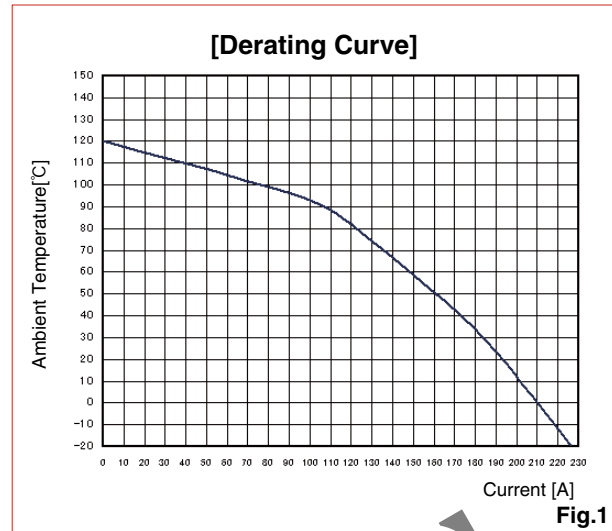
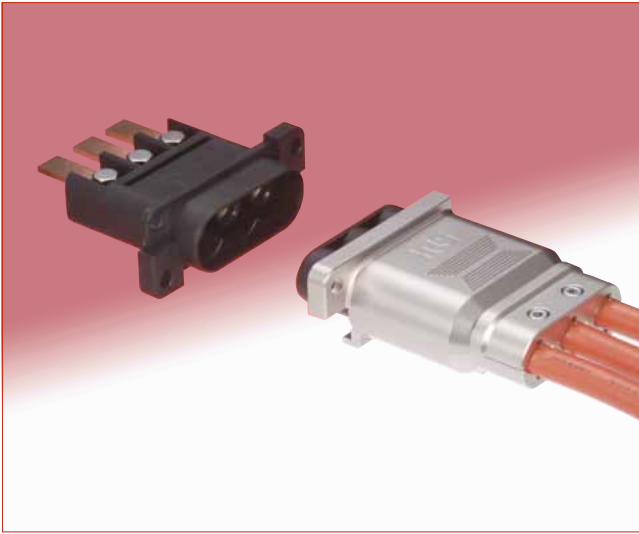


# 125A High-Current Waterproof Connectors

## EV Series



### ■ 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

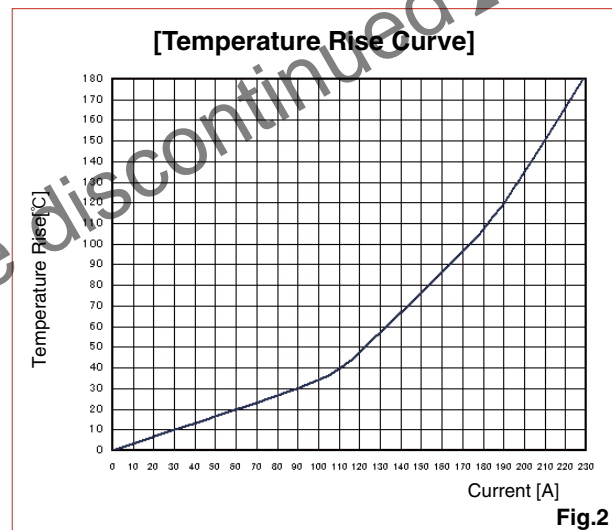
Highly reliable contact structure allows for a high current capability, guards against vibration to the contact and decreases contact resistance.

#### 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 mm<sup>2</sup> 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)<br>(Per cable specification and derating curve) | Operating Temperature     | -40 to +150°C<br>(Including temperature rise by current flow) |
|         | Voltage rating | AC 460V, DC 650V  | Storage Temperature Range | -10 to +60°C  |

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

| 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/s <sup>2</sup> , sustained period 11 ms,<br>Sine wave tests were conducted a total of 18 times,<br>three times each in 6 directions. |
| 6. Temperature cycle     | 1mΩ or less<br>Insulation resistance: 100MΩ or greater                                       | Left for a total of 5 cycles of the following:<br>-40°C: 30 mins. → Normal temperature: 2-3 min. →<br>150°C: 30 mins. → Normal temperature: 2-3 mins.   |
| 7. Humidity resistance   | Insulation resistance:<br>10MΩ or greater (when highly humid)<br>100MΩ or greater (when dry) | Left for 96 hours at temperature 40°C and humidity 95%.   |
| 8. Water proof           | IP68<br>IPX9K  | —   |

## Materials / Finish

|                | Part                   | Materials   | Finish                     | Remarks |
|----------------|------------------------|---|----------------------------|---------|
| Plug           | Outer shell            | Aluminum alloy                                      | Nickel plated              | —       |
|                | Insulator              | Polyamide(black)                                    | —                          | UL94V-0 |
|                | Rubber sealant         | Hydrogenated nitrile rubber                         | —                          | —       |
|                | Gasket                 | Fluorosilicone rubber                               | —                          | —       |
|                | Hexagonal bolt         | Copper  | Tervalent chromate filming | —       |
| Receptacle     | Hexagonal bolt w/ hole | Copper  | Tervalent chromate filming | —       |
|                | 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 | Copper/Brass           | Tervalent chromate filming / Nickel plated          | —                          |         |
| Hexagonal nut  | Brass                  | 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 (\*\*)**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

### ● Receptacle

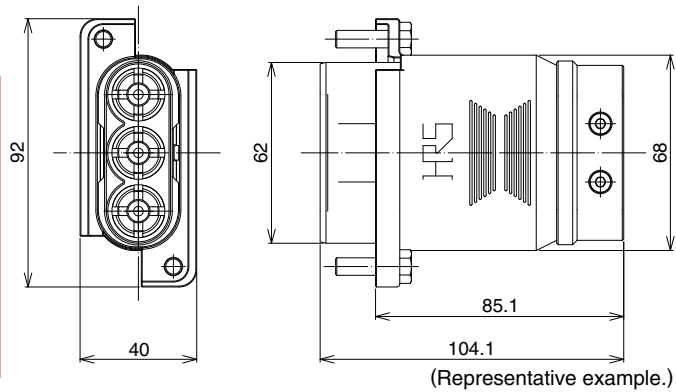
**EV 1 - 62 R \* - 3 S B (\*\*)**  
 ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

### ● Male Contact

**EV 1 - P C \* - 1 1 2 (\*\*)**  
 ① ② ⑦ ⑧ ⑤ ⑩ ⑪ ⑫ ⑨

|   |  |
|---|--|
| ① | Model Name : EV Series   |
| ② | Series Number : 1  |
| ③ | Shell Size : The shell size shows the case width of the plug's mating area or outer diameter.                          |
| ④ | Type of Shell : P : Straight plug<br>R : Straight receptacle   |
| ⑤ | Symbol for Body Form Type and Applicable Cable Range Type :<br>A : Single unit waterproof receptacle<br>1 : Notched    |
| ⑥ | Number of Contacts : Number of contacts is indicated.  |
| ⑦ | Contact Polarity : P : Male Contact<br>S : Female Contact  |
| ⑧ | Cable Termination Method : None : Solder termination<br>B : Termination by screw tightening<br>C : Crimp termination   |
| ⑨ | Other Specifications : Two-digit figures will be added if changes other than the above are made in the specifications. |
| ⑩ | Contact Type : 1 : Loose piece contacts  |
| ⑪ | Contact Form, Size : Serial numbers (1,2,3, ...) will be changed.  |
| ⑫ | Plating Specification : 2 : Silver plated  |

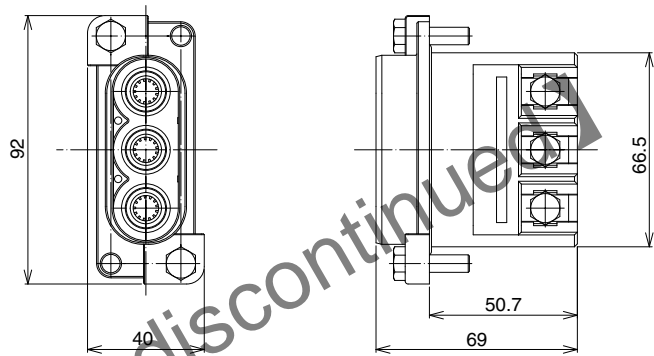
■ Plug



(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               |           |

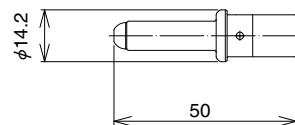
■ Receptacle



(Representative example.)

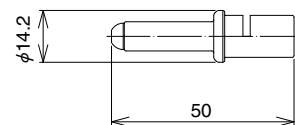
| Part No.     | HRS No.    | No. of contacts | Waterproofing             | Packaging |
|--------------|------------|-----------------|---------------------------|-----------|
| EV1-62R-3SB  | 139-0002-3 | 3               | Waterproof in mated state | 1         |
| EV1-62RA-3SB | 139-0003-6 |                 | 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 |

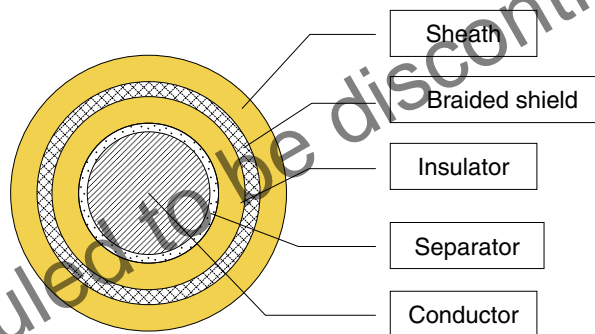
Note4 : EV1-PC1-112, EV1-PC1-112(01) is the recommended contact when using the manual oil pressure crimping tool.

## ◆ Plug : Recommended Cable Specifications and Manufacturer

| Recommended Electric Cable Manufacturer |                            | Product Name (Part No.)   |                   |
|---|----------------------------|---|-------------------|
| Hitachi Cable, Ltd.                     |                            | Shielded Cable for Electrical Vehicle<br>100°C heat resistance : A-LFF-SB<br>200°C heat resistance : A-LFF-F-SB |                   |
| Items                                   |                            | Unit  | Specifications    |
| Number of wires                         |                            | -   | 1                 |
| Conductor                               | Nominal cross-section area | mm <sup>2</sup>   | 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<br>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  $\phi 16 \leq$ , 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 :<br>9H-60 manufactured by Izumi Product Co.    |
| Electric oil pressure crimping tool *8 | HT112/REC-150F | 902-1516-5 | Equivalent model :<br>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



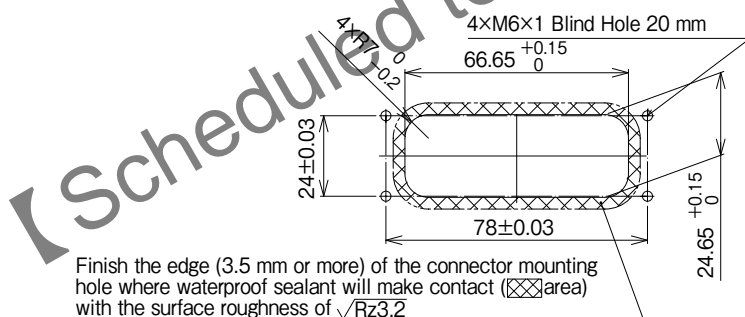
◆ Manual Oil Pressure Crimping Tool



◆ Electric Oil Pressure Crimping Tool



◆ 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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