MIURA

No. HK-05-027

Source Panel Modification Procedure When Replacing 4 kW Power Unit with 8 kW Power Unit (Single Lamp, Rail Type)

<Table>

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MIURA CO.,LTD.

202401E

1. Overview

This document describes the modification procedure for replacing a single lamp 4 kW power unit mounted in the source panel with an 8 kW power unit.

2. Applicable product

Source panel of ballast water management system equipped with 4 kW power unit (single lamp, rail type)

3. Feature of modification

During the initial replacement of the 8 kW power unit, preparation for subsequent replacements will also be carried out simultaneously. This preparation simplifies the modification of the second and subsequent power units.

First time: Replacement of terminal block, Wiring
Addition of switching power unit, Wiring
Replacement of failed 4 kW power unit, Wiring
From the second unit onwards: Replacement of failed 4 kW power unit, Wiring

<Rules for replacing UV power unit>

Regardless of the malfunction location of the 4 kW power unit, install the 8 kW power unit in ascending order of power unit numbers.

When replacing the single lamp 4 kW power unit with the 8 kW power unit, even if only one power unit is broken, replacement is necessary in sets of two power units, either “No.1+No.2”, “No.3+No.4”, “No.5+No.6”, or “No.7+No.8”.

Example) In case of failure of 4 kW power unit in ①-5

a) Remove the 4 kW power unit from ①-5.
b) Move the 4 kW power unit in ①-1 to ①-5.
c) Remove the 4 kW power unit from ①-2 and replace with the 8 kW power unit.

If the second or subsequent 4 kW power unit fails, install the 8 kW power unit using the same approach.

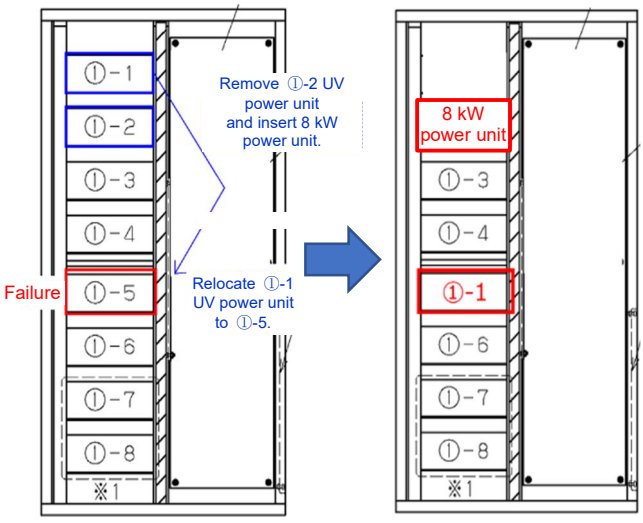


Figure 1 In case of failure of 4 kW power unit in ①-5

4. Tools and parts required

Prepare the following tools and parts for the modification.

Table 1 Tools and parts required

Name	Part code	Specification	Note
Standard tool set			
Screwdriver			
Precision screwdriver			
Initial modification kit	P1000178512-00	Single lamp type	Table 2 *Required only the first time
8 kW power unit replacement kit	P1000178516-00	Single lamp, rail type	Table 3
8 kW power unit	0000-AA8-4967-0	EBLA-8K44DSQ1	

Table 2 Initial modification kit (Single lamp type)

No.	Name	Specification	Quantity
1	Wiring for switching power unit (yellow)	IV 0.9 mm^2 yellow×2,300 mm (Three each of M4 and M5)	6
2	Wiring for switching power unit (green)	IV 1.25 mm^2 green×1,000 mm	2
3	Wiring for switching power unit (blackish gray)	SCP 4.0 mm^2 blackish gray×3,400 mm	2
4	Output wiring (blackish gray)	MLFC 2.0 mm^2 1500V blackish gray ×2,700 mm	2
5	DIN rail	For attaching switching power unit to sub-source panel	1
6	Terminal block	TS-A-PTTB4L1000V-12P-1	1
7	Switching power unit	QUINT4-PS/3AC/24DC/40(2904623)	1

<Initial modification kit (Single lamp type)>

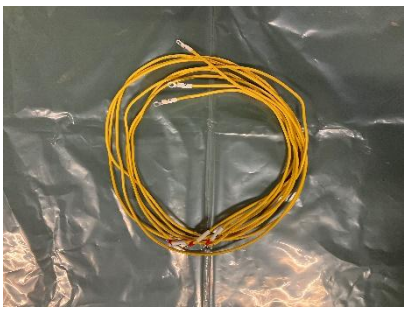
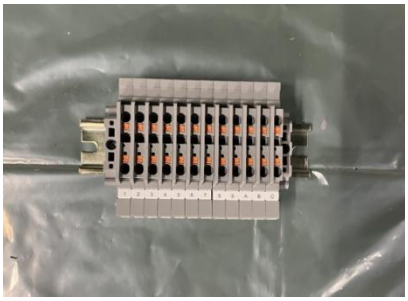
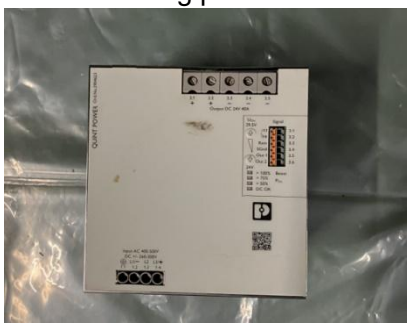
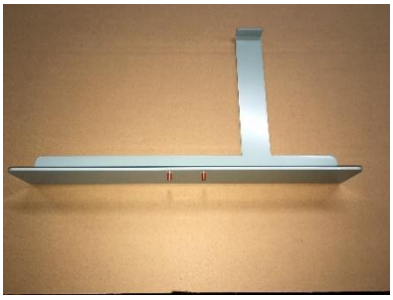
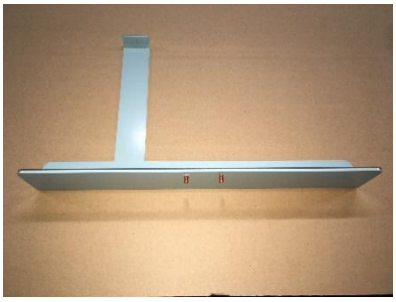
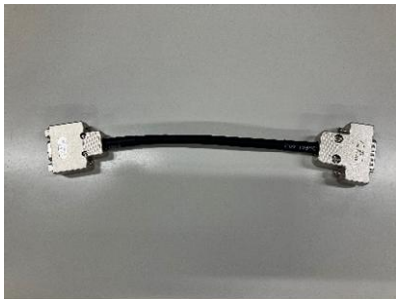
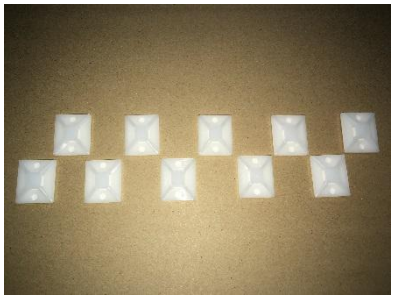
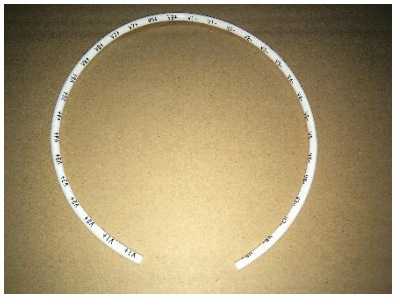
1	2	3
Wiring for switching power unit (yellow) 	Wiring for switching power unit (green) 	Wiring for switching power unit (blackish gray) 
4	5	6
Output wiring (blackish gray) 	DIN rail 	Terminal block 
7		
Switching power unit 		

Table 3 8 kW power unit replacement kit (Single lamp, rail type)

No.	Name	Specification	Quantity
1	UV power unit fixing plate (left)	For 8 kW	1
2	UV power unit fixing plate (right)	For 8 kW	1
3	Connecting cable conversion connector	-	1
4	Abnormal signal short-circuit connector	-	1
5	Input wiring (blackish gray)	MLFC 2.0 mm^2 blackish gray×3,000 mm	3
6	Output wiring (blackish gray)	MLFC 2.0 mm^2 1500V blackish gray×2,700 mm	2
7	Ground wiring (green) (for power unit)	IV 2.0 mm^2 green×3,000 mm	1
8	Band	T50R 200 mm white	20
9	Mount base	ANP-2D	10
10	Mark tube set for output wiring	For output wiring	1
11	DC24V wiring	SCP 4.0 mm^2 brackish gray×1,200 mm	2

<Parts detail of 8 kW power unit replacement kit (single lamp, rail type)>

1	2	3
UV power unit fixing plate (left) 	UV power unit fixing plate (right) 	Connecting cable conversion connector 
4	5	6
Abnormal signal short-circuit connector 	Input wiring (blackish gray) 	Output wiring (blackish gray) 
7	8	9
Ground wiring (green) 	Band 	Mount base 
10	11	
Mark tube set for output wiring 	DC24V wiring 	

5. Preparation for modification

Make sure that the main breakers of both the source panel and control panel are turned off.

Also, shut off power supply to the source panel.

6. Modification procedure

(1) Wiring removal on back of 4 kW power unit

a) Input wiring removal

Disconnect the input wiring of the two 4 kW power units to be replaced.

(Example of wiring numbers: YR, YS, YT)

b) Output wiring removal

Disconnect the output wiring of the two 4 kW power units to be replaced.

(Example of wiring numbers: V1+, V1-)

c) Ground wiring removal

Disconnect the ground wiring of the two 4 kW power units to be replaced.

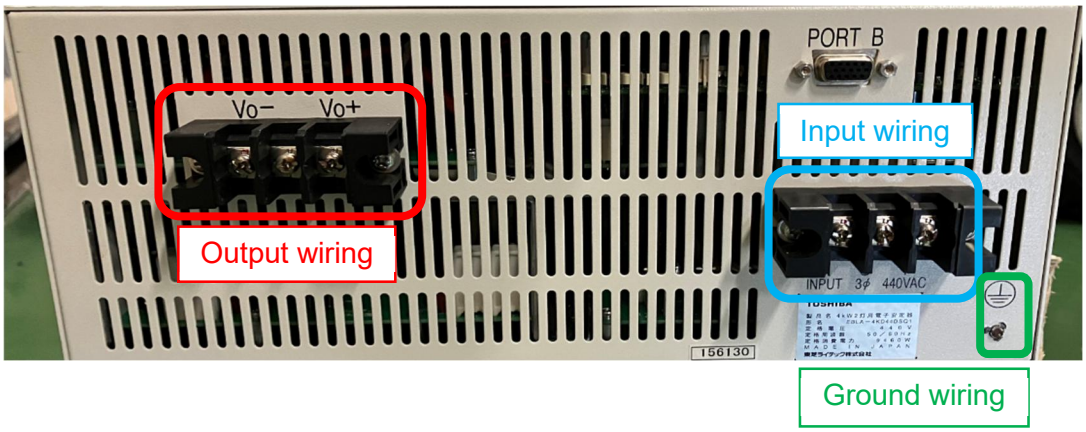


Figure 2 Wiring disconnection points on back of 4 kW power unit

d) Wiring removal on source panel side

Treat the a) to c) wiring removed from the terminal block of the source panel as follows.

Wiring	Power unit	Measure
a) Input wiring	Odd (upper) side	Discard
	Even (lower) side	Reuse if wiring reaches 8 kW power unit after replacement.
b) Output wiring	Odd (upper) side	Discard
	Even (lower) side	Discard
c) Ground wiring	Odd (upper) side	Discard
	Even (lower) side	Reuse if wiring reaches 8 kW power unit after replacement.

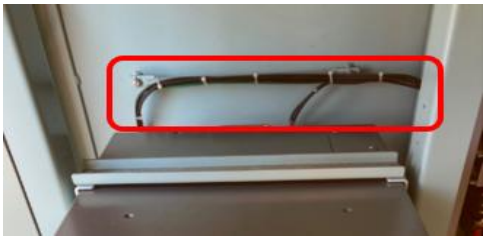


Figure 3 Wiring disconnection points on source panel side

(2) Wiring removal on front of 4 kW power unit

Disconnect connecting cables of the two 4 kW power units to be replaced.

Figure 4 Connecting cable removal

(3) Removal of 4 kW power unit

a) Removal of UV power unit holding plate

Remove the two screws that are securing the UV power unit holding plate on the top of the two 4 kW power units to be replaced.

Figure 5 Removal of screws that are securing UV power unit holding plate

b) Removal of 4 kW power unit fixing screws

Remove the four screws (M5×10) from the front of the 4 kW power unit. Keep the screws as they will be reused when installing the 8 kW power unit.

Figure 6 Removal of 4 kW power unit fixing screws

c) Removal of 4 kW power unit

Pull out the two 4 kW power units.

*Remove the UV power unit with the assistance of another person as it is a heavy object.

Figure 7 Removal of 4 kW power unit

d) Removal of rail connecting plate

Remove the four nuts that secure the rail connecting plate on the bottom that was used to mount the 4 kW power unit. Remove the two rail connecting plates for the two 4 kW power units.

The rail connecting plate on the odd (upper) side will not be reused.

Keep the even (lower) side rail connecting plate as it will be reused.

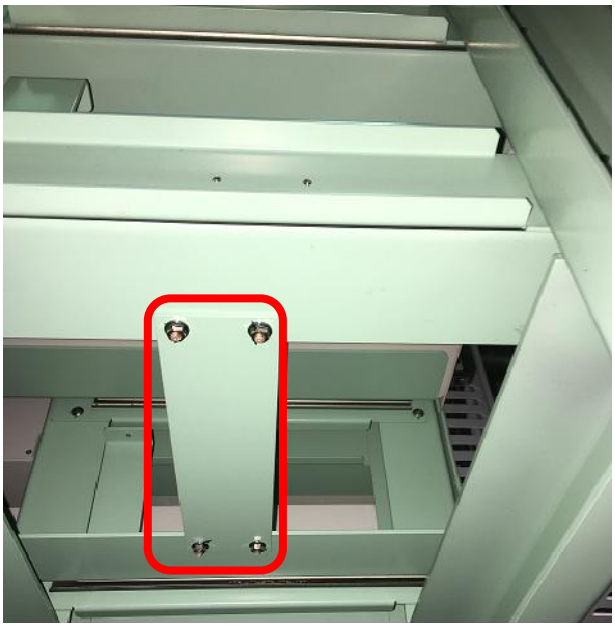


Figure 8 Removal of rail connecting plate

e) Removal of rail fixing plate and 4 kW UV power unit fixing plate

Slide the left and right UV power unit fixing plates, which were used to mount the 4 kW power unit, forward and backward. Then, remove the four screws that secure the rail fixing plate. Afterward, remove both the rail fixing plates and the UV power unit fixing plates from the left and right sides (two locations per UV power unit).

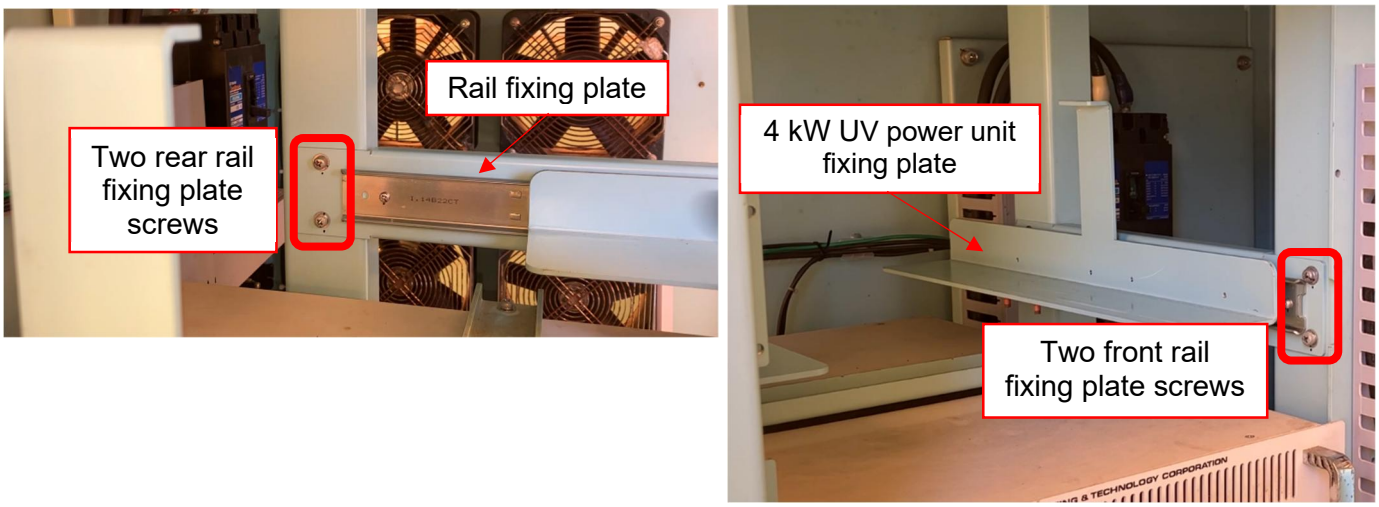


Figure 9 Removal of rail fixing plate and 4 kW UV power unit fixing plate

f) Removal of rail of 4 kW UV power unit fixing plate

Remove the four screws that secure the rail to the back of the 4 kW UV power unit fixing plate that was removed in step e). Then, remove the rail from the UV power fixing plate.

- Discard the 4 kW UV power unit fixing plates and the rails on the odd (upper) side as they will not be used.
- Discard the even (lower) side 4 kW UV power unit fixing plates as they will be replaced with ones for the 8 kW power unit.
- Keep the even (lower) side rails as they will be reused.

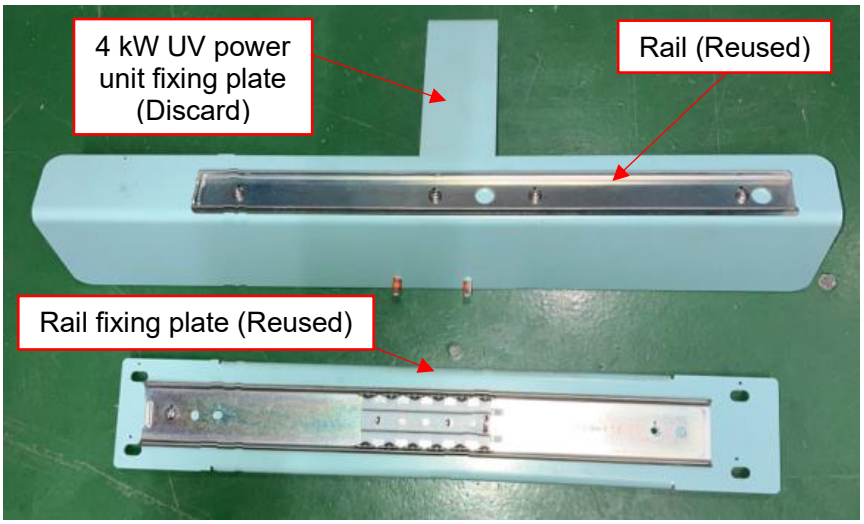


Figure 10 Removal of rail of 4 kW UV power unit fixing plate

(4) Installation of 8 kW power unit

a) Attachment of rail to 8 kW UV power unit fixing plate

Attach the rail, which was removed in step f) on page 8, to the 8 kW UV power unit fixing plate included in the modification kit using four screws. Arrange the UV power unit holding section to be on the far side.

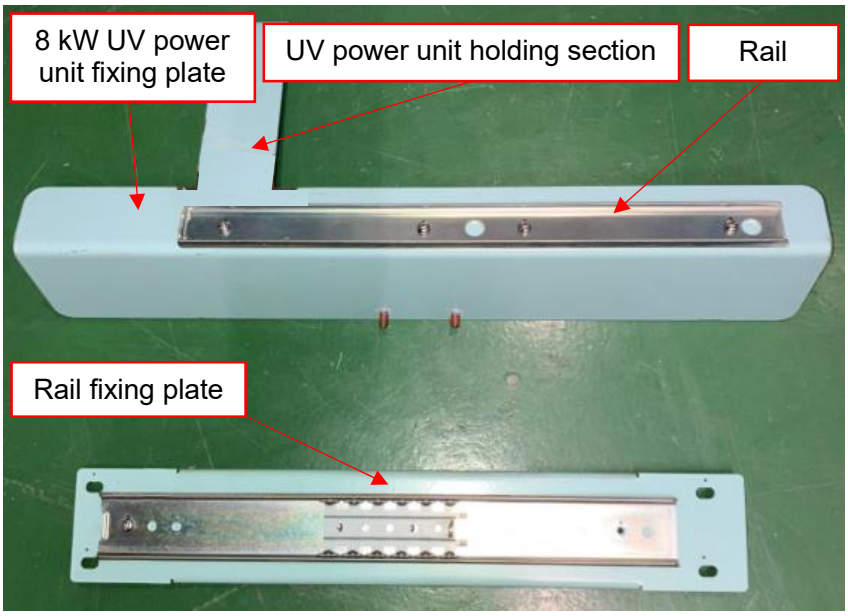


Figure 11 Attachment of rail to 8 kW UV power unit fixing plate (even side)

b) Attachment of rail fixing plate and 8 kW UV power unit fixing plate

Slide the 8 kW UV power unit fixing plate forward and backward into the location where the even (lower) side of the 4 kW power unit was installed. Secure the rail fixing plate and the 8 kW UV power unit fixing plate in place using four screws (two locations each).

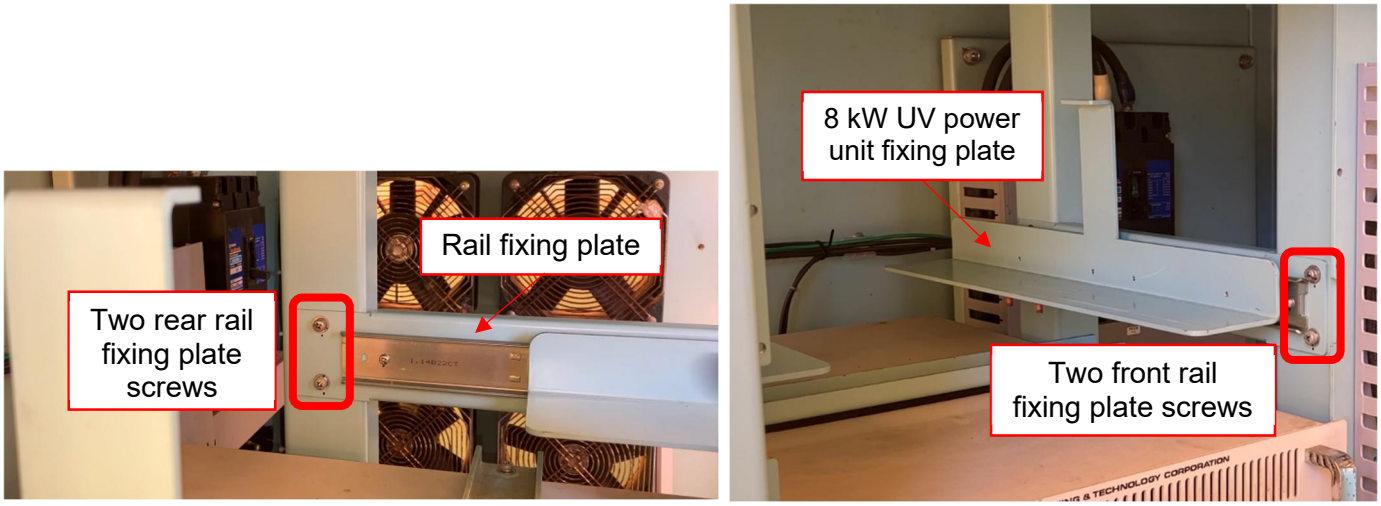


Figure 12 Attachment of rail fixing plate and 8 kW UV power unit fixing plate

c) Attachment of rail connecting plate

Attach the rail connecting plate, which was removed in step d) on page 7, to the bottom of the 8 kW power unit using four nuts.

Figure 13 Attachment of rail connecting plate

d) Installation of 8 kW power unit

Install the 8 kW power unit.

*Install the UV power unit with the assistance of another person as it is a heavy object.

Figure 14 After installing 8 kW power unit

e) Attachment of 8 kW power unit fixing screws and UV power unit holding plate

Attach the four screws (M5×10) to the front of the 8 kW power unit and the UV power unit holding plate. The fixing hole positions for the 4 kW (single lamp) and 8 kW power unit are the same.

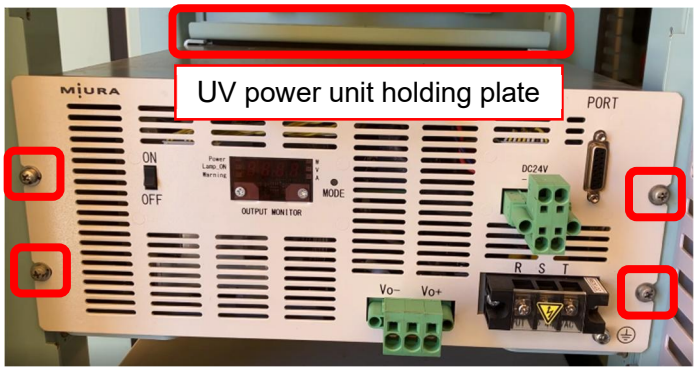


Figure 15 Attachment of 8 kW power unit fixing screws and UV power unit holding plate

(5) Removal of terminal block for 4 kW power unit First time only

To attach the terminal block for the 8 kW power unit, it is necessary to partially remove the terminal block for the 4 kW power unit that is mounted on the equipment mounting plate in the center of the existing 4 kW source panel.

a) Wiring of terminal block for 4 kW power unit

Remove both upper and lower wiring.

b) UV reactor's opposite side terminal block

Do not remove it as it will be reused.

c) UV reactor's motor side terminal block

Remove and discard as it will be replaced with one for 8 kW power unit.

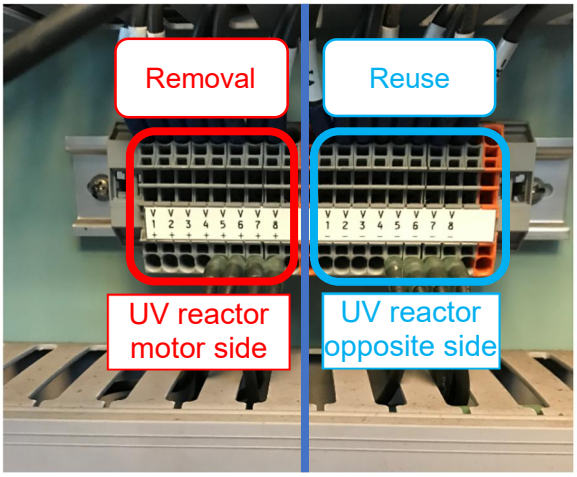


Figure 16 Terminal block for 4 kW power unit

(6) Attachment of terminal block for 8 kW power unit First time only

a) Remove the terminal block in the modification kit from the DIN rail and attach it to the red-framed area shown in Figure 17. The modification kit includes a 12-pin terminal block, but only use the number of pins required. For example, if the ballast water management system is designed for eight UV lamps, use eight pins of the terminal block in the modification kit and leave the remaining four pins unused.

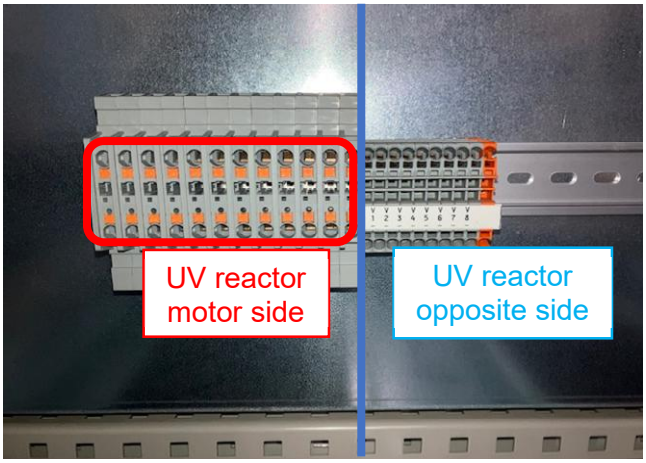


Figure 17 After mounting terminal block for 8 kW power unit

b) Reconnection of wiring

Opposite side: Reconnect both upper and lower wiring.

Motor side: Reconnect only the lower wiring. The upper output wiring will be connected to the 8 kW cable in the next step.

*Refer to the conversion table below as the terminal numbers on the terminal block will change before and after the replacement.

Table 4 Terminal number conversion table

Terminal block	Terminal number											
4 kW	V1+	V2+	V3+	V4+	V5+	V6+	V7+	V8+	V9+	V10+ or VA+	V11+ or VB+	V12+ or VC+
⇩												
8 kW	1	2	3	4	5	6	7	8	9	A	B	C

(7) Installation of switching power unit First time only

To supply DC24V for the 8 kW power unit, it is necessary to add a switching power unit.

a) Installation of switching power unit

Install the switching power unit in the space next to the right side of the contactor. Wiring to the switching power unit in advance will make subsequent work processes smoother.

*In the case of sub-4 kW source panel, the DIN rail may not be attached because there is no contactor. In this case, mount the DIN rail in the modification kit first, and then install the switching power unit.

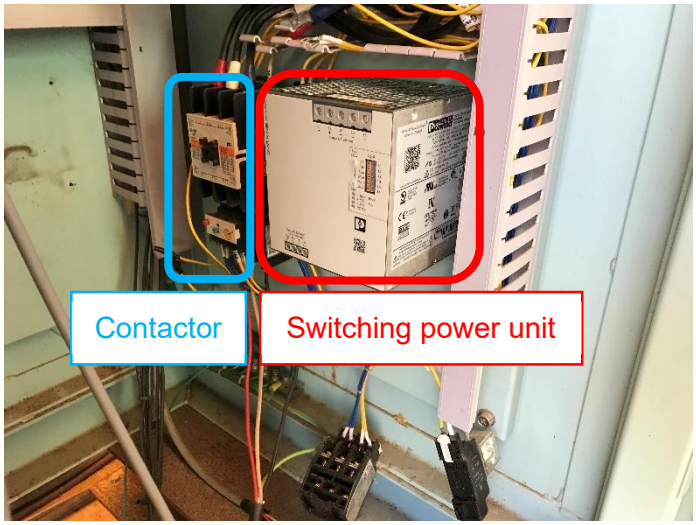


Figure 18 After installing switching power unit

(8) Wiring to switching power unit First time only

Connect the wiring in the initial modification kit to the switching power unit.

a) Switching power unit: “L1-” “L2” “L3+”⇔Connect “YR5”, “YS5”, and “YT5” in that order.

Use three No.1 IV 0.9 mm^2 yellow wiring included in the initial modification kit.

b) Switching power unit: “2.5-” “1.1”

Use two No.2 IV 2.0 mm^2 green wiring included in the initial modification kit.

c) Switching power unit: “2.1+” “2.3-”⇔Connect “B24V” and “B0V” in that order. (first 8 kW power unit only)

Use two No.3 SCP 4.0 mm^2 blackish gray wiring included in the initial modification kit.

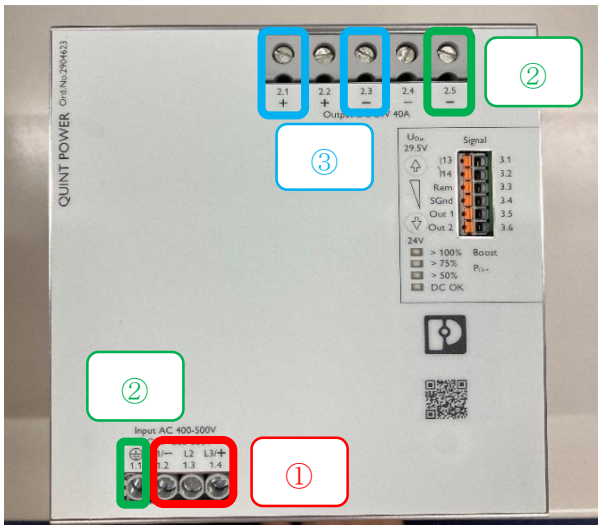


Figure 19 Wiring points and terminal numbers of switching power unit

(9) Wiring to front of 8 kW power unit

a) Input wiring (If the existing wiring reaches the 8 kW power unit, it is reused; if not, replacement is required.)

Connect the input wiring for the 8 kW power unit. (wiring numbers: YR5, YS5, YT5)

b) Output wiring

Connect the output wiring for the 8 kW power unit (MLFC2 1500V) in the modification kit.

(wiring numbers: 1,2)

Use the mark tube provided in accordance with the 8 kW power unit to be replaced.

Wiring connections for the 8 kW power unit differ from those for the 4 kW power unit. Refer to the wiring connection diagram on the next page and thereafter.

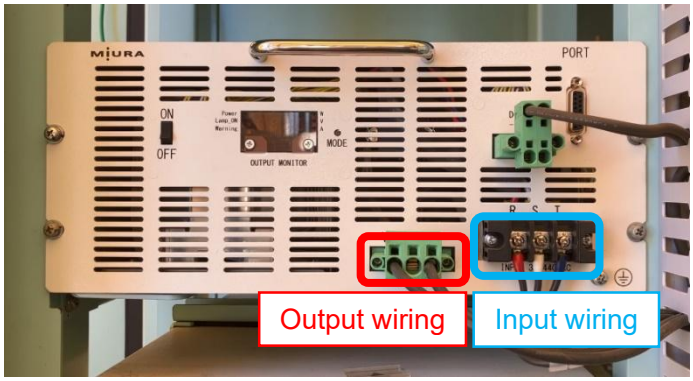


Figure 20 Wiring points on front of 8 kW power unit (input and output wiring)

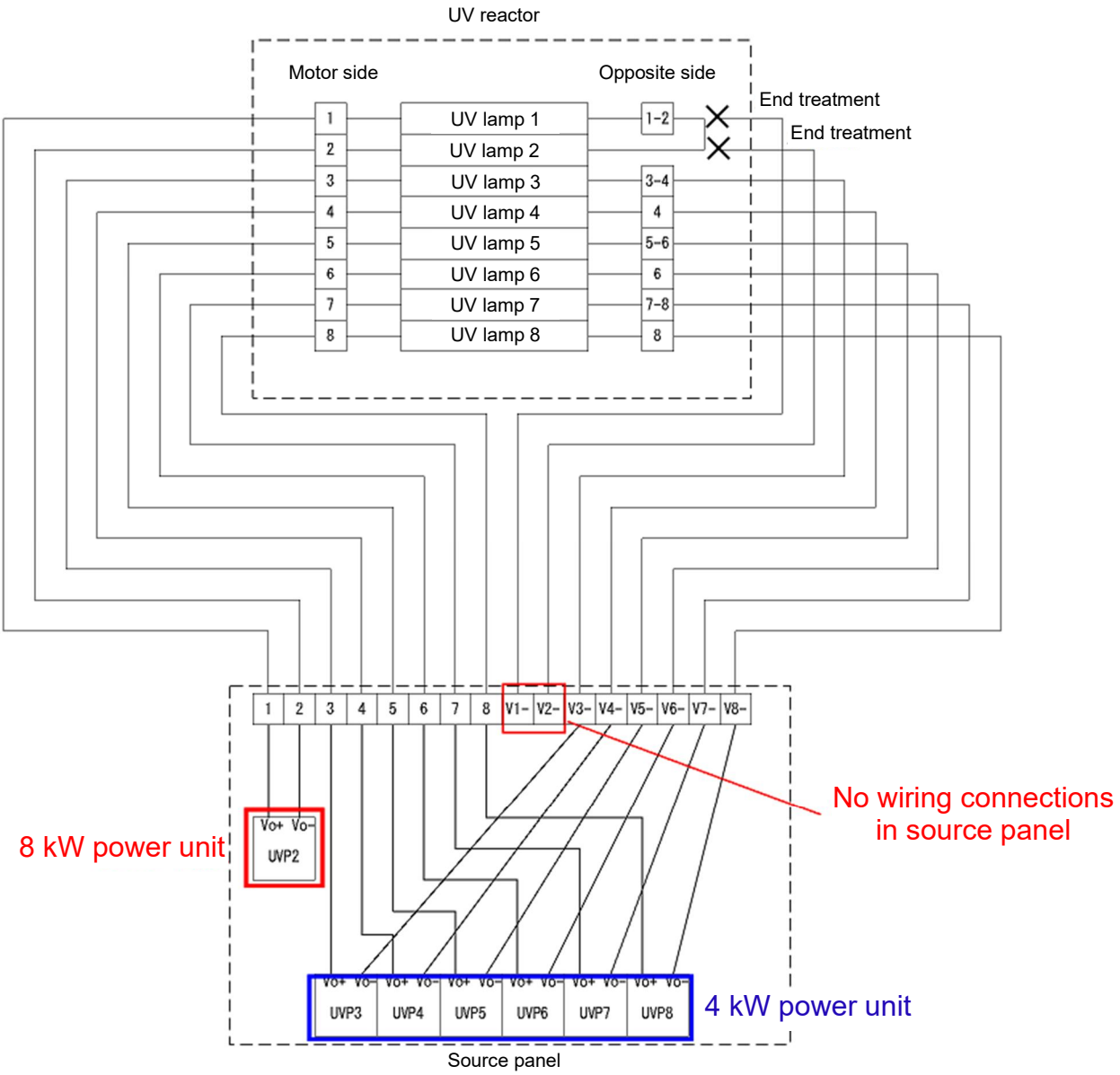


Figure 21 Wiring connection diagram for replacement of the first 4 kW power unit

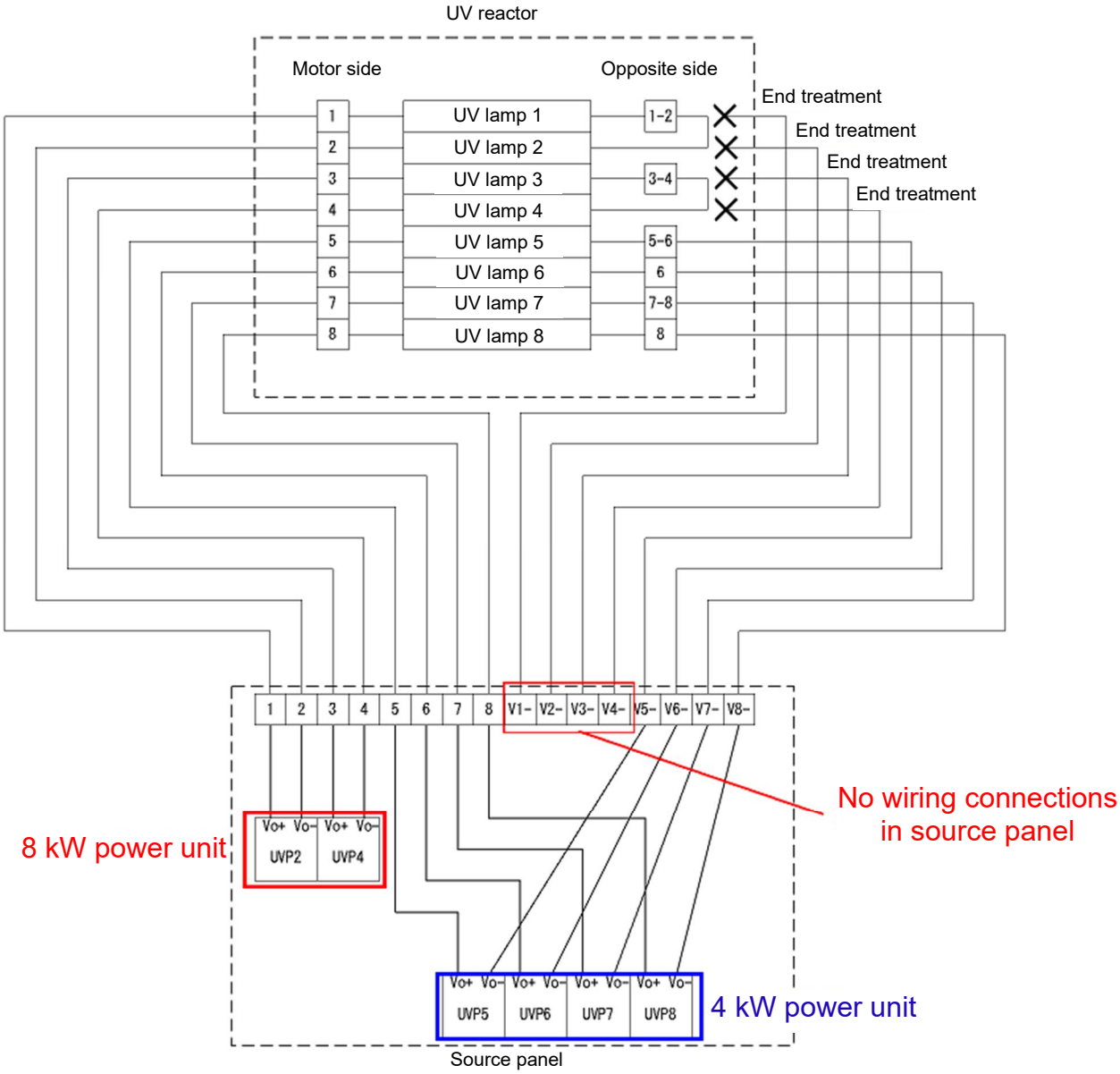


Figure 22 Wiring connection diagram for replacement of the second 4 kW power unit

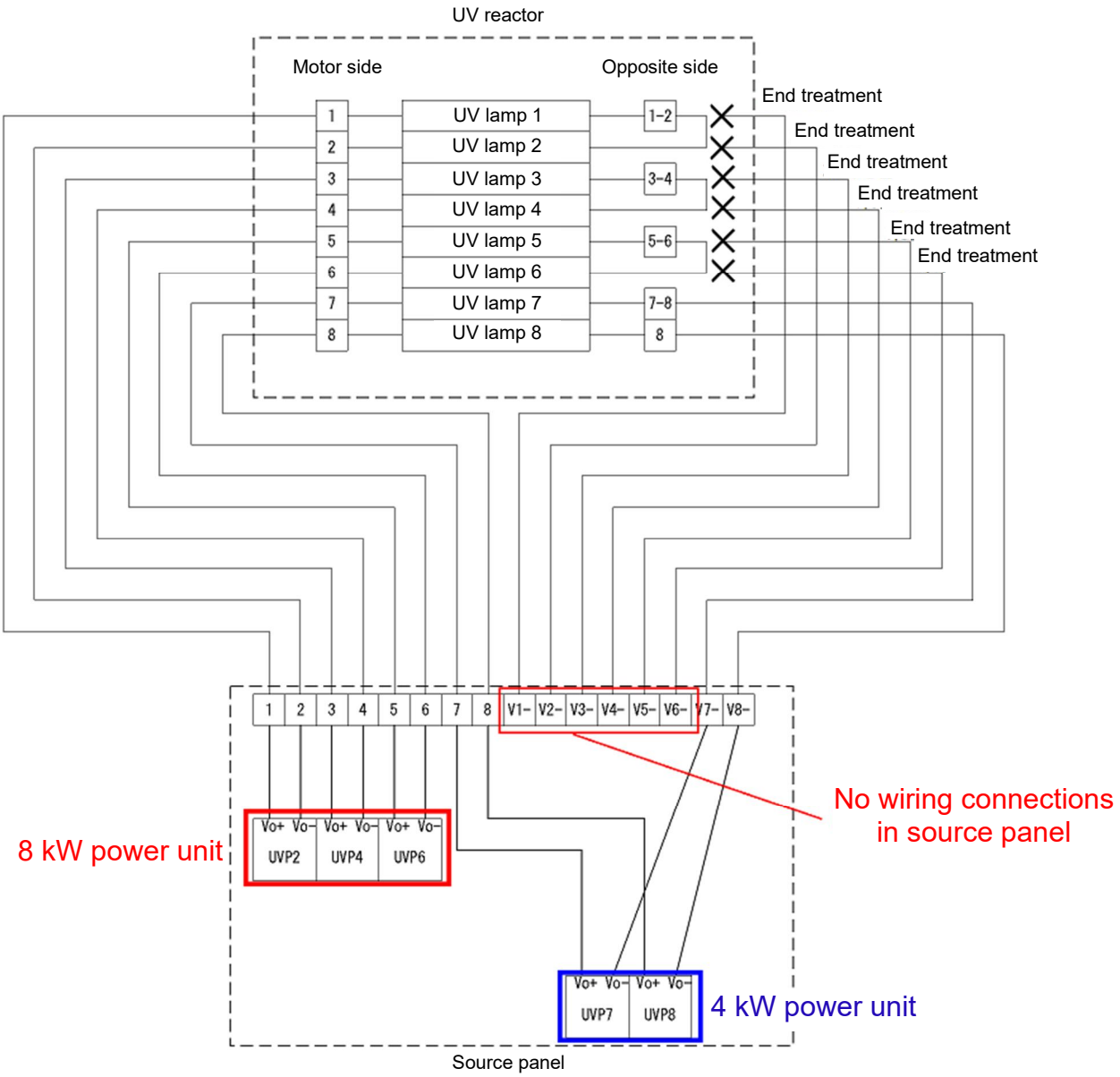


Figure 23 Wiring connection diagram for replacement of the third 4 kW power unit

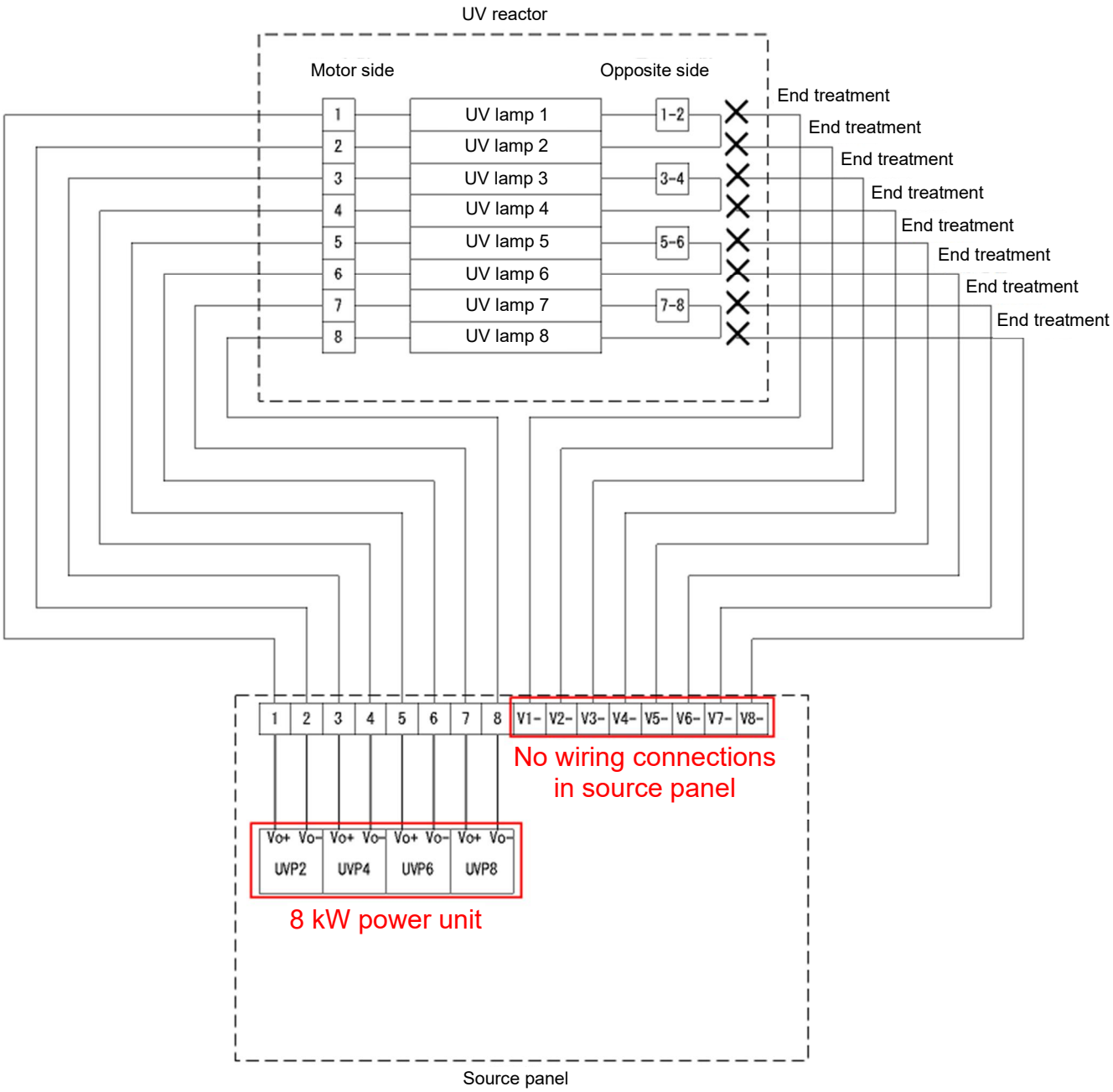


Figure 24 Wiring connection diagram for replacement of the fourth 4 kW power unit

c) Ground wiring

Connect the ground wiring for the 8 kW power unit.

Figure 25 Wiring point on front of 8 kW power unit (ground wiring)

(10) Wiring from switching power unit

a) Switching power unit “L1-” “L2” “L3+”⇔“R” “S” “T” of the branch terminal block

b) Switching power unit “2.5-” “1.1”⇔Ground bolts at the bottom of the source panel

c) Switching power unit “2.1+” “2.3-”⇔DC24V “+” and “-” of 8 kW power unit (first 8 kW power unit only)

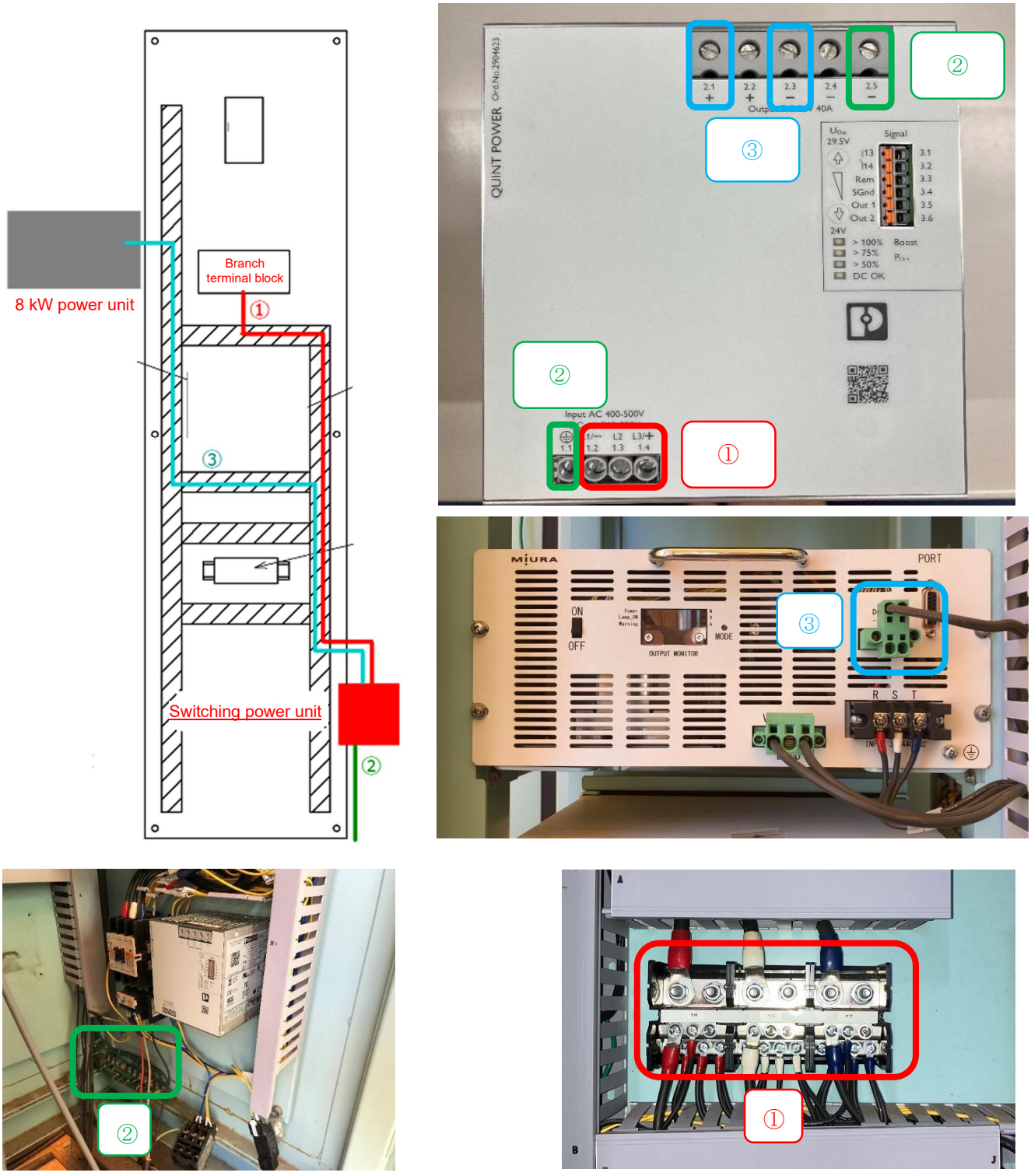


Figure 26 Wiring from switching power unit

(11) DC24V wiring connection for second and subsequent 8 kW power units

When replacing the second and subsequent 8 kW power units, route the DC24V wiring sequentially from the first 8 kW power unit. For the wiring of the DC24V connector, use the No.11 DC24V SCP 4.0 mm^2 brackish gray wiring included in the 8 kW power unit replacement kit. Rod terminals are attached at both ends for connection to the terminals of the DC24V connector. The right side of the connector is positive (+), and the left side is negative (-).

First unit :Switching power unit⇔8 kW power unit①

Second unit :8 kW power unit①⇔8 kW power unit②

Third unit :8 kW power unit②⇔8 kW power unit③

Fourth unit :8 kW power unit③⇔8 kW power unit④

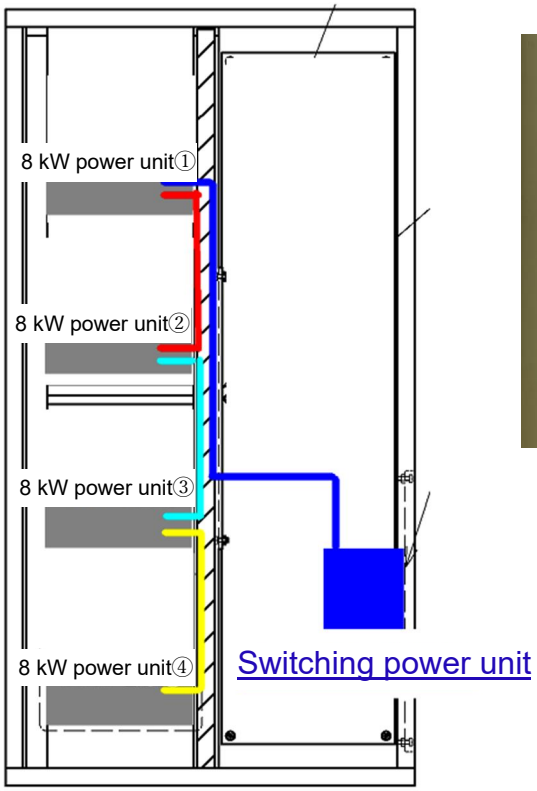


Figure 27 DC24V wiring connection diagram

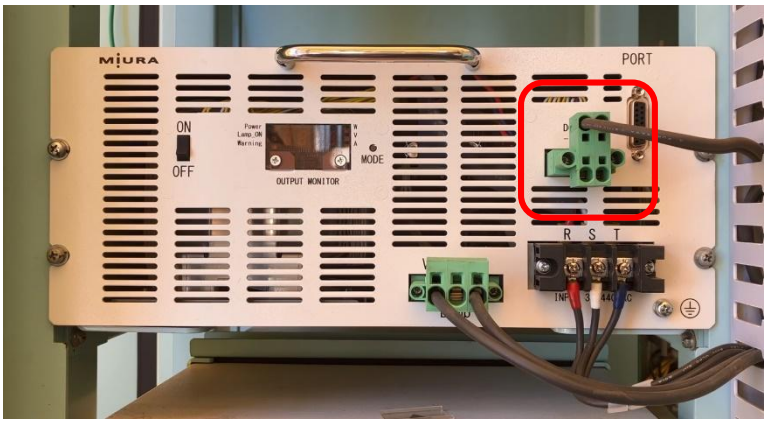


Figure 28 DC24V connector of 8 kW power unit

(12) Attachment of connecting cable conversion connector

To connect the existing cable to the 8 kW power unit installed on the even (lower) side, it is necessary to attach the connecting cable conversion connector. Attach the connecting cable conversion connector from the 8 kW power unit replacement kit (single lamp, rail type) to the cable that was disconnected from the 4 kW power unit. Then, connect it to the PORT section of the 8 kW power unit.

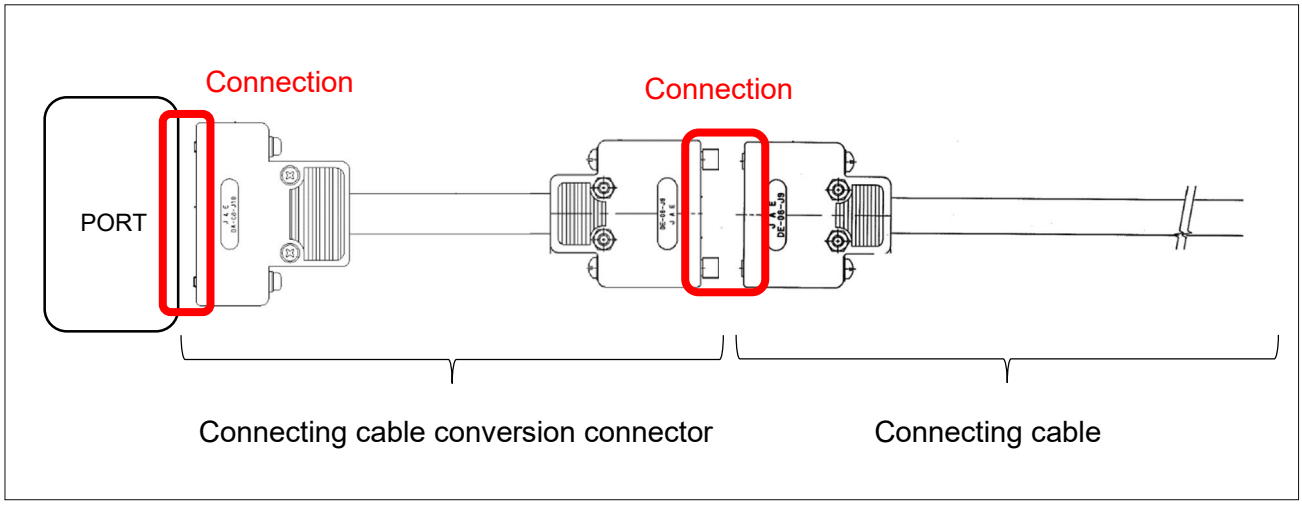


Figure 29 Connecting cable conversion connector

(13) Attachment of abnormal signal short-circuit connector

Attach the abnormal signal short-circuit connector from the 8 kW power unit replacement kit (single lamp, rail type) to the connecting cable that was connected to the odd (upper) side 4 kW power unit.

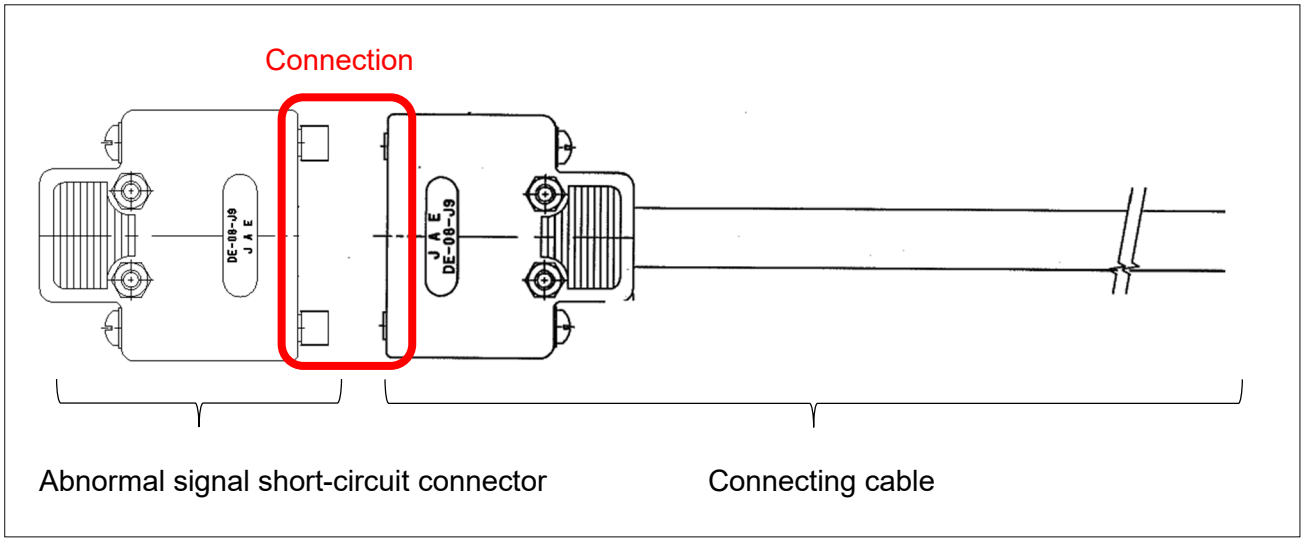


Figure 30 Abnormal signal short-circuit connector

(14) Duct storage for connecting cable conversion connector and abnormal signal short-circuit connector

Secure the connecting cable conversion connector and abnormal signal short-circuit connector with two screws each. Then, place them inside the cable duct.

Figure 31 Duct storage for connecting cable conversion connector and abnormal signal short-circuit connector

7. Operation check after replacement

After completing the replacement work, use a tester to check the continuity of the wiring of the terminal block and the 8 kW power unit. Also, if there are multiple UV reactors, check the continuity of the modified source panel and the modified UV reactor to make sure they match.

Turn on the main breakers of both the source panel and control panel and supply power to the source panel. Then, perform automatic ballasting or deballasting operation and confirm that the UV lamps are lighting up properly.

If the replaced single lamp 4 kW UV power unit includes a normal product, pack it in a cardboard box or similar packaging for storage as a spare in case of emergencies.