INSTRUCTION MANUAL

INTERLOCK CONNECTOR BOX

MODEL: TSC-MF-SS

1st Edition May.01. 2006

MADOKA SYSTEM CO., LTD.

MADOKA SYSTEM CO.,LTD.

CONTENTS

1. Outline

The Interlock Connector Box is the equipment for connecting sensor signals (contact signals) and interlock signals between machines. Interlock Connector Boxes can be connected by one multi-core cable (by an one-touch connector) and wiring saving can be achieved. The operation time of wiring and replacement can be cut down because one-touch attachment terminal blocks are employed for wiring into the interlock connector box. The interlock switch units can be installed per one unit; therefore, its replacement can be done without trouble.

Differences with conventional interlock boxes

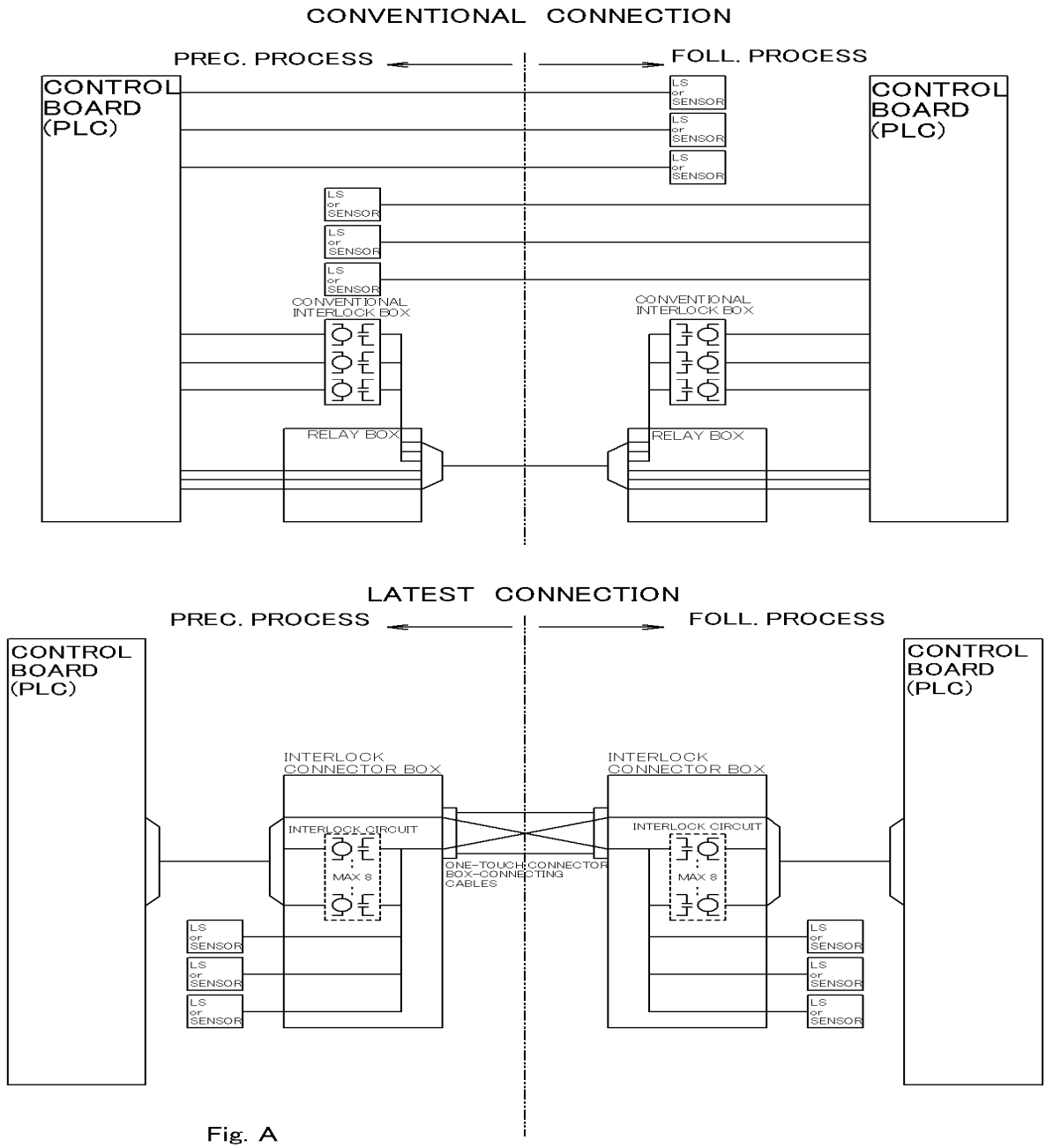


Fig. A

・The interlock connector box is common for both PREC. and FOLL. PROCESS.

・Switch units, lamp units, and box-connecting cables are NOT attached and they are sold as an option **except** 3 switch units are attached as the normal type when shipment.

・Number of connectable units

The number of connectable units for the interlock connector box is as follows:

Switch Units and Lamp Units : Max. 5

Input Units : Max. 6

In case of Input Units + Switch Units + Lamp Units : Max. 6

2. Component Units

2-1. Product Component Units

Part Name	Model	Detail
Interlock Connector Box Type SS	TSC-MF-SS	For both PREC. and FOLL. PROCESS Asi and device net slaves can NOT be installed. TSC-MF-SS can NOT be connected to TSC-MF-S or TSC-MF-M due to their different circuits inside.
Switch Unit	TSC-RAP	Exclusive switch units for TSC-MF-S, -M -SS, Refer to the detailed specifications with the concerned instruction manual.
Lamp Unit	TSC-RAP-L	Exclusive lamp units for TSC-MF-S, -M,-SS, Refer to the detailed specifications with the concerned instruction manual.
Box-Connecting Cable 1m Box-Connecting Cable 3m Box-Connecting Cable 5m	TSC-C-1 TSC-C-3 TSC-C-5	Exclusive cables for TSC-MF-S, -M,-SS. The cable housing is straight. Refer to the detailed specifications with the concerned instruction manual.
Box-Connecting Cable 1m Box-Connecting Cable 3m Box-Connecting Cable 5m	TSC-C-1-MTW TSC-C-3-MTW TSC-C-5-MTW	Exclusive cables for TSC-MF-S, -M,-SS. The cable housing is straight. MTW cables are used Refer to the detailed specifications with the concerned instruction manual.
Box-Connecting Cable 1m Box-Connecting Cable 3m Box-Connecting Cable 5m	TSC-C-1L TSC-C-3L TSC-C-5L	Exclusive cables for TSC-MF-S,-M,-SS, The cable housing is L-shape. Refer to the detailed specifications with the concerned instruction manual.
Box-Connecting Cable 1m Box-Connecting Cable 3m Box-Connecting Cable 5m	TSC-C-1L-MTW TSC-C-3L-MTW TSC-C-5L-MTW	Exclusive cables for TSC-MF-S,-M,-SS, The cable housing is L-shape. MTW cables are used. Refer to the detailed specifications with the concerned instruction manual.

Note)

TSC-RAP-1 (switch units for type Z) and TSC-RAP-1L (lamp units for type Z) can NOT be applied to TSC-MF-SS because their wire lengths are too long.

TSC-MF48-□ (cables for type Z) can NOT be applied to TSC-MF-SS because of the different shapes of the connector.

3. Appearance

3-1. TSC-MF-SS

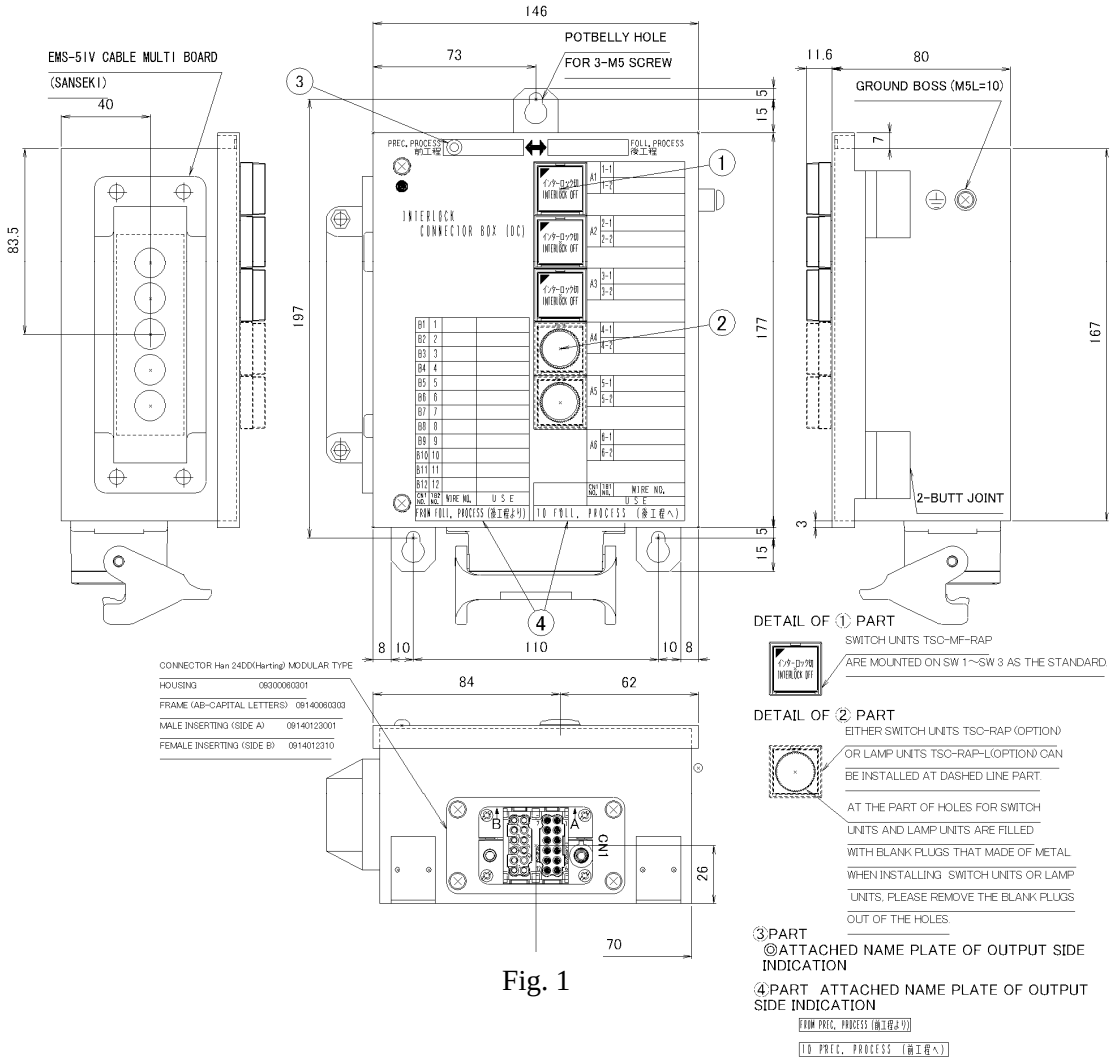
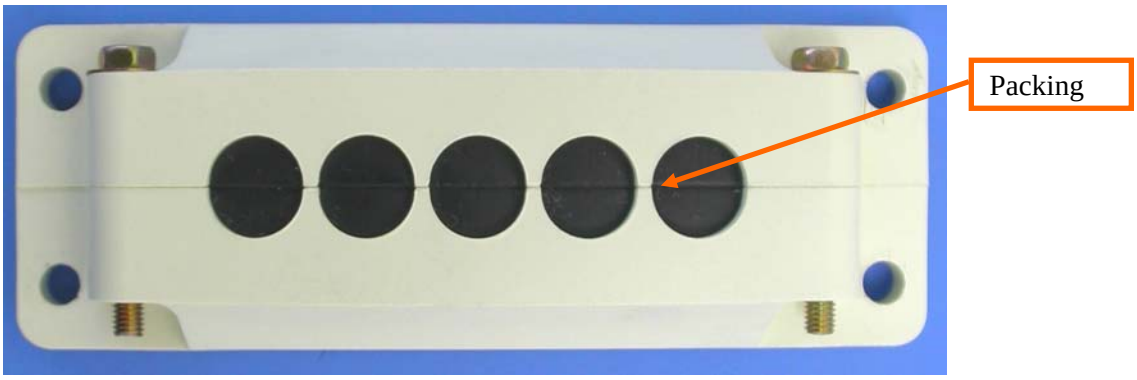


Fig. 1

・Three SW units (TSC-RAP) are installed on SW1,SW2 and SW3 as the normal type when shipment.
○ parts of SW4 and SW5 in the squares of the dashed line are blank plugs. If the blank plugs are removed, either switch units or lamp units can be installed. There are no indications of SW1～SW5 on the actual panel; however, there are indications of them at the inner side of the actual panel.

・When shipment, the name plate indication of “FOR PREC. PROCESS” is “TO FOLL. PROCESS” and “FROM FOLL. PROCESS”. When apply the equipment to “FOR FOLL. PROCESS”, fix the name plates “TO PREC. PROCESS” and “FROM PREC. PROCESS” that are attached to the equipment on the indication part ④.

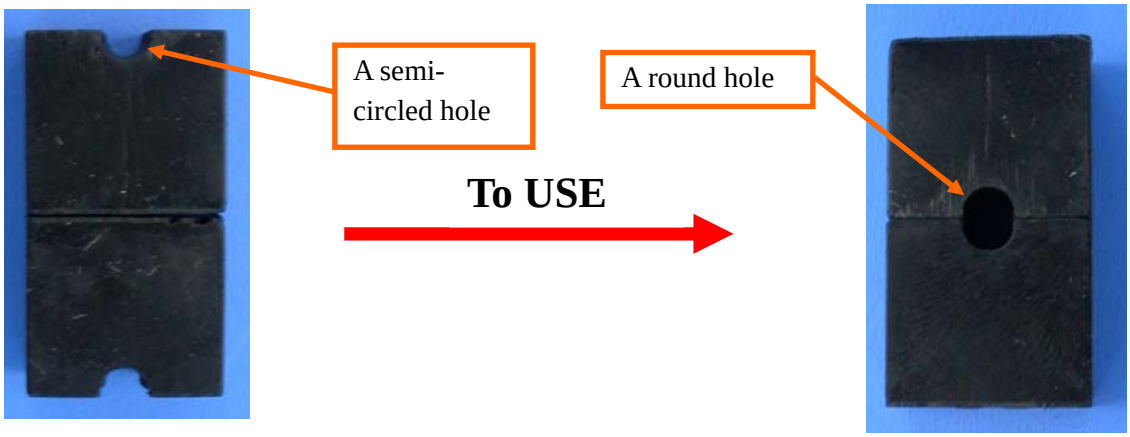
・When shipment, packing is installed inside of Cable Multi Board. (See Picture 1)
Please notice there is no hole on the packing.



Picture 1

The packing initially installed is placed like Picture 2. Each semicircle hole faces outside.

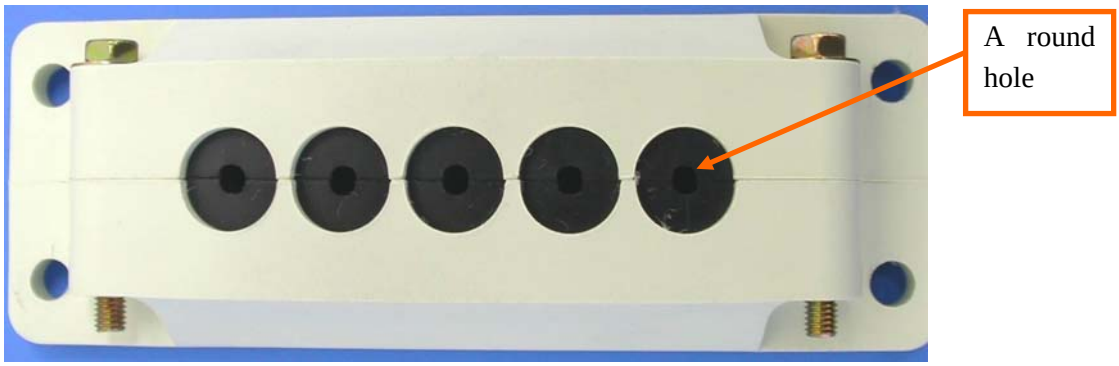
Before being used, the packing need to be flipped to make a round hole in the middle like Picture 3.



Picture 2

Picture 3

Then, please put the packing back in the Cable Multi Board again (See Picture 4).
There are holes on each of the packing to allow cables come through.



Picture 4

4. Specifications

4-1 General Specifications

ITEM	SPECIFICATIONS
Vibration Resistance	IEC60068-2-6 Compliant
Impact Resistance	IEC60068-2-27 Compliant
Atmospheric Temperature for Use	0～40℃
Atmospheric Humidity for Use	25～85%RH No Dew Condensation
Atmospheric Temperature for Preservation	－10～50℃
Environment for Use	No Corrosion Gas
Tolerable Voltage	AC1.5KV(for a minute)　Signal Terminal～FG
Insulation Resistance	Above 10MΩ　at DC500V　Signal Terminal～FG

4-2. Max. Rating

ITEM	SPECIFICATIONS
Voltage of Input Units	Max. DC30V
Current of Input Units	Max. 300mA （per a unit）

4-3. Circuit Diagram of the Interlock Connector Box

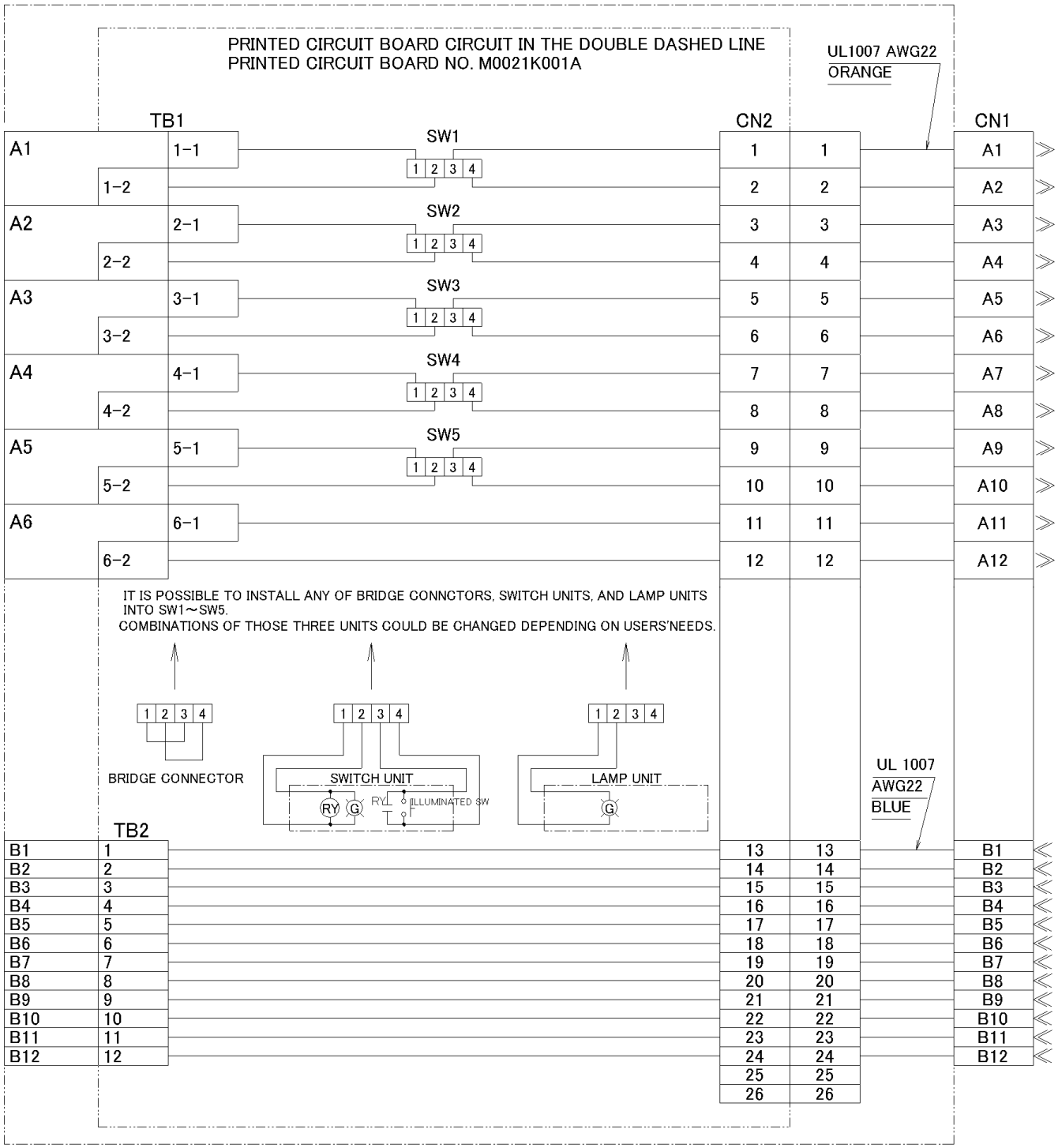


Fig. 2

5. Internal Layout of the Box

5-1. TSC-MF-SS

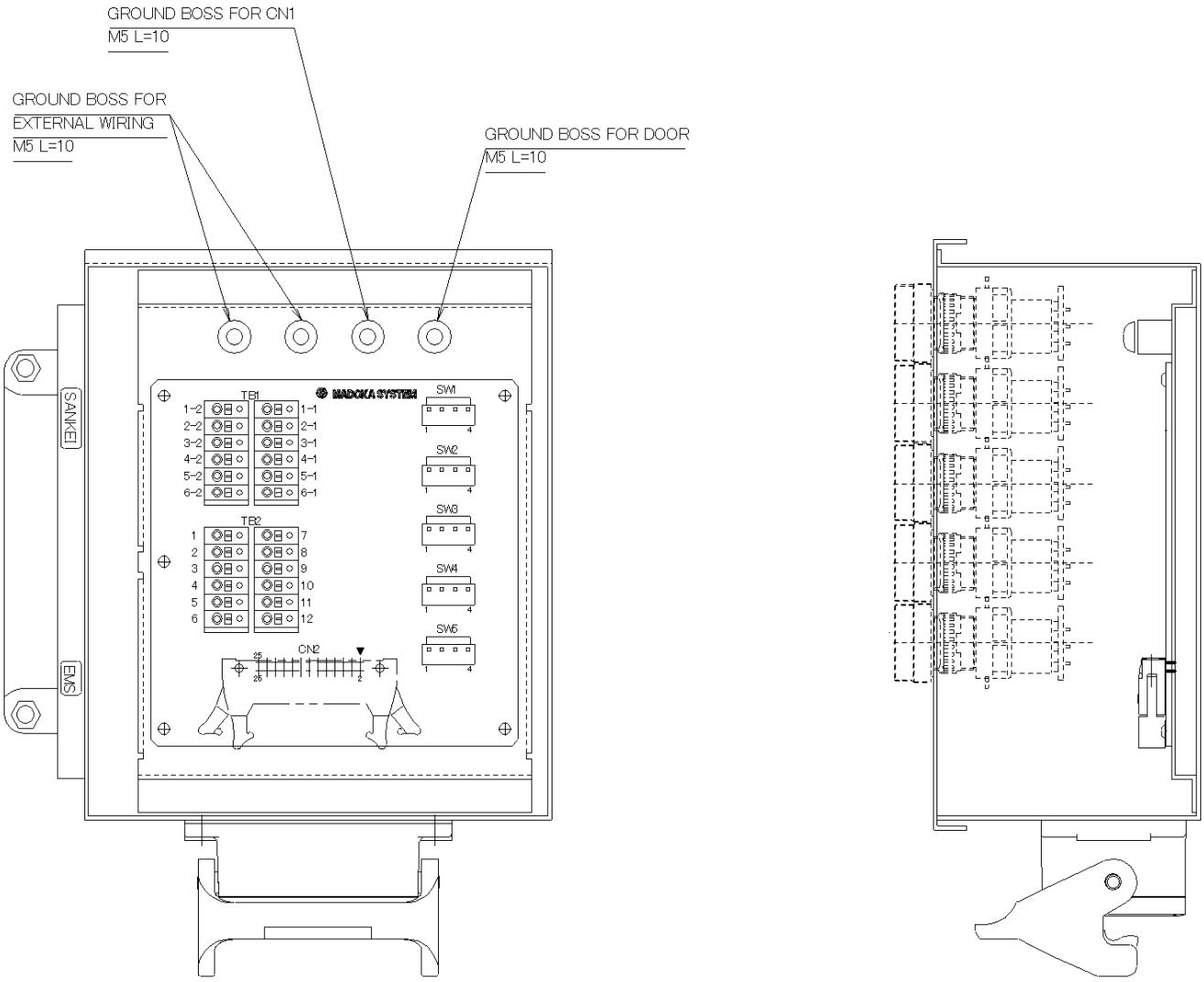


Fig. 3

・Specifications of Terminal Block

Terminal Block No.	Model	Maker	Wire Connection Method
TB1, TB2	OCN－061N	Osada Co., Ltd.	One-Touch Type by Bar Terminal (Terminal Length: 10mm)

・Recommended Suitable Terminal Model

Terminal Block No.	Name of Terminal	Model	Maker	Remark
TB1, TB2	Bar Terminal	UA-F***10	Osada Co., Ltd.	For AWG20～16 Length of Terminal: 10mm

Bar terminals' models vary with the wire size; therefore, please refer to the catalog attached at the end of this instruction manual. Use suitable tools to press bar terminals for proper work.

6. Wiring Diagrams of Unit Connection

The connection drawing shows PNP connection as an example.

6-1. Independent Connection of Input Units (Max. Units: 6)

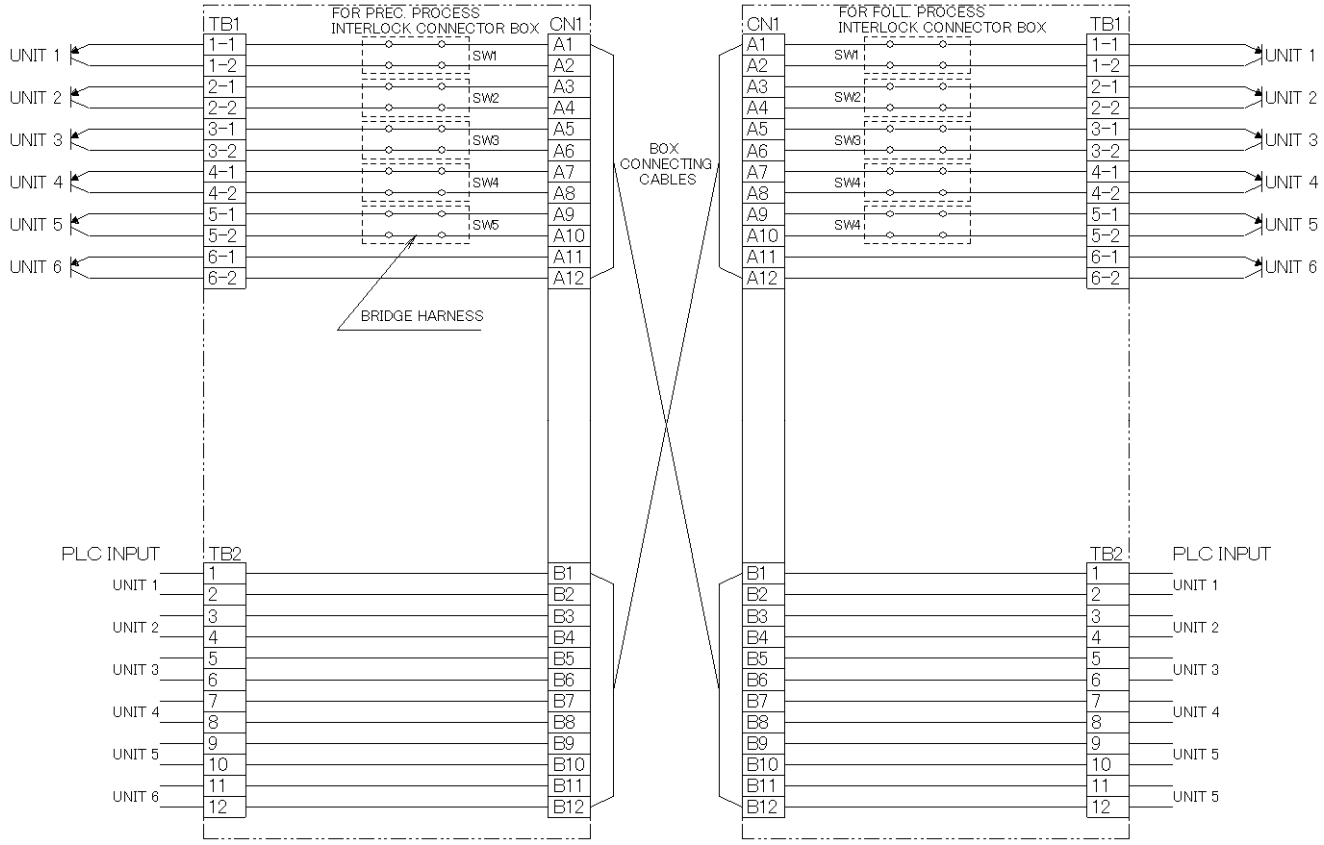


Fig. 4

6-2. Independent Connection of Switch Units + Input Units

Switch Units : 5 Input Units : 1

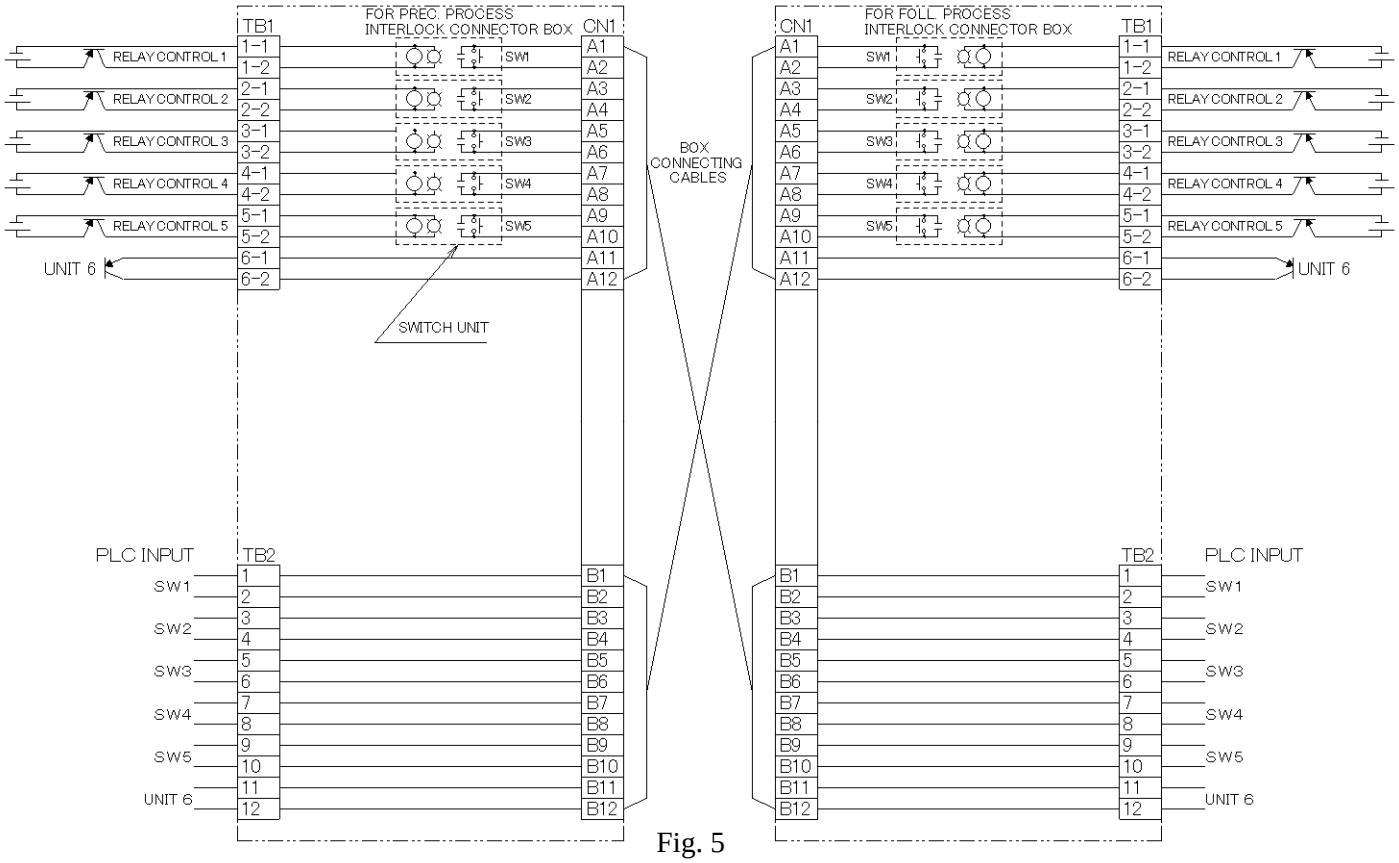


Fig. 5

6-3. Independent Connection of Lamp Units + Input Units

Lamp Units : 5 Input Units : 1

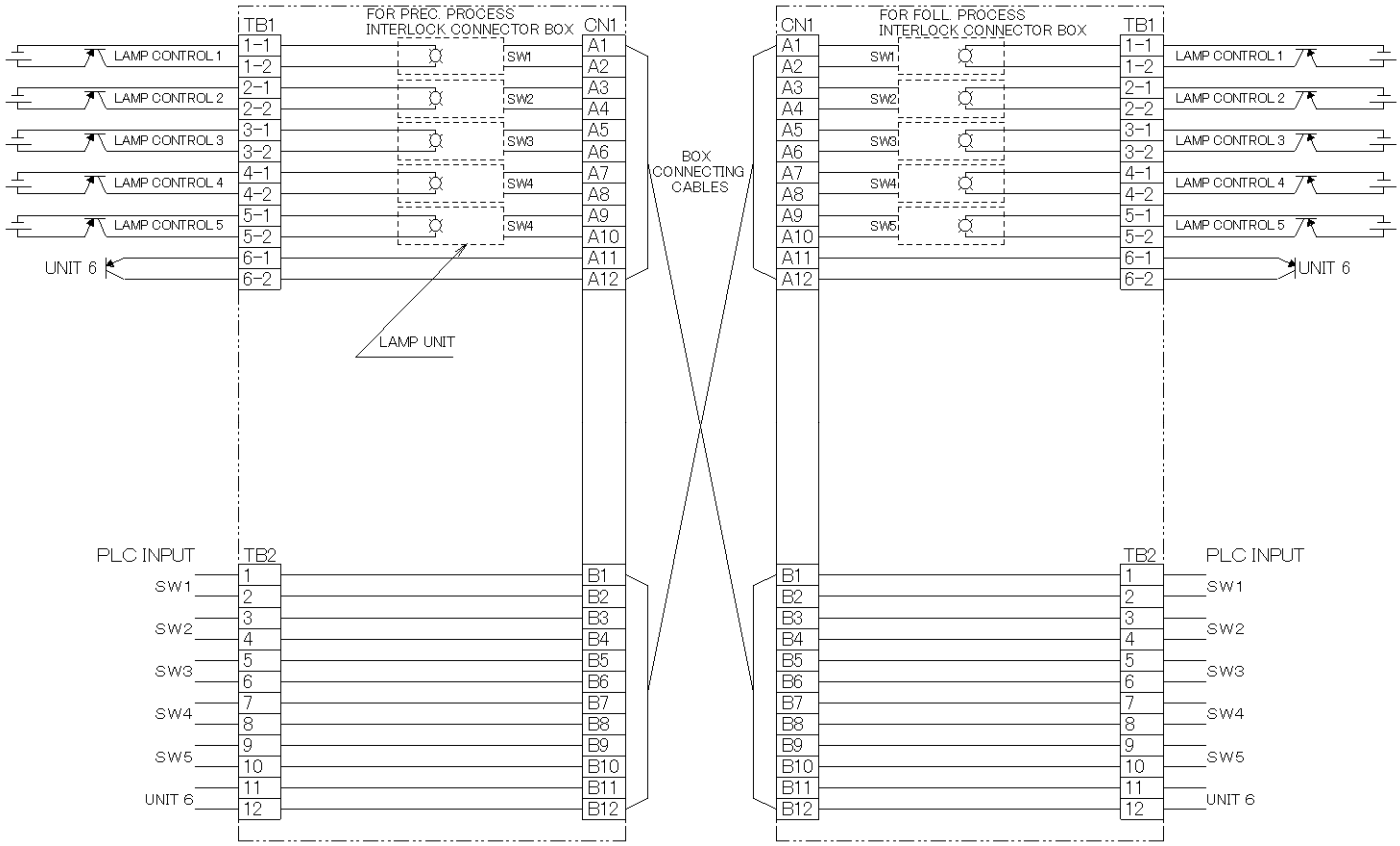
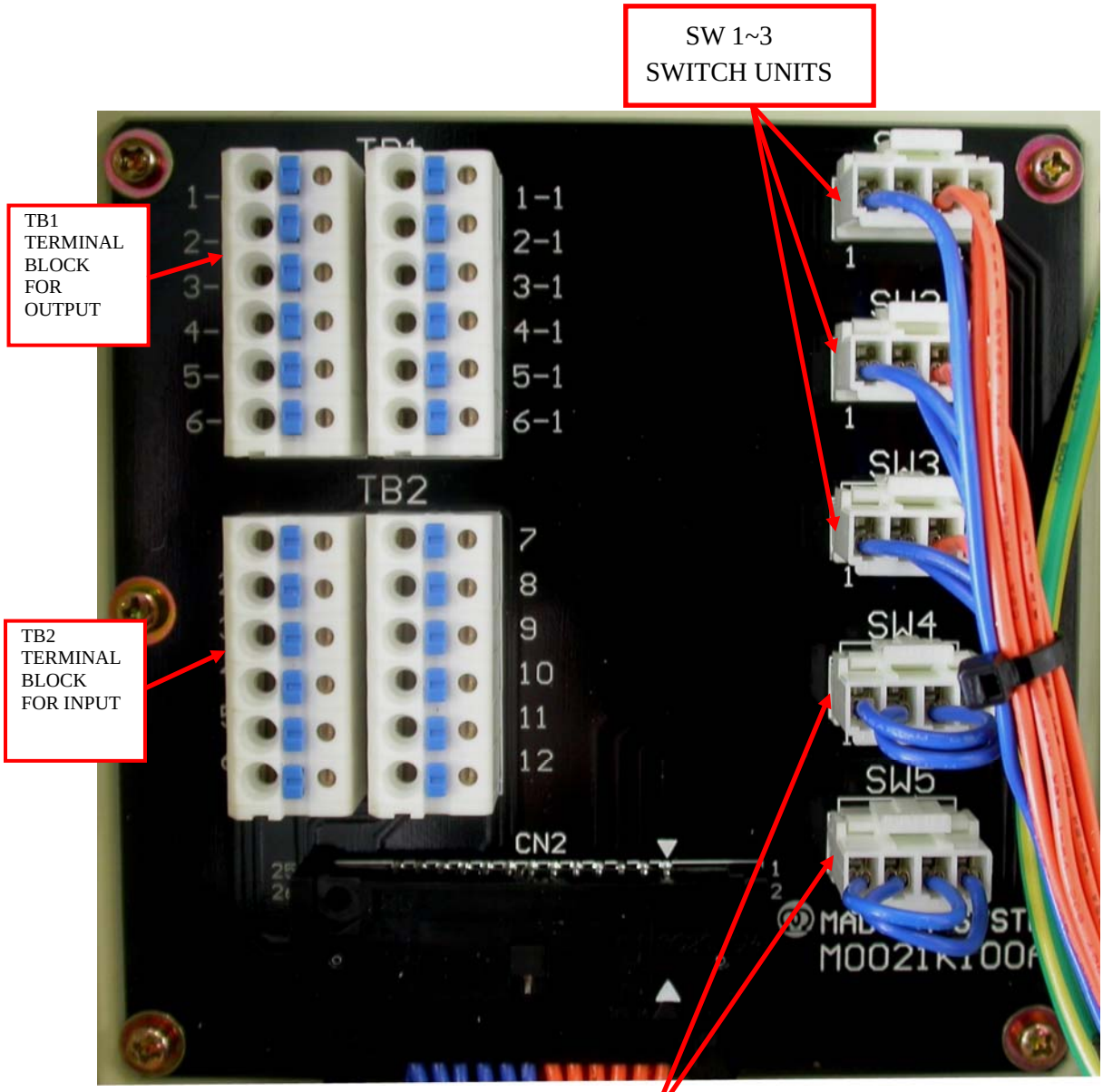


Fig. 6

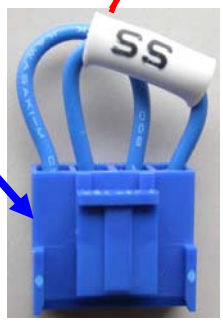
Note) When installing the switch units, remove the bridge connectors installed to SW4&5 and install the connectors of the concerned units. There is not protective diode at the relay coil on the switch printed circuit board and the lamp is non polarity.

7. Example of Unit Connection

7-1. Internal Printed Circuit Board When Regular Shipment



· NOTE
The actual color of the bridge harness housing is blue like this



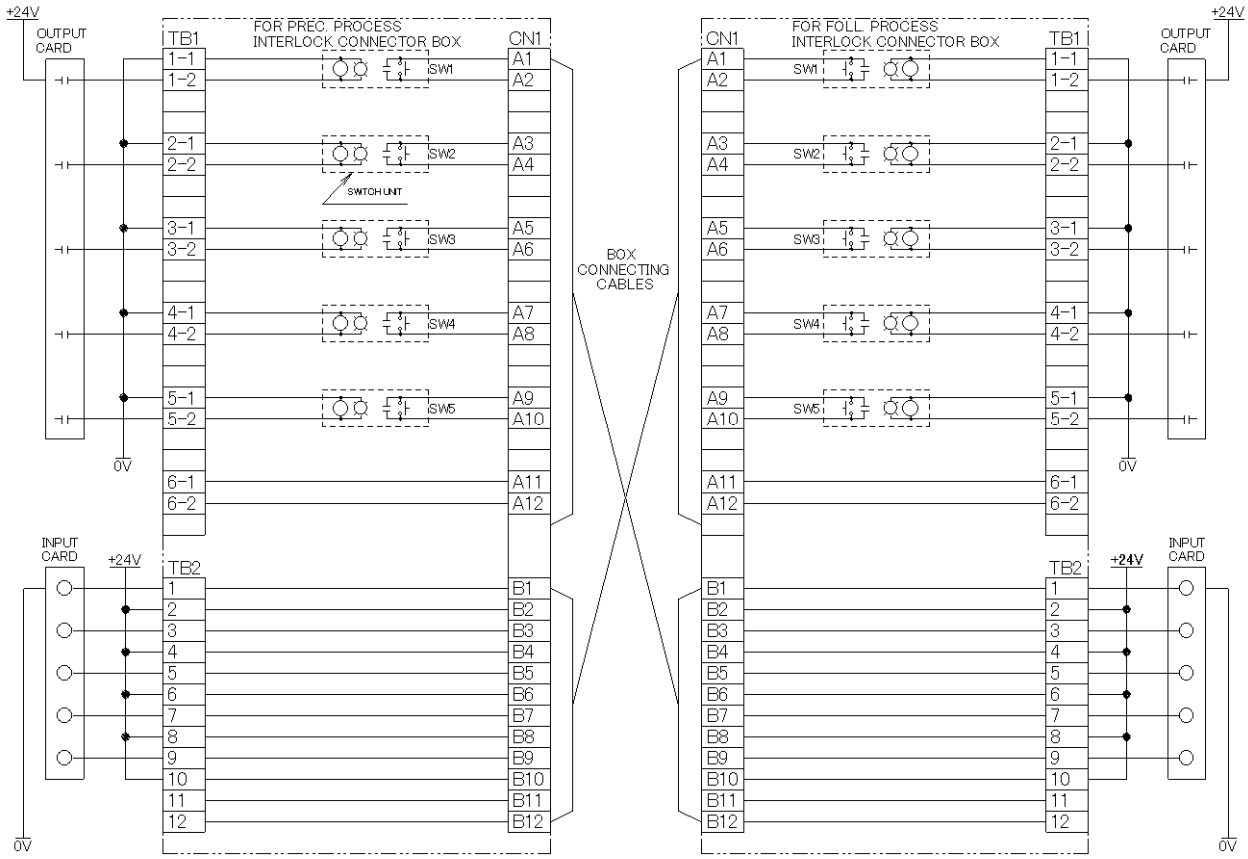
BRIDGE HARNESS

The bridge harness is built in.

NOTICE!

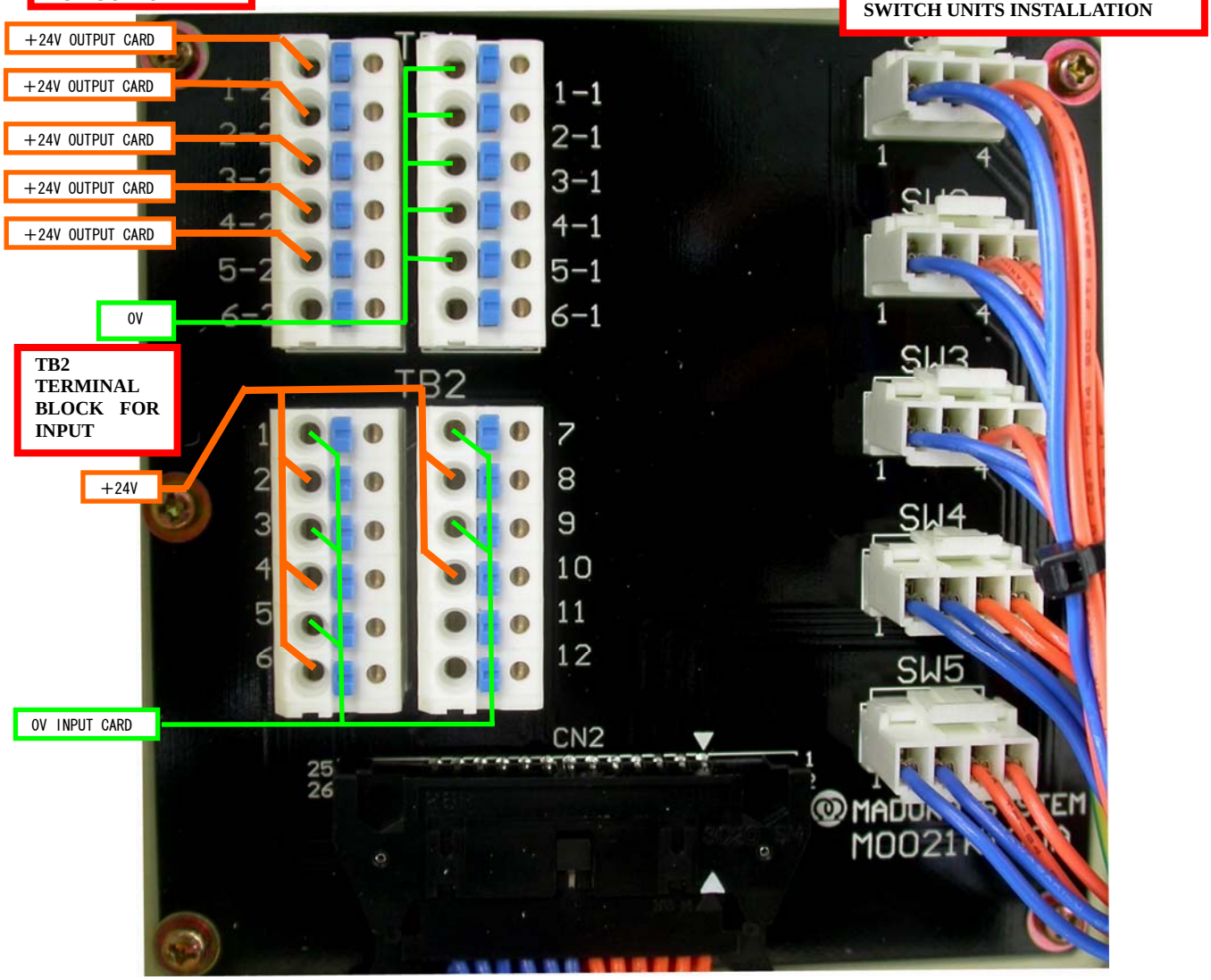
This bridge harness can NOT be used on TSC-MF-S,-M, and –Z because wiring of this bridge harness is different from one of a bridge harness for TSC-MF-S, M, and Z.

7-2. Connecting Pattern #1 (B-TYPE 5 SIGNALS)



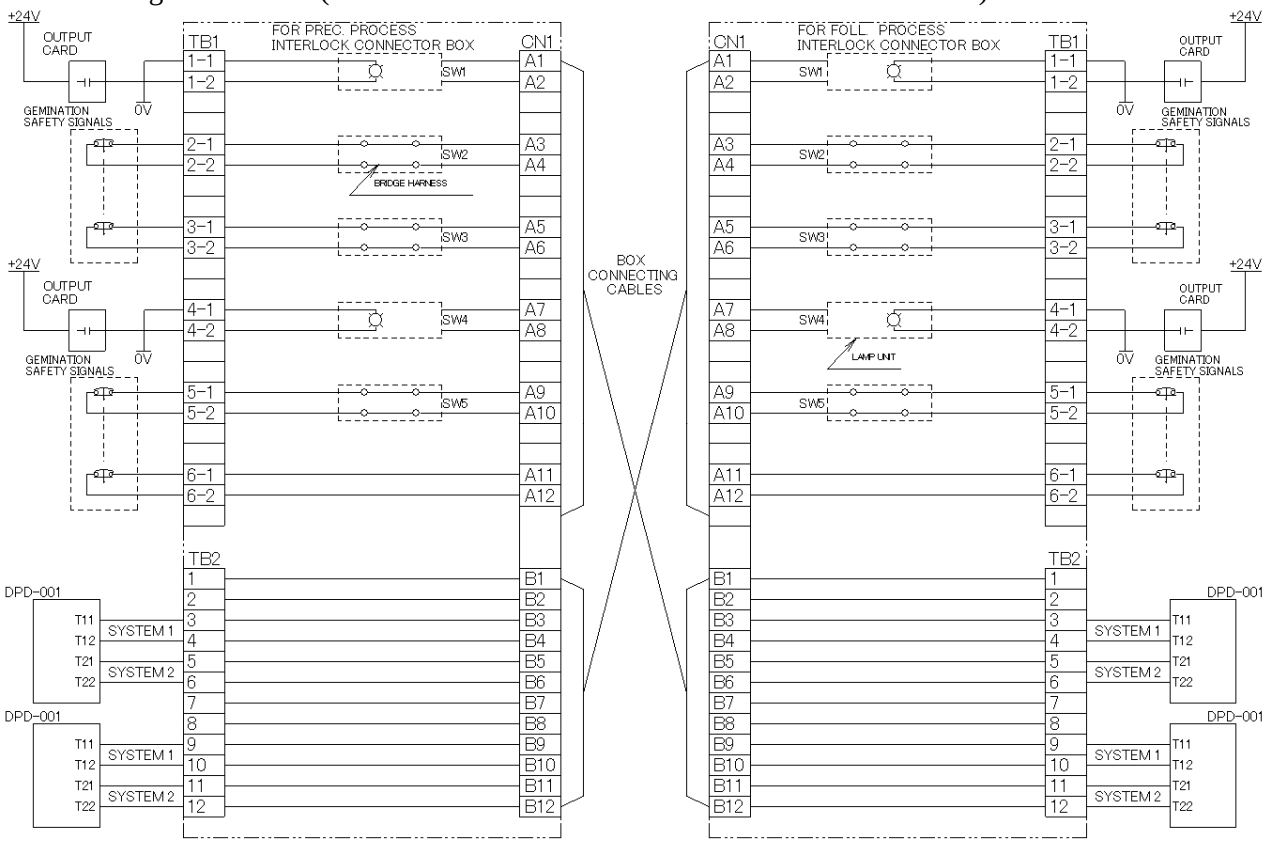
TB1 TERMINAL BLOCK FOR OUTPUT

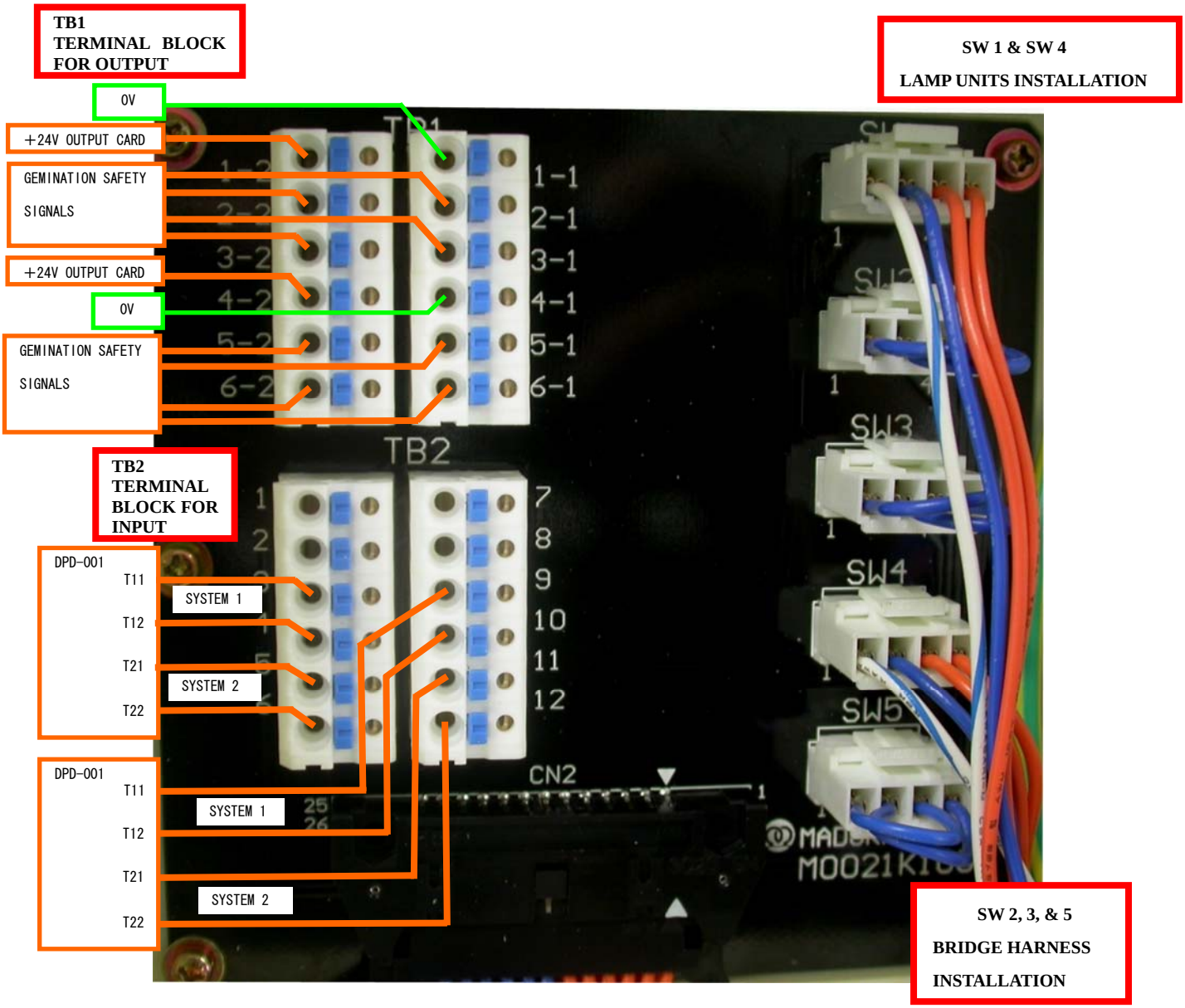
SW1~5 SWITCH UNITS INSTALLATION



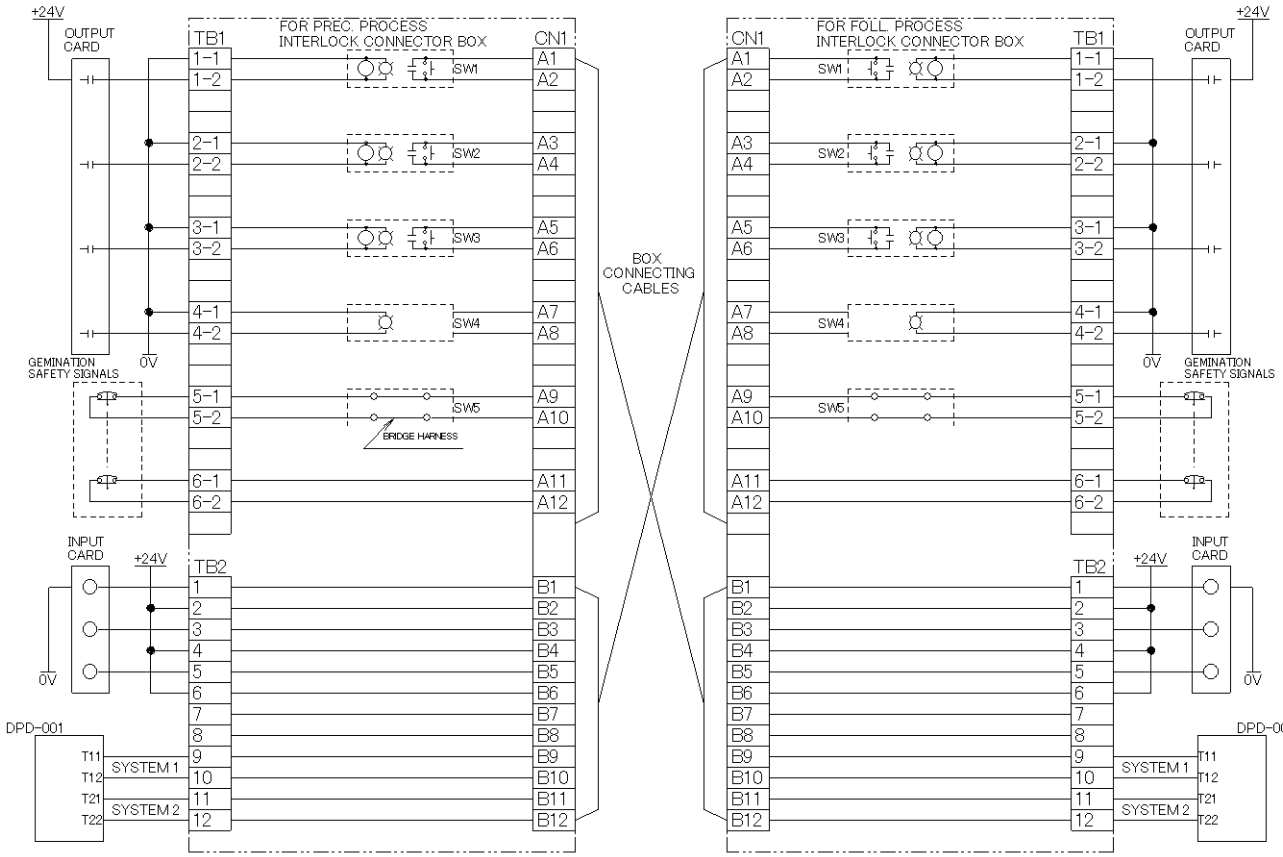
TB2 TERMINAL BLOCK FOR INPUT

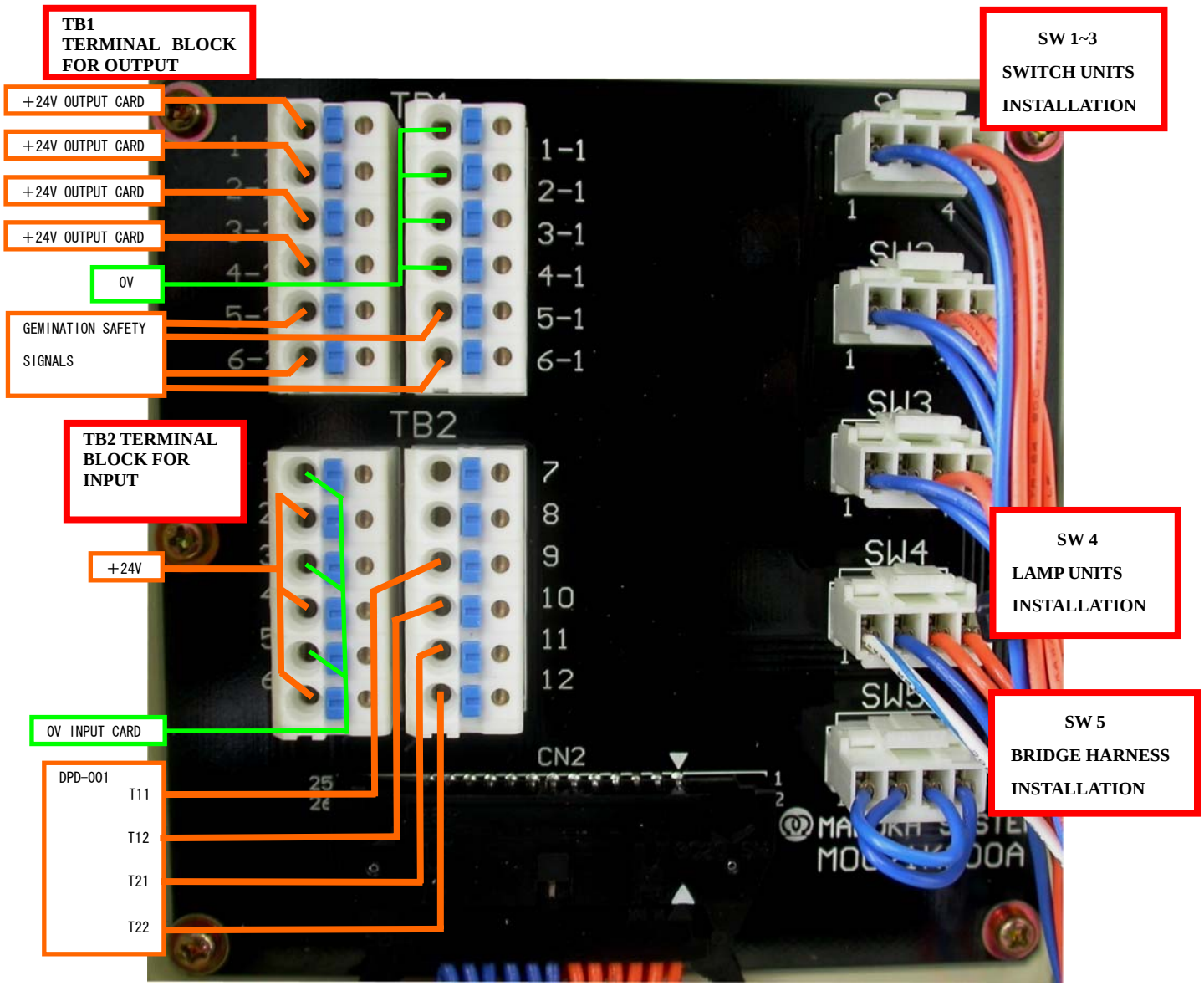
7-3. Connecting Pattern #2 (C-TYPE 2 SIGNALS CATEGORY 3 OR HIGHER)



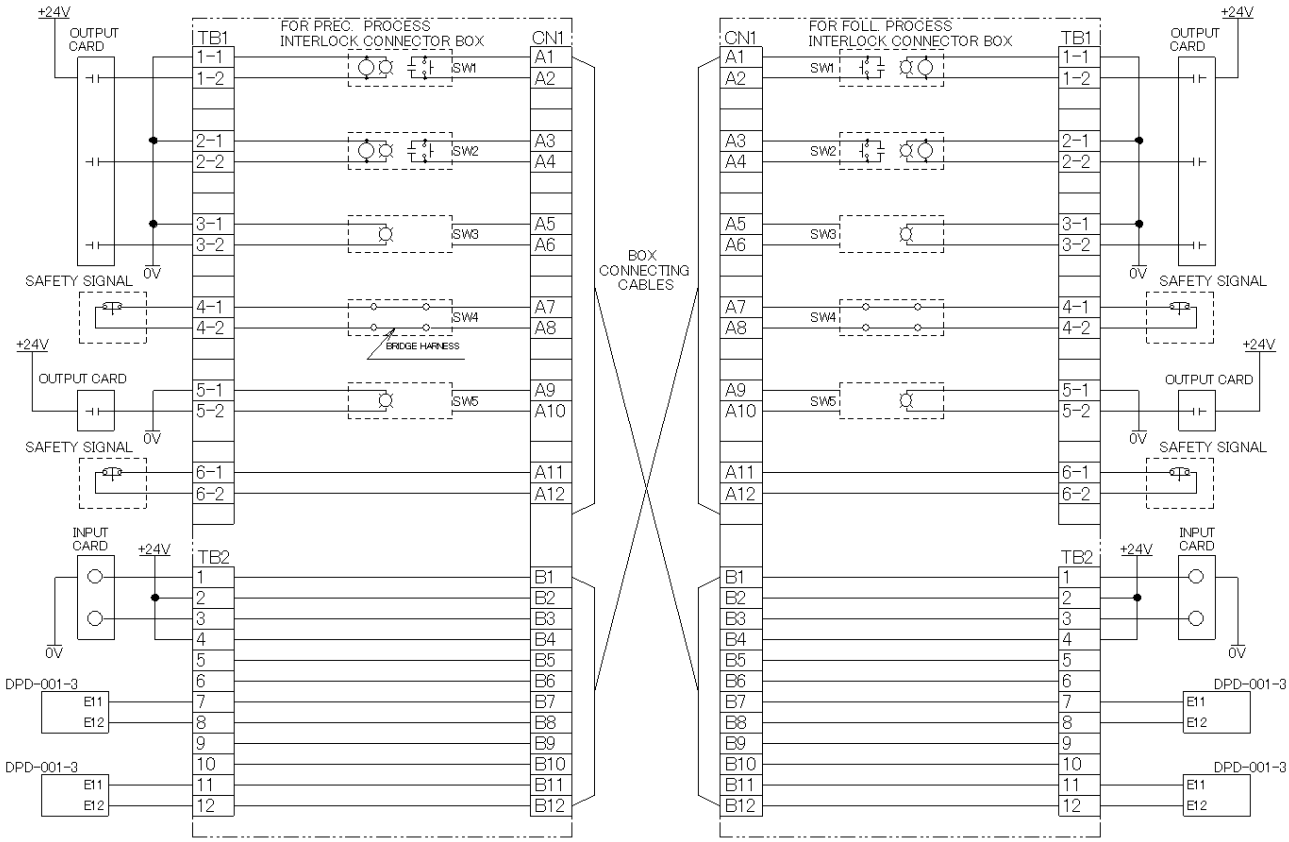


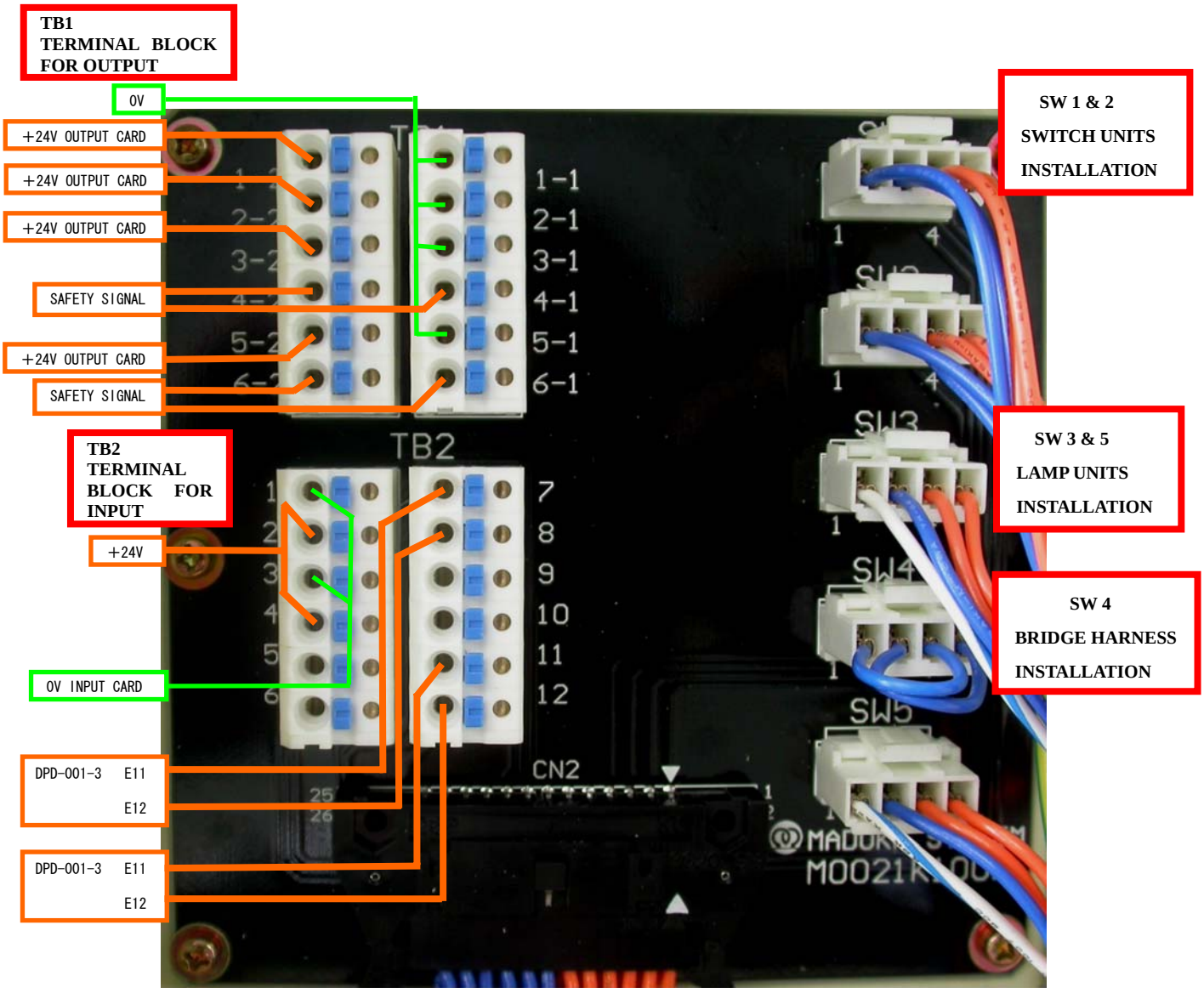
7-4 Connecting Pattern #3 (B-TYPE 3 SIGNALS CATEGORY 3 OR HIGHER)



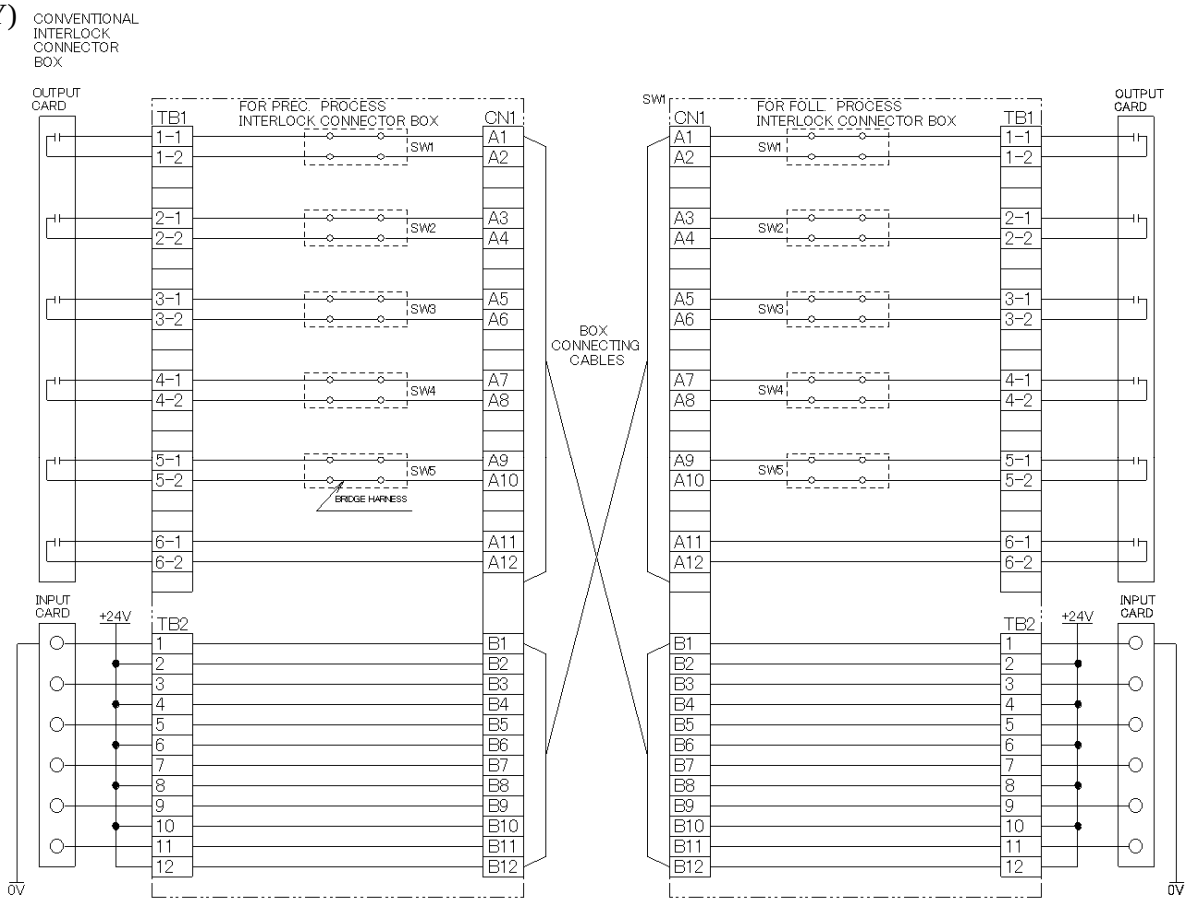


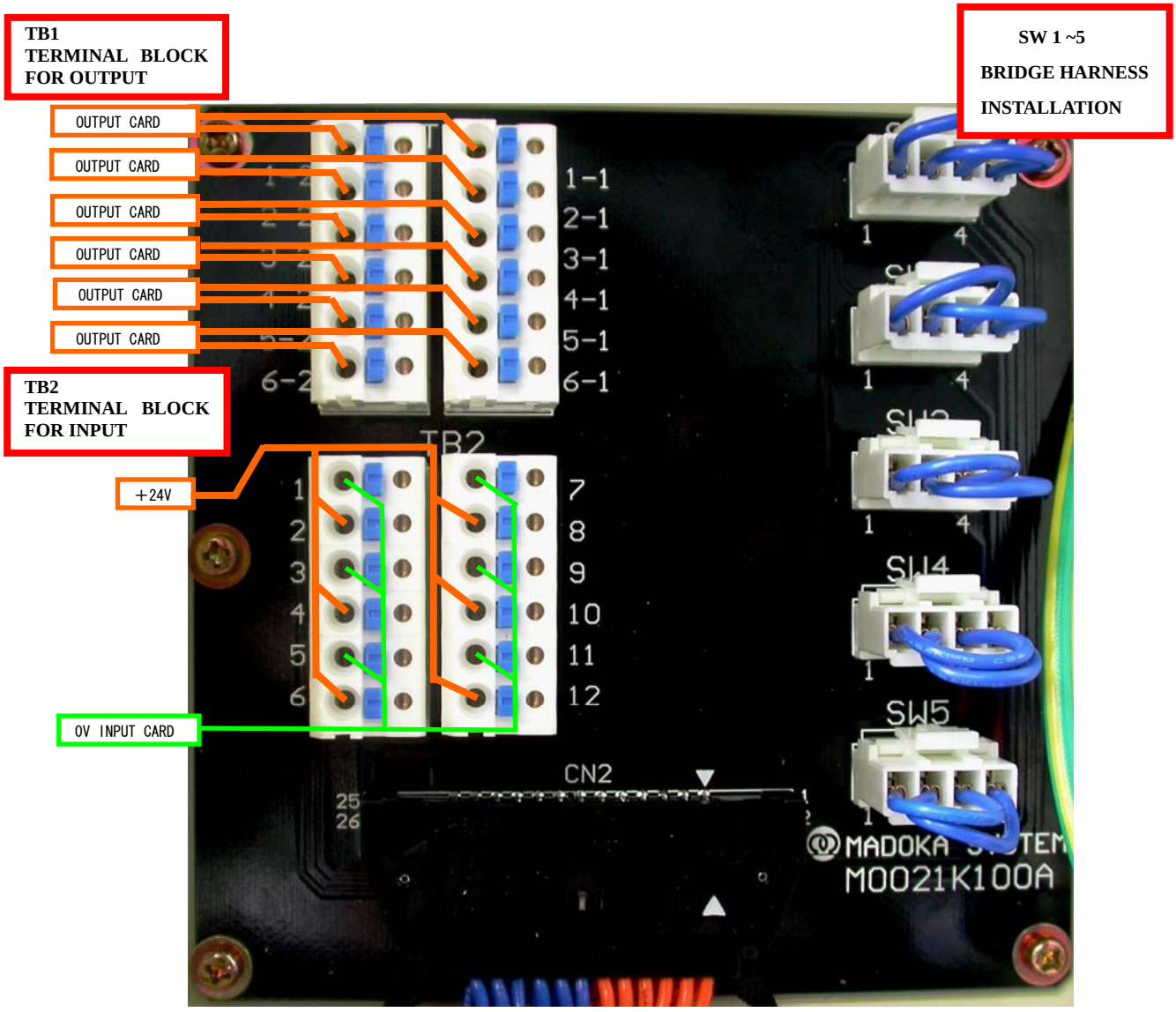
7-5 Connecting Pattern #4 (B-TYPE C-TYPE 2 SIGNALS CATEGORY 2 OR LOWER)





7-6 Connecting Pattern #5 (WITHOUT A FUNCTION OF AN INTERLOCK BOX, TERMINAL BOX FOR RELAY)



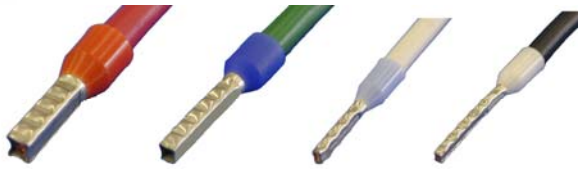


CRINPPING TOOL

ＵＡ－５２０

You can use this tool on

０．０８㎟～６㎟
AWG２８～１０



The example of shape of the bar terminals after crimp

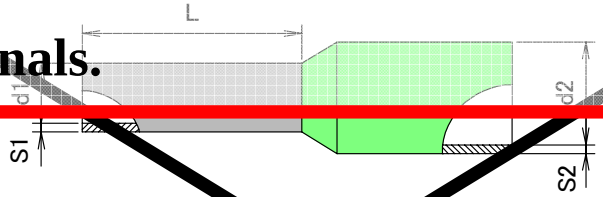
HOW TO USE

Put an adequate sized cable into the bar terminal and crimp it with this tool.

WIRE SIZE RANGE
０．０８㎟～６㎟／ＡＷＧ２８～１０

棒端子

Please contact MADOKA SYSTEM Co., ltd about details of the bar type terminals.



品　名	㎟	AWG	サイズ（mm）					色
			L	d１	S１	d２	S２	
UA-F0508	0.5	20	8	1.0	0.15	2.6	0.25	白色
UA-F0510	0.5	20	10	1.0	0.15	2.6	0.25	白色
UA-F0512	0.5	20	12	1.0	0.15	2.6	0.25	白色
UA-F0708	0.75	18	8	1.2	0.15	2.8	0.25	青色
UA-F0710	0.75	18	10	1.2	0.15	2.8	0.25	青色
UA-F0712	0.75	18	12	1.2	0.15	2.8	0.25	青色
UA-F1008	1.0	18	8	1.4	0.15	3.0	0.25	赤色
UA-F1010	1.0	18	10	1.4	0.15	3.0	0.25	赤色
UA-F1012	1.0	18	12	1.4	0.15	3.0	0.25	赤色
UA-F1508	1.5	16	8	1.7	0.15	3.5	0.25	黒色
UA-F1510	1.5	16	10	1.7	0.15	3.5	0.25	黒色
UA-F1512	1.5	16	12	1.7	0.15	3.5	0.25	黒色

品　名	㎟	AWG	サイズ（mm）					色
			L	d１	S１	d２	S２	
UA-F2008	2.0	14	8	2.0	0.15	4.0	0.25	青色
UA-F2010	2.0	14	10	2.0	0.15	4.0	0.25	青色
UA-F2012	2.0	14	12	2.0	0.15	4.0	0.25	青色
UA-F2508	2.5	14	8	2.2	0.15	4.2	0.25	グレー
UA-F2510	2.5	14	10	2.2	0.15	4.2	0.25	グレー
UA-F2512	2.5	14	12	2.2	0.15	4.2	0.25	グレー
UA-F4010	4.0	12	10	2.8	0.2	4.8	0.3	オレンジ
UA-F4012	4.0	12	12	2.8	0.2	4.8	0.3	オレンジ
UA-F6012	6.0	10	12	3.5	0.2	6.3	0.3	緑色
UA-F6016	6.0	10	16	3.5	0.2	6.3	0.3	緑色

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Instruction Manual Revision Record

Edition	Detail	Date
Draft	Draft edition	Feb, 14, 2006
1st Edit	1st edtion 6. Wiring Diagrams of Unit Connection 6-1,-2,and -3 the connections of TB1 are changed on the drawings. 7. Example of Unit Connection 7-2, -3, -4, -5, and -6 connection examples are changed.	May, 01, 2006

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