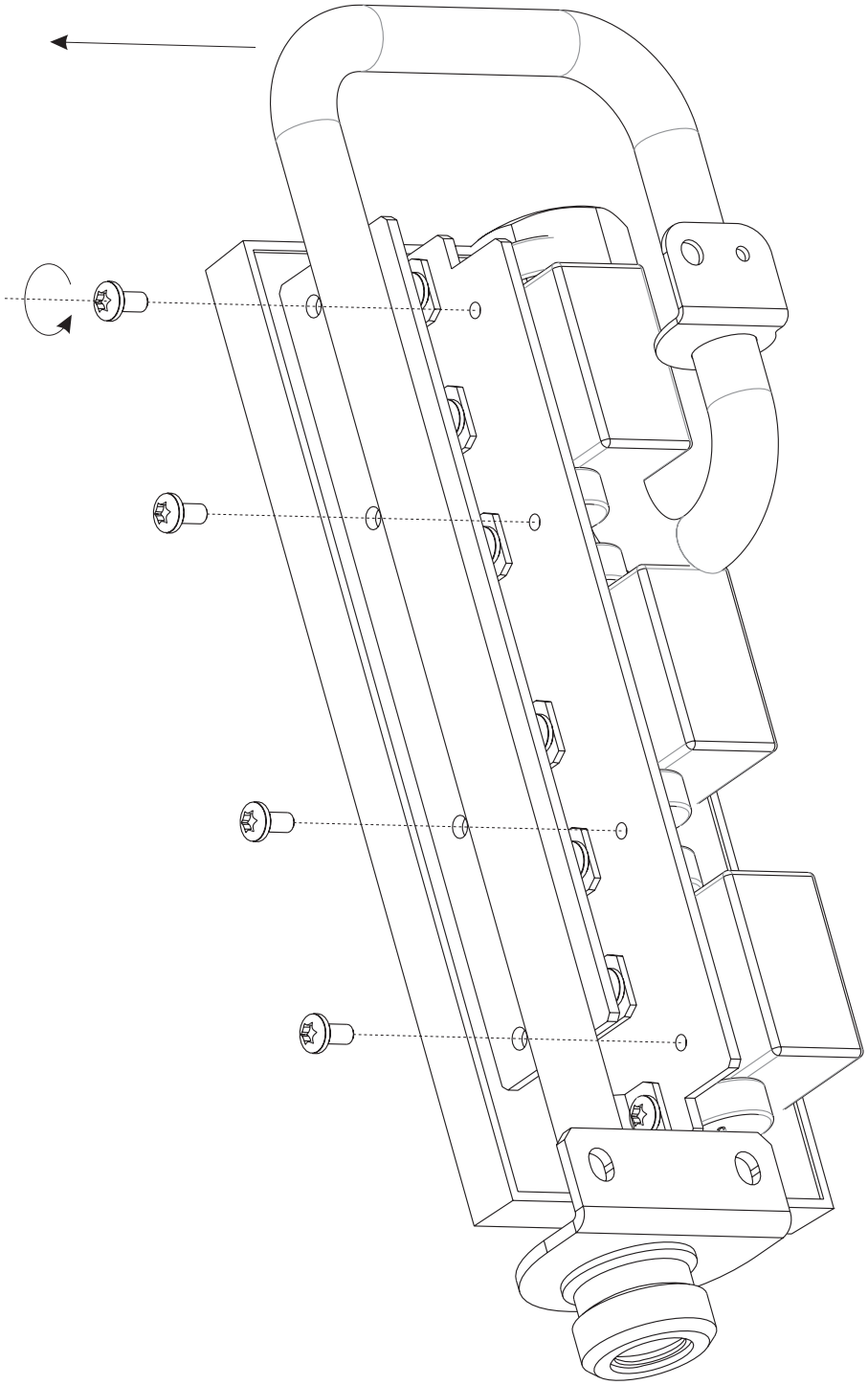
5. Electric connection of heating box.

Pic.5. Electric connection of heating box.



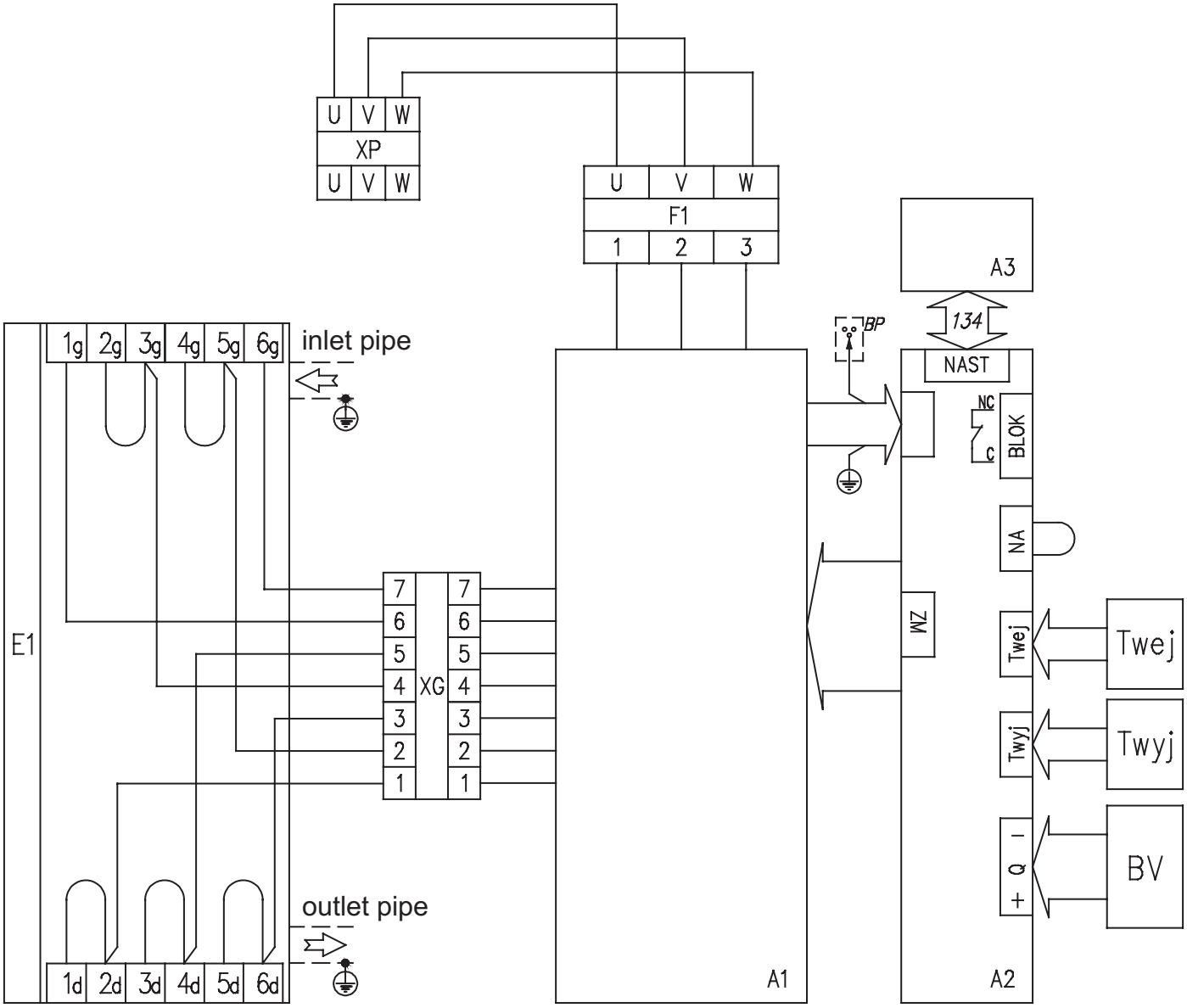
6. Dismantling of power board.

Pic.6. Dismantling of power board.



7. Wiring diagram.

Pic.7. Wiring diagram.

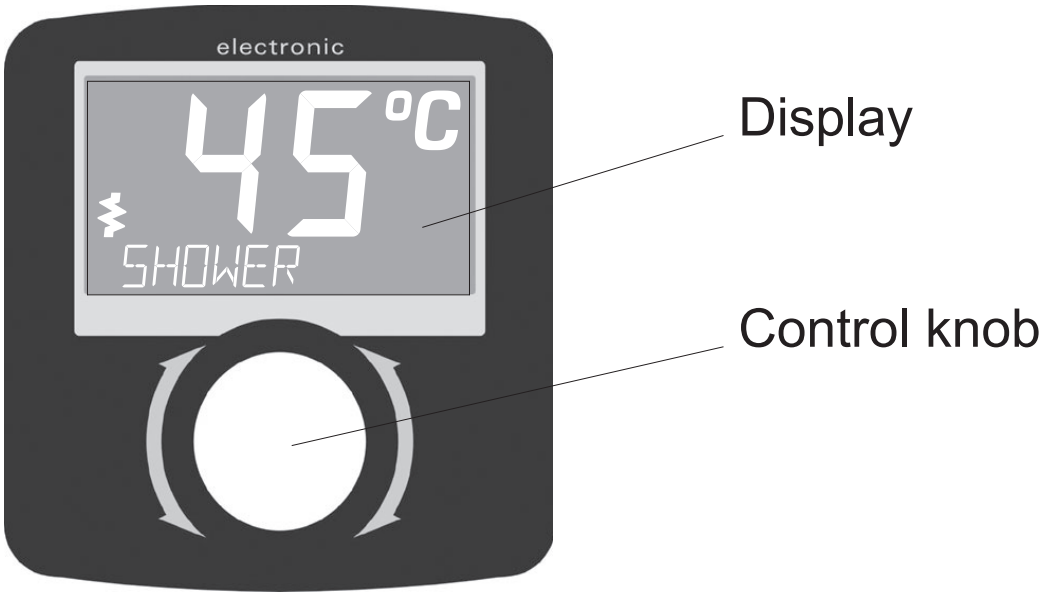


E1 - heating box
F1 - safety cut-out
XG - terminal stripe of heating box
BV - flow sensor
A1 - power board
A2 - MSP board
A3 - control panel PPE2

Twej - inlet temp. sensor
Twyj - outlet temp. sensor
NA - block appliance by the master device
BLOK - block the slave unit
XP - terminal strip
BP - air sensor

8. Control panel PPE2.

Pic.8. Control panel PPE2.



The heater switches on automatically straight after reaching the flow rate over 2,5 l/min. The temperature control system adjusts the power rate according to the water flow rate, required temperature and the temperature of water in the mains. The LCD backlight and ≋ icon signalises the heating operation. If the unit reach the maximum power value which is too low for a given operating conditions the LCD display

will show "INSUF POWER". The LED display backlight also turns on while pushing or turning the setting knob. The backlight will automatically turn off when the heating operation is turned off, or if more than 50 seconds have passed since the last adjustment.

If you block the unit by master appliance (NA entry) the display will show

"NA BLOCK"

If the fault occurs the display will show **E** icon and error message.

- ER>T INLET – inlet sensor failure,
- ER> T OUTLET – outlet sensor failure,
- ER> T MAX – temperature has exceeded the maximum value,
- ER> AIR 1 – air bubbles in the heating box – equipment detection,
- ER> AIR 2 – air bubbles in the heating box – program detection.

If the display shows ER> T MAX, ER> AIR 1 or ER> AIR 2 the unit will stop heating.

The unit will not heat again until the failure is resolved and the appropriate value of water flow is reached.

8.1. Temperature adjustment.

Turn the knob to the right to increase the temperature value, or to the left to decrease it.

Push the knob to read the temperature value that is stored in memory. Push it again to read the next stored value. You can switch between the following settings "SINK", "SHOWER" and "BATH".

To change the temperature setting in memory:

- select the temperature setting by pushing the control knob,
- push the knob and keep for about 3 seconds until the value starts to flashing,
- turn the knob to adjust the value,
- push the knob to save the value.

Notice: save the new value within 10 seconds, otherwise you will lose it.

8.2. Configuration and parameters view.

Push and keep knob for about 5 seconds until the display shows „S>SET TEMP". Some of paramaters are only for view mode (e.g. T INLET or FULL POW) but some parameters user can change (e.g. brightness or language).

Turn the knob to switch between a parameters.

- temperature (min-max) [S>SET TEMP] – 0C,
- inlet temperature value [S>T INLET] – 0C,
- outlet temperature value [S>T OUTLET] – 0C,
- flow rate [S> FLOW] – l/min,
- percentage of maximum power with which the unit currently heats [S> FULL POW] -%,
- work time [S> T – h],
- minimum brightness / stand-by-mode [S> BRIGH MIN] [0 - BRIGH MAX],
- maximum brightness / active [S> BRIGH MAX] [BRIGH MIN -25],
- select language version [S> ENGLISH] (POLSKI, FRANCAIS, ENGLISH, DEUTCH, РУССКИЙ),
- software version (PW ....., MSP.....).

Push and keep knob for about 5 seconds (until the display backlight turns off) to exit parameters setting mode.

Notice: parameters setting mode will automatically exit after 5 minutes since the last adjustment.

8.3. Maximum temperature..

Set the maximum temperature value then push and keep knob for about 5 seconds until the display shows 🔒. Take notice that the new maximum temperature value will be saved in memory for other settings as well.

To cancel the maximum temperature value, push and hold the knob for about 5 seconds (until the display shows 🔒 while you set the temperature above the minimum value.

If you try to set the temperature above the adjusted maximum value the display will show 🔒 for about 1 second..

Tab.3. Detailed description of MSP and PW boards.

Control panel (PW.18 board)	Control panel software version	MSP board	MSP board software version	Factory settings	RESET	TEST
PW.18 without resonator	PW1.1v06	MSP.80	MSP3.0v08	+	-	-
		MSP.81	MSP3.0v10	+	-	-
		MSP.90	MSP4.0v05	+	-	-
			MSP4.0v06	+	-	-
PW.18 ceramic resonator 8 MHz	PW1.1v07	MSP.80	MSP3.0v08	+	-	-
		MSP.81	MSP3.0v10	+	-	-
		MSP.90	MSP4.0v05	+	-	-
			MSP4.0v06	+	-	-
PW.18 ceramic resonator 4 MHz	PW2.1v01	MSP.80	MSP3.0v08	+	-	-
		MSP.81	MSP3.0v10	+	+	+
		MSP.90	MSP4.0v05	+	-	-
			MSP4.0v06	+	+	+

9. Spare parts list.

Tab.4. Parts list.

Pos.	Service code	Picture number	Name		Notice
1	01274	KDE2-03.00.00/1	Heating box KDE2 15kW/400V	1	Power 9/12/15 kW
	01277	KDE2-03.00.00/2	Heating box KDE2 24kW/400V		Power 18/21/24 kW
	01278	KDE2-03.00.00/3	Heating box KDE2 27kW/400V		
2					
3	01348	PPH2-01.00.00	Bottom wall PPE2/PPH2	1	
4	01349	PPH2-09.00.00	Front cover PPE2/PPH2	1	
5	01347	PPE2-05.00.00	Control panel PPE2	1	
6				1	
7	01344	PPE2-02.00.00	Inlet connection pipe PPE2	1	
8	01346	PPE2-04.00.00	Intermediate connection PPE2	1	
9	01350	PPE2-03.01.00	Power board pipe PPE2	1	
10	01285	KDH2-04.00.00	Outlet connection pipe KDE2/PPE2	1	
11				1	
12	01345	PPE2-03.00.00	Power board PPE2	1	
13	01396	KDE2-11.00.00	MSP-81 board for PPE2/PPVE	1	
	01280	KDE2-11.00.00/01/0-1	MSP-80 board for PPE2/PPVE	1	
15				1	
16				1	
17	01282	TT4-G10KC3-34-330-KOS	Temperature sensor in/out	2	
18	01284	WM-151	Air sensor	1	
19	00007	CZP-00.00.00A/XX	Flow sensor	1	
20	01281	WC3a-00.00.00/02	Safety cut-out WC-3	1	
21		WM-148	Support	1	
22	01298	WP-055	Body of heating box	1	
23	01299	WP-060	Top cover of heating box	1	
24	01301	WP-101	Top gasket of heating box	1	
25	01300	WP-061	Bottom cover of heating box	1	
26	01302	WP-100	Bottom gasket of heating box	1	
27	01303	KDE2-03.01.00/1	Heating element 2,5kW (KDE2 15kW/400V)	6	
	01304	KDE2-03.01.00/2	Heating element 4kW (KDE2 24kW/400V)	6	
	01305	KDE2-03.01.00/3	Heating element 4,5kW (KDE2 27kW/400V)	6	
28		WM-157	Bridge	5	
29	01306	CV15FR 31.2014.10003	Check valve KDE2 15kW/400V	1	7L Zielony
	01307	CV15FR 31.2020.00001	Check valve KDE2 24kW/400V	1	10L Niebieski
	00617	CV15 DN10 31.4015.0	Check valve KDE2 27kW/400V	1	CV15DN10
30		WE-010	Screw connection	1	
31	00245	WP-040	Mesh filter 1/2"	1	
32	01283	WM-156	Staple	4	
33					
34					
35	00253	WP-054.02	Gasket 1.5x14,8x8 (3/8")	1	
36	00255	WP-054.07	Gasket 1.5x18,2x11,7 (1/2")	4	
37	00337	PN-60/M-86961	O-ring 3,3x2,4	4	
38	00627		Oring 5,1x1,6		
39					
40		WM-001	Ground terminal	1	
41			Terminal stripe TLZ16 (4/12)	1	
42	00145		Ball-tap mini 1/2"	1	
43		MARCOPOL	Screw TW 3,1x8 TX	1	
44		MARCOPOL	Screw TW 3,1x25 PZ	2	
45		MARCOPOL	Screw UW 4,5x30 TBH/1	12	
46		PN-86/M-82144	Nut M5-5-A-Fe/Zn5	24	

10. Technical specification.

Tab.5. Technical specification

Water heater PPE2 electronic		**9/12/15**			**18/21/24**			**27**
Rated power	kW	9	12	15	18	21	24	27
Power of heating box	kW	15			24			27
Rated voltage		400V 3~			400V 3~			400V 3~
Rated current	A	3 x 13,0	3 x 17,3	3 x 21,7	3 x 26,0	3 x 30,3	3 x 34,6	3 x 39,0
Efficiency (at Δt=40° and water pressure at 0,4 MPa)	l/min	3,3	4,3	5,4	6,5	7,6	8,7	9,8
Fuse rated current	A	16	20	25	32	40		50
Min.connecting wires connection	mm^2	4 x 4			4 x 4		4 x 6	4 x 6
Min.connecting wires connection	mm^2	4 x 16						
The maximum allowed network impedance	Ω					0,43	0,37	0,30
Pressure in the water mains	MPa	0,1 ÷ 0,6						
Activation point (min rate)	l/min	2,5						
Temperature adjustment range	°C	30 ÷ 60						
Overall dimension (height x width x depth)	mm	440 x 245 x 126						
Weight	kg	~ 4						
Water fittings		G 1/2” (distance beetween inlet and outlet 100mm)						
The minimal resistivity of water at 15°C	Ωcm	**1100**						

Opracował: Przemysław Biegański