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1. Purpose of this manual

The purpose of this Service Manual is to provide Service Engineers with technical information regarding the new range of “Domodossola” dishwashers and to give a description of the service functionality.

This Manual describes:

- General characteristics
- Technical characteristics
- Guide to diagnostics

2. Precautions

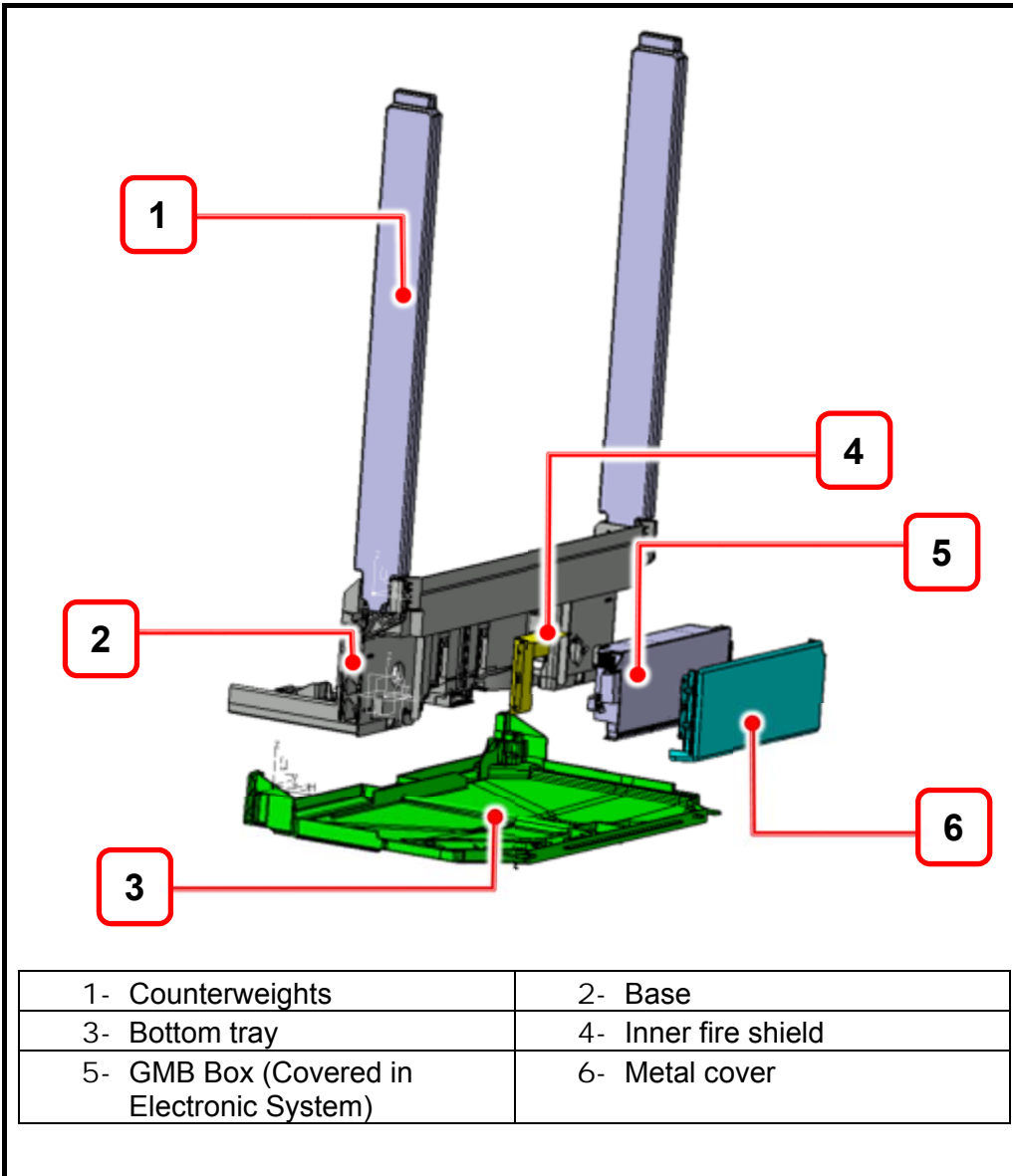
	<ul style="list-style-type: none">▪ Electrical appliances must be serviced only by qualified Service Engineers.▪ Always remove the plug from the power socket before touching internal components.
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Document Revisions

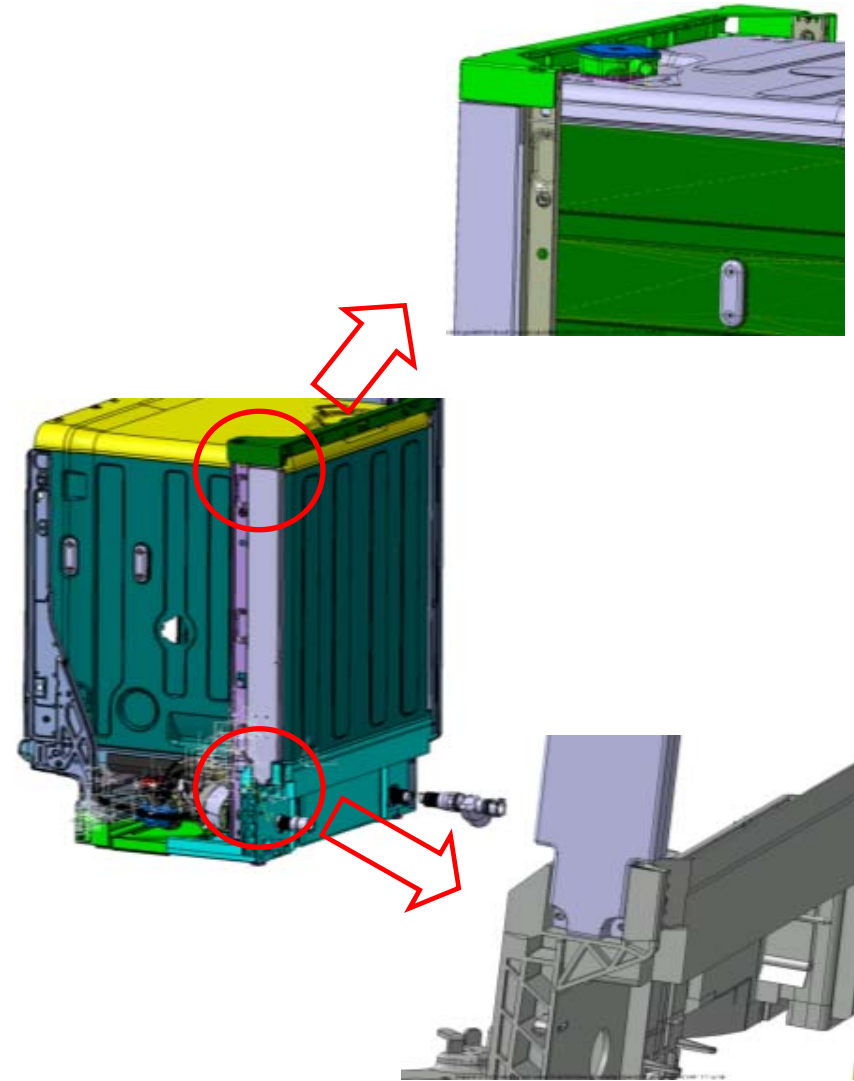
Revision	Date	Description
v0.0	8/2014	Document creation
V0.1	11/2014	Technical Details updated
V1.0	01/2015	Technical Details updated
V2.0	08/2015	Alarm codes on separate Service Manual
V3.0	03/2016	Service Mode on separate Service Manual
V4.0	03/2017	Components check table - updated

3. Technical details

3.1. Structural Parts

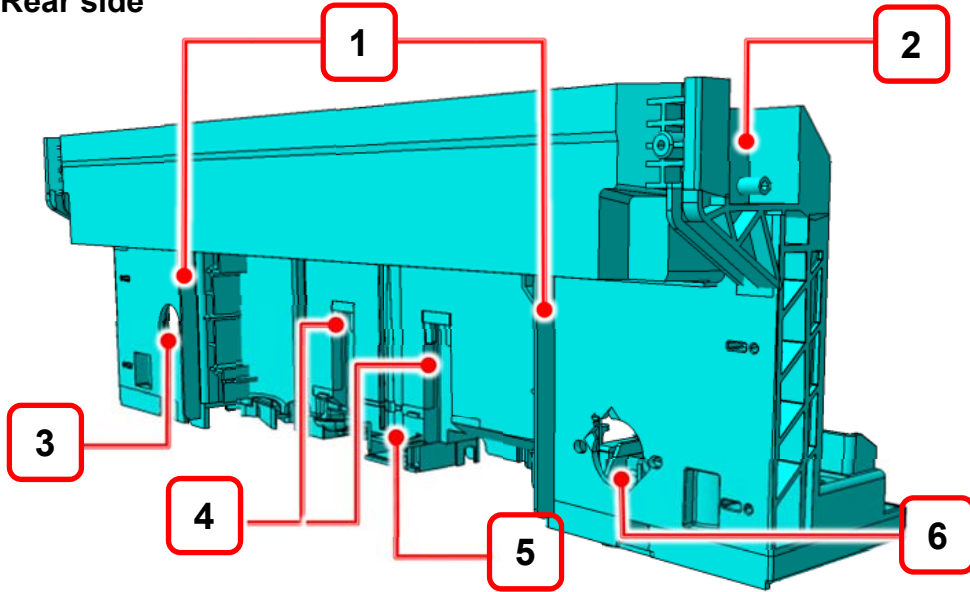


The counterweight slides under the rear bar and is attached with 2 screws in the base.



3.2. Base

Rear side



1- Ribs to prevent that water sprays in to the circuit board if the hose is damaged on the outside just after coming out from dishwasher

3- Water outlet

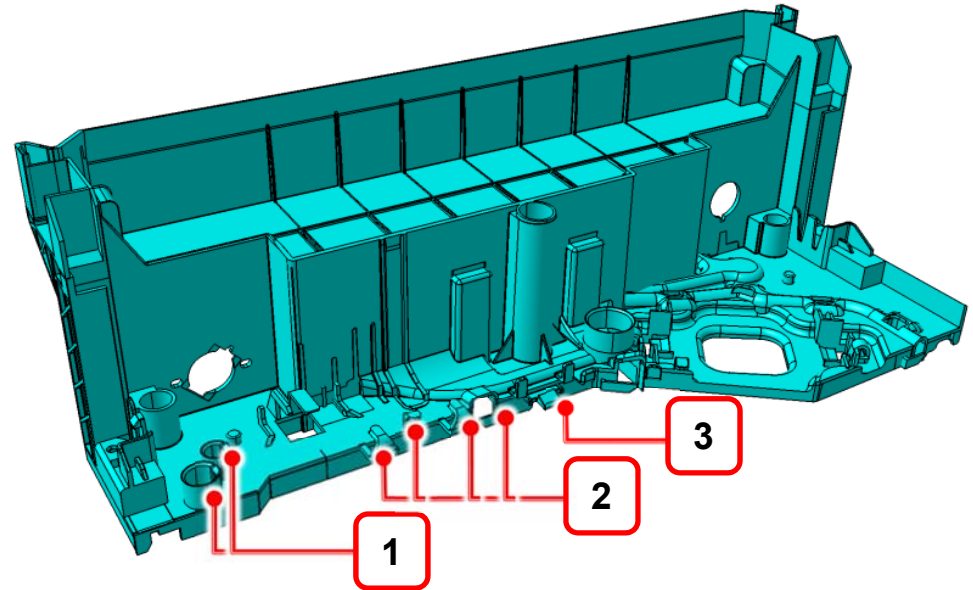
5- Ribs to prevent cables from mainboard to fall down

2- Area for swing in and attach the counter weights with screws

4- Channels for inserting the hooks from the mainboard box when assembling

6- Water inlet

Inner side



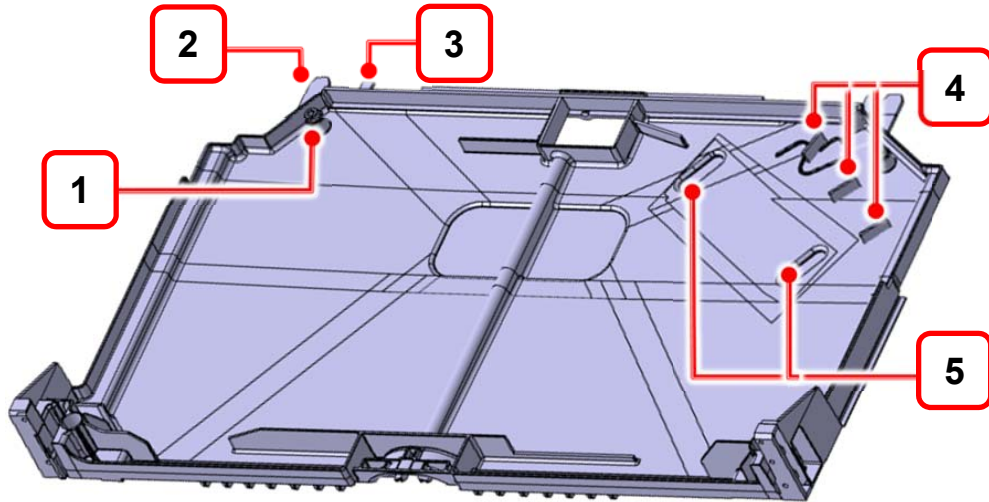
1- Holder for active drying hose

3- Holder for float switch

2- Cable exit and holders for cables

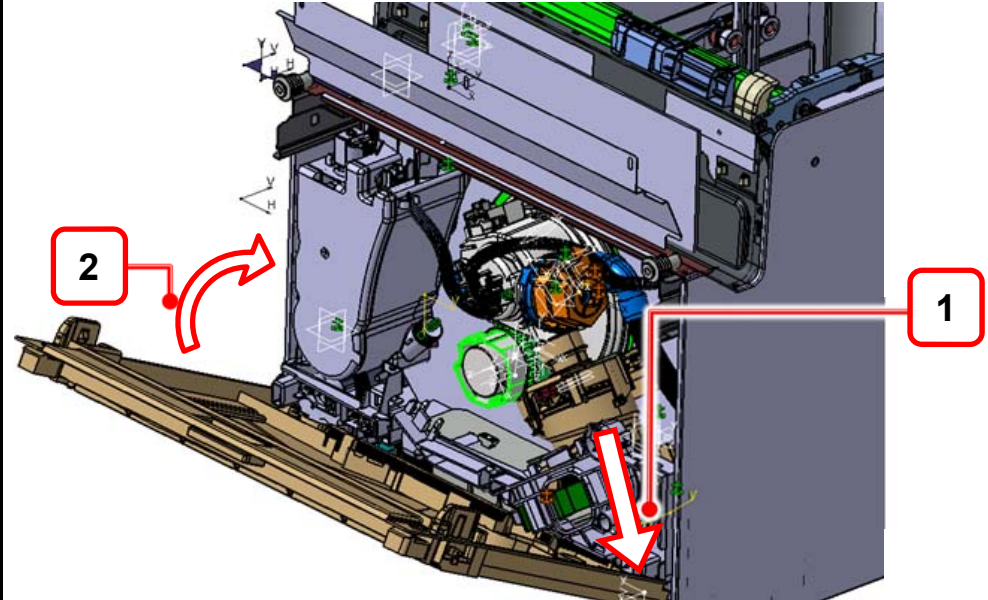
3.3. Bottom tray

Details



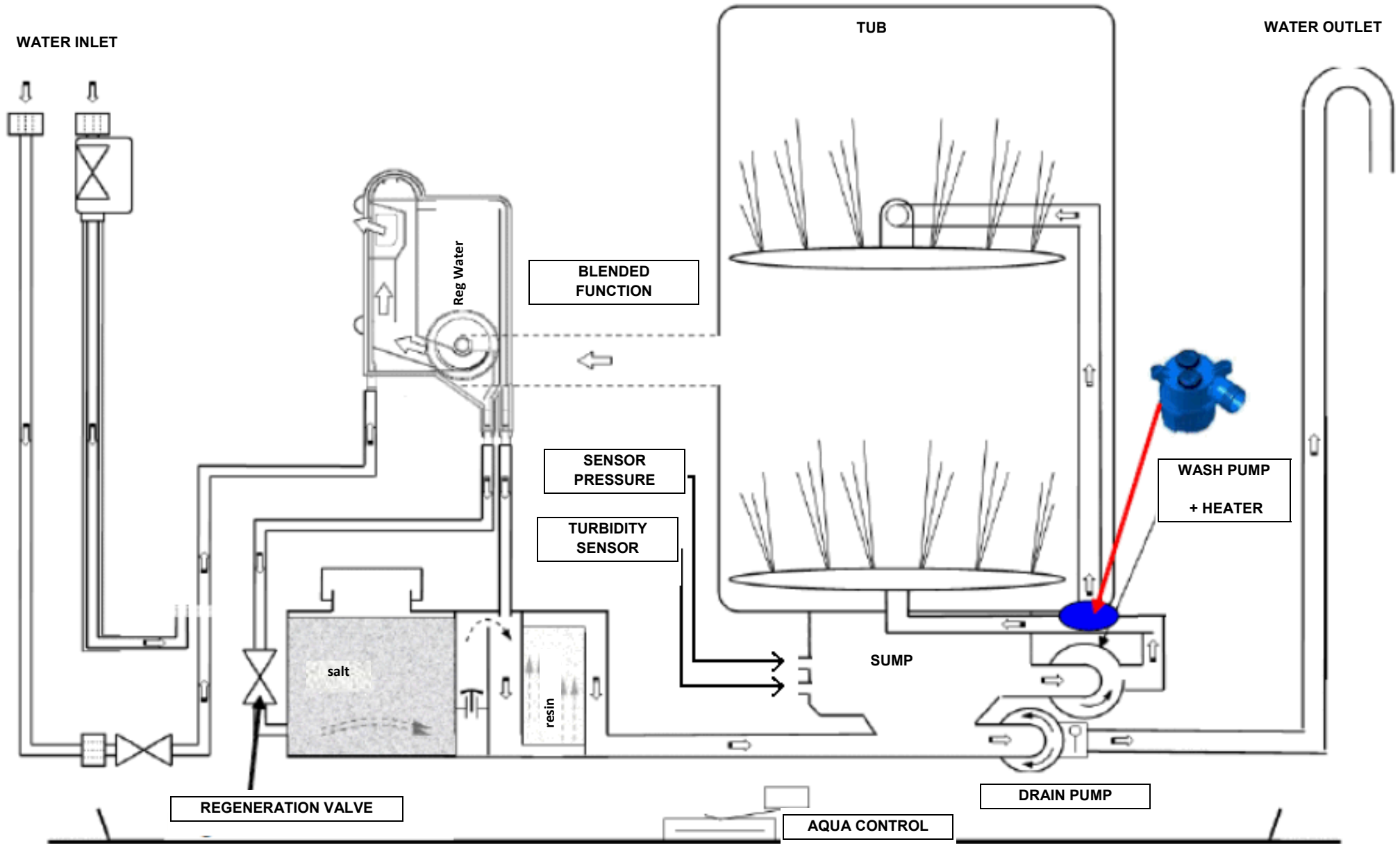
1- Screw bosses that is only planned to be backup if the snaps fails	2- Snaps for assembling tray to base
3- Ribs to help controlling the movement when assembling the tray	4- Ribs to lift cable to prevent them from reaching the water
5- Dents for rubber fixation of motor	

Assembly instructions



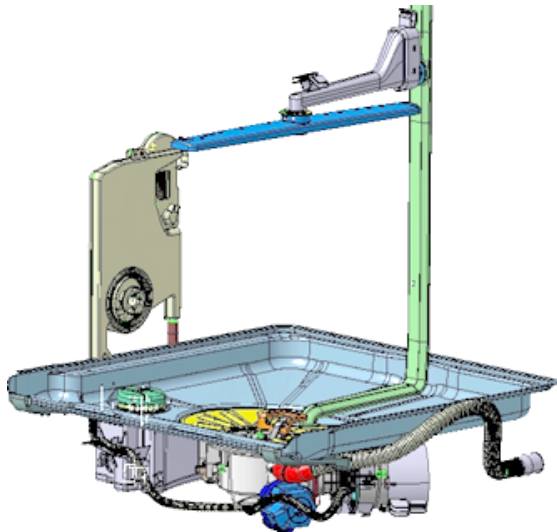
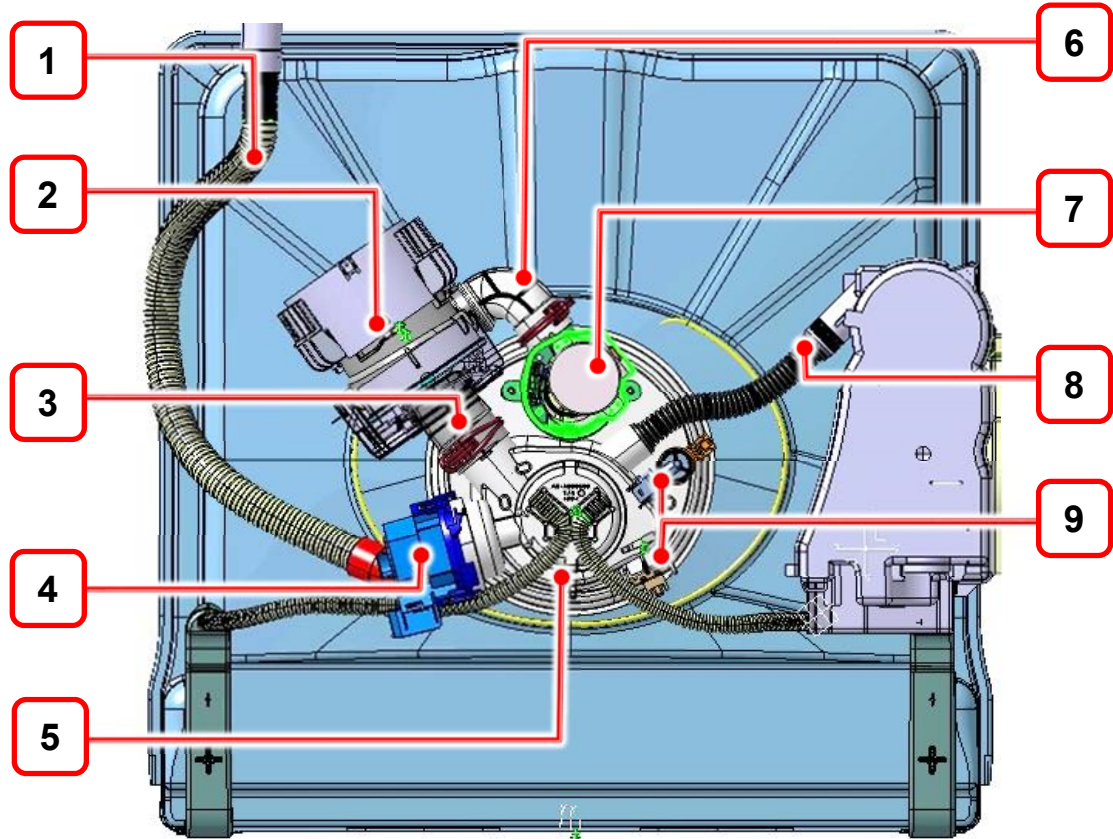
1- Insert bottom tray (without metal feet), the tabs on the tray must match the slots in the base. The tray should be horizontal if the machine lays on its back	2- Keeping bottom tray pushed inwards, rotate it into place
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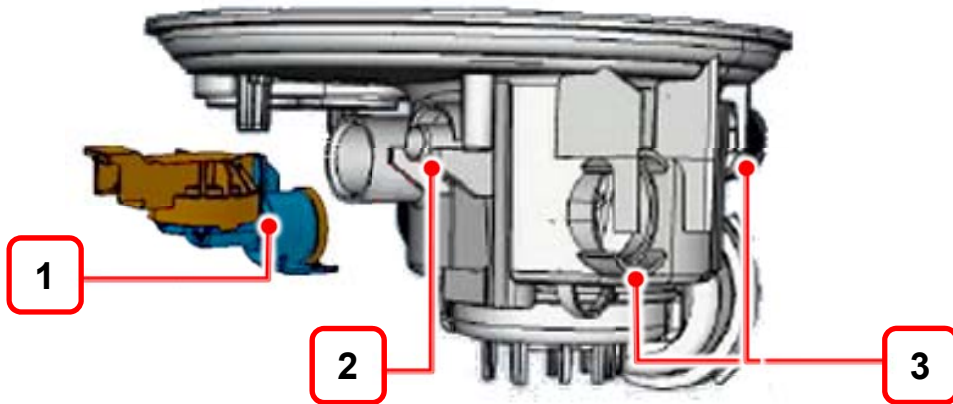
3.4. Water circuit



3.5. Hydraulic circuit

1- Drain hose.	2- Wash pump with integrated heater
3- Hose pump-sump (included with sump)	4- Drain pump
5- Sump	6- Hose pump-FC/FD (included with pump)
7- Flow controller (FC) or Flow distributor (FD)	8- Hose softener-sump
9- Sensors	

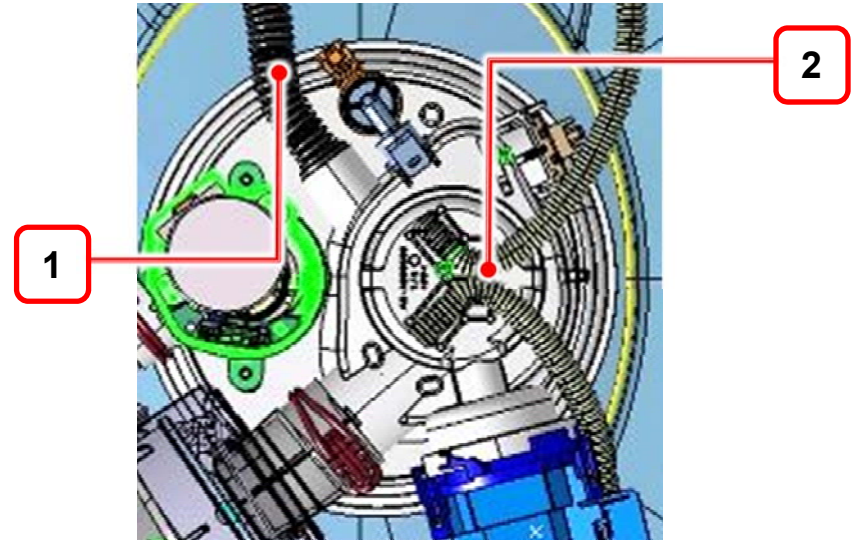




1- Pressure sensor with radial sealing

2- Pressure sensor snap:
 - robust snap from bottom
 - ribs in sump to limit rotation
 - half round rib to limit move upward

3- Harness snaps



1- Softener-sump hose:
 Corrugated pressed and sealed using o-ring compression. Symmetrical connectors from sump and softener side.

Proper assembly: must put hose to the sump and than to the softener.

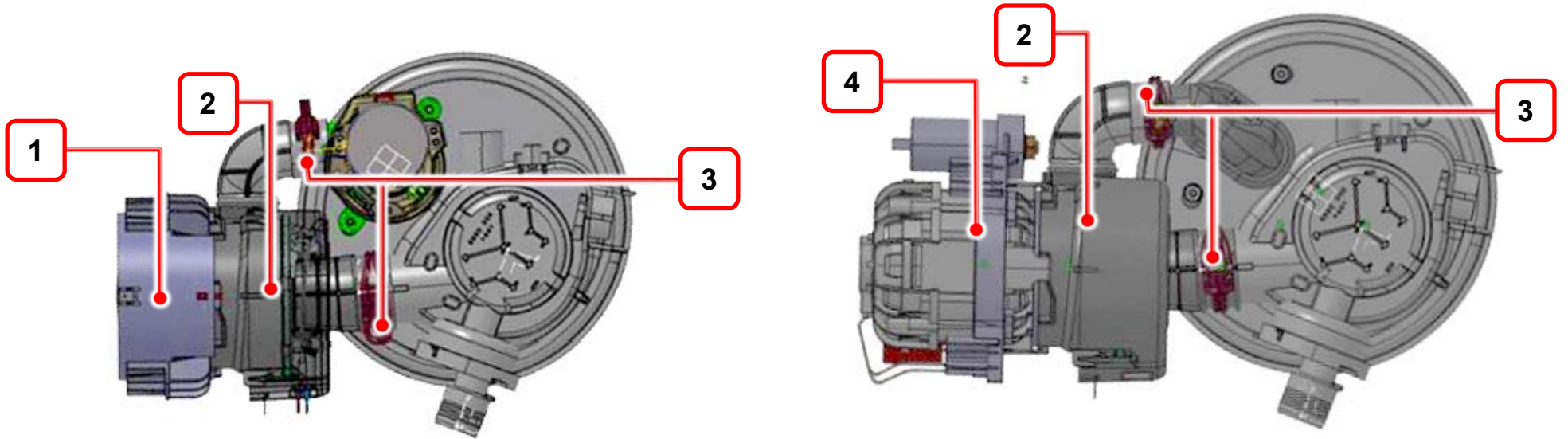
2- Overflow hoses:
 The same parts for both sides. Position provided by friction with sump ribs. Ribs are indicating correct assembly position

3.6. Sump Circ Motor and Heater

Main Pump assembly:

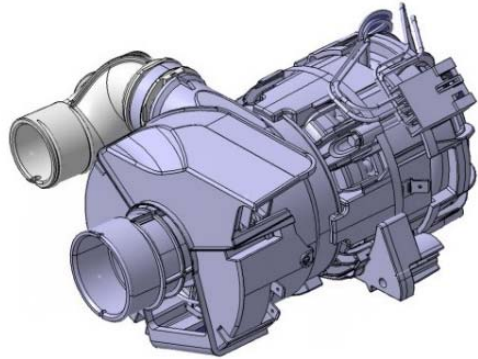
- Common interface with new volute
- Basement fixation same has D2
- Includes hose to flow controller
- Includes pump-sump hose
- Includes Omega heater
- Includes steel shield around

For both motors the heater is available as separate spare part

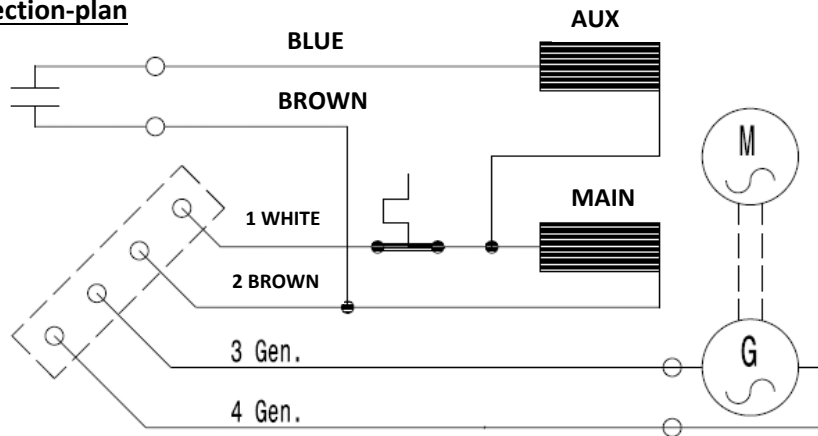


1- BLDC motor with FC	2- Omega heater
3- Clamps	4- Asynchronous motor with FD

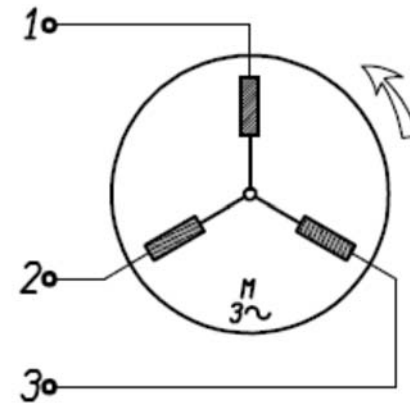
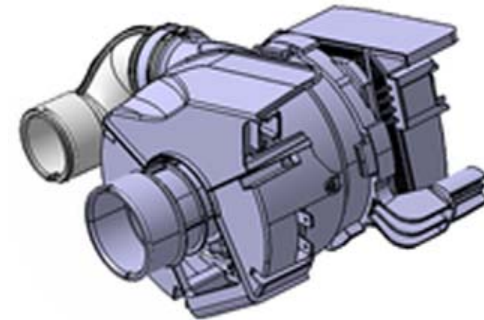
Single phase asynchronous washing pump motor with FD



Connection-plan

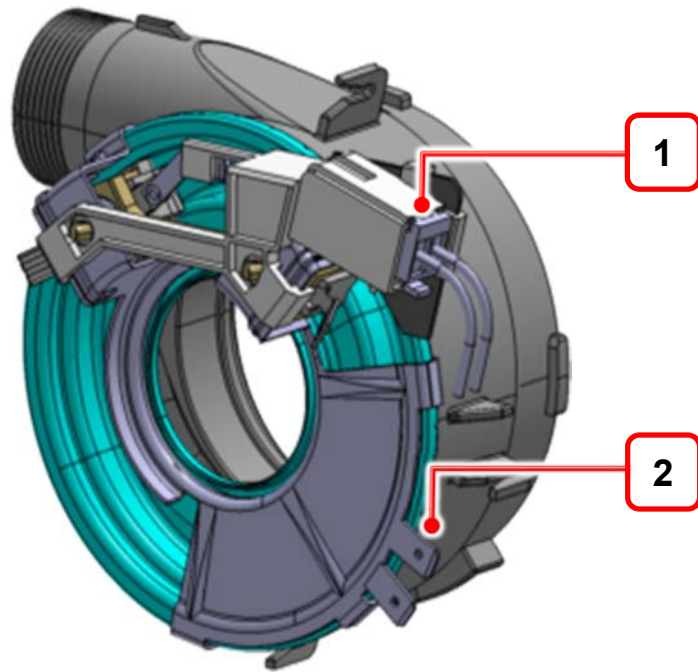


Three phase washing pump BLDC motor with FC



230/240 V 50/60 Hz Class F
Resistance: 1-2: 56 ohms/2-3: 56 ohms/3-1: 56 ohms

Omega heater:



1- Electric connection of the heater

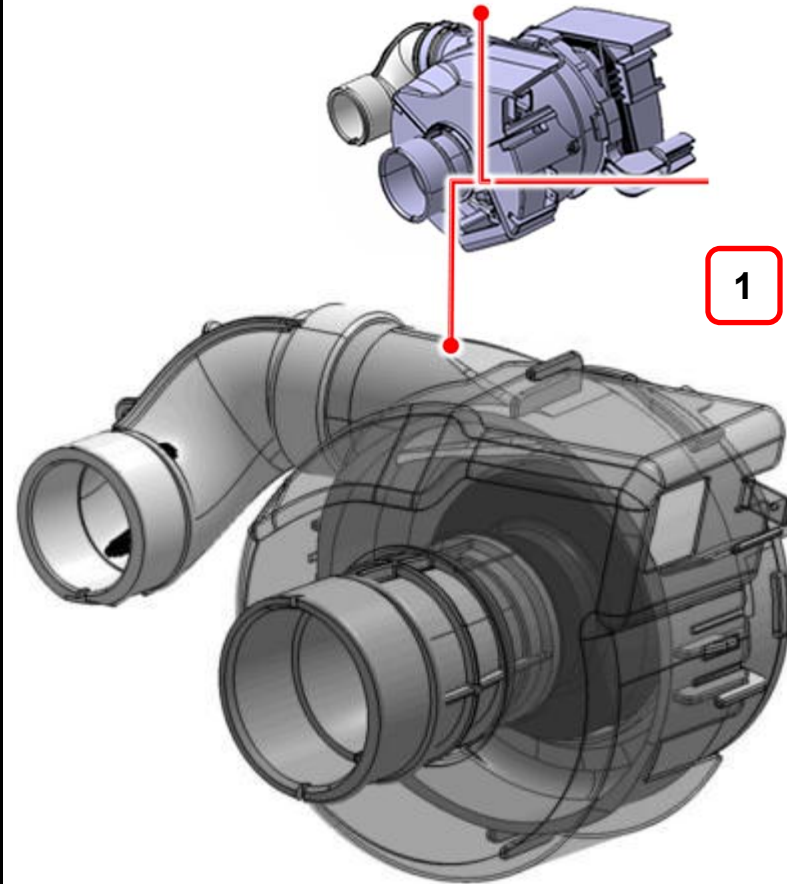
2- Ground connection

Voltage EU 220-240 V,

Power: 1800 W

Voltage EU 220-240 V,

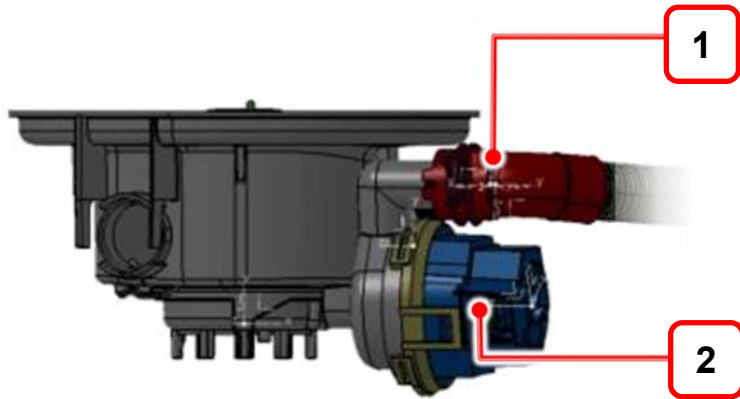
Power: 2040 W



1- Heater Cover

3.7. Sump and drain system

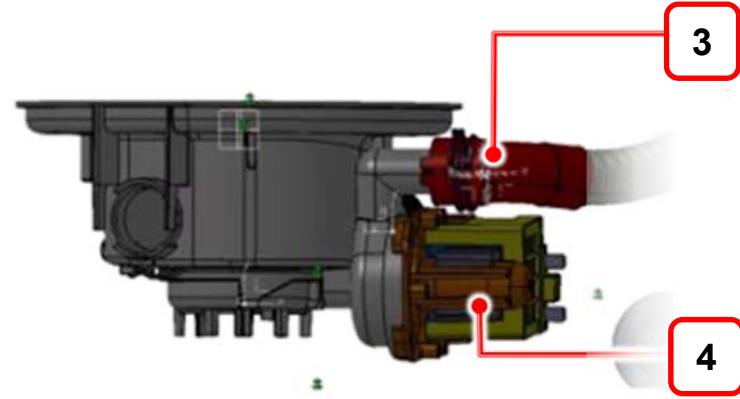
Three-phase Synchronous BLDC motor



- 1- Cuff on drain hose:
- Clamped to drain outlet.
 - Positioned by rib in sump and ribs in cuff.

- 2- Drain pump (Three-phase Synchronous BLDC motor):
- Fixed directly in sump built-in volute using
 - Bayonete system
 - Back of protection hook provided for motor

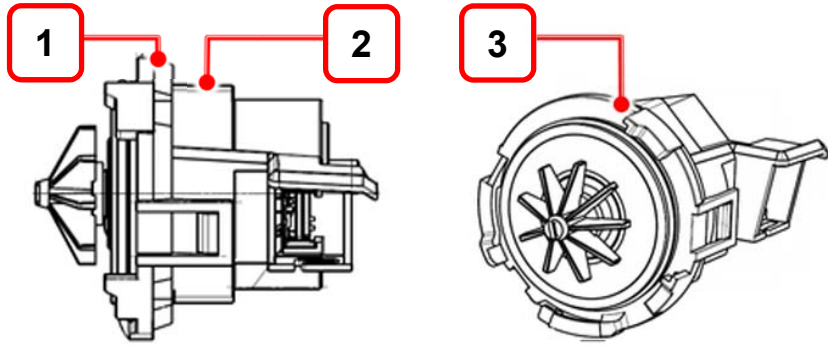
Single-phase Synchronous motor



- 3- Cuff on drain hose:
- Clamped to drain outlet.
 - Positioned by rib in sump and ribs in cuff.

- 4- Drain pump (Single-phase Synchronous motor):
- Fixed directly in sump built-in volute using
 - Bayonete system
 - Back of protection hook provided for motor

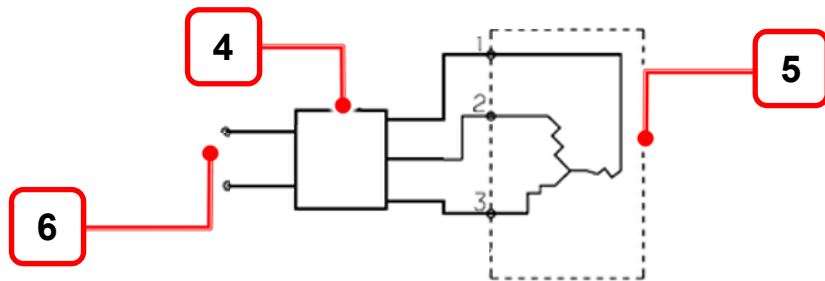
Drain pump - Three-phase Synchronous BLDC motor



Voltage 230 V 50 Hz

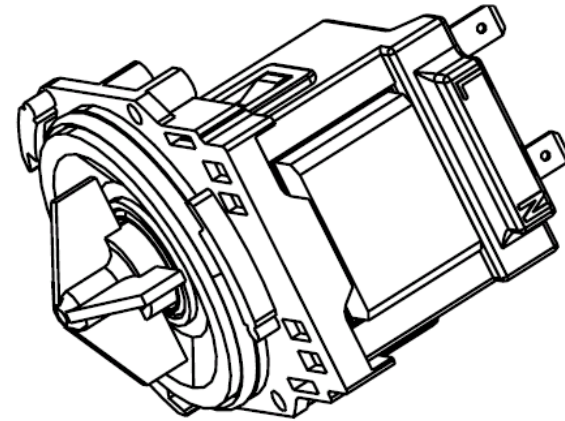
Power: 21 W → resistance 93 ohms +/- 10%

Max flow rate: 15 litre/min



1- Cover	2- Housing
3- Triple bayonet fixation aligned into sump connector	4- Motor driver (not incl. in assembly)
5- Motor	6- Power supply

Drain pump - Single-phase Synchronous motor



Voltage 230 V 50 Hz

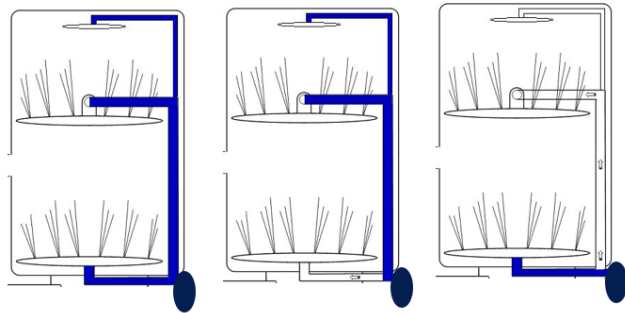
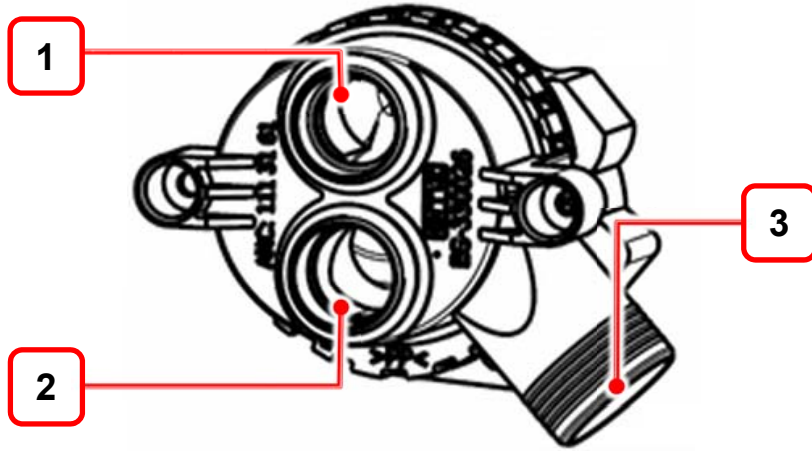
Power: 30 W → resistance aprox 225 ohms

Max flow rate: 15 litre/min

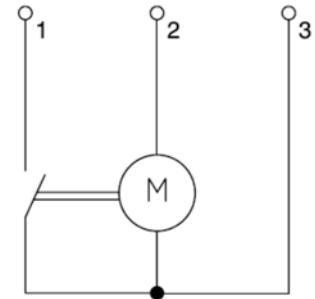
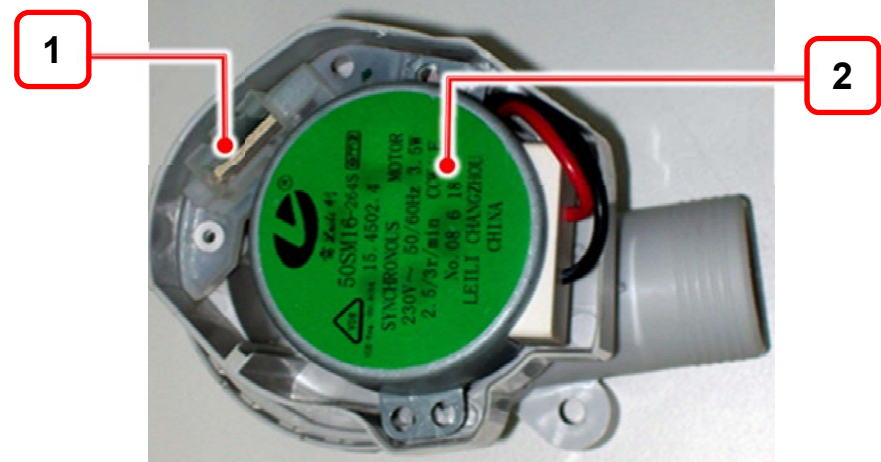
3.8. Flow controller

Details

The flow controller is designed to control the water flow towards the top spray arm only, bottom spray arm only or towards both spray arms.



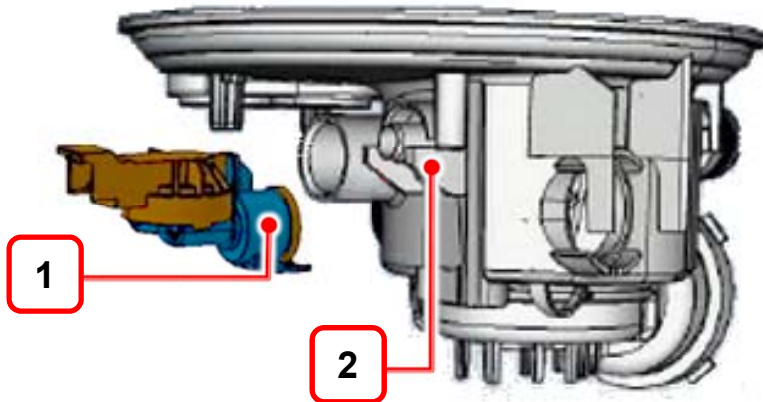
1- Water outlet to lower spray arms	2- Water outlet to upper spray arms
3- Water inlet from wash pump	



1- Micro switch	2- Synchronous motor 230V AC, 50/60Hz 2.5/3 rounds/minute Counterclockwise direction
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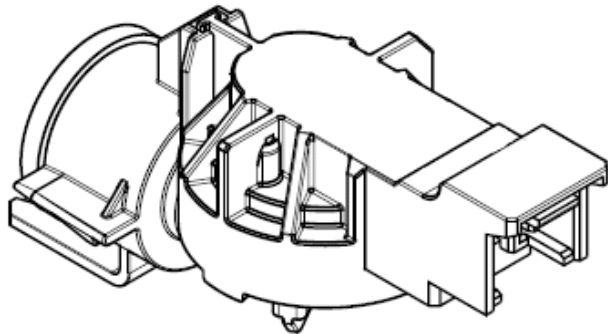
3.9. Pressure sensor

Details



1- Pressure sensor with radial sealing

2- Pressure sensor snap:
robust snap from bottom ribs in sump to limit rotation
half round rib to limit move upward



Frequency output (0-5V Signal),
Range: 0-300mm
Connection: 3 connectors RAST 2.5mm

Pressure mmWc/PA	Frequency	Tolerance 20°C	Tolerance 70°C
-	44.3	+ / - 3mmWC / 1%	+ / - 5mmWC / 1.7%
75	42.16	+ / - 3mmWC / 1%	+ / - 5mmWC / 1.7%
150	40.0	+ / - 6mmWC / 2%	+ / - 8mmWC / 2.7%
225	37.77	+ / - 9mmWC / 3%	+ / - 11mmWC / 3.7%

3.10. Turbidity sensor (High power sensor)

Control both the temperature and the turbidity of the washing water.

Positioned externally on the sump in direct contact with the water.

Fitted with an NTC sensor for control of the temperature.

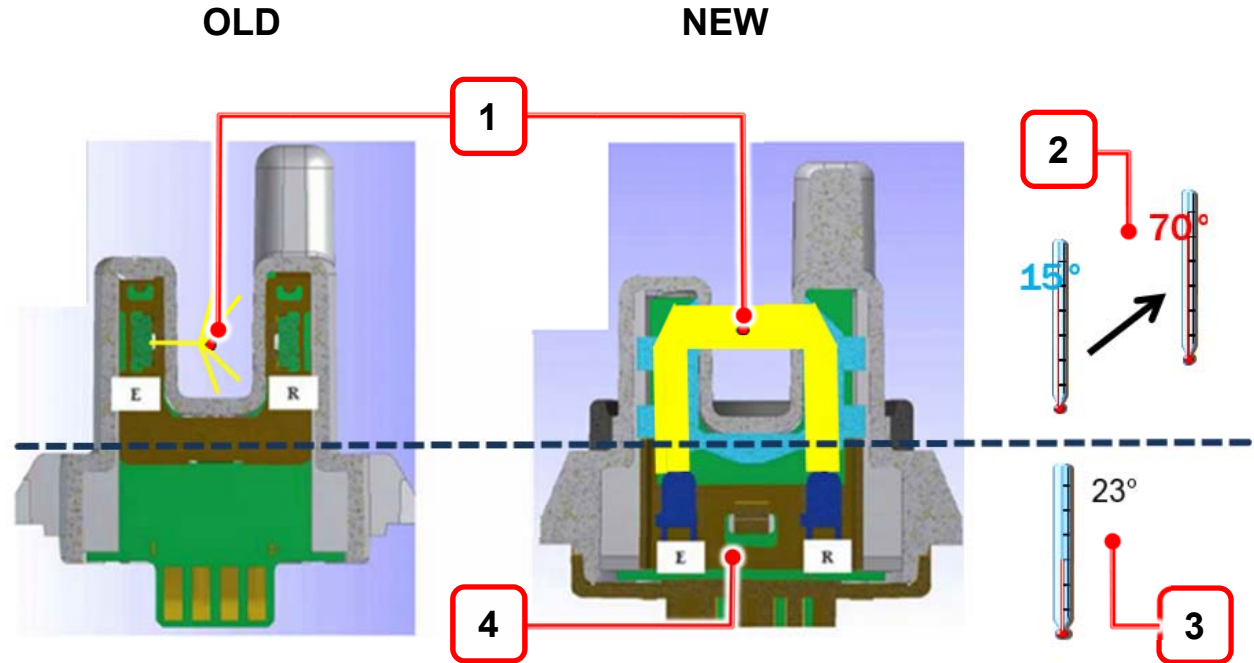
Fitted with an infra-red system for control of the turbidity of the water (i.e. the quantity of dirt in the water).

Constantly transmits the two signals to the electronic control system for processing.

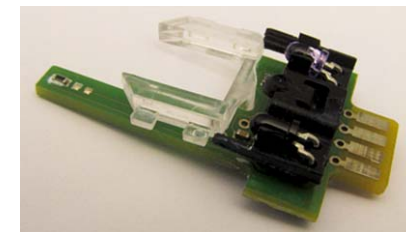
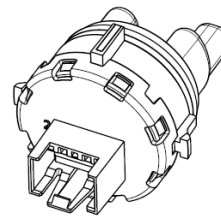
By correctly combining the signals received from the two sensors (NTC and turbidity), enables the appliance to perform "automatic" washing cycles which automatically optimize the washing cycle according to the type of load, the quantity of the load and the degree of soiling.

The light is collected by a new technology and guides the light into the measurement zone.

- Use of larger LEDs
 - the light area increases from 3 to 20sqmm
 - small dirt pieces cannot block the light beam anymore
- LEDs are located in a colder area
- less temperature fluctuations around the LED's
- higher precision during measurement
- improved signal stability
- measurement during higher pump speed is possible

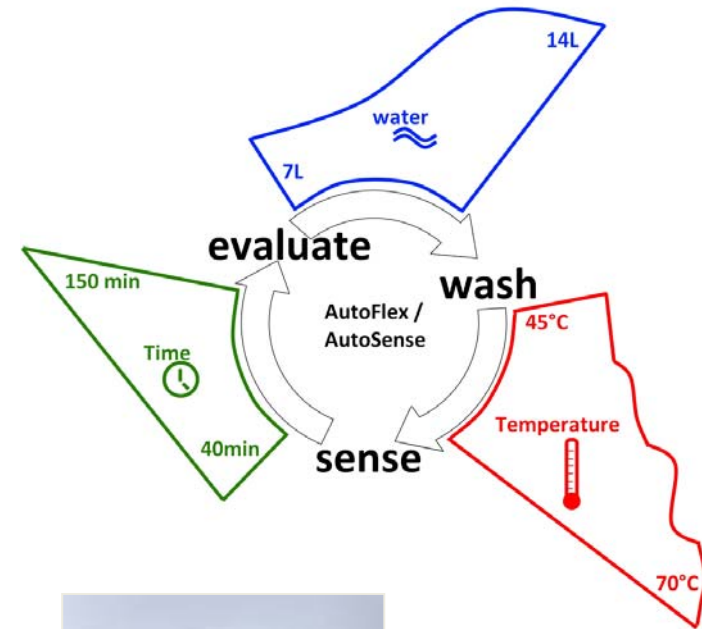


1- Dirt pieces	2- Temperature between 15-70°C in water
3- Constant 23°C measured, because LEDs are outside the hot water area	4- The temperature sensitive electrical components are out of the water zone, where the temperature is colder and more constant



3.11. Automatic Cycle: AutoSense

- The AutoSense software
 - Washes the dishes and detaches the dirt continuously
 - In this way the turbidity sensor can detect the degree of dirtiness
 - And will define, if additional rinses are necessary.
 - The measurements will be done continuously during the cycle.
- Temperature, water consumption and duration is adjusted to the degree of dirtiness.



Comparison Auto 45-70 vs AutoSense 45-70

AUTO
SENSE
45°-70°



0.6 ... 1.4kWh



7 ... 14 l



40 ... 150min

AUTO
45°-70°



0.9 ... 1.6kWh



8 ... 15 l



90 ... 160min

3.12. Electronic Main Boards

- The main board is placed on the rear side of the appliance in the basement area.
- The electronic board is assembled in a fire protected area.
- The metal cover works as fire protection and avoids mechanical damages on the main board.

PB 100



PB 200



PB 300



Features possible to support (Depending on mounting option)	PB100	PB200	PB300
Existing HV main switch	Y	Y	N
Existing LV main switch	Y	Y	N
Auto-off functionality	Y	Y	N
Future logic main switch	Y	Y	Y
BLDC Wash pump	Y	N	N
BLDC Drain pump	Y	N	N
Async Wash pump	N	Y	Y
Sync Drain pump	N	Y	Y
Wash pump Taco input	N	Y	Y
Safety isolated low voltage UI interface	Y	Y	Y
Auto Door Opener (ADO)	Y	N	N
Integrated main filter	Y	Y	Y
Integrated tub lights driver with up to 3x1W LEDs	Y	N	N
Leakage Switch	Y	Y	Y
Flow control	Y	Y	N
Existing HV dispenser	Y	Y	Y
Future Low voltage dispenser (TBD)	Y *	Y *	Y*
Inlet valve	Y	Y	Y
Regeneration valve	Y	Y	Y
Pressure sensor	Y	Y	Y
Salt sense	Y	Y	Y
Rinse sense	Y	Y	N
Display on Floor (DOF)	Y	Y	N
Beam on Floor (BOF) 2-colour	Y	Y	N
DAAS	Y	Y	Y
Extra MACS connector for future modules	Y	Y **	N
JTAG IF to microcontroller for development	Y	Y	Y
* = Depends on the LV Dispenser solution			
** = Can not be combined with DOF			

EDW-PB100

- High and Mid range covering all platforms. Supports both EU and NA via population options. BLDC wash and drain motors.
 - o Non-Insulated EU variant
 - o Insulated EU variant
 - o Insulated NA variant

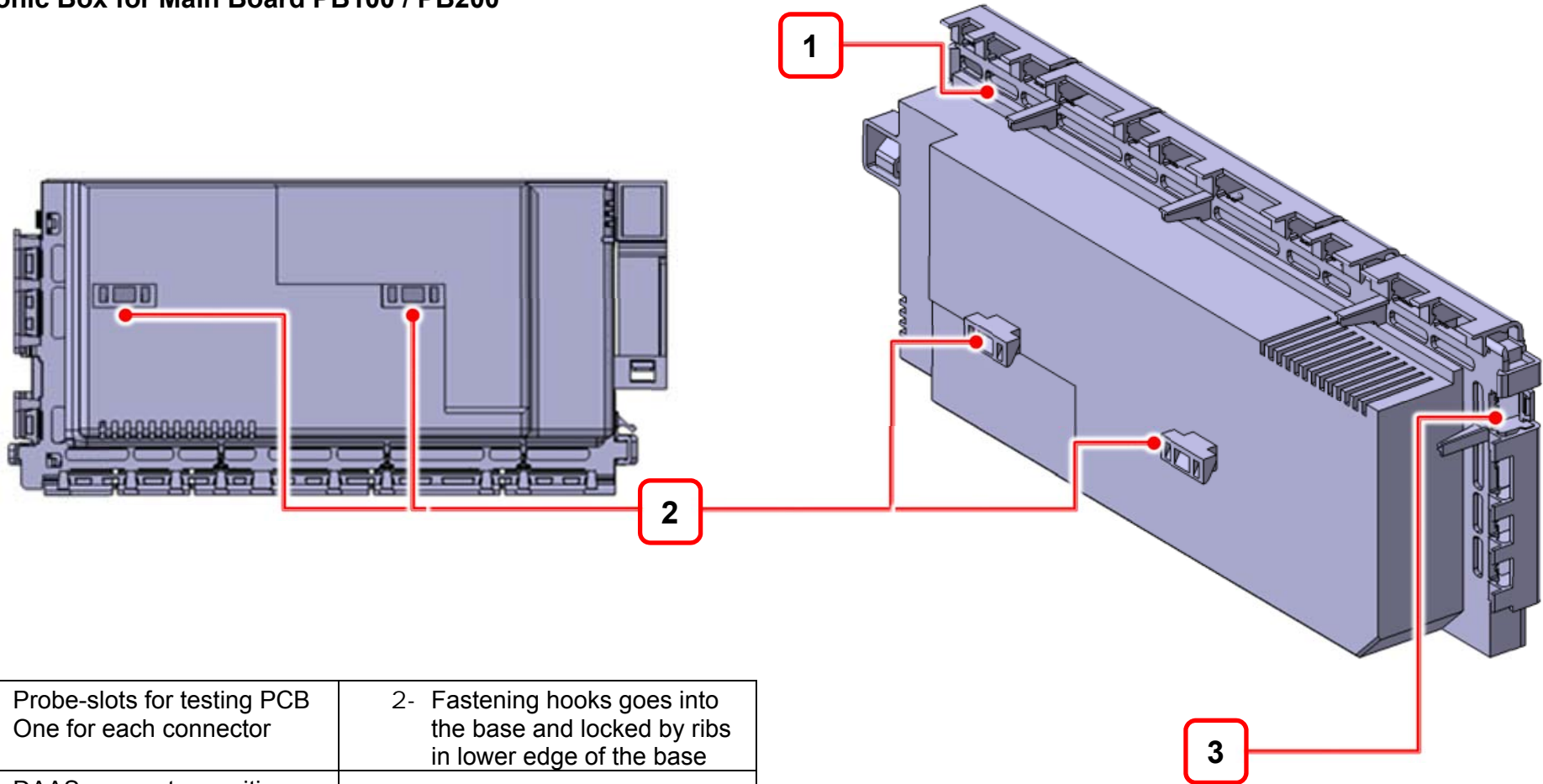
EDW-PB200

- Mid and Low range. Supports EU.
 - o Non-Insulated EU variant
 - o Insulated EU variant

EDW-PB300

- Low range. Supports EU.
 - o Insulated EU variant

Electronic Box for Main Board PB100 / PB200

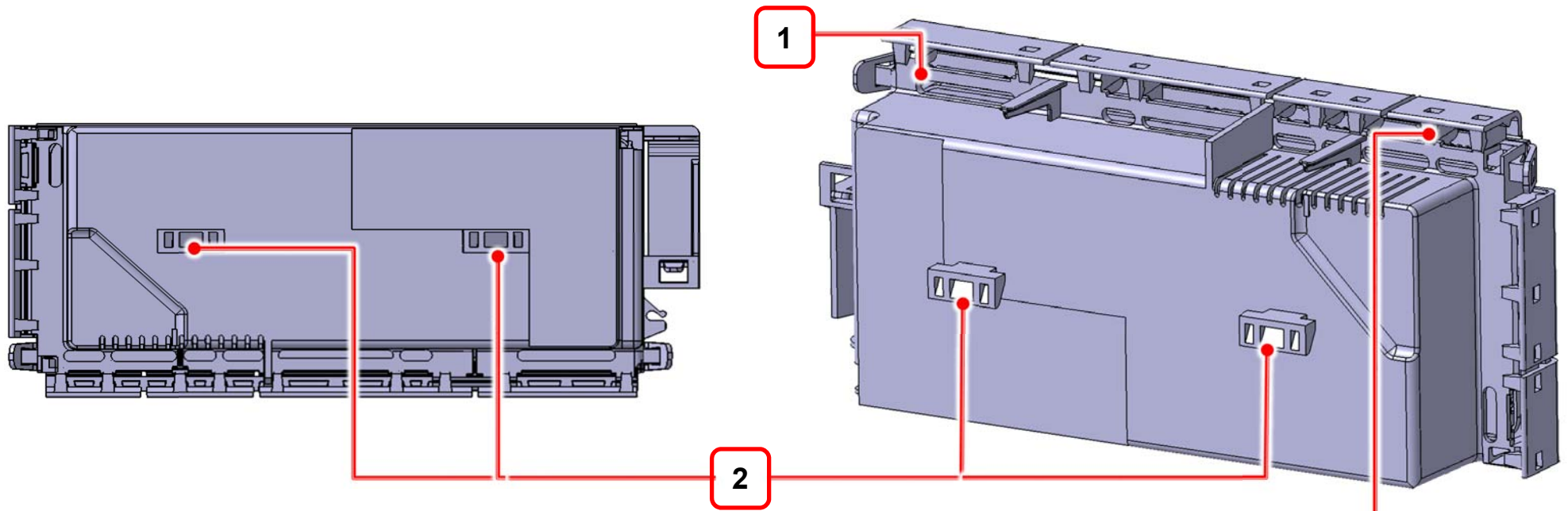


1- Probe-slots for testing PCB
One for each connector

2- Fastening hooks goes into
the base and locked by ribs
in lower edge of the base

3- DAAS-connector position
Open interface due to easy
access for service and
programming

Electronic Box for Main Board PB300



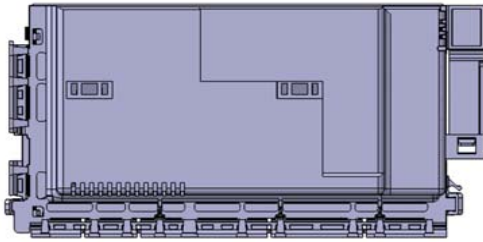
1- Probe-slots for testing PCB
One for each connector

2- Fastening hooks goes into
the base and locked by ribs
in lower edge of the base

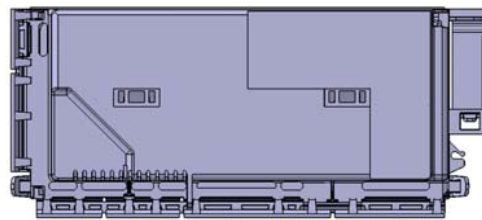
3- DAAS-connector position
Open interface due to easy
access for service and
programming
Note the position differs
from PB100/200

Differences between PB100/200 and PB300

PB100 / PB200



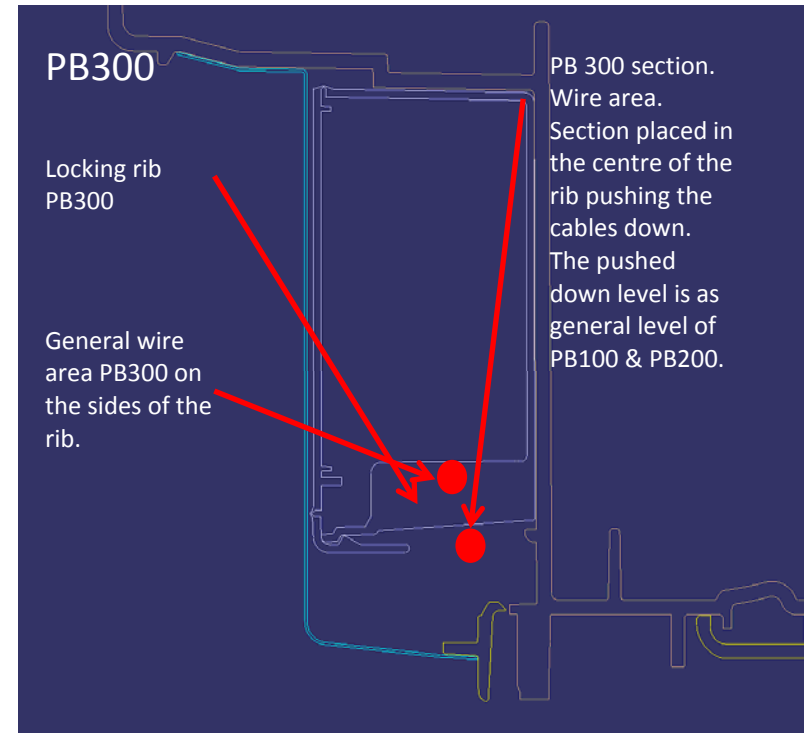
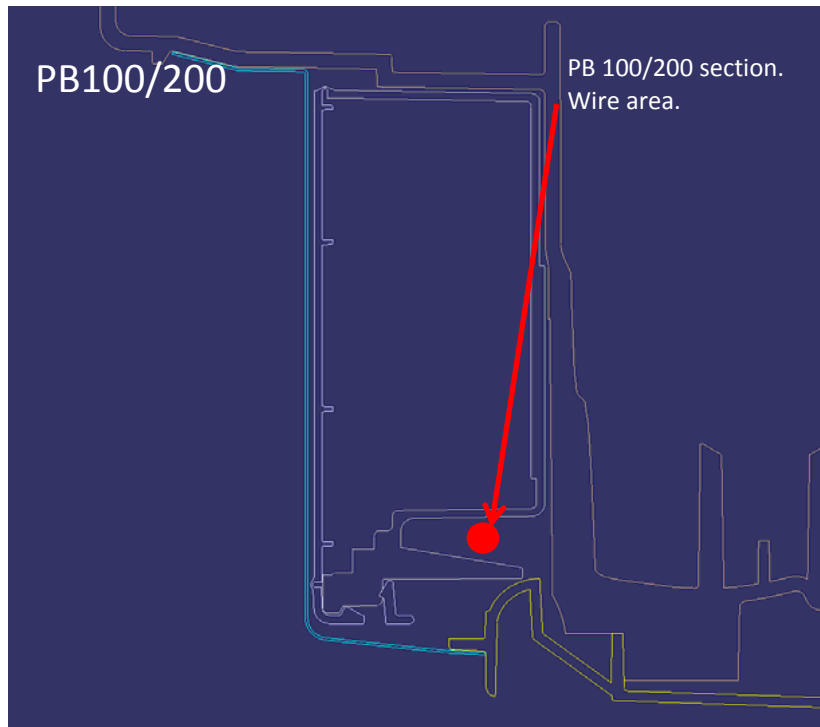
PB300



The cables are higher up on PB300 (since box is smaller) compared to PB100/200. So when the cables are pushed down under the rib the cables end up on the normal PB100/200 height.

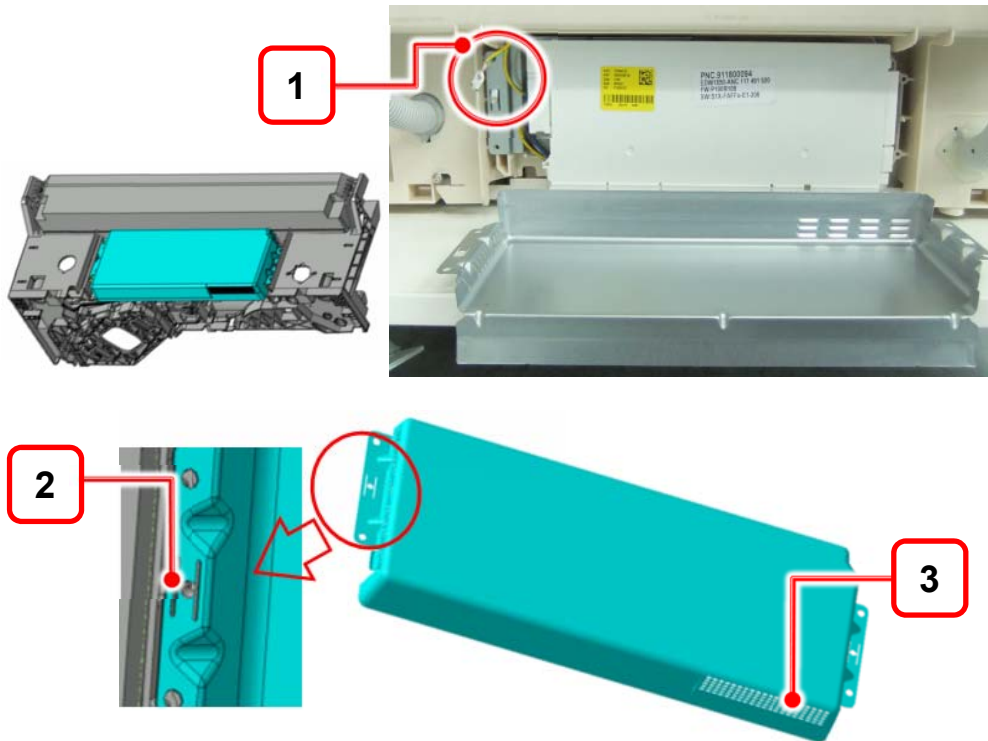
So the cables are higher everywhere than PB100/200 except under this rib where the cables are pushed down to the level of PB100/200.

No risk for cables! Even better than before since a smaller area could be close to metal cover compared with PB100/200.



Metal cover for Main Board

The metal cover is a fire shield and protects the electronics from mechanical stress.

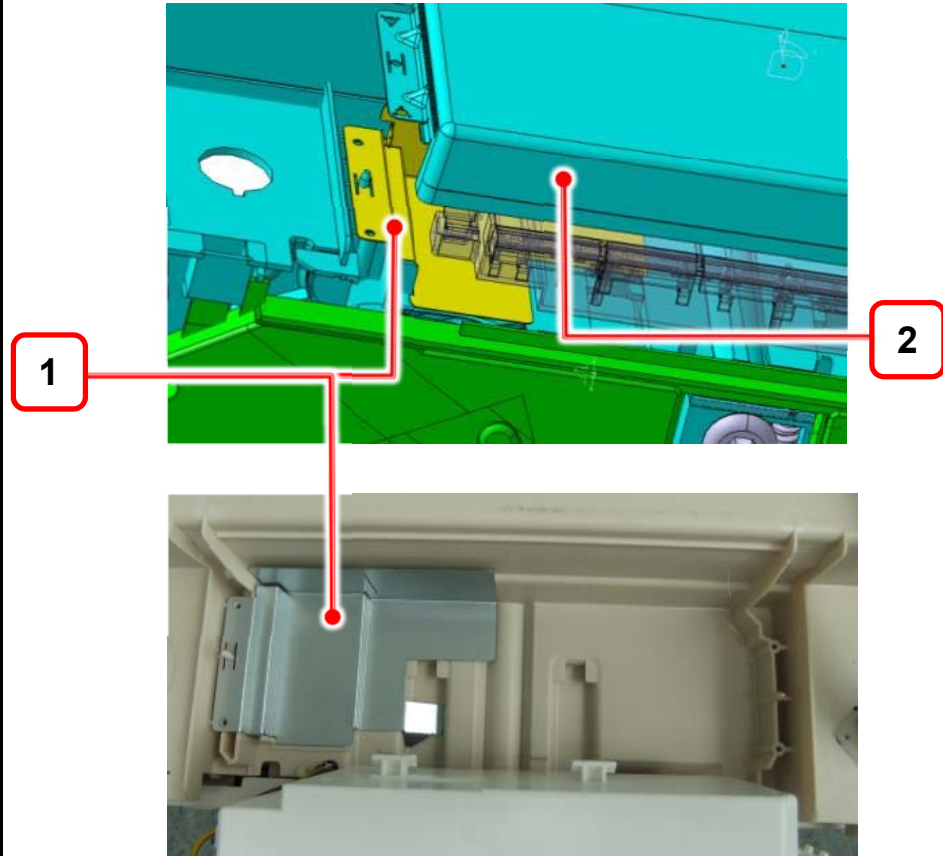


1- The yellow/green wire must be connected to the metal cover when the part is put back in position

2- Hole for pin, holding cover in place before screwing it to the base

3- Holes for ventilation

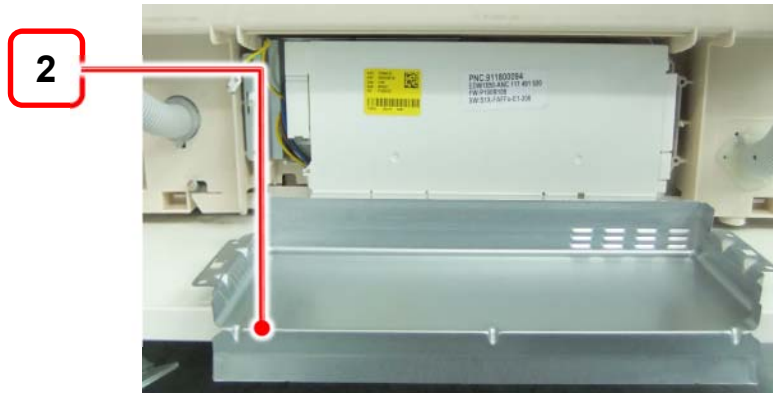
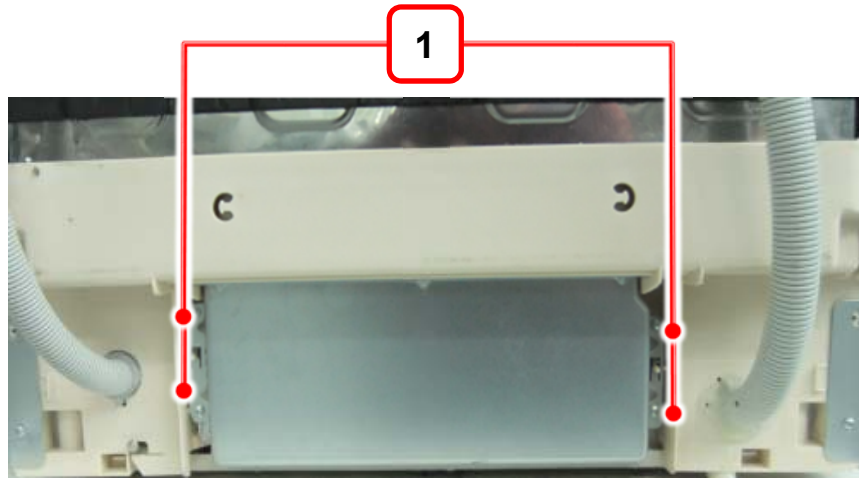
Inner fire shield



1- Inner fire shield

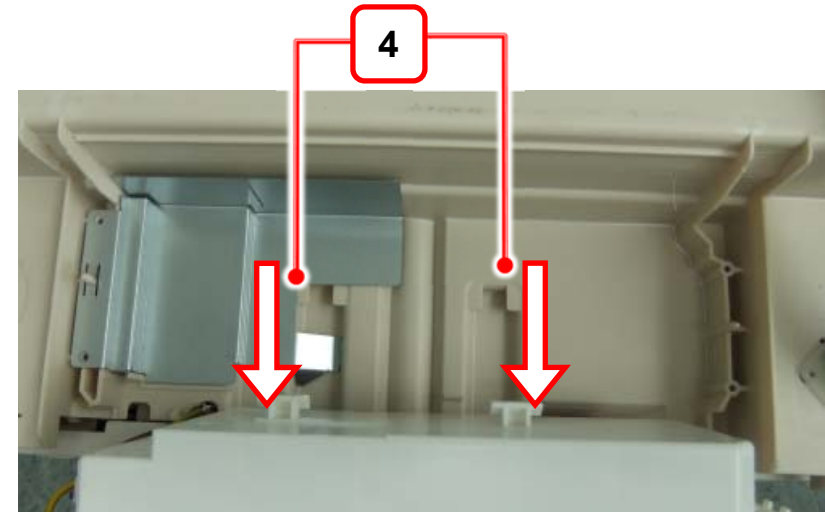
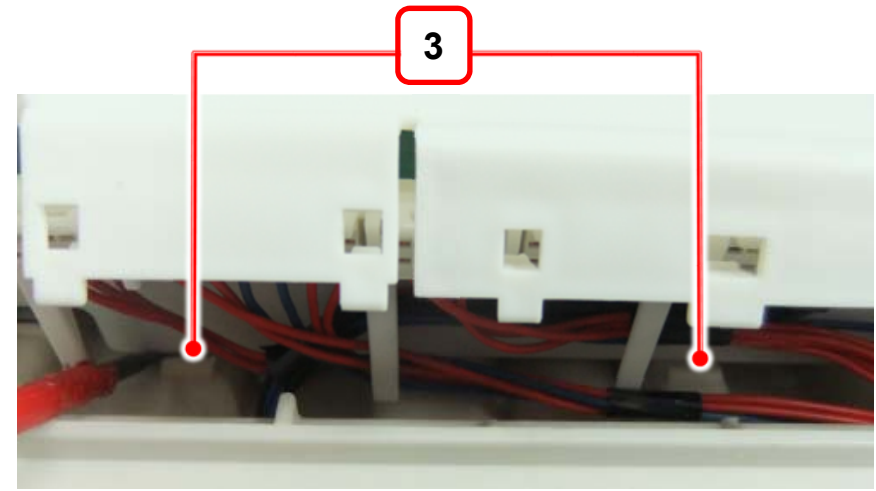
2- Metal cover to be assembled on top of electronic box

Main board disassembly



1- Remove 4 screws from the cover

2- Remove the metal cover



3- Unlock the 2 hooks

4- Pull the main board box downwards

3.13. Components check

PARTS	PB100 BLDC LEAD CONNECTIONS	PB200 ASY LEAD CONNECTIONS	PB300 ASY LEAD CONNECTIONS	CORRECT VALUE	REMARKS
POWER CABEL	A5 ↔ L	A5 ↔ L	A5 ↔ L	0 Ω	
	A6 ↔ N	A6 ↔ N	A6 ↔ N	0 Ω	
ON/OFF SWITCH	E5 ↔ E6	D5 ↔ D6	↔	0 Ω	
AUTO OFF COMMAND	E3 ↔ E4	D3 ↔ D4	↔		
				130 Ω ± 8%	DW off
Heating ELEMENT 2040W + Safety THERMOSTAT	A2 ↔ A1	A2 ↔ A1	A2 ↔ A1	25.9 Ω + 11.1% - 4.7%	Serial connection 2040W
Heating ELEMENT 1800W + Safety THERMOSTAT	A2 ↔ A1	A2 ↔ A1	A2 ↔ A1	28,7 Ω +/- 5%	Serial connection 1800W
DOOR SWITCH	N5 ↔ N6	M5 ↔ M6	↔	0 Ω	Door closed
DISPENSER	E1 ↔ E2	D1 ↔ D2	D1 ↔ D2	3900 Ω ± 8%	
RINSE AID SENSOR	J1 ↔ J2	J1 ↔ J2	↔	0 Ω	Without Rinse Aid
				INFINITE	With Rinse Aid
SALT SENSOR	J4 ↔ J3	J4 ↔ J3	E1 ↔ E2	0 Ω	Without Salt
				INFINITE	With Salt
TEMPERATURE SENSOR	L4 ↔ L5	K4 ↔ K5	G4 ↔ G5	4836 Ω ± 2.5%	At 25 °C
				915 Ω ± 4%	At 70 °C
TACHO SENSOR		G3 ↔ G1	E4 ↔ E3	223 Ω ± 5%	The motor has stopped
REGENERATION solenoid valve	G4 ↔ G3	F4 ↔ F3	D7 ↔ D6	3800 Ω ± 8%	
FILL solenoid valve	G1 ↔ G2	F1 ↔ F2	D4 ↔ D5	4100 Ω ± 10%	solenoid valve in fill pipe
				3750 Ω ± 10%	solenoid valve in base
ASY WASHING MOTOR		B4 ↔ B3	B6 ↔ B5	95 Ω ± 7%	ASY Motor
BLDC WASHING MOTOR	H4↔H5↔H6			56 Ω +5/-10%	BLDC Motor (phase-to-phase)
ASY DRAIN MOTOR + Anti-flooding		B1 ↔ B2	B1 ↔ B2	230 Ω ± 8%	Serial connection
BLDC DRAIN MOTOR	H1↔H2↔H3			93 Ω ± 10%	BLDC Motor (phase-to-phase)
FLOW CONTROLLER	F1 ↔ F2	E1 ↔ E2	↔	10400 Ω ± 8%	Motor
	F1 ↔ F3	E1 ↔ E3	↔	0 / INFINITE	Micro-switch

