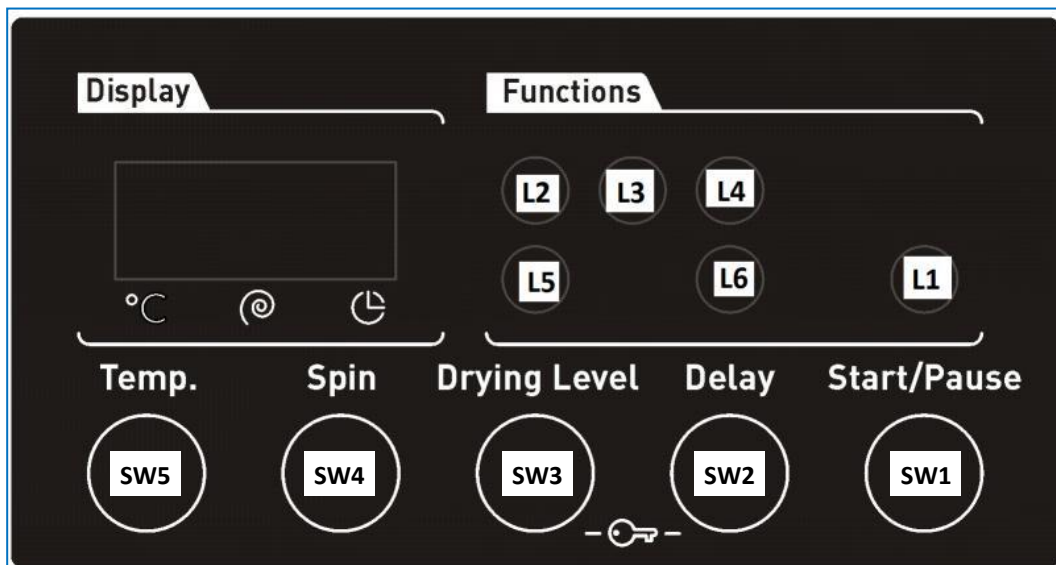
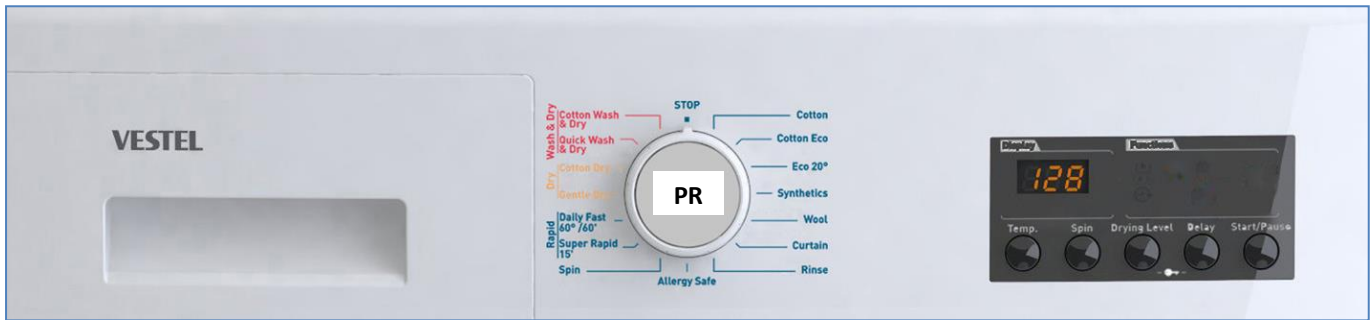




Service Manual  
for  
D4 Series



### 3. Control Panel and Acronyms



PR	Program selector 16 programs including off position
SW1	Switch 1, Start / Pause
SW2	Switch 2, Option 1 (Delay Timer)
SW3	Switch 3, Option 2 (Drying Level)
SW4	Switch 4, Spin Speed Selection
SW5	Switch 5, Temperature Selection
L1	LED 1, Start/Pause LED
L2	LED 2, Drying Level 1 LED
L3	LED 3, Drying Level 2 LED
L4	LED 4, Drying Level 3 LED
L5	LED 5, Drying Level Option LED
L6	LED 6, Delay Time LED

## 4. Test Mode

### 4.1. Autotest (With Button Model)

1. Press and hold SW5.



2. While pressing SW5, turn PR to 1<sup>st</sup> position (Cotton). Wait 3 seconds and release SW5. During test "AU" is visualized on display.



3. When autotest is finished, END screen is visualized.



#### 4.1.1. Autotest Steps

Autotest follows a predefined flowchart in order. Unlike service autotest, autotest automatically skips to next step upon completing one. The steps of the test are as follows:

Step1:

The drain pump is checked.

Step2:

Motor ramps to max spin speed while valves are activated in order.

Step3:

Motor stops, both valves are activated simultaneously.

Step4:

The motor turns to right. Also, dryer valve is activated.

Step5:

The motor turns to left.

Step6:

Both valves are activated. (Water intake for heating)

Step7:

Washer NTC is checked.

Step8:

Washer Heater is checked.

Step9:

Dryer resistance I and I&II are checked.

Step10:

Dryer NTC is checked for 2sec.

Step11:

Fan is checked.

In case of no failure test ends after this step and "End" is displayed. In case of an error detection EXX and error definition will pop up on display. (where XX is the error number 1 to 10 )

Please see following autotest chart for details.

## 4.2. Autotest (With Touch Model)

\* This test is for quick checking of the product. You can not see the failure codes.

1. Press SW3 button and simultaneously position program knob to 1



2. After 3 sec, door will be locked and the auto test starts.

The test steps are as below;

**Step1:** The pump is activated for 3 seconds and there is EPS check, the frequency value should be between the 46.04Hz and 43.40Hz. It checks the EPS and if it is OK it continues the autotest; if it is NOK then it should give E10 ERROR & cancels the autotest ( goes to the selection mode ). Also if any frequency can not be detected, then it means there is problem with connection or EPS, so it gives E10 which is EPS error and cancels the autotest.

L1-L3 and L4 should fast blink during E10 error for panels except F4.

**Step2:** The motor ramps to max spin for 15 seconds. While its speed rising up to the maximum speed the EV1 (prewash valve) is activated for 5 seconds and then the EV2 (wash valve) is activated for 5 seconds.

**Step3:** The motor reduces speed to stop (depends on the motor stop time) for 5 seconds. While it is slowing down it activates EV1 and EV2 valve, concurrently.

**Step4:** The motor turns to right.

**Step5:** The motor turns to left for 5 seconds.  
Test is stopped. In that period, the Pre Wash icon makes fast blink.

**Step6: The option 1 button is pushed**

The EV1 and EV2 are activated concurrently until it reaches pressure sensor's first level frequency ( Hz ) for 5 seconds.



**Step7:** Software will detect NTC's resistance value and will check if the temperature is between  $5^{\circ}\text{C} < T_{\text{detected}} < 40^{\circ}\text{C}$ . If it is inside the range, heating step will be done. If temperature value is outside the range, then it means NTC is detecting the temperature in a wrong way and heating step will be skipped.

**Step8:** Autotest ends and "End" is visualized on LCD for F4. For F2B, F2A, F2B and F2C "End" led will be fix on.

AUTOTEST	
Time in seconds (to be adjusted)	5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
Entering autotest	0-10
Changing power to 220 50Hz	10-15
Main Voltage 50 Hz	15-100
Door Lock Powered (Depends on door lock)	15-100
Pump	20-100
EPS measurement	20-100
Motor Ramp to max spin (max. is 20 sec.)	20-40
EV1 (flowrate dependent of washer)	20-45
EV2 (flowrate dependent of washer)	25-45
Dryer valve	45-55
Time until motor is stopped (Depends on the motor stop time)	40-45
Motor Preferred Run (Direction to Right)	45-55
Motor Inverse Run (Direction to Left)	55-65
EV1 + EV2 valves up to first level frequency (Depends on the water level)	60-70
Washer NTC check	65-75
Washer heater resistance	70-80
Dryer resistance I	75-85
Dryer resistance I + II	80-90
Dryer NTC	85-95
Fan	90-100
End Visualization	95-100
<p>Washer Ntc detection : Software will detect NTC's resistance value and will check if the temperature is between <math>5^{\circ}\text{C} &lt; T_{\text{detected}} &lt; 40^{\circ}\text{C}</math>. If it is inside the range, heating step will be done.            If temperature value is outside the range, then it means NTC is detecting the temperature in a wrong way and heating step will be skipped. Additionally if NTC connector disconnected it should shows NTC failure code(E05) on display.</p>	
<p>EPS measurement: It checks the EPS and if it OK, it continues the autotest; if it is NOK then cancel the Autotest and go to the selection mode. Also if any frequency can not be detected, then it means there is problem with connexion or EPS, so it gives E10 which is EPS error and cancels the autotest &amp; goes to the selection mode.</p>	
<p><b>Dryer Ntc detection</b> : Software will detect NTC's resistance value and will check if the temperature is between <math>0^{\circ}\text{C} &lt; T_{\text{detected}} &lt; 50^{\circ}\text{C}</math>. If it is inside the range, heating step will be done.</p>	

**Diagram for model which has button**

AUTOTEST													
Time in seconds (to be adjusted)	5	10	15	20	25	30	35	40	45	50	55	60	65
Entering autotest	█	█	█										
Changing power to 220 50Hz		█											
Main Voltage 50 Hz			█	█	█	█	█	█	█	█	█	█	█
Door Lock Powered (Depends on door lock)			█	█	█	█	█	█	█	█	█	█	█
Motor Ramp to max spin (max. is 15 sec.)				█	█	█	█	█	█	█	█	█	█
Time until motor is stopped (Depends on the motor stop time)								█	█				
Motor Preferred Run (Direction to Right)									█	█	█		
Motor Inverse Run (Direction to Left)										█	█		
EV1 (flowrate dependent of washer)					█	█		█	█				
EV2 (flowrate dependent of washer)						█	█	█	█				
Test stopped until Prewash button is pressed (symbol blinking)(REMOVED)	█	█	█	█	█	█	█	█	█	█	█	█	█
EV1 + EV2 valves up to first level frequency (Depends on the water level) (If machine is a hot water one, take water from Hot Valve)											█	█	
NTC check												█	
Heather resistance													█
Pump				█	█								
EPS measurement													

Sayfa 1

Diagram for model which has touch

## 5. Service Mode

### 5.1. Service Autotest (With Button Model)

1. Press and hold SW4.



2. While pressing SW4, turn PR to 1<sup>st</sup> position (Cotton). Wait 3 seconds and release SW4. Step 1 of service autotest will start. During test "SAU" is visualized on display. Please see details about steps in right column.



3. When autotest is finished, END screen is visualized.



#### 5.1.1. Service Autotest Steps

If you turn knob position to other program between 1<sup>st</sup> to 3<sup>rd</sup> it will skip current test and start the selected one. It is recommended not to skip any steps for a detailed checkup. Unlike autotest, service autotest starts next test step manually by rotating program selection knob.

##### Step1:

There will be a certain amount of water intake and then washer heater is activated for 8 minutes. Washer NTC values are checked in this period. In case of a washer heater/NTC failure, it pops up E05 error displaying "E05" on SW3.

At the end of heating, "SAU" visualization should make slow blink to indicate that the step is over. You can turn program knob to 2<sup>nd</sup> position to continue with step2.

\*During this step if EPS detects high water level, overflow algorithm is applied and E04 is released.

##### Step2:

Drain pump is activated; in case of a pump failure it pops up E03 error.

At the end of pump activation, "SAU" visualization should make slow blink to indicate that the step is over. You can turn program knob to 3<sup>rd</sup> position to continue with step3.

##### Step3:

Dryer Heater I and fan is activated. After 3 mins if there will be no temperature change ( $\Delta T < 10^{\circ}\text{C}$ ), it will release E14 failure.

If temperature increases accordingly ( $\Delta T > 10^{\circ}\text{C}$ ), "SAU" visualization should make slow blink to indicate that the step is over. You can turn program knob to 4<sup>th</sup> position to continue with step4.

##### Step4:

Dryer Heater II and fan is activated. After 3 mins if there will be no temperature change ( $\Delta T < 10^{\circ}\text{C}$ ), it will release E14 failure.

If temperature increases accordingly ( $\Delta T > 10^{\circ}\text{C}$ ), "SAU" visualization should make slow blink to indicate that the step is over. You can turn program knob to 5<sup>th</sup> position to continue with step5.

##### Step5:

Rapid 15' program algorithms is run to test all washing components, the only difference is error codes are displayed which normally are not displayed to end user.

If no error found in test program "SAU" visualization should make slow blink to indicate that the step is over. You can turn program knob to 6<sup>th</sup> position to continue with step6.

##### Step6:

A 5 mins drying program is run to test all drying components.

If case of no error service autotest ends and "End" is displayed.

\*If user changes the selector position, machine will do what is defined for the new selected position.

## 5.1. Service Autotest

End users can only see E1-E2-E3-E4. During service autotest, other failures can be seen.

1. To activate service autotest, Press SW2 button and simultaneously position program knob to 1.
2. After 3 sec, door will be locked , after door is locked, all leds will be fix OFF and machine will get into service autotest mode.

	Selector Position 1	Selector Position 2	Selector Position 3
	Result	Result	Result
	HEATER ON	PUMP ON	TEST PROGRAM ON
Comments :	When entering in service test, door will be locked.		TEST IS OVER Door will be unlocked, machine will go to END state.

The test steps are as below ;

### Step 1 :

Selector position 1 will be "HEATER ON"

Before heating it should take water till first level frequency then start heating.

Heater will be on max. 8 minutes. If temperature doesn't increase 2°C in 8 minutes, machine will give NTC failure. ( E05 ).

Or if the NTC connection is broken then it should give again E05 NTC failure.

L2 and L4 should fast blink during E05 error.

At the end of heating, "SAU" visualization should make slow blink to indicate that the step is over.

Note : If user changes the selector position, machine will do what is defined for the new selected position.

### Step 2 :

Selector position 2 will be "PUMP ON"

Temperature will be measured, if it is higher than 50°C, it should take 80sec. cooling water and then make "Drain+ 5sec.)

At the end of pump activation, "SAU" visualization should make slow blink to indicate that the step is over.

### Step 3 :

Selector position 3 will be "RAPID 15' "

So machine will make exactly the same algorithm of Rapid 15'.

So, time for selector position 1 is 15 minutes.

At the end of Rapid 15' the door will be unlocked and machine will go to END mode.

LD1 → Star/ Pause Led → Slow Blink

LD2 → Wash Phase Led → Slow Blink

LD3 → Rinse Phase led → Off (Except Rinse program. For Rinse program L2 makes slow blink)

LD4 → Spin Phase Led → Off (Except Spin program. For Spin program L4 makes slow blink.)

LD5 → Delay Timer Led → Off (If it is selected → On)

LD6 → Function Led → Off (If it is selected → On)

## 5.2. Failure Codes

Error Indication	Error Number	Indication in UI	Indication in SI
Door/Door Lock Failure	E01	A	A
Lack of water	E02	A	A
Pump failure	E03	A	A
Overflow	E04	A	A
NTC or Heater Failure	E05	NA	A
Motor Failure	E06	NA	A
Configuration Failure	E07	NA	A
Motor Triac Failure	E08	NA	A
Voltage Error	E09	A	A
Electronic Pressure Sensor	E10	NA	A
Dryer Board Connection Failure	E11	NA	A
Dryer Thermostat Failure	E14	NA	A
Twinjet Failure	E15	NA	A
Dryer Overheated Failure	E16	NA	A
Flowmeter Failure	E17	NA	A
Dryer NTC Failure	E18	NA	A

## 6. Critical Torque Values

	Assembly Location	Bolt/Nut/Screw	Torque Min. (Nm)	Torque Nom. (Nm)	Torque Max. (Nm)	Air Pressure Wrench Speed (rpm)
*	Transport Screw Assembly	Transport Screws	6.50	6.50	7.00	1000
*	Motor Assembly	Motor Screws	6.00	6.50	7.50	800
*	Front Concrete Weight - Front Tub Assembly	Front Counterweight Screws	14.00	14.50	14.75	600
*	Upper Counter Weight Assembly	Upper Counterweight Screws	25.00	27.50	30.00	440
*	Pulley – Drive Shaft – Washing Group Assembly	Pulley – Drive Shaft Assembly Bolt	39.50	40.00	40.50	440
*	Washer Heater Assembly	Heater Assembly Nut	3.85	4.00	4.00	970

The bolts/nuts above are important for product safety purposes. Please tighten screw, bolts and nuts according to the torque values given in table above.

## 8. Component Specifications

### 8.1. Drain Pump

Drain pump is both a mechanical and electrical component which is used to drain water inside the washing machine. It has an synchronous motor inside. For better performance maintenance, pump filter should be cleaned regularly.



Drain pump

#### *Technical features*

Nominal voltage	220-240 V	Resistor (coil)	125 $\Omega$ ( $\pm 5\%$ )
Nominal current	0.28 A ( $\pm 10\%$ )	Water flow	17 L/min(to 1 m height)
Nominal power	30 W ( $\pm 20\%$ )	Thermal protector	YES
Frequency	50 Hz		

#### *Testing component*

Check the resistance value on the component with multimeter as shown below.  
Resistance value should be between 125  $\Omega$  ( $\pm 5\%$ )



## 8.2. Heater

Heating element (Resistance) is a component which is designed to regulate temperature of water inside the drum. It has three connections: Phase, notral and ground connections.



Resistance

### *Technical features*

Heater type	Tubular heating element with NTC – sensor	Nominal power	2000 W $\pm$ 5%
Nominal voltage	230 V	Resistance	26.4 $\Omega$ $\pm$ 5%
		Termal fuse	2 sided

### *Testing component*

Check the resistance value on the component with multimeter as shown below.  
Resistance value should be between 26.4  $\Omega$   $\pm$ 5%



### 8.3. Washer NTC

The component which sends signals to PCB about the water temperature inside the tub. The resistance value of the NTC decreases as the temperature increases.



NTC

#### Technical features

Temp. (°C)	R min (kΩ)	R max (kΩ)
-10	54.9	62.6
-5	43.0	48.6
0	33.9	38.1
5	27.0	30.1
10	21.6	23.9
15	17.4	19.1
20	14.1	5.4
25	11.5	12.5
30	9.4	10.2
35	7.8	8.3
40	6.4	6.9
45	5.4	5.7

Temp. (°C)	R min (kΩ)	R max (kΩ)
50	4.5	4.7
55	3.8	3.9
60	3.2	3.3
6	2.7	2.8
70	2.3	2.4
75	1.9	2.0
80	1.7	1.8
85	1.4	1.5
90	1.2	1.3
95	1.1	1.1
100	0.9	1.0

NTC Resistance vs. NTC Temperature

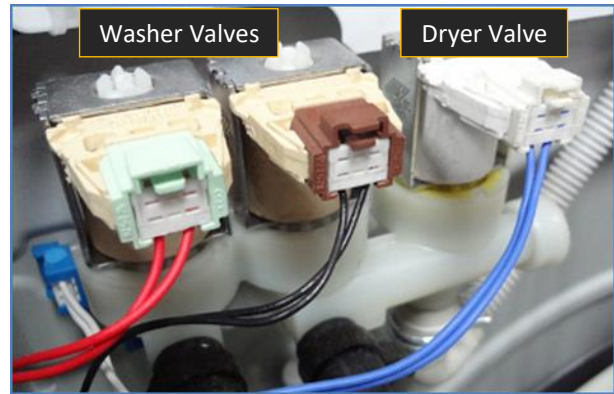
#### Testing component

Check the resistance value on the component with multimeter as shown below.



## 8.4. Valve

Valve is an electrical and mechanical component which is designed to take water from network system into the washing machine. It is operated by PCB card.



Valves

### Technical features

Nominal voltage 220-240 V  
Frequency 50-60 Hz

Flow rate (washer valves) 7 L/min ( $\pm 15\%$ )  
Flow rate (dryer valve) 1.2 L/min ( $\pm 15\%$ )  
Operating water pressure 1-10 bar

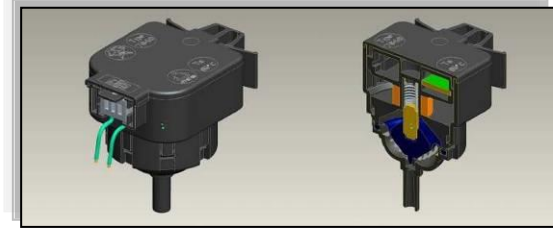
### Testing component

Check the resistance value on the component with multimeter as shown below. Washer valves' water flow rate should be 7 L/min  $\pm 15\%$ . Dryer valve's water flow rate should be 1.2 L/min  $\pm 15\%$ . Washer valves' coil resistance values should be  $3750\Omega \pm 10\%$ . Dryer valve's coil resistance value should be  $5190\Omega \pm 10\%$ .



### 8.5. Electronic Pressure Sensor (EPS)\*

Electromagnetic field occurs due to movement of pressurized membrane. The coil moves vertically by nucleus due to electromagnetic field. The water level is regulated according to the frequency changes of the coil by electronic card.



EPS

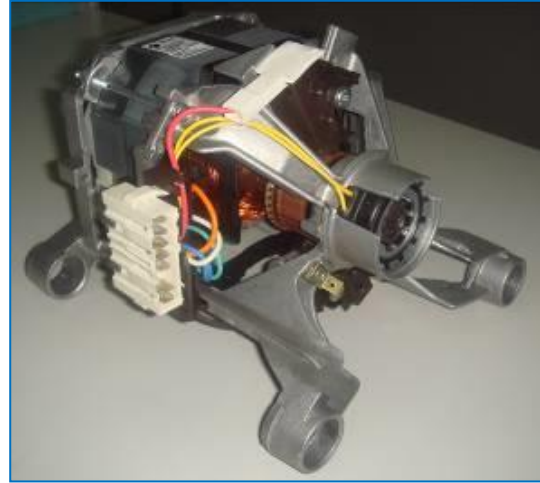
#### ***Testing component***

1. Make sure there are no laundry in washing machine, tap is connected and opened, power cord is plugged. Put no detergent in drawer.
2. Bring program knob to position 1 (Cotton 90°C program)
3. Press start button.
4. Wait for water intake step to finish. You can recognise it by listening the water sound or slightly opening and observing detergent drawer.
5. As soon as water intake is over turn program knob to position 0 (Off position)
6. Check water level from door glass. The water level should be just below door glass as seen in the picture below: (There is a %10 tolerance with this level) 32013066



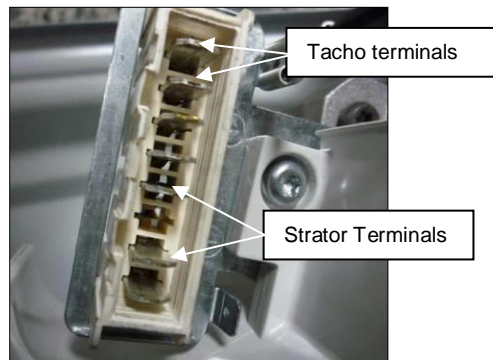
## 8.6. Motor

The washing machine has an asynchronous motor. It is controlled by the PCB. It is essential to check the motor for correct diagnosis and quick servicing. In the below picture, socket points on the motor is shown to measure with multimeter.



Motor

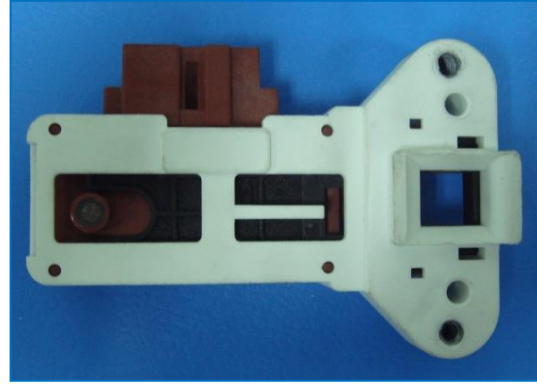
### **Motor socket terminals**



MOTOR CODE	BRAND	STATOR (FULL) $\Omega$	TACHO $\Omega$	STATOR (HALF) $\Omega$	TEMP.
32013066	ANAIMEP	1.20 $\pm$ 7%	180 $\pm$ 7%	0.55 $\pm$ 7%	20 °C

### 8.7. Door Lock\*

Door lock is activated at the beginning of the program in order to prevent the door from opening. It can be unlocked between 45 seconds to 85 seconds after the program end. This time delay is caused by the PTC which is assembled in the door lock.



Door lock

#### **Technical features**

Nominal voltage      250 V

#### **Testing component**

Check the resistance value on the component with multi-meter as shown in below figures. Resistance value should be  $1000\Omega \pm 50\%$  at  $20\text{ }^\circ\text{C}$ .



## 8.8. Fan Group

Air pump component for drying cycle. Pumps dry cold air from condenser to dryer heater.



Fan group

### Technical features

Nominal voltage	230 V	Resistance @ 20°C	82.7Ω ±3Ω
Frequency	50 Hz	Motor speed	1300 RPM
Rated Power	34 W	Air Flow Rate	70 m <sup>3</sup> /h

### Testing component

Check the resistance value on the component with multi-meter as shown in below figures. Resistance value should be 82.7Ω ±3Ω at 20 °C.



## 8.9. Dryer Heater

Air heater unit consist of two separate resistance with nickel diffusion technology.



Dryer Heater

### Technical features

Nominal voltage	230 V
Rated power (Heater I)	750 W
Rated power (Heater II)	750 W

Resistance @ 20°C	65.5 – 72.6 Ω
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### Testing component

Check the resistance value on the component with multi-meter as shown in below figures. Resistance value should be in 65.5 – 72.6 Ω range.



## 8.10. Dryer NTC

The component which sends signals to PCB about the flowing air temperature just after dryer heater. The resistance value of the NTC decreases as the temperature increases.



Dryer NTC

### Technical features

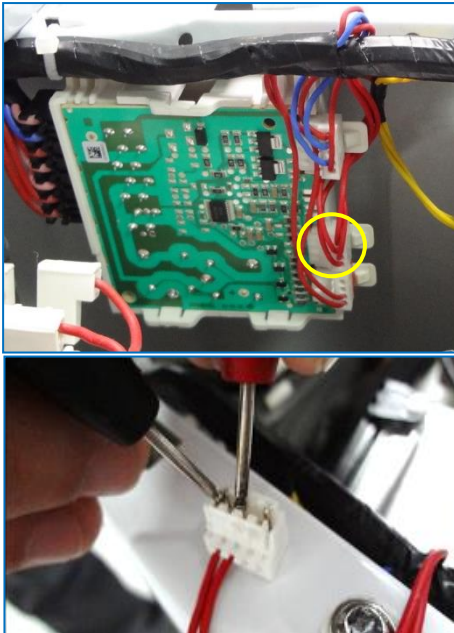
Temp. (°C)	R min (kΩ)	R max (kΩ)
25	19.40	20.60
30	15.56	16.67
40	10.19	11.10
50	6.82	7.54
60	4.65	5.23
70	3.25	3.70
80	2.32	2.68
90	1.69	1.97
100	1.24	1.47

Temp. (°C)	R min (kΩ)	R max (kΩ)
110	0.93	1.11
120	0.70	0.85
130	0.54	0.66
140	0.42	0.52
150	0.33	0.41
160	0.26	0.32
170	0.21	0.25
180	0.17	0.20

NTC Resistance vs. NTC Temperature

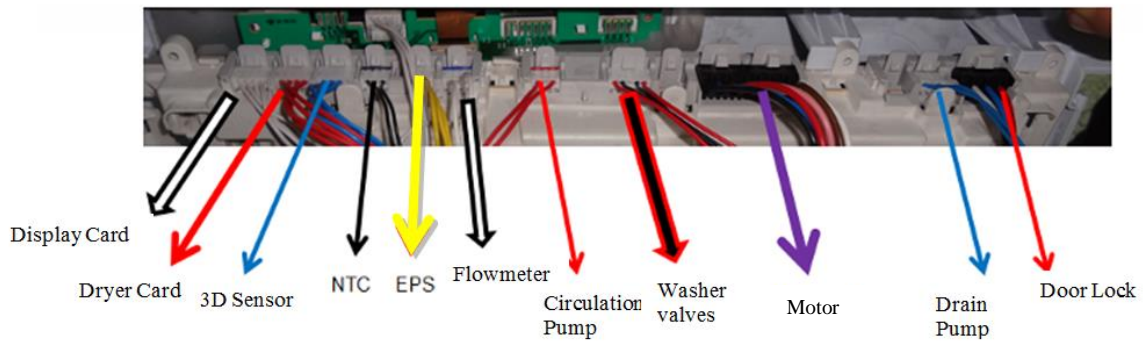
### Testing component

Check the resistance value on the component with multi-meter as shown in below figures.



## 8.11 Component Control on PCB

### Sockets on the PCB

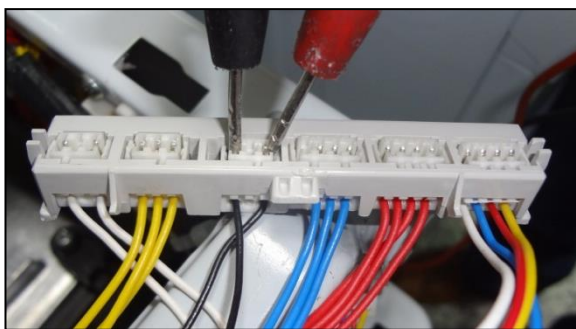


### Sockets on the Dryer Board



### 8.11.1 Washer NTC

NTC resistance values are checked (black cables) as shown. Refer to the relevant table for the NTC resistance values..



### 8.11.2 Circulation Pump

Resistance values are checked (red cables) as shown.

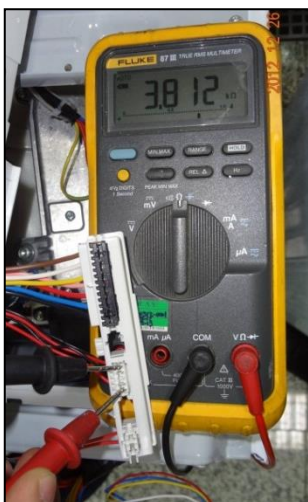
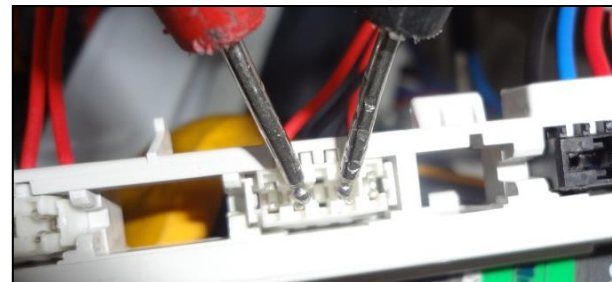
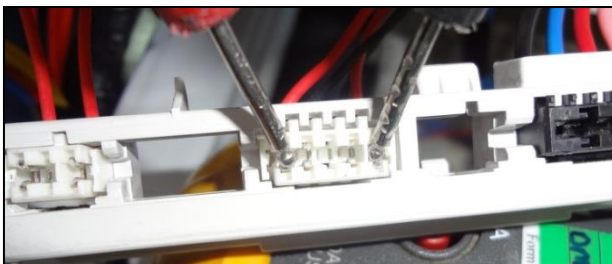


### 8.11.3 Washer Valves

Valve resistance value is checked with a multimeter as shown.  
Washer valves resistance values : 3750 Ω +10%

Pre-Wash Valve:  
Check the red cables

Main Wash Valve:  
Check the black cables



### 8.11.4 Drain Pump

Check the blue-blue cables  
 Drain Pump resistance value: 125 - 140 Ω



### 8.11.5 Door Lock

Resistance value is checked with a multimeter as shown.

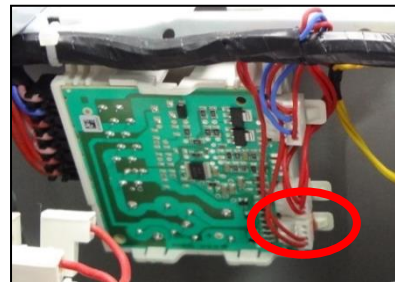
Check the white and blue cables

Resistance values 240Ω ±20% (25 °C)



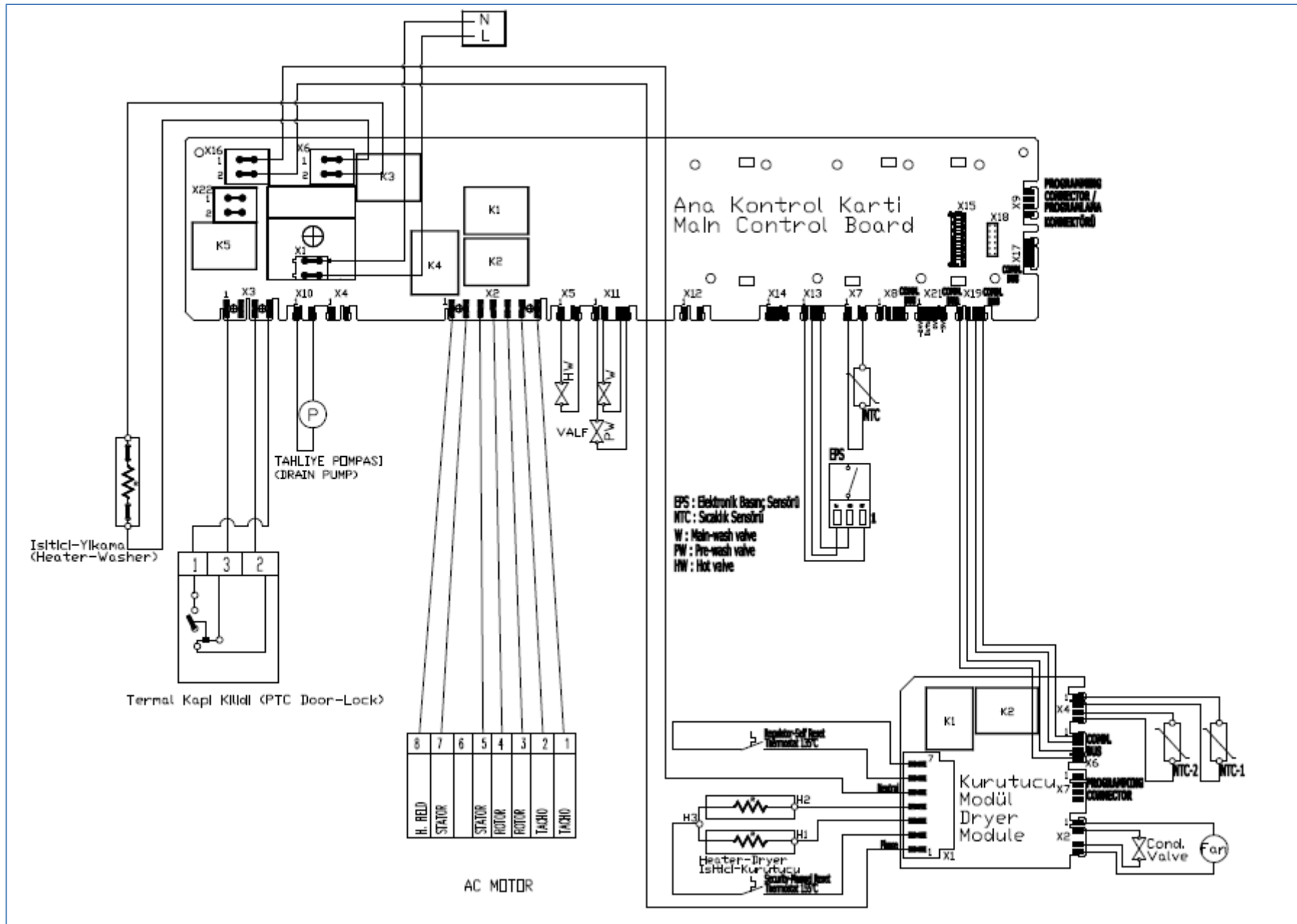
### 8.11.6 Dryer NTC

Component Control :  
 Check the socket at the bottom of the dryer board as shown.



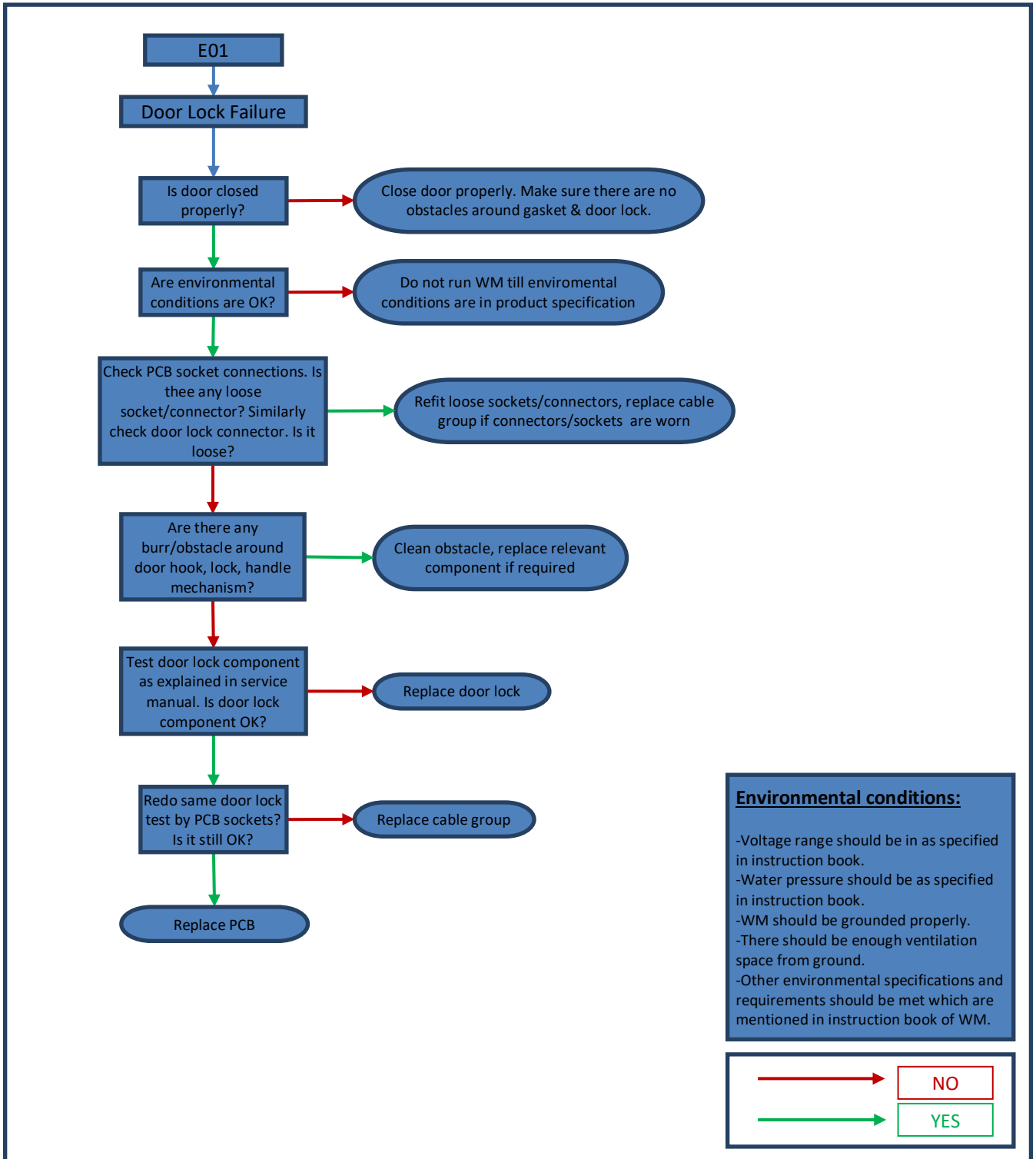
T°C	R(KΩ) MIN	R(KΩ) CEN	R(KΩ) MAX
25	19.40	20.00	20.60
30	15.56	16.11	16.67
40	10.19	10.64	11.10
50	6.819	7.176	7.544
60	4.653	4.933	5.225
70	3.246	3.466	3.697
80	2.322	2.495	2.679
90	1.688	1.825	1.972
100	1.244	1.353	1.471
110	0.9296	1.017	1.112
120	0.7042	0.7747	0.8516
130	0.5404	0.5976	0.6603
140	0.4198	0.4665	0.5180
150	0.3296	0.3681	0.4107
160	0.2614	0.2932	0.3286
170	0.2092	0.2357	0.2653
180	0.1690	0.1912	0.2161

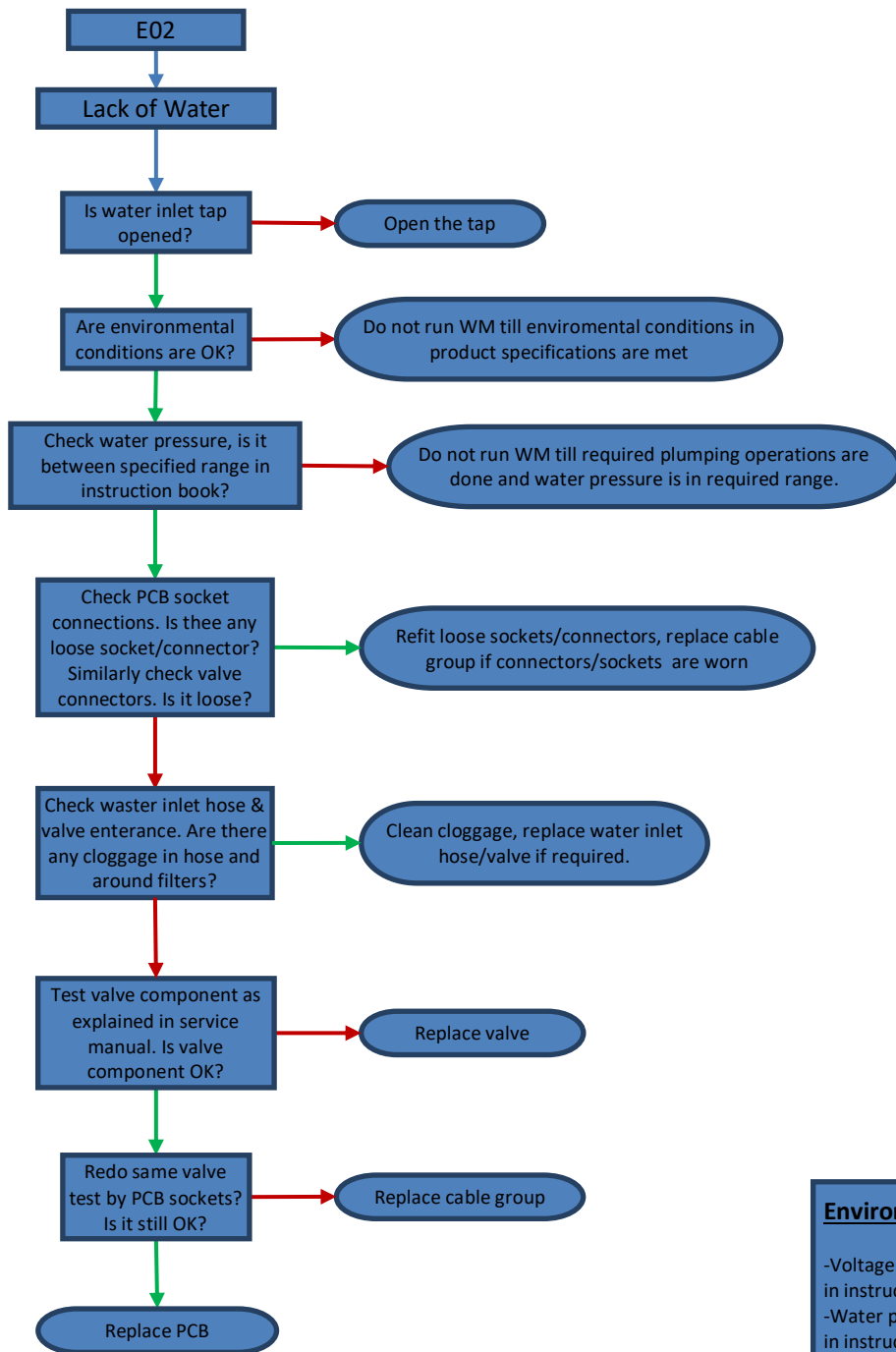
## 9. Wiring Diagram\*



# 10. Troubleshooting

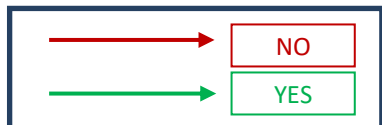
Please apply basic troubleshooting steps described in user manual. If you can not find a solution you should run service autotest and complete all steps. In case of an error encounter please follow the instructions through flowchart related with the error.

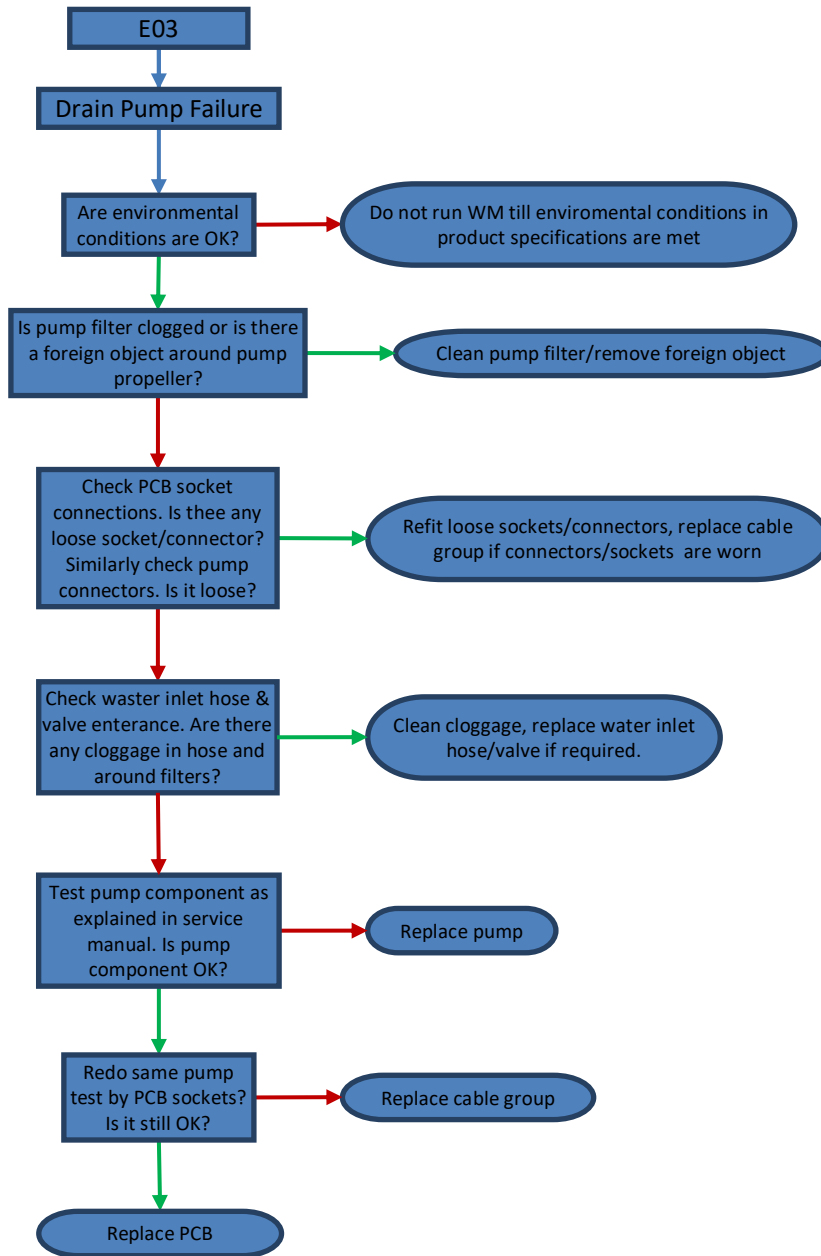




**Environmental conditions:**

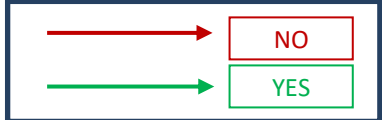
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- There should be enough ventilation space from ground.
- Other environmental specifications and requirements should be met which are mentioned in instruction book of WM.

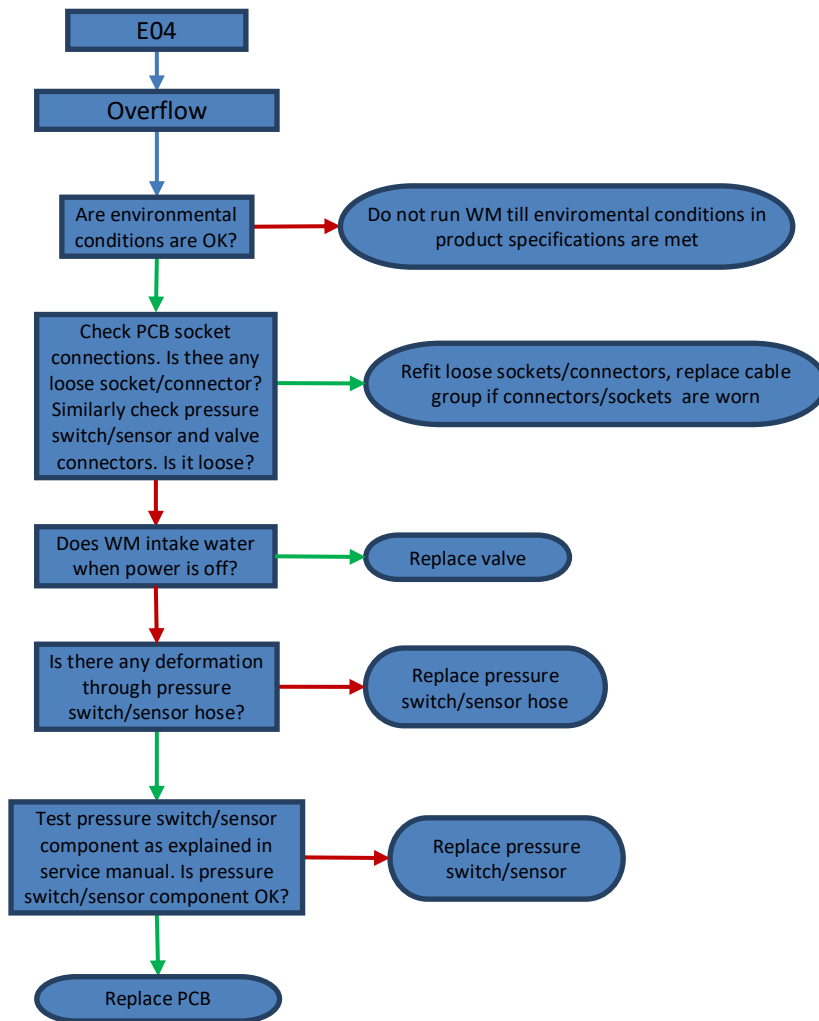




**Environmental conditions:**

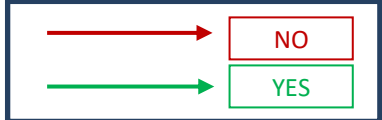
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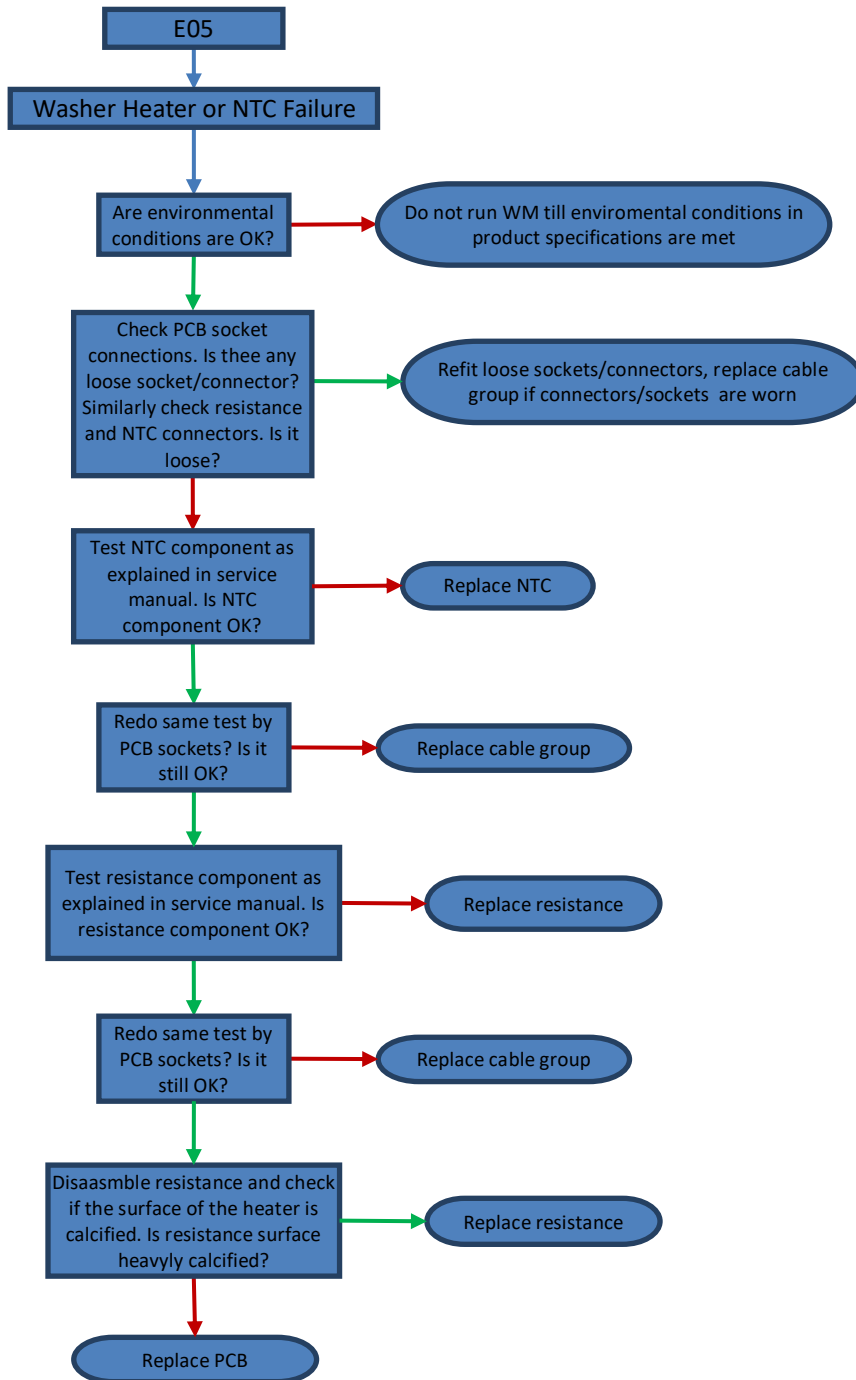




**Environmental conditions:**

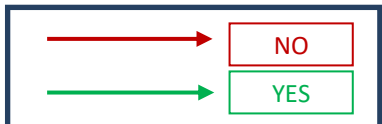
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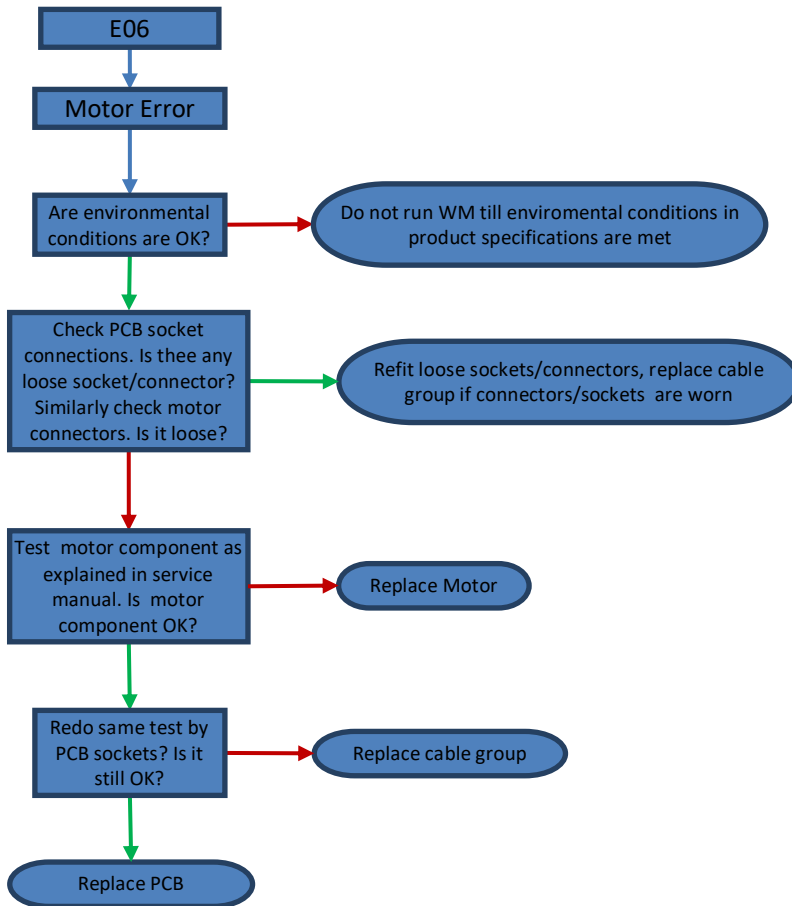




**Environmental conditions:**

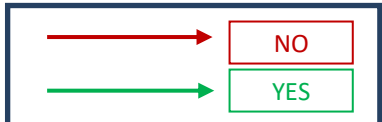
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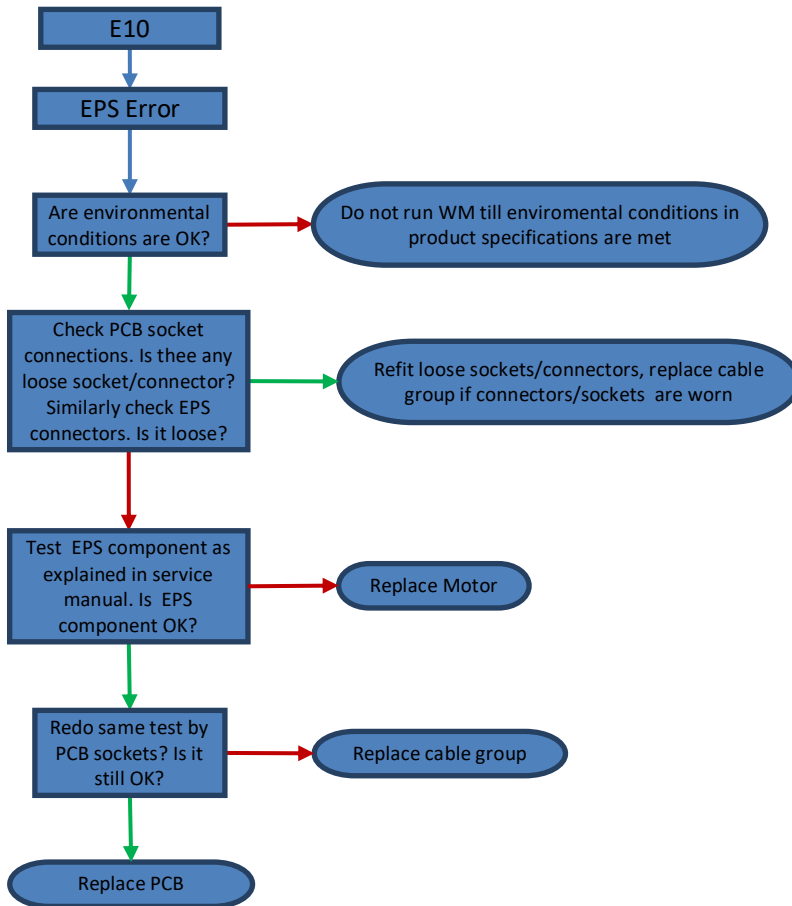




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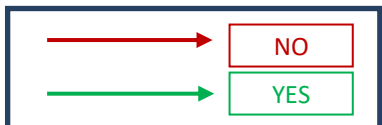
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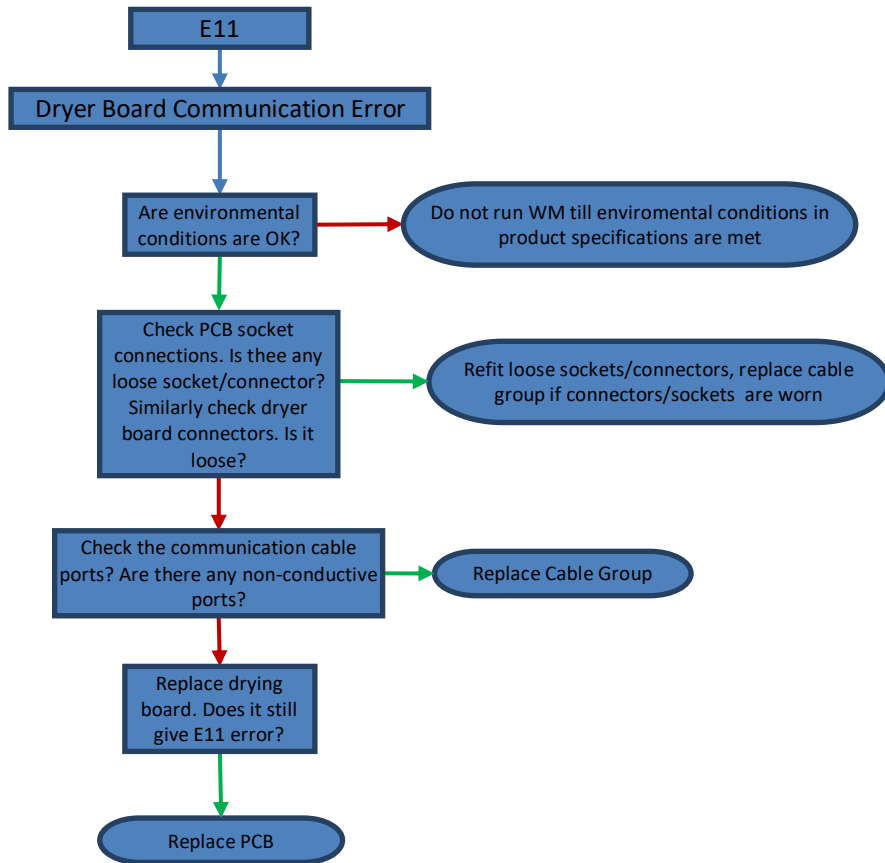




**Environmental conditions:**

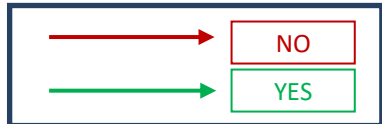
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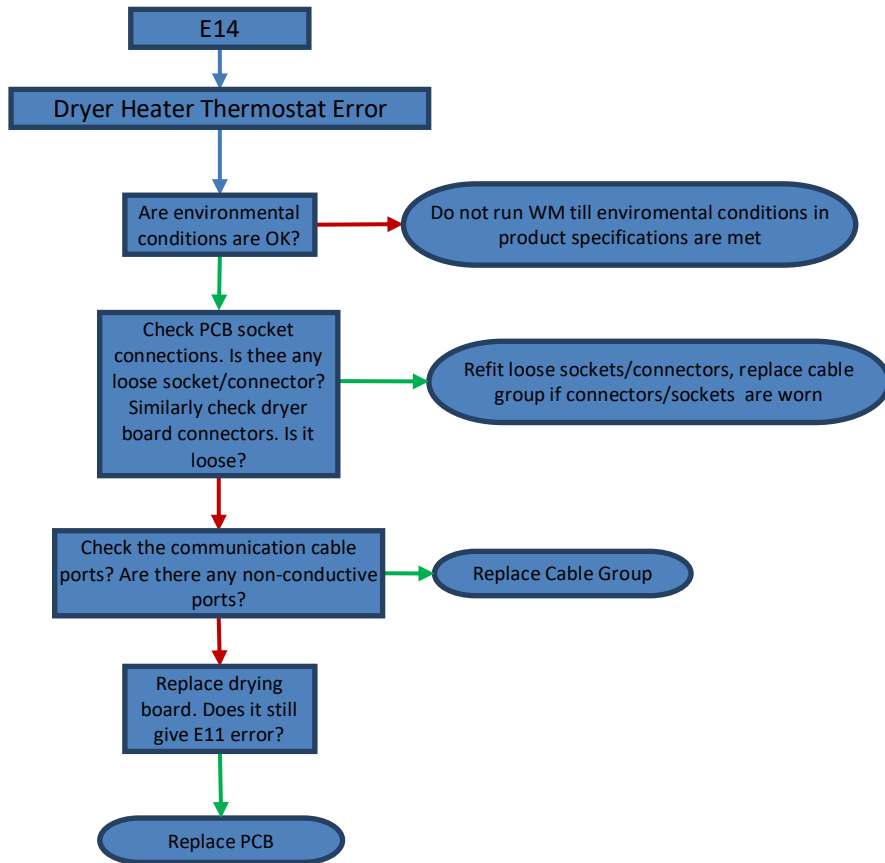




**Environmental conditions:**

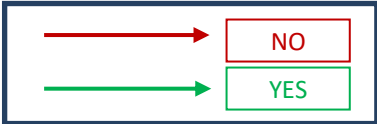
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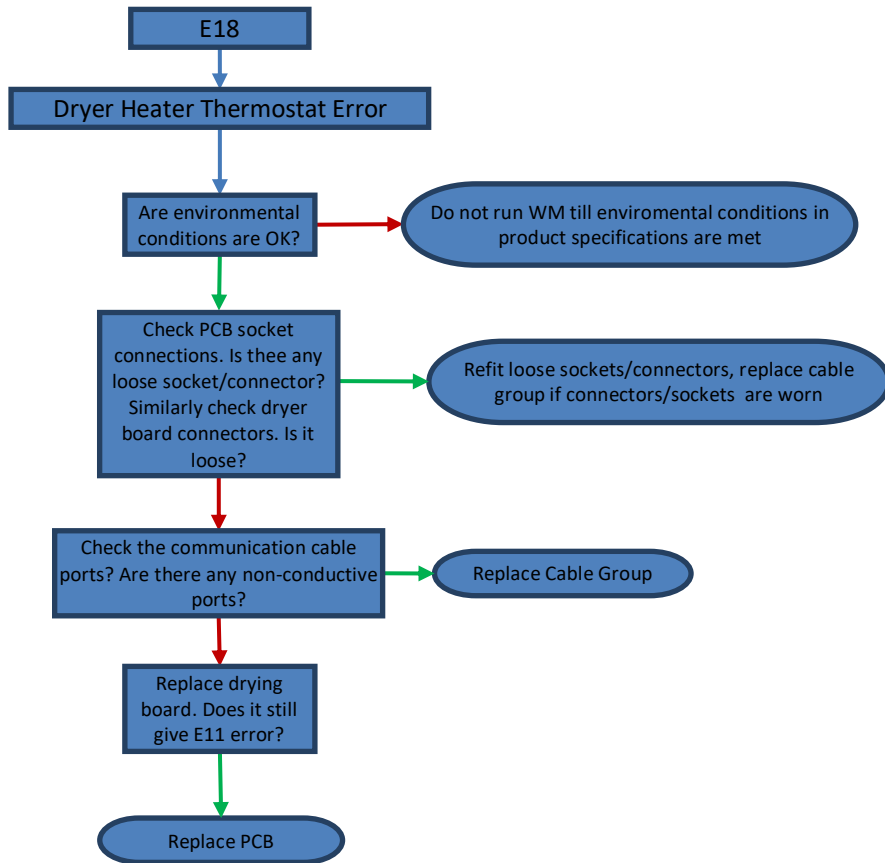




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