



EH99845801-5

TOSHIBA

Air Conditioner

Installation Manual

Application Control Kit

Model name:

TCB-PCOS1E2

Please read this manual thoroughly before starting installation work, and install the products correctly.

Precautions for safety

WARNING

- **Ask an authorized dealer or qualified installation professional to install / maintain the air conditioner.**
Inappropriate installation may result in electric shock or fire.
- **Perform installation work surely based on this Installation Manual.**
Incomplete installation causes an electric shock or a fire.
- **Ask an authorized dealer or qualified installation professional to reinstall adapters.**
Incomplete installation causes an electric shock or a fire.
- **For an electric work, this Installation Manual shall be referred and exclusive circuit shall be necessarily used. The used voltage shall be also match with the rated voltage of the product.**
If there is capacity shortage of electric circuit or installation work is poor, an electric shock or a fire may be caused.

CAUTION

- Using the specified wires, surely connect wires so that external force of wire is not applied to connecting part of the terminals; otherwise disconnection, heating or fire will generate.
 - For wiring work, use wires with correct current capacity; otherwise earth leakage, heating or fire will generate.
 - Do not apply an excessive force on the P.C. board body, otherwise bending, separation, or disconnection generates resulted heating or fire.
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- After installation work, execute a test run to confirm there is no trouble.
And also ask the customers to keep this Manual by themselves.

1 Object model

RAV-SP40*AT*, SP45*AT*, SP56*AT*

RAV-SM56*AT*, SM80*AT*

RAV-SM110*AT-E, SM140*AT-E

RAV-SM1103AT-E1, SM1403AT-E1

RAV-SM1104AT(J)P*, SM1404AT(J)P*

RAV-GP561AT(J)P*

RAV-GP56*ATW*, GP80*AT*, GP110*AT*, GP140*AT*

RAV-GM80*ATW*, GM90*ATW*

RAV-GM110*ATW*, GM140*ATW*, GM160*ATW*

RAV-GM110*AT8W*, GM140*AT8W*, GM160*AT8W*

2 Accessories

No.	Name	Total Q'ty	Q'ty to be used						Application
			SP40*, SP45*, SP56*, SM56*, SM80*	SM110*, SM140*	SM1103E1, SM1403E1	SM1104*, SM1404*	GP56*	GP80*, GP110*, GP140*, GM110*ATW, GM140*ATW, GM110*AT8W, GM140*AT8W, GM160*AT8W	
1	Wire (A) (Yellow connector: 5-core)	1	1	1	1	1	1	1	-
2	Wire (B) (Blue connector: 2-core)	1	1	1	1	1	1	1	-
3	P.C. board	1	1	1	1	1	1	1	Application control P.C. board
4	Wire (C) (Red connector: 2-core)	1	1	1	1	-	1	-	-
5	Wire (D) (Blue connector: 5-core)	1	1	1	1	1	1	1	-
6	Transformer	1	1	1	1	1	1	1	-
7	Fixing plate (A)	1	1	-	-	-	-	-	Fixing plate (SM56, 80)
8	Cover	1	1	-	-	-	-	-	For fixing plate (A)
9	Fixing plate (B)	1	-	1	-	-	-	-	Fixing plate (SM110, 140)
10	Spacer	4	4	4	4	4	4	4	For fixing Application Control P.C. board
11	Clamp	2	-	2	-	-	-	-	For fixing plate (B)
12	Screws (A) (M3 × 6)	2	2	2	2	2	-	2	For fixing Transformer
13	Screws (B) (M4 × 8)	4	4	2	-	-	2	1	For fixing plate (A) and fixing plate (B)
14	Binding band	6	5	5	5	6	6	6	For binding the wires
15	Holder	2	-	2	-	-	-	-	For holding the wires
16	Installation Manual	1	1	1	1	1	1	1	This Manual
17	Fixing plate (C)	1	-	-	1	-	-	-	Fixing plate (SM1103E1, SM1403E1)
18	Insulation protection tube	1	1	1	1	1	1	1	For covering the external wiring
19	Wire (E) (Red connector: 2-core)	1	-	-	-	1	-	1	-
20	Clamp filter (ZCAT2032-9030)	1	-	-	-	-	1	1	-
21	X capacitor	1	-	-	-	-	1	-	-
22	Wire (F) (Faston)	1	-	-	-	-	-	-	-

Wire (A): Night operation (Sound reduction) control or Power peak-cut control

Wire (B): Compressor operation output

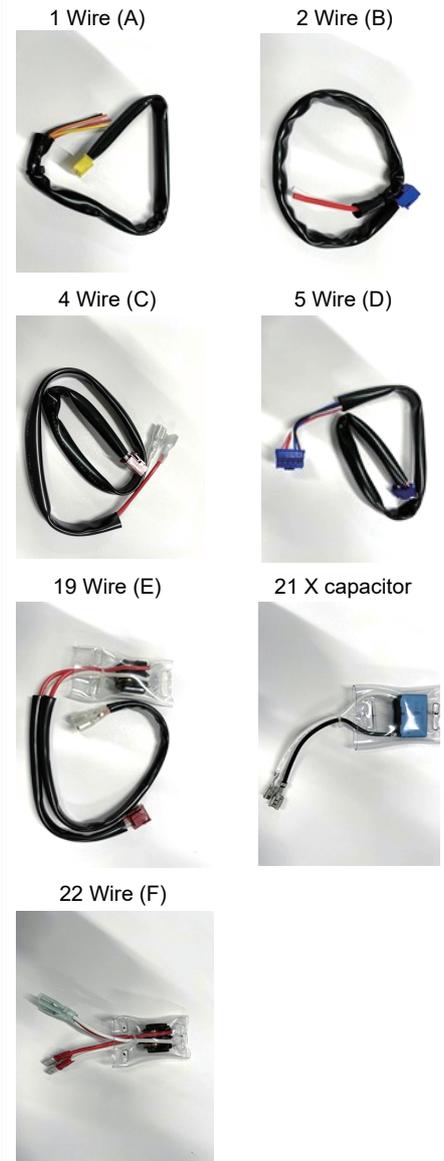
Wire (C): Power supply line (to outdoor unit terminal)

Wire (D): Communication line (to outdoor unit P.C. board)

Wire (E), (F): Power supply line (to outdoor unit terminal)

Use	• Power peak-cut control	Correspond to the temporary power peak-cut control by controlling the capacity of the outdoor unit using an external signal. Capacity control is made in 3 steps of 75%, 50% and Operation stop.
	• Night operation (Sound reduction)	The capacity is controlled using a timer procured on site (to be purchased locally) regardless of the outdoor temperature and load to reduce the sound level of the operation.
	• Compressor operation output	Outputs a dry contact ON signal when the compressor is in operation.

No.	Name	Q'ty to be used		Application
		GM80* GM90*	GM160*ATW	
1	Wire (A) (Yellow connector: 5-core)	1	1	-
2	Wire (B) (Blue connector: 2-core)	1	1	-
3	P.C. board	1	1	Application control P.C. board
4	Wire (C) (Red connector: 2-core)	1	-	-
5	Wire (D) (Blue connector: 5-core)	1	1	-
6	Transformer	1	1	-
7	Fixing plate (A)	-	-	-
8	Cover	-	-	-
9	Fixing plate (B)	-	-	-
10	Spacer	4	4	For fixing Application Control P.C. board
11	Clamp	-	-	-
12	Screws (A) (M3 × 6)	-	2	For fixing Transformer
13	Screws (B) (M4 × 8)	2	1	For fixing plate (A) and fixing plate (B)
14	Binding band	6	6	For binding the wires
15	Holder	-	-	-
16	Installation Manual	1	1	This Manual
17	Fixing plate (C)	-	-	-
18	Insulation protection tube	1	1	For covering the external wiring
19	Wire (E) (Red connector: 2-core)	-	1	-
20	Clamp filter (ZCAT2032-9030)	2	-	-
21	X capacitor	1	-	-
22	Wire (F) (Faston)	-	1	-



Wire (A): Night operation (Sound reduction) control or Power peak-cut control

Wire (B): Compressor operation output

Wire (C): Power supply line (to outdoor unit terminal)

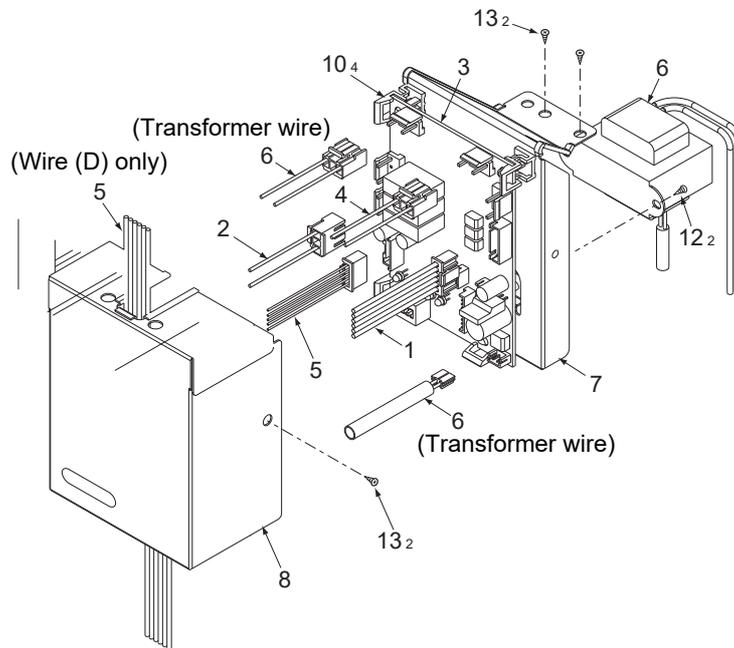
Wire (D): Communication line (to outdoor unit P.C. board)

Wire (E), (F): Power supply line (to outdoor unit terminal)

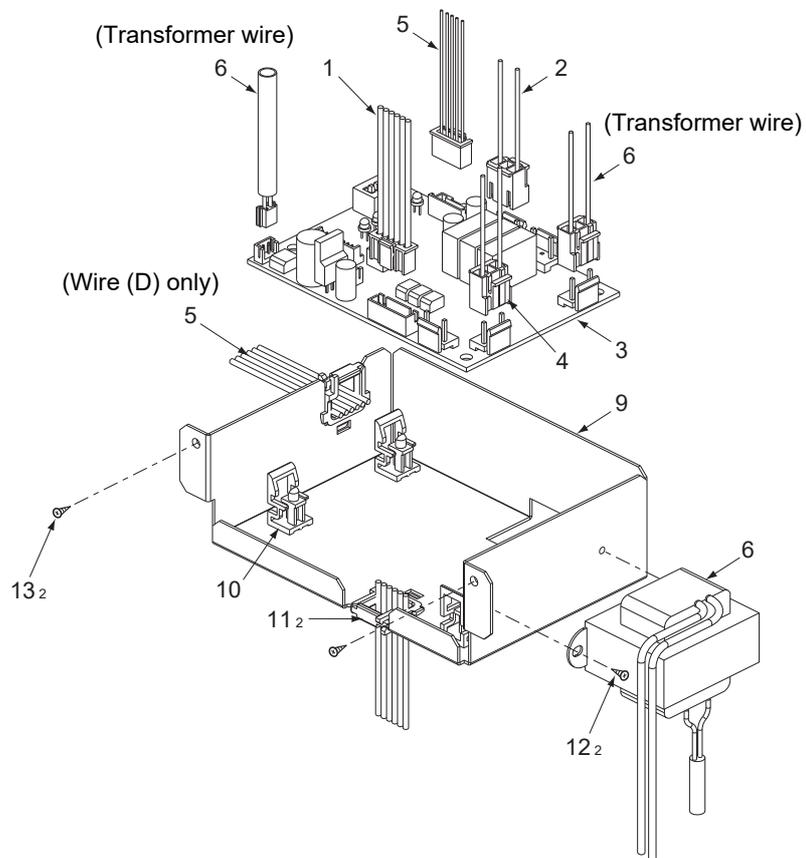
Use	• Power peak-cut control	Correspond to the temporary power peak-cut control by controlling the capacity of the outdoor unit using an external signal. Capacity control is made in 3 steps of 75%, 50% and Operation stop.
	• Night operation (Sound reduction)	The capacity is controlled using a timer procured on site (to be purchased locally) regardless of the outdoor temperature and load to reduce the sound level of the operation.
	• Compressor operation output	Outputs a dry contact ON signal when the compressor is in operation.

3 Installation

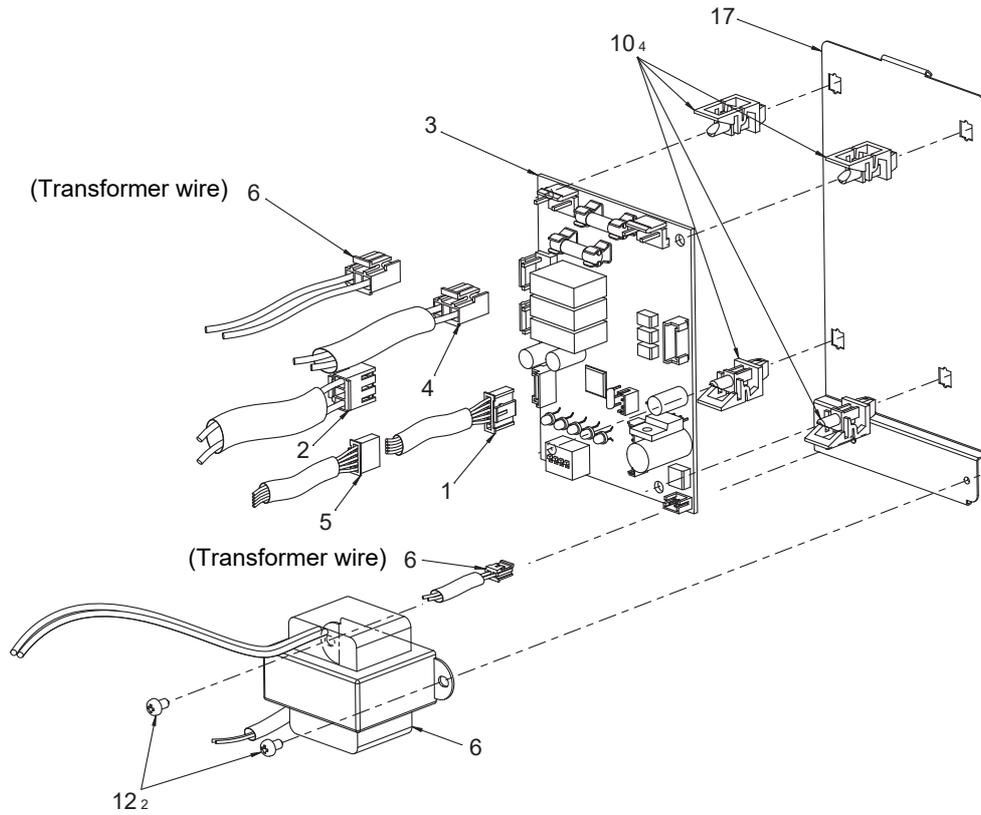
▼ SP40*, SP45*, SP56*, SM56*, SM80*



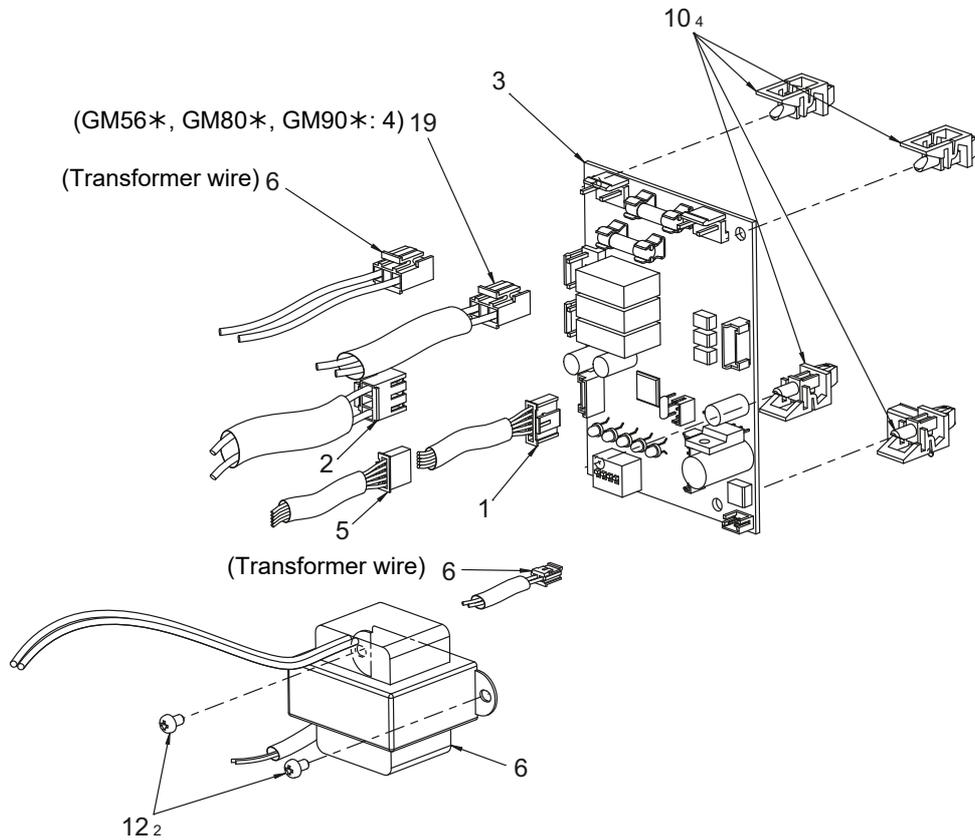
▼ SM110*, SM140*



▼ SM1103E1, SM1403E1



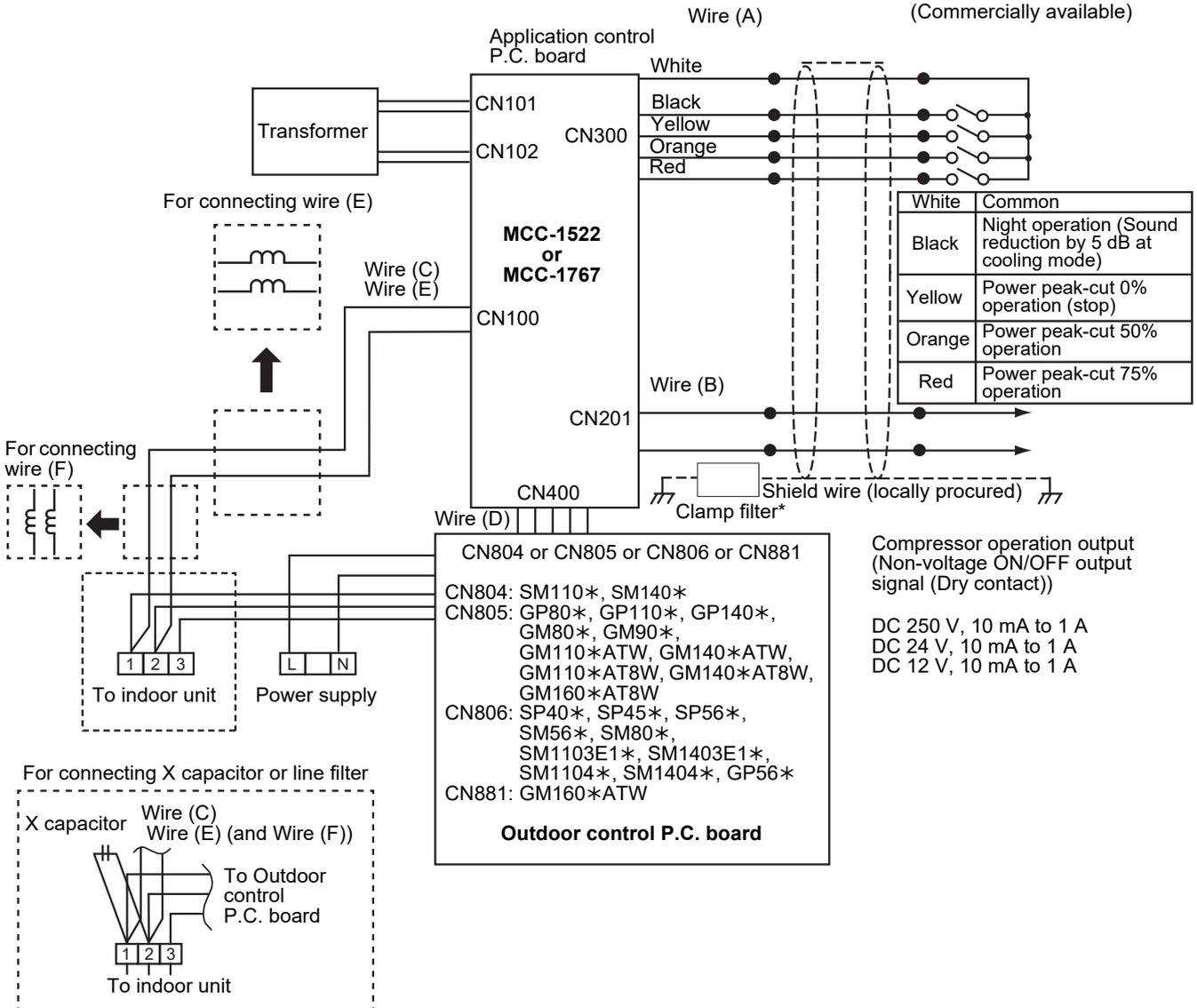
▼ SM1104*, SM1404*, GP56*, GP80*, GP110*, GP140*, GM80*, GM90*, GM110*AT(8)W, GM140*AT(8)W, GM160*AT(8)W



4 Wiring diagram

An Outdoor unit is controlled as follows by connecting between a white line and each line using Timer or Switch (locally procured).

(locally procured)
Timer or switch
(Commercially available)



⚠ CAUTION

Do not connect two or more contacts of power peak-cut with white line at the same time.

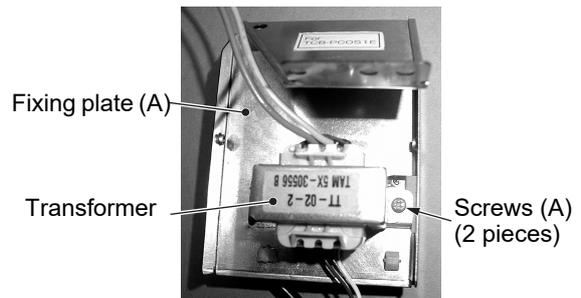
5 Parts installation and assembly to the outdoor unit

5-1. SP40*, SP45*, SP56*, SM56*, SM80*

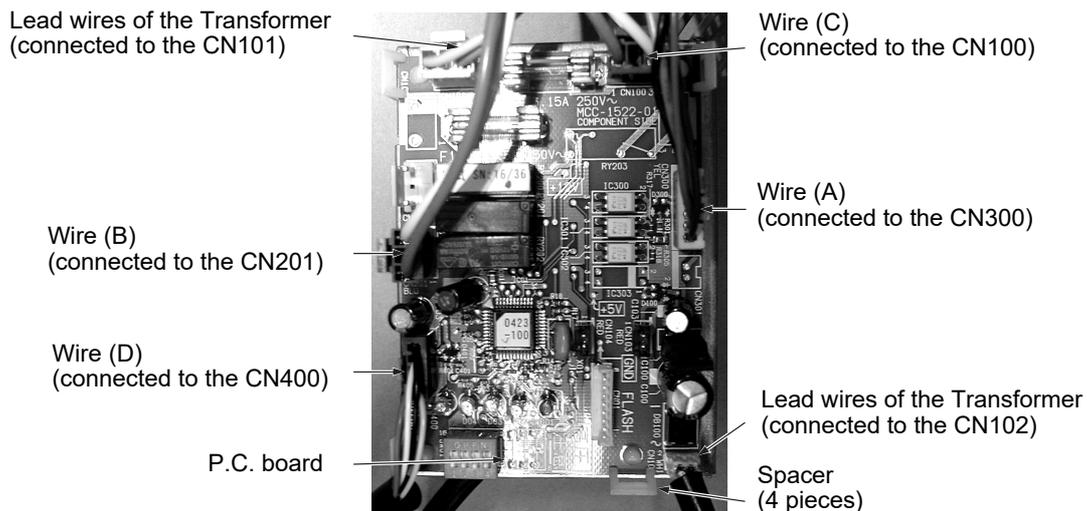
■ Installation method for the P.C. board of the outdoor unit

1 Mount a Transformer to the rear side of the Fixing plate (A) using Screws (A) (2 pieces).

2 Install Spacers (4 pieces) and P.C. board to the front side of the Fixing plate (A).



3 Connect the Lead wires (2 types) of the Transformer to the CN101 and CN102 of the P.C. board. In addition, connect the Wire (C) (2-core) to CN100 and the Wire (D) (5-core) to CN400.



NOTE

To connect the Wire (A) and the Wire (B), refer to the 4. Wiring diagram.

4 Close the cover to the Fixing plate (A) with Screws (B) (2 pieces). Pass the wires through the cut-away section of the cover and do not allow the wires to come into pinching.



⚠ CAUTION

Do not allow the wires to come into pinching with cover parts. Otherwise, the wires may be broken or heated or fire may occur.

■ Assembly to the outdoor unit

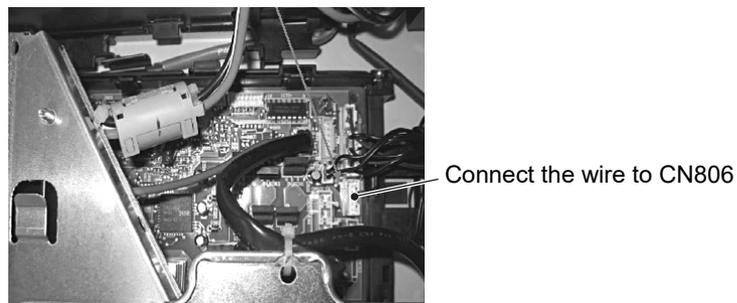
- 1 Remove the Top plate.
- 2 Remove the Front cabinet.
- 3 Remove the Cover of packed valve and wiring terminal lid.
- 4 Fix the P.C. board assembly to the Inverter assembly with Screws (B) (2 pieces).



- 5 Remove the power supply terminal block cover of the outdoor unit and connect the Wire (C) (2-core) to the faston receptacle of terminal block for power supply.



- 6 Connect the Wire (D) (5-core) to the Inverter assembly.
 - Connect the wire to CN806.



- 7 Tie the wire with cable tie, if it is necessary.
- 8 Re-assemble the Front cabinet.

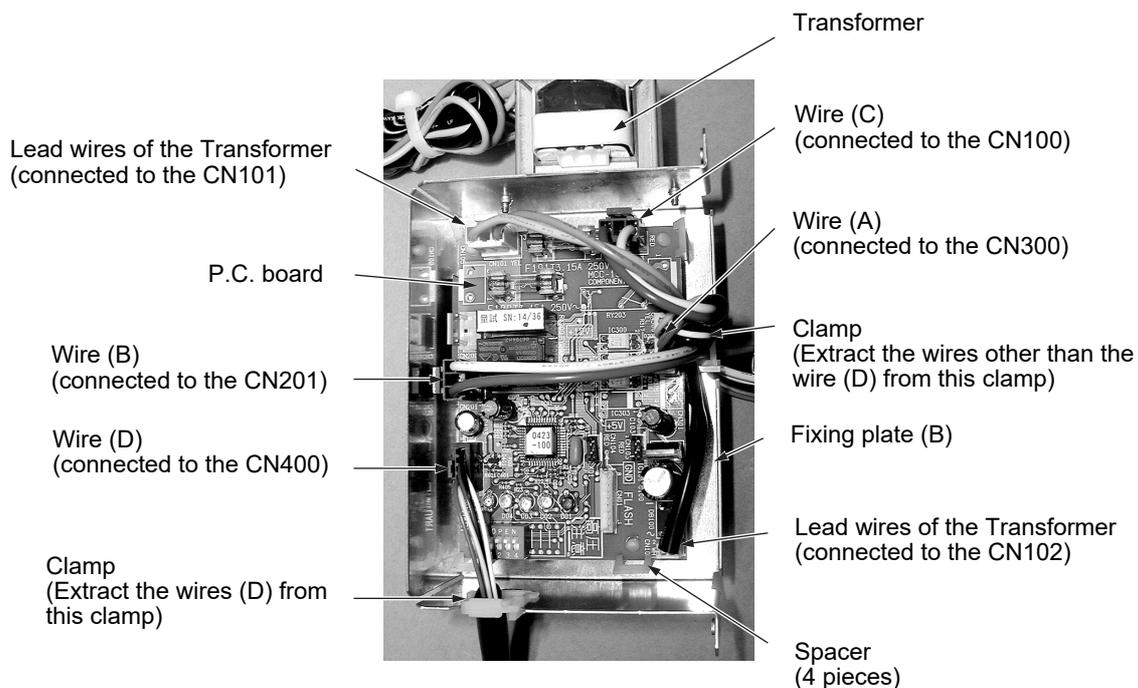
5-2. SM110*, SM140*

■ Installation method for the P.C. board of the outdoor unit

- 1 Fix the clamp to the Fixing plate (B).
- 2 Fix the Spacers (4 pieces) and P.C. board to the front side of the Fixing plate (B).
- 3 Mount the Transformer to the Fixing plate (B) using screws (A) (2 pieces).
- 4 Connect the Wire (D) (5-core) to CN400.
Pass the wires through the Clamp section of the Fixing plate (B) and do not allow the wires to come into pinching.

CAUTION

Do not allow the wires to come into pinching with cover parts.
Otherwise, the wires may be broken or heated or fire may occur.



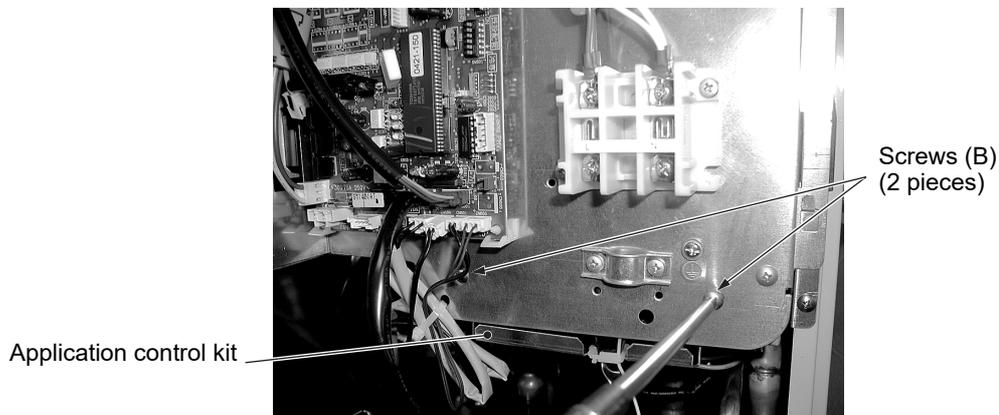
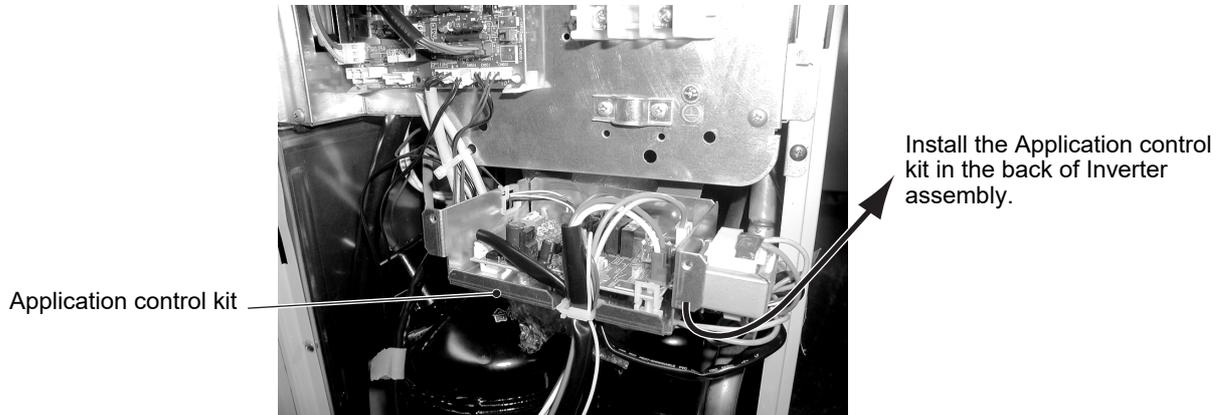
NOTE

To connect the Wire (A) and (B), refer to the 4. Wiring diagram.

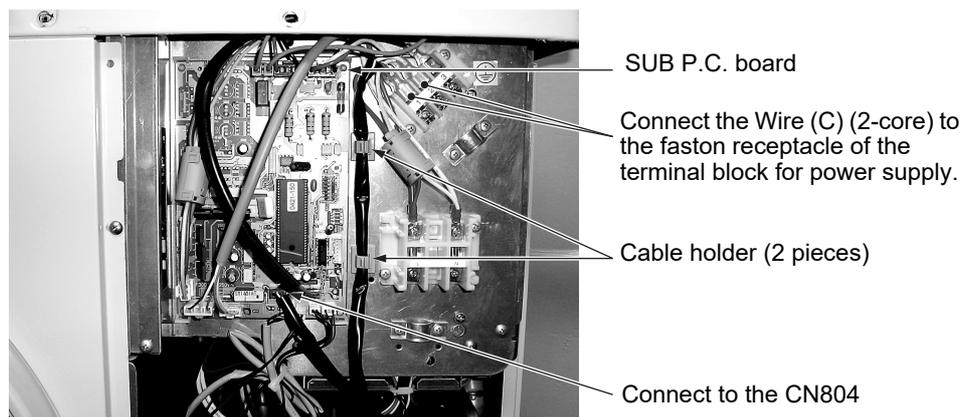
■ Assembly to the outdoor unit

1 Remove the Front cabinet.

2 Fix the Application control kit to the Inverter assembly with Screws (B) (2 pieces).



3 Connect the Wire (D) (5-core) to CN804 of the SUB P.C. board.



4 Tie the wire with cable tie, if it is necessary.

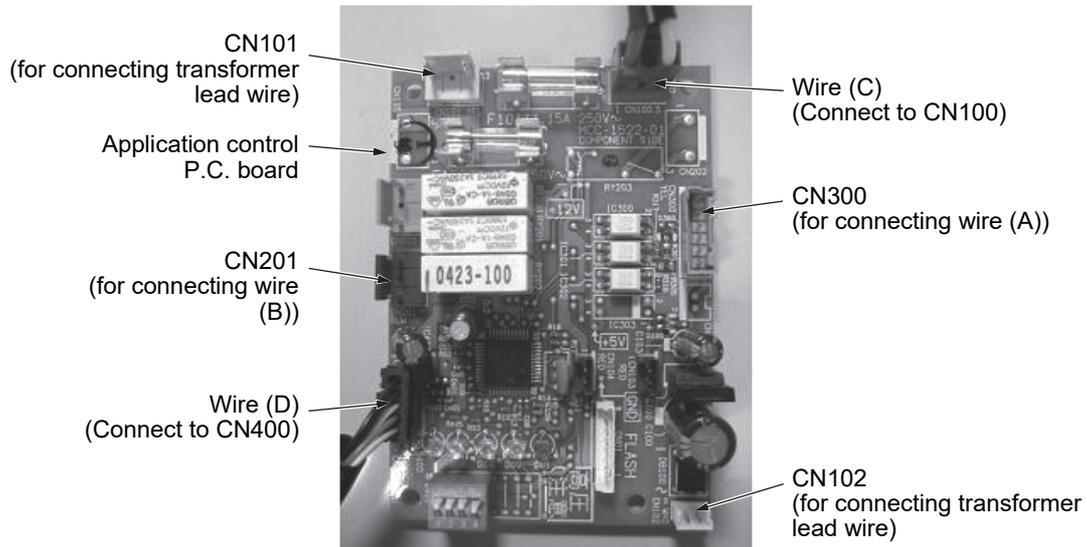
5 Re-assemble the Front cabinet.

5-3. SM1103E1, SM1403E1

■ Assembly of application control P.C. board for outdoor unit

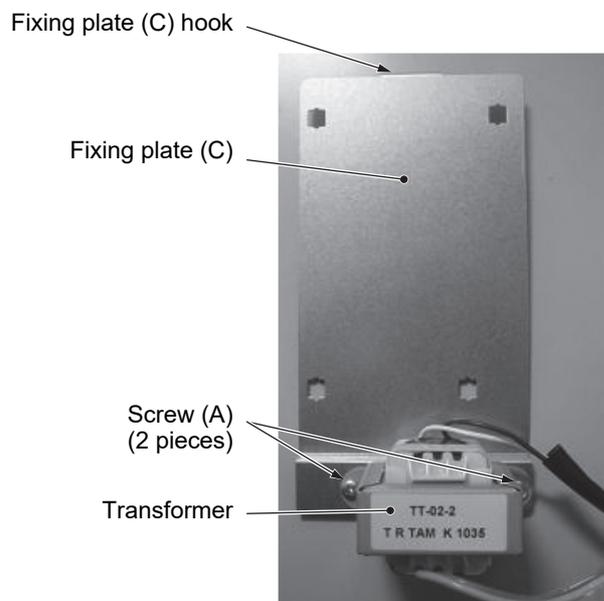
1 Connect Wire (C) to CN100 and connect Wire (D) to CN400.

Refer to 4. Wiring diagram for the installation method to connect Wire (A) and Wire (B).



■ Assembly of application control P.C. board and transformer

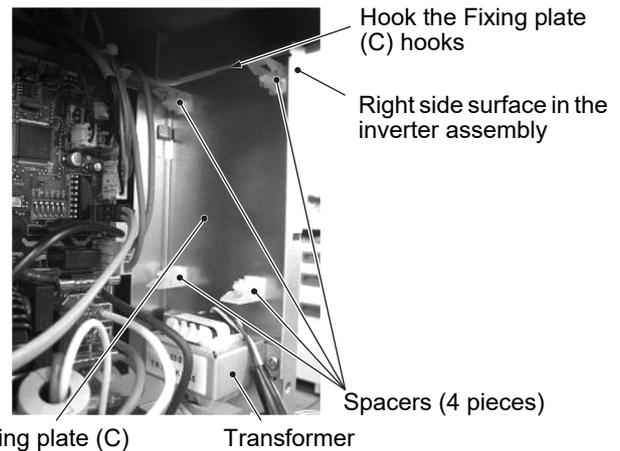
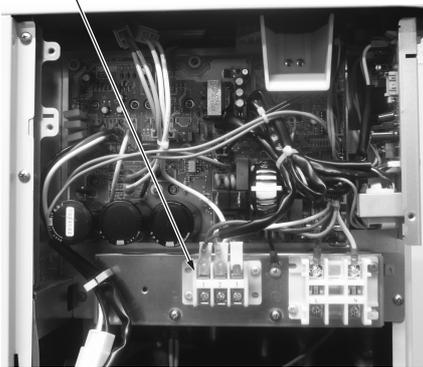
1 Attach the Transformer to the Fixing plate (C) with two Screws (A).



■ Attaching to the outdoor unit

- 1** Remove the front cabinet.
- 2** Remove the inverter assembly's electronics parts cover and terminal cover [M4 fixing Screws (4 pieces)].
- 3** Hook the application control P.C. board installation hooks on the upper part of the right side surface in the inverter assembly.
- 4** Fix Fixing plate (C) to the Spacers (4 pieces) on the right side surface in the inverter assembly. When doing this, make sure that the Spacers (4 pieces) are fixed securely to both the Fixing plate (C) and the inverter assembly.

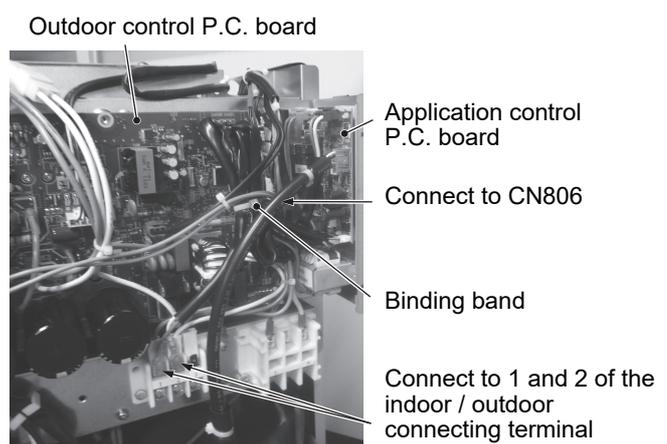
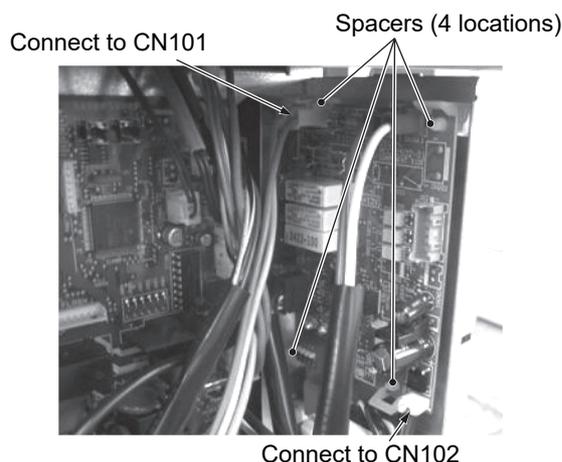
Indoor / Outdoor connecting terminal



- 5** Attach the application control P.C. board to the Spacers (4 locations).
- 6** Connect the Transformers leads (2 types) to CN101 and CN102 on the application control P.C. board.
- 7** Connect Wire (D) (5 cores) to CN806 on the outdoor unit P.C. board.
- 8** Connect Wire (C) (2 cores) to Faston terminals 1 and 2 on the indoor / outdoor connecting terminal. When doing this, make sure that the Faston is securely connected to the Faston terminal.
- 9** Use the binding band to tie the wires inside the inverter assembly in a bundle.
- 10** Attach the electronics parts cover and terminal cover with M4 fixing Screws (4 pieces). Be careful to not pinch the wires while doing this.
- 11** Attach the front cabinet.

⚠ CAUTION

Do not allow the wires to come into pinching with cover parts.
Otherwise, the wires may be broken or heated or fire may occur.

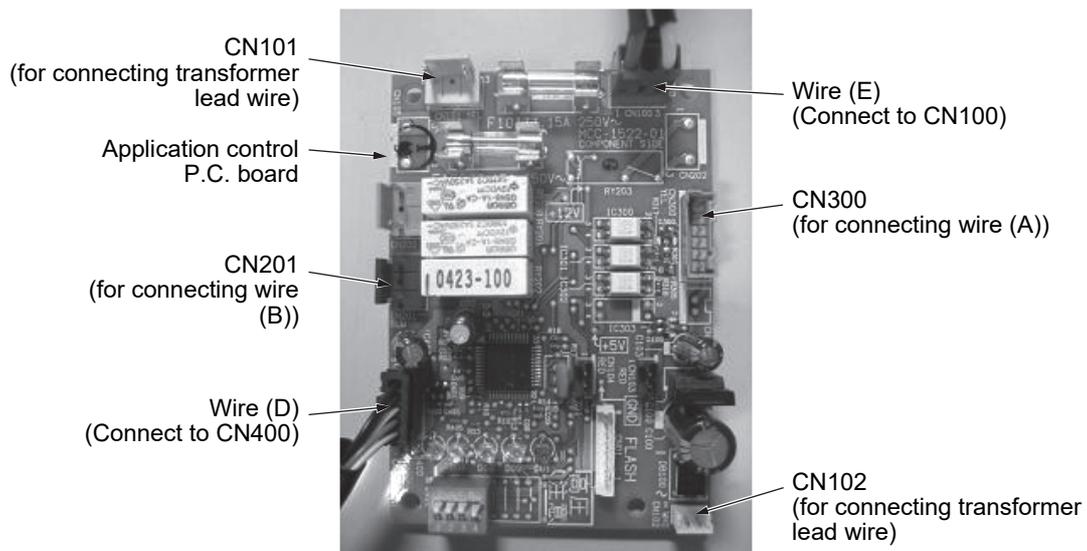


5-4. SM1104*, SM1404*, GP80*, GP110*, GP140*, GM110*ATW, GM140*ATW, GM110*AT8W, GM140*AT8W, GM160*AT8W

■ Assembly of application control P.C. board for outdoor unit

1 Connect Wire (E) to CN100 and connect Wire (D) to CN400.

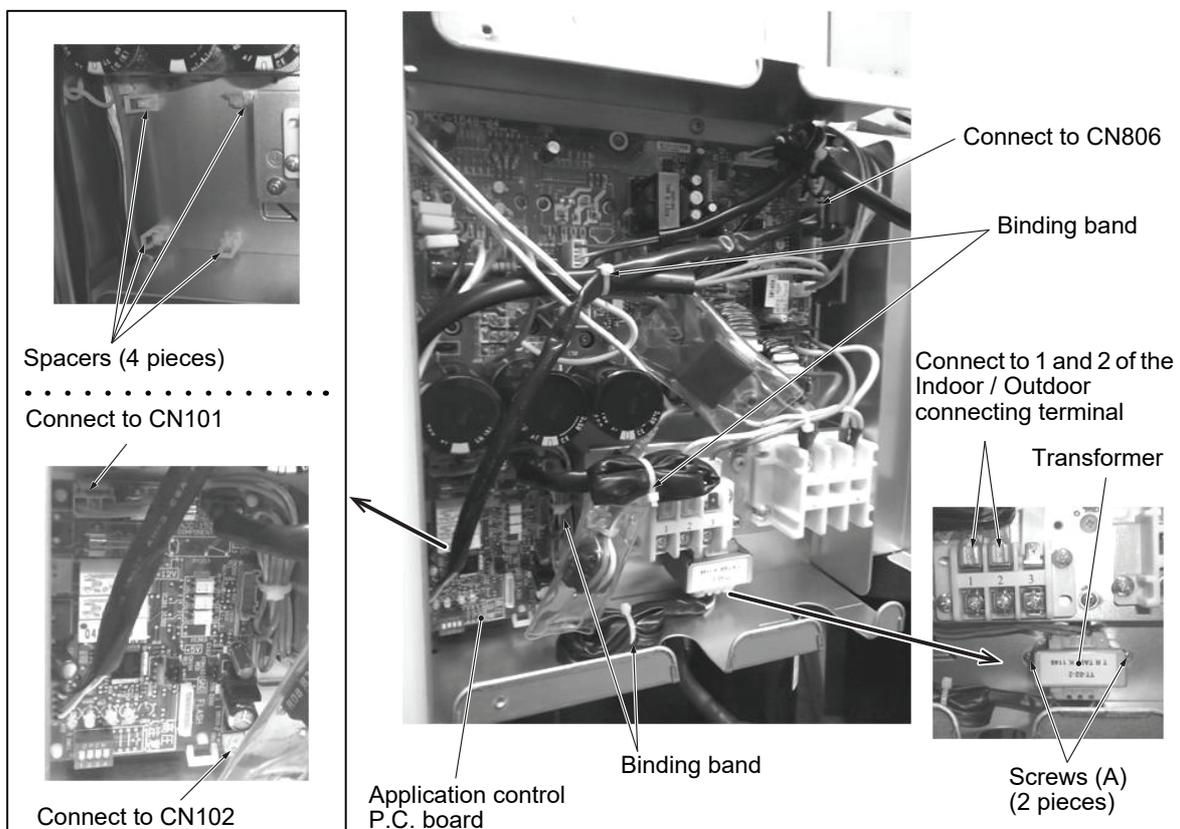
Refer to 4. Wiring diagram for the installation method to connect Wire (A) and Wire (B).



5-4-1. SM1104*, SM1404*

■ Attaching to the outdoor unit

- 1 Remove the front cabinet.
- 2 Open the electronics parts cover [M4 fixing Screws (2 pieces)].
- 3 Attach the Transformer to the inverter assembly with two Screws (A).
- 4 Fix the Spacers (4 pieces) to inverter assembly.
When doing this, make sure that the Spacers (4 pieces) are fixed securely to the inverter assembly.
- 5 Attach the application control P.C. board to the Spacers (4 locations).
- 6 Connect the Transformers leads (2 types) to CN101 and CN102 on the application control P.C. board.
- 7 Connect Wire (D) (5 cores) to CN806 on the outdoor unit P.C. board.
- 8 Connect Wire (E) (2 cores) to Faston terminals 1 and 2 on the indoor / outdoor connecting terminal. When doing this, make sure that the Faston is securely connected to the Faston terminal.
- 9 Use the binding band to tie the wires inside the inverter assembly in a bundle.
- 10 Attach the electronics parts cover with M4 fixing Screws (2 pieces). Be careful to not pinch the wires while doing this.
- 11 Attach the front cabinet.



CAUTION

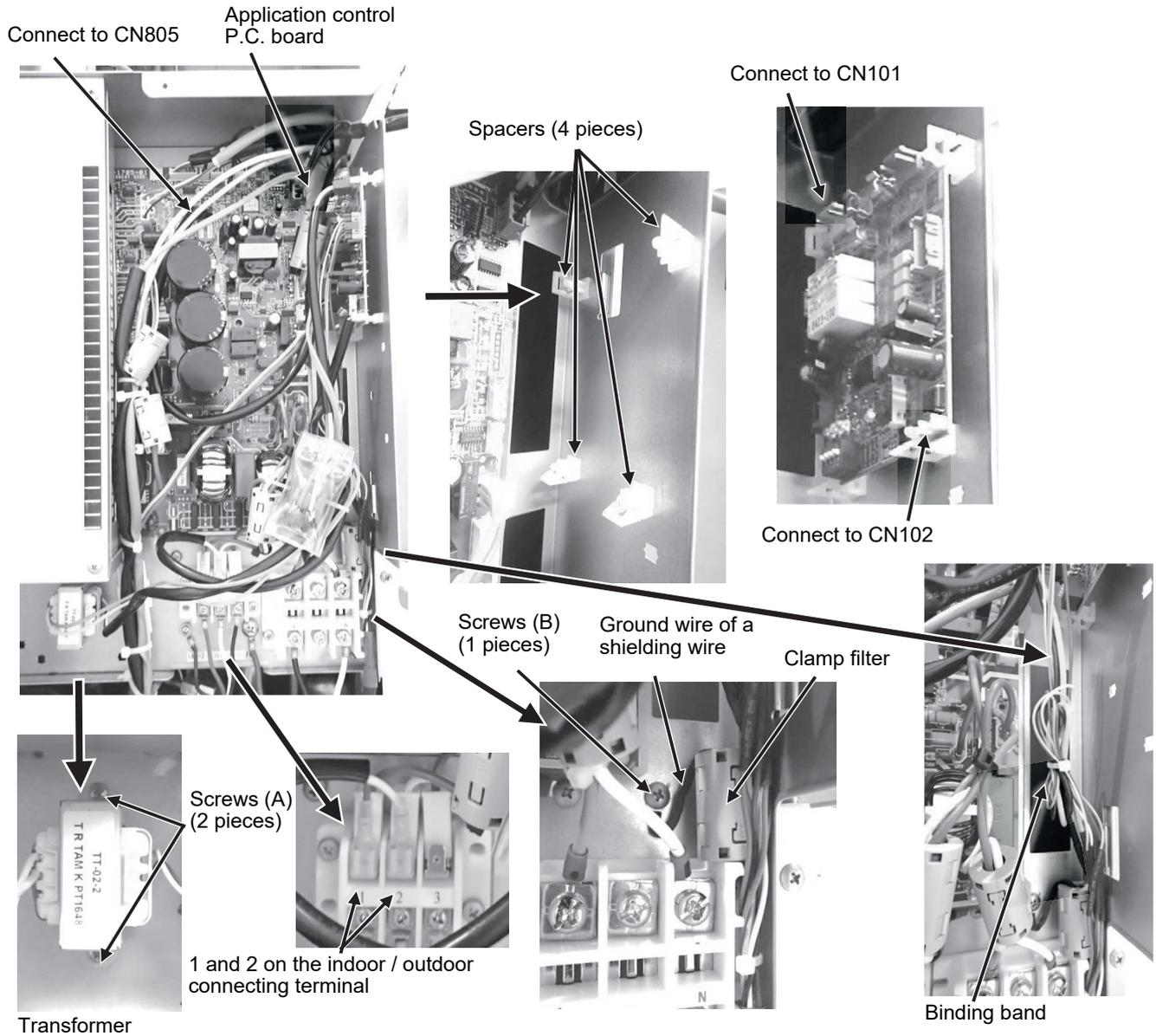
Do not allow the wires to come into pinching with cover parts.
Otherwise, the wires may be broken or heated or fire may occur.

5-4-2. GP80*, GP110*, GP140*, GM110*ATW, GM140*ATW, GM110*AT8W, GM140*AT8W, GM160*AT8W

■ Attaching to the outdoor unit

- 1** Remove the front cabinet.
- 2** Remove the terminal cover [M4 fixing Screws (2 pieces)].
- 3** Open the electronics parts cover [M4 fixing Screws (2 pieces)].
- 4** Attach the Transformer to the inverter assembly with two screws (A).
- 5** Fix the Spacers (4 pieces) to inverter assembly. When doing this, make sure that the spacers (4 pieces) are fixed securely to the inverter assembly.
- 6** Attach the application control P.C. board to the spacers (4 locations).
- 7** Connect the Transformers leads (2 types) to CN101 and CN102 on the application control P.C. board.
- 8** Connect Wire (D) (5 cores) to CN805 on the outdoor unit P.C. board.
- 9** Connect Wire (E) (2 cores) to solderless terminals 1 and 2 on the indoor / outdoor connecting terminal. When doing this, make sure that the solderless terminal is securely connected to the terminal.
- 10** Attach the clamp filter (ZCAT2032-0930) to the ground wire of shield wire. Attach the ground wire of shield wire to the inverter assembly with screw (B).
- 11** Use the binding band to tie the wires inside the inverter assembly in a bundle.
- 12** Attach the electronics parts cover with M4 fixing screws (2 pieces). Be careful to not pinch the wires while doing this.
- 13** Attach the terminal cover with M4 fixing screws (2 pieces).
- 14** Attach the front cabinet.

GP80*, GP110*, GP140*, GM110*ATW, GM140*ATW

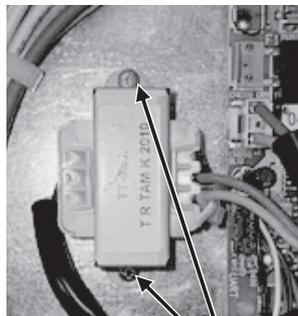
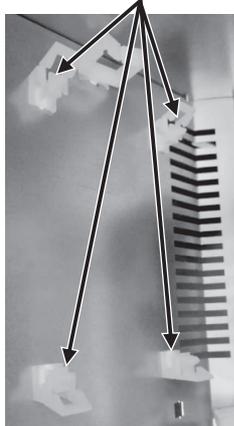


CAUTION

Do not allow the wires to come into pinching with cover parts.
 Otherwise, the wires may be broken or heated or fire may occur.

GM110*AT8W, GM140*AT8W, GM160*AT8W

Spacers (4 pieces)

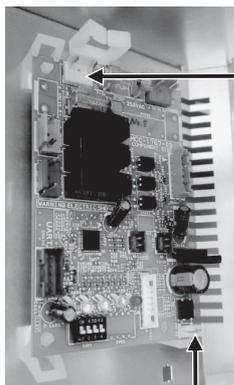


Screws (A)
(2 pieces)

1 and 2 on the indoor / outdoor
connecting terminal.



Ground wire of a shielding wire

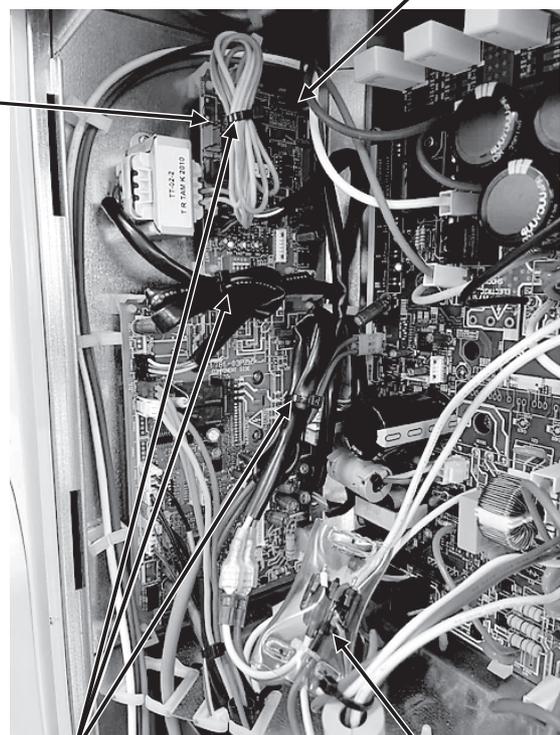


Connect to CN101

Connect to CN102

Connect to CN805

Application
control
P.C. board



Binding band

Line filter
Connect Wire (E)

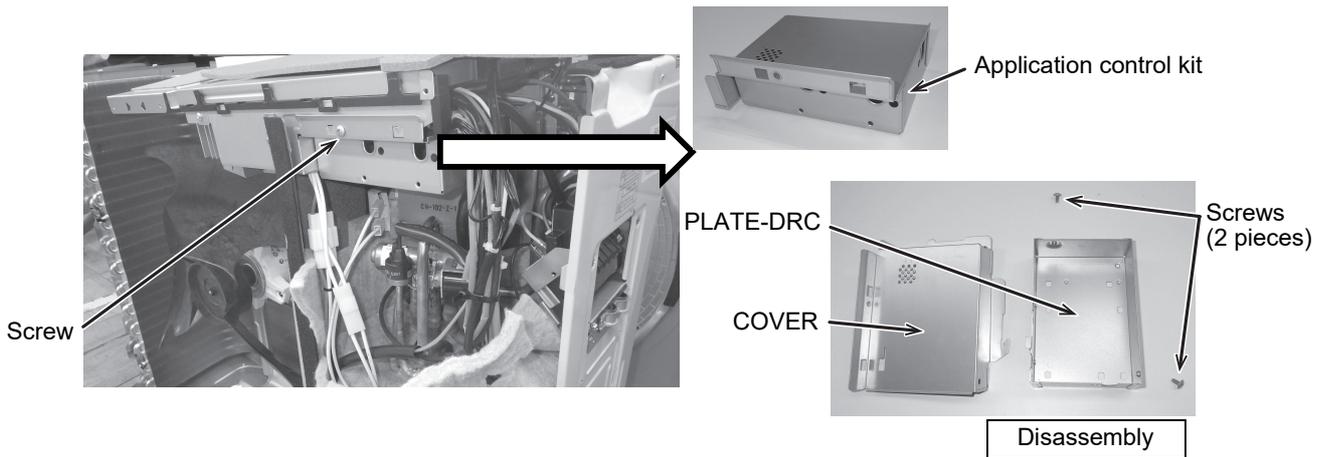
CAUTION

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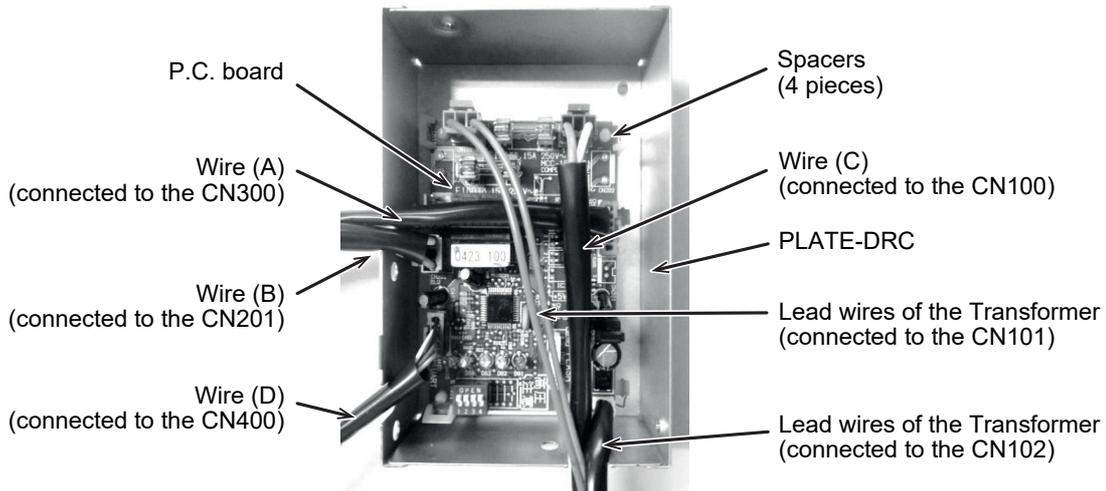
5-5. GP56*, GM80*, GM90*

■ Assembly of application control P.C. board for outdoor unit

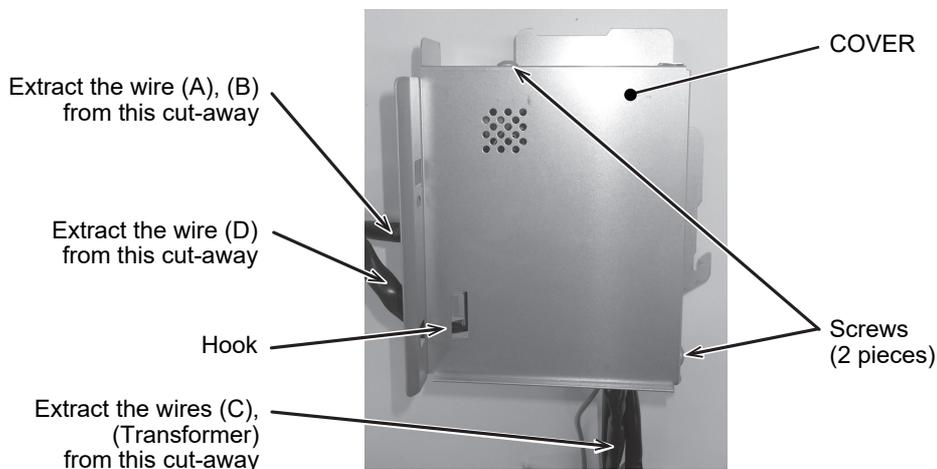
- 1 Remove the Top plate.
- 2 Remove the Front cabinet.
- 3 Remove the Cover of packed valve and wiring terminal lid.
- 4 Remove the screws to take out the Application control kit and disassemble it.



- 5 Attach the P.C. board and the Spacers (4 pieces) to the PLATE-DRC.
- 6 Connect the Lead wires (2 types) of the Transformer to the CN101 and CN102 of the P.C. board In addition, connect the Wire (B) (2-core) to CN201, the Wire (C) (2-core) to CN100 and the Wire (D) (5-core) to CN400.



-
- 7** Close the cover to the fixing PLATE-DRC with Screws (2 pieces).
Pass the wires through the cut-away section of the cover and do not allow the wires to come into pinching.



⚠ CAUTION

Do not allow the wires to come into pinching with cover parts.
Otherwise, the wires may be broken or heated fire may occur.

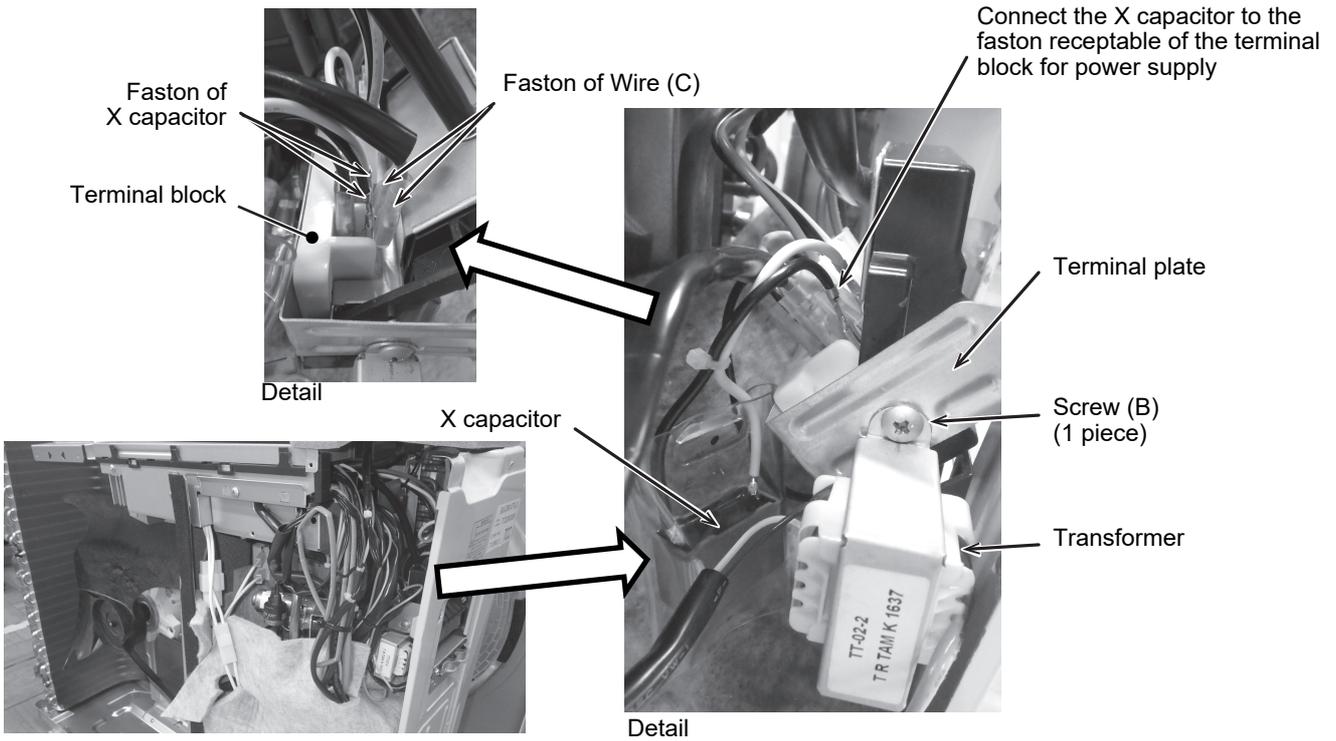
- Refer to the 21 or 22 pages for GP56*ATW*, GM80*, GM90*.

■ Assembly to the outdoor unit (GP561AT(J)P*)

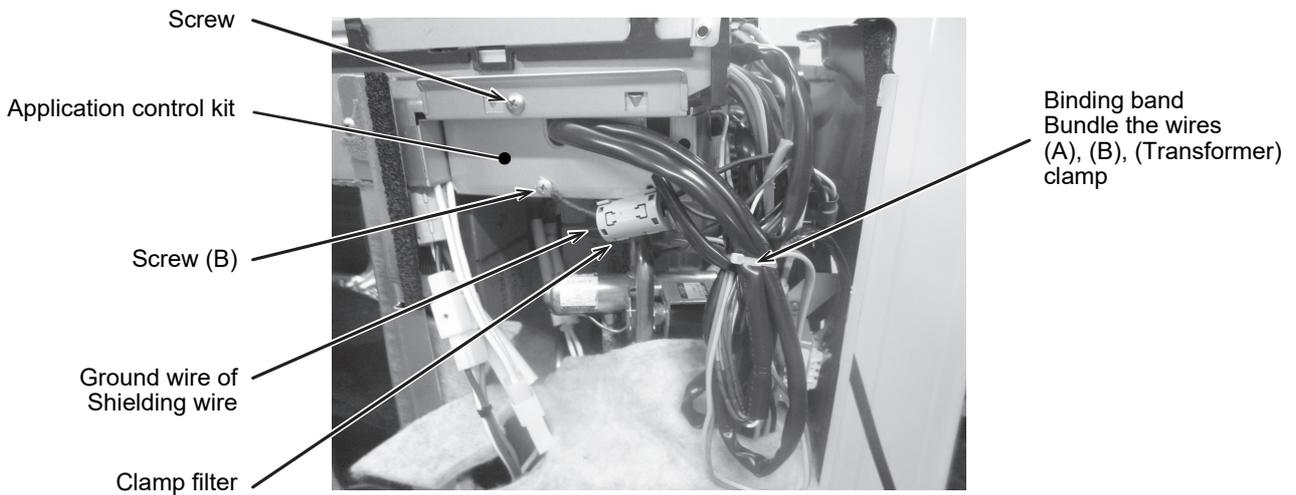
- 1** Connect the Wire (D) (5-core) to the Inverter assembly.



- 2** Connect the wire (C) (2-core) to faston of the X capacitor.
Connect the X capacitor to the faston receptable of the terminal block for power supply.
- 3** Fix the transformer to the terminal plate with the screw (B) (1 piece).



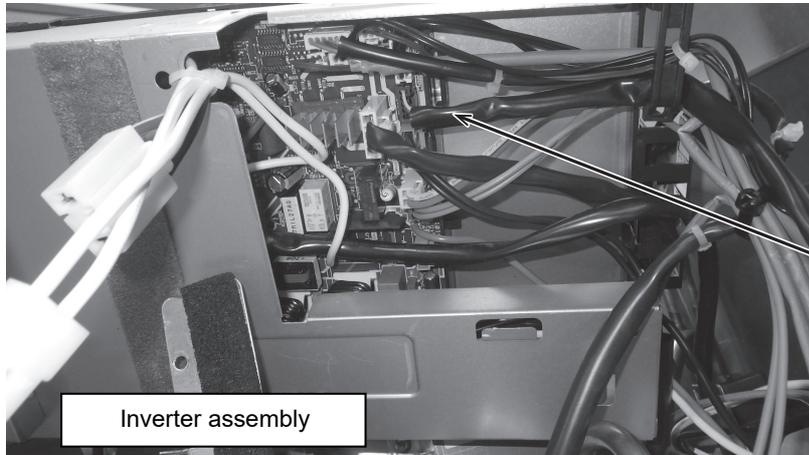
- 4** Attach the Application control kit with the screw.
- 5** Attach the ground wire of shield wire to Application control kit with screw (B).
- 6** Attach the clamp filter (ZCAT2032-0930) to the ground wire of shield wire with screw (B).
- 7** Bundle wires (A), (B), (Transformer) with the binding band.



- 8** Attach the top plate.
- 9** Attach the front cabinet.
- 10** Attach the cover of packed valve and wiring terminal lid.

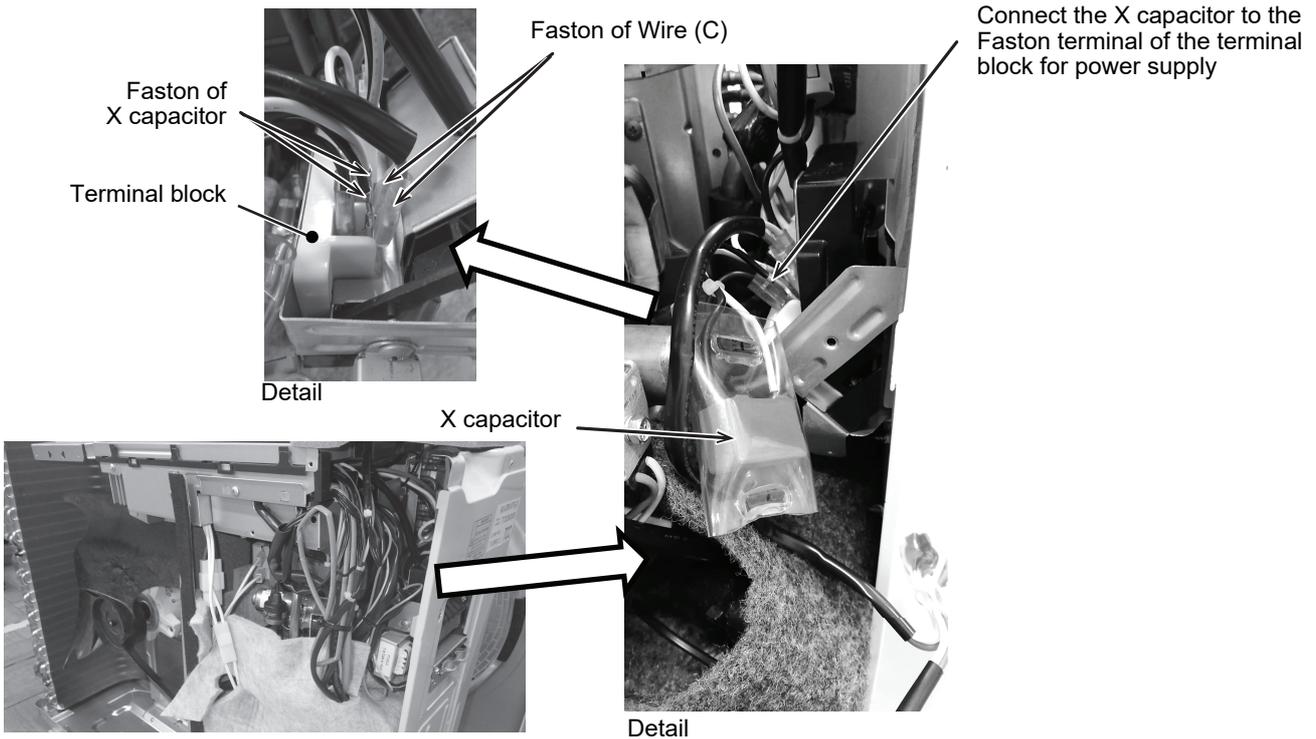
■ Assembly to the outdoor unit (GP56*ATW*, GM80*, GM90*)

1 Connect the Wire (D) (5-core) to the Inverter assembly.



Wire (D)
Connect the wire to CN806

2 Connect the wire (C) (2-core) to faston of the X capacitor.
Connect the X capacitor to the faston receptable of the terminal block for power supply.

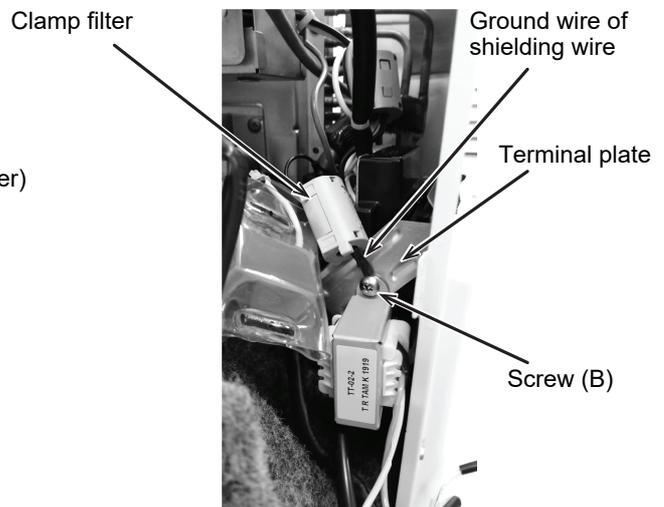
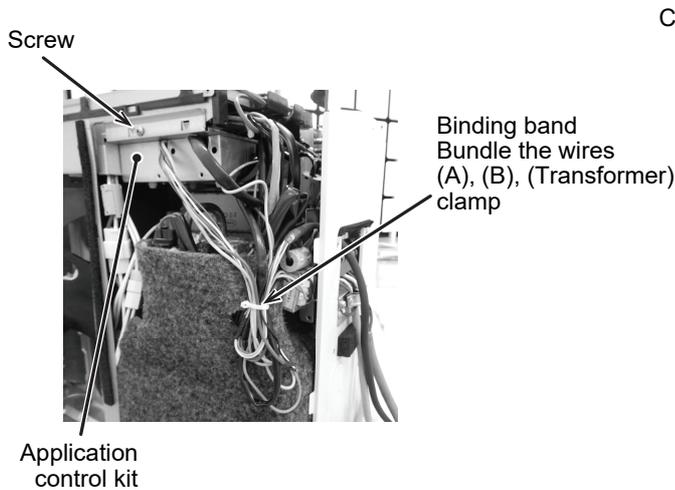


- 3** Attach the Application control kit with the screw.
- 4** Attach the clamp filter (ZCAT2032-0930) to the ground wire of shield wire.
- 5** Attach the clamp filter (ZCAT2032-0930) to the compressor wires.
(GM80*, GM90* only)



Clamp filter (GM80*, GM90* only)
Compressor wires

- 6** Fix the transformer and the ground wire of shield wire to the terminal plate with the screw (B) (1 piece).
- 7** Bundle wires (A), (B), (Transformer) with the binding band.

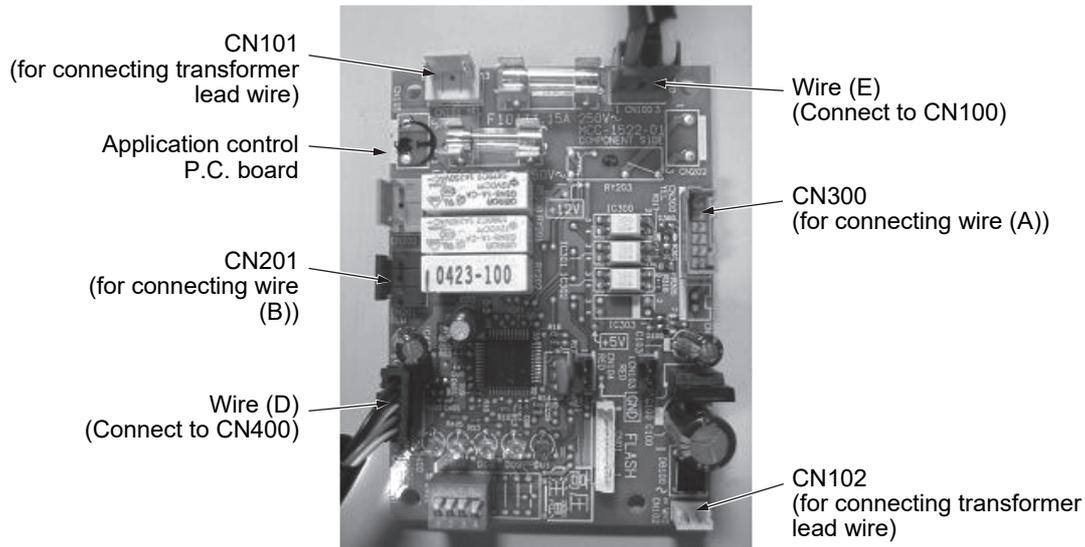


- 8** Attach the top plate.
- 9** Attach the front cabinet.
- 10** Attach the cover of packed valve and wiring terminal lid.

5-6. GM160*ATW

■ Assembly of application control P.C. board for outdoor unit

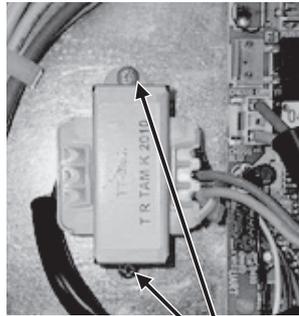
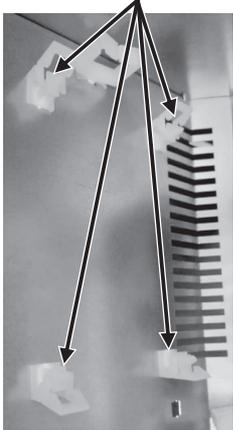
- 1 Connect Wire (E) to CN100 and connect Wire (D) to CN400.**
Refer to 4. Wiring diagram for the installation method to connect Wire (A) and Wire (B).



■ Assembly to the outdoor unit

- 1 Remove the front cabinet.**
- 2 Open the electronics part cover [M4 fixing Screws (2 pieces)].**
- 3 Attach the Transformer to the inverter assembly with two screws (A).**
- 4 Fix the Spacers (4 pieces) to inverter assembly. When doing this, make sure that the spacers (4 pieces) are fixed securely to the inverter assembly.**
- 5 Attach the application control P.C. board to the spacers (4 locations).**
- 6 Connect the Transformers leads (2 types) to CN101 and CN102 on the application control P.C. board.**
- 7 Connect Wire (D) (5 cores) to CN881 on the outdoor unit P.C. board.**
- 8 Connect Wire (E) (2 cores) and Wire (F) (Faston) to solderless terminals 1 and 2 on the indoor / outdoor connecting terminal. When doing this, make sure that the solderless terminal is securely connected to the terminal.**
- 9 Attach the ground wire of shield wire to the inverter assembly with screw (B).**
- 10 Use the binding band to tie the wires inside the inverter assembly in a bundle.**
- 11 Attach the electronics parts cover with M4 fixing screws (2 pieces). Be careful to not pinch the wires while doing this.**
- 12 Attach the front cabinet.**

Spacers (4 pieces)

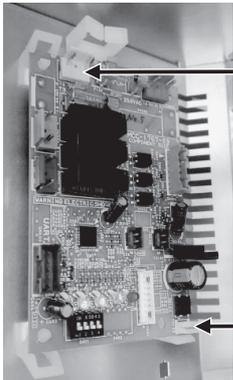


Screws (A)
(2 pieces)

1 and 2 on the indoor / outdoor
connecting terminal.



Ground wire of a shielding wire

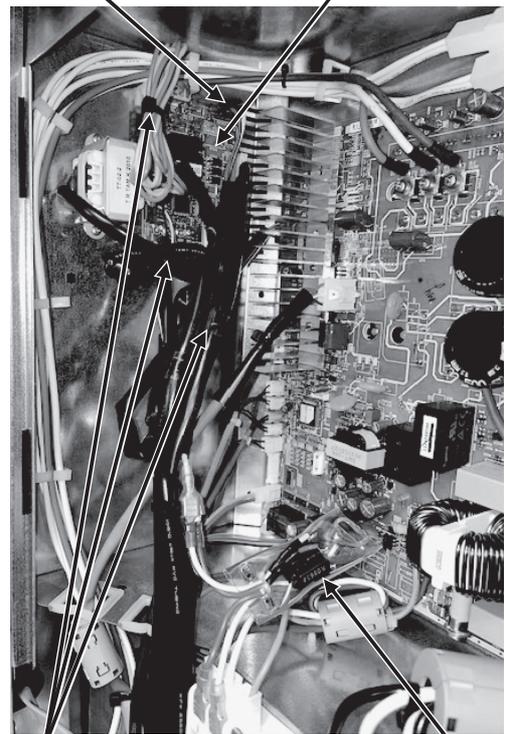


Connect to CN101

Connect to CN102

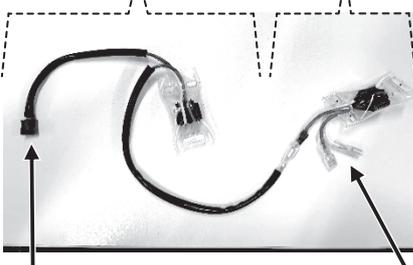
Connect to CN881

Application control P.C. board



Wire (E)

Wire (F)



Connect to
Application
control P.C. board

Connect to indoor / outdoor
connecting terminal

Binding band

Connect to Wire (E)
and Wire (F)

CAUTION

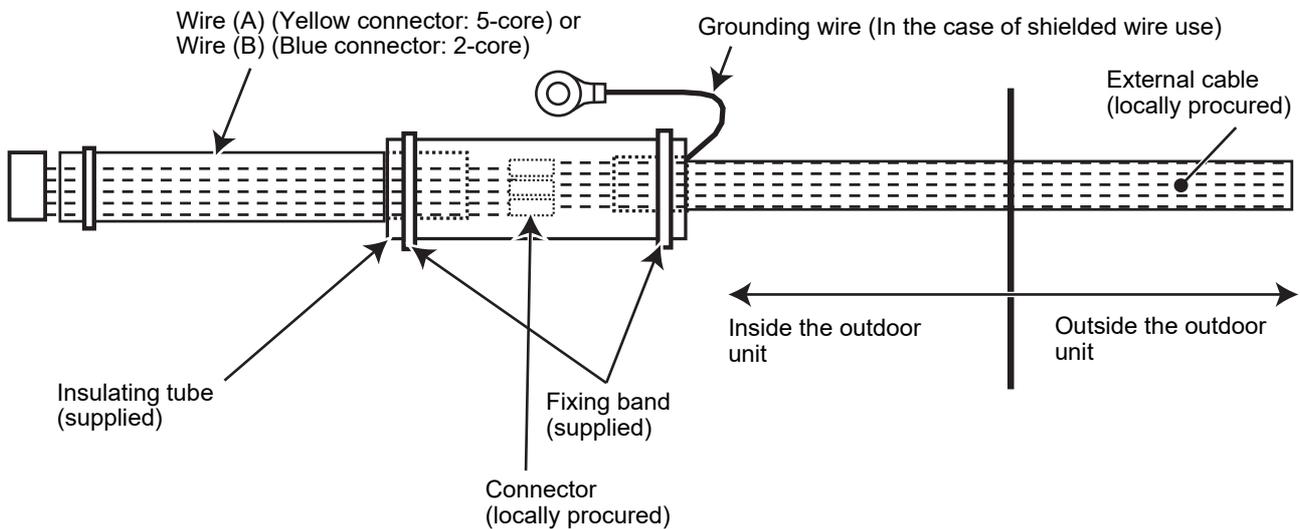
Do not allow the wires to come into pinching with cover parts.
Otherwise, the wires may be broken or heated or fire may occur.

6 Connection between the application control P.C. board and external cable, insulation specifications

⚠ CAUTION

- For insulation, be sure to observe the following instructions. Failure to do so may cause an electric shock or short circuit.
- Connect the connector to the external cable inside the outdoor unit, and avoid liquid permeation or contact with metals such as pipes.

■ Insulation specifications



External cable specifications:

External cable	For Wire (A)	Rubber jacket cable 5 × 0.75 mm ² or more (60245 IEC 57 compatible)
	For Wire (B)	Rubber jacket cable 2 × 0.75 mm ² or more (60245 IEC 57 compatible)

Number of wires × Wire size

Wire (A): Power peak-cut control and Night operation (Sound reduction)

Wire (B): Compressor operation output

■ Connecting to the external cable

- 1 Thread Wire (A) or (B) through the supplied insulating tube beforehand, and connect Wire (A) or (B) to an external cable with the above specification via the connector.
- 2 Cover the connected part with the supplied insulating tube, and fix the ends with the supplied bands.
Keep the insulating tube part inside the outdoor unit.
- 3 Pull the external cable, indoor / outdoor connection wire, and power cord out through the knockout of the outdoor unit.

