



SERIE GW0160 - GW2145 - GW1160 - GW4060 - GW4190

SERIE PW4060

SERIE WD2145 - WD1160 - WD4060 - WD4190

- TECHNICAL MANUAL -

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1 INTRODUCTION

This document is a compendium intended for the use of authorised engineers.

It must be used:

1. **By the engineers who have been specifically trained by the manufacturer** to perform maintenance work on the product
2. **In association with the device's user manual**
3. **In association with the latest-version electrical and functional diagrams.**

Although this is not always necessary, it should be remembered that the **“Tracelog” software** made available by the manufacturer allows communication with the instrument/glassware washers covered and is a **useful troubleshooting aid** for technical staff.

For details of spare parts and the latest-version documentation, please visit www.smegtech.com.

The diagrams shown can also be downloaded in pdf format from the www.smegtech.com website.

N.B.:

The diagrams shown below refer to the GW4060 and WD4060 models.

For complete technical documentation for all the models in the range, visit www.smegtech.com

The training of technical staff, provided by the main Customer Care service, is essential for the correct maintenance or repair of devices.

2 START-UP

The user is responsible for preparing the utility systems required to allow the device to be connected and supplied correctly **and for positioning the device.**

Refer to the user manual and the “INSTALLATION REQUIREMENTS” document.

The authorised engineer puts the device into service, checking:

1. **that it has been installed correctly:**
 - a. plumbing hookup;
 - b. electrical hookup;
 - c. that it is positioned in accordance with the relative requirements;

2. That the device is operating and has been set up correctly:

- a. **date/time** setting;
- b. mains water hardness **setting**;
- c. **demineralised water yes/no** setting;
- d. setting of the **presence of optionals** as appropriate for the model concerned (e.g. P3, Acquastop, "FLSW" flow switches, etc).

In addition to the above checks, the engineer must:

1. **Run program "16 SERVICE"**, preferably twice in succession, to **prime the detergent intake lines correctly**.
2. **Run a complete cycle** (with drying phase if featured in the model) and test the device to ensure that it is operating correctly (e.g. **test program** accessible from the device's SETUP menu).



The operations summarised above must be performed and recorded in accordance with the checklist provided by the manufacturer, using the **"IN-SERVICE TEST RECORD"** form ("REGISTRATION OF CORRECT OPERATION AT THE USER'S SITE").

The authorised engineer is responsible for training the staff assigned to use the device at the time of installation.

The device may only be used by specifically trained staff.

The training of the staff responsible must include specific information on the possible risks involved in the use of the device, and training in the safest possible way of carrying out the operating procedures.

The installation engineer is also responsible for **notifying the responsible authority of the USER and SUPERUSER passwords** for access to the setup parameters.

2.1 TEST PROGRAM

For firmware version prior to 4.6: the test program consists of just 2 phases plus a short drying phase (only if the drying system is installed on the model).

- PHASE 1: cold wash
- PHASE 2: thermal disinfection at 93 ° C, 10 minutes.

Water intake per phase: 9 litres (shown in the illustration as "Cold Water: 90", referring to the value in decilitres. 90 decilitres = 9 litres).

Test program detail, for fw version prior to 4.6

PHASE 1

Cold Water: 90
 P1 DETERGENT (ml/l): 10
 P3 DETERGENT (ml/l): 10
 TARGET Temperature 1 (°C): 0 Extension (min): 1

PHASE 2

Demi Water: 90
 P2 DETERGENT (ml/l): 10
 TARGET Temperature 1 (°C): 93 Extension (min): 10

DRYING

Drying temperature (°C): 110
 Drying duration (min): 10

From fw version 4.6: the test program consists of 2 phases plus a short drying phase.

The PHASE 1 has been modified: T_target 93°C, holding time 10 min. The principles for activation of the dispenser pump and drying system (when installed) are unchanged.

- PHASE 1: thermal disinfection at 93 ° C, 10 minutes, chemicals dosage
- PHASE 2: thermal disinfection at 93 ° C, 10 minutes.

The purpose of using two successive PHASES at 93 ° C is to allow an eventual adjustment with external calibrated probe, during the first phase, and to check the proper maintenance of the calibration in the second phase.

Test program detail, for fw version following the 4.6

PHASE 1

Cold Water: 90
P1 DETERGENT (ml/l): 10
P3 DETERGENT (ml/l): 10
TARGET Temperature 1 (°C): **93** Extension (min): **10**

PHASE 2

Demi Water: 90
P2 DETERGENT (ml/l): 10
TARGET Temperature 1 (°C): 93 Extension (min): 10

DRYING

Drying temperature (°C): 110
Drying duration (min): 10

Test program activation procedure:

1. Access the **SETUP** screen as described in the user manual, by entering the “technician” level password (contact the manufacturer to obtain the password if necessary);
2. Scroll through the parameters to option “-t”;
3. Use the selection buttons to change the screen setting from “--” to “on” and confirm;
4. Quit the SETUP mode (hold down the “OPEN DOOR” button);

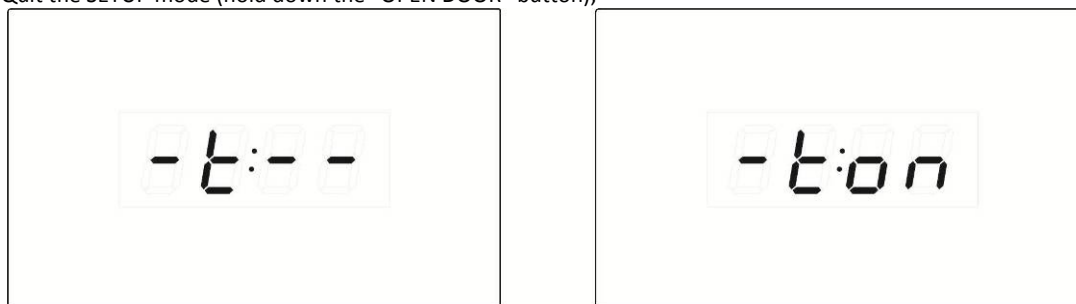
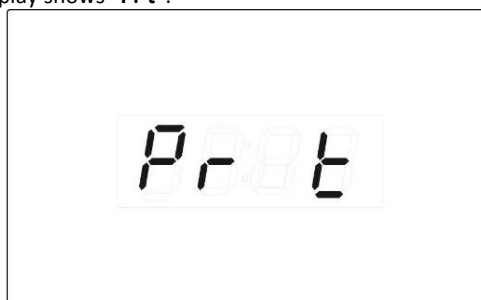


Fig. 1 - contents of Display, test program activation.

On completion of the procedure, the display shows “Pr t”.



The only program available at this point is the test program; if you do not wish to continue, switch the device off and back on.

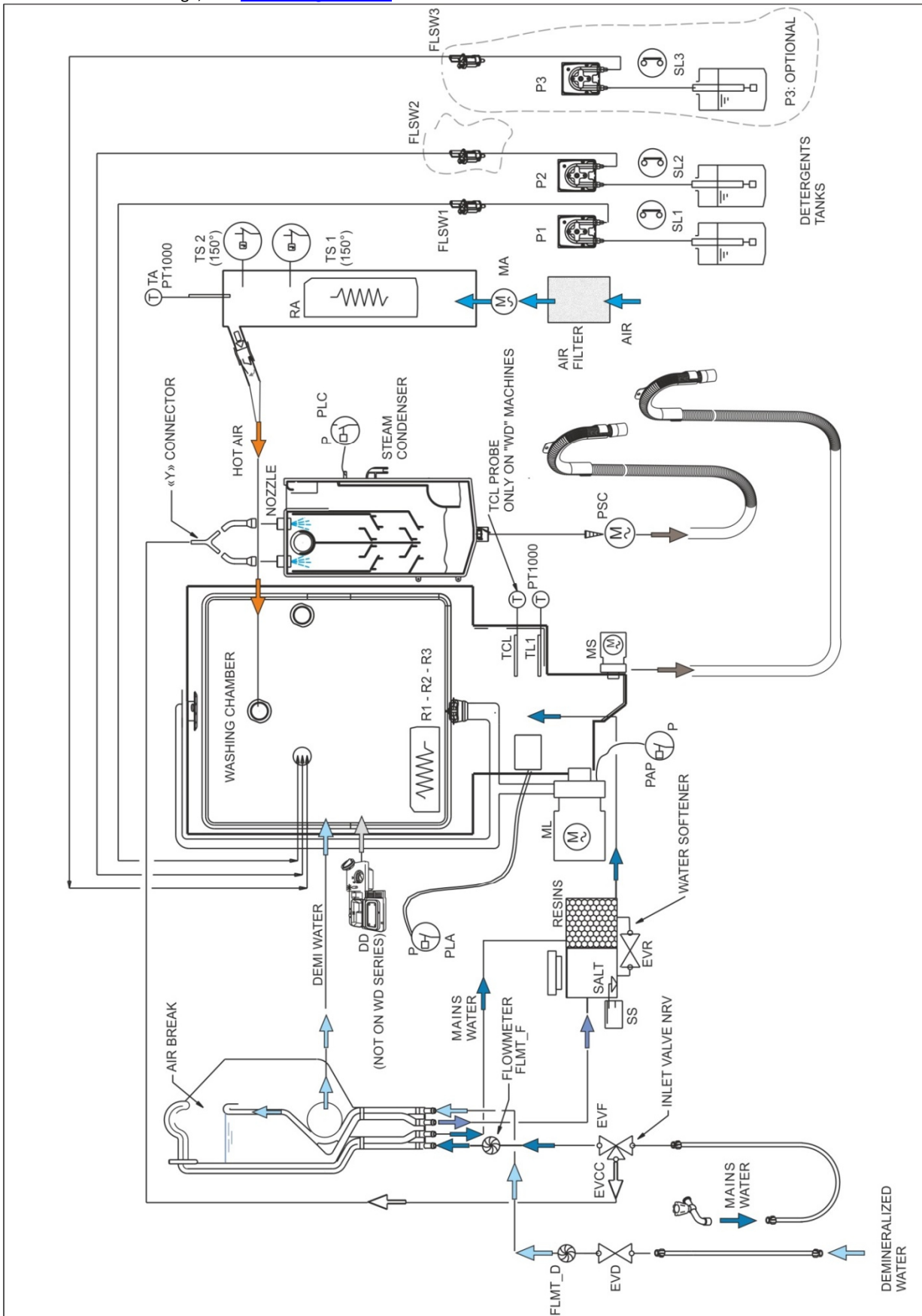


WARNING

The test program “Pr t” is intended solely for testing that the inputs and outputs are activated correctly. **It does not constitute a washing program and must never be considered as such.**

3 FUNCTIONAL DIAGRAM

N.B.: The diagrams shown below refer to the GW4060 and WD4060 models. For complete up-to-date digital documentation for all the models in the range, visit www.smegtech.com



4 WIRING DIAGRAM

In revision 04 of the present Technical Manual, the wiring diagram is cancelled from this section to leave only the official updated reference, on www.smegtech.com, for authorized technicians.

For complete up-to-date digital documentation always consult www.smegtech.com

5 KEY TO ABBREVIATIONS

AQS: Acquastop (optional) - microswitch
BPE: Electric lock
DD: Powder detergent dispenser (GW series only)
EVCC: Condenser filling solenoid valve
EVD: Demineralised water solenoid valve
EVF: Cold water solenoid valve
EVR: Softener resin regeneration solenoid valve
FMD (FLMT_D): demineralised water flowmeter
FMF (FLMT_F): Cold water flowmeter
FLSW1, FLSW2, FLSW3: detergent dispensing flow switches
KR: Chamber heating element control relay
MA: Dryer motor
MCM: Door closure microswitch
ML: Washing pump
MS: Chamber drain pump
P1, P2, ..., P10: PCB connectors
P1, P2, P3: Peristaltic detergent feeder pumps (P3 is always optional)
PAP: High pressure switch (for monitoring operation of washing pump ML)
PLA: chamber safety/level analogue pressure sensor
PLC: Condenser pressure switch (used as level sensor in the steam condenser)
PSC: Steam condenser drain pump
R1, R2, R3: Chamber heating elements
RA: Drying System heating element
SF: RFI filter
SL1, SL2, SL3: Detergent jerry can level sensors
SS: Salt sensor (salt level in integral softener tank)
TA: PT1000 probe for drying system air temperature
TCL: PT1000 probe for monitoring chamber water temperature
THS1: Safety thermostat for heating element R1
THS2, THS3: Safety thermostats for R2, R3
TL1: PT1000 probe for chamber water working temperature
TS1, TS2: Drying heating element safety thermostats
X1: Main terminal board (power supply)
XCT: "Voltage change" terminal board

6 TROUBLESHOOTING

6.1 INTRODUCING THE ANALOGUE PRESSURE SWITCH PLA

PLA: analogue level sensor, also known as the analogue pressure switch.

The analogue pressure switch is a sensor connected to the air trap inside the device, used to monitor the water level in the chamber. Since it is an analogue sensor, it allows continuous control of the water level present, unlike a conventional pressure switch, which is only able to identify 1 or 2 different levels.

The analogue pressure switch emits a frequency signal of 630/625Hz with the device empty, with no water in the chamber. The device establishes the actual value of its "zero" reading each time it resets.

As the water level increases, the PLA signal in Hz decreases.

In this manual, we will refer to relative values (L0, L1, etc.) in relation to zero rather than absolute values, since the absolute zero value is set each time the device resets.

Possible states of the PLA pressure switch	Description of state	Signal in Hz with T in chamber < 40 ° [guideline values]		Signal in Hz with T in chamber > 40 ° [guideline values]	
		GW/WD2145	OTHERS	GW/WD2145	OTHERS
Chamber empty levels	L0 – Zero	Zero	Zero	Zero	Zero
	L1 - "Empty" – pressure switch reset	25	25	18	18
Chamber full level	L2 - "Full"	31	31	24	24
Limit threshold levels	L3 - Safety level with washing pump active ML=ON Limit threshold level	60	57	60	57
	L4 - Water in Chamber (in stby). Standby status by limit threshold level.	60	60	60	60
	L5 - Safety level with washing pump off ML=OFF. static condition limit threshold level.	65	63	65	63

For versions prior to 5.0 fw apply the following levels

Possible states of the PLA pressure switch	Description of state	Signal in Hz with T in chamber < 40 ° [guideline values]	Signal in Hz with T in chamber > 40 ° [guideline values]
Chamber empty levels	L0 – Zero	Zero	Zero
	L1 - "Empty" – pressure switch reset	25	18
Chamber full level	L2 - "Full"	31	24
Limit threshold levels	L3 - Safety level with washing pump active ML=ON Limit threshold level	57	57
	L4 - Water in Chamber (in stby). Standby status by limit threshold level.	60	60
	L5 - Safety level with washing pump off ML=OFF. static condition limit threshold level.	66	66

NOTE the amount of water entering the machine is measured by the water flowmeters (FLMT_F, FLMT_D in the diagrams). The pressure switch PLA is used to intercept any abnormal situation.

THRESHOLD - WATER QUANTITY – TURBINE FLOW REGULATOR PULSE CORRESPONDENCE

Threshold setting	GW/WD2145		OTHERS	
	Turbine flow regulator pulses	Water q.ty	Turbine flow regulator pulses	Water q.ty
S0 – washing pump activation	300	1,5 litres	900	4.5 litres
S1 - prefiling	800	4 litres	1200	6 litres
S2 - fill completion	200	1 litre	600	3 litres
S3 - tank safety device	1800	9 litres	3000	15 litres

For versions prior to 5.0 fw apply the following correlations

THRESHOLD - WATER QUANTITY – TURBINE FLOW REGULATOR PULSE CORRESPONDENCE

Threshold setting	GW/WD2145		OTHERS	
	Turbine flow regulator pulses	Water q.ty	Turbine flow regulator pulses	Water q.ty
S0 – washing pump activation	300	1,5 litres	900	4.5 litres
S1 - prefiling	800	4 litres	1200	6 litres
S2 - fill completion	200	1 litre	600	3 litres
S3 - tank safety device	2000	10 litres	3000	15 litres

6.2 DEVICE OPERATING CONDITIONS

For the sake of clarity, 3 general device operating conditions are defined.

The alarms which may be present depend on the device's operating condition.

The device's response if an alarm occurs also depends on the current operating condition.

OPERATING CONDITIONS		
Descriptions used to identify the device's operating status		
CYCLE IN PROGRESS: washing cycle running	STANDBY: device on, not in "OFF" status, with no cycle running.	OFF: the PCB is powered up but in "OFF" status (the "ON/OFF" button has been pressed). In this condition, only a small number of critical inputs are monitored. "OFF" appears on the segment display.

6.3 TROUBLESHOOTING GUIDE

The alarms described apply to the various models as follows:

	"WD" (washer disinfector) series
	DRYER SYSTEM PRESENCE (Series 4060 and 4190)

ID	DESCRIPTION	EVENT WHICH TRIGGERS THE ALARM	WHEN THE ALARM OCCURS	ALARM MANAGEMENT - DEVICE RESPONSE	TROUBLESHOOTING
AF:01	Water not heated within time allowed.	1. Three-phase device: tripped if the temperature does not increase by at least 3°C in 2'. 2. Single-phase device: tripped if the temperature does not increase by at least 0.5°C in 2'.	Cycle in progress, heating phases.	Alarm indication. if $PLA \leq L1$ -> pump-out (MS=ON) for 45"; if $PLA > L1$ -> pump-out (MS=ON) for 90". "pump-out 45" -> means: the drain pump is operated for 45 seconds to restore the device to conditions of safety.	1. Check that three-phase or single-phase connection is set correctly in the device's parameters. 2. Check whether any safety thermostats have tripped and reset them if necessary. 3. Check that the chamber heating elements and their control relays are in good working order. Other possible causes / checks to be made: 4. Washing pump jammed; 5. High pressure switch (PAP) contact not being made; 6. Connection of temperature probe TL to the PCB (CONNECTOR P1); 7. Connectors to be checked: - Connection on the heating element control relay; - Connection on the PCB (CONNECTOR P5-9); - Connection on the PCB (CONNECTOR P2-2);
AF:02	The temperature difference between the two probes, "TL1" and "TC", is more than 2°C (only active on WD series)	In phases which include thermal disinfection $ TL1-TCL $ must be $< 2^\circ C$; otherwise the alarm is triggered. The alarm condition must occur for at least 5 seconds.	During the cycle, during the thermal disinfection time, starting from: $T=T_{target} +1^\circ C$	Alarm indication. if $PLA \leq L1$ -> pump-out (MS=ON) 45"; if $PLA > L1$ -> pump-out (MS=ON) 90".	1. Check that the probes in the chamber are clean/in good working order. 2. Check on the PCB that P11 and P12 are correctly connected. N.B.: The two probes TL and TCL are combined in a single unit, so in the event of a failure the entire component has to be replaced (TCL is only installed on WD series devices).
AF:04	Probe "TL1" (chamber temperature) shows a reading higher than the actual temperature.	This alarm may be triggered by a number of different conditions. a) For each heating phase controlled, the alarm condition is: $TL1 > T_{target} +5^\circ C$ for 5 sec b) Heating control failure: $TL1 > cycle\ max\ T +5^\circ C$ for 5 sec c) Heating control failure, if there are no Target Ts in the cycle: $TL1 > T = 60^\circ C + 5^\circ C$ for 5 sec. (i.e. $T_{max}=60^\circ C$ is assumed)	With cycle running.	Alarm indication. if $PLA \leq L1$ -> pump-out (MS=ON) 45"; if $PLA > L1$ -> pump-out (MS=ON) 90".	1. Check that TL1 is operating correctly. 2. Check intake water pressure. 3. Check that the heating element control relays are in good working order. 4. Check on the PCB that P11 is correctly connected.

ID	DESCRIPTION	EVENT WHICH TRIGGERS THE ALARM	WHEN THE ALARM OCCURS	ALARM MANAGEMENT - DEVICE RESPONSE	TROUBLESHOOTING
AF:05	Working temperature probe "TL1" is generating an abnormal signal (probe "open").	TL1 > 200° for at least 3 sec.	With cycle running and in standby.	Alarm indication. if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90". In standby status, the alarm resets automatically if its causes are eliminated. With cycle running a Manual Reset is required.	1. The problem may be due to probe TL1 (damaged or disconnected) or the PCB. 2. Check connector P1 and the cable as well as the probe.
AF:07	Drying temperature probe TA1 is generating an abnormal signal (probe "open").	TA1 > 200° for at least 3 sec.	With cycle running and in standby.	Alarm indication. if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90". In standby status, the alarm resets automatically if its causes are eliminated. With cycle running a Manual Reset is required.	1. The problem may be due to probe TA1 (damaged or disconnected) or the PCB. 2. Connection of temperature probe TA to the PCB (CONNECTOR P13); 3. Check the condition of the probe cable.
AF:10	Control temperature probe TCL is generating an abnormal signal (probe "open"). (only active on WD series)	TCL > 200° for at least 3 sec.	With cycle running and in standby.	Alarm indication. if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90". In standby status, the alarm resets automatically if its causes are eliminated. With cycle running a Manual Reset is required.	1. The problem may be due to probe TCL (damaged or disconnected) or the PCB.
AF:11	No cold water during filling.	(ΔFMF = 0) for 30" after activation of EVF	With cycle running, during cold water filling phase	Alarm indication. if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90".	1. Check that the intake tap is open. 2. Check the water supply pressure. 3. Check that there are no restrictions on the hose connecting the device to the tap. 4. Check that the intake solenoid valve EVF is powered up and opens correctly. 5. Check that the turbine flow regulator FMF is operating correctly. 6. Connection on the PCB (CONNECTOR P2-10).
AF:13	No demineralised water.	(ΔFMD = 0) for 30" after activation of EVD	With cycle running, during demineralised water filling phase	Alarm indication. if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90".	1. Check that the intake tap is open. 2. Check the water supply pressure. 3. Check that there are no restrictions on the hose connecting the device to the tap. 4. Check that the intake solenoid valve EVD is powered up and opens correctly. 5. Check that the turbine flow regulator FMD is operating correctly. 6. If using water from a tank, check that the tank is not empty or placed too low down. 7. Check that the display settings actually correspond to the water connections (demi water present or not). 8. Connection on the PCB (CONNECTOR P2-9).

ID	DESCRIPTION	EVENT WHICH TRIGGERS THE ALARM	WHEN THE ALARM OCCURS	ALARM MANAGEMENT - DEVICE RESPONSE	TROUBLESHOOTING
AF:17	Cold water filling time not correct.	<p>The setting is split, with 2 filling thresholds.</p> <p>First threshold "S1" corresponds to prefilling</p> <p>Second threshold "S2" corresponds to the quantity required to complete the fill</p> <ul style="list-style-type: none"> • The first threshold FULFILLS the following equation: filling timeout = [Qty of water to be taken in (dl) x 10(sec)] • The second threshold is constant at 150 SECONDS + Extra Filling Time. if the Extra Filling Time is 30 sec the timeout for the 2nd threshold is: filling timeout = 150 + 30 = 180 sec 	With cycle running, during cold water filling phase.	<p>Alarm indication.</p> <p>if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90".</p>	<ol style="list-style-type: none"> 1. Check the cold water filling system in the same way as for alarm ID11 (taps, pressure, no restrictions on hoses, etc.). 2. Turbine flow regulator FLMT_F 3. Connector P2-10
AF:19	Demi filling time too long. The device is taking too long to take in demineralised water.	As indicated above for AF:17	With cycle running, during demi filling phase.	<p>Alarm indication.</p> <p>if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90".</p>	<ol style="list-style-type: none"> 1. Check the demineralised water filling system in the same way as for alarm ID13 (taps, pressure, no restrictions on hoses, etc.). 2. turbine flow regulator FLMT_D 3. Connector P2-9
AF:23	Not enough water. Chamber water level too low.	<p>Alarm active at end of STATIC filling (ML=OFF) threshold "S0".</p> <p>Throughout the phase, if PLA < "L1" for 10" an alarm is triggered; in this case, pump ML stops. If PLA > "L2" the pump starts up again.</p> <p>NB: The sequence is repeated 10 times , after which an alarm is triggered</p>	Active throughout the cycle.	<p>Alarm indication.</p> <p>if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90".</p>	<ol style="list-style-type: none"> 1. Check air trap (obstructed or fouled); 2. Check pressure switch - air trap connection pipe (obstructed or fouled); 3. Height of drain pipe, check that the drain meets the specifications supplied. 4. Connection on the PCB (CONNECTOR 10) and/or on pressure switch PLA; 5. PLA pressure switch malfunction; 6. Washing filter fouled; 7. Check that washing pump ML1 is operating correctly. 8. Check that the turbine flow regulators FMF and FMD are operating correctly.
AF:25	Malfunction related to washing pump "ML". Washing pump pressure too low.	<p>PAP=0 with timeout 5 sec.</p> <p>For fw versions after 4.6xx, the following rule also applies: Before activation of the washing pump (if PAP is not at rest- contact open) and with filling (water) complete and until the pump-out phase when ML is required to operate.</p>	After filling with water, active until pump-out phase	<p>Alarm indication.</p> <p>if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90".</p>	<ol style="list-style-type: none"> 1. Washing pump malfunctioning (also check starting capacitor); 2. Washing pump connection on PCB (CONNECTOR P5-12); 3. Pressure switch (PAP) malfunctioning; 4. Pressure switch PAP connection on PCB (CONNECTOR P2-2); 5. Too much foam in chamber. Check that the washing chamber does not contain material which generates too much foam 6. Check that the drain meets the specifications supplied.

ID	DESCRIPTION	EVENT WHICH TRIGGERS THE ALARM	WHEN THE ALARM OCCURS	ALARM MANAGEMENT - DEVICE RESPONSE	TROUBLESHOOTING
AF:26	Malfunction involving water being taken into chamber at wrong time. Cold water intake valve "EVF" may have failed.	Number of pulses FMF is $n_{FMF} > 400$ when the valve is not activated [FMF=0] 400 pulses correspond to about 2 litres.	During the cycle when EVF is not active.	Alarm indication. if $PLA \leq L1 \rightarrow$ pump-out (MS=ON) 45"; if $PLA > L1 \rightarrow$ pump-out (MS=ON) 90".	Check the water intake circuit, especially: 1. solenoid valve EVF 2. intake turbine flow regulator 3. condition of system in relation to the installation prerequisites
AF:28	Malfunction involving demineralised water being taken into tank at wrong time. Cold water intake valve "EVF" may have failed.	Number of FMD pulses is $n_{FMD} > 400$ when the valve is not activated [FMD=0] 400 pulses correspond to about 2 litres.	During the cycle when EVD is not active.	Alarm indication. if $PLA \leq L1 \rightarrow$ pump-out (MS=ON) 45"; if $PLA > L1 \rightarrow$ pump-out (MS=ON) 90".	Check the water intake circuit, especially: 1. solenoid valve EVD 2. intake turbine flow regulator 3. condition of system in relation to the installation prerequisites
AF:29	Chamber does not empty. Pump-out not occurring.	- The cycle starts with a pump-out phase. In this phase, the alarm is triggered if $(PLA > L1)$ for $t > 60$ seconds (regardless of the status of PAP1). For fw versions after 4.6xx, the following rule applies: Pump-out phases during the cycle: $(PLA > L1)$ for $t > 180$ sec. For fw versions before 4.6xx, the following rule applies: - Pump-out phases during the cycle: $(PLA > L1)$ or $(PAP=1)$ for $t > 180$ sec.	Active in pump-out phases during the cycle and when the cycle starts.	Alarm indication. No change in filling phases.	1. Malfunction of drain pump MS; 2. Connection on the PCB (CONNECTOR P5-8) and/or on drain pump; 3. Check air trap (obstructed or fouled); 4. Check pressure switch PLA - air trap connection pipe (obstructed or fouled); 5. Check the height of the drain pipe and/or any obstructions in the drain (e.g. slow drainage); Check that the drain system meets the specifications and is free from obstructions or restrictions. 6. Connection on the PCB (CONNECTOR 10) and/or on pressure switch PLA; 7. PLA pressure switch malfunction; 8. Connection on PCB (CONNECTOR P2-2) and/or on pressure switch PAP; 9. Malfunction of pressure switch PAP (with the chamber empty, the contact in use is N.O.); 10. Check that the filters inside the device are not fouled.
AF:30	During the working cycle, the chamber water level exceeds the safety level. Water safety level.	$(PLA = L3)$ or $(N_{FMF} > S3)$ or $(N_{FMD} > S3)$ for $t > 5$ seconds 3000 pulses correspond to about 14 litres.	During the cycle.	Alarm indication. if $PLA \leq L1 \rightarrow$ pump-out (MS=ON) 45"; if $PLA > L1 \rightarrow$ pump-out (MS=ON) 90".	1. Check that the 2 drain pipes are not connected to the same point (for models with steam condenser); Check that the drain meets the specifications supplied. 2. Connection on the PCB (CONNECTOR P10) and/or on pressure switch; 3. PLA pressure switch malfunction; 4. Check that the filling solenoid valves fitted (EVF and EVD) cut off the flow completely. 5. Check that the air trap and connection pipe to the filler pressure switch PLA are clean. 6. Check that PLA is operating correctly.

ID	DESCRIPTION	EVENT WHICH TRIGGERS THE ALARM	WHEN THE ALARM OCCURS	ALARM MANAGEMENT - DEVICE RESPONSE	TROUBLESHOOTING
AF:32	Water standing in washing chamber with device in standby.	(PLA > L4) for t > 5 seconds Abnormal level detected with device in standby.	In standby (i.e. with "device stopped") and with "OFF" showing on the display.	Alarm indication. if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90". the alarm resets automatically if its causes are eliminated.	1. A solenoid valve may be leaking; Check that the filling solenoid valves fitted (EVF, EVD and EVCC) cut off the flow completely. 2. Connection on the PCB (CONNECTOR 10) and/or on pressure switch PLA; 3. PLA pressure switch malfunction; 4. Check that the drain meets the specifications supplied.
AF:33	Steam condenser water intake anomaly. No water in steam condenser.	If (EVCC=ON) and (PLC = OFF) for t > 60 seconds	When condenser solenoid valve is active EVCC=ON	Alarm indication. PLA ≤ L1 -> pump-out (MS=ON) 45". the alarm resets automatically if its causes are eliminated.	1. Condenser nozzles fouled; Check that the spray nozzles inside the steam condenser are not obstructed. 2. Solenoid valve EVCC malfunctioning; Check that solenoid valve EVCC is operating correctly. 3. Condenser drainage hose not correctly positioned; 4. Condenser pressure switch (PLC) malfunctioning; 5. Condenser-pressure switch connection pipe obstructed and/or blocked; 6. Connection on PCB (CONNECTOR P2-5) and/or on pressure switch; 7. Check that the intake tap is open. 8. Check the water supply pressure. 9. Check that there are no restrictions on the hose connecting the device to the tap.
AF:34	Steam condenser water drainage failure.	(PSC=ON) and (PLC=1) for t > 30 seconds (the condenser level pressurise switch must reset within 30 seconds).	With cycle running, when EVCC is active (EVCC=ON)	Alarm indication. if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90". the alarm resets automatically if its causes are eliminated.	1. Drain pump (PSC) malfunctioning or blocked; 2. Connection on the PCB (CONNECTOR P5-7) and/or on drain pump; 3. Condenser pressure switch (PLC) malfunctioning; 4. Condenser-pressure switch connection pipe obstructed and/or blocked; 5. Connection on PCB (CONNECTOR P2-5) and/or on pressure switch; 6. Check that the drain meets the specifications supplied.
AF:37	Drainage problems when using a mixture of water.	The mixing temperature set is not reached before pump-out. TCL > T_target	Active during the mixing phase included to reduce the water temperature. Mixing takes place before pump-out, only if the mix water drainage option is active (it is never enabled during thermal disinfection). On 4060 range	Alarm indication at end of cycle.	Possible causes: 1. Drainage temperature set too low in relation to starting conditions 2. Intake water temperature too high - the cooling effect required is not achieved.

ID	DESCRIPTION	EVENT WHICH TRIGGERS THE ALARM	WHEN THE ALARM OCCURS	ALARM MANAGEMENT - DEVICE RESPONSE	TROUBLESHOOTING
A-:41	P1 detergent intake anomaly	<p>Detergent intake is monitored by counting the ON intervals of the flow switch associated to the pump. $\sum(P1_FLSW=ON) = t_P1_target$.</p> <p>The pump is activated (P1=ON) to obtain this value.</p> <p>"peristaltic pump activation time": TAP.</p> <p>Error condition:</p> <ul style="list-style-type: none"> - If $TAP > 2 \times t_P1_target$ - If FLSW1=ON before activation - If FLSW1=OFF for a time equal to t_P1_target. 	P1 delivery phase	<p>Alarm indication at end of cycle.</p> <p>No action on machine filling procedures.</p>	<ol style="list-style-type: none"> 1. Check the supply of detergent P1 2. Check that pump P1 is operating 3. Check that the connection pipes between sensor SL1 and the chamber inlet are not crushed or obstructed 4. Check that flow switch FLSW1 is operating correctly.
A-:42	P2 detergent intake anomaly	Equivalent to A 41 but for P2	P2 delivery phase	<p>Alarm indication at end of cycle.</p> <p>No action on machine filling procedures.</p>	Equivalent to A 41 but for P2
A-:43	P3 detergent intake anomaly	Equivalent to A 41 but for P3	P3 delivery phase	<p>Alarm indication at end of cycle.</p> <p>No action on machine filling procedures.</p>	Equivalent to A 41 but for P3
AF:54	Door opening detected with cycle in progress. Door interlock microswitch malfunction.	MCM = 0	DURING THE CYCLE	<p>Alarm indication. Cycle stops.</p> <p>if $PLA \leq L1 \rightarrow$ pump-out (MS=ON) 45"; if $PLA > L1 \rightarrow$ pump-out (MS=ON) 90".</p>	<ol style="list-style-type: none"> 1. Check the status of the contacts of the microswitch (MCM) – N-O with door open, N-C with door closed; 2. Connection on PCB (CONNECTOR P2-3) and/or on microswitch; <p>The alarm is triggered if MCM=0, i.e. the contacts of the microswitch signalling electric closure of the door are open</p> <ol style="list-style-type: none"> 1. Check operation of MCM with door open and closed 2. Check that the door is firmly held in place in the closed position
AF:56	Door interlock device malfunction, automatic opening failure.	<p>MCM=1 with BPE=1</p> <p>During opening of the door, with the release solenoid BPE1 activated, microswitch MCM does not switch (from 1 to 0), so the door is not opening, or opening is not being detected.</p>	During door opening, (BPE=1).	<p>Alarm indication. Cycle stops.</p> <p>if $PLA \leq L1 \rightarrow$ pump-out (MS=ON) 45"; if $PLA > L1 \rightarrow$ pump-out (MS=ON) 90".</p>	<ol style="list-style-type: none"> 1. Operation of the electric lock coil, check operation of solenoid BPE1. 2. Connection on PCB (CONNECTOR P5-1) and/or on electric lock; 3. Check that the door is properly aligned and can open freely; 4. Check the status of the contacts of the microswitch (MCM) – N-O with door open, N-C with door closed; 5. Connection on PCB (CONNECTOR P2-3) and/or on microswitch 6. Check that the door is not being obstructed during opening

ID	DESCRIPTION	EVENT WHICH TRIGGERS THE ALARM	WHEN THE ALARM OCCURS	ALARM MANAGEMENT - DEVICE RESPONSE	TROUBLESHOOTING
AF:58	Dryer heating failure.	If the temperature does not increase by at least 1°C in 5 minutes.	During drying with heating element active (RA=ON).	Alarm indication. Cycle stops. if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90".	1. Drying thermostats with manual reset tripped; 2. Heating element RA has failed (rated value ~ 70Ω); 3. Connection of temperature probe TA to the PCB (CONNECTOR P13); 4. Check the condition of the probe cable; 5. Operation of drying motor MA; 6. Connection on the PCB (CONNECTOR P8 AND P9) and/or on dryer motor; 7. Dryer air intake filter fouled; 8. Check that temperature probe TA1 is correctly fitted in place. 3. Check that probe TA1 is operating correctly.
AF:67	Dryer motor "cooling" malfunction. Cooling is included at the end of the drying phase to bring the load processed and the heating elements to a safe temperature.	The final phase of the drying process is "cooling" - with dryer motor MA=ON and heating element RA=OFF t_start_r, t_end_r = initial and final moments of the cooling phase. 1st alarm condition: TA(t_start_r) – TA(t_end_r) > 15 2nd alarm condition: TA(t_fine_r)>90	Drying cooling phase (MA=ON, RA=OFF).	Alarm indication at end of cycle (the end of the drying phase is also the end of the cycle). if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90".	1. Connection of temperature probe TA to the PCB (CONNECTOR P13); 2. Check the condition of the probe cable; 3. Operation of drying motor MA; 4. Connection on the PCB (CONNECTOR P8 AND P9) and/or on dryer motor MA; 5. Dryer intake filter fouled; 6. Air flow into chamber obstructed (CHECK valve and/or chamber inlet valve) 7. Check temperature probe TA. 8. Check that the control relay of heating element RA is working correctly. Perform "stand-alone" drying phase to check the system.
A-:68	P1 jerry can empty	SL1 = 1 for 10 sec The level sensor is signalling low chemical level.	In standby.	No reaction, this is a warning SO THE CYCLE IS NOT STOPPED. The warning reappears if the user attempts to start another cycle; it can be bypassed by pressing the Start/Stop button.	1. Top up the level of detergent P1 2. Check that sensor SL1 is operating correctly.
A-:69	P2 jerry can empty	As for "A-:68"	As for "A-:68"	As for "A-:68"	As for "A-:68"
A-:70	P3 jerry can empty	As for "A-:68"	As for "A-:68"	As for "A-:68"	As for "A-:68"
AF:73	Internal memory data storage error	Flash memory writing error	-	-	Error in the management of the memory containing the processes saved in the microprocessor. 1. If the problem persists, download the firmware onto the motherboard again. 2. If necessary, replace the motherboard.

ID	DESCRIPTION	EVENT WHICH TRIGGERS THE ALARM	WHEN THE ALARM OCCURS	ALARM MANAGEMENT - DEVICE RESPONSE	TROUBLESHOOTING
AF:74	Water leak from chamber. Alarm only enabled with the Acquastop accessory fitted.	ACUASTOP = 1 for 5 seconds (the acquastop is a device with a float connected to a microswitch. It is fitted on the bottom of the device and detects any water leaks).	During the cycle, in standby and in OFF status	Alarm indication, pump-out until condition PLA=L1 is reached	<ol style="list-style-type: none"> 1. Check that the water supply conditions comply with the conditions specified in the manual. 2. Check that the filler solenoid valves (EVF, EVCC and EVD) are shutting off properly. 3. Check the tightness of the water connections, the hoses leading to the chamber, the steam condenser and the softener. 4. Check that there are no leaks from the chamber. 5. Check that the acquastop microswitch is operating correctly.
AF:75	No salt in softener. This alarm does not appear on the Display but is recorded in the appliance memory; the relative LED illuminates on the display.	SS = 1 for 5 sec	During the cycle and standby.	No reaction, this is a warning SO THE CYCLE IS NOT STOPPED.	<ol style="list-style-type: none"> 1. Fill the softener salt tank (cap in the chamber). 2. Check operation of the salt sensor SS on the softener.
AF:77	Intake water temperature over 45°C; prewash temperature must be below 45°C. Alarm generally disabled on GW series products.	TL > 45°C (temperature in chamber)	During filling; specifically, the condition is checked when the water taken in is close to the washing pump activation threshold (difference of 3 dl).	Alarm indication. Cycle stops. if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90".	<ol style="list-style-type: none"> 1. If a cycle has just ended, leave the chamber to cool with the door open for about ten minutes (especially if a drying phase has not been performed). 2. Check the intake water temperature. The limit of 45°C is recommended by the 15883 standards to prevent proteins from coagulating.
AF:78	<i>Restore fail.</i> Motherboard problem.	Status reset error. Date not saved correctly the last time the device was switched off.			Disconnect the appliance from the electricity supply. If the problem persists, replace the motherboard.
AF:79	Program not compatible.	Check performed at start-up: program setting error. The program cannot be run (e.g. because recycled water or an alternative drain is not available)	At start of cycle.	Alarm indication. The cycle is not started.	Use the WD-TRACE software to check the program parameters for any setting errors.

ID	DESCRIPTION	EVENT WHICH TRIGGERS THE ALARM	WHEN THE ALARM OCCURS	ALARM MANAGEMENT - DEVICE RESPONSE	TROUBLESHOOTING
AF:84	Dryer temperature reading higher than actual temperature	TA > TA_MAX (typical threshold: 143°C)	During drying.	MA=ON for 240 seconds Drying motor is activated at high speed to cool the probe. (with RA=OFF).	<ol style="list-style-type: none"> 1. Connection of temperature probe TA to the PCB (CONNECTOR P13); 2. Check the condition of the cable of probe TA; 3. Operation of drying motor MA; 4. Connection on the PCB (CONNECTOR P8 AND P9) and/or on dryer motor; 5. Dryer intake filter fouled; 6. Air flow into chamber obstructed (CHECK valve and/or chamber inlet valve); Check that the valve on the air line is not blocked. 7. Check that the probe is correctly fitted in place. 8. Check that probe TA is operating correctly.
AF:91	Internal memory full.	The space available for storing cycle data is running out.	In standby.	No response. If the setup overwrite function is not set as on, the device shuts out; it does not perform any further cycles until the memory is cleared.	Download and clear the memory following the procedure described in the WD-TRACE manual.
AF:92	Drying filter maintenance	The number of hours before filter change has been reached. [counter_h_filter = target_hours_filter]	With cycle running and in standby.	Warning on display.	Replace the drying absolute filter and reset the counter. Also decide whether to replace the relative filter.
AF:93	Device maintenance	The number of hours before the next service has been reached. [counter_h_maint = target_hours_maint]	During the cycle and in standby	Warning on display.	<p>Service the device and inspect all parts potentially subject to wear. Decide whether to make any replacements.</p> <p>The user manual contains a short guide as to which components should be inspected.</p> <p>Reset the maintenance hour counter. Perform a complete cycle to check that everything is functioning correctly.</p> <p>A short test program, specifically developed for use by the after-sales service and accessed from the SETUP menu, is also available.</p>
AF:94	Temperature below target temperature during extension phase. T not stable	<p>TL1 < T_target for $t \geq 5''$</p> <p>.during thermal disinfection phases, t is calculated as the sum of the intervals which satisfy the condition. $t = \sum t_i$ where t_i is an interval during which the above condition has been satisfied</p> <p>.During washing phases, this condition is less restrictive. $t_i > 5$. If the interval $t_i < 5$, the counter is reset and its reading is not added into the calculation.</p>	Cycle in progress, thermal disinfection and washing phases.	Alarm indication. Cycle stops. if PLA ≤ L1 -> pump-out (MS=ON) 45"; if PLA > L1 -> pump-out (MS=ON) 90".	<ol style="list-style-type: none"> 1. Check that probe TL1 is operating correctly 2. Check that the drain meets the specifications supplied.

ID	DESCRIPTION	EVENT WHICH TRIGGERS THE ALARM	WHEN THE ALARM OCCURS	ALARM MANAGEMENT - DEVICE RESPONSE	TROUBLESHOOTING
AF:96	Analog pressure switch malfunction	Signal from analogue pressure switch PLA out of range	During the cycle, in standby and in OFF status	pump-out (MS=ON) 90"	<ol style="list-style-type: none"> 1. PLA pressure switch malfunction; 2. Connection on the PCB (CONNECTOR 10) and/or on pressure switch PLA; 3. Check the intake and drain water connections and that the device has been installed as specified. 4. Check that the analogue pressure switch PLA is operating correctly (preferably with the aid of the TRACELOG software).

7 DEVICE PARAMETERS

The operating parameters set on the device itself can be viewed by printing the parameters (see point PRINTING THE DEVICE PARAMETERS in the user manual), or in a file downloaded by TraceLog (see the SERVICE PARAMETERS section of the TraceLog manual).

The examples shown refer to the WD2145 device.

7.1 Printout

Serial Number: 333333333	Fw version installed
10/12/14 09:56:38	Total cycles performed
FW Ver: 4.18.0 [24] 5.2 [2]	Cycles since last service
MD Ver: 2.5.0 [E]	Dryer operating hours (not featured on model considered)
Print Parameter	File overwriting; 1=yes, 0=no
Cycl performed: 24	Printout language
Cycl since serv: 2	Water type enabling; 1=yes, 0=no
Dr. hrs s.serv: 0	Dispenser pumps fitted; 1=yes, 0=no
Overwrite record: 1	Flow switches fitted; 1=yes, 0=no and relative % ratio (see flow switch setting section of TraceLog manual)
Lang.: English	Dispenser pump delivery rate
Cold Water: 1	Quantity of product dispensed (ml/litre) by program
Demi Water: 1	Absolute filter and dryer fitted: 1=yes, 0=no
Pump P1: 1	Aqua stop accessory fitted: 1=yes, 0=no
Pump P2: 1	Door opening at end of cycle; 1=on, 0=off
Pump P3: 0	Power supply*: 1=three-phase, 0=single-phase
Flowswitch 1: 1 (99 %)	Mains frequency: 50=50Hz, 60=60Hz, AUTO=automatic detection mode
Flowswitch 2: 0	Extra fill time (min.)
Flowswitch 3: 0	Sump washing before demi rinse: 0=NO, 1=YES
P1 Fl.rate (ml/min): 46	Condenser activation: 0=NO, 65=YES, from 65°C upward
P2 Fl.rate (ml/min): 46	Water hardness and relative litres treatable by softener
P3 Fl.rate (ml/min): 46	Powder dispenser: 1=installable, 0= NOT installable
P1 dose (ml/l): 4.0	Last rinse signalling: 0=NO, 1=YES
P2 dose (ml/l): 2.0	Cycle repetition: 0=NO, 1=YES and number of
P3 dose (ml/l): 0.0	Detergent dispensing modification lock 0=NO,
Dryer: 0	
Dryer fill.: 0	
Aquastop: 0	
Auto door opening: 0	
Triphase supply: 1	
Frequency: AUTO	
Mix disch.temp(°C): 0	
Extra Load Time: 0	
Sump Rinse: 0	
Condenser on deg: 65	
TL Offset (°C/10) 0	
TLC Offset (°C/10) 0	
TA Offset (°C/10) 0	
Water Hardn.(°F): 40 (°F)	
L belw. regen.: 25 (l)	
Detergent dispenser: 1	
Check last rinse: 0	
Cycle Repeat: 1	
N. Cycle Repeat: 3	
% Detergent fixed: 0	

* Parameters used for display of the time remaining

7.2 TraceLog File

The file downloaded using TraceLog contains the essential parameters, using “True” and “False” respectively to indicate whether or not the relevant parameter is present, instead of “0” or “1”

SERIAL CODE:

[CSER]:3333333333

VERSIONS:

[0010]BootVer: (5.2.0.2)
[0011]BootDate: (29/8/2012)
[0012]MainVer: (4.18.0.36)
[0013]MainDate: (21/11/2014)

SERVICE PARAMETERS:

[0501]Cold Water: (True)
[0503]Demi Water: (True)
[0540]FP P1: (True)
[0541]FP P2: (False)
[0542]FP P3: (False)
[050E]SLP1: (True)
[050F]SLP2: (True)
[0510]SLP3: (False)
[0538]Drying Motor: (False)
[0539]Acqua Stop: (False)
[053E]Auto Door: (False)
[053A]Absolute Filter: (False)
[0507]Sump Rinse: (False)
[0513]Offset TL (°C/10): (0)
[0514]Offset TCL (°C/10): (0)
[0515]Offset TA (°C/10): (0)
[0545]Delivery Pump 1 (ml/min): (46)
[0549]Delivery Pump 2 (ml/min): (46)
[0536]Delivery Pump 3 (ml/min): (46)
[050A]Temperature Mixed Drain (°C): (0)
[0508]Ss extra water load: (0)
[0509]Quantity of treated Water (lt): (25)
[0546]Three-Phase Power Supply: (True)
[055A]Frequency: (Autodetect)
[0504]N° Repetitions: (3)
[053D]Cyclic Program: (True)
[0558]Powder detergent box enabled: (True)
[0601]Last Rinse: (False)
[0602]Block Dosage: (False)

N.B.:

Remember that during download, the parameters and thus the customisations set in the device will be shown.

8 PLANNED MAINTENANCE

The following section is taken from the user manual to provide the engineer with guidance on the essential planned maintenance procedures.



Maintenance operations are not covered by the product Warranty, which does not include the replacement of components which deteriorate due to normal wear and tear.

The operations required are:

1. Inspection and if necessary replacement of worn **peristaltic pump** components (especially the internal hose)
2. Inspection of the **detergent intake** pipes and replacement if necessary
3. Inspection of the **door gasket** and replacement if necessary
4. Inspection of the **drying system filters** (relative and absolute) and replacement if necessary
5. Inspection and if necessary cleaning/replacement of the **filters** (water intake filters on the filler pipes, detergent filters on the suction systems)
6. Checking of the intake **water hardness setting** (the user must first have the intake water analysed to allow the correct settings to be made)
7. Checking of the **detergent dosage settings**.
8. Inspection of the **steam condenser** assembly
 - a. Inspection of the **nozzles**, check that water is flowing correctly
 - b. Inspection of the connection, water intake, water drainage and level pressure switch connection **hoses**
9. Checking of the correct **operation and calibration of the tank temperature probes**. This check is performed:
 - a. By comparison with a calibrated instrument;
 - b. Preferably using a target temperature of 93°C and the preset test cycle. The authorised engineer can activate the test cycle using the " Set -t " menu. With effect from FW version 4.6.x.x, the cycle includes two consecutive phases at $T=T_{\text{target}}$ to allow calibration in the first phase and a check on correct operation of the probes during the second phase.
 - c. Any corrections (offsets on the probe readings) are then entered using the software app.
 - d. It should be remembered that the temperature acceptability condition, during the extensions, is T within the range $[T_{\text{target}}; T_{\text{target}}+5^{\circ}\text{C}]$.
10. **Performance of a complete operating cycle**, including the drying phase, to check for any leaks or malfunctions. (The test cycle which can be run by the authorised engineer can be used for a simultaneous check on probe calibration and on the correct operation of the device overall).

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