

S/M No. :

## Service Manual

### Drum Washing Machine

Model: WFC3V11ZDNH01D2GW  
(DWC-PS1512X)

#### ✓ Caution

: In this Manual, some parts can be changed for improving, their performance without notice in the parts list. So, if you need the latest parts information, please refer to PPL(Parts Price List) in Service Information Center (<http://svc.dwe.co.kr>).

**Dongbu Daewoo Electronics**

Aug. 2016

# DRUM WASHING MACHINE SERVICE MANUAL

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# 1. WHAT IS DRUM Washing Machine?

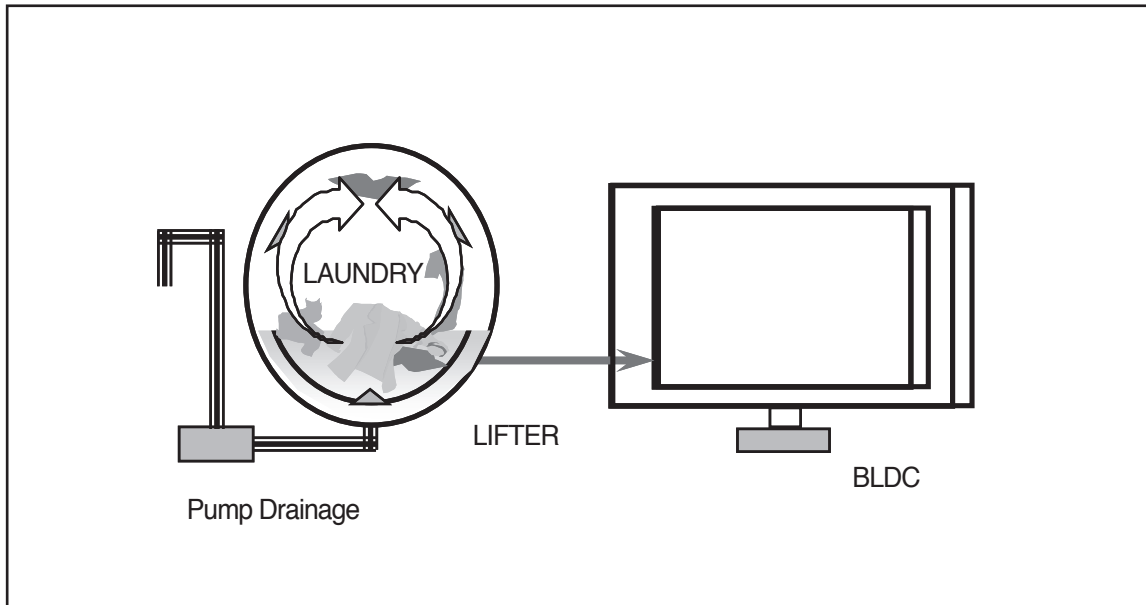
## 1. Drum Washing Machine

Water consumption is reduced by using the power of the laundry falling (free-fall) created when rotating the drum. With temperature control system, this drum washing machine saves energy and improves washing performance at the same time.

## 2. Key Features

- ◆ **Waist Care**  
Designed by the waist, and the most comfortable angle eject into the laundry is convenient and easy to manipulate.
- ◆ **The World's First Steam White Course**  
The Steam White Course save more 50 percent of Electricity, Water, Time than previous White Course.
- ◆ **Star Drum**  
Using Star Drum is able to higher Washing Performance and Minimal damage of laundry, water consumption.
- ◆ **The biggest capacity with compact size**  
15 Kg Capacity enable to wash bigger laundry.
- ◆ **Simultaneous supply of cold and hot water**  
As cold and hot water is supplied at the same time heating time and energy is saved.
- ◆ **Luxury Audio Dial**  
Using the advanced Audio Dial is luxury design of exterior.
- ◆ **The World's First Shoes Course** Enable to wash shoes.
- ◆ **DD inverter motor**  
The direct-drive type of which motor is directly connected to drum without an interim chuth, significantly reduces noise and vibration.
- ◆ **Self-Cleaning Course of Drum.**  
Enable to Self-Cleaning of Drum.
- ◆ **Digital Condensing Dry System.**  
Condensing Dry System with saveing energy.
- ◆ **For pump drainage,** the powerful pump speeds up drainage process.
- ◆ **AUTO DETERGENT SYSTEM**  
No more prepare detergent before every washing (only liquid detergent and fabric softener)
- ◆ **SMART WASH**  
you can wash easily like stocking,lingerie use smart wash system

### 3. Power System



- DD Control: Direct drive type of direct connection between drum and motor
- Rotation by powerful high-performance BLDC motor
- Pump drainage type for built-in installation and Natural drainage

## 4. Major Functions

### ① Washing

When rotating drum after putting in the laundry and detergent into the drum, the laundry are rotated by protrusions (lifters) attached inside the drum.

Washing is carried out with bending and impact actions generated by falling of the laundry to the bottom part of drum.

### ② Rinsing

Rinsing cleanly washes out detergent and dirt removed from the laundry after washing cycle.

### ③ Spin-drying

Weak, standard and strong spin cycle can be selected according to types of fabrics to be washed. spin-wringing is carried out by rotation (the centrifugal force) of drum according to the designated speed.

### ④ Drainage

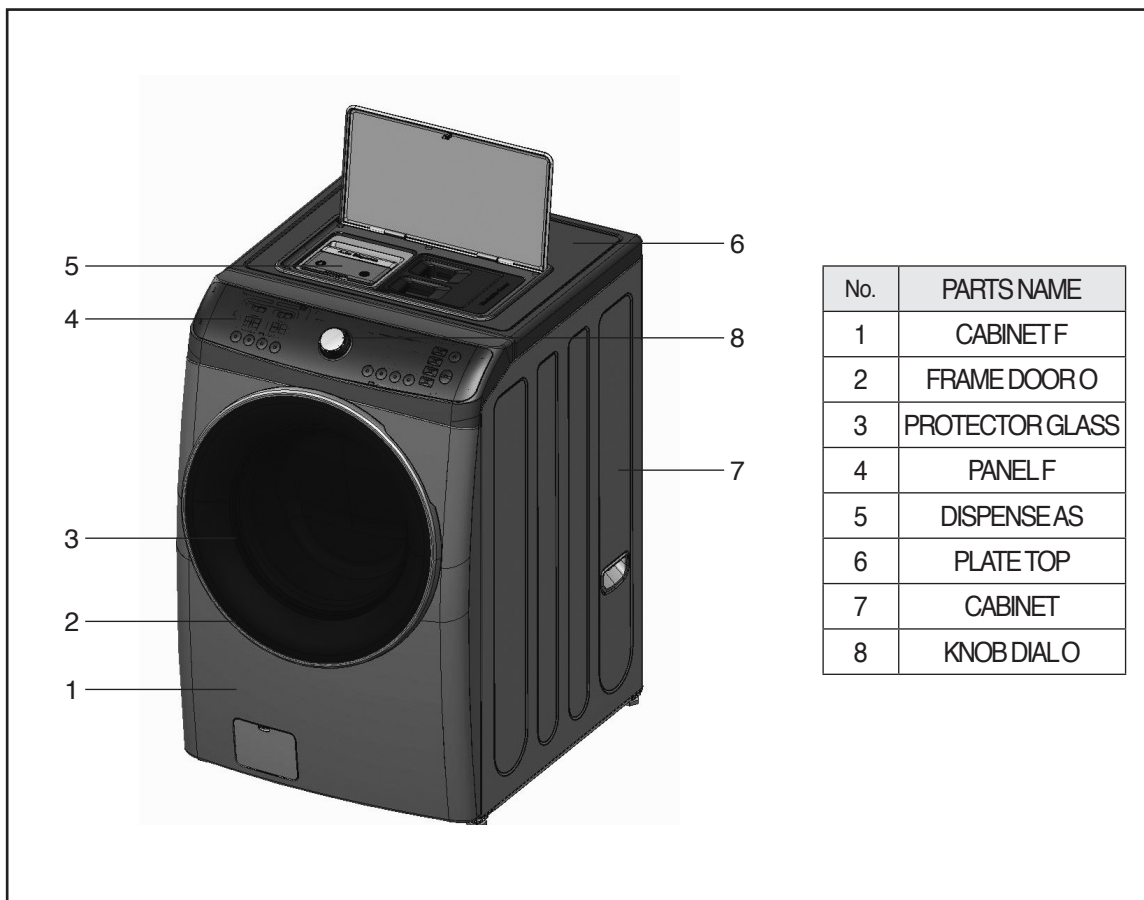
Pump Drainage: Powerful pump for built-in installation and application of filter to remove foreign substances

Natural Drainage: Applied Natural Drainage as the same pullsator.

## 2. Washer Specification

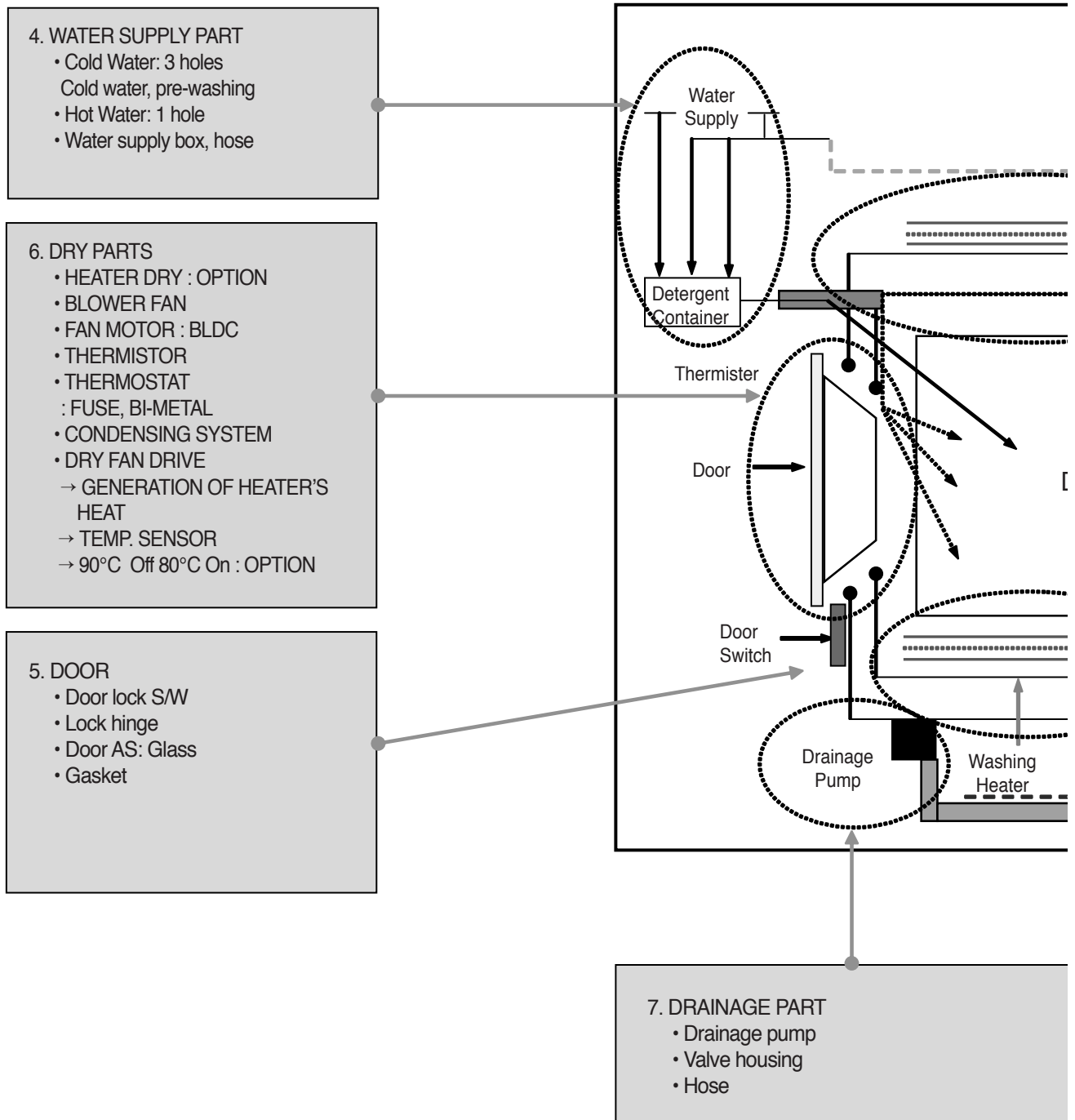
### 1. Product Specification

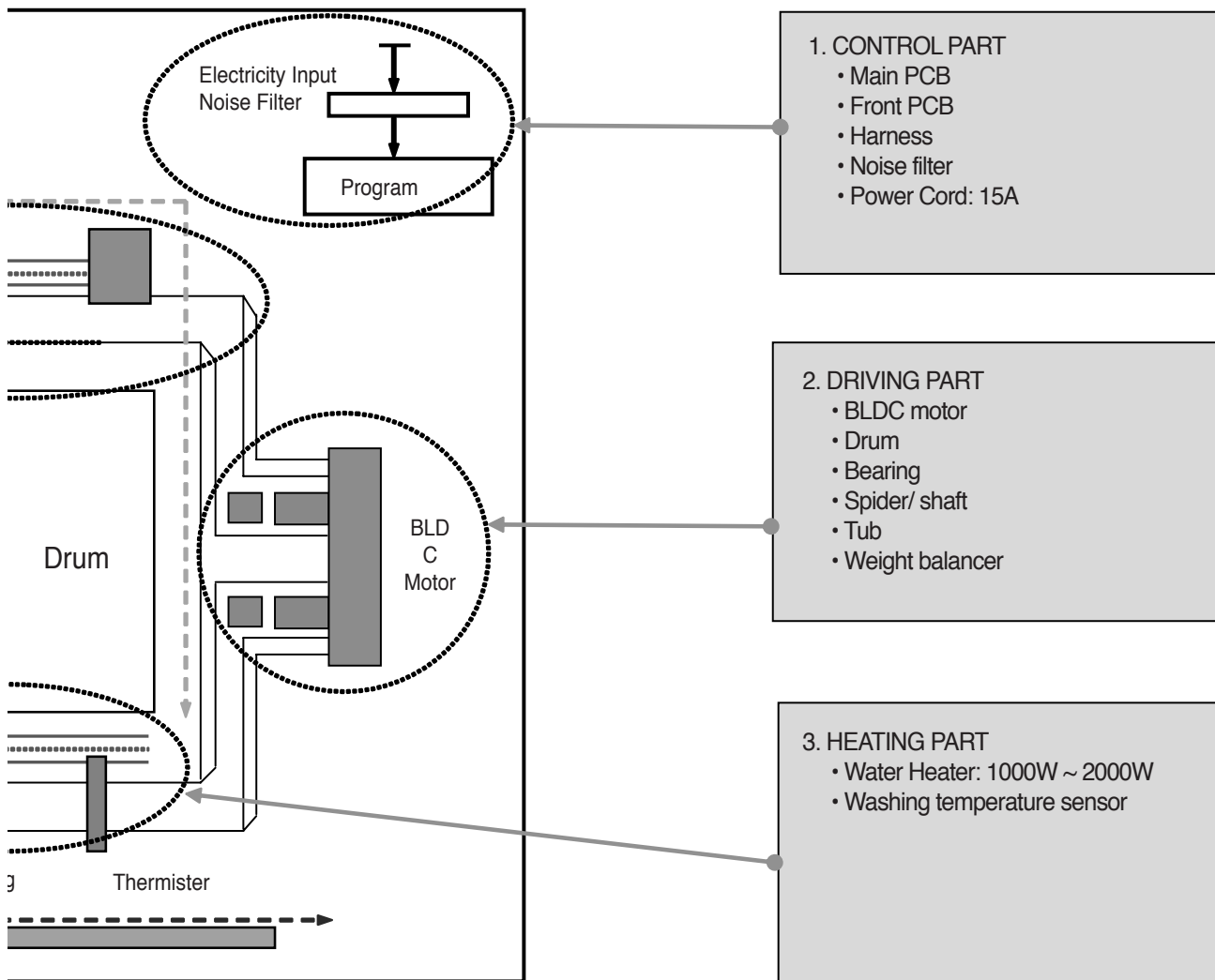
#### WFC3V11\* SERIES



DIMENSION(WxDxH)		630mm(W) x 767mm(D) x 986mm(H)
MACHINE WEIGHT		84 kg
WATER CONSUMPTION		WASH 91 ℓ / DRY 51 ℓ
WASHING CONSUMPTION		31 ℓ
POWER SOURCE		220-240V/50Hz , 220-240V/60Hz, 100-127V/60Hz
POWER CONSUMPTION	WASHING	200W (Heating ) ~ 2000W
	DRY	1200W ~ 2100W
CAPACITY	WASHING	15 kg
	SPIN	15 kg
	DRY	8 kg
WASHING TYPE		DRUM TYPE
DRY TYPE		Digital condensing dry system
OPERATION WATER PRESSURE		29kPa ~ 784kPa(0.3kgf/cm <sup>2</sup> ~8kgf/cm <sup>2</sup> )

### 3. Operating Mechanism Diagram



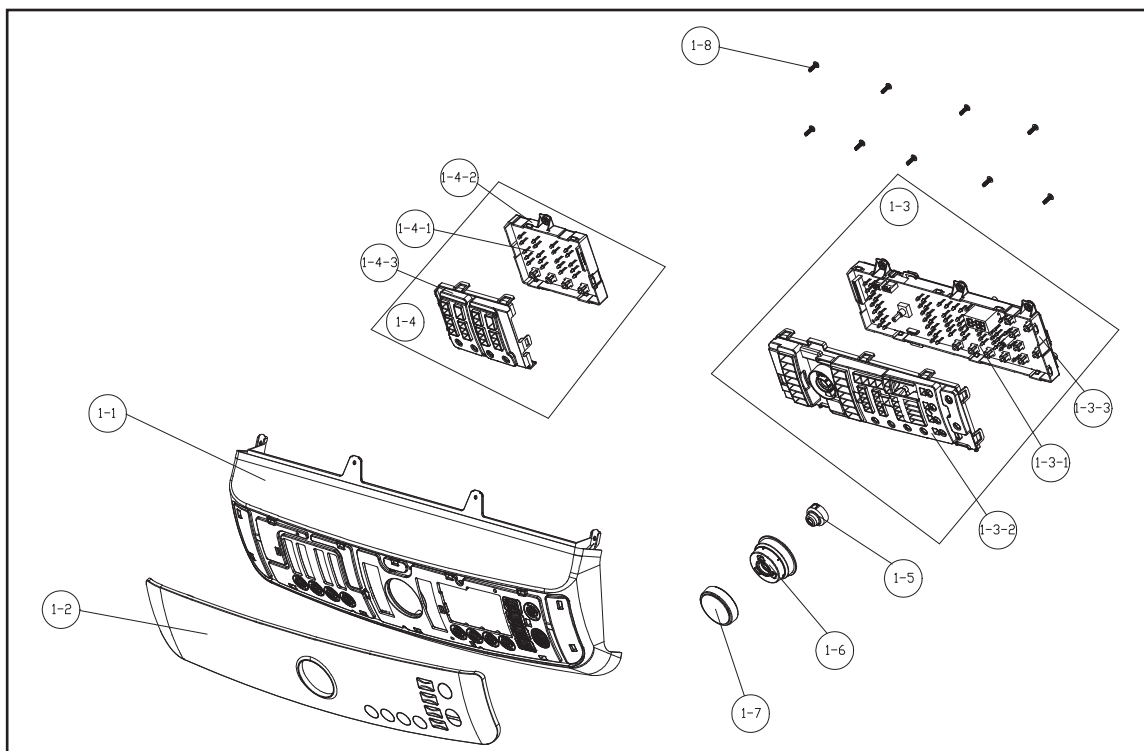




## 4. Parts list by ass'y

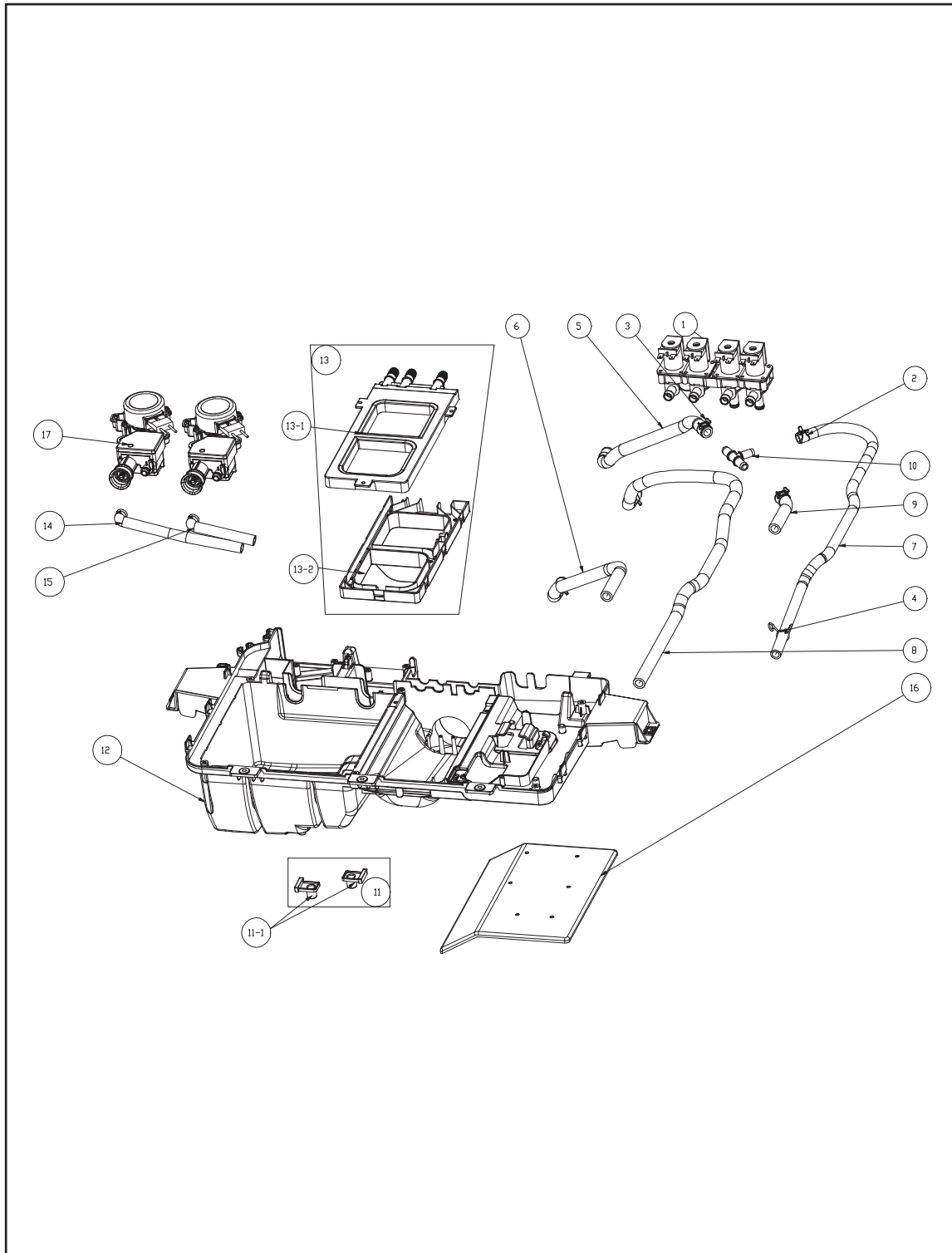
### 1. PANEL F AS

#### WFC3V11\* SERIES



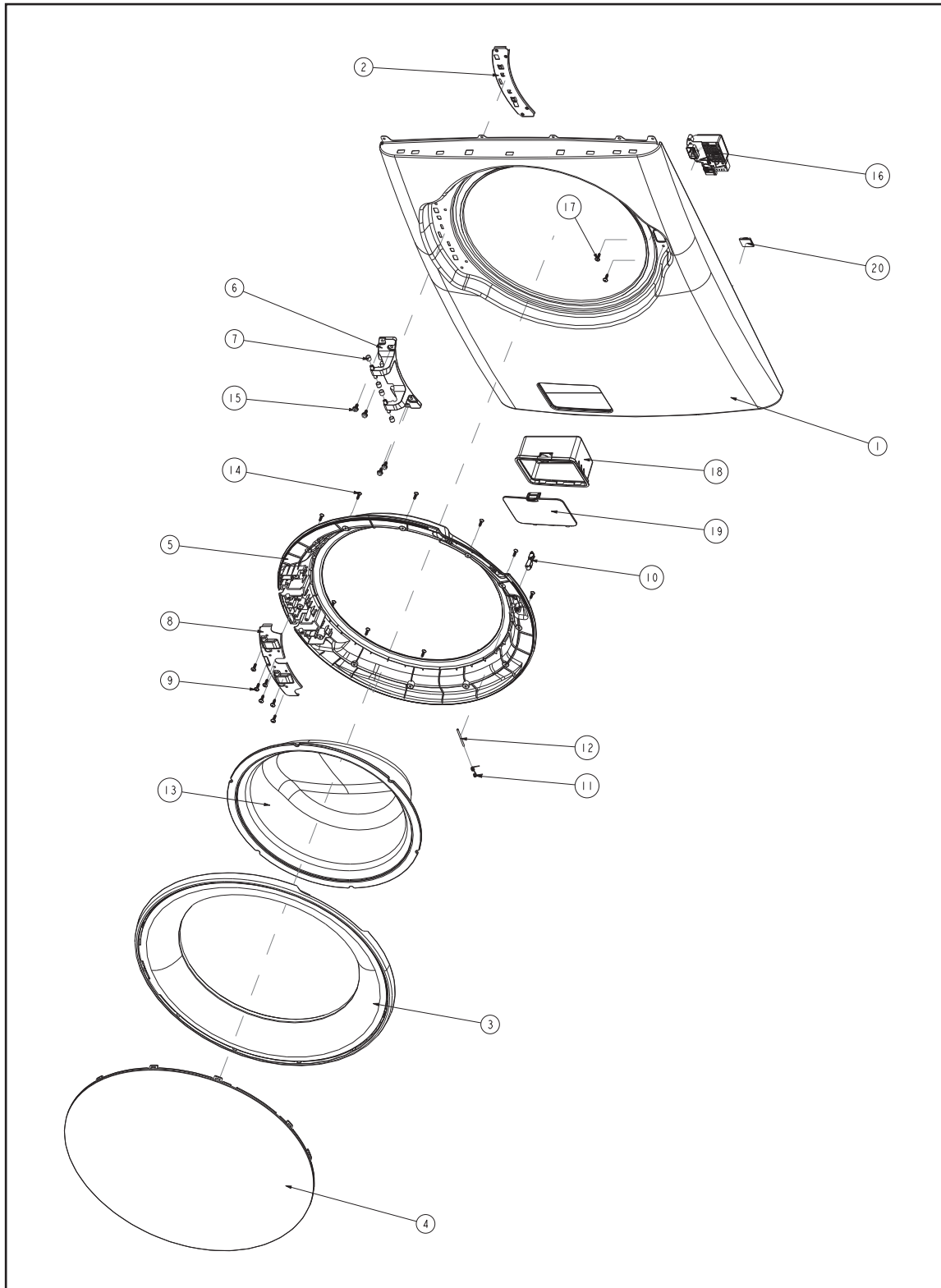
No.	Part Name	Part Code	Description	Qty	Remarks
1	PANEL *F AS	36139-0054113-00	PISA, CHILE, 1200, COLD+HOT, CP, N-BB, 220V	1	
1-1	PANEL *F SUB AS	36139-0055200-00	PANEL *F(GY-349A)+SPRAY(SV-6501BP), PISA	1	
1-2	DECO PANEL *F	36115-0017312-00	TR ABS, IN-MOLD(BLACK), PISA 1ST, CHILE	1	
1-3	WM PCB FRONT ASSY	40302-1076600-00	F PCB AS, CHILE, C-PUMP, C+H, CLEAN-JET, 1200, 15K, 22V, AUTO DET	1	
1-3-1	WM PCB DEFAULT ASSY	40302-1049000-04	PISA MANUAL FRONT PCB DEFAULT AS	1	
1-3-2	HOLDER LED	36129-0031000-00	ABS(WH-011A), PISA	1	
1-3-3	CASE PCB *F	36110-0059300-00	ABS(GY-349A), PISA	1	
1-4	WM PCB FRONT OPTION ASSY	40302-1061500-04	PISA AUTO FRONT OPTION PCB AS	1	
1-4-1	WM PCB BOARD	40302-1025900-00 40302-1049200-00	PISA 1ST/2ND FRONT PCB, FR-1 PISA FRONT AUTO OPTION PCB, FR-1	1	
1-4-2	CASE PCB BASE	36110-0060400-00	ABS(GY-349A), PISA	1	
1-4-3	HOLDER LED	36129-0032200-00	ABS(WH-011A),PCB FRONT HOLDER LED, PISA	1	
1-5	HOLDER KNOB	3613066700	POM	1	
1-6	KNOB DIAL *I	36132-0008800-00	ABS(BK-084A), PISA	1	
1-7	KNOB DIAL *O	36132-0008900-00	ABS+AL, PISA	1	
1-8	SCREW TAPPING	7122401411	T2S TRS 4X14 MFZN	9	

## 2. INLET BOX AS



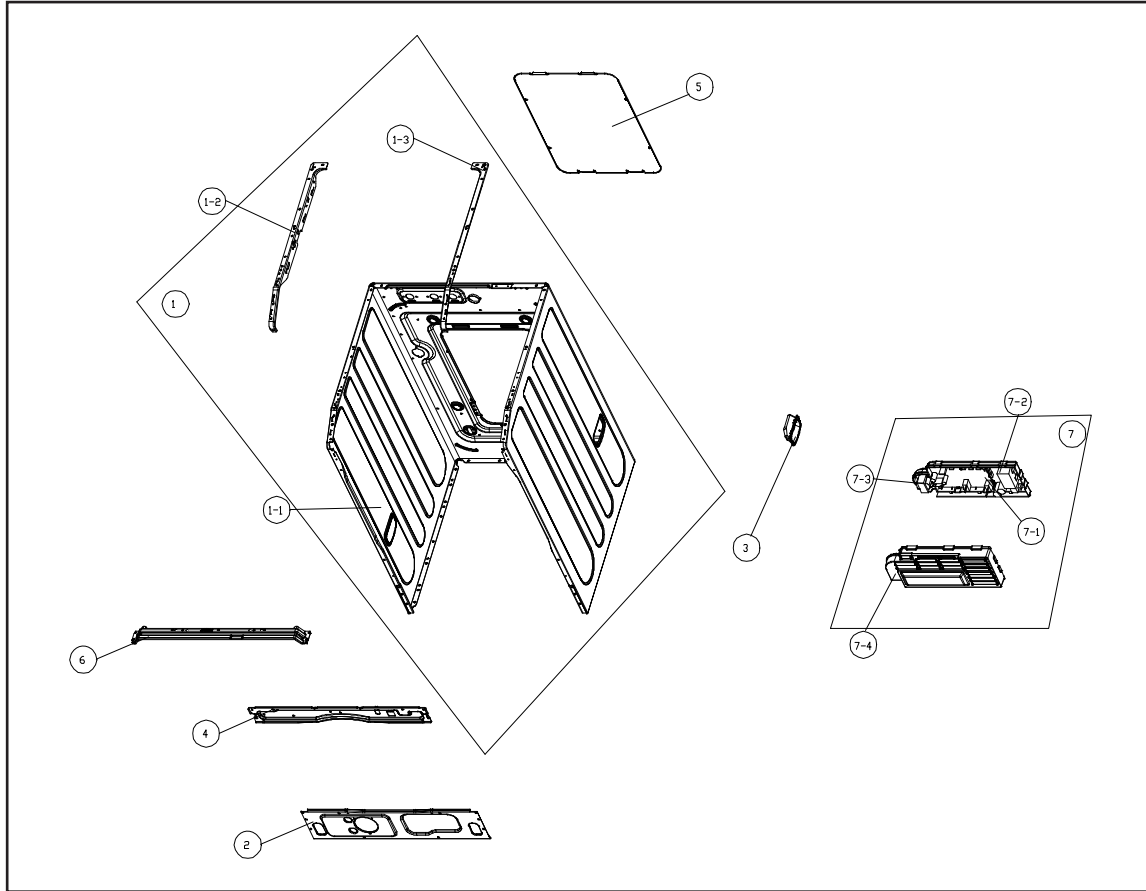
No.	Part Name	Part Code	Description	Qt'y	Remarks
1	VALVE INLET AS	66150-0009601	4WAY, DREAMTECH, 220-240V 50/60HZ, PISA	1	COLD
2	CLAMP HOSE	3611205820	ID12 W8 T0.8	1	
3	CLAMP HOSE	3611205800	CLAMP HOSE 100H,ID=13.8 W=10,0 0.9T	6	
4	CLAMP HOSE	3611206710	ID=12,D=1.6,WIRE-TYPE	1	
5	HOSE WATER SUPPLY	3613270900	HOSE WATER SUPPLY EPDM ID9.5 OD14.5	1	200mm
6	HOSE WATER SUPPLY	3613270900	HOSE WATER SUPPLY EPDM ID9.5 OD14.5	1	250mm
7	HOSE WATER SUPPLY	3613270930	HOSE WATER SUPPLY EPDM ID8.5 OD12.5_SHOWER	1	750mm
8	HOSE WATER SUPPLY	3613270900	HOSE WATER SUPPLY EPDM ID9.5 OD14.5	1	820mm
9	HOSE WATER SUPPLY	3613270900	HOSE WATER SUPPLY EPDM ID9.5 OD14.5	1	90mm
10	PIPE JOINT	3614413300	PP	1	
11	SENSOR REED AS	66143-0003100	SENSOR REED AS - DETERGENT	1	
11-1	HOLDER REED S/W	36129-0031200		2	
12	INLET BOX	36176-0006100	PP	1	
13	NOZZLE AS	36183-0008900	PP(NOZZLE*T,NOZZLE*U)	1	
13-1	NOZZLE T	36183-0007600	PP	1	
13-2	NOZZLE U	36183-0007700	PP	1	
14	PIPE OUTLET DETERGENT	36140-0001500	LDPE	1	
15	PIPE OUTLET SOFTENER	36140-0001600	LDPE	1	
16	PLATE INSULATOR DUCT	36141-0022000	SGCC, 0.6T	1	
17	UNIT PUMP AS	66149-0019900-00	220-240V, PISA	2	
18	SCREW TAPPING	90007-0006600	T2S TRS 4X14 MFZN	12	

### 3. CABINET F ASSY



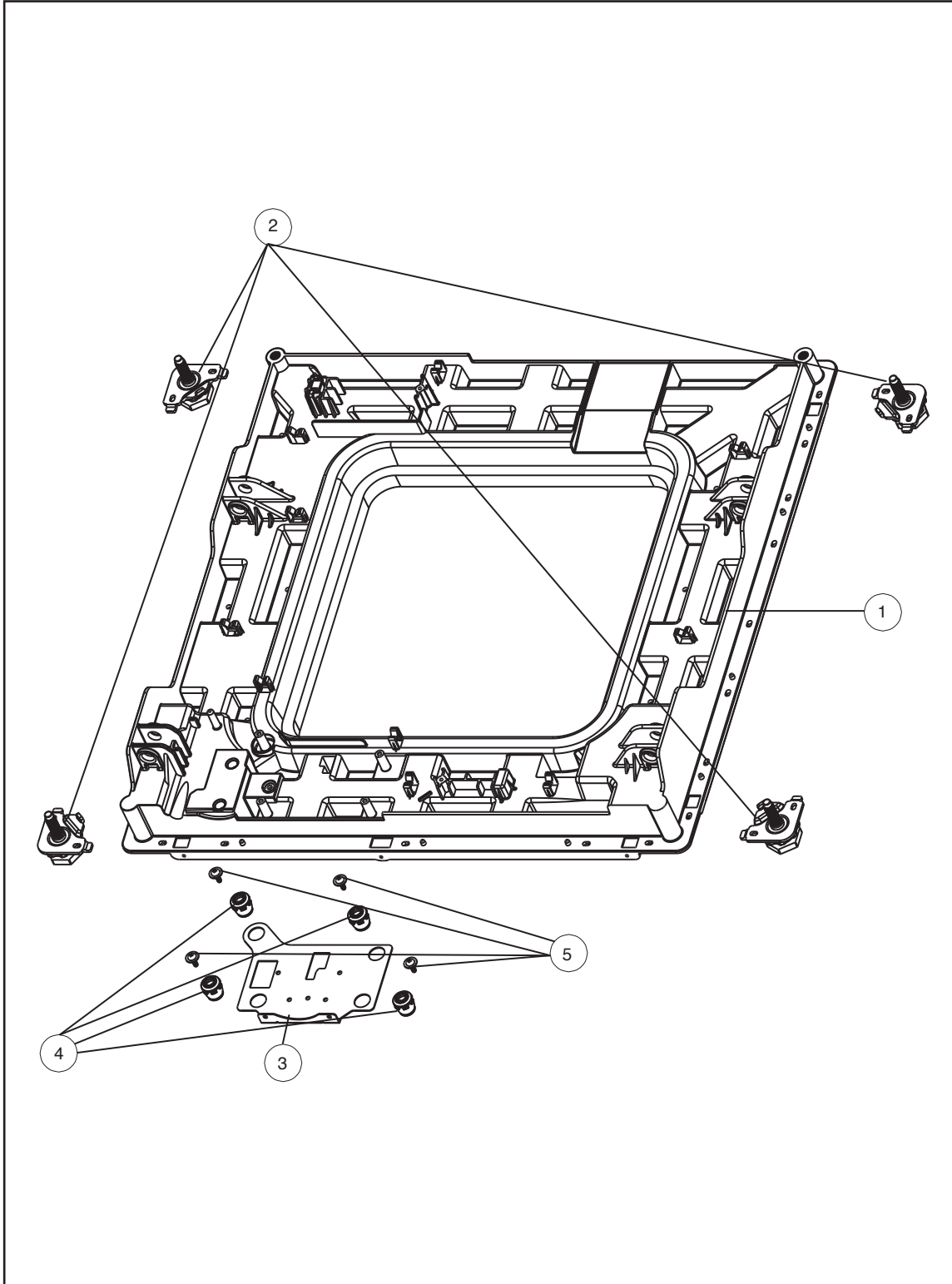
No.	Part Name	Part Code	Description	Qty	Remarks
1	CABINET *F SUB AS	36108-0017200	SECD 0,8T	1	
2	SUPPORTER HINGE	36147-0005700	SECC 1,2T	1	
3	FRAME DOOR *O AS	36121-0020000	ABS,DECORATOR GILDING	1	
4	PROTECTOR GLASS	36185-0004900	TR ABS	1	
5	FRAME DOOR *I	36121-0015900	PP	1	
6	HINGE DOOR	36128-0003600	ALDC 12S	1	
7	CAP HINGE DOOR	3610916500	POM	4	
8	HINGE BRACKET	36128-0003700	SGCC 1,2T	1	
9	SCREW TAPPING	7122401611	T22 TRS 4X16 MFZN	6	
10	HOOK DOOR	36130-0002800	ZNDC	1	
11	HOOK SPRING	36130-0002800	SUS304,D3,0	1	
12	PIN HANDLE	3618200100	SUS, D3,0	1	
13	DOOR GLASS	361A110500	GLASS(11KG/13KG)_BORAL	1	
14	SCREW TAPPING	7115401629	T1 FLT 4X16 SUS	13	
15	SCREW TAPPING	3616051230	ZN-NI, F/L M/S(SE) 5*12	4	
16	SWITCH DOOR LOCK	66148-0005100	EVOLUTION BITRON 4P 250V 16A	1	
			EVOLUTION DL-S2 BITRON 120V EURASIA	1	
17	SCREW TAPPING	7122401608	T2S TRS 4X16 SUS430	2	
18	CASE PUMP	36110-0058900	PP	1	
19	COVER PUMP	36113-0019500	ABS	1	
20	SPECIAL WIRE	3613802600	WIRE CORD CLIP(CEWCK-20),NYLON66,3M MOUNT	1	

## 4. CABINET ASSY



No.	Part Name	Part Code	Description	Qt'y	Remarks
1	CABINET SUB AS			1	
1-1	CABINET	36108-0002016	PCM 0,8T*947,2*1942,5 (GY-6501C)	1	
1-2	FRAME *T*L AS	36121-0016401	T/U's SGCC 1,6T	1	
1-3	FRAME *T*R AS	36121-0016501	T/U's SGCC 1,6T	1	
2	FRAME LOWER	36121-0016000	SGCC 1,2T	1	
3	HANDLE CABINET	36125-0000103	PP	2	
4	FRAME UPPER	36121-0016100	SGCC 1,2T	1	
5	COVER BACK AS	36113-0001901	SGCC 0,35T	1	
6	FRAME COVER	36121-0018600	SGCC 1,6T	1	
7	PCB MAIN AS	36199-0010100	MAIN PCB AS, PISA	1	
7-1	WM PCB INVERTER ASSY	40302-1061100	MAIN PCB AS, PISA	1	
7-2	CASE PCB MAIN	36110-0058800-01	UL, HIPS V0, VE-0856, MAIN PCB COVER	1	
7-3	UNIT REACTOR AS	66149-0013101-00	RT-046B RUIKAI EURASIA AWG18	1	
7-4	COVER PCB MAIN	36113-0019400	UL, HIPS V0, VE-0856, MAIN PCB COVER	1	

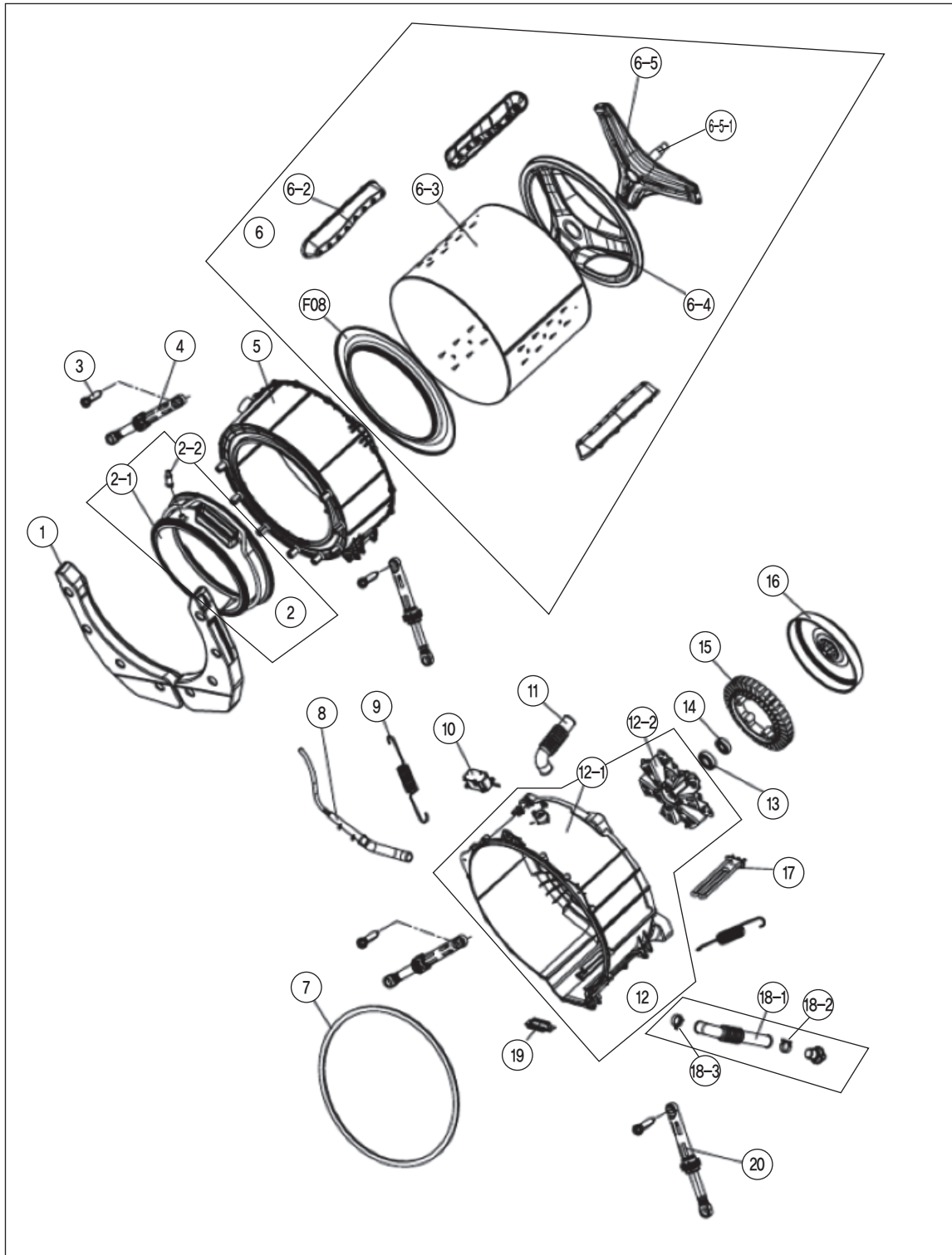
## 5. BASE U AS



No.	Part Name	Part Code	Description	Qty	Remarks
1	BASE *U	36103-0001900	PP	1	
2	LEG ADJUST AS	3617703610	DWD-T'S,SILICA BUTYL	4	
2-1	SUPPORTER LEG	3615303610	SGCC, 2,3T	4	
2-2	FIXTURE LEG	3612006400	ABS, DWD-100DR	4	
2-3	FOOT AS	36120-0000400	FOOT AS FOOT+SPECIAL BOLT, INSERT TYPE, BUTYL+SILICA+CACIUM	4	
3	PLATE DAMPER PUMP	36141-0020400	SGCC, 1,0T	1	
4	DAMPER PUMP	36166-0000700	EPDM	4	
5	SPECIAL SCREW AS	3616030600	TAPTITE P, TRS4*16, WASHER	4	

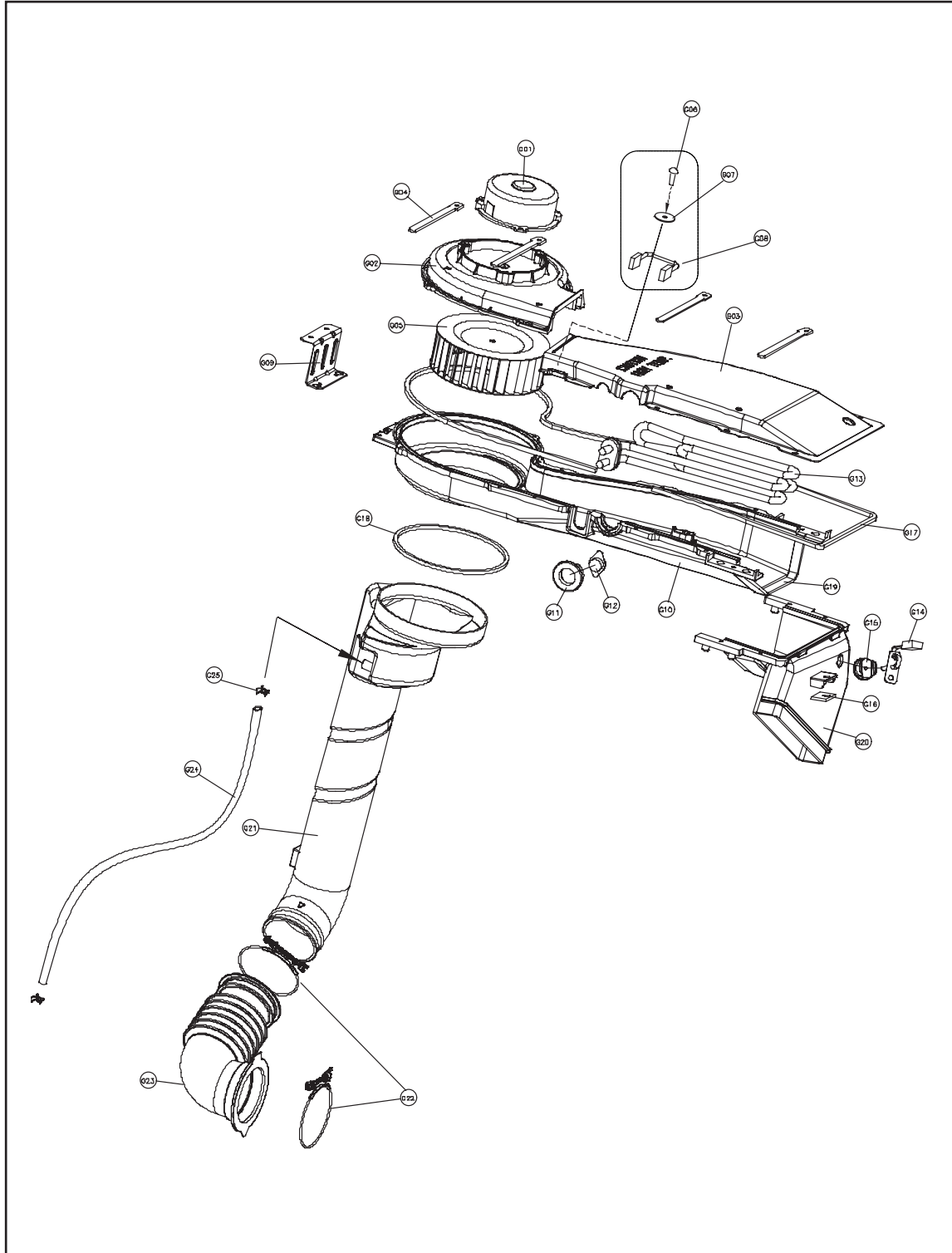


## 6. TUB ASSY



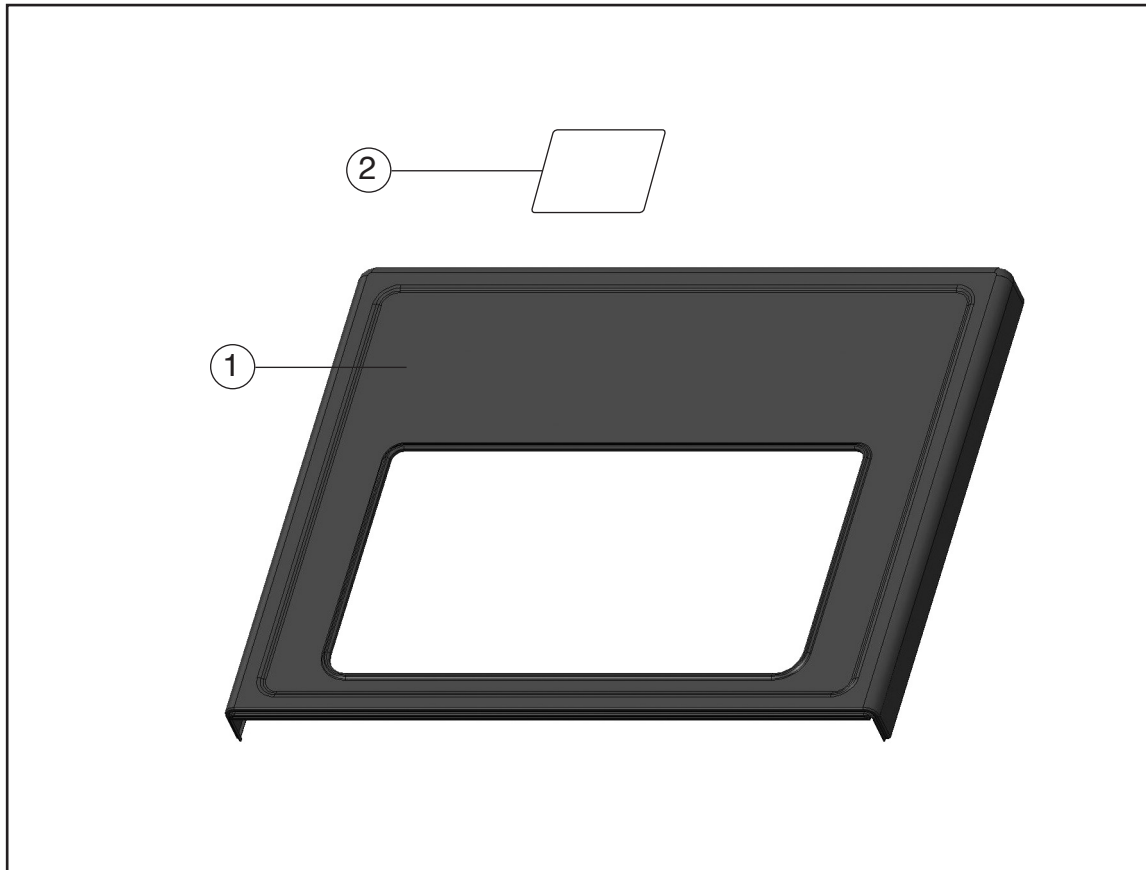
No.	Part Name	Part Code	Description	Qty	Remarks
1	BALANCER WEIGHT R AS	36154-0006101	PP,BLOWER, PISA	1	
	BALANCER WEIGHT L AS	36154-0006201	PP,BLOWER, PISA	1	
2	GASKET AS	36123-0007601-00	NOZZLE SHOWER NOZZLE JET NOZZLE GASKET PISA	1	
2-1	GASKET DRY	36123-0006200	EPDM, DRY, PISA	1	
2-2	NOZZLE SHOWER	3618104000	PP	1	
2-3	NOZZLE GASKET	36183-0008500	PP	1	
3	DAMPER PIN	361A700200	AKS D=14,5	4	
4	DAMPER FRICTION	361A700110	70N AKS ST=170-260 DL=197,5 LOW NOISE	2	
5	TUB *F	36196-0003001	FRPP, DWD-T110R	1	
6	DRUM AS	36170-0003406-00	DRUM AS, DRUM F NEW, 1PIECE LIFT, NON-NANO, PISA	1	
6-1	DRUM *F	36170-0000601-00	SUS 0,6T PISA DRUM F	1	
6-2	LIFTER WASH	361A401610	LIFTER WASH,PP,1PIECE,STRAIGHT,C-UD	3	
6-3	DRUM CENTER	3617003011	SUS 0,5T STAR DRUM	1	
6-4	DRUM REAR	3617003210	SUS 0,6T	1	
6-5	SPIDER AS	361A300200	11KG, ALDC	1	
6-5-1	SHAFT SPIDER	36144-0000100-01	SHAFT SPIDER SM45C, E,U	1	
7	GASKET TUB	3612324300	EPDM, L=1810	1	
8	AIR TRAP AS	36152-0000900	PISA,HOSE+TRAP,L=815mm(PRESSURE)	1	
8-1	AIR TRAP	36152-0000700-00	AIR TRAP PP	1	
8-2	HOSE AIR TRAP	36131-0007400-00	HOSE AIR TRAP EPDM, DWD-T120R	1	
8-3	HOSE AIR PRESSURE	36131-0017203-00	EPDM ID=4 , OD=10 PISA STAR SHAPE TYPE		
9	SPRING SUSPENSION	3615115810	D12K,D=3,8,L=194,K=0,8508 HOT DIPPING GALVANIZING	2	
10	UNIT BUBBLE PUMP AS	36189L4150	220-240V DBK-240D* RP CUSHION T110'S	1	option
		36189L4G00	100-130V DBK-240D* RP CUSHION T110'S		
11	HOSE AIR	36131-0018900	RUBBER 44X86X172 PISA PJT	1	
12	TUB REAR AS	36196-0037100	TUB REAR+BEARING HOUSING CHANGE CORE, PISA 1ST/2ND	1	
12-1	TUB REAR	36196-0002903	FRPP	1	
12-2	BEARING HOUSING	3616304600	ALDC, DWD-T120R	1	
13	BEARING *I	3616303100	F,L,E,U,6206ZZ	1	
14	BEARING *O	3616303200	F,L,E,U,6205ZZ	1	
15	UNIT STATOR BLDC	36189L6200	AL,DON1300W 30T 36POLE,NMT,PBT CLASS F	1	
16	UNIT ROTOR BLDC	36189L6300	DON1300W SR-FERRITE12,30~32T,NMT	1	
17	HEATER WASH	66127-0001302	230V 2000W INCOLOY800 2FUSE	1	
		66127-0001301-00	230V 2000W SUS304 NI-DI 2FUSE	1	
		66127-0002002-00	120V 1000W SUS304 NI-DI 2FUSE	1	
18	HOSE DRAIN INNER AS	36131-0018300	HOSE DRAIN INNER AS PISA	1	
18-1	HOSE DRAIN *I	36131-0006900	ST+EL, 1010MM	1	
18-2	CUFF HOSE DRAIN	36164-0000500	PP,PUMP	1	
18-3	CLAMP HOSE	36111-0005201	SK5 PISA PJT PISA PJT PAN TYPE CLAMP 1,2T, ID26, Width12	2	
19	FIXTURE HEATER	3612009300	SUS 0,7T, DWD-T110R	1	
20	DAMPER FRICTION	361A700110	70N AKS ST=170-260 DL=197,5 LOW NOISE	2	
21	UNIT DRAIN PUMP AS	66149-0019601	B15-5A 220-240V 50HZ PISA	1	DUAL

## 7. DUCT B AS + DUCT PIPE AS



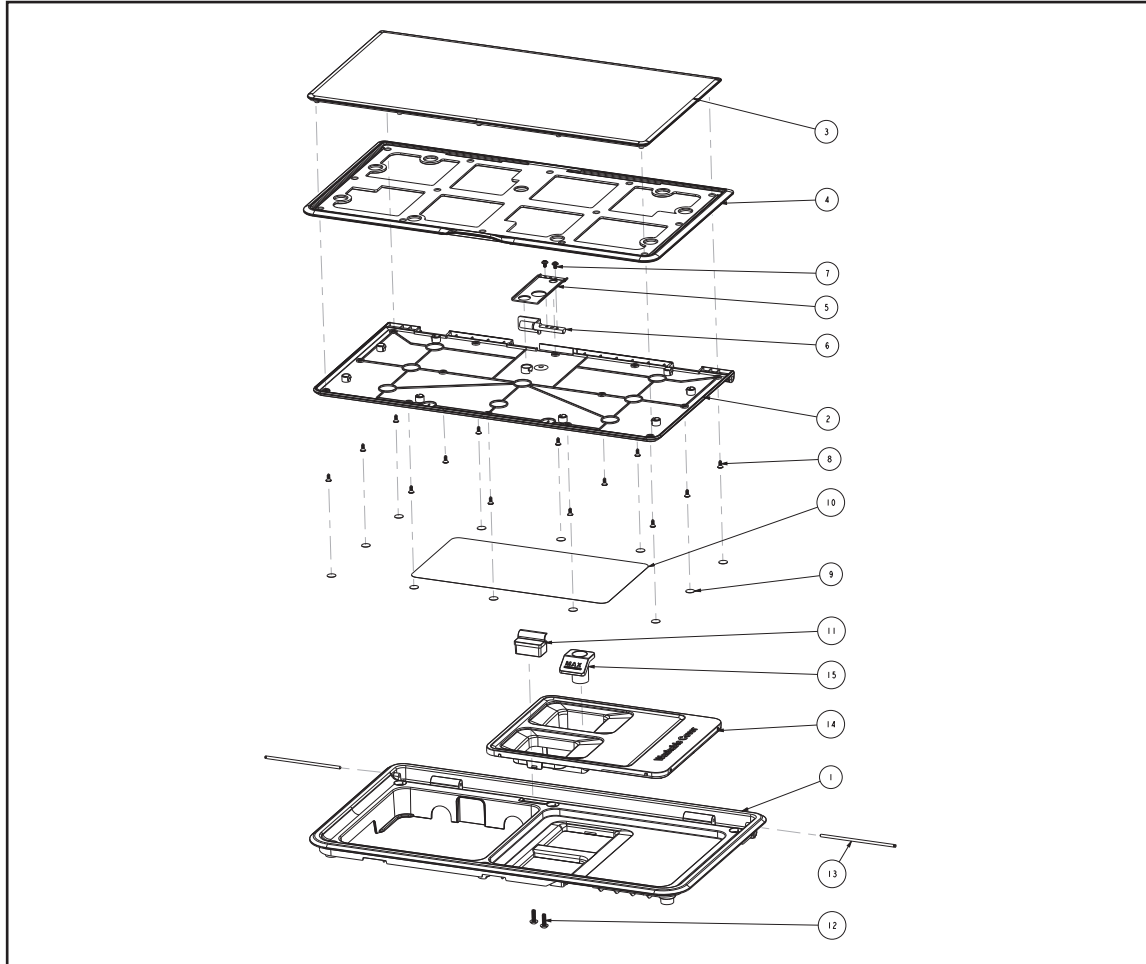
No	Part Name	Part Code	Description	Qty	Remarks
G01	UNIT FAN MOTOR	36189L3Z20	ISM-7780 6DWWA 24V.	1	
G02	COVER DUCT	3611428700	ALDC	1	
G03	DUCT B UPPER	361A202100	ALCOST 0,5T	1	
G04	CLAMP CORD	3611203330	DABE-2, A=9, B=5,3, L=105	3	
G05	FAN AS	3611885900	DI33 FAN	1	
G06	SCREW TAPPING	7122400811	T2S TRS 4x8	1	
G07	SPECIAL SCREW AS	3616030100	TAPTITE P, TRS 4*16, WASHER	1	
G08	HARNESS SUB AS	66126-0006104	HARNESS SUB AS DF-119S 15A 250V DUCT B AS GWTT DONGYANG	1	
G09	FRAME HEATER FRANGE	3612209700	SBHG 1,2t	1	
G10	DUCT B LOWER	361A202200	AL, 3t	1	
G11	PACKING THERMOSTAT	3614009900	SILICON	1	
G12	SWITCH THERMOSTAT	3619046500	ON 120 ° C OFF 150 ° C 230V	1	
G13	HEATER DRY	3612800900	220V, 2100W	1	
G14	THERMISTOR DRY	361AAAAC30	R40=26.065k $\Delta$ 0, R90=4,4278 $\Delta$ 0	1	
G15	PACKING RUBBER	3614009800	SILICON	1	
G16	CUSHION DRY	3611570500	NBR, 20 x20 x 3T	2	
G17	GASKET SEAL A	3612324200	EPDM FOAM, DIA=5, L=1335	1	
G18	GASKET SEAL B	3612320810	EPDM FOAM, L=412, 4,9 x 4,4 x 4,8	1	
G19	GASKET INLET	3612323800	EVA, 10 x 211 x 1T	1	
G20	DUCT GUIDE	361A202300	AL, 3T	1	
G21	DUCT AS	361A200850	T120R	1	
G22	CLAMP AS(DUCT)	3611203700	DUCT	2	
G23	BELLOWS DUCT	3616403000	EPDM	1	
G24	HOSE WATER SUPPLY	3613270900	TR120R CONDENSED WATER	1	
G25	CLAMP SPRING	3611203800	ID=15,5, T=0,6, B=10	2	

## 8. PLATE TOP ASSY



No.	Part Name	Part Code	Description	Qt'y	Remarks
1	PLATE *T	36141-0022800	SECD 1,0T	1	
2	LABEL CAUTION	36133-0032100	YUPO+OPP	1	

## 9. Cover Plate AS



No.	Part Name	Part Code	Description	Qty	Remarks
1	COVER PLATE	36113-0022800	ABS	1	
2	COVER BOTTOM	36113-0024600	ABS	1	
3	COVER UP	36113-0023000	ABS	1	
4	COVER MID	36113-0022900	GPPS	1	
5	HINGE HOLDER	36128-0003900	SGCC, 1,2T	1	
6	HINGE DOOR AS	36128-0004100	COVER DETERGENT HINGE, PISA	1	
7	SCREW MACHINE	90007-0030500	PH M3*5(PITCH 0,5) WASHER	2	
8	SCREW TAPPING	90007-0030800	FLT M3 X 8 SUS 304	14	
9	CAP SCREW	36109-0011500	PET 0,18T	12	
10	LABEL DETERGENT	36133-0032200	248,6X128,6, YUPO	1	
11	HINGE COVER	36128-0003800	ABS 728-94527	1	
12	SCREW TAPPING	90007-0006600	T2S TRS 4X14 MFZN	2	
13	SHAFT COVER HINGE	36144-0002400		2	
14	COVER DETERGENT	36113-0025900	PP	1	
15	CAP SOFTENER	36109-0009900	PP	1	

## 5. Control Part Function Specification

### 1. Function Specification

#### 1) Sequence chart

PROCESS		SELECTABLE		WASHER / COMBO												
				Cotton						Synthetics	Soak					
				Clean jet			Super Express				Clean jet			Super Express		
COURSE		TIME(min)	Low	Mid	High	Low	Mid	High	High	Low	Mid	High	Low	Mid	High	
PRE WASH	Load Sensing	NO	7.2sec	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
	Water Supply	Time(min)														
		23.70	mid	2												
	Pre Wash	Time(min)														
		-	10													
	Drain	Time(min)														
		25.80	2													
	B Spin	Time(min)														
-		2														
Spin	Time(min)															
	400 RPM		2, 3													
	800 RPM		3													
Pre Wash Time				0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	
STEAM	Load Sensing	NO	7.2sec	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	
	Water Supply	Time(min)														
		24.70	steam	2												
	Steam Heating	Time(min)														
		Steam	83°C/78°C	20												
Steam Wash	Time(min)															
	Steam	83°C/88 °C	25													
Steam Time				0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	
WASH	Load Sensing	OK	7.2sec	OK	OK	OK	OK	OK	OK	NO	OK	OK	OK	OK	OK	
	Water Supply	Time(min)														
		23.70	speed	1												
		23.75	low	2	2			2			2			2		
		23.70	mid	2		2			2		2		2		2	
		23.70	high	2			2			2			2		2	
	Soak	Time(min)														
		-	30								30	30	30	30	30	
	Wash1 (Before-Heating)	Time(min)														
		-	15													
		-	5	15	15	15	15	15	15	5	15	15	15	15	15	
	Wash2 (Heating)	Time(min)														
		-	10													
		-	20	20				20			20			20		
		-	30													
		-	35		35	35		35	35	35		35	35		35	
		-	45													
	Wash3 (After-Heating)	Time(min)														
		-	3													
		-	5													
		-	10													
		-	15	15	15		15	15			15	15		15	15	
		-	20							20						
		-	25			25			25				25		25	
	-	30														
	-	35														
	Wash Time				0:52	1:07	1:17	0:52	1:07	1:17	1:02	1:22	1:37	1:47	1:22	1:37

PROCESS		SELECTABLE		WASHER / COMBO												
				Cotton						Synthetics	Soak					
				Clean jet			Super Express				Clean jet			Super Express		
COURSE		TIME(min)	Low	Mid	High	Low	Mid	High	High	Low	Mid	High	Low	Mid	High	
RINSE	Rinse Count			2	2	2	3	3	3	3	2	2	2	3	3	3
	Drain	Time(min)														
		25.80	1													
			2	2	2	2	2	2	2	2	2	2	2	2	2	2
	B Spin	Time(min)														
		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Spin	Time(min)														
		400 RPM	2, 3													
		800 RPM	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Water Supply	Time(min)														
		23.20	mid	2	2	2	2	2	2	2	2	2	2	2	2	2
	Rinse	Time(min)														
		-		3	3	3	3	3	3	3	3	3	3	3	3	3
	Drain	Time(min)														
25.80		1														
Rinse Shower	Time(min)															
	1	1														
Rinse Time			0:24	0:24	0:24	0:36	0:36	0:36	0:36	0:24	0:24	0:24	0:36	0:36	0:36	
SPIN	Drain	Time(min)														
		25.80	2	2	2	2	2	2	2	2	2	2	2	2	2	
	B Spin	Time(min)														
		-	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Spin	Time(min)														
		400 RPM	3, 5													
		600 RPM	7													
		800 RPM	2, 7	7	7	7	7	7	7	7	7	7	7	7	7	7
		1000 RPM	10													
Crease Care	1200 RPM		10													
	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Spin Time			0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:12	
Dry	Dry	Time(min)														
		70 °C/60 °C	30, 90													
		80 °C/70 °C	35													
	Cooling	90 °C/80 °C		40, 90												
-		5														
Dry Time			0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	
Total Time			1:28	1:43	1:53	1:40	1:55	2:05	1:50	1:58	2:13	2:23	2:10	2:25	2:35	



PROCESS		SELECTABLE		WASHER / COMBO												
				Prewash						Intensive						Wool
				Clean jet			Super Express			Clean jet			Super Express			
COURSE		TIME(min)	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	
PRE WASH	Load Sensing	NO	7.2sec	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Water Supply	Time(min)														
		23.70	mid	2	2	2	2	2	2	2	2	2	2	2	2	
	Pre Wash	Time(min)														
		-	10	10	10	10	10	10	10	10	10	10	10	10	10	
	Drain	Time(min)														
		25.80	2	2	2	2	2	2	2	2	2	2	2	2	2	
	B Spin	Time(min)														
		-	2	2	2	2	2	2	2	2	2	2	2	2	2	
Spin	Time(min)															
	400 RPM	2, 3														
	800 RPM	3	3	3	3	3	3	3	3	3	3	3	3	3		
Pre Wash Time				0:19	0:19	0:19	0:19	0:19	0:19	0:19	0:19	0:19	0:19	0:19	0:00	
STEAM	Load Sensing	NO	7.2sec	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Water Supply	Time(min)														
		24.70	steam	2												
	Steam Heating	Time(min)														
		Steam	83°C/78°C	20												
Steam Wash	Time(min)															
	Steam	83°C/88 °C	25													
Steam Time				0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	
WASH	Load Sensing	OK	7.2sec	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	NO	NO
	Water Supply	Time(min)														
		23.70	speed	1												
		23.75	low	2	2			2								2
		23.70	mid	2		2			2		2	2	2	2	2	
		23.70	high	2			2			2						
	Soak	Time(min)														
		-	30													
	Wash1 (Before-Heating)	Time(min)														
		-	15							5	5	5	5	5	5	
		-	5	15	15	15	15	15	15							
	Wash2 (Heating)	Time(min)														
		-	10													10
		-	20	20				20			20			20		
		-	30													
		-	35		35	35		35	35		35	35		35	35	
		-	45													
		-	60													
	Wash3 (After-Heating)	Time(min)														
		-	3													5
		-	5													
		-	10													
		-	15	15	15		15	15								
		-	20													
		-	25			25			25							
		-	30							30	30	30	30	30	30	
		-	35													
Wash Time				0:52	1:07	1:17	0:52	1:07	1:17	1:02	1:22	1:37	1:47	1:22	1:37	1:47

PROCESS		SELECTABLE		WASHER / COMBO												
				Prewash						Intensive						Wool
				Clean jet			Super Express			Clean jet			Super Express			
COURSE		TIME(min)	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	Mid	High	Low	
RINSE	Rinse Count			2	2	2	3	3	3	2	2	2	3	3	3	2
	Drain	Time(min)														
		25.80	1													
		2		2	2	2	2	2	2	2	2	2	2	2	2	2
	B Spin	Time(min)														
		2	2		2	2	2	2	2	2	2	2	2	2	2	2
	Spin	Time(min)														
		400 RPM	2, 3													2
		800 RPM	3		3	3	3	3	3	3	3	3	3	3	3	
	Water Supply	Time(min)														
		23.20	mid	2		2	2	2	2	2	2	2	2	2	2	2
	Rinse	Time(min)														
		-		3		3	3	3	3	3	3	3	3	3	3	3
Drain	Time(min)															
	25.80	1														
Rinse Shower	Time(min)															
	1	1														
Rinse Time				0:24	0:24	0:24	0:36	0:36	0:36	0:24	0:24	0:24	0:36	0:36	0:36	0:22
SPIN	Drain	Time(min)														
		25.80	1													
		2		2	2	2	2	2	2	2	2	2	2	2	2	
	B Spin	Time(min)														
		-	2		2	2	2	2	2	2	2	2	2	2	2	2
	Spin	Time(min)														
		400 RPM	3, 5													3
		600 RPM	7													
		800 RPM	2, 7		7	7	7	7	7	7	7	7	7	7	7	
1000 RPM		10														
1200 RPM	10															
Crease Care	-		1		1	1	1	1	1	1	1	1	1	1		
Spin Time				0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:12	0:07	
Dry	Dry	Time(min)														
		70 °C/60 °C	30, 90													
		80 °C/70 °C	35													
		90 °C/80 °C	40, 90													
Cooling	-		5													
	Dry Time				0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
Total Time				1:28	1:43	1:53	1:40	1:55	2:05	1:50	1:58	2:13	2:23	2:10	2:25	2:35

PROCESS	SELECTABLE			Duvet	WASHER / COMBO				WASHER					COMBO				
					Tub Clean <sub>1</sub>	Tub Clean <sub>2</sub>	Baby Care	Speed	Lingeri	Dark Wash			Rinse + Spin	Cotton Dry		Air Wash	Wash & Dry	
COURSE			TIME(min)	Mid	High	High	Low	Low	Low	Low	Mid	High	Mid	1200 RPM	800 RPM	Mid	1200 RPM	800 RPM
PRE WASH	Load Sensing	NO		7.2sec	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Water Supply	Time(min)																
		23.70	mid	2														
	Pre Wash	Time(min)																
		-	10															
	Drain	Time(min)																
		25.80	2															
	B Spin	Time(min)																
-		2																
Spin	Time(min)																	
	400 RPM		2, 3															
	800 RPM		3															
Pre Wash Time					0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
STEAM	Load Sensing	NO		7.2sec	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Water Supply	Time(min)																
		24.70	steam	2			2											
	Steam Heating	Time(min)																
		Steam	83°C/78°C	20			20											
Steam Wash	Time(min)																	
	Steam	83°C/88 °C	25			25												
Steam Time					0:00	0:00	0:00	0:47	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
WASH	Load Sensing	OK		7.2sec	NO	NO	NO	NO	NO	NO	OK	OK	OK	-	-	-	-	NO
	Water Supply	Time(min)																
		23.70	speed	1					1									
		23.75	low	2				0		2	2	2	2				1	1
		23.70	mid	2	2	2	2											
	Soak	Time(min)																
		-	30			30	30											
	Wash1 (Before-Heating)	Time(min)																
		-	15															
		-	5	5	5				5	5	5	5						
	Wash2 (Heating)	Time(min)																
		-	10															
		-	20															
		-	30															
		-	35					35										
		-	45															
	Wash3 (After-Heating)	Time(min)																
-		3						3									3	3
-		5								5								
-		10							10									
-		15					15				15							
-		20		20	20	20						20						
-		25																
Wash Time					0:27	0:57	0:57	0:50	0:04	0:17	0:12	0:22	0:27	0:00	0:00	0:00	0:04	0:04

PROCESS		SELECTABLE		Duvet	WASHER / COMBO				WASHER					COMBO				
					Tub Clean <sub>1</sub>	Tub Clean <sub>2</sub>	Baby Care	Speed	Lingeri	Dark Wash			Rinse + Spin	Cotton Dry 1200 RPM   800 RPM		Air Wash	Wash & Dry 1200 RPM   800 RPM	
	COURSE		TIME(min)	Mid	High	High	Low	Low	Low	Low	Mid	High	Mid	Mid	Mid	Mid	Mid	Mid
RINSE	Rinse Count			2	2	2	4	1	2	2	2	2	1	0	0	0	1	1
	Drain	Time(min)																
		25.80	1					1									1	1
			2	2	2	2			2	2	2	2	2					
	B Spin	Time(min)																
		2	2	2	2	2			2	2	2	2	2					
	Spin	Time(min)																
		400 RPM	2, 3		3	3	3			3	3	3	3					
		800 RPM	3	3										3				
	Water Supply	Time(min)																
		23.20	mid	2	2	2	2	2	2	2	2	2	2	2			2	2
Rinse	Time(min)																	
	-		3	3	3	3			3	3	3	3	3					
Drain	Time(min)																	
	25.80	1						1								1	1	
Rinse Shower	Time(min)																	
	1	1														1	1	
SPIN	Rinse Time			0:24	0:24	0:24	0:48	0:05	0:24	0:24	0:24	0:24	0:12	0:00	0:00	0:00	0:05	0:05
	Drain	Time(min)																
		25.80	1					1									1	1
			2	2	2	2			2	2	2	2	2	2	2			
	B Spin	Time(min)																
		-	2	2	2	2	2	2	2	2	2	2	2	2	2		2	2
	Spin	Time(min)																
		400 RPM	3, 5		5	5	5			5	5	5	5					
		600 RPM	7															
		800 RPM	2, 7	7				2										
		1000 RPM	10															
	Crease Care	Time(min)																
-		1	1			1			1	1	1	1	1	5	5			
Spin Time			0:12	0:09	0:09	0:10	0:05	0:10	0:10	0:10	0:10	0:12	0:19	0:23	0:00	0:10	0:10	
Dry	Load Sensing	OK	7.2sec	-	-	-	-	-	-	-	-	-	-	OK	OK	NO	NO	NO
	Dry	Time(min)																
		70 °C/60 °C	90															
		80 °C/70 °C	35													35		
		90 °C/80 °C	30, 40, 250		30									250	250		40	40
Cooling	-	5																
Dry Time			0:00	0:30	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	4:10	4:10	0:35	0:40	0:40	
Total Time			1:03	2:00	1:30	2:35	0:14	0:51	0:46	0:56	1:01	0:24	4:29	4:33	0:35	0:59	0:59	

PROCESS		SELECTABLE			PERU	CHILE	MEXICO	MIDDLE EAST	SAUDI		CHINA	OTHER COUNTRIES		
					Clean jet	Clean jet	Clean jet	Clean jet	Clean jet		Clean jet	Clean jet		
					Prue Wash	Smart Wash	Eco Logico	Batik Care	Abaya	Thobe	Spin	Eco Whites		
COURSE			TIME(min)	Mid	Mid	Mid	Low	Low	Low	Low	Low	Mid	High	
PRE WASH	Load Sensing	NO		7.2sec	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Water Supply	Time(min)												
		22.80 KHz	mid	2	2									
	Pre Wash	Time(min)												
		-		10	10									
	Drain	Time(min)												
		24.69 KHz		1	2									
	B Spin	Time(min)												
		-		2	2									
Spin	Time(min)													
	400 RPM		2, 3											
	800 RPM		3	3										
Pre Wash Time					0:19	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	
STEAM	Load Sensing	NO		7.2sec	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
	Water Supply	Time(min)												
		24.70	steam	2										
	Steam Heating	Time(min)												
		Steam	83°C/78°C	20										
Steam Wash	Time(min)													
	Steam	83°C/88 °C	25											
Steam Time					0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	
WASH	Load Sensing	OK		7.2sec	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	Water Supply	Time(min)												
		23.58 KHz	low	2			2							
		22.80 KHz	mid	2	2	2		2	2	2		2	2	2
		22.80 KHz	high	2										
	Soak	Time(min)												
		-		30										
	Wash1 (Before-Heating)	Time(min)												
		-		5	5	5	15	5	5	5		5	5	5
	Wash2 (Heating)	Time(min)												
		-		20		20	20							
		-		30										
		-		35										
		-		45								45		
		-		60	60								60	60
	Wash3 (After-Heating)	Time(min)												
		-		5					5					
-			10		10		10		10					
-			15											
-			20											
-			25	25							20	20	20	
Wash Time					1:32	0:37	1:27	0:17	0:12	0:17	0:00	1:12	1:27	1:27

PROCESS	SELECTABLE		PERU	CHILE	MEXICO	MIDDLE EAST	SAUDI		CHINA	OTHER COUNTRIES		
			Clean jet	Clean jet	Clean jet	Clean jet	Clean jet		Clean jet	Clean jet		
			Prue Wash	Smart Wash	Eco Logico	Batik Care	Abaya	Thobe	Spin	Eco Whites		
	COURSE	TIME(min)	Mid	Mid	Mid	Low	Low	Low	Low	Low	Mid	High
RINSE	Rinse Count		3	2	2	2	2	2	0	3	3	3
	Drain	Time(min)										
		24.69 KHz	2	2	2	2	2	2		2	2	2
	B Spin	Time(min)										
		2	2	2	2	2	2	2		2	2	2
	Spin	Time(min)										
		400 RPM	2, 3			3	3	3				
		800 RPM	3	3	5					3	3	3
	Water Supply	Time(min)										
		22.80 KHz	mid	2	2	2	2	2		2	2	2
SPIN	Rinse	행금시간(min)										
		-	3	3	5	3	3	3		3	3	3
	Rinse Time		0:36	0:20	0:32	0:24	0:24	0:24	0:00	0:36	0:36	0:36
	Drain	Time(min)										
		24.69 KHz	2	2	2	2	2	2	2	2	2	2
	B Spin	Time(min)										
		-	2	2	2	2	2	2	2	2	2	2
	Spin	Time(min)										
		400 RPM	3, 5			5	5	5				
		800 RPM	2, 7	7					7	7	7	7
		1000 RPM	10		10							
Dry	Crease Care	1200/1400 RPM	10									
		-	1	1	1	1	1	1	1	1	1	1
		Spin Time	0:15	0:12	0:15	0:10	0:10	0:10	0:12	0:12	0:12	0:12
		Load Sensing	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
	Dry	Time(min)										
		70 °C/60 °C	30									
		80 °C/70 °C	35									
		90 °C/80 °C	40, 90									
	Cooling	-	5									
		Dry Time	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
	Total Time		2:42	1:09	2:14	0:51	0:46	0:51	0:12	2:00	2:15	2:15

## 2. Skill of each Sequence

### 2-1. Washing Sequence

#### 1) Washing Sequence part

Course \ Part	LOAD SENSING	WATER LEVEL	TIME		
Main	O	Decision Level	Before-Heating	Heating	After-Heating
Pre	X	Low	X	X	10min, 15min
Soak	X	Low	X	X	30min

- ① Prewash and Soak working previous main washing.
- ② Decision Level' decide Water Level and Time to Load Sensing in Cotton course.
- ③ Soak consist of water supply and washing, after this, start main washing.
- ④ Heater does not working in prewash and soak course.

#### 2) Wathing Time

Course \ Park	Water temperature in High volt area ( °C )	Water temperature in Low volt area ( °C )	Water Level	Before-Heating Time (min)	Heating Time (min)	After-Heating Time (min)	Total Washing Time (min)
Cotton	0	0	Small/Middle/High	0	0	0	0
	20	20	Small	15	15	5	35
			Middle	15	20	15	50
			High	15	20	25	60
	40	40	Small	15	20	5	40
			Middle	15	35	15	65
			High	15	35	25	75
	60	50	Small	15	45	5	65
			Middle	15	60	15	90
			High	15	60	25	100
	95	60	Small	15	95	5	115
			Middle	15	105	15	135
			High	15	105	25	145
Synthetics	0	0	High	0	0	20	20
	20	20	High	5	20	20	45
	40	40	High	5	35	20	60
	60	50	High	5	60	20	85
Soak	0	0	Small/Middle/High	0	0	0	0
	20	20	Small	15	15	5	35
			Middle	15	20	15	50
			High	15	20	25	60
	40	40	Small	15	20	5	40
			Middle	15	35	15	65
			High	15	35	25	75
	60	50	Small	15	45	5	65
			Middle	15	60	15	90
			High	15	60	25	100
	95	60	Small	15	95	5	115
			Middle	15	105	15	135
			High	15	105	25	145

Park Course	Water temperature in High volt area ( °C )	Water temperature in Low volt area ( °C )	Water Level	Before- Heating Time (min)	Heating Time (min)	After- Heating Time (min)	Total Washing Time (min)
Wool	0	0	Small	0	0	5	5
	20	20	Small	0	10	5	15
	40	40	Small	0	10	5	15
Duvet	0	0	Middle	5	0	20	25
Intensive	0	0	Small/Middle/High	0	0	0	0
	20	20	Small	5	15	30	50
			Middle	5	20	30	55
			High	5	20	30	55
	40	40	Small	5	20	30	55
			Middle	5	35	30	70
			High	5	35	30	70
	60	50	Small	5	45	30	80
			Middle	5	60	30	95
			High	5	60	30	95
	95	60	Small	5	95	30	130
			Middle	5	105	30	140
			High	5	105	30	140
Tub Clean	0	0	High	0	0	20	20
	20	20	High	5	20	20	45
	40	40	High	5	35	20	60
	60	50	High	5	60	20	85
	95	60	High	5	105	20	130
Baby Care	20	20	Small	0	30	15	45
	40	40	Small	0	35	15	50
	60	50	Small	0	50	15	65
	95	60	Small	0	85	15	100
Speed Wash	0	0	Small	0	0	3	3
Prewash	0	0	Small/Middle/High	0	0	0	0
	20	20	Small	15	15	5	35
			Middle	15	20	15	50
			High	15	20	25	60
	40	40	Small	15	20	5	40
			Middle	15	35	15	65
			High	15	35	25	75
	60	50	Small	15	45	5	65
			Middle	15	60	15	90
			High	15	60	25	100
	95	60	Small	15	95	5	115
			Middle	15	105	15	135
			High	15	105	25	145
Lingeri	0	0	Small	0	0	10	10
Dark Wash	0	0	Small/Middle/High	0	0	0	0
	20	20	Small	5	15	20	40
			Middle	5	20	20	45
			High	5	20	20	45
	40	40	Small	5	20	20	45
			Middle	5	35	20	60
			High	5	35	20	60



<div>Park</div> <div>Course</div>	Water temperature in High volt area ( °C )	Water temperature in Low volt area ( °C )	Water Level	Before-Heating Time (min)	Heating Time (min)	After-Heating Time (min)	Total Washing Time (min)
Rinse+Spin	-	-	-	0	0	0	0
Cotton Dry	-	-	-	0	0	0	0
Air Refresh	-	-	-	0	0	0	0
Wash&Dry	0	0	Small	0	0	3	3
Cotton Eco	40	40	Middle	5	35	20	60
	60	50	Middle	5	60	20	85
Peru Wash	0	0	Small/Middle/High	0	0	0	0
	20	20	Small	5	15	25	45
			Middle	5	20	25	50
			High	5	20	25	50
	40	40	Small	5	20	25	50
			Middle	5	35	25	65
			High	5	35	25	65
	60	50	Small	5	45	25	75
			Middle	5	60	25	90
			High	5	60	25	90
	95	60	Small	5	95	25	125
			Middle	5	105	25	135
			High	5	105	25	135
Smart Wash	0	0	Small/Middle/High	0	0	0	0
	20	20	Small	5	15	5	25
			Middle	5	20	5	30
			High	5	20	5	30
	40	40	Small	5	20	5	30
			Middle	5	35	5	45
			High	5	35	5	45
	60	50	Small	5	45	5	55
			Middle	5	60	5	70
			High	5	60	5	70
	95	60	Small	5	95	5	105
			Middle	5	105	5	115
			High	5	105	5	115
Eco Logico	0	0	Small/Middle/High	0	0	0	0
	20	20	Small	5	15	20	40
			Middle	5	20	20	45
			High	5	20	20	45
	40	40	Small	5	20	20	45
			Middle	5	35	20	60
			High	5	35	20	60
	60	50	Small	5	45	20	70
			Middle	5	60	20	85
			High	5	60	20	85
	95	60	Small	5	95	20	120
			Middle	5	105	20	130
			High	5	105	20	130
Batik Care	0	0	Small	0	0	10	10
Abaya	0	0	Small	0	0	5	5
Thobe	0	0	Small	0	0	10	10
Spin	-	-	-	0	0	0	0
Eco Whites	40	40	Small	5	20	20	45
			Middle	5	35	20	60
			High	5	35	20	60
	60	50	Small	5	45	20	70
			Middle	5	60	20	85
			High	5	60	20	85

- ① Washing Heater isn't reworking after reach decision temperature.
- ② The washing time is divided into the heating time and the main washing time that follows it. The heating time is gone immediately after the heating is finished or stopped until the heating is completed.
- ③ There is cold water supply in Wool Course.

### 3) Electric Current Time of Washing Motor

Course \ Part	Water temperature in High volt area ( ° C )	Water temperature in Low volt area ( ° C )	MOTOR TIME On/OFF (sec)					Speed
			Water supply	Washing			Crease care	
				Wash 1	Wash 2	Wash 3		
				Before-Heating	Heating	After-Heating		
Cotton	0 ~ 60	0 ~ 50	5/10	10/14	10/14	10/14	10/5	47 r.p.m
	95	60	5/10	10/15	10/15	7/15	10/5	47 r.p.m
Synthetics	0 ~ 60	0 ~ 50	5/10	10/14	10/14	10/10	10/5	47 r.p.m
Soak	0 ~ 60	0 ~ 50	5/10	10/14	10/14	10/14	10/5	47 r.p.m
	95	60	5/10	10/15	10/15	7/15	10/5	47 r.p.m
Wool	0 ~ 40	0 ~ 40	X	X	1/20	1/20	X	47 r.p.m
Duvet	0	0	5/10	10/14	X	10/14	10/5	47 r.p.m
Intensive	0 ~ 60	0 ~ 50	5/10	10/14	10/14	10/14	10/5	47 r.p.m
	95	60	5/10	10/15	10/15	10/15	10/5	47 r.p.m
Tub Clean	0 ~ 60	0 ~ 50	5/10	10/14	10/14	10/14	10/5	47 r.p.m
	95	60	5/10	10/15	10/15	10/15	10/5	47 r.p.m
Baby Care	20 ~ 60	20 ~ 50	5/5(Steam)	X	10/14	10/14	10/5	47 r.p.m
	95	60	5/10		10/15	7/15	10/5	47 r.p.m
Speed Wash	0	0	5/15	X	X	18/6	X	47 r.p.m
Prewash	0 ~ 60	0 ~ 50	5/10	10/14	10/14	10/14	10/5	47 r.p.m
	95	60	5/10	10/15	10/15	7/15	10/5	47 r.p.m
Lingeri	0	0	X	10/14	10/14	10/14	10/5	47 r.p.m
Dark Wash	0 ~ 40	0 ~ 40	5/10	10/14	10/14	10/14	10/5	47 r.p.m
Rinse+Spin	X	X	X	X	X	X	10/5	47 r.p.m
Cotton Dry	X	X	X	X	X	X	10/5	47 r.p.m
Air Refresh	X	X	X	X	X	X	10/5	47 r.p.m
Wash&Dry	0	0	5/15	X	X	18/6	X	47 r.p.m
Cotton Eco	40 ~ 60	40 ~ 50	5/10	10/14	10/14	10/14	10/5	47 r.p.m
Peru Wash	0 ~ 60	0 ~ 50	5/10	10/14	10/14	10/14	10/5	47 r.p.m
	95	60	5/10	10/15	10/15	7/15	10/5	47 r.p.m
Smart Wash	0 ~ 60	0 ~ 50	5/10	10/14	10/14	10/14	10/5	47 r.p.m
	95	60	5/10	10/15	10/15	7/15	10/5	47 r.p.m
Eco Logico	0 ~ 60	0 ~ 50	5/10	10/14	10/14	10/14	10/5	47 r.p.m
	95	60	5/10	10/15	10/15	7/15	10/5	47 r.p.m
Batik Care	0	0	5/10	10/14	X	10/14	10/5	47 r.p.m
Abaya	0	0	5/10	10/14	X	5/15	10/5	47 r.p.m
Thobe	0	0	5/10	10/14	X	10/14	10/5	47 r.p.m
Spin	0	0	5/10	X	X	10/14	10/5	47 r.p.m
Eco Whites	40 ~ 60	40 ~ 50	5/10	10/14	10/14	10/14	10/5	47 r.p.m
이불털기	X	X	X	X	X	X	10/5	47 r.p.m

- ① It works decision cycle.
- ② If Motor Restriction occur by overload, Motor try to rework opposite direction.
- ③ While Water Supply, Motor Stick proceed ON first.
- ④ Crease Care is process of removal laundry that stick to drum It works after Spin Sequence.
- ⑤ Circulation pump operates after water supply.
- ⑥ The motor on/off time is apply to 'Wash 1' in Prewash.
- ⑦ The motor on/off time is 10s/170s in Soak.

#### 4) Water re-supply

- ① Water is resupplied when the water level is found to be low by monitoring it every 2 minutes after completing the water supply.
- ② The motor is stopped during the water re-supply.
- ③ During washing, a max fifteen times of water re-supply can be done. If the water level drops after that, no extra water is supplied.
- ④ If the water level is lower than the reset level during water re-supply, the IE error is issued and the heater is turned off.

## 2-2 Rinse operation

### 1) Water supply

Water Level \ Part	Circulation Model (KHz)		Non-circulation Model (KHz)
	Clean jet ON	Clean jet OFF	
Normal	23.20	22.95	22.95
Cotton Eco.			
Rinse/add. water	23.00	22.75	22.75

- ① In the rinsing cycle, only cold water is supplied.
- ② In the final rinsing cycle, the cold water valve and the reserved washing valve are opened to inject softener.
- ③ Circulation pump operates after water supply in rinsing cycle.

### 2) Re-Water Supply

- ① After 1 min. in Rinse Sequence, check water level and work Re-Water Supply.

### 3) Sinse Sequence

Course \ Part	Rinse Time(min)	Mid. Spin	Mid. Spin RPM	Rinsing	MOTOR TIME On/OFF (sec)			Speed
					Water supply	Rinse	Final rinse	
Cotton	3	3	800	2	5/10	10/10	5/15	47 r.p.m
Synthetics	3	3	800	3	5/10	10/10	5/15	47 r.p.m
Soak	3	3	800	2	5/10	10/10	5/15	47 r.p.m
Wool	3	2	400	2	X	2/20	2/20	35 r.p.m
Duvet	3	3	800	2	5/10	10/10	5/15	47 r.p.m
Intensive	3	3	800	3	5/10	10/10	5/15	47 r.p.m
Tub Clean	3	3	400	2	5/10	10/10	5/15	47 r.p.m
Baby Care	3	3	400	4	5/10	10/10	5/15	47 r.p.m
Speed Wash	2(Water supply Rinsing)	1	400	1	3/20	10/10	5/15	47 r.p.m
Prewash	3	3	800	2	5/10	10/10	5/15	47 r.p.m
Lingeri	3	2	400	2	X	10/10	10/10	35 r.p.m
Dark Wash	3	3	400	2	5/10	10/10	5/15	47 r.p.m
Rinse+Spin	3	3	800	1	5/10	10/10	5/15	47 r.p.m
Cotton Dry	0	0	X	X	X	X	X	47 r.p.m
Air Refresh	0	0	X	X	X	X	X	47 r.p.m
Wash&Dry	2(Water supply Rinsing)	1	400	1	3/20	10/10	5/15	47 r.p.m
Cotton Eco	3	3	800	3	5/10	10/10	5/15	47 r.p.m
Peru Wash	3	3	800	3	5/10	10/10	5/15	47 r.p.m
Smart Wash	3	3	800	2	5/10	10/10	5/15	47 r.p.m
Eco Logico	3	3	800	2	5/10	10/10	5/15	47 r.p.m
Batik Care	3	3	400	2	5/10	10/10	5/15	47 r.p.m
Abaya	3	3	400	2	5/10	5/10	5/15	47 r.p.m
Thobe	3	3	400	2	5/10	10/10	5/15	47 r.p.m
Spin	0	0	X	X	X	X	X	47 r.p.m
Eco Whites	3	3	800	3	5/10	10/10	5/15	47 r.p.m

### 4) Drain

- ① After Drainage Sequence, Drain Motor is still ON.

## 2-3 Spin Sequence

1) Drain

① Reset Level : 25.80 KHz

2) Spin time

Couse \ Part	Drain time (min)	B-Spin time (min)	Spin time (min)	Spin RPM	Optional RPM
Cotton	2	2	7	800	400, 800, 1000, 1200
Synthetics	2	2	7	800	400, 800, 1000
Soak	2	2	7	800	400, 800, 1000, 1200
Wool	2	2	3	400	400
Duvet	2	2	7	800	400, 800
Intensive	2	2	7	800	400, 800, 1000, 1200
Tub Clean	2	2	5	400	400, 800, 1000, 1200
Baby Care	2	2	5	400	400, 800, 1000, 1200
Speed Wash	1	2	2	800	800
Prewash	2	2	7	800	400, 800, 1000, 1200
Lingeri	2	2	5	400	400
Dark Wash	2	2	5	400	400, 800, 1000, 1200
Rinse+Spin	2	2	7	800	400, 800, 1000, 1200
Cotton Dry	0	0	0	X	X
Air Refresh	0	0	0	X	X
Wash&Dry	1	2	10	1000	1000
Cotton Eco	2	2	10	1200	1200
Peru Wash	2	2	10	1000	400, 800, 1000, 1200
Smart Wash	2	2	7	800	400, 800, 1000, 1200
Eco Logico	2	2	7	800	400, 800, 1000, 1200
Batik Care	2	2	5	400	400
Abaya	2	2	5	400	400
Thobe	2	2	5	400	400
Spin	2	2	7	800	400, 800, 1000, 1200
Eco Whites	2	2	7	800	400, 800, 1000, 1200

## 2-4 Termination

### 1) Textile pulling

- ① After the spin is completed, the laundry is taken off from the drum wall to prevent wrinkles. It lasts for 1min.
- ② The motor operation depends on the type of textile pulling.
- ③ No textile pulling is done for Hand Wash, Wool, Speed, Sports Wear and Wash&Dry.

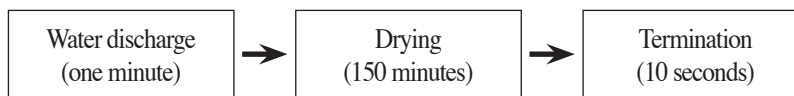
### 2) Termination

- ① The buzzer sound will be heard for 10 seconds after completing textile pulling. Also the power is off.
- ② If a drying cycle is added, then it will proceed to drying.
- ③ When termination begins, the door lock is released.

## 2-5 Drying cycle

### 1) Organization of a drying cycle

Ex) If standard drying is selected (total time of 2:30)



### 2) Drying spins

If a drying cycle is added to general operation, to improve the dryness, operation takes place at constant rpm higher than the selected spin rpm for a certain duration.

Course	Drying spins	Remarks
Standard	Strongest	Strongest spin selected regardless of the selected spin operation.
High temp boiling	Strongest	
Steam boiling	Strongest	
Heavy stains	Strongest	
High speed	Strongest	

- ① The drying spin sequence is the same as the general strongest drying sequence.

### 3) Textile pulling

- ① At the time of textile pulling, the fan motor starts operating.
- ② Textile pulling is done for sixty seconds.

#### 4) Motor conduction time for a drying cycle

Drying Option	Textile pulling	Cooling & Wrinkle free	Drying	Cycle time (min)	Heater ON/ OFF	Remarks
Cup-Borad	10/5	10/5	15/5	210	90/85	High Volt Area
Very	10/5	10/5	15/5	260	90/85	
Iron	10/5	10/5	15/5	60	90/85	
Low	10/5	10/5	15/5	110	70/60	
Time	10/5	10/5	15/5	30/60/90/120/150 /180/210/240/270	90/85	
Air Refresh	10/5	10/5	15/5	35	80/70	
Tub Clean	10/5	10/5	15/5	30	70/60	
Wash & Dry	10/5	10/5	15/5	40	90/85	
Cup-Borad	10/5	10/5	15/5	210	90/85	Low Volt Area
Very	10/5	10/5	15/5	260	90/85	
Iron	10/5	10/5	15/5	60	90/85	
Low	10/5	10/5	15/5	110	70/60	
Time	10/5	10/5	15/5	30/60/90/120/150 /180/210/240/270	90/85	
Air Refresh	10/5	10/5	15/5	35	80/70	
Tub Clean	10/5	10/5	15/5	30	70/60	
Wash & Dry	10/5	10/5	15/5	40	90/85	

- ① You can select one of 1 hr/ 90 minutes/2 hours.
- ② If a sports shoes course is selected and the time is selected, the motor conduction time is determined by a sports shoes course.
- ③ Except for a sports shoes course, if the time is selected then the motor conduction time is determined by the standard course.

#### 5) Drying valve operation

- ① 20 seconds after drying starts, it continues until drying is completed) 10 sec on/ 10 sec off.

#### 6) Cooling operation

- ① Its purpose is to lower the temperature of the tank after drying is completed) The fan motor and the main motor operate at the same time.
- ② If the drum internal temperature is below 55 degrees, cooling is terminated.
- ③ The total duration of cooling is five minutes) If the internal temperature can't be lowered, then the time is not reduced anymore.

### 2-6 Steam operation

#### 1) Steam water supply

- ① In steam operation, the water is supplied twice for one minute each.
- ② Constant temperature control is done until reaching the initial phase steam water supply point.
- ③ If the laundry is soaked in the water and the water level drops, then water is supplied again) To reduce the number of water supplies, the water supply level is set to 10mm higher than the steam point (1.5 phase).
- ④ Depending on load sensing or the course setting value, the water supply level is chosen to be low or extra low.
- ⑤ If powder DET is injected, then the main washing valve is opened and closed five times.
- ⑥ If liquid DET is selected the liquid DET stirring motor operates for 30 sec for low levels and for 20 sec for extra low levels) At this time, the main washing valve operates too.
- ⑦ When liquid DET is fully injected, then washing water supply including constant temperature control begins.
- ⑧ If powder DET is selected or liquid DET injection completion is memorized, then liquid DET injection process is skipped.
- ⑨ If the water supply is completed, to clean the DET box, the main washing valve and the reserved washing valve operate for 10 seconds.

## 2) Steam heating

- ① The heater operates until the target water temperature is reached.
- ② Steam heating temperature setting

Course	Temperature setting	Time setting
Power saving	70°C	15 min
Standard	75°C	15 min
Strong	90°C	20 min

- ③ When the target temperature is reached, the time set for steam heating is reduced.

## 3) Steam washing

- ① The water temperature is maintained and the steam effect is maximized in this operation.
- ② Steam washing time

Course	Temperature setting	Time setting
Power saving	7 min	70°C/75°C
Standard	10 min	75°C/80°C
Strong	15 min	90°C/95°C
Strong	25 min	90°C/95°C

- ③ The reserved washing v/v operates for three seconds every three minute to flow the water to the door glass.

## 4) Finishing steam water supply

- ① Steam washing is completed and it is advanced to the main washing) For this purpose, the same water level as the general standard is achieved.
- ② The time set for water supply is one minute.

## 5) Finishing steam washing

- ① It is required when you failed to reach the target temperature in the main washing.
- ② The time set for water supply is 25 minutes.

## 6) Main washing

- ① Same as the general standard washing.



### 3. Main Function of PCB Program

#### 3-1. LOAD SENSING

##### 1) Water level-determining load sensing

1. When the standard, boiling and saving boiling courses are selected, load sensing is performed.
2. Prior to the washing cycle, sensing is performed on dry laundry.
3. After running the motor at 95 rpm, the rotation time for the drum is measured to determine the amount of laundry.

##### 2) Spin B load sensing

1. After the washing cycle is terminated, in the first medium spinning condition, sensing is performed on wet laundry.
2. After running the motor at 95 rpm, the rotation time for the drum is measured to determine the amount of laundry.
3. Depending on the measured amount of laundry, the unbalance reference value for Spin B in the main spinning cycle and the medium spinning cycle is selected.

##### 3) Load data

###### 1. Water level-determining load data

A value to determine the water level for washing.

Laundry(dry)	L/S valve	Remarks
Small (0 ~ 2 KG)	66 or less	
Middle (2KG ~ 10KG)	110 or less	
High (10KG ~ 15KG)	110 or more	

###### 2. Spin B laundry data

: Sensing data for selecting a reference value of unbalance in Spin B.

Laundry(wet)	L/S valve	Remarks
1	65 or less	
2	100 or less	
3	175 or less	
4	270 or less	
5	270 or more	

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### 3-2. Balance Spin

#### 1) Motor runs during balance spin

- ① Spreading the laundry : Rotating the same 45 rpm with left and right direction alternatively.
- ② Unbalance checking point : first step, check the U.B at 95 rpm, 160 rpm second step, check the U.B at 200 rpm 370 rpm Third step 440 rpm. If the unbalance data is over the criterion This process will be repeated.
- ③ After drain, check the unbalance data again. This is so-called balance spin step.

#### 2) Property of balance spin

- ① Conducting 20 times maximum.
- ② If the washer can not pass balance spin step during 20 times, the water will be supplied.
- ③ If the washer can not pass 20 times of balance spin, UE error mode will be display on '18:88'

### 3-4 Constant Temperature Control

- 1) Constant temperature control is performed on the washing water supply only and for rinsing or drying, only cold water v/v is used to supply water.
- 2) Supplied water level

Water level classification	Water level (mm)	Frequency (KHz)
Overflow	265	22.6
Rinsing water level	225	23.18
Medium rinsing water level	255	22.61
Clean rinsing	240	22.96
Low (early)	235	23.2
Low (resupply)	195	23.75
Small (early)	195	23.75
Small (resupply)	168	24.05
SAFETY	135	24.55
RESET	90	25.80

1. Reset  
: Water supply reference level. After reaching the reset water level, 30 minutes pass before the spin begins. The minimum necessary water level required for operation of the heater.
2. Safety  
The water level where the door can be opened. The door only opens when it is below the safety water level.
3. Small water level  
: Water level corresponding to 'small' selected as the washing water level.
4. Low water level  
Water level corresponding to 'low' selected as the washing water level.
5. Rinsing water level  
: Water level for rinsing selected in all courses except hand cloths, stockings or lingerie.
6. Medium rinsing water level  
: Water level for rinsing selected in the hand cloths, stockings or lingerie course.
7. Clean rinsing water level  
: Water level when clean rinsing is selected.
8. Overflow water level  
The water level where forceful discharge is deemed necessary because the water level is too high. When this level is reached, the water supply is halted and then it is discharged until it reaches the reset water level.

### 3) Constant temperature control

To minimize the energy consumed by the heater and reduce the time required for washing, the cold water v/v and the hot water v/v are properly controlled until the required water temperature is reached.

1. After operating the hot water v/v until it reaches the water level where it is possible to detect the water temperature, if it fails to reach the target temperature, the hot water v/v will continue to operate. If the target temperature is met, then the cold water v/v is operated.
2. Depending on whether the target temperature is reached, the cold and hot water v/v keeps turning on and off. In other words, to prevent the water temperature from continuing to rise after reaching the target temperature, the hot water v/v is turned off and the cold water v/v is turned on. As the cold water is supplied, the water temperature drops and when it is 5 degrees below the target water temperature, then the hot water v/v is turned on and the cold water v/v is turned off to raise the water temperature.
3. For the water supply cycle shown in 1 and 2, if the water level is met, then the water supply stops and it moves onto the next washing cycle.
4. In the earlier stage, the hot water valve is used to supply water. If the hot water valve is closed or not connected then there would be no difference in water level for 60 seconds. In this case, the constant water temperature control is ignored and only cold water is supplied.

### 4) Constant temperature control valve operation algorithm

1. When 30 degrees is selected – target temperature of 35 degrees

		50°C	55°C	50°C	55°C	50°C	55°C	50°C	55°C
Cold water v/v:	10s								
Hot water v/v:									

---

### 3-5 Door S/W

#### 1) Door S/W operation

##### 1. Door locking

Three seconds after the bimetal of the door S/W starts operating, a 20 msec duty cycle pulse is applied twice to the solenoid until it is locked. The bimetal starts operating as soon as you press the power button.

##### 2. Door unlocking

Turn off the bimetal of the door S/W and a 20 msec duty cycle pulse is applied twice to the solenoid until it is unlocked.

##### 3. Door locking is required so that the motor and other electrical components can operate to maintain the normal cycles.

##### 4. After the power button is pressed, if the washing water temperature sensor indicates a temperature higher than 61 degrees or the water level is above the safety level, the door is closed.

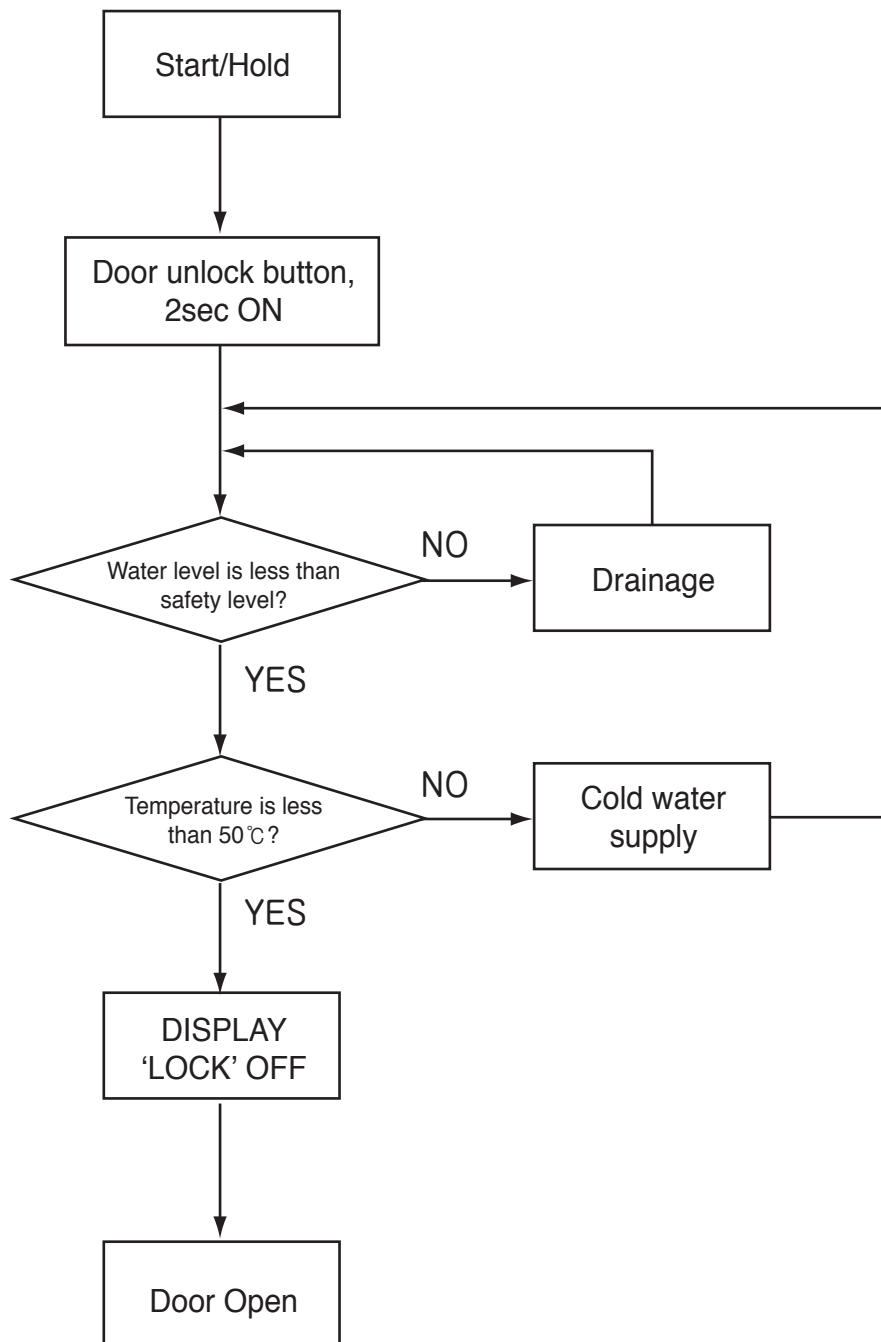
##### 5. When the cycle is terminated, the door is opened immediately.

##### 6. When the cycle is halted, the door is always opened if it is allowed to.

#### 2) Door opening system

##### 1. If laundry is added during washing or you want to open the door forcefully, then you can press the door closing cancel button to open the door.

##### 2. The door opening system using the door closing cancel button is for you to open the door forcefully when it is not in the normal cancelation condition. There are some necessary sequences to satisfy the condition for opening the door.



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### 3-6 Child lock

1. If you press the spin and condensing dry button at the same time while in the cycle, it will enter into the child lock mode.
2. In the child lock mode, no buttons except the power button can operate.
3. In the child lock mode, 'CHL' indicates the fact that the child lock is on and 'CHL' and the remaining cycle time, '18:88' are displayed in turns.
4. When you enter into child lock mode, press the water temperature button and the dry button at the same time to cancel the lock.

### 3-7 Water discharge sequence

1. If the reset water level is reached within one minute after water discharge is started, then the standby time after reset is 30 seconds.
2. If the reset water level is reached more than one minute after water discharge starts, then the standby time after reset is 120 seconds.
3. If it fails to reach the reset water level for 10 minutes, 'OE' is displayed.

### 3-8 Detergent sensing

1. If no liquid detergent or softener is in the detergent container or detergent has been used less than twice, the sensor determines that there is no detergent.
2. If makes such a decision, then the 'No detergent' or 'No softener' LED is on.
3. If it determines that there is no detergent in the early stage, then the 'No detergent' or 'No softener' LED will blink and the buzzer sound will be heard.
4. If it determines that there is no detergent during the cycle, then the 'No detergent' or 'No softener' LED will be turned on and the cycle will progress regardless.
5. If the liquid detergent is selected but no liquid detergent is detected in the early stage, the cycle can't progress.
6. If the powder detergent is selected but no powder detergent is detected, then the 'No detergent' LED is not turned on and there is no buzzer sound.

## 4. Test Mode

### 4-1 Load operation test mode

: You can easily check the operational status of each load and PCB assy.

#### 1) How to enter

: Power S/W on -> While holding down the washing button, turn on the spin button three times -> The custom LED window displays 'Ld'. -> Each time you press the water temperature button, the load operates as follows.

MICOM version -> L C (lock close) \_> run -> b1,b2,b3,b4,b5,b6,b7 -> F (fan motor) -> H (Hot v/v) -> C (Cold v/v) -> P (Pre-washing v/v) -> d (dry v/v) -> bb (bubble) -> L1 (Liquid detergent auto injection device's sync motor) -> L2 (softener auto injection device's sync motor) -> dr (water discharge sync motor) -> L O (Lock S/W open)

#### \*\*Motor error related items

1. b1: Hole sensor signal not received
2. b2: IPM FAULT (overcurrent) error
3. b3: Motor start
4. b4: Motor align error (RPM not equal to zero one minute after the motor brake starts operating.)
5. b5: The difference between the target RPM and the current RPM is greater than 120 RPM.
6. b6: Overvoltage error (detects more than 450V)
7. b7: Undervoltage error (detects more than 140V)

#### 2) Characteristics

1. All the electrical components can operate when MICOM successfully detects the closed door (LC, Lock Close) and the custom LED's Lock lamp is on.  
It takes 0.5 to 1 seconds until the MICOM detects the closed door since it is actually closed.
2. While operating the load, it checks various sensors such as washing, drying temperature and water level. If any defect is found, an error message is displayed.
3. The main BLDC motor is not inspected. To inspect the main motor, a spin or washing cycle should be selected.
4. If the water level sensor, main motor hall IC, drying temperature sensor or washing temperature sensor malfunctions, an error message will be shown in test mode.
5. Motor operation is omitted. To check motor operation, you need to select a washing or spin cycle.



#### 4-2 PCB inspection test mode

##### 1) How to enter

: While holding down the washing/rinsing/spin button, turn on the power S/W. It will progress in the following sequence.

ALL LED On -> Spin button -> All LED Off -> L C (Lock Close) -> R (Motor right) -> L (Motor left) -> F (Fan motor) -> H (hot v/v) -> C (cold v/v) -> P (pre-washing v/v) -> d (dry v/v) -> bb (bubble) -> h1 (washing heater) -> h2 (drying heater) -> dr (water discharge sync motor on) -> LO (lock S/W open)

##### 2) Characteristics

1. Using all LED on/off, you can determine whether the display is erroneous or not.
2. While operating the load, it checks various sensors such as washing, drying temperature and water level. If any defect is found, an error message is displayed.

#### 4-3 Water level frequency check mode

##### 1) How to enter and control

: Power S/W on -> while holding down the washing button, turn on the dry button three times.

1. In the 18:88 LED window, the current water level frequency is displayed initially.

**2 6 2** : Only the three digits in 25.2 kHz are displayed.

##### 2) Characteristics

1. As the initial frequency and the water level are changed, you can check the corresponding frequency.
2. When the water level sensor is normal, then the frequency varies depending on the amount of water.

#### 4-4 Line test mode

: This is the main line set test mode.

##### 1) How to enter

###### 1. Water temperature button + power S/W on

: Washing and drying heater operate and fan motor operates.

H1 (drying heater on for two seconds) -> H1 off for one second -> H2 (washing heater on for two seconds) -> H2 off for one second

The fan motor keeps operating since you have entered the test mode and until terminated.

###### 2. Spin button + power S/W on

: All the load/sensor including the motor are tested.

L T (Left and right shifted motor operation) -> Spin button pressed once (H, C, d, P v/v operate)

-> Spin button pressed once (water discharge sync motor on)

After discharging water, it runs at 95 rpm. It measures the unbalance valve and it spins at 750 rpm (unbalance reference value of 100)

-> During tests, it keeps sensing whether the liquid detergent and the softener exist. If no detergent, then the 'No detergent' and 'No softener' LED will be on and buzzer sounds will be heard.

Sensing	Valve operation	display	Valve and sync motor operation status
Detergent sensing	Detergent sync motor HCDP	L_t	L/R shifted motor operation
		Dry button once	
		D_o	Liquid detergent and softener sync motor ON
		H	Hot water valve on for two seconds
		C	Cold water valve on for two seconds/hot water valve off
		d	Drying water valve on for two seconds/hot water valve off
		P	Pre-washing valve on for two seconds/drying valve off
		d_c	Liquid detergent & softener sync motor OFF/pre-washing valve OFF
		Spin button once	
		dr	Water discharge sync motor ON. After discharging water, it runs at 95rpm. It measures the unbalance valve and spins at 750 rpm.

---

#### 4-5 Detergent injection control test mode

- 1) How to enter: Power ON -> While holding down the washing button, press the detergent selection button three times. -> 'DEt' displayed.
- 2) Pressing the rinsing button, 1, 2 and 1 will be displayed.
- 3) If you press the rinsing button, the above number is displayed. At this time, press the water temperature button to display the current settings.
- 4) How to change the settings
  - Up: Press the spin button to go up.
  - Down: Press the reserve button to go down.
  - Save after changes -> Press the operation button -> Auto power off and the value saved.
- 5) Set values
  1. '1': On time for the liquid detergent sync motor for washing.
    - Default: 30
    - Range: 20 to 50
    - Unit: 5
  2. '1': On time for the liquid detergent sync motor for rinsing.
    - Default: 40
    - Range: 30 to 60
    - Unit: 5

## 5. Error reporting function

### 5-1. IE (Input Error) - Error in water supply

#### 1) Conditions of Occurrence

- ① In case the designated water level is not reached in 5 minutes during water supply or re-supply

2) All LEDs are turned off and 'IE' blinks in 18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error display is cleared when turning off/ on power.

### 5-2. OE (Output Error) - Error in drainage

#### 1) Conditions of Occurrence

- ① In case water level does not reach reset point in 10 minutes after drainage starts

2) All LEDs are turned off and 'OE' blinks in 18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error display is cleared when turning off/ on power.

### 5-3. UE (Unbalance Error)

#### 1) Conditions of Occurrence

- ① In case main spin-drying is not reached within 20 cycles of balance spin-drying
- ② In case balance spin-drying fails during interim spin-drying, UE occurs as the cycle moves to the next process.

2) All LEDs are turned off and 'UE' blinks in 18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error mode is cleared by opening door and organizing the laundry in spin-dry chamber, closing door and pressing start/ temporary stop button. Then, spin-drying begins again.

---

#### **5-4. LE (Lock Error) - Door opening error**

##### **1) Conditions of Occurrence**

- ① When intending to begin cycle by pressing start/ temporary stop button while door is opened
- 2) All LEDs are turned off and 'LE' blinks in 18:88 display.
- 3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- 4) Error display is cleared when turning off/ on power.

#### **5-5. E1 - Water level detection error**

##### **1) Conditions of Occurrence**

- ① In case water level is below reset or overflow is detected in line test mode
- 2) Water supply motor is kept on until water level falls below reset.
- 3) All LEDs are turned off and 'E1' blinks in 18:88 display.
- 4) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- 5) Error display is cleared when turning off/ on power.

#### **5-6. E2 - Overflow error**

##### **1) Conditions of Occurrence**

- ① In case water level in water tank is above overflow level due to continuous operation of water supply valve
- 2) Water supply motor is kept on until water level falls below reset.
- 3) All LEDs are turned off and 'E2' blinks in 18:88 display.
- 4) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- 5) Error display is cleared when turning off/ on power.

---

### **5-7. E4 - Water leakage during washing**

#### 1) Conditions of Occurrence

- ① In case water level falls below re-supply even after 15 times of re-supply prior to finishing of water heating

2) All LEDs are turned off and 'E4' blinks in 18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error display is cleared when turning off/ on power.

### **5-8. E9 - Abnormalities in water level sensor**

#### 1) Conditions of Occurrence

- ① In case water level frequency is of 15KHz or lower and 30KHz or higher during cycle due to abnormalities in water level sensor, etc.

2) All LEDs are turned off and 'E9' blinks in 18:88 display.

3) Error buzzer alarm is sounded for 10 seconds per every 10 minutes.

4) Error display is cleared when turning off/ on power.

---

## 5-9. Motor-related Error

### 1) E5 (DC-Link High Voltage) Error

- ① In case DC-link voltage to IPM increases to 450V or higher
- ② Motor operation is stopped and 'E5' is shown in display window.
- ③ Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- ④ Error display is cleared when turning off/ on power.

### 2) E6 (EMG) Error

- ① In case current detected with EMG port is of 20A or higher
- ② Motor operation is stopped and 'E6' is shown in display window.
- ③ Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- ④ Error display is cleared when turning off/ on power.

### 3) E7 (Direction) Error

- ① In case signal of Hall IC is different from the predicted signal according to direction of rotation
- ② Motor operation is stopped and 'E7' is shown in display window.
- ③ Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- ④ Error display is cleared when turning off/ on power.

### 4) E8 (Initial Operation Fail) Error

- ① In case input signal of Hall IC is abnormal due to problems in motor connection, etc.
- ② Motor operation is stopped and 'E8' is shown in display window.
- ③ Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- ④ Error display is cleared when turning off/ on power.

## 5-10. Error in Temperature Sensor

### 1) H2 Error - Washing temperature sensor open/ short

- ① In case washing temperature sensor is defective or not connected
- ② Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- ③ Error display is cleared when turning off/ on power.

### 2) H4 Error - Washing temperature sensor overheating

- ① In case temperature detected by washing temperature sensor is 95°C or higher
- ② Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- ③ Error display is cleared when turning off/ on power.

---

3) H5 Error - Water temperature error in wool/ delicate course

- ① In case water temperature in wool/ delicate course is 45°C or higher
- ② Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- ③ Error display is cleared when turning off/ on power.

4) H6 Error - Abnormality in washing heater

- ① Within 15 minutes after heater operation begins;  
In case standard temperature is of 42°C or lower: If temperature does not increase by 2°C or more In  
case standard temperature is higher than 42°C: If temperature does not increase by 1°C or more
- ② If temperature falls below standard temperature by 2°C or more due to re-supply of water, etc.,  
standard temperature is reset as the current temperature and error check time of 15 minutes is reset.
- ③ Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- ④ Error display is cleared when turning off/ on power.

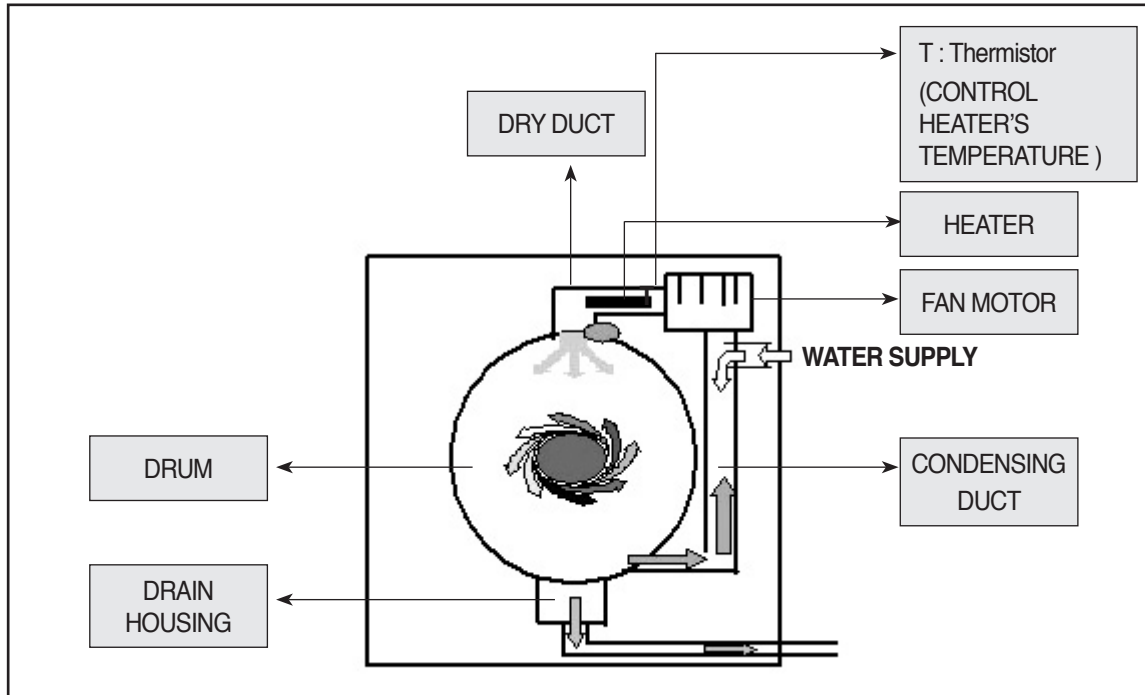
5) H8 Error - Washing heater overheating

- ① In case washing heater temperature increases by 5°C or more within 30 seconds when there is no  
water in tank, etc.
- ② Error buzzer alarm is sounded for 10 seconds per every 10 minutes.
- ③ Error display is cleared when turning off/ on power.



## 1. Heater

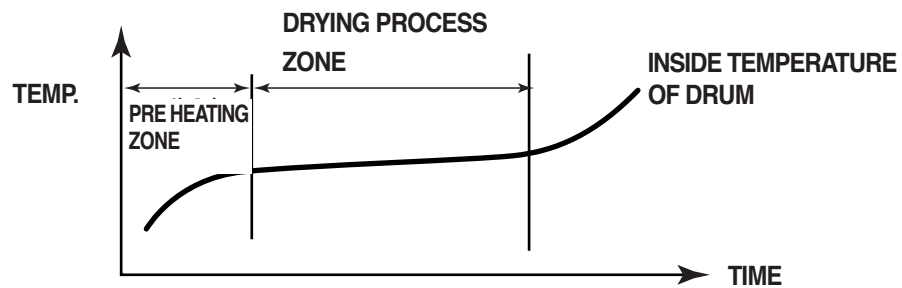
### 1) Dry Function Diagram



While rotating DRUM, DRY HEATER apply heat to air and FAN blows it into DRUM evaporating water in the laundry.

- Evaporated water is sucked into CONDENSING DUCT, and condensed in DUCT contacting WATER SUPPLY (condensed water is extracted through DRAIN HOUSING).
- Dry function is performed by continuous repetition of evaporating and condensing circulation as above.

### 2) Temp- Time Graph During Dry Cycle



### 3) TROUBLE SHOOTING OF DRY SYSTEM

#### ◆ HEATER DRY

Function : heating the air during dry

- FAILURE MODE : \* "H7" - The air cannot be heated to 10°C during 2 min.
- CHECKING METHOD : \* Check the resistance of heater coil and replace with new one.

#### ◆ Thermistor

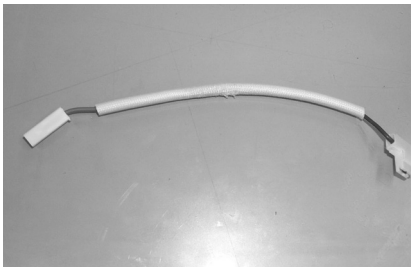
Function : sensing the air temperature.

- FAILURE MODE : \* The air cannot be heated even though water is supplied.
  - \* "H1" - shot or cut-off
  - \* "H3" - air temp. is reached over 150°C
- CHECKING METHOD : \* Check the resistance of thermistor, replace with new one.

#### ◆ FUSE TEMPERATURE

function : protecting from the fire hazard or overheating, if the temp., rises over 128°C, power supply will be cut-off.

##### • Pictures



- FAILURE MODE : Dry is not performed.
- CHECKING METHOD : Check if fuse is short, and replace with new one.

#### ◆ SWITCH THERMOSTAT(BIMETAL)

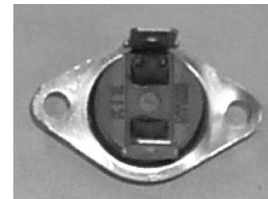
function : control the duct temperature, if the temp reached over 150°C, all power supply will be cut. and if the temp go down 120°C the power will be ON.

protecting overheating by cutting off heater power supply if the temperature rises over 150°C, and reoperating heater by connecting heater power supply if the temperature falls under 120°C.

##### • OPERATING TEMPERATURE

OPEN TEMPERATURE(OFF)	150°C ± 5°C
CLOSE TEMPERATURE(ON)	120°C ± 5°C

##### • PICTURE



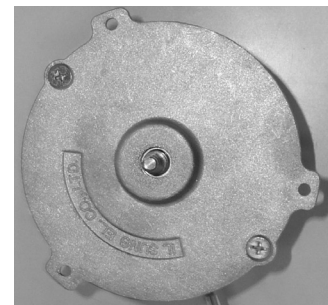
#### ◆ UNIT FAN MOTOR

function : circulating the inside air during dry process.

##### • SPEC

ITEMS		SPEC
RATING VOLTAGE		24V
RPM	MOTOR	3700 ± 10%
	DUCT FAN AS	1900 ± 10%
ROTAING DIRECTION		CW

##### • PICTURE



• FAILURE MODE : \* E3 shown : FAN MOTOR cannot work.


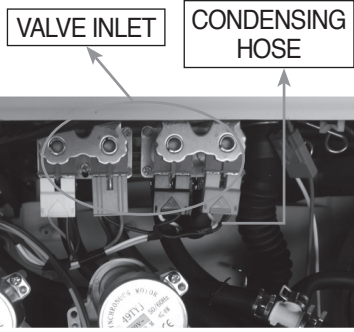
• CHECKING METHOD : Check the FAN MOTOR is short, and replace with new one.

#### 4) LACK OF DRY PERFORMANCE

• Situation : after drying, the clothes still get wet.

- cause)    ☞ The laundry amount is more than the recommendation capacity 7.0kg.  
              ☞ Condensing cold water is not supplied.  
              ☞ Clogging Bellows Duct results in poor air circulation.

checking method)

part name	checking point	checking results	jurge	repair method
BELLOWS DUCT		clogging bellows duct	heater was overheated owing to poor air circulation	clean the bellow duct
VALVE INLET +Condensing HOSE		no water supply from inlet valve	VALVE INLET connector slipped out	connect normally
			VALVE INLET broken	replace valve inlet
			ill-connection of condensing hose to duct pipe	connect normally

• Situation after drying, the clothes was soaked and hot.

- cause)    ☞ The dry is done from bad spin performance because of unbalance.  
              ☞ no spin was done before the dry had started.

• Situation : PCB shows "H1" or "H3".

cause)    ☞ Thermistor is broken.


             ☞ Thermistor is short or cut-off.

countermeasures)    ☞ replace the Thermistor.

• Situation : PCB shows "H7".

cause)      🔧 Dry heater is cut-off.  
                  🔧 Fuse temp. is cut-off.

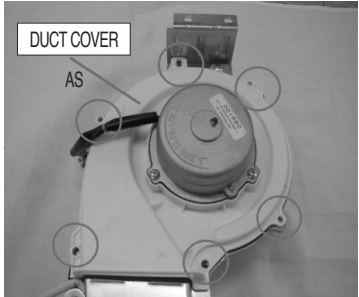
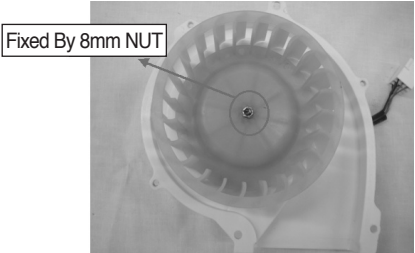
repaire method)      🔧 replace the Dry heater.  
                              🔧 replace the Fuse temp.

checking point	part name	checking results	repaire method
	HEATER	dry Heater is short or cut-off.	replace the dry Heater.
	SENSOR TEMP.	Thermistor is short or cut-off.	replace the Thermistor.
	FUSE TEMP.	FUSE TEMPERATURE is cut-off.	replace the FUSE TEMPERATURE.

• situation : PCB shows "E3".

cause) FAN MOTOR can not work.

countermeasures) Replace the Fan Motor.

part name	checking results	repair method	disassemble process of Fan Motor
FAN MOTOR	fan motor failure	replace fan motor	<p>① Disassemble Duct Cover As from Duct B As (Screw 4EA)</p>  <p>② Disassemble FAN AS From Duct Cover As (Fixed by 8mm NUT)</p>  <p>③ Disassemble the FAN MOTOR(SCREW 3EA)</p>

Remarks) control times of each parts during dry process

parts	Control time
MOTOR	15 sec On, 5sec Off
DRAIN MOTOR	Continous working
FAN MOTOR	Continous working
DRY HEATER	95°C On, 105°C Off
INLET VALVE	30sec On, 5sec Off

# Washing Heater Temp. Sensor Table

R25 : 11.981K $\Omega$   $\pm$  4.04%

R80 : 1.704K $\Omega$   $\pm$  3%

B25/100 : 3760K  $\pm$  1%

TEMP	MIN	NORMAL	MAX	TEMP	MIN	NORMAL	MAX	TEMP	MIN	NORMAL	MAX	TEMP	MIN	NORMAL	MAX
℃	K $\Omega$	K $\Omega$	K $\Omega$	℃	K $\Omega$	K $\Omega$	K $\Omega$	℃	K $\Omega$	K $\Omega$	K $\Omega$	℃	K $\Omega$	K $\Omega$	K $\Omega$
-40	282.914	298.650	314.387	0	34.352	35.975	37.599	40	6.403	6.653	6.903	81	1.603	1.653	1.703
-39	266.642	281.416	296.191	1	32.776	34.318	35.861	41	6.169	6.409	6.648	82	1.555	1.603	1.652
-38	251.432	265.311	279.190	2	31.284	32.749	34.214	42	5.946	6.176	6.405	83	1.508	1.556	1.603
-37	237.208	250.252	263.296	3	29.869	31.262	32.655	43	5.732	5.952	6.172	84	1.463	1.510	1.556
-36	223.900	236.165	248.430	4	28.528	29.852	31.177	44	5.527	5.738	5.949	85	1.419	1.464	1.509
-35	211.440	222.978	234.516	5	27.256	28.516	29.776	45	5.320	5.523	5.725	86	1.377	1.421	1.465
-34	199.683	210.537	221.392	6	26.044	27.242	28.440	46	5.131	5.325	5.518	87	1.336	1.379	1.422
-33	188.669	198.885	209.101	7	24.893	26.033	27.174	47	4.949	5.135	5.321	88	1.297	1.339	1.381
-32	178.347	187.967	197.587	8	23.801	24.887	25.972	48	4.774	4.953	5.131	89	1.259	1.300	1.342
-31	168.668	177.731	186.793	9	22.764	23.798	24.831	49	4.607	4.778	4.950	90	1.222	1.262	1.302
-30	159.588	168.129	176.670	10	21.780	22.764	23.748	50	4.443	4.608	4.772	91	1.186	1.226	1.265
-29	150.999	159.049	167.099	11	20.836	21.773	22.710	51	4.289	4.447	4.605	92	1.152	1.191	1.229
-28	142.937	150.527	158.117	12	19.939	20.832	21.725	52	4.141	4.292	4.444	93	1.119	1.157	1.194
-27	135.366	142.526	149.685	13	19.087	19.938	20.788	53	3.999	4.144	4.290	94	1.087	1.124	1.161
-26	128.253	135.009	141.766	14	18.277	19.088	19.899	54	3.862	4.002	4.142	95	1.057	1.093	1.129
-25	121.566	127.945	134.324	15	17.506	18.279	19.052	55	3.722	3.856	3.990	96	1.027	1.063	1.098
-24	115.230	121.252	127.274	16	16.770	17.507	18.244	56	3.595	3.723	3.852	97	0.999	1.033	1.067
-23	109.271	114.959	120.647	17	16.069	16.772	17.475	57	3.473	3.596	3.720	98	0.971	1.005	1.038
-22	103.665	109.039	114.413	18	15.402	16.072	16.743	58	3.355	3.474	3.593	99	0.944	0.977	1.010
-21	98.387	103.467	108.547	19	14.767	15.407	16.046	59	3.243	3.357	3.471	100	0.918	0.950	0.982
-20	93.416	98.220	103.024	20	14.162	14.773	15.383	60	3.133	3.243	3.353	101	0.893	0.924	0.955
-19	88.603	93.141	97.679	21	13.576	14.158	14.741	61	3.029	3.135	3.240	102	0.868	0.899	0.930
-18	84.072	88.361	92.649	22	13.018	13.574	14.130	62	2.929	3.030	3.132	103	0.845	0.875	0.905
-17	79.806	83.860	87.914	23	12.486	13.017	13.548	63	2.833	2.930	3.028	104	0.822	0.851	0.881
-16	75.788	79.622	83.456	24	11.980	12.487	12.993	64	2.740	2.834	2.928	105	0.799	0.827	0.856
-15	72.000	75.628	79.255	25	11.497	11.981	12.465	65	2.654	2.744	2.835	106	0.777	0.805	0.833
-14	68.408	71.840	75.272	26	11.037	11.499	11.962	66	2.569	2.656	2.743	107	0.756	0.784	0.811
-13	65.021	68.270	71.518	27	10.598	11.040	11.482	67	2.487	2.571	2.654	108	0.736	0.763	0.790
-12	61.825	64.902	67.978	28	10.179	10.601	11.024	68	2.408	2.489	2.569	109	0.716	0.743	0.769
-11	58.810	61.724	64.637	29	9.780	10.183	10.587	69	2.333	2.410	2.487	110	0.697	0.723	0.749
-10	55.963	58.724	61.485	30	9.400	9.786	10.172	70	2.258	2.332	2.407	111	0.679	0.704	0.729
-9	53.214	55.829	58.443	31	9.036	9.405	9.775	71	2.187	2.259	2.331	112	0.661	0.686	0.710
-8	50.620	53.097	55.573	32	8.688	9.042	9.395	72	2.119	2.188	2.257	113	0.644	0.668	0.692
-7	48.171	50.517	52.864	33	8.356	8.695	9.033	73	2.054	2.120	2.187	114	0.627	0.651	0.674
-6	45.857	48.081	50.305	34	8.039	8.363	8.686	74	1.991	2.055	2.119	115	0.610	0.634	0.657
-5	43.670	45.779	47.889	35	7.737	8.047	8.357	75	1.928	1.990	2.051	116	0.595	0.617	0.640
-4	41.594	43.594	45.594	36	7.448	7.744	8.041	76	1.869	1.928	1.988	117	0.579	0.602	0.624
-3	39.630	41.528	43.425	37	7.170	7.455	7.739	77	1.812	1.869	1.927	118	0.565	0.586	0.608
-2	37.773	39.574	41.375	38	6.905	7.178	7.450	78	1.758	1.813	1.868	119	0.550	0.572	0.593
-1	36.016	37.725	39.435	39	6.652	6.912	7.173	79	1.705	1.758	1.811	120	0.536	0.557	0.578

### Day Heater Temp. Sensor Table

R40 : 26.065K $\Omega$   $\pm$  3%  
R100 : 3.3K $\Omega$   $\pm$  11.1%  
B40/100 : 4025K  $\pm$  2%

T(°C)	Rmin	Rcent	Rmax	T(°C)	Rmin	Rcent	Rmax	T(°C)	Rmin	Rcent	Rmax
0	142.55	162.21	184.12	56	12.980	14.066	15.203	112	2.211	2.343	2.477
1	135.55	154.09	174.72	57	12.520	13.557	14.643	113	2.149	2.279	2.411
2	128.93	146.41	165.85	58	12.078	13.069	14.105	114	2.090	2.217	2.347
3	122.68	139.17	157.48	59	11.655	12.601	13.591	115	2.032	2.158	2.285
4	116.76	132.32	149.59	60	11.248	12.153	13.097	116	1.977	2.100	2.225
5	111.17	125.86	142.13	61	10.857	11.722	12.624	117	1.923	2.043	2.166
6	105.87	119.74	135.09	62	10.483	11.309	12.171	118	1.870	1.989	2.110
7	100.86	113.96	128.45	63	10.123	10.913	11.736	119	1.820	1.936	2.055
8	96.12	108.50	122.16	64	9.777	10.533	11.319	120	1.771	1.885	2.002
9	91.62	103.32	116.22	65	9.445	10.168	10.919	121	1.723	1.836	1.950
10	87.37	98.43	110.61	66	9.125	9.817	10.535	122	1.678	1.788	1.900
11	83.33	93.79	105.30	67	8.818	9.481	10.167	123	1.633	1.741	1.852
12	79.51	89.40	100.27	68	8.524	9.157	9.813	124	1.590	1.696	1.805
13	75.88	85.24	95.51	69	8.240	8.846	9.474	125	1.548	1.652	1.759
14	72.44	81.30	91.01	70	7.967	8.548	9.148	126	1.508	1.610	1.715
15	69.17	77.56	86.74	71	7.705	8.261	8.834	127	1.468	1.569	1.672
16	66.07	74.01	82.70	72	7.452	7.985	8.533	128	1.430	1.529	1.630
17	63.13	70.65	78.87	73	7.210	7.719	8.244	129	1.393	1.490	1.590
18	60.34	67.46	75.24	74	6.976	7.464	7.966	130	1.357	1.453	1.550
19	57.68	64.43	71.80	75	6.751	7.218	7.699	131	1.323	1.416	1.512
20	55.16	61.56	68.53	76	6.534	6.982	7.442	132	1.289	1.381	1.475
21	52.76	58.83	65.43	77	6.326	6.755	7.195	133	1.256	1.346	1.439
22	50.48	56.24	62.49	78	6.125	6.536	6.957	134	1.225	1.313	1.404
23	48.31	53.77	59.70	79	5.931	6.325	6.729	135	1.194	1.281	1.370
24	46.25	51.43	57.05	80	5.745	6.123	6.509	136	1.164	1.249	1.337
25	44.28	49.20	54.53	81	5.565	5.927	6.297	137	1.135	1.219	1.305
26	42.41	47.08	52.13	82	5.392	5.739	6.093	138	1.107	1.189	1.274
27	40.63	45.07	49.86	83	5.225	5.558	5.897	139	1.080	1.160	1.244
28	38.94	43.15	47.69	84	5.064	5.383	5.708	140	1.053	1.132	1.215
29	37.32	41.32	45.64	85	4.909	5.215	5.526	141	1.027	1.105	1.186
30	35.78	39.58	43.68	86	4.759	5.053	5.351	142	1.002	1.079	1.158
31	34.31	37.93	41.82	87	4.615	4.896	5.182	143	0.978	1.053	1.131
32	32.91	36.35	40.04	88	4.476	4.746	5.019	144	0.954	1.028	1.105
33	31.58	34.85	38.36	89	4.341	4.600	4.862	145	0.931	1.004	1.080
34	30.31	33.41	36.75	90	4.212	4.460	4.711	146	0.909	0.980	1.055
35	29.09	32.05	35.22	91	4.086	4.325	4.566	147	0.887	0.958	1.031
36	27.93	30.75	33.76	92	3.965	4.194	4.425	148	0.866	0.935	1.007
37	26.83	29.50	32.37	93	3.849	4.068	4.289	149	0.846	0.914	0.984
38	25.77	28.32	31.04	94	3.736	3.947	4.159	150	0.826	0.893	0.962
39	24.76	27.19	29.77	95	3.627	3.829	4.033				
40	23.80	26.11	28.57	96	3.522	3.716	3.911				
41	22.87	25.07	27.42	97	3.420	3.606	3.793				
42	21.99	24.09	26.32	98	3.322	3.501	3.680				
43	21.15	23.15	25.27	99	3.227	3.399	3.571				
44	20.34	22.25	24.27	100	3.135	3.300	3.465				
45	19.57	21.39	23.31	101	3.043	3.205	3.367				
46	18.84	20.57	22.40	102	2.954	3.113	3.272				
47	18.13	19.78	21.53	103	2.867	3.024	3.180				
48	17.46	19.03	20.69	104	2.784	2.937	3.092				
49	16.81	18.31	19.90	105	2.704	2.854	3.006				
50	16.19	17.62	19.13	106	2.626	2.774	2.923				
51	15.60	16.96	18.40	107	2.551	2.696	2.842				
52	15.03	16.33	17.71	108	2.478	2.621	2.764				
53	14.48	15.73	17.04	109	2.408	2.548	2.689				
54	13.96	15.15	16.40	110	2.340	2.477	2.616				
55	13.46	14.60	15.79	111	2.274	2.409	2.546				



## 7. HEATER

### 1) Spec of Heater of Washing Machine

	WASH			
MAKER	IRCA	IRCA	IRCA	IRCA
RATED	220V	230V	130V	110V
CONSUMPTION POWER	2000W	2000W	1000W	1000W
PART CODE	3612802400	3612802410	3612802440	3612802430
	DRYER			
MAKER	IRCA	IRCA	IRCA	IRCA
RATED	220V	230V	120V	110V
CONSUMPTION POWER	2100W	2100W	1200W	1200W
PART CODE	3612800900	3612801400	3612802100	3612801300

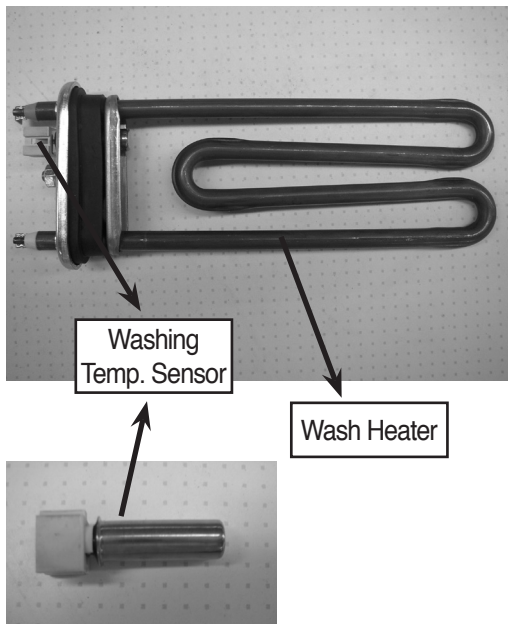
Temp. Fuse of Washing Heater (184°C CUT OFF TYPE)

: Located inside heater to prevent fire, etc. caused by heating without water due to breakdown of water level sensor, etc.

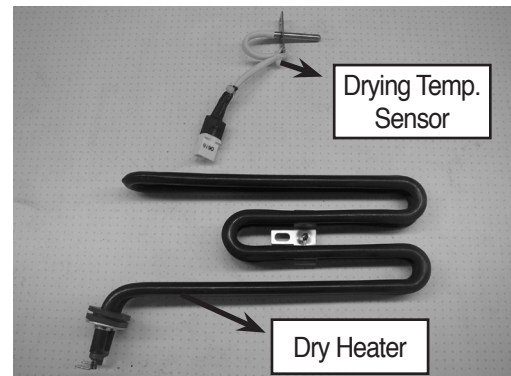
: Cut-off in app. 1min in case of overheating, heater temp. of app. 270°C

: Washing heater must be used under water.

#### ※ Wash Heater



#### ※ Day Heater



## 2) Breakdown Diagnosis

Breakdown Symptoms	Cause	Diagnosis	Solution	PCB Error Mode
Washing water not heated (common for drum)	Wiring short	Check for short	Connect the cut-off part.	"H6"
	Washing heater or temp. fuse short	Check for short: Normal if 23.3~25.7ohm between both terminals of washing heater	Replace washing heater.	"H6"
	Connector/ terminal loosening	Check for loosening: Common for drum	Insert terminal.	"H6"
	Defect in washing heater temp. sensor	Measuring resistance between both terminals of sensor:	Replace temp. sensor.	"H2"
Overheating of washing water	Defect in washing heater temp. sensor	Measuring resistance between both terminals of sensor:	Replace temp. sensor.	"H2" or "H4"

### Heater Replacement

#### \* How to Replace Washing Heater and Temp. Sensor

1. Remove the connector from the heater.  
Unfasten the earth wire  
Pull out the thermistor.
2. Heater fix nut is unfasten by tool.



3. Pulling the heater & thermistor



4. Replacing Heater and Temo. Sensor

5. Administer assembly in reverse order and make sure to fasten heater nuts first before the earth nuts.

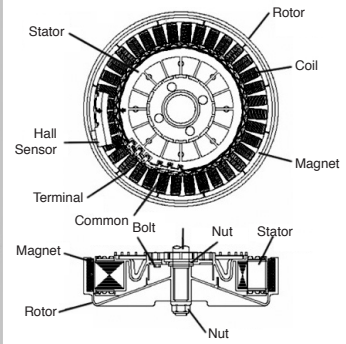
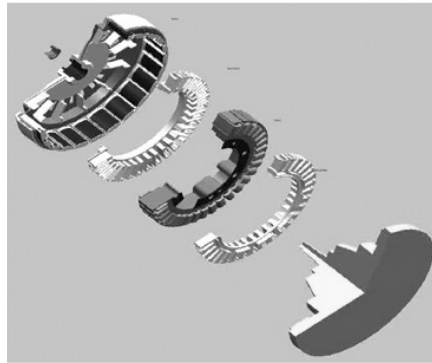


## 8. MOTOR

### 1) Structure of BLDC Motor



BLDC MOTOR



### 2) Power Transmission System of BLDC Motor

#### Sequence diagram of BLDC MOTOR

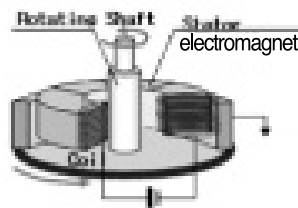


Drum

Motor



#### Direct Drive Motor

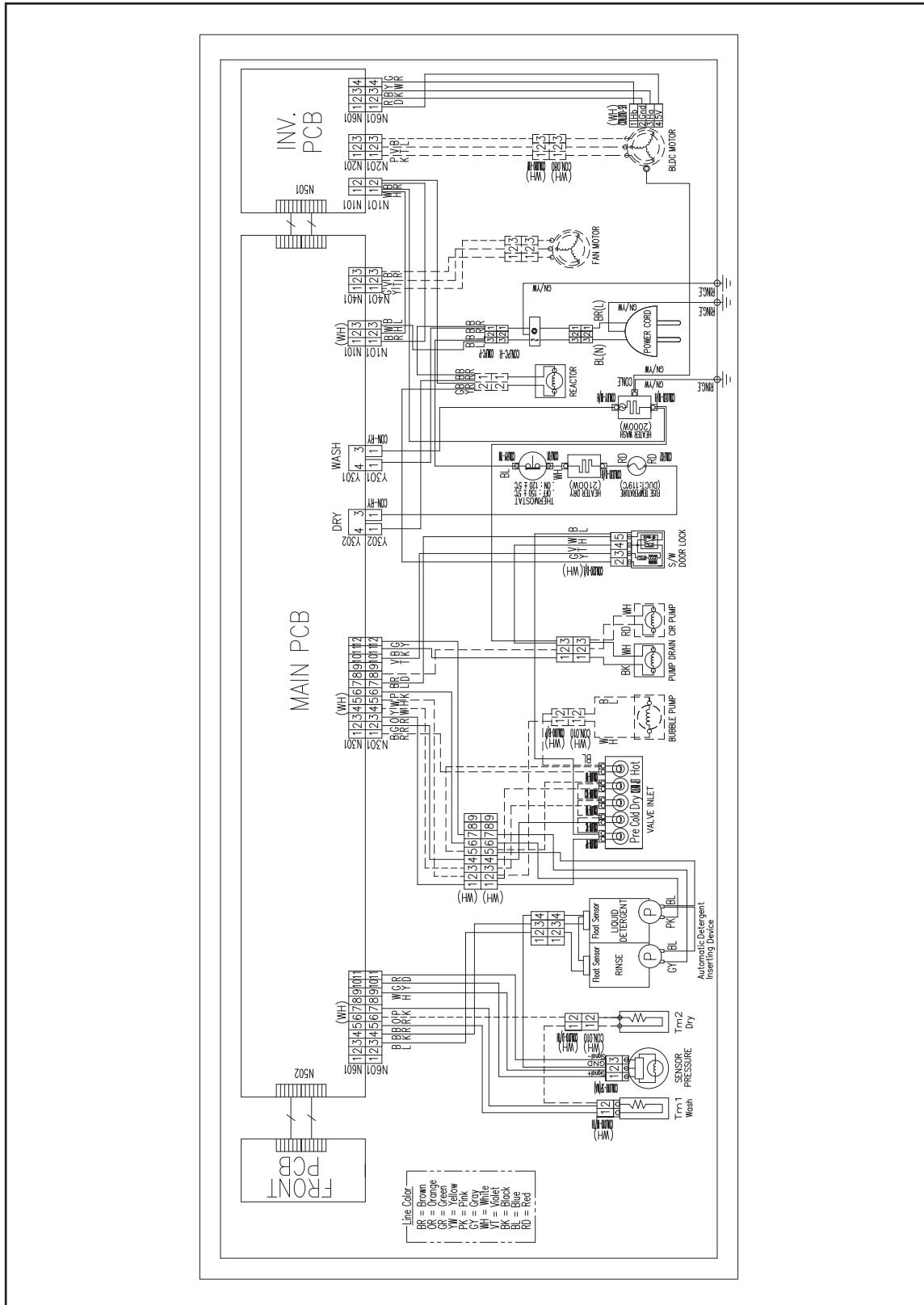


generating high power by rotator  
(a permanent magnet) and stator  
(multiple coils)

### 3) Specification

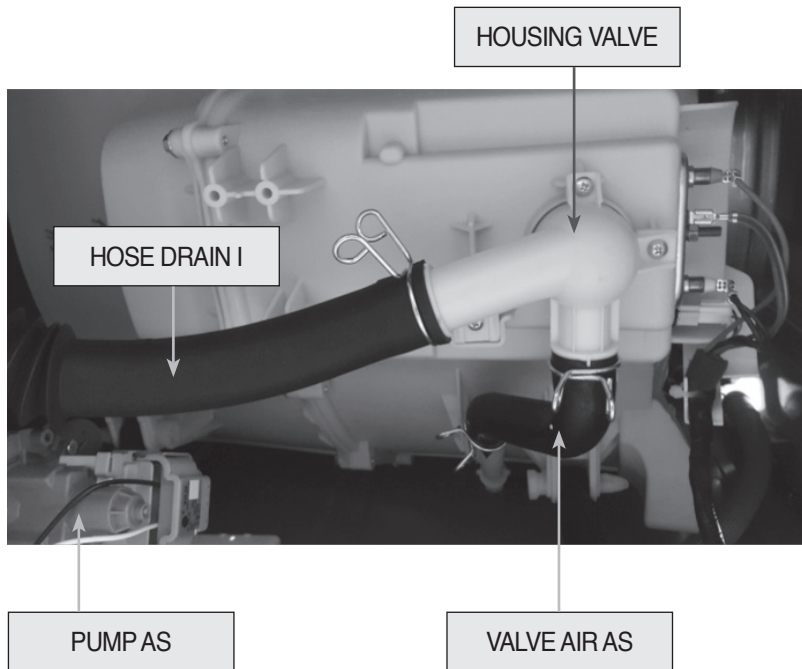
Classification	Item	BLDC : DD Motor
1. General	Rated Voltage	V <sub>m</sub> = 310 [Vdc], Hall IC Voltage 5 [Vdc]
	Insulating Structure	Type B, insulator method
	External Appearance	Shaft connection and stator connection structure, Air-gap : 1mm
	No. of Poles	24 poles, Core: 36 slots, Layer: [30mm]
2. Performance	Consumption Power	390[W]±10[%], during washing (picked value)
	RPM	During Washing: 45RPM, During Spin-drying: 1300RPM
	Output Characteristics	Torque: 300Kgf.cm (washing: 45rpm) Current: 1.5A (washing: 45rpm), AC Input Terminal - Washing: 250Wo, 2.5A (spin-drying: 800rpm) Spin-drying: 380Wo
3. Structure	Stator Resistance	ø265x30H
		U(blue) - V(purple) : 13.8Ω[at 75°C] V(purple) - W(pink) : 13.8Ω[at 75°C] W(pink) - U(blue) : 13.8Ω[at 75°C] cf) Motor resistance at ambient temp. of 7.04 ~ 8.1Ω 0 ~ 35°C
	Rotor	Magnet : 24 segments, bracket, serration
	Hall IC	2-sensor Control Type, Top Central Angle: 7.5 degrees Signal Error Angle (phase difference): 90±5 degrees (based on electric angle)

## 6. WIRING DIAGRAM



## 7. TROUBLE SHOOTING REGARDING DRAIN

### 1) Structure of Dran Parts by TUB



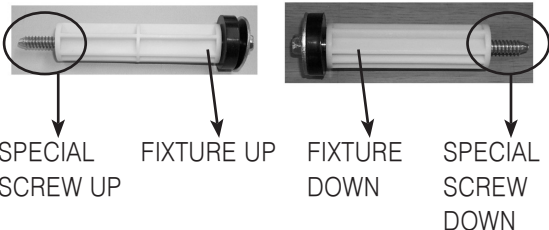

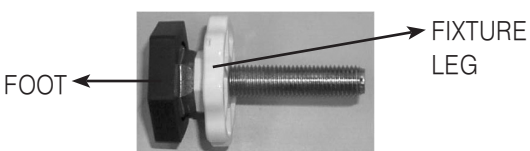
### 2) Checking Methods

- Situation :
  - \* "OE" is shown on PCB.
  - \* Not finishing drain during 10 min.
  - \* The water level can not reach to RESET POINT during 10 min of drain.

Checking Methods	Replacing methods
* Check the hose drain O condition; twisted or frozen.	* replace HOSE DRAIN O
* Check the hose drain O condition, blocked. * DRAIN MOTOR is broken.	* clean the inside of Filter. * replace DRAIN MOTOR


## 8. INSTALLATION GUIDE

### 1) Related Parts and Configuration

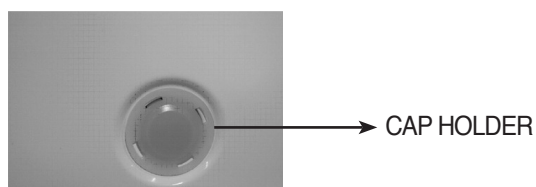
PARTS NAME	FIGURES	REMARKS
FIXTURE UP/ DOWN AS		FIXTURE UP AS (3612008200) : L= 109mm FIXTURE DOWN AS (3612008300) : L=143mm
UNIT SERVICE WRENC		① Remove Fixture UP/DOWN AS ② Adjust Leg
LEG ADJUST AS		

### 2) INSTALLATION PROCESS

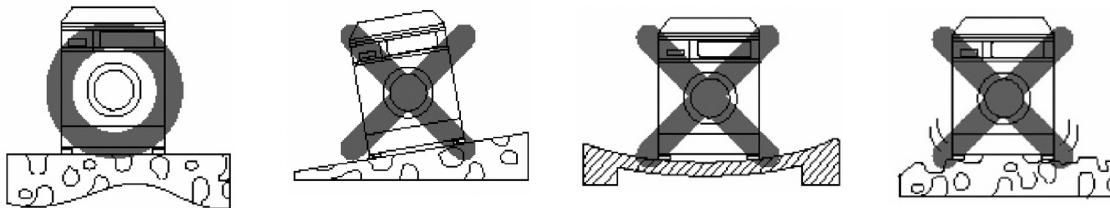
#### ① Remove the FIXTURE UP/DOWN AS

Removal Method	Remarks
	<ul style="list-style-type: none"> <li>☞ Disassemble the FIXTURE UP/DOWN AS by turning CCW direction.</li> <li>☞ Please keep FIXTURE UP/DOWN AS for later use.</li> <li>☞ When fixing FIXTURE UP/DOWN AS, turn it CW direction.</li> </ul>

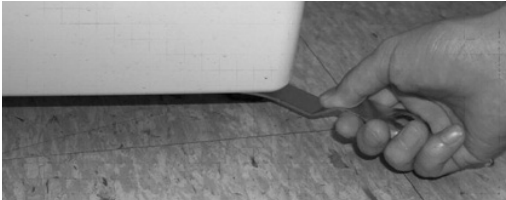
#### ② Insert CAP HOLDER(4EA) after removing FIXTURE UP/DOWN AS.



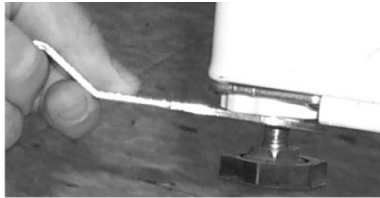
③ Please install the DRUM WASHING MACHINE properly on even and hard floor as below.



④ Adjust the level of washer using LEG ADJUST AS.

Adjusting Method	Remarks
	<ul style="list-style-type: none"> <li>☞ If turned CW, the LEG ADJUST AS moves the washer upward.</li> <li>☞ If turned CCW, the LEG ADJUST AS moves the washer downward.</li> </ul>

⑤ After adjusting level, fix SPECIAL BOLT.

Adjusting Method	Remarks
	<ul style="list-style-type: none"> <li>☆ Please fix the SPECIAL BOLT by rotating it CCW in order to prevent washer vibration.</li> </ul>



## 9. ATTENTION POINT WITH SERVICING

No	Item	Part Name	Checking Point
1	Replacing Thermistor Dry	Thermistor Dry	Keep the Packing from seperating (Hold Packing when replacing) Keep the Packing from folding
2	Replacing Duct B As & Duct Pipe	DUCT B AS & DUCT PIPE	Check the sealing between Duct Pipe & Duct B AS
3	Replacing & Repairing Inlet Valve	Inlet Valve	Use only screw M4*8 for fixing Inlet Valve
4	Replacing Hose Drain	Hose Drain	Keep the sealing condition of Tub O tightly
5	Replacing HOSE A,B,C	HOSE A,B,C	Check the assembling order between INLET BOX & Hose A,C : Pre Wash-Cold
6	Replacing	Heater Wash Heater Wash	Unfastening the nut for fixing earth first then unfasten the nut for fixing heater
			At assembling the heater dry, check if the assembling condition between fixture heater is tight.(little gap on left & right)
			At fastening the nut for fixing the heater wash, keep the protrusion length of bolt to 10~12mm. (if under 10mm, water can leak, and if over 12mm, fixture heater can deform)
7	Replacing "Thermistor Wash"	Thermistor Wash	Unfasten the Nut for fixing heater, replace the thermistor, and fasten the nut for fixing heater
8	Assembling "Hinge Door"	Hinge Door	At fastening screw for fixing Door AS, be careful so that scratching at the related parts does not happen : If the scratching happens, it is possible to be claimed about appearance damage
9	(Dis)assembling	Door As "Door AS"	Be careful about the up/down direction of Door Glass : Keep the indication point of the part code downward.
10	(Dis)assembling "Motor AS"	MOTOR AS	To avoid the injury on the hand, grip the rim of the rotor At initiating the assembling operation of the stator, grip the stator and fasten the screw; at unfastening the screw, grip the stator so that it does not fall.
11	Damper AS	Damper AS	Fixed 4 Dampers with spring when assemble.

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# ABOUT THIS MANUAL

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