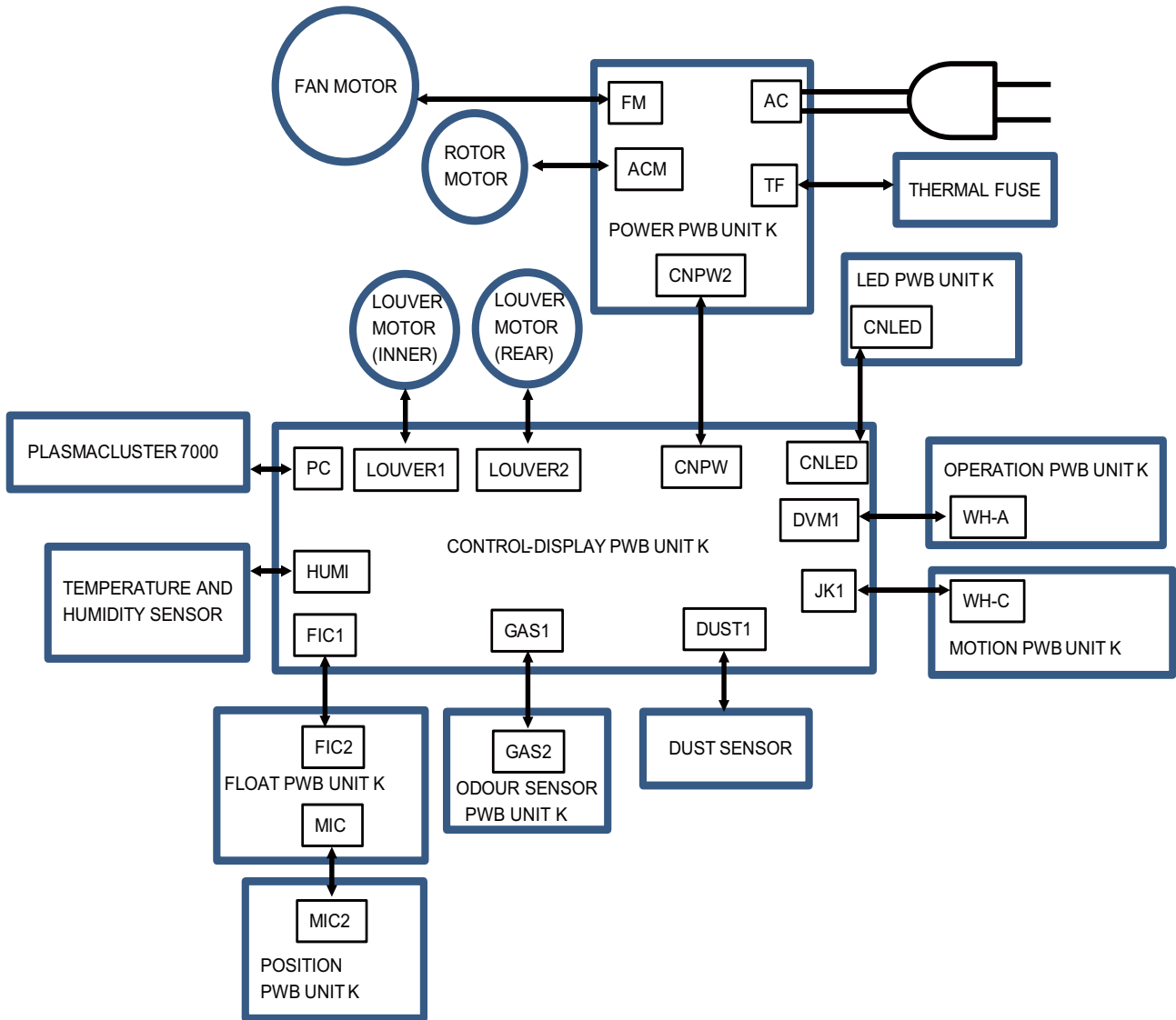


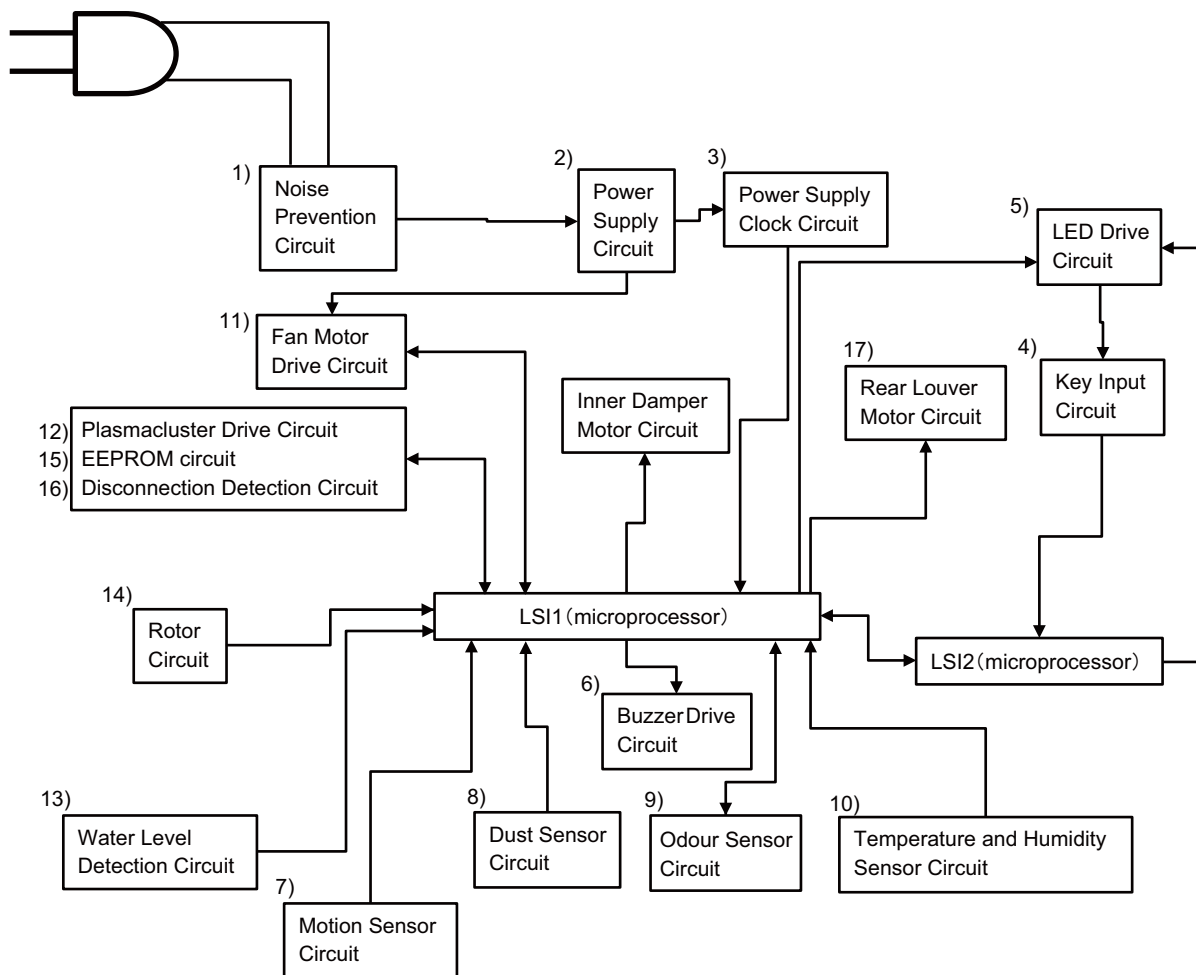
CHAPTER 3. EXPLANATION CIRCUITS

[1] SCHEMATIC DIAGRAM OF CIRCUITS



[2] EXPLANATION OF CIRCUITS

1. BLOCK DIAGRAM



2. EXPLANATION OF CIRCUITS

2.1. NOISE PREVENTION CIRCUIT

This protects the circuits from external noise and power surges entering through the AC plug, and also absorbs noise exiting outward from the AC plug. The circuit consists of film capacitors C1 and C2, varistor VRS1, current fuse FUSE1, and line filter L1.

2.2. POWER SUPPLY CIRCUIT

2.2.1 Vm

The commercial power supply (220-240V AC) passes through current fuse FUSE1, is rectified by diode bridge DB1, smoothed by electrolytic capacitor C3, and supplied as the fan motor power source and the power source for power supply circuit. (Vm= Approx. 311-339V DC)

2.2.2 VL 15V

Output no. 1 is rectified by diode D3, smoothed by electrolytic capacitor C22 and used as power supply VL for the fan motor drive circuit, buzzer drive circuit, and power supply for 12V DC. (VL= Approx. 15 V DC)

2.2.3 VL2 12V

VL2 is made by voltage down through 3 diodes from 15V DC, and used as power supply for louver motor drive. (VL= Approx. 12 V DC)

2.2.4 VCC

Output no.2 is rectified by diode D4, smoothed by electrolytic capacitor C24 and used as power supply VCC for microprocessor LSI1 and LSI2 drive, PCI drive circuit, LED drive circuit, and various sensor circuits. (VL= Approx. 5 V DC)

2.2.5 Vn

VCC is converted to 3.3V as power supply Vn for the flash memory. (Vn= Approx. 3.3 V DC)

2.3. POWER SUPPLY CLOCK GENERATION CIRCUIT

The voltage between the input and output (GND) terminal of DB1 is divided by resistors R1, R2, and R5 and fed into digital transistor Q1 to convert it into a square wave signal of the same frequency as the commercial power supply. The signal passes through resistor R105 and ceramic capacitor C112 is fed into pin 9 of microprocessor LSI1.

Microprocessor LSI1 uses this signal as a reference signal for the time count, and thereby identifies the power supply frequency and performs time control of various types of output.

If the state of this input signal remains “H” or “L” longer than a certain time, microprocessor LSI1 determines that a power failure has occurred and stops all loads.

2.4. KEY INPUT CIRCUIT

When a key is pressed, a strobe signal corresponding to that key is fed into pin no.29 or no.30 of microprocessor LSI2. The strobe signal is detected and the pressed key identified.

- Key ON: “H”
- Key OFF: “L”

2.5. LED DRIVE CIRCUIT

- Static drive circuit

Control and Display PWB Unit (around 2-digit of 7-segment LED) : Plasmacluster Ion Light and Patrolling Light are controlled by static drive.

- Each LED is turned on and off by controlled from pin no.1, no.19 and no.20 of microprocessor LSI1.

Cleanliness Monitor (indirect lightning around front air outlet) : LED106-110 of Operation PWB Unit are controlled by static drive.

- Each LED is controlled by microprocessor LSI2.

- Dynamic drive circuit

Control and Display PWB Unit (around 2-digit of 7-segment LED) : LED except for which are controlled by static drive mentioned above are controlled by dynamic drive.

- LEDs are turned on by repeated “H” and “L” signals are output from pin no 22, 23, 26-31 and 50 of microprocessor LSI1, and controlled by pin no 34-37 of microprocessor LSI1.

Operation PWB Unit (around buttons of top surface) : LED except for which are controlled by static drive mentioned above are controlled by dynamic drive.

- LEDs are turned on by repeated “H” and “L” signals are output from pin no 21-24 of microprocessor LSI2, and controlled by pin no 2 and 25-27 of microprocessor LSI2.

2.6. BUZZER CIRCUIT

Buzzer Bz is sounded by an “H”/“L” pulse signal from pin no.64 of microprocessor LSI1. The sounding frequency of the buzzer is approximately 2 kHz.

2.7. MOTION SENSOR CIRCUIT

2.7.1 PRINCIPLE OF THE MOTION SENSOR

When someone who has higher temperature more than 4 degrees Celcius than background one and moves about 1.0m/s, enters within the viewing angle of motion sensor, 5V is outputted from motion sensor and is fed into pin no.10 of microprocessor LSI1.

It means that someone has been detected.

Except the above conditions, motion sensor is outputted 0V.

2.7.2 CONTROL

Microprocessor LSI1 gets the information about presence or absence of person every 1 second.

When the input value to microprocessor LSI1 is 5V more than twice of 10 times, motion sensor detects people. Except the above condition, no one is in the room.

Then 6 states below the table are determined based on the results both motion sensor and light sensor.

Illuminance	Judgement	Condition of transition to [No one is in the room.]	Condition of transition to [A few people are in the room.]	Condition of transition to [Many people are in the room.]	Remarks
Light	non	—	Motion sensor detects people.	—	
	a few	non-detection for 15 minutes	—	Motion sensor detects people a total of more than 25 seconds in 1 minute.	
	many	—	Motion sensor detects people a total of less than 30seconds in 5 minutes.	—	Once the state shifts to [many people], it maintains for 5 minutes.
Dark	non	—	Motion sensor detects people.	—	
	a few	non-detection for 1hour	—	Motion sensor detects people a total of more than 30seconds in 5 minute.	Once the state shifts to [a few people], it maintains for 5 minutes.
	many	—	Motion sensor detects people a total of less than 30seconds in 5 minutes.	—	Once the state shifts to [many people], it maintains for 5 minutes.

2.8. DUST SENSOR CIRCUIT

Dust Sensor is high sensitivity.

Power is supplied to Dust Sensor (pin no.2&3 are GND and no.5 is Vcc of connector DUST1), and Dust Sensor works by PWM signal.

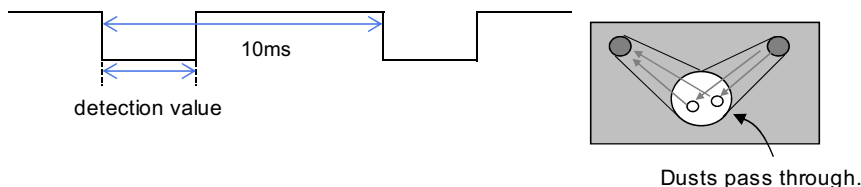
VLED(5V) is supplied to LED in Dust Sensor (pin no.4 of connector DUST1).

Vo(pin no.1 of connector DUST1) is input to pin no.21 of microprocessor LSI1 through R208 and C208.

2.8.1 PRINCIPLE OF DUST SENSOR

Infrared LED inside Dust Sensor is turned on by pulse signal from microprocessor and is reflected by dusts which pass through the interior of the Sensor.

Internal light receiving element detects and amplifies the reflected light, and outputs from output terminal.



- Dust is low: Received light is low. → Output is small. (Period of Lo is short.)
- Dust is much: Received light is much. → Output is large. (Period of Lo is long.)

2.8.2 CONTROL

The first time the unit is operated, the value approximately 2 seconds after the unit is powered on is compared to the initial reference value setting in the microprocessor.

If air is clean, the reference value is updated to the new one. If air is dirty, the reference value is not changed.

When the unit is operated after 2 times, after 2 seconds from start of operation, the value is compared to the reference value of the previous time and the new reference value is decided.

The dust sensor operates continuously while the unit runs and identifies the level of dirtiness by comparing the detection value with the reference value every about 1 second, and fan motor control are performed 5 steps based on the level of dirtiness.

2.9. ODOUR SENSOR CIRCUIT

Odour Sensor is driven by a control signal of the output from pin no.58 of microprocessor LSI1 through R176 and Q603. ("H": drive, "L": stop)

The sensor output signal passes through R177 and C128 and is fed into pin no.56 (the A/D conversion terminal) of microprocessor LSI1.

2.9.1 PRINCIPLE OF THE ODOUR SENSOR

When an odour component such as ammonia and alcohol comes in contact with the surface of the sensor element, which is a Metallic Oxide semiconductor, the resistance changes, and this is used to detect odours such as cigarette smoke and other common odours.

Odour is strong :value of resistance is large. → Output voltage is high.

Odour is weak : value of resistance is small. → Output voltage is low.

2.9.2 CONTROL

The detection value 2 minutes after the unit is powered on is taken as the reference value, and after that the value is detected at 1-second intervals and compared to the reference value to identify the dirtiness of the air, cleanliness monitor display and fan motor control are performed based on the dirtiness of the air.

However, when restart is carried out within 1 minute from the last operation stop, the reference value of the last operation is used.

The odour sensor operates continuously. When the unit stops, the circuit is stopped to reduce standby power consumption.




































However, the odour sensor is running for 1 minute after the unit is stopped.

The update method of reference

Detection value	Reference value
Current level is cleaner than reference value.	The reference value is immediately changed to the current value.
Current level is dirtier than reference value and the level is changing. (odour suddenly increases)	The reference value is kept. When the level becomes cleaner than the reference level later, the reference value is updated.
Current level is dirtier than reference value but level does not change. (natural change)	The reference value is not changed. The reference value is updated to the cleanest state at 8 minute intervals.

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The degree of dirtiness is calculated to total degree of dirtiness together odour sensor level and PM2.5 detection level, and turns on a cleanliness monitor in 7 steps as follows.

Total degree of dirtiness	Lighting color and pattern of cleanliness monitor	Lighting speed
Clean	 Pale blue  Pale blue  White  Pale blue  Pale blue	Lighting
Dirtiness1	 Yellow  White  White  White  Yellow	Slow
Dirtiness2	 Yellow  Yellow  Yellow  Yellow  Yellow	Slow
Dirtiness3	 Orange  Yellow  Yellow  Yellow  Orange	Slow
Dirtiness4	 Orange  Orange  Orange  Orange  Orange	Fast
Dirtiness5	 Red  Orange  Orange  Orange  Red	Fast
Dirtiness6	 Red  Red  Red  Red  Red	Fast

* The lamps on both sides are a bit darker than the three lamps in the center.

2.10. TEMPERATURE AND HUMIDITY SENSOR CIRCUIT

The temperature and humidity in the room are monitored by temperature and humidity sensors.

The temperature sensor detects the temperature by feeding the voltage divided by resistor R131 and thermistor between pin no.3 and 4 of connector HUM11 into pin no.55 of microprocessor LS11.

The humidity sensor detects the humidity by feeding the signal of pin no.2 of connector HUM11 into pin no.54 of microprocessor LS11.

2.11. FAN MOTOR DRIVE CIRCUIT

The fan motor has 4 input terminals and 1 output terminal.

Vm(Pin 7-FM) : DC voltage input that supplies the power for motor revolution (Vm= approx. 311-339V DC).
Vm is created by the power circuit and input directly. Supplied continuously.

GND(Pin 5-FM) : Ground. Vm, Vcc, Vs, PG and all other voltages mean potential differences from GND.

Vcc(Pin 3-FM) : DC voltage input terminal that forms the power supply for the circuit inside the fan motor.
When the unit is running, an "H" signal from pin no.2 of microprocessor LS11 turns on transistor Q128 and supply a voltage approximately equal to VL to Vcc (Vcc = approx. 15 V DC).

Vs(Pin 2-FM) : Input terminal that controls the rotation number of the fan motor (speed command signal).
After supplying Vcc when the unit is running, a PWM (x/256ms) pulse is outputted from pin no.4 of microprocessor LS11, smoothed by the circuit of Q127, Q3, R6-R9 and C13, and supplied a DC voltage to Vs terminal through R6 and C12. (Vs = approx. 0 to 6 V DC).

PG(Pin 1-FM) : Fan motor rotation number output terminal (feedback signal).
Fan motor outputs pulse signal according to the rotation number, which passes through the circuit of R103, R107 and C111, and is fed into pin no.3 of microprocessor LS11.
The microprocessor LS11 obtains the current rotation number based on this PG signal and continuously controls the Vs signal to fit the rotation number to specified one.

2.12. PLASMACLUSTER DRIVE CIRCUIT

The Plasmacluster unit is a power supply unit that supplies high voltage for the emission of ions from the cluster electrode. 5VDC is supplied to the Plasmacluster unit to operate it.

When "H" is outputted from pin no.47 of microprocessor LS11 to turn on driver IC IC101, unit is running. When "L" is outputted from pin no.47 of microprocessor LS11, unit stops.

2.13. WATER LEVEL DETECTION CIRCUIT

This circuit detects whether water is in the humidification tray or not. When there is water in the humidification tray, the magnet of float SW gets closer to the float PWB unit, and Hall IC turns on and outputs the "L" level.

When there is not water in the humidification tray, the magnet leaves from the float PWB unit, and Hall IC turns off and serves as the "H" level by pull-up resistor R134.

The sensor output signal is fed into pin no.7 of microprocessor LS11.

2.14. ROTOR MOTOR DRIVE CIRCUIT

2.14.1 ROTOR POSITION DETECTION CIRCUIT

This is a circuit for detecting the position where the humidification filter is not soaked in the water in the humidification tray.

When the humidification filter frame rotates and reaches to the position where the humidification filter is not soaked in the water in the humidification tray, the magnet gets closer to the rotor position detection circuit K, and Hall IC turns on and outputs the "L" level.

When humidification filter is in the position which is soaked in the water of the humidification tray, the magnet leaves from the float SW, and Hall IC turns off, and serves as the "H" level by pull-up resistor R133.

The sensor output signal is fed into pin no.8 of microprocessor LSI1, and the position of a humidification filter is judged.

2.14.2 ROTOR MOTOR DRIVE CIRCUIT

When the solid state relay SSR1 turns on, 220-240V AC is supplied. When the humidification filter frame rotates, "H" is outputted from pin no.62 of microprocessor LSI1 and SSR1 is driven.

However, when it is judged that water is not in the humidification tray by a water level detection circuit as mentioned above 2.13., solid state relay SSR1 does not turn on.

And also during humidification, it runs intermittently low mode, SSR1 turns on every 3 minutes. (Rotor motor rotates 1 revolution per about 1 minute, and stops about 2 minutes.)

2.15. EEPROM

Data about exchange integral time of unit etc. are read out / written in EEPROM which is mounted at PCI(CKITTA272AKKZ) by using the repetitive signal "H" "L" to input or output to pin no.24 and 25 of microprocessor LSI1 due to operating time.

The code information to identify a genuine product or not is also memorized in EEPROM.

2.16. DETECTION CIRCUIT OF CONNECTOR DETACHMENT FOR PCI UNIT

This is a circuit to check whether PCI unit (CKITTA272AKKZ) is connected correctly.

When PCI unit is not connected, the signal fed into microprocessor LSI1 becomes "L" due to pull-down resistor R123.

When PCI unit is connected, the signal fed into microprocessor LSI1 becomes "H" because 5V is applied from PCI unit.

It is checked whether PCI unit (CKITTA272AKKZ) is connected or not by using these input voltages "L" "H".

2.17. LOUVER MOTOR CIRCUIT

Two louver motors are controlled.

(1) Inner Damper Motor (Louver Motor 1): 12V AC is supplied constantly to pin no.1 of the connector STM (LOUVER1).

When the unit is turned on, "H" is outputted from pin no.42, 57, 61 and 48 of microprocessor LSI1, and "L" is outputted from pin no.2-5 of the connector LOUVER1 through the IC101.

(2) Rear Louver Motor (Louver Motor 2): 12V AC is supplied constantly to pin no.1 of the connector STM (LOUVER2).

When the unit is turned on, "H" is outputted from pin no.41, 40, 39 and 38 of microprocessor LSI1, and "L" is outputted from pin no.2-5 of the connector LOUVER2 through the IC102.

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[3] TEST MODE

1. Overview Test mode is used to check the operation of the circuit boards, sensors, and load outputs.
2. Entering test mode Turn on the power while pressing the "88" button and the "MODE" button.
3. Exiting test mode Pushing the "ON / OFF" button or wait for about 1 minute after turning off the power.
4. Description Follow the procedures below to check the operation of the circuit boards, sensors, and load outputs.

[STEP.1] All LED turn on Test

Turn on the power while pressing the "88" button and "MODE" button, a buzzer beeps and the test mode is set.

No.	Loads Output					Lamps Output (Upper side: Operation Panel Lower side: Front)																				
1	(Chid Lock)		(Filter)			SLEEP MAX POLLON MED MIN					HUMIDIFY		Plasmacluster Ion SPOT		Clean Ion Shower	INTELLIGENT										
	(Air Outlet LED)					● ● ● ● ● *3					Green Green Green Green Green															
	Fan Motor	PCI	Humid motor	Rear Louver	Inner Dumper	FM	PCI	HUM	RLM	DMP	ON (MAX)	OFF	ON	Open (3sec)	Nomal (9sec)	PM 2.5	☁	≡	●	☼	Ion	88	°C	W	%	h
				*1	*1											*2	*2	*2		*3	*3					

- *1 Make sure that the rear louver moves to the fully open position. (About 3 seconds)
Make sure that the internal damper moves to the standard position. (About 9 seconds)
Even if you press the "INTELLIGENT" button during operation and proceed to [STEP 2], the motor will continue to operate until operation is completed.
- *2 Make sure that PM lamp, dust lamp, and odour lamp are white.
- *3 Make sure that the Cleanliness Monitor (3 color LED × 5) is green.
Make sure that ● lamp and ☼ lamp are green.
Make sure that the air outlet LED (white LED × 5) lights up.

[STEP.2] Model code Test. And red LED turn on Test.

Press "INTELLIGENT" button. The buzzer beeps and goes to No. 2.
Even if you press the "INTELLIGENT" button, the buzzer sounds "beep" 3 times and if you can not proceed to No. 2, the circuit board is defective.
At this time, the ● lamp or ☼ lamp does not turn on.

No.	Loads Output					Lamps Output (Upper side: Operation Panel Lower side: Front)																				
2	(Chid Lock)		(Filter)			x x x x x					x x x x x *6					Red Red Red Red Red										
	(Air Outlet LED)					x x x x x					Red Red Red Red Red															
	Fan Motor	PCI	Humid motor	Rear Louver	Inner Dumper	FM	PCI	HUM	RLM	DMP	ON (MAX)	(OFF)	ON	OFF	OFF	PM 2.5	☁	≡	●	☼		*4	x	x	x	x
												ON								*5	*5					

- *4 **Model Code TEST** Make sure that "Model code" and "22" are alternately displayed in the 7 seg display.
Model code : KCG60EU 「61」
- *5 Make sure that ● lamp and ☼ lamp are red.
- *6 Make sure that the Cleanliness Monitor (3 color LED × 5) is red.

[STEP.3] LSI-1 Program version Test And orange LED turn on Test.

Press the "Clean Ion Shower" button. Then the buzzer beeps and goes to No. 3.


No.	Loads Output					Lamps Output (Upper side: Operation Panel Lower side: Front)																					
3	(Chid Lock)		(Filter)			x x x x x					x x x x x *8					Blue Blue Blue Blue Blue											
	(Air Outlet LED)					x x x x x					Blue Blue Blue Blue Blue																
	Fan Motor	PCI	Humid motor	Rear Louver	Inner Dumper	FM	PCI	HUM	RLM	DMP	ON (MAX)					PM 2.5	x	x	●	x	x	*7	02	x	x	x	x
																				*8							

- *7 **LSI-1 Program version TEST**. Make sure that "02" and "33" are alternately displayed in the 7 seg display.
- *8 Make sure that the Cleanliness Monitor (3 color LED × 5) is blue. Make sure that ● lamp is orange.

[STEP.7] Humidity sensor Test. Humidification "OFF" detection switch Test. And more.

Press the "MODE" button. Then the buzzer beeps and goes to No. 7.
 (If all of the dust, gas, fan, light sensor and float SW are not acceptable, the "MODE" button will not be valid.)

No.	Loads Output					Lamps Output (Upper side: Operation Panel Lower side: Front)							
7	(Chid Lock)		(Filter)			x	x						
	x		x			x	x	HUMIDIFY	Plasmacluster Ion SPOT	Clean Ion Shower		INTELLIGENT	
						x	x	MIN *23	x	x	x	x	
	Fan Motor	PCI	Humid motor	Rear Louver	Inner Dumper	x x x x x	x	x	x	x	x	x	
FM	PCI	HUM	RLM	DMP									
ON (MIN) *23	ON	ON	OFF Swing	OFF Swing	x	☁ *21	x		x	x	*22	*20	
			↓	↓								x x	
			Swing	Swing								% x	

- *20 Humidity sensor test. "Value detected by humidity sensor" and "77" are alternately displayed in 7 segments.
 ⇒ Make sure that "the value detected by the humidity sensor" is not greatly different from the temperature near the unit.
- *21 Make sure that the dust monitor turns on.
- *22 Make sure that the  lamp turns on.
 If the lamp is not lit after 3 minutes or more from the start of inspection, the humidification "OFF" detection switch inspection (The buzzer will continue to sound until the lamp lights up. However, pressing "INTELLIGENT" will stop the buzzer.)
- *23 After confirming that the air volume became weak, Confirm that there is no abnormal sound. (motor noise, PCI noise, etc)
- *24 When pushing the "Clean ion shower" button, make sure that the inner damper repeats the opening and closing operation.
 When the "Plasmacluster Ion SPOT" button is pressed, make sure that the rear louver repeats the opening and closing operation.

[STEP.8] Initialize user setting contents

Press the "timer" button. Then the buzzer beeps and goes to No.8.
 The "timer" button is invalid if the motion sensor does not detect "person".

No.	Loads Output					Lamps Output (Upper side: Operation Panel Lower side: Front)							
8	(Chid Lock)		(Filter)			x	●						
	x		●			x	x	HUMIDIFY	Plasmacluster Ion SPOT	Clean Ion Shower		INTELLIGENT	
						x	x	x	x	x	x	x	
	Fan Motor	PCI	Humid motor	Rear Louver	Inner Dumper	x x x x x	x	x	x	x	x	x	
FM	PCI	HUM	RLM	DMP									
Same as No. 7. No confirmation required												*26	
					x	x	x		x	x	x	x x	
												x h	

- *25 Make sure that the "filter" lamp is lit. When the "timer" button is pressed, initialization of the user set value is executed. If initialization is not required, skip this step and go to step 9.
- *26 Confirm that "88" is blinking in 7 seg display.

[STEP.9] End of product electrical inspection mode

Press the "Power ON/OFF" button. The buzzer (Long Beep) rings, exits test mode and returns to normal operation.

No.	Loads Output					Lamps Output (Upper side: Operation Panel Lower side: Front)							
9	(Chid Lock)		(Filter)			x	x						
	x		x			x	x	HUMIDIFY	Plasmacluster Ion SPOT	Clean Ion Shower		INTELLIGENT	
						x	x	x	x	x	x	x	
	Fan Motor	PCI	Humid motor	Rear Louver	Inner Dumper	x x x x x	x	x	x	x	x	x	
FM	PCI	HUM	RLM	DMP									
OFF	OFF	OFF	Close (3sec)	Normal (9sec)								x x	
			↓	↓	x	x	x		x	x	x	x x	
			OFF	OFF								x x	

- Make sure that all lamps are turned off.
- Make sure that fan motor output and PCI output are OFF.
- Make sure the rear louver is closed.

[4] ERROR MODE

Overview

Error mode is a self-diagnostic function that uses sensors to detect abnormal conditions and failures in the unit and circuits, and executes load operation and error displays based on what is detected. The unit has 5 error modes.

List of error mode

[888] Lamp	Error Mode
C1	Fan motor failure
E2	Humidification "off" position detection error
C4	"°C" Lamp Blinks Temperature sensor failure
	"%" Lamp Blinks Humidity sensor failure
C6	Communication between microcomputers failure
C9	No Ion Generating Unit failure

1) Fan motor rpm error

- (1) Overview
Error mode that activates when locking of the fan motor or an open connector is detected.
- (2) Detection time
During all modes when unit is running.
- (3) Conditions to occur
This error mode activates when rotation of the fan motor can not be detected for 15 seconds.
- (4) Error display
"C1" indication flashes in [88] Lamp.
- (5) Load operation
All loads are immediately turned off and operation is stopped.
- (6) Solution
 - 1) It is possible that this error mode is canceled, when the "Power ON/OFF" button of the main body is pushed. Also, unplug the AC plug from the outlet and wait for about 1 minute to cancel. However, it becomes same error mode if the cause is not removed.
 - 2) Check that the connector of the fan motor is inserted, otherwise, replace the fan motor or the circuit board.

2) Humidification "off" position detection error

- (1) Overview
Error mode that operates when a humidifying filter motor lock or connector open is detected.
- (2) Detection time
During all modes when unit is running.
- (3) Conditions to occur
This error mode activates when there is not the state change of the position detection SW during humidifying filter motor operating for 4minutes.
(In normally, the position detection SW is ON for about 1 second once in about 50 ~ 60 seconds.)
- (4) Error display
"E2" indication flashes in [88] Lamp.
- (5) Load operation
The humidifying filter motor turns off, and the humidifying operation stops.
- (6) Solution
 - 1) It is possible that this error mode is canceled, when the "Power ON/OFF" button of the main body is pushed. Also, unplug the AC plug from the outlet and wait for about 1 minute to cancel. It is removed by the change of the operation mode. (Not removed by the change of the fan mode.) When the float switch detects a change of "there is no water" to "there is water" during operation, it is automatically canceled. However, it becomes same error mode if the cause is not removed.
 - 2) Install the humidification filter, filter frame, tray, and float precisely.
 - 3) Check that the connector of the Humid motor and Humid position pwb unit is inserted definitely.
 - 4) Replace the Humid motor or circuit board.

3) Temperature and Humidity sensor error

- (1) Overview
Error mode that activates when a short-circuit or broken wire is detected in the circuit to detect humidity. Operation of all modes continues and the unit can be operated normally.
- (2) Detection time
During all modes when unit is running excluding 2 seconds immediately after starting operation. (It is not detected for 5 seconds immediately after plugging the AC plug into the outlet.)
- (3) Conditions to occur
Detect short circuit or disconnection of wiring between CPU and sensor.

Temperature sensor

Sensor output voltage [V]	Temperature	Status
0.000 ~0.527	Over 94°C	failure
0.527~4.766	-36°C~93°C	normal
4.766 ~5.000	Under -36°C	failure

Humidity sensor

Sensor output voltage [V]	Humidity	Status
0.000~0.029	Under 5%	failure
0.029~3.975	6%~99%	normal
3.975~5.000	Over 100%	failure

- (4) Error display
 "C4" indication flashes in [88] Lamp.
 Operation of all modes continues and the unit can be operated normally.
- (5) Load operation
 All load outputs continue normal operation. (Control for humidity 30%)
 All switches are effective as usual with out "Timer" button and "88" button.
- (6) Solution
 Check that the connector of the temperature and humidity sensor is inserted.
 Otherwise, replace the temperature and humidity sensor or the circuit board.

4) Communication between microcomputers error

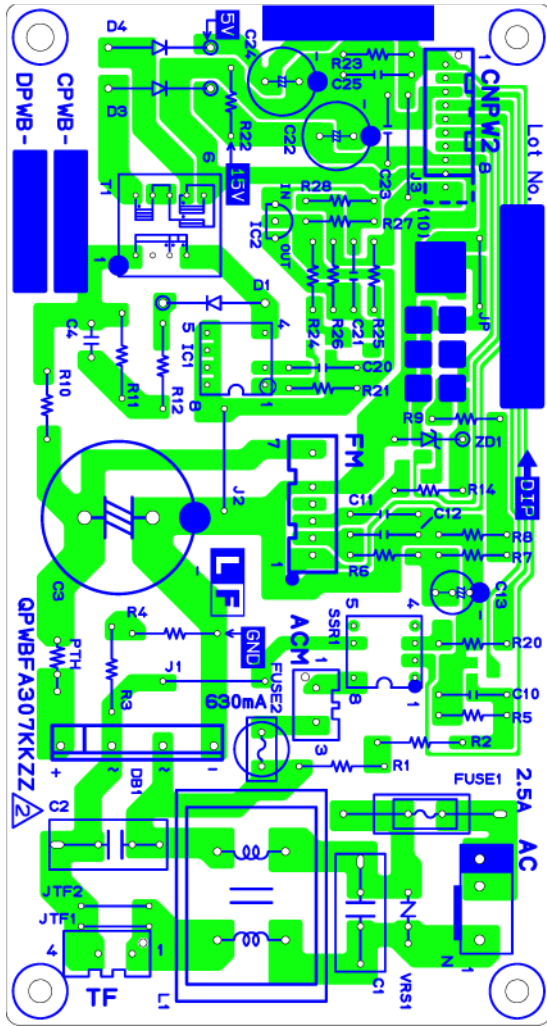
- (1) Overview
 Error mode that activates when the communication between LSI1(MASTER) and LSI2(SLAVE) becomes interrupted.
- (2) Detection time
 Always on during power supply.
- (3) Conditions to occur
 It detects when normal data transmission / reception has been interrupted for 8 seconds or more between the master LSI (control / display board) and the slave LSI (operation board).
- (4) Error display
 "C6" indication flashes in [88] Lamp.
- (5) Load operation
 All loads are immediately turned off and operation is stopped.
- (6) Solution
 It is possible that this error mode is canceled, when you unplug the AC plug from the outlet and wait about 1 minute.
 However, it becomes same error mode if the cause is not removed.
 Check that the connector is inserted. Otherwise, replace the circuit board.

5) No Ion Generating Unit Error

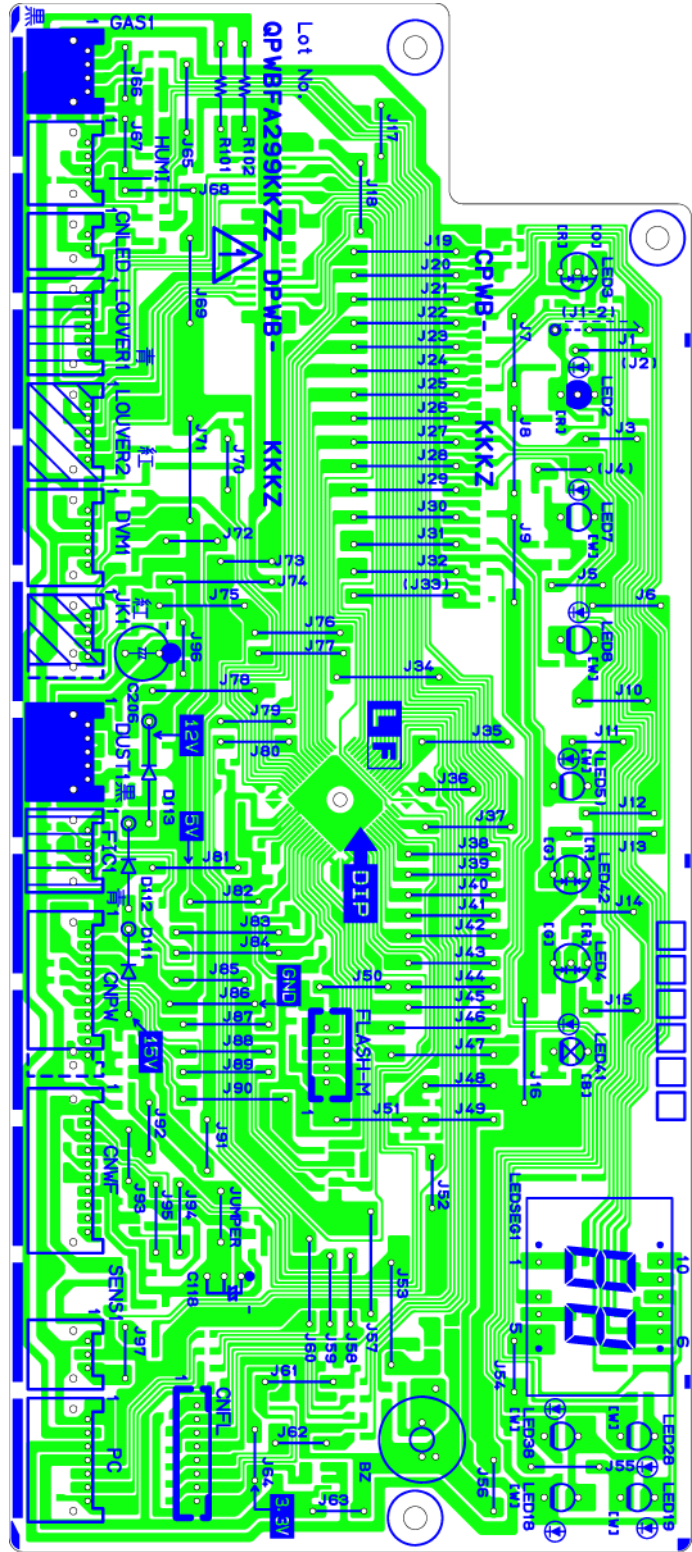
- (1) Overview
 Error mode that activates when "Ion Generating Unit" is not attached.
- (2) Detection time
 During all modes when unit is running.
- (3) Conditions to occur
 During all modes when unit is running.
- (4) Error display
 "C9" indication flashes in [88] Lamp.
 Plasmacluster sign (blue LED) turn off.
- (5) Load operation
 Ion generating unit outputs stop. Other outputs continue as usual.
 All switches are effective as usual with out "Timer" button and "88" button.
- (6) Solution
 Make sure that the ion generation unit is attached correctly
 Make sure that harness is correctly connected to the circuit board.
 Otherwise, replace "Ion Generating Unit" or the circuit board.

[5] PRINTED WIRING BOARD

Power Supply Substrate



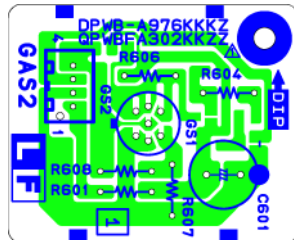
Control - Display Substrate



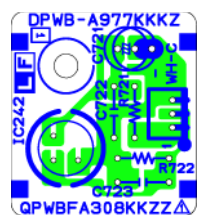
Position Substrate



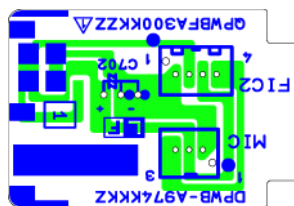
Odor Sensor Substrate



Motion Substrate

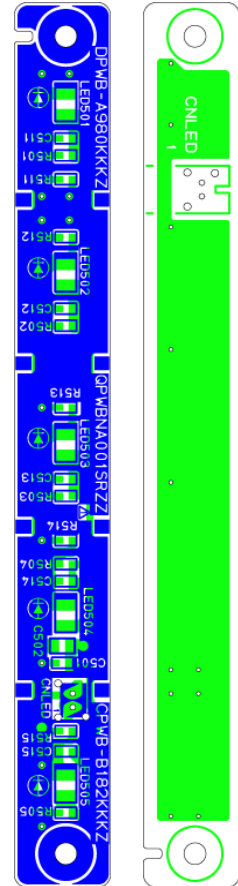
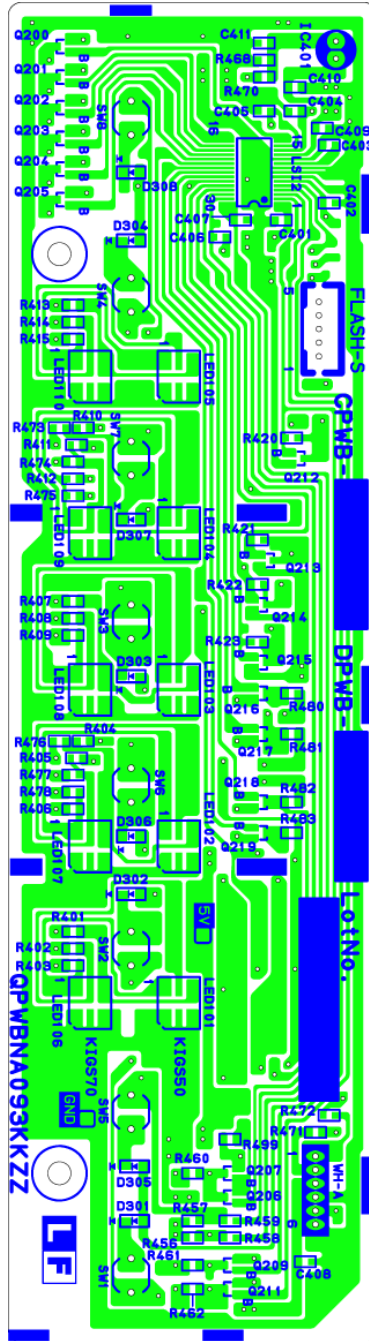
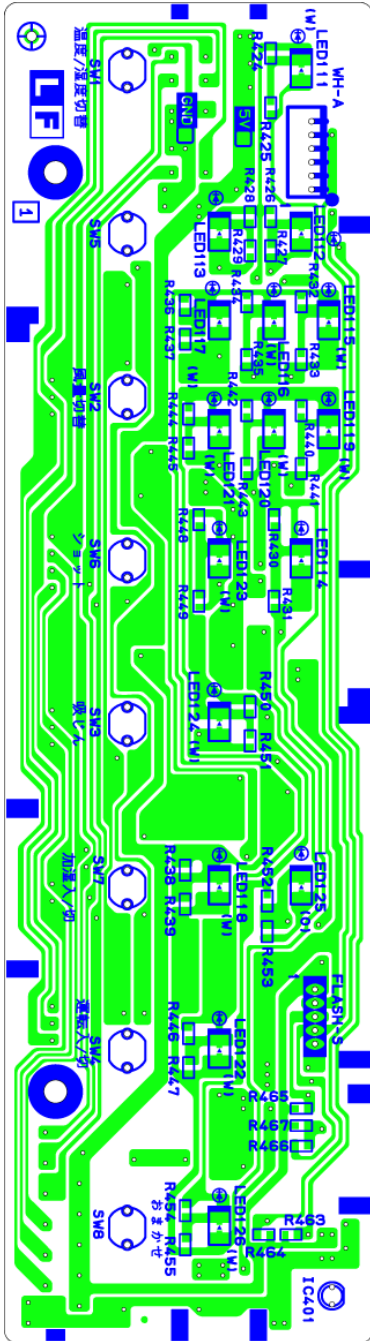


Float Substrate



Operation Substrate

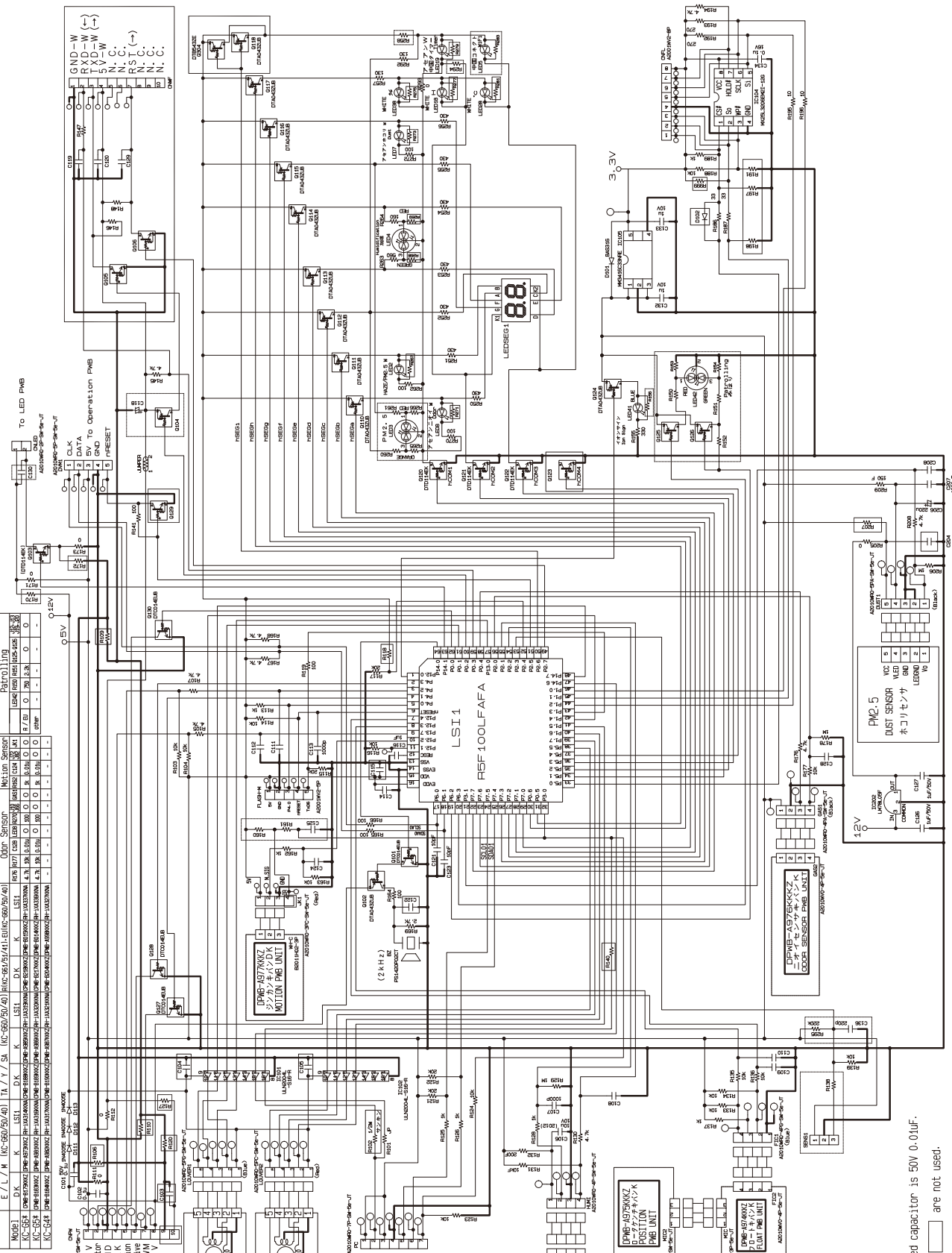
LED Substrate



セイボロボウジキパンク
CONTROL-DISPLAY PWB UNIT

Difference Table

Model	5 / L / M (KCG50/50/40)	II / Y / SL (KCG50/50/40)	III / Y / SL (KCG50/50/40)	Other Sensor	Motor Sensor	Part(1) Part
KC-50A	○	○	○	○	○	○
KC-50B	○	○	○	○	○	○
KC-50C	○	○	○	○	○	○
KC-50D	○	○	○	○	○	○
KC-50E	○	○	○	○	○	○
KC-50F	○	○	○	○	○	○
KC-50G	○	○	○	○	○	○
KC-50H	○	○	○	○	○	○
KC-50I	○	○	○	○	○	○
KC-50J	○	○	○	○	○	○
KC-50K	○	○	○	○	○	○
KC-50L	○	○	○	○	○	○
KC-50M	○	○	○	○	○	○
KC-50N	○	○	○	○	○	○
KC-50O	○	○	○	○	○	○
KC-50P	○	○	○	○	○	○
KC-50Q	○	○	○	○	○	○
KC-50R	○	○	○	○	○	○
KC-50S	○	○	○	○	○	○
KC-50T	○	○	○	○	○	○
KC-50U	○	○	○	○	○	○
KC-50V	○	○	○	○	○	○
KC-50W	○	○	○	○	○	○
KC-50X	○	○	○	○	○	○
KC-50Y	○	○	○	○	○	○
KC-50Z	○	○	○	○	○	○

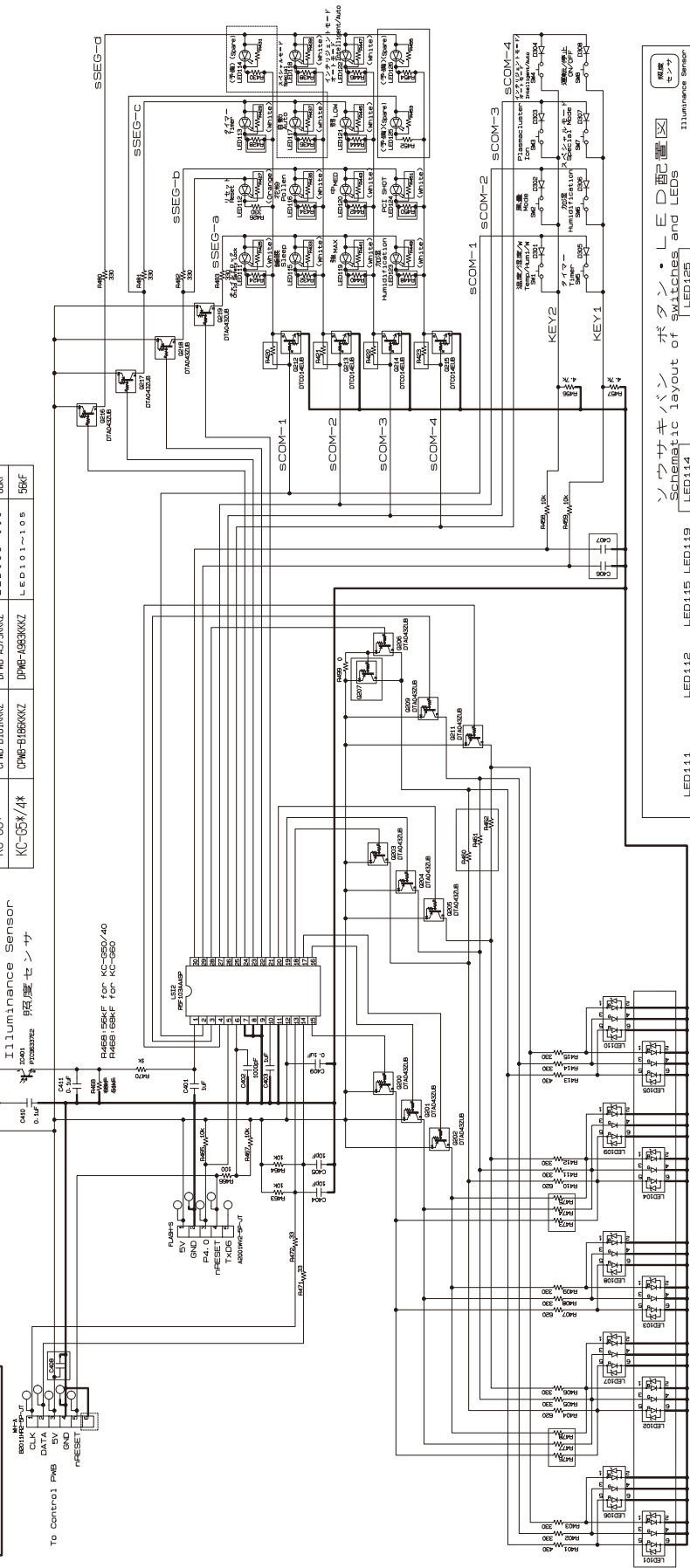


- Note
1. Unspecified capacitor is 50V 0.01uF.
 2. Parts in are not used.

Difference Table

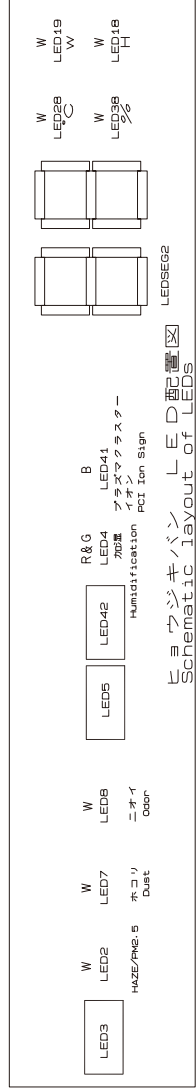
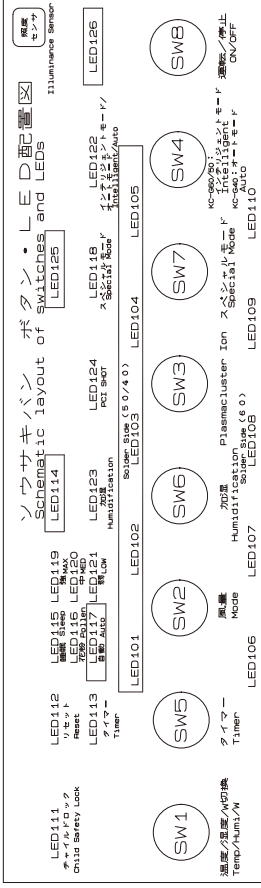
MODEL	DK	K	3-color LED	PH69
KC-G6*	CPMB-B181KKKZ	DPMB-A975KKKZ	LED106~110	66F
KC-G5*/4*	CPMB-B181KKKZ	DPMB-A962KKKZ	LED101~109	56F

CPMB-B181/186KKKZ
ソフタキバン
OPERATION PWB UNIT

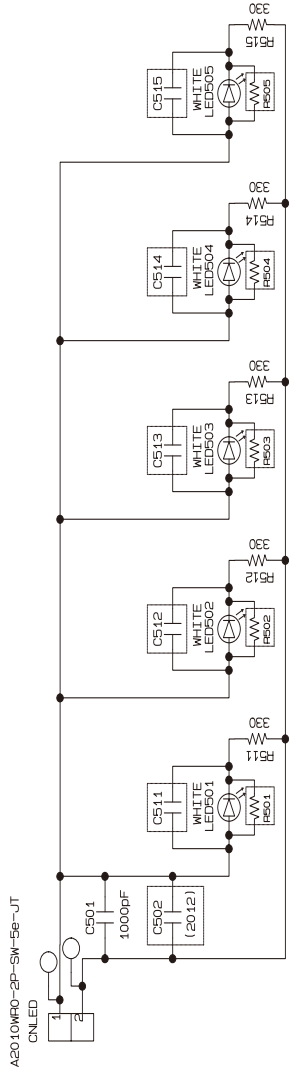


LED101~105: for KC-G50/40
LED106~110: for KC-G60

- Note
1. Unspecified capacitor is 5.0V 0.01uF.
 2. Parts in are not used.
 3. LED which color is not specified is white.



CPWB-B182KKKZ
 LED 5mm K
 LED PWB UNIT



Note

1. Parts in () or [] are not used.
2. Unspecified resistor is size of 1608 and 1/10W.