JECA FAIR 2018
57th
JECA PRODUCTS AWARD
Japan Electrical Construction Association
Honorable mention

ZERO SCREW™ Terminal Block Supporting Up to 500A **EF2** Series

ZERO SCREW™

JIS C 8201-7-1
NECA C 2811 (Old JIS 2811)

Алматы (7273)495-231
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 **Казахстан** +7(7172)727-132 **Киргизия** +996(312)96-26-47

https://hirose.nt-rt.ru/ || hes@nt-rt.ru

The Zero Screw Solution.

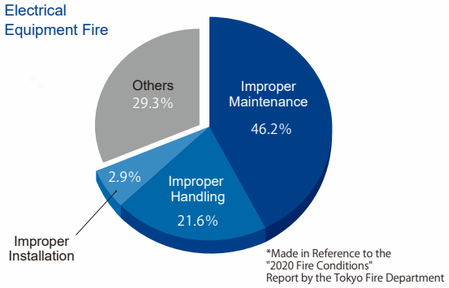
The ZERO SCREW™ terminal block achieves enhanced safety and reduces construction time.

The ZERO SCREW terminal block (EF2 Series) can be connected in a single action without screws.
Simply insert the ring terminal to connect. Since a highly reliable contact can be maintained over a long time period, maintenance work is also reduced. It is a new choice of terminal block that improves the work quality, construction time and the safety of electrical facilities.

1 Reduced Electrical Equipment Fire Risk

Maintains Stable Connection

Major Causes of Electrical Equipment Fire



*Made in Reference to the "2020 Fire Conditions" Report by the Tokyo Fire Department

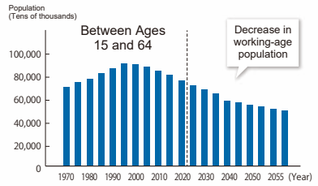
An electrical fire not only endangers the life of building users, it also lowers trust in developers, construction companies and fire source product suppliers. About 70% of the cause of electrical fires is poor handling and lack of maintenance. More specifically, screw looseness can be identified as the cause of these fires. Period maintenance and inspection of screws is required. Even with periodic maintenance, it is difficult to completely prevent an accident.
The ZERO SCREW terminal block maintains a highly reliable connection for a long time with its unique, screw-less design that reduces fire risk caused by loose screws in electrical equipment to zero.

2 Solves the Shortage of Technicians

Simply Insert the Contact to Connect

Work quality with screw type terminal blocks varies due to differences in technician skill level during screw tightening and torque management.
The ZERO SCREW terminal block connects by just insertion, enabling stable work quality regardless of workers' ability. It is ideal for future staffing where there will be fewer skilled workers.

Data for Changes in the Working-age Population



*Source : Ministry of Internal Affairs and Communications, Japan

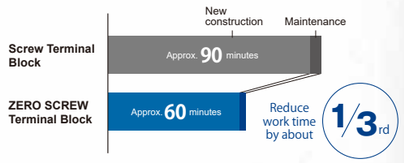
3 Shortens Construction Time Drastically

Reduce All Process Related to Screws

With screw type terminal blocks, screwing and unscrewing is required for new construction and torque checking is needed during maintenance. Since the ZERO SCREW Terminal Block has no screws, it can reduce the number of work hours by more than one-third compared to a conventional screw terminal block for a dramatic reduction in construction time.

Work Hours Comparison with Screw Terminal Block

* The graph is an example of work hours.
New construction + maintenance =
Work hours for single phase × Three phases × Board (15 Routes)



ZERO SCREW™ 3 Features

Easy Operation

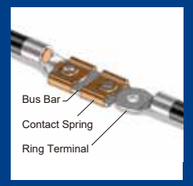
Simply insert to Connect. No screws needed.

Quick and secure single action positive lock design. Unlike a conventional screw terminal block, an operator with less experience can easily maintain stable work quality. Visual confirmation of the insertion status from the top after mating ensures safety.

Long-term Stable Connection

Highly Reliable Connection with Unique Contact Spring Design

Unique design presses the ring terminal directly against the bus bar for connection, improving contact reliability and maintaining a stable, long-term connection.

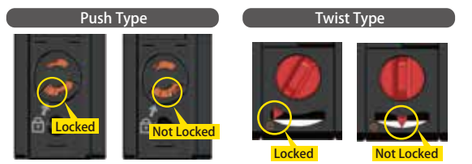


Positive Lock

Fully Locked State is the Standard Position

EF2 is always in a locked state when connected. The safety design prevents the ring terminal from coming out unless the bottom is pressed and the ring terminal is removed. This design also prevents workers from forgetting to lock the connector and the ring terminal from falling out.

Can visually check the insertion state from the top after mating.



EF2 Series — ZERO SCREW™ Terminal Block Supporting Up to 500A

Product		500	400	250	200	150	60	30
Part Number	Push Type	-	-	-	-	-	EF2-D60B-1	EF2-D30B-1
	Twist Type	EF2A-D500B-1	EF2A-D400B-1	EF2A-D250B-1	EF2A-D200B-1	EF2A-D150B-1	-	-
	One-sided screw Type (Push)	-	-	-	-	-	EF2-DH60B-1	EF2-DH30B-1
	One-sided screw Type (Twist)	EF2A-DH500B-1	EF2A-DH400B-1	EF2A-DH250B-1	EF2A-DH200B-1	EF2A-DH150B-1	-	-
Image								
Rated Current		500A : 250mm² (500MCM)	400A : 200mm² (400MCM)	310A : 150mm² (250MCM)	175A : 60mm² (1/0 AWG) 240A : 100mm² (4/0 AWG)	94A : 22mm² (4 AWG) 132A : 38mm² (2 AWG) 175A : 60mm² (1/0 AWG)	40A : 5.5mm² (10 AWG) 50A : 8mm² (8 AWG) 70A : 14mm² (6 AWG)	16A : 1.25mm² (16 AWG) 21A : 2mm² (14 AWG) 30A : 3.5mm² (12 AWG) 40A : 5.5mm² (10 AWG)
Rated Voltage		1,000V AC、1,500V DC				600V AC/DC		
Operating Temperature		-25 to +105℃ (Includes current rising due to current flow.)						
Contact Resistance		0.1mΩ Max. (1A DC)					1mΩ Max. (1A DC)	
Withstanding Voltage		5,000V AC for 1 min.				2,500V AC for 1 min.		
Mating Durability		50 times						
Environmental Standards		RoHS2 compliant						
Compatible Terminal		R250-16 from Nichifu or JST, or equivalent terminal	R200-16 from Nichifu or JST, or equivalent terminal	R150-16 from Nichifu or JST, or equivalent terminal	R60-12 or R100-12 from Nichifu or JST, or equivalent terminal	R22-12, R38-12 or R60-12 from Nichifu or JST, or equivalent terminal	R5.5-6, R8-5 or R14-5 from Nichifu or JST, or equivalent terminal	R1.25-5, R2-5, R3.5-4 or R5.5-4 from Nichifu or R1.25, R2-5, 3.5-R4 or R5.5-4 from JST, or equivalent terminal

●Please choose a terminal with the largest hole diameter available.

⚠ *Terminal thickness is important. Using an inappropriate crimp terminal may result in performance degradation and serious accident. Please make sure to use applicable terminals.

Part Number Configuration

EF2 - DH 150B -1 (01)
❶ ❷❸ ❹ ❺ ❻ ❼

❶Series Name
EF2 : Push type
EF2A : Twist

❷Mount Type
D : DIN rail mount type

❸Connection Type
Blank : Single action type
H : One-sided screw type

❹Current Capacity

❺Protect Design
Blank=No protection design
B, BA= With Protection Design

❻Linked Quality
(D150 type only)

❼Plate
Blank=With end plate
(01)=No end plate

Crimp Terminal Conformity Table

Current Capacity	R1.25	R2	R3.5	R5.5	R8	R14	R22	R38	R60	R100	R150	R200	R250
30	✓	✓	✓	✓	×	×	×	×	×	×	×	×	×
60	×	×	×	✓	✓	✓	×	×	×	×	×	×	×
150	×	×	×	×	×	×	✓	✓	✓	×	×	×	×
200	×	×	×	×	×	×	×	×	✓	✓	×	×	×
250	×	×	×	×	×	×	×	×	×	×	✓	×	×
400	×	×	×	×	×	×	×	×	×	×	×	✓	×
500	×	×	×	×	×	×	×	×	×	×	×	×	✓

✓ : Usable crimp terminals ×: Unusable crimp terminals

PRODUCT CATALOG

HIROSE ELECTRIC CO.,LTD.

EM12M Series

Single Pos. Snap-in Lock Power Connectors Supporting up to 90A

High-Current

Finger Protect

1 Touch Locking

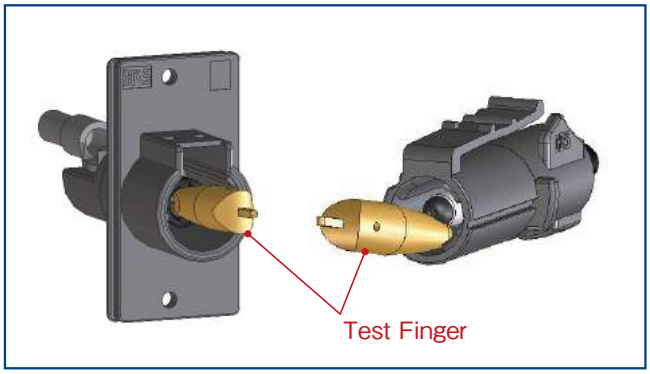
Features

1. Quick, snap-in lock

The snap-in design allows mating to complete in one touch, reducing wiring steps. EM12M does not need screws like traditional terminal blocks, preventing loosening.

2. Safety design with finger protection

Finger protection allows safe operation for field operators.



3. Available cable size : 22mm^2, 38mm^2

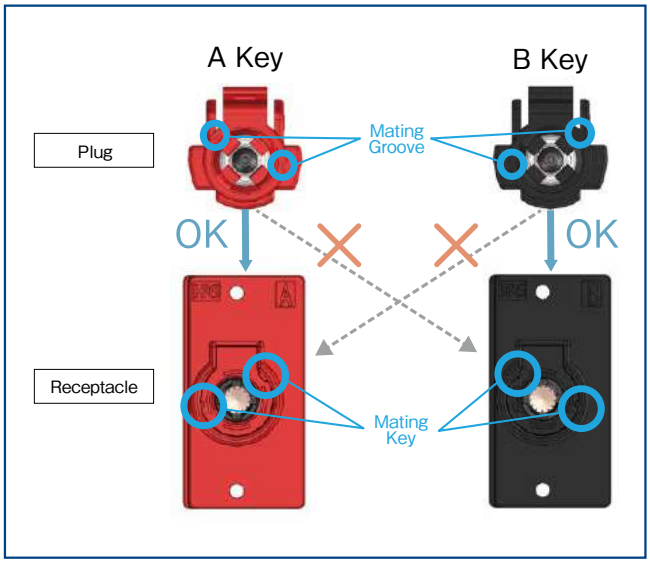
2 kinds of contacts are provided for compatibility with two cable sizes.

4. Easy crimp termination with commercially available tools

No special tools are required.

5. Equipped with guide keys

Guide keys are used to prevent incorrect wiring.



6. TÜV, UL certified

7. RoHS compliant

Product Specifications

Rated Current (Note 1)	38mm², 2 AWG, Ambient Temperature 25℃	22mm², 4 AWG, Ambient Temperature 25℃	14mm², 6 AWG	Operating Temperature (Note 2)	-25 to +105℃
	130A	130A	70A	Storage Temperature Range	-10 to +60℃
Rated Voltage	1000V AC/DC				

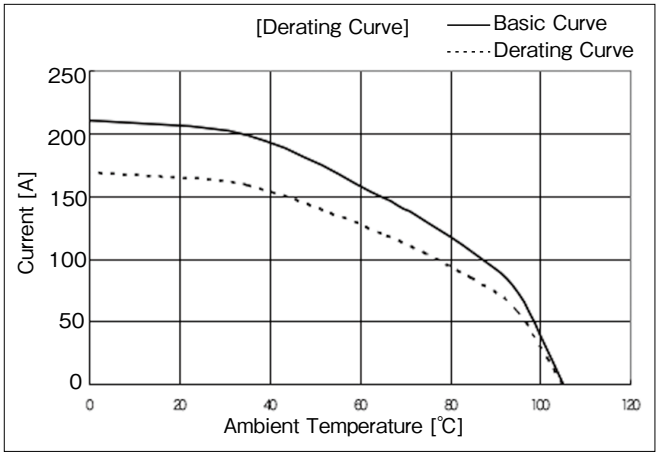
UL	Rated Current (Note 1)	38mm², 2 AWG	22mm², 4 AWG	14mm², 6 AWG	Operating Temperature (Note 2)	-25 to +105℃
		90A	90A	70A	Storage Temperature Range	-10 to +60℃
	Rated Voltage	600V AC/DC				

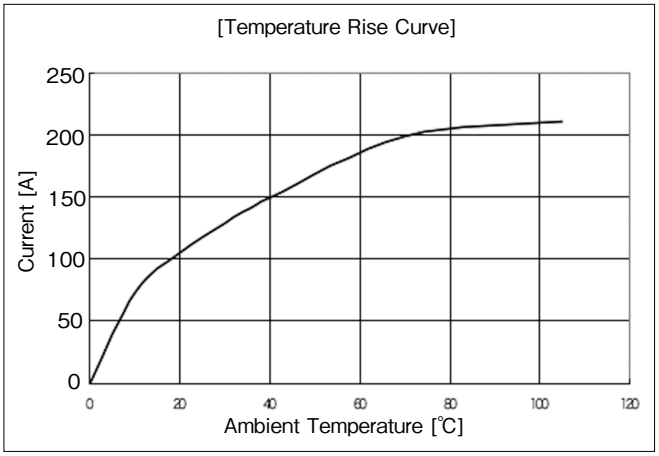
TÜV	Rated Current (Note 1)	38mm², 2 AWG	22mm², 4 AWG	14mm², 6 AWG	Operating Temperature (Note 2)	-25 to +105℃
		90A	90A	70A	Storage Temperature Range	-10 to +60℃
	Rated Voltage	600V AC/DC				

Note 1 : The value of rated current varies with the ambient temperature. It is recommended to use the product within the derating curve zone.
When using a UL or TÜV approved product, please use the product within the specified range as well as the derating curve area.
Note 2 : Including temperature rise due to current flow.

Items	Specifications	Conditions
Contact Resistance	0.5mΩ Max.	Measured with 1A DC
Insulation Resistance	1,000MΩ Min.	Measured with 500V DC
Withstanding Voltage	No flashover or breakdown	3310V AC for 1 min.
Mating Durability	Contact Resistance : 1mΩ Max. Inserting and Extracting Force : 100N Max.	30 mating cycles
Temperature Cycles	Insulation Resistance : 1000MΩ Min.	-55℃ : 30 minutes → Room temperature : 2 to 3 minutes → 105℃ : 30 minutes → Room temperature : 2 to 3 minutes 5 cycles
Salt Water Spray	Should not have functional problems	5% concentration of salt water, left for 48 hours
Humidity Resistance (Steady State)	Insulation Resistance : 10MΩ Min. (in high humidity) 100MΩ Min. (dry)	Temperature 40℃ , humidity 90 to 95%, 96 hours

[Reference] Derating Curve and Temperature Rise Curve





Note 1 : The derating curve is derived from the basic curve multiplied by the derating factor of 0.8.
Note 2 : The measurement method of the derating curve is shown below.
- Test specimen : EM12M unused prior to testing.
- Test cable conductor cross sectional area : 22mm^2
- Power supplied while the specimen is in a stationary state and then measured.

Materials / Finish

Component	Material	Finish	Remarks
Housing	PBT Resin	-	UL94V-0
Contact Cover	PA Resin	-	UL94V-0
Contact Spring	Copper Alloy	Silver Plating	-
Contact	Copper	Silver Plating	-
Screw Parts	Brass	Nickel Plating	-

Product Number Structure

Refer to the chart below when determining the product specifications from the product number.
Please select from the product numbers listed in this catalog when placing orders.

■ Connector

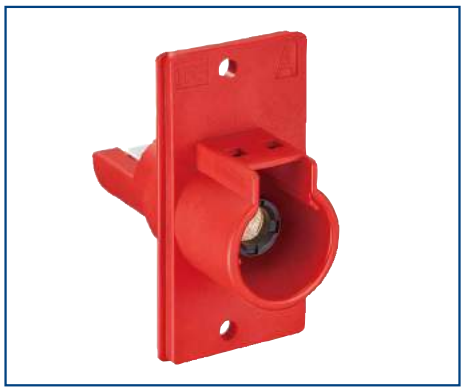
EM 12 M R # - 1 S C A (##)
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

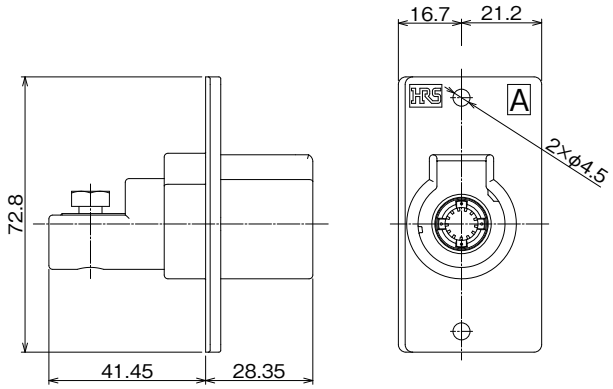
■ Crimp Contact

EV 1 - P C # - 1 1 2 (##)
❶ ⓫ ❼ ❽ ❺ ⓬ ⓭ ⓮ ❿

❶ Series Name	EM, EV	❽ Contact Termination Method	C = Crimp termination
❷ Shell Size	12	❾ Mating Guide Display	2 different keying options available from A to B
❸ Specialty	M = Mold type	❿	Other specification differences are noted with (01),(02) etc. to distinguish certain variations.
❹ Connector Type	R = Receptacle P = Plug	⓫ Series Number	
❺ Distinguishes Specification Differences		⓬ Contact Type	1 = Loose piece contacts
❻ No. of Pos.	1=1pos.	⓭ Contact Form, Size	1 = Supports an equivalent cable with 22mm^2 conductor cross section area 3 = Supports an equivalent cable with 38mm^2 conductor cross section area
❼ Contact Gender	S = Female contact P = Male contact	⓮ Plating Specification	2 = Silver plated

Receptacle

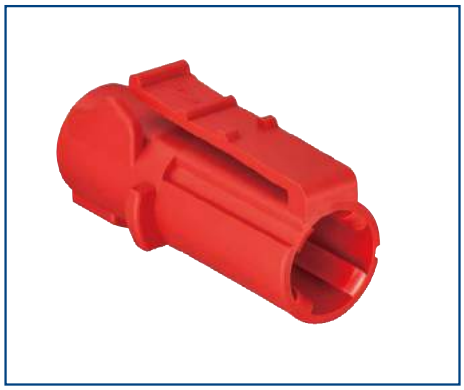


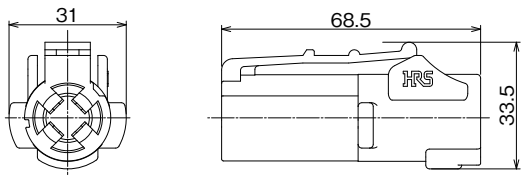


Unit : mm

Part No.	HRS No.	Remarks	Purchase Unit
EM12MR-1SCA(10)	CL0138-0030-2-10	Color : Red	10pcs per box
EM12MR-1SCB	CL0138-0032-8-00	Color : Black	

Plug

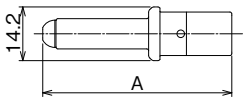




Unit : mm

Part No.	HRS No.	Remarks	Purchase Unit
EM12MP-1PCA(10)	CL0138-0031-5-10	Color : Red	10pcs per box
EM12MP-1PCB	CL0138-0033-0-00	Color : Black	

Crimp Contact

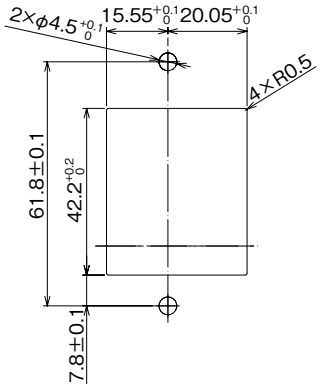


Unit : mm

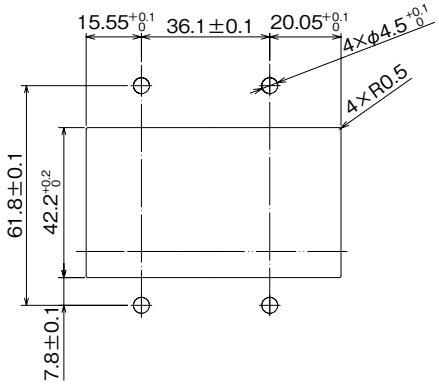
Part No.	HRS No.	A	Remarks	Purchase Unit
EV1-PC-132(02)	CL0139-0014-2-02	57	38mm^2	1pcs per bag
EV1-PC-112(02)	CL0139-0004-9-02	50	22mm^2	

Panel Cut-Out Dimensions from Receptacle Mating Side

Single Mounting



Double Mounting



Recommended Crimp Tools

HT111/9H-60

HT112/REC-150F

Type	Part No.	HRS No.	Remarks
Manual Hydraulic Crimp Tool	HT111/9H-60	CL0902-1515-2-00	Equivalent product : 9H-60 made by Maxell Izumi Co., Ltd.
Electric Hydraulic Crimp Tool	HT112/REC-150F	CL0902-1516-5-00	Equivalent product : REC-150F made by Maxell Izumi Co., Ltd.

Note : Please perform regular maintenance on your crimp tool according to its instruction manual.

Safety Precautions

⚠ Warning

- Do not touch the exposed conductor while it is energized, failing to follow this warning may cause an electric shock and injury.
- The power should be in the OFF position when inserting or extracting this connector.
- After mating this connector, perform a light pull on the cable to ensure that it has been correctly mated and the locking process will hold it in place. If it is not mated correctly, then the cable will be removed. An incomplete mate is a significant danger threat because disconnection or contact failure may occur during operation.

⚠ Caution

- This connector was designed to be used in a stable and stationary environment. Do not try to operate this connector where vibrations will occur.
- Please only use Hirose approved contacts, using non-specified contacts can result in a lowering of the product's performance and cause a serious accident. Please contact your local Hirose representative for additional information.