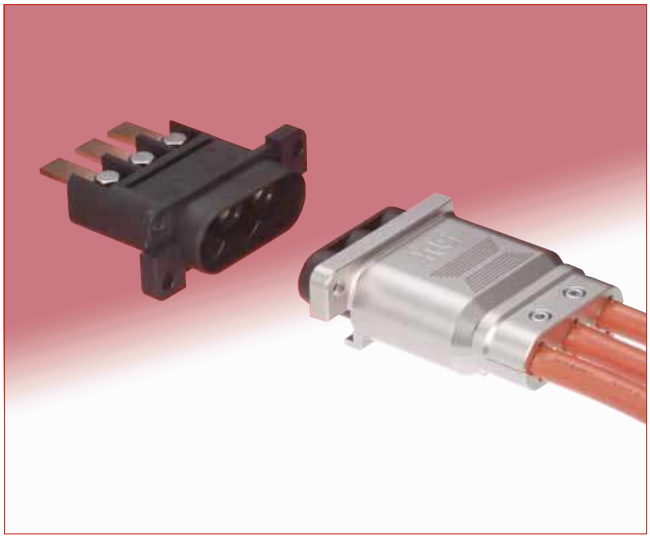
125A High-Current Waterproof Connectors

EV Series



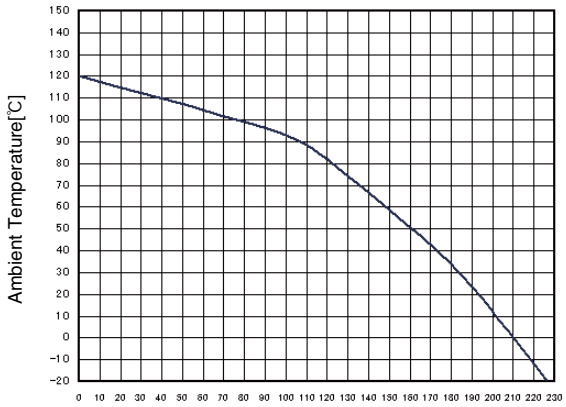


Fig.1

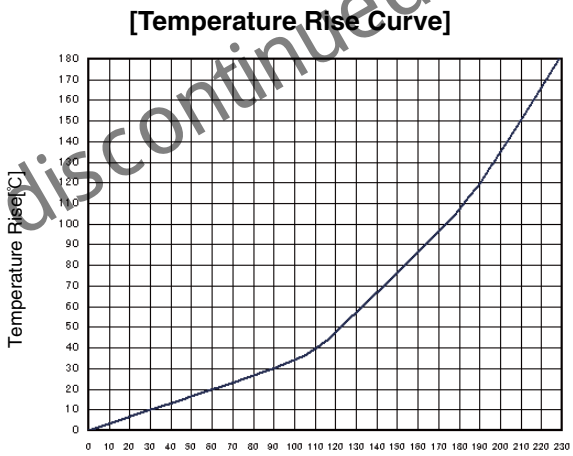


Fig.2

■Features

1. Screw Cramp

Reliable lock by screw and nut. Superior anti-vibration performance by mounting to chassis.

2. Waterproof Structure

The EV series is IP67 water resistant in unmated state (when EV1-62RA-3SB, EV1-62RA-2SB is used). It is IP68/X9K water resistant in mated. The use of special rubber component for the internal seals enhance oil and water resistance.

3. Standard Tool for Contact Assembly

Contacts can be crimped using readily available JIS standard tools (JIS C 9711).

4. Downsizing

Staggered panel flange design saves space.

5. Lightweight

The shell is constructed of an aluminum alloy material enabling it to be lightweight.

6. Multi-Point Contact Spring

Highly reliable contact structure allows for a high current capability, guards against vibration to the contact and decreases contact resistance.

7. Shielded Design

The metal shell enhances EMI shielding.

8. Finger Protection

Contact and connector design protects against accidental electrical shock using IEC 60601 test procedure.

Measurement Condition

The plug has three contacts where 20 mm² electric wires are connected and then covered with a corrugated housing. Measurement was taken by connecting copper bus bars of 3 mm x 12 mm to the three contacts of the receptacle and wiring in series.

Remarks

Derating curve and temperature rise curve changes slightly by a given cable that is being used and slight variations occur under the same conditions. Therefore, the values indicated above are reference values and not guaranteed values.

■Product Specifications

Ratings	Current rating	125A (180A max. *1) (Per cable specification and derating curve)	Operating Temperature	-40 to +150℃ (Including temperature rise by current flow)
	Voltage rating	AC 460V, DC 650V	Storage Temperature Range	-10 to +60℃

Note1 : Under the assumption that it is used at normal temperature (20℃±15℃).

Items	Specifications	Conditions
1. Contact resistance	0.5mΩ or less	Measured at DC 1A
2. Insulation resistance	1000MΩ or greater	Measured at DC 500V
3. Withstanding voltage	No flashover or breakdown	AC 2000V for 1 min.
4. Vibration resistance	No electric outage of 10μs or greater	JIS D 1601, Type 3D -Grade 110
5. Shock	No electric outage of 10μs or greater	Acceleration 490 m/s², sustained period 11 ms, Sine wave tests were conducted a total of 18 times, three times each in 6 directions.
6. Temperature cycle	1mΩ or less Insulation resistance: 100MΩ or greater	Left for a total of 5 cycles of the following: -40℃: 30 mins. → Normal temperature: 2-3 min. → 150℃: 30 mins. → Normal temperature: 2-3 mins.
7. Humidity resistance	Insulation resistance: 10MΩ or greater (when highly humid) 100MΩ or greater (when dry)	Left for 96 hours at temperature 40℃ and humidity 95%.
8. Water proof	IP68 IPX9K	——

■Materials / Finish

Part		Materials	Finish	Remarks
Plug	Outer shell	Aluminum alloy	Nickel plated	–
	Insulator	Polyamide(black)	–	UL94V-0
	Rubber sealant Gasket	Hydrogenated nitrile rubber Fluorosilicone rubber	–	–
	Hexagonal bolt Hexagonal bolt w/ hole	Copper	Tervalent chromate filming	–
Receptacle	Insulator	Polyamide (black)	–	UL94V-0
	Female contact	Copper Alloy	Silver plated *2	–
	Contact spring			–
	Rubber ring (O ring)	Hydrogenated nitrile rubber (Fluorosilicone rubber)	–	–
	Hexagonal bolt Hexagonal nut	Copper/Brass Brass	Tervalent chromate filming / Nickel plated Nickel plated	–
Male Contact	Contact	Copper alloy	Silver plated *2	–
	Cap	Polyamide (black)	–	UL94V-0

Note2 : Silver-plated contacts can discolor by reacting to sulfur in the air (formation of silver sulfide coat), however, they can be used without any problem. Contact resistance may increase in an extremely rare case. If it has increased significantly, please check contact resistance before use.

■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.

●Plug

EV	1	–	62	P	＊	–	3	P	C	(＊＊)
❶	❷		❸	❹	❺		❻	❼	❽	❾

●Receptacle

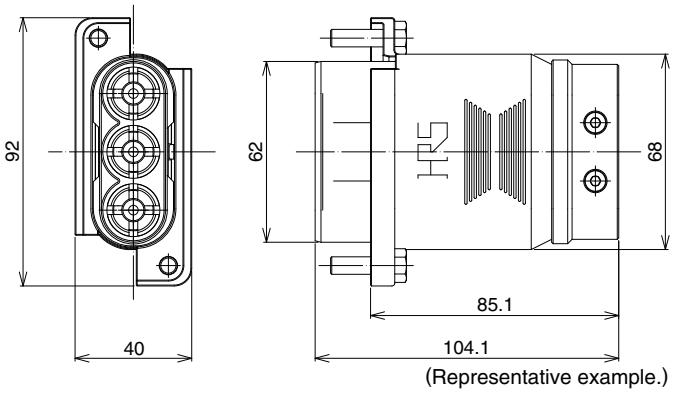
EV	1	–	62	R	＊	–	3	S	B	(＊＊)
❶	❷		❸	❹	❺		❻	❼	❽	❾

●Male Contact

EV	1	–	P	C	＊	–	1	1	2	(＊＊)
❶	❷		❼	❽	❺		❿	⓫	⓬	❾

❶ Model Name : EV Series
❷ Series Number : 1
❸ Shell Size : The shell size shows the case width of the plug's mating area or outer diameter.
❹ Type of Shell : P : Straight plug R : Straight receptacle
❺ Symbol for Body Form Type and Applicable Cable Range Type : A : Single unit waterproof receptacle 1 : Notched
❻ Number of Contacts : Number of contacts is indicated.
❼ Contact Polarity : P : Male Contact S : Female Contact
❽ Cable Termination Method : None : Solder termination B : Termination by screw tightening C : Crimp termination
❾ Other Specifications : Two-digit figures will be added if changes other than the above are made in the specifications.
❿ Contact Type : 1 : Loose piece contacts
⓫ Contact Form, Size : Serial numbers (1,2,3, ･･･) will be changed.
⓬ Plating Specification : 2 : Silver plated

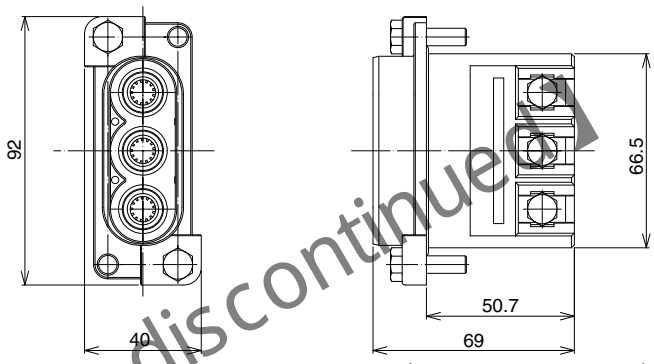
■Plug



(Representative example.)

Part No.	HRS No.	No. of contacts	Packaging
EV1-62P-3PC	139-0001-0	3	1
EV1-62P-2PC	139-0007-7	2	

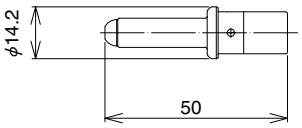
■Receptacle



(Representative example.)

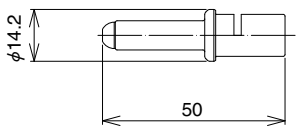
Part No.	HRS No.	No. of contacts	Waterproofing	Packaging
EV1-62R-3SB	139-0002-3	3	Waterproof in mated state	1
EV1-62RA-3SB	139-0003-6		Waterproof as single unit	
EV1-62RA-2SB	139-0008-0	2		

◆Male Contacts



Part No.	HRS No.	Packaging
EV1-PC-112 *3	139-0004-9	3 pcs/pack
EV1-PC-112 (01)*3	139-0004-9 01	2 pcs/pack

Note3 : EV1-PC-112, EV1-PC-112(01) is the recommended contact when using the electric oil pressure crimping tool.



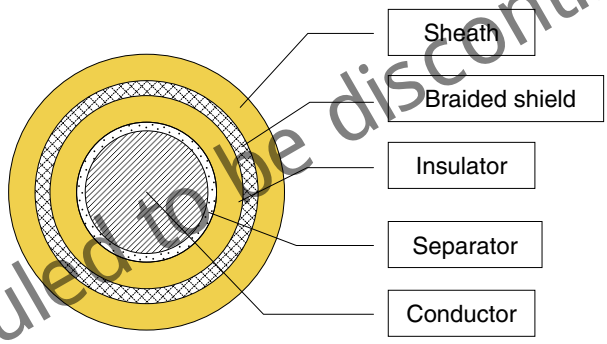
Part No.	HRS No.	Packaging
EV1-PC1-112 *4	139-0005-1	3 pcs/pack
EV1-PC1-112(01) *4	139-0005-1 01	2 pcs/pack

Note4 : EV1-PC1-112, EV1-PC1-112(01) is the recommended contact when using the manual oil pressure crimping tool.

◆Plug : Recommended Cable Specifications and Manufacturer

Recommended Electric Cable Manufacturer		Product Name (Part No.)	
Hitachi Cable, Ltd.		Shielded Cable for Electrical Vehicle 100℃ heat resistance : A-LFF-SB 200℃ heat resistance : A-LFF-F-SB	
Items		Unit	Specifications
Number of wires		-	1
Conductor	Nominal cross-section area	mm^2	20
	Composition	# of wires/mm	19/13/0.32TA (*5)
	Outer diameter	mm	6.5
Separator thickness		mm	0.05
Insulator	Standard thickness	mm	1.1
	Outer diameter		8.55-9.05
Braided shield (*6)	Composition	Strands/Wires mm	8/24/0.18TA (*5)
	Braid thickness	mm	0.45
Sheath	Standard thickness	mm	1.0
Outer diameter in finished state		mm	11.25-11.75

Note5 : TA indicates a tin plated soft copper wire.
Note6 : Braided shield is not waterproof structure.



◆Receptacle : Recommended Sizes of Copper Bus Bar and Round Bare Crimp Connector

	Width [mm]	Thickness [mm]
Copper Bus Bar	16mm max.	3 to 4
Round Bare Crimp Connector (*7) (Size 22 is recommended)		1.8

Note7 : When connecting with a round, bare crimp contact, please use a plain washer (for M6 [outer diameter ϕ16≦, thickness 1.6mm]). Assemble the plain washer between the round bare crimp contact and the hexagonal bolt, not between the round bare crimp contact and the contact. When using a copper-tube crimp contact instead of a round bare crimp contact, use the one with the maximum width of 16mm and the thickness of 3.6mm. In this case, no plain washer is required.

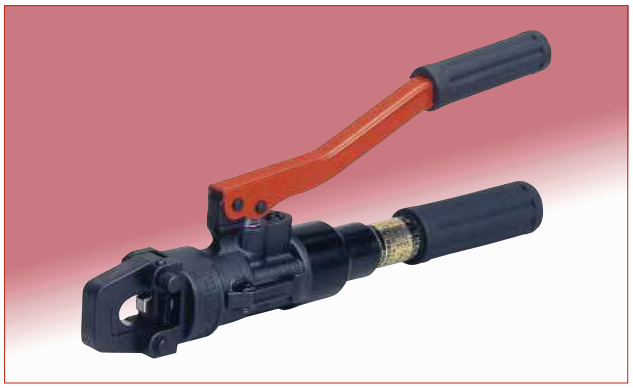
◆Applicable Tool/Jig

Tool/Jig	Part No.	HRS No.	Remarks
Contact extraction tool	EV1-PC-TP	150-0251-5	———
Manual oil pressure crimping tool *8	HT111 / 9H-60	902-1515-2	Equivalent model : 9H-60 manufactured by Izumi Product Co.
Electric oil pressure crimping tool *8	HT112/REC-150F	902-1516-5	Equivalent model : REC-150F manufactured by Izumi Product Co.

Note8 : Applicable tools are JIS C 9711 Compression Tools for Wire Connectors of Interior Wiring (JIS general tools). As crimping performance varies by tool, please use the recommended tool.

◆Contact Extraction Tool

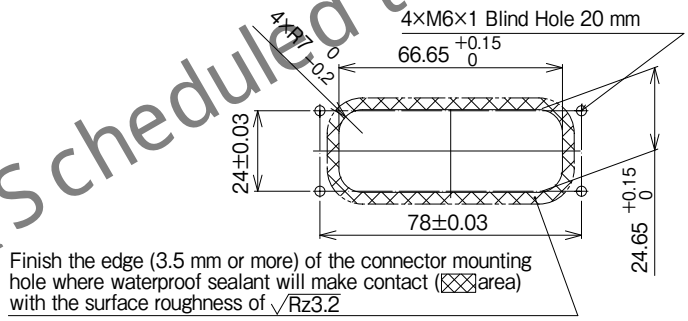
◆Manual Oil Pressure Crimping Tool



◆Electric Oil Pressure Crimping Tool

[Scheduled to be discontinued]

◆Panel cut out Dimensions for Plug and Receptacle



Remarks : The dimensions of the panel mounting hole are the dimensions when seen from the plug mating side.

◆PRECAUTIONS

1. Always make sure to turn the power off before inserting or extracting the connectors.
2. Always check the condition of the connectors and terminals for damage or debris before mating.
3. Use of non-recommended wire can affect the performance. Only use the recommended cables to maintain waterproof performance, shielding performance and cable crimping strength.
4. Please contact a Hirose sales representative for the harnessing procedure.
5. Braided shield is not waterproof structure.

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HRS

HIROSE ELECTRIC CO.,LTD.
2-6-3,Nakagawa Chuoh,Tsuzuki-Ku,Yokohama-Shi 224-8540,JAPAN
TEL: +81-45-620-3526 Fax: +81-45-591-3726
http://www.hirose.com
http://www.hirose-connectors.com