



**2 Specifications and Ratings**

**INSTRUCTION SHEET**  
Original Instructions  
Robot controller connection terminal  
Cable  
**SE9Z Series**

Thank you for purchasing this IDEC product. Confirm that the delivered product is what you have ordered. Read this instruction sheet to make sure of correct operation.

**SAFETY PRECAUTIONS**

In this operation instruction sheet, safety precautions are categorized in order of importance to Warning and Caution :

**⚠ WARNING**

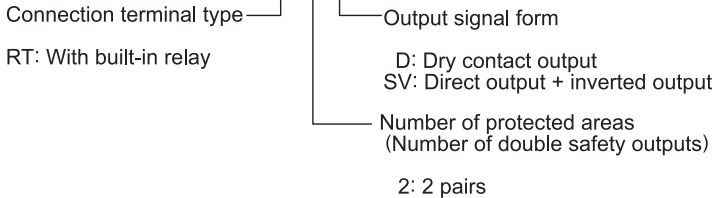
Warning notices are used to emphasize that improper operation may cause severe personal injury or death.

**⚠ CAUTION**

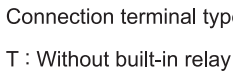
Caution notices are used where inattention might cause personal injury or damage to equipment.

**1 Type**

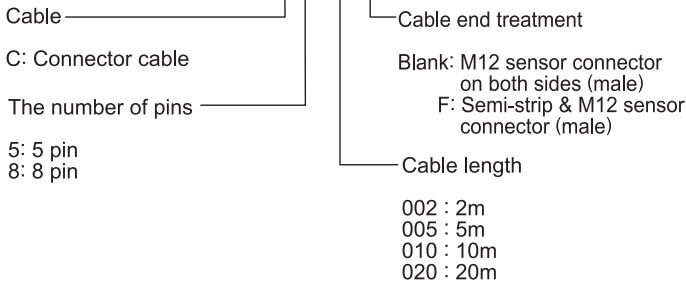
Type: SE9Z-RT2SV



Type: SE9Z-T



Type: SE9Z-C8010F



Type	SE9Z-RT2D	SE9Z-RT2SV	SE9Z-T
Applicable Directive	RoHS Directive (CE marking)		
Operating Temperature	-30 to +55°C (no freezing)		
Operating Humidity	25 to 85% (no condensation)		
Storage Temperature	-30 to +80°C (no freezing)		
Storage Humidity	25 to 85% (no condensation)		
Pollution Degree	3 (inside 2)		
Altitude	2000m max.		
Rated Operating Voltage	DC24V ± 10%		
Rated Insulation Voltage<U> (M12 sensor connector)	AC/DC30V		
Maximum Current	Power line: 2A Others: 500mA (excluding RS485 line)		
Rated Power Consumption	Approx. 0.05W (power lamp)		
Built-in Relay	RF2V-1A1B-D24		None
Built-in Relay Quantity	4 pcs	2 pcs	-
Built-in Relay Characteristics	Rated Load (Resistive Load)	AC/DC24V 500mA	-
	Minimum Applied Load	DC1V 1mA	-
	Response Time	5ms max. (when rated operating voltage is applied) (Time from turning off the coil voltage to turning off the a contact)	-
	Operating Time	15max. (at 20°C) (When the rated operating voltage is applied, contact bounce is not included)	-
	Contact Resistance (Initial Value)	220mΩmax. (By DC5V / 1A voltage drop method)	-
	Rated Power Consumption	Approx. 0.7W (per relay)	-
Mechanical Durability	10,000,000 min. (Operation frequency 18,000 times / hour)	-	
	Electrical Durability	100,000 min. (rated load) (Operation frequency 1,800 times / hour)	-
Shock Resistance	Operating Extremes: 50m/s <sup>2</sup> Damage Limits: 1,000m/s <sup>2</sup>		
Vibration Resistant	Operating Extremes/Damage Limits : 10-55Hz half amplitude 0.35mm		
Connector	Input Side	Push-in terminal block	
	Output Side	M12 sensor connector (A code) 8 pin / 5 pin	
Connector Insertion/Removal Durability	100 min. (M12 sensor connector)		
Cable Tensile Strength	50N min.		
Conduit Side Applicable Cable	Cable Size: AWG22-28		
	Cable Diameter: φ8.2mm		
Degree of Protection	IP65		
Body Color	Black		
Power Lamp Color	Green		
Weight	Approx. 360g	Approx. 320g	Approx. 200g

\* For details on the built-in relay, refer to the RF2 type catalog.  
\* For voltage and current specifications, in addition to the above table, use within the specifications of the equipment connected to this product.

● UL certification acquisition parts list

This product is composed of UL certified materials. Please refer to the parts list in the table below.

SE9Z-RT

Parts Name	Type No.	Ratings	Manufacturer	UL/CSA Approval
Relay	RF2V-1A1B-D24	NO:277V AC,6A (Res.) 30V DC,6A (Res.) NC:277V AC,3A (Res.) 30V DC,3A (Res.)	IDEC	E55996
PCB Terminal	LSF-SMT 3.50	300V,12A (Use groupB),300V,10A (Use groupD)	Weidmuller	E60693
P.W.B.	-	Min.130°C,V-0	-	Any R/C (ZPMV2) DSR
CASE	B3UG4	Min.140°C,V-2	BASF	E41871

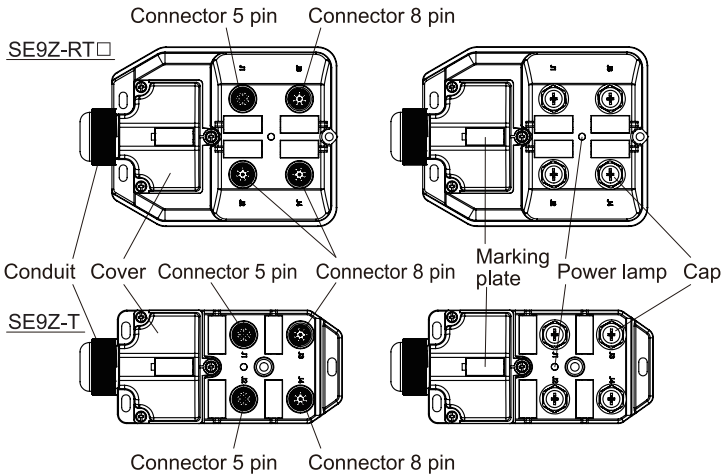
SE9Z-T

Parts Name	Type No.	Ratings	Manufacturer	UL/CSA Approval
PCB Terminal	LSF-SMT 3.50	300V,12A (Use groupB),300V,10A (Use groupD)	Weidmuller	E60693
P.W.B.	-	Min.130°C,V-0	-	Any R/C (ZPMV2) DSR
CASE	B3UG4	Min.140°C,V-2	BASF	E41871

## 3 Installation /Wiring

### Installation

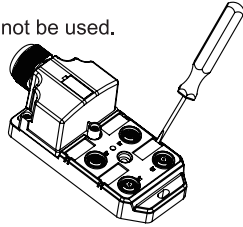
- When mounting the main unit, fix it with screws with flat washer (D=8 separate order).



- Mounting the cover to the main unit with the supplied screws.

### Cap

- Attach the supplied cap to the connector that will not be used.
- When using a screwdriver to attach or remove the cap, do not tighten it with more than 0.56 Nm.

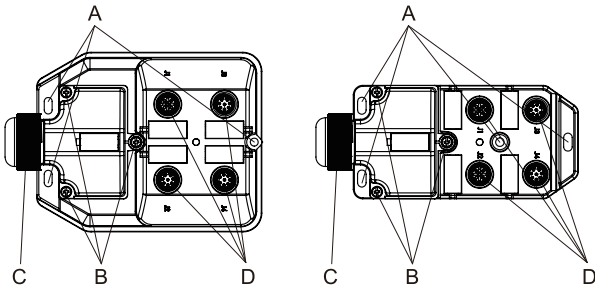


### Marking Plate

- When removing, use a precision flathead screwdriver, etc.

### Recommended Screw Tightening Torque

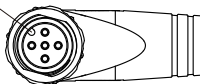
	Screw Position	Screw Tightening Torque
For mounting main unit (M4 screw x3 or 4 (SE9Z-T only))	A	1.0 to 1.2Nm
For mounting cover (M3 screw x3)	B	0.45 to 0.55Nm
For mounting conduit	C	2.25 to 2.75Nm
For mounting connector and cap	D	0.54 to 0.66Nm



### Wiring

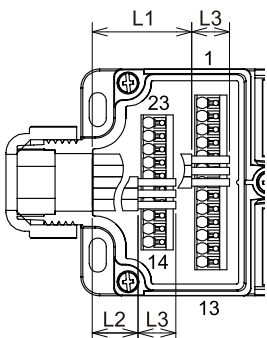
- Use the dedicated cable (SE9Z-C□) for the connector wiring, or use the male connector cable (lock type screw type) of the M12 sensor connector (A code).
- When using the L-angle type, select the one with the pin arrangement (cable pull-out direction and position of the erroneous insertion prevention rib) shown in the figure below.

Misinsertion prevention rib



### Wire Length inside the terminal

	Terminals No.1 to 13	Terminal No.14 to 23
Wire Length L1, L2	L1=50mm	L2=40mm
Wire Length L3	L3=8 to 9mm	

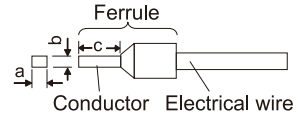


### Applicable Wire Size in Terminal

- Direct wiring: 0.14 to 0.34mm<sup>2</sup> (One for each terminal)  
Wiring should be done based on IEC 60204-1.  
(Note) When using a stranded wire, make sure that adjoining terminals are not short-circuited with protruding core wires.  
Also, do not solder the core wires to avoid protruding wires.
- Ferrules  
When using stranded wire, insulated ferrule should be used.  
Use below insulated ferrule.  
Insulation ferrules: 0.14 to 0.34mm<sup>2</sup> (28 AWG to 22 AWG)  
Crimp Width a: 1.7mm max.  
Crimp Height b: 1.5mm max.  
Conductor length c: 8-9mm

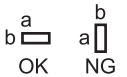
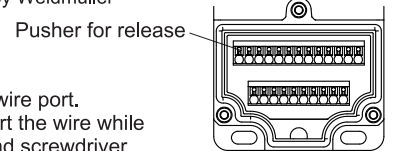
Type No.	Applicable Wire
H0.14/10 GR SV*	0.14mm <sup>2</sup>
S3TL-H025-12WJ	0.25mm <sup>2</sup>
S3TL-H034-12WT	0.34mm <sup>2</sup>

Crimping tool: PZ6 Roto L\* \*Made by Weidmuller



### Wiring Instruction

- Inserting the wire  
Insert the wire to the back of the wire port.  
When using a stranded wire, insert the wire while pressing the pusher with a flathead screwdriver.
- Removing the wire  
Pushing the pusher with a flathead screwdriver, remove the wire straight.



### CAUTION

- After wiring, tug lightly to make sure that the wire is properly connected.
- When releasing wire, the power source should be disconnected.
- Operate the pusher with a force of 20N. Do not press by a force of 40N and over.
- Do not pull the wire out without depressing the pusher. When pulling the wire, be sure to pull in a straight direction. Otherwise, the socket may be damaged.
- Cut the wire carefully to get a flat end.
- Make sure that ferrule sleeve is completely filled by the conductor. Depending on the cross section, the conductor should protrude approx. 0 to 1 mm from the ferrule sleeve.
- When using the ferrule, it is recommended that the cable is first passed through the conduit and cover before clamping the ferrule.
- When processing the shield, be careful not to scratch your fingertips with the cross section of the strands.

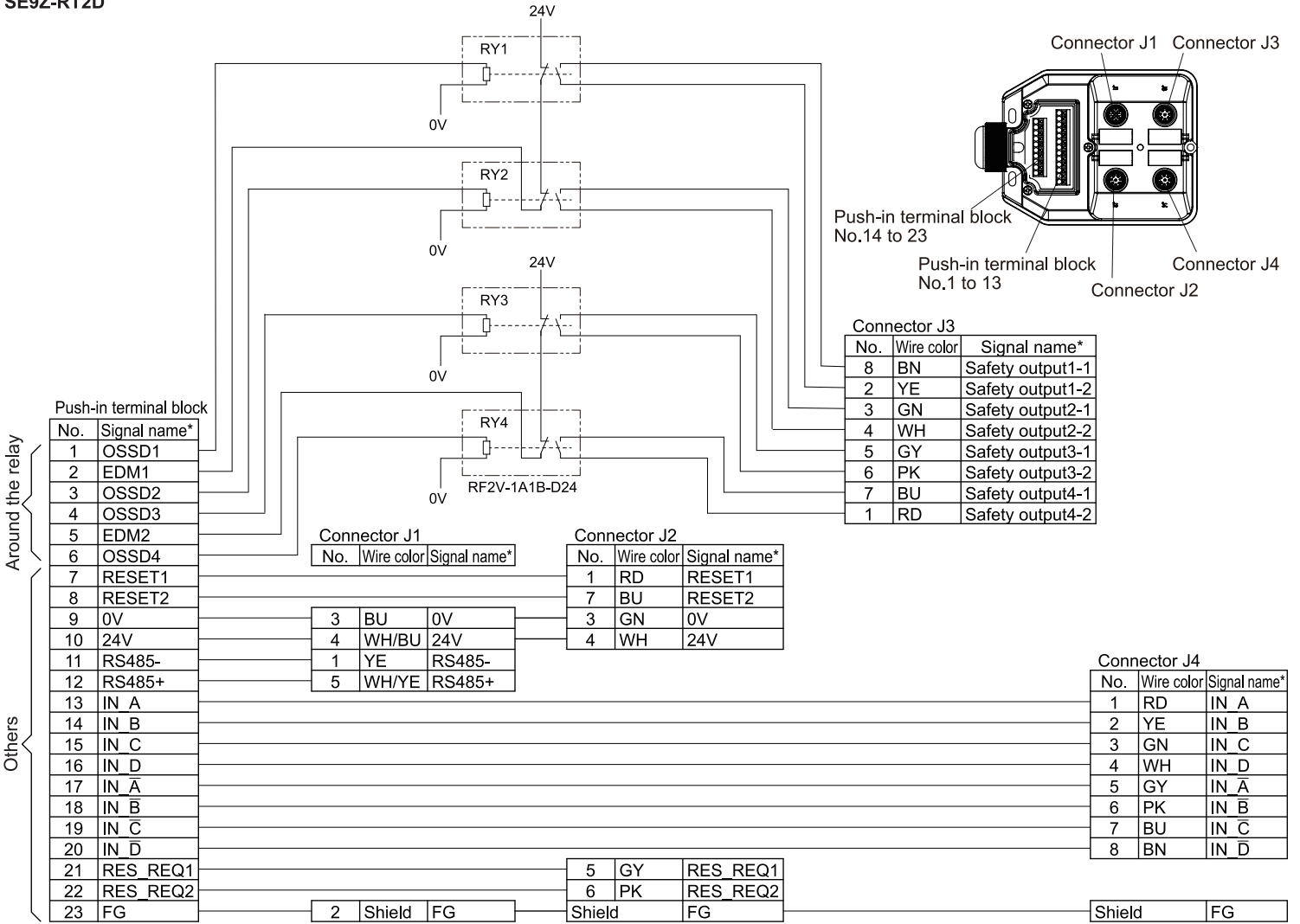
## 4 Insruction

### WARNING

- Turn off the power to the product before starting installation, removal, wiring, maintenance, and inspection. Failure to turn power off may cause electrical shocks or fire hazard.
- Do not disassemble or modify the product. Also do not attempt to disable the product function, otherwise a breakdown or an accident will result.
- Do not apply an excessive shock to the product. A shock to the product exceeding 1,000 m/s<sup>2</sup> may cause failure.
- Make sure to install the product in a place where it cannot be damaged. Make sure to conduct a proper risk assessment evaluation before using the product, and use a shield or a cover to protect the product if need be.
- The internal relay has polarity. Be sure to wire correctly. Do not apply voltage that exceed the rated voltage, otherwise the internal relay will be burnt out.
- When wiring, make sure that water, oil, etc. do not enter from the end of the cable.
- When wiring to the terminal block, do not push the screwdriver with more force than necessary. The driver may cause cracks and shavings inside, which may cause a malfunction.
- Tighten each thread within the recommended tightening torque range.
- Do not install or store the product in a place where the temperature changes rapidly and condensation may occur, as it may cause a malfunction or malfunction.
- Please note that use in the vicinity of a very strong magnetic field may cause malfunction.

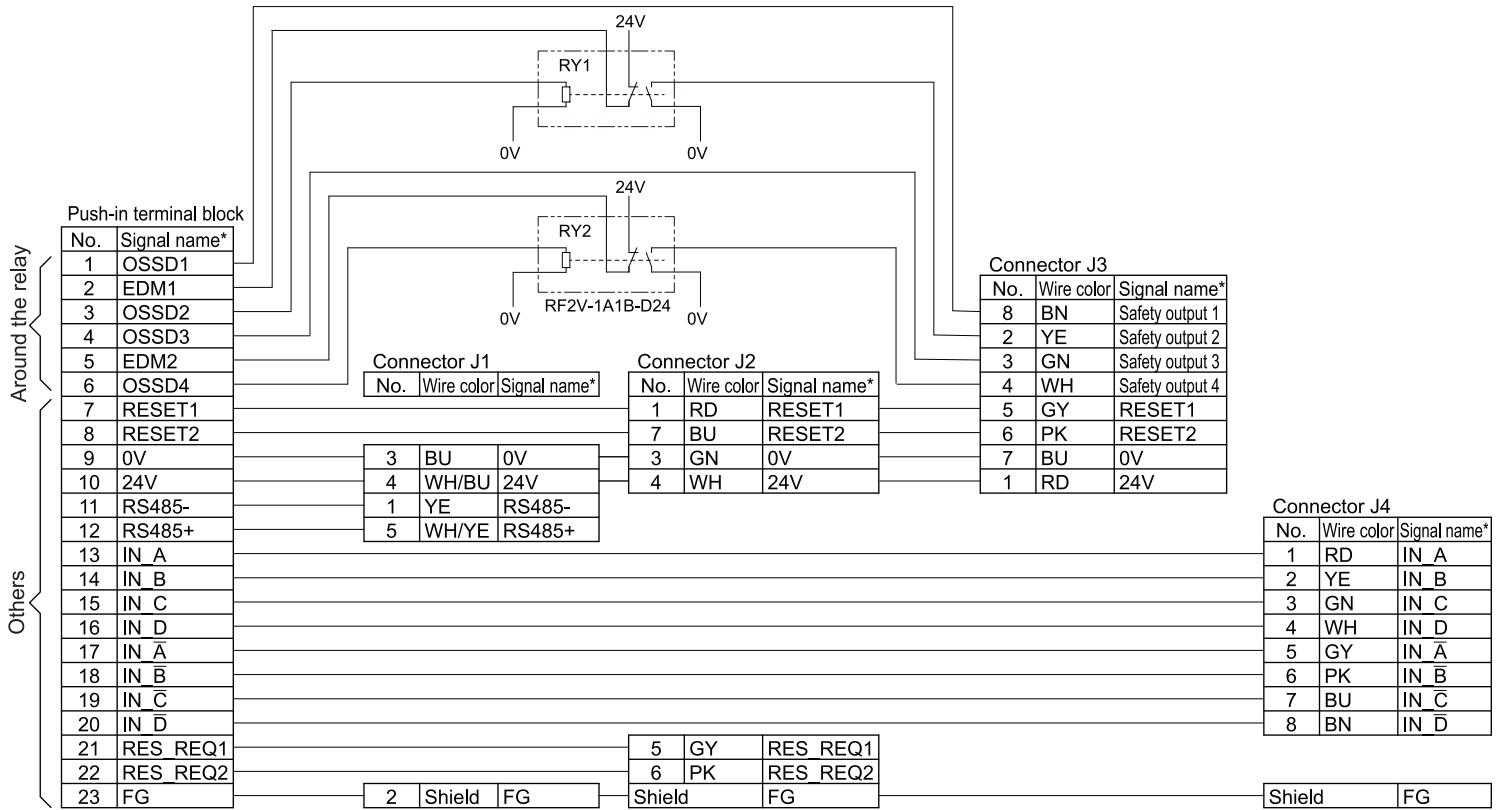
**5 Internal Circuit**

SE9Z-RT2D

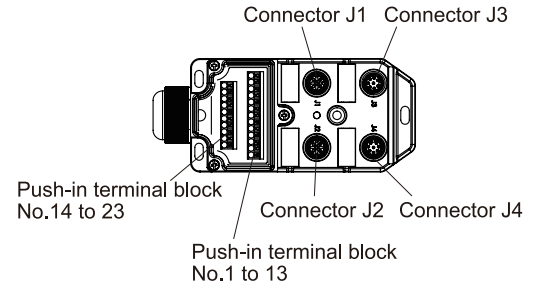


\* The signal name is when connected to SE2L.

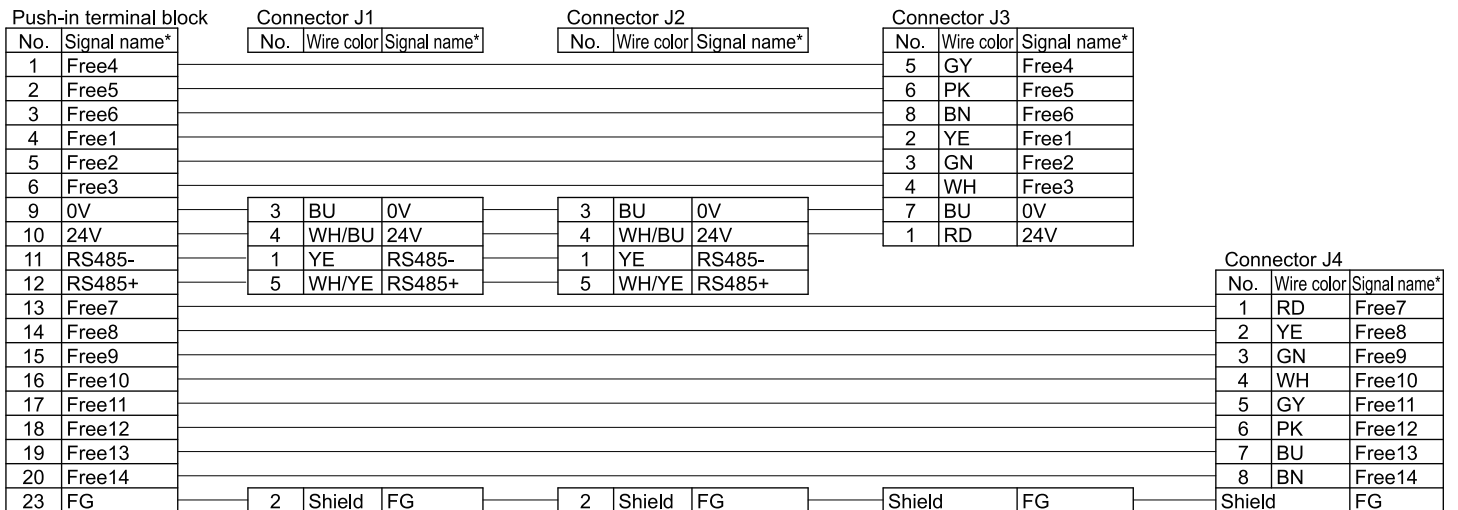
## SE9Z-RT2SV



\* The signal name is when connected to SE2L.



## SE9Z-T



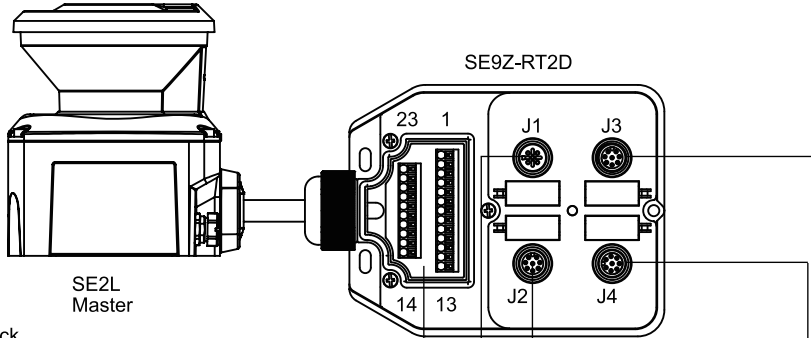
\* The signal name is when connected to SE2L.

**6 Connection Example**

Connection method and connector pin layout when using SE2L-H05LP with master-slave connection

When the connection destination of the master is contact input (general controller)

Connect the master SE2L and SE9Z-RT2D, and the slave SE2L and SE9Z-T.



SE9Z-RT2D Push-in terminal block

SE2L Master	Wire color	No.
OSSD1	RD	1
EDM1	GN	2
OSSD2	YE	3
OSSD3	RD/BK	4
EDM2	GN/BK	5
OSSD4	YE/BK	6
RESET1	YE/GN	7
RESET2	YE/BU	8
0V	BU	9
24V	BN	10
RS485-	WH/RD	11
RS485+	WH/BU	12
IN A	PL	13
IN B	GY	14
IN C	WH	15
IN D	PK	16
IN A	PL/BK	17
IN B	GY/BK	18
IN C	WH/BK	19
IN D	PK/BK	20
RES_REQ1	OR	21
RES_REQ2	OR/BK	22
FG	Shield	23

Note: For details, refer to the SE2L manual.

Connector J3

No.	Wire color	Signal name
8	BN	Safety output1-1
2	YE	Safety output1-2
3	GN	Safety output2-1
4	WH	Safety output2-2
5	GY	Safety output3-1
6	PK	Safety output3-2
7	BU	Safety output4-1
1	RD	Safety output4-2
Shield		FG

Cable SE9Z-C8

Connector J4

No.	Wire color	Signal name
1	RD	IN A
2	YE	IN B
3	GN	IN C
4	WH	IN D
5	GY	IN A
6	PK	IN B
7	BU	IN C
8	BN	IN D
Shield		FG

Cable SE9Z-C8

Connector J1

No.	Wire color	Signal name
1	YE	RS485-
5	WH/YE	RS485+
3	BU	0V
4	WH/BU	24V
2	Shield	FG

Cable SE9Z-C5

Connector J2

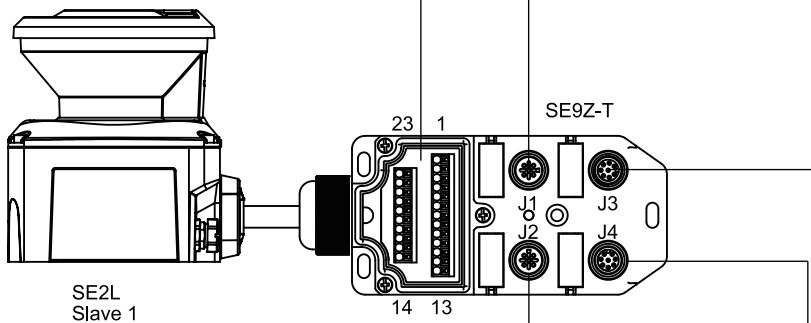
No.	Wire color	Signal name
1	RD	RESET1
7	BU	RESET2
5	GY	RES_REQ1
6	PK	RES_REQ2
4	WH	24V
3	GN	0V
2	YE	NC
8	BN	NC
Shield		FG

Cable SE9Z-C8

SE9Z-T Push-in terminal block

SE2L slave	No.
Free4	1
Free5	2
Free6	3
Free1	4
Free2	5
Free3	6
0V	9
24V	10
RS485-	11
RS485+	12
Free7	13
Free8	14
Free9	15
Free10	16
Free11	17
Free12	18
Free13	19
Free14	20
FG	23

Note: For details, refer to the SE2L manual.



Connector J3

No.	Wire color	Signal name
1	RD	24V
7	BU	0V
2	YE	Free1
3	GN	Free2
4	WH	Free3
5	GY	Free4
6	PK	Free5
8	BN	Free6
Shield		FG

Cable SE9Z-C8

Connector J1 and J2

No.	Wire color	Signal name
1	YE	RS485-
5	WH/YE	RS485+
3	BU	0V
4	WH/BU	24V
2	Shield	FG

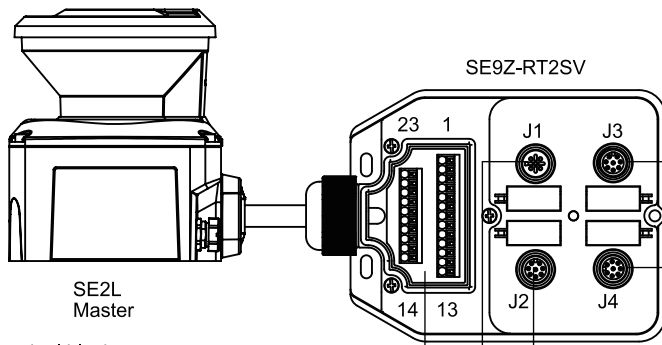
Cable SE9Z-C5

Connector J4

No.	Wire color	Signal name
1	RD	Free7
2	YE	Free8
3	GN	Free9
4	WH	Free10
5	GY	Free11
6	PK	Free12
7	BU	Free13
8	BN	Free14
Shield		FG

Cable SE9Z-C8

When the master connection destination is inverse input (FUNAC controller)  
Connect the master SE2L and SE9Z-RT2SV, and the slave SE2L and SE9Z-T.



SE9Z-RT2SV Push-in terminal block

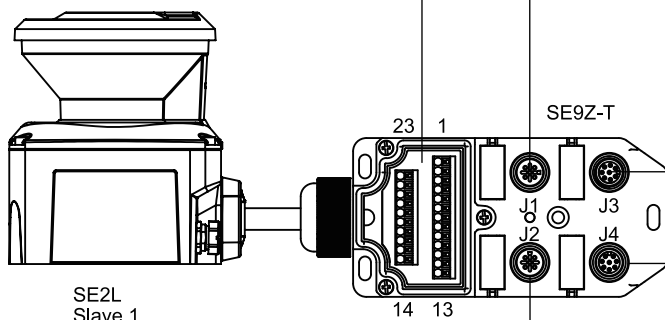
SE2L Master	Wire color	No.
OSSD1	RD	1
EDM1	GN	2
OSSD2	YE	3
OSSD3	RD/BK	4
EDM2	GN/BK	5
OSSD4	YE/BK	6
RESET1	YE/GN	7
RESET2	YE/BU	8
0V	BU	9
24V	BN	10
RS485-	WH/RD	11
RS485+	WH/BU	12
IN A	PL	13
IN B	GY	14
IN C	WH	15
IN D	PK	16
IN A	PL/BK	17
IN B	GY/BK	18
IN C	WH/BK	19
IN D	PK/BK	20
RES_REQ1	OR	21
RES_REQ2	OR/BK	22
FG	Shield	23

Note: For details, refer to the SE2L manual.

SE9Z-T Push-in terminal block

SE2L slave	No.
Free4	1
Free5	2
Free6	3
Free1	4
Free2	5
Free3	6
0V	9
24V	10
RS485-	11
RS485+	12
Free7	13
Free8	14
Free9	15
Free10	16
Free11	17
Free12	18
Free13	19
Free14	20
FG	23

Note: For details, refer to the SE2L manual.



SE2L  
To J1 of SE9Z-T  
of slave 2 connection

Connector J1 and J2

No.	Wire color	Signal name
1	YE	RS485-
5	WH/YE	RS485+
3	BU	0V
4	WH/BU	24V
2	Shield	FG

Cable SE9Z-C5

Connector J3

No.	Wire color	Signal name	Remarks
8	BN	Safety output 1	OSSD1
2	YE	Safety output 2	0V output when OSSD2 of SE2L is on
3	GN	Safety output 3	OSSD3
4	WH	Safety output 4	0V output when OSSD4 of SE2L is on
5	GY	RESET1	
6	PK	RESET2	
7	BU	0V	
1	RD	24V	
Shield		FG	

Cable SE9Z-C8

Connector J4

No.	Wire color	Signal name
1	RD	IN A
2	YE	IN B
3	GN	IN C
4	WH	IN D
5	GY	IN A
6	PK	IN B
7	BU	IN C
8	BN	IN D
Shield		FG

Cable SE9Z-C8

Connector J2

No.	Wire color	Signal name
1	RD	RESET1
7	BU	RESET2
5	GY	RES_REQ1
6	PK	RES_REQ2
4	WH	24V
3	GN	0V
2	YE	NC
8	BN	NC
Shield		FG

Cable SE9Z-C8

Connector J3

No.	Wire color	Signal name
1	RD	24V
7	BU	0V
2	YE	Free1
3	GN	Free2
4	WH	Free3
5	GY	Free4
6	PK	Free5
8	BN	Free6
Shield		FG

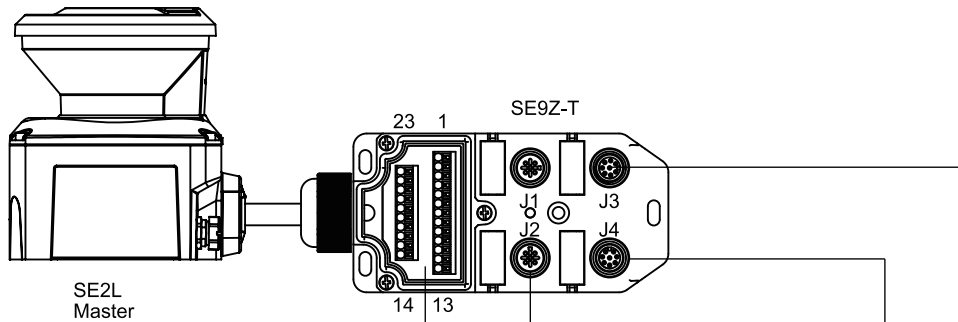
Cable SE9Z-C8

Connector J4

No.	Wire color	Signal name
1	RD	Free7
2	YE	Free8
3	GN	Free9
4	WH	Free10
5	GY	Free11
6	PK	Free12
7	BU	Free13
8	BN	Free14
Shield		FG

Cable SE9Z-C8

When the master connection destination can directly input the SE2L OSSD signal  
Connect SE2L and SE9Z-T to both master and slave.  
Please use the Free terminal for OSSD and other input / output signals.



SE9Z-T Push-in terminal block

SE2L Master	No.
Free4	1
Free5	2
Free6	3
Free1	4
Free2	5
Free3	6
0V	9
24V	10
RS485-	11
RS485+	12
Free7	13
Free8	14
Free9	15
Free10	16
Free11	17
Free12	18
Free13	19
Free14	20
FG	23

SE2L  
To J1 of SE9Z-T  
of slave connection

Connector J1 and J2

No.	Wire color	Signal name
1	YE	RS485-
5	WH/YE	RS485+
3	BU	0V
4	WH/BU	24V
2	Shield	FG

Cable SE9Z-C5

Connector J3

No.	Wire color	Signal name
1	RD	24V
7	BU	0V
2	YE	Free1
3	GN	Free2
4	WH	Free3
5	GY	Free4
6	PK	Free5
8	BN	Free6
Shield		FG

Cable SE9Z-C8

Connector J4

No.	Wire color	Signal name
1	RD	Free7
2	YE	Free8
3	GN	Free9
4	WH	Free10
5	GY	Free11
6	PK	Free12
7	BU	Free13
8	BN	Free14
Shield		FG

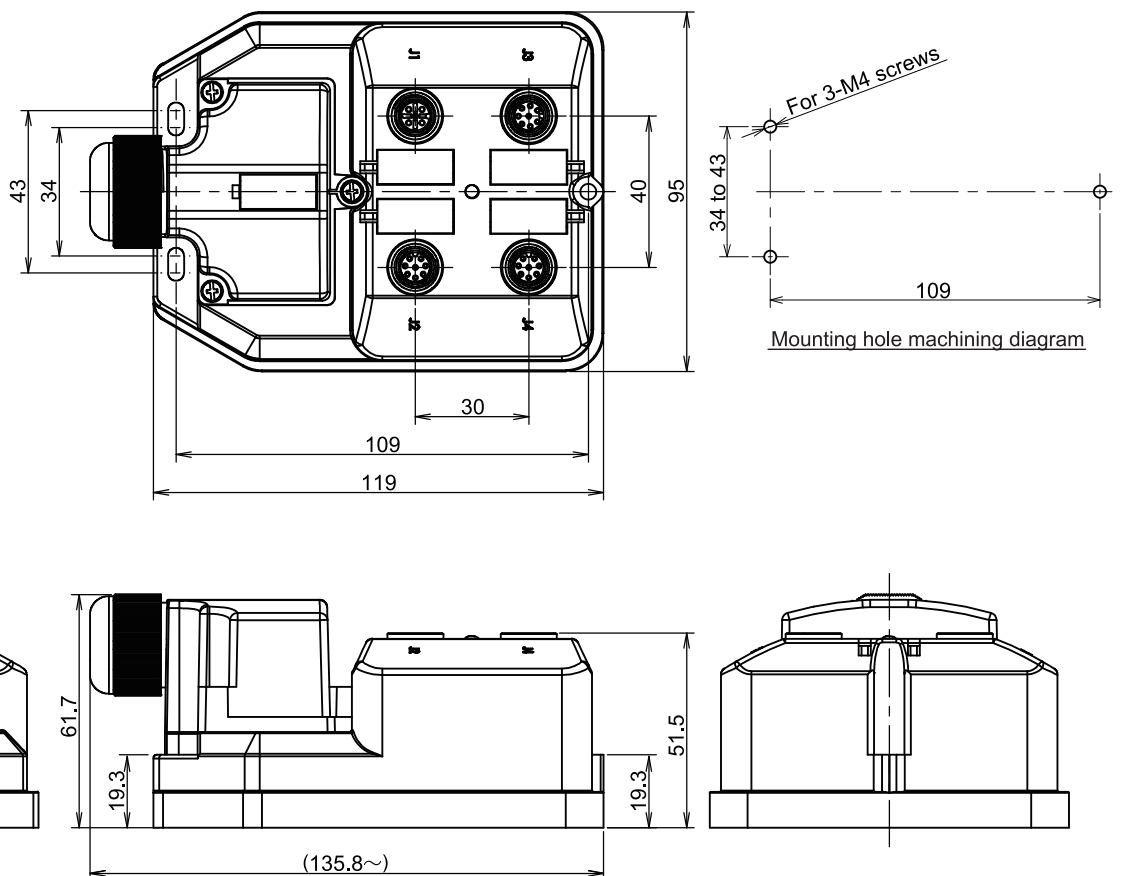
Cable SE9Z-C8

Note: For details, refer to the SE2L manual.

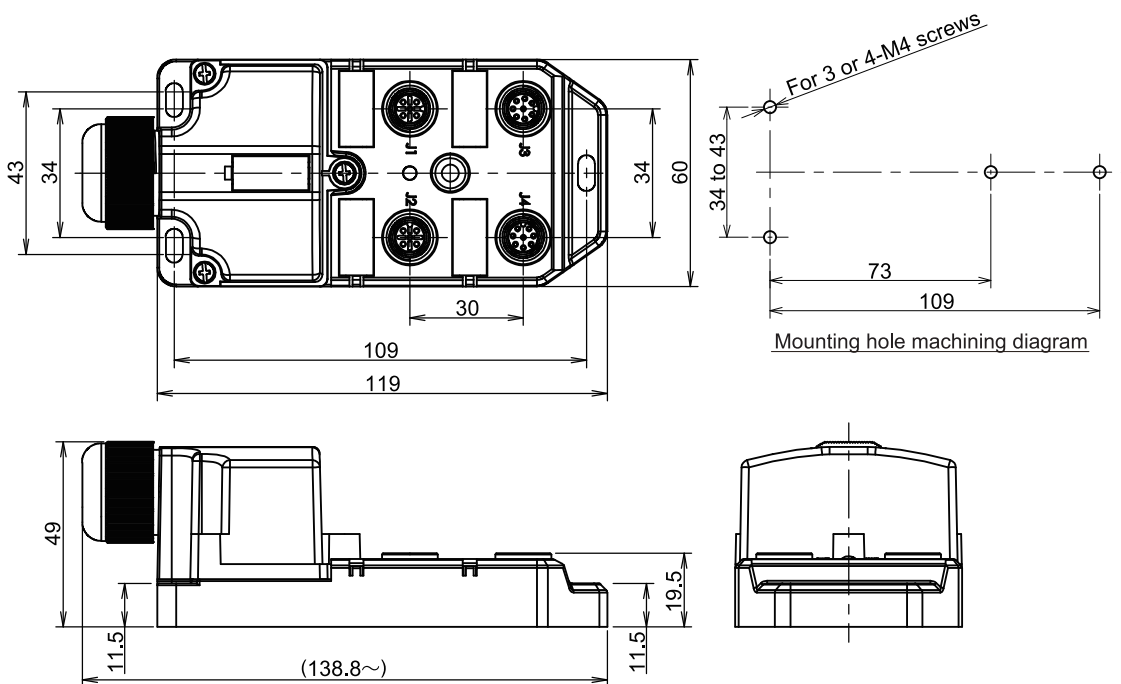


**7** Dimensions (mm)

Type: SE9Z-RT□



Type: SE9Z-T



**8** Precautions for disposal

- When disposing of this product, treat it as industrial waste.

**IDEC CORPORATION**

<http://www.idec.com>

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