WASHING MACHINE
DRUM TYPE

Basic Model : WF448AAW/XAA
(PURPLE PROJECT)

Model Name : WF419*
WF409*
(ACE PROJECT)

Model Code : WF419AAW/XAA
WF409SNL/XAC

SERVICE *Manual*

WASHING MACHINE (DRUM)

WF419***

WF409***

CONTENTS

Refer to the service manual in the GSPN (see the rear cover) for the more information.

CONTENTS

1. SAFETY INSTRUCTIONS

1-1. SAFETY INSTRUCTIONS FOR SERVICE ENGINEERS

► Be sure to observe the following instructions to operate the product correctly and safety to prevent possible accidents and hazards while servicing.

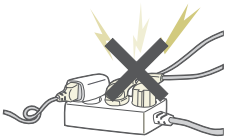
► Two types of safety symbols, Warning and Caution, are used in the safety instructions.

⚠ WARNING	**Hazards or unsafe practices that may result in severe personal injury or death.**
⚠ CAUTION	**Hazards or unsafe practices that may result in minor personal injury or property damage.**

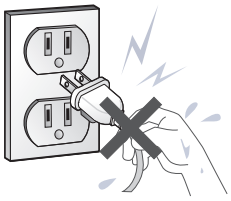
⚠ WARNING BEFORE SERVICING

- (When servicing electrical parts or harnesses) Make sure to disconnect the power plug before servicing.
  ✔ Failing to do so may result in a risk of electric shock.

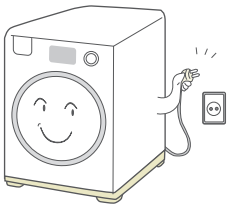
- Do not allow consumers to connect several appliances to a single power outlet at the same time.
  ✔ There is a risk of fire due to overheating.



- When removing the power cord, make sure to hold the power plug when pulling the plug from the outlet.
  ✔ Failing to do so may damage the plug and result in fire or electric shock.



- When the washing machine is not being used, make sure to disconnect the power plug from the power outlet.
  ✔ Failing to do so may result in electric shock or fire due to lightning.



- Do not place or use gasoline, thinners, alcohol, or other flammable or explosive substances near the washing machine.
  ✔ There is a risk of explosion and fire caused from electric sparks.

⚠ WARNING WHILE SERVICING

- Check if the power plug and outlet are damaged, flattened, cut or otherwise degraded.
  ✔ If faulty, replace it immediately.
  Failing to do so may result in electric shock or fire.

- Completely remove any dust or foreign material from the housing, wiring and connection parts.
  ✔ This will prevent a risk of fire due to tracking and electrical hazard..

- When connecting wires, make sure to connect them using the relevant connectors and check that they are completely properly.
  ✔ If tape is used instead of the connectors, it may cause fire due to tracking.

- Make sure to discharge the PBA power terminals before starting the service.
  ✔ Failing to do so may result in a high voltage electric shock.

- When replacing the heater, make sure to fasten the nut after ensuring that it is inserted into the bracket-heater.
  ✔ If not inserted into the bracket-heater, it touches the drum and causes noise and electric leakage.

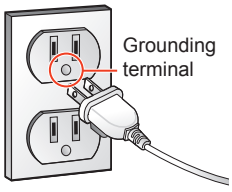
⚠ WARNING AFTER SERVICING

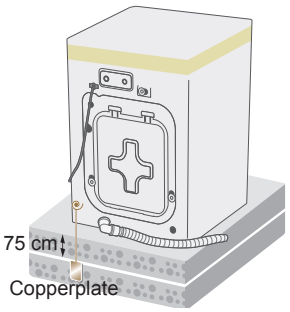
- Check the wiring.
  ✔ Ensure that no wire touches a rotating part or a sharpened part of the electrical harness.

- Check for any water leakage.
  ✔ Perform a test run for the washing machine using the standard course and check whether there is any water leakage through the floor section or the pipes.

- Do not allow consumers to repair or service any part of the washing machine themselves.
  ✔ This may result in personal injury and shorten the product lifetime.

- If it seems that grounding is needed due to water or moisture, make sure to run grounding wires.
  (Check the grounding of the power outlet, and additionally ground it to a metallic water pipe.)
  ✔ Failing to do so may result in electric shock due to electric leakage.
  [Running a grounding wire]
  - Twist a grounding wire (copper wire) two or three times around the tap.
  - If you connect the grounding wire to a copperplate, bury it 75 cm under the earth in a place with a lot of moisture.
    ⚠ Do not connect the grounding wire to a gas pipe, plastic water pipe or telephone wire. There is a risk of electric shock or explosion.



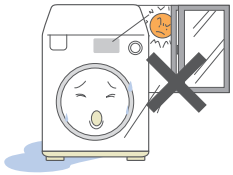


⚠ CAUTION BEFORE SERVICING

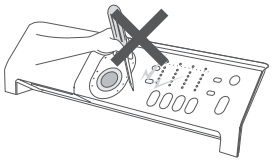
- Do not sprinkle water onto the washing machine directly when cleaning it.
  - ✔ This may result in electric shock or fire, and may shorten the product lifetime.

- Do not place any containers with water on the washing machine.
  - ✔ If the water is spilled, it may result in electric shock or fire. This will also shorten the product lifetime.

- Do not install the washing machine in a location exposed to snow or rain.
  - ✔ This may result in electric shock or fire, and shorten the product lifetime.



- Do not press a control button using a sharp tool or object.
  - ✔ This may result in electric shock or damage to the product.



⚠ CAUTION WHILE SERVICING

- When wiring a harness, make sure to seal it completely so no liquid can enter.
  - ✔ Make sure that they do not break when force is exerted.

- Check if there is any residue that shows that liquid entered the electric parts or harnesses.
  - ✔ If any liquid has entered into a part, replace it or completely remove any remaining moisture from it.

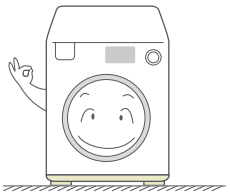
- If you need to place the washing machine on its back for servicing purposes, place a support(s) on the floor and lay it down carefully so its side is on the floor.
  - ✔ Do not lay it down on its front. This may result in the inside tub damaging parts.

⚠ CAUTION AFTER SERVICING

- Check the assembled status of the parts.
  - ✔ Now is a good time to inspect your work. Review all connections and wiring, including mounting hardware.

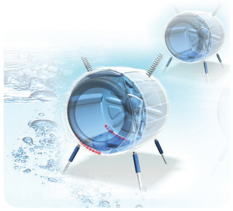
- Check the insulation resistance.
  - ✔ Disconnect the power cord from the power outlet and measure the insulation resistance between the power plug and the grounding wire of the washing machine. The value must be greater than 10MΩ when measured with a 500V DC Megger

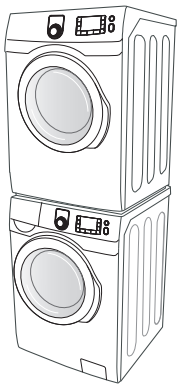
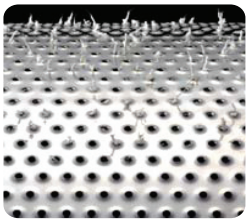
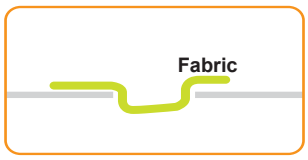
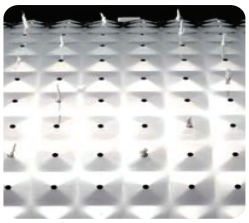
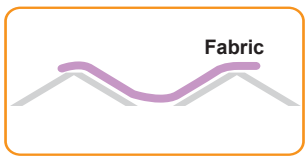
- Check whether the washing machine is level the floor with respect to the original position of the washing machine prior to service.
  By doing this now will reduce for the need of customer dissatisfaction and redo call.
  - ✔ Vibrations can shorten the lifetime of the product.



2. FEATURES AND SPECIFICATIONS

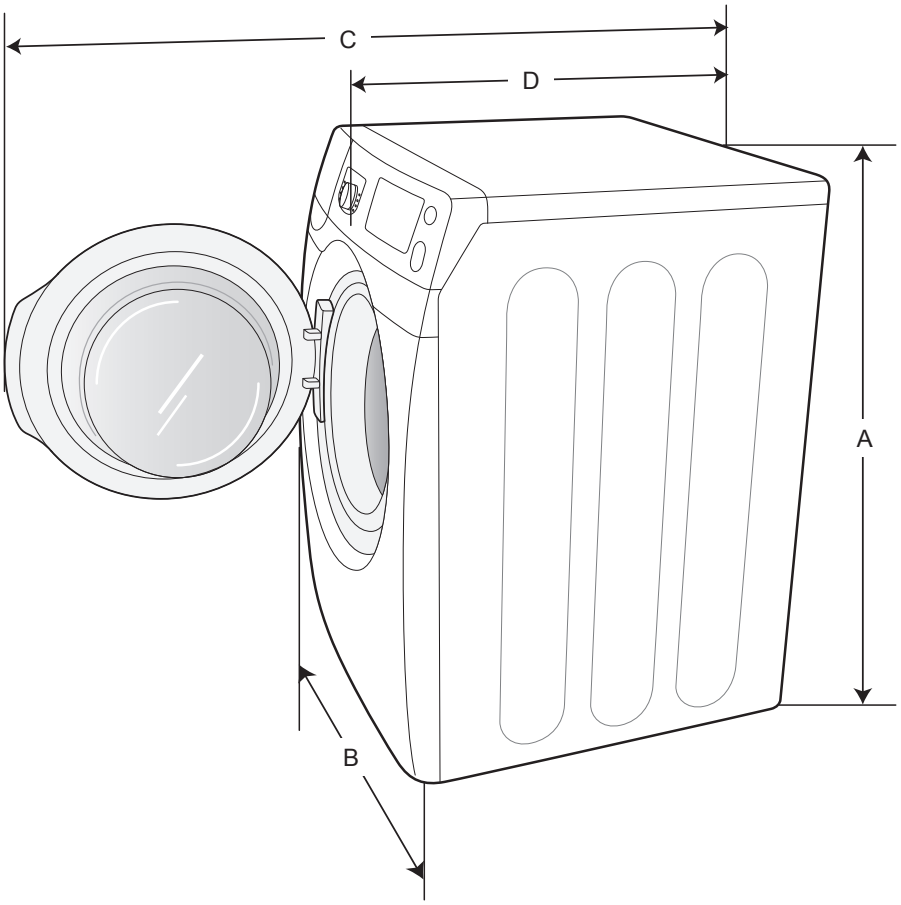
2-1. FEATURES

Features	Description
Active Fresh™ Sanitization (Only model WF419)**	• The winning combination! Samsung's silver nano technology combines the sanitizing effect of silver with state-of-the art science for the ultimate in clean. Two plates of 99.9% pure silver are converted into silver ions through electrolysis. They penetrate deep into the wash water to kill bacteria and fungi. Even in cold, bleach-less water, the silver particles kill 99.9% of odor causing bacteria for a "super clean" wash. So washing in cold water is energy efficient and better for your clothes. • Samsung's unique technology generates silver ions that remove bacteria and fungi, and creates an invisible shield that protects your clothes from unwanted odors until your next wash. Using an ancient and proven purification technique so simple, yet so advanced, it removes microbes even in cold water. • Effect of Silver Wash System - Keeps Stored Clothes Fresh The Ag+ Silver (Nano) Technology anti-bacterial effect keeps fabric free from odor-causing micro-organisms for up to one month, without the use of strong chemical cleaners. There's no need to worry about musty-smelling clothes even if they remain unused for a long period. - Makes Shapeless Garments a Thing of the Past High temperatures and harsh bleaches can damage and discolor your clothes. The Ag+ Silver (Nano) Technology helps your clothes last longer, without stretching, shrinking, pilling or fading.  
VRT Steam™ (Only model WF419)**	• Superior washing performance • Loosen up grime/dirt easily with the tough of a button. • Saving time & energy providing extraordinary cleaning power. 
Quietest VRT™	• Lowest Vibration & Noise • Samsung's VRT™ provides smooth operation at spin speeds up to 1200 rpm. • 2nd floor as well as main floor installation available 
High efficiency energy & Water saving	• Washing with Samsung's Activ Fresh™, even in cold water, sanitizes the laundry thereby saving 92% of the energy normally used with hot water sanitization.
Direct drive inverter motor	• The power to handle anything! Our direct-drive inverter motor delivers power right to the washer tub from a variable speed, reversible motor. A beltless direct-drive motor generates a higher spin speed of 1200 rpms for more effective, quiet operation. The washer also has fewer moving parts, meaning fewer repairs.
Woolmark certified	• The machine wash wool cycle on the Samsung Activ Fresh™ machines has been tested and has passed the required Woolmark Company specification for machine washable wool products. Fabrics should be washed according to the instructions on the garment label as specified by Woolmark and Samsung.

Features	Description
Pedestal with storage drawers **(Model No : WE357A7P/E/W)**	• An optional 15” pedestal is available to raise the washer for easier loading and unloading. It also offers a built-in storage drawer that can hold a 100 oz. bottle of detergent 
Stacking **(Model No : SK-5A/XAA)**	• Samsung washers and dryers can be stacked to maximize usable space. An optional stacking kit is available for purchase from your Samsung retailer. 
Diamond Drum	• The washing performance has improved and potential damage to the clothing has been minimized. (The size of the holes on the diamond drum has been reduced for minimizing damage to the clothing/garment.) - The embossed wall of the drum serves as a washboard, dramatically increasing the washing performance compared with existing drum washing machines, which uses the power of the difference in elevation only. - The size of holes has been reduced drastically, maintaining the optimal wash performance (Washing Cost 1.0) while saving on water and electricity required for washing. - The structure of the holes on the diamond drum was redesigned to minimize potential damage to the clothing.  **Conventional**   **Diamond Drum** 

2-2. SPECIFICATIONS

Model		WF419*** / WF409***	
Wash type		Front loading type	
Dimension (Inches / mm)	A: High-Overall	39” / 991 mm	
	B: Width	27” / 686 mm	
	C: Depth with door open 90º	51.7” / 1314 mm	
	D: Depth	31.9” / 811 mm	
Water pressure		20 ~ 116 psi (137 ~ 800 kpa)	
Weight		99 Kg	
Capacity		4.3 cu.ft	
Power consumption	Washing	120 V	300 W
	Washing and heating	120 V	1100 W
	Spin	120 V	700 W
	Drain	120 V	80 W
Spin revolution	rpm	1200 RPM (1150 RPM)	

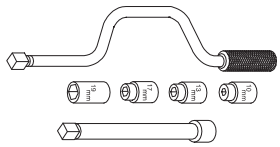
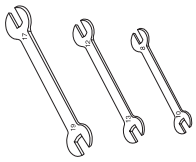
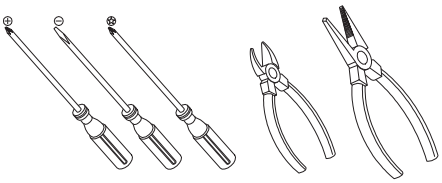
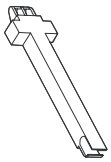


2-3. COMPARING SPECIFICATIONS WITH EXISTING MODELS

Grade		ACE BEST	ACE BETTER	PURPLE
Model Name		WF419***	WF409***	WF448AAW WF448AAE WF448AAP WF438AAR WF428AAW WF428AAL
Image				
Capacity		4.3 cu.ft	4.3 cu.ft	4.5 cu.ft
Size (W x D x H)		27”(686mm) x 31.9”(811mm) x 39”(991mm)	27”(686mm) x 31.9”(811mm) x 39”(991mm)	27”(686mm) x 31.9”(811mm) x 39”(991mm)
Energy	Rating Voltage	120V/60Hz	120V/60Hz	120V/60Hz
	Washing Watage	300 W	300 W	250 W
	Washing & Heating	1100 W	1100 W	1100 W
	Spin Watage	700 W	700 W	600 W
	Drain Watage	80 W	80 W	80 W
	Annual Energy Consumption (Kwh/ Year)	109	109	166
Main Spec	Drum Volume	104 ℓ	104 ℓ	109 ℓ
	RPM (Max Spin Speed)	1200	1200	1300
	MOTOR	DD	DD	DD
	MEF	2.86	2.86	2.68
	WCF	3.1	3.1	3.4
USP	VRT (Lowest Vibration & Noise)	O	O	O
	Steam Kit	O	X	O
	Silver Wash	O	X	O
	Diamond Drum	O	O	O
	Internal Heater	O	O	O
	Circulation Pump	O	O	O
	Interial Drum Light	X	X	O
Design	Display Type	LED	LED	LED + 2.5” LCD
	Display Color (LED)	RED	RED	White LCD + Red
	Door Trim	Chrome	Imperial Silver	Chrome
	Frame	W : White U : Blue-Steel	L : Onyx Blue	W : White E : Copper P : Stainless platium R : Tango red L : Onyx blue

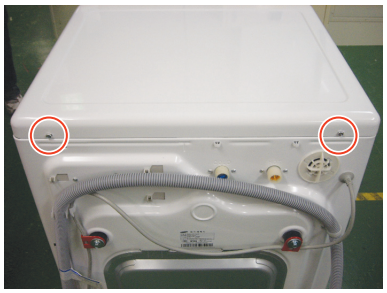
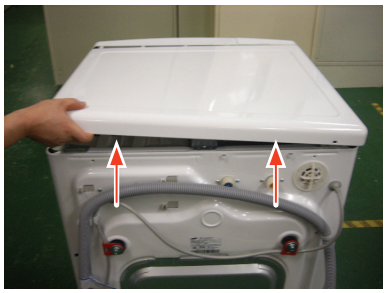
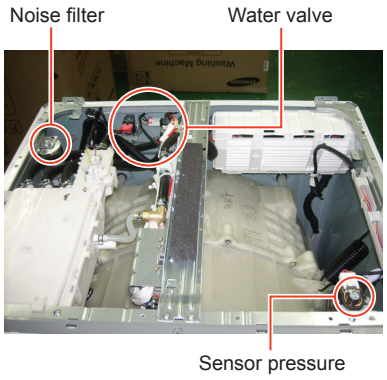
3. DISASSEMBLY AND REASSEMBLY

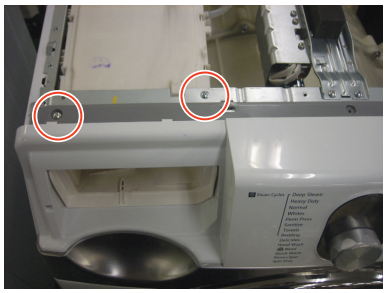
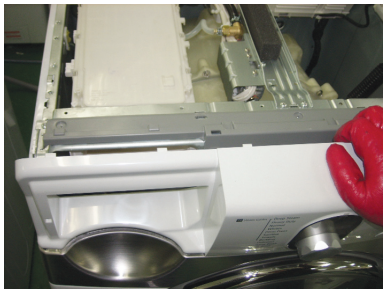
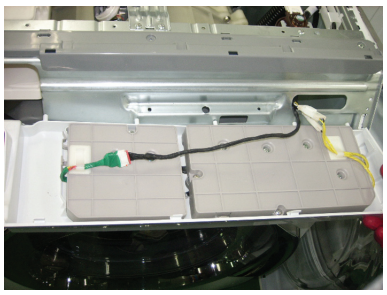
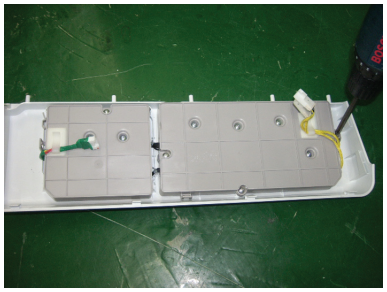
3-1. TOOLS FOR DISASSEMBLY AND REASSEMBLY

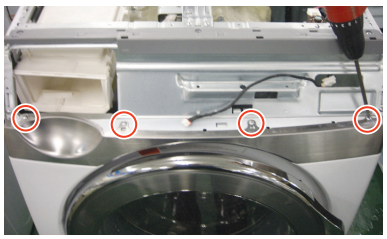
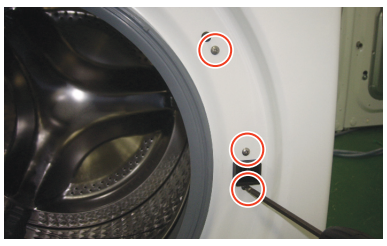
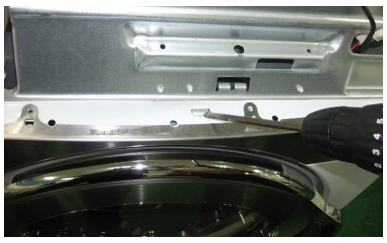
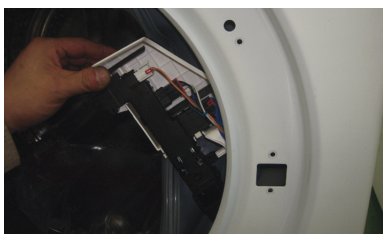
Tool		Type	Remarks
	Socket Wrench with 6” Extension	10mm 13mm 19mm	Heater (1) Motor (1), Balance (5), 2 holes of each left and right of the shock absorber 1 Pulley hole
	Open End wrench	10mm 13mm 19mm	Replaceable for the box driver. Since the bolt runs idle when the box driver is used, use the box driver 17mm.
	Vice pliers		Tool to protect the idle and abrasion of the bolt for the box driver.
	Others (Driver, Nipper, Long nose)		General tools for the after service.
	JIG for the Tub		1 (Disassemble and Assemble)

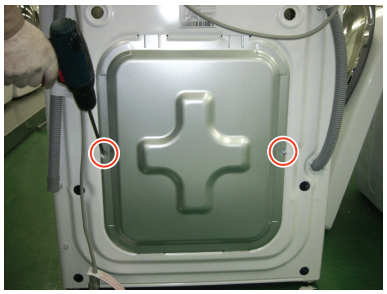
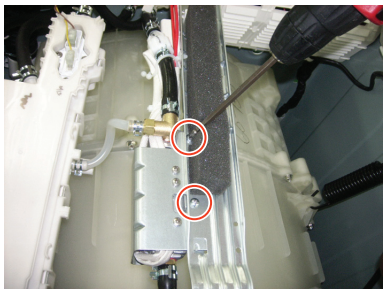
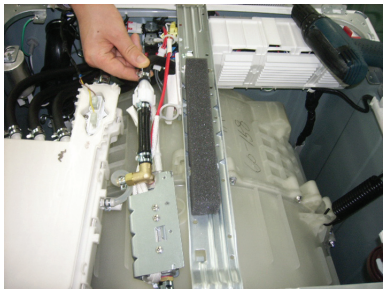
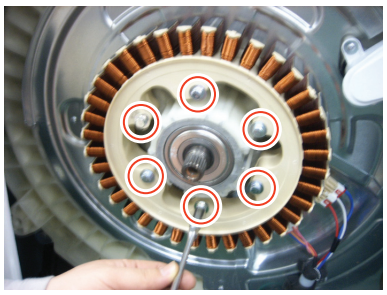
3-2. STANDARD DISASSEMBLY DRAWINGS

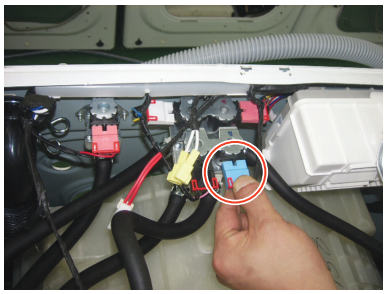
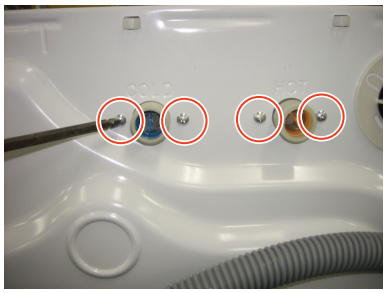
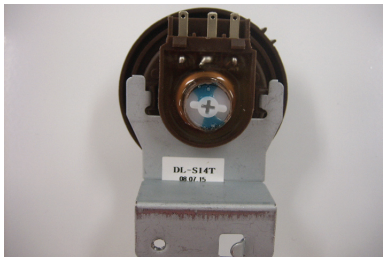
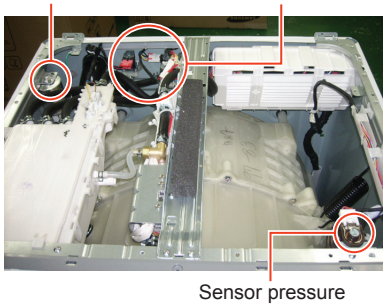
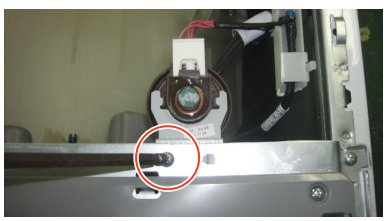
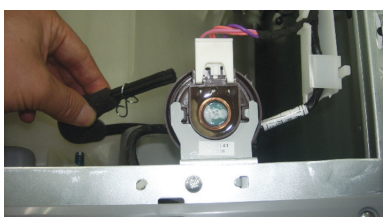
► This is a standard disassembly diagram and may differ from the actual product.
Use this material as a reference when disassembling and reassembling the product.

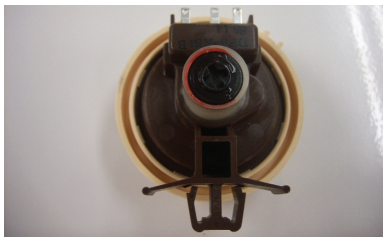
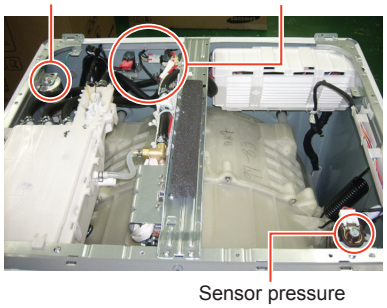
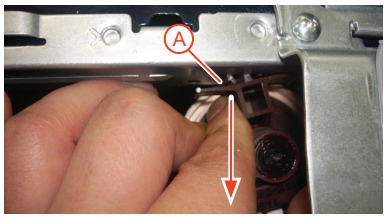
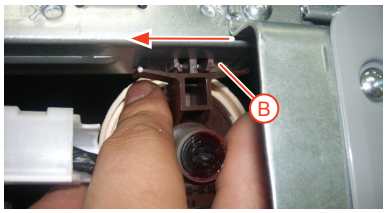
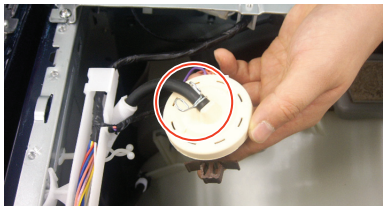
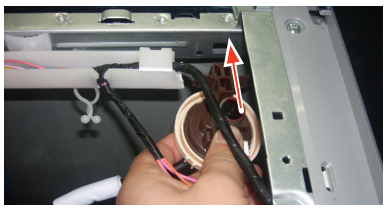
Part	Figure	Description
ASSY COVER TOP		1. Remove the two screws holding the Top Cover at the back of the unit.
		2. Remove the top-cover by lifting it up after pulling it back about 15mm.
		3. With the top cover removed you will now have access to service the Water pressure sensor, EMI Noise Filter, Hot and Cold Water Valves, Steam ASSY, Hose Draw ASSY, and Main PCB ASSY.

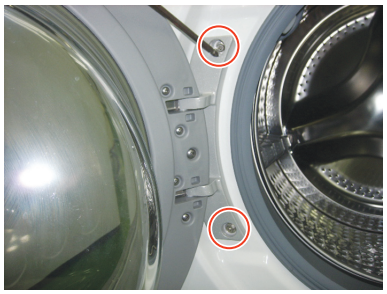
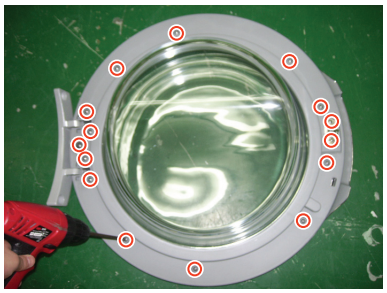
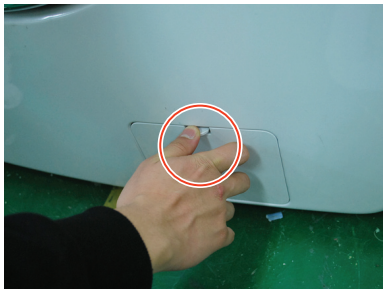
Part	Figure	Description
MAIN-PCB AND SUB-PCB PANEL		1. Remove the 2 screws at the top of the ASSY-PANEL CONTROL.
		2. Hold the ASSY-PANEL CONTROL while pulling it upwards and release the hook to remove it.
		3. Carefully disconnect the two wiring connectors by hand.
		4. Remove the 9 screws holding the PCB and release the hooks on both sides to remove the PCB for repair / replacement.

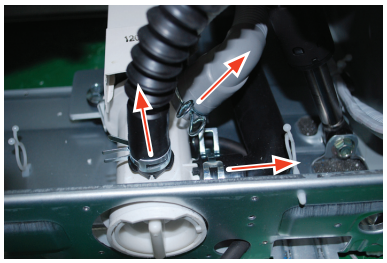
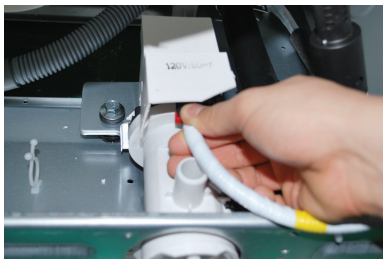
Part	Figure	Description
FRAME FRONT		1. Separate the Wire-Diaphragm from the Front-Frame and remove the Diaphragm.
		2. Remove the 4 screws holding the FRAME-FRONT.
		3. Remove the 4 screws holding the GUIDE-COVER FILTER of the FRAME-FRONT.
		4. Untie the hose.
		5. Remove the 3 screws.
		6. Push the hook.
		7. Disconnect the terminal for the DOOR-LOCK switch.

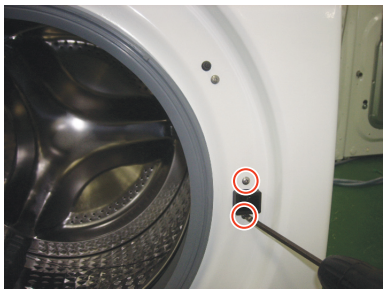
Part	Figure	Description
COVER-BACK		• Remove the 2 screws holding the Back-Cover at the back of the washing machine
STEAMER (Only model WF419**)		1. Remove the 2 screws holding the Guide Wire at the upper of the washing machine.
		2. Disconnect the terminal for the steamer
DD MOTOR		1. Remove the one bolt for the DD Motor.
		2. Remove the 6 screws.

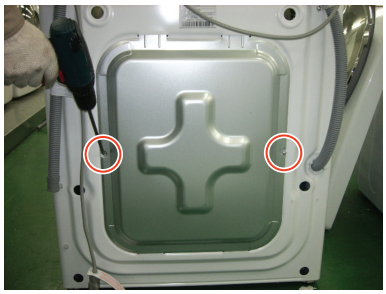
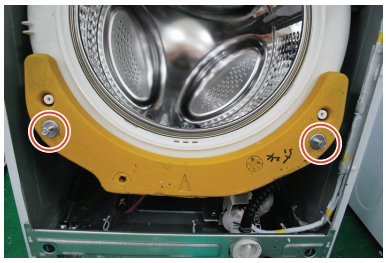
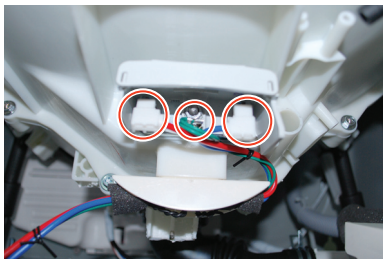
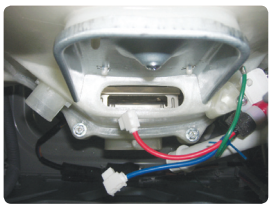
Part	Figure	Description
WATER SUPPLY VALVE		1. Remove the Top Assy-Plate. 2. Disconnect the water supply valve wire connector.
		3. Remove the 4 screws holding the water supply valve.
WATER LEVEL SENSOR (The Bracket type)		**The Bracket type water level sensor**
		1. Separate the Top Assy-Plate.
		2. Remove the screw holding the water level sensor.
		3. Disconnect the wire between the PRESSURE HOSE and the water level sensor for repair / replacement.

Part	Figure	Description
WATER LEVEL SENSOR (The Hook type)		**The Hook type water level sensor**
		► **Disassembly** 1. Separate the Top Assy-Plate.
		1. To remove the water lever sensor, push it slowly in the direction of the arrow shown in the figure on the left. Since this disassembly method uses the elasticity of the water level sensor hook, imposing too strong a force may damage it.
		2. While a force is imposed on the water lever sensor as directed in step 1, pull the hook Ⓐ in the direction of the arrow until it is removed from the bracket spring.
		3. Impose a force slowly in the direction of the arrow designated in the figure on the left until the hook Ⓑ is removed. Then remove the water level sensor.
		► **Assembly** 1. Connect the pressure hose to the body of the water level sensor and lock it using the clamp. When connecting the water level sensor to the set, make sure to connect it after draining water by operating the spin cycle.
		2. To fix the body of the water level sensor, insert the hook into the square hole of the bracket spring until a “click” sound is heard.

Part	Figure	Description
DOOR HINGE		1. Remove the 2 screws holding the Door Hinge and separate the door.
		2. Remove the 15 screws holding the Holder Glass, separate the Holder Glass and replace the hinge.
DRAIN PUMP		1. Insert the (-) screwdriver into the upper part of the Filter Cover and push it downwards to release the latch.
		2. Drain the remaining water through the drainage hose. Be sure to use a small bowl to collect the water collected from the drain hose.
		3. Separate the Drain Filter by turning it counterclockwise. Since the remaining water may flow out, place a bowl underneath it when separating the filter..

Part	Figure	Description
DRAIN PUMP (Continued)		4. Drain the remaining water through the drainage hose.
		5. Disconnect the wire connector.
		6. Push it back and lift it up.
	✔ Check Points for Troubleshooting 1. Separate the Drain Filter and check if any alien substances are inside the pump (e.g. coins, buttons .., etc.) → Remove these if found. 2. Check if the wire connector for the Drain Pump ASSY has come loose. Reconnect if necessary. 3. When water leaks, check the assembly status of the Clamp Hose, and Cap Drain → Take the relevant countermeasure if necessary. Turn the filter cap counterclockwise, clean and remove any material that has collected.	

Part	Figure	Description
DOOR-LOCK S/W		1. Open the Door. Remove the Wire Diaphragm and remove it from The Front Frame. For easier disassembly, remove the spring from the lower part of the Diaphragm with a (-) screwdriver. Since the Diaphragm can be damaged when removing it, remove it slowly in one direction.
		2. Remove the 2 screws.
		3. Remove the screw holding the Door-Lock S/W. Remove the Door-Lock S/W. Remove the connection wire. (Remove the connector after releasing it by pressing the latch.)

Part	Figure	Description
Heater		1.Seperate the Back Cover
		2.Seperate the 2 bolts
		3. Seperate the Connection Housing(3). Remove the nut holding the heater and the heater.
		4. Remove the heater from the Tub. ⚠ **Caution**  Make sure to insert the Heater into the correct position of the bracket inside the Tub when reassembling it. Otherwise, there is a risk of fire. Make sure to push it inwards until the packing part comes into the Tub completely when reassembling it so that the packing part is completely stuck to the Tub. Fasten the holding nut with a force of 5Kgf/ cm2. If the nut is not fastened properly, there is a risk of water leaking.

Reassembly is in the reverse order of the removal.

4. TROUBLESHOOTING

4-1. ERROR MODES

► **This is a washer integrated error mode. For detailed information, refer to the general repair scripts.**

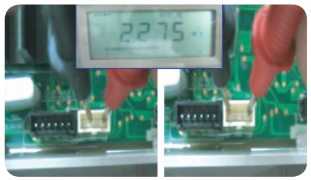
Error Type	For USA		Causes	Remarks
	LED	LCD		
Water Level Sensor	LE	Error! Water Level Sensor Problem	- The part of the hose where the water level sensor is located is damaged (punctured). - The hose is clogged with foreign material. - The hose is folded. - Too much lubricant has been applied to the insertion part of the air hose. - Hose engagement error (disengaged) - Part fault (Faulty internal soldering) - The water level sensor terminal is disengaged. - Main PBA fault.	
Motor Driving Error and Hall Sensor Error	3E	Error! The motor is not working properly.	- The PBA connector terminal is not connected. - The motor spin net is not engaged. - The motor's internal coil is damaged (short-circuited or cut) - The hall sensor terminal is not connected. - Foreign material (a screw) has entered the motor.	This error occurs because of restrained revolutions
	E3		- Motor overloaded due to too much laundry (Non-sensing) - The motor hall sensor terminal is not connected. - PBA fault - The motor driving error from the PBA is weak. : Unstable relay operation, etc.	This error occurs when an interference is generated due to too much laundry, etc.
	bE		- This occurs due to erroneous operating signals from the motor hall sensor. - The IPM terminal of the main PBA is not connected. - The DD motor cover is out of place. - The PCB housing terminal is not connected. - PBA fault - DD motor fault	
Water Supply Error	nF	Error! Low Water Pressure	- Foreign material is entering the water supply valve. - The water supply valve terminal is not connected. (Wire disconnected) - The warm water and rinse connectors are wrongly connected to each other. - This occurs if the PCB terminal from the drain hose to the detergent drawer is not connected. Check whether the transparent hose is folded or torn.	If this error occurs in the Wool course
			- The cold and warm water supply hoses are wrongly engaged into each other. - The temperature of the water supplied through the dry valve during a dry cycle is sensed as higher than 70 ˚C.	The water supplied for 1 minute drying the drying cycle is 0.3 ~ 0.4 L.
			- The water temperature is sensed as higher than 50 ˚C in the Wool or Lingerie courses.	
Drain Error	nd	Error! No Draining	- The pump motor impeller is damaged internally. - The wrong voltage (220 V → 110 V) is supplied to the parts. - Part fault - This occurs due to freezing in the winter season - The drain hose is clogged. (Injection error, foreign material) - Clogged with foreign material - The water pump terminal is not connected: rubber band, bills, cotton, hair pins, coins have collected inside the drain pump ASSY.	

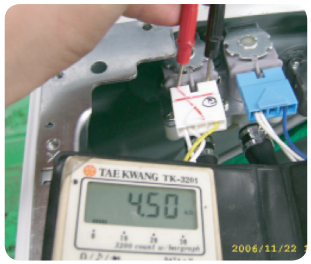
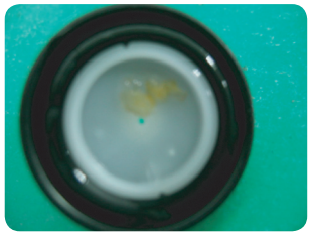
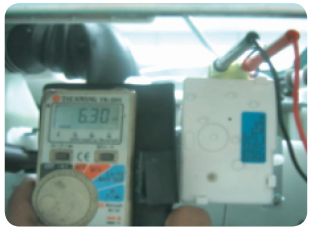
Error Type	For USA		Causes	Remarks
	LED	LCD		
Power Error	2E		- Check the consumer's power conditions. : Make sure to check the operating voltage. Connect a tester to the internal power terminals during the Boil or Dry operations and observe the washing machine's operation carefully. : Check the voltages. (An error occurs when under or over voltage is supplied.) : Check whether a plug receptacle is used. When the connecting wire is 1m, a momentary low voltage may drop up to 10 V - Main PBA fault (sometimes)	
	PF	-	- This error is not a fault but occurs during a momentary power failure : When this error code is displayed, the operation restarts from the cycle that was stopped due to the power failure. : If the washing machine is not operating and this error code is displayed, it is displayed to notify that a power failure has occurred.	
Communication Error	-		- The signals between the sub and main PBAs are not sensed because of commuication error. - Check the connector connections between the sub and main PBAs carefully. → Check for incorrect or loose connections, etc. - Remove the sub PBA C/Panel and check for any faulty soldering.	
Switch Error (Main Relay Error)	E2		- The Power button is pressed continually (for more than 12 seconds). - A switch is jammed or stuck due to be pressed unevenly due to deformation of the control panel or button. - This error may occur when the screws that hold the sub PBA in place are tightened too much. - A button other than the Power button is continually pressed (for more than 30 seconds). - Deformation of an internal plastic injection part - A screw for assembling the sub PBA is tightened too much.	
	Sr		- The main relay of the PBA is short-circuited. - The main relay terminal is connected incorrectly. (The terminal is bent and contact cannot be made.)	When the PBA motor relay does not operate

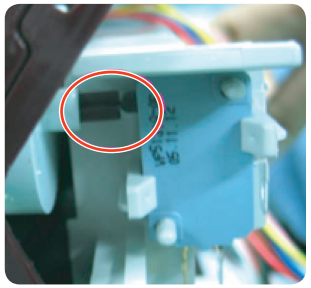
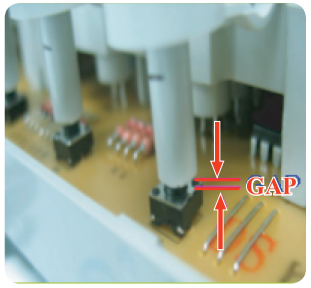
Error Type	For USA		Causes	Remarks
	LED	LCD		
Door Error	dS (Before operation)		- A switch contact error because of a deformation of the door hook - When the door is pulled by force	When the door is not opened after the door open operation
	dL (During operation)		- This occurs in the Boil wash because the door is pushed due to a pressure difference from internal temperature changes	When the door is not locked after the door close operation
	LO (Unlock Fail)		- The door lock switch terminal is connected incorrectly. - The door lock switch terminal is broken. - This occurs intermittently because of an electric wire leakage - Main PCB fault	
	FL (Lock Fail)			
Heater Error	Hr (Heater Relay)		- The washing heater is short-circuited or has a wire disconnected. - The washing heater in the tub has an error. (Contact error, temperature sensor fault) - If the water level sensor operates without water because water is frozen or for any other reason and the temperature sensor engaged at the bottom to prevent overheating for the washing heater detects a temperature of 100 to 150 ˚C, the washing machine turns the input power off.	If the heater has no error, this occurs because of a PBA relay malfunction.
			- This error occurs when the red temperature sensor at the center of the dry heater operates (at a temperature higher than 145 ˚C) : Corrective action – Press the button at the center lightly. The washing machine will operate normally. Alternatively, replace the temperature sensor if the temperature sensing is unstable because of functional degradation. - This occurs when the steam function does not operate normally. - This error does not occur in existing drum products. Check whether the product is a steam model	
Water Leakage Error	LE		- Heater engagement fault (out of place) - The air hose is out of place and water leakage occurs during the spin cycle. - The tub back at the safety bolts fixing part is broken. - Water leakage occurs at the front with foaming because of too much detergent - Water leakage occurs because the connecting hose to the detergent drawer is connected incorrectly. - The drain pump filter cover is engaged incorrectly. - Water leakage occurs at the drain hose. - The duct condensing holding screws are worn. - The nozzle-diaphragm is engaged in the opposite direction or the rubber packaging is omitted. - Water leakage occurs because the screws that hold the tub back and front in place are fastened incorrectly. - The leakage sensor is faulty.	

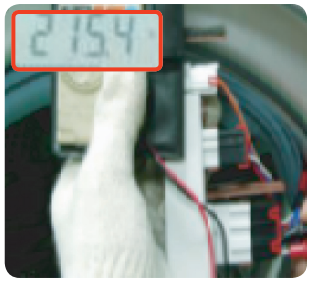
Error Type	For USA		Causes	Remarks
	LED	LCD		
Overflow Error	OE		- Water is supplied continually because the water level detection does not work. - Because the drain hose is clogged and there is an injection error (at a narrow section), the water level detection does not work and water is supplied continually. - Water is supplied continually because of freezing or because there is foreign material in the water supply valve. - This error may occur when the water level sensor is degraded.	This error occurs because the water level sensor terminal is out of place.
Temperature Sensor Error	tE		- The washing heater in the tub has an error. (Contact error, temperature sensor fault) - The connector is connected incorrectly or is disconnected. - If the water level sensor operates without water because the water is frozen or for any other reason and the temperature sensor engaged at the bottom to prevent overheating for the washing heater detects a temperature of 100 to 150 ˚C, the washing machine turns the input power off.	Heater sensor fault : When the connector is connected incorrectly or has a wire disconnected or contact error
Unbalance Error	dc		- As laundry causes this error, check the laundry. - Find the reason for the unbalance and solve it as directed in the user manual.	
Foaming Detected	SUdS		- This occurs when too much foaming is detected. It is also displayed while foaming is removed. When the removal is finished, the normal cycle proceeds. “Sud” or “SUdS” is displayed when too much foaming is detected and “End” is displayed when the removal of the foaming is finished. (This is one of the normal operations. It is an error for preventing non-sensing faults.)	
Mems PBA Error Detected	E8	-	- Error detected in the Mems PBA or data error detected. Check the wire connections. Replace if necessary. 1. Check the wire connections. 2. Replace the Mems PBA. 3. Main PBA wire connection error or PBA’s silver nano part malfunction. Replace if necessary.	

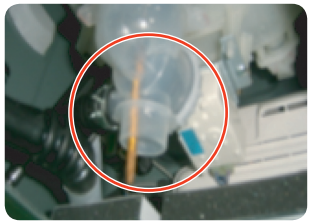
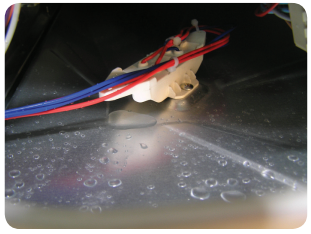
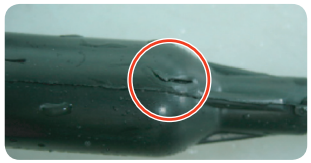
► These are common troubleshooting procedures for each drum-type washer error mode. For detailed information, refer to the general repair scripts.

Error Type	Error Mode		Causes	Corrective Actions	Description of Photo
	LED	LCD			
Water Level Sensor	LE	Error! Water Level Sensor Problem	• Water level sensor fault • Incorrect connections of the water level sensor terminal • The hose part for the water level sensor is folded. • Main PCB fault	• Check the water level sensor terminal connections and contacts. • An error occurs if an incorrect water level sensor is used. Make sure to check the material code. (Abnormal operation) • If the water level sensor is faulty, replace it. • If the error persists despite taking the action above, replace the PBA.	 Check the water level sensor frequency. - Check it after the water level sensor and the connector are connected. - Frequency: Approx. 26.4 KHz with no load
Washing Motor Error and Hall Sensor Error	3E E3 bE	Error! The motor is not working properly.	• Washing motor fault • Washing motor hall sensor fault • Incorrect connections of the washing motor/hall sensor connector • Washing motor rotor and stator fault • Main PCB fault	• Check the motor connector terminal connections and contacts. • 3E is displayed because overloading occurs due to too much laundry. • If the hall sensor terminal is faulty, replace the hall sensor. • Check whether the stator of the motor cover is damaged. • Check for coil disconnections due to foreign material. • If the PBA control circuit is faulty, replace the PBA.	 ► DD MOTOR Check the resistance on the main PCB motor. (Between pins 1 and 3, and 1 and 4 of the four (4) pins) - Resistance: Approx. 2 to 4 MΩ - Check the voltage when the power is on.  ► UNIVERSAL MOTOR Check the Resistance of Nos.1 and 4 of the wire pin on the side of the TACHO SENSOR. - Resistance: Approximately 40 to 45 Ω (Normal)  ► THREE PHASE MOTOR Measure the Resistance of Nos. 2 and 3 of the wire pin on the side of the HALL SENSOR. - The revolution of the drum needs to be reproduced. (Turn the drum by hand.) - Resistance: Approximately 3 to 12V (Voltages may differ depending on the speed of the revolutions.)

Error Type	Error Mode		Causes	Corrective Actions	Description of Photo
	LED	LCD			
Water Supply Error	nF	Error! Low Water Pressure	• Water supply value fault • Main PCB fault • Freezing in the winter season	• If the water supply valve has a wire disconnected, replace it. • Check whether the water supply valve is clogged with foreign material and whether water is supplied continually. • Check whether no water is supplied because of freezing in the winter season. • If the PBA relay operates abnormally, replace the PBA.	  1. Check the resistance for the water supply valve. - Resistance: 4.0 to 5.0 Ω between the terminals of the water supply valve. 2. Check whether there is foreign material in the water supply valve diaphragm.
Drain Error	nd	Error! No Draining	• Drain pump fault • Freezing in the winter season • Foreign materials in the drain pump • Main PCB fault	• Check whether the revolutions of the drain pump motor are restrained by foreign material. • Check the same thing for the natural drain process. • Check the wire connectors on Main PCB and Drain Pump ASSY. The connector or wire may have poor physical connection. • If the drain pump operates abnormally intermittently when the temperature of the water in the tub is high. • If the motor revolutions are restrained due to freezing in the winter season, check the method to remove the freezing and remove as directed.	 ► DRAIN MOTOR Resistance: Approximately 6.3 Ω between the Terminals for the Water Supply Valve  ► DRAIN PUMP Resistance: Approximately 174 Ω between the Terminals for the Water Supply Valve

Error Type	Error Mode		Causes	Corrective Actions	Description of Photo
	LED	LCD			
Communication Error	-	Error! Electronic Control Problem	• The signals between the sub and main PBAs are not sensed. • Incorrect wire connections between the sub and main PBAs.	• Check the wire connections and terminal contacts between the sub and main PBAs. • Check for disconnected wires. • Check whether the sub PBA is short-circuited because of moisture. • If the main PBA's communication circuit is faulty, replace it.	-
Switch Error (Main Relay Error)	E2 Sr	Error! A button is either stuck or is being pressed continuously.	• The Power button is continually pressed. • A button other than the Power button is continually pressed. • Main PCB relay fault	• Check whether either the Power switch or a tact switch is continually pressed. • Check whether the service PBA holding screws are fastened too tight. If they are fastened too tight, loosen them a little. • If the main PBA switching IC on/off error has occurred, replace the main PBA. • The "E2" error occurs if the main relay connections are incorrect. Check the connections. If there is no error in the connections, replace the main PBA.	  Check the contact between the control panel buttons and their corresponding tact switch. - There must be a gap between a control panel button and its corresponding micro switch. Otherwise, an error occurs after approx. 30 seconds has passed.

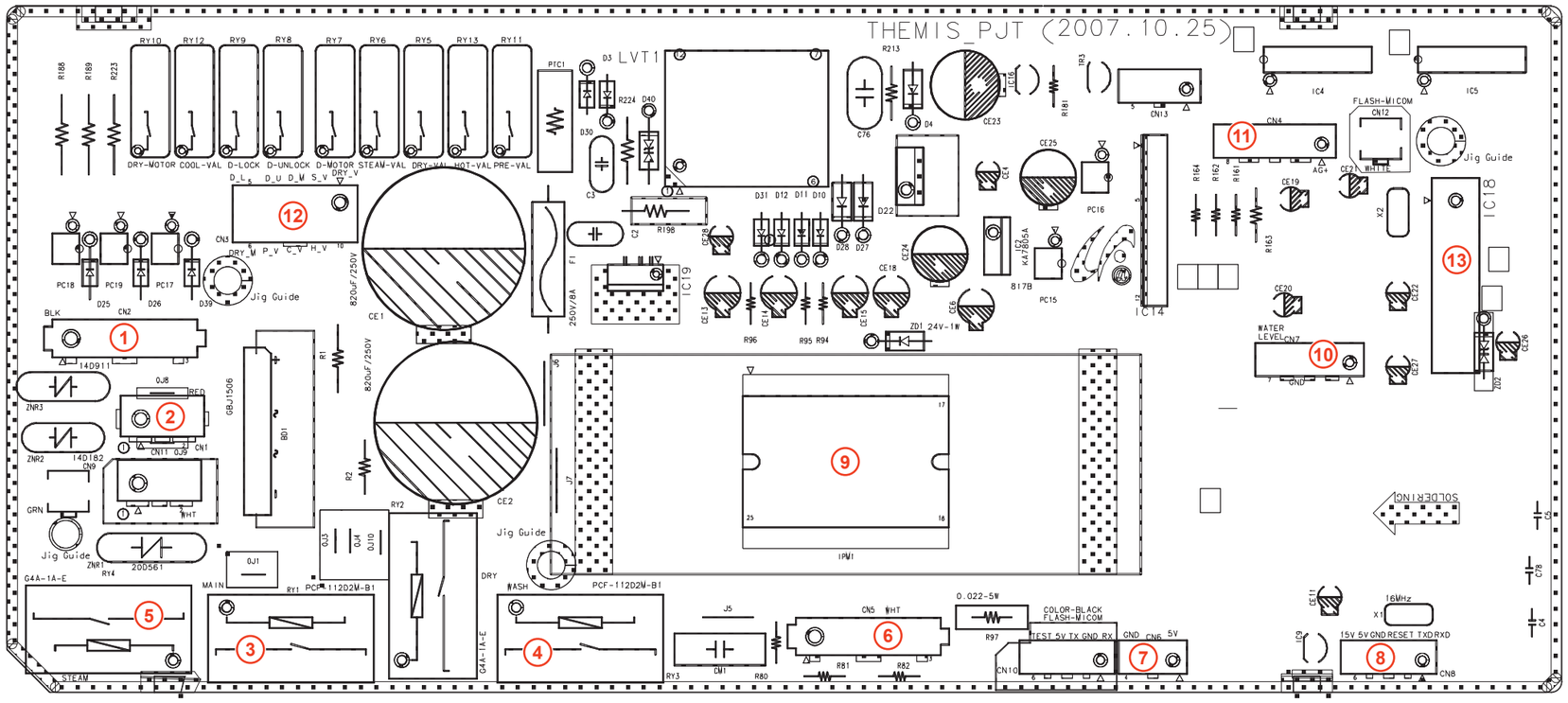
Error Type	Error Mode		Causes	Corrective Actions	Description of Photo
	LED	LCD			
Door Error	dS	Error! Door is open.	• Door switch fault • Drain pump fault • Dry duct fan motor fault. • Main PCB fault	• If a dS error occurs, check whether it occurs during the Boil cycle. - If it is detected that the door is open, close the door. • The 220V is directly connected to the door. Check and repair the power wire connections and insulation state. • Check the door switch. Replace if faulty. • Check the main PBA door sensing circuit. Replace if faulty.	 ► TYPE 1 Check the door switch voltage. Check the voltage after the power is on. (That is, check the door switch when the power button is turned on and no operating key is pressed.)
	dL	Error! The door was unlocked while the washer was running.			
	LO	Error! The door will not unlock.			 ► TYPE 2 The resistance of Nos. 3 and 5 of the DOOR LOCK SWITCH must be approximately 949 Ω.
	FL	Error! The washer door would not lock.			
Heater Error	Hr	Error! Water Temperature Control Problem	• Heater fault • A fault of the red temperature sensor at the center of the dry heater • Steam function fault • Freezing in the winter season	• Check for wires are disconnected in the washing heater. Replace if faulty. - An Hr error occurs. • If the dry heater or air refresh heater overheating sensor is faulty, replace it. - An Hr error occurs. • Check the steam heater. Replace if it is faulty. - An Hr error occurs.	-

Error Type	Error Mode		Causes	Corrective Actions	Description of Photo
	LED	LCD			
Water Leakage Error	LE	Error! Water Leakage Problem	• Check for any leakage. • Foreign material in the DV case • Fault of a hose or incorrect part engagement in the product	• Check for any leakage on the base, Hose, Valve and Tub connections and take any required action. • During natural draining, this error occurs because the drain bellows are clogged with foreign material. Remove the foreign material. • Check the drain motor operation. Replace if it does not operate normally.	  ► DRAIN PUMP TYPE (Automatic Drainage) Check whether there is any foreign material in the bellows. Check for any foreign material, such as underwear wires or coins.
					 ► PUMP TYPE Check for any leakage on the base, Hose, Valve and Tub connections.
Overflow Error	OE	Error! Water Supply Problem	• Water level sensor fault • Freezing in the winter season	• If the water level sensor has a functional error, replace it. • Check the hose. This error occurs if it is torn or has a hole. • This error occurs if water is frozen in the winter season. Use hair dryer to defrost hose. Consider relocating the unit to warmer location.	 Check the hose connected to the water level sensor. Check whether the hose is folded, cut, or damaged.

Error Type	Error Mode		Causes	Corrective Actions	Description of Photo
	LED	LCD			
Temperature Sensor Error	tE	Error! Temperature Sensor Problem	• Washing temperature sensor fault • Dry temperature sensor fault • Faulty and incorrect connections of the dry condensing sensor • Main PCB fault • Freezing in the winter season	• Check the connections for the washing heater temperature sensor connector. • If the washing heater temperature sensor has a functional error, replace it. - A tE error occurs. • Check the connections for the dry heater temperature sensor connector. • If the dry heater temperature sensor has a functional error, replace it. • Check the connections for the duct condensing temperature sensor connector. • If the duct condensing temperature sensor has a functional error, replace it.	-
Unbalance Error	dc	Error! Unbalanced Load	• Motor hall sensor fault • Caused by the laundry contents	• Check the type of laundry. Check whether they may cause an unbalanced situat ion. - Educate the consumer in this case is to press pause reposition the load or remove a few items. Press start to continue and complete the wash cycle.	-

5. PCB DIAGRAM

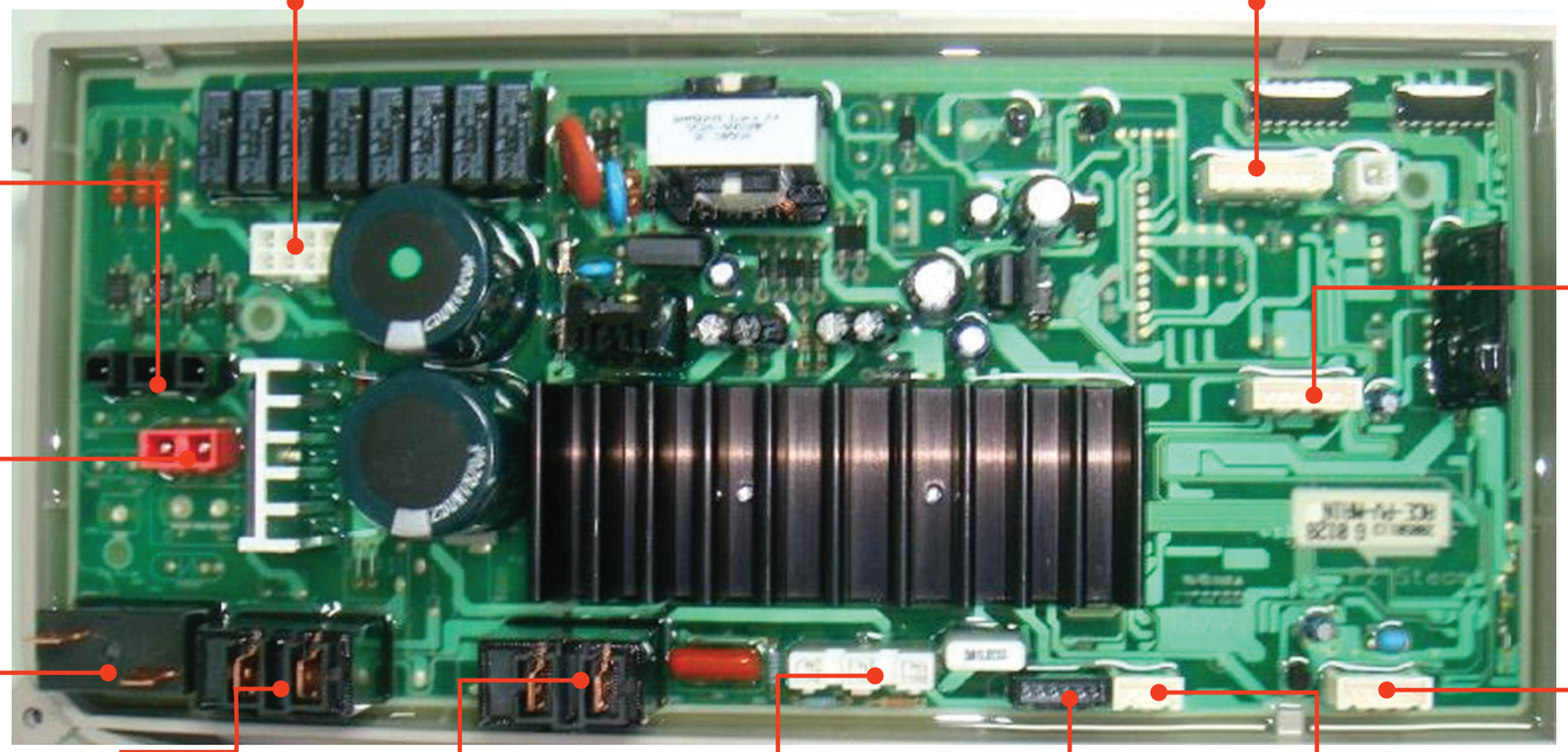
5-1. MAIN PCB



Location	Part No.	Function	Description
1	CN2	PBA Power Supply	Supplies 120V of AC power
2	CN1	Reactor Connection Port	Blocks noise generated when the motor operates.
3	RY1	Main Relay	Supplies PBA power when the Power button is pressed.
4	RY3	Washing Heater Relay	The switch for the Washing Heater power supply drive.
5	RY4	Steam Heater Relay (Only WF419***)	The switch for the Steam Heater power supply drive.
6	CN5	Motor Power Supply Port	Supplies the 3-phase drive voltage for the Washing Motor.
7	CN6	Hole Sensor Connection Port	Detects whether the Washing Motor is working normally.

Location	Part No.	Function	Description
8	CN8	SUB PBA Connection Port	Supplies power to the Sub PBA and provides a communications function.
9	IPM1	Washing Motor Drive IC	Switches and supplies the voltages for the motor.
10	CN7	Water Level And Temperature Sensor Connector	Detects the laundry, water supply, and water draining operations and detects whether each heater is working properly.
11	CN4	Door And Silver Nano Connector	Detects the door operations and supplies power for the Silver Nano.
12	CN3	Each Load Connection Port	The port to supply power for each electric device.
13	IC18	Ag IC (Only WF419***)	Drives the Ag IC.

5-2. CONNECTOR AND RELAY PORT PART DETAILED MANUAL (MAIN PCB)



► **CN3**
1. Door Lock Close
2. Door Lock Open
3. Drain Pump
4. Steam Valve
5. Bleach Valve
6. Circulation Pump
7. Pre Valve
8. Main Valve
9. Hot Valve

► **CN4**
1. Door Switch
2. Empty Pin
3. Door Switch
4. Empty Pin
5. Empty Pin
6. Empty Pin
7. AG Sensor
8. AG Sensor

► **CN2**
1. AC Power Port
2. AC Power OFF Detection Sensor
3. Door Detection Sensor (LOCK, UNLOCK)

► **CN7**
1. Empty Pin
2. Empty Pin
3. Empty Pin
4. Washing Water Temperature Sensor
5. Ground
6. Washing Water Level Sensor
7. Washing Water Level Sensor

► **CN1**
1. Reactor Connection Port
2. Reactor Connection Port

► **CN8**
1. Communications Port (Rx)
2. Communications Port (Tx)
3. Rest Signal Output
4. Ground
5. 5V
6. 15V

► **RY4 (Only WF419***)**
1. Steam Heater Relay Switch
2. Steam Heater Relay Switch

► **RY1**
1. Main Power Relay Switch
2. Main Power Relay Switch

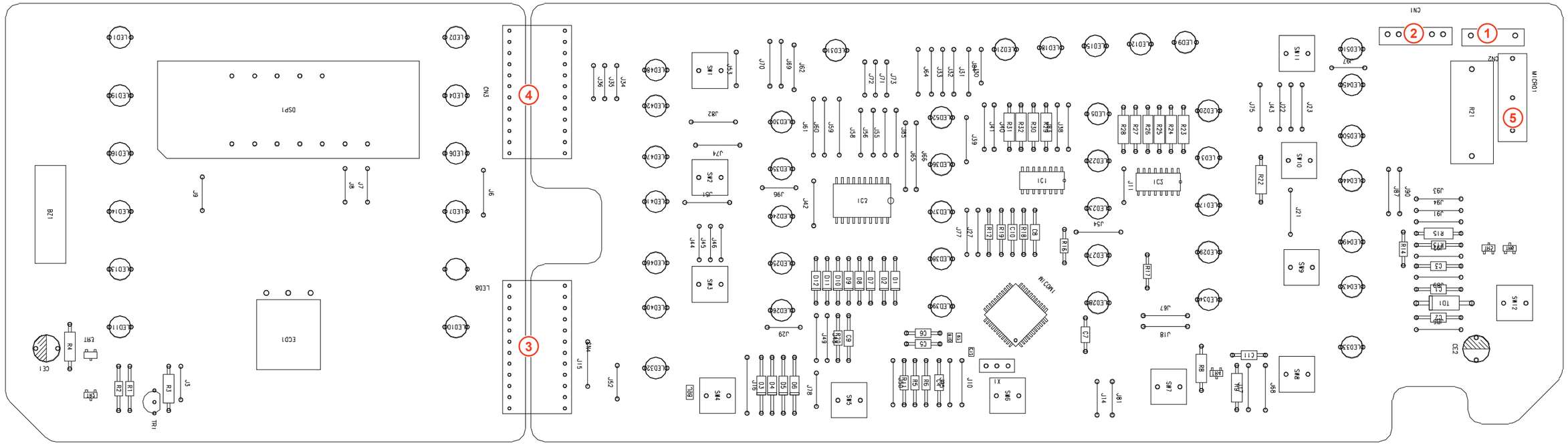
► **RY4**
1. Washing Heater Relay Switch
2. Washing Heater Relay Switch

► **CN5**
1. Motor Power (U Phase)
2. Motor Power (V Phase)
3. Motor Power (W Phase)

► **CN10**
1. AC OFF Check
2. Test Mode
3. 5V
4. Transmission Port
5. Ground
6. Input Port

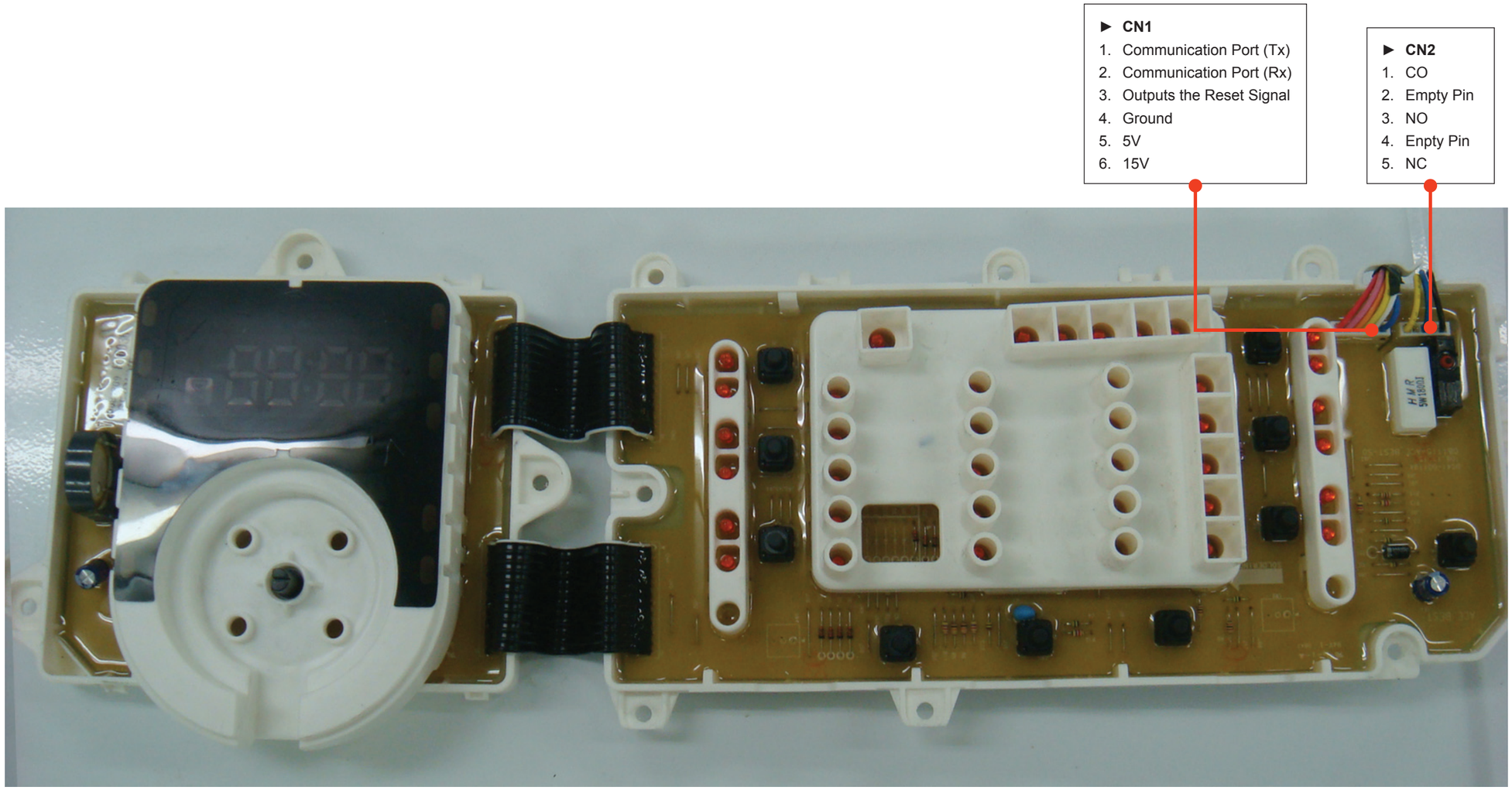
► **CN6**
1. 5V
2. Hole Sensor Signal
3. Hole Sensor Signal
4. Ground

5-3. SUB PCB (BEST : WF419***)

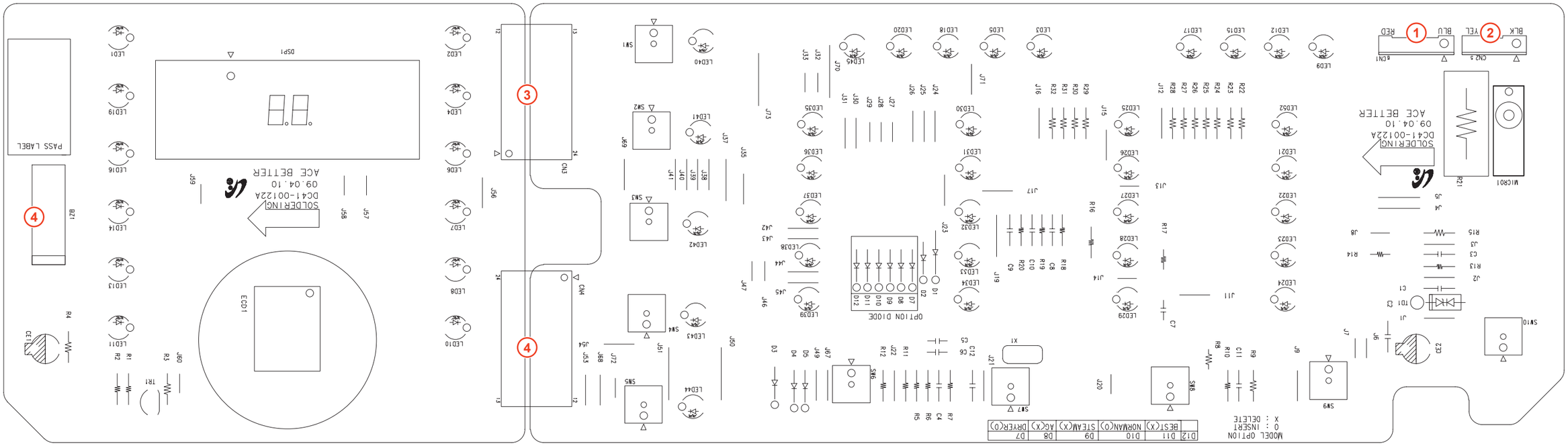


Location	Part No.	Function	Description
1	CN2	Power Connection Port	Receives power from the Main PBA and provides a communications function.
2	CN1	Main PBA Connection Port	Connects power.
3	CN4	PBA Connection Port	Connects the LED board and the Encoder switch board
4	CN3	PBA Connection Port	Connects the LED board and the Encoder switch board
5	MICRO1	Main S/W	Main Relay On/Off

5-4. CONNECTOR PORT PART DETAILED MANUAL (SUB PCB - BEST : WF419***)

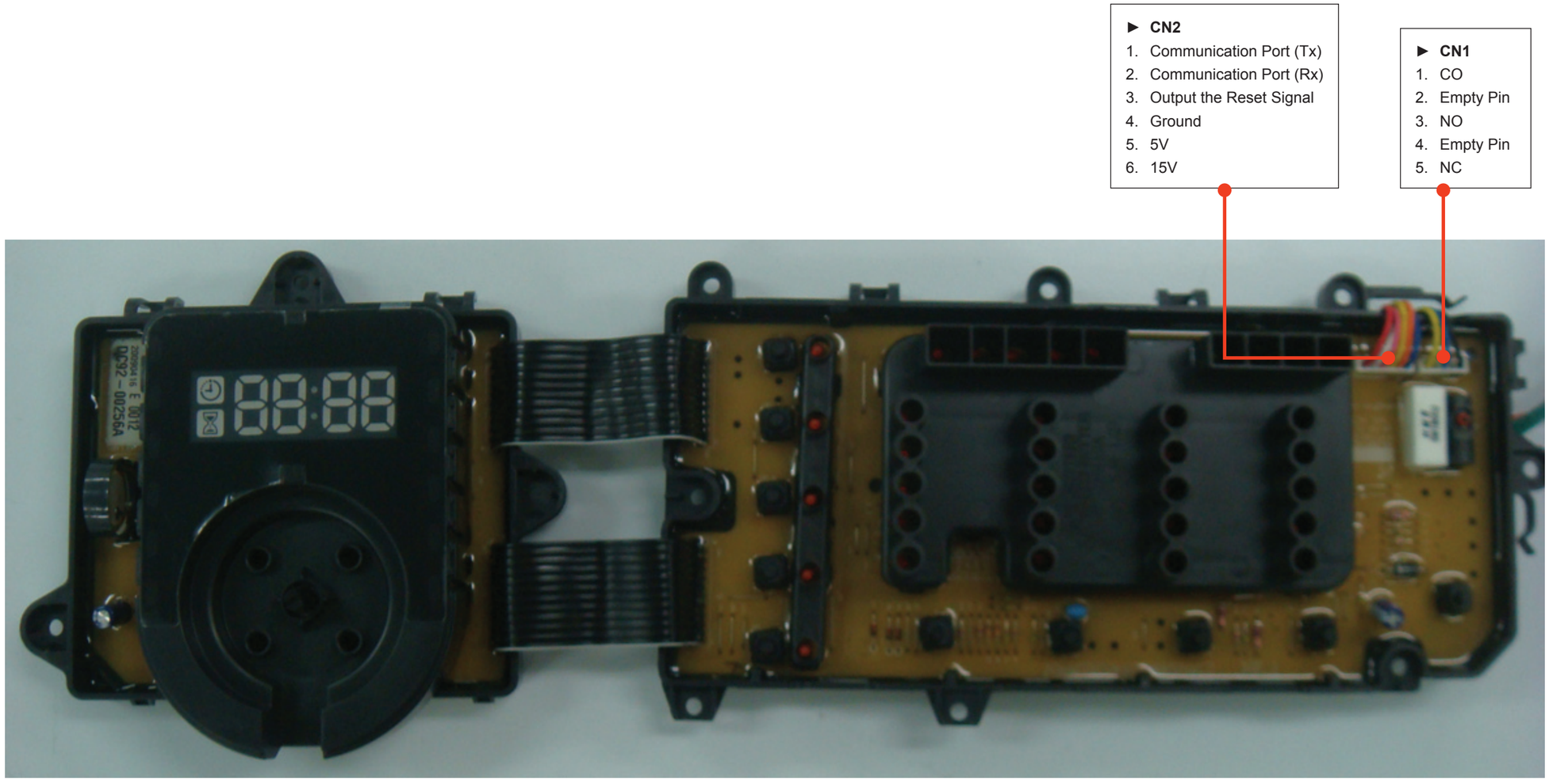


5-5. SUB PCB (BETTER : WF409***)



Location	Part No.	Function	Description
1	CN2	Power Connection Port	Connects Power
2	CN1	Main PCB Connection Port	Receives power from the Main PBA and provides a communication function
3	CN3, CN4	DISPLAY Connection Port	Connects the 1888 Board and the Graphics Board
4	BZ1	BUZZER Circuit	Generates sound when the Menu key is pressed, the Encoder operates and the menu is closed.

5-6. CONNECTOR PORT PART DETAILED MANUAL (SUB PCB - BETTER : WF409***)

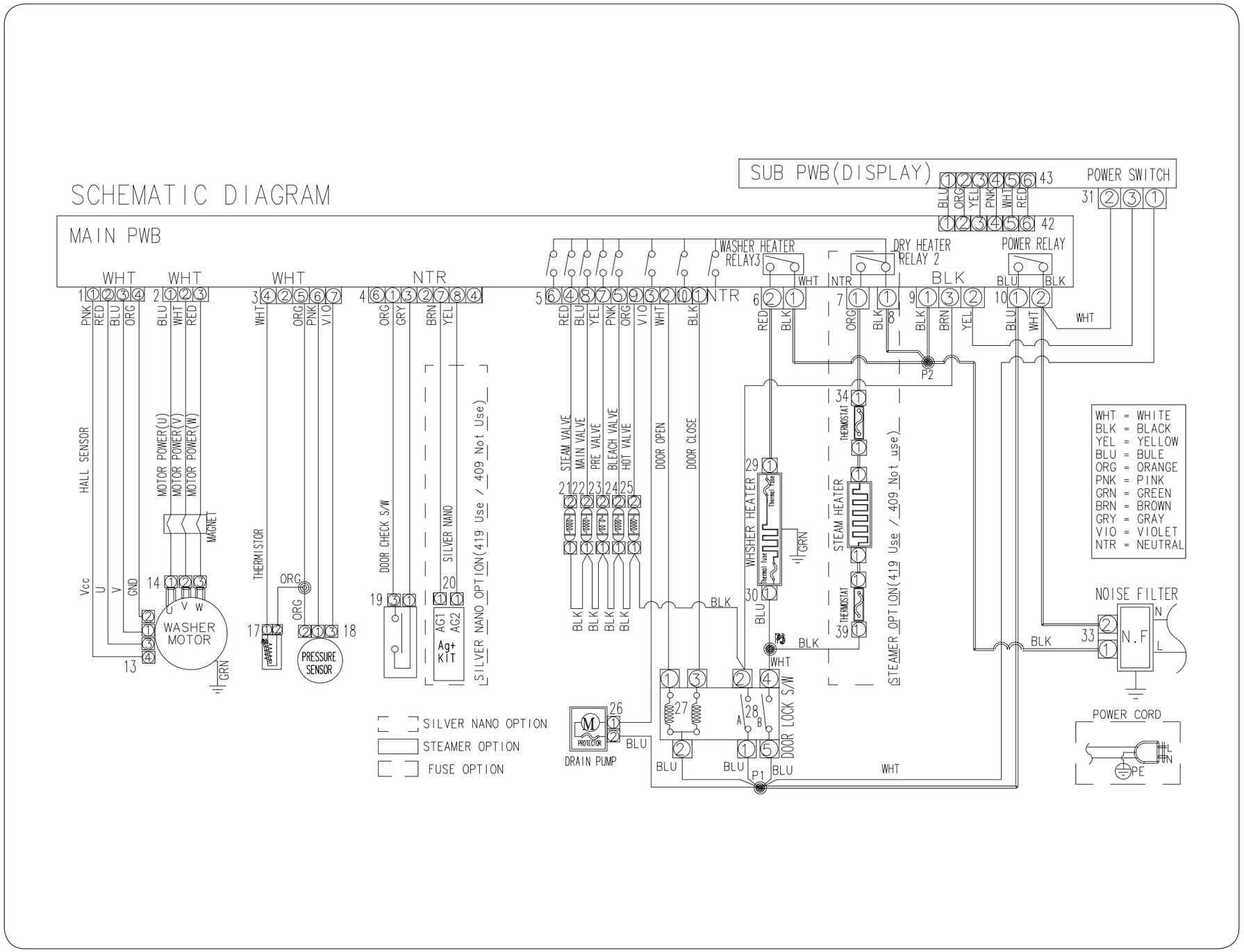


6. WIRING DIAGRAM

6-1. WIRING DIAGRAM

■ REFERENCE INFORMATION

BLK	BLACK
BLU	BLUE
GRN	GREEN
GRY	GRAY
NTR	NATURAL
ORG	ORANGE
PNK	PINK
RED	RED
SKYBLU	SKYBLUE
VIO	VIOLET
WHT	WHITE
YEL	YELLOW



7. SCHEMATIC DIAGRAM

7-1. MAIN CONTROL

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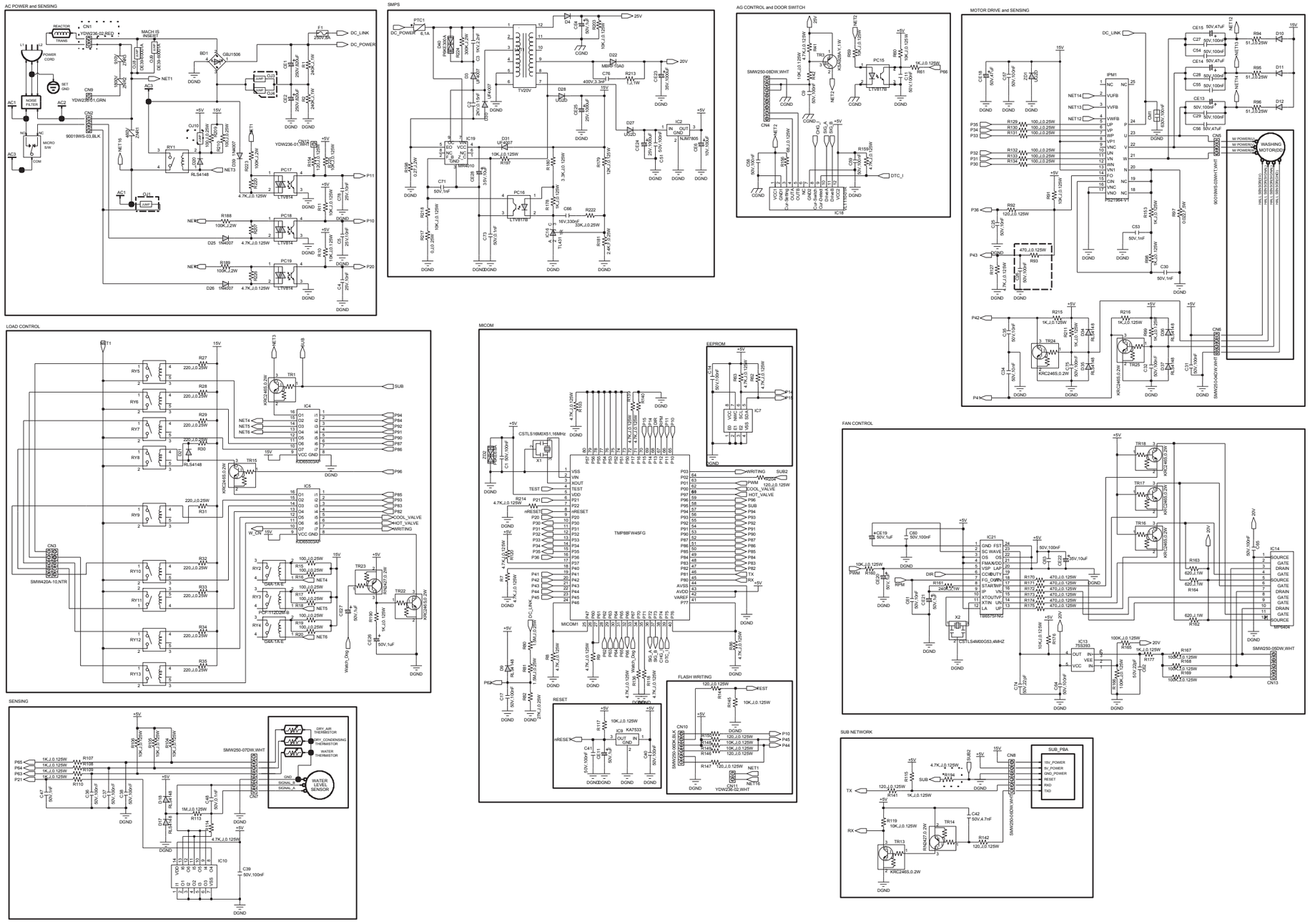

7-2. SUB CONTROL (BEST : WF419***)

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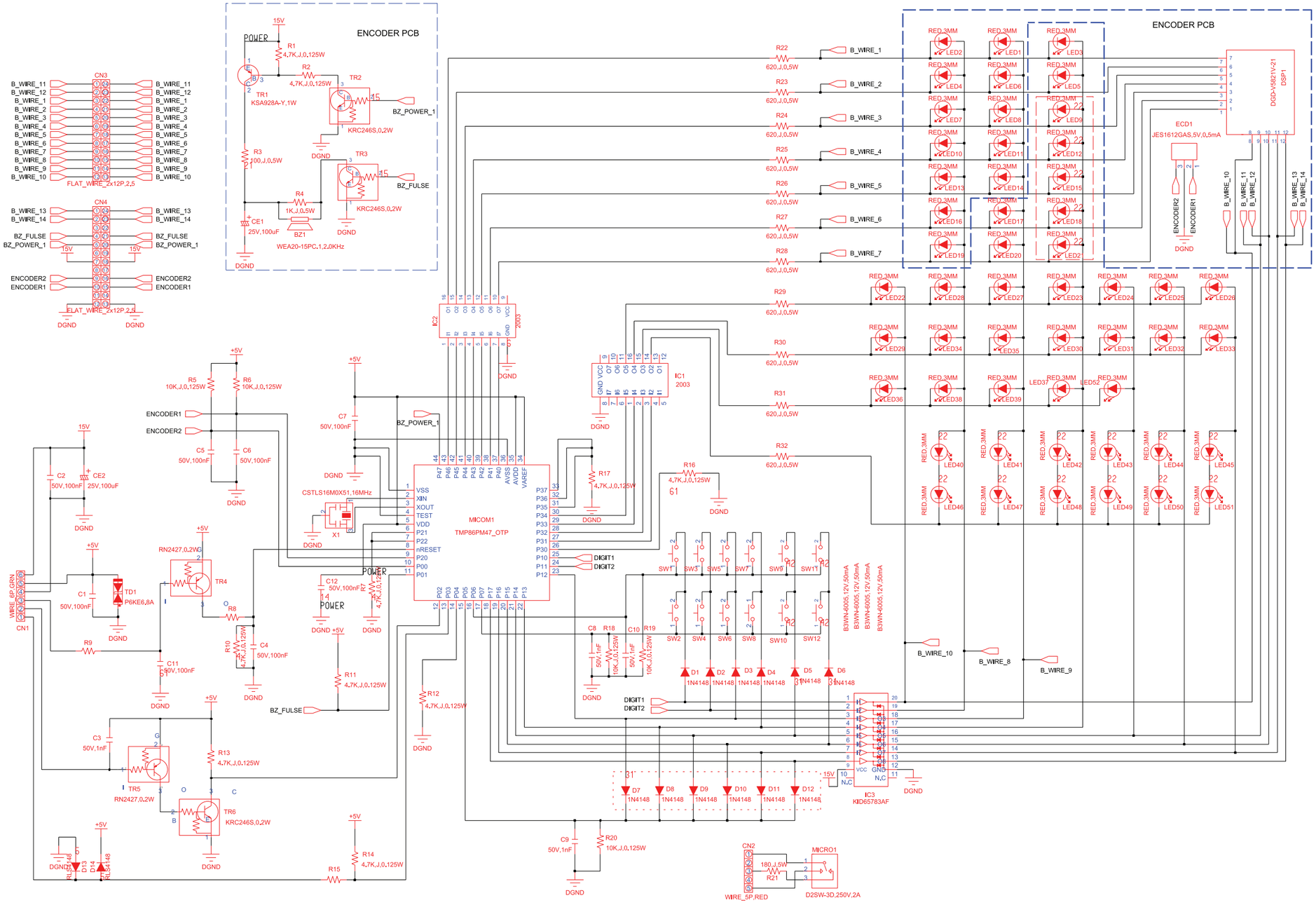

7-3. SUB CONTROL (BETTER : WF409***)

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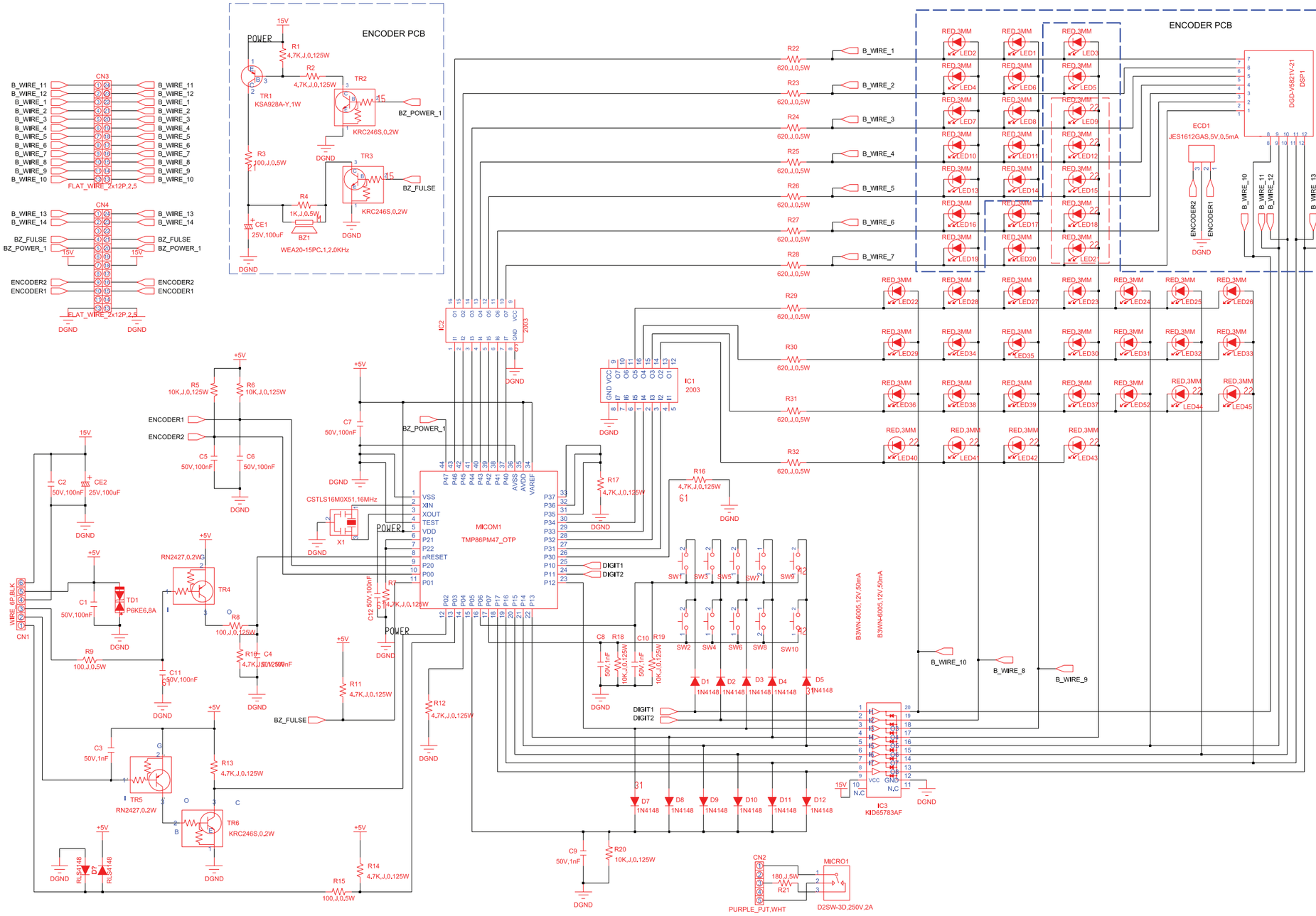

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