# SERVICE MANUAL

DISHWASHERS


**Dishwashers with electronic control system**

# DOMODOSSOLA

**With**

**2nd Generation Door lock**


Customer Care - EMEA
Training and Operations Support
Technical Support

Publication number

**599 80 18 - 23**

EN

Edition: 010/2016 - Rev. 00

**CONTENTS**

# 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

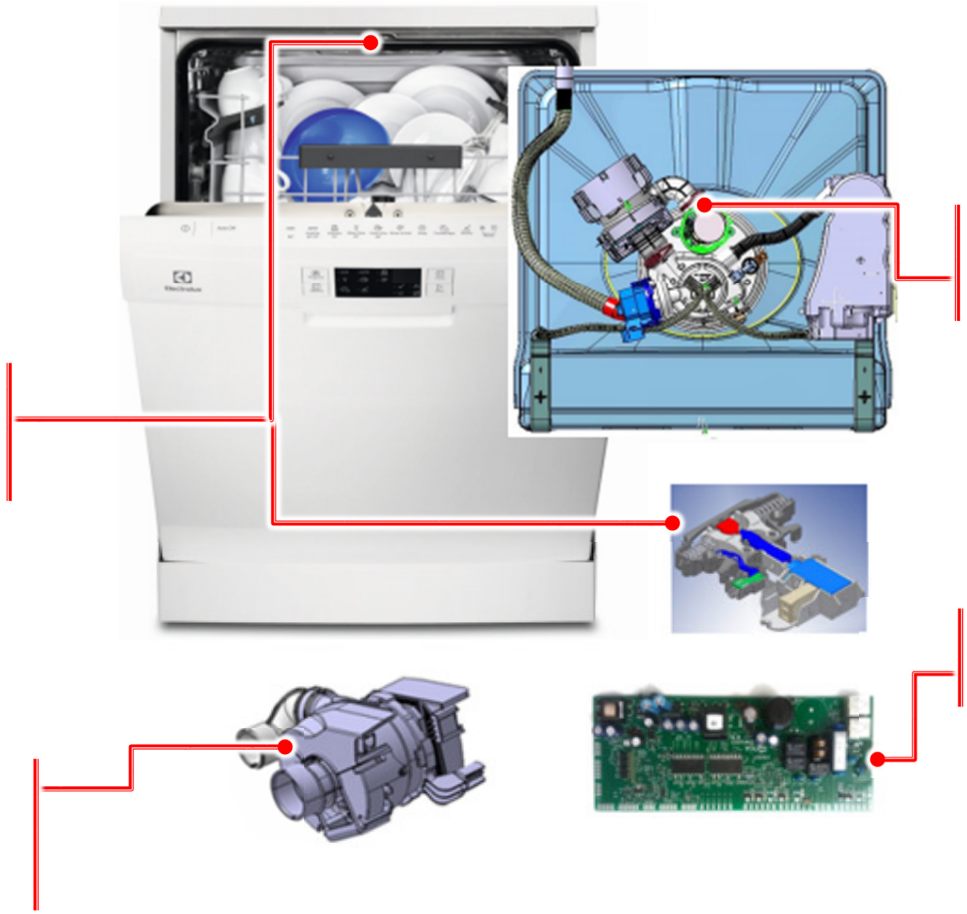
- **Electrical appliances must be serviced only by qualified Service Engineers.**
- **Always remove the plug from the power socket before touching internal components.**

Document Revisions

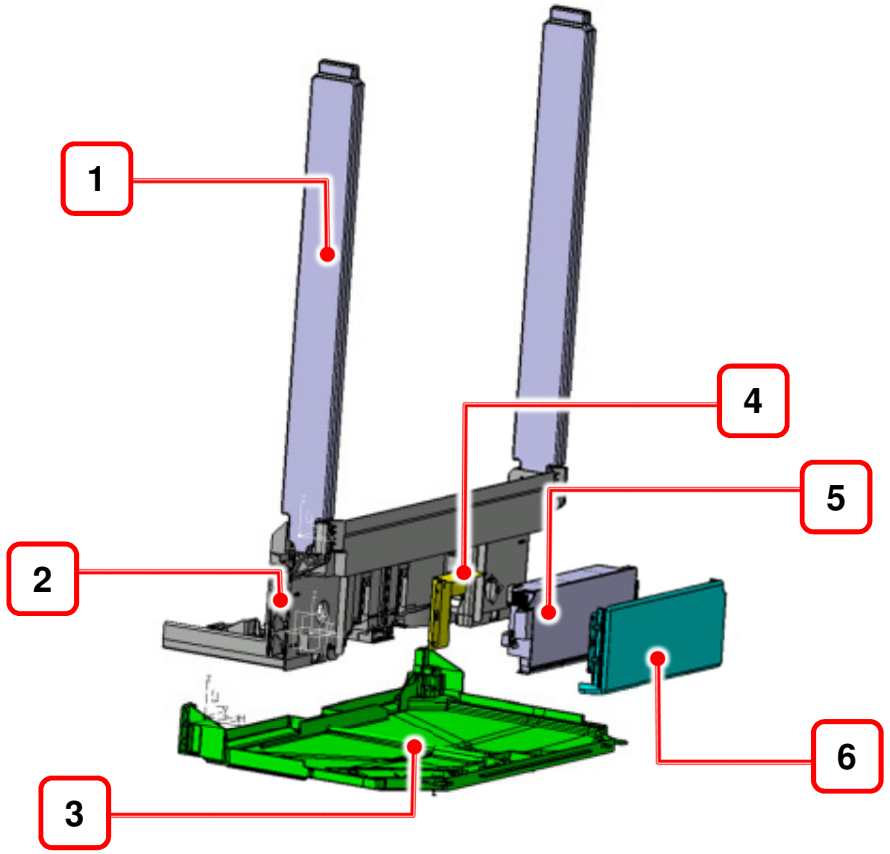
| Revision | Date | Description |
|---|---|---|
| v0.0 | 10/2016 | Document creation |

# 3. Technical details

## 3.1. Product overview

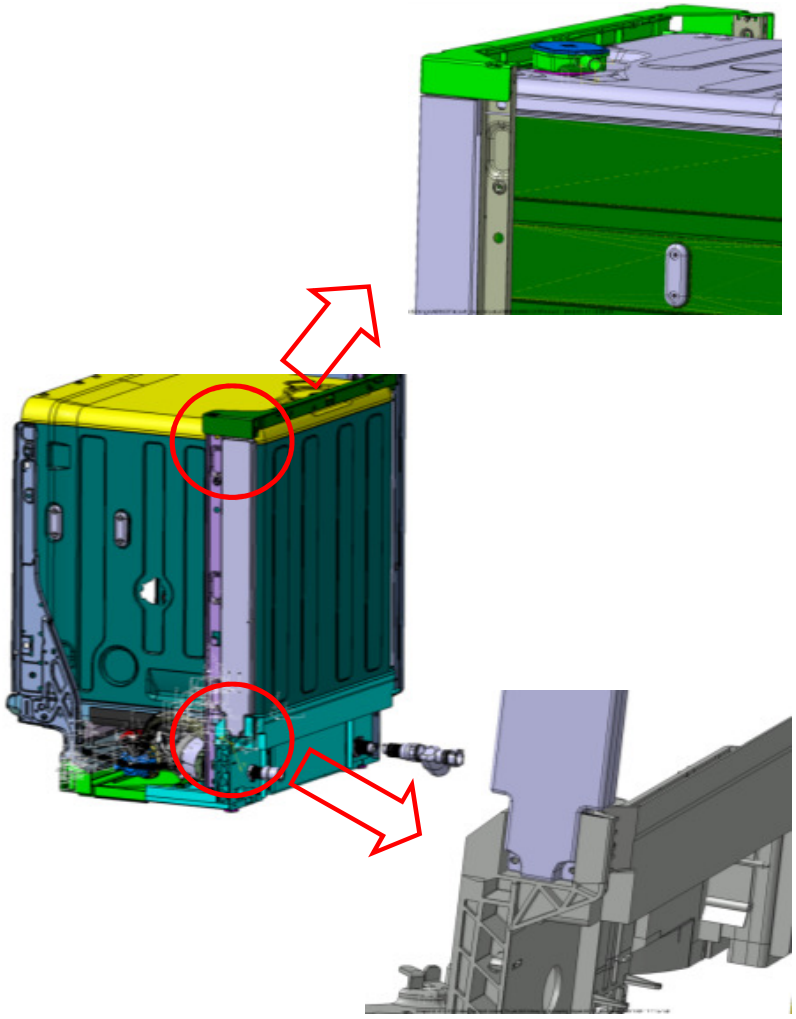


## 3.2. Structural Parts



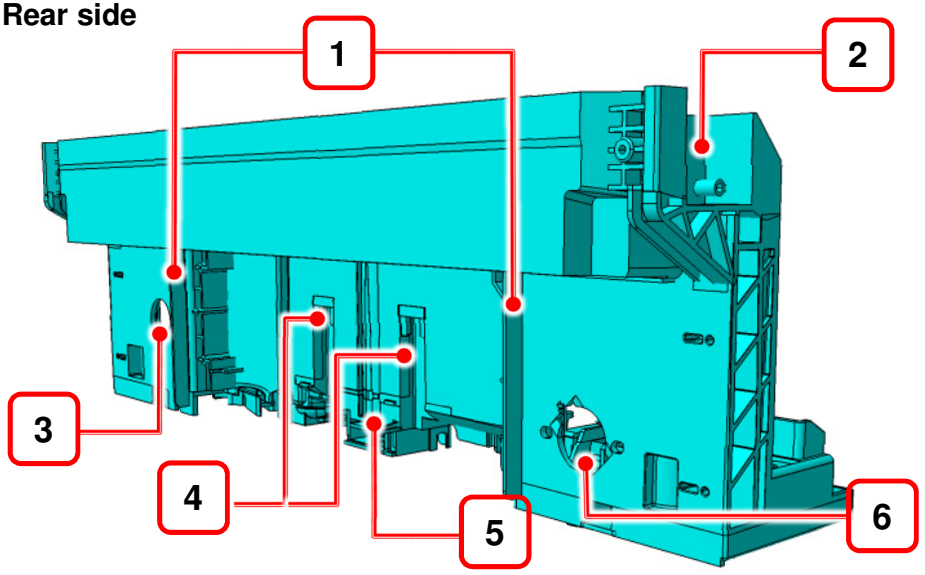

| | |
|---|---|
| **1-** Counterweights | **2-** Base |
| **3-** Bottom tray | **4-** Inner fire shield |
| **5-** GMB Box (Covered in Electronic System) | **6-** Metal cover |

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



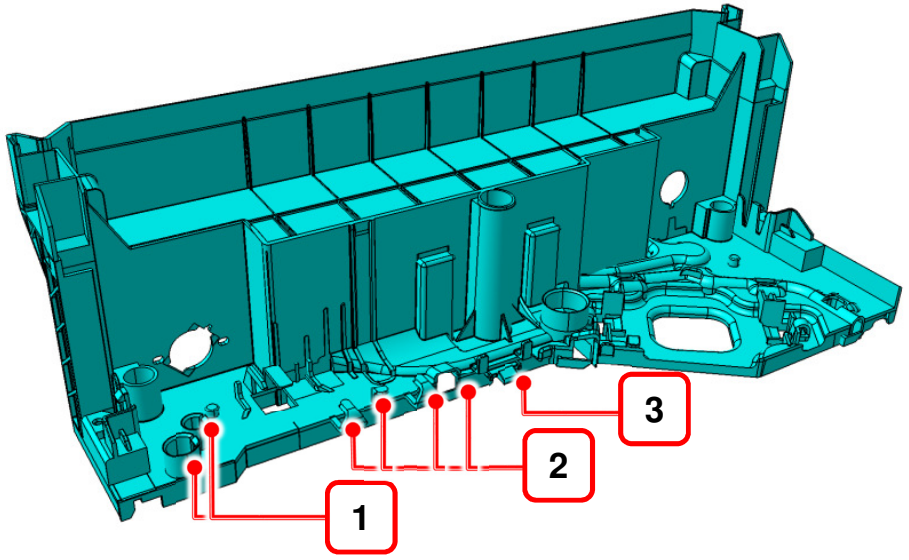
## 3.3. Base

**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 | **2-** Area for swing in and attach the counter weights with screws |
| **3-** Water outlet | **4-** Channels for inserting the hooks from the mainboard box when assembling |
| **5-** Ribs to prevent cables from mainboard to fall down | **6-** Water inlet |

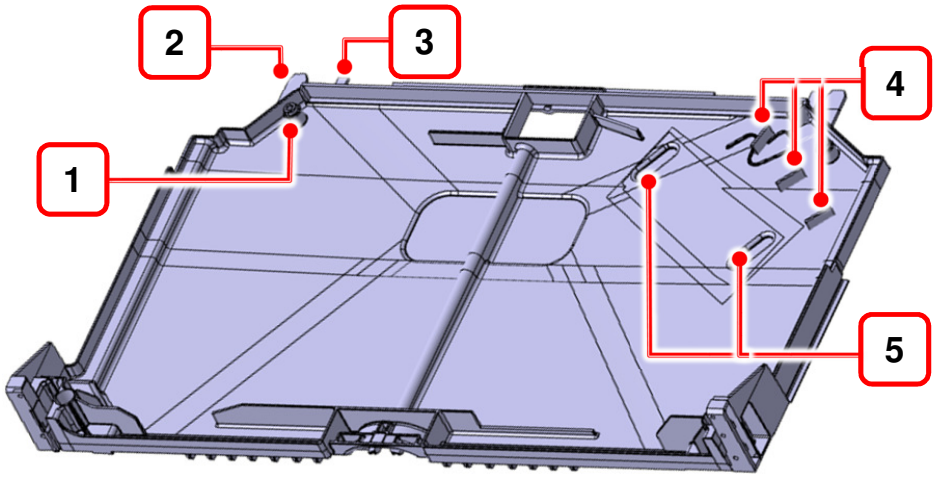
**Inner side**




| | |
|---|---|
| **1-** Holder for active drying hose | **2-** Cable exit and holders for cables |
| **3-** Holder for float switch | |

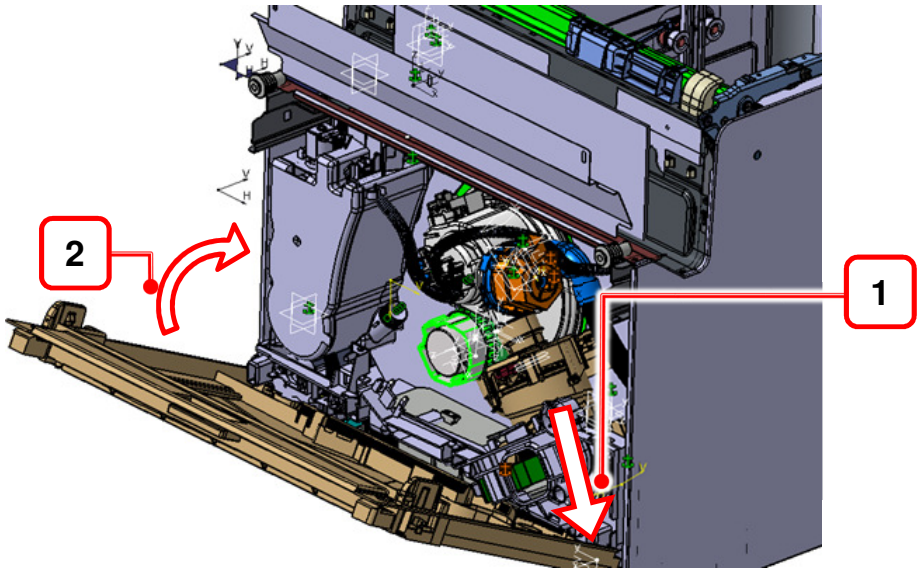
## 3.4. Bottom tray

**Details**



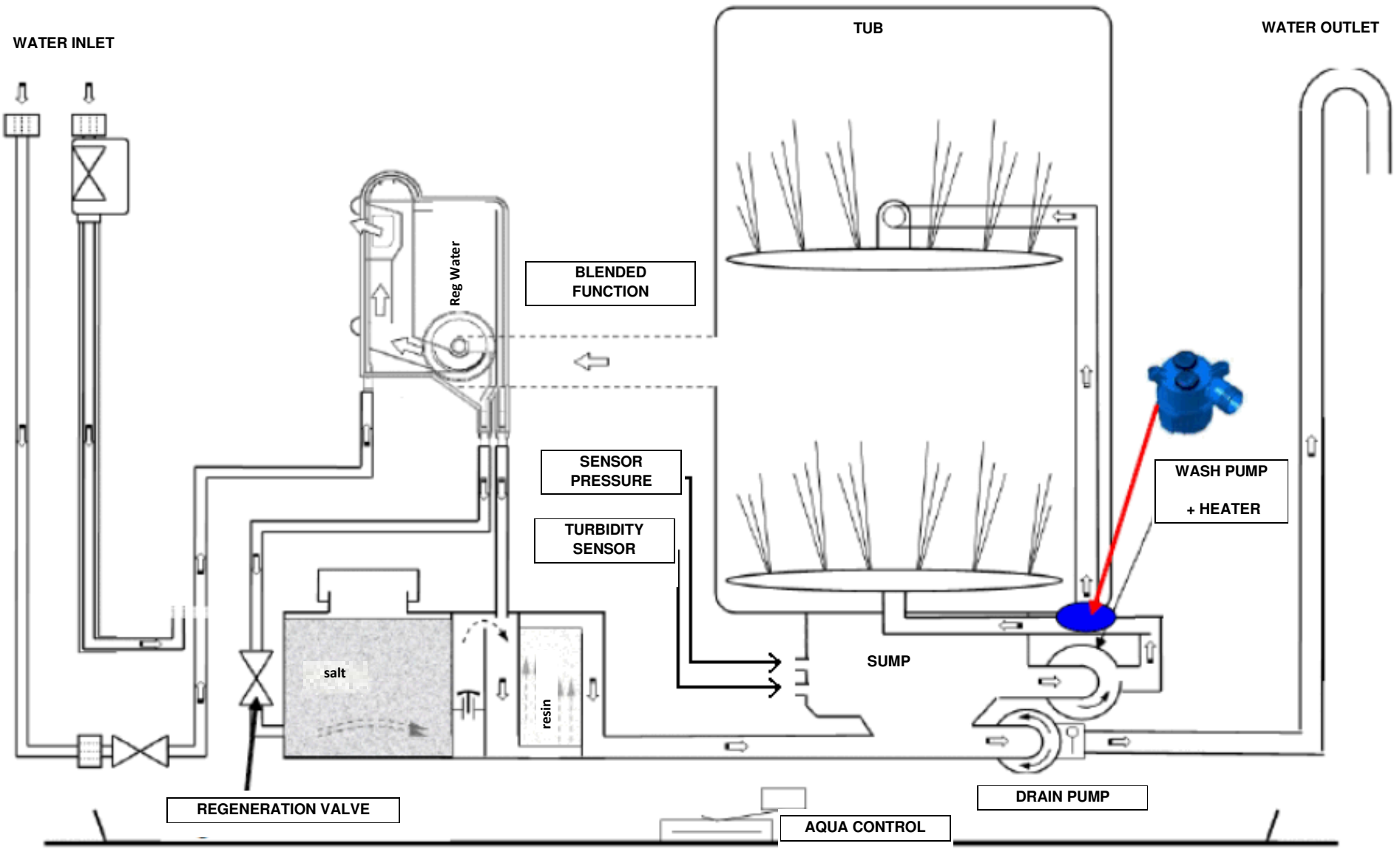

| | |
|---|---|
| **1-** Screw bosses that is only planned to be backup if the snaps fails | **2-** Snaps for assembling tray to base |
| **3-** Ribs to help controlling the movement when assembling the tray | **4-** Ribs to lift cable to prevent them from reaching the water |
| **5-** Dents for rubber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

**Assembly instructions**



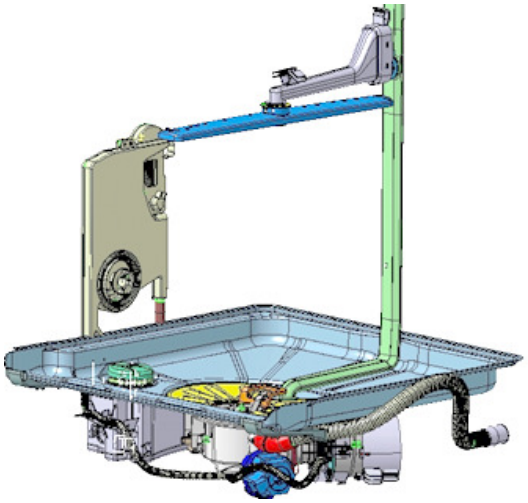

| | |
|---|---|
| **1-** Insert bottom tray (without metal feet), the tabs on the tray must match the slots in the base.<br>The tray should be horizontal if the machine lays on its back | **2-** Keeping bottom tray pushed inwards, rotate it into place |

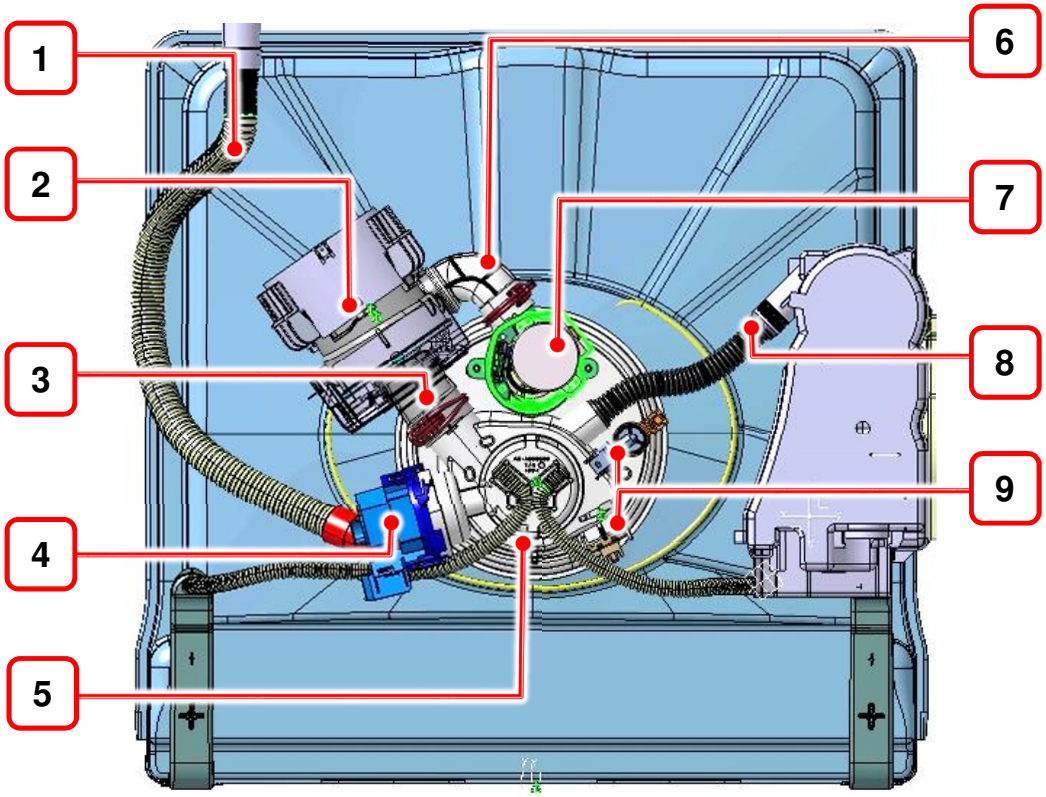
## 3.5. Water circuit

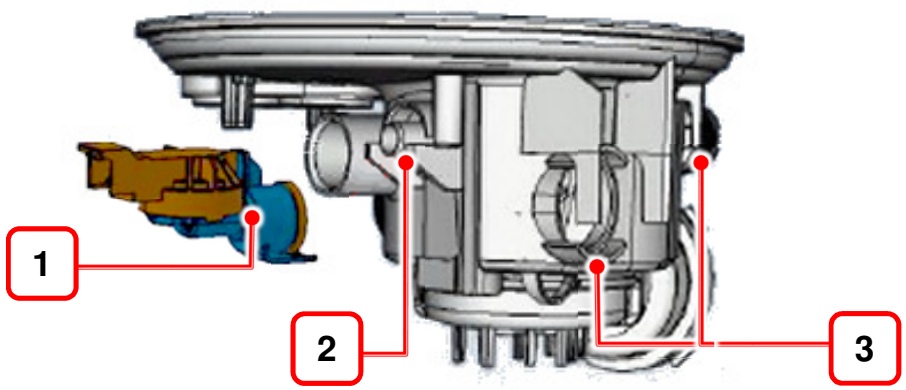


## 3.6. Hydraulic circuit

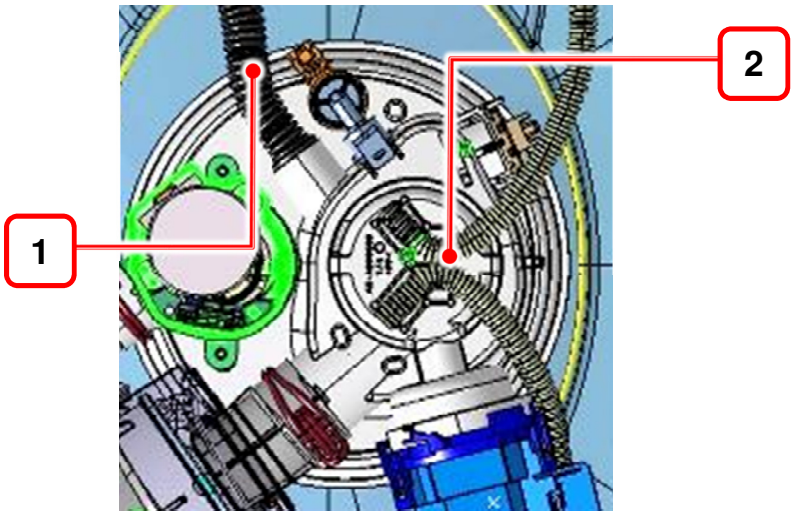
| | |
|---|---|
| **1-** Drain hose. | **2-** Wash pump with integrated heater |
| **3-** Hose pump-sump (included with sump) | **4-** Drain pump |
| **5-** Sump | **6-** Hose pump-FC/FD (included with pump) |
| **7-** Flow controller (FC) or Flow distributor (FD) | **8-** Hose softener-sump |
| **9-**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








| | |
|---|---|
| **1-** Pressure sensor with radial sealing | **2-** Pressure sensor snap:<br>- robust snap from bottom<br>- ribs in sump to limit rotation<br>- half round rib to limit move upward |
| **3-** Harness snaps | |



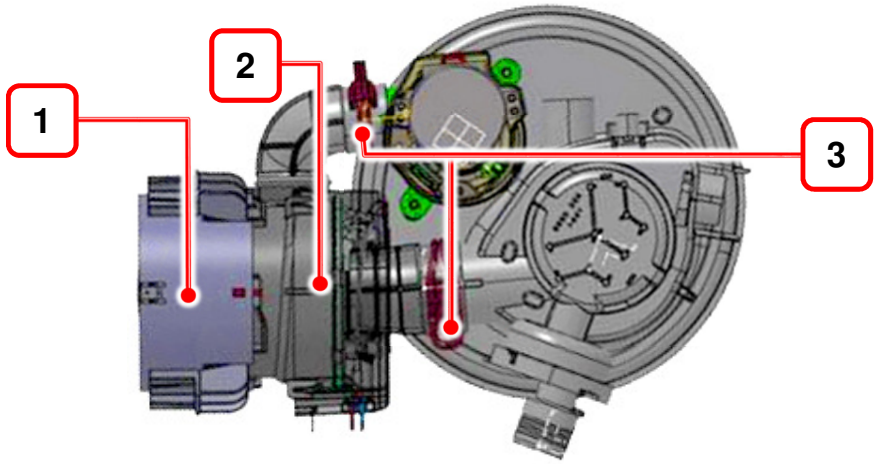

| | |
|---|---|
| **1-** Softener-sump hose: Corrugated pressed and sealed using o-ring compression. Symmetrical connectors from sump and softener side.<br><br>Proper assembly: must put hose to the sump and than to the softener. | **2-** Overflow hoses: The same parts for both sides. Position provided by friction with sump ribs. Ribs are indicating correct assembly position |

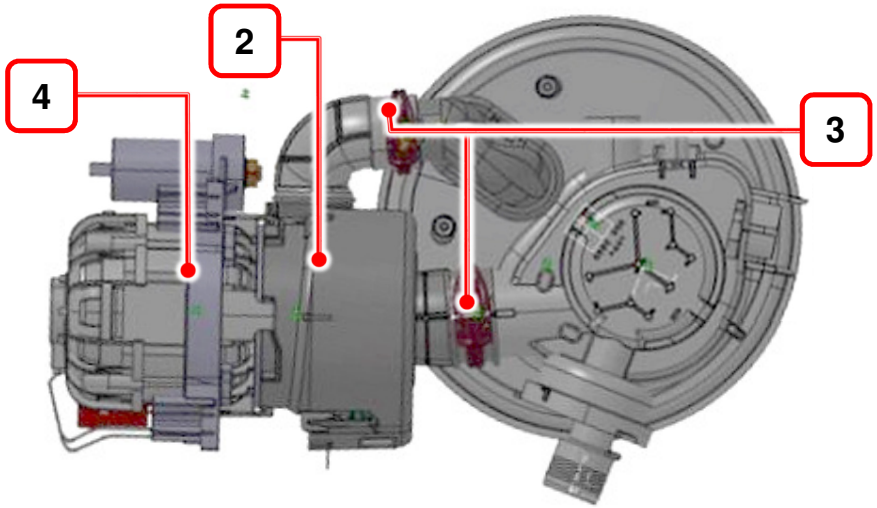
## 3.7. Sump Circ Motor and Heater

**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

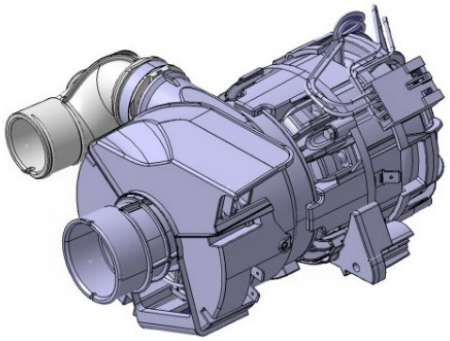
For both motors the heater is available as separate spare part



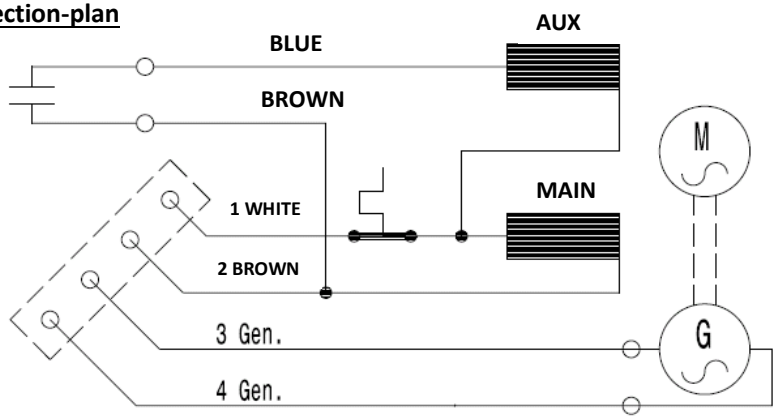




| | |
|---|---|
| **1-** BLDC motor with FC | **2-** Omega heater |
| **3-** Clamps | **4-** Asynchronous motor with FD |

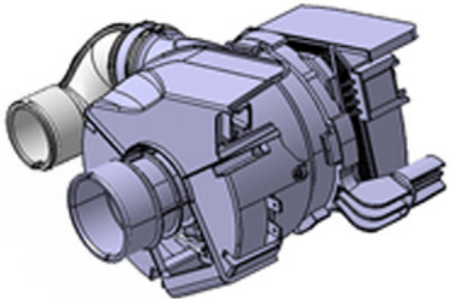
**Single phase asynchronous washing pump motor with FD**

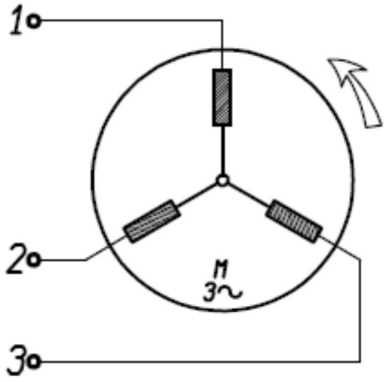


**Connection-plan**



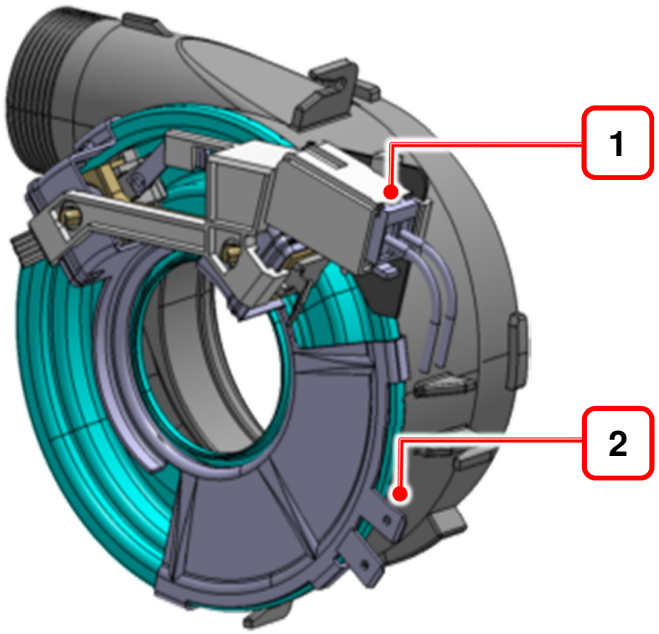

**Three phase washing pump BLDC motor with FC**





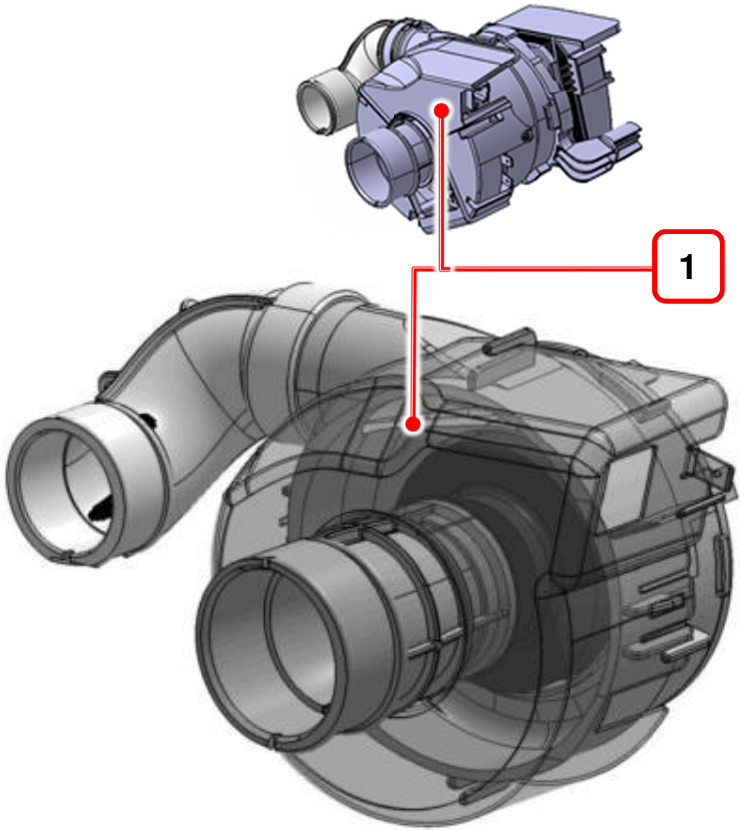

230/240 V 50/60 Hz Class F
Resistance: 1-2: 56 ohms/2-3: 56 ohms/3-1: 56 ohms

**Omega heater:**




| | |
|---|---|
| **1-** Electric connection of the heater | **2-** Ground connection |

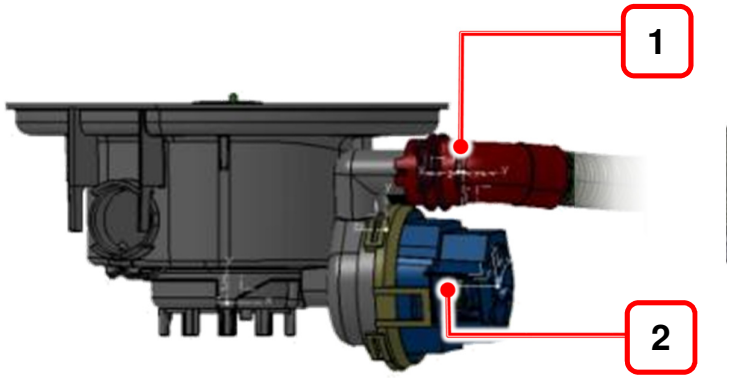
| Voltage EU 220-240 V, | Power: 1800 W |
|---|---|




| | |
|---|---|
| **1-** Heater Cover | |

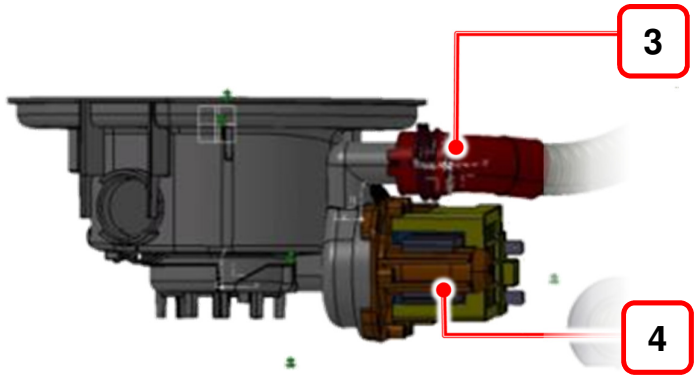
## 3.8. Sump and drain system

**Three-phase Synchronous BLDC motor**



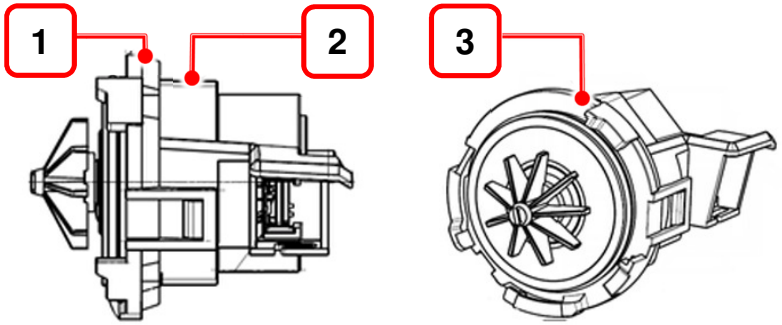

| | |
|---|---|
| **1-** Cuff on drain hose:<br>- Clamped to drain outlet.<br>- Positioned by rib in sump and ribs in cuff. | **2-** Drain pump (Three-phase Synchronous BLDC motor):<br>- Fixed directly in sump built-in volute using<br>- Bayonete system<br>- Back of protection hook provided for motor |

**Single-phase Synchronous motor**




| | |
|---|---|
| **3-** Cuff on drain hose:<br>- Clamped to drain outlet.<br>- Positioned by rib in sump and ribs in cuff. | **4-** Drain pump (Single-phase Synchronous motor ):<br>- Fixed directly in sump built-in volute using<br>- Bayonete system<br>- Back of protection hook provided for motor |

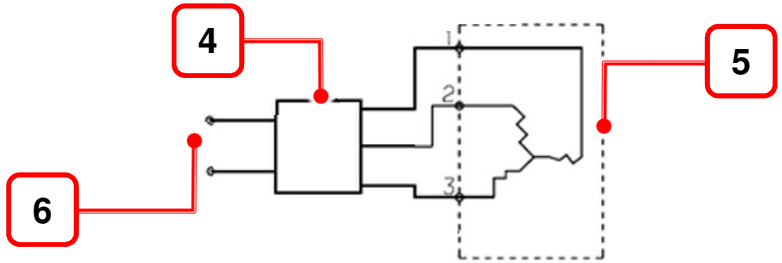
## Drain pump - Three-phase Synchronous BLDC motor




Voltage 230 V 50 Hz

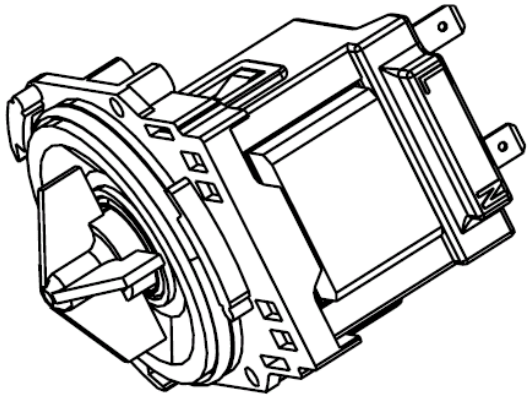
Power: 21 W → resistance 46,5 ohms +/- 10%

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

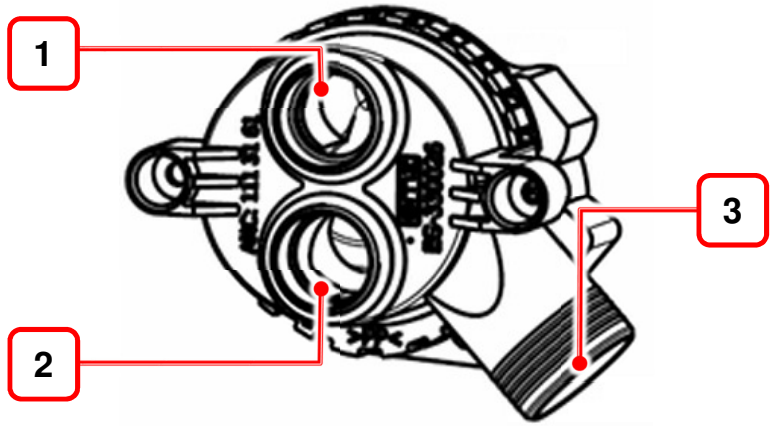
Power: 30 W → resistance aprox 225 ohms

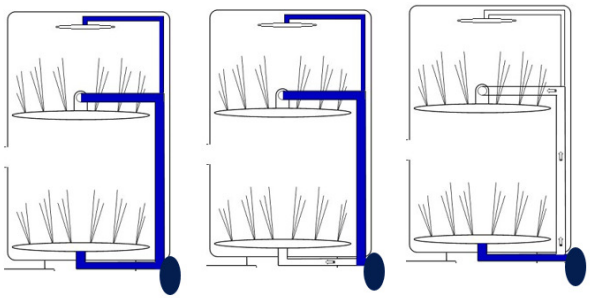
Max flow rate: 15 litre/min

## 3.9. Flow controller

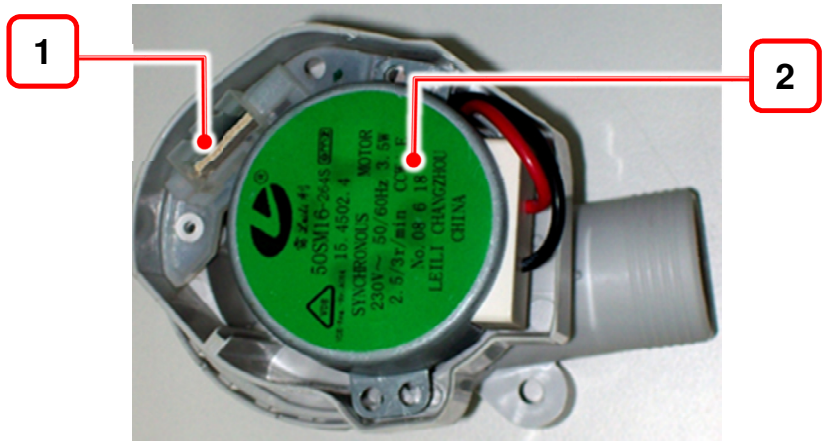
**Details**

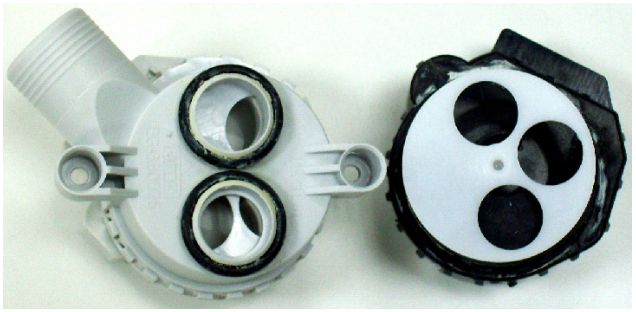
The flow controller is designed to control the water flow towards the top spray arm only, bottom spray arm only or towards both spray arms.

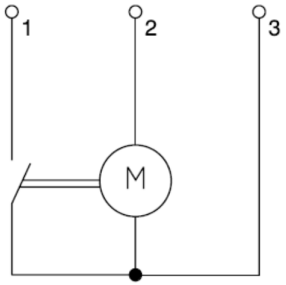


| | |
|---|---|
| **1-** Water outlet to lower spray arms | **2-** Water outlet to upper spray arms |
| **3-** Water inlet from wash pump | |



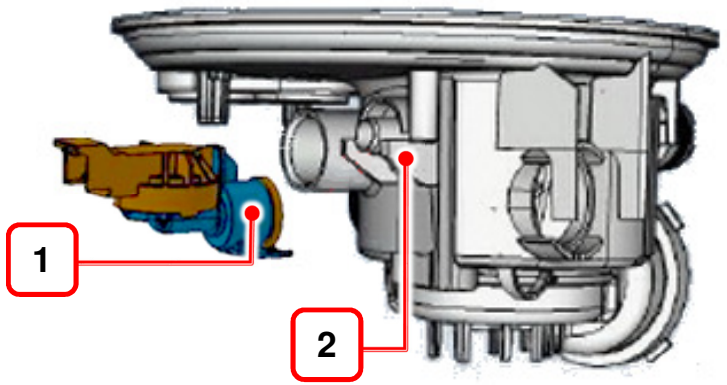





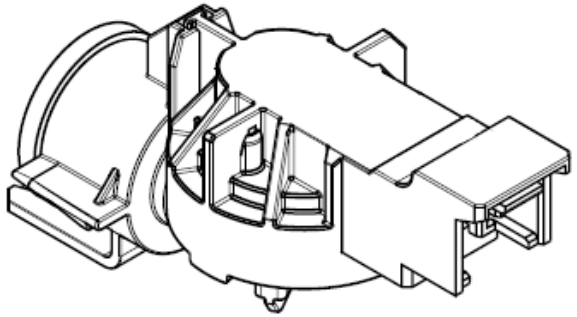

| | |
|---|---|
| **1-** Micro switch | **2-** Synchronous motor<br>230V AC, 50/60Hz<br>2.5/3 rounds/minute<br>Counterclockwise direction |

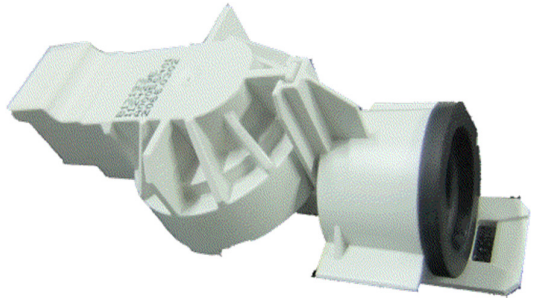
## 3.10. Pressure sensor

**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% |

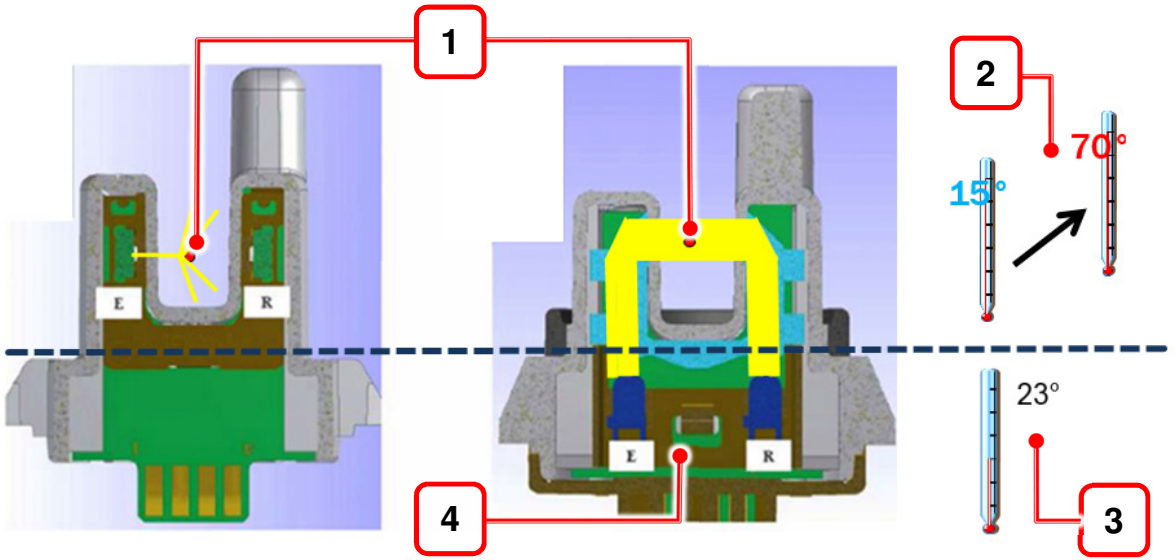
## 3.11. Turbidity sensor (High power sensor)

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.

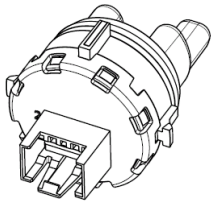
The light is collected by a new technology and guides the light into the measurement zone.

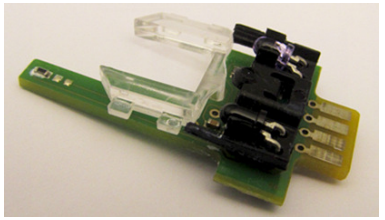
- Use of larger LEDs
  - the light area increases from 3 to 20sqmm
  - small dirt pieces cannot block the light beam anymore
- LEDs are located in a colder area
- less temperature fluctuations around the LED's
- higher precision during measurement
- improved signal stability
- measurement during higher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

**OLD** **NEW**



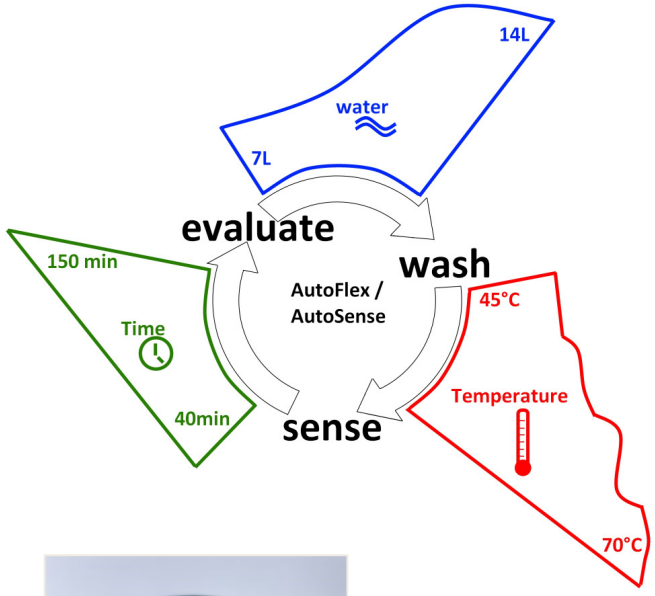

| | |
|---|---|
| **1-** Dirt pieces | **2-** Temperature between 15-70°C in water |
| **3-** Constant 23°C measured, because LEDs are outside the hot water area | **4-** The temperature sensitive electronical components are out of the water zone, where the temperature is colder and more constant |





## 3.12. 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

## 3.13. XtraDry option

The XtraDry option increases drying performance and impact the following:

- Extension of the drying phase
- Higher temperature in the rinse cycle
- Increase adding of rinse aid

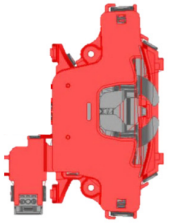
| PROGRAM | DRYING PHASE | TEMPERATURE HOT RINSE | RINSE AID |
|---|---|---|---|
| Intensive 70℃ | +30min | +1℃ (70℃) | +3 ml |
| Auto 45℃ - 70℃ | +30min | +1℃ (70℃) | +3 ml |
| Eco 50℃ | +0min | +15℃ (70℃) | +1,5 ml |
| Glass 45℃ | +30min | +5℃ (60℃) | +3 ml |
| 30 Min. 60℃ | +30min | +10℃ (70℃) | +3 ml |

The XtraDry option (extending time for better drying) and Time Saver option (reducing time) are not compatible.

## 3.14. Door Lock with Auto Door Opening – 2nd generation

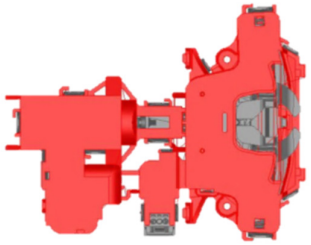
### Doorlock

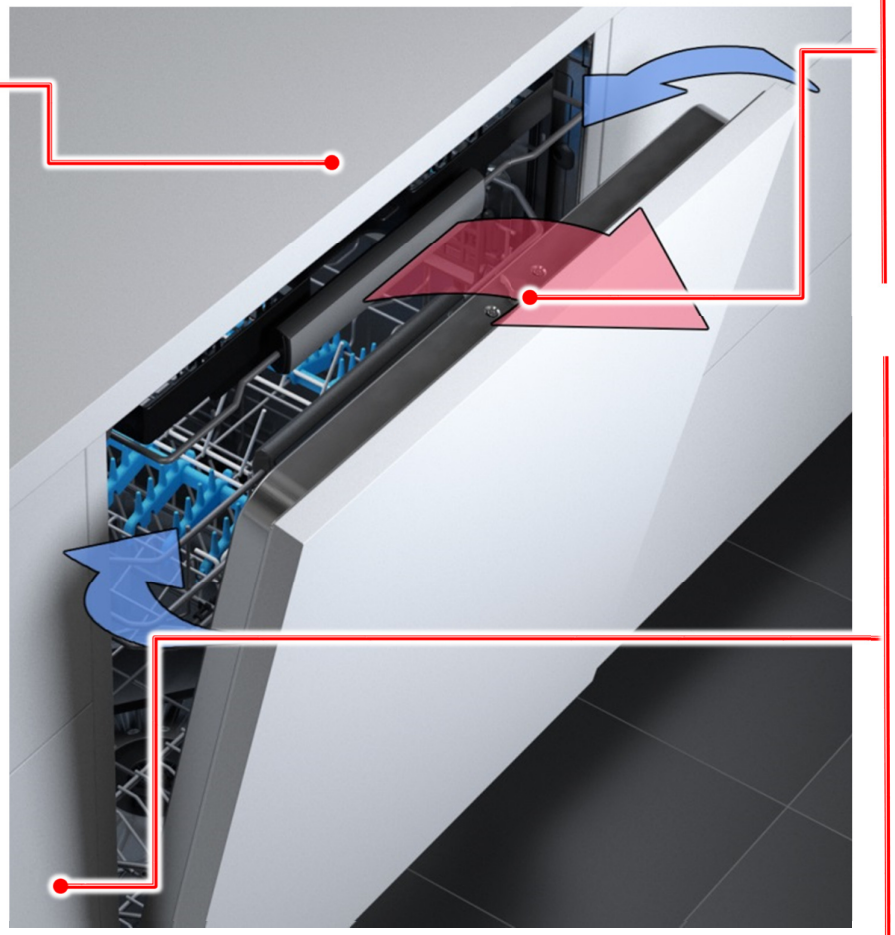
The door lock is fixed on the upper front cross bar, springs are adjusted to 50/60N.



### Doorlock with Auto door opening

The mechanism to open the door is integrated in the locking device to guarantee process control



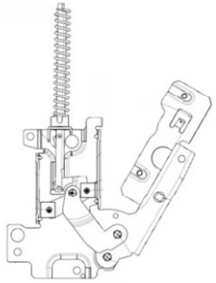


### Diamond

Opening and Closing feeling are defined by the shape of the diamond sitting in the door

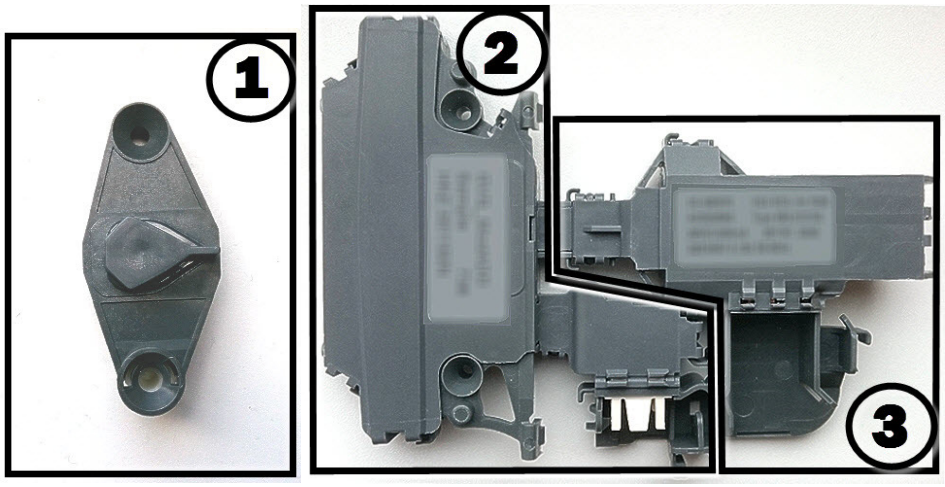
### Hinges

After the locking is disengaged the hinges balance the door at 10 cm opening, to guarantee air flow for drying efficiency and furniture protection.

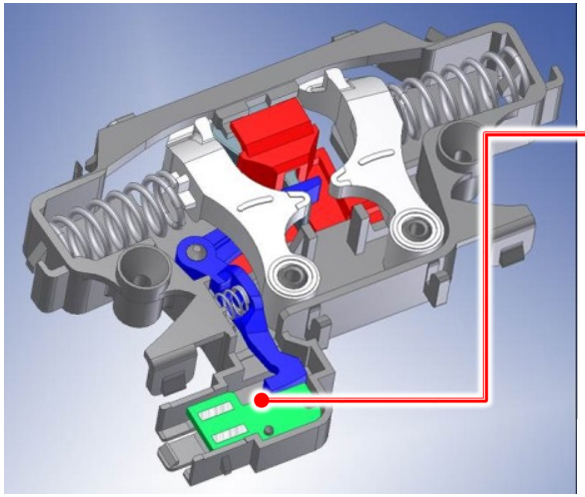


The door lock will have in the same part also the auto door opening. The door will open because of the new door hinges. The door lock, auto door opening and door hinges allow this new integrated system for better drying performance.

1 – Diamond
2 – Door lock
3 – Auto door opening



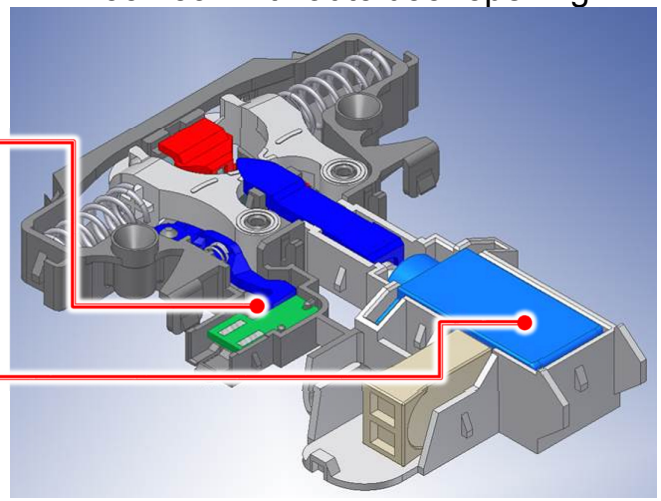

Door lock



28V DC micro switch

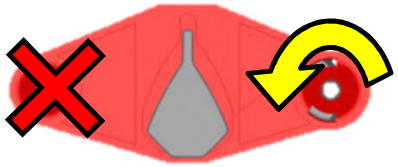
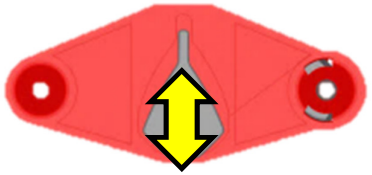
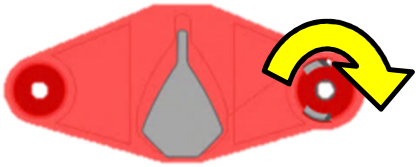
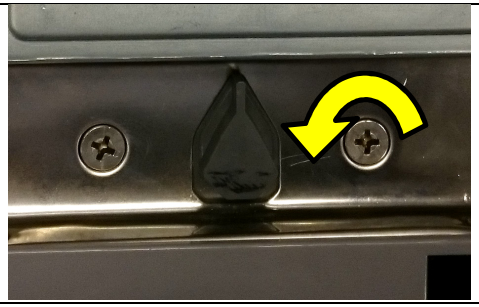
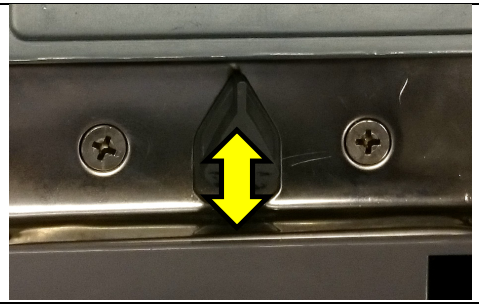
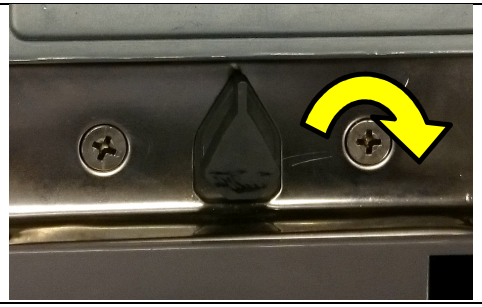
220/240V AC Wax actuator

Door lock with auto door opening



The diamond is fixed on the door, and it's possible to adjust the diamond position.

## How to adjust the Diamond position

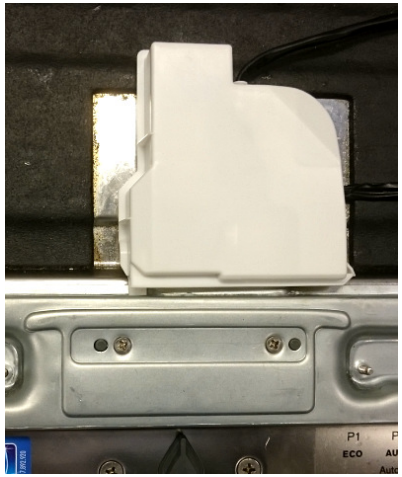
| | | |
|---|---|---|
| - Loosen the right screw of the diamond until it spins.<br>- Do **not** loosen the left screw at the same time.<br>- Push downwards with the screwdriver on the screw to loosen the clamping lever. | - Lift up the diamond between 2 fingers.<br>- Push forward or backward (according to needed adjustment)<br>- Push down until locked in position. | - Fix the right screw again to lock the diamond. |
|  |  |  |
|  |  |  |

Detail of the lever on the Diamond.

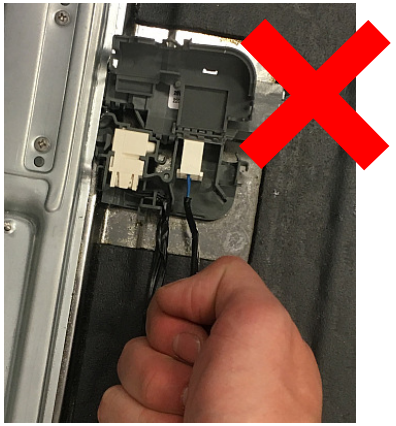
If door is hard to keep closed: adjust diamond forward into the dishwasher.
If door is closing too much: adjust out of the dishwasher.

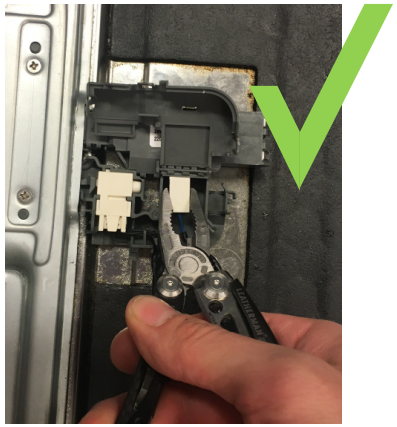
## Disassembly:

The door lock is snapped and fixed with 2 screws on the upper front cross bar, to exchange it, the crossbar has to be taken.

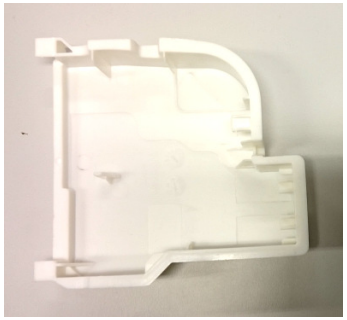


Door lock with Auto door opening assembly

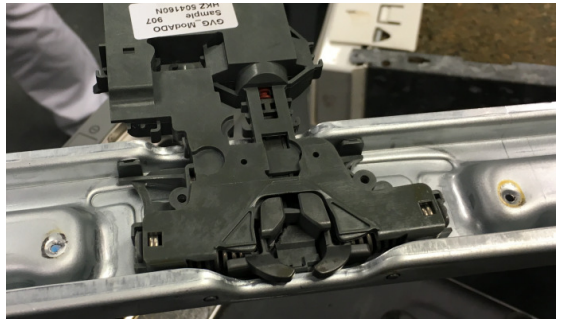




When replacing the Door lock or Door lock with Auto door opening do not Pull on the wire's – use plyers to pull off connector.



Cover of Door lock with Auto door opening

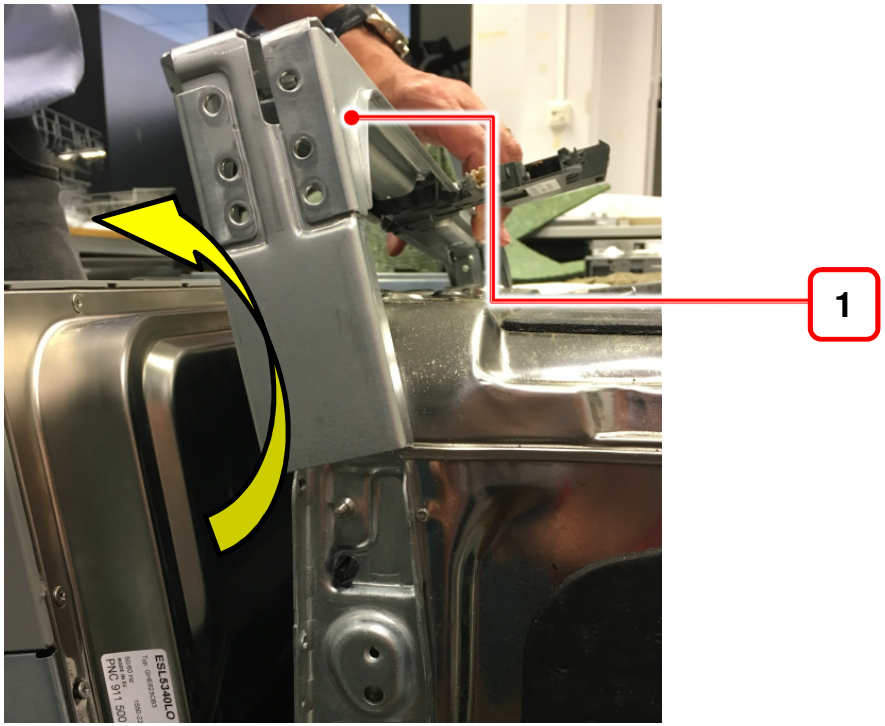


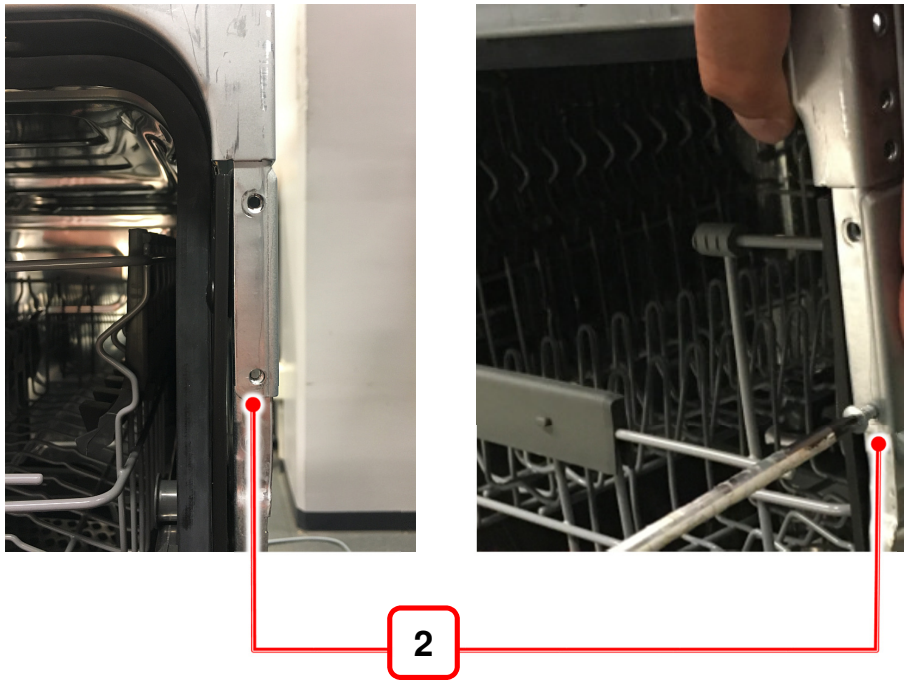
Detail of the snapped fixation with 2 screws on the upper front cross bar

Assembly:

- Use manual screw driver to avoid overturning and damaging the screws
- Make sure wires are not twisted or damaged
- Regarding the Wax motor – polarization does not matter
- Put the wires in the cable channel
- Put the cover
- Functional test with Service menu after assembly

**Details**




| | |
|---|---|
| **1-** When assembling the crossbar needs to be rotated from the hingebar / tub | **2-** When assembling the crossbar, start with the front, lower screws for positioning |

## Auto door opening (ADO) – working description

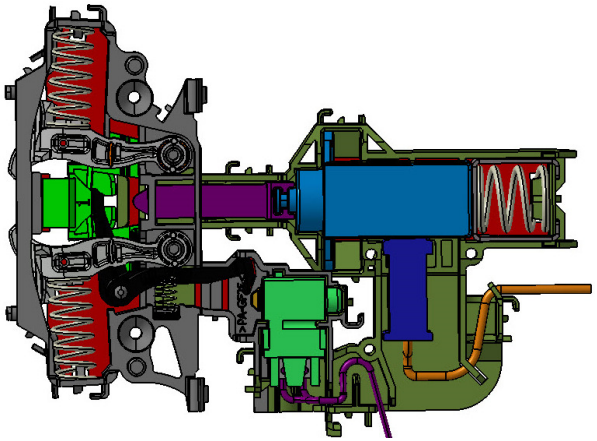
When the machine is done with the washing cycle, the door will open:

- The Wax motor in the auto door opening (ADO) is activated
- Latest 2min later the door lock release the door.
- The door falls through the weight of the door itself to 10cm opening, because the hinges are balanced for 10cm opening.
- The 10 cm opening allows for faster exchange of moist and dry air.
- When the drying is done, the machine beeps. The door remains open even after the cycle is finished.
-

The Auto door opening (ADO) is default on with option AirDry enabled.

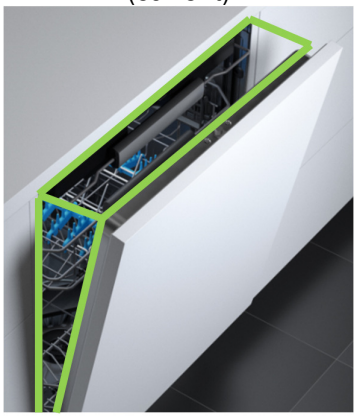
The consumer may deactivate AirDry option on user mode for:

- Child safety feature
- Protection of the kitchen furniture, if customer is unsure.



ADO 1st Generation
(previous)

ADO 2nd Generation
(current)

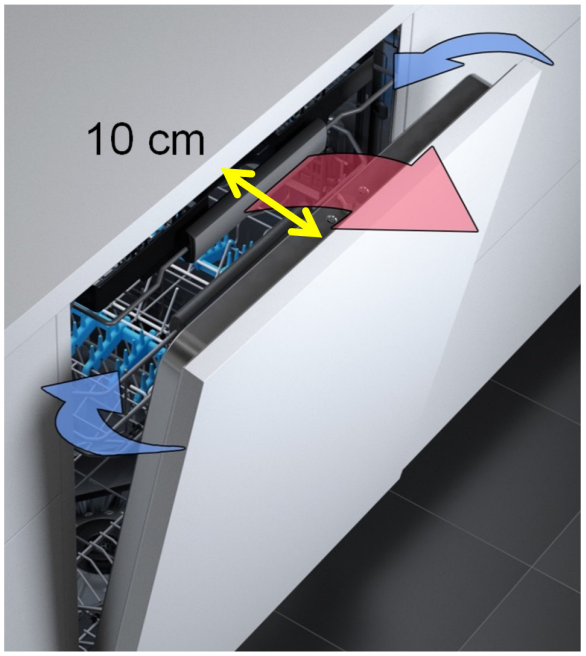


Increased opening allows for faster exchange of moist and dry air

- Increased drying speed
- Decreased risk for condensation

## How to check the Auto door opening (ADO)

- Open the door
- Activate service mode
- Go to actuator position 10
- Close door
- Wait 2 minutes for the door to open
- Check if the door opens 10cm between the upper front cross bar and inner door




**Door opens:**

5 to 10cm - Drying results are as expected.

10 to 20cm – According to specification

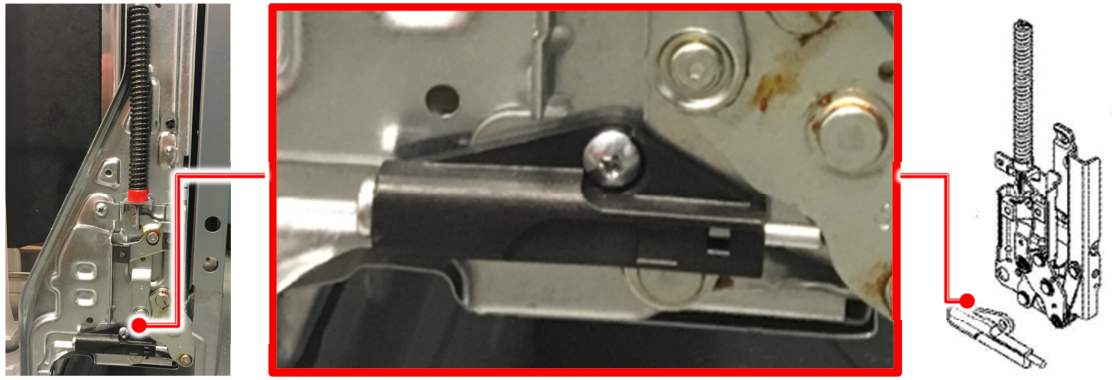
More than 20 cm – The door might fall all the way open and this could mean that panel might be too heavy.

## Door not closing

Probably the Auto door opener is still active.

The Wax motor is still warm, because it take about 3 min for cooling and allow the door to close.

On fully integrated models there is a “pusher” (damper) located on the hinge to assure that the door goes open.



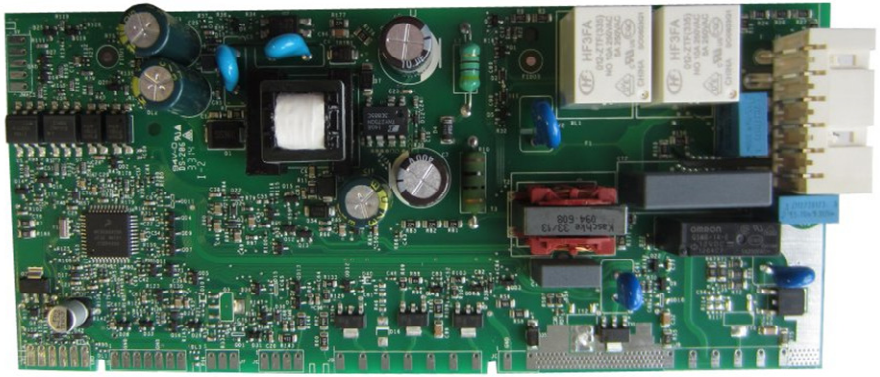
## 3.15. Electronic Main Boards

- 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 200**

**PB 100**

**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.
    - Non-Insulated EU variant
    - Insulated EU variant
    - Insulated NA variant

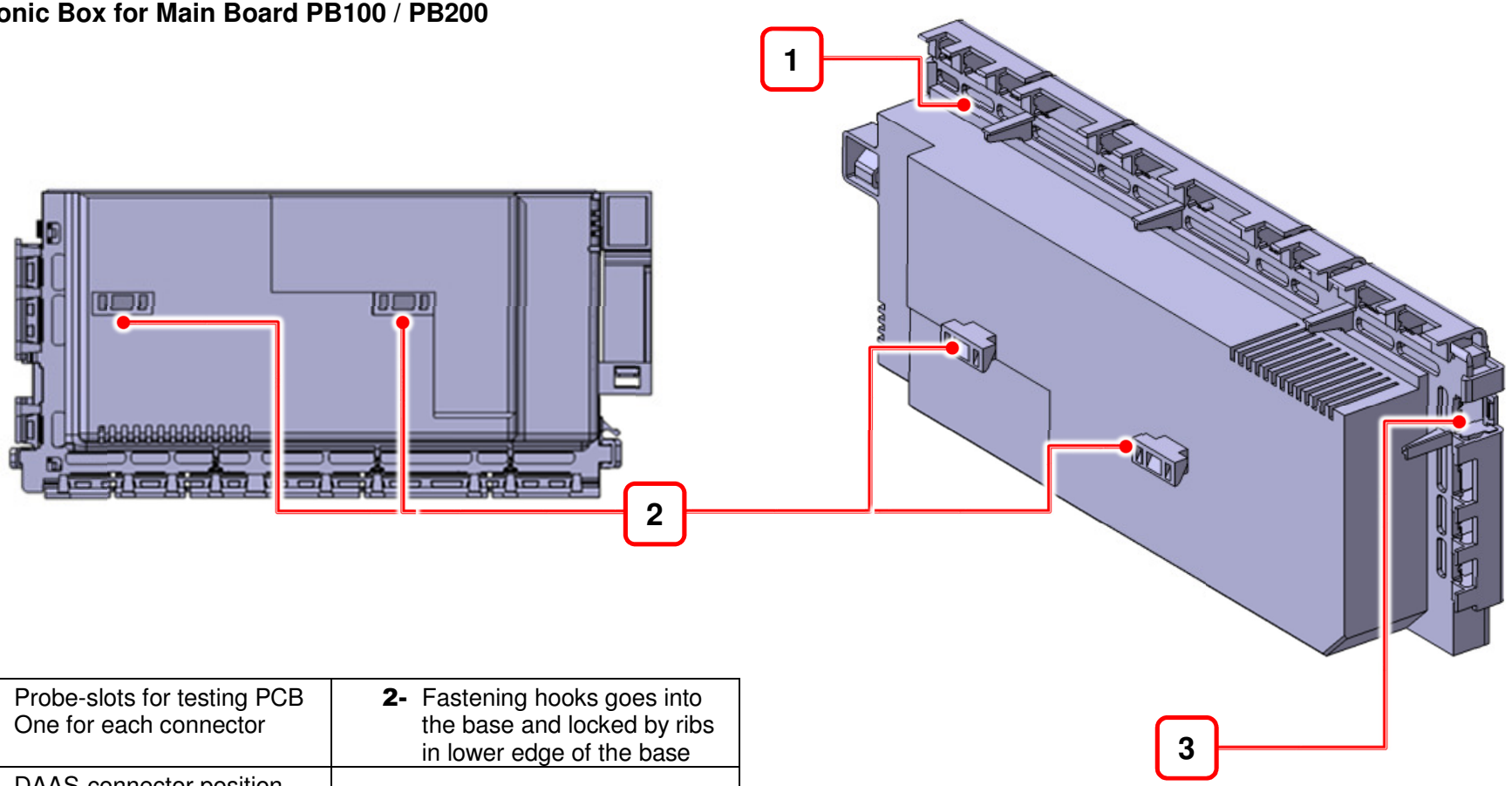
**EDW-PB200**

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

**EDW-PB300**

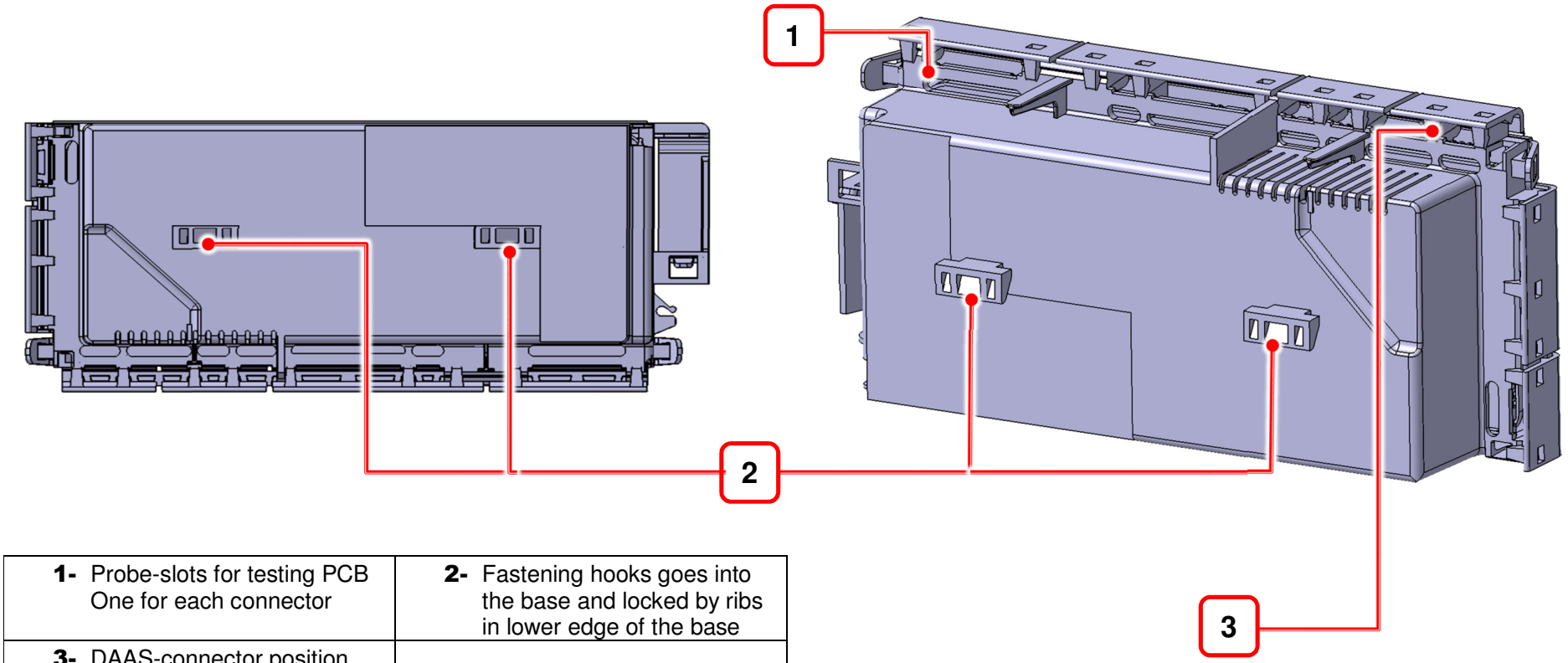
- Low range. Supports EU.
    - Insulated EU variant

## 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 | |

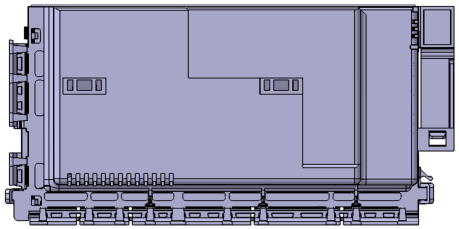
## Electronic Box for Main Board PB300



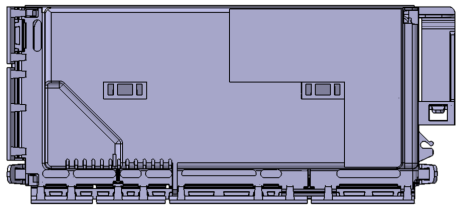

| | |
|---|---|
| **1-** Probe-slots for testing PCB<br>One for each connector | **2-** Fastening hooks goes into the base and locked by ribs in lower edge of the base |
| **3-** DAAS-connector position<br>Open interface due to easy access for service and programming<br>Note the position differs from PB100/200 | |

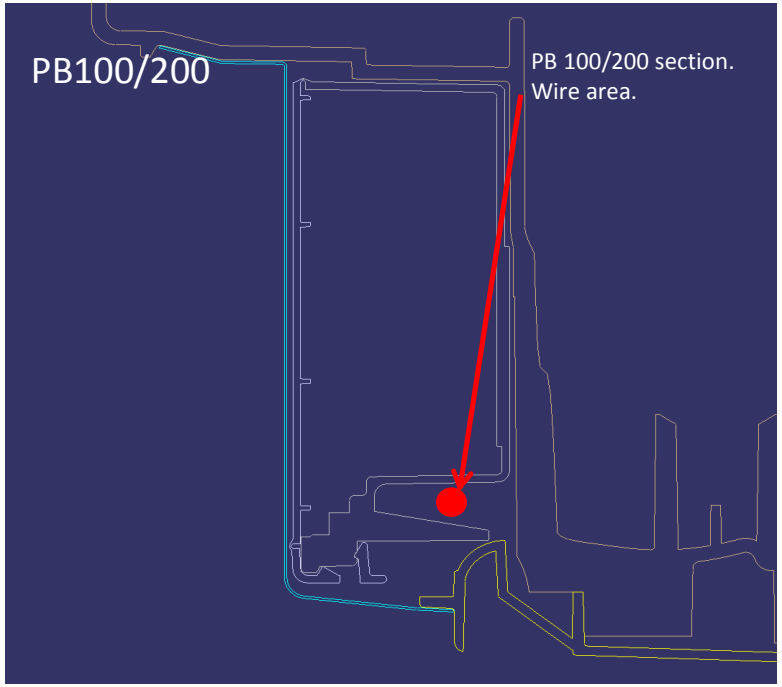
## Differences between PB100/200 and PB300

PB100 / PB200



PB300

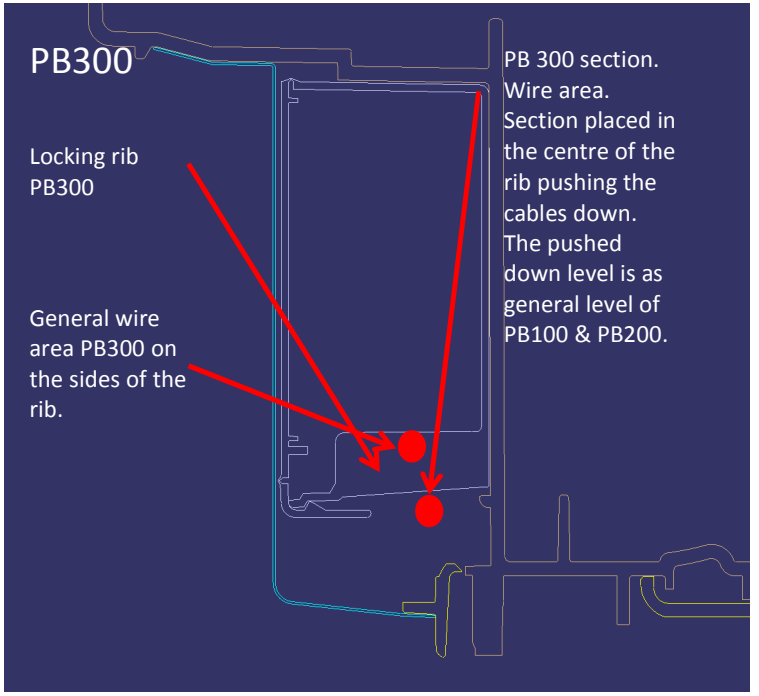





The cables are higher up on PB300 (since box is smaller) compared to PB100/200. So when the cables are pushed down under the rib the cables end up on the normal PB100/200 height.

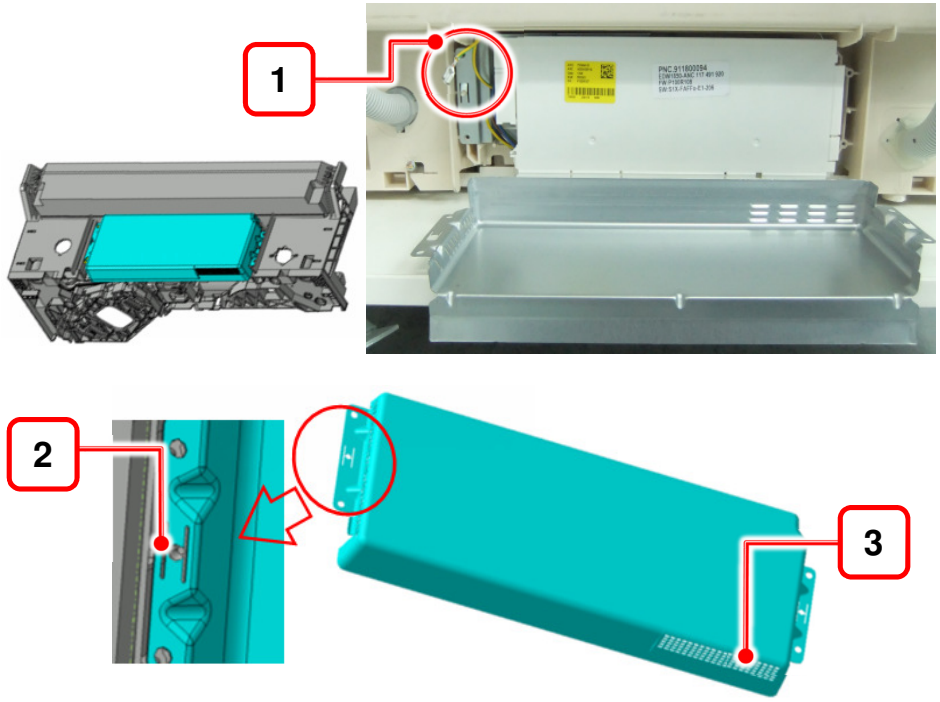
So the cables are higher everywhere than PB100/200 except under this rib where the cables are pushed down to the level of PB100/200.

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



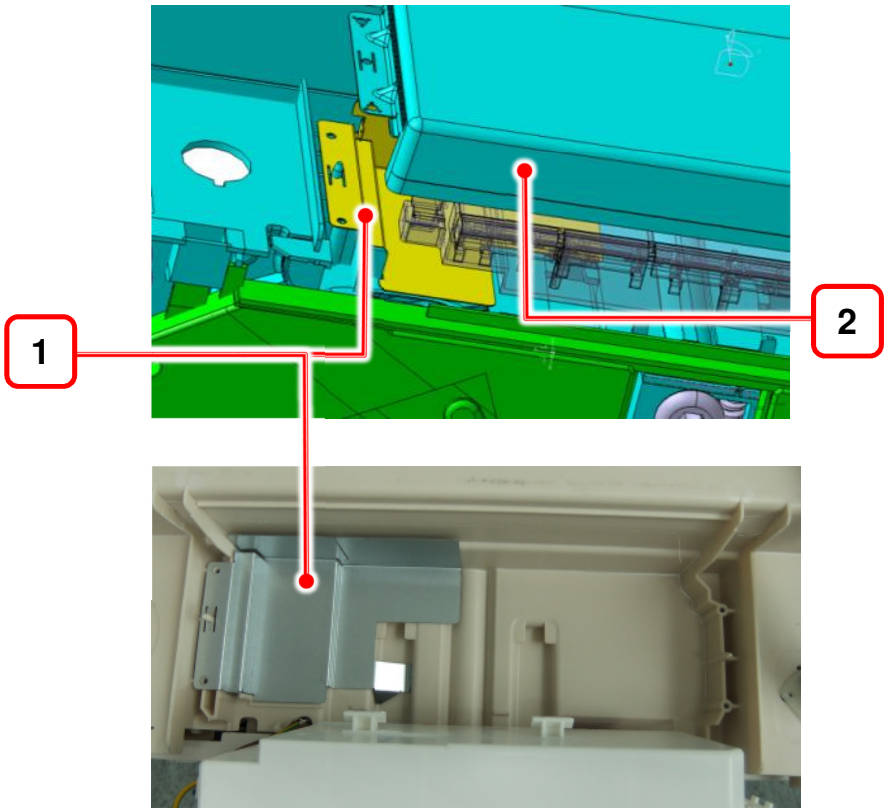
## Metal cover for Main Board

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



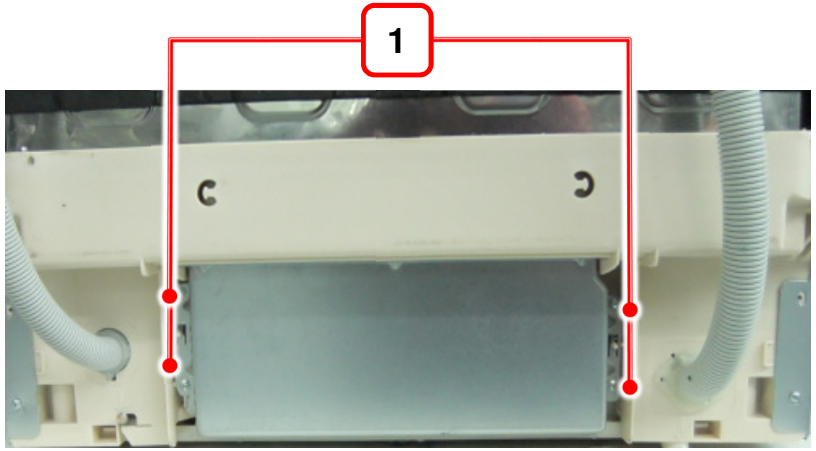

| | |
|---|---|
| **1-** The yellow/green wire must be connected to the metal cover when the part is put back in position | **2-** Hole for pin, holding cover in place before screwing it to the base |
| **3-** Holes for ventilation | |

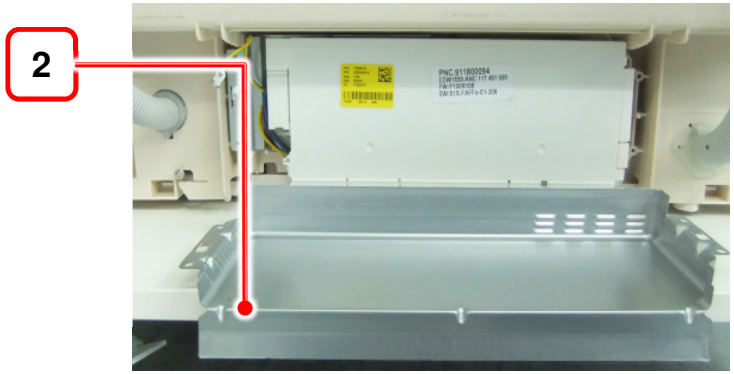
## Inner fire shield



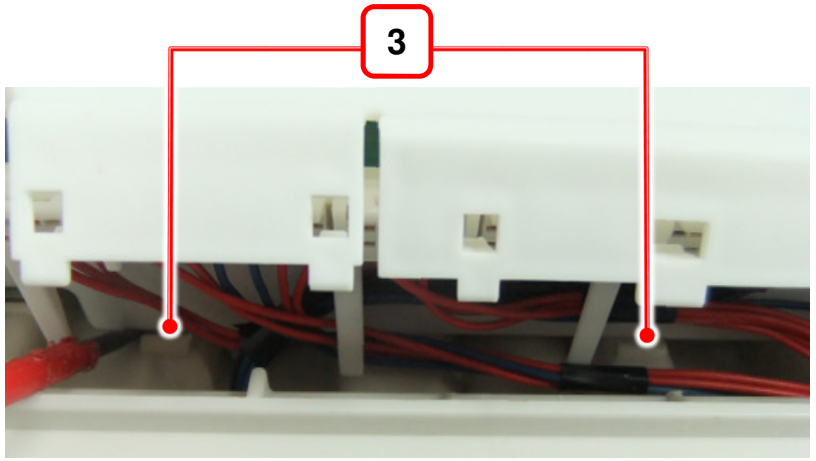

| | |
|---|---|
| **1-** Inner fire shield | **2-** Metal cover to be assembled on top of electronic box |

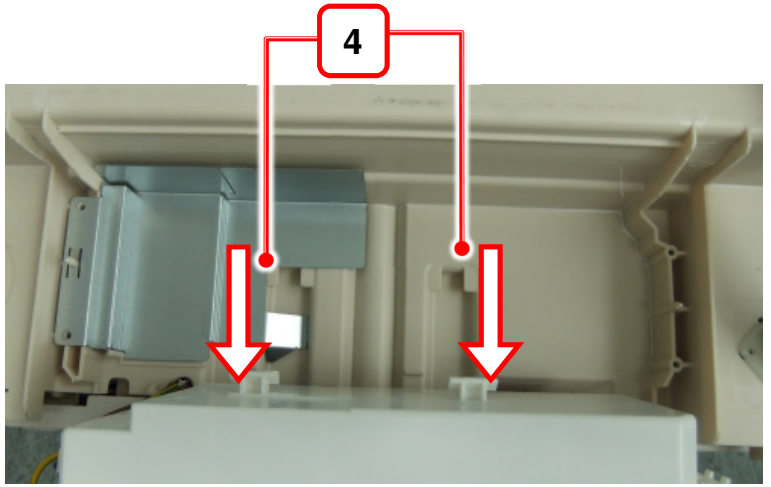
## Main board disassembly




| | |
|---|---|
| **1-** Remove 4 screws from the cover | **2-** Remove the metal cover |




| | |
|---|---|
| **3-** Unlock the 2 hooks | **4-** Pull the main board box downwards |

## 3.16. 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 + Safety THERMOSTAT | A2 ↔ A1 | A2 ↔ A1 | A2 ↔ A1 | 25.9 Ω + 11.1% - 4.7% | Serial connection 2040W |
| 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 $^0$C |
| | | | | 915 Ω ± 4% | At 70 $^0$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 |
| WASHING MOTOR | ↔ | B4 ↔ B3 | B6 ↔ B5 | 95 Ω ± 7% | AC Motor |
| DRAIN MOTOR + Anti-flooding | ↔ | B1 ↔ B2 | B1 ↔ B2 | 230 Ω ± 8% | Serial connection |
| FLOW CONTROLLER | F1 ↔ F2 | E1 ↔ E2 | ↔ | 10400 Ω ± 8% | Motor |
| | F1 ↔ F3 | E1 ↔ E3 | ↔ | 0 / INFINITE | Micro-switch |