

## 4. CONTROL FUNCTIONS

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## 4-1. Room Temperature Control

### 4-1-1. U-25PZ3E5, U-36PZ3E5, U-50PZ3E5, U-60PZ3E5A, U-71PZ3E5A U-36PZH3E5, U-50PZH3E5, U-60PZH3E5

- The body sensor or remote controller sensor detects temperature in the room. The detected temperature is called the room temperature. The body sensor is the one contained in the indoor unit.

	Body sensor is enabled	Remote controller sensor is enabled
Set temp.	Set temp. in remote controller	Set temp. in remote controller
Detected temp. by sensor	Detected temp. by body sensor	Detected temp. by remote controller sensor
Room temp.	Detected temp. by body sensor - *correction temp.	Detected temp. by remote controller sensor

- The thermostat is turned ON or OFF according to the following  $\Delta T$ .

$\Delta T$ (Cooling)	$\Delta T = \text{room temp.} - \text{set temp. (set temp. in remote controller)}$
$\Delta T$ (Heating)	$\Delta T = \text{set temp.} - \text{room temp.}$

※ Correction temperature (only during heating)

If the indoor unit is installed on the ceiling, temperature near the ceiling is higher than near the floor. When the body sensor is enabled, lower temperature near the floor must be considered. To correct this difference in temperature, the correction temperature is used.

The factory setting for the correction temperature is different depending on the model. See "4-11. Parameter".

Example: Cooling temperature correction

4-Way Cassette (correction temperature: 0 degrees)

Body sensor is enabled

Set temp. in remote controller	28°C	28°C	28°C
Detected temp. by sensor	30.0°C	26.5°C	26.0°C
Detected temp. by body sensor	30.0°C	26.5°C	26.0°C
Detected temp. by remote controller sensor	30.0°C	26.5°C	26.0°C
Room temp. = temp. detected by body sensor	30.0°C =30.0	26.5°C =26.5	26.0°C =26.0
$\Delta T$	+2.0deg	-1.5deg	-2.0deg
	Thermostat ON	Thermostat ON	Thermostat OFF

Example: Heating temperature correction

4-Way Cassette (correction temperature: 4 degrees)

Body sensor is enabled

Set temp. in remote controller	20°C	20°C	20°C
Detected temp. by sensor	17.0°C	25.5°C	26.0°C
Detected temp. by body sensor	17.0°C	25.5°C	26.0°C
Detected temp. by remote controller sensor	13.0°C	21.5°C	22.0°C
Room temp. = temp. detected by body sensor - 4 deg	13.0°C =17.0-4 deg	21.5°C =25.5-4 deg	22.0°C =26.0-4 deg
$\Delta T$	+7.0deg	-1.5deg	-2.0deg
	Thermostat ON	Thermostat ON	Thermostat OFF

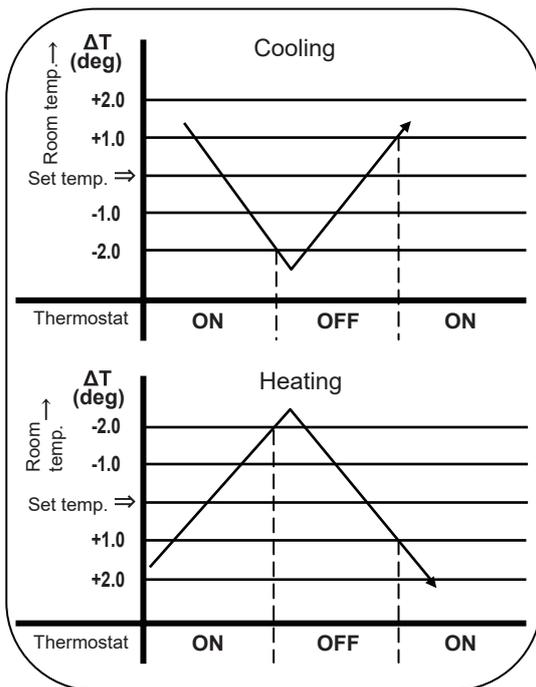
Remote controller sensor is enabled

Set temp. in remote controller	28°C	28°C	28°C
Detected temp. by sensor	30.0°C	27.0°C	26.5°C
Detected temp. by body sensor	30.0°C	27.0°C	26.5°C
Detected temp. by remote controller sensor	30.0°C	27.0°C	26.5°C
Room temp. = temp. detected by remote controller sensor	30.0°C =30.0	27.0°C =27.0	26.5°C =26.5
$\Delta T$	+2.0deg	-1.0deg	-1.5deg
	Thermostat ON	Thermostat ON	Thermostat OFF

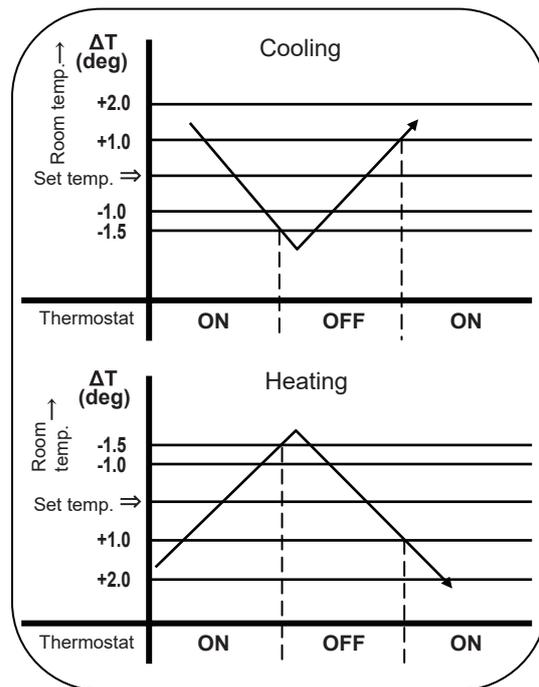
Remote controller sensor is enabled

Set temp. in remote controller	20°C	20°C	20°C
Detected temp. by sensor	17.0°C	21.0°C	21.5°C
Detected temp. by body sensor	21.0°C	25.0°C	25.5°C
Detected temp. by remote controller sensor	17.0°C	21.0°C	21.5°C
Room temp. = temp. detected by remote controller sensor	17.0°C =17.0	21.0°C =21.0	21.5°C =21.5
$\Delta T$	+3.0deg	-1.0deg	-1.5deg
	Thermostat ON	Thermostat ON	Thermostat OFF

Body sensor is enabled



Remote sensor is enabled



- (1) The thermostat does not turn ON 3 minutes after it turns OFF.
- (2) The thermostat does not turn OFF for 60 minutes during the test run mode. (Forced thermostat ON)  
\*However, the thermostat turns OFF if an alarm occurs.
- (3) The thermostat turns OFF when  $\Delta T$  continues in thermostat OFF zone for 3 minutes.

#### 4-1-2. U-100PZ3E5, U-125PZ3E5, U-140PZ3E5 U-100PZ3E8, U-125PZ3E8, U-140PZ3E8

- The body sensor or remote controller sensor detects temperature in the room. The detected temperature is called the room temperature. The body sensor is the one contained in the indoor unit.

	Body sensor is enabled	Remote controller sensor is enabled
Set temp.	Set temp. in remote controller	Set temp. in remote controller
Detected temp. by sensor	Detected temp. by body sensor	Detected temp. by remote controller sensor
Room temp.	Detected temp. by body sensor - *correction temp.	Detected temp. by remote controller sensor

- The thermostat is turned ON or OFF according to the following  $\Delta T$ .

$\Delta T$ (Cooling)	$\Delta T = \text{room temp.} - \text{set temp. (set temp. in remote controller)}$
$\Delta T$ (Heating)	$\Delta T = \text{set temp.} - \text{room temp.}$

※ Correction temperature (only during heating)

If the indoor unit is installed on the ceiling, temperature near the ceiling is higher than near the floor. When the body sensor is enabled, lower temperature near the floor must be considered. To correct this difference in temperature, the correction temperature is used.

The factory setting for the correction temperature is different depending on the model. See “4-11. Parameter”.

Example: Cooling temperature correction  
4-Way Cassette (correction temperature: 0 degrees)  
Body sensor is enabled

Set temp. in remote controller	28°C	28°C	28°C
Detected temp. by sensor	30.0°C	27.0°C	26.5°C
Detected temp. by body sensor	30.0°C	27.0°C	26.5°C
Detected temp. by remote controller sensor	30.0°C	27.0°C	26.5°C
Room temp. = temp. detected by body sensor	30.0°C =30.0	27.0°C =27.0	26.5°C =26.5
$\Delta T$	+2.0deg	-1.0deg	-1.5deg
	Thermostat ON	Thermostat ON	Thermostat OFF

Example: Heating temperature correction  
4-Way Cassette (correction temperature: 4 degrees)  
Body sensor is enabled

Set temp. in remote controller	20°C	20°C	20°C
Detected temp. by sensor	17.0°C	25.0°C	25.5°C
Detected temp. by body sensor	17.0°C	25.0°C	25.5°C
Detected temp. by remote controller sensor	13.0°C	21.0°C	21.5°C
Room temp. = temp. detected by body sensor - 4 deg	13.0°C =17.0-4 deg	21.0°C =25.0-4 deg	21.5°C =25.5-4 deg
$\Delta T$	+7.0deg	-1.0deg	-1.5deg
	Thermostat ON	Thermostat ON	Thermostat OFF

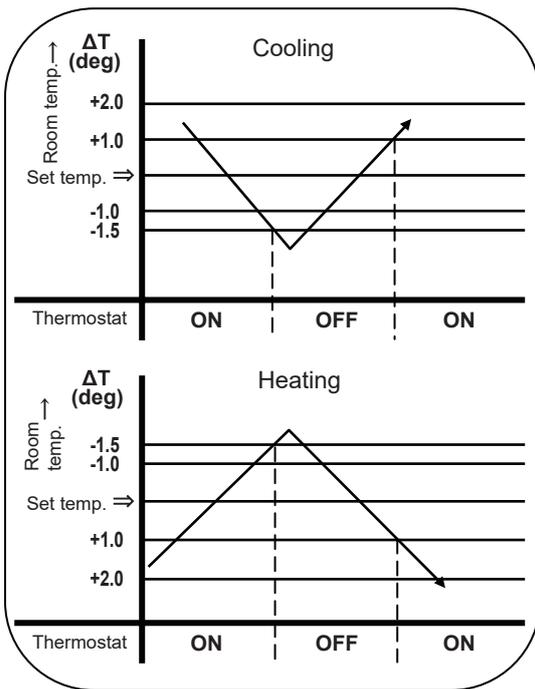
Remote controller sensor is enabled

Set temp. in remote controller	28°C	28°C	28°C
Detected temp. by sensor	30.0°C	27.0°C	26.5°C
Detected temp. by body sensor	30.0°C	27.0°C	26.5°C
Detected temp. by remote controller sensor	30.0°C	27.0°C	26.5°C
Room temp. = temp. detected by remote controller sensor	30.0°C =30.0	27.0°C =27.0	26.5°C =26.5
$\Delta T$	+2.0deg	-1.0deg	-1.5deg
	Thermostat ON	Thermostat ON	Thermostat OFF

Remote controller sensor is enabled

Set temp. in remote controller	20°C	20°C	20°C
Detected temp. by sensor	17.0°C	21.0°C	21.5°C
Detected temp. by body sensor	21.0°C	25.0°C	25.5°C
Detected temp. by remote controller sensor	17.0°C	21.0°C	21.5°C
Room temp. = temp. detected by remote controller sensor	17.0°C =17.0	21.0°C =21.0	21.5°C =21.5
$\Delta T$	+3.0deg	-1.0deg	-1.5deg
	Thermostat ON	Thermostat ON	Thermostat OFF

Body sensor is enabled  
Remote sensor is enabled



- (1) The thermostat does not turn OFF for 5 minutes after it turns ON.
- (2) The thermostat does not turn ON 3 minutes after it turns OFF.
- (3) The thermostat does not turn OFF for 60 minutes during the test run mode. (Forced thermostat ON)  
\*However, the thermostat turns OFF if an alarm occurs.
- (4) The thermostat turns OFF when  $\Delta T$  continues in thermostat OFF zone for 3 minutes.

**4-1-3. U-71PZH3E5, U-100PZH3E5, U-125PZH3E5, U-140PZH3E5  
U-71PZH3E8, U-100PZH3E8, U-125PZH3E8, U-140PZH3E8**

- The body sensor or remote controller sensor detects temperature in the room. The detected temperature is called the room temperature. The body sensor is the one contained in the indoor unit.

	Body sensor is enabled	Remote controller sensor is enabled
Set temp.	Set temp. in remote controller	Set temp. in remote controller
Detected temp. by sensor	Detected temp. by body sensor	Detected temp. by remote controller sensor
Room temp.	Detected temp. by body sensor - *correction temp.	Detected temp. by remote controller sensor

- The thermostat is turned ON or OFF according to the following  $\Delta T$ .

$\Delta T$ (Cooling)	$\Delta T = \text{room temp.} - \text{set temp. (set temp. in remote controller)}$
$\Delta T$ (Heating)	$\Delta T = \text{set temp.} - \text{room temp.}$

※ Correction temperature (only during heating)

If the indoor unit is installed on the ceiling, temperature near the ceiling is higher than near the floor. When the body sensor is enabled, lower temperature near the floor must be considered. To correct this difference in temperature, the correction temperature is used.

The factory setting for the correction temperature is different depending on the model. See “4-11. Parameter”.

Example: Cooling temperature correction  
4-Way Cassette (correction temperature: 0 degrees)  
Body sensor is enabled

Set temp. in remote controller	28°C	28°C	28°C
Detected temp. by sensor	30.0°C	27.0°C	26.5°C
Detected temp. by body sensor	30.0°C	27.0°C	26.5°C
Detected temp. by remote controller sensor	30.0°C	27.0°C	26.5°C
Room temp. = temp. detected by body sensor	30.0°C =30.0	27.0°C =27.0	26.5°C =26.5
$\Delta T$	+2.0deg	-1.0deg	-1.5deg
	Thermostat ON	Thermostat ON	Thermostat OFF

Example: Heating temperature correction  
4-Way Cassette (correction temperature: 4 degrees)  
Body sensor is enabled

Set temp. in remote controller	20°C	20°C	20°C
Detected temp. by sensor	17.0°C	25.0°C	25.5°C
Detected temp. by body sensor	17.0°C	25.0°C	25.5°C
Detected temp. by remote controller sensor	13.0°C	21.0°C	21.5°C
Room temp. = temp. detected by body sensor - 4 deg	13.0°C =17.0-4 deg	21.0°C =25.0-4 deg	21.5°C =25.5-4 deg
$\Delta T$	+7.0deg	-1.0deg	-1.5deg
	Thermostat ON	Thermostat ON	Thermostat OFF

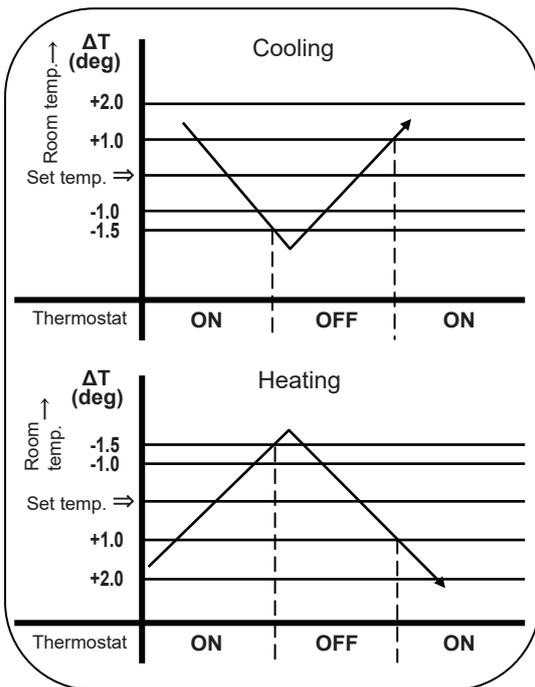
Remote controller sensor is enabled

Set temp. in remote controller	28°C	28°C	28°C
Detected temp. by sensor	30.0°C	27.0°C	26.5°C
Detected temp. by body sensor	30.0°C	27.0°C	26.5°C
Detected temp. by remote controller sensor	30.0°C	27.0°C	26.5°C
Room temp. = temp. detected by remote controller sensor	30.0°C =30.0	27.0°C =27.0	26.5°C =26.5
$\Delta T$	+2.0deg	-1.0deg	-1.5deg
	Thermostat ON	Thermostat ON	Thermostat OFF

Remote controller sensor is enabled

Set temp. in remote controller	20°C	20°C	20°C
Detected temp. by sensor	17.0°C	21.0°C	21.5°C
Detected temp. by body sensor	21.0°C	25.0°C	25.5°C
Detected temp. by remote controller sensor	17.0°C	21.0°C	21.5°C
Room temp. = temp. detected by remote controller sensor	17.0°C =17.0	21.0°C =21.0	21.5°C =21.5
$\Delta T$	+3.0deg	-1.0deg	-1.5deg
	Thermostat ON	Thermostat ON	Thermostat OFF

Body sensor is enabled  
Remote sensor is enabled



- (1) The thermostat does not turn OFF for 5 minutes after it turns ON.
- (2) The thermostat does not turn ON 3 minutes after it turns OFF.
- (3) The thermostat does not turn OFF for 60 minutes during the test run mode. (Forced thermostat ON)  
 \*However, the thermostat turns OFF if an alarm occurs.
- (4) The thermostat turns OFF when  $\Delta T$  continues in thermostat OFF zone for 3 minutes.

## 4-2. Heating Standby

- In heating mode, the indoor fan speed decreases to prevent cold air discharge from the indoor unit. During this time, (heating standby) is displayed on the remote controller.

(1) This condition occurs in the following cases.

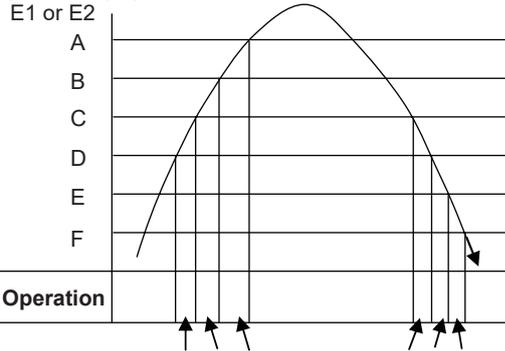
- Thermostat OFF
- Defrosting operation
- Indoor heat exchanger liquid temperature (E1 or E2) < X°C just after heating operation started the fan speed may sometimes increase when this condition continues for 6 minutes.

Indoor unit type	U3	F3	K3	T3	Y3
X (°C)	20	22	23	22	20

(2) The fan mode increases when the heat exchanger liquid temperature (E1 or E2) or discharge air temperature increases.

- \* The fan mode is selected based on E1 temperature and E2 temperature as shown in the below figure. If the E1 temperature and E2 temperature are different, the higher temperature is used.

Temperature (°C)



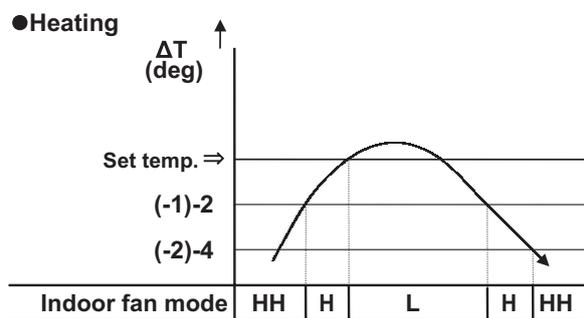
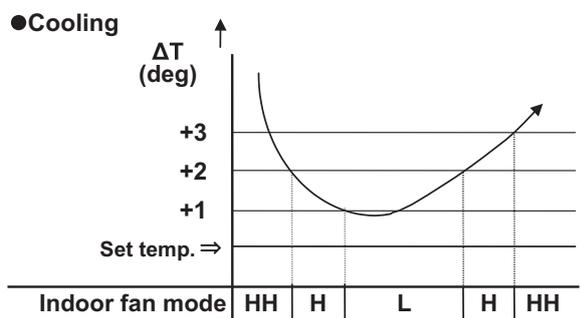
Indoor unit type	U3	F3	K3	T3	Y3
A	24	26	27	26	24
B	22	24	25	24	22
C	20	22	23	22	20
D	18	20	21	20	18
E	12	14	15	14	12
F	8	10	11	10	8

Set fan speed	*HH	STOP	LL	L	H	HH	H	L	LL	STOP
fan	H	STOP	LL	L	H	H	H	L	LL	STOP
speed	L	STOP	LL	L	L	L	L	L	LL	STOP

- \* The function of "HH" is identical to the automatic fan speed mode.

### 4-3. Automatic Fan Speed Control

- (1) The indoor fan mode is controlled as shown below during the automatic fan mode.
- (2) The fan mode does not change for 3 minutes during cooling operation and 1 minute during heating operation once it is changed.
- (3) The values in the parenthesis are when the remote controller sensor is enabled.



## 4-4. Drain Pump Control

The drain pump operates in the following conditions.

- (1) Cooling thermostat ON
- (2) The float switch worked.
- (3) The drain pump may often operate for a while when the cooling thermostat turns OFF or the indoor unit is stopped.
- (4) The drain pump can be turned on when the cooling thermostat is OFF if the setting is made to prevent water collected in the drain pan for a long time. For details, see "7-3. Detailed Settings Function".
- (5) The indoor unit heat exchanger liquid temperature (E1 or E2) is less than 0°C.

※ The drain pump operates for 20 minutes once it starts operating.

## 4-5. Automatic Heating/Cooling Control

- (1) The operating mode is selected according to the set temperature and room temperature when the operation is started.
  - Room temperature  $\geq$  set temperature in remote controller  $- 1^{\circ}\text{C} \rightarrow$  Cooling mode
  - Room temperature  $<$  set temperature in remote controller  $- 1^{\circ}\text{C} \rightarrow$  Heating mode
- (2) The set temperature is corrected according to the operating mode. The correction temperature is +2 degrees in cooling mode and -2 degrees in heating mode at the time of factory shipment.
  - ※ The correction value is different depending on the model. See “4-11. Parameter” for details.
  - Corrected cooling temperature – control temperature for cooling
  - Corrected heating temperature – control temperature for heating

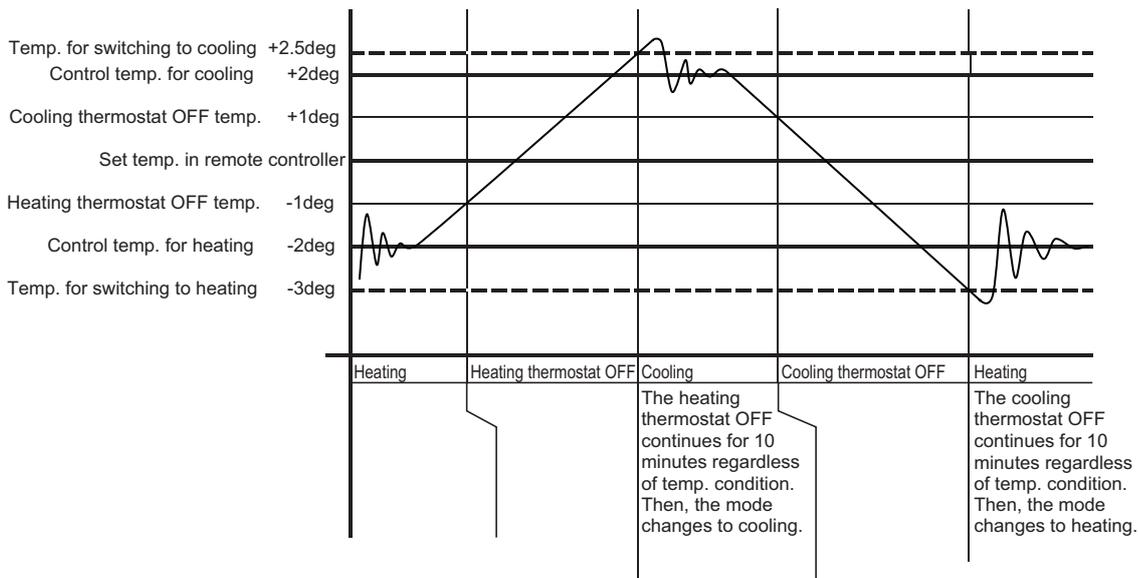
When setting temperature in remote controller is  $20^{\circ}\text{C}$  in the cooling mode (at shipment) :

Control temp. for cooling	$22^{\circ}\text{C}$
Set temp. in remote controller	$20^{\circ}\text{C}$
Control temp. for heating	$18^{\circ}\text{C}$

- (3) Condition for mode change

Heating  $\rightarrow$  Cooling: Room temperature  $\geq$  Control temperature for cooling  $+ 0.5$  degree  
 Cooling  $\rightarrow$  Heating: Room temperature  $\leq$  Control temperature for heating  $-1.0$  degree

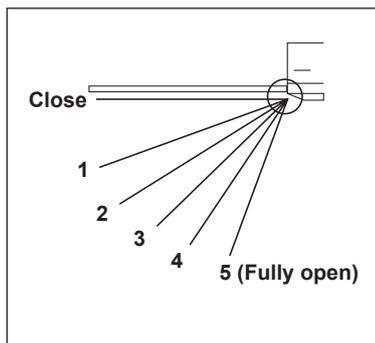
When setting temperature in remote controller is  $20^{\circ}\text{C}$  in the cooling mode :



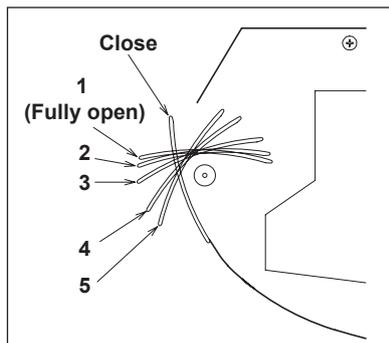
For settings at the time of factory shipment, see “4-11. Parameter”.

## 4-6. Automatic Flap Control

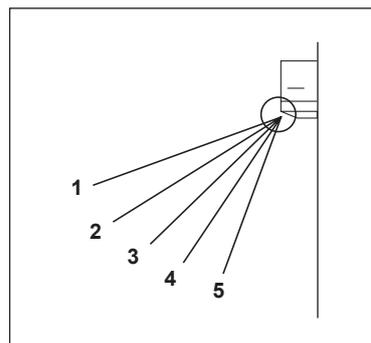
- The flap position can be selected from 5 positions.



4-Way Cassette Type  
4-Way Cassette 60 × 60 Type



Ceiling Type



Wall Mounted Type

Operating mode	Flap position	
Cooling/Dry	1 · 2 · 3 · 4* · 5*	* U3, Y3
Fan	1 · 2 · 3 · 4 · 5	
Heating	1 · 2 · 3 · 4 · 5	

- The flap will be closed automatically when the indoor unit is stopped.  
Close: 4-Way Cassette Type, Wall Mounted Type, Ceiling Type, 4-Way Cassette 60 × 60 Type
- For 4-Way cassette type (U3) and 4-Way Cassette 60 × 60 Type (Y3), the flap closes once and moves to the set position when the operating mode is changed.

### NOTE

- Do not change the flap position manually.
- Only the swing operation can be used.
  - The swing operation can be set for the flap.

#### **4-7. Filter Sign**

- (1) When accumulated operating time of the indoor unit reaches the set time, the filter sign appears on the remote controller. Clean the filter.

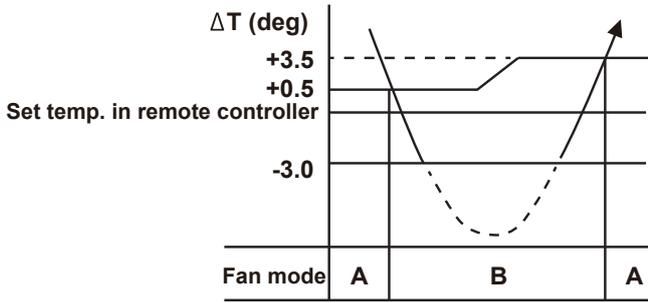
See Item code 01~02 under “7-2. List of Simple Setting Items” and “Filter sign ON times for each model” under “7-5. Simple Setting Items”.

- (2) After cleaning the filter, press the filter button on the remote controller once. The filter sign turns off.

### 4-8. Fan Control during Dry Mode

The fan control during dry mode is as follows.

#### 4-8-1. U-25PZ3E5, U-36PZ3E5, U-50PZ3E5, U-60PZ3E5A, U-71PZ3E5A U-36PZH3E5, U-50PZH3E5, U-60PZH3E5

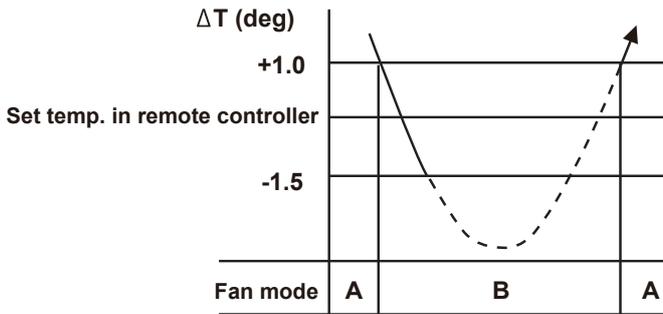


A: Fan mode is set in the remote controller

B: Fan mode is DRY-L during thermostat ON, LL during thermostat OFF

(  $L \geq \text{DRY-L} \geq \text{LL}$  )

#### 4-8-2. U-100PZ3E5, U-125PZ3E5, U-140PZ3E5 U-100PZ3E8, U-125PZ3E8, U-140PZ3E8

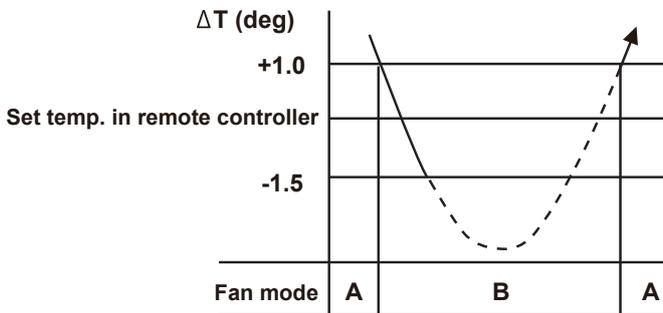


A: Fan mode is set in the remote controller

B: Fan mode is DRY-L during thermostat ON, LL during thermostat OFF

(  $L \geq \text{DRY-L} \geq \text{LL}$  )

#### 4-8-3. U-71PZH3E5, U-100PZH3E5, U-125PZH3E5, U-140PZH3E5 U-71PZH3E8, U-100PZH3E8, U-125PZH3E8, U-140PZH3E8



A: Fan mode is set in the remote controller

B: Fan mode is DRY-L during thermostat ON, LL during thermostat OFF

(  $L \geq \text{DRY-L} \geq \text{LL}$  )

## 4-9. Ventilation Fan Output

- The output of ventilation turns ON when the indoor unit turns ON. Also, when the indoor unit turns OFF, the output of the ventilation turns OFF.
- The ventilation fan can also be turned ON and OFF using the ventilation button on the remote controller.

Refer to the operating instructions supplied with the remote controller.

To enable this function, set the indoor EEPROM DN31 to "0001" in advance.

#### **4-10. T10 Terminal**

Using the T10 terminal, each indoor unit can be operated or stopped separately. Also, operating condition can be checked.

#### 4-11. Parameter

Type	Model	Indoor item code "06"	Indoor item code "1E"	Indoor item code "86"
		Correction temp. (heating)	Heat/cool switching correction temp. (automatic heat/cool)	Fan speed when cooling thermostat OFF
		Setting at time of factory shipment	Setting at time of factory shipment	Setting at time of factory shipment
U3	4-Way Cassette	4 deg	2 deg	LL
F3	Middle Static Pressure Duct	4 deg	2 deg	LL
K3	Wall Mounted	2 deg	2 deg	LL
T3	Ceiling	4 deg	2 deg	LL
Y3	4-Way Cassette 60 × 60	4 deg	2 deg	LL

The parameter may sometimes increase or decrease in accordance with the outdoor temperature, the use of indoor fan tap and operating mode.

## 4-12. Control Functions

### 4-12-1. U-25PZ3E5, U-36PZ3E5, U-50PZ3E5, U-60PZ3E5A, U-71PZ3E5A U-36PZH3E5, U-50PZH3E5, U-60PZH3E5

#### 4-12-1-1. Compressor Frequency Control

The frequency of the compressor's inverter is limited by either of the following controls depending on whether the cooling or heating mode is in operation.

##### Cooling Mode :

- Indoor air temperature control
- Maximum and minimum frequency control
- Current release control
- Cooling high-load prevention control
- Cooling freeze prevention control
- Discharge temperature control

##### Heating Mode :

- Indoor air temperature control
- Maximum and minimum frequency control
- Current release control
- Heating high-load prevention control
- Discharge temperature control

#### 1) Maximum and Minimum Frequency Control

The compressor's inverter frequency is controlled in accordance with the model and operation mode. The maximum and minimum frequencies for each model are shown in the table below.

\* There are cases in which frequency is limited with other control functions depending on operational conditions, so operations are not always carried out in accordance with the maximum frequencies listed below.

· Maximum and Minimum Frequency

Type			PZ3					PZH3		
Model name (U-)			25PZ3E5	36PZ3E5	50PZ3E5	60PZ3E5A	71PZ3E5A	36PZH3E5	50PZH3E5	60PZH3E5
Indoor	Maximum Frequency (Hz)	Cooling	65	65	73	97	64	52	88	97
		Heating	80	80	90	110	70	90	102	115
Outdoor	Minimum Frequency (Hz)	Cooling	20	20	15	15	16	15	15	15
		Heating	20	20	15	15	16	15	15	15

\* There is a case in which the frequency set at maximum and minimum may sometimes decrease in accordance with ambient temperature and indoor loads.

#### 2) Current Release Control

The inverter frequency is controlled so that the current value for the inverter compressor is less than the figure listed in the table below in order to prevent abnormal increases in the inverter circuit included in the electrical component box of the outdoor unit.

Current release control with primary current : The limited values are modified in accordance with ambient temperature.

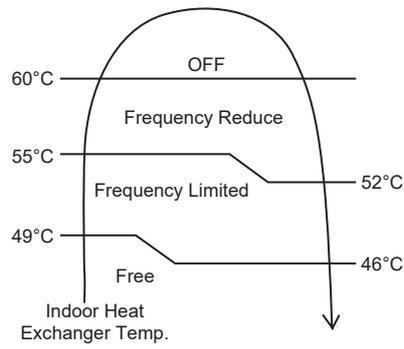
Type			PZ3					PZH3		
Model name (U-)			25PZ3E5	36PZ3E5	50PZ3E5	60PZ3E5A	71PZ3E5A	36PZH3E5	50PZH3E5	60PZH3E5
Outdoor	Is (A)	Cooling	7.86	7.86	8.87	11.22	13.49	5.88	10.05	11.22
		Heating	8.01	8.01	9.59	10.59	11.22	6.97	9.78	10.59

### 3) Cooling Overload Control

- Detects the outdoor pipe temperature and carry out below restriction/limitation (Limit the compressor operation frequency).
- The compressor stop if outdoor pipe temperature exceeds 60°C.

#### 4) Heating Overload Control

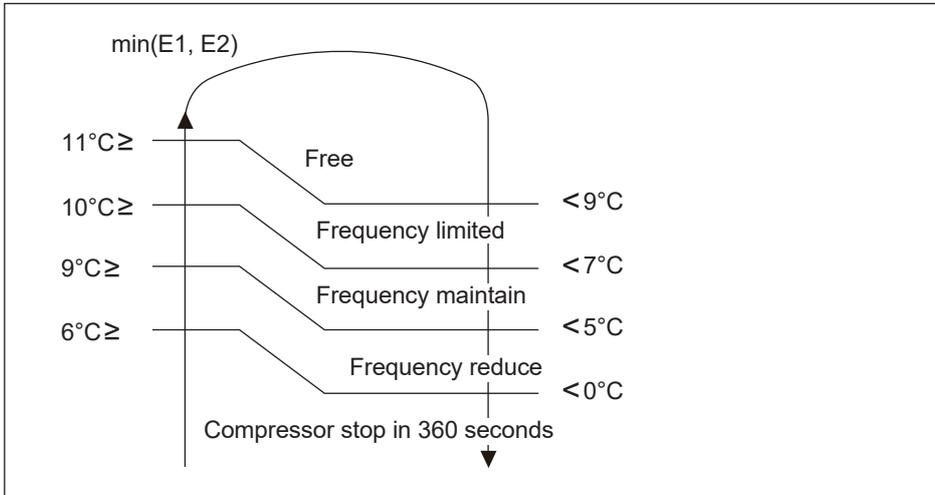
- The compressor operating frequency is regulated in accordance to indoor heat exchanger temperature as shown below.
- If the heat exchanger temperature exceeds 60°C, compressor will stop.



### 5) Cooling Freeze Prevention Control

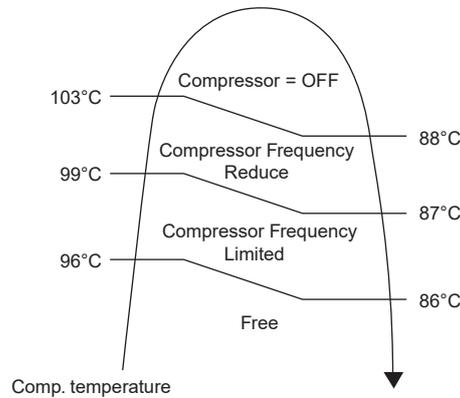
The following control is performed during cooling operations (including dry mode operation), in accordance with whichever of the indoor heat exchanger temperatures (E1 or E2) is lower. (See the chart below.)

- (a) Frequency will not be decreased less than 5.5 minutes after thermostat ON.
- (b) The threshold value is increased in accordance with the indoor load (differences of temperature).



### 6) Compressor Overheating Prevention Control

- Instructed frequency for compressor operation will be regulated by compressor temperature. The changes of frequency are as below.
- If compressor temperature exceeds 103°C, compressor will be stopped.

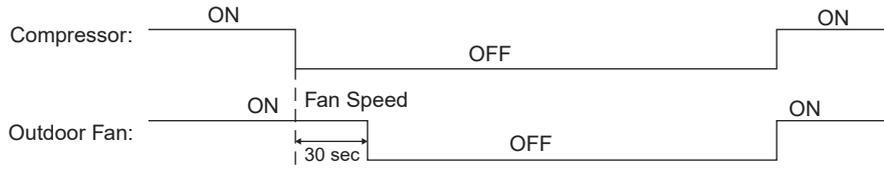


### 4-12-1-2. Deice Operation

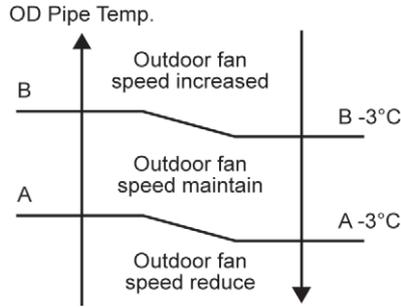
When outdoor pipe temperature and outdoor air temperature is low, deice operation start where indoor fan motor and outdoor fan motor stop.

### 4-12-1-3. Outdoor Fan Motor Operation

Outdoor fan motor is operated with various fan speeds with compressor RPM. It starts when compressor starts operation and it stops 30 seconds after compressor stops operation.

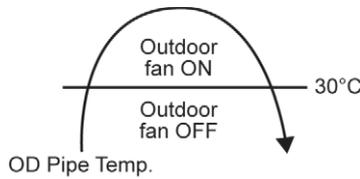


- During cooling operation, and outdoor ambient temperature is below 8°C, outdoor fan speed will be controlled according to outdoor piping temperature as following:



	OD Pipe Temperature
A	26°C
B	33°C

- During above condition, when indoor heat exchanger temperature is below 5°C, the outdoor fan will stop according to outdoor piping temperature as following:



## 4-12-2. U-100PZ3E5, U-125PZ3E5, U-140PZ3E5

### U-100PZ3E8, U-125PZ3E8, U-140PZ3E8

#### 4-12-2-1. Indoor Air Temperature Control

The thermostat is switched on and off in accordance with  $\Delta T$  shown below.

$\Delta T = (\text{Indoor air temperature}) - (\text{Temperature set with the remote controller})$	
In the body thermostat mode (setting at factory shipment)	Indoor air temperature = (Body sensor) - (Shift temperature *)
In the remote controller thermostat mode	Indoor air temperature = (Remote controller sensor)

#### \* Shift Temperature

Only valid during heating operation. Set at 0 °C during cooling operation.

The settings at factory shipment during heating operation are as follows:

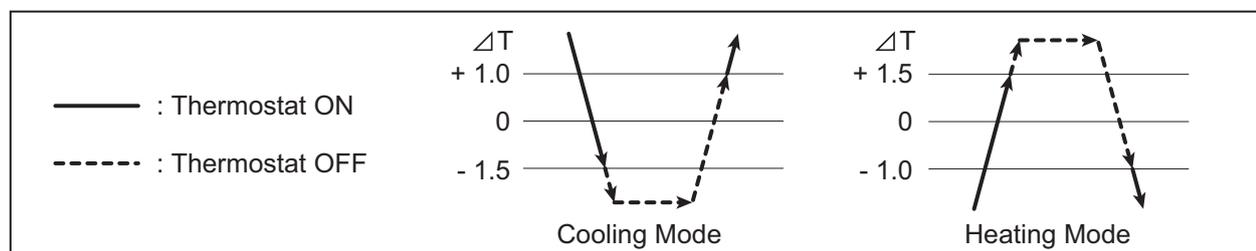
Wall Mounted type : 2°C

Floor Standing type : 0°C

All other types (4-way types, Concealed types, etc.) : 4°C

This function acts as the coefficient for adjusting differences in temperature caused by the height of the living space from the floor to the ceiling (the temperature at ceiling height is higher) during heating operation.

The setting can be modified between 0°C and 6°C with mode [06] (Simple Settings Function) on the remote controller.



- (1) Once the thermostat has been switched on, it cannot be switched off again by indoor air temperature control for a period of 5 minutes.
- (2) Once the thermostat has been switched off, it cannot be switched on again for a period of 3 minutes.
- (3) When in the test run operation mode, the thermostat will not be switched off by indoor air temperature control and the operation will continue.
- (4) The thermostat turns off when  $\Delta T$  continues in thermostat OFF zone for 3 minutes.

#### 4-12-2-2. Compressor Frequency Control

The frequency of the compressor's inverter is limited by either of the following controls depending on whether the cooling or heating mode is in operation.

##### Cooling Mode :

- Indoor air temperature control
- Maximum and minimum frequency control
- Current release control
- Cooling high-load prevention control
- Cooling freeze prevention control
- Discharge temperature control

##### Heating Mode :

- Indoor air temperature control
- Maximum and minimum frequency control
- Current release control
- Heating high-load prevention control
- Discharge temperature control

### 1) Indoor Air Temperature Control

By the control method, not only the thermostat is switched on and off, as explained section “4-12-2-1. Indoor Air Temperature Control”, but also the frequency of the compressor's inverter is controlled in accordance with  $\Delta T$  and fluctuations in indoor air temperature. Inverter frequency is controlled as follows:

When $\Delta T$ is high (not yet reached the temperature set with the remote controller).	Controlled so that the inverter frequency is increased.
When $\Delta T$ is low (approximately +1.0 or less in the cooling mode or approximately -1.0 or more in the heating mode).	Controlled so that the inverter frequency is decreased or kept.

### 2) Maximum and Minimum Frequency Control

The compressor's inverter frequency is controlled in accordance with the model and operation mode. The maximum and minimum frequencies for each model are shown in the table below.

\* There are cases in which frequency is limited with other control functions depending on operational conditions, so operations are not always carried out in accordance with the maximum frequencies listed below.

· Maximum and Minimum Frequency

Type		PZ3					
Model name (U-)		100PZ3E5	100PZ3E8	125PZ3E5	125PZ3E8	140PZ3E5	140PZ3E8
Maximum Frequency (Hz)	Cooling	70	65	69			
	Heating	99	95	99			
Minimum Frequency (Hz)	Cooling	12	10.5	11			
	Heating	15	12	12			

\* There is a case in which the frequency set at maximum and minimum may sometimes decrease in accordance with ambient temperature and indoor loads.

### 3) Current Release Control

The inverter frequency is controlled so that the current value for the inverter compressor is less than the figure listed in the table below in order to prevent abnormal increases in the inverter circuit included in the electrical component box of the outdoor unit.

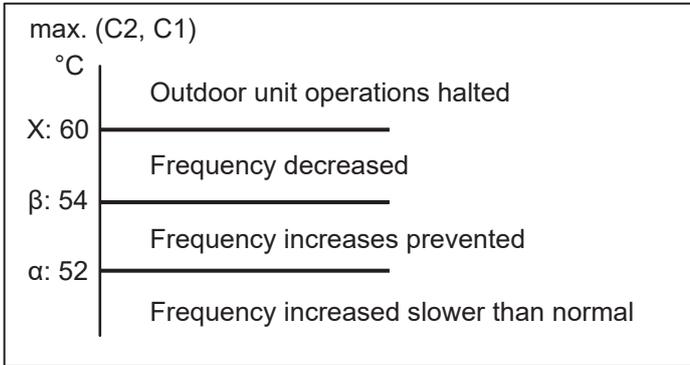
Current release control with primary current : The limited values are modified in accordance with ambient temperature.

Type		PZ3					
Model name (U-)		100PZ3E5	100PZ3E8	125PZ3E5	125PZ3E8	140PZ3E5	140PZ3E8
Is (A)	Cooling	23	8.2	27	9.2	27.5	9.5
	Heating	23.5	8.5	28	9.5	29	10

#### 4) Condensation Temperature Control (cooling)

This system control is performed to limit the inverter frequency in order to restrict high pressure's abnormal increase and high-load operating prevention in the cooling mode. In accordance with the temperature of the outdoor heat exchanger temperature sensors (C1, C2), such controls are performed as to halting the operations of the indoor unit, decreasing the inverter frequency and restricting its increase, etc.

- (a) The threshold value is decreased in accordance with the compressor frequency or indoor load (differences of temperature).
- (b) When "X" values are lowered, the results basically become  $\beta=X-2$ ,  $\alpha=X-3$ .



CODE: 30D (for X setting \*2)

Setting No.	1	2	3	4 *1	5
X (°C)	52	56.5	58.5	60	62

CODE: 30E (for α setting \*2)

CODE: 30F (for β setting \*2)

EEPROM			*1
α	-10	~	0
β	-10	~	0

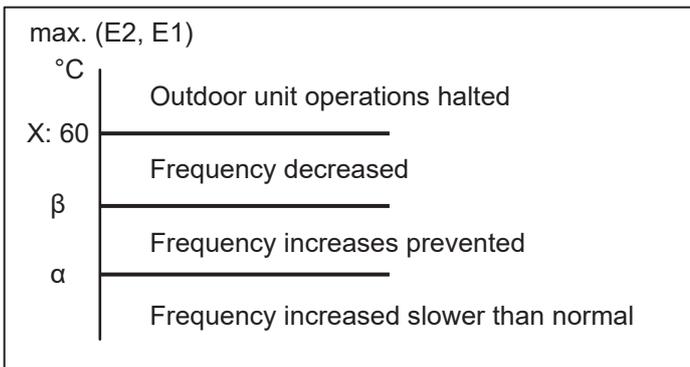
\*1 Setting at factory shipment

\*2 Use the CZ-RTC6 series remote controller for setting  
See "7-3. Detailed Settings Function"

#### 5) Condensation Temperature Control (heating)

This system control is performed to limit the inverter frequency in order to restrict high pressure's abnormal increase and high-load operating prevention in the heating mode. In accordance with the temperature of the indoor heat exchanger temperatures sensor (E1, E2), such controls are performed as to halting the operations of the indoor unit, decreasing the inverter frequency and restricting its increase, etc.

- (a) The threshold value is decreased in accordance with the compressor frequency or indoor load (differences of temperature).
- (b) When "X" values are lowered, the results basically become  $\beta=X-2$ ,  $\alpha=X-3$ .



CODE: 30D (for X setting \*2)

Setting No.	1	2	3	4 *1	5
X (°C)	52	56.5	58.5	60	62

CODE: 308 (for α setting \*2)

CODE: 309 (for β setting \*2)

EEPROM			*1
α	-10	~	0
β	-10	~	0

\*1 Setting at factory shipment

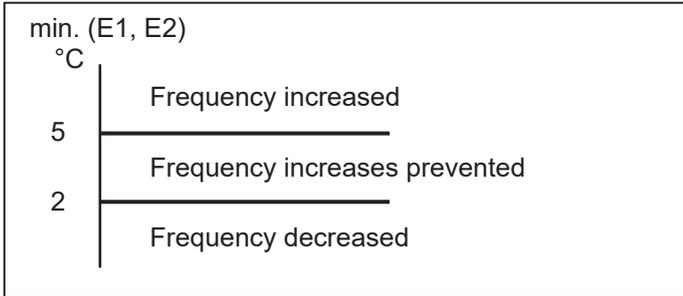
\*2 Use the CZ-RTC6 series remote controller for setting  
See "7-3. Detailed Settings Function"

Model name (U-)	100PZ3E5 100PZ3E8	125PZ3E5 125PZ3E8	140PZ3E5 140PZ3E8
α	47	47	47
β	51	51	51

### 6) Cooling Freeze Prevention Control

The following control is performed during cooling operations (including dry mode operation), in accordance with whichever of the indoor heat exchanger temperatures (E1 or E2) is lower. (See the chart below.)

- (a) Frequency will not be decreased less than 6 minutes after thermostat ON.
- (b) The threshold value is increased in accordance with the indoor load (differences of temperature).



CODE: 30A (for  $\alpha$  setting \*2)  
 CODE: 30B (for  $\beta$  setting \*2)

EEPROM			*1	
$\alpha$	-15	.....	0	9
$\beta$	-15	.....	0	9

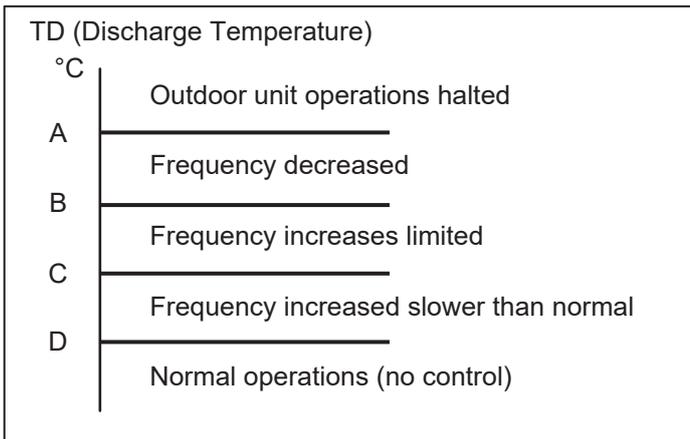
- \*1 Setting at factory shipment
- \*2 Use the CZ-RTC6 series remote controller for setting  
 See "7-3. Detailed Settings Function"

## 4

### 7) Discharge Temperature Control

The following control is performed to prevent the discharge temperature from rising abnormally in order to protect the inverter compressor.

In accordance with the temperature of the discharge sensor TD, such controls are performed as to limiting the increase of inverter frequency, decreasing it or halting operation of the compressor.



Model name (U-)	100PZ3E5 100PZ3E8	125PZ3E5 125PZ3E8	140PZ3E5 140PZ3E8
A	103	103	103
B	92	92	92
C	88	88	88
D	86	86	86

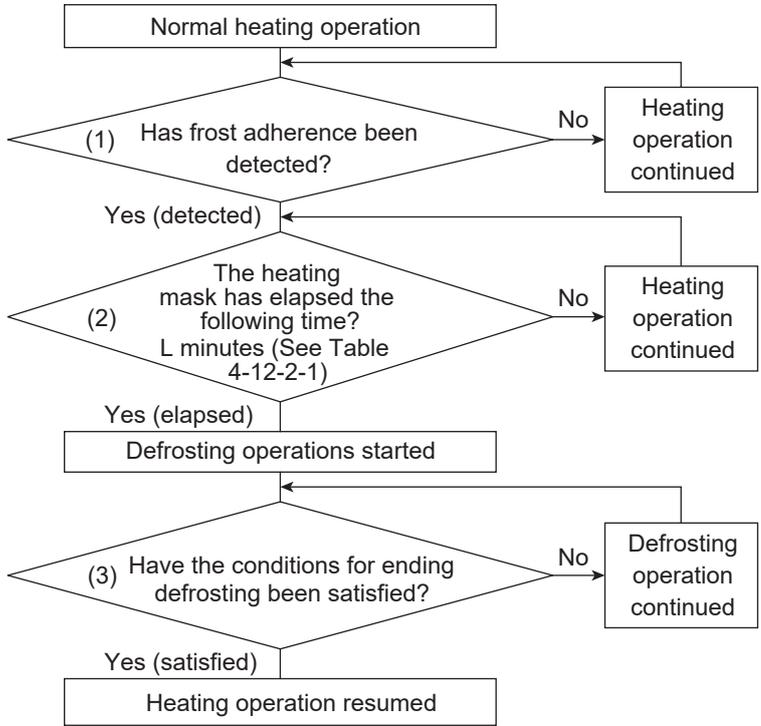
\* If the discharge temperature exceeds A°C, operations of the compressor are halted and restarted after 3 minutes.

If this start/stop activity is repeated 5 times, the alarm "P03" (abnormal discharge temperature) occurs.

### 8) Defrosting Control

This control function removes frost that has adhered to the outdoor heat exchanger during the heating operation. The control is performed to prevent the deterioration of the heating capabilities attributed to the adherence of frost, and to prevent the crack or crush of pipes attributed to the accretion of ice. The following control is performed in accordance with the ambient temperature and the outdoor heat exchanger temperature sensor (C1).

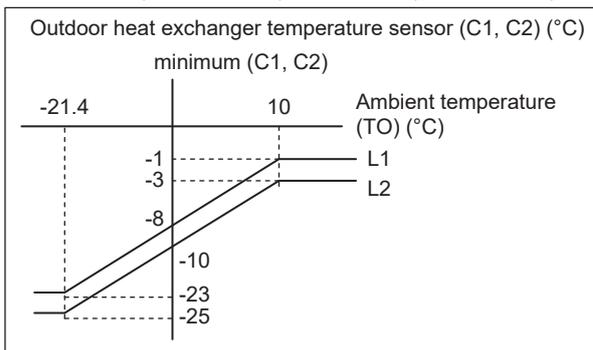
#### Overall Flow Chart of Defrosting Control



(1) Frost adherence detection

- If the following conditions are satisfied during heating operations, it is regarded as "frost adherence is detected".
- Frost adherence detection is performed in accordance with the ambient temperature (TO) and the outdoor heat exchanger temperature sensor (C1, C2).
- Frost adherence detection conditions
  - (a) Outdoor heat exchanger temperature sensor (minimum [C1, C2]) ≤ L1 elapsed 60 minutes (accumulated time).
  - (b) Outdoor heat exchanger temperature sensor (minimum [C1, C2]) ≤ L2 elapsed consecutive M minutes (See Table 4-12-2-1) × 2 times.

<U-100PZ3E5, U-125PZ3E5, U-140PZ3E5, U-100PZ3E8, U-125PZ3E8, U-140PZ3E8>



- (c) Outdoor heat exchanger temperature (C1) < -3 °C is detected over N minutes (accumulated time) (See Table 4-12-2-1).

(2) Heating Mask Time

This refers to the shortest time that heating operations must be performed without defrosting operations being executed. The mask time for this model is L minutes (See Table 4-12-2-1).

\* Defrosting operations will not be started until the defrosting mask time has elapsed, even if frost adherence has been detected.

### (3) Ending Defrosting

Defrosting operations are ended when the following conditions are satisfied.

- Ending defrosting conditions
  - (a) When the temperature of the outdoor heat exchanger temperature sensor (C1) is over P °C (See Table 4-12-2-1).
  - (b) When the temperature of the outdoor heat exchanger temperature sensor (C1) is 6°C or higher for consecutive 60 seconds.
  - (c) When a maximum of 15 minutes defrosting time has elapsed.

**Table 4-12-2-1. Set Value of Defrosting Control**

Model name (U-)	100PZ3E5	125PZ3E5	140PZ3E5
	100PZ3E8	125PZ3E8	140PZ3E8
L : Heating mask time	35	35	35
M : Frost adherence detection continuous time	4	4	4
N : Accumulated time less than -3°C	80	80	80
P : Ending defrosting C1 temperature	10	10	10

## 4

### 9) Outdoor Unit Fan Control

The appropriate rotations per minute for the outdoor unit fan are determined in accordance with the ambient temperature and the frequency of the compressor inverter.

The outdoor unit fan step is controlled between a range of W1 (Step 1) and WF (Step 15).

### 10) Outdoor Unit's Electrical Expansion Valve Control

The electrical expansion valve controls the amount of refrigerant that is allowed to flow in accordance with the operation status.

The valve is adjusted in accordance with the discharge temperature (TD), the outdoor heat exchanger temperature sensor (C1), the suction temperature sensor (TS), and the indoor unit's heat exchanger temperature sensors (E1 and E2).

#### (1) Cooling Mode

Controlled so that the suction temperature (TS) - indoor heat exchanger temperature minimum (E1 and E2) is between 0 degree and 2 degrees under normal conditions.

There are cases where the aperture opens wider than normal operation if the discharge temperature increases.

#### (2) Heating Mode

Controlled so that the suction temperature (TS) - outdoor heat exchanger temperature (C1) is between 0 degree and 2 degrees under normal conditions.

There are cases where the aperture opens wider than normal operation if the discharge temperature increases.

### 11) Demand Control

There are two styles of demand operations available in methods of restraining power consumption.

When sending the demand signal from an external input, use the OPT terminal on indoor unit control PCB or MINI Seri-Para I/O Unit

For details of the OPT terminal on the indoor unit control PCB, see “4-13. Indoor Unit Control PCB Switches and Functions”.

#### Wiring example

Connect the wiring with reference to Fig. 4-12-2-1 and Table 4-12-2-2.

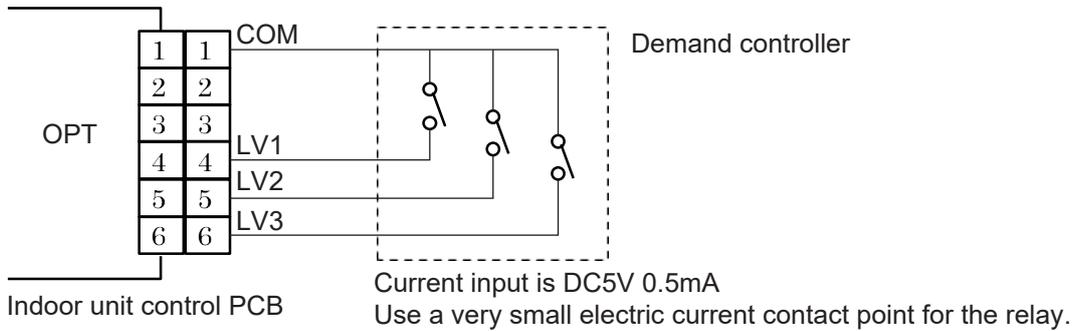


Fig. 4-12-2-1

LV1, LV2, LV3 / Use this terminal for demand control.

- When using the demand function, use the CZ-RTC6 series remote controller for setting.

● **When setting the demand function using a wired remote controller**

Use the CZ-RTC6 series remote controller for setting.

**<Procedure of CZ-RTC6 series>**

**Stop the system before performing these steps.**

- (1) Keep pressing the ,  and  buttons simultaneously for 4 or more seconds.

The “Maintenance func” screen (Fig. 4-12-2-2) appears on the LCD display.

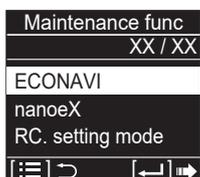
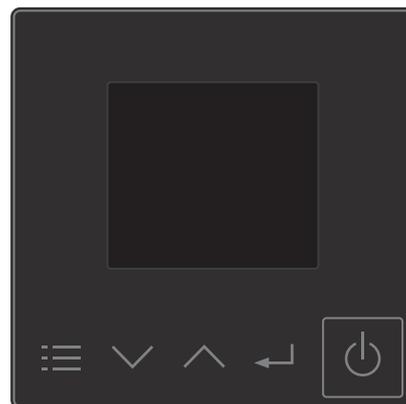


Fig. 4-12-2-2

- (2) Press the  or  button to see each menu.

Select “Detailed settings” (Fig. 4-12-2-3) on the LCD display and press the  button.

The “Detailed settings” screen (Fig. 4-12-2-4) appears on the LCD display.



CZ-RTC6 series

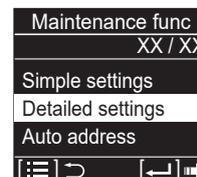


Fig. 4-12-2-3

- (3) Select the “Unit no.” (Fig. 4-12-2-4) by pressing the  or  button.

After selecting “Unit no.”, press the  button and proceed to Step (4).

**NOTE**

If the address setting is not set up correctly, the “ALL” will be displayed in the “Unit no.”.

If the  button is pressed, proceed to Step (6).

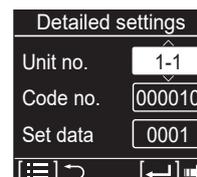


Fig. 4-12-2-4

- (4) Keep pressing the  button for 2 seconds or more during selecting “Code no.”. (Fig. 4-12-2-5)

Change the “Code no.” one digit at a time so that it becomes [0002EE] along with the following procedures.

Change the value (Fig. 4-12-2-6) by pressing the  or  button. After changing the value, press the  button and set the next digit.

Change the value (Fig. 4-12-2-7) by pressing the  or  button. After changing the value, press the  button and set the next digit.

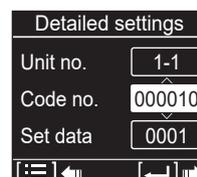


Fig. 4-12-2-5

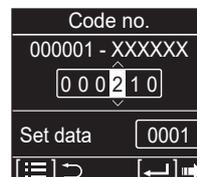


Fig. 4-12-2-6

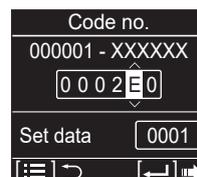


Fig. 4-12-2-7

Change the value (Fig. 4-12-2-8) by pressing the or button.  
After changing all digits, press the button and proceed to Step (5).

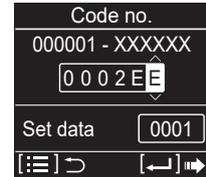


Fig. 4-12-2-8

(5) Select one of the Setting Data "0001" by pressing the or button.

Code no.	Item	Set data	
		0000 *	0001
0002EE	OPT Setting (4-6 pin)	Quiet / EXCT	Demand

\* Setting at factory shipment

After selecting "Set data", press the button. (If setting continuously, follow the procedures from Fig. 4-12-2-6.)

If you wish to change the selected indoor unit or finish setting, press the button twice (the display returns to Step (3)).

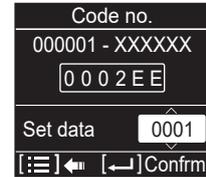


Fig. 4-12-2-9

(6) If the button is pressed under the display Step (3) the following display (Detailed setting-end screen) (Fig. 4-12-2-10) appears.

Then select "YES" by pressing the or button and press the button.  
(Return to normal remote controller display.)



Fig. 4-12-2-10

Demand control can be selected as the following table.

Input current should be DC24V, 10mA

Connecting wiring must be used "shield wiring".

Table 4-12-2-2

Short-circuit			Control (range of operations)
LV3-COM	LV2-COM	LV1-COM	
0	0	0	No restricted
0	0	1	Rated current restricted to A% (A% = 75% at factory shipment)
0	1	0	Rated current restricted to B% (B% = 50% at factory shipment)
1	0	0	Control OFF

\* The operational current is restricted to either A% or B% as a general indicator during demand input.

- A% and B% can be amended in calibrations of 5% between 40% and 130% with CZ-RTC6 series remote controller.

For details on how to amend the parameters, see "7-3. Detailed Settings Function".

A% value amendments: Parameters are amended with item code "2F2" (demand 1).

B% value amendments: Parameters are amended with item code "2F3" (demand 2).

**4-12-3. U-71PZH3E5, U-100PZH3E5, U-125PZH3E5, U-140PZH3E5  
U-71PZH3E8, U-100PZH3E8, U-125PZH3E8, U-140PZH3E8**

**4-12-3-1. Indoor Air Temperature Control**

The thermostat is switched on and off in accordance with  $\Delta T$  shown below.

$\Delta T = (\text{Indoor air temperature}) - (\text{Temperature set with the remote controller})$	
In the body thermostat mode (setting at factory shipment)	Indoor air temperature = (Body sensor) - (Shift temperature *)
In the remote controller thermostat mode	Indoor air temperature = (Remote controller sensor)

**\* Shift Temperature**

Only valid during heating operation. Set at 0 °C during cooling operation.

The settings at factory shipment during heating operation are as follows:

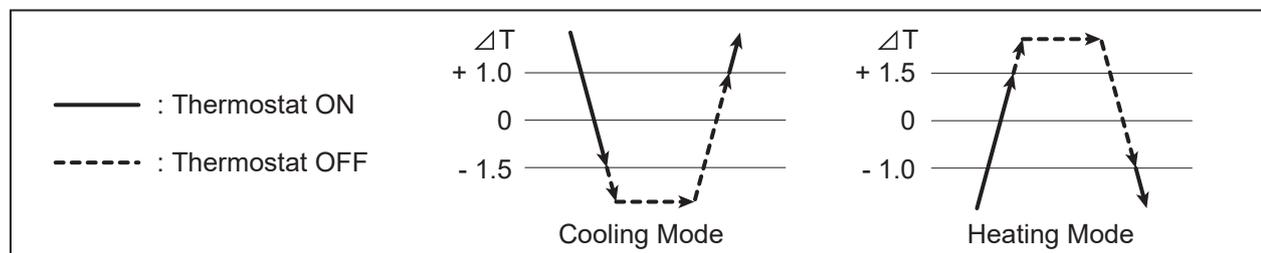
Wall Mounted type : 2°C

Floor Standing type : 0°C

All other types (4-way types, Concealed types, etc.) : 4°C

This function acts as the coefficient for adjusting differences in temperature caused by the height of the living space from the floor to the ceiling (the temperature at ceiling height is higher) during heating operation.

The setting can be modified between 0°C and 6°C with mode [06] (Simple Settings Function) on the remote controller.



- (1) Once the thermostat has been switched on, it cannot be switched off again by indoor air temperature control for a period of 5 minutes.
- (2) Once the thermostat has been switched off, it cannot be switched on again for a period of 3 minutes.
- (3) When in the test run operation mode, the thermostat will not be switched off by indoor air temperature control and the operation will continue.
- (4) The thermostat turns off when  $\Delta T$  continues in thermostat OFF zone for 3 minutes.

**4-12-3-2. Compressor Frequency Control**

The frequency of the compressor's inverter is limited by either of the following controls depending on whether the cooling or heating mode is in operation.

**Cooling Mode :**

- Indoor air temperature control
- Maximum and minimum frequency control
- Current release control
- Cooling high-load prevention control
- Cooling freeze prevention control
- Discharge temperature control

**Heating Mode :**

- Indoor air temperature control
- Maximum and minimum frequency control
- Current release control
- Heating high-load prevention control
- Discharge temperature control

### 1) Indoor Air Temperature Control

By the control method, not only the thermostat is switched on and off, as explained section “4-12-1. Indoor Air Temperature Control”, but also the frequency of the compressor's inverter is controlled in accordance with  $\Delta T$  and fluctuations in indoor air temperature. Inverter frequency is controlled as follows:

When $\Delta T$ is high (not yet reached the temperature set with the remote controller).	Controlled so that the inverter frequency is increased.
When $\Delta T$ is low (approximately +1.0 or less in the cooling mode or approximately -1.0 or more in the heating mode).	Controlled so that the inverter frequency is decreased or kept.

### 2) Maximum and Minimum Frequency Control

The compressor's inverter frequency is controlled in accordance with the model and operation mode. The maximum and minimum frequencies for each model are shown in the table below.

\* There are cases in which frequency is limited with other control functions depending on operational conditions, so operations are not always carried out in accordance with the maximum frequencies listed below.

· Maximum and Minimum Frequency

Type		PZH3			
Model name (U-)		71PZH3E5 71PZH3E8	100PZH3E5 100PZH3E8	125PZH3E5 125PZH3E8	140PZH3E5 140PZH3E8
Maximum Frequency (Hz)	Cooling	95	60	65	78
	Heating	84	65	70	75
Minimum Frequency (Hz)	Cooling	13	10	10	10
	Heating	15	12	12	12

\* There is a case in which the frequency set at maximum and minimum may sometimes decrease in accordance with ambient temperature and indoor loads.

### 3) Current Release Control

The inverter frequency is controlled so that the current value for the inverter compressor is less than the figure listed in the table below in order to prevent abnormal increases in the inverter circuit included in the electrical component box of the outdoor unit.

Current release control with primary current : The limited values are modified in accordance with ambient temperature.

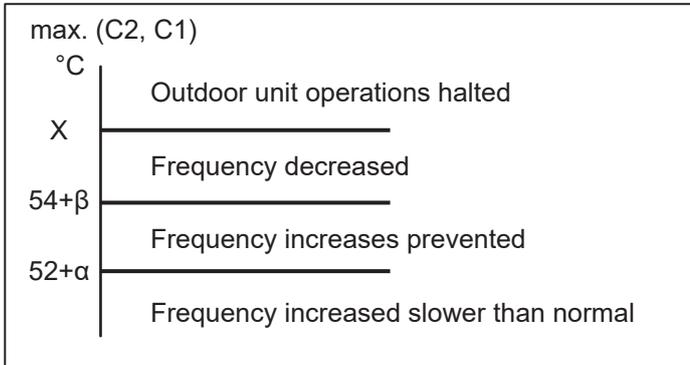
Type		PZH3			
Model name (U-)		71PZH3E5	100PZH3E5	125PZH3E5	140PZH3E5
Is (A)	Cooling	16.5	23.0	26.0	27.0
	Heating	16.5	23.0	26.0	27.0
Model name (U-)		71PZH3E8	100PZH3E8	125PZH3E8	140PZH3E8
Is (A)	Cooling	5.5	8.0	9.0	9.5
	Heating	5.5	8.0	9.0	9.5

**4) Condensation Temperature Control (cooling)**

This system control is performed to limit the inverter frequency in order to restrict high pressure's abnormal increase and high-load operating prevention in the cooling mode.

In accordance with the temperature of the outdoor heat exchanger temperature sensors (C1, C2), such controls are performed as to halting the operations of the indoor unit, decreasing the inverter frequency and restricting its increase, etc.

- (a) The threshold value is decreased in accordance with the compressor frequency or indoor load (differences of temperature).
- (b) When "X" values are lowered, the results basically become  $\beta=X-2$ ,  $\alpha=X-3$ .



CODE: 30D (for X setting \*2)

Setting No.	1	2	3	4 *1	5
X (°C)	52	56.5	58.5	60	62

CODE: 30E (for α setting \*2)

CODE: 30F (for β setting \*2)

EEPROM			*1
α	-10	~	0
β	-10	~	0

\*1 Setting at factory shipment

\*2 Use the CZ-RTC6 series remote controller for setting

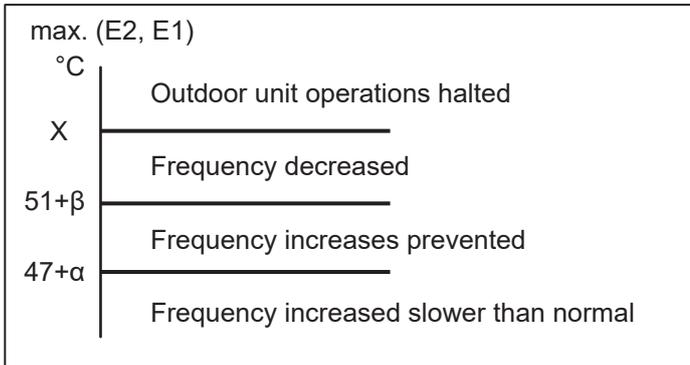
See "7-3. Detailed Settings Function"

**5) Condensation Temperature Control (heating)**

This system control is performed to limit the inverter frequency in order to restrict high pressure's abnormal increase and high-load operating prevention in the heating mode.

In accordance with the temperature of the indoor heat exchanger temperatures sensor (E1, E2), such controls are performed as to halting the operations of the indoor unit, decreasing the inverter frequency and restricting its increase, etc.

- (a) The threshold value is decreased in accordance with the compressor frequency or indoor load (differences of temperature).
- (b) When "X" values are lowered, the results basically become  $\beta=X-2$ ,  $\alpha=X-3$ .



CODE: 30D (for X setting \*2)

Setting No.	1	2	3	4 *1	5
X (°C)	52	56.5	58.5	60	62

CODE: 308 (for α setting \*2)

CODE: 309 (for β setting \*2)

EEPROM			*1
α	-10	~	0
β	-10	~	0

\*1 Setting at factory shipment

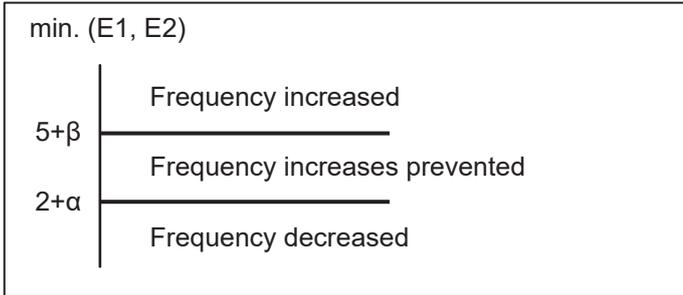
\*2 Use the CZ-RTC6 series remote controller for setting

See "7-3. Detailed Settings Function"

### 6) Cooling Freeze Prevention Control

The following control is performed during cooling operations (including dry mode operation), in accordance with whichever of the indoor heat exchanger temperatures (E1 or E2) is lower. (See the chart below.)

- (a) Frequency will not be decreased less than 6 minutes after thermostat ON.
- (b) The threshold value is increased in accordance with the indoor load (differences of temperature).



CODE: 30A (for  $\alpha$  setting \*2)  
 CODE: 30B (for  $\beta$  setting \*2)

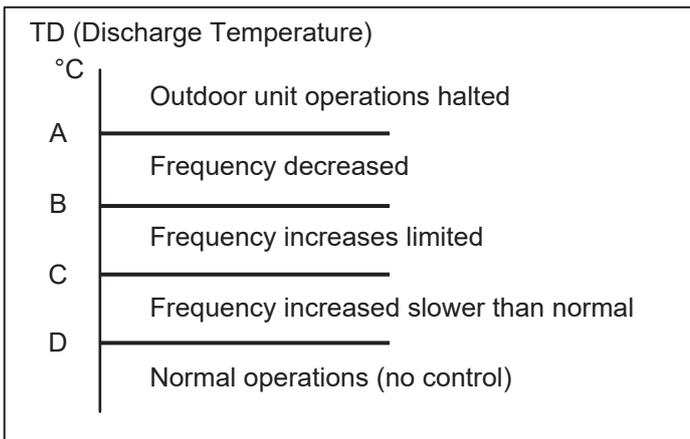
EEPROM			*1		
$\alpha$	-15	.....	0	.....	9
$\beta$	-15		0		9

- \*1 Setting at factory shipment
- \*2 Use the CZ-RTC6 series remote controller for setting  
 See "7-3. Detailed Settings Function"

### 7) Discharge Temperature Control

The following control is performed to prevent the discharge temperature from rising abnormally in order to protect the inverter compressor.

In accordance with the temperature of the discharge sensor TD, such controls are performed as to limiting the increase of inverter frequency, decreasing it or halting operation of the compressor.



Model name (U-)	71PZH3E5 71PZH3E8	100PZH3E5 100PZH3E8	125PZH3E5 125PZH3E8	140PZH3E5 140PZH3E8
A	103	103	103	103
B	92	92	92	92
C	88	88	88	88
D	86	86	86	86

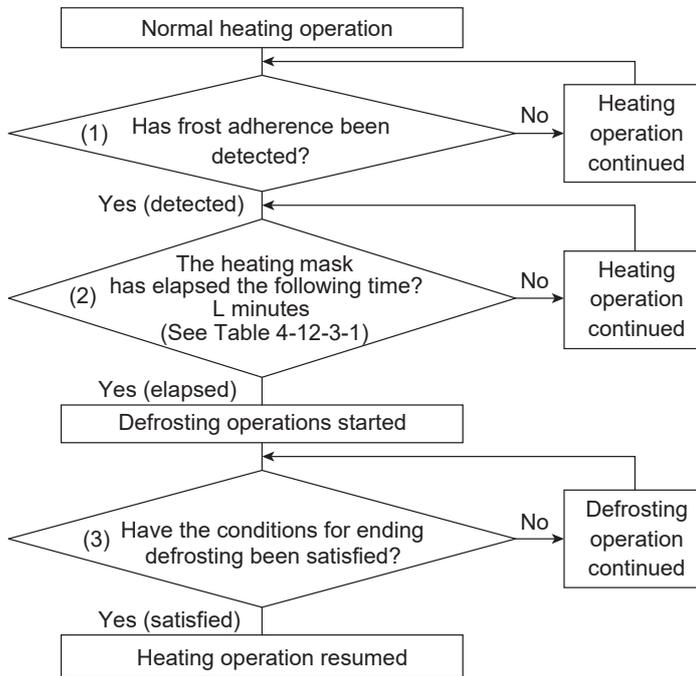
\* If the discharge temperature exceeds A°C, operations of the compressor are halted and restarted after 3 minutes.

If this start/stop activity is repeated 5 times, the alarm "P03" (abnormal discharge temperature) occurs.

## 8) Defrosting Control

This control function removes frost that has adhered to the outdoor heat exchanger during the heating operation. The control is performed to prevent the deterioration of the heating capabilities attributed to the adherence of frost, and to prevent the crack or crush of pipes attributed to the accretion of ice. The following control is performed in accordance with the ambient temperature and the outdoor heat exchanger temperature sensor (C1).

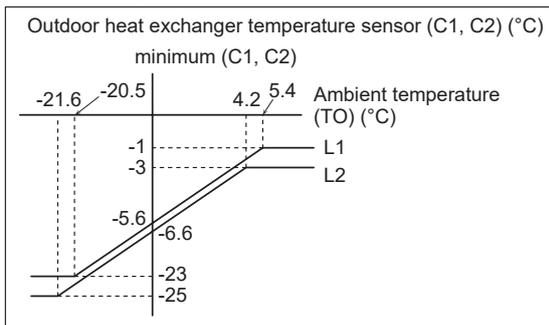
### Overall Flow Chart of Defrosting Control



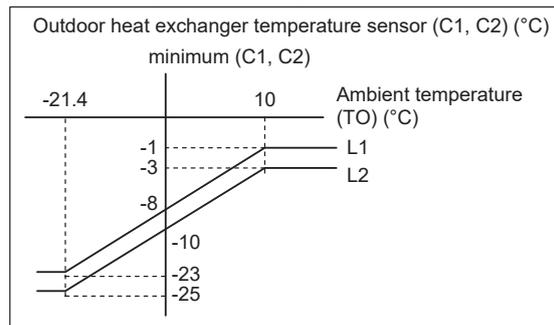
#### (1) Frost adherence detection

- If the following conditions are satisfied during heating operations, it is regarded as "frost adherence is detected".
- Frost adherence detection is performed in accordance with the ambient temperature (TO) and the outdoor heat exchanger temperature sensor (C1, C2).
- Frost adherence detection conditions
  - (a) Outdoor heat exchanger temperature sensor (minimum [C1, C2])  $\leq$  L1 elapsed 60 minutes (accumulated time).
  - (b) Outdoor heat exchanger temperature sensor (minimum [C1, C2])  $\leq$  L2 elapsed consecutive M minutes (See Table 4-12-3-1)  $\times$  2 times.

<U-71PZH3E5, U-71PZH3E8>



<U-100PZH3E5, U-125PZH3E5, U-140PZH3E5>  
<U-100PZH3E8, U-125PZH3E8, U-140PZH3E8>



- (c) Outdoor heat exchanger temperature (C1)  $<$  -3 °C is detected over N minutes (accumulated time) (See Table 4-12-3-1).

#### (2) Heating Mask Time

This refers to the shortest time that heating operations must be performed without defrosting operations being executed. The mask time for this model is L minutes (See Table 4-12-3-1).

- \* Defrosting operations will not be started until the defrosting mask time has elapsed, even if frost adherence has been detected.

(3) Ending Defrosting

Defrosting operations are ended when the following conditions are satisfied.

- Ending defrosting conditions
  - (a) When the temperature of the outdoor heat exchanger temperature sensor (C1) is over P °C (See Table 4-12-3-1)
  - (b) When the temperature of the outdoor heat exchanger temperature sensor (C1) is 6°C or higher for consecutive 60 seconds.
  - (c) When a maximum of 15 minutes defrosting time has elapsed.

**Table 4-12-3-1. Set Value of Defrosting Control**

Model name (U-)	71PZH3E5 71PZH3E8	100PZH3E5 100PZH3E8	125PZH3E5 125PZH3E8	140PZH3E5 140PZH3E8
L : Heating mask time	35	35	35	35
M : Frost adherence detection continuous time	1	4	4	4
N : Accumulated time less than -3°C	80	80	80	80
P : Ending defrosting C1 temperature	10	10	10	10

**9) Outdoor Unit Fan Control**

The appropriate rotations per minute for the outdoor unit fan are determined in accordance with the ambient temperature and the frequency of the compressor inverter.

The outdoor unit fan step is controlled between a range of W1 (Step 1) and WF (Step 15).

**10) Outdoor Unit's Electrical Expansion Valve Control**

The electrical expansion valve controls the amount of refrigerant that is allowed to flow in accordance with the operation status.

The valve is adjusted in accordance with the discharge temperature (TD), the outdoor heat exchanger temperature sensor (C1), the suction temperature sensor (TS), and the indoor unit's heat exchanger temperature sensors (E1 and E2).

(1) Cooling Mode

Controlled so that the suction temperature (TS) - indoor heat exchanger temperature minimum (E1 and E2) is between 0 degree and 2 degrees under normal conditions.

There are cases where the aperture opens wider than normal operation if the discharge temperature increases.

(2) Heating Mode

Controlled so that the suction temperature (TS) - outdoor heat exchanger temperature (C1) is between 0 degree and 2 degrees under normal conditions.

There are cases where the aperture opens wider than normal operation if the discharge temperature increases.

## 11) Demand Control

There are two styles of demand operations available in methods of restraining power consumption.

When sending the demand signal from an external input, use the OPT terminal on indoor unit control PCB or MINI Seri-Para I/O Unit

For details of the OPT terminal on the indoor unit control PCB, see "4-13. Indoor Unit Control PCB Switches and Functions".

### Wiring example

Connect the wiring with reference to Fig. 4-12-3-1 and Table 4-12-3-2.

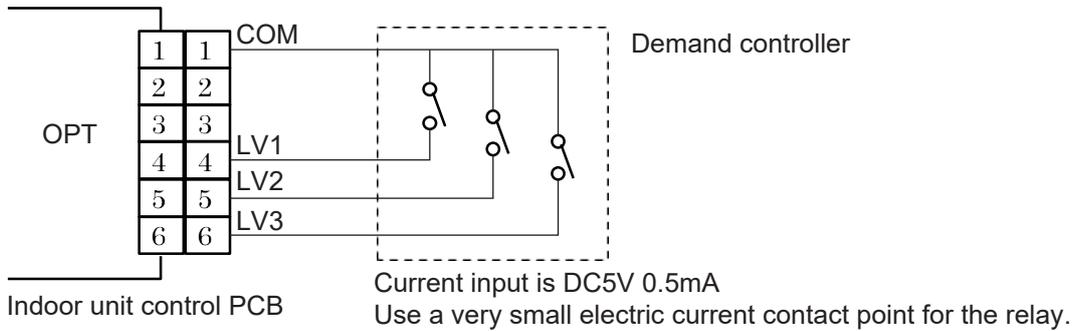


Fig. 4-12-3-1

LV1, LV2, LV3 / Use this terminal for demand control.

- When using the demand function, use the CZ-RTC6 series remote controller for setting.

● **When setting the demand function using a wired remote controller**

Use the CZ-RTC6 series remote controller for setting.

<Procedure of CZ-RTC6 series>

**Stop the system before performing these steps.**

- (1) Keep pressing the ,  and  buttons simultaneously for 4 or more seconds.

The “Maintenance func” screen (Fig. 4-12-3-2) appears on the LCD display.

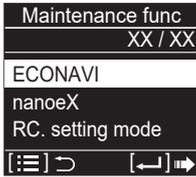
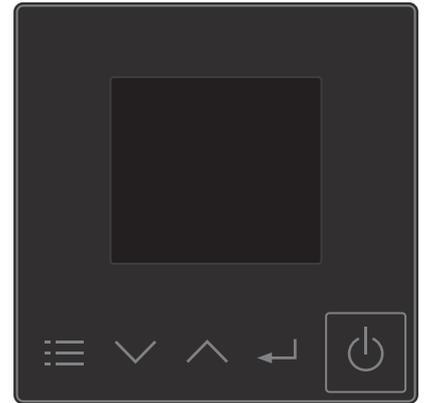


Fig. 4-12-3-2



CZ-RTC6 series

- (2) Press the  or  button to see each menu.

Select “Detailed settings” (Fig. 4-12-3-3) on the LCD display and press the  button.

The “Detailed settings” screen (Fig. 4-12-3-4) appears on the LCD display.

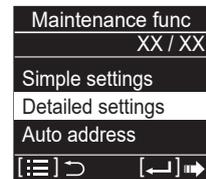


Fig. 4-12-3-3

- (3) Select the “Unit no.” (Fig. 4-12-3-4) by pressing the  or  button.

After selecting “Unit no.”, press the  button and proceed to Step (4).

**NOTE**

If the address setting is not set up correctly, the “ALL” will be displayed in the “Unit no.”.

If the  button is pressed, proceed to Step (6).

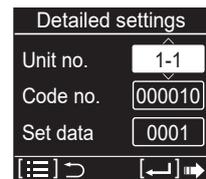


Fig. 4-12-3-4

- (4) Keep pressing the  button for 2 seconds or more during selecting “Code no.”. (Fig. 4-12-3-5)

Change the “Code no.” one digit at a time so that it becomes [0002EE] along with the following procedures.

Change the value (Fig. 4-12-3-6) by pressing the  or  button. After changing the value, press the  button and set the next digit.

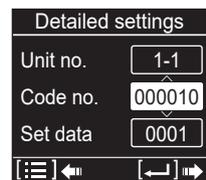


Fig. 4-12-3-5

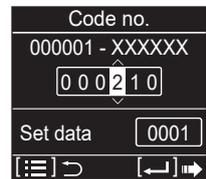


Fig. 4-12-3-6

Change the value (Fig. 4-12-3-7) by pressing the  or  button. After changing the value, press the  button and set the next digit.

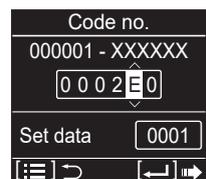


Fig. 4-12-3-7

Change the value (Fig. 4-12-3-8) by pressing the or button.  
After changing all digits, press the button and proceed to Step (5).

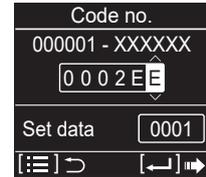


Fig. 4-12-3-8

(5) Select one of the Setting Data "0001" by pressing the or button.

Code no.	Item	Set data	
		0000 *	0001
0002EE	OPT Setting (4-6 pin)	Quiet / EXCT	Demand

\* Setting at factory shipment

After selecting "Set data", press the button. (If setting continuously, follow the procedures from Fig. 4-12-3-6.)

If you wish to change the selected indoor unit or finish setting, press the button twice (the display returns to Step (3)).

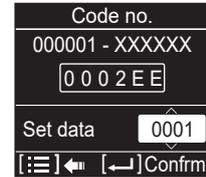


Fig. 4-12-3-9

(6) If the button is pressed under the display Step (3) the following display (Detailed setting-end screen) (Fig. 4-12-3-10) appears.

Then select "YES" by pressing the or button and press the button. (Return to normal remote controller display.)



Fig. 4-12-3-10

Demand control can be selected as the following table.

Input current should be DC24V, 10mA

Connecting wiring must be used "shield wiring".

Table 4-12-3-2

Short-circuit			Control (range of operations)
LV3-COM	LV2-COM	LV1-COM	
0	0	0	No restricted
0	0	1	Rated current restricted to A% (A% = 75% at factory shipment)
0	1	0	Rated current restricted to B% (B% = 50% at factory shipment)
1	0	0	Control OFF

\* The operational current is restricted to either A% or B% as a general indicator during demand input.

- A% and B% can be amended in calibrations of 5% between 40% and 130% with CZ-RTC6 series remote controller.

For details on how to amend the parameters, see "7-3. Detailed Settings Function".

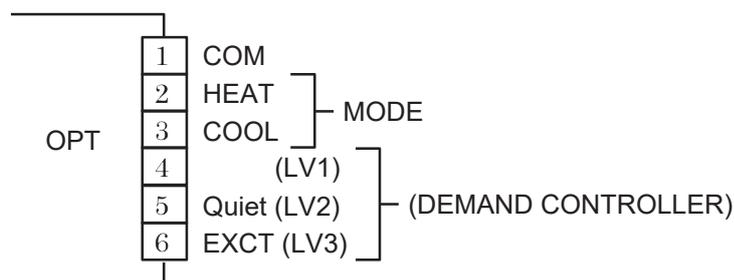
A% value amendments: Parameters are amended with item code "2F2" (demand 1).

B% value amendments: Parameters are amended with item code "2F3" (demand 2).

## 4-13. Indoor Unit Control PCB Switches and Functions

### [Indoor unit control PCB]

- T10 (CN061):** **6P plug (YEL)** / Used for remote control operation. (See the Remote Control Section.)  
Control items: (1) Start/stop input (2) Remote controller prohibit input  
(3) Start signal output (4) Alarm signal output
- EXCT (CN073):** **2P plug (RED)** / Can be used for demand control. When input is present, forces the unit to operate with the thermostat OFF.
- DISP (CN062):** **6P plug (BLK) 2-5pin** / Short-circuiting this pin allows operation to be controlled by the remote controller even when an outdoor unit is not connected. (In this case, alarm "E04," which indicates trouble in the serial communication between the indoor and outdoor unit, does not occur.)
- CHK (CN062):** **6P plug (BLK) 1-4pin** / Test pin. Short-circuiting this pin allows the indoor FM (H fan speed), drain pump, flap motor (F1 position), and electronic expansion valve full-open position to be checked.  
However, this function turns OFF if the indoor unit protection mechanism is activated. The components will operate even if the remote controller and outdoor unit are not connected, however, the remote control cannot be used for control even if it is connected. This pin can be used for short-term tests.
- JP1 (JP001):** **Jumper wire** / Allows selection of the T10 terminal start/stop signal. (See the Remote Control Section.)  
Setting at time of shipment: Pulse signal  
Jumper wire cut: Static signal (continuous signal)
- FAN DRIVE (CN032):** **2P plug (WHT)** / This terminal sends the signal to the ventilation fan when a commercially available ventilation fan is operated by the FAN button on the wired remote controller. (See the Remote Control Section.)  
Use a ventilation fan which can accept the no-voltage contact A signal as the external input signal.
- POWER LED:** **LED (RED)** / Illuminates when the power is ON. Flashes when there is trouble with the EEPROM (IC010: nonvolatile memory).
- EEPROM (IC010):** **Nonvolatile memory** / Used to store model information and other data. When replacing the PCB, remove the EEPROM from the old PCB and install it onto the new PCB. If there is IC trouble, replace with a new IC (provided with the servicing PCB), and set the necessary information using the wired remote controller. (For the setting procedure, see the servicing technical materials.)
- OPT(CN601):** **Used for 6P plug (RED)** / MODE, DEMAND control.  
1 pin: For COM setting, 2-3 pin: For MODE setting, 4-6 pin: For DEMAND / Quiet, EXCT setting



Indoor unit control PCB

- \* When using these functions, use the lead wires described below.  
Lead wire with 6P socket (Service parts: Parts code / ACPA60C7898)  
Check the delivery date in advance because of BTO (build-to-order manufacturing).

#### NOTE:

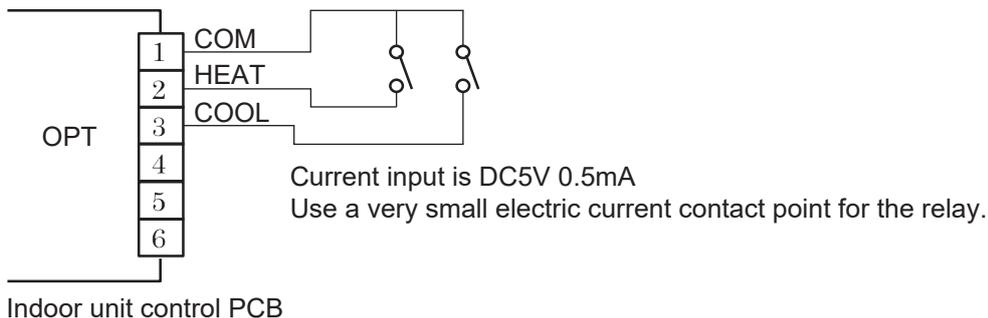
- Wire length between the indoor control PCB and the electrical contact should be less than 2 m.
- Nonuse lead wires should be insulated.

**1. MODE / Indoor Unit Cooling and Heating mode select pin**

1-2 pin short circuit: Heating mode, 1-3 pin short circuit: Cooling mode

- When the heating side is shorted in cooling mode, it changes to heating mode. When the cooling side is shorted in heating mode, it changes to cooling mode.

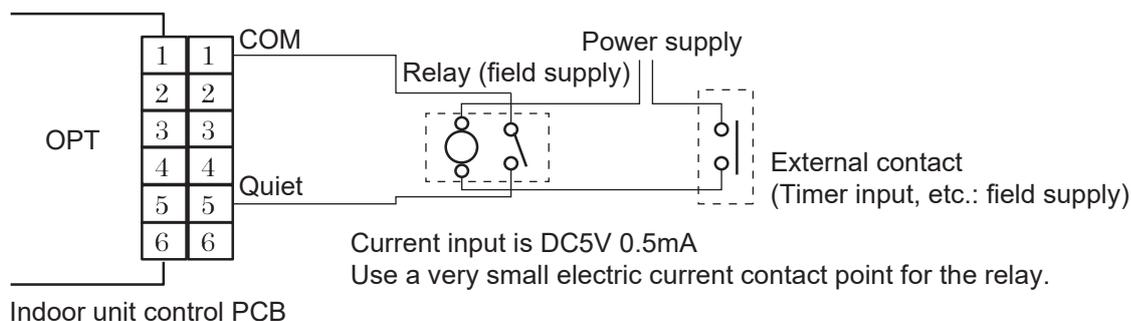
● **Wiring example**



**2. Quiet / Low noise mode operation is available.**

- Operating with limited outdoor fan and compressor frequencies.
- When the relay is switched ON, low noise operation is performed. (Non-voltage contact "a")

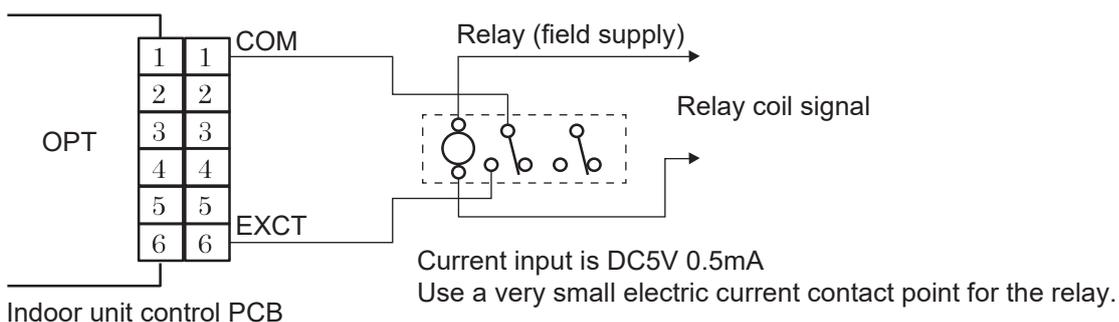
● **Wiring example**



**3. EXCT / DEMAND control available**

- When input, the thermos is forcibly switched OFF.

● **Wiring example**



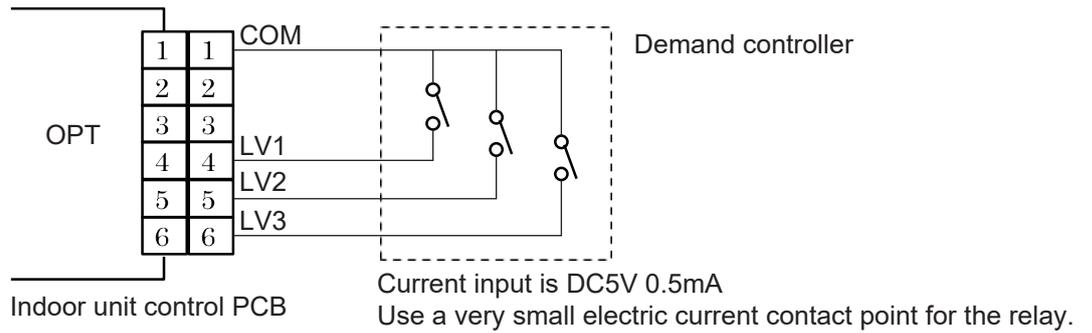
**4. LV1, LV2, LV3** / Use this terminal for demand control.

- When using the demand function, use the CZ-RTC6 series remote controller for setting.
- The below table shows the operating range.  
Select the operating range. See the following table.

pin no. for demand section	Operating range
LV1	Approx. 75% of rated current
LV2	Approx. 50% of rated current
LV3	Stop

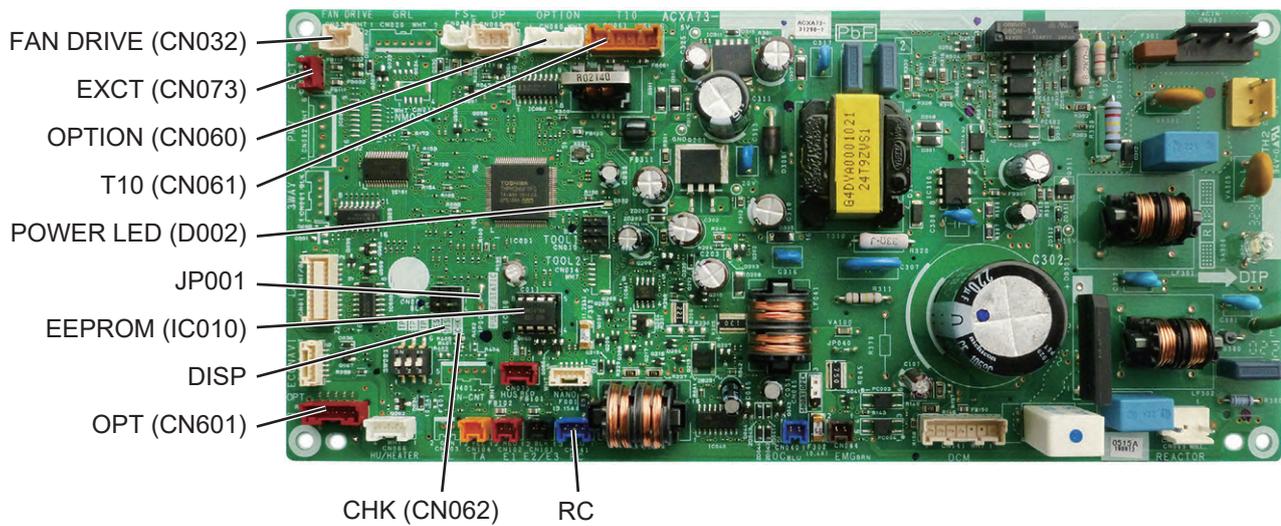
● **Wiring example**

Connect the wires. See the below diagram and above table.



#### 4-Way Cassette Type

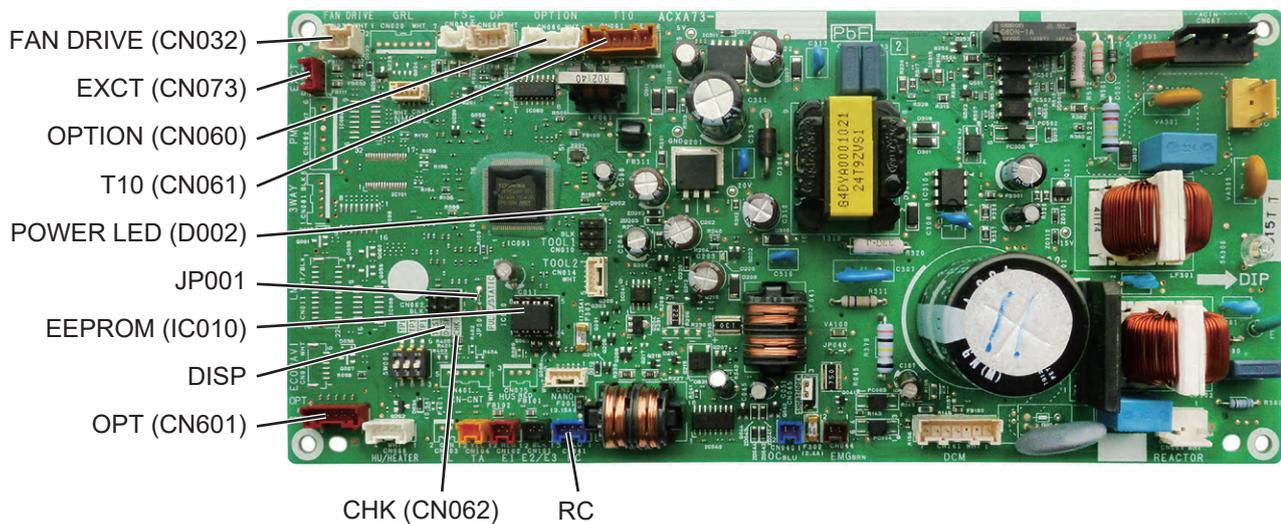
■ Indoor Unit Control Board : ACXA73-3129\* (S-3650PU3E, S-6071PU3E, S-1014PU3E)



4

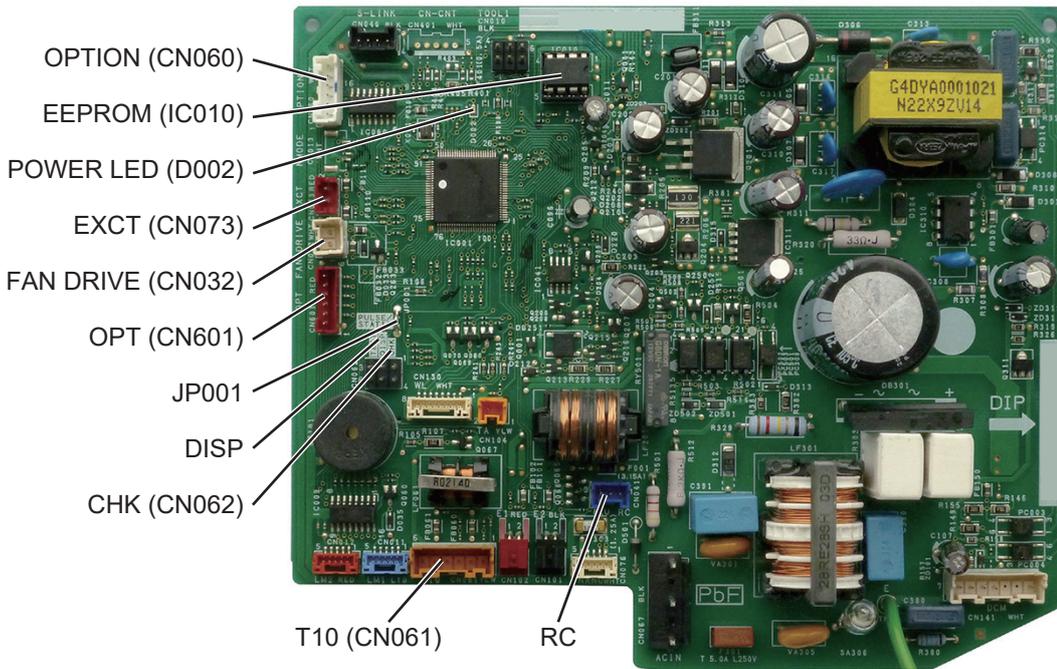
#### Middle Static Pressure Duct Type

■ Indoor Unit Control Board : ACXA73-3440\* (S-3650PF3E, S-6071PF3E, S-1014PF3E)



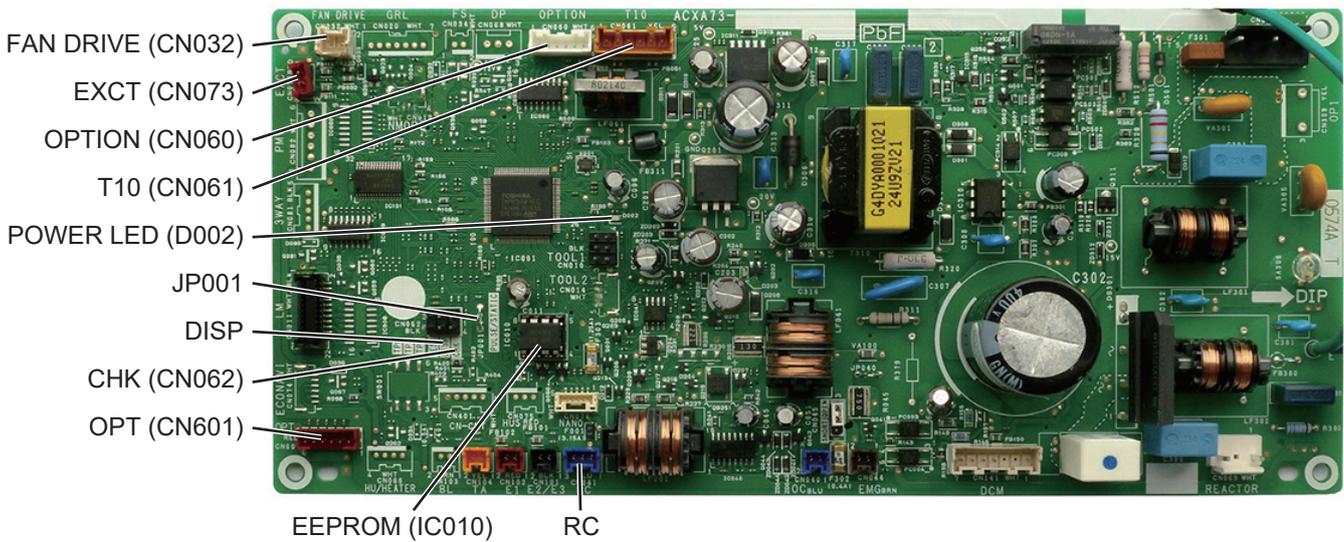
**Wall Mounted Type**

**Indoor Unit Control Board : ACXA73-3671\* (S-3650PK3E, S-6010PK3E)**



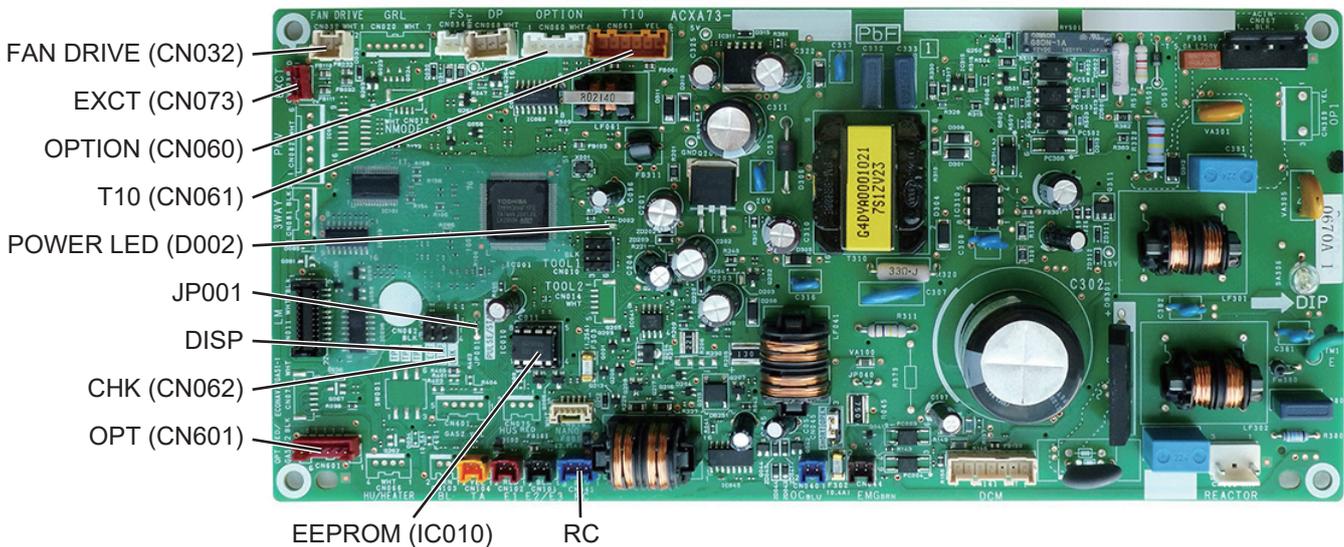
**Ceiling Type**

**Indoor Unit Control Board : ACXA73-3611\* (S-3650PT3E, S-6071PT3E, S-1014PT3E)**



**4-Way Cassette 60 × 60 Type**

**Indoor Unit Control Board : ACXA73-3565\* (S-25PY3E, S-36PY3E, S-50PY3E, S-60PY3E)**



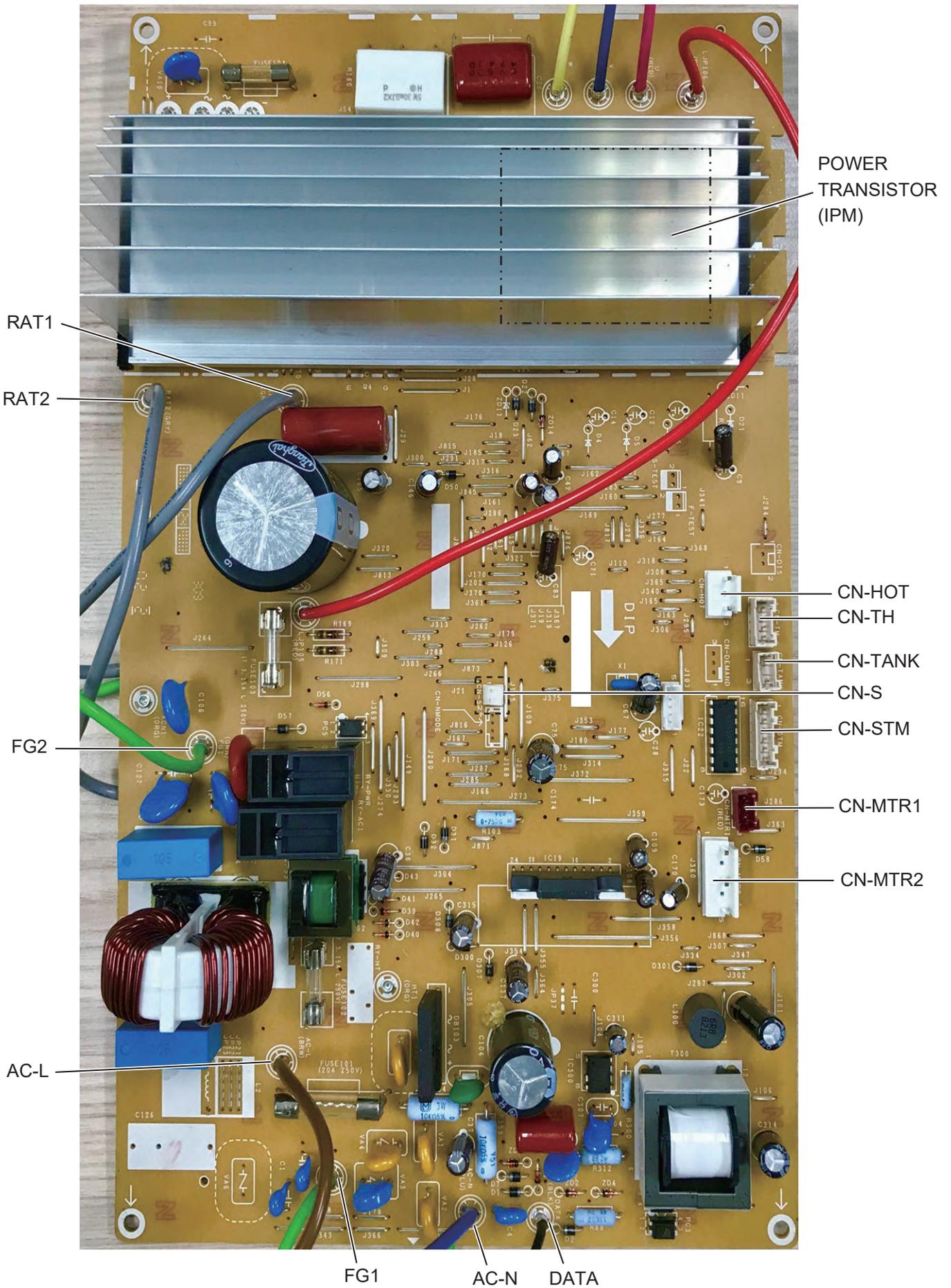
# 4-14. Outdoor Unit Control PCB

4-14-1. U-25PZ3E5, U-36PZ3E5, U-50PZ3E5, U-60PZ3E5A, U-71PZ3E5A

U-25PZ3E5, U-36PZ3E5

■ CR-PCB : ACXA73-3379\*

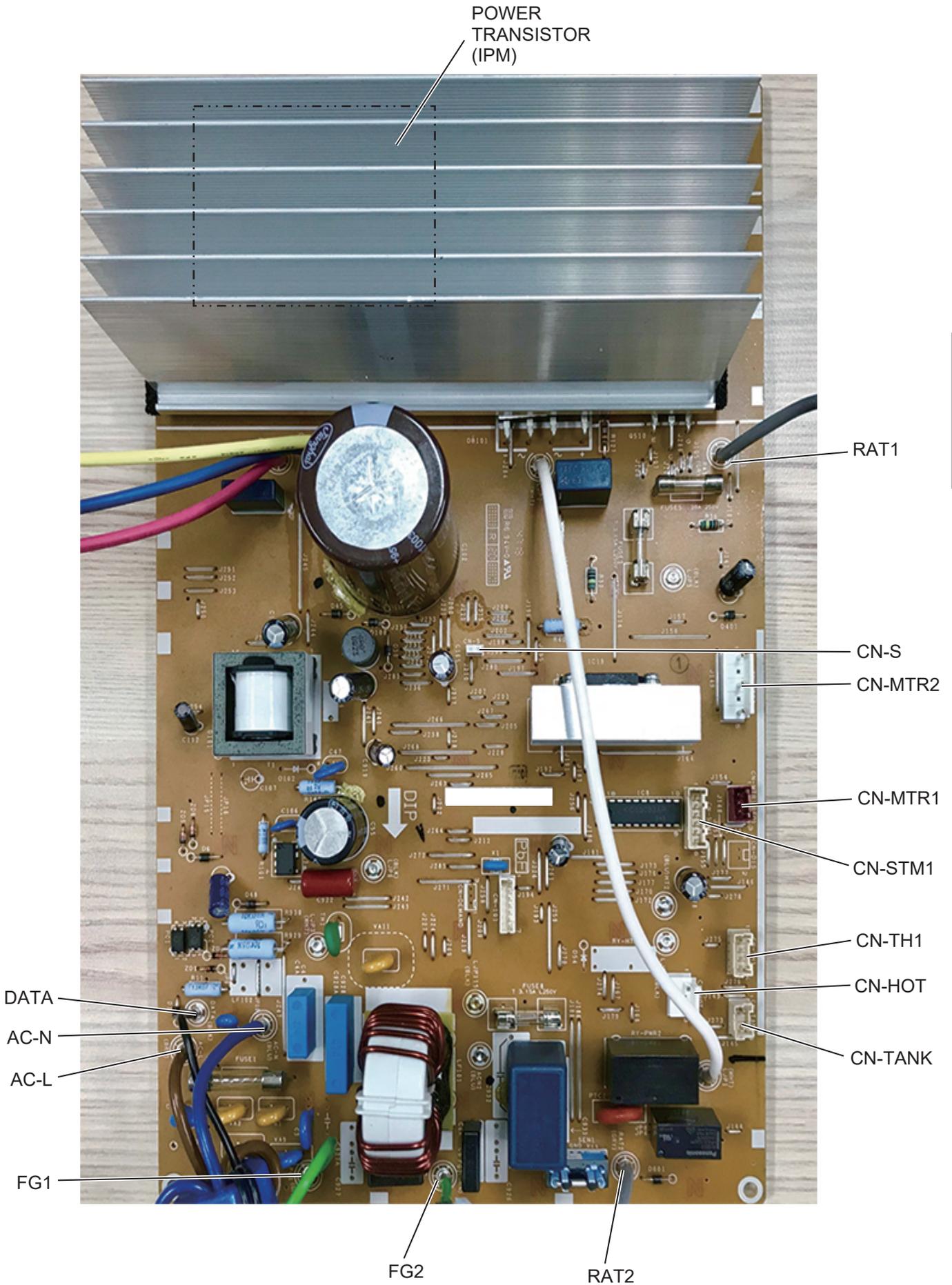
4



4-14-1

U-50PZ3E5, U-60PZ3E5A, U-71PZ3E5A

■ CR-PCB : ACXA73-3380\*



**4-14-2. U-100PZ3E5, U-125PZ3E5, U-140PZ3E5**

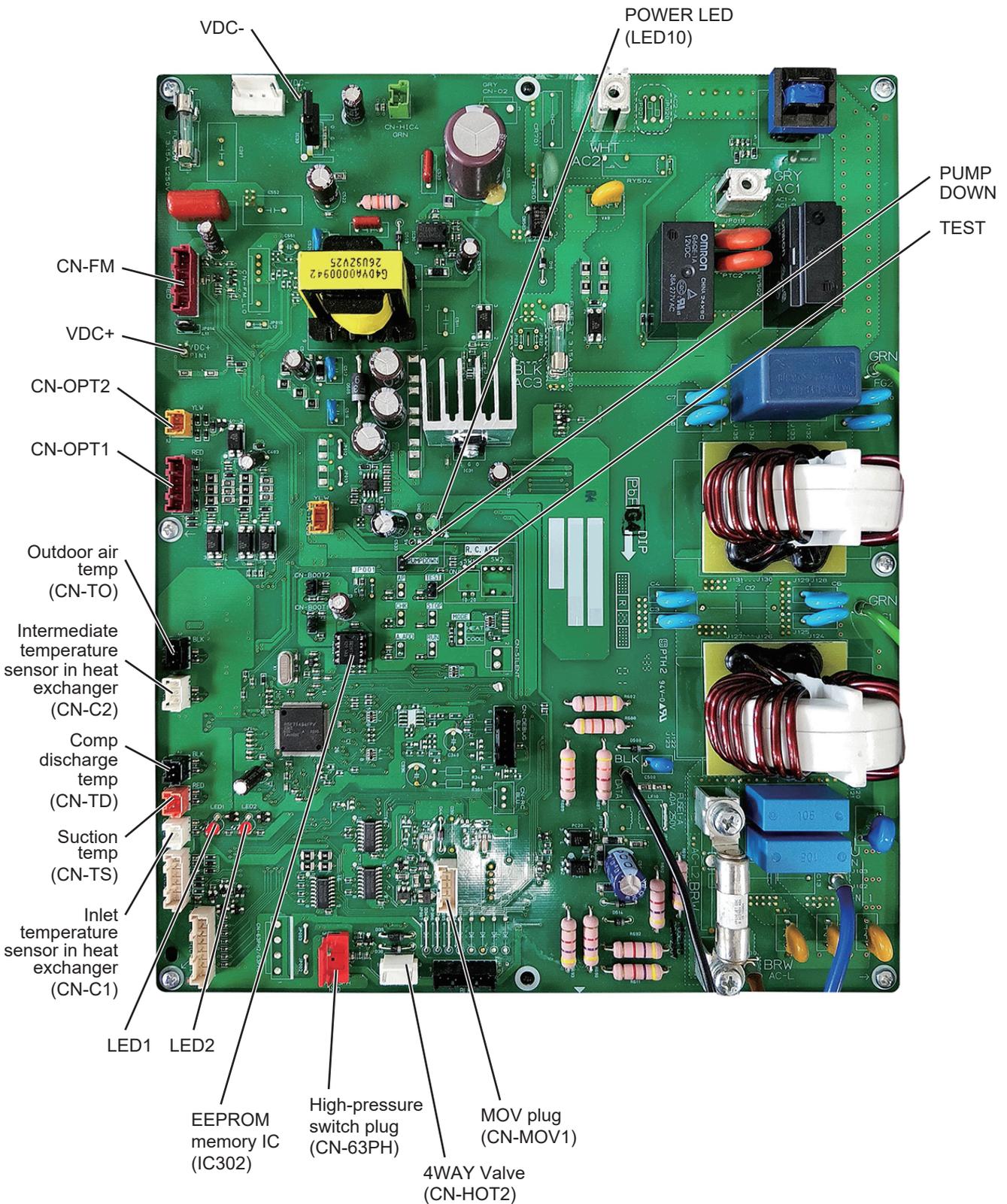
**U-100PZ3E8, U-125PZ3E8, U-140PZ3E8**

**U-100PZ3E5, U-125PZ3E5, U-140PZ3E5**

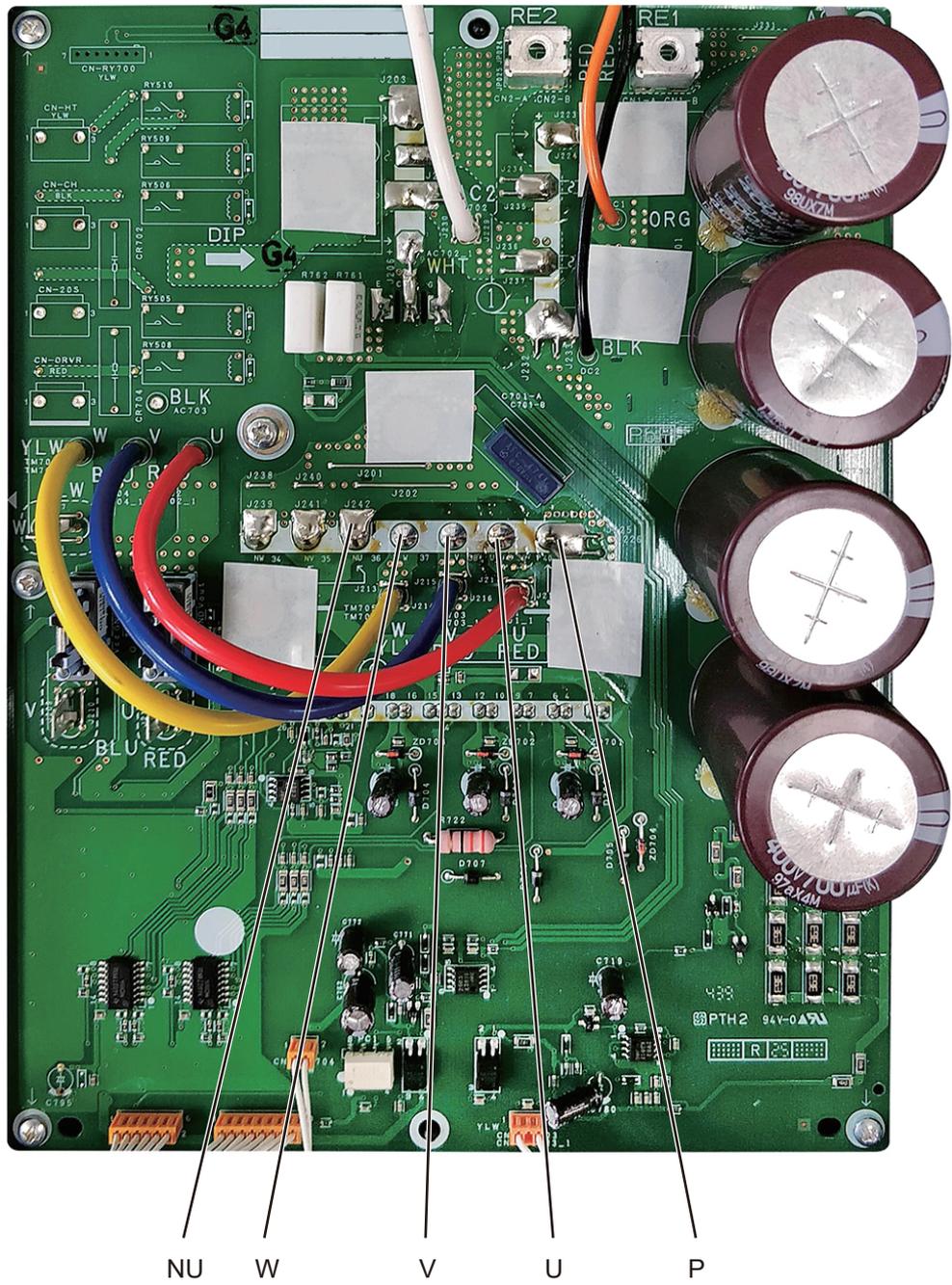
■ CR-PCB : ACXA73-33930 (U-100PZ3E5)

■ CR-PCB : ACXA73-33950 (U-125PZ3E5, U-140PZ3E5)

**4**



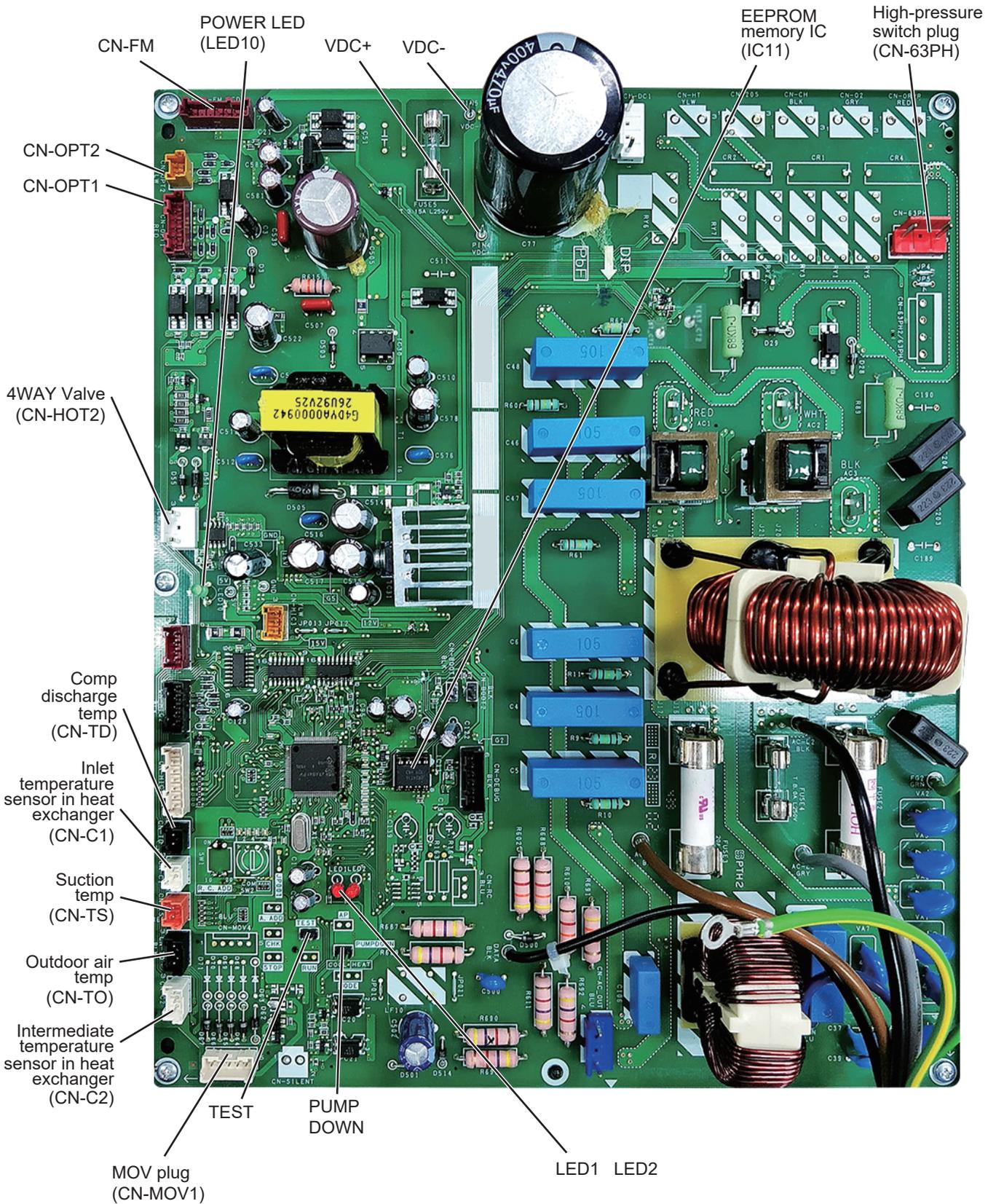
- HIC-PCB : ACXA73-33940 (U-100PZ3E5)
- HIC-PCB : ACXA73-33960 (U-125PZ3E5, U-140PZ3E5)



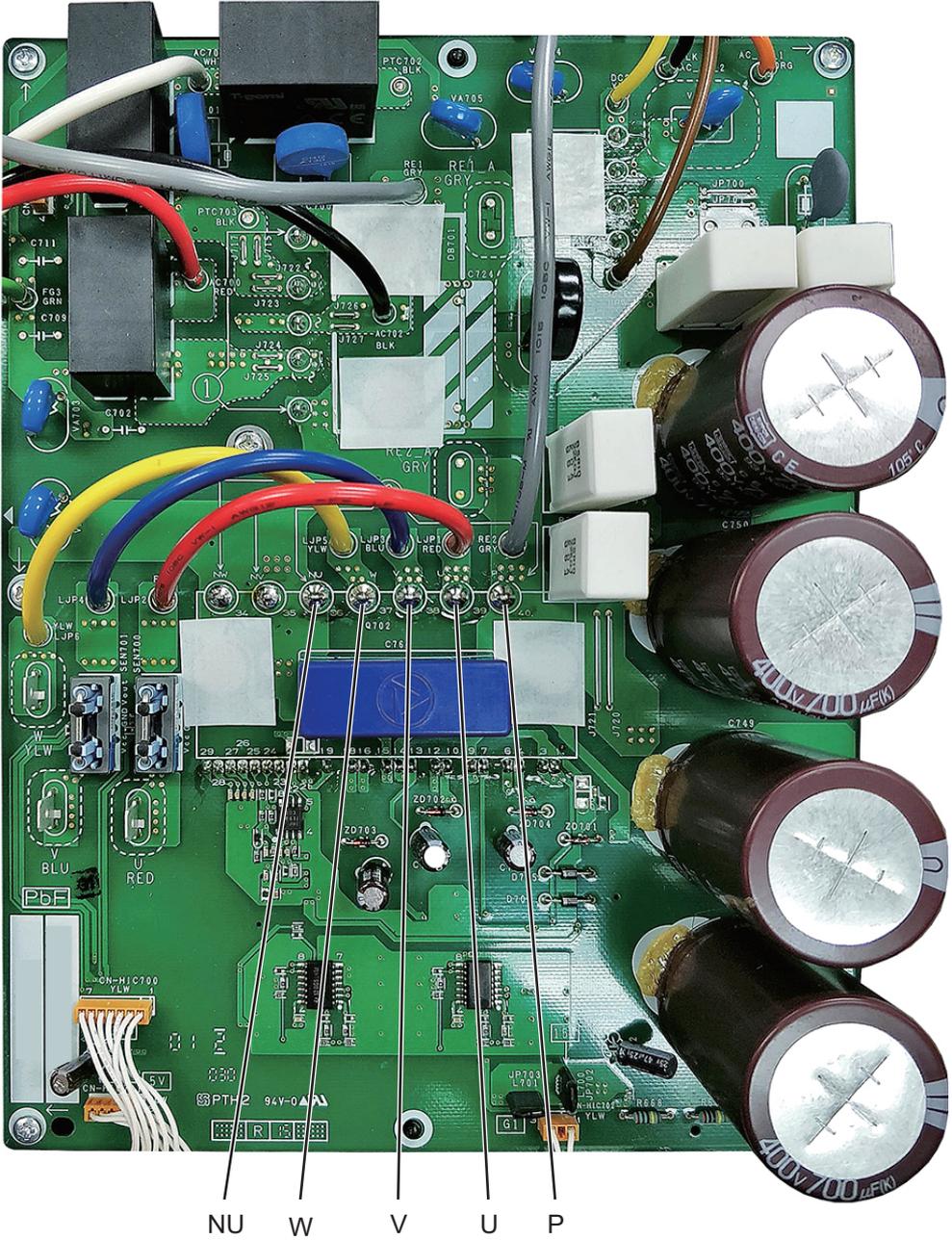
U-100PZ3E8, U-125PZ3E8, U-140PZ3E8

■ CR-PCB : ACXA73-33970 (U-100PZ3E8, U-125PZ3E8, U-140PZ3E8)

4



■ HIC-PCB : ACXA73-33980 (U-100PZ3E8, U-125PZ3E8, U-140PZ3E8)

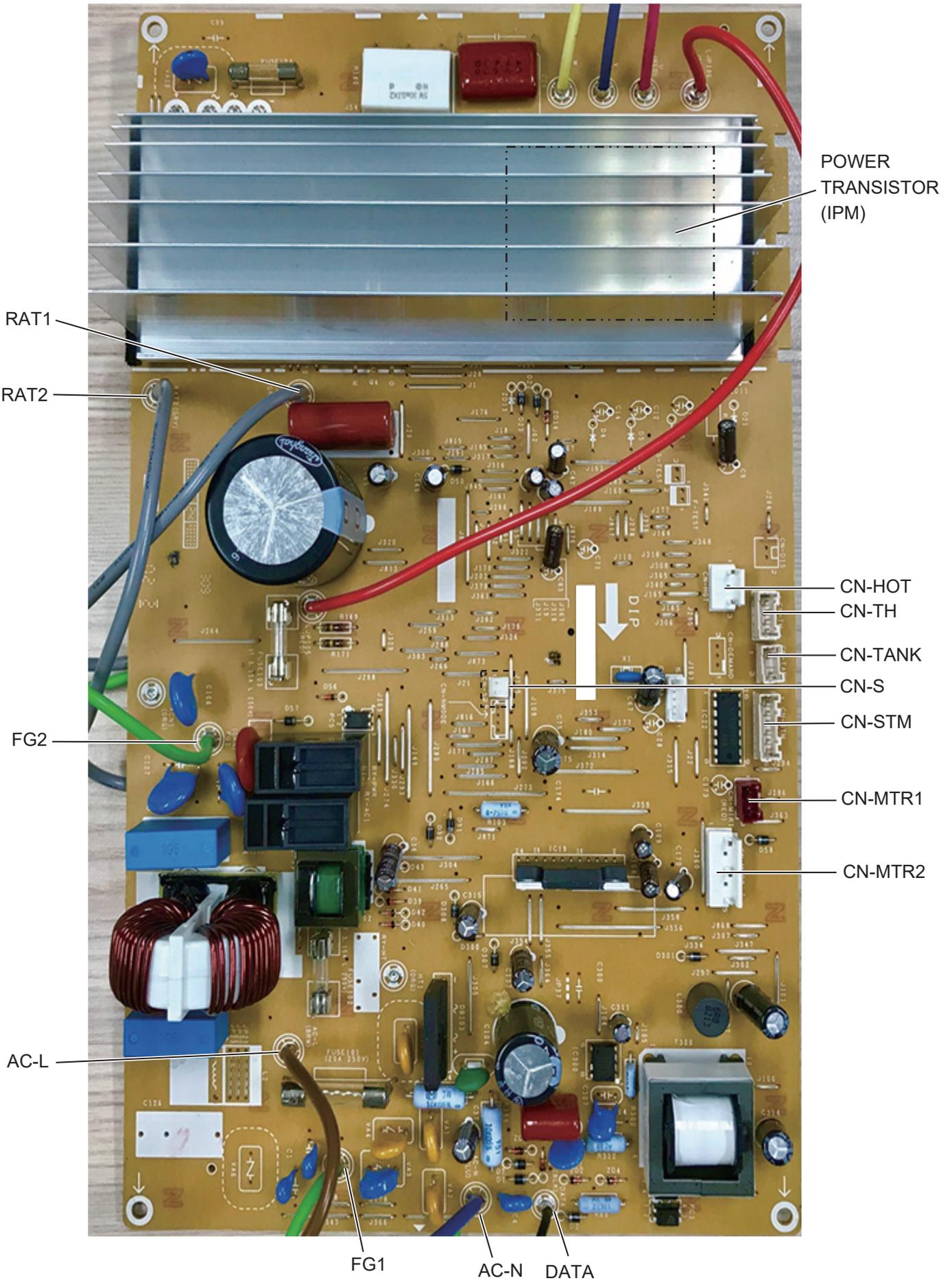


4-14-3. U-36PZH3E5, U-50PZH3E5, U-60PZH3E5

U-36PZH3E5, U-50PZH3E5, U-60PZH3E5

■ CR-PCB : ACXA73-3901\*

4



POWER TRANSISTOR (IPM)

RAT1

RAT2

FG2

AC-L

FG1

AC-N

DATA

CN-HOT

CN-TH

CN-TANK

CN-S

CN-STM

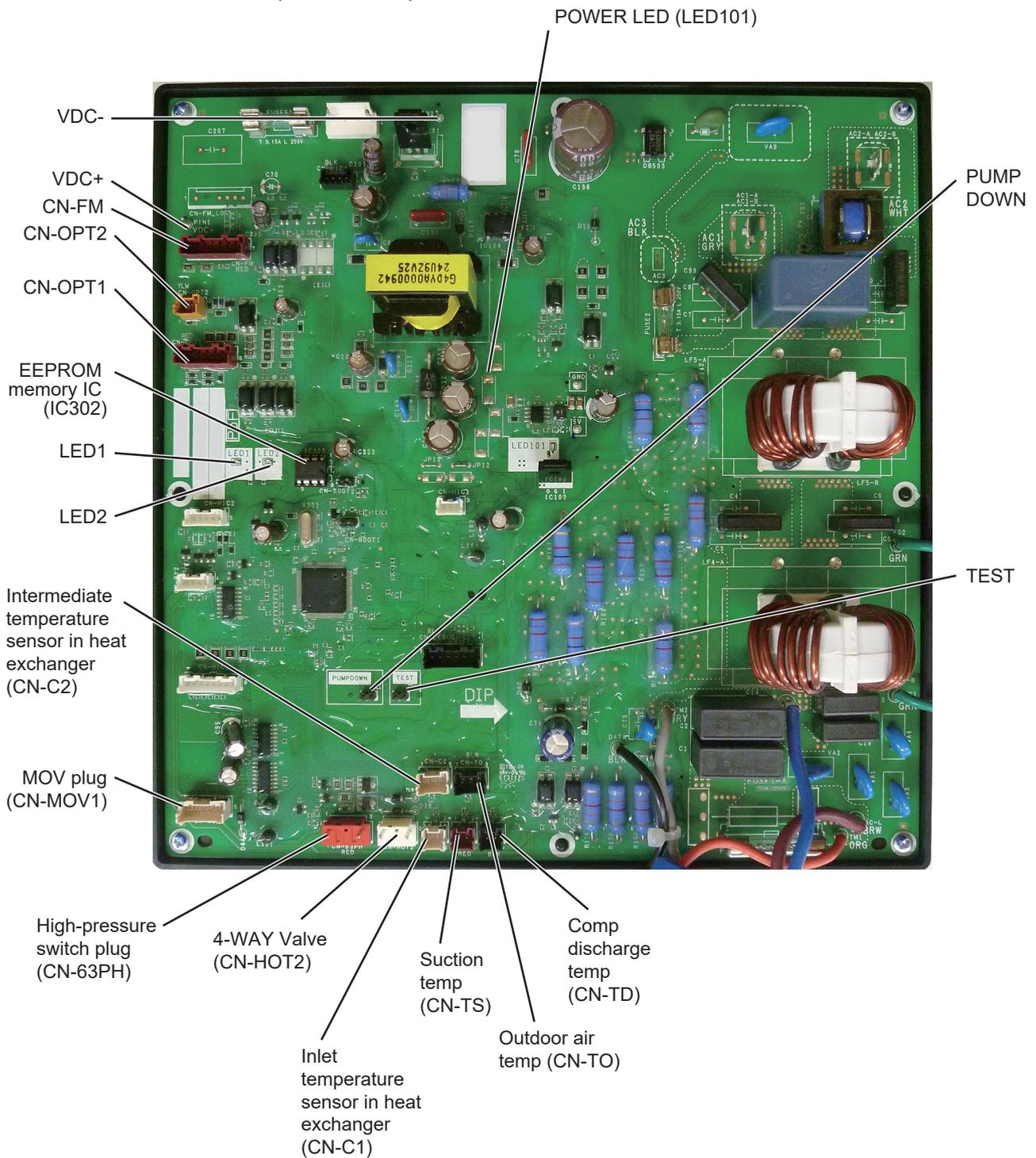
CN-MTR1

CN-MTR2

DIP

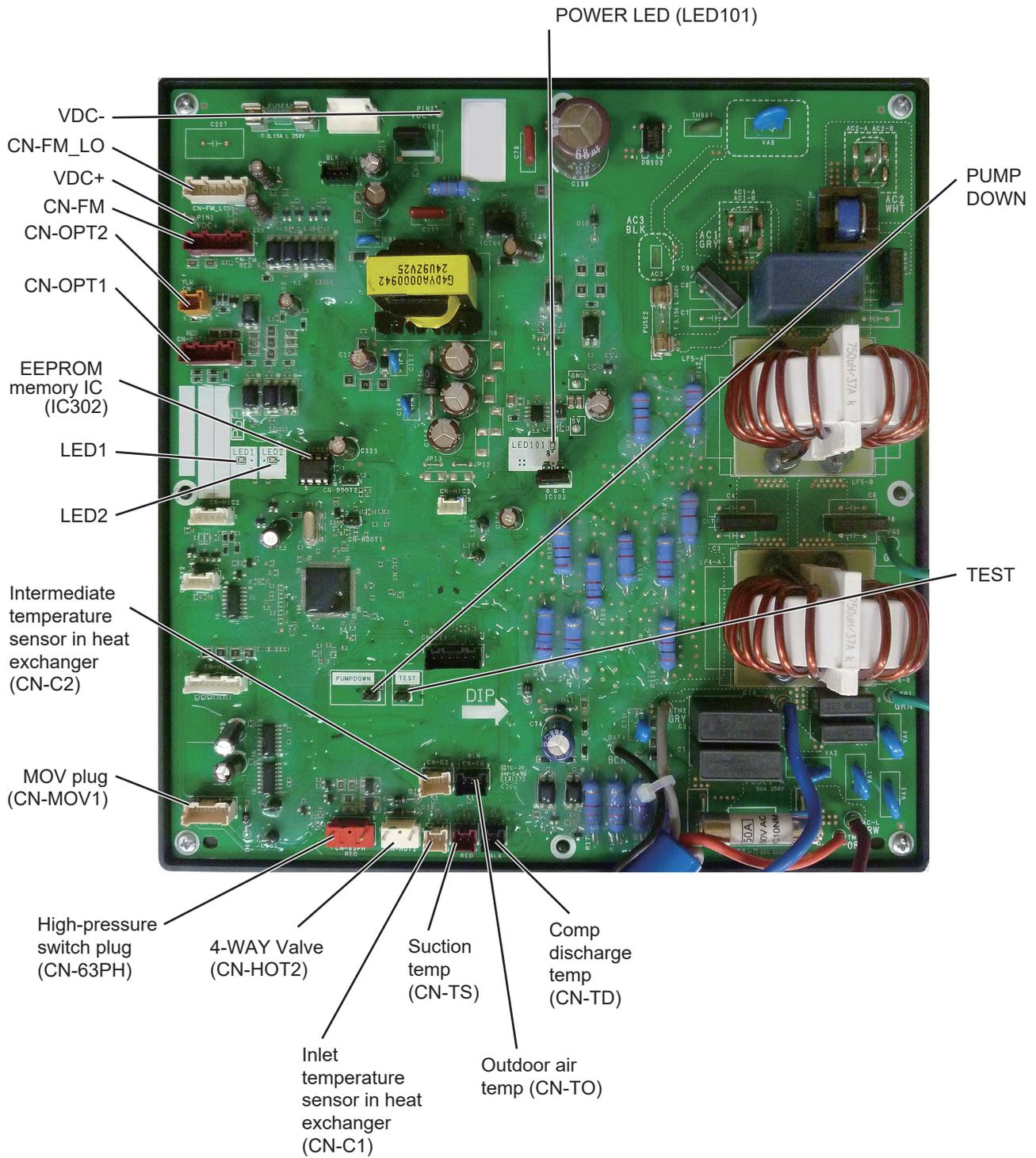
**4-14-4. U-71PZH3E5, U-100PZH3E5, U-125PZH3E5, U-140PZH3E5  
 U-71PZH3E8, U-100PZH3E8, U-125PZH3E8, U-140PZH3E8  
 U-71PZH3E5, U-100PZH3E5, U-125PZH3E5, U-140PZH3E5**

■ **CR-PCB : ACXA73-3552\* (U-71PZH3E5)**

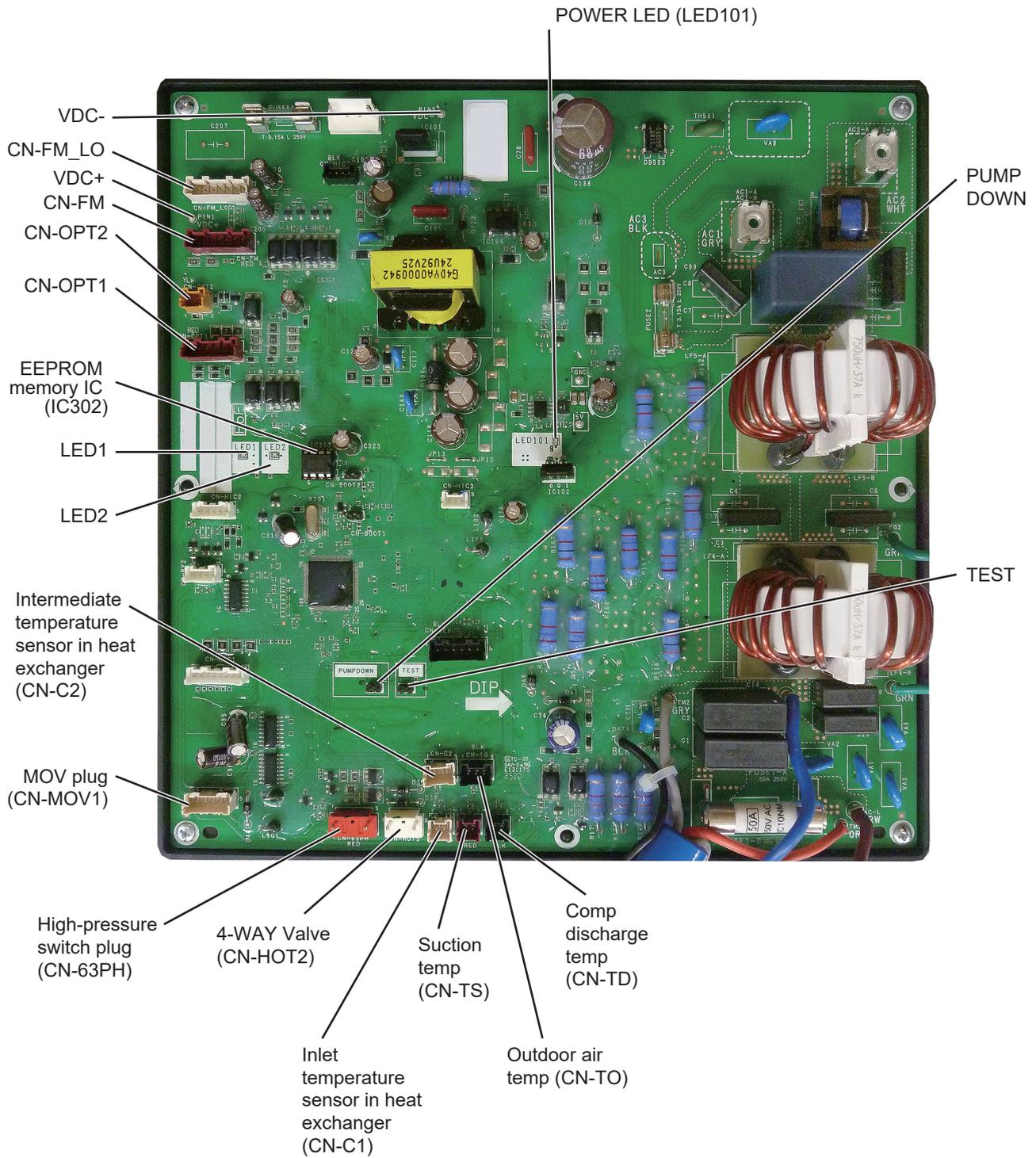


■ CR-PCB : ACXA73-3551\* (U-100PZH3E5)

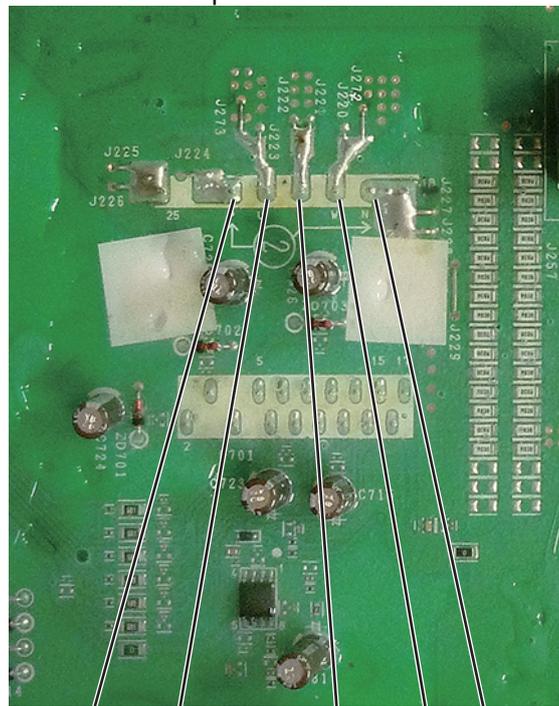
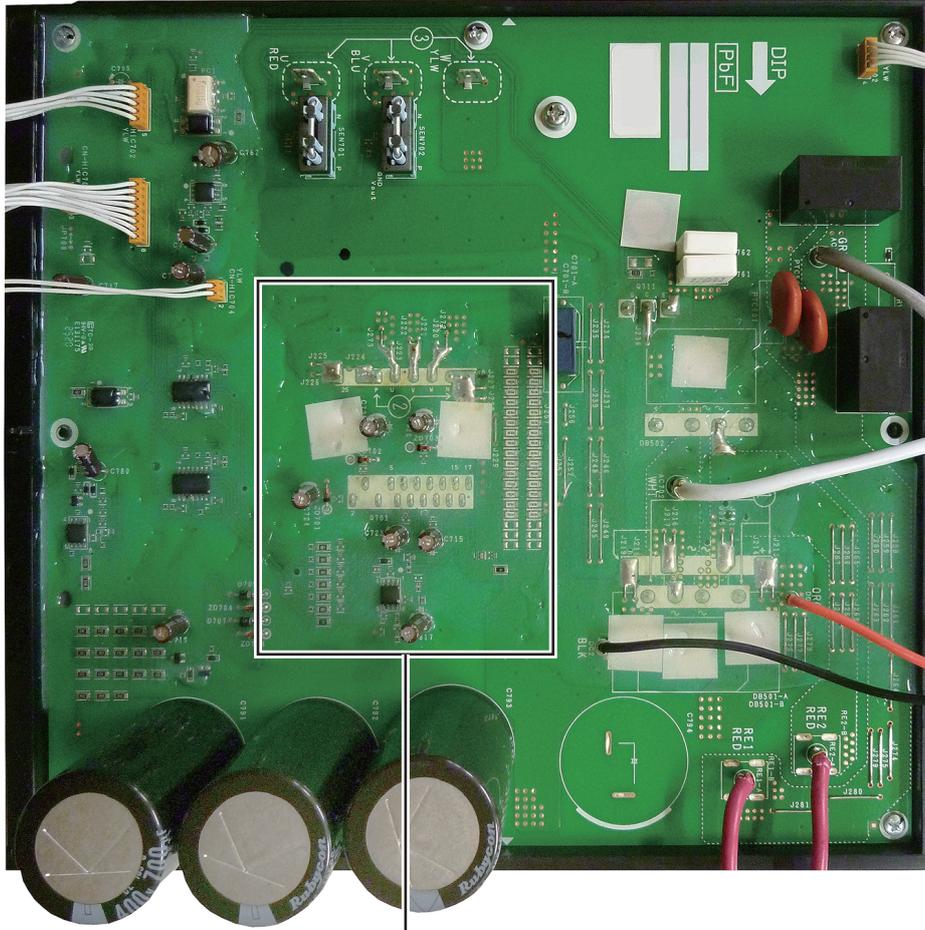
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■ CR-PCB : ACXA73-3550\* (U-125PZH3E5, U-140PZH3E5)

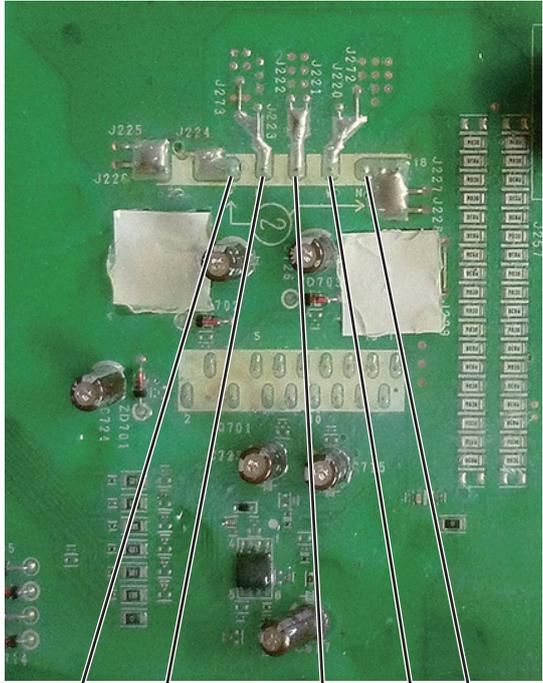
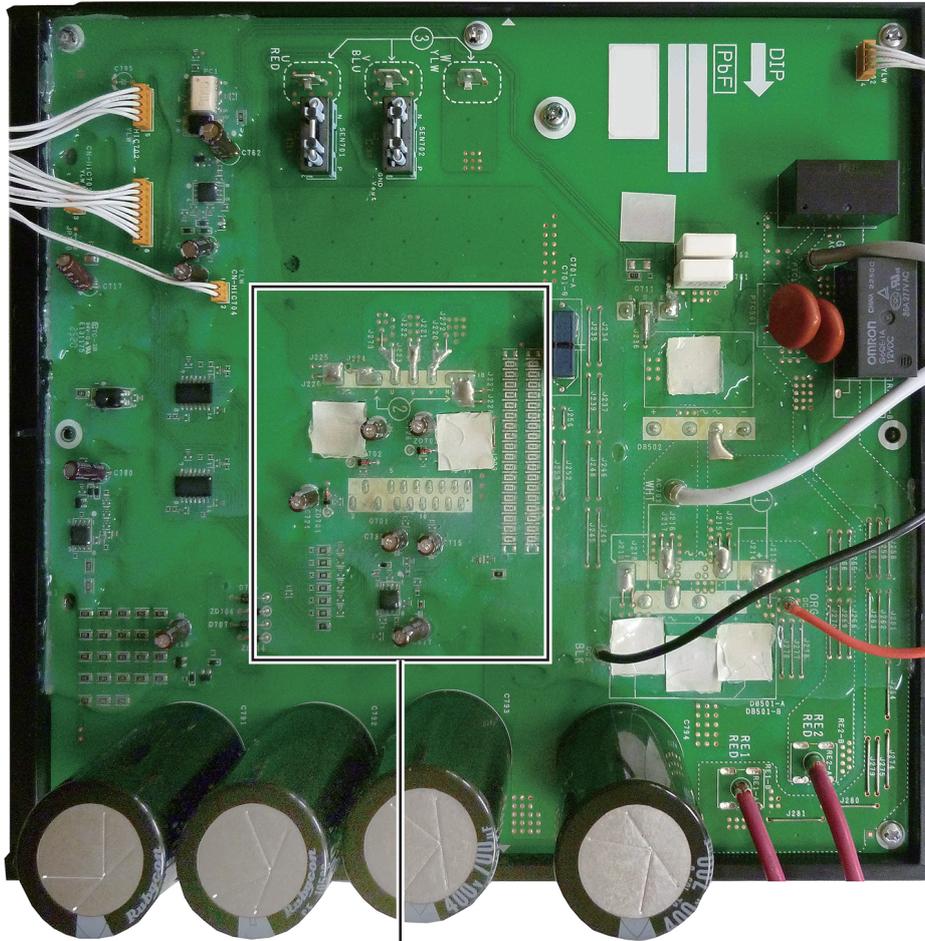


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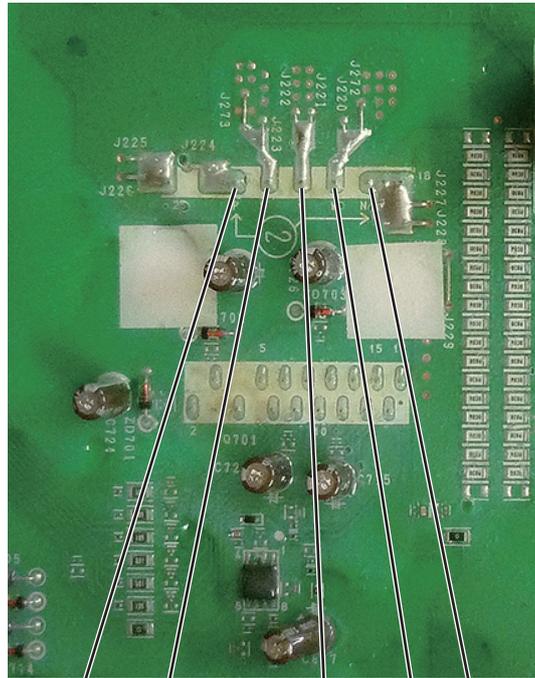
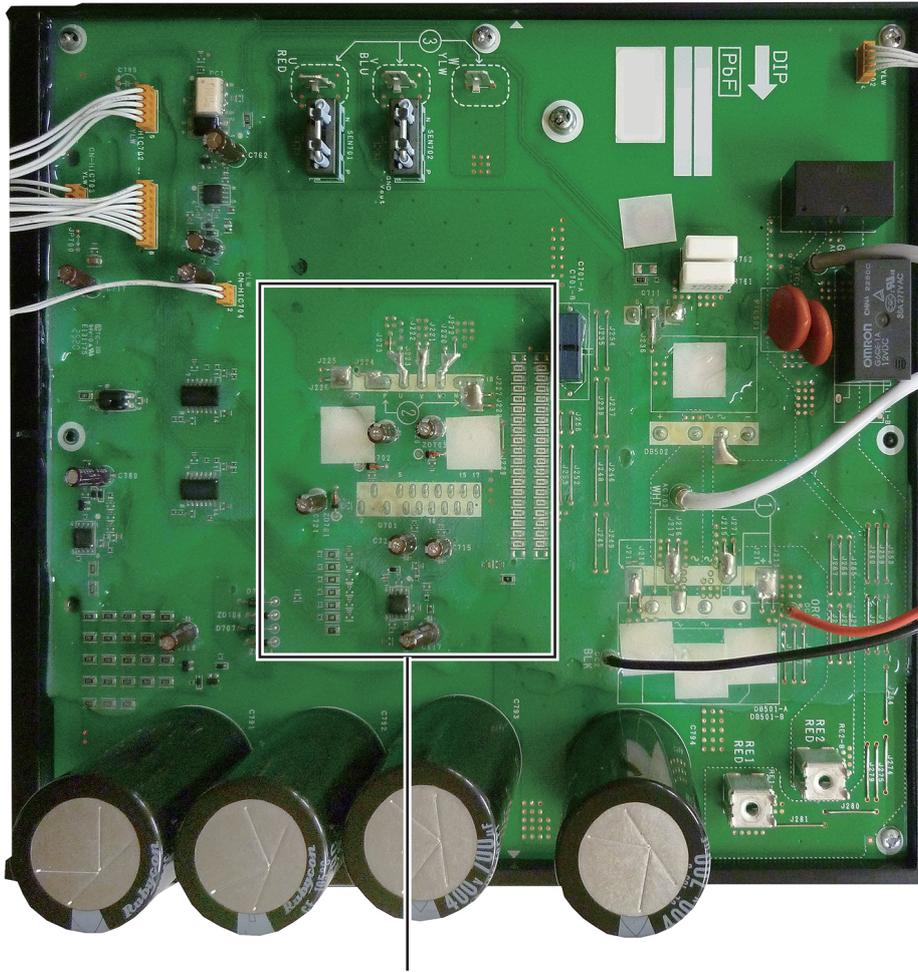
P U V W N

■ HIC-PCB : ACXA73-3554\* (U-100PZH3E5)



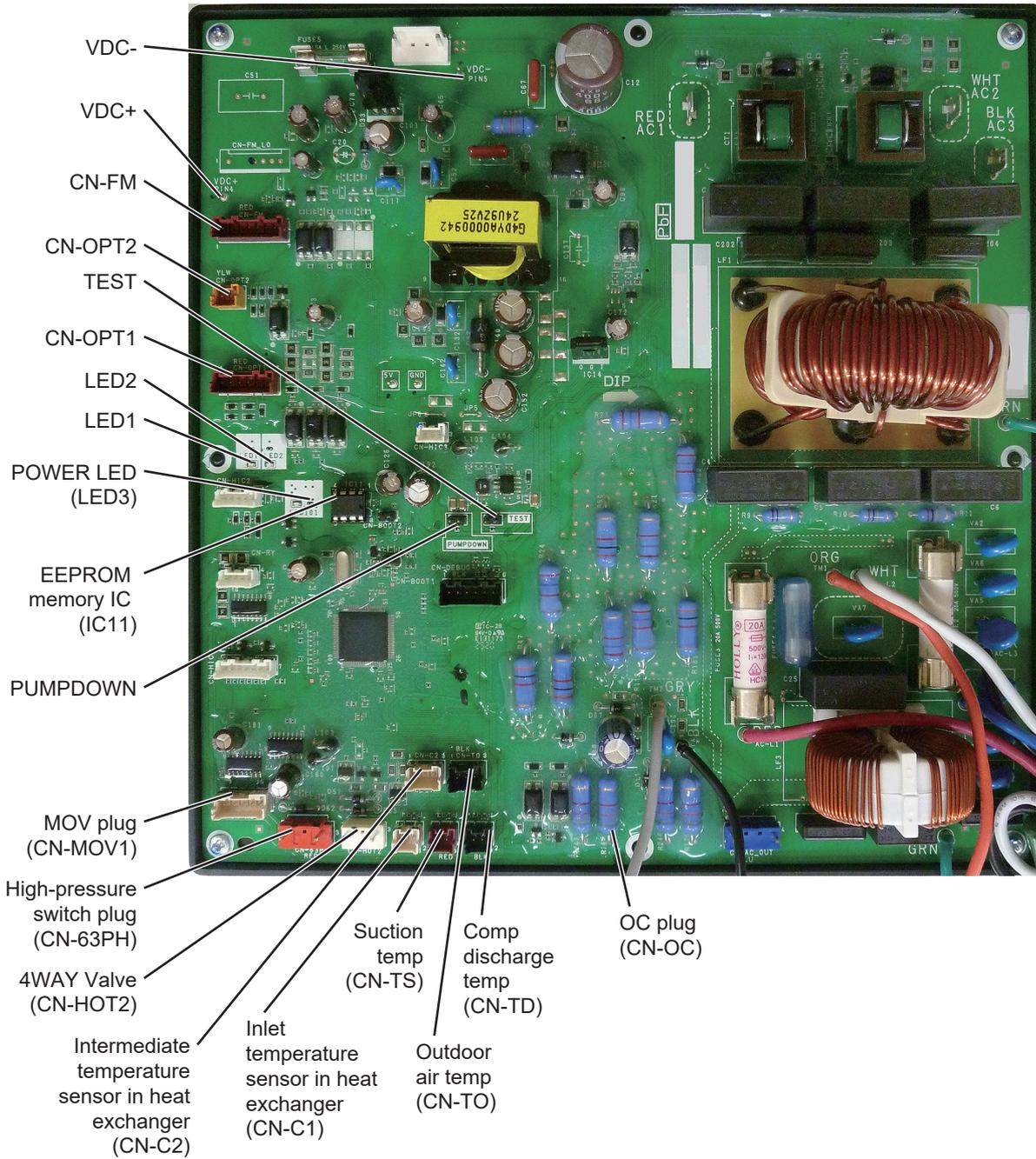
■ HIC-PCB : ACXA73-3553\* (U-125PZH3E5, U-140PZH3E5)

4



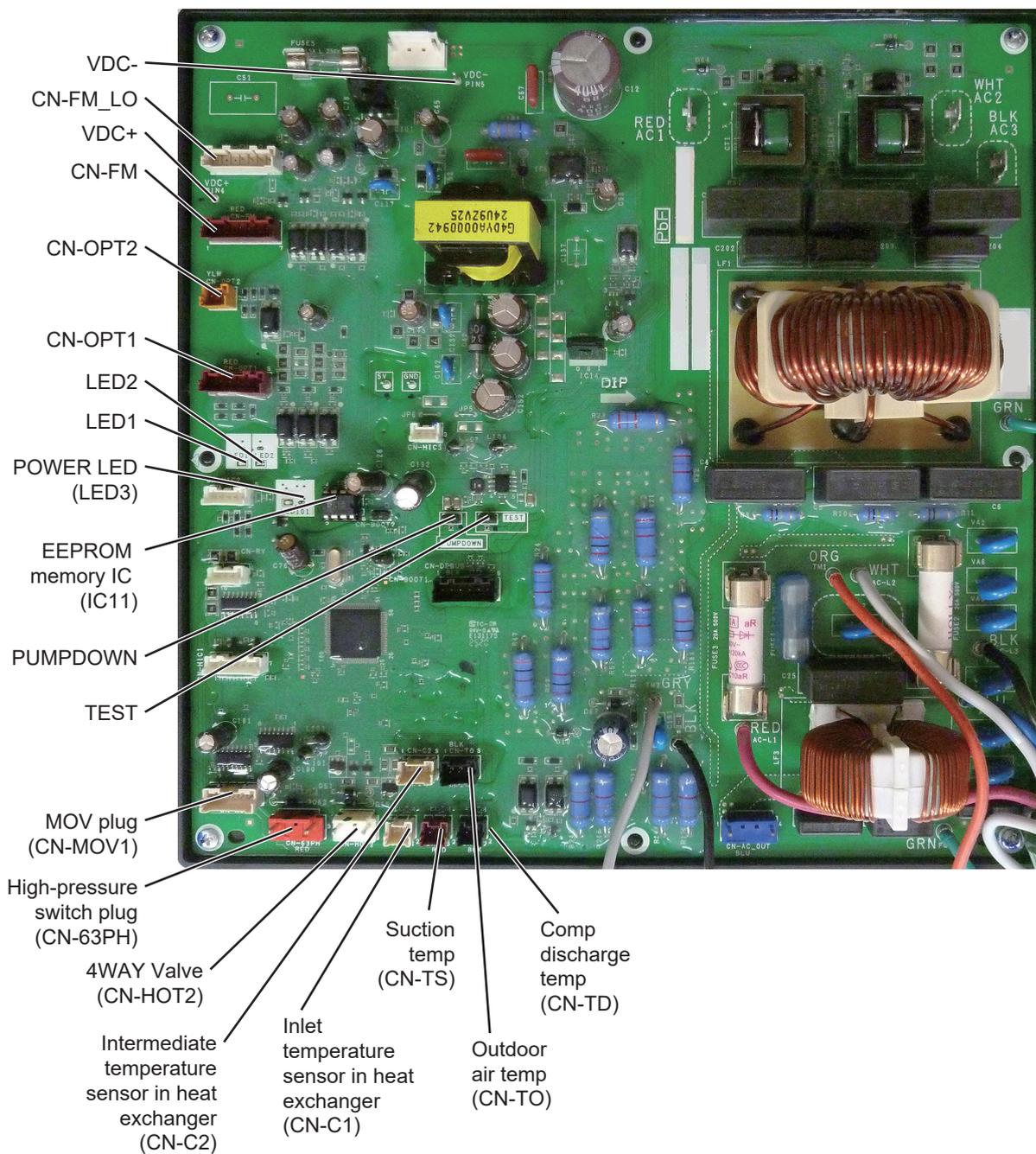
U-71PZH3E8, U-100PZH3E8, U-125PZH3E8, U-140PZH3E8

■ CR-PCB : ACXA73-3557\* (U-71PZH3E8)

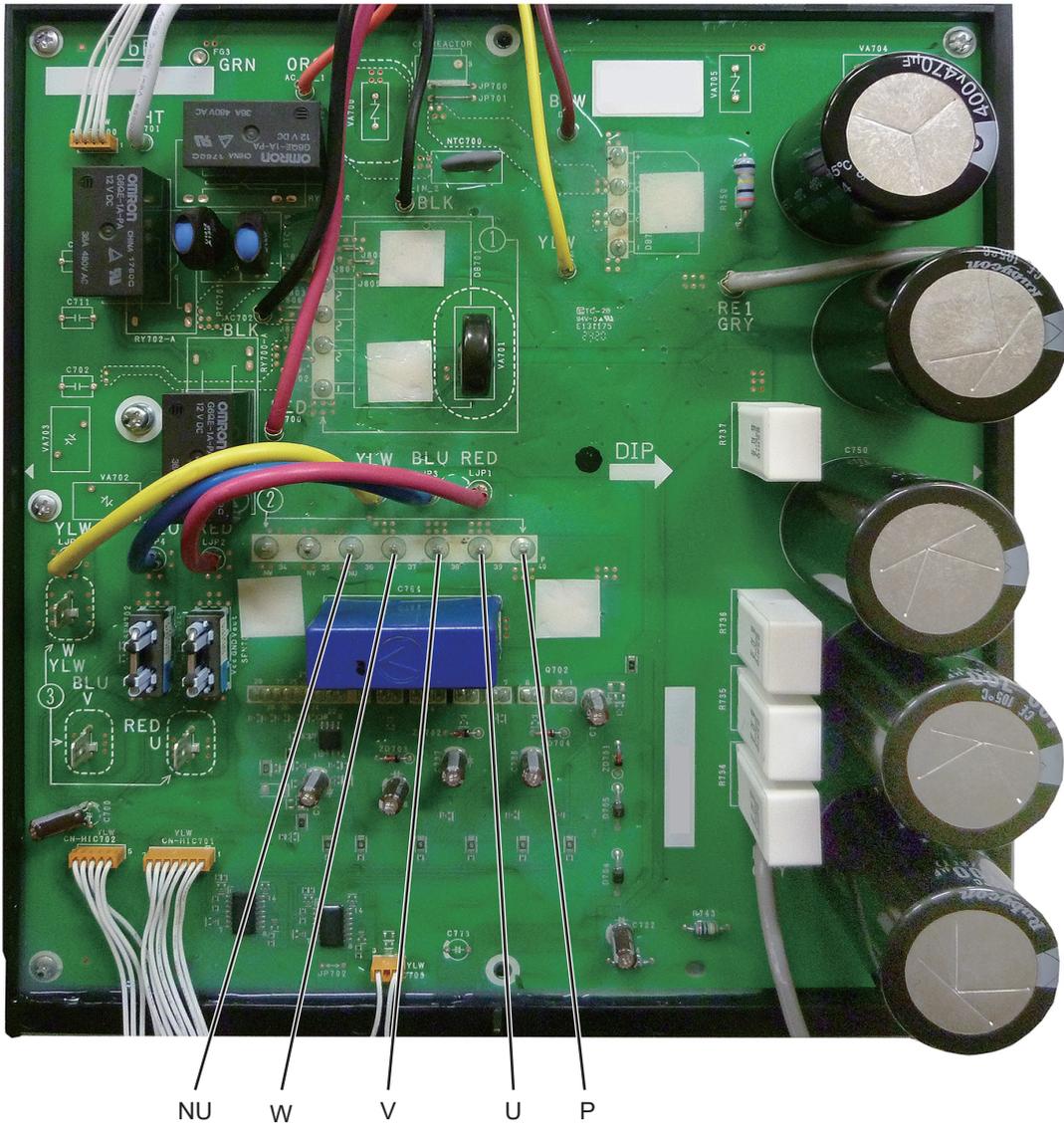


■ CR-PCB : ACXA73-3556\* (U-100PZH3E8, U-125PZH3E8, U-140PZH3E8)

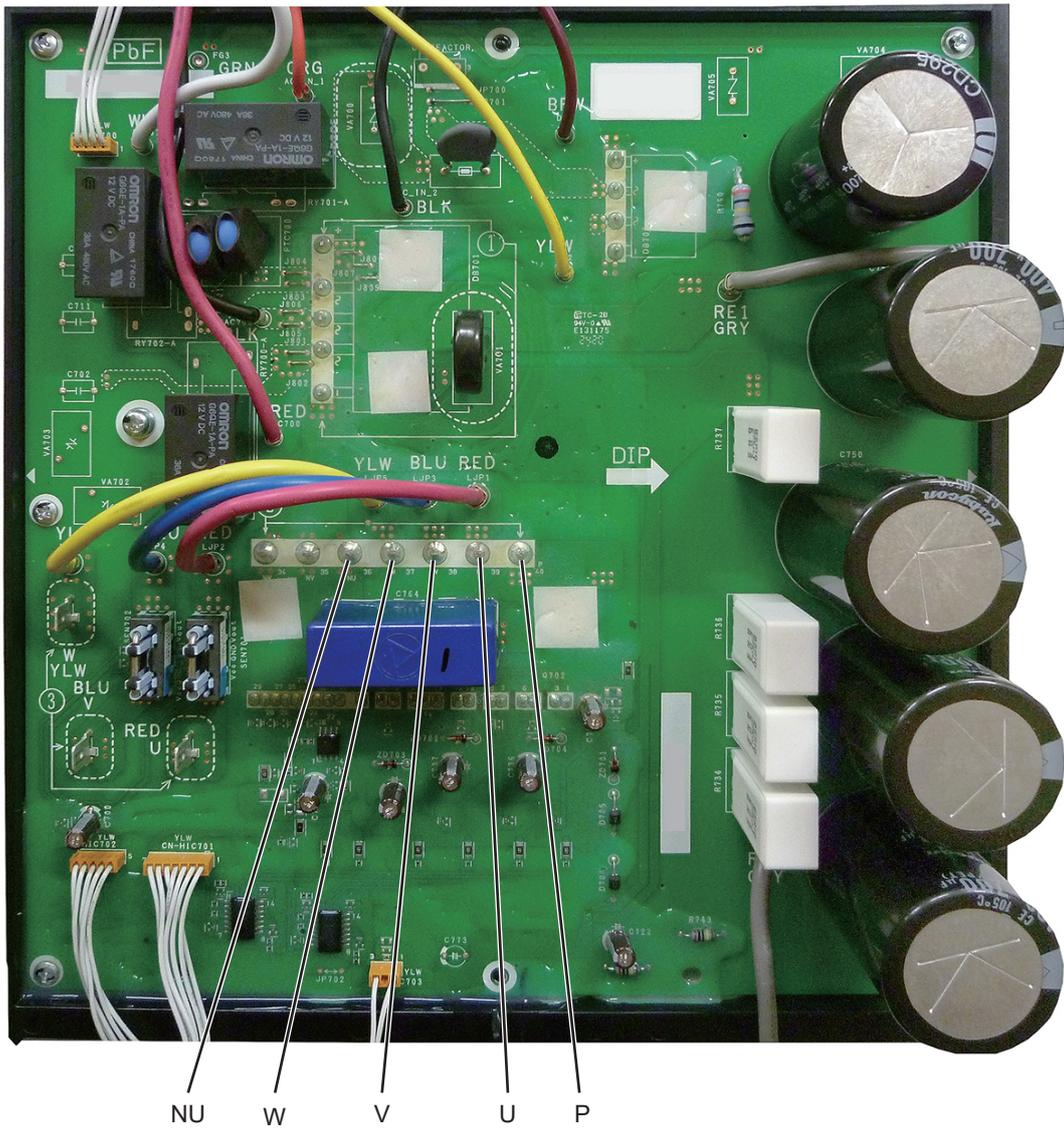
4



■ HIC-PCB : ACXA73-3559\* (U-71PZH3E8)



■ HIC-PCB : ACXA73-3558\* (U-100PZH3E8, U-125PZH3E8, U-140PZH3E8)



4

## Functions of Outdoor Unit PCB

LED 1 LED 2	LED (red × 2) <ul style="list-style-type: none"><li>• LED 1 and 2 blink alternately while auto address setting is in progress.</li><li>• Display the alarm contents for alarms that are detected by the outdoor unit.</li></ul>
POWER LED	LED (green): Power indicator Indicates the DC 5V power on the outdoor unit control PCB.
PUMP DOWN	2P plug (black): Refrigerant recovery Pin <ul style="list-style-type: none"><li>• Short circuit this Pin to perform refrigerant recovery control using cooling operation. The compressor and the indoor unit fan will be operated in cooling mode for a maximum of 10 minutes.</li></ul> When refrigerant recovery is completed, close the valves and open circuit this Pin to stop the operation.
TEST	2P plug (black) <ul style="list-style-type: none"><li>• This Pin is used to test the PCB at the factory.</li><li>• When the power is turned ON after this Pin has been short-circuited, all output signals will be output in sequence. (Sequential output does not occur if this Pin is short-circuited when the power is already ON.) Releasing this Pin returns the unit to normal control.</li></ul>

## 4-15. Self-Diagnostics Function Table

### 4-15-1. U-25PZ3E5, U-36PZ3E5, U-50PZ3E5, U-60PZ3E5A, U-71PZ3E5A U-36PZH3E5, U-50PZH3E5, U-60PZH3E5

- Causes and corrections in instances when auto address setting cannot be started.

Trouble	Cause and correction
An alarm appears immediately when auto address setting is started from the remote controller.	Check the "Alarm Displays" table and correct the problem.
Nothing happens when the operator attempts to start auto address setting from the remote controller.	Check that the remote controller wiring and the connection cable between outdoor and indoor unit are connected correctly. Check that the indoor unit power is ON.

- Causes and corrections in instances when auto address setting starts, but cannot be completed successfully.

Trouble	Cause and correction
An alarm appears on the remote controller sometime from several seconds to several minutes after auto address setting is started.	Check the "Alarm Displays" table and correct the problem.

- If alarm E15 or E16 appears after auto address setting is started, check the following items.

Alarm display	Alarm description
E15	The total capacity of indoor units is too lower than that of outdoor unit.
E16	The total capacity of indoor units is too higher than that of outdoor unit. The number of indoor units is too many.

Check items	E15	E16
Check that the indoor unit power is turned ON.	○	
Check that the connection cable between outdoor and indoor unit is connected correctly. (Check that there are no open circuits, short circuits, terminal plugs, incorrect wiring to the remote controller terminals, or similar problems.)	○	○
Check that the remote controller wiring is connected correctly. (Check that there are no open circuits, short circuits, incorrect wiring to the connection cable between outdoor and indoor unit terminals, control wiring for group control, or similar problems.)	○	
[ U3, F3, K3, T3 ] Check that there are no indoor units where the item code 11, 12, 13, 14 was already incorrectly set by manual or auto address setting.	○	○

- When auto address setting is started from the remote controller, **SETTING** (SETTING) appears on the remote controller at units where the connection cable between outdoor and indoor unit and remote controller wiring are connected correctly.
- In the case of indoor unit group control, if there is a mistake in the remote controller connection cable between outdoor and indoor unit for group control, addresses may not be set even if **SETTING** (SETTING) appears.
- Even if alarm E15 or E16 appears, addresses are set at those indoor units which could be verified. The set addresses can be checked using the remote controller.
- If one of the below alarms appears when the remote controller is operated after auto address setting was completed.

Remote controller display	Cause
Nothing is displayed.	The remote controller is not connected correctly (power trouble). The indoor unit power was cut off after auto address setting was completed.
E01	The remote controller is not connected correctly (remote controller receiving trouble). The remote controller of an indoor unit where the indoor unit address is not set is inadvertently operated. (Communications with the outdoor unit are not possible.)
E02	The remote controller is not connected correctly (trouble with sending of the signal from the remote controller to the indoor unit).
P09	The indoor unit ceiling panel connector is not connected correctly.

## Alarms for indoor units

Alarm Code	Alarm Meaning
E01	Remote Controller Reception Error
E02	Remote Controller Transmission Error
E03	Error in Indoor Unit Receiving Signal from Remote Controller (central)
E04	Error in Indoor Unit Receiving Signal from the Outdoor Unit
E08	Duplicate Indoor Unit Address Settings Error
E09	More Than One Remote Controller Set to Main Error
E14	Main Unit duplication in Simultaneous-operation Multi Control (detected outdoor unit)
E15	Auto Address Alarm (The total capacity of indoor units is too low.)
E16	Auto Address Alarm (The total capacity of indoor units is too high or the total number of indoor units is too many.)
E18	Faulty Communication in Group Control Wiring
P09	Faulty wiring connections of (ceiling) indoor unit panel
P31	Group Control Error

## Alarms for outdoor units

Alarm Code	Alarm Meaning
E04	Error in Indoor Unit Receiving Signal from the Outdoor Unit
F04	Compressor Discharge Temperature Sensor (TD) Trouble
F06	Inlet Temperature Sensor (C1) in Heat Exchanger Trouble
F08	Outdoor Air Temperature Sensor (TO) Trouble
H01	Primary (input) Overcurrent Detected
H02	PAM Trouble
H03	Primary Current CT Sensor (current sensor) Failure
L18	4-Way Valve Operation Failure
P03	Compressor Discharge Temperature Trouble
P04	High Pressure Trouble
P05	AC Power Supply Trouble
P07	HIC (IPM) Temperature Trouble
P13	Alarm Valve Open
P15	Insufficient Gas Level Detected
P16	Compressor Overcurrent Trouble
P22	Outdoor Unit Fan Motor Trouble
P29	Lack of INV compressor wiring, INV compressor actuation failure (including locked), DCCT failure

**4-15-2. U-100PZ3E5, U-125PZ3E5, U-140PZ3E5  
U-100PZ3E8, U-125PZ3E8, U-140PZ3E8**

- Causes and corrections in instances when auto address setting cannot be started.

<b>Trouble</b>	<b>Cause and correction</b>
The power LED on the outdoor unit control PCB does not turn ON.	Check for any errors in the power wiring to the outdoor unit, and check for a missing phase.
LED 1 and 2 on the outdoor unit control PCB do not turn OFF when the outdoor unit power is turned ON, and auto address setting cannot be started.	Check the "Alarm Displays" table and correct the problem.
An alarm appears immediately when auto address setting is started from the remote controller.	
Nothing happens when the operator attempts to start auto address setting from the remote controller.	Check that the remote controller wiring and the connection cable between outdoor and indoor unit are connected correctly. Check that the indoor unit power is ON.

- Causes and corrections in instances when auto address setting starts, but cannot be completed successfully.

<b>Trouble</b>	<b>Cause and correction</b>
An alarm appears on the remote controller sometime from several seconds to several minutes after auto address setting is started.	Check the "Alarm Displays" table and correct the problem.
LED 1 and 2 on the outdoor unit control PCB indicate that auto address setting is in progress (the LEDs blink alternately) for several minutes after auto address setting is started (the compressors may also start and stop several times), however, LED 1 and 2 never indicate that auto address setting is completed (turn OFF).	Check the alarm details on the "Outdoor Unit Control PCB LED 1 and 2 Alarms" table, then check the "Alarm Displays" table and correct the problem.

- If alarm E15, E16, or E20 appears after auto address setting is started, check the following items.

<b>Alarm display</b>	<b>Alarm description</b>
E15	The total capacity of indoor units is too lower than that of outdoor unit.
E16	The total capacity of indoor units is too higher than that of outdoor unit. The number of indoor units is too many.
E20	The outdoor unit received no serial signals from indoor units within 90 seconds after auto address setting was started.

Check items	E15	E16	E20
Check that the indoor unit power is turned ON.	○		○
Check that the connection cable between outdoor and indoor unit is connected correctly. (Check that there are no open circuits, short circuits, terminal plugs, incorrect wiring to the remote controller terminals, or similar problems.)	○	○	○
Check that the remote controller wiring is connected correctly. (Check that there are no open circuits, short circuits, incorrect wiring to the connection cable between outdoor and indoor unit terminals, control wiring for group control, or similar problems.)	○		○
[ U3, F3, K3, T3 ] Check that there are no indoor units where the item code 11, 12, 13, 14 was already incorrectly set by manual or auto address setting.	○	○	

- When auto address setting is started from the outdoor unit control PCB or from the remote controller, **SETTING** (SETTING) appears on the remote controller at units where the connection cable between outdoor and indoor unit and remote controller wiring are connected correctly. LED 1 and 2 on the outdoor unit control PCB blink alternately.
- In the case of indoor unit group control, if there is a mistake in the remote controller connection cable between outdoor and indoor unit for group control, addresses may not be set even if **SETTING** (SETTING) appears.
- Even if alarm E15 or E16 appears, addresses are set at those indoor units which could be verified. The set addresses can be checked using the remote controller.
- If one of the below alarms appears when the remote controller is operated after auto address setting was completed (LED 1 and 2 on the outdoor unit control PCB are turned OFF), follow the instructions in the table below and correct the problem location.

Remote controller display	Cause
Nothing is displayed.	The remote controller is not connected correctly (power trouble). The indoor unit power was cut off after auto address setting was completed.
E01	The remote controller is not connected correctly (remote controller receiving trouble). The remote controller of an indoor unit where the indoor unit address is not set is inadvertently operated. (Communications with the outdoor unit are not possible.)
E02	The remote controller is not connected correctly (trouble with sending of the signal from the remote controller to the indoor unit).
P09	The indoor unit ceiling panel connector is not connected correctly.

## Alarms for indoor units

Alarm Code	Alarm Meaning
E01	Remote Controller Reception Error
E02	Remote Controller Transmission Error
E03	Error in Indoor Unit Receiving Signal from Remote Controller (central)
E04	Error in Indoor Unit Receiving Signal from the Outdoor Unit
E08	Duplicate Indoor Unit Address Settings Error
E09	More Than One Remote Controller Set to Main Error
E14	Main Unit duplication in Simultaneous-operation Multi Control (detected outdoor unit)
E15	Auto Address Alarm (The total capacity of indoor units is too low.)
E16	Auto Address Alarm (The total capacity of indoor units is too high or the total number of indoor units is too many.)
E18	Faulty Communication in Group Control Wiring
P09	Faulty wiring connections of (ceiling) indoor unit panel
P31	Group Control Error

## Alarms for outdoor units

Alarm Code	Alarm Meaning
E04	Error in Indoor Unit Receiving Signal from the Outdoor Unit
E06	Outdoor Unit Failed to Receive Serial Communication Signals from Indoor Unit
E15	Auto Address Alarm (The total capacity of indoor units is too low.)
E16	Auto Address Alarm (The total capacity of indoor units is too high or the total number of indoor units is too many.)
E20	Connection Problem of Indoor / Outdoor Units

F04	Compressor Discharge Temperature Sensor (TD) Trouble
F06	Inlet Temperature Sensor (C1) in Heat Exchanger Trouble
F07	Intermediate Temperature Sensor (C2) in Heat Exchanger Trouble
F08	Outdoor Air Temperature Sensor (TO) Trouble
F12	Compressor Inlet Suction Temperature Sensor (TS) Trouble
F31	Outdoor Unit Nonvolatile Memory (EEPROM) Trouble

H01	Primary (input) Overcurrent Detected
H02	PAM Trouble
H03	Primary Current CT Sensor (current sensor) Failure
H31	HIC Trouble

L10	Outdoor Unit Capacity not Set or Invalid
L13	Indoor Unit Type Setting Error
L18	4-Way Valve Operation Failure

P03	Compressor Discharge Temperature Trouble
P04	High Pressure Trouble
P05	AC Power Supply Trouble
P13	Alarm Valve Open
P15	Insufficient Gas Level Detected
P16	Compressor Overcurrent Trouble
P22	Outdoor Unit Fan Motor Trouble
P29	Lack of INV compressor wiring, INV compressor actuation failure (including locked), DCCT failure
P31	Group Control Error

- The number of times that LED 1 and 2 blink on the outdoor unit control PCB can be used to check the alarm display. (See "Checking the LED 1 and 2 Alarm Display on the Outdoor Unit Control PCB".)

### Contents of LED Display on the Outdoor Unit Control PCB (CR)

	LED1	LED2	Remark
Normal operation			
Pre-trip (High pressure protection)	○		LED1 Blinking : 0.8sec-ON / 0.3sec-OFF
Pre-trip (other)	○		LED1 Blinking : 0.5sec-ON / 0.5sec-OFF
Alternate blinking of outdoor unit LED during alarms	LED1 blinks M times, and then LED2 blinks N times. The cycle then repeats. M=2:P alarm, 3:H alarm, 4:E alarm, 5:F alarm, 6:L alarm, N=alarm No Example: LED1 blinks 4 times, then LED2 blinks 6 times. The cycle then repeats. Alarm is "E06"		
Refrigerant recovery mode	○	●	

○ : Blinking      ● : ON

**4-15-3. U-71PZH3E5, U-100PZH3E5, U-125PZH3E5, U-140PZH3E5  
U-71PZH3E8, U-100PZH3E8, U-125PZH3E8, U-140PZH3E8**

- Causes and corrections in instances when auto address setting cannot be started.

<b>Trouble</b>	<b>Cause and correction</b>
The power LED on the outdoor unit control PCB does not turn ON.	Check for any errors in the power wiring to the outdoor unit, and check for a missing phase.
LED 1 and 2 on the outdoor unit control PCB do not turn OFF when the outdoor unit power is turned ON, and auto address setting cannot be started.	Check the "Alarm Displays" table and correct the problem.
An alarm appears immediately when auto address setting is started from the remote controller.	
Nothing happens when the operator attempts to start auto address setting from the remote controller.	Check that the remote controller wiring and the connection cable between outdoor and indoor unit are connected correctly. Check that the indoor unit power is ON.

- Causes and corrections in instances when auto address setting starts, but cannot be completed successfully.

<b>Trouble</b>	<b>Cause and correction</b>
An alarm appears on the remote controller sometime from several seconds to several minutes after auto address setting is started.	Check the "Alarm Displays" table and correct the problem.
LED 1 and 2 on the outdoor unit control PCB indicate that auto address setting is in progress (the LEDs blink alternately) for several minutes after auto address setting is started (the compressors may also start and stop several times), however, LED 1 and 2 never indicate that auto address setting is completed (turn OFF).	Check the alarm details on the "Outdoor Unit Control PCB LED 1 and 2 Alarms" table, then check the "Alarm Displays" table and correct the problem.

- If alarm E15, E16, or E20 appears after auto address setting is started, check the following items.

<b>Alarm display</b>	<b>Alarm description</b>
E15	The total capacity of indoor units is too lower than that of outdoor unit.
E16	The total capacity of indoor units is too higher than that of outdoor unit. The number of indoor units is too many.
E20	The outdoor unit received no serial signals from indoor units within 90 seconds after auto address setting was started.

Check items	E15	E16	E20
Check that the indoor unit power is turned ON.	○		○
Check that the connection cable between outdoor and indoor unit is connected correctly. (Check that there are no open circuits, short circuits, terminal plugs, incorrect wiring to the remote controller terminals, or similar problems.)	○	○	○
Check that the remote controller wiring is connected correctly. (Check that there are no open circuits, short circuits, incorrect wiring to the connection cable between outdoor and indoor unit terminals, control wiring for group control, or similar problems.)	○		○
[ U3, F3, K3, T3 ] Check that there are no indoor units where the item code 11, 12, 13, 14 was already incorrectly set by manual or auto address setting.	○	○	

- When auto address setting is started from the outdoor unit control PCB or from the remote controller, **SETTING** (SETTING) appears on the remote controller at units where the connection cable between outdoor and indoor unit and remote controller wiring are connected correctly. LED 1 and 2 on the outdoor unit control PCB blink alternately.
- In the case of indoor unit group control, if there is a mistake in the remote controller connection cable between outdoor and indoor unit for group control, addresses may not be set even if **SETTING** (SETTING) appears.
- Even if alarm E15 or E16 appears, addresses are set at those indoor units which could be verified. The set addresses can be checked using the remote controller.
- If one of the below alarms appears when the remote controller is operated after auto address setting was completed (LED 1 and 2 on the outdoor unit control PCB are turned OFF), follow the instructions in the table below and correct the problem location.

Remote controller display	Cause
Nothing is displayed.	The remote controller is not connected correctly (power trouble). The indoor unit power was cut off after auto address setting was completed.
E01	The remote controller is not connected correctly (remote controller receiving trouble). The remote controller of an indoor unit where the indoor unit address is not set is inadvertently operated. (Communications with the outdoor unit are not possible.)
E02	The remote controller is not connected correctly (trouble with sending of the signal from the remote controller to the indoor unit).
P09	The indoor unit ceiling panel connector is not connected correctly.

## Alarms for indoor units

Alarm Code	Alarm Meaning
E01	Remote Controller Reception Error
E02	Remote Controller Transmission Error
E03	Error in Indoor Unit Receiving Signal from Remote Controller (central)
E04	Error in Indoor Unit Receiving Signal from the Outdoor Unit
E08	Duplicate Indoor Unit Address Settings Error
E09	More Than One Remote Controller Set to Main Error
E14	Main Unit duplication in Simultaneous-operation Multi Control (detected outdoor unit)
E15	Auto Address Alarm (The total capacity of indoor units is too low.)
E16	Auto Address Alarm (The total capacity of indoor units is too high or the total number of indoor units is too many.)
E18	Faulty Communication in Group Control Wiring
P09	Faulty wiring connections of (ceiling) indoor unit panel
P31	Group Control Error

## Alarms for outdoor units

Alarm Code	Alarm Meaning
E04	Error in Indoor Unit Receiving Signal from the Outdoor Unit
E06	Outdoor Unit Failed to Receive Serial Communication Signals from Indoor Unit
E15	Auto Address Alarm (The total capacity of indoor units is too low.)
E16	Auto Address Alarm (The total capacity of indoor units is too high or the total number of indoor units is too many.)
E20	Connection Problem of Indoor / Outdoor Units

F04	Compressor Discharge Temperature Sensor (TD) Trouble
F06	Inlet Temperature Sensor (C1) in Heat Exchanger Trouble
F07	Intermediate Temperature Sensor (C2) in Heat Exchanger Trouble
F08	Outdoor Air Temperature Sensor (TO) Trouble
F12	Compressor Inlet Suction Temperature Sensor (TS) Trouble
F31	Outdoor Unit Nonvolatile Memory (EEPROM) Trouble

H01	Primary (input) Overcurrent Detected
H02	PAM Trouble
H03	Primary Current CT Sensor (current sensor) Failure
H31	HIC Trouble

L10	Outdoor Unit Capacity not Set or Invalid
L13	Indoor Unit Type Setting Error
L18	4-Way Valve Operation Failure

P03	Compressor Discharge Temperature Trouble
P04	High Pressure Trouble
P05	AC Power Supply Trouble
P13	Alarm Valve Open
P15	Insufficient Gas Level Detected
P16	Compressor Overcurrent Trouble
P22	Outdoor Unit Fan Motor Trouble
P29	Lack of INV compressor wiring, INV compressor actuation failure (including locked), DCCT failure
P31	Group Control Error

- The number of times that LED 1 and 2 blink on the outdoor unit control PCB can be used to check the alarm display. (See "Checking the LED 1 and 2 Alarm Display on the Outdoor Unit Control PCB".)

### Contents of LED Display on the Outdoor Unit Control PCB (CR)

	LED1	LED2	Remark
Normal operation			
Pre-trip (High pressure protection)	○		LED1 Blinking : 0.8sec-ON / 0.3sec-OFF
Pre-trip (other)	○		LED1 Blinking : 0.5sec-ON / 0.5sec-OFF
Alternate blinking of outdoor unit LED during alarms	LED1 blinks M times, and then LED2 blinks N times. The cycle then repeats. M=2:P alarm, 3:H alarm, 4:E alarm, 5:F alarm, 6:L alarm, N=alarm No Example: LED1 blinks 4 times, then LED2 blinks 6 times. The cycle then repeats. Alarm is "E06"		
Refrigerant recovery mode	○	●	

○ : Blinking    ● : ON

– MEMO –