Proveno 4G
Technical Manual

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1 Models and Options

Kettles

Sales code	*Description*
MG4224300	Combi kettle Proveno 4G 40E
MG4224302	Combi kettle Proveno 4G 60E
MG4224304	Combi kettle Proveno 4G 80E
MG4224306	Combi kettle Proveno 4G 100E
MG4224308	Combi kettle Proveno 4G 150E
MG4224310	Combi kettle Proveno 4G 200E
MG4224312	Combi kettle Proveno 4G 300E
MG4224314	Combi kettle Proveno 4G 400E
MG4224320	Combi kettle Proveno 4G 40S
MG4224322	Combi kettle Proveno 4G 60S
MG4224324	Combi kettle Proveno 4G 80S
MG4224326	Combi kettle Proveno 4G 100S
MG4224328	Combi kettle Proveno 4G 150S
MG4224330	Combi kettle Proveno 4G 200S
MG4224332	Combi kettle Proveno 4G 300S
MG4224334	Combi kettle Proveno 4G 400S

E = electrically heated kettle

S = direct steam heated kettle

Installation

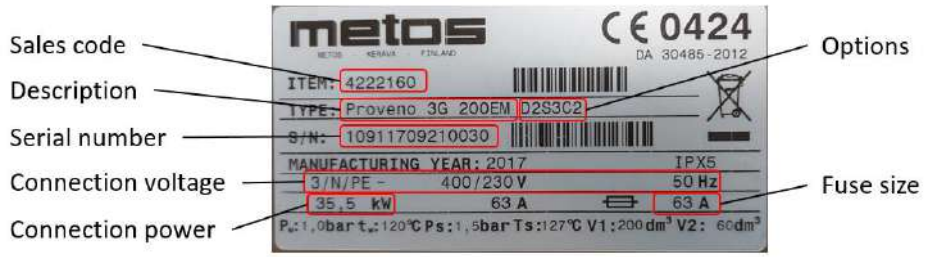
Sales code	*Description*	*Abbreviation*
MG4224000	Surface installation	FM
MG4224002	Sub-surface installation	FM
MG4224004	Group installation, surface	GRL, GRM, GRR
MG4224006	Group installation, sub-surface	GRL, GRM, GRR
MG4224008	Free standing 40-100	FS
MG4224010	Free standing 150-400	FS
MG4224012	Group installation, free standing 40-100	GRL, GRM, GRR
MG4224014	Group installation, free standing 150-400	GRL, GRM, GRR
MG4224016	Free standing, mid floor kit 1	
MG4224018	Free standing, mid floor kit 2	
MG4224020	Installation flanges for free standing	

Options

Sales code	*Description*	*Abbreviation*
MG4224022	Welded bowl covers	HG
MG4222992	Extra power	H
MG4222966	Standard handshower S1	S1
MG4222964	Heavy duty handshower S2	S2
MG4222962	Reel-in handshower S3	S3
MG4222950	Cooling C2	C2

MG4222952	Cooling C3i	C3i
MG4222954	Cooling C5i	C5i
MG4222956	Cooling C3i PA (pressurized air)	C3i PA
MG4222958	Cooling C5i PA (pressurized air)	C5i PA
MG4212292	Double water connection	T
MG4222960	Foot pedal for mixing & tilting	FP
MG4008006	Wireless HACCP transmitter (IOLiving)	HA
	Food temperature output	DO
MG4224026	Socket power outlet 230V 16A	PO
MG4211972	D1 tap	D1
MG4222135	D2 tap	D2
MG4215822	Heavy duty mixer tool 150 L	-
MG4215719	Heavy duty mixer tool 200 L	-
MG4215721	Heavy duty mixer tool 300 L	-

Rating plate markings:

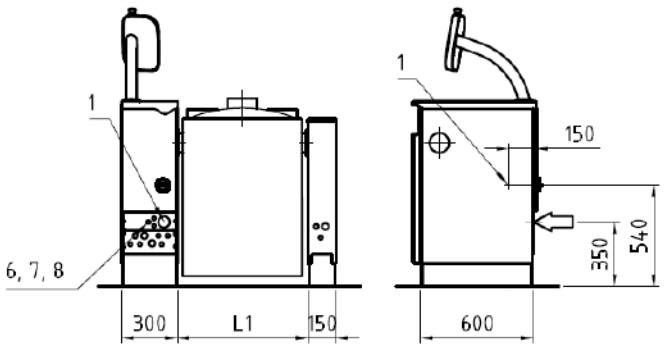


2 Connections

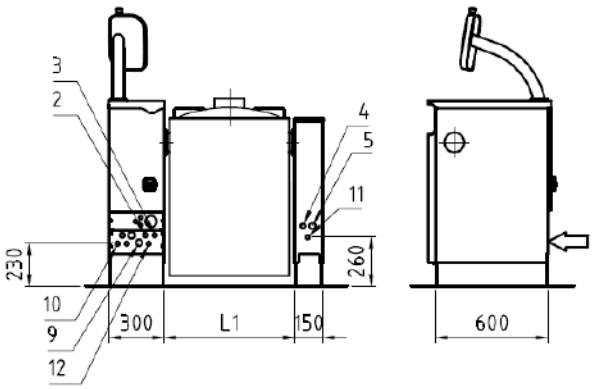
All connections and dimensions are the same for free standing and floor mounted installations.

2.1 Single Kettle Installation

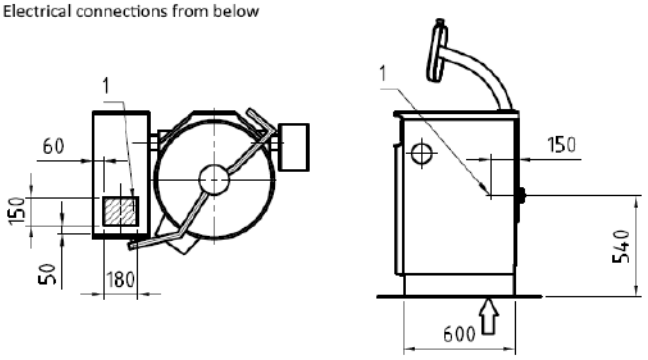
A. Electrical connections from rear



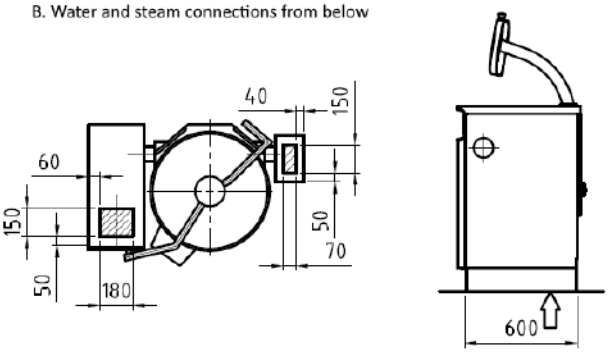
A. Water and steam connections from rear



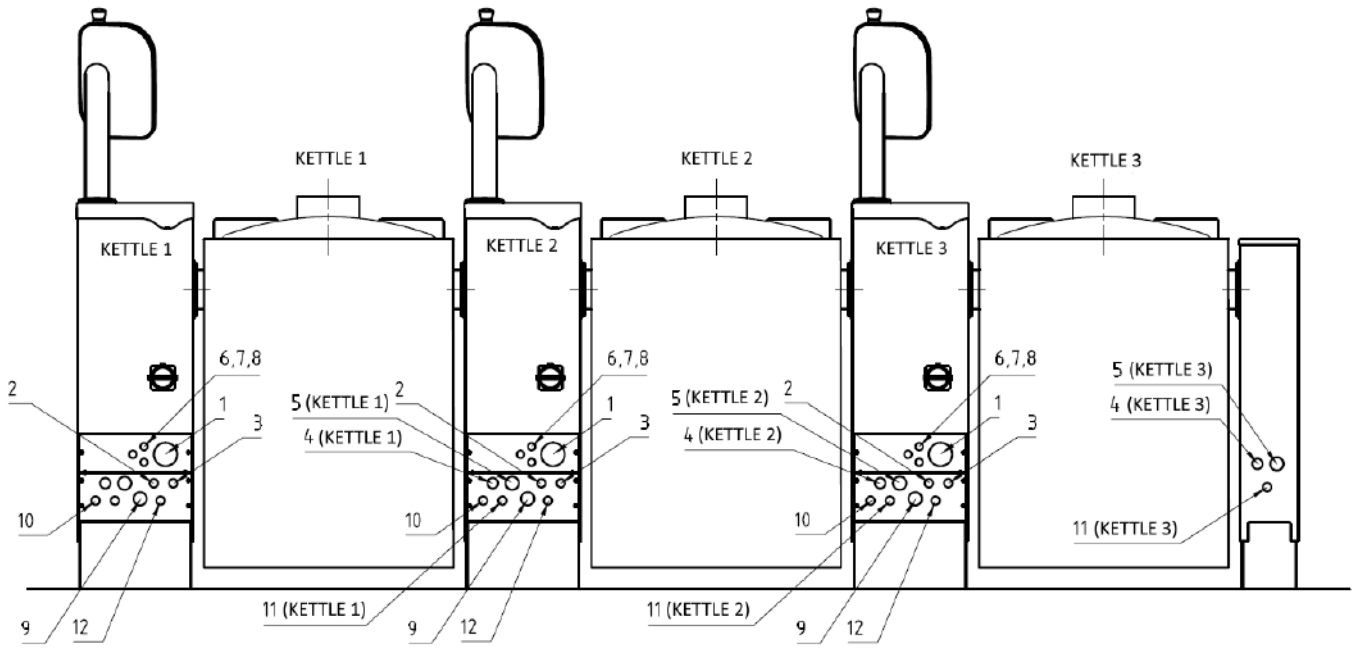
B. Electrical connections from below



B. Water and steam connections from below



2.2 Group Installation



1. Electrical connection, PG21/PG36/PG48 gland
2. Cold water connection R1/2” (ø15), to be fitted with one way valve and shut off valve, min flow 25L/min
3. Hot water connection R1/2” (ø15), to be fitted with one way valve and shut off valve (option)
4. Ice bank cooling inlet R3/4” max. pressure 3 bar, flow 90L/min. (option)
5. Ice bank cooling outlet R1” (option)
6. Ice bank cooling control cable (option)
7. HACCP cabling (option)
8. Power management system control cable (option)
9. Steam inlet R3/4” / R1” / R1 1/4” (option)
10. Condensate outlet R1/2” / R3/4” (option)
11. Compressed air inlet R1/2” (option)
12. Twin water inlet R1/2”(option)

Electrical connection power cord sizes:

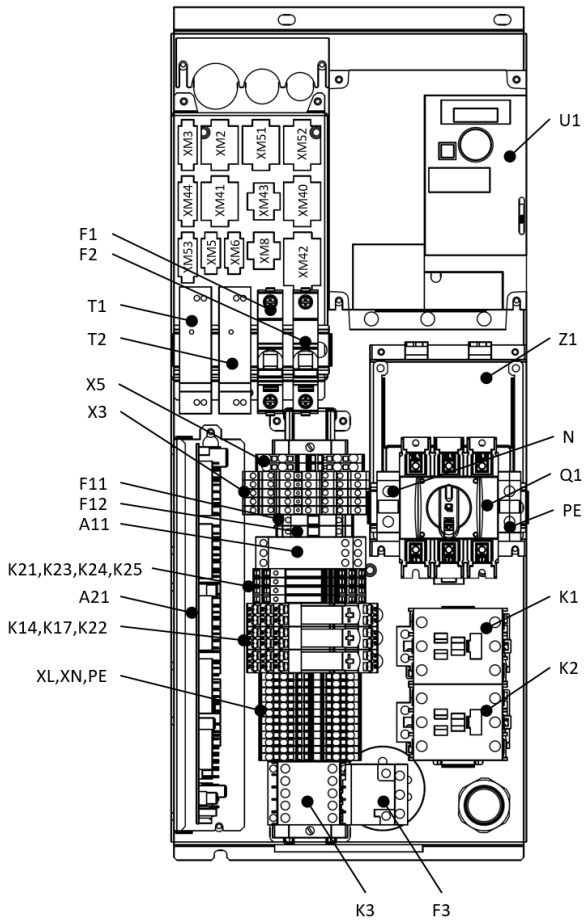
Model	**Power cord diameter (cable gland size)**	**Power cord cross section (terminal block size)**
Proveno S	PG21 (13 - 18 mm)	max. 16 mm^2
Proveno 40E	PG36 (22 - 32 mm)	max. 16 mm^2
Proveno 60E	PG36 (22 - 32 mm)	max. 16 mm^2
Proveno 80E	PG36 (22 - 32 mm)	max. 16 mm^2
Proveno 100E	PG36 (22 - 32 mm)	max. 16 mm^2
Proveno 150E	PG36 (22 - 32 mm)	max. 16 mm^2
Proveno 200E	PG36 (22 - 32 mm)	max. 35 mm^2
Proveno 300E	PG48 (34 - 44 mm)	max. 35 mm^2
Proveno 400E	PG48 (34 - 44 mm)	max. 35 mm^2

The table above shows the power cord sizes that fit through the cable glands and to the terminal blocks. It is not a guide or recommendation for selecting the power cord. It is the responsibility of the electrician to select and use the type of cable that is suitable for the installation.

2.3 Electrical Connection to Icebank Unit

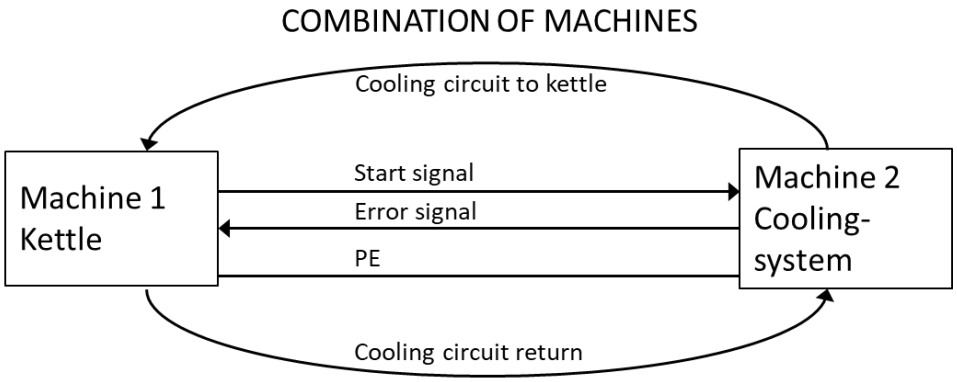
See control circuit diagram S01055

The Proveno combikettle and the icebank have two control line connections in order to co-operate during the cooling process of the kettle. Both connections are potential free. The first control connection is for starting of the icebank circulation pump for the kettle when cooling is requested. The second control line is for signaling of a possible malfunction of the icebank to the kettle user panel. The connection terminals are shown in the picture below.



X3:7-8	Potential free icebank pump control signal
X3:9-10	Potential free malfunction signal from icebank

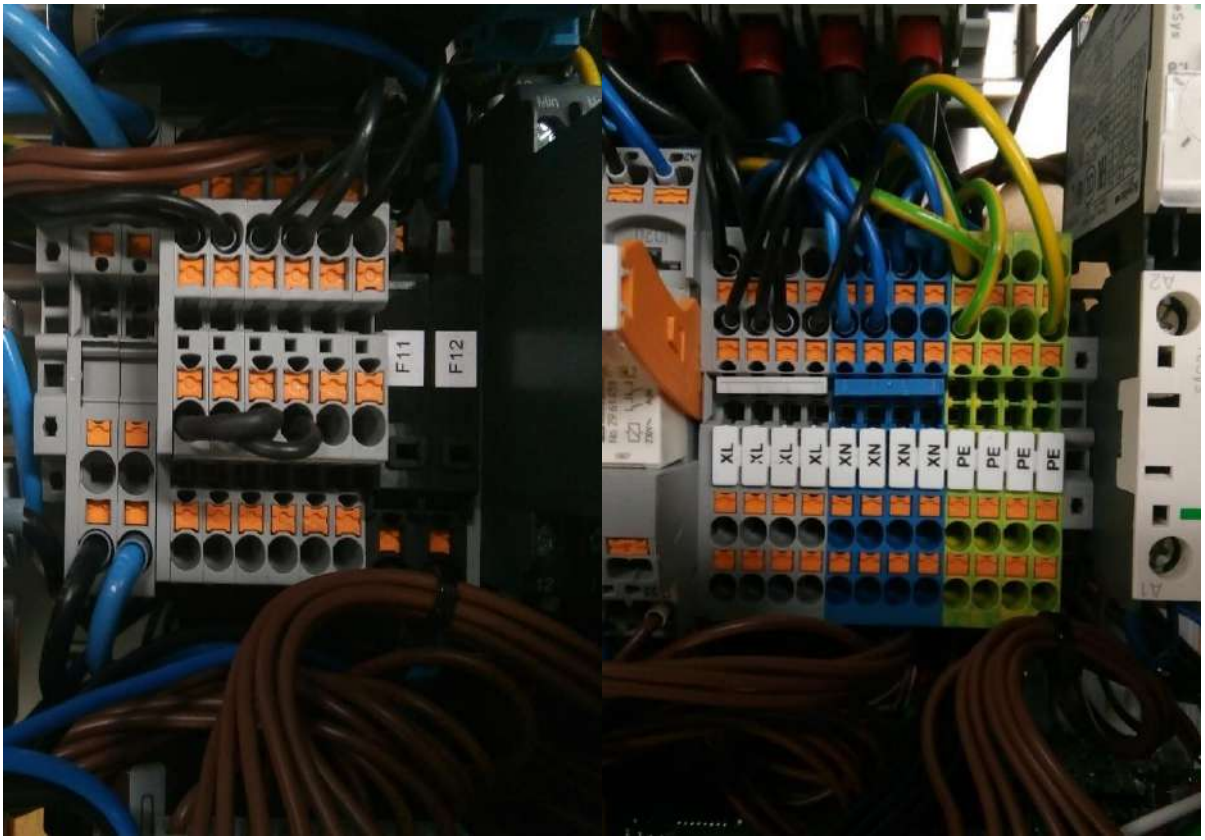
NOTE! When the combikettle and icebank unit control circuits are interconnected a combination of machines as specified by the EC Machinery Directive is created. This requires that at commissioning a signed declaration of conformity must be provided covering the combination of the two machines. Appropriate safety and operation tests must be done and documented.



2.4 Electrical Connection to Peak Power Regulating Systems

See control circuit diagram S01056

The Proveno combikettle is prepared for connection to peak power regulating systems like Sicotronic or Ecotronic. These systems continuously monitor all the connected appliances of the site and intelligently control electrical power usage in order to keep total peak energy under set limit and at the same time minimize the effect this has on the usage of the appliances. The connection terminals are shown in the picture below. Before making the connections the wire links between terminals X3:1-3 and X3:2-4 must be removed.



Remove wires from X3:1-4 to connect external system	
X3:1, 3	Heating contactor K2 control
X3:2, 4	Heating contactor K1 control
X3:5	Heating ON signal
XN	Neutral
PE	Protective earth

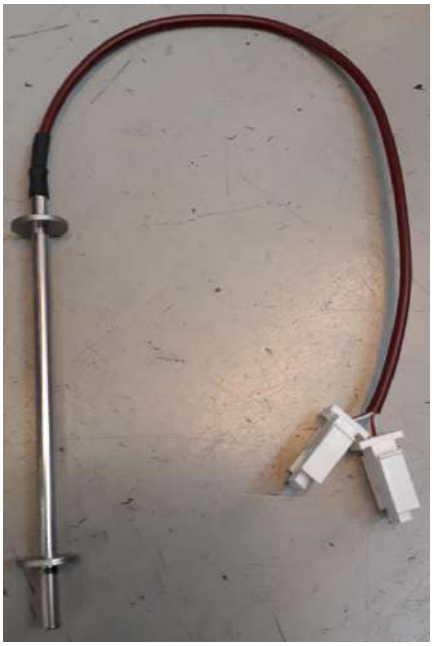
2.5 Forced Half Power

See control circuit diagram S01056

In cases where there is a limitation of electrical power supply there is a possibility to force the kettle to half heating power in order to enable some other appliance to momentarily be switched on. This will of course to some extent affect the cooking process of the kettle. The control input is to be connected to a potential free closing contact. The connection terminals are shown in the picture below.

X3:11-12	Potential free forced half power input

2.6 External HACCP Sensor Module (IoLiving)



MG4008006 Wireless HACCP transmitter (IOLiving)

MG3659027 B3 2xPt1000 food temperature sensor

MG3773305 3M Dual lock fastener – 10 cm 2 pcs

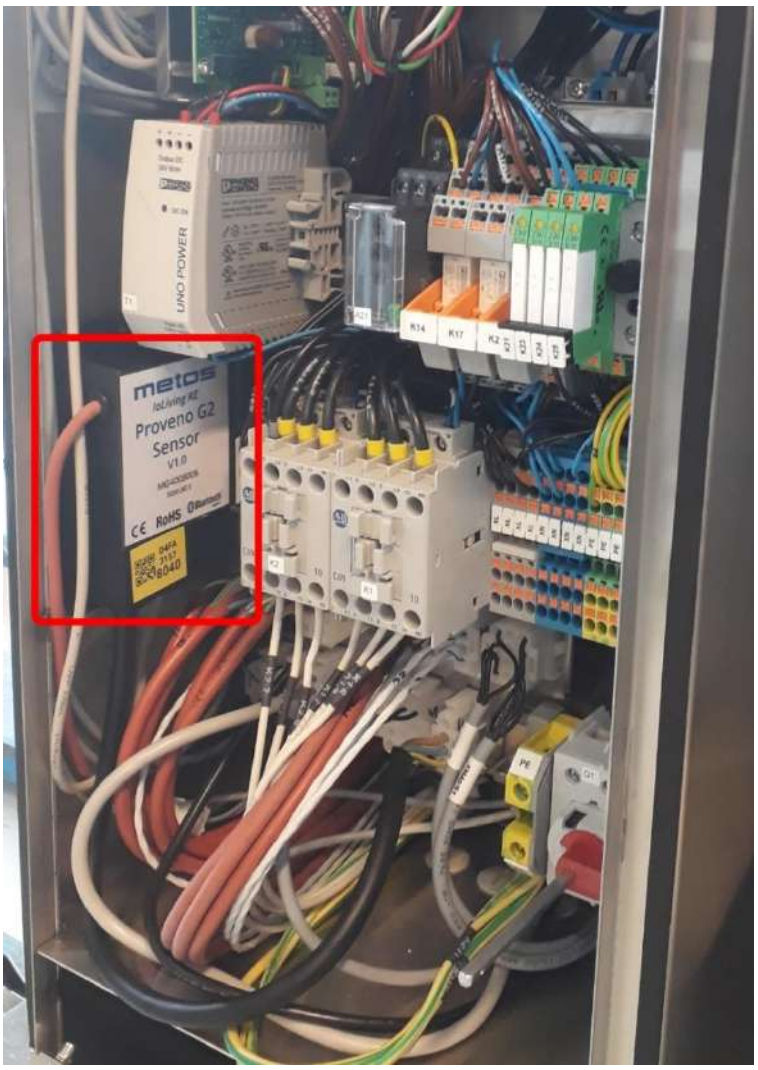
2.6.1 Fitting the Sensor Module

In order to fit the sensor module the following cover plates of the kettle must be removed as described below,

- tilt the kettle fully
- turn the mains switch on the control pillar rear cover plate in the 0 –position
- loosen the two screws at the bottom edge of the rear cover plate and remove the plate
- loosen the two screws at the bottom edge of the front cover plate and remove the plate
- remove the jacket drain valve and loosen the screws of the kettle bowl cover plate

Now there is full access to all areas needed during the installation.

The HACCP sensor module is fitted from the back of the control pillar to the side plate of the electrical compartment using the two 3M Dual Lock strips. Check that the mounting surfaces are clean and grease free before fitting the Dual Lock strips. First peel off the protective film from one strip and attach it firmly to the back of the sensor module enclosure. Then press the other strip onto the attached one and peel off the protective film. After that position the sensor module on the electrical compartment side plate and press firmly to get good adhesion.



2.6.2 Cabling and changing the food temperature sensor

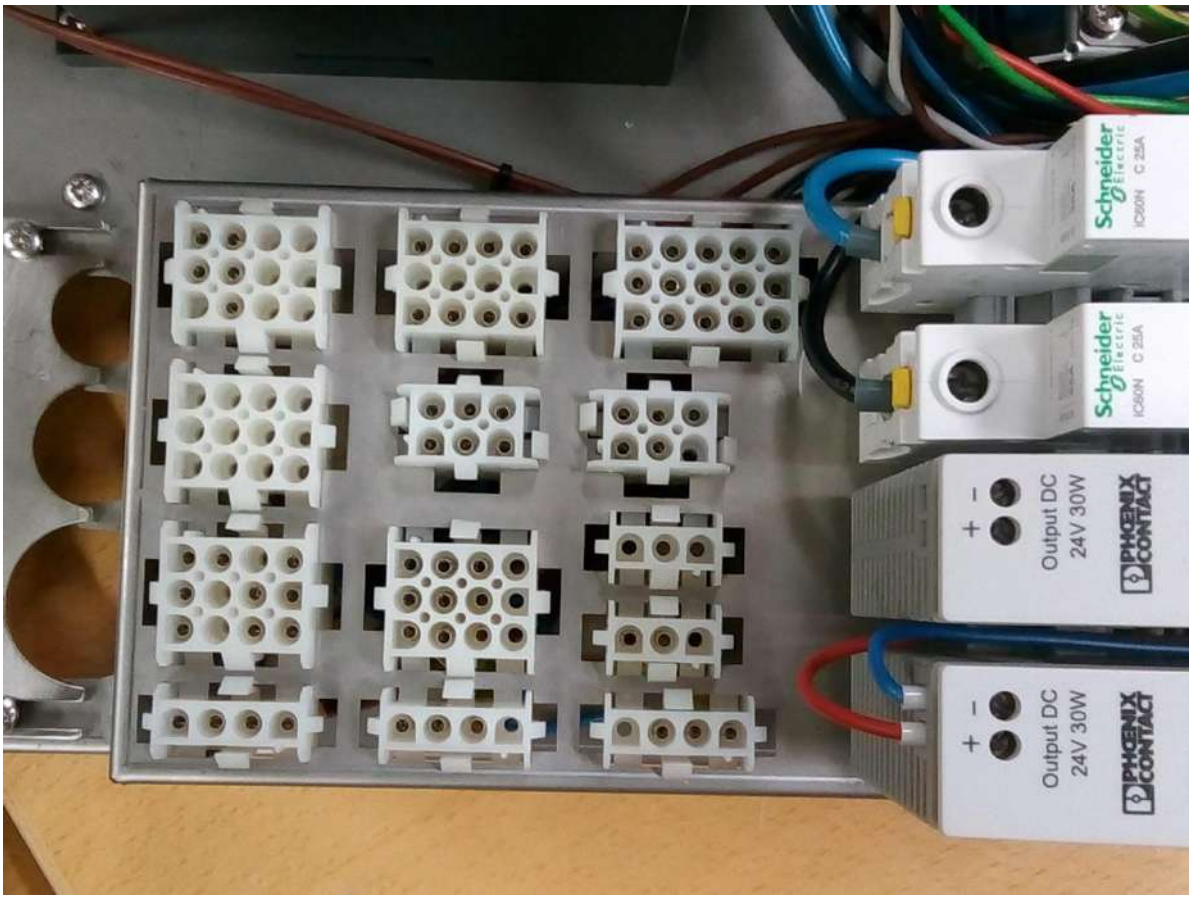
Route the cable with the white two pole connector through the kettle bowl axle. Remove the existing food sensor by disconnecting it and removing the two screws holding the mounting bracket. Insert the new twin sensor food temperature sensor and refit the bracket and mounting screws. Connect one of the output connectors to the original sensor cable and the other to the new cable going to the HACCP sensor module.

2.6.3 Cabling the power and status cables

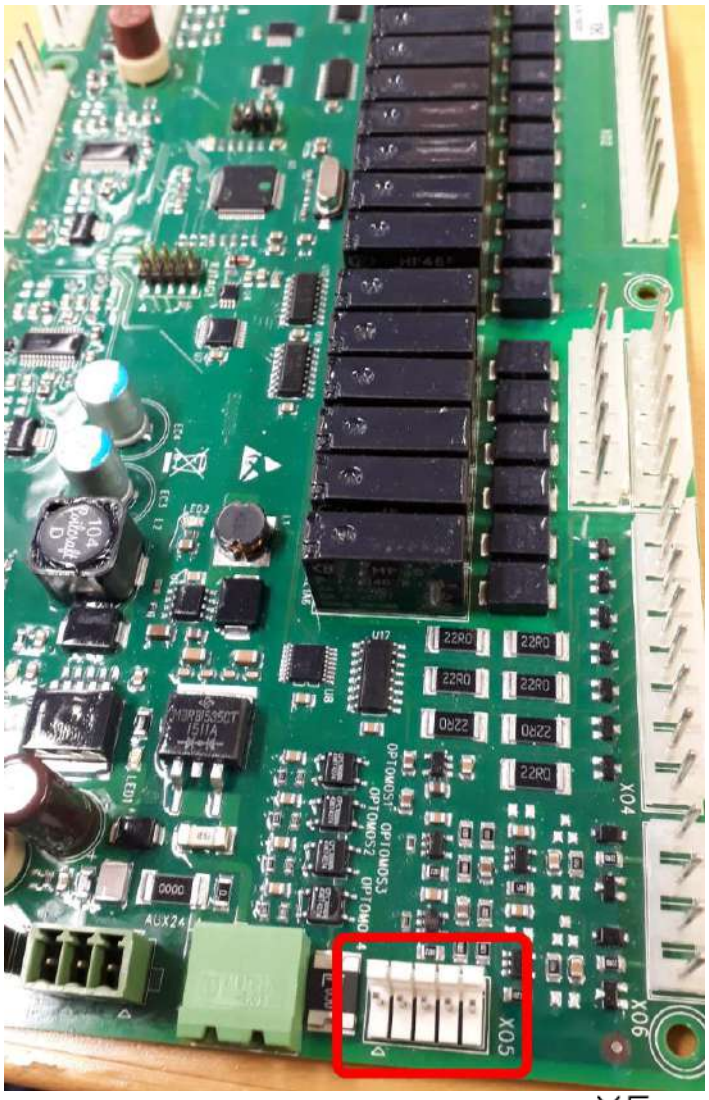
See control circuit diagram S01090

Seen from the electrical compartment side the rectangular cable feed through frame has spare cable glands that can be used for the power and status cables of the sensor module.

The power cable is connected to connector XM53 in the electrical compartment



The sensor module status cable connector is connected to connector XO5 on the I/O board.



2.6.4 Finalising the installation

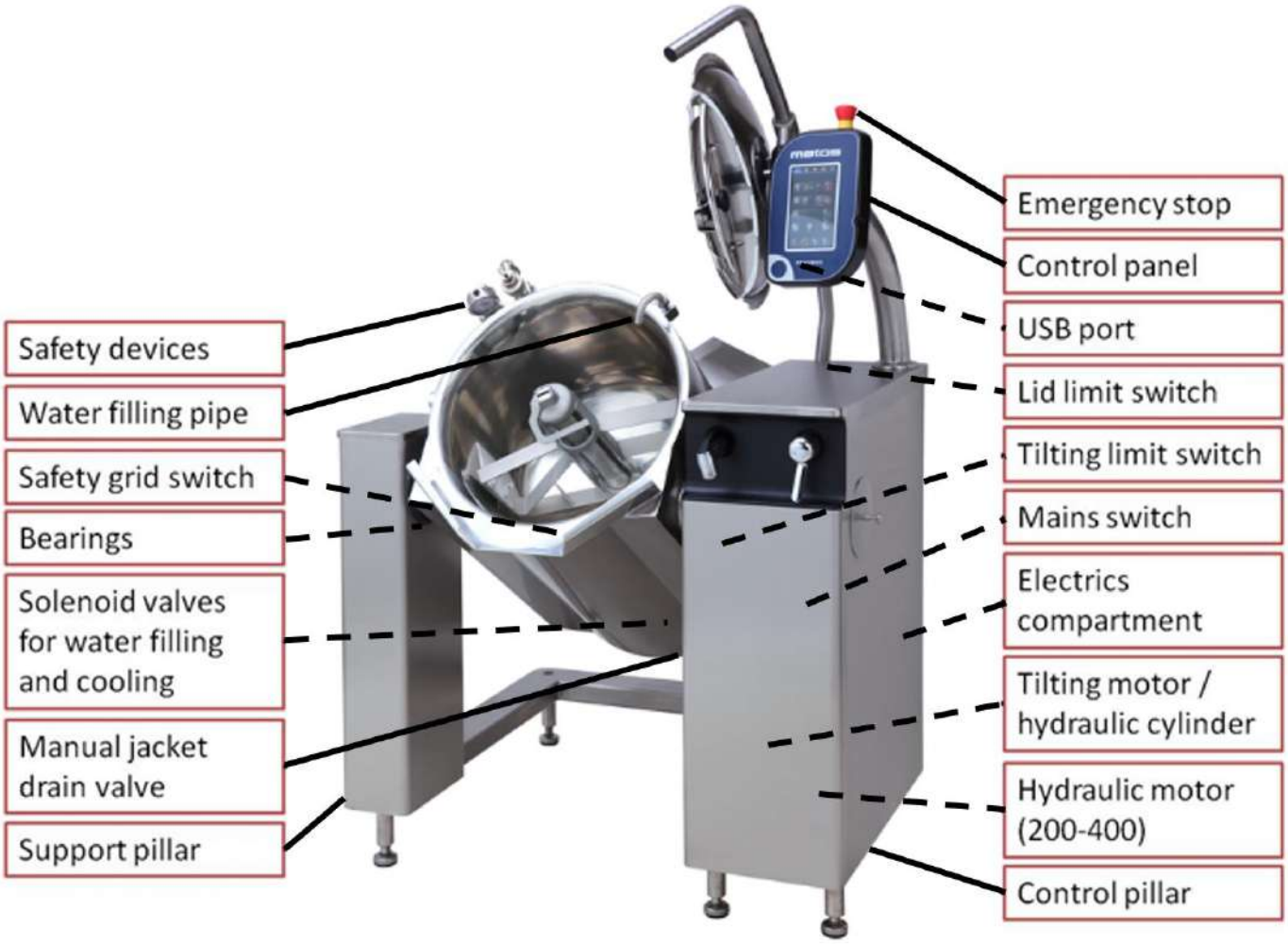
Check that all the cables are properly routed and that no cables interfere with the kettle tilting arm. Refit all the cover plates and switch the mains switch on. Place the code sticker on the back plate. Use IoLiving mini app on your Android device to check that the following readings are sent to the application:

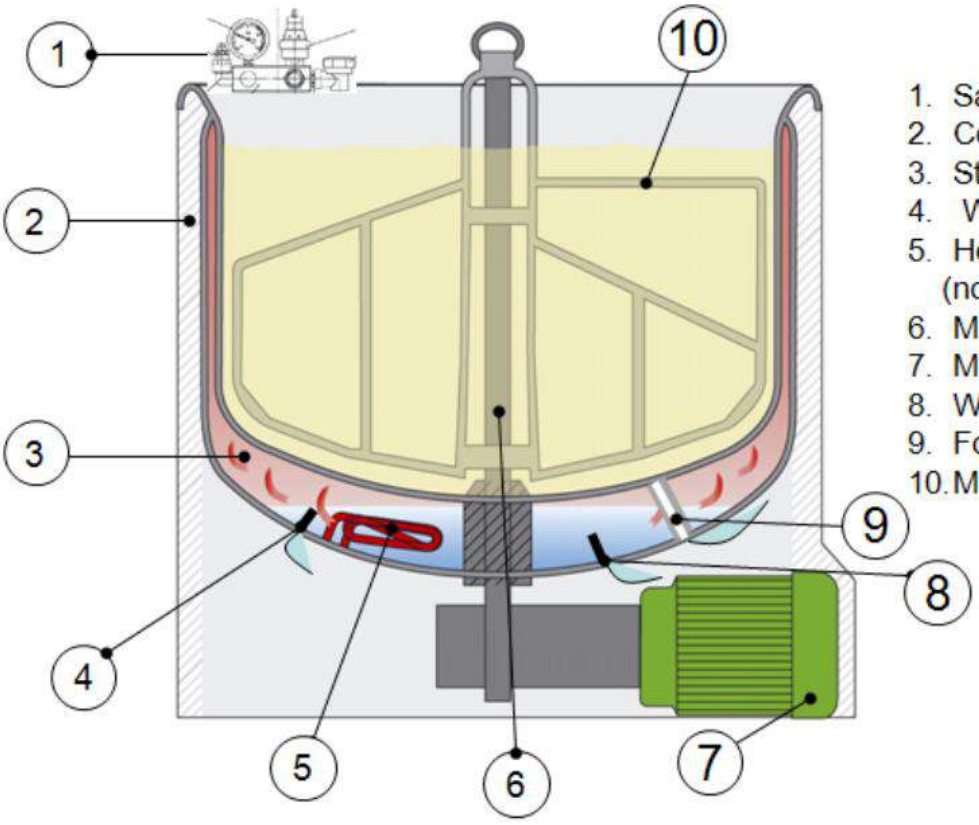
- Food temperature (Temperature 1)
- Mixing (K4)
- Heating (K2)
- Cooling (K5)

The IoLiving mini app may be downloaded from www.ioliving.com/ioliving-download-center if necessary.

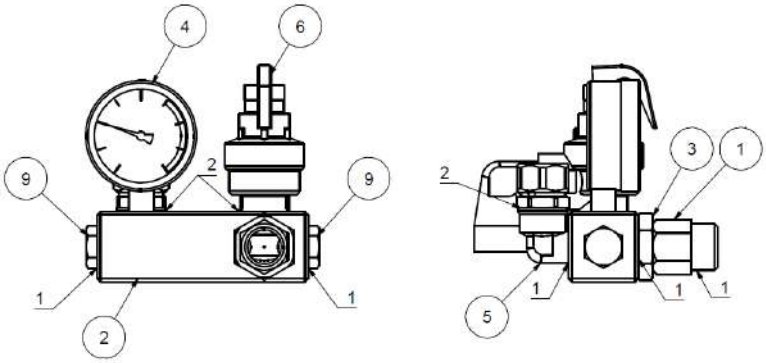
See IoLiving user's manual for further instructions on using the sensor.

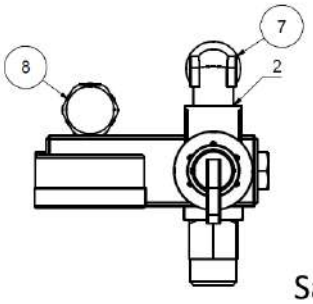
3 Operation





1. Safety Group
2. Cover plates/insulation
3. Steam jacket
4. Water level sensor B1
5. Heating element E1+2+3+4 (not in direct steam heated)
6. Mixer axle
7. Mixer motor M1
8. Water temperature sensor B2
9. Food temperature sensor B3
10. Mixer Tool (detachable)





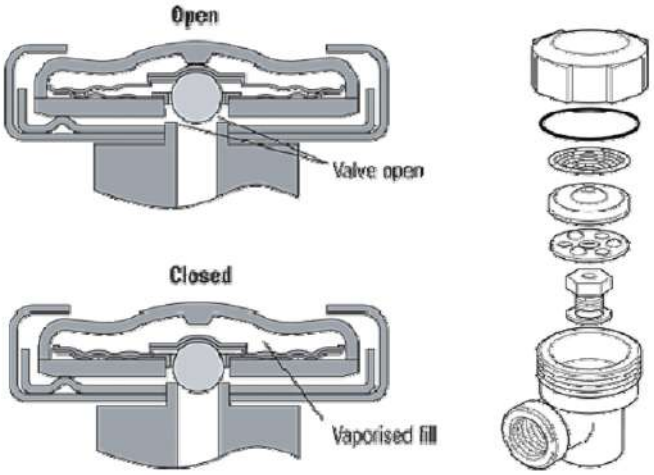
4. Manometer = Shows pressure in steam jacket
6. Safety valve 1,5bar = Releases jacket pressure in failure situations
8. Vacuum valve = Prevents vacuum creating into steam jacket

Safety valve must be replaced if it does not open until 2,0 bar

Safety group

Operation of balanced pressure steam trap capsule

The differential below steam temperature at which the trap operates is governed by the concentration of the liquid mixture in the capsule. The 'thin-walled' element gives a rapid response to changes in pressure and temperature. The result is the response line as illustrated below.



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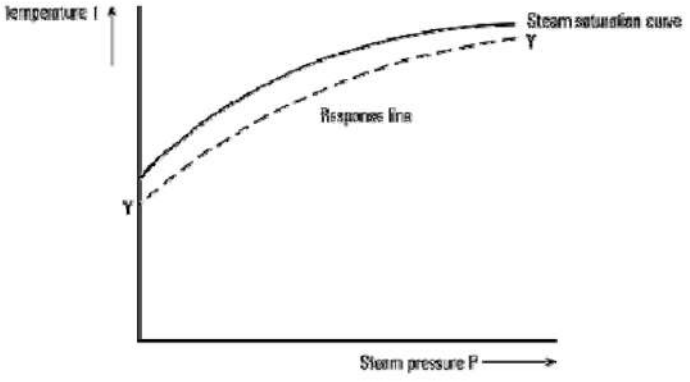


Proveno E and S de-aerator capsule operates 13°C below steam saturation point.
Proveno S steam trap capsule in condense line operates 6°C below steam saturation point.

3.1 Power on / off

Mains switch

The mains switch cuts all the electrics supply from the device

Emergency stop

The emergency stop switch cuts the power from the control electronics and the heating contactor's control current. It does not cut the power from the frequency converter.

Power button

The power button on the touch display starts the UI. When the power button is pressed:

- Fresh water function starts if a time longer than that specified in parameter 702 (default 12 h) has passed since water was last added. If the kettle is not in cooking position, a prompt appears telling that the kettle should be returned to cooking position
- The water level in the jacket is checked and water is added if necessary (electrically heated versions)

In daily operation, only power button is used to turn the device on / off.

3.2 Heating

Proveno kettle can be made with two different types of heating;

- ☐ Electric (E)
- ☐ Direct Steam (S)

Electric heated version has heating resistors (E1,E2,E3,E4) inside the steam jacket which are operated by contactors K1 and K2. Number and power of resistor depends on the kettle size. See main circuit diagrams S01049, S00311, S01051, S01050, S01056 and S01102 for heating elements and contactor wiring.

Steam version uses valves Y7 and Y8 to release steam inside the steam jacket from steam line. Steam heated kettle is equipped with condensate removal trap V4 which allows condensate to empty from the jacket to condensate line. See control circuit diagram S01056 for heating valve control wiring (Y7, Y8).

Both versions are equipped with air removal trap V1 which releases cold air from steam jacket during heating.

Before the heating can start:

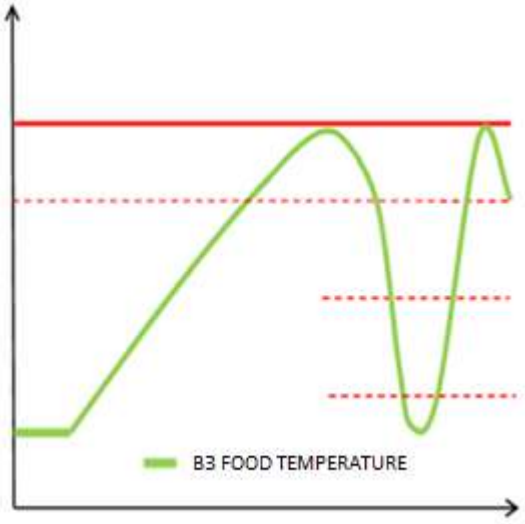
- ☐ Both versions (E,S) must be in upright position, which is indicated with switch S1 (see tilting chapter for details).
- ☐ Electric heated version water level must be over the resistors inside the steam jacket for heating to start. Water level is monitored by water level electrode B1 (see automatic water filling).
- ☐ Electric heated kettle also has pressure switch A2 which disconnects heating if jacket pressure is more than 1,4bar. See circuit diagram S01056.

Jacket temperature is measured with B2 temperature sensor. Food temperature is measured with B3 temperature sensor (see temperature measurment chapter for details)

3.2.1 Heating control

Electric and steam heated versions heating is controlled same way and according to next rules

- ☐ K1 or Y7 activated = **half power**
- ☐ K1 **and** K2 **OR** Y7 **and** Y8 activated= **full power**

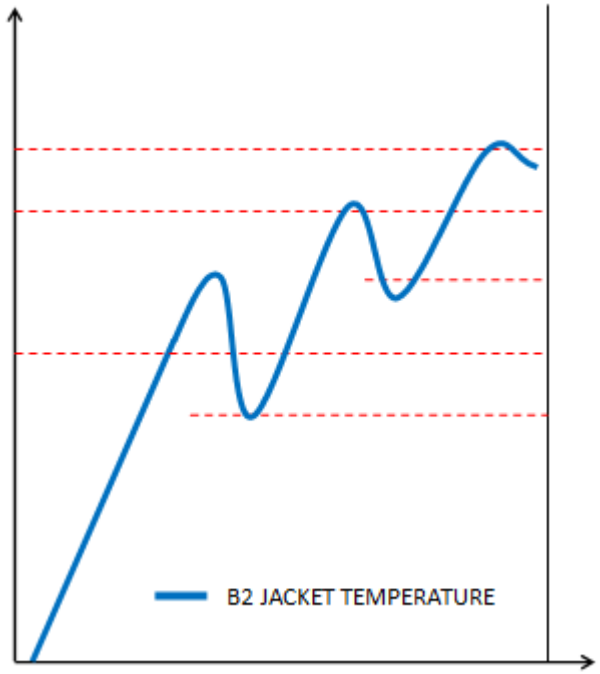


Set food temperature

Heating turned off 0,5°C before set food temperature

Heating back on to half power 1,5°C below set temperature

Heating back to full power 2,5°C below set temperature



Steam jacket temperature value (set or calculated)

Heating turned off 0,1°C below the value

Heating back on to half power 1 °C below value

Heating froms full to half power 1,5°C below value

Heating back to full power 2,5°C below value

Both measurments need to be either below half power or full power or ignored by the program for contactors or steam valves to be activated

Maximum set temperature is 120°C

Alarm for overheat is 124°C

3.2.2 Heating programs

Proveno has different heating programs; Basic, Easy Boil, Delta T, Steam Jacket Temperature, Food/Steam Jacket Temperature.

Steam jacket temperature is calculated by the software depending on the heating mode. Principals for controlling contactors or steam valves on and off are same for all heating programs.

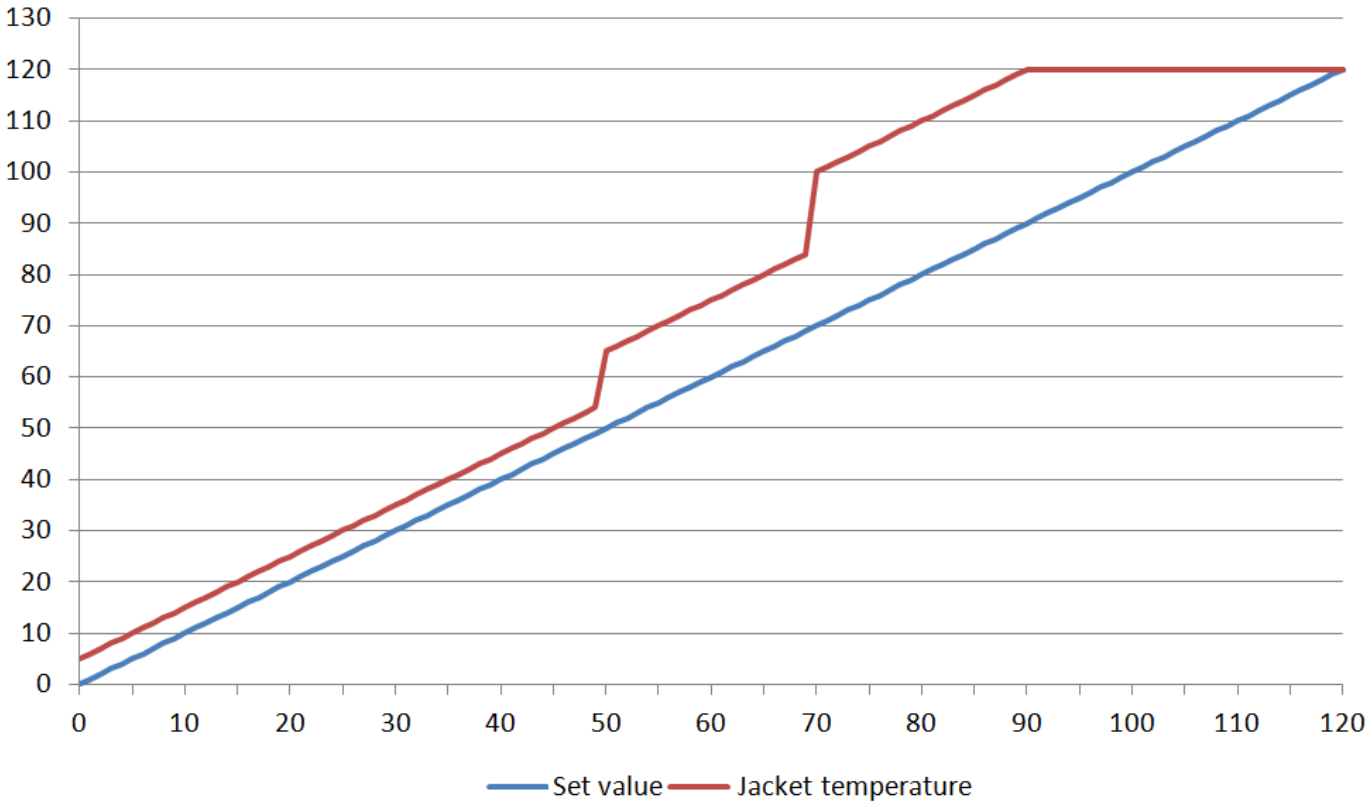
- ☐ **Basic**: User inputs desired food temperature and program chooses automaticly power level. User can afterwards change the power level which affects the jacket temperature.

  If set temperature is 100°C or over, food temperature measurement (B3) is ignored and heating is controlled only by (B2) jacket temperature measurment. This can be chaged with parameter 343 if higher or lower temperature is needed.

Automatic power level selection	
Set temperature	Power level
1-49°C	2
50°C-69°C	4
70°C-89°C	5
90°C-120C°C	6

Power level	Jacket temperature
6	Set value + 80°C
5	Set value + 30°C
4	Set value + 15°C
3	Set value + 10°C
2	Set value + 5°C
1	Set value + 0°C

Example: Food temperature input 50°C and power level 5 → 50°C+30°C=Jacket temperature 80°C



Picture above: Jacket temperature vs. set value using the automatic power level selection in basic heating

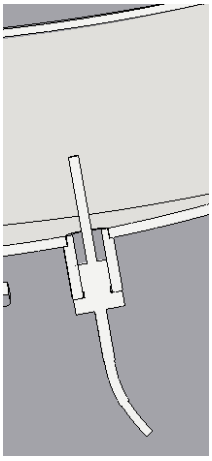
- ☐ **Easy Boil:** Sets food temperature to parameter 345 (default 98°C) and power level 6. After reaching the food temperature program sets power level automaticly to 3. If user has changed power level during heating, change will be made when boil temperature is reached. Food temperature is ignored after reaching the boiling temperature.
- ☐ **Delta T:** Keeps temperature difference between food temperature and jacket temperature with user given difference. In other words, the jacket temperature rises when food temperature rises maintaining the difference between jacket temperature and food temperature until food target temperature is reached
- ☐ **Steam Jacket Temperature:** Food temperature measurement B3 is ignored and heating is controlled only with steam jacket temperature.
- ☐ **Steam Jacket/Food Temperature**: User can input jacket and food temperature independently.

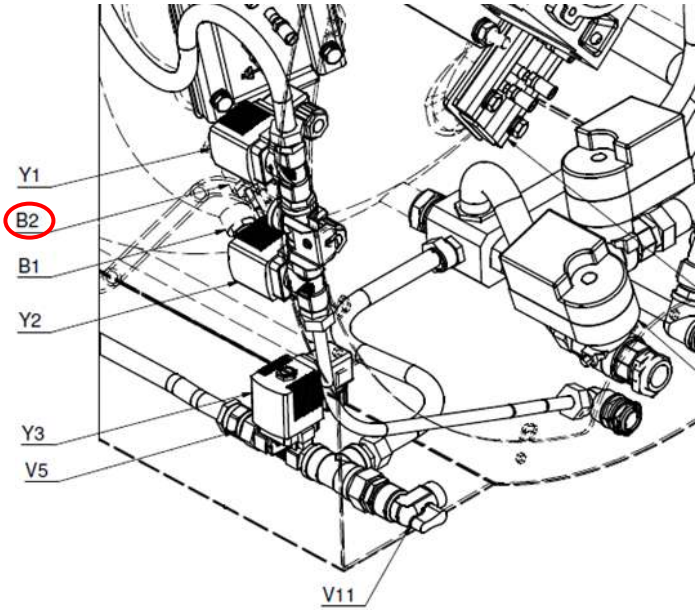
3.2.3 Heating Parameters

Nr		Default	min	max	unit
300	Default cooking temperature	80	0	120	°C
343	Temperature limit for switching to only B2 control	100	90	110	°C
345	"Easy boil" boiling temperature	98	90	110	°C
361	Power K1 (Value used for energy consumption reporting)	6000	1000	50000	W
362	Power K2 (Value used for energy consumption reporting)	6000	1000	50000	W

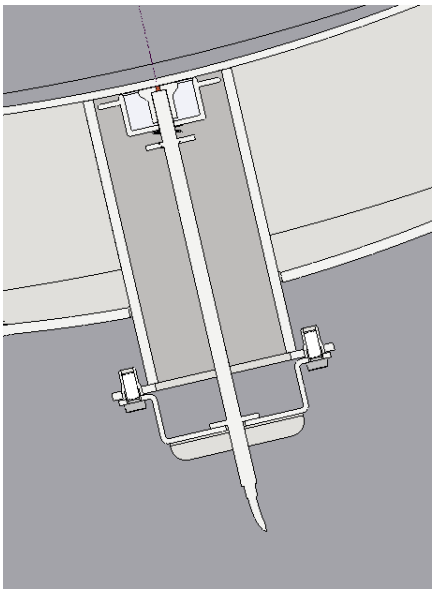
3.2.4 Temperature measurement

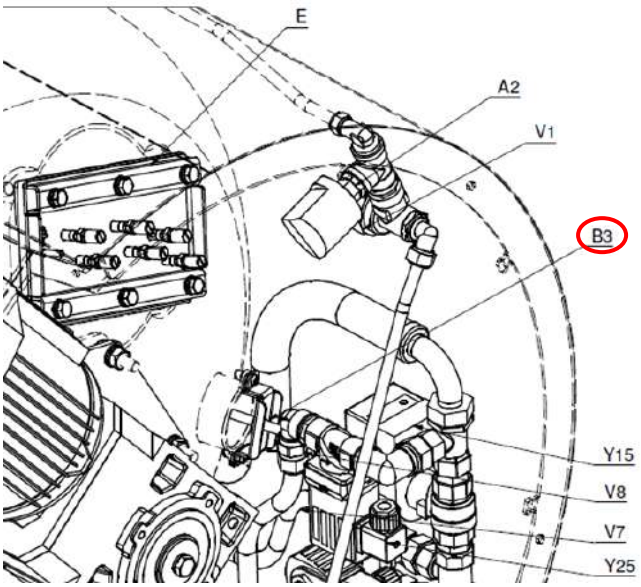
There are two temperature measurement sensors; B2 and B3. Wirings can be found in diagram S01061.





B2 measures temperature inside steam jacket.





B3 measures food temperature through kettle bottom. For accurate measurement its recommended to use mixer when measuring foods with viscosity. Because the measurement probe is at bottom the amount of food in kettle effects the temperature measurement. With large quantities extra time is needed for the temperature to become same at top and bottom of the food mass.

See chapter 7.4 for instructions on replacing the B3 probe

3.3 Cooling

Automatic cooling is an option. The cooling options available are C2, C3i, C3i PA, C5i and C5i PA.

See control circuit diagram S01055 for cooling water flow valves control wiring (Y3, Y5, Y4, Y15, Y18, Y16, Y25) and icebank connection wiring (X3).

See the PI-diagrams (O01005)for reference.

See chapter 2 “Connections” for water and ice bank connection details.

The following parameters are related to cooling:

Nr	Parameters page		Default	min	max	unit
400	Cooling	Default cooling target temperature	30	0	100	°C
401	Cooling	Cooling keep temperature hysteresis	1	0	10	°C
402	Cooling	C5 cooling, tap water to ice bank change temperature	75	0	100	°C
403	Cooling	C5 cooling, tap water empty time before ice bank	0	0	600	s
404	Cooling	Cooling phase end timeout to decrease food 1C	15	0	60	min
405	Cooling	Icebank water flow factor	4	1	10	
406	Cooling	Pressure air water empty flow factor	2	1	10	
410	Cooling	Cooling water empty time	70	60	1200	s
430	Cooling	Ice bank alarm input polarity	NO, alarm when closed			
440	Cooling	Cooling water outlet opening delay	10	5	180	s

3.3.1 Automatic tap water cooling C2

When the cooling cycle is started, valve Y3 opens, water flows into the jacket and the steam in the jacket cools down (1). After a time specified in parameter 440, also valve Y4 opens to let the cooling water out to the floor drain. Valves Y3 and Y4 remain open until the target food temperature is reached or until the temperature does not drop anymore (2). The timeout for temperature not dropping is set in parameter 404. If the hold function for cooling is selected, cooling is paused and the valves are closed. They are opened again if the food temperature rises for the amount specified in parameter 401 (3). When the stop button is pressed, the kettle proceeds to jacket emptying phase (4). This is also done right after reaching the target temperature if the finish function for cooling is selected. During jacket emptying, valves Y3 and Y4 are closed and valve Y5 opened. The jacket emptying time depends on the kettle size and is set in parameter 410.

The cooling sequence may be stopped at any time using the stop button. Stopping cooling always leads to the jacket emptying phase (4). If cooling is stopped in the beginning (1), the kettle moves to the jacket emptying phase after the time specified in parameter 440 has elapsed.

Cooling is paused if the kettle is not in cooking position.

If food water is filled during the cooling cycle, cooling is paused.

	description	end condition	Y3	Y4	Y5
1	tapwater cooling start	parameter 440 time elapsed (this phase is not done when new cooling is started while any other cooling phase is ongoing)			
2	tapwater cooling	food temperature (B3) reach cooling target OR B3 decrease 1C slower than parameter 404 => hold target is reached temperature			
3	hold cool tapwater	pushing stop button (this phase is done only in hold cooling)			
4	tapwater emptying	parameter 410 time elapsed			
5	end of cooling				

	must be active
	on/off control with hysteresis, parameter 401

3.3.2 Automatic cooling with ice water C3i (PA)

When the cooling cycle is started, valve Y18 opens, ice water flows into the jacket and the steam in the jacket cools down (1). After a time specified by dividing parameter 440 by parameter 405, valve Y12 (NO) closes not to let the cooling water out to the floor drain and Y15 opens to let the water back to the ice bank. The time specified in parameter 440 is divided with a factor in parameter 405 because the ice water flow is higher than the tap water flow. Valves Y18 and Y15 remain open and Y12 remains closed until the target food temperature is reached or until the temperature does not drop anymore (2). The timeout for temperature not dropping is set in parameter 404. If

the hold function for cooling is selected, cooling is paused and the valves are closed. They are opened again if the food temperature rises for the amount specified in parameter 401 (3). When the stop button is pressed, the kettle proceeds to jacket emptying phase (4). This is also done right after reaching the target temperature if the finish function for cooling is selected.

If the kettle is **not** equipped with pressurized air draining (C3i), the cooling water in the jacket is poured down to the floor drain. During jacket emptying, valve Y5 is opened. The jacket emptying time depends on the kettle size and is set in parameter 410.

If the kettle is equipped with pressurized air draining (C3i PA), the cooling water in the jacket is pushed back to the ice bank using pressurized air. During jacket emptying, valve Y12 is closed not to let the water to the floor drain and Y25 is opened to let the water to the ice bank. Valve Y16 is opened after a 20 second delay to let the pressurized air into the jacket. The jacket emptying time depends on the kettle size and is specified by dividing parameter 410 by parameter 406.

The cooling sequence may be stopped at any time using the stop button. Stopping the cooling always leads to the jacket emptying phase (4). If the cooling is stopped in the beginning (1), the kettle moves to the jacket emptying phase after the time specified in parameter 440 has elapsed.

Cooling is possible also if the kettle is tilted. The jacket emptying phase (4) is paused if the kettle is not in cooking position.

Food water filling and bypass are possible during the cooling cycle.

	description	end condition	Y3	Y4	Y5	Y9	Y12	Y15	Y16	Y18	Y25	X3(7-8)
1	icewater cooling start	(parameter 440/parameter 405) time elapsed (this phase is not done when new cooling is started while any other cooling phase is ongoing)										
2	icewater cooling	food temperature (B3) reach cooling target OR B3 decrease 1C slower than parameter 404 => hold target is reached temperature										
3	hold cool icewater	pushing stop button (this phase is done only in hold cooling)										
4	icewater emptying	IF (parameter 103 compressed air = no) parameter 410 time elapsed, IF (parameter 103 compressed air = yes) (parameter 410/parameter 406) time elapsed										
5	end of cooling											

	must be active
	on/off control with hysteresis, parameter 401
	active if parameter 103 compressed air = yes, otherwise not active
	active if parameter 103 compressed air = no, otherwise not active
	goes active after parameter 450 delay if parameter 103 compressed air = yes, otherwise stays not active

3.3.3 Automatic two phase cooling (tap water/ice water) C5i (PA)

Cooling is started with tap water if food temperature is above the value specified in parameter 402 (default 75°C). If food temperature is below that value, the kettle moves automatically to ice water cooling start phase (55).

When the cooling cycle is started, valve Y3 opens, water flows into the jacket and the steam in the jacket cools down (10). After a time specified in parameter 440, also valve Y4 opens to let the cooling water out to the floor drain. Valve Y12 (NO) closes not to let the cooling water out to the floor drain through this line. Valves Y3 and Y4 remain open and Y12 closed until the change to ice water temperature (parameter 402) is reached (20).

If tapwater emptying to floor drain is active (parameter 403 > 0), valve Y5 is opened to let the water flow to floor drain (40). If the kettle is equipped with pressurized air draining, valve Y12 (NO) is closed not to let the water to the floor drain through this line and valve Y16 is opened after a 20 second delay to let the pressurized air into the jacket to help the water to flow to the floor drain faster. If tapwater emptying to floor drain is inactive, the kettle moves to icewater cooling phase (60) without emptying the jacket first.

In icewater cooling phase (60), valve Y12 (NO) is closed not to let the cooling water out to the floor drain, valve Y18 is open to let the ice water flow into the jacket and valve Y15 is open to let the water back to the ice bank. Valves Y18 and Y15 remain open and Y12 remains closed until the target food temperature is reached or until the temperature does not drop anymore. The timeout for temperature not dropping is set in parameter 404. If the hold function for cooling is selected, cooling is paused and the valves are closed. They are opened again if the food temperature rises for the amount specified in parameter 401 (70). When the stop button is pressed, the kettle proceeds to icewater emptying phase (80). This is also done right after reaching the target temperature if the finish function for cooling is selected.

If the kettle is **not** equipped with pressurized air draining (C5i), the cooling water in the jacket is poured down to the floor drain. During jacket emptying, valve Y5 is opened. The jacket emptying time depends on the kettle size and is set in parameter 410.

If the kettle is equipped with pressurized air draining (C5i PA), the cooling water in the jacket is pushed back to the ice bank using pressurized air. During jacket emptying, valve Y12 is closed not to let the water to the floor drain and Y25 is opened to let the water to the ice bank. Valve Y16 is opened after a 20 second delay to let the pressurized air into the jacket. The jacket emptying time depends on the kettle size and is specified by dividing parameter 410 by parameter 406.

The cooling sequence may be stopped at any time using the stop button. Stopping the cooling leads to the tapwater emptying phase (50) or to the icewater emptying phase (80) depending on when the stop button is pushed. If cooling is stopped in the beginning (10), the kettle moves to the emptying phase after the time specified in parameter 440 has elapsed.

Tapwater cooling is only possible if the kettle is in cooking position. Icewater cooling is possible also if the kettle is tilted. The jacket emptying phases (40, 50 and 80) are paused if the kettle is not in cooking position.

Food water filling and bypass are possible during the emptying and icewater cooling phases (40-80). Food water filling in tapwater cooling phases (10-30) will pause the cooling.

	description	end condition	Y3	Y4	Y5	Y9	Y12	Y15	Y16	Y18	Y25	X3(7-8)
10	tapwater cooling start	if food temperature (B3) is under parameter 402 temperature => phase 55 OR parameter 440 time elapsed (this phase is not done when new cooling is started while any other cooling phase is ongoing)										
20	tapwater cooling	food temperature (B3) reach parameter 402 temperature => phase 40 OR food temperature (B3) reach cooling target temperature OR B3 decrease 1C slower than parameter 404 => phase 40										
30	hold cool tapwater	pushing stop button => phase 50 (this phase is done only in hold cooling)										
40	tapwater emptying, change to icewater	parameter 403 time elapsed (this phase is done only if parameter 403 >0) (after this phase, next is phase 60)										
50	tapwater emptying, cooling target reached	IF (parameter 103 compressed air = no) parameter 410 time elapsed, IF (parameter 103 compressed air = yes) (parameter 410/parameter 406) time elapsed (after this phase, next is phase 90)										
55	icewater cooling start	(parameter 440/parameter 405) time elapsed (this phase is not done when new cooling is started while any other cooling phase is ongoing)										
60	icewater cooling	food temperature (B3) reach cooling target temperature OR B3 decrease 1C slower than parameter 404 => hold target is reached temperature										
70	hold cool icewater	pushing stop button (this phase is done only in hold cooling)										
80	icewater emptying	IF (parameter 103 compressed air = no) parameter 410 time elapsed, IF (parameter 103 compressed air = yes) (parameter 410/parameter 406) time elapsed										
90	end of cooling											

	must be active
	on/off control with hysteresis, parameter 401
	active if parameter 103 compressed air = yes, otherwise not active
	active if parameter 103 compressed air = no, otherwise not active
	goes active after parameter 450 delay if parameter 103 compressed air = yes, otherwise stays not active

3.4 Mixing

The mixer motor is run with a variable frwquency drive (VFD). There are three sizes of motors and drives:

- ☐ 0,75kW for kettle sizes 40 – 100l
- ☐ 1,5kW for kettle sizes 150 – 300l
- ☐ 2,2kW for kettle size 400l

All drives are one phase models except for the 400l AC 230V 3/PE (Norwegian voltage) kettle model which has a three phase 2,2kW drive.

In order to start the mixer:

- ☐ The kettle must be in the cooking position (S1), if not, a message is shown in the display
- ☐ The lid (S4) and the safety grid (S3) must be closed, if not, a message is shown in the display

If the lid is opened during mixing, the mixer is stopped using the variable speed drive's safe torque off function.

The following parameters are related to mixing:

Nr	Parameters page		Default	min	max	unit
100	Configuration	Kettle size	40			
115	Configuration	Pause mixer during a waiting note in a program	Yes			
502	Mixing	Back and forth mixing clockwise time	10	2	60	s
503	Mixing	Back and forth mixing counter clockwise time	10	2	60	s
505	Mixing	Power mixing clockwise time	4	2	60	s
506	Mixing	Power mixing counter clockwise time	2	1	60	s
507	Mixing	Minimum mixer rotation speed	15	15	140	rpm
508	Mixing	Maximum mixer rotation speed	140	15	140	rpm
509	Mixing	Delay before power mixing starts	3	1	10	S

There are nine pre-defined mixing cycles. The users are able to create their own mixing cycles but not to change the pre-defined ones. The mixing cycles P1…P6 are legacy cycles intended for the users who have used the mixing programs in previous Proveno kettles. The mixing cycles M1…M3 are intended for all users and also to be used with cooking programs.

Kettle size controls the rpm in the pre-defined mixing cycles

Mixing cycle		RPM 40-60L	RPM 80-100L	RPM 150-200L	RPM 300-400L	CW (s)	CCW (s)	duration
M1—Stirring with pause	phase 1	15	15	15	15	6	6	36 s
	phase 2	0	0	0	0	-	-	2 min
M2—Crumbling		120	103	76	60	2	2	
M3—Mashing	phase 1	60	60	60	60	4	2	1 min
	phase 2	95	80	70	70	10	2	60 min
P1—Soup stirring	phase 1	15	15	15	15	6	6	36 s
	phase 2	0	0	0	0	-	-	2 min
P2—Meat cooking	phase 1	140	95	75	60	2	2	6 min
	phase 2	35	35	35	35	10	5	8 min
	phase 3	35	35	35	35	20	5	20 min
	phase 4	15	15	15	15	20	5	10 min
P3—Mashed potatoes	phase 1	60	60	60	60	10	3	1 min
	phase 2	95	70	70	70	8	2	6 min
	phase 3	60	50	50	50	8	2	6 min
P4—Dessert	phase 1	35	35	20	20	8	4	30 min
	phase 2	35	35	20	20	8	4	10 min
	phase 3	95	85	60	60	8	2	40 min
P5—Porridge	phase 1	30	30	20	15	8	4	60 min
	phase 2	30	30	20	15	8	4	20 s
	phase 3	0	0	0	0	-	-	1 min
P6—Dough	phase 1	60	60	60	60	2	2	1 min
	phase 2	50	50	50	50	5	2	6 min

3.4.1 Variable Frequency Drives

See control circuit diagram S01052 and S01053 for variable frequency drive wiring (U1). See control circuit diagrams S01052 and S01053 for lid and safety grid wiring.

Schneider Electric ATV320 variable frequency drives (VFD), used in theese kettles, have a safe torque off (STO) functionality. This means that motor torque is turned off safely and drive friendly, without need of cutting the supply of the drive. As can be seen in the control circuit diagrams, relay K22 is connected to the STO input. When safety lid/grid (S3) is out of place, STO is activated. Mixing while tilting bypass the STO activation by bypassing the S3 switch with relay K17. K17 is controlled by the kettle software.

In some special cases the drive can protect itself in a way that the power supply of the drive must be turned off for a time sufficient (about 1 minute) and on again. This is easily done by the mains switch of the kettle (Q1).

3.4.1.1 *Changing the drive*

Whenever the drive needs to be replaced, the best way is to order a pre-configured drive. This way there is no need to change drive parameters by hand.

Ensure that the air ventilation label on top of the drive is removed in order to have a sufficient air-cooling of the drive. If the label is accidentially in place, the drive will shut down more easily with heavy mixing load.

In order to meet electro-magnetical compatibility (EMC) requirements, the kettle has a RFI filter (Z1) in connection with the VFD. The main reason for the filter is to reduce noice created by the VFD entering to the mains supply cabling.

In most of the kettles, a 1 phase drive is used. Only in special cases, like 400 liter 3/PE AC230V (Norwegian voltage) or 3/PE 400/230V (no neutral), 3 phase model of the drive is needed. The table below shows the information needed to make sure that replacing the drive or/and the corresponding filter proceeds smoothly.

Kettle model	VFD model	VFD voltage	VFD power	VFD with parameter code	EMC filter model	EMC filter code
40-100 E/S	ATV320 U07M2C	200-240V, 1 phase	0,75 kW	MG3912080	1ELF10YA	MG3909887
150-300 E/S	ATV320 U15M2C	200-240V, 1 phase	1,5 kW	MG3912081	1ELF16YA	MG3909886
400 E/S	ATV320 U22M2C	200-240V, 1 phase	2,2 kW	MG3912082	1ELF20YA	MG3910317
400 E 3/PE AC230V	ATV320 U22M3C	200-240V, 3 phase	2,2 kW	MG3912083	3ELF16YA	MG3909882
400 E/S 3/PE 400/230V	ATV320 U22N4C	380-500V, 3 phase	2,2 kW	MG3912084	3ELF16YA	MG3909882

3.4.1.2 Drive parameters

In case there would be a need to adjust the drive parameters by hand, the table below lists the paramerest changed from a standard drive to make it pre-configured for the kettle. Supply mains voltage to the drive. Enter the according menu to find the parameter and set the value seen from the table below.

parameter	menu		0,75kW 1 phase 200-240V 07M2C	1,5kW 1 phase 200-240V 15M2C	2,2kW 1 phase 200-240V 22M2C	2,2kW 3 phase 200-240V 22M3C	2,2kW 3 phase 380-500V 22N4C
ACC	COnF->FULL->Set-	Acceleration ramp time	0,4 s	0,4 s	0,4 s	0,4 s	0,4 s
DEC	COnF->FULL->Set-	Deceleration ramp time	0,4 s	0,4 s	0,4 s	0,4 s	0,4 s
TFR	COnF->FULL->SIM-	Max. output frequency	120 Hz	120 Hz	120 Hz	120 Hz	120 Hz
HSP	COnF->FULL->Set-	High Speed	112 Hz	108 Hz	105 Hz	105 Hz	105 Hz
UFR	COnF->FULL->drC-	IR compensation	50 %	50 %	50 %	50 %	50 %
ITH	COnF->FULL->Set-	Motor thermal current	3,1 A	6,1 A	8,5 A	8,5 A	4,9 A
NCR	COnF->FULL->SIM-	Nominal motor current	3,1 A	6,1 A	8,5 A	8,5 A	4,9 A
SFR	COnF->FULL->Set-	Drive switching freq.	10 kHz	10 kHz	10 kHz	10 kHz	10 kHz
FR1	COnF->FULL->CtL-	Configuration reference 1	AI2	AI2	AI2	AI2	AI2
OLL	COnF->FULL->FLt- ->tHt-	Stop type - motor o/load	Ignore/nO	Ignore/nO	Ignore/nO	Ignore/nO	Ignore/nO

Example:

[rdY] -> ent -> rot -> [ConF] -> ent -> [FULL] -> ent -> rot -> [Set-] -> ent -> rot -> [ACC] -> ent -> rot -> [0.4] -> ent

ESC button gets you back in the menu

ent = push dial knob

rot = rotate dial knob to find next selection

[XXX] = display show XXX

3.5 Water

See control circuit diagram S01055 for water valves control wiring (Y1, Y2, Y3). See control circuit diagram S01061 for water flow meter wiring (P1).

See the PI-diagrams for reference.

Related components:

- ☐ B1 = Water level electrode
- ☐ P1 = Flow meter
- ☐ P2 = Flow meter (double water option)
- ☐ Y1 = Food water inlet solenoid valve
- ☐ Y2 = Food water bypass to drain solenoid valve
- ☐ Y3 = Jacket filling solenoid valve

See the Cooling section in this manual for additional components related to the cooling options.

The following parameters are related to water:

Nr	Parameters page		Default	min	max	unit
101	Configuration	Heating type	Electric			
225	UserInterface	Sound for food water target amount reached				
700	Water	Tap water bypass (PURE) mode	Automatic			
701	Water	Water bypass (PURE) time	60	30	600	s
702	Water	Water bypass (PURE) interval	12	0	24	h
703	Water	Maximum dose of foodwater	Kettle size	10	500	l
704	Water	P1 Water flow measured pulses per liter	1000	500	1500	p
705	Water	P1 Water flow correction pulses per tap open	250	0	1500	p
706	Water	Water flow monitoring enabled	Yes			
712	Water	Unit precision for food water inputs	1			
714	Water	P2 Water flow measured pulses per liter	1000	500	1500	p
715	Water	P2 Water flow correction pulses per tap open	250	0	1500	p
812	TechnicalAlarm	Jacket over fill hysteresis. Time to fill after upper limit	6	0	99	s
813	TechnicalAlarm	Jacket water filling timeout for request to open water tap	12	0	180	s
814	TechnicalAlarm	Jacket water filling timeout for alarm	180	0	600	s

All Proveno kettles are equipped with automatic water filling. Water can be added either using automatic dosage or manual dosage. In automatic dosage, a required amount of water is set and the dosage is started. When the set amount of water is reached, water filling stops. In manual dosage there are two functions. The button can be pressed shortly to start filling water and then pressed shortly again to stop filling water, or it can be pressed continuously to fill water for as long as the button is pressed. Despite the filling method, the reached amount of water is shown in the balloon next to the water filling button.

3.5.1 Jacket water filling

If the heating type (parameter 101) is Electric, the jacket is filled automatically when the kettle is started if the water level electrode B1 is not covered with water and the kettle is in cooking position. When the water level reaches the electrode B1, water filling continues for the time specified in parameter 812.

3.5.2 Fresh water function (Pure)

The parameters 700, 701 and 702 control the fresh water function. When water is added to the kettle bowl or the kettle is powered on and the parameter 700 is set to Automatic (default), water is poured down to the floor drain for the time specified in parameter 701 (60 s) if a time specified in parameter 702 (12 h) has passed since last water usage. The kettle must be in cooking position for the fresh water function to activate.

The fresh water function may be stopped on the fresh water function control panel under the Settings tab

If parameter 702 is set to zero, fresh water function is activated every time when water is added in the kettle bowl using either manual or automatic water dosage.

If parameter 700 is set to Manual, the fresh water function can be activated manually on the fresh water function control panel under the Settings tab.

3.5.3 Twin water connection

Twin water connection is installed and the option activated at the factory. This option includes another flow meter (P2) and related piping. When using twin water connection, food and bypass water (Y1 & Y2) are separated from jacket water (Y3). With twin water connection, jacket water can be calcium treated or otherwise purified. It is also possible to fill the jacket with warm tap water (not with C2 cooling).

3.5.4 Water dosage calibration

Parameters 704 and 705 (714 & 715 for P2) are used to calibrate water dosage. Parameter 704 (714) sets the number of pulses per liter in constant flow. Parameter 705 (715) sets the extra number of pulses added in calculation when a solenoid valve is opened. This is used to compensate the inertia of the flow meter.

The calibration of the flow meter is done by filling a pot with water from the water filling pipe. Caught water is weighed. If weight of water and volume are incorrect, the value in the parameters is corrected. Follow these instructions.

- Tare scale with a pot that you take water
- Ask 1 litre of water
- Weigh the amount of water (grams.)
- Add to current value p705(p715) compare to table for 1 litre
- Ask 1 litre again and check the weight

When 1 litre value is right

- Ask 5 litre of water
- Weigh the amount of water (grams.)
- Add to current value p704(p714), compare to table for 5 litres
- Ask 5 litres again and check the weight

Table for 1 litre				Table for 5 litres		
Weight (grams.)	Add/subtract	New value to p705 if was 250		Weight (grams.)	Add/subtract	New value to p704 if was 1000
800	-200	50		4800	-40	1040
810	-190	60		4810	-38	1038
820	-180	70		4820	-36	1036
830	-170	80		4830	-34	1034
840	-160	90		4840	-32	1032
850	-150	100		4850	-30	1030
860	-140	110		4860	-28	1028
870	-130	120		4870	-26	1026
880	-120	130		4880	-24	1024
890	-110	140		4890	-22	1022
900	-100	150		4900	-20	1020
910	-90	160		4910	-18	1018
920	-80	170		4920	-16	1016
930	-70	180		4930	-14	1014
940	-60	190		4940	-12	1012
950	-50	200		4950	-10	1010
960	-40	210		4960	-8	1008
970	-30	220		4970	-6	1006
980	-20	230		4980	-4	1004
990	-10	240		4990	-2	1002
1000	0	250		5000	0	1000
1010	10	260		5010	2	998
1020	20	270		5020	4	996
1030	30	280		5030	6	994
1040	40	290		5040	8	992
1050	50	300		5050	10	990
1060	60	310		5060	12	988
1070	70	320		5070	14	986
1080	80	330		5080	16	984
1090	90	340		5090	18	982
1100	100	350		5100	20	980
1110	110	360		5110	22	978
1120	120	370		5120	24	976
1130	130	380		5130	26	974
1140	140	390		5140	28	972
1150	150	400		5150	30	970
1160	160	410		5160	32	968
1170	170	420		5170	34	966
1180	180	430		5180	36	964
1190	190	440		5190	38	962
1200	200	450		5200	40	960
1210	210	460		5210	42	958

3.5.5 Food water dosage precision

Parameter 712 controls the precision of food water dosage and display. By default, the precision is set to 1 which means full liters. If the parameter is set to 0,1, the dosage may be set using a precision of one deciliter. This only applies for dosages below 10 liters. For larger dosages, the precision is always full liters.

3.6 Tilting

See main circuit diagrams S01049, S00311, S01051, S01050 and S01102 for hydraulic unit sypply wiring. See control circuit diagrams S01052 and S01053 for lid and safety grid wiring. See control circuit diagram S01054 for tilting limit switches wiring (S1, S2), hydraulic unit control wiring (K3, Y6), electrical tilting control wiring (M1).

The following parameters are related to tilting:

Nr	Parameters page		Default	min	max	unit
600	Tilting	Tilting pull back enabled	Yes			

Tilting is only possible when the lid is fully open. Limit switch S4 is used to sense the lid open position.

Limit switch S1 is used to recognize the cooking position and limit switch S2 is used to recognize the tilting end position.

For safety reasons, the kettle only tilts for as long as the tilting button is pressed. Only a short pull back motion is done without pressing the button.

Kettle sizes 40 l – 150 l use linear actuator for tilting and kettle sizes 200 l – 400 l use hydraulic motor and cylinder.

Tilting the kettle:

- The kettle keeps tilting as long as the tilting button is pressed or until limit switch S2 is activated.
- If the lid is closed, the kettle is not tilting and an information message is shown on the screen.
- If the kettle is tilted for longer than 2 s and tilting pull back is enabled (parameter 600), automatic pull back motion is done after the tilting button is released. Pull back motion is not done if the kettle is fully tilted and limit switch S2 is activated.
- The kettle is returned to cooking position by keeping the tilting return button pressed. The motion stops when limit switch S1 is activated.

3.7 Options

See control circuit diagram S01090 for foot pedal, twin water, dual food temperature sensor options wiring (S6, P2, B3/2, A22).

3.8 How the kettle react after power off situations

The software of the kettle constantly monitors and saves information about the state (what is going on) in the kettle. With help of that information, the software does its best to continue after a power off situation as if no power off situation had happened. As an example if the kettle was keeping the food warm, it will continue doing that after recoveing from a power off situation. Another example is that if the user was using automatic water filling to fill a desired amount of water, the desired water amount will be completed after a power off situation if it was interrupted by the power off situation.

3.8.1 Information about the power off situation

- How long power was off (hours, minutes)
- Date and time of start of power off situation
- Ongoing functions/state before power off situation
- Food temperature before and after power off situation, if heating or cooling was ongoing

- Filled food water amount (liters) before power off situation, if water amount filling was ongoing
- Scheduled programs set before power off situation and information if program started late because of (long) power off situation
-

Ongoing functions/state information is recorded to be on even if it is temporary disabled. An example of this is heating that is recorded to be on even if it is temporary disabled during tilting.

After the power off situation, information about the power off situation is shown on screen.

3.8.2 What the kettle do automatically after a power off situation

After a power off situation, the kettle recovers to the state where it was before the power off situation. It does so even without any interaction with the user. There are however some exceptions to this. Hold-to-run functions always need the user to keep the function ongoing, also after a power off situation. This is why theese functions do not continue automatically. Examples of hold-to-run functions are tilting, mixing while tilting and safety valve test.

Note that the kettle does not make any judgement wether the food still is ok to eat or not. This judgement is totally in the hands of the user of the kettle.

4 Diagnostic and Service Capabilities in the Software

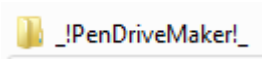
Use service code 314697 to log in as a service technician.

NOTE! The code above is to be handed over to qualified service technicians only

When logged in, you will see the following functions on the Settings tab:

Fresh water function	Start/stop fresh water function Set duration and interval of automatic fresh water function
Memory functions	See the following pages
Set Teach Mode on	Entering teach mode, see user manual
Language	Set the UI language. **Note!** Some of the pages accessed by service technicians are in English only
Time and date	Set time and date
Sounds	See the following pages
Parameters	See the following pages
Safety valve test	See the following pages
Diagnostic tool	See the following pages
Version info	Check the version of the UI software
Use of electricity and water	See the electricity and water consumption readings. The electricity consumption is shown in electrically heated kettles only. It is the calculated energy consumption used for heating. The mixer motor and control electronics energy consumption is not tracked. Both the electricity and water consumption readings are the cumulative readings since the software was installed. They can only be reset by changing or initializing the µSD card.
Set serial number	Used to set the kettle serial number if the µSD card is changed
Edit service contact	See the following pages

4.1 Software update



Software update is done with a USB memory stick which has the correct software installed. The directory _!PenDriveMaker!_ must be in the root of the USB memory stick.

Insert the USB memory stick in the USB port behind the control panel. Use the emergency stop switch to cut the power from the control electronics. Release the emergency stop switch. The kettle starts and checks for a new software version. If the USB memory has the correct software, the software update starts and the image below is shown.

It is also possible to start the software update from the Settings tab when logged in with the service code.

After update the kettle restarts again. You must not remove the USB memory before the kettle has completed the restart.

Remember to disconnect the USB memory stick when restart is completed. Proveno checks for USB memory each time the electricity is turned on. If a USB memory with software is connected when the kettle is powered on the software will be updated.

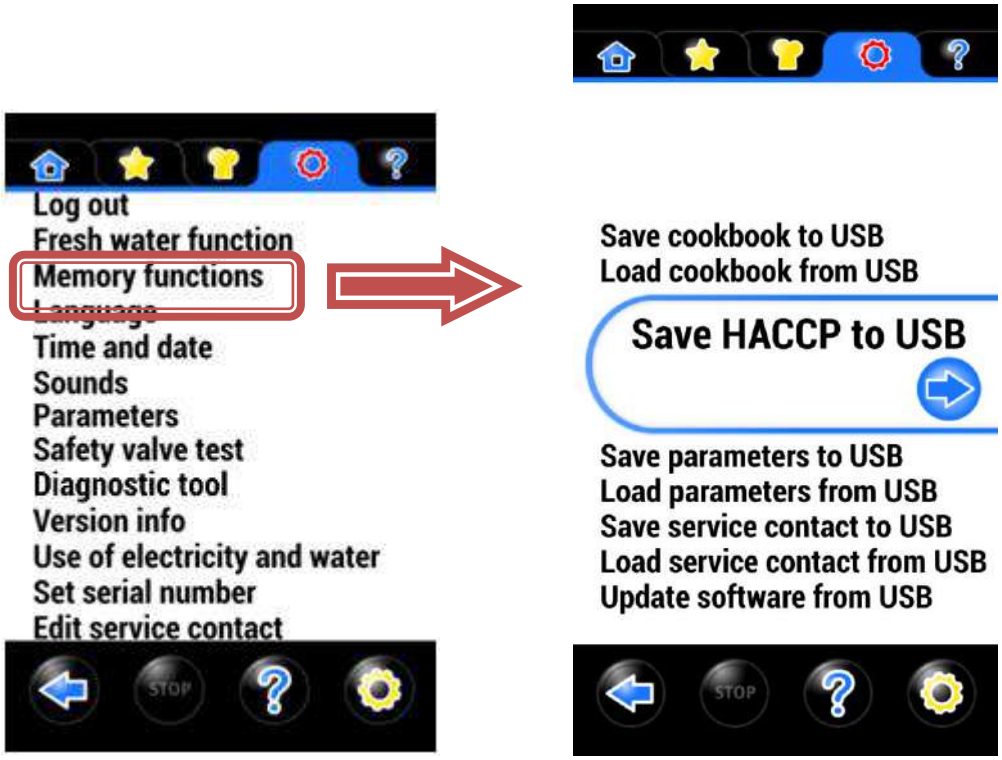
During software update the parameters:

- Will stay untouched if their values are in range according to the new software
- If parameter value is out of range it will be reset to default
- If parameter does not exist anymore in the new software it will be deleted
- New parameters will be set to default value

Software and all other data are stored in micro SD-card in the panel. **Without correct SD-card with correct software installed Proveno will not start.**

NOTE! Software and parameters both have to be correct for correct function of the kettle. In order to be sure to have latest parameters, update visible and hidden parameters with latest revision of the parameter file: P3G service parameters, DOC000402. This is the way to reset parameters not changeable by chef except all configuration parameters. Do this parameters update always together with the software update and especially if the kettle has older software than version 1.00 before update.

4.2 Memory functions



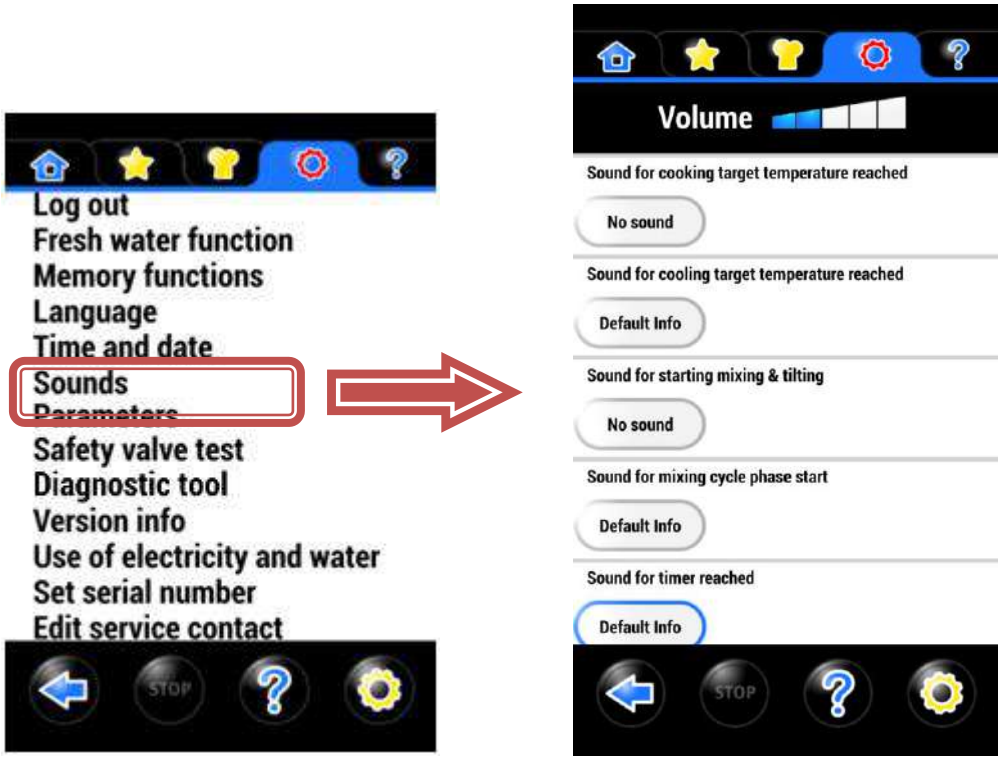
A service technician has access to several memory functions that a chef has no access to.

NOTES

Load cookbook from USB – Kettle size check is bypassed when logged in as a service technician. This makes it possible to load the default cookbook to any size of a kettle

Save HACCP to USB – The HACCP data includes time stamp, set target temperature, measured food temperature, measured jacket temperature, heating state (on/off), cooling state (on/off), mixer state (on/off) and total energy consumption reading. The file is saved on the USB stick in CSV format and can be opened with Excel. The log file includes data from previous 30 days.

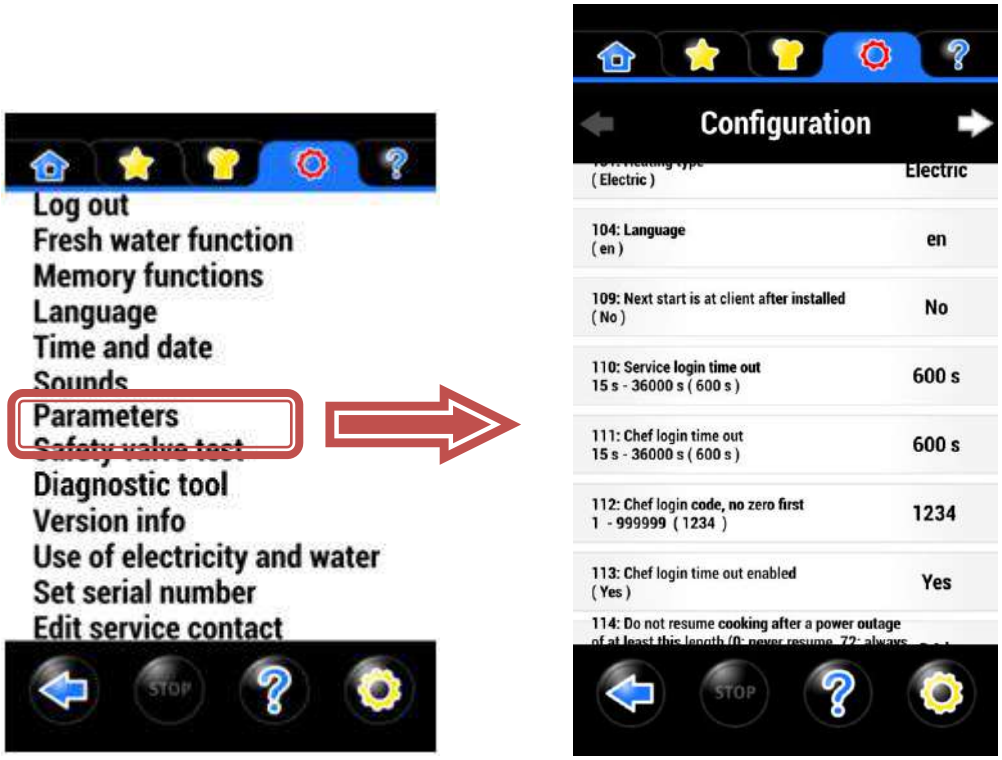
4.3 Sounds



A service technician has access to several sound settings that a chef has no access to:

	Login level	Default	min	max	unit
Sound for cooking target temperature reached	COOK				
Sound for cooling target temperature reached	COOK	Default Info			
Sound when starting mixing while tilting	SERVICE				
Sound for timer reached	COOK	Default Info			
Sound for food water target amount reached	COOK				
Sound for recipe start to run	SERVICE				
Sound for recipe check point	COOK	Default Info			
Repeat check point sound	SERVICE	Yes			
Check point sound interval	SERVICE	10	5	60	s
Time to repeat check point sound (0=forever)	SERVICE	30	0	600	s
Sound for mixing cycle phase start	SERVICE	Default Info			
Sound for general info	SERVICE	Default Info			
Sound for general alarm	SERVICE	Default Alarm			
Repeat general alarm sound	SERVICE	Yes			
General alarm sound interval	SERVICE	10	5	60	s
Time to repeat alarm sound (0=forever)	SERVICE	30	0	600	s
Sound for recipe completed	COOK	Five Stars			
Repeat recipe completed sound	SERVICE	Yes			
Recipe completed sound interval	SERVICE	10	5	60	s
Time to repeat recipe completed sound (0=forever)	SERVICE	30	0	600	s

4.4 Parameters



A service technician has access to the following parameters:

Nr	Parameters page		Default	min	max	unit
100	Configuration	Kettle size	40			
101	Configuration	Heating type	Electric			
104	Configuration	Language	en			
109	Configuration	Next start is at client after installed	No			
110	Configuration	Service login time out	600	15	36000	s
111	Configuration	Master chef login time out	600	15	36000	s
112	Configuration	Master chef login code, no zero first	1234	1	999999	
113	Configuration	Master chef login time out enabled	Yes			
114	Configuration	Do not resume cooking after a power outage of at least this length (0: never resume, 72: always resume)	24	0	72	h
115	Configuration	Pause mixer during a waiting note in a program	Yes			
200	UserInterface	Go to black screen timeout	30	10	2700	s
201	UserInterface	All users can edit favorites	Yes			
202	UserInterface	Time of user inactivity before screen saver activates	120	10	3600	s
203	UserInterface	Time to show screen lock info display	2000	500	10000	ms
204	UserInterface	Time to press lock button to lock the screen	1500	1000	10000	ms
205	UserInterface	Time to press unlock button to unlock the screen	1500	1000	10000	ms
206	UserInterface	Food water filling unit in GUI	Liter			
207	UserInterface	Temperature unit in GUI and logs	Celsius			
208	UserInterface	Time to press the power button to turn off the kettle	2000	500	10000	ms
210	UserInterface	Recipe checkpoint, first add time button increment	60	10	1800	s

211	UserInterface	Recipe checkpoint, second add time button increment	300	10	1800	s
212	UserInterface	Time to hide mixer settings after no action (0: no auto hiding)	60	0	600	s
220	UserInterface	Sound volume	40	0	100	
221	UserInterface	Sound for cooking target temperature reached				
222	UserInterface	Sound for cooling target temperature reached	Default Info			
223	UserInterface	Sound when starting mixing while tilting				
224	UserInterface	Sound for timer reached	Default Info			
225	UserInterface	Sound for food water target amount reached				
226	UserInterface	Sound for recipe start to run				
227	UserInterface	Sound for recipe check point	Default Info			
228	UserInterface	Repeat check point sound	Yes			
229	UserInterface	Check point sound interval	10	5	60	s
230	UserInterface	Time to repeat check point sound (0=forever)	30	0	600	s
231	UserInterface	Sound for mixing cycle phase start	Default Info			
235	UserInterface	Sound for general info	Default Info			
236	UserInterface	Sound for general alarm	Default Alarm			
237	UserInterface	Repeat general alarm sound	Yes			
238	UserInterface	General alarm sound interval	10	5	60	s
239	UserInterface	Time to repeat alarm sound (0=forever)	30	0	600	s
240	UserInterface	Sound for recipe completed	Five Stars			
241	UserInterface	Repeat recipe completed sound	Yes			
242	UserInterface	Recipe completed sound interval	10	5	60	s
243	UserInterface	Time to repeat recipe completed sound (0=forever)	30	0	600	s
250	UserInterface	Show mode active.	No			
251	UserInterface	Teach mode active. Operates without i/o board installed	No			
258	UserInterface	Teach mode exit timeout (0=no timeout)	4	0	100	h
260	UserInterface	Heating simulated in show mode?	Yes			
261	UserInterface	Cooling simulated in show mode?	Yes			
262	UserInterface	Water simulated in show mode?	Yes			
270	UserInterface	Heating / cooling transition message enabled	Yes			
271	UserInterface	If cooling is set this much higher than actual temperature -> transition message	40	1	120	°C
272	UserInterface	If heating is set this much lower than actual temperature -> transition message	40	1	120	°C
274	UserInterface	Time to show the "initial heating completed" note	30	10	3600	s
300	Heating	Default cooking temperature	80	0	120	°C
301	Heating	Default Hold temperature	70	50	100	°C
343	Heating	Measured B3 temperature limit for switching to B2 control (P18)	100	90	110	°C
345	Heating	Boiling temperature (P20)	98	90	110	°C
361	Heating	Power K1	Depends	1000	50000	W

			on kettle size			
362	Heating	Power K2	Depends on kettle size	1000	50000	W
400	Cooling	Default cooling target temperature	30	0	100	°C
401	Cooling	Cooling keep temperature hysteresis	1	0	10	°C
402	Cooling	C5 cooling, tap water to ice bank change temperature	75	0	100	°C
403	Cooling	C5 cooling, tap water empty time before ice bank	0	0	600	s
404	Cooling	Cooling phase end timeout to decrease food 1C	15	0	60	min
405	Cooling	Icebank water flow factor	4	1	10	
406	Cooling	Pressure air water empty flow factor	2	1	10	
410	Cooling	Cooling water empty time	70	60	1200	s
430	Cooling	Ice bank alarm input polarity	NO, alarm when closed			
440	Cooling	Cooling water outlet opening delay	10	5	180	s
502	Mixing	Back and forth mixing clockwise time	10	2	60	s
503	Mixing	Back and forth mixing counter clockwise time	10	2	60	s
505	Mixing	Power mixing clockwise time	4	2	60	s
506	Mixing	Power mixing counter clockwise time	2	1	60	s
507	Mixing	Minimum mixer rotation speed	15	15	140	rpm
508	Mixing	Maximum mixer rotation speed	140	15	140	rpm
509	Mixing	Delay before power mixing starts	3	1	10	S
600	Tilting	Tilting pull back enabled	Yes			
700	Water	Tap water bypass (PURE) mode	Automatic			
701	Water	Water bypass (PURE) time	60	30	600	s
702	Water	Water bypass (PURE) interval	12	0	24	h
703	Water	Maximum dose of foodwater	40	10	500	l
704	Water	P1 Water flow measured pulses per liter	1000	500	1500	p
705	Water	P1 Water flow correction pulses per tap open	250	0	1500	p
706	Water	Water flow monitoring enabled	Yes			
712	Water	Unit precision for food water inputs	1			
714	Water	P2 Water flow measured pulses per liter	1000	500	1500	p
715	Water	P2 Water flow correction pulses per tap open	250	0	1500	p
800	TechnicalAlarm	Safety valve pre-heat target temperature	120	100	130	°C
801	TechnicalAlarm	Safety valve test pre-heat timeout	1200	60	2400	s
802	TechnicalAlarm	Safety valve test K4 feedback timeout	60	10	200	s
803	TechnicalAlarm	Temperature to fail safety valve test	130	100	135	°C
812	TechnicalAlarm	Jacket over fill hysteresis. Time to fill after upper limit	6	0	99	s
813	TechnicalAlarm	Jacket water filling timeout for request to open water tap	12	0	180	s
814	TechnicalAlarm	Jacket water filling timeout for alarm	180	0	600	s

Kettle size defines the default value for parameters 345, 361, 362, 440. Kettle size and heating type define the default value for parameter 410.

4.5 Safety valve test

Settings tab > Safety valve test

4.5.1 Electrical heating

Step 1

- Press the play button. Jacket is heated up to 120°C (parameter 800)
- If the temperature does not rise to 120°C in given time (parameter 801) -> error
- A prompt tells you that the kettle is heated up and tells you to hold the test button to continue test

Step 2

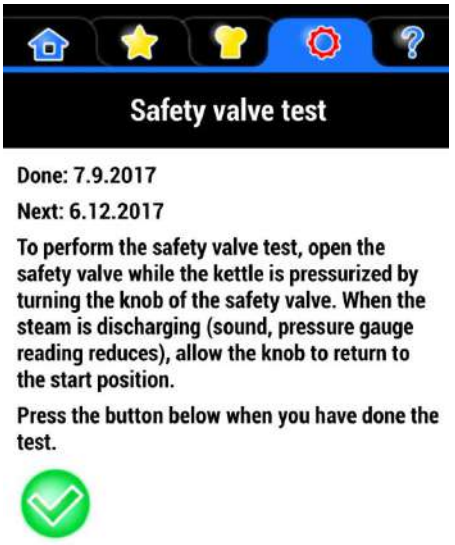
- Hold the test button until the safety valve opens
- Heating is turned on
- Output DODirectHeating_K4 is on
- When the jacket temperature reaches pressure switch set point, relay K4 closes. The temperature keeps rising above the limit of normal operation.
- Input DISafetyDeviceTest_K4 is activated when a feedback signal from relay K4 is received. If not activated in given time (parameter 802) -> error
- The jacket temperature keeps rising
- If the jacket temperature rises above the maximum temperature of 130°C (parameter 802) -> error
- When the safety valve opens and the test button is released, the test is passed

Any of the above mentioned errors will lead to failing the safety valve test. A new test can be performed when the jacket temperature is cooled down.

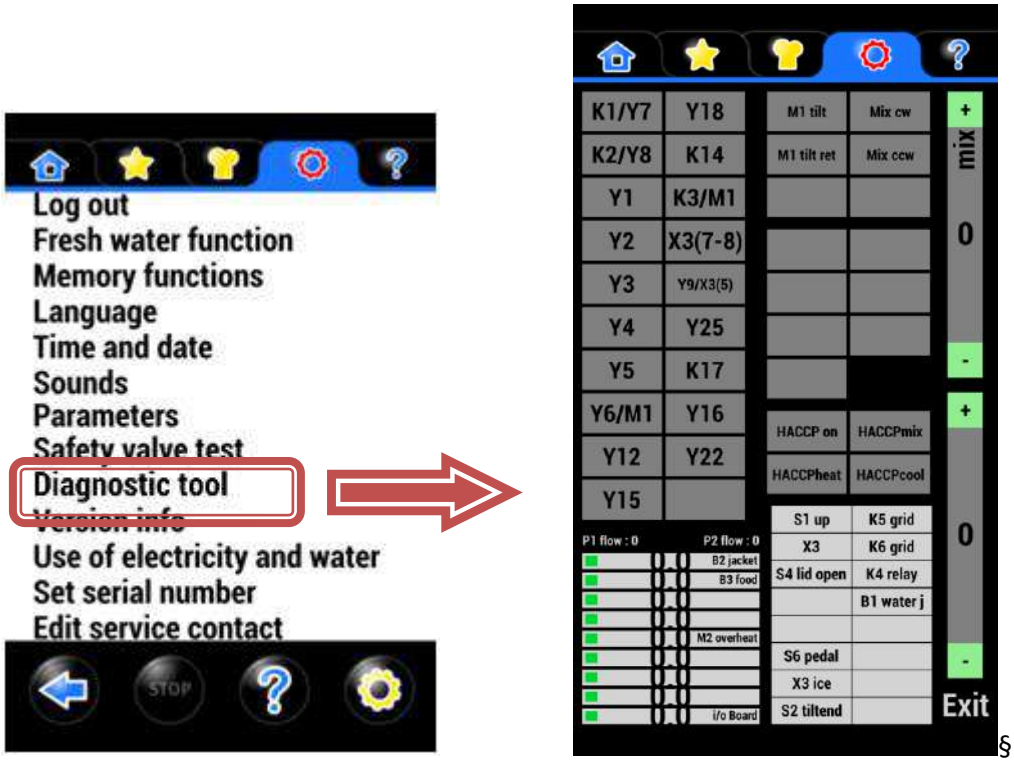
4.5.2 Direct steam heating

In direct steam heated kettles there is an instruction for performing the safety valve test as shown below. After testing the safety valve as instructed, press the Done button and the dates are updated.

CAUTION – The steam discharging through the safety valve is hot! Use appropriate protection to avoid injuries.



4.6 Diagnostic tool

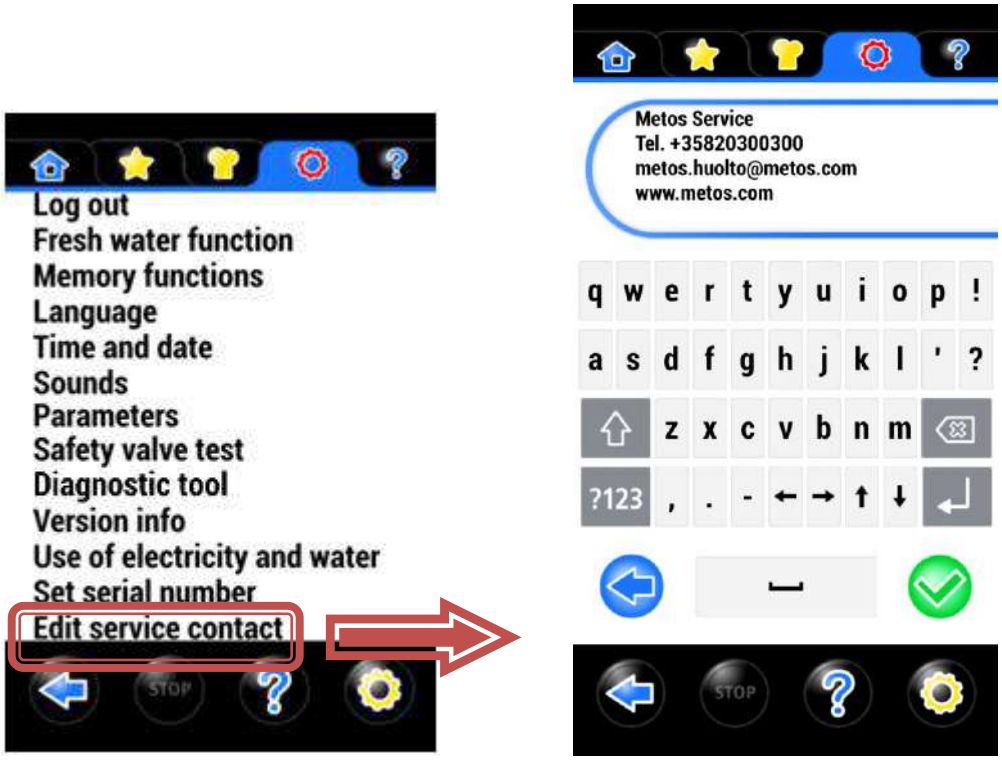


The Diagnostic tool shows the current status and lets you control the solenoid valves and contactors for troubleshooting. It also shows the readings of analog signals and statuses of digital signals.

When you enter the Diagnostic tool, the following prompt is shown.

See the attached circuit diagrams and PI-diagrams for reference when using the Diagnostic tool

4.7 Edit service contact



Set the contact information of the local service organization. This will be shown when there is an error and the kettle prompts the user to contact service.

4.8 Show mode

The kettle can be set to work in show mode (restricted availability of power and water). The following parameters control the functions in show mode:

250	UserInterface	Show mode active.	No			
260	UserInterface	Heating simulated in show mode?	Yes			
261	UserInterface	Cooling simulated in show mode?	Yes			
262	UserInterface	Water simulated in show mode?	Yes			

Heating, cooling and water are simulated in show mode by default.

5 Electronics

See control circuit diagram S01027 for touch panel and I/O board wiring (A1, A21).

5.1 Touch screen panel (A1)

The touch screen and panel board are integrated and must be replaced simultaneously. The panel board designation is **A1** in diagrams.

5.1.1 Main panel board connections

- DC_IN 24VDC supply
- AUDIO signal to I/O board A2
- RS85_COM1 serial data connection to/from I/O board A2
- JBAT_EN battery enabling jumper
- Micro-SD memory card containing software, parameters, programs etc.
- USBA/B USB memory connection for loading software, parameters, programs etc.
- BAT battery holder (CR2032 3V battery)

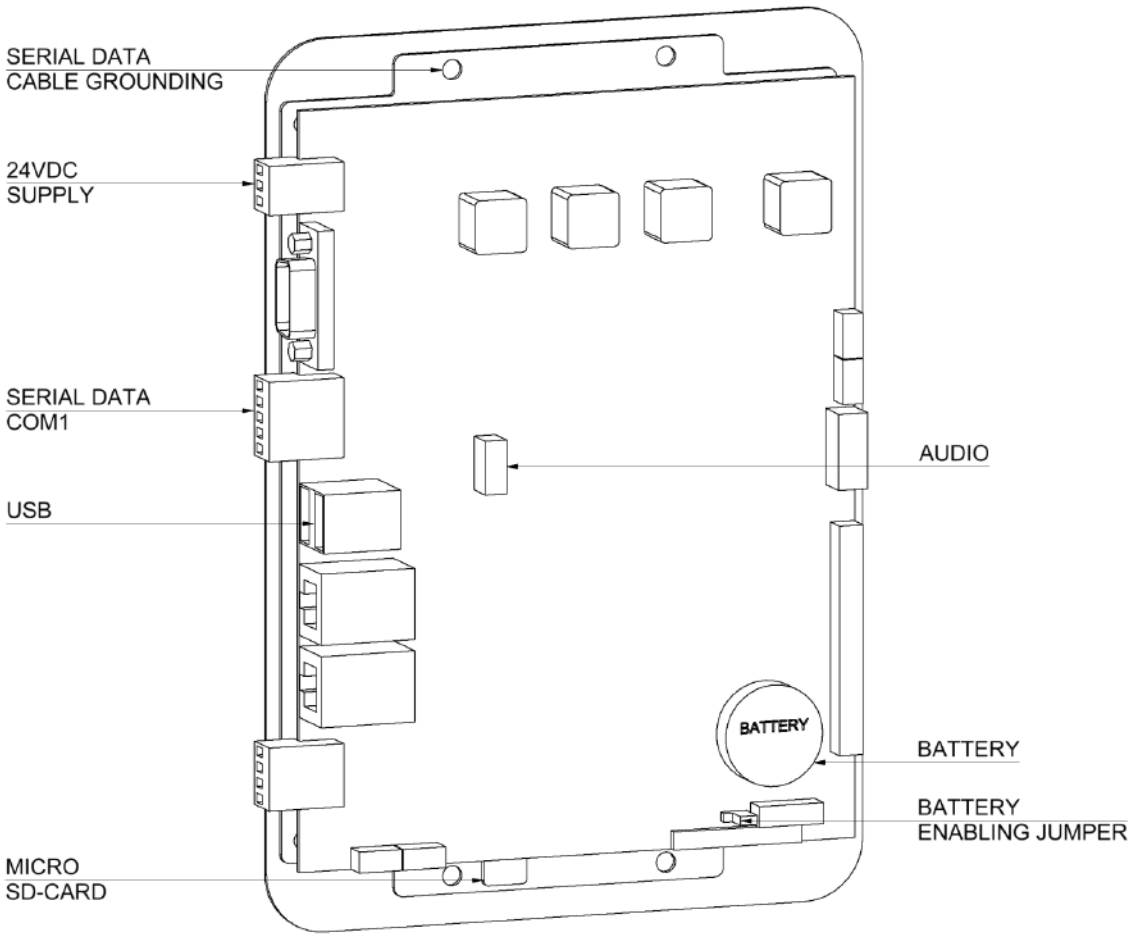


Figure 1: Touch screen panel A1 connectors.

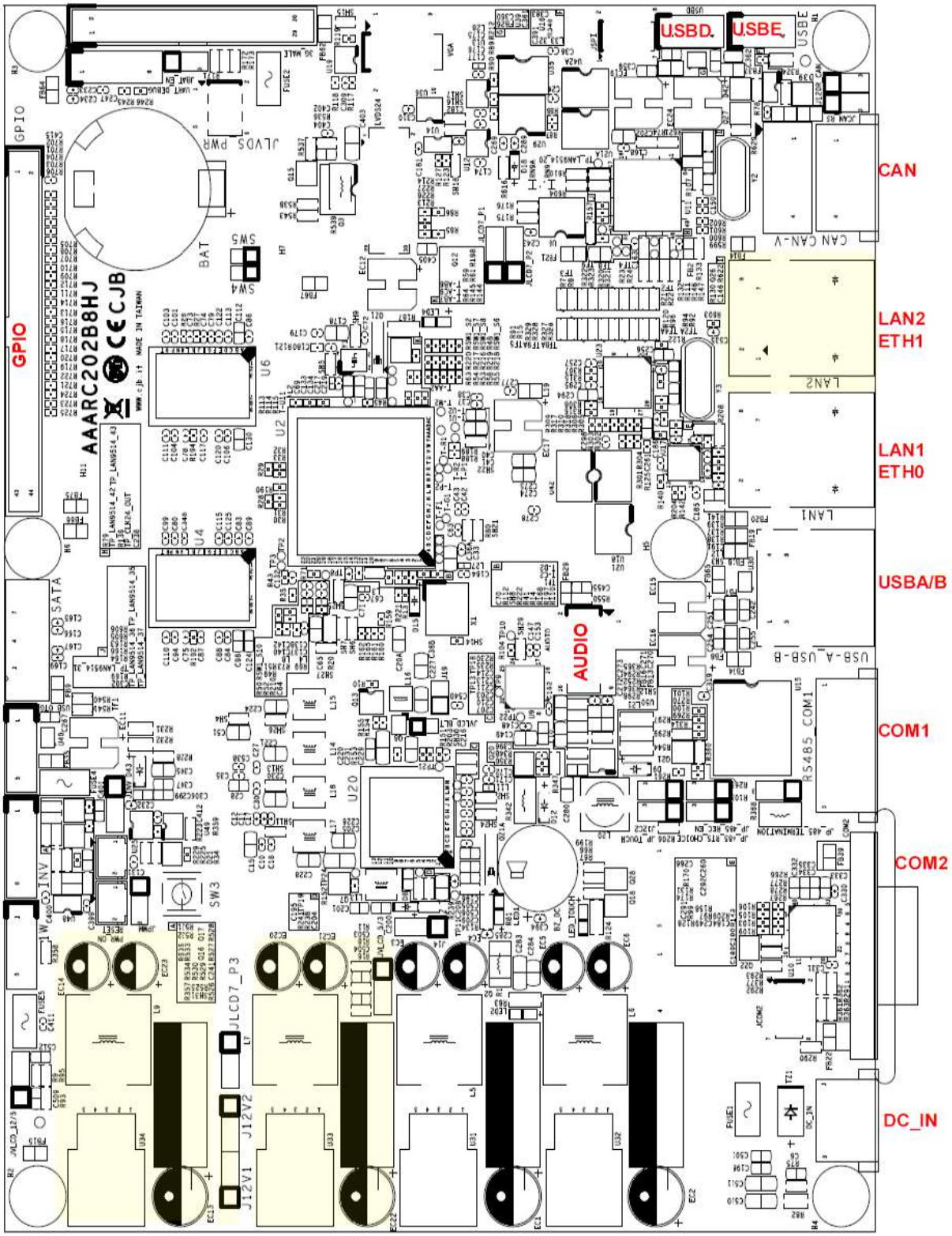


Figure 2: Panel board top side

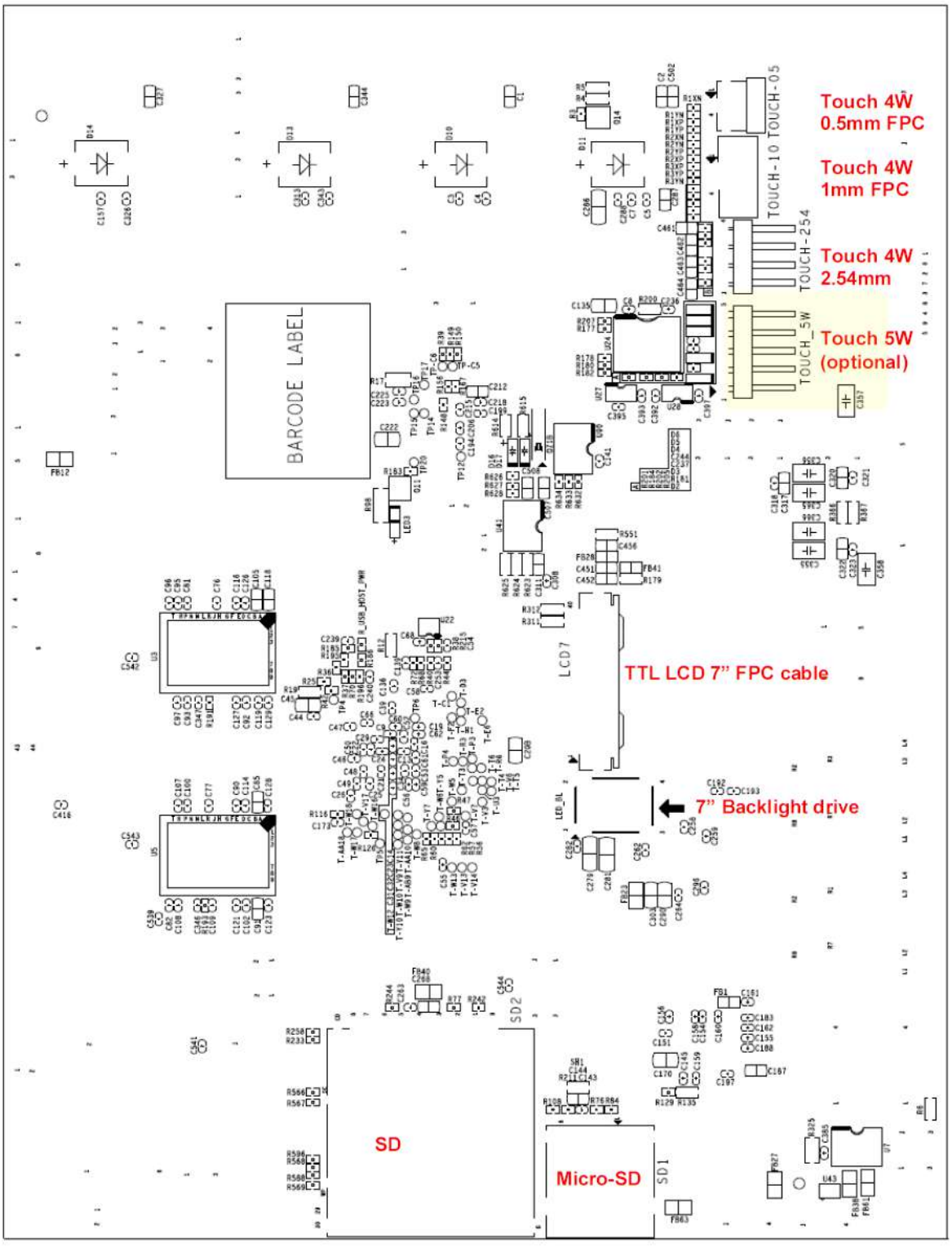


Figure 3: Panel board bottom side

5.1.2 Battery jumper

Touch screen panel board A1 has an onboard 3V battery(CR2032). Battery jumper connects and disconnects battery from board. Battery enables time and date memory saving during power offs. **This battery jumper needs to be in-usage position** as in image below. Check this before installing new panel.

In parking position (2-3) the battery is off.

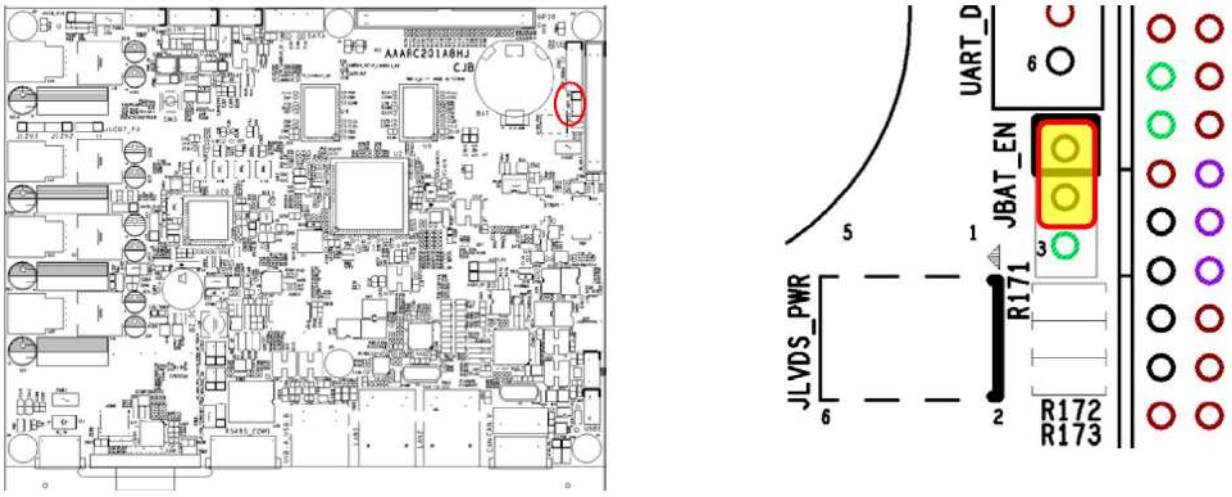


Figure 4: Onboard battery jumper in-usage position.

Battery spare part code MG5049118

Jumper spare part code MG3912317

5.2 I/O board (A21)

All sensors and valves are connected to I/O board **A21** located at the main electrical compartment.

5.2.1 Main I/O board connections

- DC_IN 24VDC supply
- AUD1 audio signal from panel board A1
- AUDIO_MONO1 amplified audio signal to loudspeaker H1
- X1 serial data connection to/from panel board A1

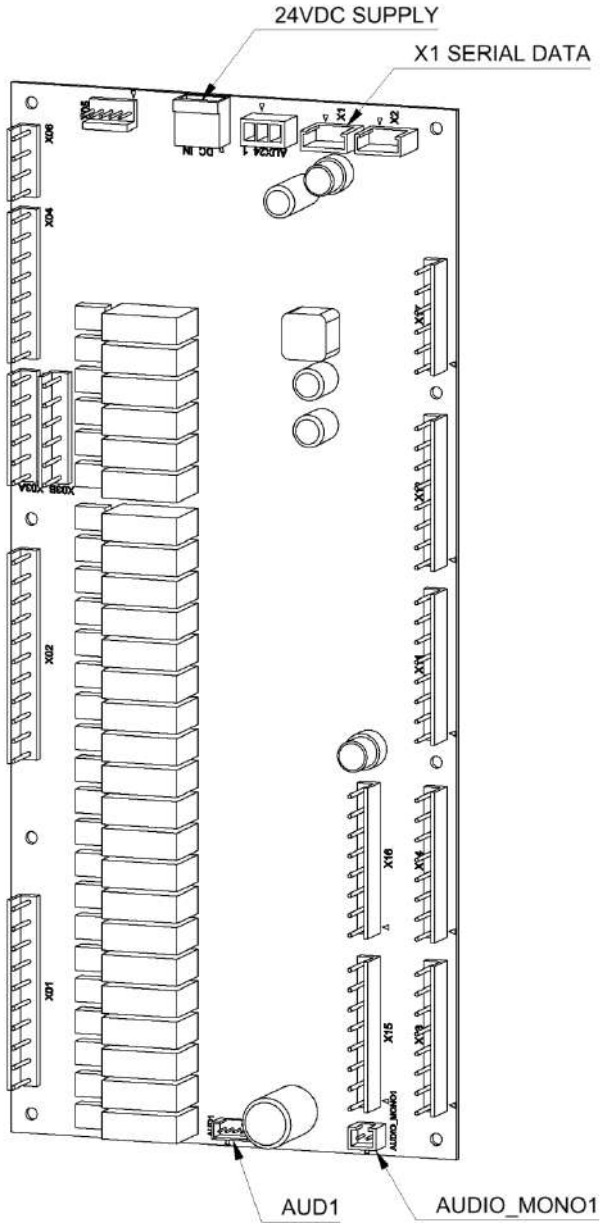


Figure 5: I/O board layout, main connections.

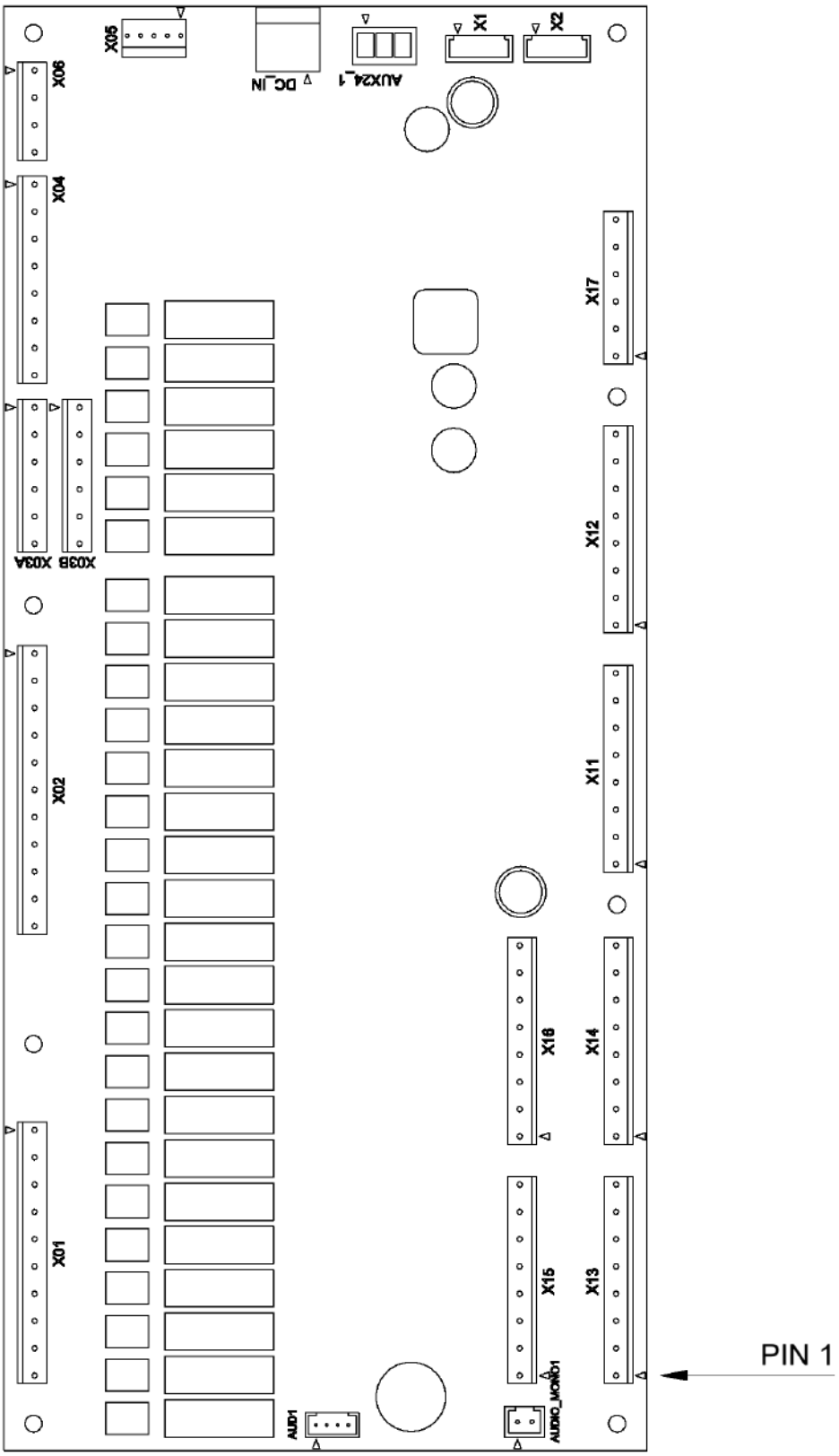


Figure 6: I/O board layout. Arrow heads indicate PIN 1.

5.3 Electrical compartment

See Designations section

5.4 Replacing micro SD-card

In orderto replace the micro SD-card, the new card need to be **initialized for the kettle**. Using any micro SD-card from the local store will not work. The initialized card must be ordered from the spare parts department of the supplier of the kettle.

If micro SD-card is replaced the kettle is reset to factory defaults. **Always after replacing micro SD memory card, also update software and parameters from USB memory stick to ensure correct function. Note: there are parameters not shown with service log in, but loaded from USB memory stick, and it is important that these are correct for correct function.**

The best way to ensure an easy and problem free replacement of micro SD-card is to save parameters and cookbook to USB memory stick (see 4.2 Memory functions) before replacement. After replacement the same parameters and cookbook are then loaded from the same USB memory stick.

If for some reason this is not possible, example could be a broken or lost micro SD-card, the needed parameters must be set properly by hand (see 4.4 Parameters). As an absolute minimum, Configuration parameters must be checked and set to correct settings. In any unclear situation, it could be a good idea to order a factory settings parameters file to be loaded with USB memory stick. Also after this, configuration parameters must be changed to right value.

Note! If micro SD-card is replaced, all of the users settings and custom cookbook programs are lost. Users should be always reminded that the cookbook have to be backed up to a USB memory.

Needed ordering codes:

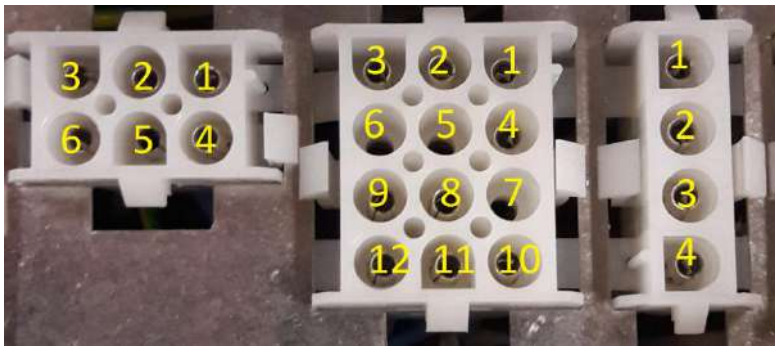
Software update USB package (directory): DOC000279

Parameters service settings USB file: DOC000402

Micro SD-card initialized for the kettle: MG3912016

Note that changes to these can be done during the lifetime of the kettle. To be sure, check with technical support that you have the latest version.

5.5 Connectors pin assignments



Mate-n-lok connectors

XM2	1	P1/black
	2	P1/red
	3	P1/brown
	4	B1/signal
	5	(PE)
	6	coding
	7	empty
	8	A2/3
	9	A2/2
	10	A2/1
	11	S3
	12	S3

XM3	1	B2
	2	B2
	3	B3
	4	B3

XM5	1	M2/PTC
	2	M2/PTC
	3	coding

XM6	1	M1/red
	2	M1/orange
	3	M1/green

XM8	1	S5/1(N)
	2	S5/2(N)
	3	empty
	4	S5/1(L)
	5	S5/2(L)
	6	PE

XM18	1	S3
	2	S3

XM19	1	P1/black
	2	P1/red
	3	P1/brown

XM20	1	B2
	2	B2

XM21	1	B3
	2	B3

XM40	1	S1/13
	2	empty
	3	S2/13
	4	S1/14
	5	empty
	6	S2/14
	7	S1/31
	8	empty
	9	S2/31
	10	S1/32
	11	coding
	12	S2/32

XM41	1	Y1/1
	2	Y1/2
	3	Y1/PE
	4	Y2/1
	5	Y2/2
	6	Y2/PE
	7	Y3/1
	8	Y3/2
	9	Y3/PE
	10	empty
	11	empty
	12	coding

XM42	1	Y12/1
	2	Y12/2
	3	Y12/PE
	4	XM55/Y5/brown
	5	XM55/Y5/black
	6	XM55/Y5/grey/blue
	7	Y4/1
	8	Y4/2
	9	Y4/PE
	10	XM56/Y15/brown
	11	XM56/Y15/black
	12	XM56/Y15/grey/blue
	13	XM57/Y18/brown
	14	XM57/Y18/black
	15	XM57/Y18/grey/blue

XM43	1	Y16/1
	2	Y16/2
	3	Y16/PE
	4	Y25/1
	5	Y25/2
	6	Y25/PE

XM44	1	M1/brown(L)	Y6/1
	2	M1/blue(N)	Y6/2
	3	PE	Y6/PE
	4	coding	coding

XM51	1	empty
	2	empty
	3	empty
	4	empty
	5	empty
	6	empty
	7	empty
	8	empty
	9	empty
	10	coding
	11	empty
	12	empty

XM52	1	S6
	2	S6
	3	coding
	4	P2/red
	5	P2/brown
	6	P2/black
	7	empty
	8	empty
	9	empty
	10	empty
	11	empty
	12	empty

XM53	1	coding
	2	IOLiving/brown(L)
	3	IOLiving/blue(N)
	4	IOLiving/PE

XM54	1	IOLiving/B3
	2	IOLiving/B3

XM55	1	Y5/brown
	2	Y5/black
	3	Y5/blue

XM56	1	Y15/brown
	2	Y15/black
	3	Y15/blue

XM57	1	Y18/brown
	2	Y18/black
	3	Y18/blue

Terminal block connectors

X3	1	K2 control XO1/2
	2	K1 control XO1/1
	3	K2 control K2/A1
	4	K1 control K1/A1
	5	Heating ON XO2/6
	6	empty
	7	Cooling ON K21
	8	Cooling ON K21
	9	Icebank malfunction
	10	Icebank malfunction
	11	Forced half power
	12	Forced half power

X4	1	Y8/brown
	2	Y7/brown
	3	Y9/brown
	XN	Y7-9/blue
	PE	Y7-9/yellow/green

I/O Board connectors

XO1	1	K1/A1 (X3/2-X3/4)	Y7/1 (X4/2)
	2	K2/A1 (X3/1-X3/3)	Y8/1 (X4/1)
	3	Y1/1 (XM41/1)	
	4	Y2/1 (XM41/4)	
	5	Y3/1 (XM41/7)	
	6	Y4/1 (XM42/7)	
	7	Y5, K23/A1	
	8	Y6/1 (XM40/10 - S1/32 -S1/31 - XM40/7 - XM44/1)	M1 (XM44/1)
	9	Y12/1 (XM42/1)	
	10	XL 230VAC	

XO2	1	Y15, K24/A1	
	2	Y18, K25/A1	
	3	K14/A1	
	4	K3/A2 (XM40/12 - S2/32 - S2/31 - XM40/9 - F3/95 - F3/96)	M1 (XM44/1)
	5	K21/A1	
	6	X3/5	Y9/1 (X3/5 - X4/3)
	7	Y25/1 (XM43/4)	
	8	K17/A1	
	9	Y16/1 (XM43/1)	
	10	(Y22/1) not used	
	11	empty	

XO3A	1	M1/red (XM6/1)
	2	M1/green (XM40/12 - S2/32 - S2/31 - XM40/9 - XM6/3)
	3	M1/red (XM6/1)
	4	M1/orange (XM40/10 - S1/32 - S1/31 - XM40/7 - XM6/2)
	5	empty
	6	empty

XO3B	1	U1/+24V
	2	U1/DI2
	3	U1/+24V
	4	U1/DI1
	5	empty
	6	empty

XO4	1	empty
	2	empty
	3	empty
	4	empty
	5	empty
	6	empty
	7	empty
	8	empty

XO5	1	HACCP Common
	2	HACCP ON
	3	HACCP Heating ON
	4	HACCP Mixing ON
	5	HACCP Cooling ON

XO6	1	U1/AI2
	2	U1/COM
	3	empty
	4	empty

DC_IN	1	T1/+
	2	T1/-

AUX24_1	1	empty
	2	empty
	3	empty

X1	1	A2/RS485_COM1/4
	2	A2/RS485_COM1/3
	3	A2/RS485_COM1/5
	4	shield/ground

X2	1	empty
	2	empty
	3	empty
	4	empty

XI1	1	B2 (XM3/1 - XM20/1)
	2	B2 (XM3/2 - XM20/2)
	3	B3 (XM3/3 - XM21/1)
	4	B3 (XM3/4 - XM21/2)
	5	empty
	6	empty
	7	empty
	8	empty

XI2	1	M2 temperature (XM5/1)
	2	M2 temperature (XM5/2)
	3	empty
	4	empty
	5	empty
	6	empty
	7	empty
	8	empty

XI3	1	S1/13 (XM40/1)
	2	S1/14 (XM40/4)
	3	X3/11
	4	X3/12
	5	S4/1 (XS4-1)
	6	S4/4 (XS4-4)
	7	empty
	8	empty

XI4	1	empty
	2	empty
	3	S6/13 (XM52/1)
	4	S6/14 (XM52/2)
	5	X3/9
	6	X3/10
	7	S2/13 (XM40/3)
	8	S2/14 (XM40/6)

XI5	1	K22/14
	2	empty
	3	K22/14
	4	K22/21
	5	K14/24
	6	K14/21
	7	A11/11
	8	A11/12

XI6	1	empty
	2	empty
	3	empty
	4	empty
	5	empty
	6	empty
	7	empty
	8	empty

XI7	1	P1/red (XM2/2)
	2	P1/brown (XM2/3)
	3	P1/black (XM2/1)
	4	P2/red (XM52/4)
	5	P2/brown (XM52/5)
	6	P2/black (XM52/6)

AUD1	1	A1/AUDIO/7
	2	A1/AUDIO/3
	3	A1/AUDIO/5
	4	A1/AUDIO/1

AUDIO_MONO1	1	H1
	2	H1

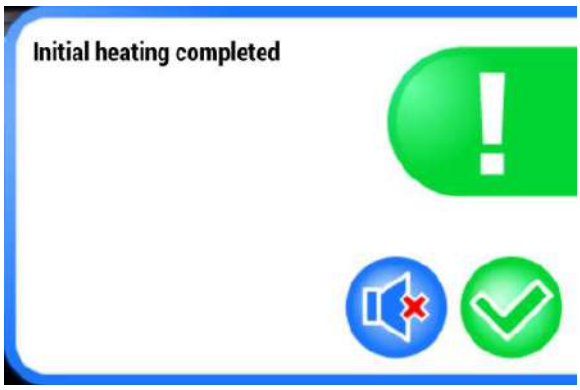
6 Troubleshooting

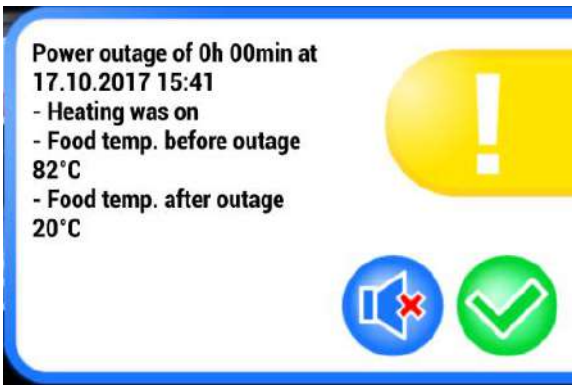
6.1 Self diagnostic

The kettle indicates multiple error and malfunction situations by sounding an alarm and showing a pop up window on screen. Depending on severity of the problem it may be possible to continue the use.

6.1.1 Information messages

Info messages have no ID.





Status	Disabled functions	Signals	Parameters	Solution
cooking position	mixing&tilting	S1	-	tilt the kettle
food temperature fall timeout in cooling	cooling (starts holding current temperature)	B3	404	use higher cooling target or lower cooling water temperature
grid open	mixing	K22/S3	-	close grid
heating	cooling	-	-	stop heating to start cooling
lid closed	tilting	S4	-	open lid
not in cooking position	mixing, heating, cooling with tapwater	S1	-	return to cooking position
safety valve test reminder	-	-		perform safety valve test
target temperature reached in heating	-	B3	-	-
scheduled program	all other functions than scheduled program	-	-	cancel scheduled program in order to use the kettle
bypass water ongoing	foodwater filling	-	-	stop bypass water to fill foodwater
jacket water level low	heating, safety valve test	A11/B1		secure water supply to kettle

6.1.2 Alarm messages

All alarm **IDs** are listed below with possible solutions.

ID	Status	Disabled functions	Signals	Parameters	Solution
20	lid/grid conflict	tilting, mixing, tilting&mixing	S4, K22/S3	-	put grid in place or repair sensors
22	mixer motor overheat	mixing, tilting&mixing	M2 heat		wait for mixer motor to cool down or repair sensor
40	cooking/end position conflict	tilting, mixing, tilting&mixing, heating, cooling	S1, S2	-	repair tilting position limit switches
41	jacket water level low timeout	heating, safety valve test	A11/B1	814	secure water supply to kettle or repair B1/A11 or Y3
42	food temperature out of range	heating, cooling	B3		repair food temperature sensor
43	jacket temperature out of range	heating, cooling, safety valve test	B2		repair jacket temperature sensor
44	jacket temperature overheat	heating	B2		check heating related parts to find reason for overheating, contactors K1 and K2, pressure switch A2, steam feed valves Y7 and Y8 in case of steam heated kettle
45	safety valve test has failed	heating, cooling	-	800-803	try safety valve test again and if needed follow detailed behavour of pressure/temperature and feedback relay input K14 to find reason for failing the test
52	icebank malfunction	cooling	X3 icebank	430	check icebank failure feedback wiring and signal polarity (parameter 430), check icebank

60	water flow meter / vater valve (Y1, Y2, Y3) conflict	cooling, foodwater filling, bypass water	P1 (P2)		check watersupply, check water flow meter P1, valves Y1-Y3 and relater piping
62	water flow meter / vater valve (Y1, Y2, Y3) conflict, water flow when Y1-Y3 closed	-	P1 (P2)		check valves Y1-Y3 and related piping for water leakage

ID	Status	Disabled functions	Signals	Parameters	Solution
71	Safety valve test pre-heat timeout	heating, cooling (alarm id 45)	B2	801	find reason for too slow heating of jacket, check contactors K1 and K2, heating elements E1-E4, water level in jacket B1/A11, if needed adjust parameter 801 value
72	jacket temperature over safety valve test limit	heating, cooling (alarm id 45)	B2	803	change to new safety valve
74	K14 feedback relay signal timeout	heating, cooling (alarm id 45)	K14	802	Check relay K14 and pressure switch A2, check also possible reasons for slow heating, if needed adjust parameter 802 value
80	possible software problem	all functions	-	-	restart kettle by power off/on
81	no connection between I/O board (A21) and touch screen panel (A1)	all functions	-	-	check wiring W4 between I/O board A21 and touch screen panel A1, if needed repair or replace with new wiring
82	I/O board (A21) on-board temperature sensor high reading	all functions	i/o board		wait for electronics to cool down, find reason for overheat in electrical compartment, if I/O board is broken => replace with new board

When an alarm or info occurs and there is a question about how to proceed, **it is a good idea to take a picture of the screen and send this picture together with the question**. This will help in supporting to the exact situation at hand.

6.2 General troubleshooting

Malfunction	Possible cause	What to do
The kettle cannot be switched on	The mains switch is in the OFF position	Turn the mains switch fitted on the rear part of the control pillar right side to the ON position
	The emergency stop button is pushed	Release the emergency stop switch by turning it clockwise
	The fuses in the main fuse box are blown/ triggered	Change/excite the fuses
	The delivery of electric energy is interrupted	Check if the delivery of electric energy is interrupted elsewhere and wait for it to return
screen is white	missing micro SD card	re-install micro SD card, turn off and turn on mains switch
screen is black	kettle in stand-by mode	touch the screen
	emergency stop pushed	release emergency stop
	mains switch in off state	turn mains switch to on state
	no mains supply voltage	supply voltage to kettle
	24VDC power supply broken	replace 24VDC power supply (T1)
	24VDC wiring broken or displaced	replace or re-install wiring (W1)
	fuse blown	find reason for blown fuse, correct problem that caused fuse to blow, replace fuse
nothing is working	possible software problem	restart kettle by switching off/on mains switch, re-install sofrware from USB memory stick, replace with new micro SD card if nothing else helps
	connection between I/O board and touch screen panel failure (alarm ID: 81)	replace or re-install wiring (W4)
	I/O board temperature too high (alarm ID: 82)	wait for electrical compartment to cool down, find reason for overheating, correct problem causing overheating
kettle not heating	jacket water level low	wait for water to be filled automatically, check water supply to kettle, check jacket filling valve (Y3) and corresponding wiring, check water level relay (A11) and settings on knobs and corresponding wiring, check water level electrode (B1), check water purity level (denatured water or similar does not conduct electricity good enough to be detected)
	contactor broken	replace with new contactor (K1, K2)
	tilting position limit switch broken	replace tilting limit switch (S1, S2) and if needed corresponding wiring (W12, W13)

	food or jacket temperature sensor broken	replace broken sensor (B2, B3) and corresponding wiring (W32, W33) if needed
	safety valve test has failed	do safety valve test again until it is done successfully
	in steam heated kettle steam feed problem	find reason for steam feed problem
	in steam heated kettle steam feed valve (Y7, Y8) broken	replace broken valves
heating is slow	contactor broken	replace with new contactor
	one or several heating elements broken	replace heating elements (E1-E2)
	too much water in jacket	Drain the jacket using the manual drain valve and test again
cooling not working	food or jacket temperature sensor broken	replace broken sensor (B2 and/or B3) and corresponding wiring (W32/W33) if needed
	safety valve test has failed	do safety valve test again until it is done successfully
	icebank problem	repair icebank
	water flow meter broken	replace water flow meter (P1/P2)
	cooling related valve broken	relplace broken valve (Y1-Y5, Y12, Y15-16, Y18, Y25), replace corresponding relay (K23-25) and corresponding wiring if needed
	icebank control signal wiring or relay K21 broken	replace with new relay (K21) or correct wiring if needed
cooling is slow	twisted hose	untwist hoses and make sure they don't twist again by tilting kettle several times to end position
	water supply limited	correct water supply
	icebank problem	repair icebank
Water comes out of safety valve in cooling	cooling related valve broken	relplace broken valve (Y1-Y5, Y12, Y15-16, Y18, Y25), replace corresponding relay (K23-25) and corresponding wiring if needed
kettle is not mixing	VFD parameters not loaded	order VFD with preloaded parameters or load parameters by hand
	mixer motor overheated	wait for mixer motor to cool down, replace broken motror if needed
	mixer motor temperature sensor broken	check sensor wiring (W9) and replace motor if needed
	grid is open	close grid
	grid sensor is broken	replace broken grid sensor (S3) or corresponding relay (K22) or corresponding wiring if needed

	lid or grid sensor broken	replace lid sensor (S4) or grid sensor (S3) or corresponding relay (K22) or corresponding wiring if needed
	tilting position limit swith broken	replace tilting limit switch (S1 and/or S2) and if needed corresponding wiring (W12/W13)
kettle not tilting	hydraulic pump motor electrical cable wires connected in wrong order	rewire motor (M3)
	hydraulic unit broken	replace broken unit
	hydraulic motor protection F3 activated or broken	find reason for protection activation or replace broken protection part (F3)
	contactor K3 broken	replace broken contactor
	electrical tilting motor broken	replace broken motor (M1) or corresponding wiring if needed
	lid or grid sensor broken	replace lid sensor (S4) or grid sensor (S3) or corresponding relay (K22) or corresponding wiring if needed
	tilting position limit swith broken	replace tilting limit switch (S1, S2) and if needed corresponding wiring (W12, W13)
foodwater filling not working	water flow meter broken	replace water flow meter (P1)
	water valve broken	replace broken valve (Y1)
	water supply problem	correct water supply
water bypass not working	water flow meter broken	replace water flow meter (P1)
	water valve broken	replace broken valve (Y2)
	water supply problem	correct water supply
no sound	speaker or speaker wire broken or missing	replace speaker (H1) or speaker wire (W5) if needed
	audio cable broken or missing	replace audio wiring (W3)
	I/O board partially broken	replace I/O board (A21)
	touch screen panel board partially broken	replace panel board (A1)
safety valve test fail	safety valve broken	replace safety valve
	safety valve test feedback relay (K14) broken	replace relay K14
	pressure switch (A2) broken	replace pressure switch A2
	wrong parameters in use	check parameters 801-803 and change value if needed
foot pedal not working	foot pedal factory activation parameter not activated	check signal S6 at the diagnostic tool. If the pedal works, ask a new parameter file from TSC
	broken foot pedal (S6) or wiring (W34)	replace foot pedal S6 or wiring W34

IOLiving not working	cables broken or displaced	re-install or replace IOLiving
	I/O board partially broken	replace I/O board (A21)
	dual food temperature sensor broken	replace food temperature sensor (B3) NOTE use MG3912433
wrong part of touch screen activated when touching the screen	touch screen not clean (maybe small amount of food on the screen)	clean touch screen
strange or wrong behavour in some functionality	wrong parameters in use	re-load parameters with USB memory stick, use file DOC000402
heating elements get broken	water level relay wrong wired or adjustment knobs in wrong position	re-adjust water level relay (A11), check wiring
	water level electrode B1 broken	replace electrode B1
	limestone on heating elements	perform limestone removal (descaling)
time and date reset after power off	touch screen panel battery missing or run out	peplace with new battery MG5049118
	touch screen panel battery enabling "jumper" missing or displaced	replace jumper MG3912317
Food temperature indicator on screen shows higher temperature that jacket temperature in heating	Temperature sensors B2 and B3 cables flipped	re-wire sensors B2 and B3
Control circuit fuses (F11, F12) blown	Solenoid valve coil defected	Disconnect the coils. Replace fuses. Check and fix the defected coils

7 Service instructions

7.1 Recommended periodic service

The recommended service period depends on the utilization rate of the equipment:

Utilization rate	**Normal** **< 8h/day (56h/week)**	**Heavy** **8 – 12h/day (56-84h/week)**	**Industrial** **> 12h/day (84h/week)**
Recommended service period	12 months	6 months	4 months

7.1.1 General

- ☐ Check the kettle position – cooking and fully tilted, adjust if needed
- ☐ Check oil level in hydraulic motor if the kettle is equipped with hydraulic tilting (200-400 l)
- ☐ Check heating and temperature display
- ☐ Check water flow and measuring accuracy, adjust if needed
- ☐ Test safety grid mixer stop function
- ☐ Test foot switch operation (option)
- ☐ Check the lid mechanism and limit switches
- ☐ Check the mixer tool and scrapers condition

7.1.2 Electrical connections

- ☐ Check and tighten (screw in) electrical connections, especially high currents.
- ☐ Measure heating elements' and mixer motor's insulation resistance
- ☐ Check earthing
- ☐ Check the electrical components' condition and connections (switches, contactors, relays, etc…)

7.1.3 Water connection

- ☐ Pressure min 2,5bar
- ☐ Clean filters or sieves

7.1.4 Electric heating / Steam generator

- ☐ Perform de-scaling if necessary
- ☐ Check and clean the water level electrode
- ☐ Check the heating elements' condition, sealings and connections
- ☐ Check the manometer operation and reading at 120°C (1 bar)
- ☐ Perform safety valve test

7.1.5 Direct Steam heating

- ☐ Check the steam supply and condensate line connections
- ☐ Clean the condensate removal traps
- ☐ Check the manometer operation and reading at 120°C (1 bar)
- ☐ Perform safety valve test

7.1.6 Software

- ☐ Check the software version. Update if newer version is available.

7.2 Steam generator descaling

Depending on the hardness of water a periodical descaling of the steam generator is advisable in order to prevent efficiency degrade, valve clocking and heating element failures. A 1 mm scale buildup on the heating element doubles the temperature of the resistance coil inside the heater and shortens the lifetime of the element by 80%. The recommended descaling interval depends on the water hardness as shown in the table below:

	mmol/l	°dH	Recommended descaling interval
Soft:	< 1,1	< 6°dH	5 years
Medium:	1,1-1,6	6 - 9°dH	3 years
Hard:	> 1,6	> 9°dH	1 year

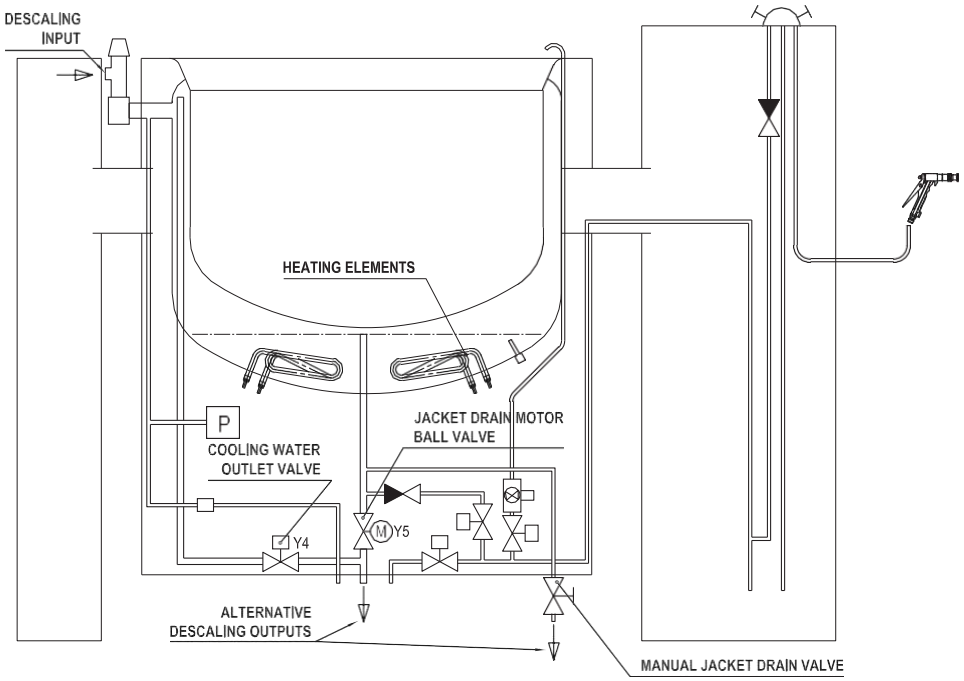
The hardness of water can be asked from the local waterworks. Hard water may also be softened using external water treatment units to reduce the need for descaling.

The easiest way to carry out the descaling process is to use a descale solution pump unit to fill and circulate the solution through the steam generator. Descaling pump units are available from the bigger sellers of descaling chemicals. A pump unit also makes the descaling process safer and more efficient due to the continuous descaling solution circulation.

In order to have the right amount of descaling solution the table below lists the different kettle size steam jacket volumes. The working descaling solution must be prepared according to the manufacturer's instructions. Take care that the descaling chemical is intended for descaling of stainless steel.

Kettle size	Water in steam generator at normal level in liters	Steam jacket total volume in liters
40	14	20
60	14	22
80	15	42
100	15	45
150	21	54
200	21	60
300	37	100
400	37	109

The descaling pump unit output hose is connected to the safety valve output that has a ¾" female thread. Flip the safety valve lever so the valve stays open. The descaling pump unit return hose is connected to the steam jacket drain valve in the right bottom corner of the kettle bowl. The thread is ½" male. On kettles with automatic cooling where the drain motor ball valve Y5 present it is also possible to use the outlet pipe as descaling solution outlet. In order to do this the Y5 valve must be run into the open position using the Diagnostic tool.



When descaling bigger kettles the descaling pump tank will propably not be big enough to accommodate the whole descaling solution volume. In this case ready made solution must be pumped into the jacket in a couple of batches in order to fill the jacket to at least normal steam generator water level.

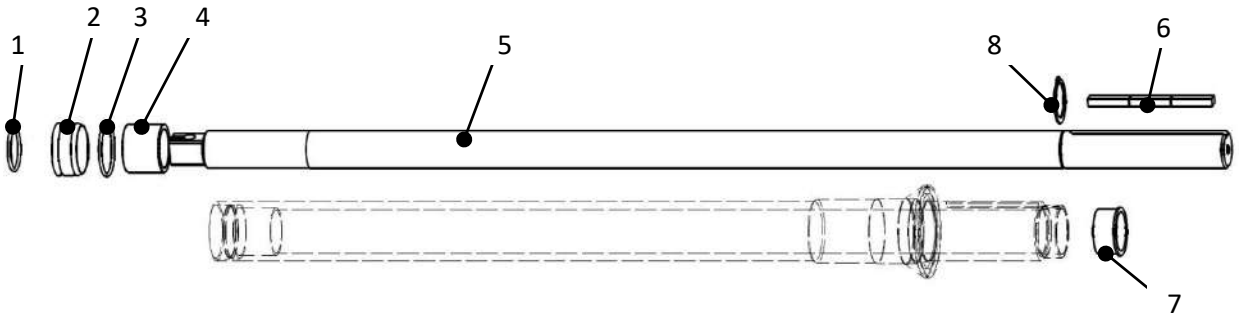
For many descaling chemicals the descaling is faster if the temperature of the solution is higher. Follow the supplier's instructions and set the kettle heating to 50°C. Let the solution circulate for the time described by the descaler supplier. If the supplier has given instructions on how to check the process efficiency e.g. by measuring the solution pH, follow them.

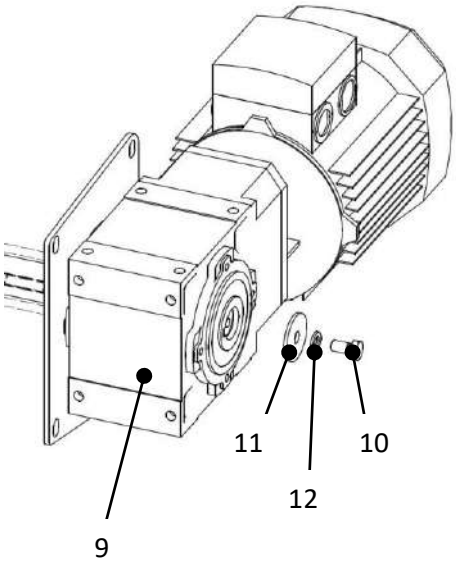
After descaling disconnect the descaling pump unit hoses, drain the descaling solution from the jacket into a container for proper neutralisation and disposal as described by the descaling chemical supplier.

After this the kettle jacket must be thoroughly flushed to get all loose scale particles out. On kettles with tapwater cooling this can be done using the kettle cooling function. On kettles with icebank cooling it is not allowed to use the cooling for flushing as it might transfer descaling chemical deposits to the icewater tank. In this case the flushing must be done using a hose feeding tapwater through the safety valve.

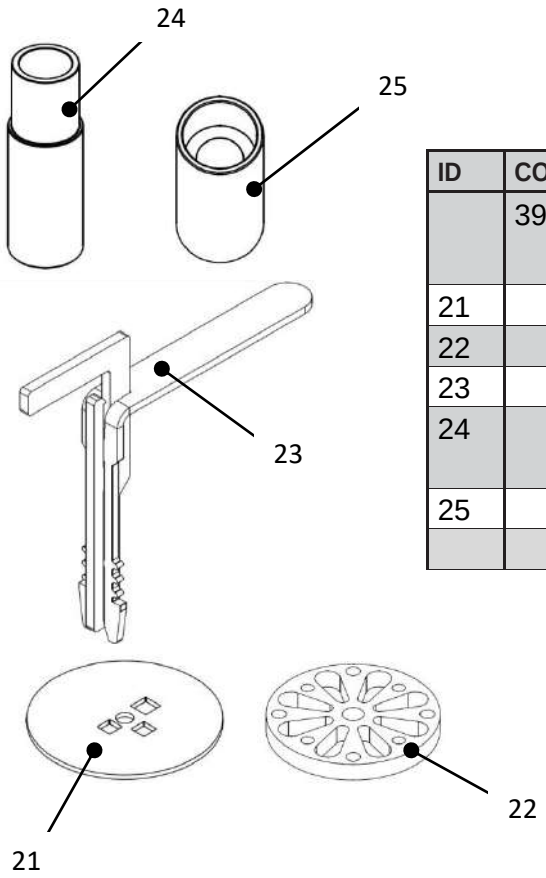
After at least five flushings the drain valve Y5 and the manual drain valve and connected pipes must be checked for any loose scale particles. It is also recommended to detach the water level probe and check and clean it and the mounting area from scale particles if present. Also remember to release the safety valve lever to the normal operating position.

7.3 Replacing the mixer motor



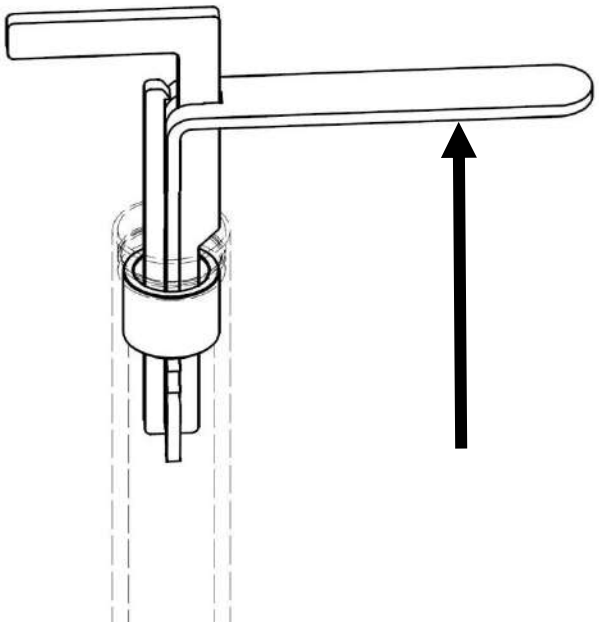


ID	CODE	TYPE	Qty	DESCRIPTION
1	3601456		1	O-ring
2	3601425		1	Bushing
3	3601455		1	O-ring
4	3601427		1	Bronze bearing
5	3604300	400	1	Axle
5	3601422	300	1	Axle
5	3601451	200	1	Axle
5	3601453	150	1	Axle
5	3601502	100	1	Axle
5	3601504	80, 60	1	Axle
5	3601506	40	1	Axle
6	3601408		1	Key
7	3601569		1	Aligning bushing
8	3604355	400	1	Serger-ring
9	3601459	40,60,80,100	1	Gear motor
9	3601458	150,200,300	1	Gear motor 1,5kW,M2
9	3604213	400	1	Gear motor 2,2kW
10	3470332		1	Screw M10x25
11	3601550		1	Washer M10
12	3021217		1	Spring washer M10



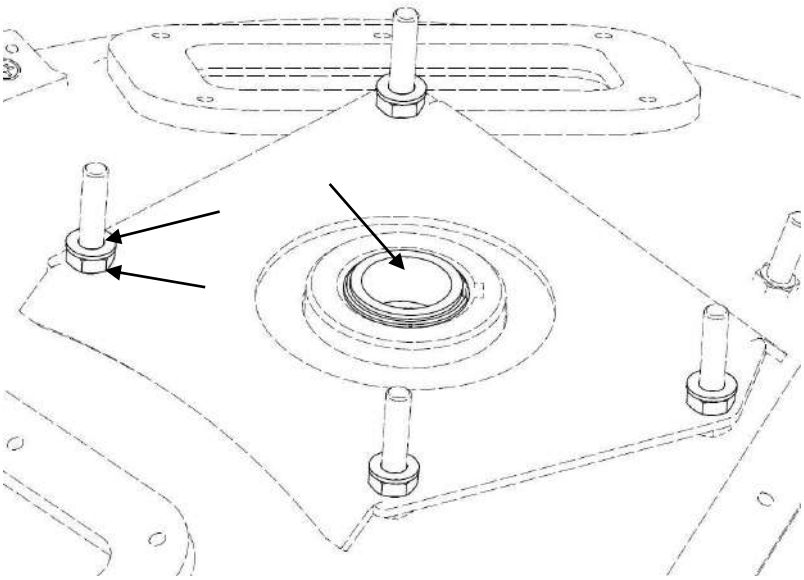
ID	CODE	CODE	Qty	DESCRIPTION
	3908868		1	Tool kit, For replacing mixer motor, Bronze bearing and axle
21		3908888	1	Key mounting tool
22		3908869	1	Mixer axle removal tool
23		3908701	1	Bronze bearing extractor
24		3908042	1	Mixer axle centering and bronze bearing
25		3906057	1	Bushing mounting tool

If the bronze bearing is worn out and must be replaced. First remove the axle and bushing. Then position the bearing extractor (23) as shown in a picture below and make sure it locks into the bearing. Tap in the direction of the arrow so that the bearing dismounts from the mixer axle tube.



Clean and oil the bearing surface before reinstallation. Check the axle key track and adjust with rasp/file if necessary. **Correct centering**, **height** and **alignment** as described below are very important when reassembling parts!

1.



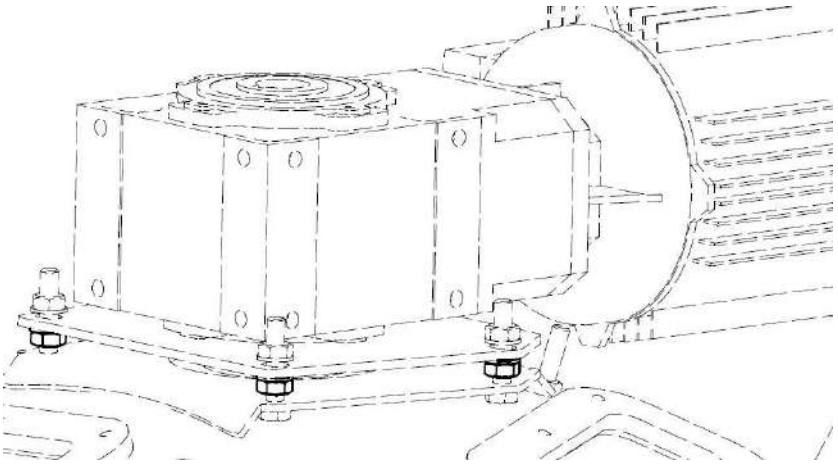
There are 4 nuts and washers. These are "stoppers" so the mixer motor does not go too "deep" and keep metal from rubbing against metal.

With these nuts you will also adjust the height and center of the axle, so that it is fully straight.

There is also a white nylon bushing. This is also for preventing metal to rub against metal.

If the mixer motor is installed too deep, this bushing will wear off.

2.



After you have pushed motor and axle in, turn those 4 nuts with washers so they are right under the motor chassis (if needed).

These will prevent motor to move closer to jacket when you are tightening mixer motor.

Now when you have moved all 4 nuts against motor chassis, its time to check if the motor axle is straight.

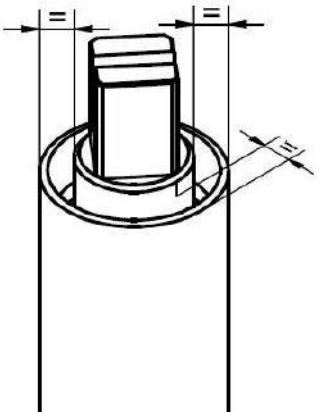
3.

Axle centering is done without bushing

When you have placed axle right height in the middle and you have tightened the motor in place, axle should be movable by hand approx. 1mm.

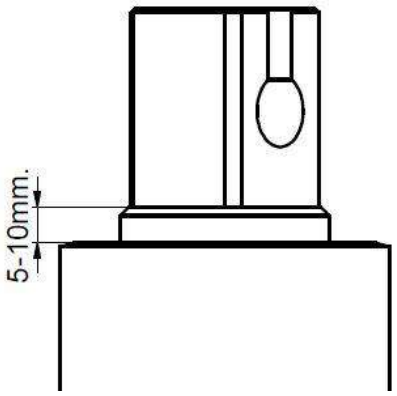
If it's not installed straight, then it will lean against bronze bearing and it is not possible to move by hand.

After checking, that the axle is straight, turn the kettle to normal cooking position and check if the axle is still straight. Normally it is not, so you need to tilt the kettle again and adjust it a little bit more. Mixer axle centering tool (24) should slide inside the axle tube effortlessly.



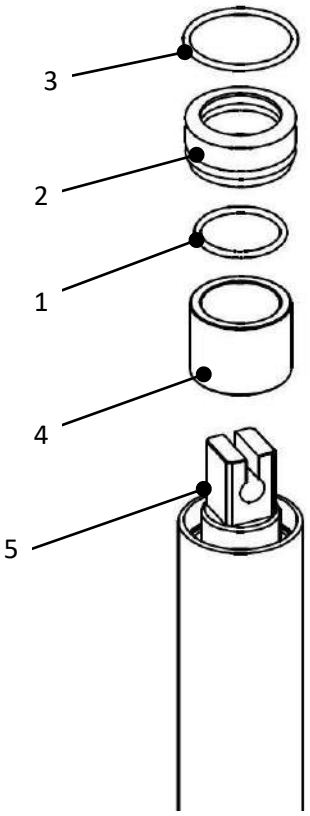
Mixing axle round unworked part must come out of shaft tube end about **5-10 mm, depending on the model of kettle.**

However 3mm is minimum height.

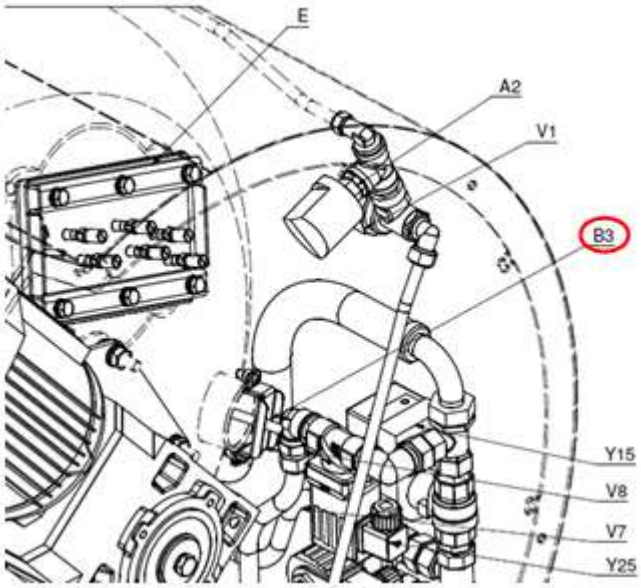


When replacing mixer axle, use tools descripted above. Replacing the bearing is not always necessary if it is OK.

The bearing inner measure is 35 mm. If bearing is worn by the shaft tube inner surface, the bearing must be replaced.



7.4 Changing the B3 temperature probe



Remove B3 probe from bottom of the kettle

Clean the old thermal compound from the bottom of the kettle inside the tube

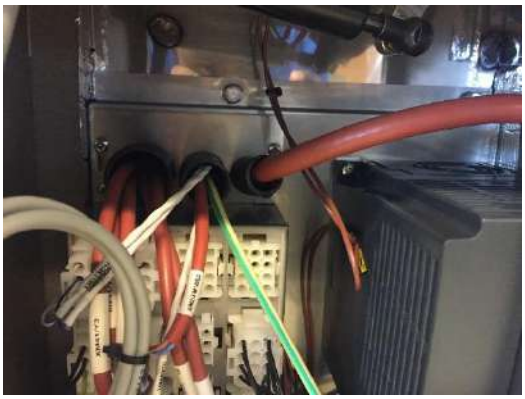
Apply thermal compound MG3912327 supplied with the new probe to tip of new probe.

Install probe to its place

7.5 Ferrite beads and earthings

When disconnecting, replacing and connecting wires, pay attention to the ferrite beads and earthings below.

The ferrite FB1 MG3646138 is mounted around the heating element cabling MG3604931, MG3604932 or MG3604933 in the electrical compartment as shown. Also see electrical diagrams S01049 and S00311.

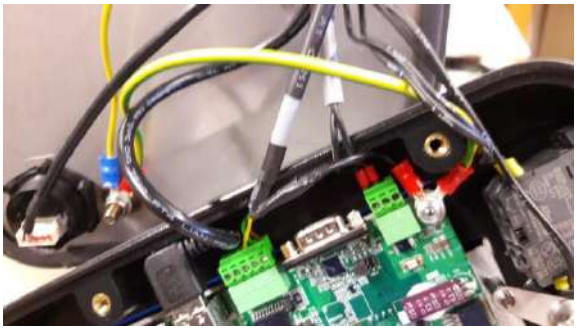


The ferrite FB2 MG3910343 is installed as part of an electronic component assembly. Check that it is installed. See also electric diagram S01052.

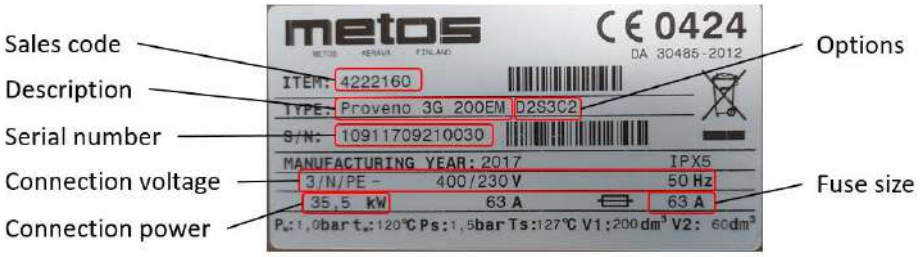
The ferrite FB3 MG3910343 is mounted around the serial communication cable MG3910552 at the end of the I/0 board in component assembly as shown. See also electric diagram S01027.

Ferrites FB2 and FB3 are Wurth Electronic split ferrites. They can be opened with the security key as shown.

The communication cable MG3910552 is grounded on the earthing screw at the touch panels electronics card MG3902624. At the same point, the electronics board is earthed on the frame. See also electric diagram S01027.



8 Spareparts



Type designation on the rating plate:

1 PROVENO 4G

- the kettle model line

2 300E

- 40 = 40 liter kettle
- 60 = 60 liter kettle
- 80 = 80 liter kettle
- 100 = 100 liter kettle
- 150 = 150 liter kettle
- 200 = 200 liter kettle
- **300** = 300 liter kettle
- 400 = 400 liter kettle

- **E** = electrically heated kettle
- S = direct steam heated kettle

3 D1S3

- **D1** = standard jacket draw off tap
- D2 = bottom draw off valve connection SMS63

- S1 = standard handshower
- S2 = heavy duty handshower
- **S3** = reel-in handshower

4 C5i

- C2 = automatic tapwater cooling
- C3 = icewater cooling
- C3iPA=icewater cooling+drainage with pressurised air
- **C5i** = two phase cooling, tapwater - icewater
- C5iPA=two phase cooling+ drainage with pressurized air

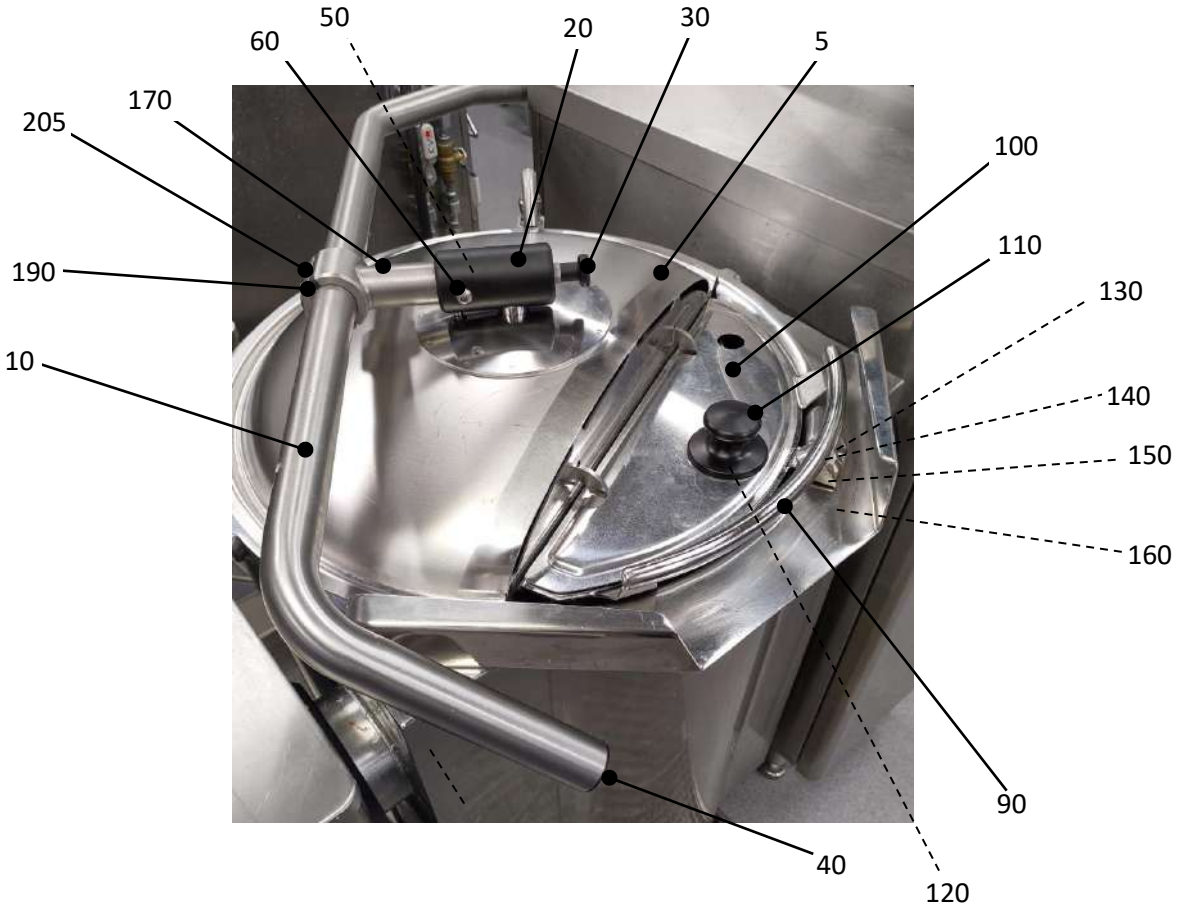
5 HADOTFP

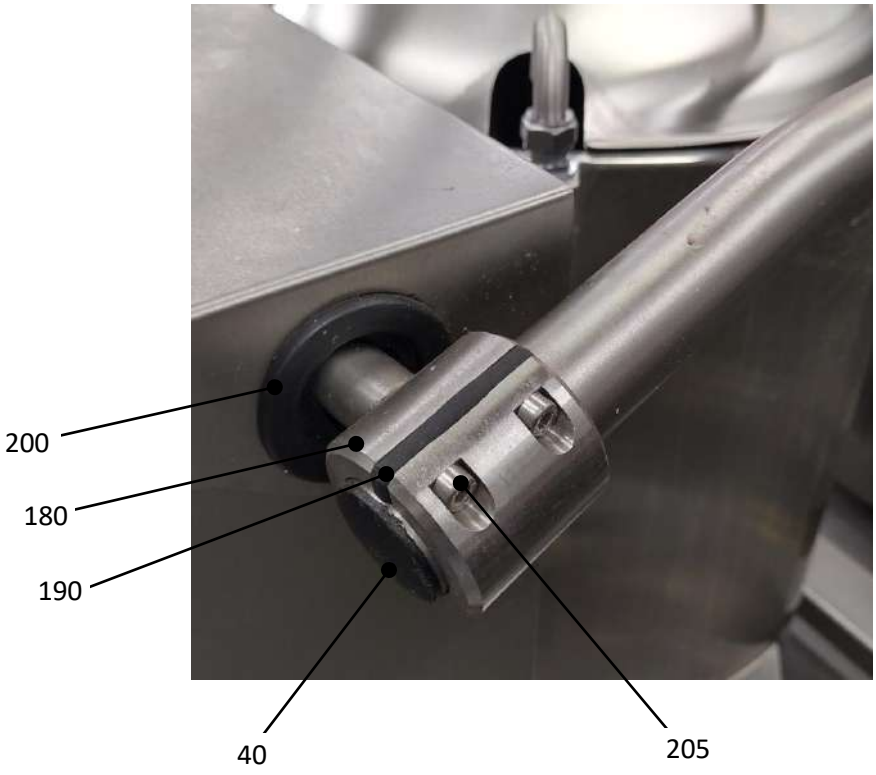
- **HA** = IoLiving HACCP sensor
- **DO** = double output Pt1000 food temperature sensor
- **T** = twin water connection
- **FP** = foot pedal for mixing while tilting
- HG = welded bowl covers
- PO = socket power outlet 230V 16A

6 X

- **X** = customer specific modification

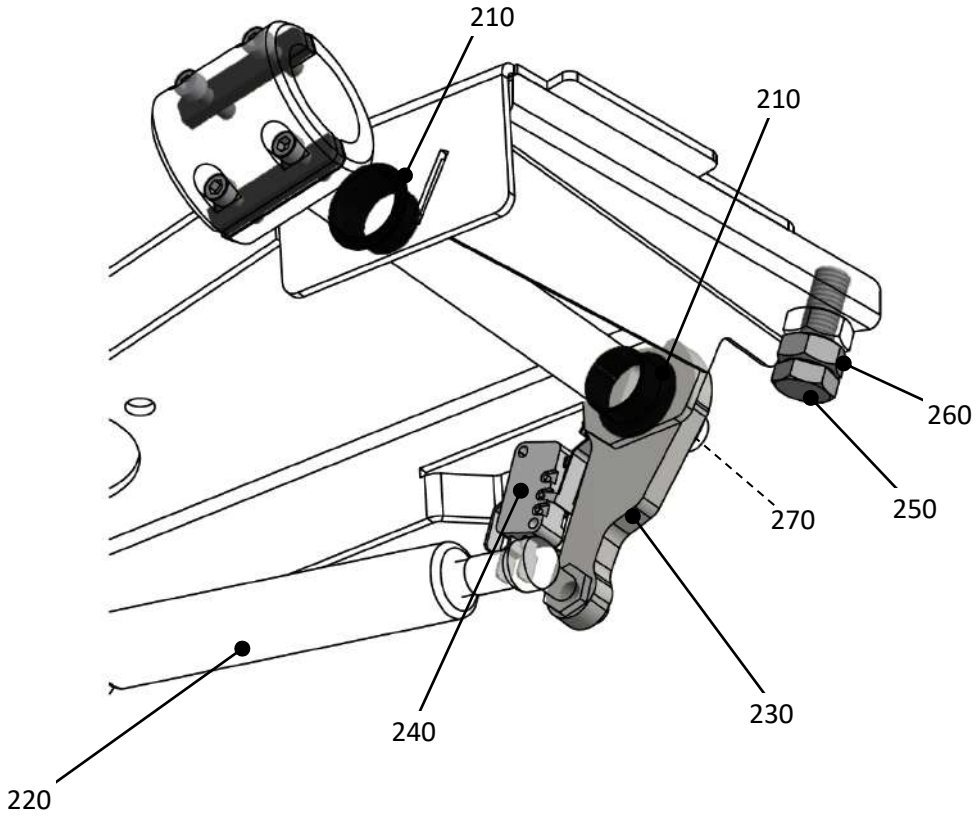
LID ASSEMBLY





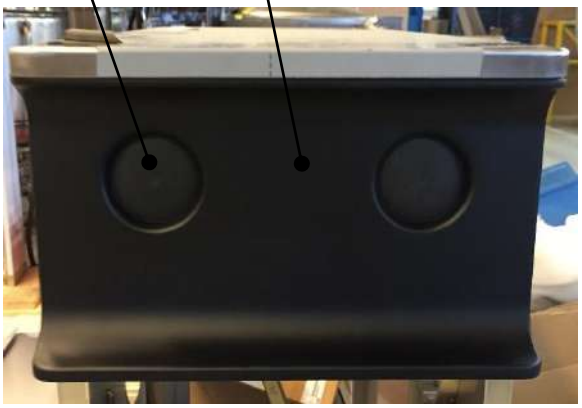
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
LID ASSEMBLY					
5	3915164	40, 60	1		Lid
5	3917270	80, 100	1		Lid
5	3917278	150, 200	1		Lid
5	3917291	300, 400	1		Lid
10	3915083	40, 60	1		Lifting arm
10	3915566	80, 100	1		Lifting arm
10	3915567	150, 200	1		Lifting arm
10	3914701	300	1		Lifting arm
10	3915167	400	1		Lifting arm
20	3914704		1		Lid center mount
30	3572550		1		Interlock plunger
40	3604869		2		End cap
50	3604852		1		Locking insert
60	3771584		1		Screw M8x25
90	3601970	40, 60	1		Safety grid
90	3601971	80, 100	1		Safety grid
90	3601972	150, 200	1		Safety grid
90	3601973	300, 400	1		Safety grid
100	3601896	40, 60	1		Lid opening cover
100	3601897	80, 100	1		Lid opening cover
100	3601898	150, 200	1		Lid opening cover
100	3601899	300, 400	1		Lid opening cover
110	3573786		1		Knob
120	K275032		1		Cramp
130	3601906		1		Magnet housing
140	3601910		1		Magnet
150	3603141		1		O -ring
160	K353400		1 #		Magnetic switch, S3
170	3915094		1		Adjusting stem
180	3914525	40,60,100,150,200,300	1		Arm hinge
180	3917264	400	1		Arm hinge
190	3912060		4		Clamp seal
200	3604859		1		Hinge axle seal
205	3470558		4		Screw M5x16
			#	Recommended sparepart	

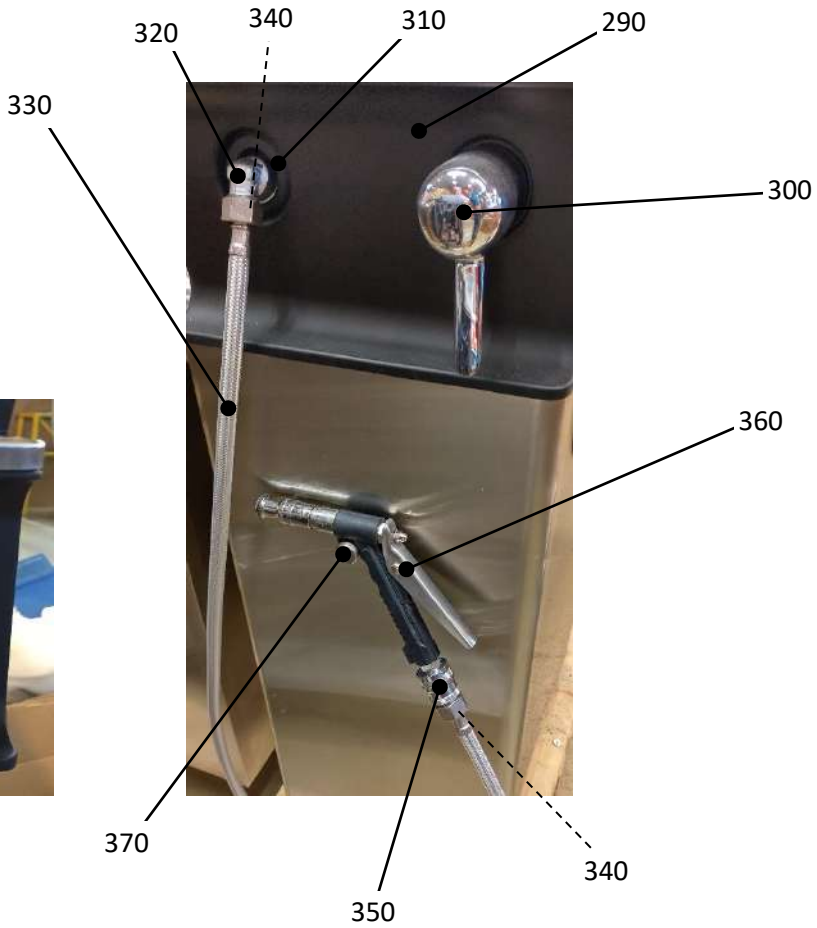
LID HINGE ASSEMBLY

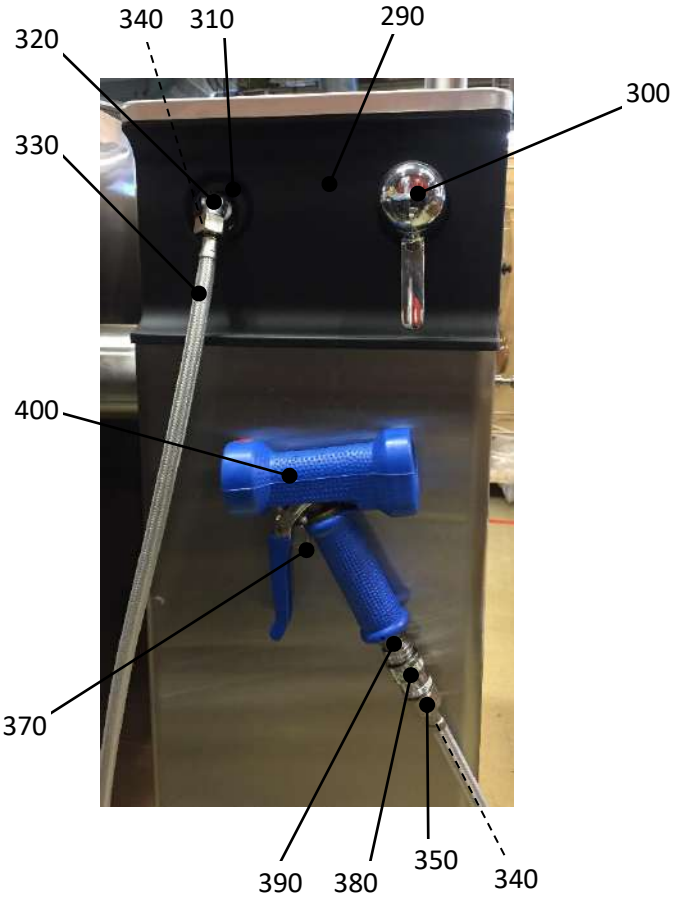


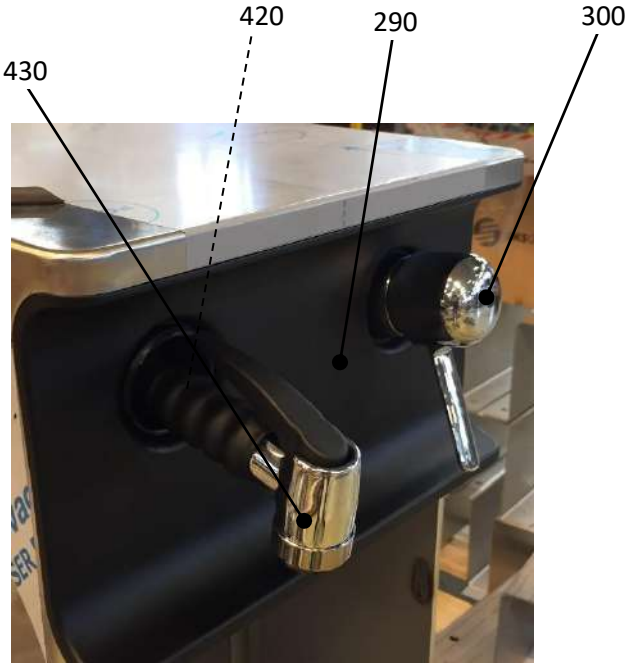
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
LID HINGE ASSEMBLY					
210	3905892		1		Bearing, ø=18
220	3916525	40, 60	1#		Gas spring 200N
220	3918267	80, 100	1#		Gas spring 250N
220	3917276	150, 200	1#		Gas spring 450N
220	3914532	300, 400	1#		Gas spring 750N
230	3914370		1		Spring bracket
240	3604858		1#		Microswitch, S4
250	3911076	40-300	1		Bolt M10x30
250	3516467	400	1		Bolt M10x50
260	3905367		1		Nut M10
270	3025998		1		Nut M12
			#	Recommended sparepart	

CONTROL PILLAR

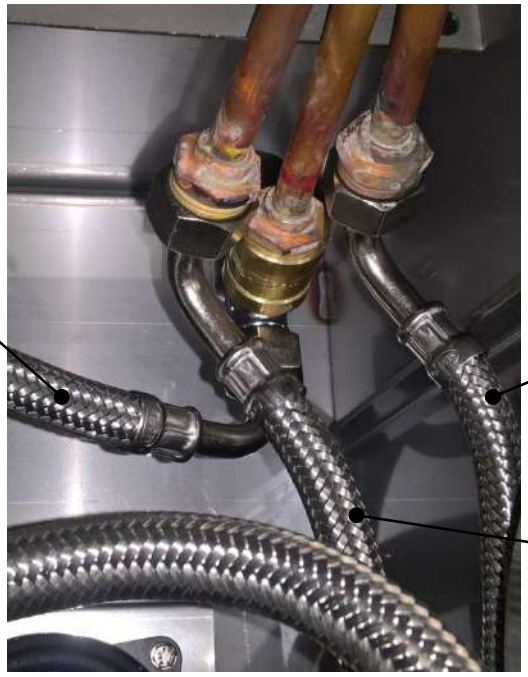


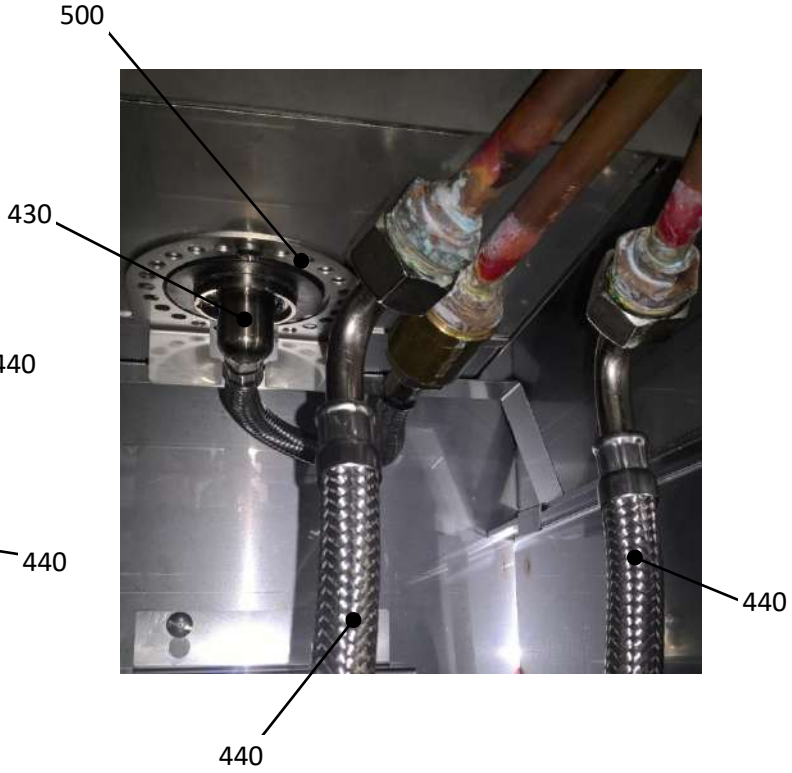


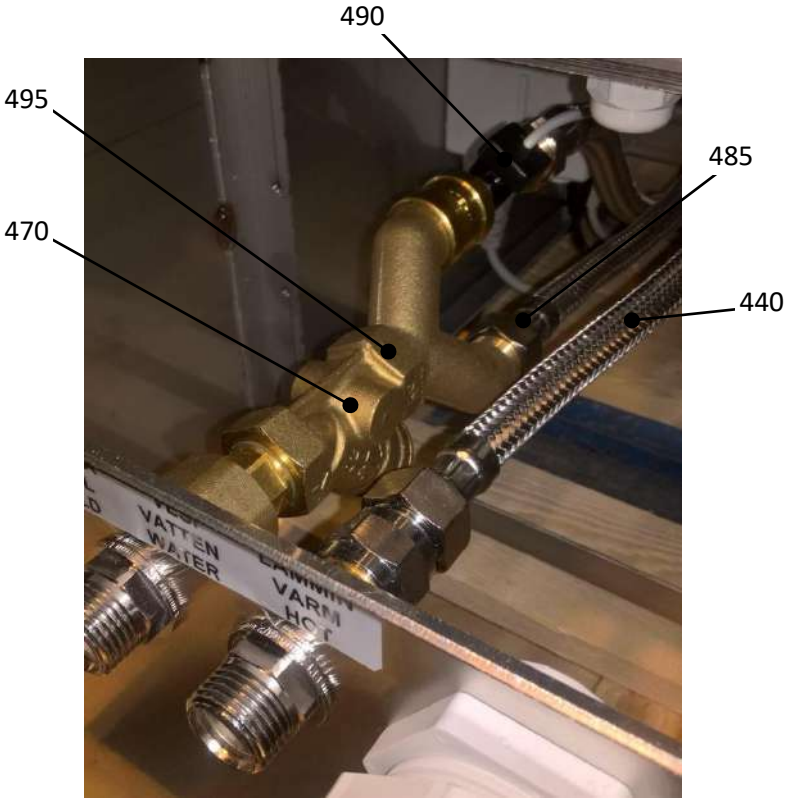




CONTROL PILLAR – WATER PIPING

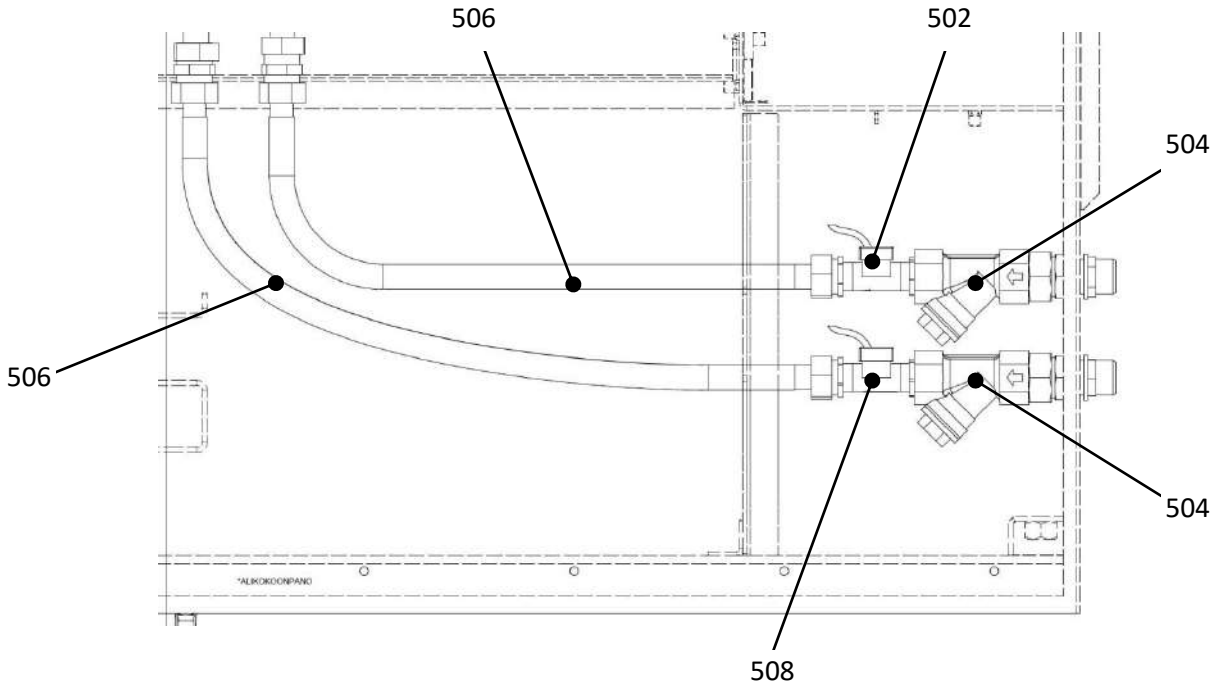






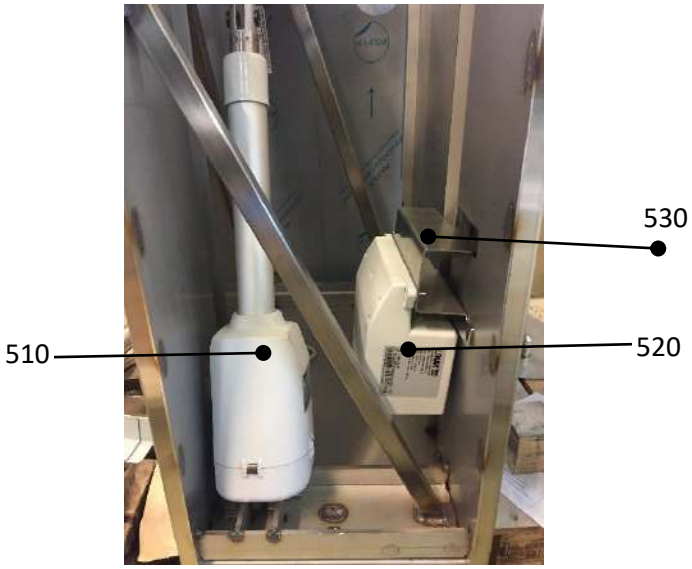
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
CONTROL PILLAR - WATER PIPING					
280	3604099		1		Cover cap
290	3913663		1		Front panel
300	3911062		1	S1, S2, S3	Single handle faucet
310	3605085		1	S1, S2	Mounting adapter
320	5301635		1	S1, S2	90° connector
330	K421020		1	S1, S2	Hose 1,7 m, straight ends
340	5301402		2	S1, S2	Fiber seal R1/2
350	3476126		1	S1, S2	Female quick connector
360	3602006		1	S1	Shower pistol
370	5301669		1	S1	Support peg
380	5301205		1	S2	Male quick connector
390	3018694		1	S2	Double nipple R½
400	3604102		1	S2	Heavy duty shower pistol
420	3910155		1	S3	Hose feed trough
430	3910415		1	S3	Reel-in handshower, complete
440	3601443		1	S1, S2, S3	Hose 1/2” L=1000mm.
450	3604685		1	S1, S2	Hose 1/2” L=300mm.
460	3602074		1	S1, S2, S3	Hose 1/2” L=500mm.
470	3019899		1	S1, S2, S3	Oblique strainer
480	3605675		1		Hose 1/2” L1200mm.
485	3604754		1		One way valve
490	3603565		1#		Flow meter, P1
495	3911734		1		Assembly, P1
500	3907301		1		Hose guide
			#	Recommended spareparts	

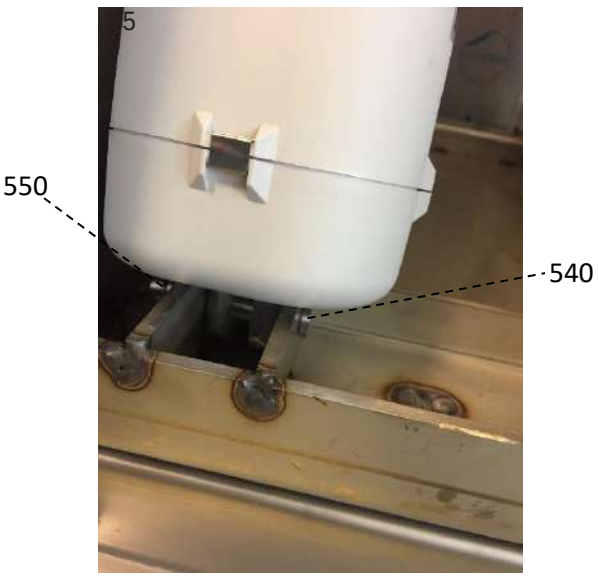
CONTROL PILLAR – WATER PIPING – TWIN WATER

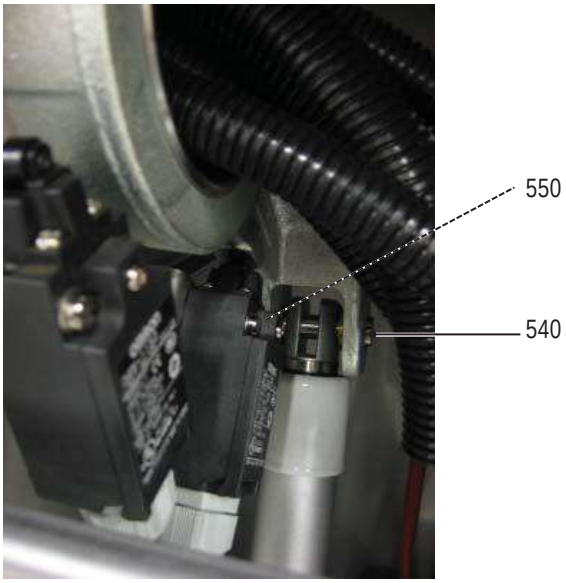


ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
CONTROL PILLAR - WATER PIPING – TWIN WATER					
502	3603565		1#		Flow meter, P1
504	3019899		1		Oblique strainer
506	3602074		1		Hose 1/2” L=500mm.
508	3603565		1#		Flow meter, P2
			#	Recommended spareparts	

CONTROL PILLAR - LINEAR ACTUATOR TILTING

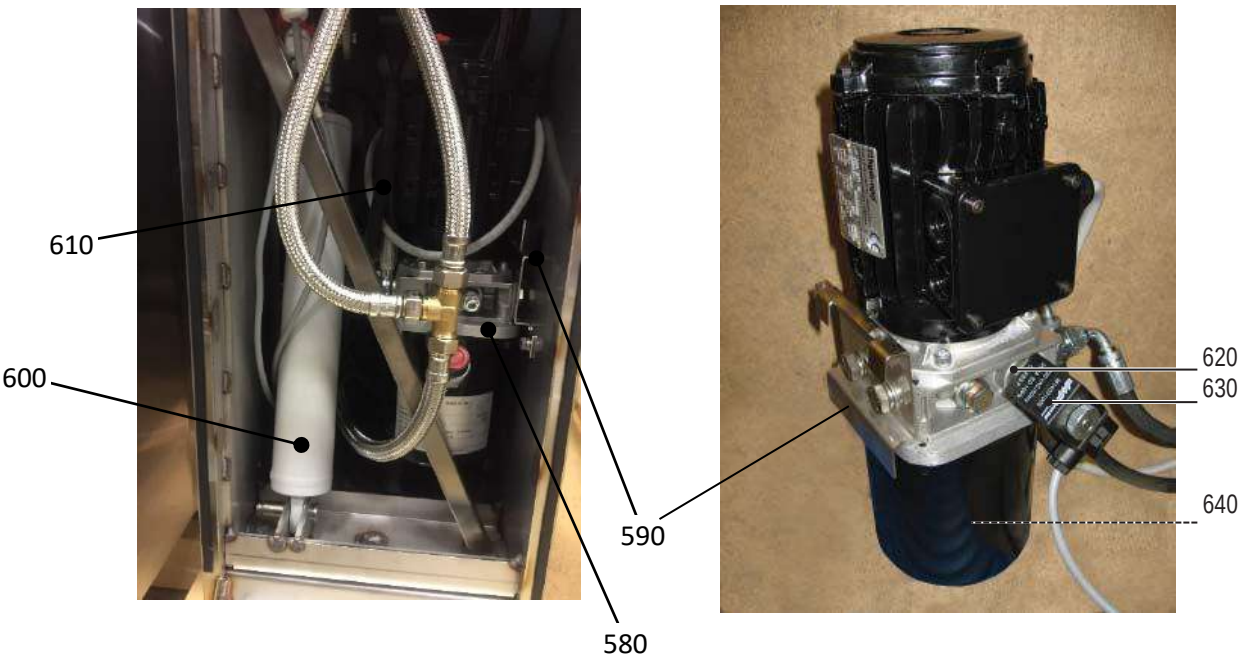


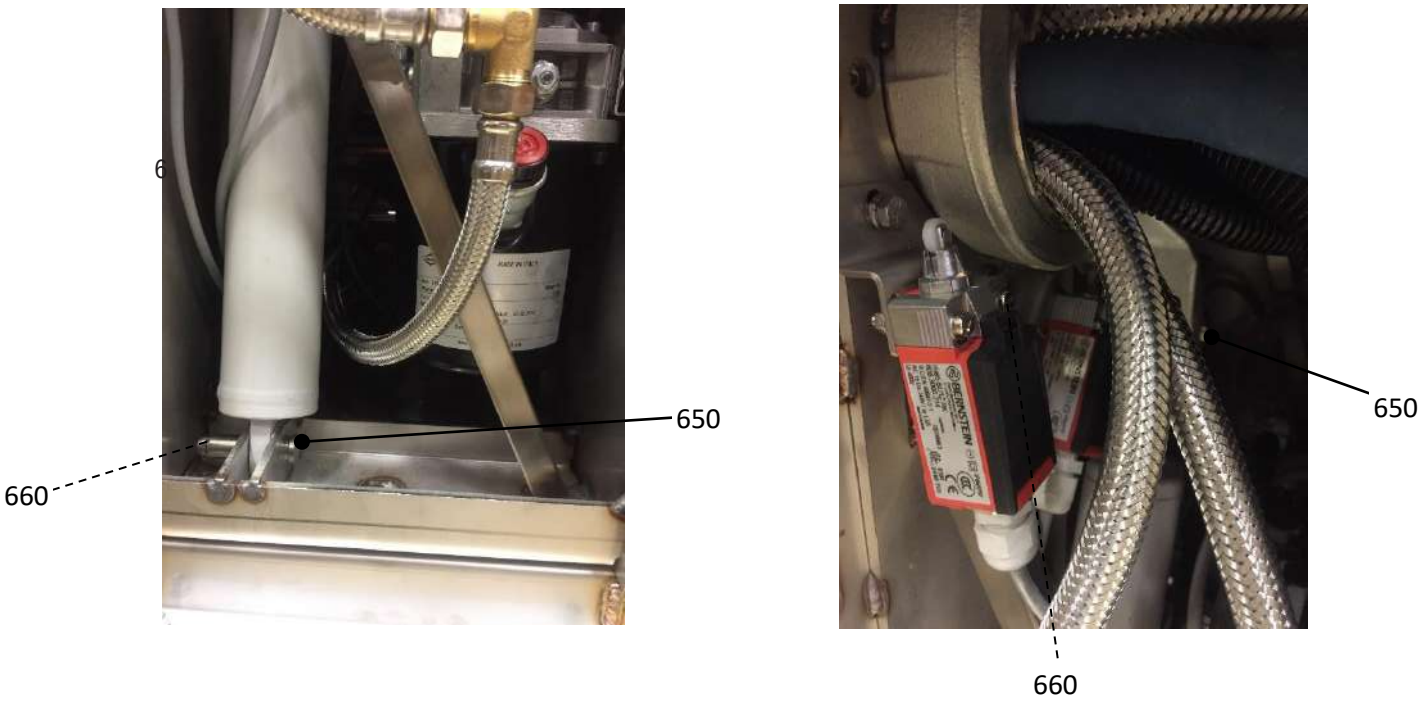




ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
CONTROL PILLAR - LINEAR ACTUATOR TILTING					
510	3604529	40 ,60, 80, 100, 150	1#		Tilting motor M1
520	3604530	40, 60, 80, 100, 150	1		Control unit for M1
530	3914863	40, 60, 80, 100, 150	1		Control unit holder
540	3601067	40, 60, 80, 100, 150	1		Shaft
550	3640143		1		Cotter pin
			#	Recommended spareparts	

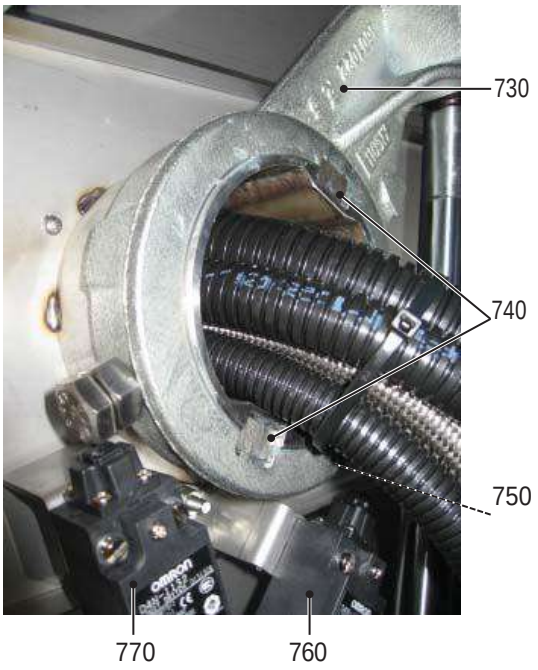
CONTROL PILLAR - HYDRAULIC TILTING

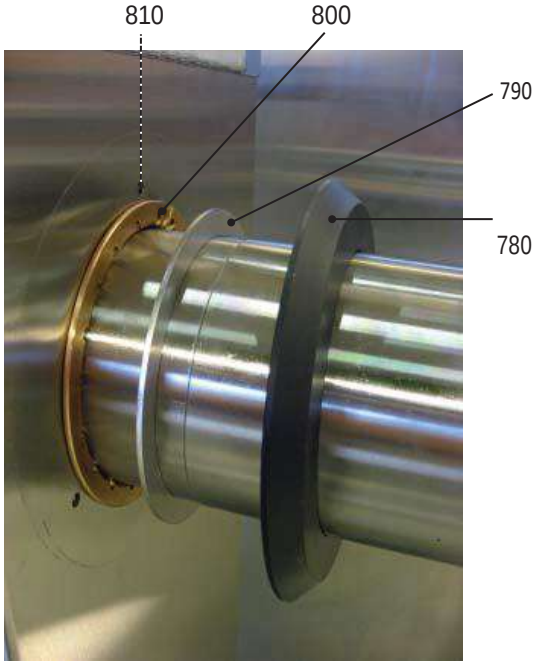




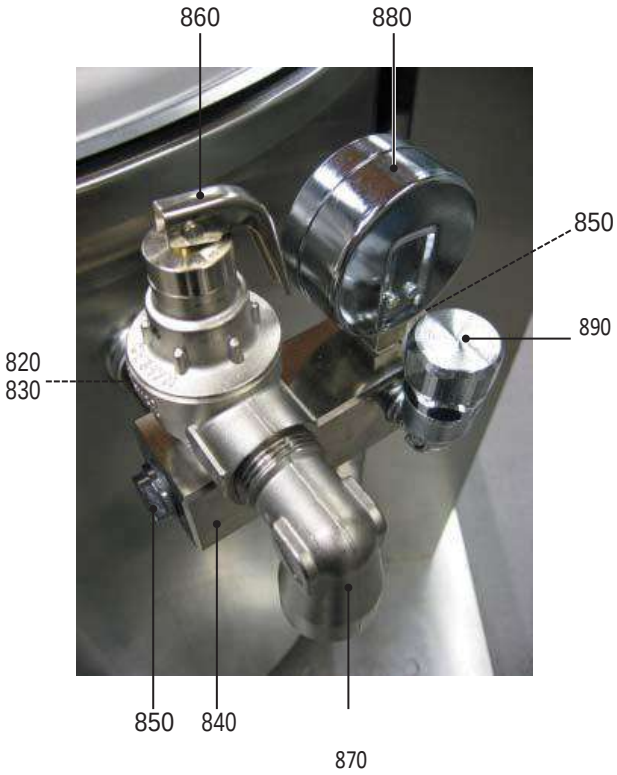
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
CONTROL PILLAR - HYDRAULIC TILTING					
580	3604101	200, 300, 400	1#		Hydraulic unit 140 bar
590	3914863	200, 300, 400	1		Hydraulic unit holder
600	3917128	200, 300, 400	1		Cylinder
610	3604748	200, 300, 400	1		Hose 850mm
620	3604759	200, 300, 400	1		Cartridge valve
630	3604760	200, 300, 400	1		Valve coil
640	3570626	200, 300, 400	1		Hydraulic oil 1L
650	3601066	200, 300, 400	1		Shaft
660	3640143		1		Cotter pin
			#	Recommended spareparts	

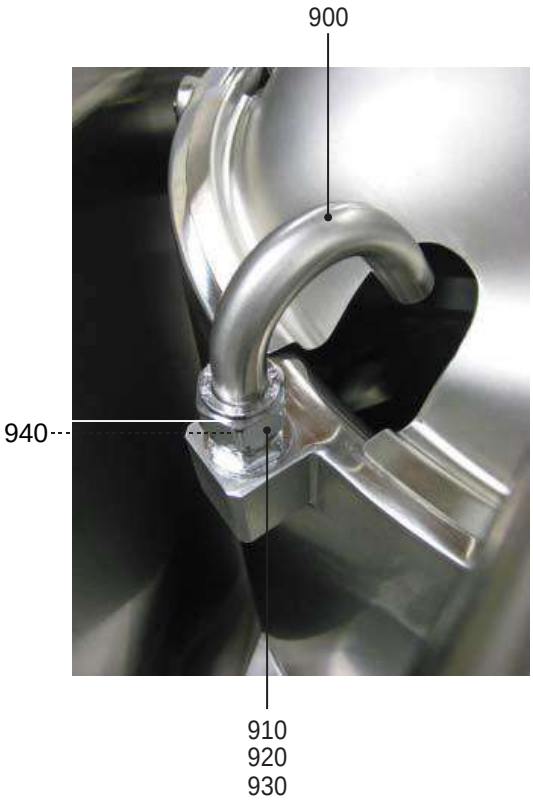
CONTROL PILLAR - TILTING





KETTLE BOWL FITTINGS

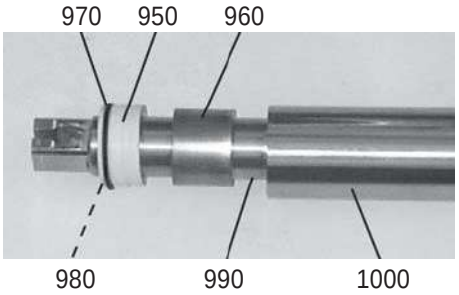


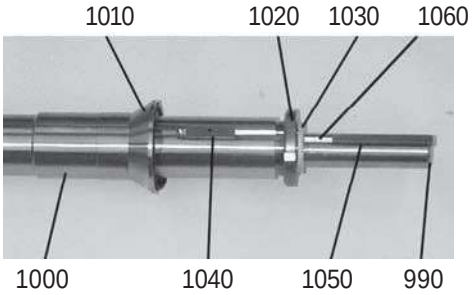


ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
CONTROL PILLAR - TILTING					
730	3601022		1		Tilting arm
740	3601418		2		Key
750	3623028		1		Stop screw
760	5312389		1#		Limit switch S1
770	5312389		1#		Limit switch S2
780	3604582		1		Bearing cover
790	3604581		1		Locking ring
800	3604580		1		Bearing
810	3601361		3		Screw
			#	Recommended spareparts	

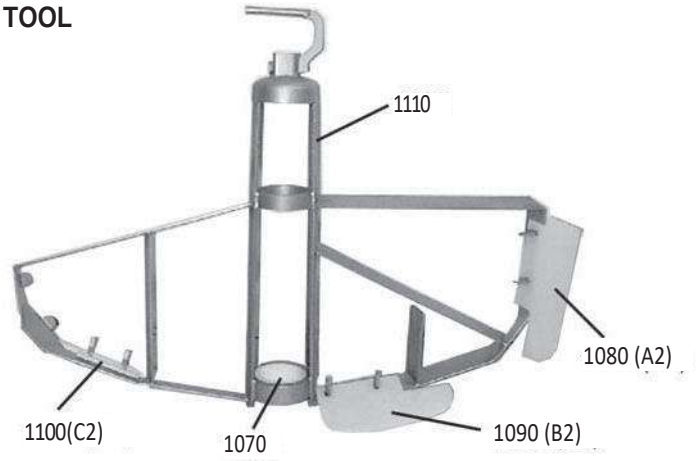
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL FITTINGS					
820	3601473		1		Locking nut
830	3601402		1		Connection coupling
840	3601403		1		Distribution block
850	3193262		1		Plug
860	3601405		1		Safety valve
870	K445220		1		Corner coupling
880	3582822		1		Pressure gauge
890	3604686		1		Vacuum breaker
900	3604876		1		Spout
910	K444815		1		Spout connector
920	K445517		1		Conical seal
930	K445516		1		Connector nut
940	3604872		1		One way valve insert
			#	Recommended spareparts	

MIXER BODY





MIXERTOOL

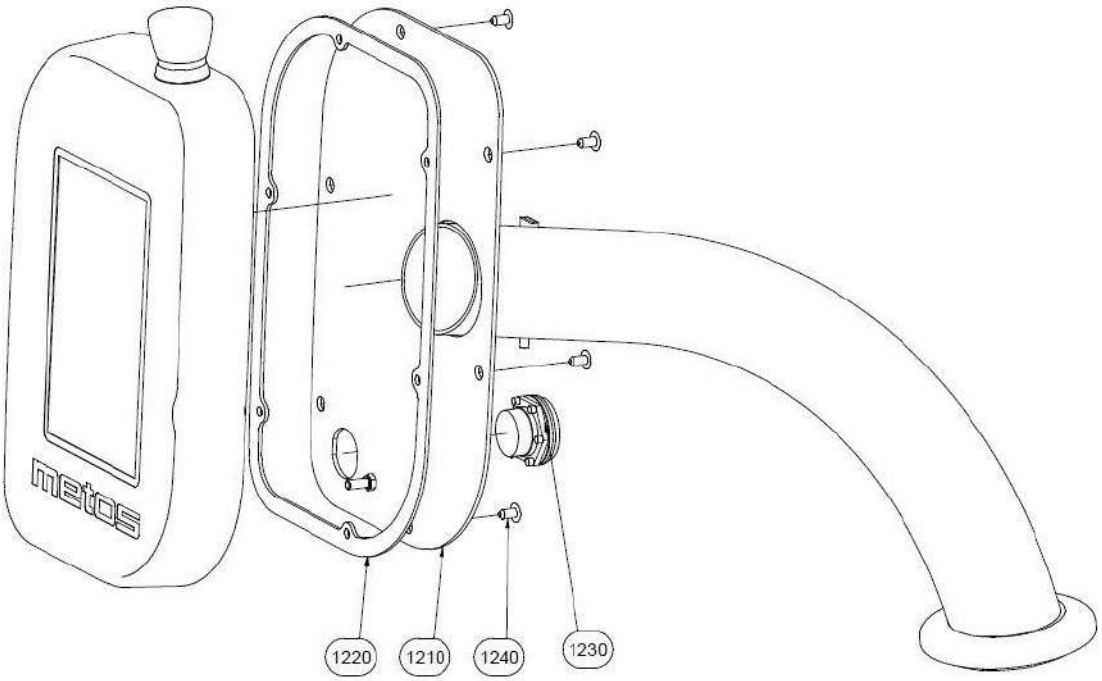


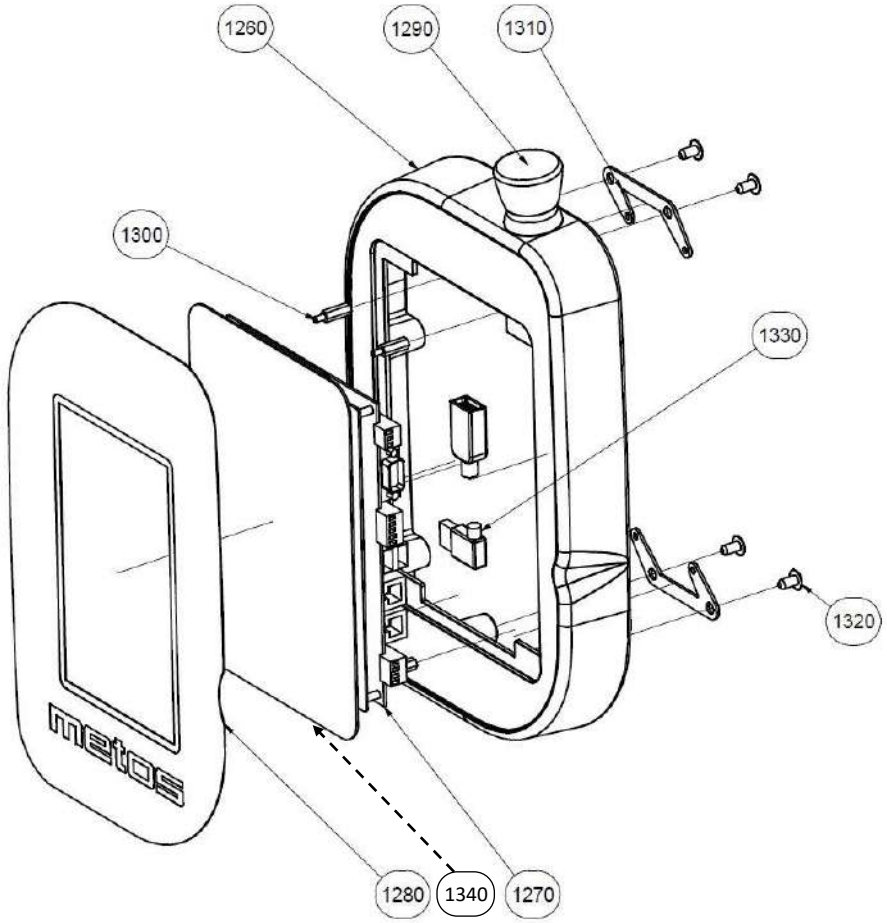
Scraper	40	60	80	100	150	200	300	400
Side scraper A2	-	1	1	2	1	2	1	2
Bottom scraper B2	-	-	1	1	1	1	1	1
Bottom scraper	1	1	-	-	1	1	2	2

ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
MIXER BODY					
950	3601425		1		Bushing
960	3601427		1		Bearing
970	3601456		1		O-ring
980	3601455		1		O-ring
990	3601506	40	1		Axle
990	3601504	60, 80	1		Axle
990	3601502	100	1		Axle
990	3601453	150	1		Axle
990	3601451	200	1		Axle
990	3601422	300	1		Axle
990	3604300	400	1		Axle
1000	3601507	40	1		Shaft tube
1000	3601452	60, 80, 150	1		Shaft tube
1000	3601503	100	1		Shaft tube
1000	3601450	200	1		Shaft tube
1000	3601423	300	1		Shaft tube
1000	3604299	400	1		Shaft tube
1010	3601457		1		O-ring
1020	3478839		1		Nut
1030	3601569		1		Aligning bushing
1040	3601410		1		Key
1050	3601408		1#		Key
1060	3604355		1		Seeger ring
			#	Recommended spareparts	

ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
MIXER TOOL					
1070	3601442		1		Bearing
1080	3602058	60, 80, 150, 300, 400	1		Scraper A2 (side)
1080	3602058	100, 200	1		Scraper A2(side)
1090	3602059	80, 100, 150, 200, 300,	1		Scraper B2 (bottom)
1100	3602060	300, 400	1		Scraper C2 (bottom)
1100	3602060	40, 60, 150, 200	1		Scraper C2 (bottom)
1110	3602760	40	1		Stirring tool, incl.
1110	3602761	60	1		Stirring tool, incl.
1110	3602762	80	1		Stirring tool, incl.
1110	3602763	100	1		Stirring tool, incl.
1110	3602764	150	1		Stirring tool, incl.
1110	3602765	200	1		Stirring tool, incl.
1110	3602766	300	1		Stirring tool, incl.
1110	3604335	400	1		Stirring tool, incl.
			#	Recommended spareparts	

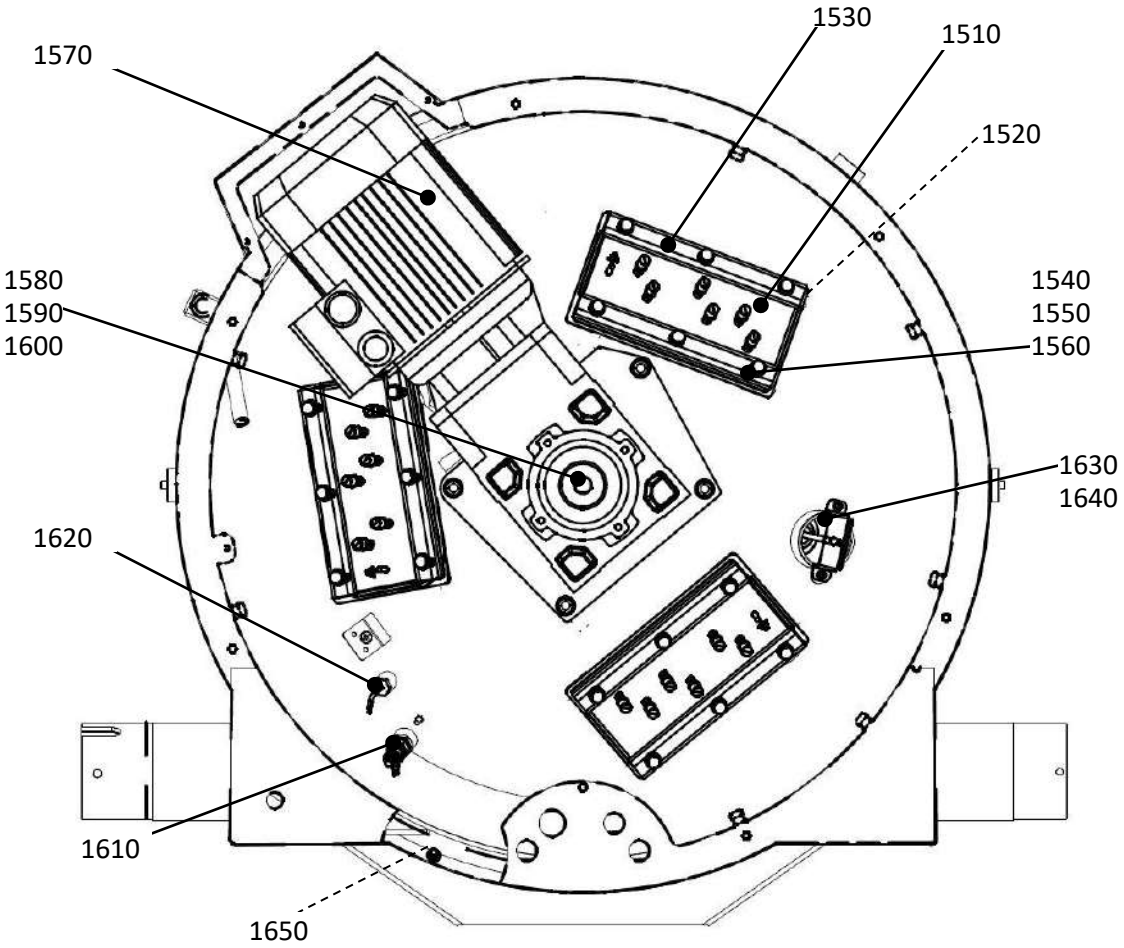
CONTROL PANEL



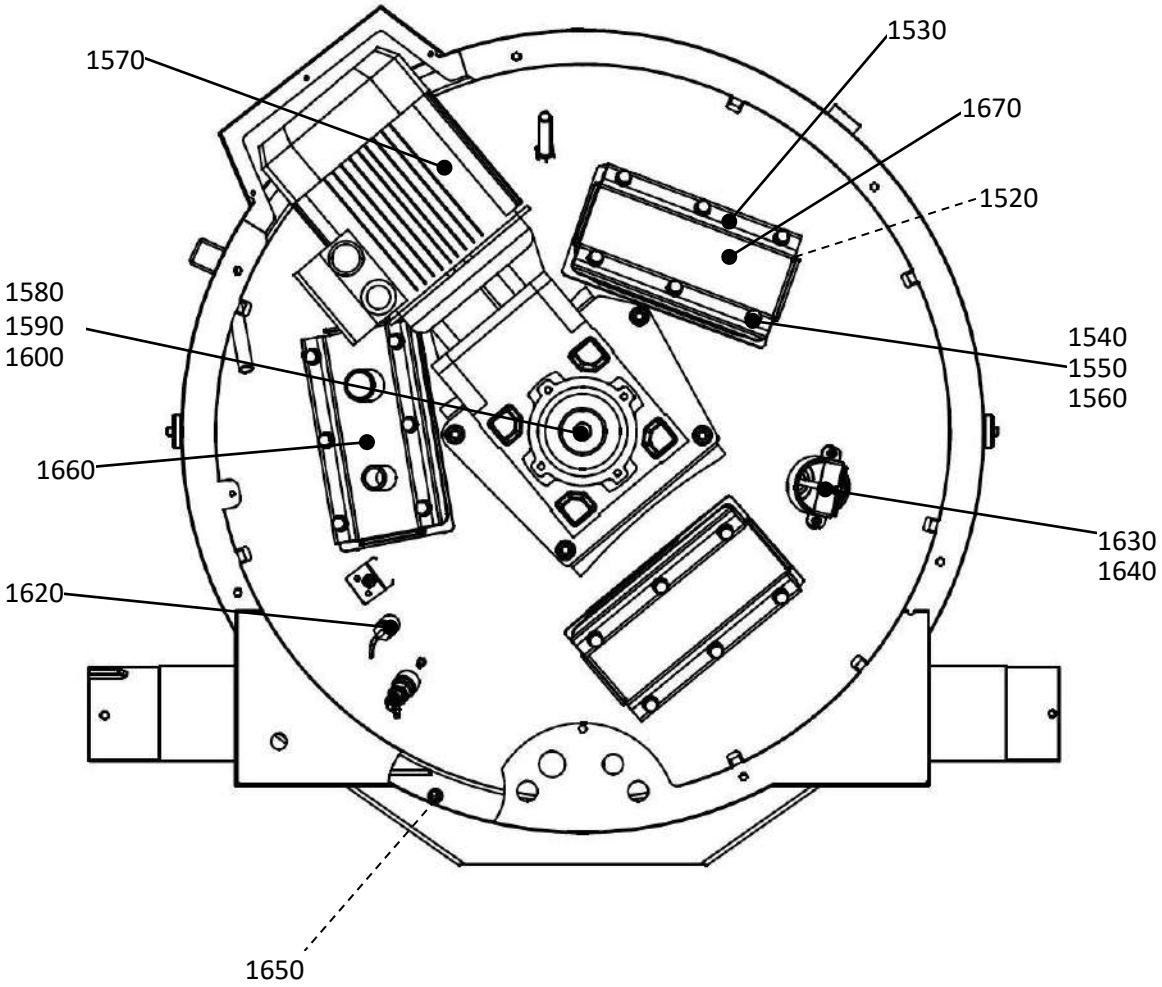


ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
CONTROL PANEL					
1210	3915052		1		Control panel arrm
1220	3907843		1		Seal
1230	3908116		1		Cable usb bulgin
1240	3255945		1		Screw M5 x 10
1260	3907625		1		Console case
1270	3902624		1		Electronics card, A1
	3912138		1#		Service kit, Card+stick-on label
1280	3907628		1		Stick-on label
1290	3646748		1		Emergency stop switch
1300	3907644		1		M3 spacer h=15
1310	3907645		1		Support iron
1320	3255945		1		Screw M5 x 10
1330	3910366		1		Cable usb
1340	3912016		1		µSD card with Proveno software
	3909090		1		USB 2.0 memory stick 8GB. Empty
	5049118		1		Battery for electronics card A1
	3912317		1		Jumper socket for battery on A1
			#	Recommended spareparts	

KETTLE BOWL – HEATING ELEMENTS(E) AND SENSORS

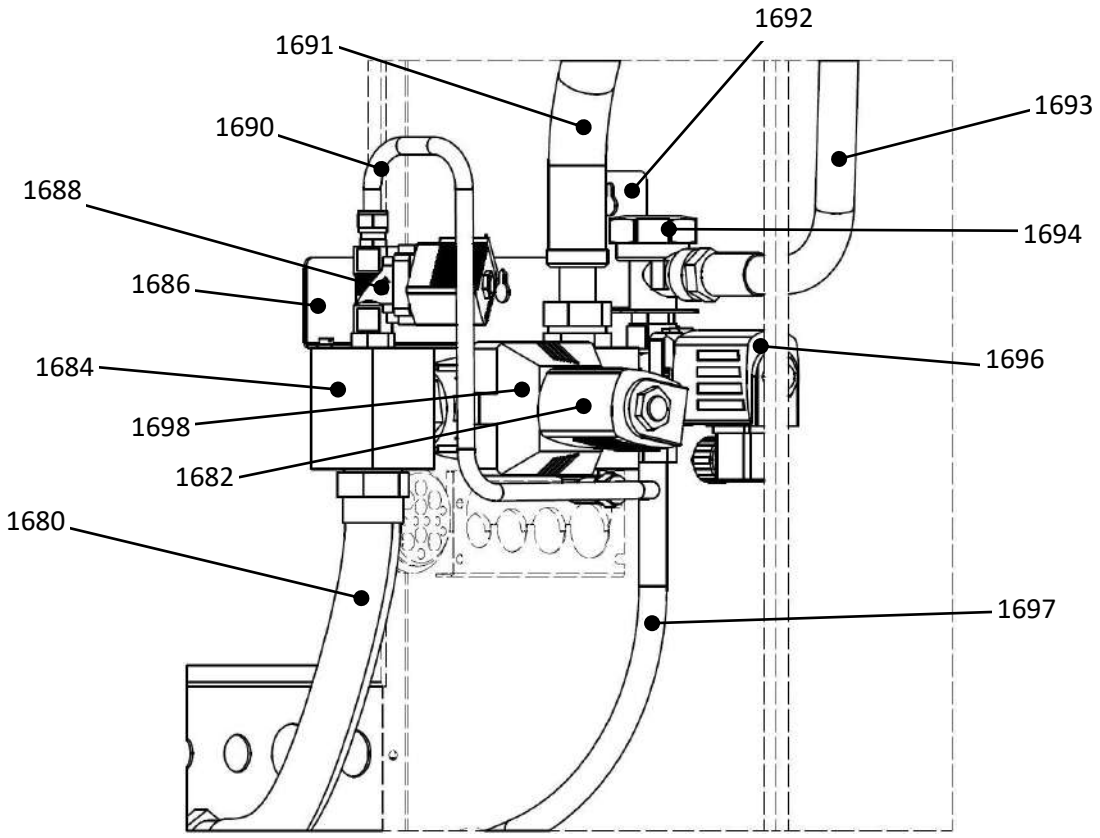


KETTLE BOWL – DIRECT STEAM HEATING(S) AND SENSORS



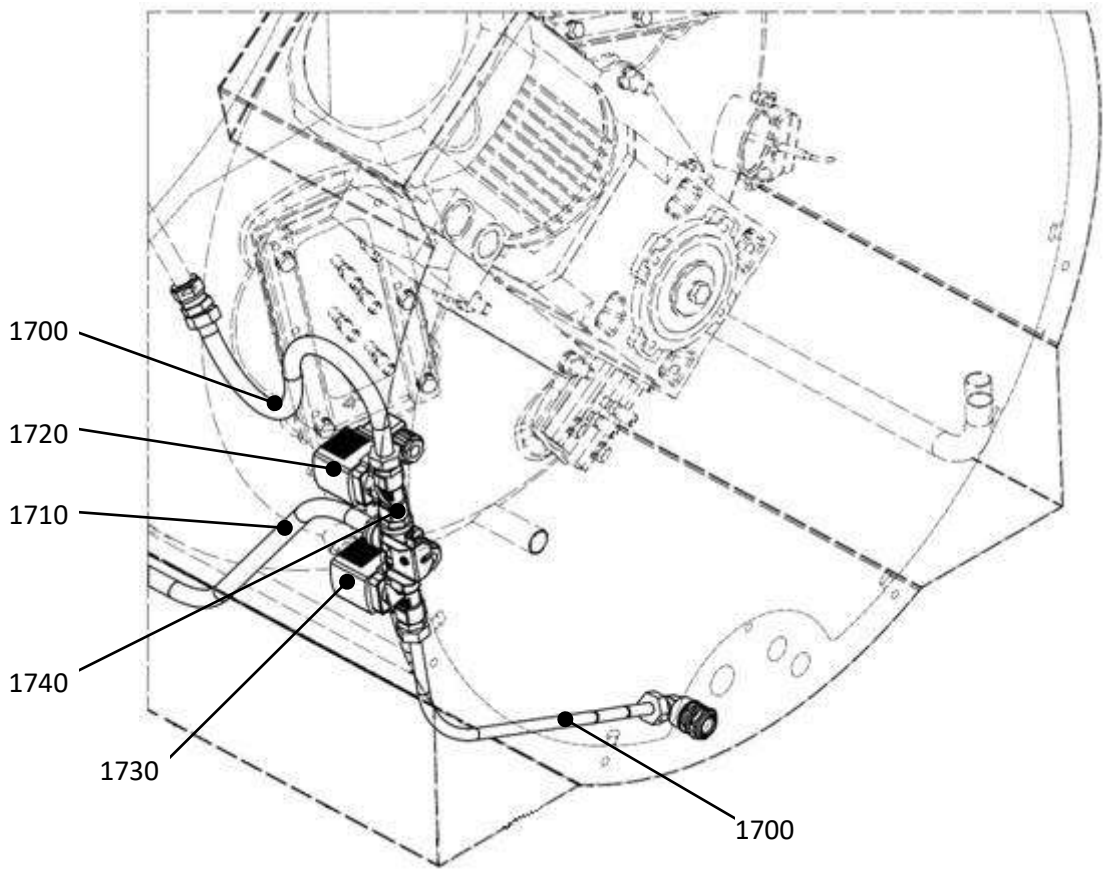
ID	CODE	TYPE	Qty	VOLTAGE	DESCRIPTION
KETTLE BOWL - HEATING ELEMENTS / STEAM HEATING AND SENSORS					
1510	3912202	40	1	A,C,D,F,G,H,I,J,K,L	Heating element Incoloy 6kW E1, E2
1510	3912203	60, 150	1	A,C,D,F,G,H,I,J,K,L	Heating element Incoloy 8kW E1, E2
1510	3912203	150	1	A,C,D,F,G,H,I,J,K,L	Heating element Incoloy 8kW E3
1510	3912204	80, 100	1#	A,C,D,F,G,H,I,J,K,L	Heating element Incoloy 10kW E1, E2
1510	3912204	200	1#	A,C,D,F,G,H,I,J,K,L	Heating element Incoloy 10kW E3
1510	3912205	200	1#	A,C,D,F,G,H,I,J,K,L	Heating element Incoloy 12kW E2, E3
1510	3912205	300	1#	A,C,D,F,G,H,I,J,K,L	Heating element Incoloy 12kW E1 - E4
1510	3912207	400	1	A,C,D,F,G,H,I,J,K,L	Heating element Incoloy 14,4kW E1 - E4
1520	3601207		1#		Heating element gasket
1530	3601208		2		Fastening bracket
1540	3029907		6		Bolt M8x30
1550	3021217		6		Spring washer M8
1560	3021917		6		Washer M8
1570	3601459	40, 60, 80, 100	1#		Gear motor 0,75kW M2
1570	3601458	150, 200, 300	1#		Gear motor 1,5kW M2
1570	3604213	400	1		Gear motor 2,2kW M2
1580	3470332		1		Bolt M10x25
1590	3021217		1		Spring washer M10
1600	3601550		1		Washer D45/d11
1610	3601732		1		Water level probe B1
1620	3646787		1#		Steam jacket temperature probe B2
1630	3912432		1#		Food temp probe B3 + thermal paste
1630	3912433	HA, DO	1		Food temp probe B3 + thermal paste
	3912327		1		Thermal paste
1640	3909331		1		Probe fixing plate
1650	K353400		1 #		Magnetic switch S3
1660	3909489		1		Steam input flange
	3912212		1		Service kit, Steam input flange
1670	3909325		1		Blind flange
	3912211		1		Service kit, Blind flange
			#	Recommended sparepart	

DIRECT STEAM INPUT – CONDENSATE OUTPUT - CONTROL PILLAR



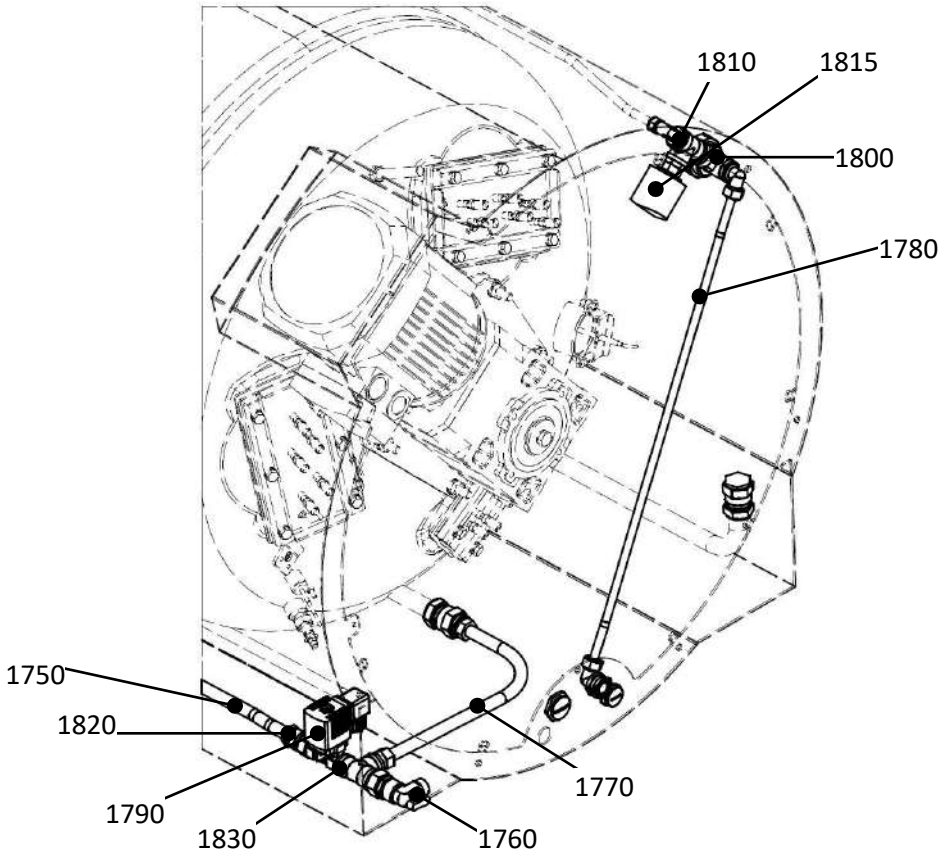
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
-DIRECT STEAM INPUT – CONDENSATE OUTPUT - CONTROL PILLAR					
1680	3912403		1		Hose 1”L=400 + seals
	3912069		1		Seal 1”
1682	3602213	40,60,80,100	1#		Solenoid valve, Y8
	3602216		1		Service kit, Y8
	N/A		-		Coil 230V, Y8
1682	3602212	150,200,300,40	1#		Solenoid valve, Y8
	3602216		1		Sevice kit, Y8
	N/A		-		Coil230V, Y8
1684	3911896		2		Distributor block
1686	3911905		1		Support plate
1688	3602215		1#		Solenoid valve, Y7
	3602218		1		Service kit, Y7
	N/A		-		Coil 230V, Y7
1690	3911616	40,60,80,100	1		Tube
1690	3911900	150,200,300,400	1		Tube
1691	3914173	40-100	1		Hose 1/2” L=2000 + seals
	K421080	40-100	1		Fiber seal 1/2”
	3912381	150-400	1		Hose 1” L=1700mm + seals
	3912069	150-400	2		Fiber seal 1”
1692	3911906		1		Support plate
1693	3912438		1		Hose 1/2” L=1750mm.
	K421080		1		Fiber seal R1/2
1694	3019271		1		Vacuum valve, V4
1696	3260825		1#		Solenoid valve, Y9
	3230732		1		Service kit, Y9
	N/A		-		Coil 230V, Y9
1697	3602074		1		Hose 1/2” L=500mm.
1698	3911822		1		Valve assembly, Steam input 40-100
1698	3911902		1		Valve assembly, Steam input 150-
			#	Recommended sparepart	

FOOD WATER INLET – E – S



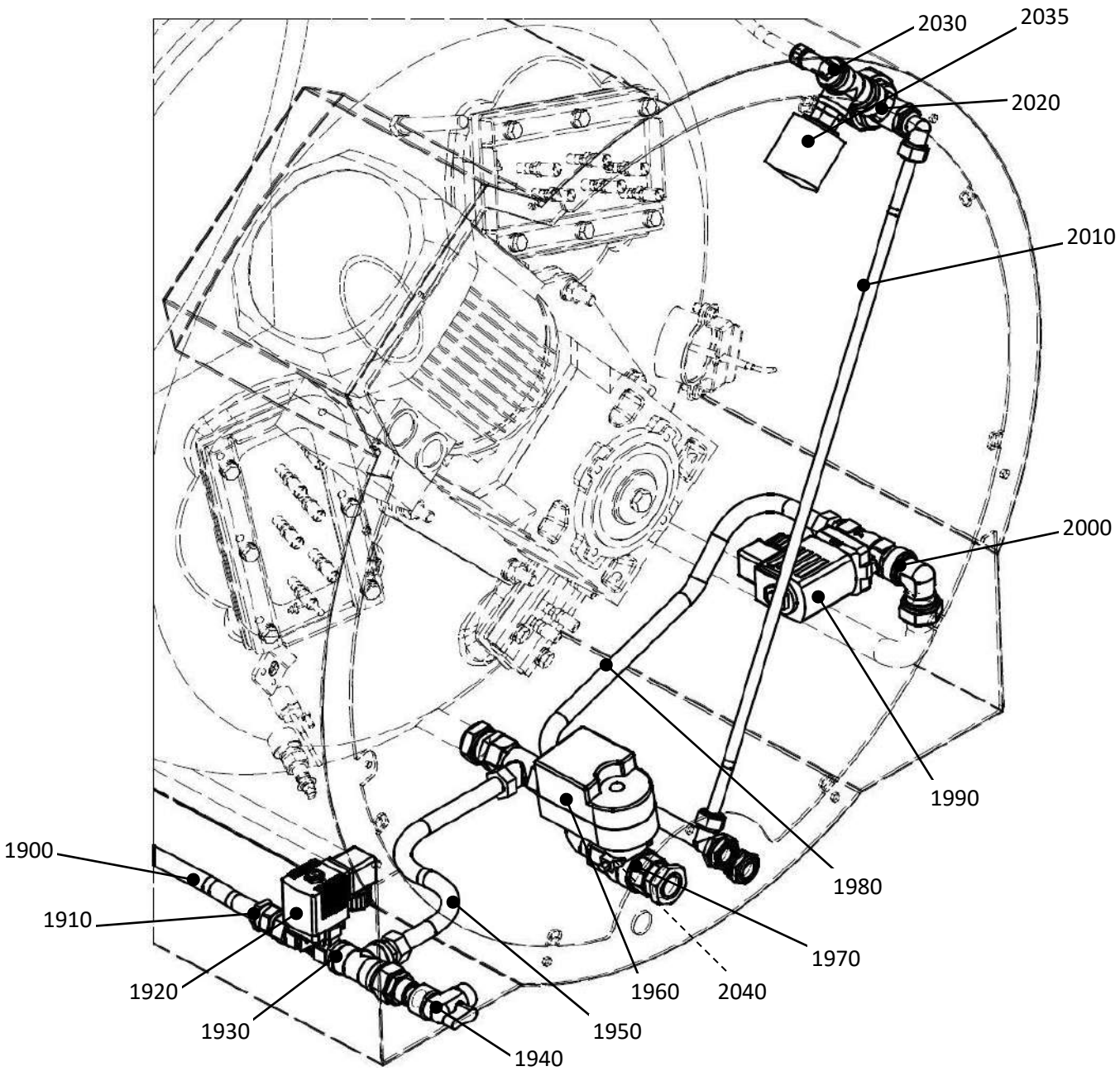
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
FOOD WATER INLET – E - S					
1700	3910142	40, 60, 80, 100	1		Hose 1/2” L=300mm.
1700	3605138	150, 200, 300, 400	1		Hose 1/2” L=500mm.
1710	3605675		1		Hose 1/2” L=1200mm.
1720	3663563		1#		Solenoid valve, Y1
1730	3663563		1#		Solenoid valve, Y2
	N/A		-		Service kit, Y1, Y2
	3662221		1		Coil 230V, Y1, Y2
1740	3909674		1		Valve assembly, Y1, Y2
			#	Recommended sparepart	

KETTEL BOWL – PIPING – E - C0 – WITHOUT COOLING



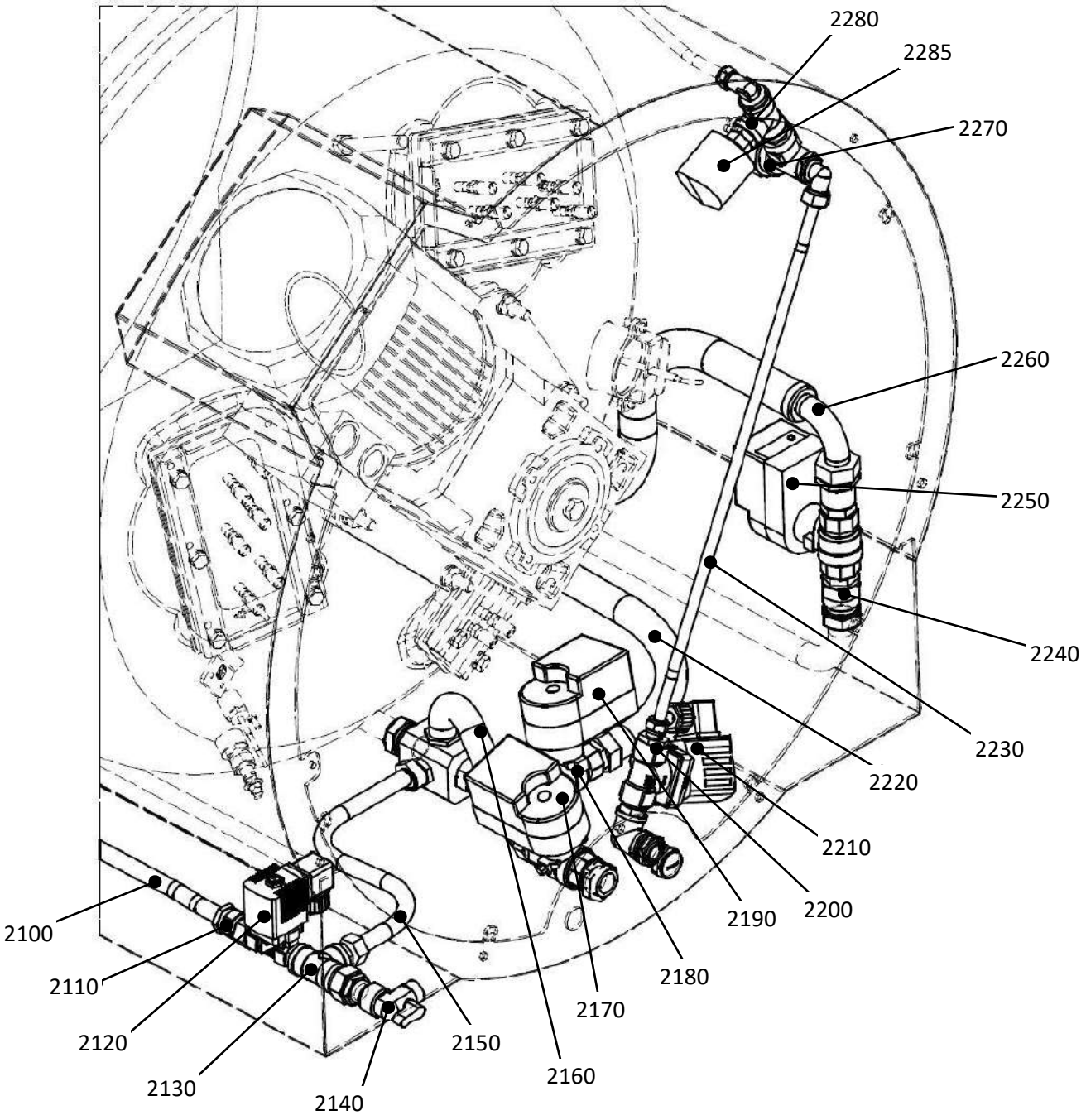
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL - PIPING – E - C0 – WITHOUT COOLING					
1750	3605675		1		Hose 1/2” L=1200mm.
1760	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
1770	3602074		1		Hose 1/2” L=500mm
1780	3910123		1		Aeration tube
1790	3663563		1#		solenoid valve, Y3
	N/A		-		Service kit, Y3
	3662221		1		Coil 230V, Y3
1800	3019271		1		Air removal trap, V1
1810	3448009		1#		Pressure switch, A2
1815	3485064		1		Pressure switch guard
1820	3604754		1		Oneway valve
1830	3909415		1		Valve assembly, Y3
			#	Recommended sparepart	

KETTLE BOWL – PIPING – E - C2 COOLING



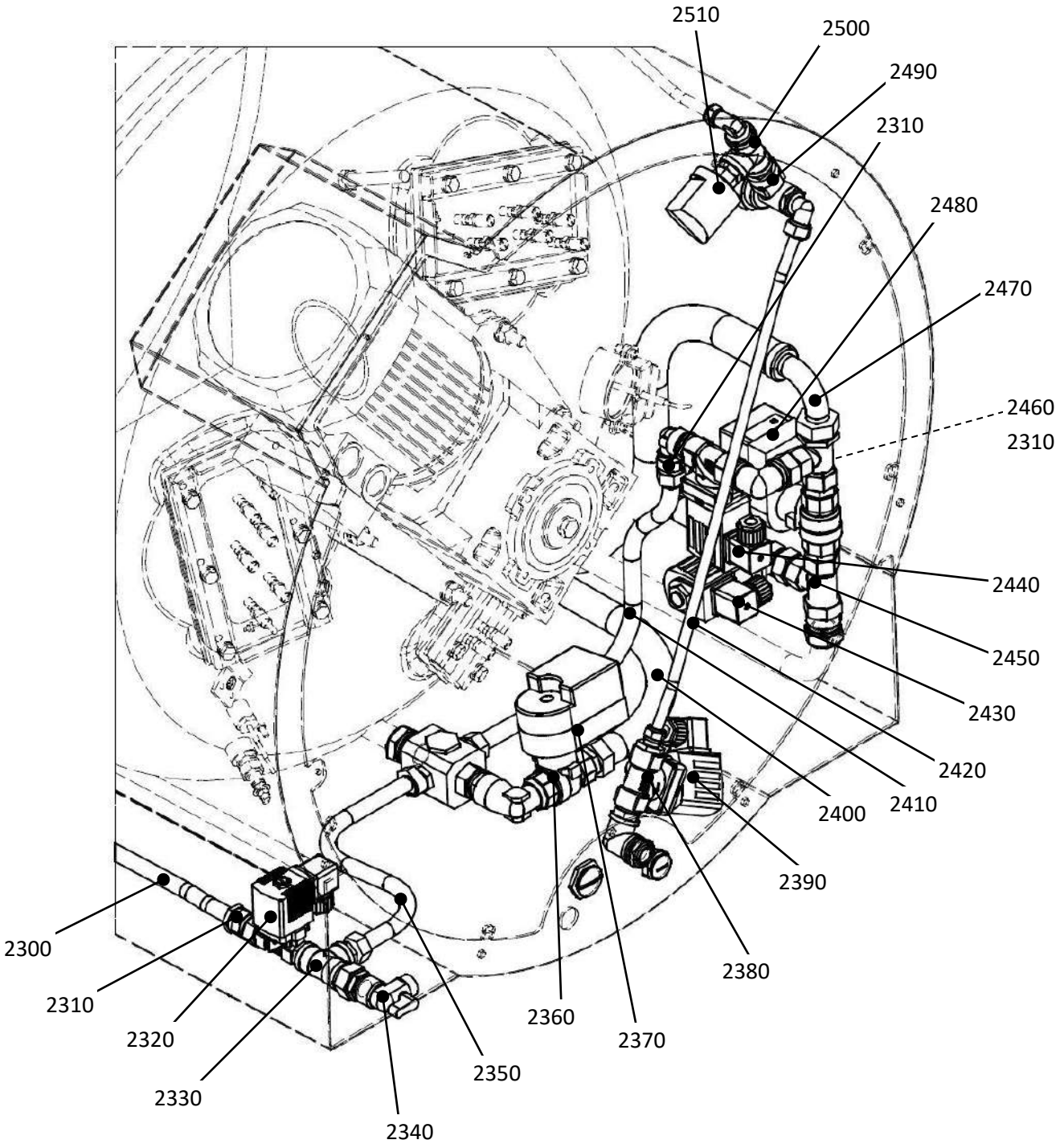
ID	CODE	TYPE		ACCESSORY	DESCRIPTION
KETTLE BOWL - PIPING – E - C2 COOLING					
1900	3605675		1		Hose 1/2” L=1200mm.
1910	3604754		1		Oneway valve
1920	3663563		1#		solenoid valve, Y3
	N/A		-		Service kit, Y3
	3662221		1		Coil 230V, Y3
1930	3909415		1		Valve assembly, Y3
1940	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
1950	3602074		1		Hose 1/2” L=500mm.
	K422740		1		Angle ball valve handle
1960	3909729		1		Motor ball valve, Y5
1970	3909373		1		Valve assembly, Y5
1980	3602074		1		Hose 1/2” L=500mm.
1990	3260825		1#		Solenoid valve, Y4
	3662217		1		Service kit, Y4
	N/A		-		Coil 230V, Y4
2000	3909444		1		Valve assembly, Y4
2010	3910123		1		Aeration tube
2020	3019271		1		Air removal trap, V1
2030	3448009		1#		Preasure switch, A2
2035	3485064		1		Preasure switch guard
2040	3912401		1		Flexible tube 3/4” + seal
	3910112		1		Seal 3/4”
			#	Recommended sparepart	

KETTLE BOWL – PIPING – E – C3i COOLING



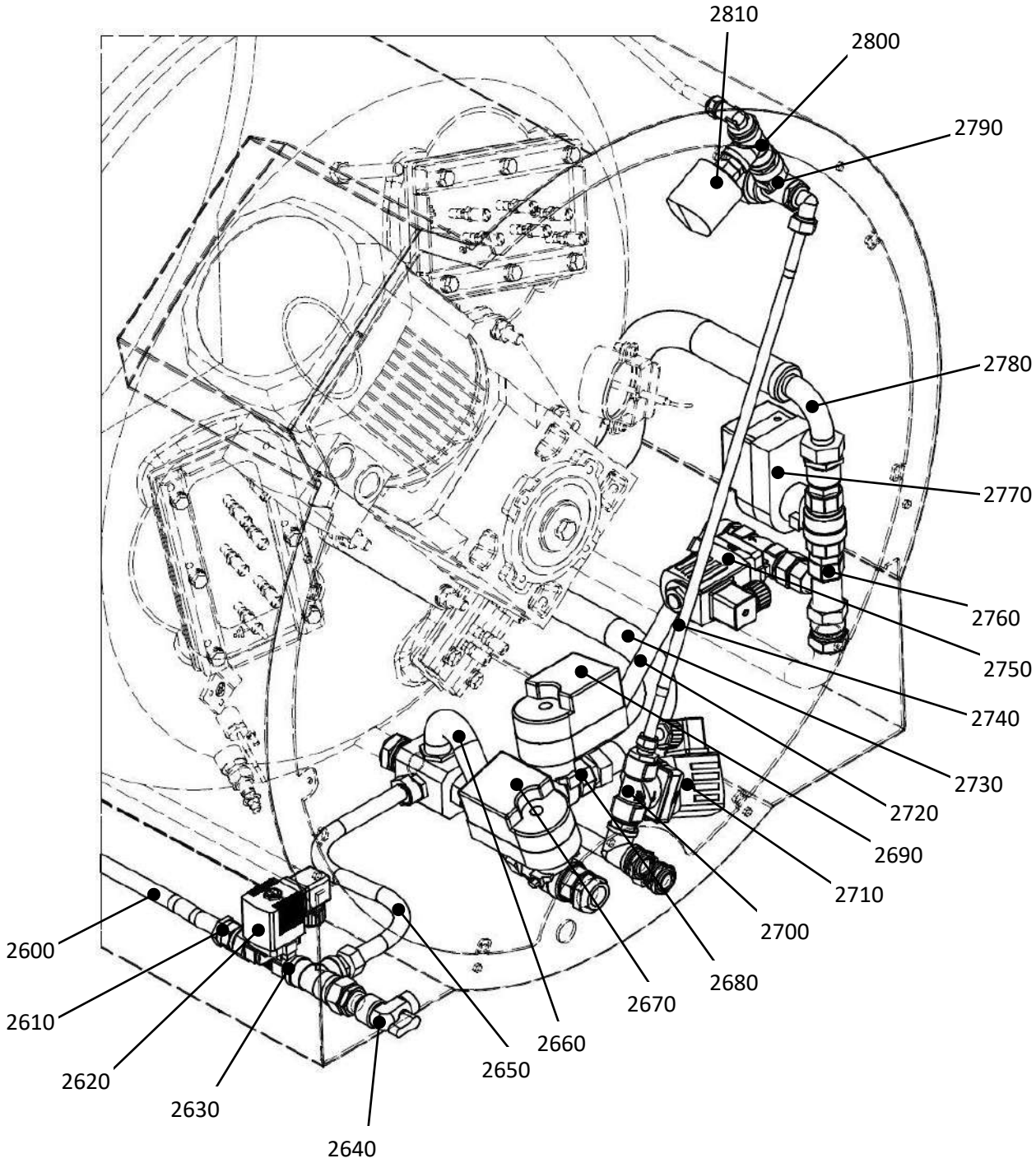
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL – PIPING -E – C3i COOLING					
2100	3605675		1		Hose 1/2” L=1200mm.
2110	3604754		1		One way valve
2120	3663563		1#		Solenoid valve, Y3
	N/A		-		Service kit, Y3
	3662221		1		Coil 230V, Y3
2130	3909415		1		Valve assembly, Y3
2140	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
2150	3602074		1		Hose 1/2” – 1/2” L=500mm
2160	3912401		1		Flexible tube 3/4” + seal
	3910112		1		Seal 3/4”
2170	3909729		1		Motor ball valve, Y5
2180	3909720		1		Valve assembly, Y5, Y18
2190	3909729		1		Motor ball valve, Y18
2200	3910991		1		Valve assembly, Y12
2210	3266840		1#		Solenoid valve, Y12, NO
	N/A		-		Service kit, Y12
	3662222		1		Coil 230V, Y12
2220	3912382	40,60, 80, 100	1		Hose 3/4” L=1600mm + seals
2220	3912383	40 - 100 Group	1		Hose 3/4” L=1800mm + seals
2220	3912384	150, 200, 300, 400	1		Hose 3/4” L=1800mm +seals
2220	3912387	150 – 400 Group	1		Hose 3/4” L=2000mm +seals
	3910112		2		Seal ¾”
2230	3910123		1		Aeration tube
2240	3909739		1		Valve assembly, Y15
2250	3909729		1		Motor ball valve, Y15
2260	3912381	40, 60, 80, 100	1		Hose 1” L=1700mm + seals
2260	3912380	40 – 100 Group	1		Hose 1” L=2000mm + seals
2260	3912385	150, 200, 300, 400	1		Hose 1” L=1800mm + seals
2260	3912386	150 – 400 Group	1		Hose 1” L=2100mm + seals
	3912069		2		Seal 1”
2270	3019271		1		Air removal trap, V1
2280	3448009		1#		Pressure switch, A2
2285	3485064		1		Pressure switch guard
			#	Recommended spareparts	

KETTLE BOWL – PIPING – E – C3iPA COOLING - DRAINAGE WITH PRESSURISED AIR



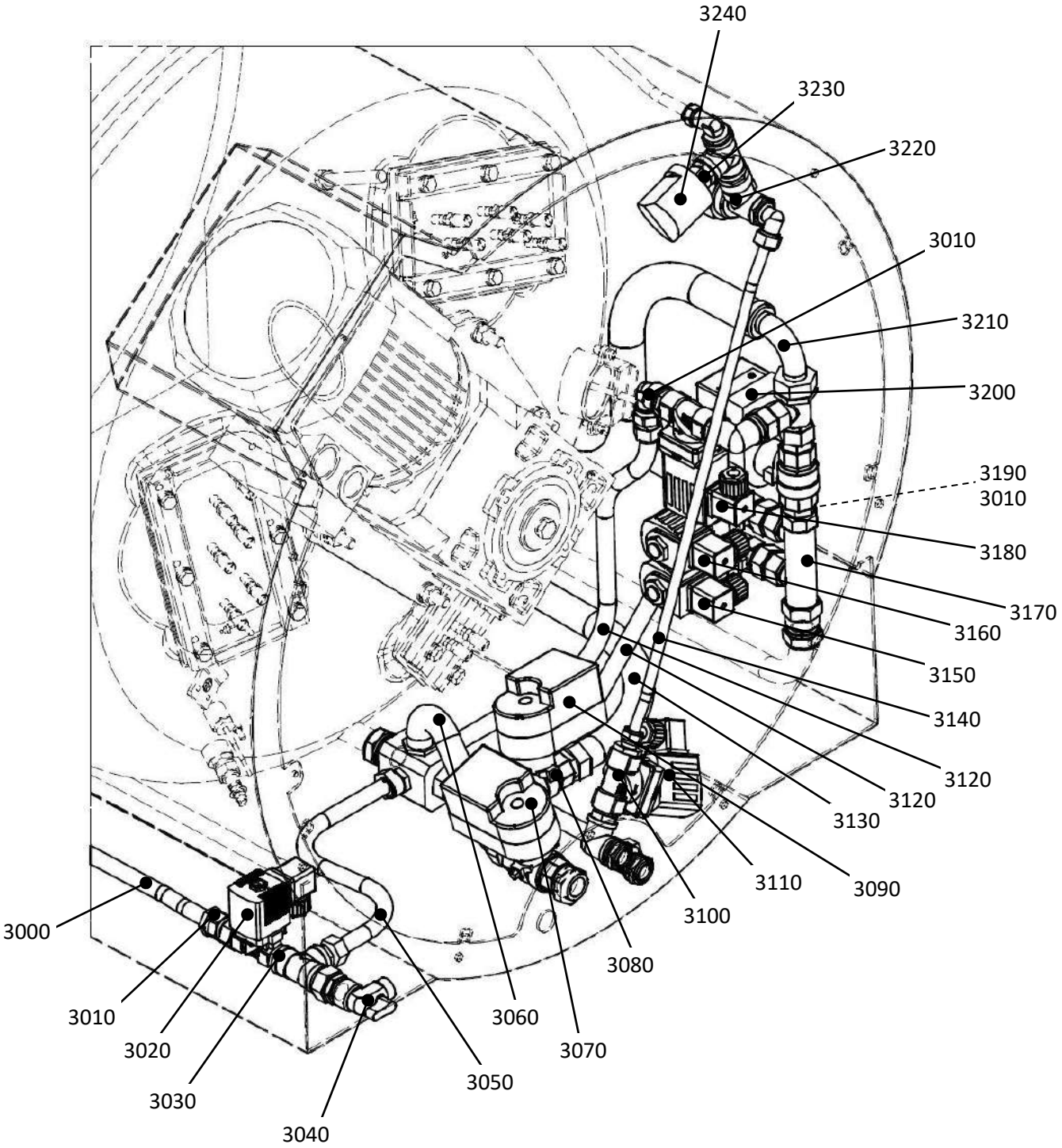
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL – PIPING -E – C3iPA COOLING – DRAINAGE WITH PRESSURISED AIR					
2300	3605675		1		Hose 1/2” L=1200mm.
2310	3604754		1		One way valve
2320	3663563		1#		Solenoid valve, Y3
	N/A		-		Service kit, Y3
	3662221		1		Coil 230V, Y3
2330	3909415		1		Valve assembly, Y3
2340	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
2350	3602074		1		Hose 1/2” L=500mm.
2360	3911926		1		Valve assembly, Y18
2370	3909729		1#		Motor ball valve, Y18
2380	3910991		1		Valve assembly, Y12
2390	3266840		1#		Solenoid valve, Y12, NO
	N/A		-		Service kit, Y12
	3662222		1		Coil 230V, Y12
2400	3912382	40,60, 80, 100	1		Hose 3/4” L=1600mm +seals
2400	3912383	40 - 100 Group	1		Hose 3/4” L=1800mm +seals
2400	3912384	150, 200, 300, 400	1		Hose 3/4” L=1800mm +seals
2400	3912387	150 – 400 Group	1		Hose 3/4” L=2000mm +seals
	3910112		2		Seal ¾”
2410	3602074		1		Hose 1/2” L=500mm.
2420	3910123	150,200	1		Aeration tube
2430	3260825		1#		Solenoid valve, Y16
2440	3260825		1#		Solenoid valve ,Y25
	3662217		1		Service kit, Y16, Y25
	N/A		-		Coil 230V, Y16, Y25
2450	3909738		1		Valve assembly, Y16, Y25,
2460	3906903		1		Hose 1/2” L=1800mm.
2470	3912381	40, 60, 80, 100	1		Hose 1” L=1700mm + seals
2470	3912380	40 – 100 Group	1		Hose 1” L=2000mm + seals
2470	3912385	150, 200, 300, 400	1		Hose 1” L=1800mm + seals
2470	3912386	150 – 400 Group	1		Hose 1” L=2100mm + seals
	3912069		2		Seal 1”
2480	3909729		1#		Motor ball valve, Y15
2490	3019271		1		Air removal trap, V1
2500	3448009		1#		Pressure switch, A2
2510	3485064		1		Pressure switch guard
			#	Recommended spareparts	

KETTLE BOWL – PIPING – E – C5i COOLING



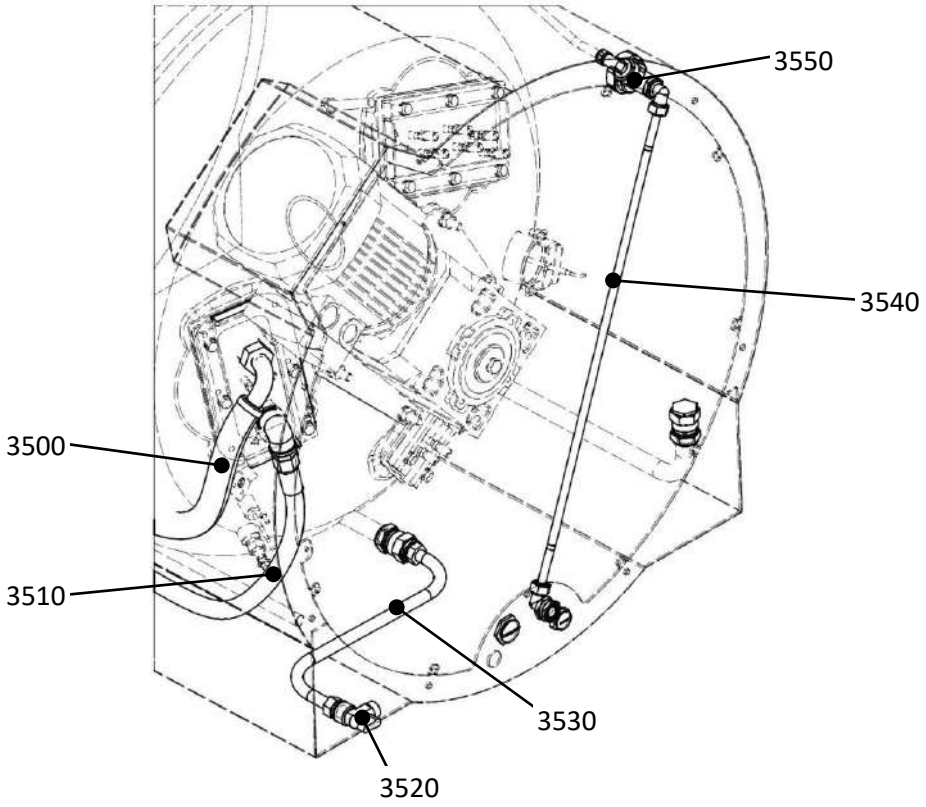
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL – PIPING -E – C5i COOLING					
2600	3605675		1		Hose 1/2” L=1200mm.
2610	3604754		1		One way valve
2620	3663563		1#		Solenoid valve, Y3
	N/A		-		Service kit, Y3
	3662221		1		Coil 230V, Y3
2630	3909415		1		Valve assembly, Y3
2640	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
2650	3602074		1		Hose 1/2” L=500mm
2660	3912401		1		Flexible tube 3/4” + seal
	3910112		1		Seal 3/4”
2670	3909729		1#		Motor ball valve, Y5
2680	3909720		1		Valve assembly, Y5, Y18
2690	3909729		1#		Motor ball valve, Y18
2700	3910991		1		Valve assembly, Y12
2710	3266840		1#		Solenoid valve, Y12, NO
	N/A		-		Service kit, Y12
	3662222		1		Coil 230V, Y12
2720	3602074		1		Hose 1/2” L=500mm
2730	3912382	40,60, 80, 100	1		Hose 3/4” L=1600mm +seals
2730	3912383	40 - 100 Group	1		Hose 3/4” L=1800mm +seals
2730	3912384	150, 200, 300, 400	1		Hose 3/4” L=1800mm +seals
2730	3912387	150 – 400 Group	1		Hose 3/4” L=2000mm +seals
	3910112		2		Seal ¾”
2740	3910123		1		Aeration tube
2750	3260825		1#		Solenoid valve, Y4
	3662217		1		Service kit, Y4
	N/A		-		Coil 230V, Y4
2760	3909740		1		Valve assembly, Y4, Y15
2770	3909729		1#		Motor ball valve, Y15
2780	3912381	40, 60, 80, 100	1		Hose 1” L=1700mm + seals
2780	3912380	40 – 100 Group	1		Hose 1” L=2000mm + seals
2780	3912385	150, 200, 300, 400	1		Hose 1” L=1800mm + seals
2780	3912386	150 – 400 Group	1		Hose 1” L=2100mm + seals
	3912069		2		Seal 1”
2790	3019271		1		Air removal trap, V1
2800	3448009		1#		Pressure switch, A2
2810	3485064		1		Pressure switch guard
			#	Recommended spareparts	

KETTLE BOWL – E – C5iPA COOLING – DRAINAGE WITH PRESSURISED AIR



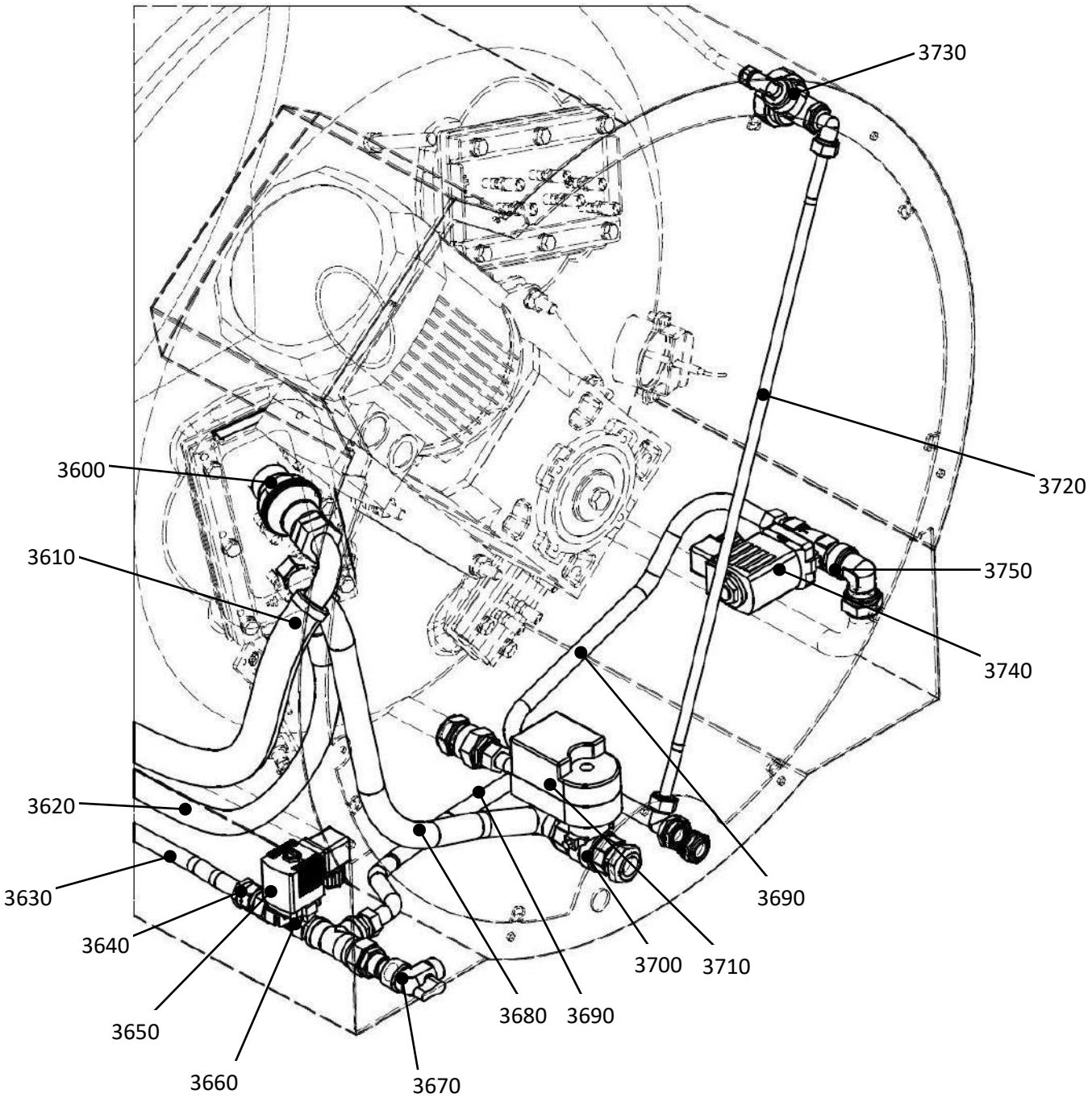
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL – PIPING -E – C5iPA COOLING – DRAINAGE WITH PRESSURISED AIR					
3000	3605675		1		Hose 1/2” L=1200mm.
3010	3604754		1		One way valve
3020	3663563		1#		Solenoid valve, Y3
	N/A		-		Service kit, Y3
	3662221		1		Coil 230V, Y3
3030	3909415		1		Valve assembly, Y3
3040	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
3050	3602074		1		Hose 1/2” L=500mm
3060	3912401		1		Flexible tube 3/4” + seal
	3910112		1		Seal 3/4”
3070	3909729		1#		Motor ball valve, Y5
3080	3909720		1		Valve assembly, Y5, Y18
3090	3909729		1#		Motor ball valve, Y18
3100	3910991		1		Valve assembly, Y12
3110	3266840		1#		Solenoid valve, Y12, NO
	N/A		-		Service kit, Y12
	3662222		1		Coil 230V, Y12
3120	3602074		1		Hose 1/2” L=500mm
3120	3602074		1		Hose 1/2” L=500mm
3130	3912382	40,60, 80, 100	1		Hose 3/4” L=1600mm + seals
3130	3912383	40 - 100 Group	1		Hose 3/4” L=1800mm + seals
3130	3912384	150, 200, 300, 400	1		Hose 3/4” L=1800mm +seals
3130	3912387	150 – 400 Group	1		Hose 3/4” L=2000mm +seals
	3910112		2		Seal ¾”
3140	3910123		1		Aeration tube
3150	3260825		1#		Solenoid valve, Y16
3160	3260825		1#		Solenoid valve, Y4
3170	3909694		1		Valve assembly, Y16, Y4, Y25,
3180	3260825		1#		Solenoid valve, Y25
	3662217		1		Service kit, Y4, Y16, Y25
	N/A		-		Coil 230V, Y4, Y16, Y25
3190	3906903		1		Hose 1/2” L=1800mm.
3200	3909729		1		Motor ball valve, Y15
3210	3912381	40, 60, 80, 100	1		Hose 1” L=1700mm + seals
3210	3912380	40 – 100 Group	1		Hose 1” L=2000mm + seals
3210	3912385	150, 200, 300, 400	1		Hose 1” L=1800mm + seals
3210	3912386	150 – 400 Group	1		Hose 1” L=2100mm + seals
	3912069		2		Seal 1”
3220	3019271		1		Air removal trap, V1
3230	3448009		1#		Pressure switch, A2
3240	3485064		1		Pressure switch guard
			#	Recommended spareparts	

KETTLE BOWL – S – C0 WITHOUT COOLING



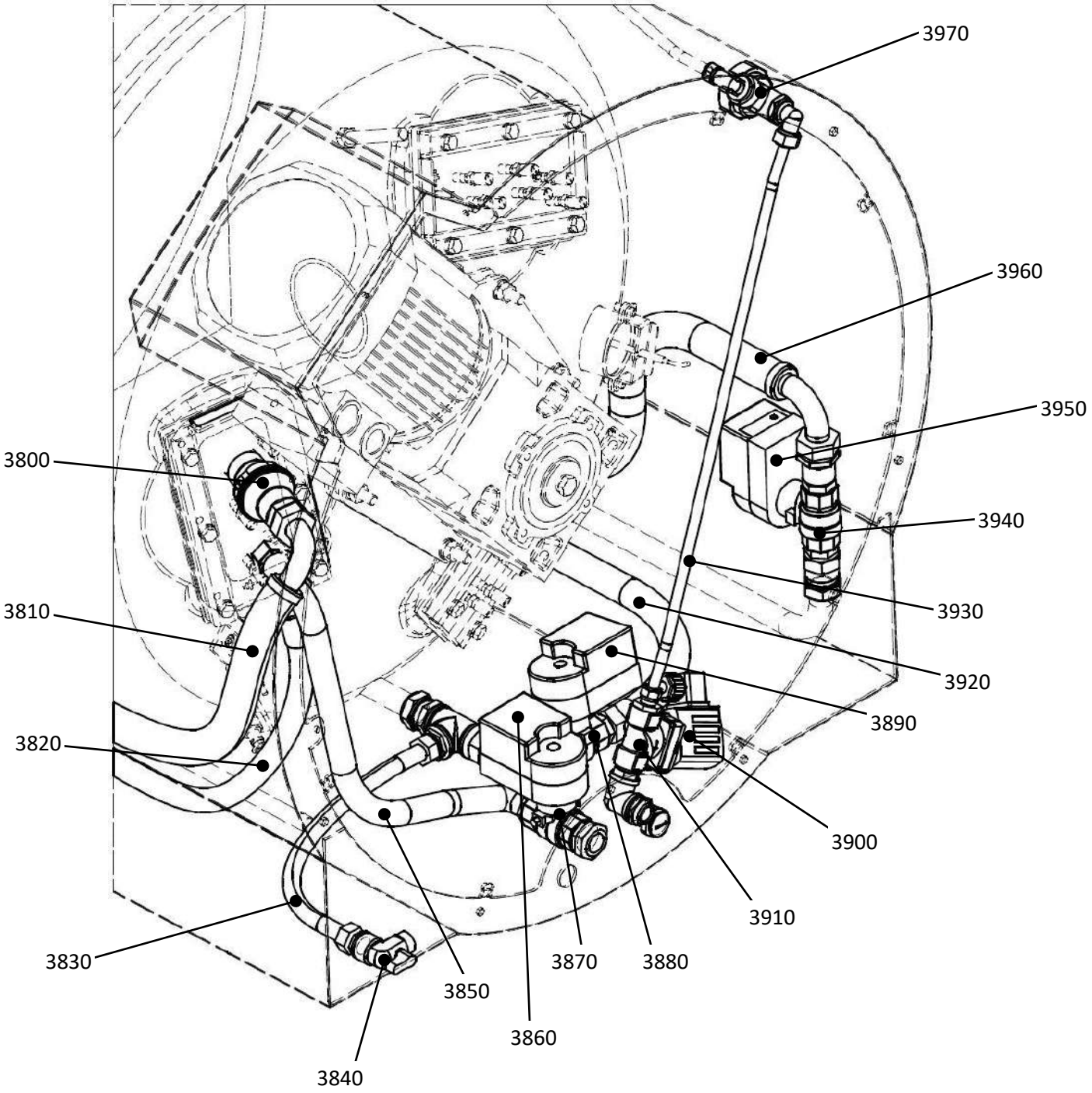
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL - PIPING – S - C0 – WITHOUT COOLING					
3500	3914173	40-100	1		Hose 1/2” L=2000 + seals
	K421080	40-100	1		Fiber seal 1/2”
	3912381	150-400	1		Hose 1” L=1700mm + seals
	3912069	150-400	2		Fiber seal 1”
3510	3912438		1		Hose 1/2” L=1750mm + seal
	K421080		1		Fiber seal 1/2”
3520	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
3530	3602074		1		Hose 1/2” L=500mm
3540	3910123		1		Aeration tube
3550	3019271		1		Air removal trap, V1
			#	Recommended spareparts	

KETTLE BOWL – S – C2 COOLING



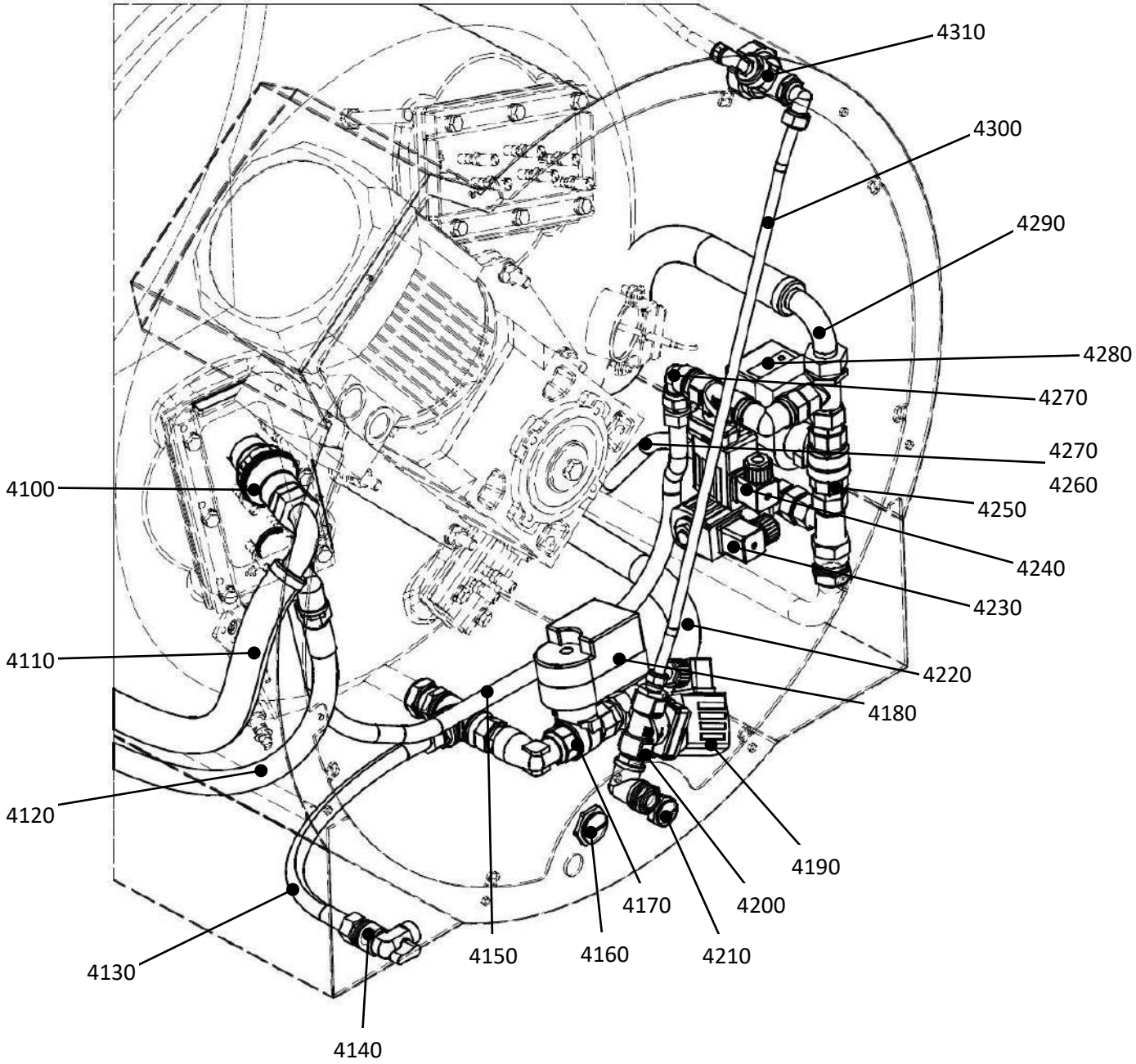
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL - PIPING – S – C2 COOLING					
3600	3911933		1		One way valve 1”
3610	3912381		1		Hose 1” L=1700mm + seals
	3912069		2		Fiber seal R1
3620	3914173	40-100	1		Hose 1/2” L=2000 + seals
	K421080	40-100	1		Fiber seal 1/2”
	3912381	150-400	1		Hose 1” L=1700mm + seals
	3912069	150-400	2		Fiber seal 1”
3630	3605675		1		Hose 1/2” L=1200mm.
3640	3604754		1		One way valve
3650	3663563		1#		Solenoid valve, Y3
	N/A		-		Service kit, Y3
	3662221		1		Coil 230V, Y3
3660	3909415		1		Valve assembly, Y3
3670	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
3680	3912404		1		Hose L=500mm 3/4”
	3910112		1		Fiber seal R3/4”
3690	3602074		1		Hose 1/2” L=500mm
3700	3911522		1		Valve assembly, Y5
3710	3909729		1#		Motor ball valve, Y5
3720	3910123		1		Aeration tube
3730	3019271		1		Air removal trap, V1
3740	3260825		1#		Solenoid valve, Y4
	3662217		1		Service kit, Y4
	N/A		-		Coil 230V, Y4
3750	3909444		1		Valve assembly, Y4
			#	Recommended spareparts	

KETTLE BOWL – S – C3i COOLING



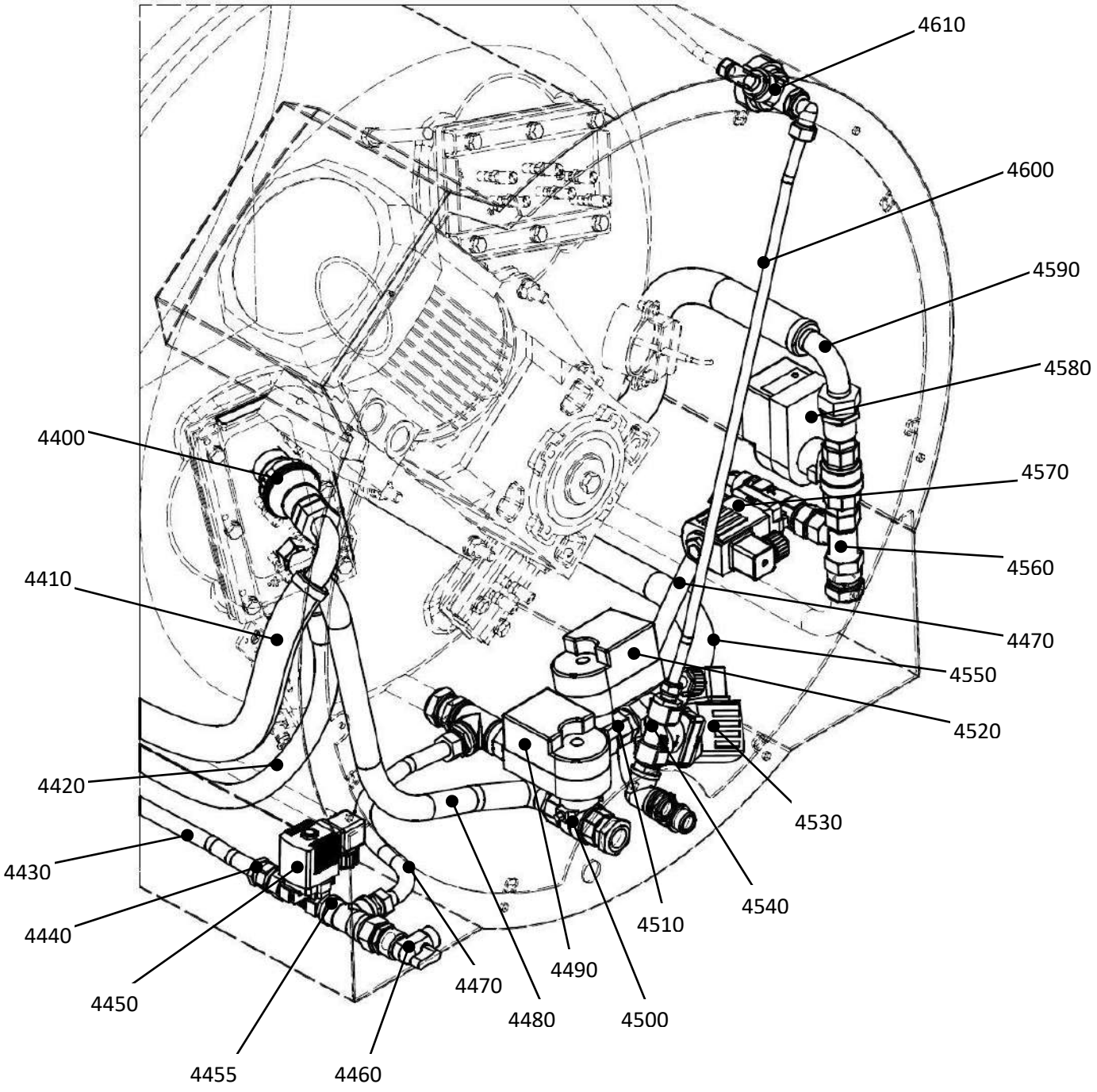
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL - PIPING – S – C3i COOLING					
3800	3911933		1		One way valve 1”
3810	3914173	40-100	1		Hose 1/2” L=2000 + seals
	K421080	40-100	1		Fiber seal 1/2”
	3912381	150-400	1		Hose 1” L=1700mm + seals
	3912069	150-400	2		Fiber seal 1”
3820	3912438		1		Hose 1/2” L=1750mm + seal
	K421080		1		Fiber seal 1/2”
3830	3602074		1		Hose 1/2” L=500mm
3840	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
3850	3912404		1		Hose L=500mm 3/4”
	3910112		1		Fiber seal R3/4”
3860	3909729		1#		Motor ball valve, Y5
3870	3911522		1		Valve assembly, Y5
3880	3911556		1		Valve assembly, Y18
3890	3909729		1#		Motor ball valve, Y18
3900	3266840		1#		Solenoid valve, Y12, NO
	N/A		-		Service kit, Y12
	3662222		1		Coil 230V, Y12
3910	3910991		1		Valve assembly, Y12
3920	3912382	40,60, 80, 100	1		Hose 3/4” L=1600mm + seals
3920	3912383	40 - 100 Group	1		Hose 3/4” L=1800mm + seals
3920	3912384	150, 200, 300, 400	1		Hose 3/4” L=1800mm +seals
3920	3912387	150 – 400 Group	1		Hose 3/4” L=2000mm +seals
	3910112		2		Seal ¾”
3930	3910123		1		Aeration tube
3940	3909739		1		Valve assembly, Y15
3950	3909729		1		Motor ball valve, Y15
3960	3912381	40, 60, 80, 100	1		Hose 1” L=1700mm + seals
3960	3912380	40 – 100 Group	1		Hose 1” L=2000mm + seals
3960	3912385	150, 200, 300, 400	1		Hose 1” L=1800mm + seals
3960	3912386	150 – 400 Group	1		Hose 1” L=2100mm + seals
	3912069		2		Seal 1”
3970	3019271		1		Air removal trap, V1
			#	Recommended spareparts	

KETTLE BOWL – S – C3iPA COOLING – DRAINAGE WITH PRESSURISED AIR



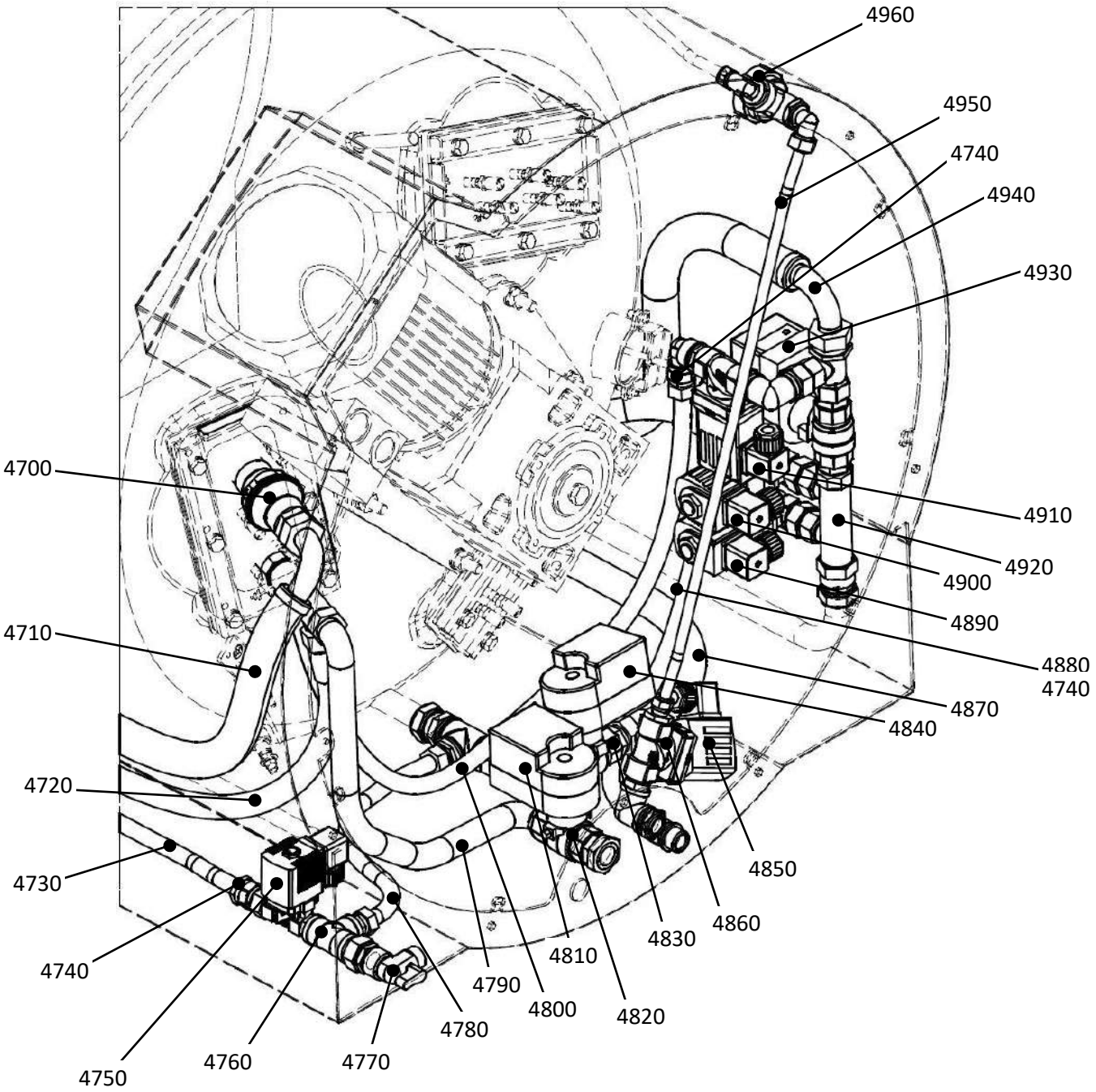
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL - PIPING – S – C3iPA COOLING – DRAINAGE WITH PRESSURISED AIR					
4100	3911933		1		One way valve 1”
4110	3914173	40-100	1		Hose 1/2” L=2000 + seals
	K421080	40-100	1		Fiber seal 1/2”
	3912381	150-400	1		Hose 1” L=1700mm + seals
	3912069	150-400	2		Fiber seal 1”
4120	3912438		1		Hose 1/2” L=1750mm + seal
	K421080		1		Fiber seal 1/2”
4130	3602074		1		Hose 1/2” L=500mm
4140	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
4150	3914308		1		Hose 1/2” L=700mm.
	K421080		1		Fiber seal 1/2” + seal
4160	3910396		1		Hole plug M25
4170	3911556		1		Valve assembly, Y18
4180	3909729		1#		Motor ball valve, Y18
4190	3266840		1#		Solenoid valve, Y12, NO
	N/A		-		Service kit, Y12
	3662222		1		Coil 230V, Y12
4200	3910991		1		Valve assembly, Y12
4210	K382730		1		Hole plug M20
4220	3912382	40,60, 80, 100	1		Hose 3/4” L=1600mm + seals
4220	3912383	40 - 100 Group	1		Hose 3/4” L=1800mm + seals
4220	3912384	150, 200, 300, 400	1		Hose 3/4” L=1800mm +seals
4220	3912387	150 – 400 Group	1		Hose 3/4” L=2000mm +seals
	3910112		2		Seal ¾”
4230	3260825		1#		Solenoid valve, Y16
4240	3260825		1#		Solenoid valve ,Y25
	3662217		1		Service kit,Y16, Y25
	N/A		-		Coil 230V, Y16, Y25
4250	3909738		1		Valve assembly, Y16, Y25, Y15
4260	3906903		1		Hose 1/2” L=1800mm.
4270	3604754		1		One way valve
4280	3909729		1		Motor ball valve, Y15
4290	3912381	40, 60, 80, 100	1		Hose 1” L=1700mm + seals
4290	3912380	40 – 100 Group	1		Hose 1” L=2000mm + seals
4290	3912385	150, 200, 300, 400	1		Hose 1” L=1800mm + seals
4290	3912386	150 – 400 Group	1		Hose 1” L=2100mm + seals
	3912069		2		Seal 1”
4300	3910123		1		Aeration tube
4310	3019271		1		Air removal trap, V1
			#	Recommended spareparts	

KETTLE BOWL – S – C5i COOLING



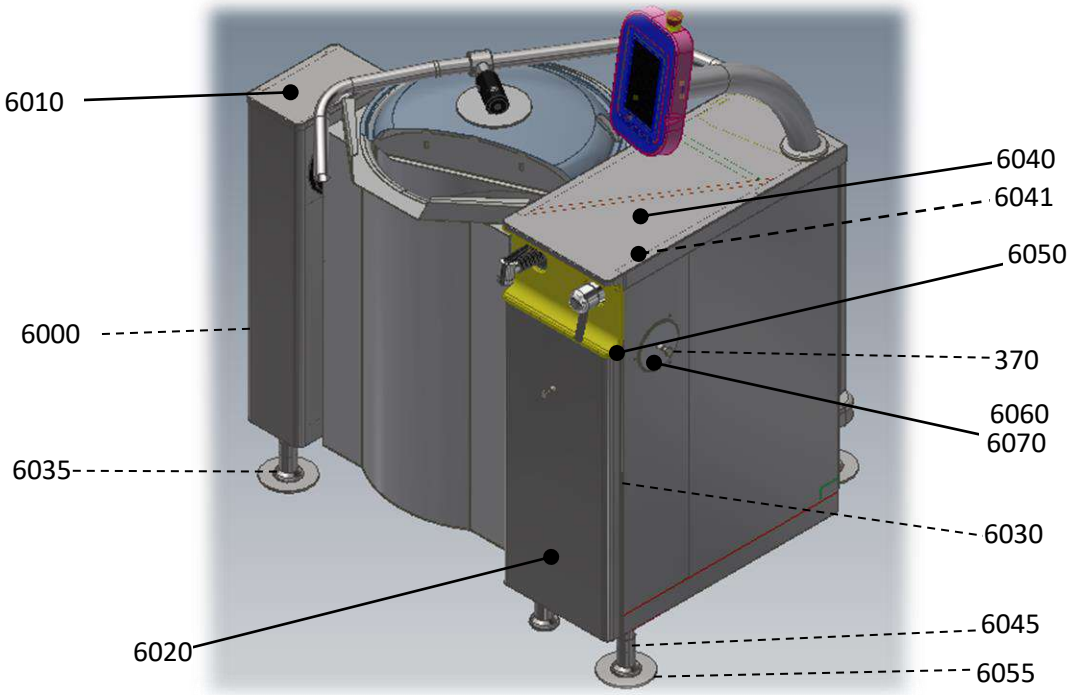
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL - PIPING – S – C5i COOLING					
4400	3911933		1		One way valve 1”
4410	3914173	40-100	1		Hose 1/2” L=2000 + seals
	K421080	40-100	1		Fiber seal 1/2”
	3912381	150-400	1		Hose 1” L=1700mm + seals
	3912069	150-400	2		Fiber seal 1”
4420	3912438		1		Hose 1/2” L=1750mm + seal
	K421080		1		Fiber seal 1/2”
4430	3605675		1		Hose 1/2” L=1200mm.
4440	3604754		1		One way valve
4450	3663563		1#		Solenoid valve, Y3
	N/A		-		Service kit, Y3
	3662221		1		Coil 230V, Y3
4455	3909415		1		Valve assembly, Y3
4460	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
4470	3602074		1		Hose 1/2” L=500mm
4480	3912404		1		Hose L=500mm 3/4”
	3910112		1		Fiber seal R3/4”
4490	3909729		1#		Motor ball valve, Y5
4500	3911522		1		Valve assembly, Y5
4510	3911556		1		Valve assembly, Y18
4520	3909729		1#		Motor ball valve, Y18
4530	3266840		1#		Solenoid valve, Y12, NO
	N/A		-		Service kit, Y12
	3662222		1		Coil 230V, Y12
4540	3910991		1		Valve assembly, Y12
4550	3912382	40,60, 80, 100	1		Hose 3/4” L=1600mm+seals
4550	3912383	40 - 100 Group	1		Hose 3/4” L=1800mm+seals
4550	3912384	150, 200, 300, 400	1		Hose 3/4” L=1800mm+seals
4550	3912387	150 – 400 Group	1		Hose 3/4” L=2000mm+seals
	3910112		2		Seal ¾”
4560	3909740		1		Valve assembly, Y4, Y15
4570	3260825		1#		Solenoid valve, Y4
	3662217		1		Service kit, Y4
	N/A		-		Coil 230V, Y4,
4580	3909729		1#		Motor ball valve, Y15
4590	3912381	40, 60, 80, 100	1		Hose 1” L=1700mm + seals
4590	3912380	40 – 100 Group	1		Hose 1” L=2000mm + seals
4590	3912385	150, 200, 300, 400	1		Hose 1” L=1800mm + seals
4590	3912386	150 – 400 Group	1		Hose 1” L=2100mm + seals
	3912069		2		Seal 1”
4600	3910123		1		Aeration tube
4610	3019271		1		Air removal trap, V1
			#	Recommended spareparts	

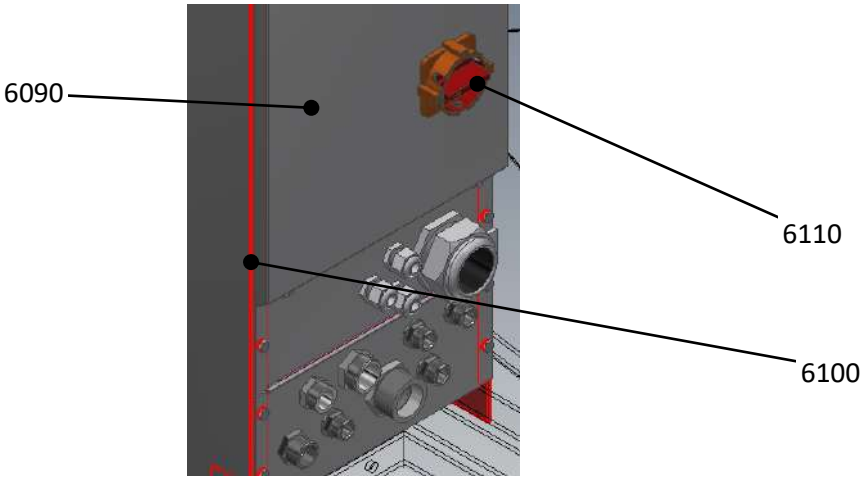
KETTLE BOWL – S – C5iPA COOLING – DRAINAGE WITH PRESSURISED AIR

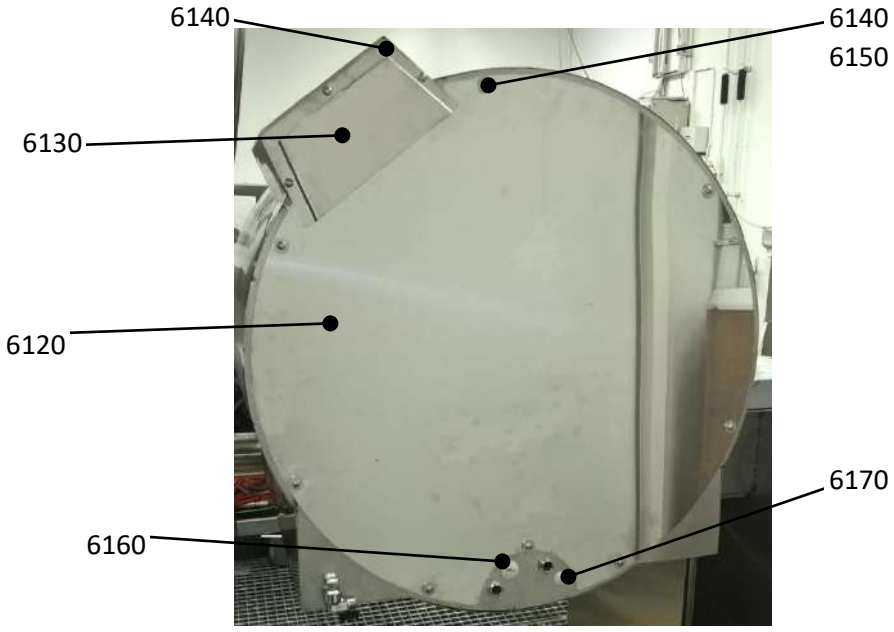


ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
KETTLE BOWL - PIPING – S – C5iPA COOLING – DRAINAGE WITH PRESSURISED AIR					
4700	3911933		1		One way valve 1”,
4710	3914173	40-100	1		Hose 1/2” L=2000 + seals
	K421080	40-100	1		Fiber seal 1/2”
	3912381	150-400	1		Hose 1” L=1700mm + seals
	3912069	150-400	2		Fiber seal 1”
4720	3912438		1		Hose 1/2” L=1750mm + seal
	K421080		1		Fiber seal 1/2”
4730	3605675		1		Hose 1/2” L=1200mm.
4740	3604754		1		One way valve
4750	3663563		1#		Solenoid valve, Y3
	N/A		-		Service kit, Y3
	3662221		1		Coil 230V, Y3
4760	3909415		1		Valve assembly, Y3
4770	K422750		1		Angle ball valve
	K422740		1		Angle ball valve handle
4780	3602074		1		Hose 1/2” L=500mm
4790	3912404		1		Hose L=500mm 3/4”
	3910112		1		Fiber seal R3/4”
4800	3914308		1		Hose 1/2” L=700mm + seal
	K421080		1		Fiber seal 1/2”
4810	3909729		1#		Motor ball valve, Y5
4820	3911522		1		Valve assembly, Y5
4830	3911556		1		Valve assembly, Y18
4840	3909729		1#		Motor ball valve, Y18
4850	3266840		1#		Solenoid valve, Y12, NO
	N/A		-		Service kit, Y12
	3662222		1		Coil 230V, Y12
4860	3910991		1		Valve assembly, Y12
4870	3912382	40,60, 80, 100	1		Hose 3/4” L=1600mm + seals
4870	3912383	40 - 100 Group	1		Hose 3/4” L=1800mm + seals
4870	3912384	150, 200, 300, 400	1		Hose 3/4” L=1800mm +seals
4870	3912387	150 – 400 Group	1		Hose 3/4” L=2000mm +seals
	3910112		2		Seal ¾”
4880	3602074		1		Hose 1/2” L=500mm
4890	3260825		1#		Solenoid valve, Y16
4900	3260825		1#		Solenoid valve, Y4
4910	3260825		1#		Solenoid valve, Y25
	3662217		1		Service kit, Y4, Y16, Y25
	N/A		1		Coil 230V, Y4, Y16, Y25
4920	3909694		1		Valve assembly, Y16,Y4,Y25,Y15
4930	3909729		1		Motor ball valve, Y15
4940	3912381	40, 60, 80, 100	1		Hose 1” L=1700mm + seals
4940	3912380	40 – 100 Group	1		Hose 1” L=2000mm + seals
4940	3912385	150, 200, 300, 400	1		Hose 1” L=1800mm + seals
4940	3912386	150 – 400 Group	1		Hose 1” L=2100mm + seals
	3912069		2		Seal 1”
4950	3910123		1		Aeration tube
4960	3019271		1		Air removal trap, V1
			#	Recommended spareparts	

OUTER COVER PLATES

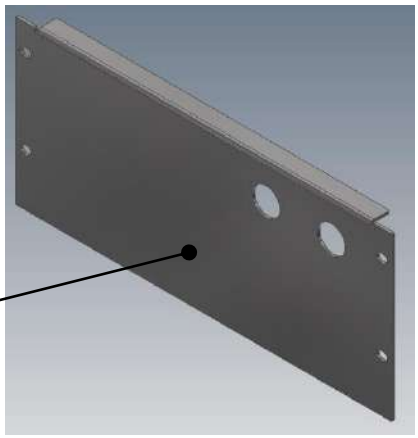


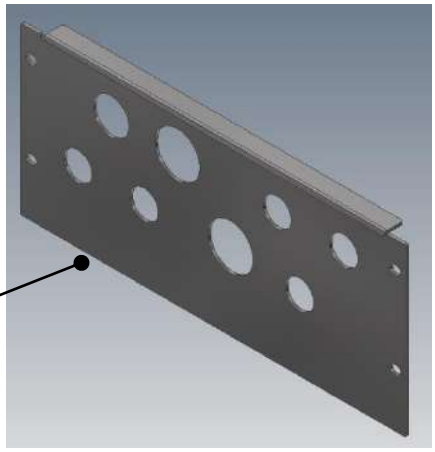


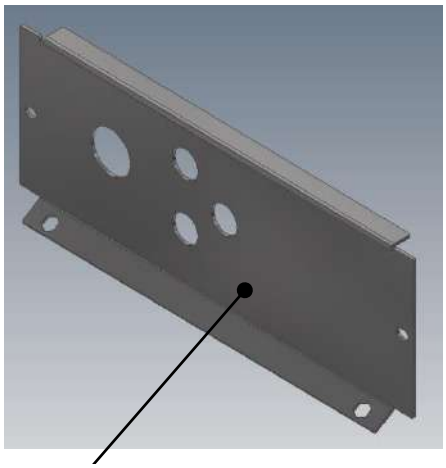


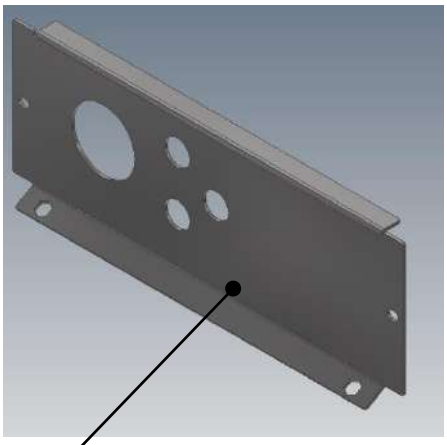
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
OUTER COVER PLATES					
6000	3915063		1		Support pillar side cover plate
6010	3914910		1		Support pillar top cover
6020	3913621		1		Control pillar front cover plate
6030	3605109		1		Front cover plate seal L=2,0m
6035	3915091		1		Setting foot
6040	3913467		1		Control pillar top cover
6041	3604434		1		Double-sided bonding tape
6045	3917052		1		Casing pipe
6050	3604598		1		Outer axle hole cover Ø150
6055	3917055		1		Installation flange
6060	3604600		1		Middle axle hole cover guide
6070	3604599		1		Inner axle hole cover Ø115
6080	5301669		1		Support peg
6090	3913780		1		Control pillar rear cover plate
6100	3605109		1		Rear cover plate seal L=1,5m
6110	3485025		1		Handle Q1
6120	3909988	40, 60	1		Kettle bowl bottom plate
6120	3909668	80, 100	1		Kettle bowl bottom plate
6120	3910311	150, 200	1		Kettle bowl bottom plate
6120	3909337	300, 400	1		Kettle bowl bottom plate
6130	3906375	40, 60,	1		Mixer motor cover
6130	3906185	80, 100	1		Mixer motor cover
6130	3906435	150, 200	1		Mixer motor cover
6130	3601727	300, 400	1		Mixer motor cover
6140	3450174		1		Screw M5*25
6150	3906198		1		Washer
6160	3910396		1		Hole plug M25
6170	K382730		1		Hole plug M20
			#	Recommended spareparts	

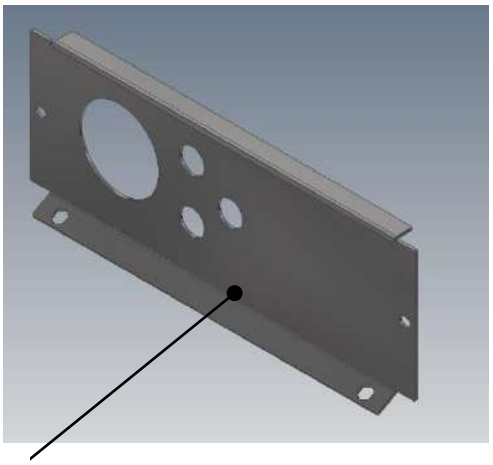
FEEDTHROUGH PLATE – CONTROL PILLAR





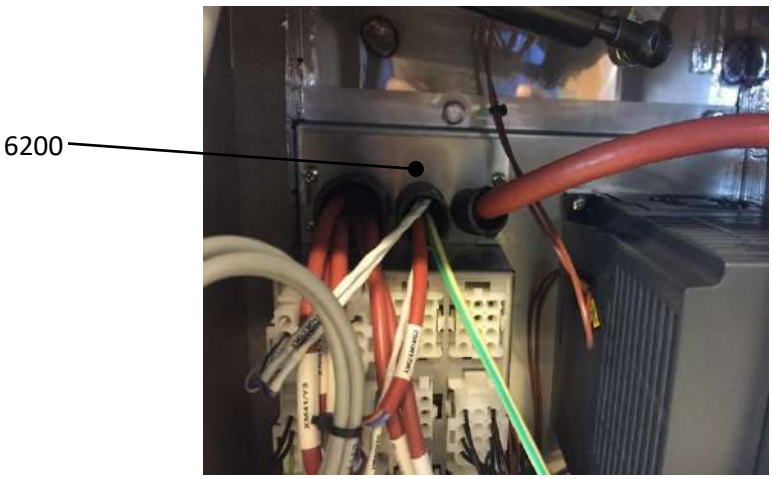


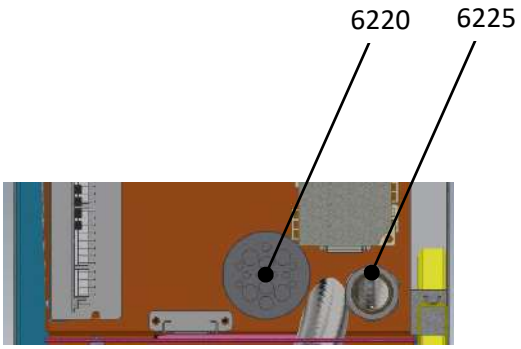


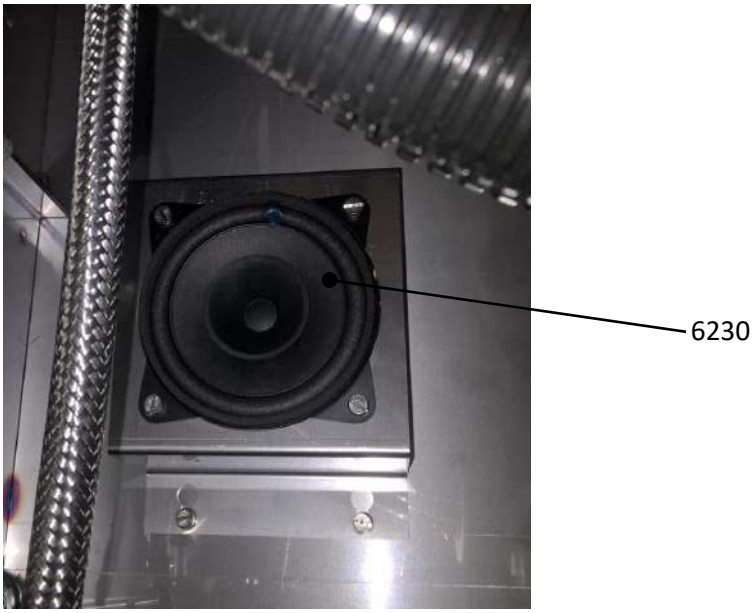


ID	**DESCRIPTION**	**MRP**
6180	Feedthrough plate water	3915484
6182	Feedthrough plate Steam, Water, Ice Water 40-400	3914812
6184	Feedthrough plate Electric 40-400S	3917381
6186	Feedthrough plate Electric 40-200E	3915483
6188	Feedthrough plate Electric 300-400E	3914813

CABLING, SPEAKER

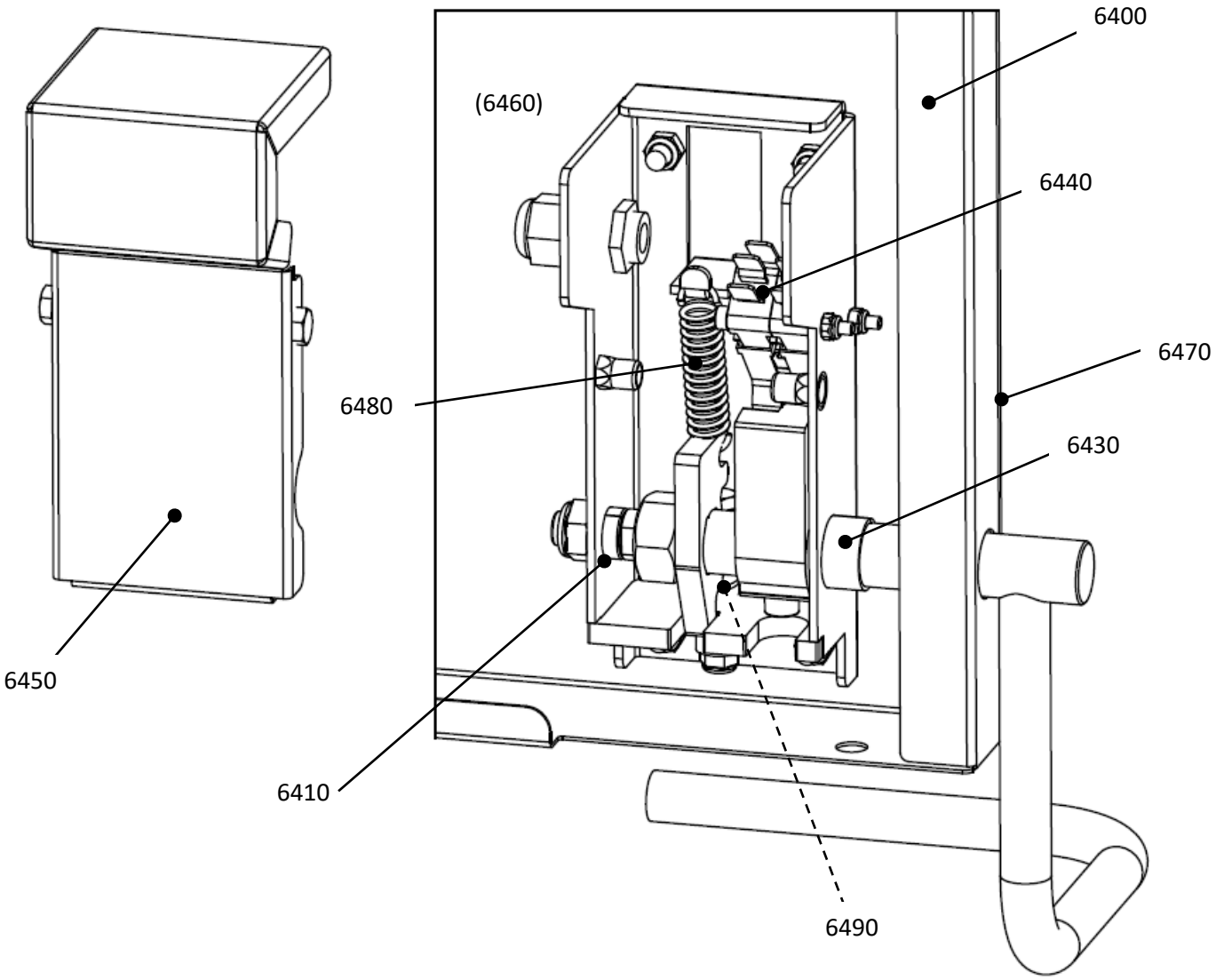






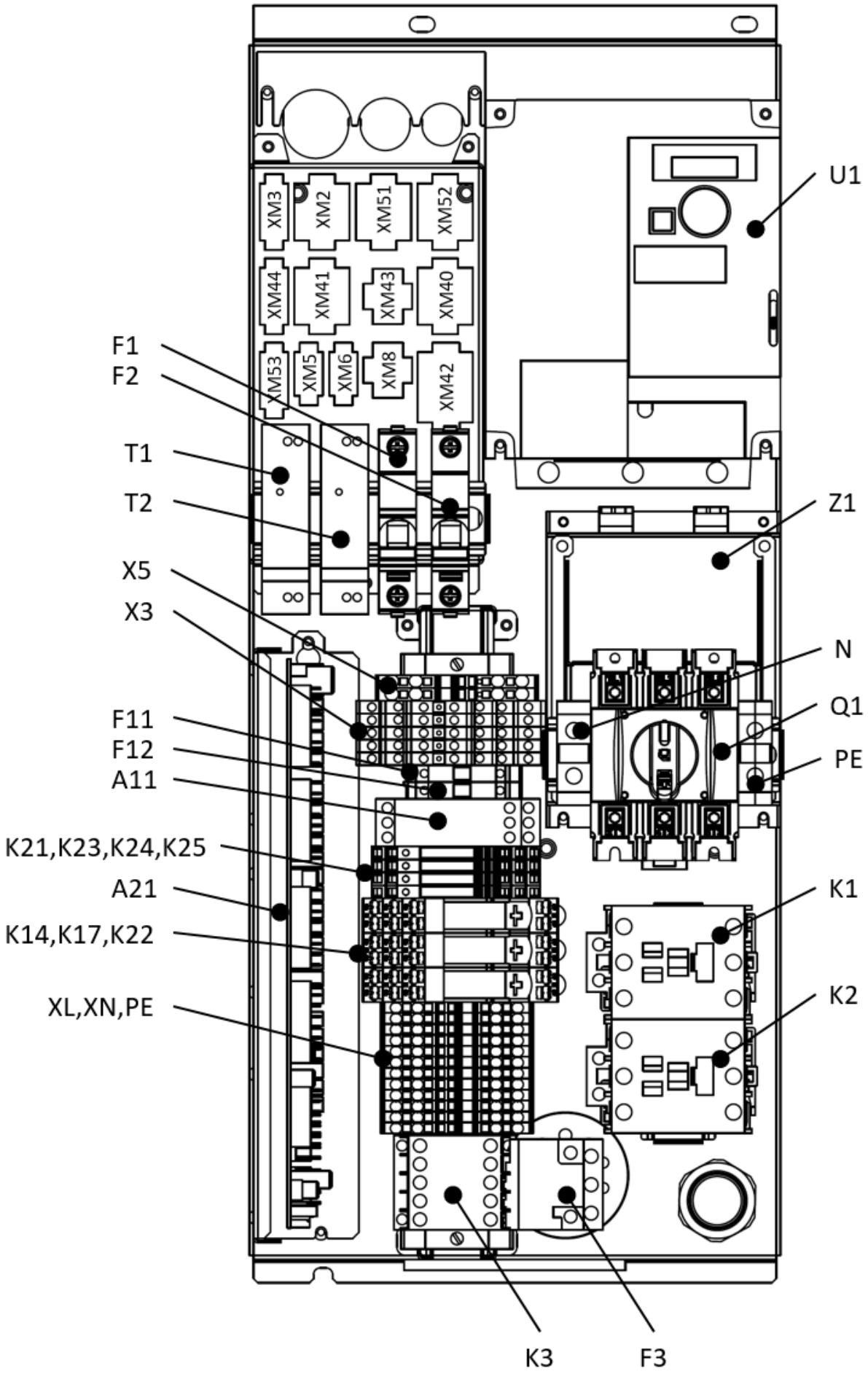
ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
CABLING, SPEAKER					
6200	3914731		1		Feedthrough plate, Upper
6220	3910378		1		Grommet
6225	3908313		1		Plug-in fitting
6230	3905639		1		Loudspeaker, H1
			#	Recommended spareparts	

FOOT PEDAL FOR MIXING WHILE TILTING



ID	CODE	TYPE	Qty	ACCESSORY	DESCRIPTION
FOOTSWITCH					
6400	3918425		1		Assembly with front panel
6410	3912654		1		Plain bearing
6430	3905893		1		Plain bearing
6440	3604858		2		Microswitch
6450	3918389		1		Splash Cover
6460	3913767		1		Cable
6470	3918417		1		Front panel
6480	3913620		1		Extension spring
6490	3915516		1		Compression spring
			#	Recommended spareparts	

ELECTRICAL SPAREPARTS



P3G electrical compartment codes

	40-100L	150L	200-300L	400L
Electrical 400/230V	MG3917317	MG3917319	MG3917321	MG3917323
Steam 400/230V	MG3917318	MG3917320	MG3917322	MG3917324
Electrical AC230V				
Steam AC230V				

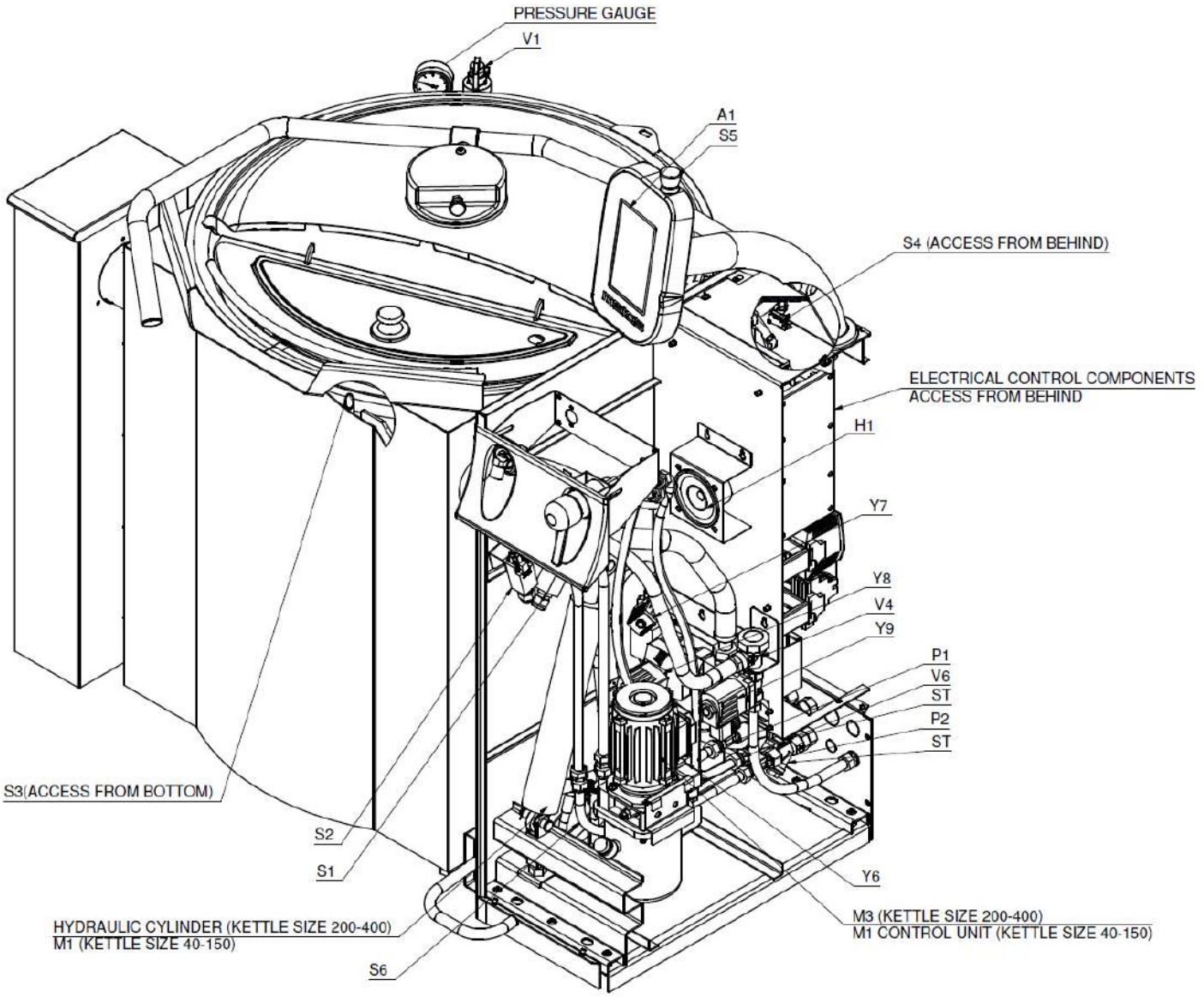
P3G electrical spare parts

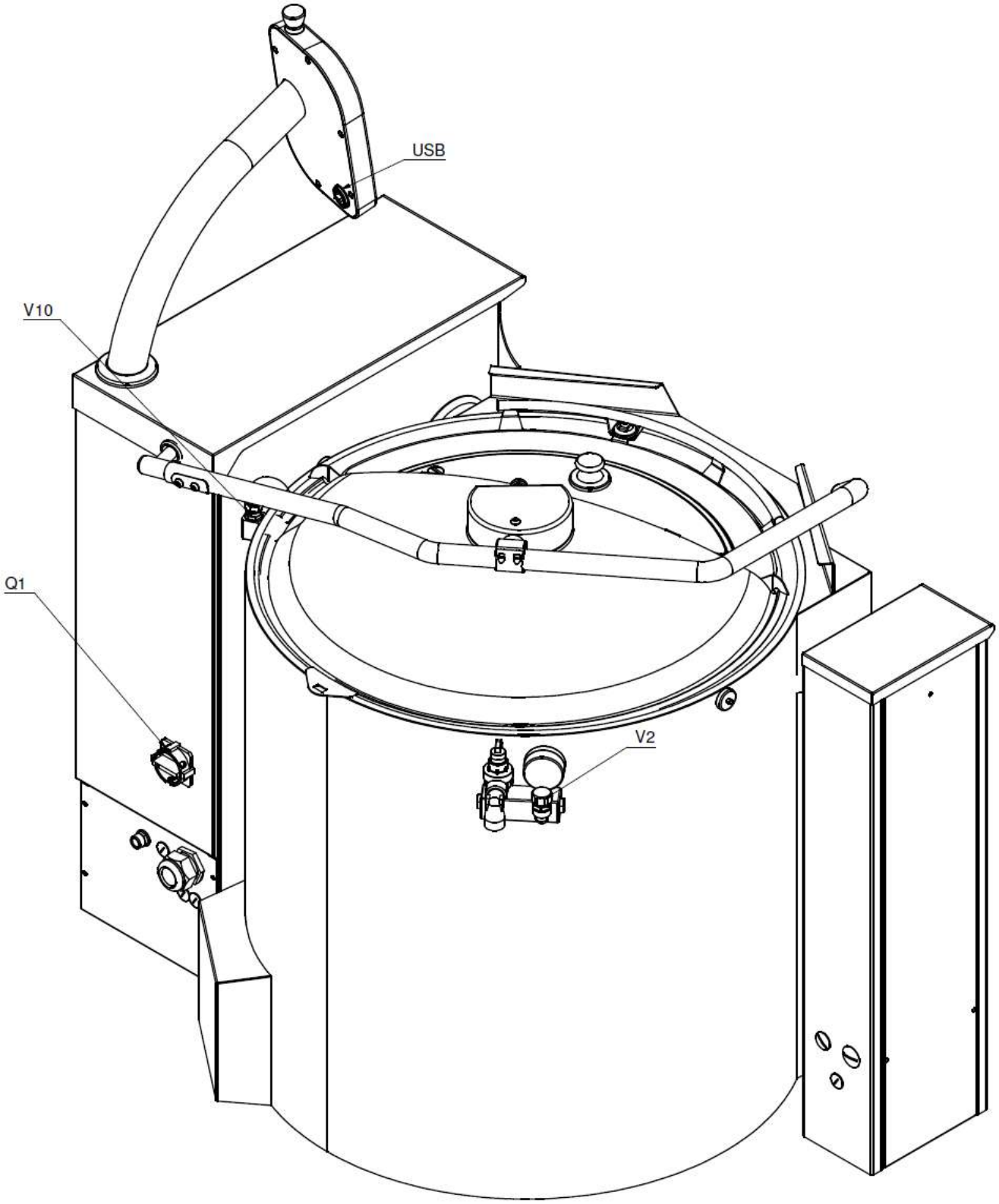
part	code	kettle model	qty	accessory	description
A21	MG3901830	all	1	-	I/O board
T1, T2	MG3913729	all	1	-	Power supply 24VDC
Q1	MG3659004	S, E 40-150	1	-	Mains switch - 80A
Q1	MG3485018	E 200-400	1	-	Mains switch - 160A
K1, K2	MG3438748	E 40-150	2#	-	Contactor – Heating, 32A
K1, K2	MG3240709	E 200-400	2#	-	Contactor – Heating, 65A
K1, K2	MG3008791	E 300-400 AC230V	2#	-	Contactor – Heating, 85A
A11	MG3908521	E	1	-	Relay – Water level
K3	MG3912198	200-400	1	-	Contactor – Hydraulic tilting
F3	MG3912199	200-400	1	-	Thermal overload relay - Hydraulic tilting, 1,2-1,8A
F3	MG3912200	200-400 AC230V	1	-	Thermal overload relay - Hydraulic tilting, 1,8-2,6A
F1	MG3914966	40-300	2	-	Fuse holder terminal block, 5 x 20 mm
F1	MG3914966	E 400 AC230V	3	-	Fuse holder terminal block, 5 x 20 mm
F1	MG3512053	40-100	2#	-	Fuse, 5 x 20 mm, 10A
F1	MG3486131	150-300	2#	-	Fuse, 5 x 20 mm, 16A
F1	MG3486131	E 400 AC230V	3#	-	Fuse, 5 x 20 mm, 16A
F1	MG3910521	400	2	-	Fuse holder terminal block, 10 x 38 mm
F1	MG3910522	400	2#	-	Fuse, 10 x 38 mm, 20A
F11, F12	MG3912197	all	2	-	Fuse holder terminal block, 5 x 20 mm, max 6,3A
F11, F12	MG3916537	all	2#	-	Fuse, 5 x 20 mm, 2A
K14, K17, K22	MG3907895	all	3	-	Relay - 16 mm wide
K21, K23, K24, K25	MG3909487	all	4	-	Relay - 6,2 mm wide
Z1	MG3909886	40-300	1	-	RFI Filter, 16A, 1 phase
Z1	MG3910317	400	1	-	RFI Filter, 20A, 1 phase
Z1	MG3909882	E 400 AC230V	1	-	RFI Filter, 16A, 3 phase
U1	MG3912080	40-100	1#	-	VFD - preprogrammed, 0,75kW, 1 phase, 230V
U1	MG3912081	150-300	1#	-	VFD - preprogrammed, 1,5kW, 1 phase, 230V
U1	MG3912082	400	1#	-	VFD - preprogrammed, 2,2kW, 1 phase, 230V
U1	MG3912083	E 400 AC230V	1#	-	VFD - preprogrammed, 2,2kW, 3 phase, 230V
X3	MG3912192	all	6	-	Terminal block - double level, push in, 4 mm2, grey
N	MG3912193	S, E 40-150	1	-	Terminal block - screw, 16 mm2, blue
N	MG3912195	E 200-400	1	-	Terminal block - screw, 35 mm2, blue
PE	MG3912194	S, E 40-150	1	-	Terminal block - screw, 16 mm2, yellow/green
PE	MG3912196	E 200-400	1	-	Terminal block - screw, 35 mm2, yellow/green
PE	MG3912191	all	4	-	Terminal block - 4 connections, push in, 2,5 mm2, yellow/green

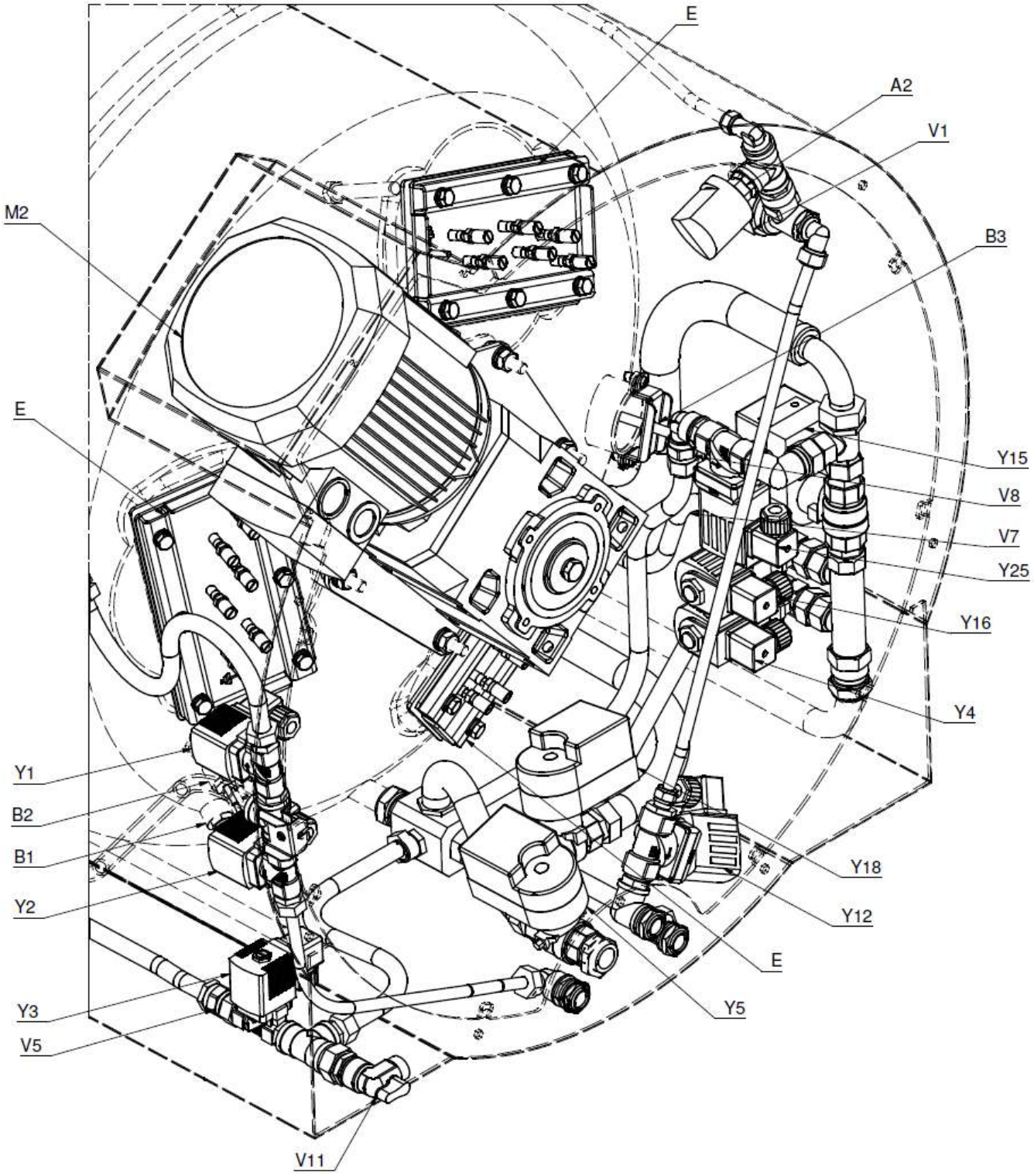
XL	MG3912189	all	4	-	Terminal block - 4 connections, push in, 4 mm2, grey
XN	MG3912190	all	4	-	Terminal block - 4 connections, push in, 4 mm2, blue
XM5, XM6	MG3911025	all	2	-	Connector - 3 position, female housing
XM3, XM44, XM53	MG3912182	all	3	-	Connector - 4 position, female housing
XM8, XM43	MG3912183	all	2	-	Connector - 6 position, female housing
XM2, XM40, XM41, XM51, XM52	MG3912184	all	5	-	Connector - 12 position, female housing
XM42	MG3912185	all	1	-	Connector - 15 position, female housing
-	MGK364590	all	X	-	Connector - contact female
-	MGK364580	all	X	-	Connector - contact male
XS4-1, XS4-4	MG3093081	all	2	-	Connector - Abiko 6,3 mm, insulated
X4	MG3912186	S	4	-	Terminal block - push in, 4 mm2, grey
X4	MG3912187	S	4	-	Terminal block - push in, 4 mm2, blue
X4	MG3912188	S	4	-	Terminal block - push in, 4 mm2, yellow/green
FB1	MG3646138	E	1	-	Ferrite bead
FB2, FB3	MG3910343	all	2	-	Ferrite bead
-	MG3910591	S	1	-	Cable set P3G Y7 Y8 (W28-W29)
-	MG3909612	-	1	C0	Cable set P3G valves no cooling C0 (W17-W19)
-	MG3909611	-	1	C5i PA	Cable set P3G valves C5 with PA (W17-W26)
-	MG3909610	-	1	C5i	Cable set P3G valves C5 no PA (W17-W24)
-	MG3909609	-	1	C3i PA	Cable set P3G valves C3 with PA (W17-W19, W22-W26)
-	MG3909608	-	1	C3i	Cable set P3G valves C3 no PA (W17-W19, W22-W24)
-	MG3909606	-	1	C2	Cable set P3G valves C2 no PA (W17-W19, W21-W22)
-	MG3910557	all	1	-	Cable set P3G S1 S2 (W12-W13)
-	MG3910664	all	1	-	Cable set P3G panel (W1, W3-W4)
-	MG3910500	all	1	-	Cable set P3G mixer motor (W8)
-	MG3910584	40-150	1	-	Cable set P3G M1 (W15-W16)
-	MG3909613	all	1	-	Cable set P3G kettle (W9, W11, W27, W31-W33)
W30	MG3910592	S cooling	1	-	Cable P3G Y9
W14	MG3910572	200-400	1	-	Cable P3G Y6
W5	MG3910551	all	1	-	Cable P3G speaker
W34	MG3910594	-	1	FS	Cable P3G foot pedal
W6	MG3604931	E 300-400	1		Cable set heating elements 300-400
W6	MG3604932	E 40-100	1		Cable set heating elements 40-100
W6	MG3604933	E 150-200	1		Cable set heating elements 150-200
W6	MG3604932	E 80-100 AC230V	2		Cable set heating elements 40-100
W6	MG3604933	E 200 AC230V	2		Cable set heating elements 150-200
W6	MG3604931	E 300-400 AC230V	2		Cable set heating elements 300-400
W10	MG3604920	all	1	-	Cable emergency stop

W1	Touch screen board 24VDC sypply
W2	I/O board 24VDC supply
W3	Audio signal
W4	Serial communication
W5	Speaker signal
W6	Heating element
W8	Mixing motor
W9	Mixing motor temperature signal
W10	Emergency stop
W11	Safety lid/grid
W12	Tilting cooking position
W13	Tilting end position
W14	Hydraulic tilting return valve
W15	Electrical tilting supply
W16	Electrical tilting control signal
W17	Food water valve
W18	Bypass water valve
W19	Jacket tapwater filling valve
W20	Air eliminator valve
W21	Jacket emptying to drain valve
W22	Cooling water out to drain valve
W23	Cooling water out to icebank valve
W24	Cooling water in from icebank valve
W25	Compressed air to jacket valve
W26	Jacket emptying to icebank valve
W27	Pressure switch
W28	Steam feed full power valve
W29	Steam feed half power valve
W30	Steam condence out valve
W31	Jacket water level electrode
W32	Jacket tempetature signal
W33	Food temperature signal
W34	Foot pedal signal
W35	Foot pedal signal (new foot pedal, page 126)
W36	Foot pedal jumper (new foot pedal, page 126)

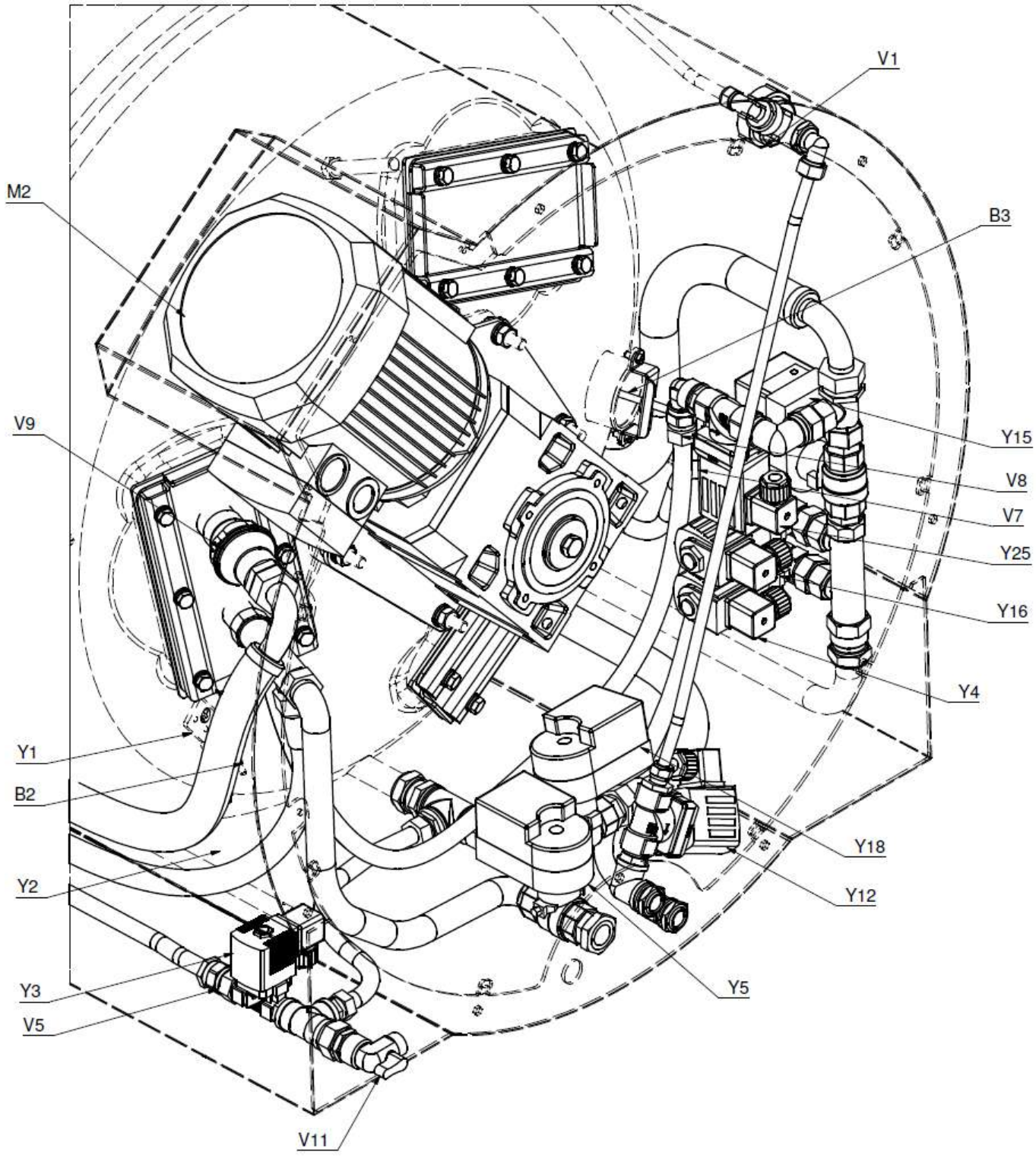
9 Designations



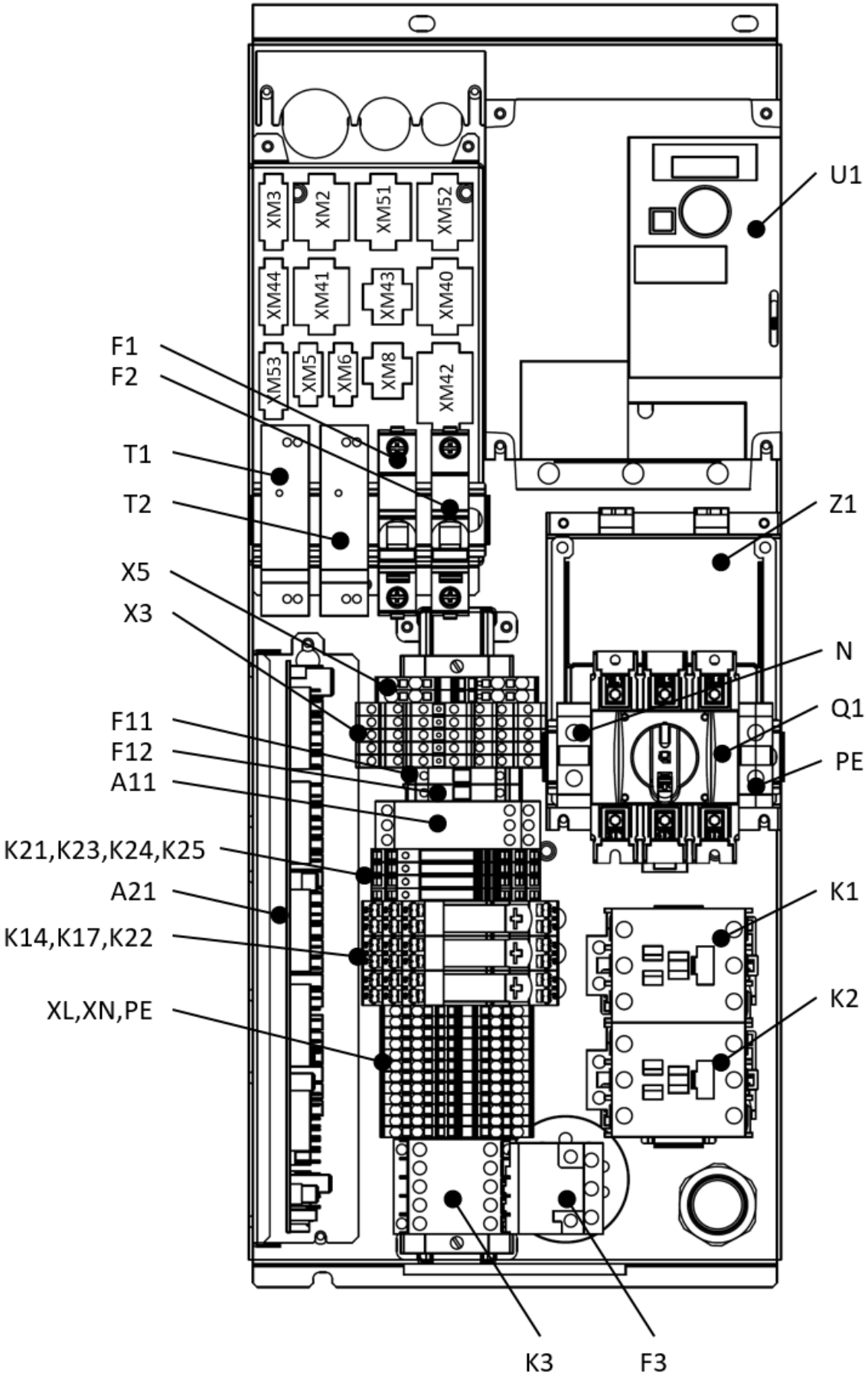

USB
V10
Q1
V2



Electrical heating



Direct steam heating



Electrics compartment

Designation	English	Suomi
A1	Touch screen panel board	Kosketuspaneelikortti
A11	Relay – Water level	Rele – Veden pinnankorkeus
A2	Pressure switch	Painekytkin
A21	I/O board	I/O kortti
B1	Sensor – Water level electrode	Anturi – Vesipintaelektrodi
B2	Sensor – Jacket temperature	Anturi – Vaipan lämpötila
B3	Sensor – Food temperature	Anturi – Ruoan lämpötila
E1	Heating element	Lämmitysvastus
E2	Heating element	Lämmitysvastus
E3	Heating element	Lämmitysvastus
E4	Heating element	Lämmitysvastus
F1	Fuse	Sulake
F3	Fuse – Hydraulic tilting	Sulake – Hydraulinen kallistus
F11	Fuse – Control circuit	Sulake – Ohjauspiiri
F12	Fuse – Control circuit	Sulake – Ohjauspiiri
FB1	Ferrite bead	Ferriitti
FB2	Ferrite bead	Ferriitti
H1	Loudspeaker	Kaiutin
K1	Contactor – Heating	Kontaktori – Lämmitys
K2	Contactor – Heating	Kontaktori – Lämmitys
K3	Contactor – Hydraulic tilting	Kontaktori – Hydraulinen kallistus
K14	Relay – Pressure switch feedback	Rele – Painekytkimen takaisinkytkentä
K17	Relay – Mixing while tilting	Rele – Sekoitus kallistettaessa
K21	Relay – Ice bank control	Rele – Jääpankin ohjaus
K22	Relay – Safety lid	Rele – Ritiläkansi
K23	Relay – Y5 control	Rele – Y5 ohjaus
K24	Relay – Y15 control	Rele – Y15 ohjaus
K25	Relay – Y18 control	Rele – Y18 ohjaus
M1	Motor – Electric tilting	Moottori – Sähköinen kallistus
M2	Motor – Mixer	Moottori – Sekoitin
M3	Motor – Hydraulic tilting	Moottori – Hydraulinen kallistus
P1	Flow meter	Virtausanturi
P2	Flow meter – Twin water	Virtausanturi - Kaksoisvesi
Q1	Mains switch	Erotuskytkin
S1	Limit switch – Cooking position	Rajakytkin – Perusasento
S2	Limit switch – Tilting end position	Rajakytkin – Kallistuksen ääriasento
S3	Magnetic switch – Safety lid	Magneettikytkin – Ritiläkansi
S4	Limit switch – Lid	Rajakytkin – Kansi
S5	Switch – Emergency stop	Kytkin – Hätäseis
S6	Switch – Safety food pedal	Kytkin – Turvajalkapoljin
ST	Strainer	Mudanerotin
T1	Power supply 24VDC	Virtalähde 24VDC
T2	Power supply 24VDC	Virtalähde 24VDC
U1	Frequency converter	Taajuusmuuttaja
V1	Air removal trap	Ilmanpoistin
V2	Vacuum valve	Imusuoja
V3	Safety valve	Varoventtiili
V4	Condensate removal trap	Lauhteenerotin
V5…V10	Check valve	Takaiskuventtiili
V11	Manual jacket drain valve	Vaipan tyhjennysventtiili
X-	24VDC from T1 (+)	24VCD (+)
X+	24VDC from T1 (-)	24VCD (-)
XL	Fuse protected mains voltage (230 VAC)	Sulakesuojattu L (230 VAC)
XN	Fuse protected mains voltage (230 VAC)	Sulakesuojattu N (230 VAC)
Y1	Valve – Food water supply	Venttiili – Ruokaveden syöttö
Y2	Valve – Food water bypass	Venttiili – Ruokaveden ohivirtaus
Y3	Valve – Jacket filling / tap water cooling in	Venttiili – Vaipantäyttö / verkostojäähdytys sisään
Y4	Valve – Tap water cooling out	Venttiili – Verkostojäähdytys ulos
Y5	Motor valve – Jacket emptying	Moottoriventtiili – Vaipan tyhjennys

Y6	Valve – Hydraulic tilting return	Venttiili – Hydraulisen kallistuksen palautus
Y7	Valve – Steam supply, half power	Venttiili – Höyrynsyöttö, puoliteho
Y8	Valve – Steam supply, full power	Venttiili – Höyrynsyöttö, täysi teho
Y9	Valve – Condensate line close during cooling	Venttiili – Lauhdelinjan sulku jäähdytyksen aikana
Y12	Valve – Air eliminator line close during cooling	Venttiili – Ilmanpoiston sulku jäähdytyksen aikana
Y15	Motor valve – Ice bank cooling water out	Moottoriventtiili – Jääpankkijäähdytys ulos
Y16	Valve – Compressed air in	Venttiili – Paineilma sisään
Y18	Motor valve – Ice bank cooling water in	Moottoriventtiili – Jääpankkijäähdytys sisään
Y25	Valve – Jacket emptying to ice bank	Venttiili – Vaipan tyhjennys jääpankkiin
Z1	RFI Filter	RFI Suodin

PT1000 SENSOR RESISTANCE TABLE

The ohm - temperature dependency formula for a PT1000 sensor is:

Sensor Resistance (ohm) = 1000 * (1 + ((3,90802x10^{-3} * C) – (0,5802x10^{-6} * C^2))

C°	Ohm	C°	Ohm	C°	Ohm	C°	Ohm
-30	882,2	20	1 077,9	70	1 270,7	120	1 460,6
-29	886,2	21	1 081,8	71	1 274,5	121	1 464,4
-28	890,1	22	1 085,7	72	1 278,4	122	1 468,1
-27	894,1	23	1 089,6	73	1 282,2	123	1 471,9
-26	898,0	24	1 093,5	74	1 286,0	124	1 475,7
-25	901,9	25	1 097,3	75	1 289,8	125	1 479,4
-24	905,9	26	1 101,2	76	1 293,7	126	1 483,2
-23	909,8	27	1 105,1	77	1 297,5	127	1 487,0
-22	913,7	28	1 109,0	78	1 301,3	128	1 490,7
-21	917,7	29	1 112,8	79	1 305,1	129	1 494,5
-20	921,6	30	1 116,7	80	1 308,9	130	1 498,2
-19	925,5	31	1 120,6	81	1 312,7	131	1 502,0
-18	929,5	32	1 124,5	82	1 316,6	132	1 505,7
-17	933,4	33	1 128,3	83	1 320,4	133	1 509,5
-16	937,3	34	1 132,2	84	1 324,2	134	1 513,3
-15	941,2	35	1 136,1	85	1 328,0	135	1 517,0
-14	945,2	36	1 139,9	86	1 331,8	136	1 520,8
-13	949,1	37	1 143,8	87	1 335,6	137	1 524,5
-12	953,0	38	1 147,7	88	1 339,4	138	1 528,3
-11	956,9	39	1 151,5	89	1 343,2	139	1 532,0
-10	960,9	40	1 155,4	90	1 347,0	140	1 535,8
-9	964,8	41	1 159,3	91	1 350,8	141	1 539,5
-8	968,7	42	1 163,1	92	1 354,6	142	1 543,2
-7	972,6	43	1 167,0	93	1 358,4	143	1 547,0
-6	976,5	44	1 170,8	94	1 362,2	144	1 550,7
-5	980,4	45	1 174,7	95	1 366,0	145	1 554,5
-4	984,4	46	1 178,5	96	1 369,8	146	1 558,2
-3	988,3	47	1 182,4	97	1 373,6	147	1 561,9
-2	992,2	48	1 186,2	98	1 377,4	148	1 565,7
-1	996,1	49	1 190,1	99	1 381,2	149	1 569,4
0	1 000,0	50	1 194,0	**100**	1 385,0	150	1 573,1
1	1 003,9	51	1 197,8	101	1 388,8	151	1 576,9
2	1 007,8	52	1 201,6	102	1 392,6	152	1 580,6
3	1 011,7	53	1 205,5	103	1 396,4	153	1 584,3
4	1 015,6	54	1 209,3	104	1 400,2	154	1 588,1
5	1 019,5	55	1 213,2	105	1 403,9	155	1 591,8
6	1 023,4	56	1 217,0	106	1 407,7	156	1 595,5
7	1 027,3	57	1 220,9	107	1 411,5	157	1 599,3
8	1 031,2	58	1 224,7	108	1 415,3	158	1 603,0
9	1 035,1	59	1 228,6	109	1 419,1	159	1 606,7
10	1 039,0	60	1 232,4	110	1 422,9	160	1 610,4
11	1 042,9	61	1 236,2	111	1 426,6	161	1 614,2
12	1 046,8	62	1 240,1	112	1 430,4	162	1 617,9
13	1 050,7	63	1 243,9	113	1 434,2	163	1 621,6
14	1 054,6	64	1 247,7	114	1 438,0	164	1 625,3
15	1 058,5	65	1 251,6	115	1 441,7	165	1 629,0
16	1 062,4	66	1 255,4	116	1 445,5	166	1 632,7
17	1 066,3	67	1 259,2	117	1 449,3	167	1 636,5
18	1 070,2	68	1 263,1	118	1 453,1	168	1 640,2
19	1 074,0	69	1 266,9	119	1 456,8	169	1 643,9

REVISION	DESCRIPTION	DATE	AUTHOR
A	Original		

Page numbers refer to previous revision.

PROVENO 3G PI-DIAGRAMS

OPTIONS

Water options

2. Shower option S1/S2/S3
3. Double water inlet option T
4. Shower and double water inlet S1/S2/S3 + Double water inlet option T

Cooling options Electric heated kettle

5. C0 (NO COOLING)
6. C2
7. C3i
8. C5i
9. C3i + PA
10. C5i + PA
11. C5i + PA + S1/S2/S3 + T

Cooling options Steam heated kettle

12. C0 (NO COOLING)
13. C2
14. C3i
15. C5i
16. C3i + PA
17. C5i + PA
18. C5i + PA+ S1/S2/S3 + T

DESIGNATION

A	PRESSURISED AIR
A2	PRESSURE SWITCH
B1	WATER LEVEL ELECTRODE
B2	JACKET TEMPERATURE
B3	FOOD TEMPERATURE
C	CONDENSATE
CW	COLD POTABLE WATER
CW2	JACKET FILLING/COOLING WATER
HW	HOT WATER
IW	ICE WATER
P1	FLOW METER
P2	FLOW METER
S	STEAM
ST	STRAINER
V1	AIR REMOVAL TRAP
V2	VACUUM VALVE
V3	PRESSURE RELIEF VALVE
V4	CONDENSATE REMOVAL TRAP
V5	CHECK VALVE
V6	CHECK VALVE
V7	CHECK VALVE
V8	CHECK VALVE
V9	CHECK VALVE
V10	CHECK VALVE
V11	MANUAL JACKET EMPTYING VALVE
Y1	FOOD WATER
Y2	FOOD WATER BYPASS TO DRAIN
Y3	JACKET FILLING / TAP WATER COOLING IN
Y4	TAP WATER COOLING WATER OUT
Y5	JACKET EMPTYING
Y7	STEAM HALF POWER
Y8	STEAM FULL POWER
Y9	CONDENSATE CLOSE DURING COOLING
Y12	AIR ELIMINATOR CLOSE DURING COOLING
Y15	ICE BANK COOLING WATER OUT
Y16	PRESSURIZED AIR IN
Y18	ICE BANK COOLING WATER IN
Y25	JACKET EMPTYING TO ICE BANK

Rev.	Muutos	Pvm.	Suunn.
B	V10 AND V11 ADDED	31.10.2017	PUUPPAN

metos

Tuote PROVENO | Multi

Malli

Suhde 1:5

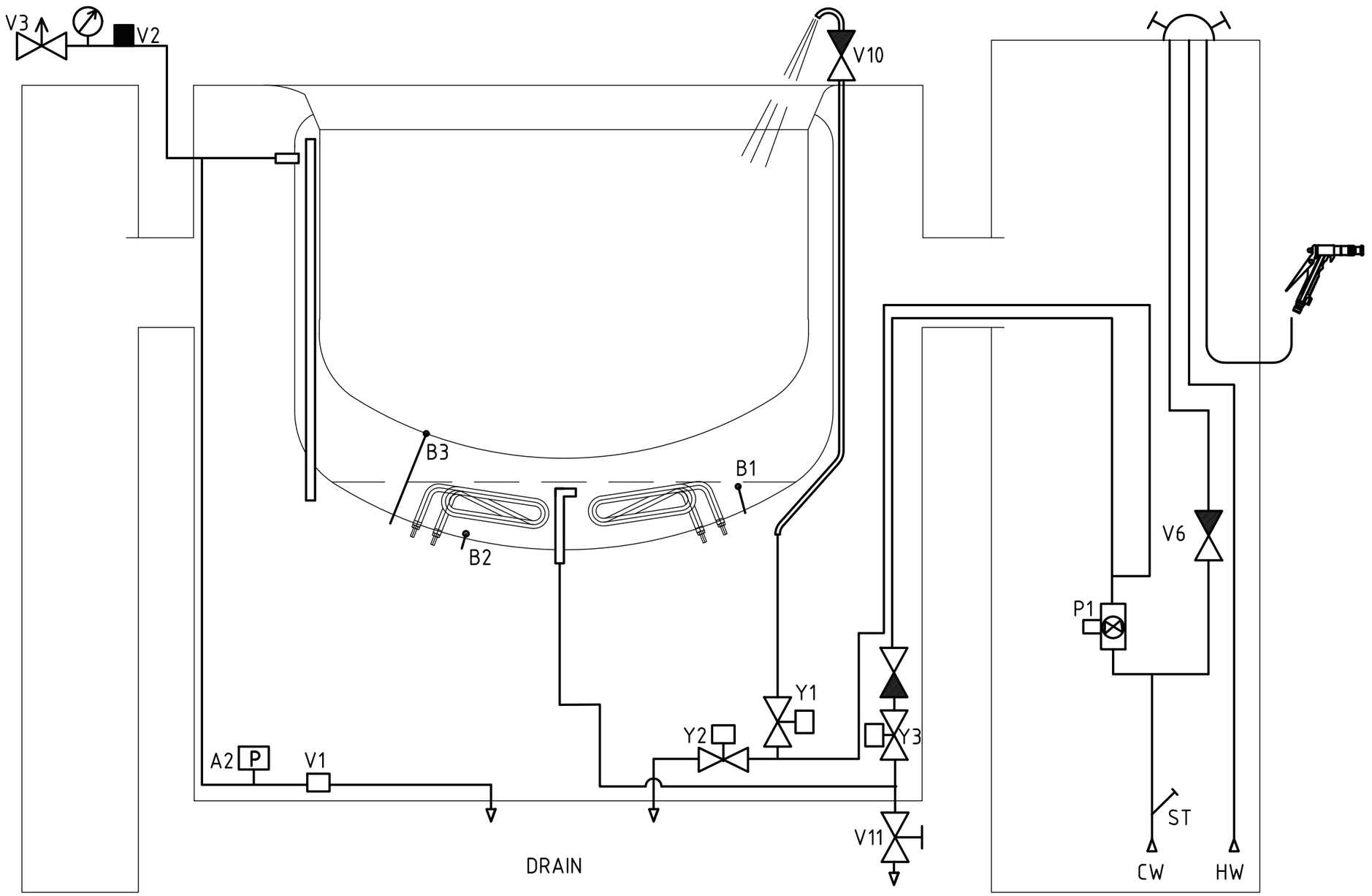
Suunn. 16.11.2016 PUUPPAN

PI-DIAGRAM
PROVENO 3G
INDEX/DESIGNATION

Koodi 001005 A 1

Tulostettu 31.10.2017

Toleroimattomat mitat LT06031



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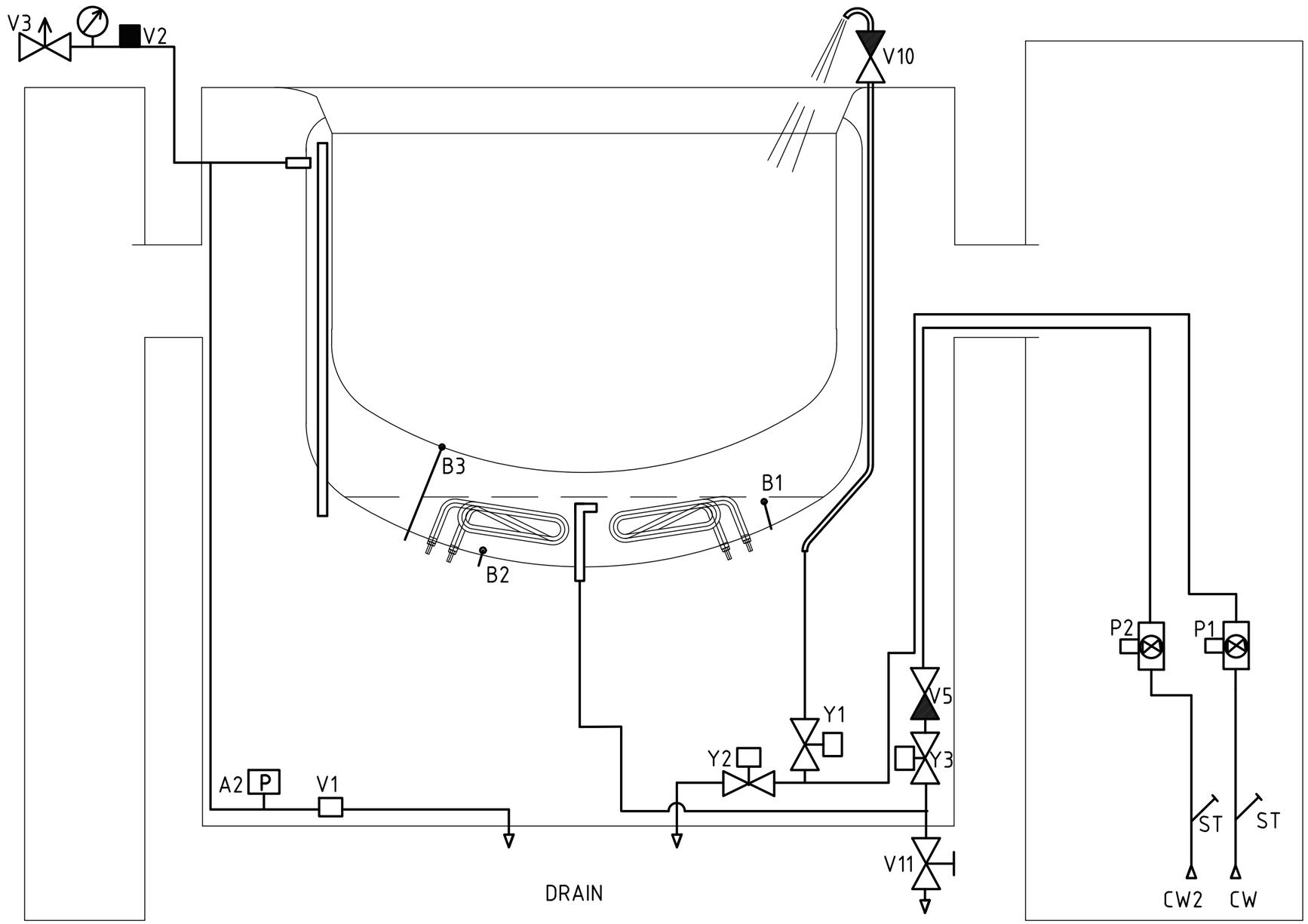
			Tulostettu 31.10.2017
			Toleroimattomat mitat LT06031



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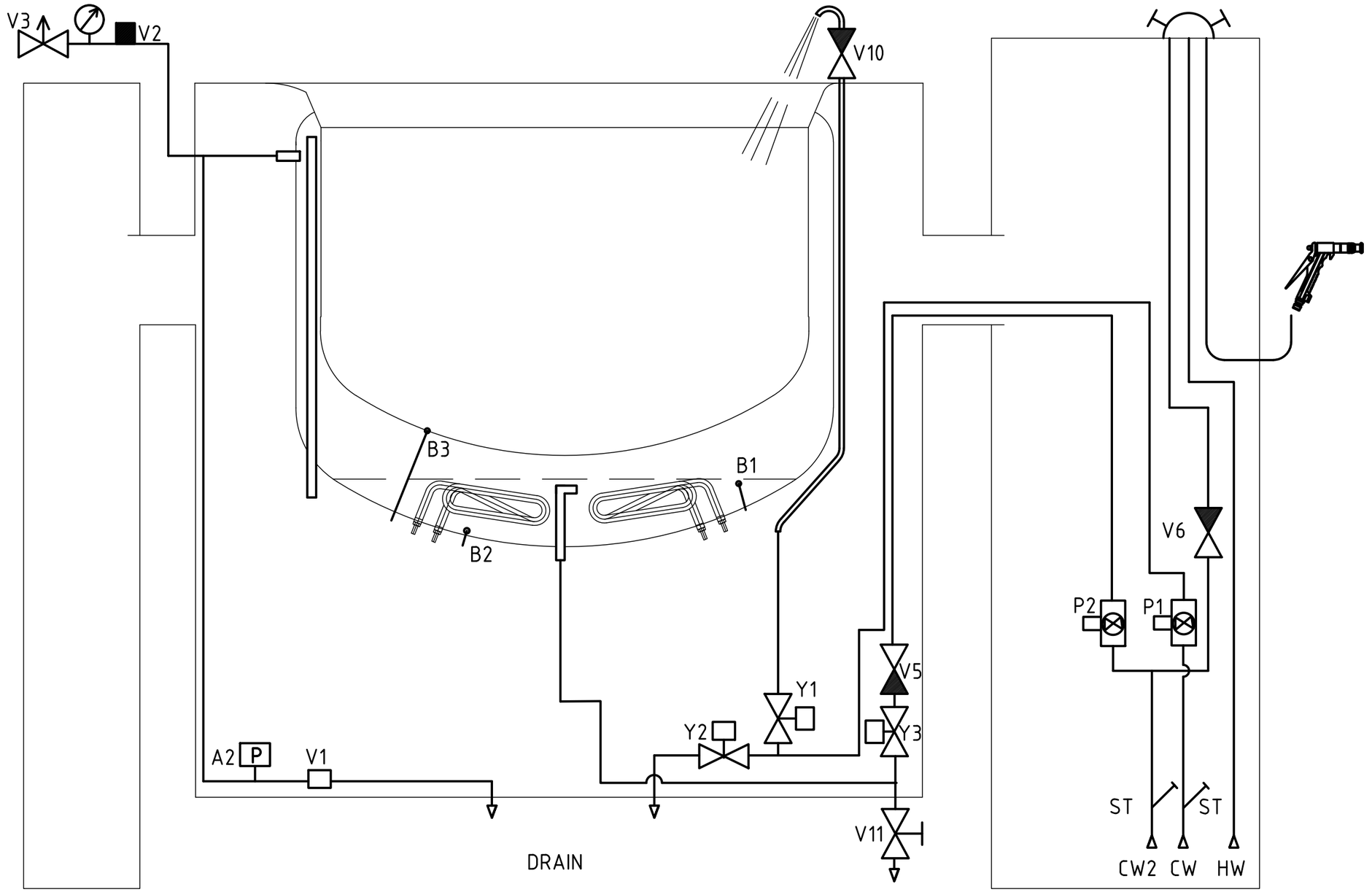

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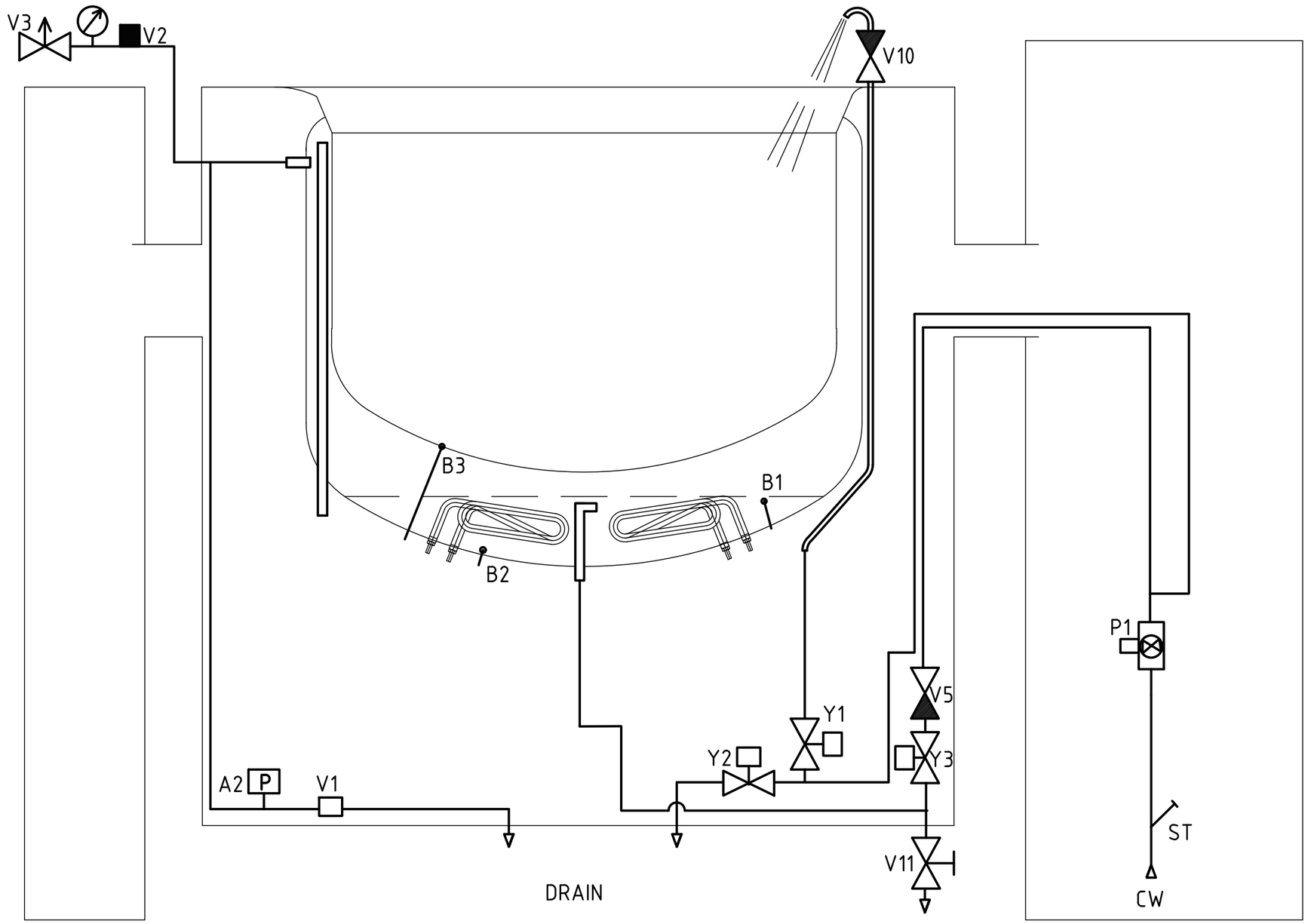
			Toleroimattomat mitat LT06031



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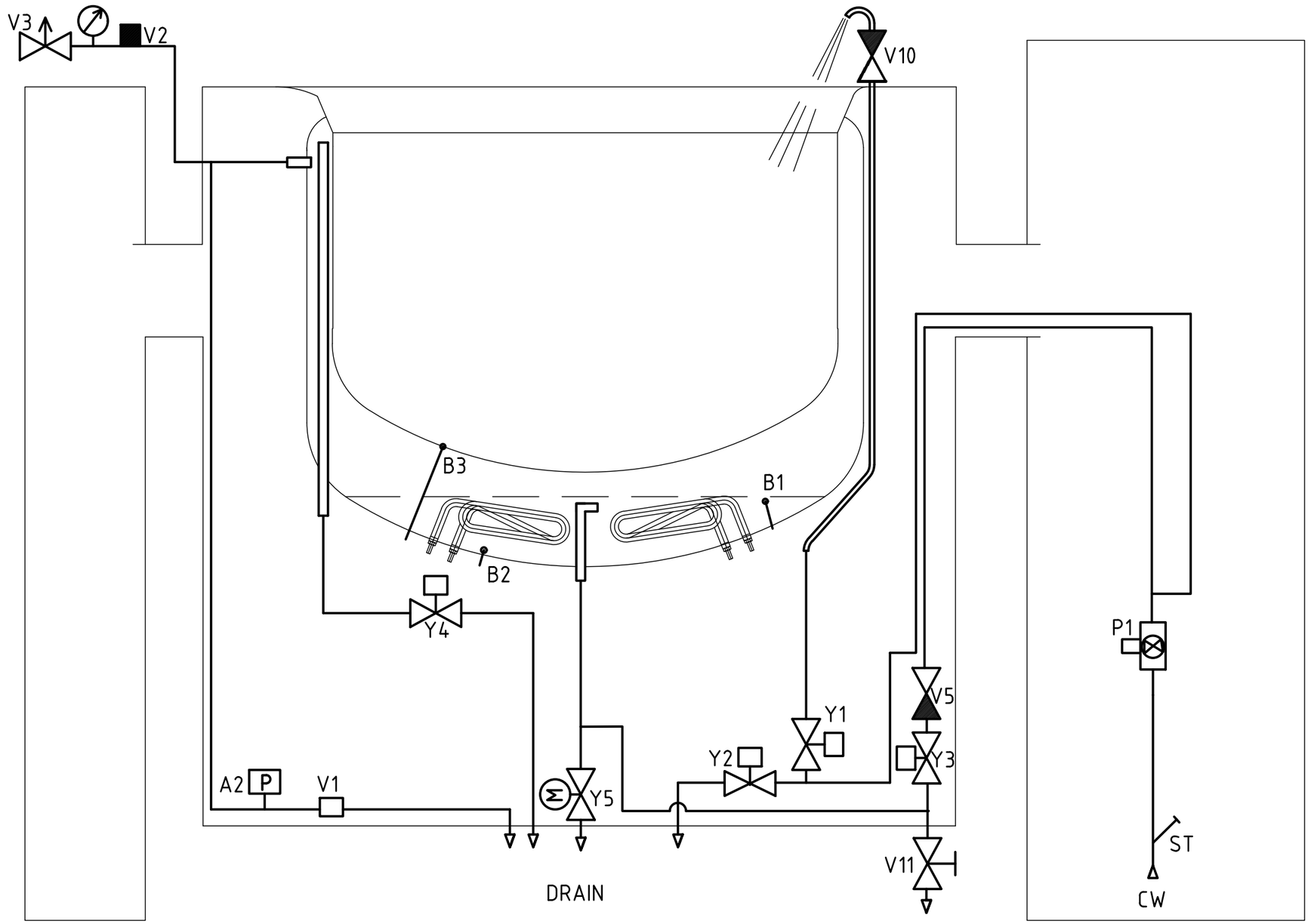

metos	Tuote PROVENO	Multi	Suhde 1:5
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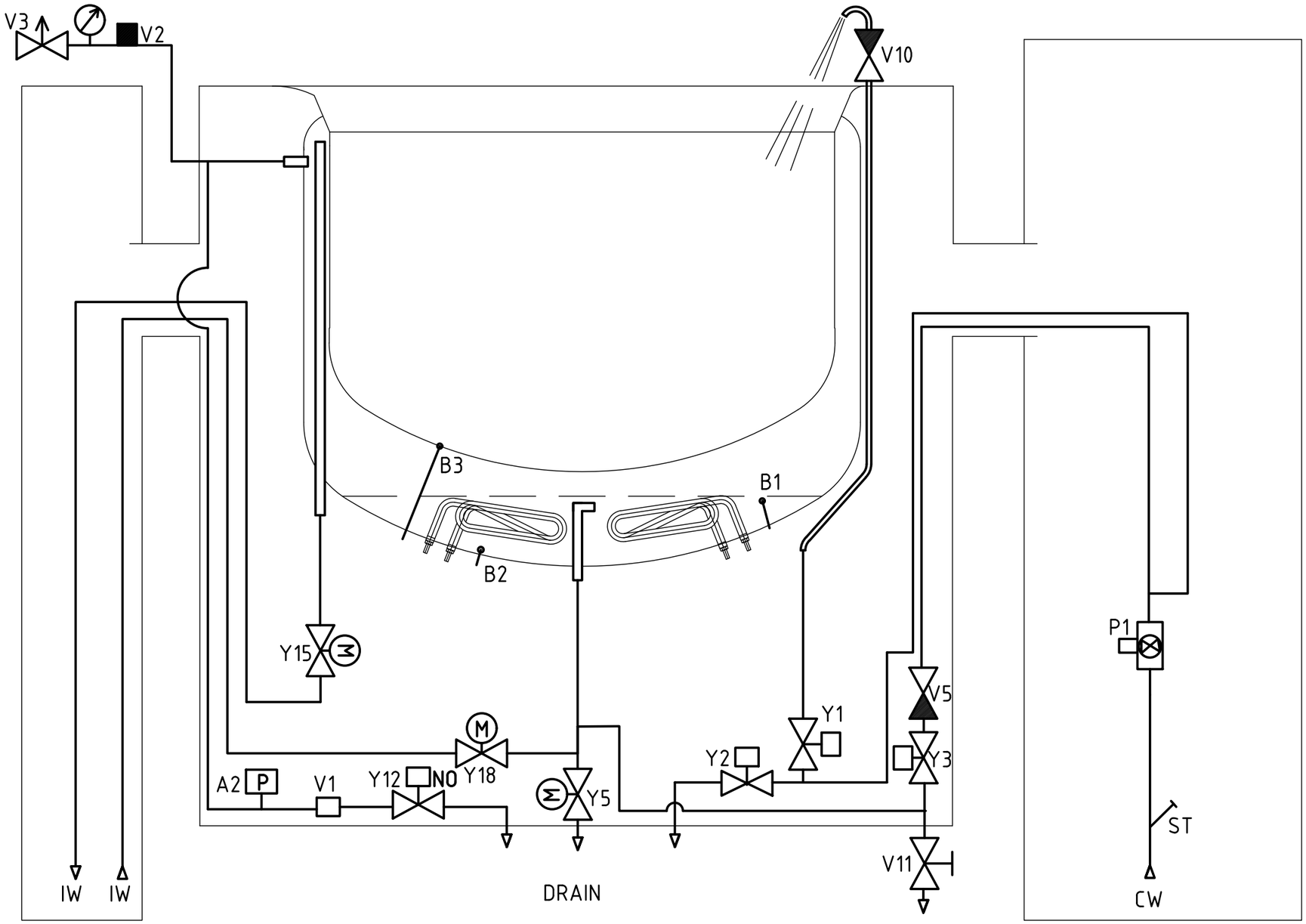
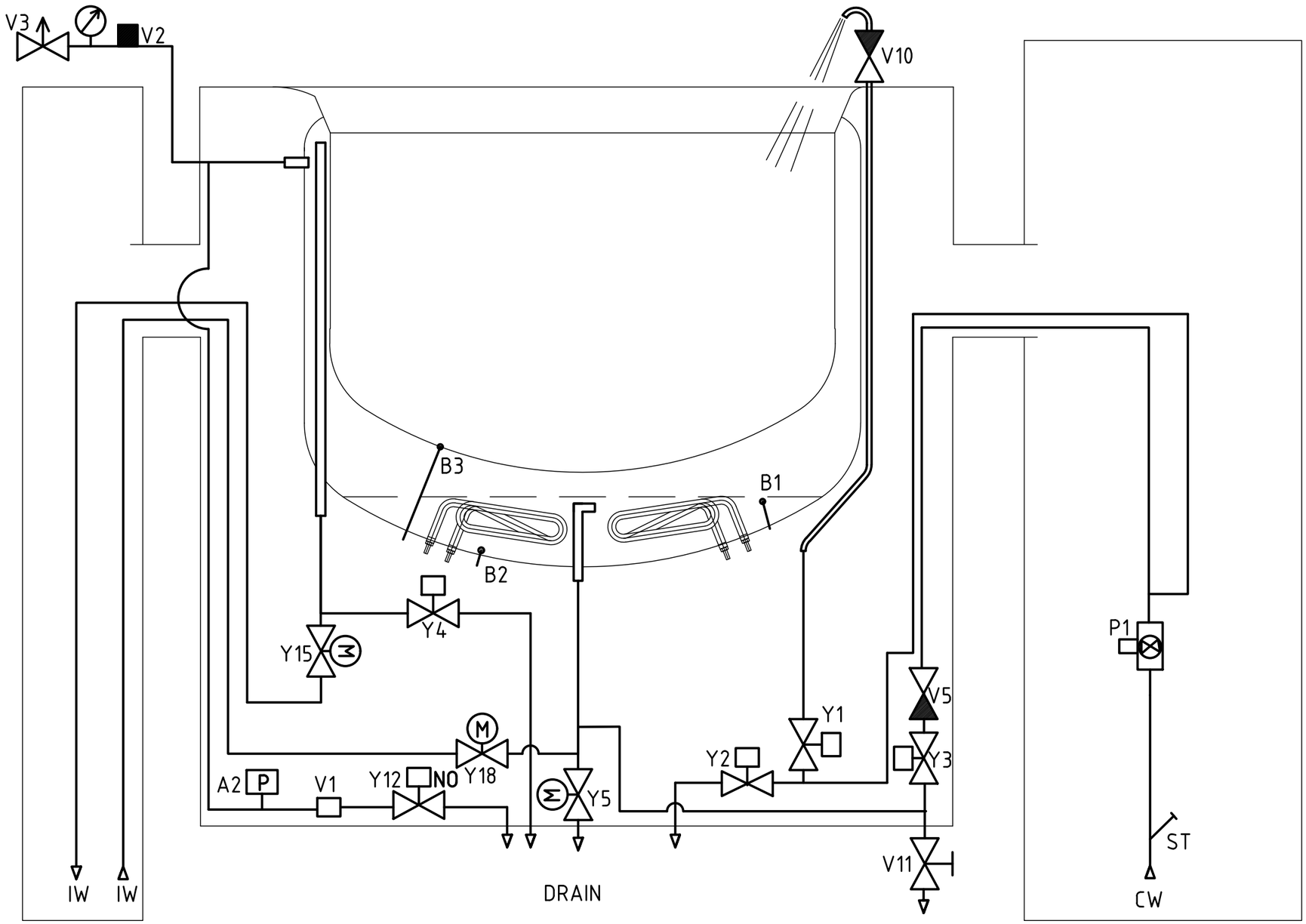
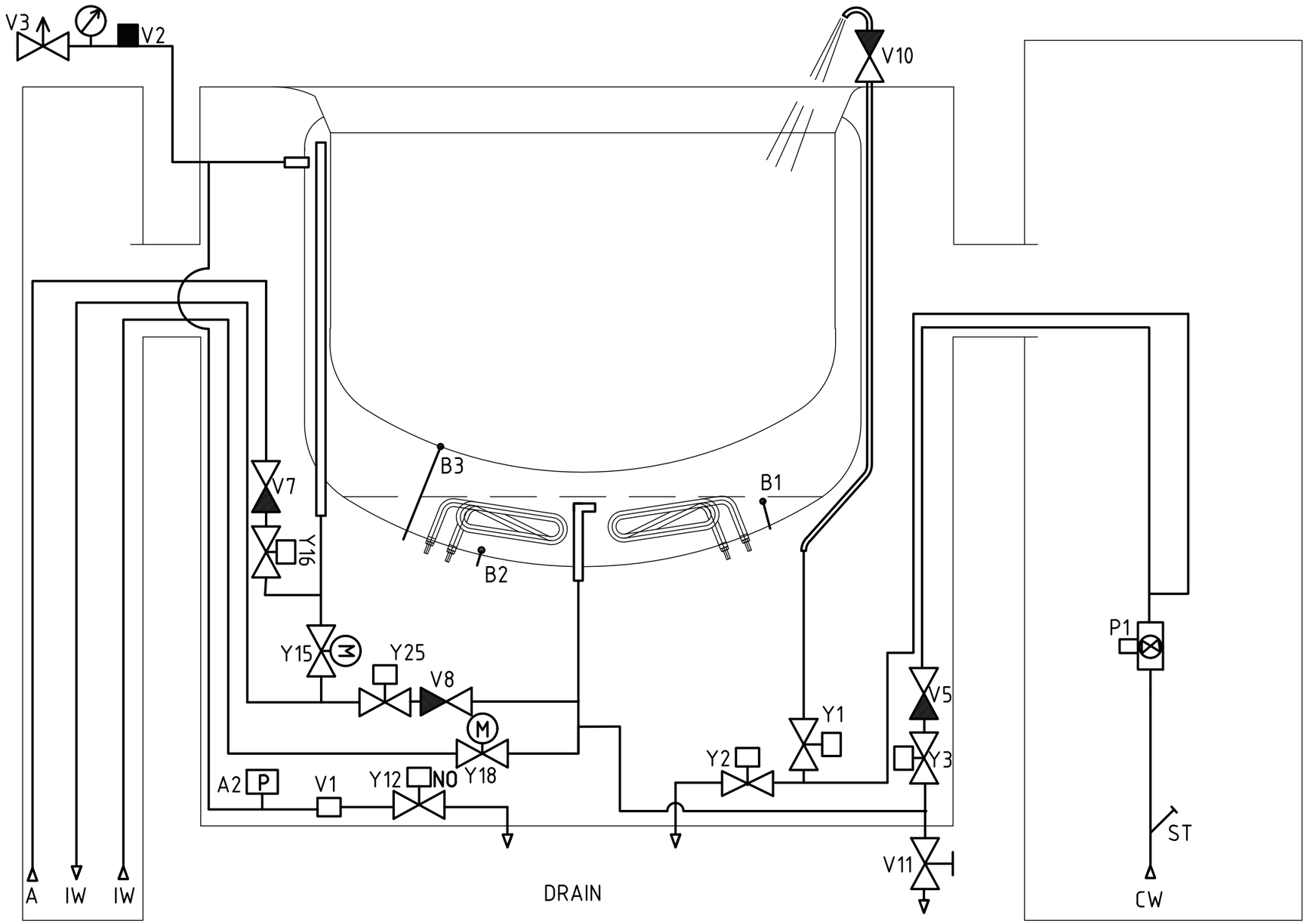
PI-DIAGRAM PROVENO E C2	Koodi		001005 A 6
			Tulostettu 31.10.2017
			Toleroimattomat mitat LT06031



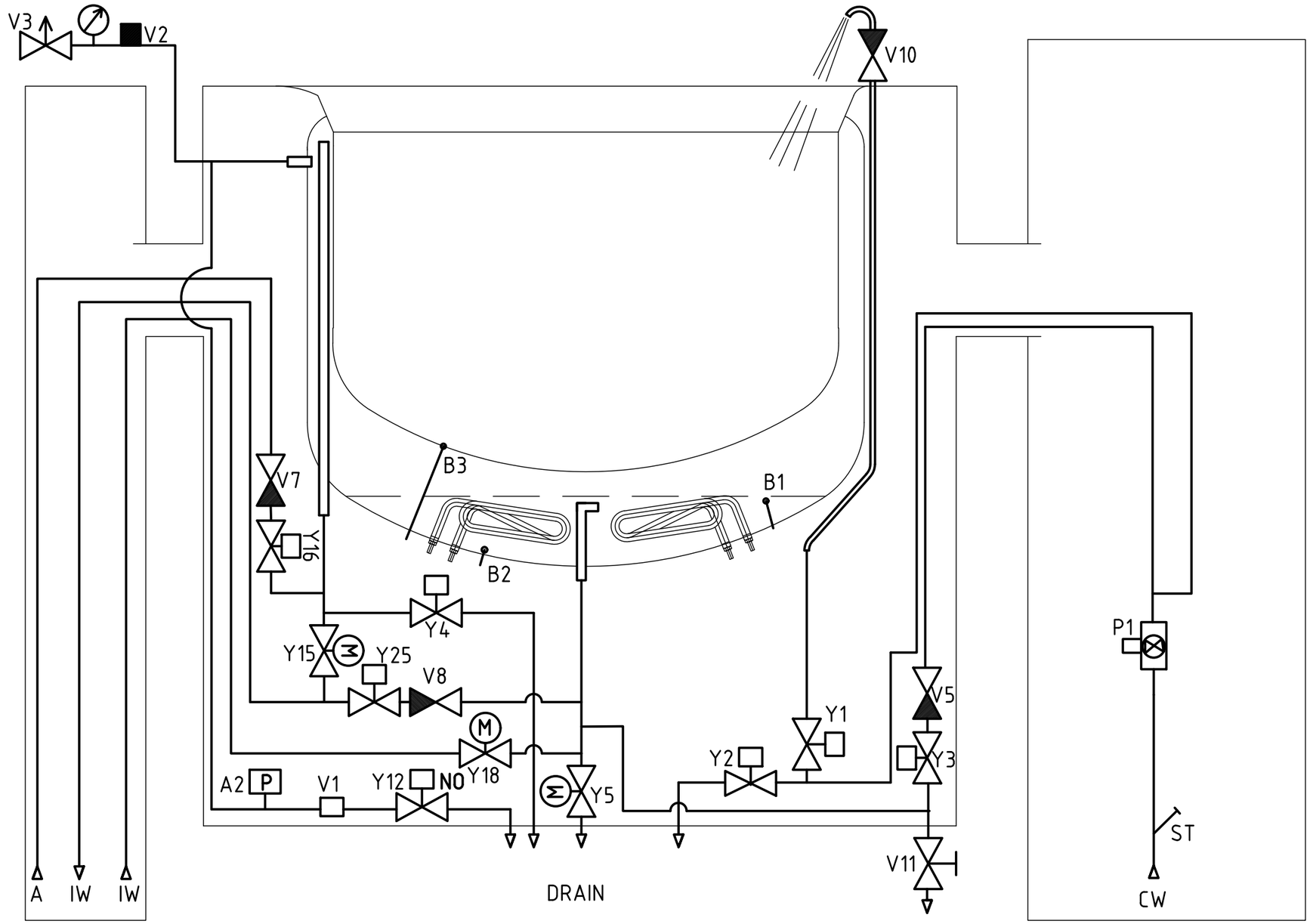
metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN
PI-DIAGRAM PROVENO E C3	Koodi		001005 A 7
			Tulostettu 31.10.2017
			Toleroimattomat mitat LT06031



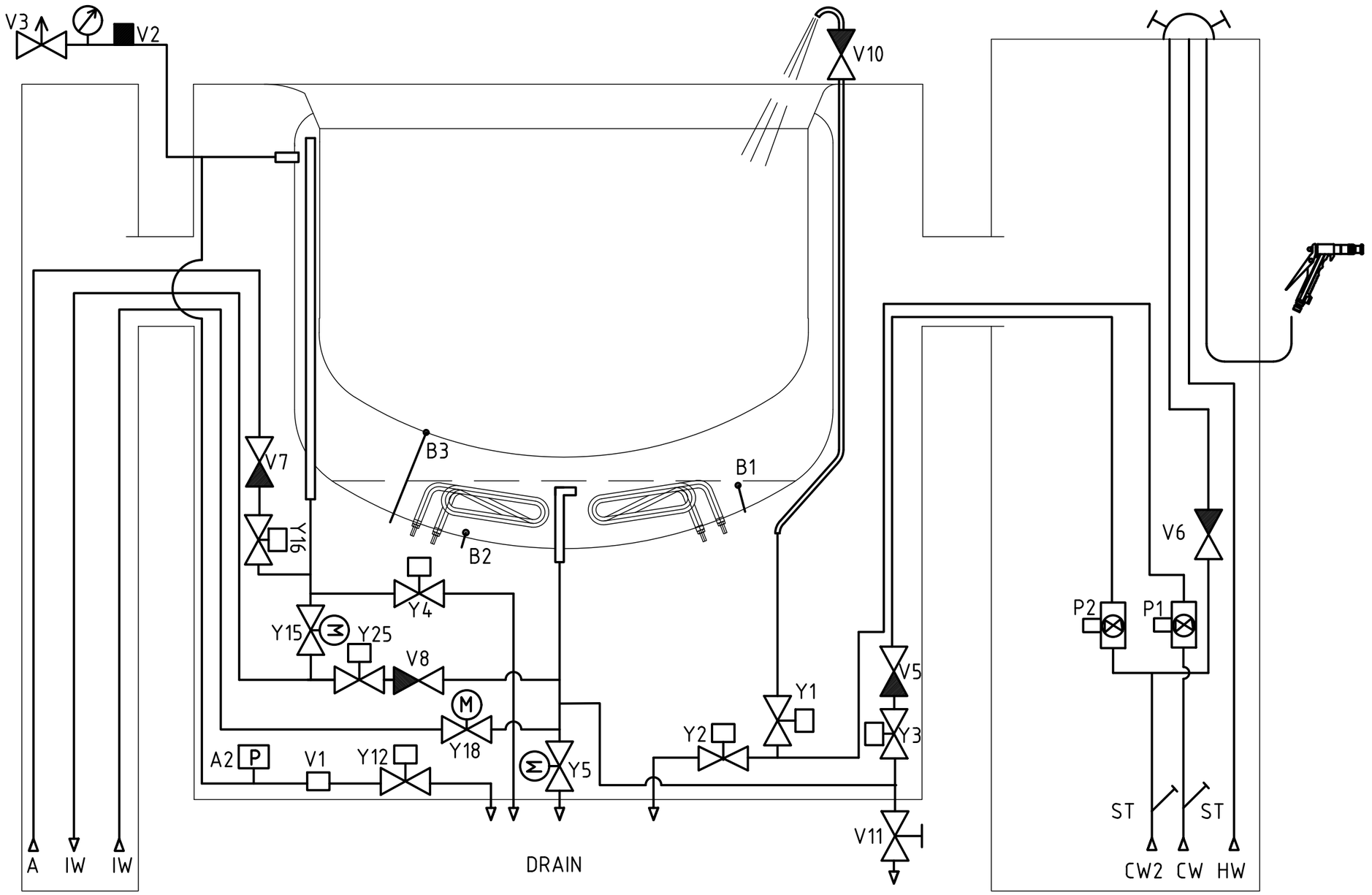
metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN
PI-DIAGRAM PROVENO SÄHKÖ C5	Koodi		001005 A 8
			Tulostettu 31.10.2017
			Toleroimattomat mitat LT06031



metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN
PI-DIAGRAM PROVENO E C3 + PA	Koodi		001005 A 9
			Tulostettu 31.10.2017
			Toleroimattomat mitat LT06031



metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN
PI-DIAGRAM PROVENO E C5 + PA	Koodi		001005 A 10
			Tulostettu 31.10.2017
			Toleroimattomat mitat LT06031



metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN

PI-DIAGRAM

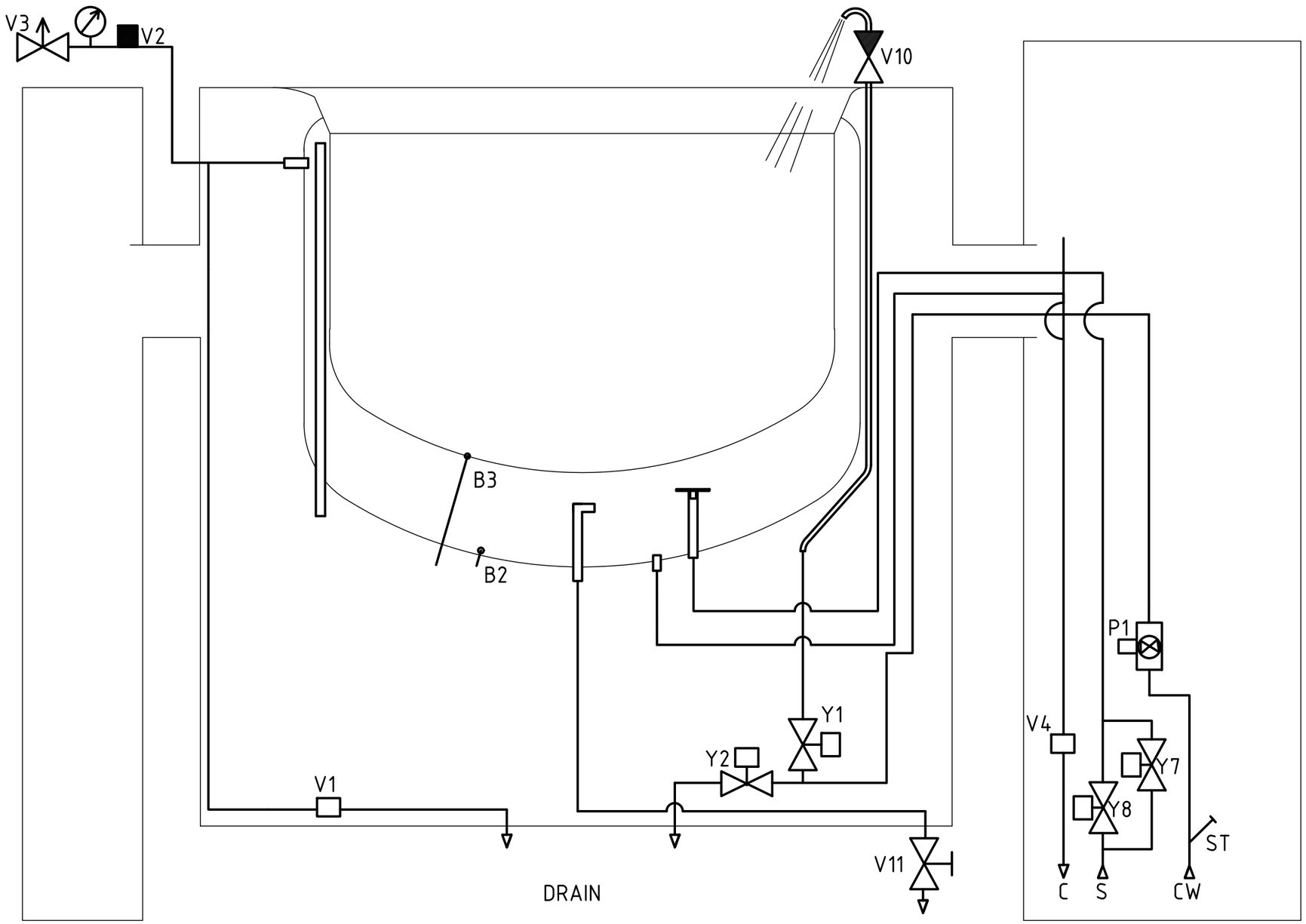
PROVENO E
C5 + PA + S1,S2,S3 + T

Koodi

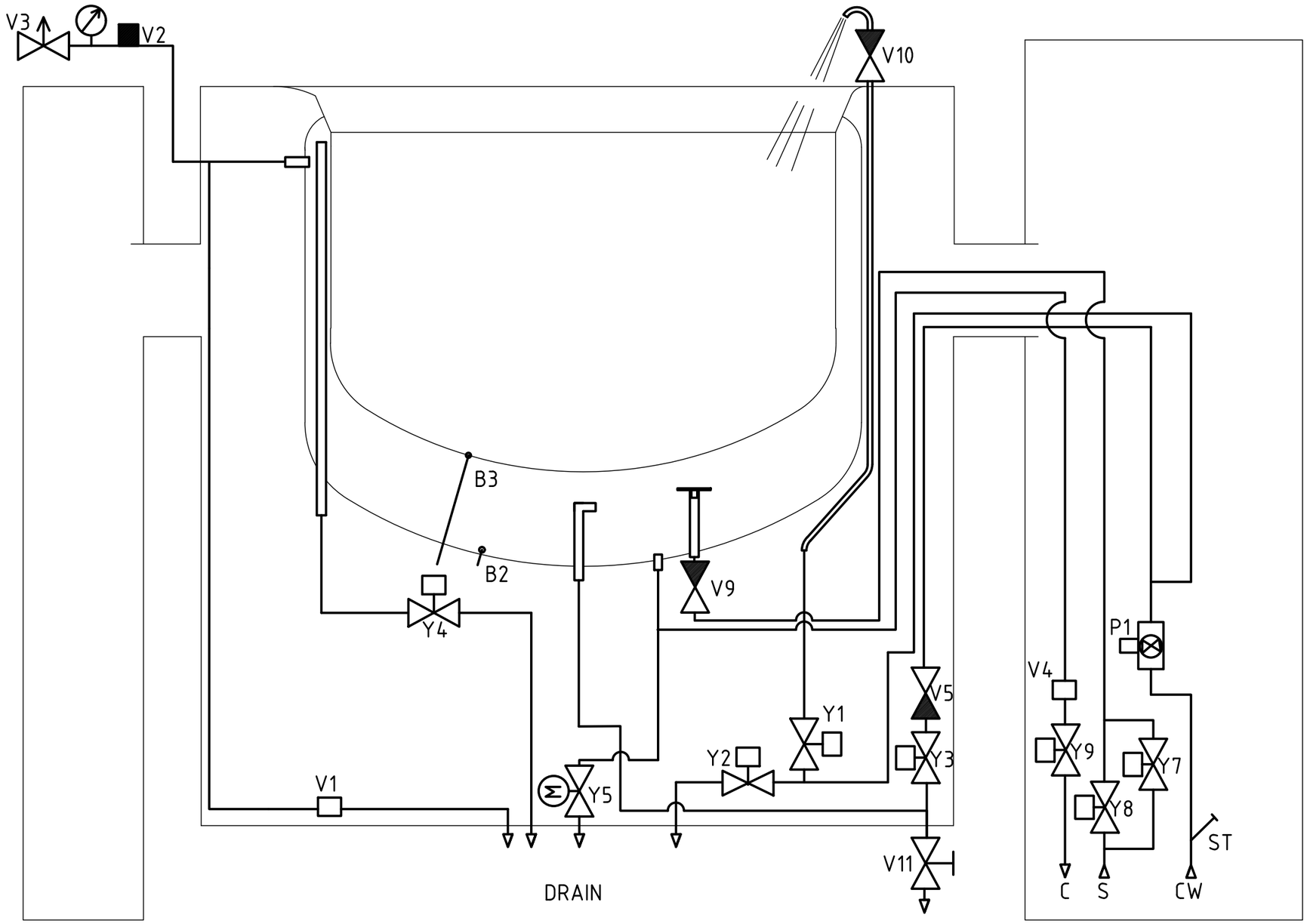
001005 A 11

Tulostettu 31.10.2017

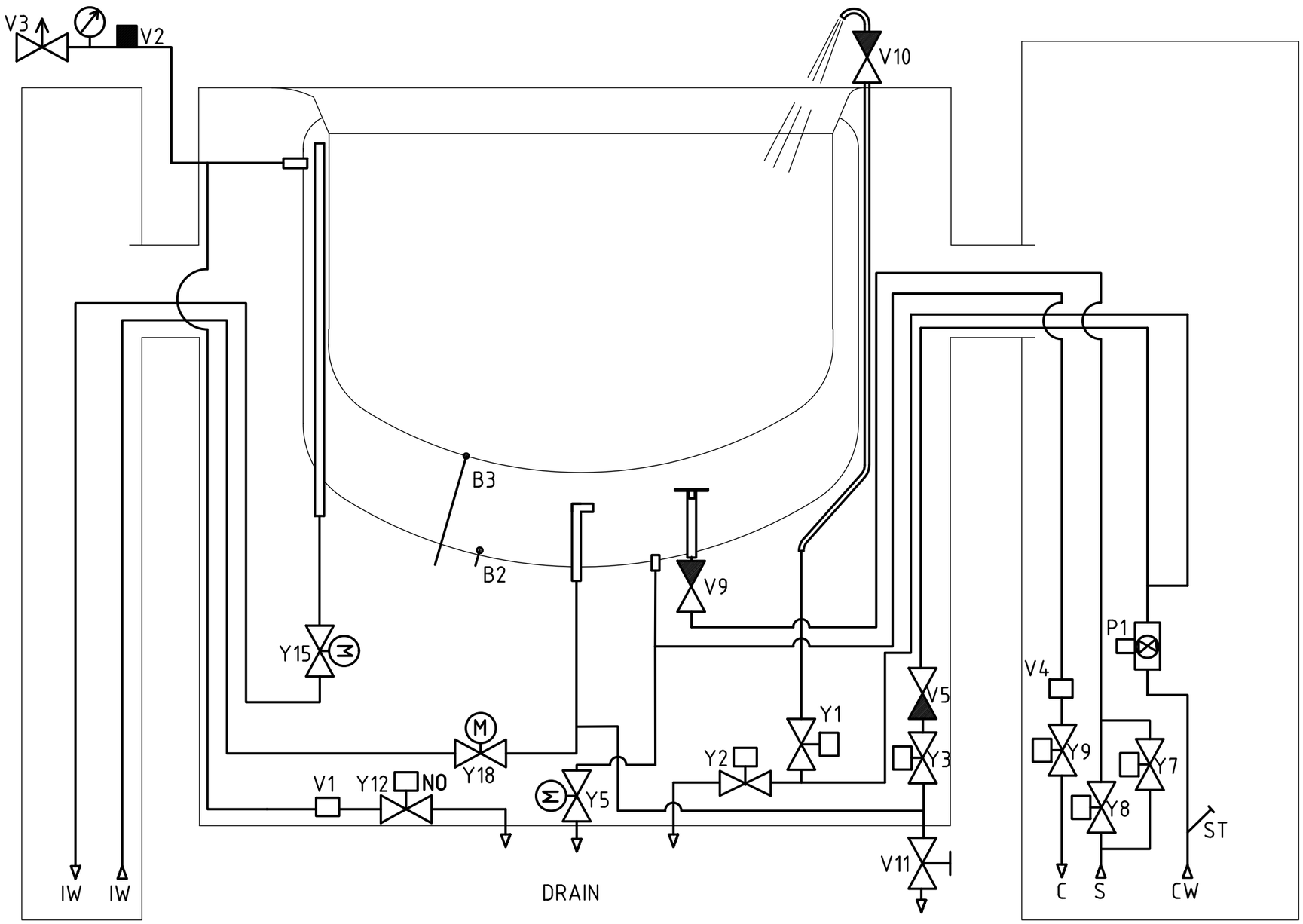
Toleroimattomat mitat LT06031



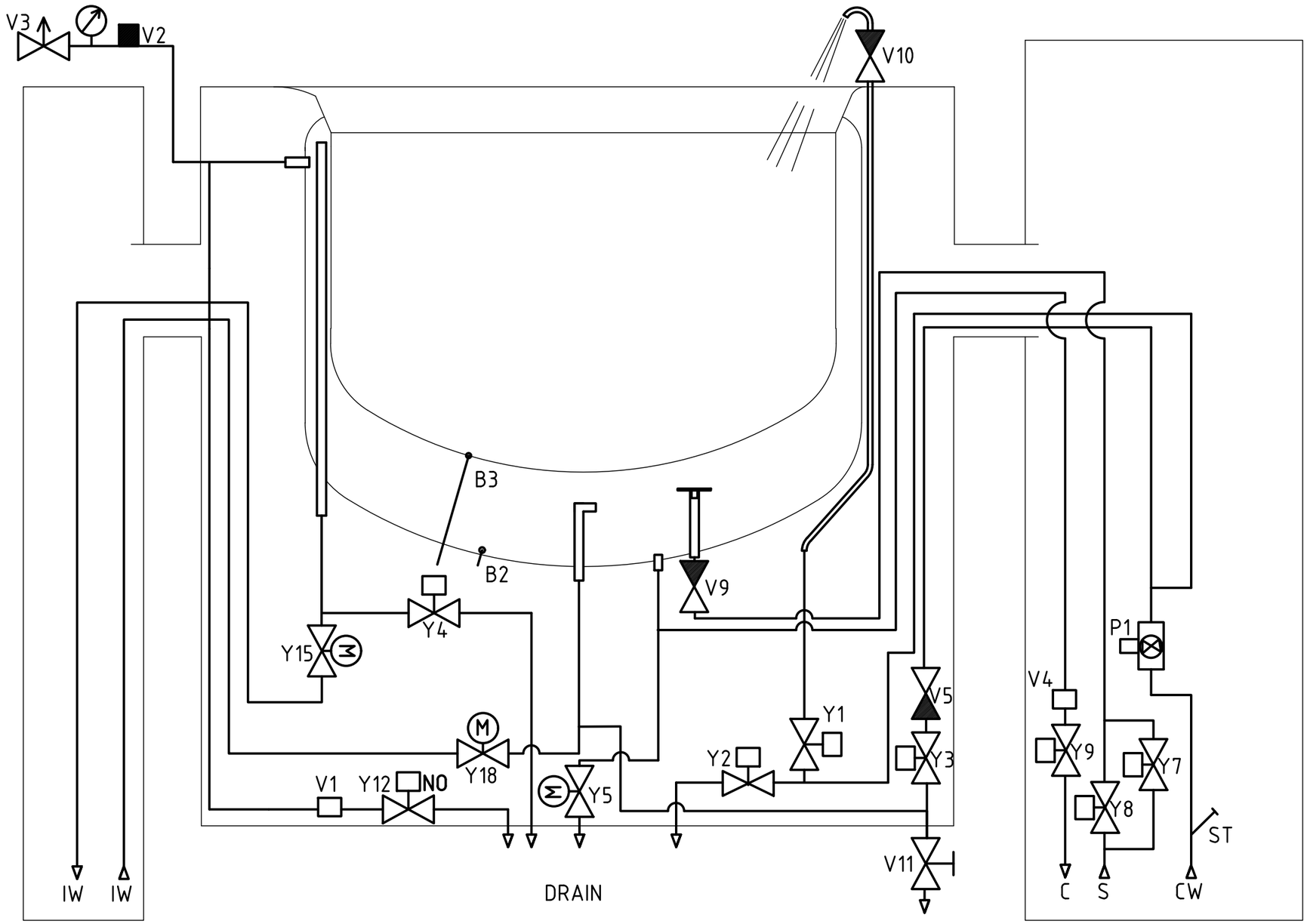
metos	Tuote PROVENO	Multi	Suhde 1:5	
	Malli		Suunn. 16.11.2016	PUUPPAN
PI-DIAGRAM PROVENO S C0 (NO COOLING)	Koodi		001005 A 12	
			Tulostettu 31.10.2017	
			Toleroimattomat mitat LT06031	



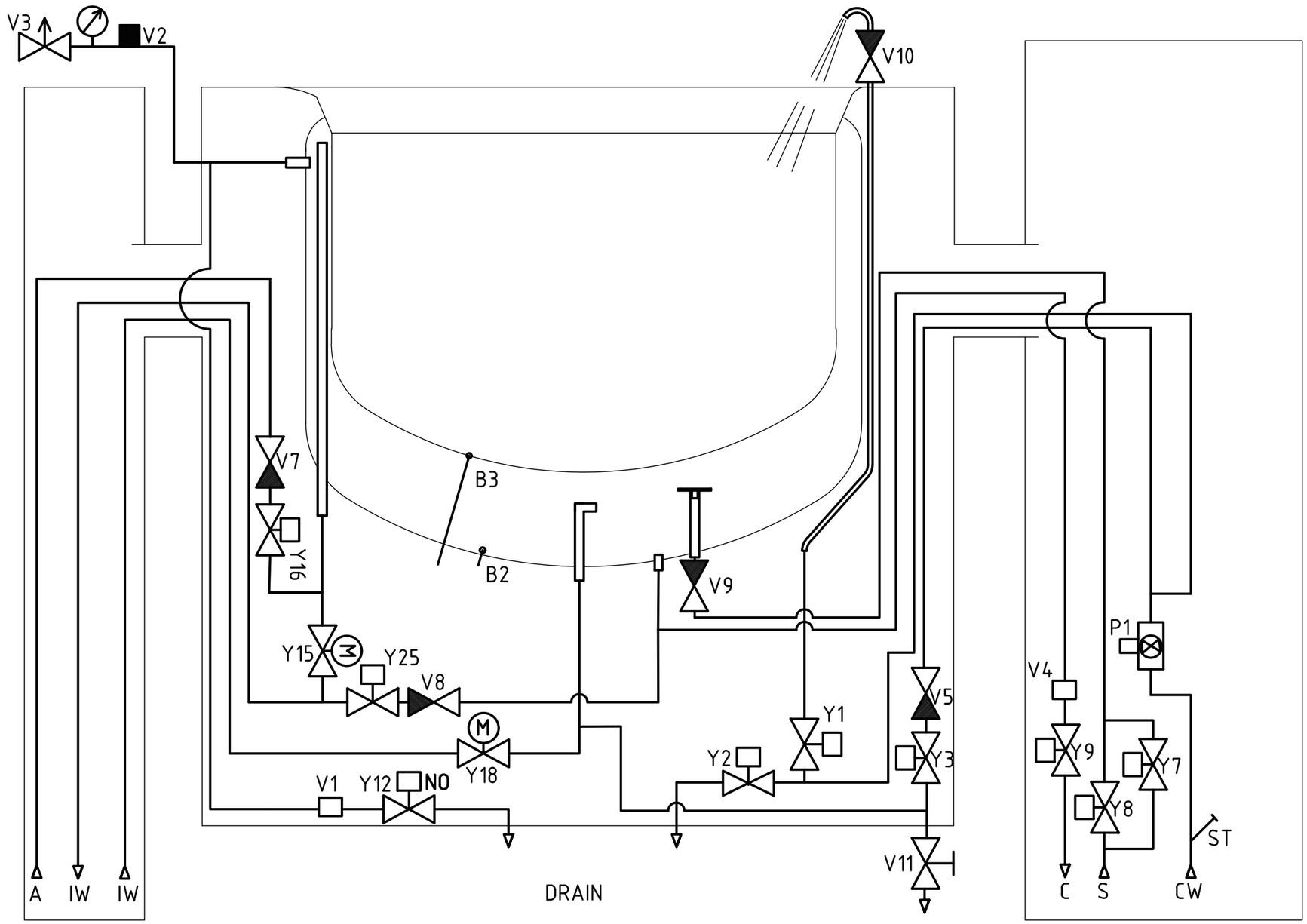
metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN
PI-DIAGRAM PROVENO S C2	Koodi		001005 A 13
			Tulostettu 31.10.2017
			Toleroimattomat mitat LT06031



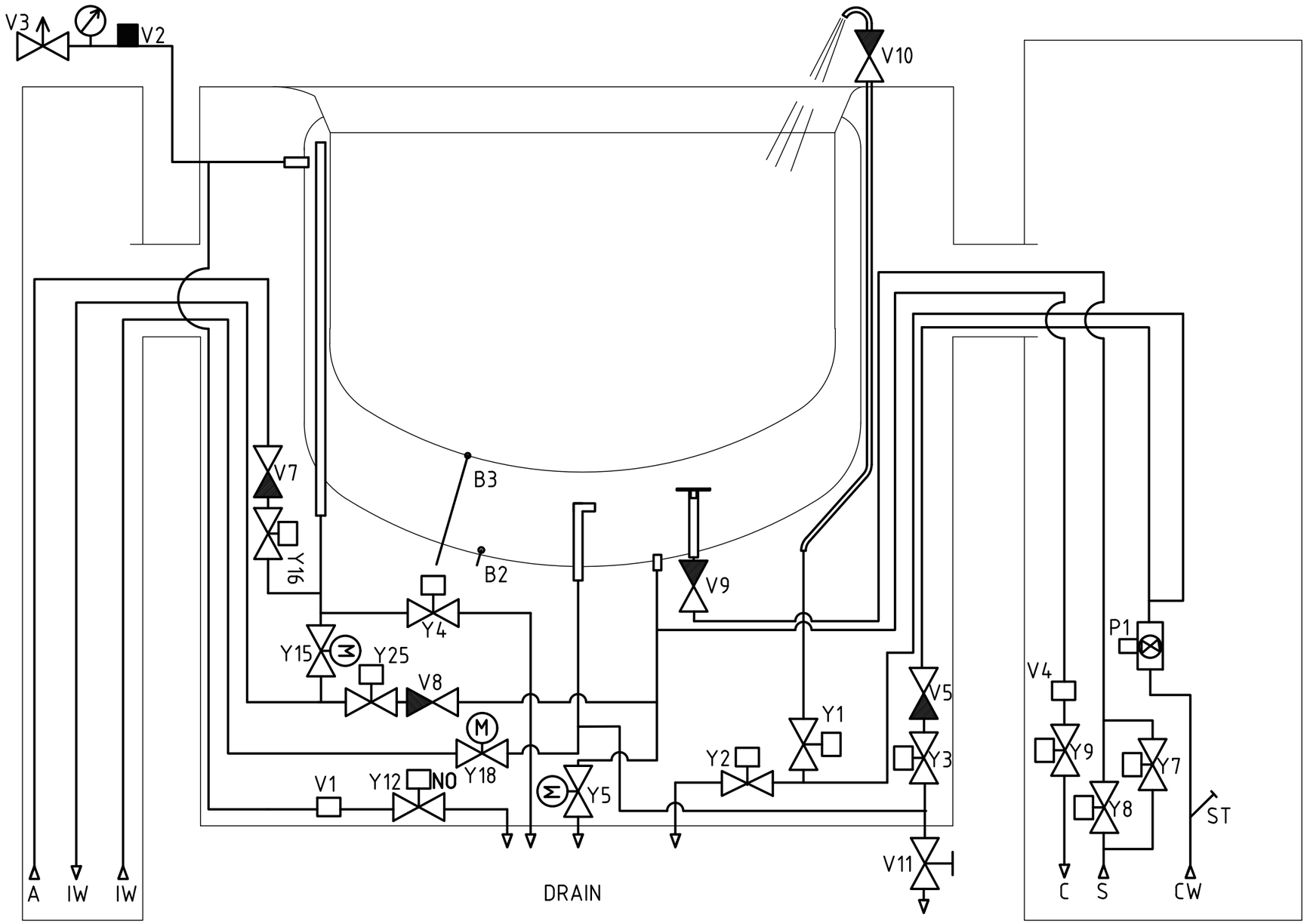
metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN
PI-DIAGRAM PROVENO S C3	Koodi		001005 A 14
			Tulostettu 31.10.2017
			Toleroimattomat mitat LT06031



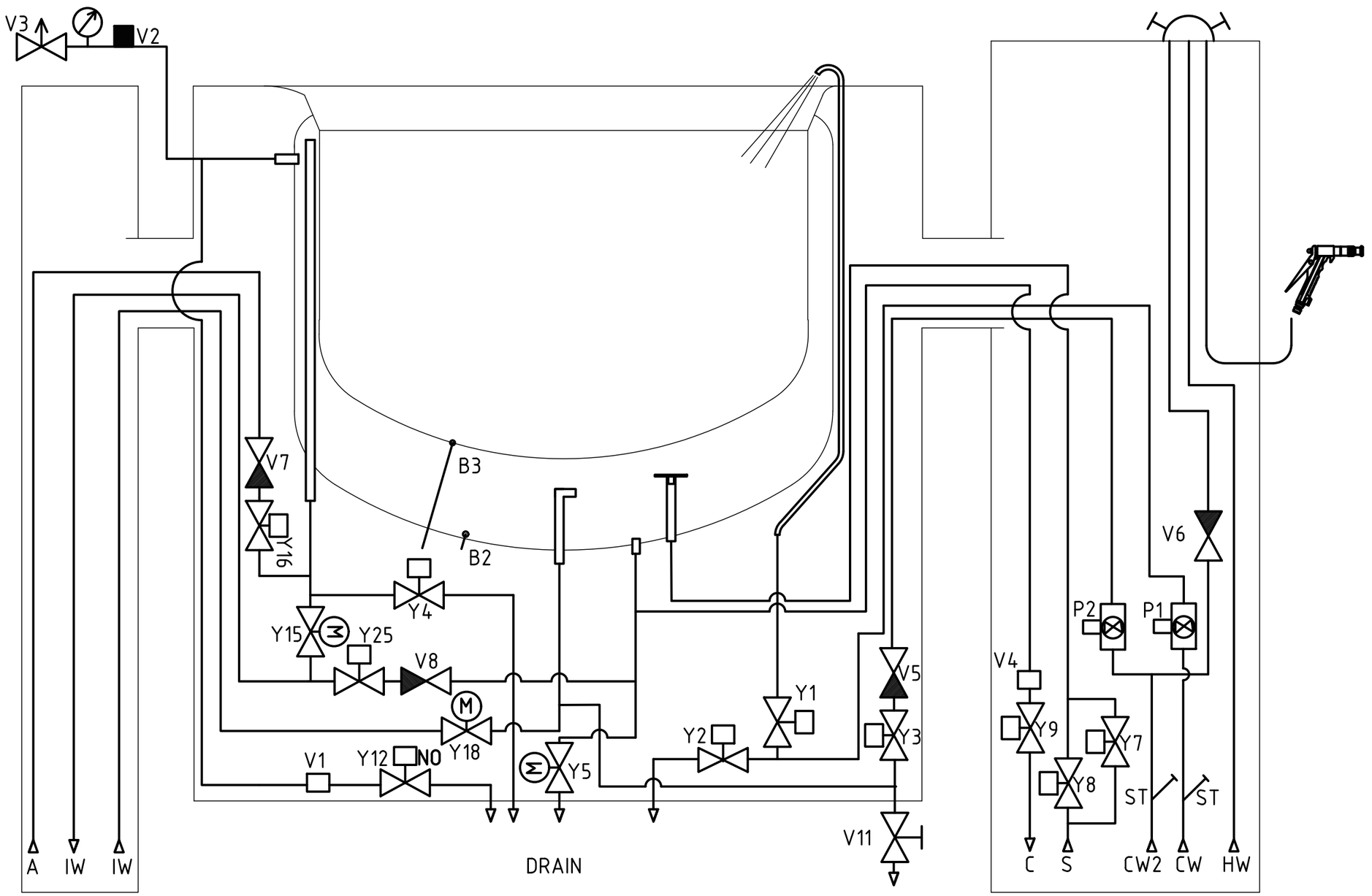
metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN
PI-DIAGRAM PROVENO S C5	Koodi		001005 A 15
			Tulostettu 31.10.2017
			Toleroimattomat mitat LT06031



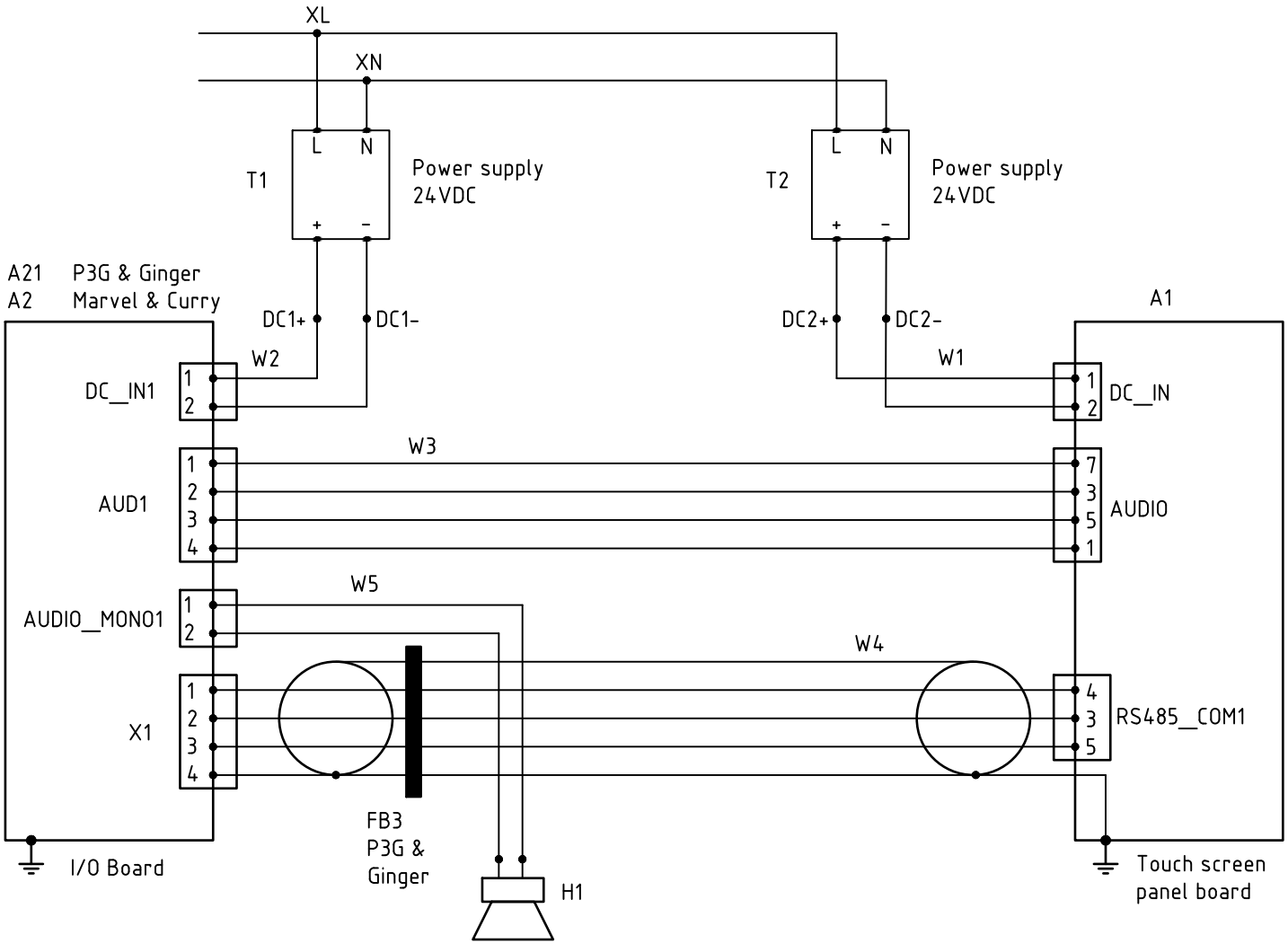
metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN
PI-DIAGRAM PROVENO S C3 + PA	Koodi		001005 A 16 Tulostettu 31.10.2017 Toleroimattomat mitat LT06031



metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN
PI-DIAGRAM PROVENO S C5 + PA	Koodi		001005 A 17
			Tulostettu 31.10.2017
			Toleroimattomat mitat LT06031



metos	Tuote PROVENO	Multi	Suhde 1:5
	Malli		Suunn. 16.11.2016 PUUPPAN
PI-DIAGRAM PROVENO S C5 + PA + S1/S2/S3 + T	Koodi		001005 A 18 Tulostettu 31.10.2017 Toleroimattomat mitat LT06031



Rev.	Muutos	Pvm.	Suunn.
G	Added to include Curry & Ginger products	7.3.2019	porthmi

metos

Tuote: Marvel / Curry / P3G / Ginger — Multi

Malli: all

Koodi

OHJAUSKAAVIO
CONTROL CIRCUIT DIAGRAM

general

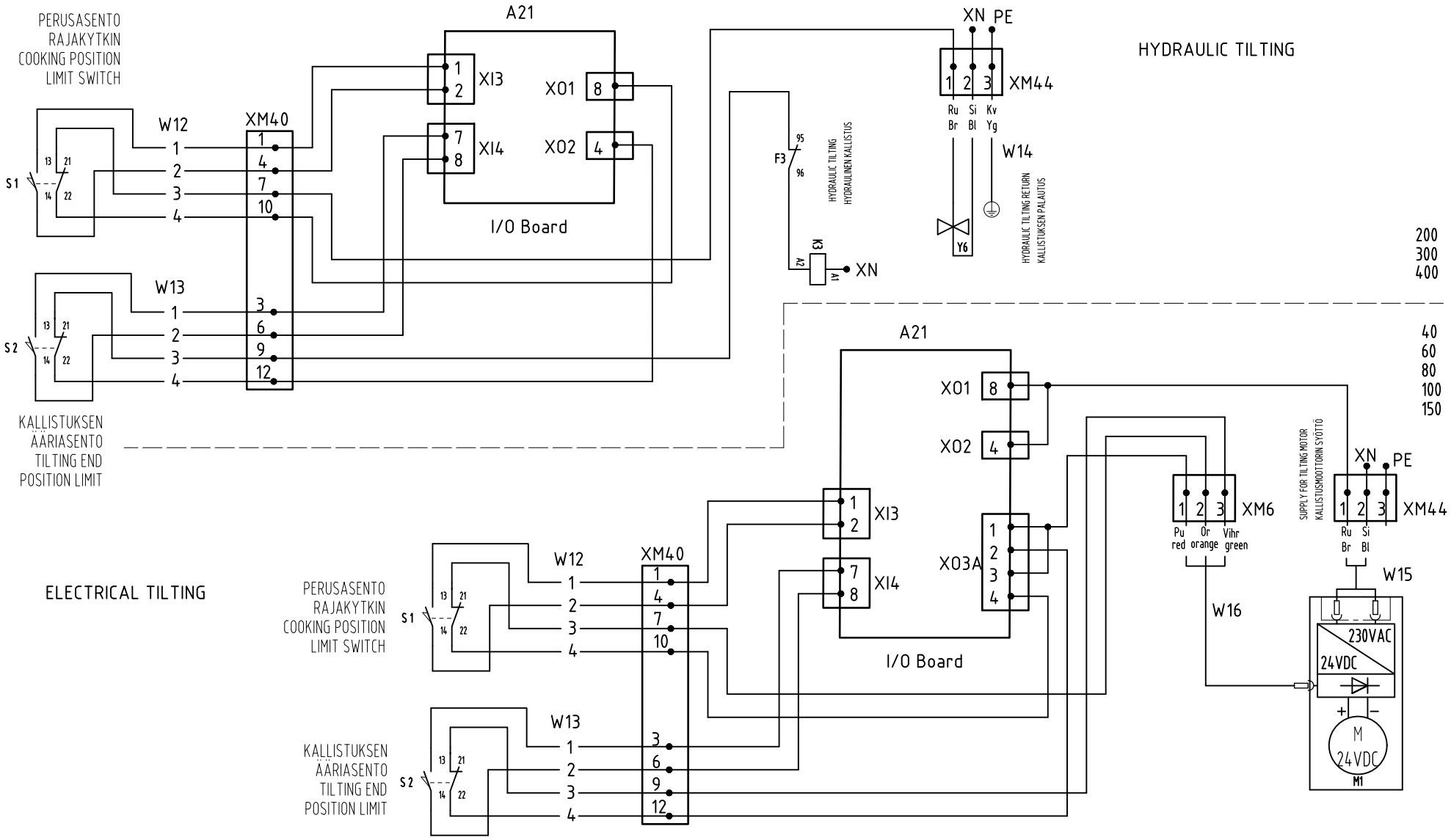
Suhde: 1:1 — Lehti: X

Suunn. 02.06.2015 porthm

Liittyy: S01026, S01028 S01029, S01030 S01031, S01049

S01027 G

Tulostettu 07.03.2019



KALLISTUS	TILTING	Vihr	Vihreä	green
24V	24V	Pu	Punainen	red
KALLISTUKSEN PALAUTUS	TILTING RETURN	Or	Oranssi	orange

D	Limit switches S1 & S2 Omron -> Bernstein, contact numbers 31,32 -> 21,22	05.06.2017	porthmi
Rev.	Muutos	Pvm.	Suunn.

metos

Tuote PROVENO P3G | Multi

Malli HYDRAULIC / ELECTRICAL TILTING

Koodi

OHJAUSKAAVIO
CONTROL CIRCUIT DIAGRAM

TILTING

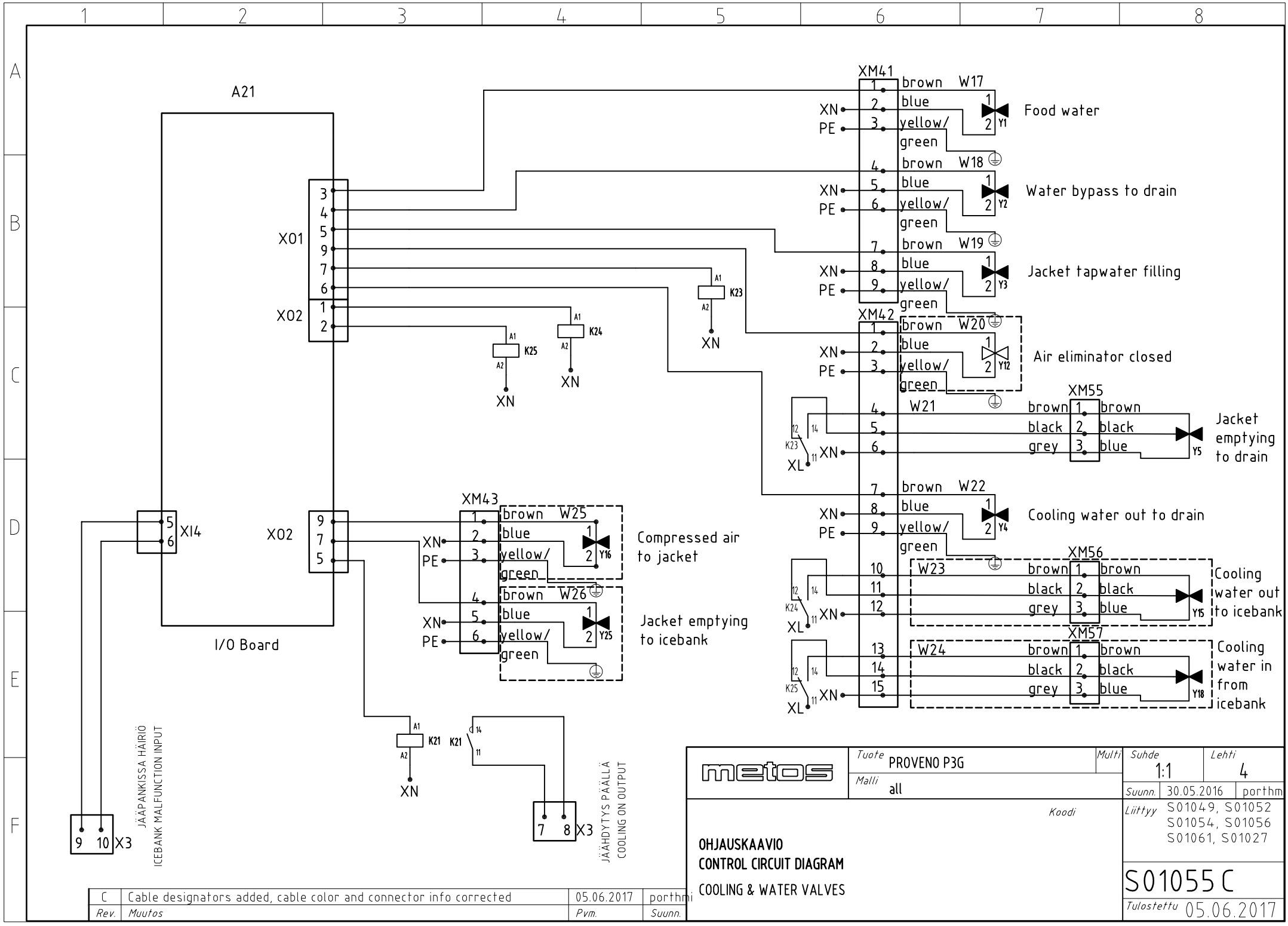
Suhde 1:1 | Lehti 3

Suunn. 24.05.2016 porthm

Liittyy S01049, S01052
S01055, S01056
S01061, S01027

S01054D

Tulostettu 08.04.2019



Rev.	Muutos	Pvm.	Suunn.
C	Cable designators added, cable color and connector info corrected	05.06.2017	porthmi

metos

Tuote PROVENO P3G — Multi

Malli all

Koodi

OHJAUSKAAVIO
CONTROL CIRCUIT DIAGRAM
COOLING & WATER VALVES

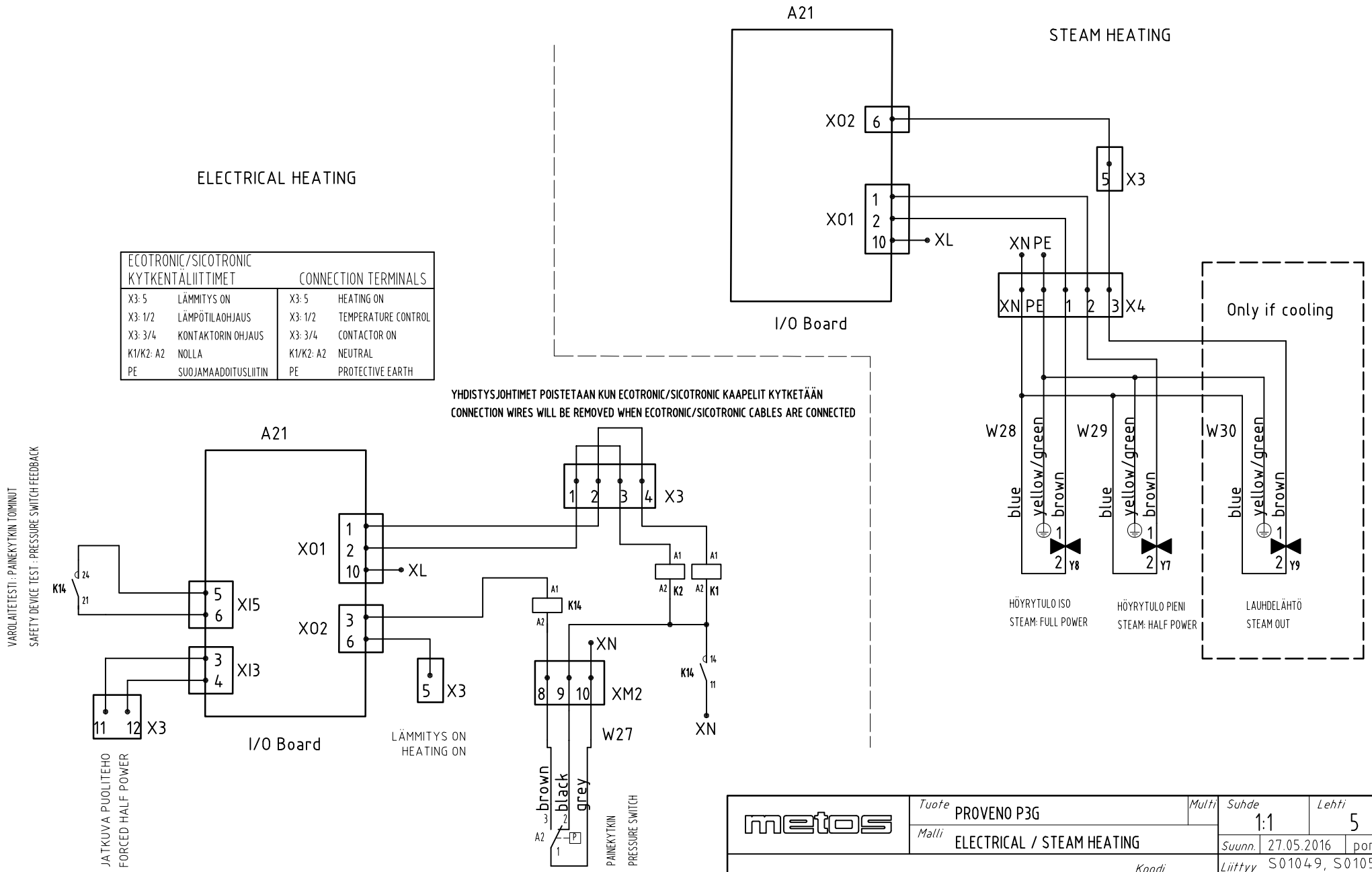
Suhde 1:1 — Lehti 4

Suunn. 30.05.2016 porthm

Liittyy S01049, S01052 S01054, S01056 S01061, S01027

S01055 C

Tulostettu 05.06.2017



Rev.	Muutos	Pvm.	Suunn.
D	Cable designators and color info updated, K4 -> K14	06.06.2017	porthm

metos

Tuote PROVENO P3G Multi

Malli ELECTRICAL / STEAM HEATING

Koodi

OHJAUSKAAVIO
CONTROL CIRCUIT DIAGRAM

HEATING

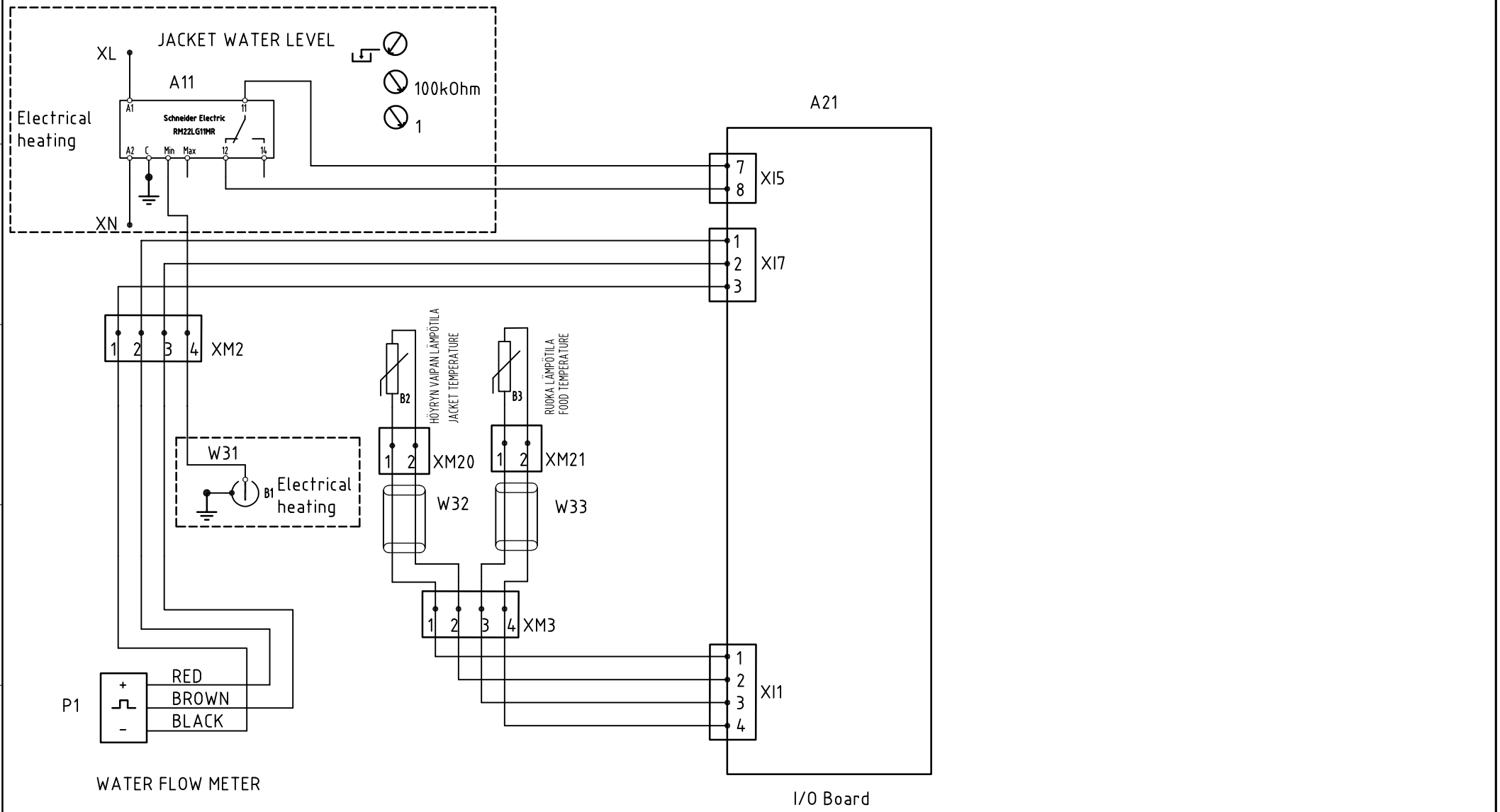
Suhde 1:1 | Lehti 5

Suunn. 27.05.2016 porthm

Liittyy S01049, S01052 S01054, S01055 S01061, S01027

S01056 D

Tulostettu 06.06.2017



Rev.	Muutos	Pvm.	Suunn.
C	Cables updated, XM19 removed	06.06.2017	porthmi

metos

Tuote PROVENO P3G | Multi

Malli all

Koodi

OHJAUSKAAVIO
CONTROL CIRCUIT DIAGRAM

TEMPERATURE, WATER LEVEL & FLOW

Suhde 1:1 | Lehti 6

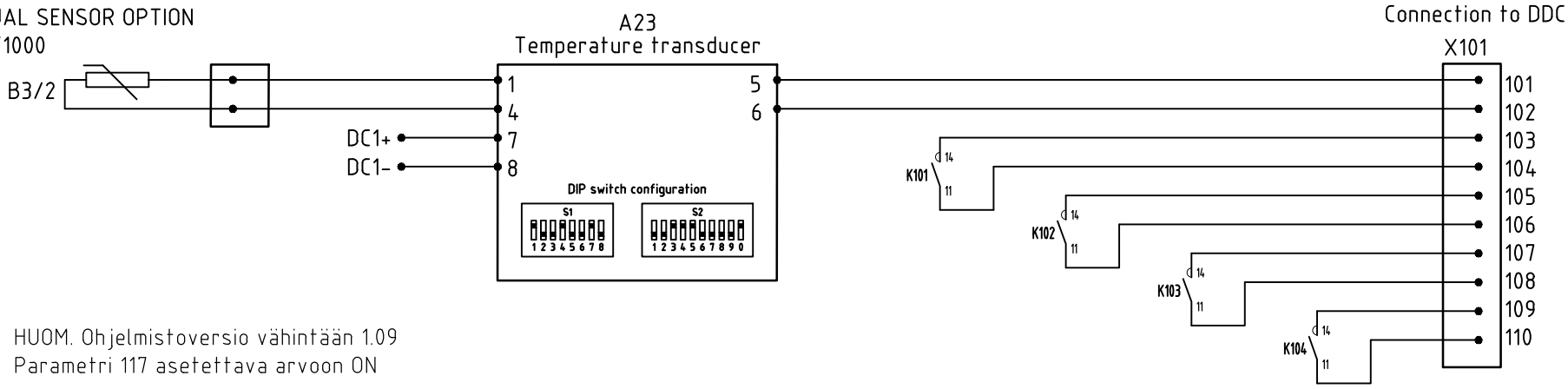
Suunn. 31.05.2016 porthm

Liittyy S01049, S01052 S01054, S01055 S01056, S01027

S01061 C

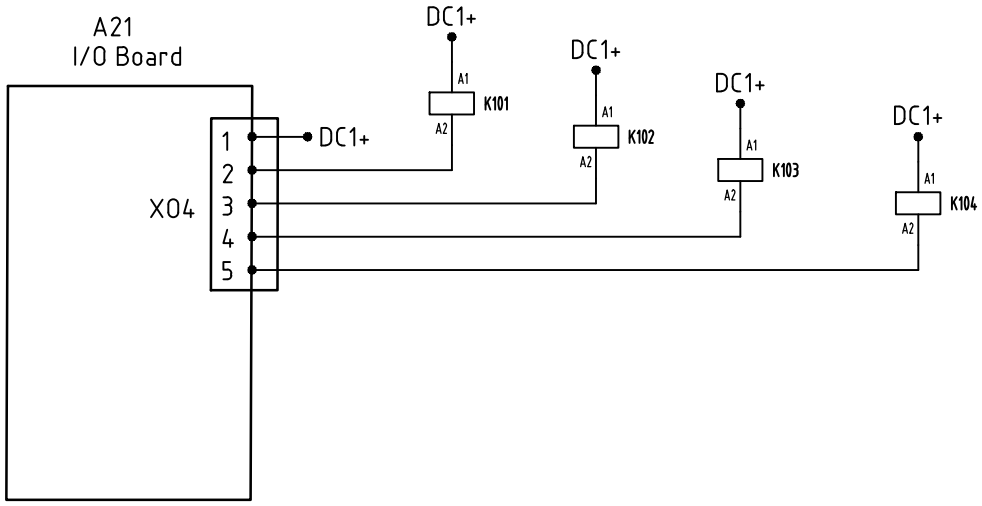
Tulostettu 06.06.2017

FOOD TEMPERATURE
DUAL SENSOR OPTION
PT1000



HUOM. Ohjelmistoversio vähintään 1.09
Parametri 117 asetettava arvoon ON

NOTE: Firmware must be version 1.09 or later
Parameter 117 must be set to ON



X101 connector signals:
101 - food temperature, active 4..20 mA output +
102 - food temperature, active 4..20 mA output -
food temperature range: -20..140 ºC
103 - heating on, potential free contact 1
104 - heating on, potential free contact 2
105 - cooling on, potential free contact 1
106 - cooling on, potential free contact 2
107 - mixing on, potential free contact 1
108 - mixing on, potential free contact 2
109 - alarm active, potential free contact 1
110 - alarm active, potential free contact 2

Rev.	Muutos	Pvm.	Suunn.
C	Added A23 DIP switch configuration and mention of sw and parameters	6.8.2018	saloka

metos

Tuote PROVENO P3G | Multi

Malli all

Koodi

OHJAUSKAAVIO
CONTROL CIRCUIT DIAGRAM

DDC connection option

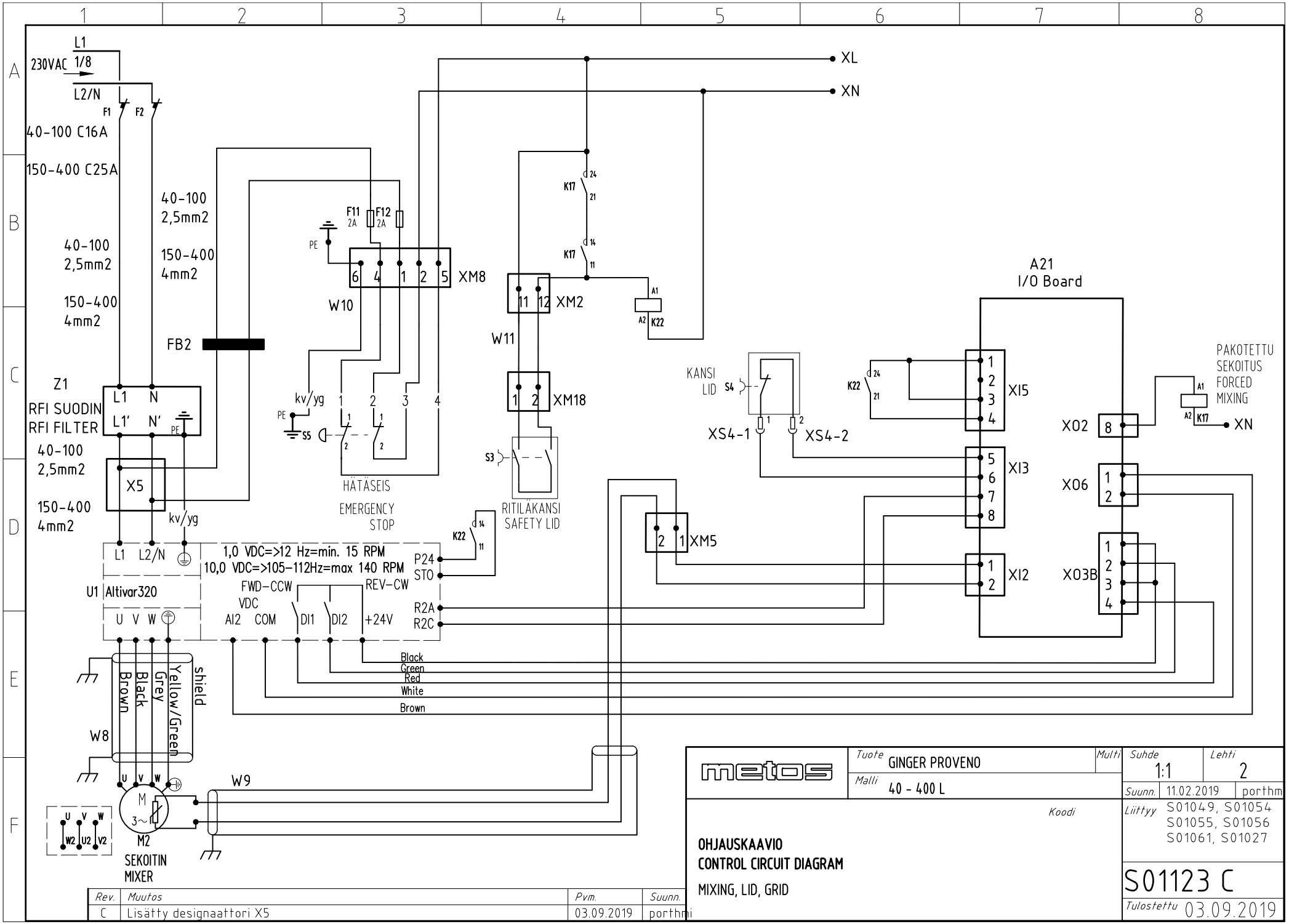
Suhde 1:1 | Lehti 8

Suunn. 15.2.2018 porthm

Liittyy S01049, S01054
S01055, S01056
S01061, S01027

S01110 C

Tulostettu 9.8.2018



Rev.	Muutos	Pvm.	Suunn.
C	Lisätty designaattori X5	03.09.2019	porthmi

metos

Tuote	GINGER PROVENO	Multi
Malli	40 - 400 L	
Koodi		

OHJAUSKAAVIO
CONTROL CIRCUIT DIAGRAM

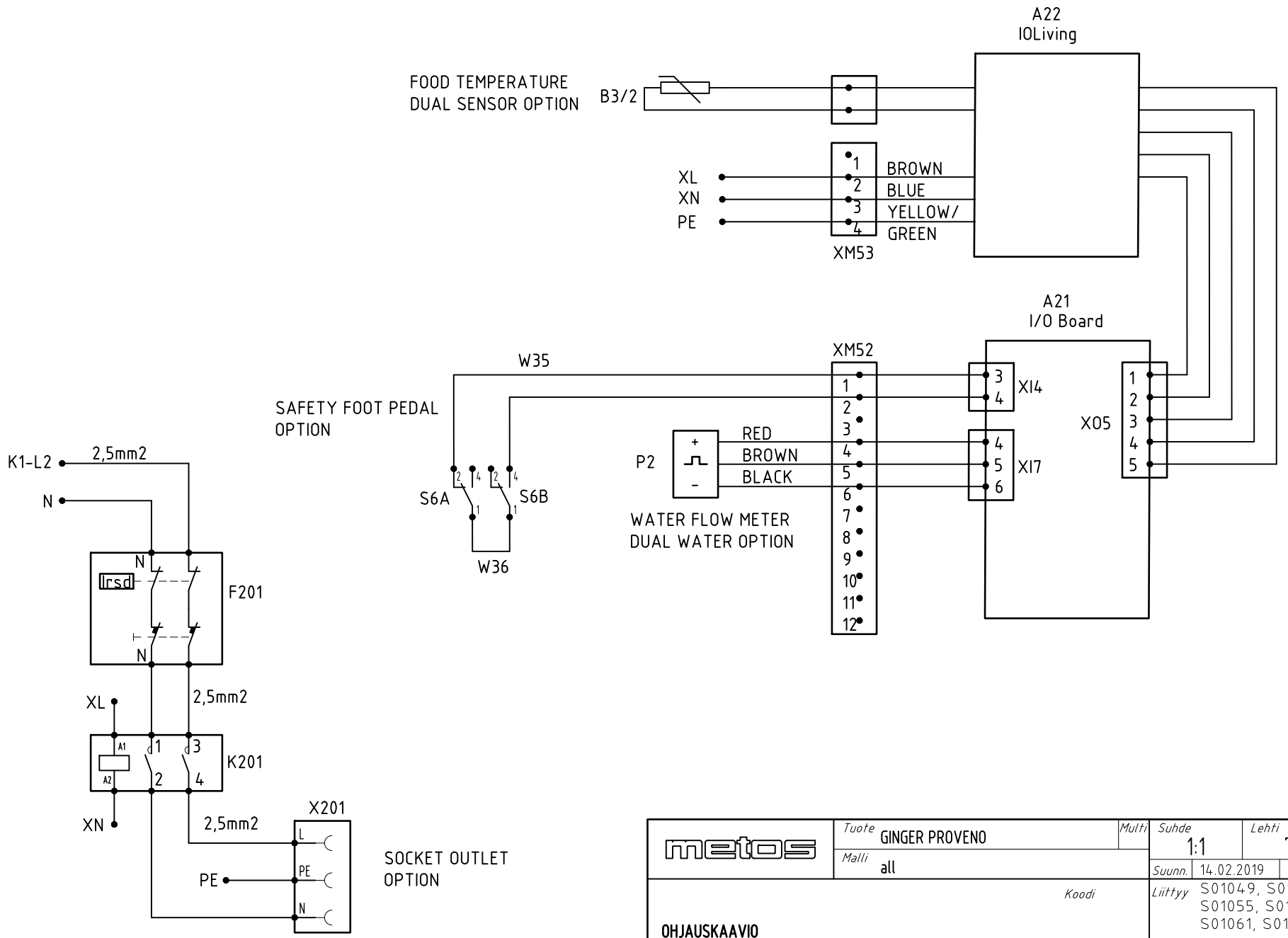
MIXING, LID, GRID

Suhde	Lehti
1:1	2
Suunn. 11.02.2019	porthm

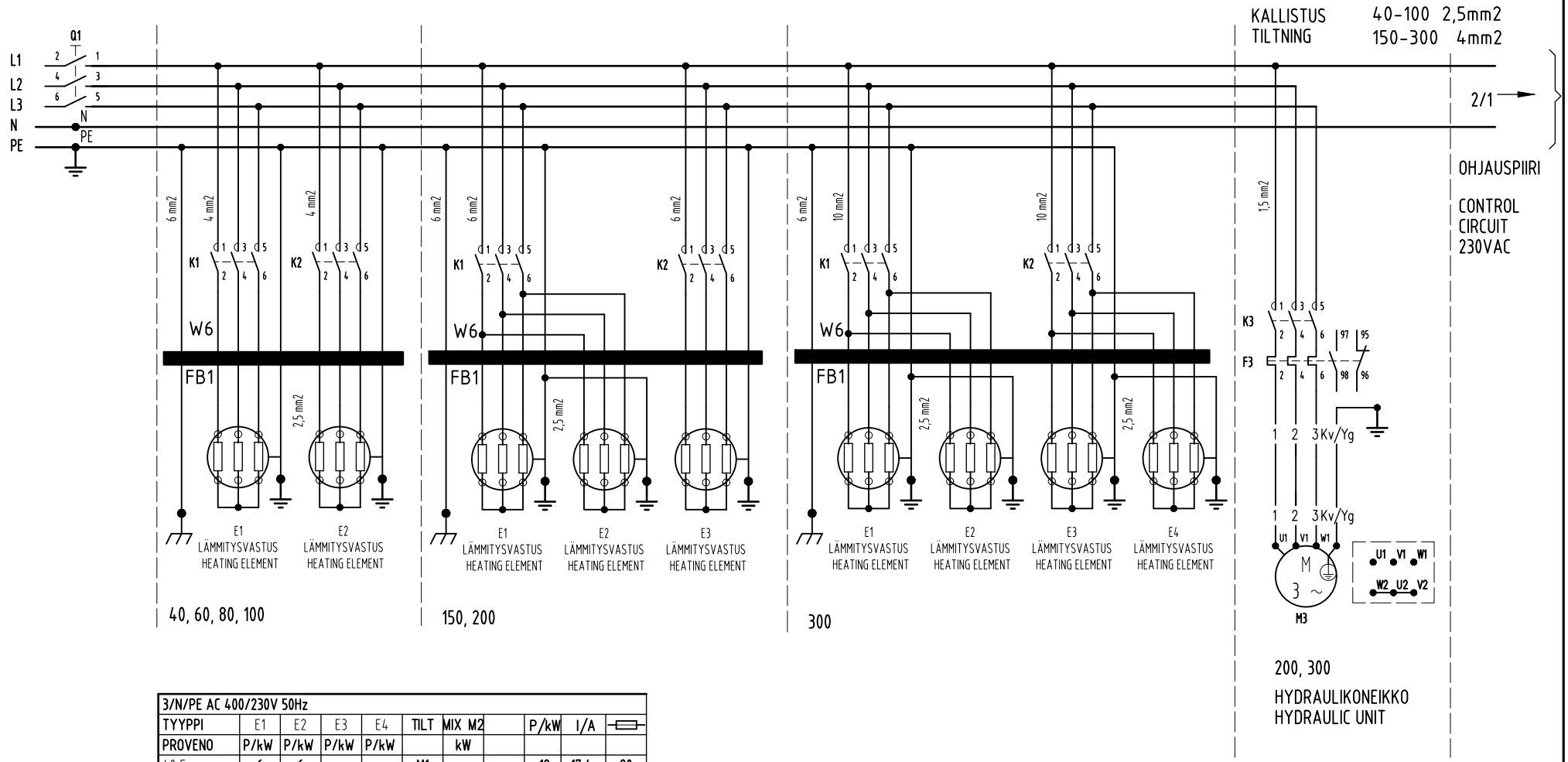
Liittyy S01049, S01054
S01055, S01056
S01061, S01027

S01123 C

Tulostettu 03.09.2019



metos	Tuote GINGER PROVENO	Multi	Suhde 1:1	Lehti 7
	Malli all		Suunn. 14.02.2019	porthm
	Koodi		Liittyy S01049, S01054 S01055, S01056 S01061, S01027	
OHJAUSKAAVIO CONTROL CIRCUIT DIAGRAM OPTIONS			S01125 A	
			Tulostettu 14.02.2019	



3/N/PE AC 400/230V 50Hz										
TYYPPI	E1	E2	E3	E4	TILT	MIX M2		P/kW	I/A	
PROVENO	P/kW	P/kW	P/kW	P/kW		kW				
40 E	6	6	-	-	M1	-		12	17,4	20
40 EM	6	6	-	-	M1	0,75		14	26,1	32
60 E	8	8	-	-	M1	-		16	23,2	25
60 EM	8	8	-	-	M1	0,75		18	31,9	32
80 E	10	10	-	-	M1	-		20	29,0	32
80 EM	10	10	-	-	M1	0,75		22	37,7	40
100 E	10	10	-	-	M1	-		20	29,0	32
100 EM	10	10	-	-	M1	0,75		22	37,7	40
150 E	8	8	8	-	M1	-		24	34,8	35
150 EM	8	8	8	-	M1	1,5		27,6	50,5	63
200 E	10	12	12	-	M3	-		34	49,3	50
200 EM	10	12	12	-	M3	1,5		37,6	65	80
300 E	12	12	12	12	M3	-		48	69,6	80
300 EM	12	12	12	12	M3	1,5		51,6	85,3	100

metos

Tuote GINGER PROVENO — Multi

Malli 40 - 300 L Electrical heating

Koodi

Suhde 1:1 | Lehti 1

Suunn. 25.03.2019 porthm

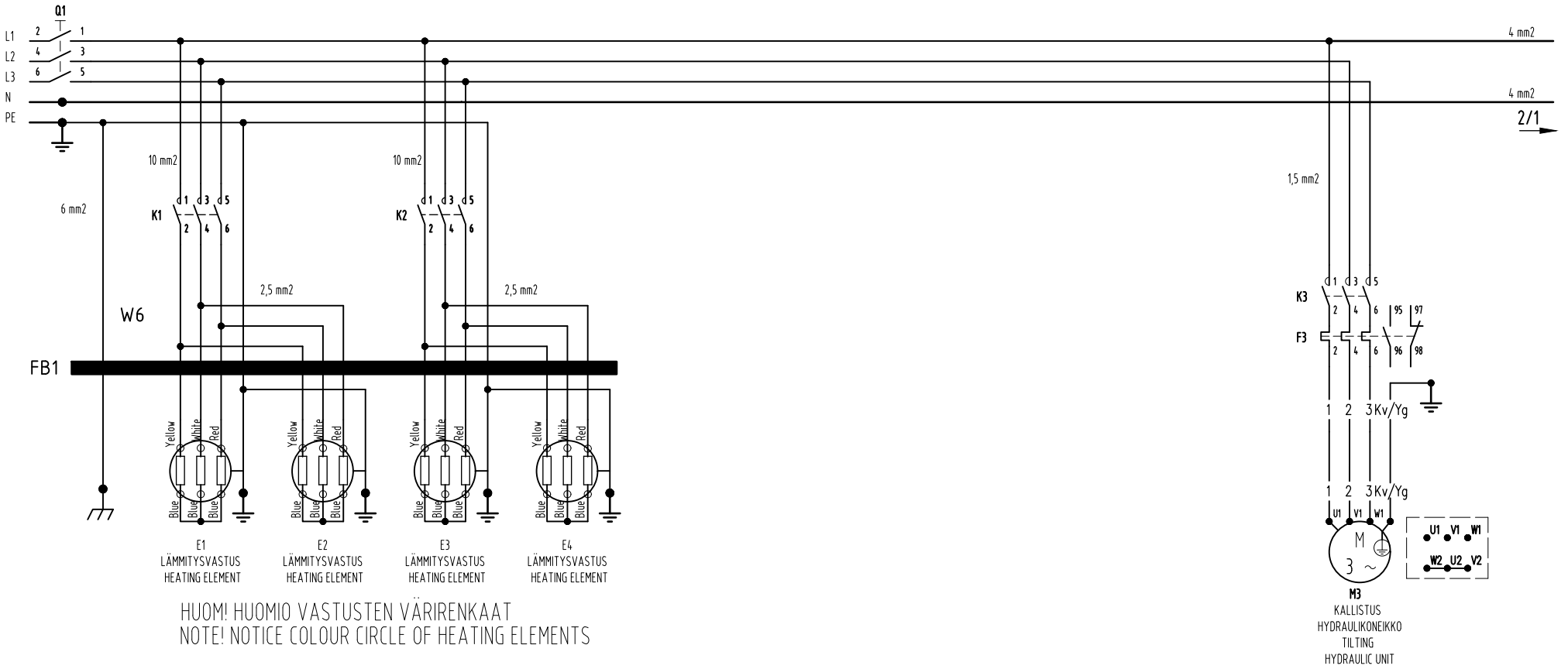
Liittyy

PÄÄKAAVIO
MAIN CIRCUIT DIAGRAM

3/N/PE AC 400/230V 50-60Hz

S01131 A

Tulostettu 25.03.2019



HUOM! HUOMIO VASTUSTEN VÄRIRENKAAT
NOTE! NOTICE COLOUR CIRCLE OF HEATING ELEMENTS

3/N/PE 400/230V 50–60Hz										
TYYPPI	400/230V							3/N/PE 400/230V		
TYPE	E1	E2	E3	E4	TILT	MIX M2		P/kW	I/A	
	P/kW	P/kW	P/kW	P/kW		kW				
400 E	14,4	14,4	14,4	14,4	M3	–		57,6	86,6	100
400 EM	14,4	14,4	14,4	14,4	M3	2,2		62,4	95,6	100

metos

Tuote GINGER PROVENO | Multi

Malli 400L Electrical heating

Koodi

PÄÄKAAVIO
MAIN CIRCUIT DIAGRAM

3/N/PE 400/230V 50-60Hz

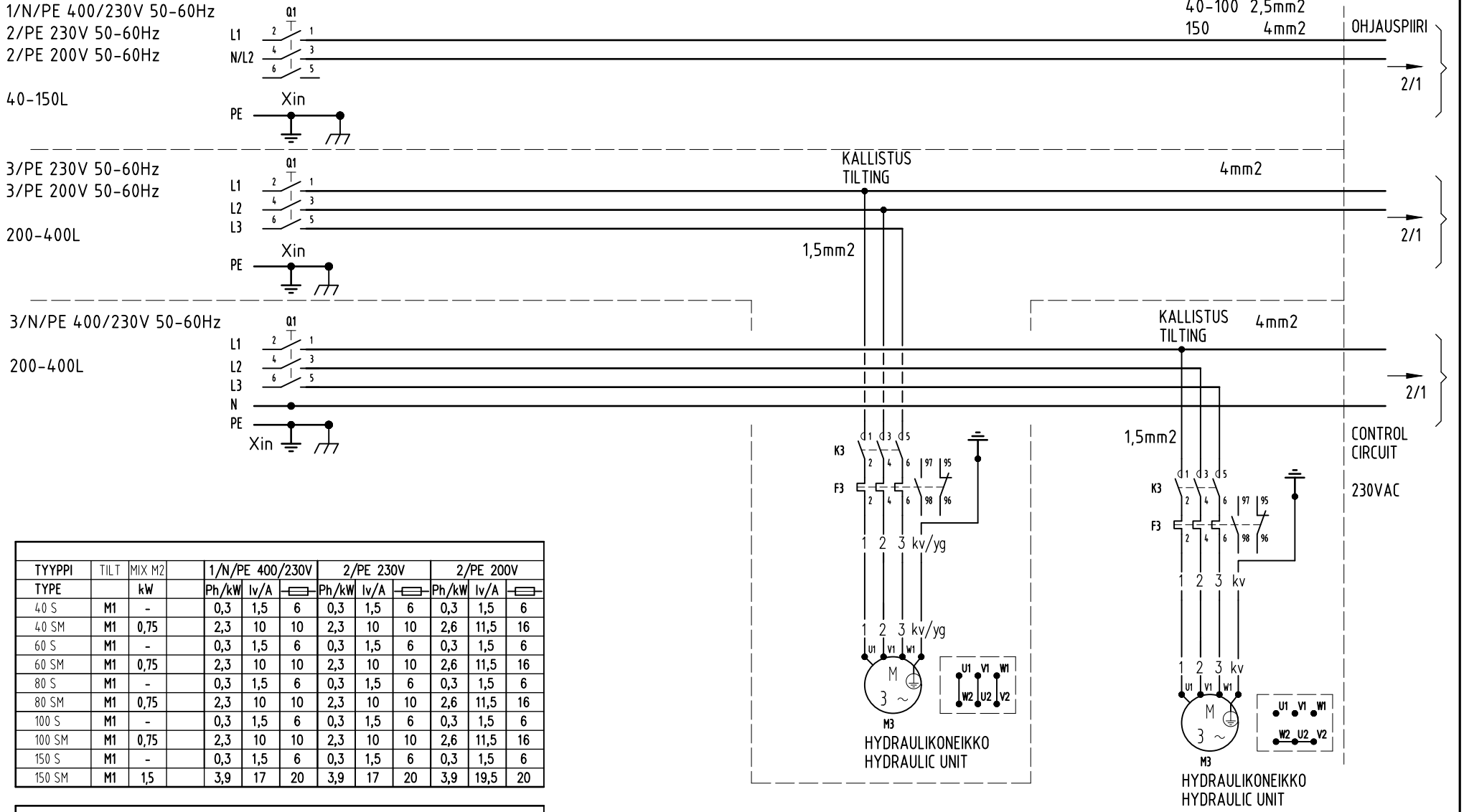
Suhde 1:1 | Lehti 1

Suunn. 25.03.2019 porthm

Liittyy

S01132 A

Tulostettu 25.03.2019



TYYPPI	TILT	MIX M2		1/N/PE 400/230V			2/PE 230V			2/PE 200V		
TYPE		kW		Ph/kW	Iv/A		Ph/kW	Iv/A		Ph/kW	Iv/A	
40 S	M1	-		0,3	1,5	6	0,3	1,5	6	0,3	1,5	6
40 SM	M1	0,75		2,3	10	10	2,3	10	10	2,6	11,5	16
60 S	M1	-		0,3	1,5	6	0,3	1,5	6	0,3	1,5	6
60 SM	M1	0,75		2,3	10	10	2,3	10	10	2,6	11,5	16
80 S	M1	-		0,3	1,5	6	0,3	1,5	6	0,3	1,5	6
80 SM	M1	0,75		2,3	10	10	2,3	10	10	2,6	11,5	16
100 S	M1	-		0,3	1,5	6	0,3	1,5	6	0,3	1,5	6
100 SM	M1	0,75		2,3	10	10	2,3	10	10	2,6	11,5	16
150 S	M1	-		0,3	1,5	6	0,3	1,5	6	0,3	1,5	6
150 SM	M1	1,5		3,9	17	20	3,9	17	20	3,9	19,5	20

TYYPPI	TILT	MIX M2		3/N/PE 400/230V			3/PE 230V			3/PE 200V		
TYPE		kW		Ph/kW	Iv/A		Ph/kW	Iv/A		Ph/kW	Iv/A	
200 S	M3	-		1,4	2,3	6	1,4	3,6	6	1,3	3,4	6
200 SM	M3	1,5		5,0	18	20	5,0	19,3	20	4,9	21,4	25
300 S	M3	-		1,4	2,3	6	1,4	3,6	6	1,3	3,4	6
300 SM	M3	1,5		5,0	18	20	5,0	19,3	20	4,9	21,4	25
400 S	M3	-		1,4	2,3	6	1,4	3,6	6	1,3	3,4	6
400 SM	M3	2,2		6,2	23,2	25	6,2	24,5	25	6,1	27,4	32

metos

Tuote: GINGER PROVENO | Multi

Malli: 40 - 400L HÖYRY / STEAM

Suhde: 1:1 | Lehti: 1

Suunn.: 25.03.2019 porthm

Koodi

PÄÄKAAVIO

MAIN CIRCUIT DIAGRAM

1/N/PE 400/230V 50-60Hz, 3/N/PE 400/230V 50-60Hz

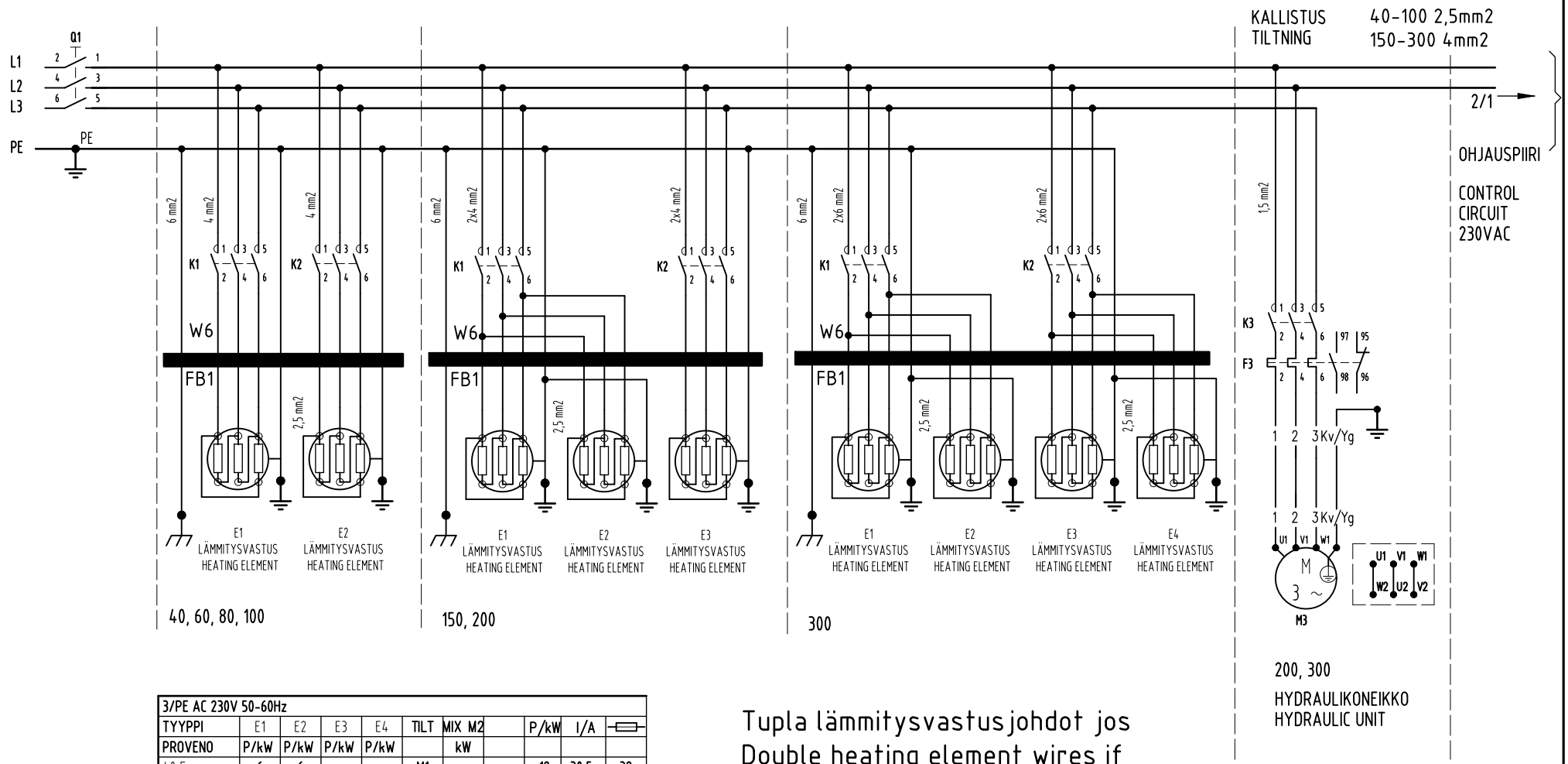
2/PE 230V 50-60Hz, 3/PE 230V 50-60Hz

2/PE 200V 50-60Hz, 3/PE 200V 50-60Hz

Liittyy

S01133 A

Tulostettu 25.03.2019



3/PE AC 230V 50-60Hz										
TYYPPI	E1	E2	E3	E4	TILT	MIX M2		P/kW	I/A	
PROVENO	P/kW	P/kW	P/kW	P/kW		kW				
40 E	6	6	-	-	M1	-		12	30,5	32
40 EM	6	6	-	-	M1	0,75		14	38,8	40
60 E	8	8	-	-	M1	-		16	40,2	50
60 EM	8	8	-	-	M1	0,75		18	48,9	50
80 E	10	10	-	-	M1	-		20	50,2	63
80 EM	10	10	-	-	M1	0,75		22	58,9	63
100 E	10	10	-	-	M1	-		20	50,2	63
100 EM	10	10	-	-	M1	0,75		22	58,9	63
150 E	8	8	8	-	M1	-		24	60,2	63
150 EM	8	8	8	-	M1	1,5		27,6	75,9	80
200 E	10	12	12	-	M3	-		34	85,3	100
200 EM	10	12	12	-	M3	1,5		37,6	101,0	125
300 E	12	12	12	12	M3	-		48	120,5	125
300 EM	12	12	12	12	M3	1,5		51,6	136,2	160

Tupla lämmitysvastusjohdot jos
Double heating element wires if
E1-4: 10kW, 12kW (80, 100, 200, 300L)

metos

Tuote GINGER PROVENO — Multi

Malli 40 - 300 L Electrical heating

Koodi

Suhde 1:1 | Lehti 1

Suunn. 25.03.2019 porthm

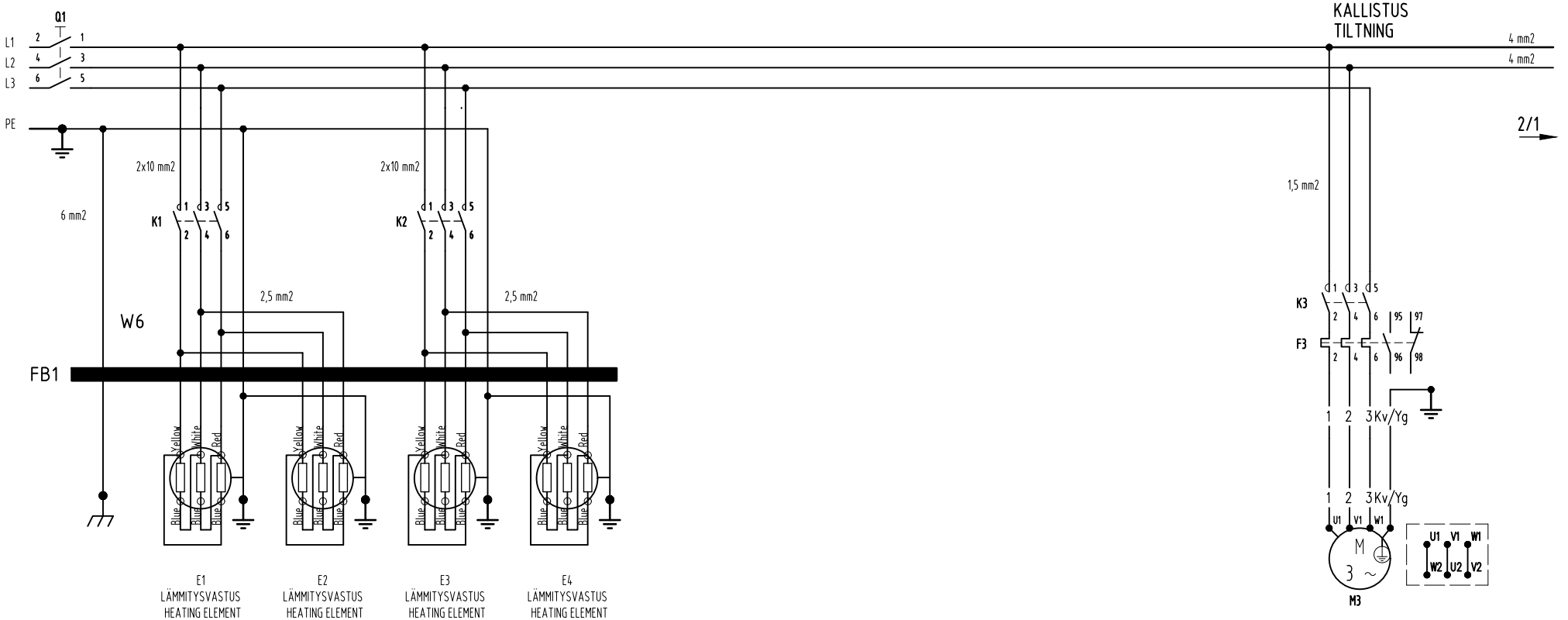
Liittyy

PÄÄKAAVIO
MAIN CIRCUIT DIAGRAM

3/PE AC 230V 50-60Hz

S01134 A

Tulostettu 25.03.2019



HUOM! HUOMIO VASTUSTEN VÄRIRENKAAT
NOTE! NOTICE COLOUR CIRCLE OF HEATING ELEMENTS

Tupla lämmitysvastusjohdot
Double heating element wires

3/PE AC 230V 50-60Hz										
TYYPPI	400/230V							3/PE AC 230V		
TYPE	E1	E2	E3	E4	TILT	MIX M2		P/kW	I/A	⊣⊢
	P/kW	P/kW	P/kW	P/kW		kW				
400 E	14,4	14,4	14,4	14,4	M3	–		57,6	145	160
400 EM	14,4	14,4	14,4	14,4	M3	2,2		62,4	158	160

metos

Tuote GINGER PROVENO — Multi

Malli 400L Electrical heating

Koodi

PÄÄKAAVIO
MAIN CIRCUIT DIAGRAM

3/PE AC 230V 50-60Hz

Suhde 1:1 | Lehti 1

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