Automotive High Voltage Waterproof Connector
HVH-280 Series (Waterproof)

Features

1. Rated current: 30A
   Rated voltage: 600V AC/DC
2. Low profile and small size
   Miniaturization by using two screws greatly reduces the mounting area. Rated current is 30A with a 40% height reduction compared to competitive products.
3. High Heat Resistance
   Ambient temperature up to 120°C.
4. High Vibration Resistance
   Can be used in severe environments such as inside vehicles where strong vibration is present.
5. IPXXB (finger protection) (Compliant with JIS C0920)
6. IPX9K (high pressure washing) waterproof (Compliant with JIS D 5020)
   Suitable for harsh high pressure washing environments such as an interface connector for automobiles and industrial equipment.
7. Reinforced EMI Prevention
   The metal shield and ground provide complete EMI protection.
8. CPA (Half-Fit Prevention Mechanism)
   The use of a CPA (Connector Position Assurance) mechanism ensures a secure fit and prevents malfunctions due to poor mating.
9. Mating Detection Circuit
   A mating detection circuit ensures worker safety. The connector is designed so that no current flows to the power terminal unless the detection circuit’s signal terminal contacts it (interlock mechanism) to prevent electric shocks.

*When using the interlock mechanism, it is necessary for the customer to build the circuit.
## Product Specifications

<table>
<thead>
<tr>
<th>Items</th>
<th>Specifications</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated Current</strong></td>
<td>30A (Note 1)</td>
<td>Operating Temperature -40°C to +120°C</td>
</tr>
<tr>
<td><strong>Rated Voltage</strong></td>
<td>600V AC/DC</td>
<td>Storage Temperature Range -10°C to +60°C (Note 2)</td>
</tr>
<tr>
<td><strong>Contact resistance</strong></td>
<td>Power 3mΩ/ Signal 10mΩ/ Shield 50mΩ max.</td>
<td>Measured at 10A DC</td>
</tr>
<tr>
<td><strong>Insulation resistance</strong></td>
<td>100MΩ min.</td>
<td>Measured at 1000V DC</td>
</tr>
<tr>
<td><strong>Withstanding Voltage</strong></td>
<td>There shall be no flashover or dielectric breakdown.</td>
<td>Apply 2500V AC for 1 minute.</td>
</tr>
<tr>
<td><strong>Mating Durability</strong></td>
<td>Contact Resistance : Power 5mΩ/ Signal 20mΩ Max.</td>
<td>30 mating cycles (insertion/extraction)</td>
</tr>
<tr>
<td><strong>Vibration Resistance</strong></td>
<td>No electrical discontinuity of 1μs or more.</td>
<td>Frequency : 20 to 200Hz (acceleration : 88m/s²) 3 minutes per cycle (Repeated) 3 directions, 3 cycles each.</td>
</tr>
<tr>
<td><strong>Lock Strength</strong></td>
<td>98N Min.</td>
<td>Breaking strength of the lock is measured while tensile in the direction of the mating axis</td>
</tr>
<tr>
<td><strong>Breakage torque</strong></td>
<td>No breakage</td>
<td>Tightened at 2.88N·m (Max.) using an M4 screw</td>
</tr>
<tr>
<td><strong>Humidity Resistance</strong></td>
<td>Contact resistance : Power 5mΩ/ Signal 20mΩ Max. Insulation resistance : 100MΩ Min.</td>
<td>Left at a temperature of 85°C for 96 hours with a relative humidity of 90 to 95%</td>
</tr>
<tr>
<td><strong>Thermal shock</strong></td>
<td>Contact Resistance : Power 5mΩ Max. Insulation Resistance : 100MΩ Min.</td>
<td>Temperature -40°C → Room temperature → 120°C → Room temperature Time : 30 → 5 → 30 → 5 minutes for 1000 cycles</td>
</tr>
<tr>
<td><strong>Heat resistance</strong></td>
<td>Contact Resistance : Power 5mΩ/ Signal 20mΩ Max.</td>
<td>Left at a temperature of 125°C for 300 hours</td>
</tr>
<tr>
<td><strong>Cold resistance</strong></td>
<td>Contact Resistance : Power 5mΩ/ Signal 20mΩ Max.</td>
<td>Left at a temperature of ~40°C for 120 hours</td>
</tr>
<tr>
<td><strong>Sulfurous Acid Resistance</strong></td>
<td>Contact Resistance : Power 5mΩ/ Signal 20mΩ Max.</td>
<td>Left unmated in sulfurous acid gas for 96 hours at a room temperature with a concentration of 25ppm and a humidity of 75% RH or higher</td>
</tr>
<tr>
<td><strong>Water resistance</strong></td>
<td>No water immersion</td>
<td>After leaving the panel assembled in 125°C, flooding and cooling</td>
</tr>
</tbody>
</table>

Note 1: Ambient temperature of 105°C and 12 AWG used for operating current listed. The rating current depends on operating temperature and cable used. Please contact a Hirose Sales Office for inquiries.

Note 2: This storage temperature is for long-term storage of unused products.
### Materials / Finish

<table>
<thead>
<tr>
<th>Product Component</th>
<th>Part</th>
<th>Material</th>
<th>Finish</th>
<th>UL Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plug</td>
<td>Housing</td>
<td>PBT resin</td>
<td>Orange</td>
<td>UL94V-0</td>
</tr>
<tr>
<td></td>
<td>Holder</td>
<td>PBT resin</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seal</td>
<td>Silicone rubber</td>
<td>White</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shield Terminal</td>
<td>Stainless steel</td>
<td>Tin plating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Terminal</td>
<td>Copper alloy</td>
<td>Tin plating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collar</td>
<td>SWCH</td>
<td>Nickel plating</td>
<td></td>
</tr>
<tr>
<td>Socket</td>
<td>Housing</td>
<td>PBT resin</td>
<td>Orange</td>
<td>UL94V-0</td>
</tr>
<tr>
<td></td>
<td>CPA</td>
<td>PBT resin</td>
<td>Red</td>
<td>UL94V-0</td>
</tr>
<tr>
<td></td>
<td>Holder</td>
<td>PBT resin</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Seal</td>
<td>Silicone rubber</td>
<td>Blue, rouge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shield terminal</td>
<td>Stainless steel</td>
<td>Tin plating</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Terminal</td>
<td>Copper alloy</td>
<td>Tin plating</td>
<td></td>
</tr>
</tbody>
</table>

### 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 Housing

HVH − 280 − 2 / 2 P − HU

- **Series Name** : HVH
- **Series No.** : 280
- **Number of contacts** : Power : 2
- **Signal** : 2
- **Connector type** : P : Plug type
  - **Form type** : HU : Housing
- **Form Type** : SCF : Socket crimp terminal/reel

#### Socket Holder

HVH − 280 − 2 / 2 S − HO

- **Series Name** : HVH
- **Series No.** : 280
- **Connector type** : P : Plug type
  - **Form type** : HU : Housing
- **Form Type** : SCF : Socket crimp terminal/reel

#### Terminal

HVH − 280 − 1214 SCF

- **Series Name** : HVH
- **Series No.** : 280
- **Applicable Wire size** : 1214 : 12 to 14 AWG
- **Form Type** : PCF : Plug crimp terminal/reel
  - **Form Type** : SCF : Socket crimp terminal/reel
## Product Configurations

### Plug connector
- HVH-280-2/2P-HO
- HVH-280-1214PCF
- ZE05-2022SCF

### Socket connector
- HVH-280-2/2S-HU
- HVH-280-1214SCF
- HVH-280-4.2CF

## HVH-280 Series Mating Table

<table>
<thead>
<tr>
<th>Plug connector</th>
<th>Socket connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVH-280 2pos. Plug connector</td>
<td>HVH-280 2pos. Socket Connector</td>
</tr>
<tr>
<td>Configuration Product Name</td>
<td>Configuration Product Name</td>
</tr>
<tr>
<td>HVH-280-2/2P-HU</td>
<td>HVH-280-2/2S-HU</td>
</tr>
<tr>
<td>HVH-280-2/2P-HO</td>
<td>HVH-280-2/2S-HO</td>
</tr>
<tr>
<td>HVH-280-1214PCF</td>
<td>HVH-280-2/2S-WS</td>
</tr>
<tr>
<td>ZE05-2022SCF(※)</td>
<td>HVH-280-1214SCF</td>
</tr>
<tr>
<td></td>
<td>HVH-280-4.2CF</td>
</tr>
</tbody>
</table>

*Required only for when using the mating detection feature.*
HVH-280 Series (Waterproof) ● Automotive High Voltage Waterproof Connector

### Plug

- **Part No.** HVH-280-2/2P-HU
- **HRS No.** 778-0500-0
- **Key Position** Standard key

- **Part No.** HVH-280-2/2P-HU (A)
- **HRS No.** 778-0510-0
- **Key Position** (A) Key

- **Part No.** HVH-280-2/2P-HU (B) Under development (Note 2)
- **HRS No.** Under development
- **Key Position** (B) Key

Note 1: The product is sold in sets (100 pieces per set) so please order based on number of sets.

Note 2: (B) Key is currently under development. Please contact Hirose sales representative for the details.

Note 3: Please contact Hirose sales representative for panel cut-out dimensions.

### Plug Holder

- **Part No.** HVH-280-2/2P-HO
- **HRS No.** 778-0506-0

Note 1: The product is sold in packs (100 pieces per pack) so please order based on number of packs.

Note 2: This product is compatible with wires that have an outer diameter of Ø4.0 to 4.4mm Interface cable: Ø1.5mm max. Please contact a Hirose sales representative regarding other cables.
■Socket

![Socket Image](image)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Key Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVH-280-2/2S-HU</td>
<td>778-0504-0</td>
<td>Standard Key</td>
</tr>
<tr>
<td>HVH-280-2/2S-HU (A)</td>
<td>778-0508-0</td>
<td>(A) Key</td>
</tr>
<tr>
<td>HVH-280-2/2S-HU (B)</td>
<td>Under development (Note 2)</td>
<td>(B) Key</td>
</tr>
</tbody>
</table>

Note 1: The product is sold in sets (100 pieces per set) so please order based on number of sets.
Note 2: (B) Key is currently under development. Please contact Hirose representative for the details.

■Socket Holder

![Socket Holder Image](image)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVH-280-2/2S-HO</td>
<td>778-0507-0</td>
</tr>
</tbody>
</table>

Note 1: The product is sold in packs (100 pieces per pack) so please order based on number of packs.
Note 2: This product is compatible with wires that have an outer diameter of φ5.0 to 5.4mm. Please contact a Hirose sales representative regarding other cables.
Seal

**Part No.** | **HRS No.**
---|---
HVH-280-2/2S-WS | 778-0505-0

Note 1: The product is sold in packs (100 pieces per pack) so please order based on number of packs.

Note 2: This product is compatible with wires that have an outer diameter of Ø5.0 to 5.4mm.

Please contact a Hirose sales representative regarding other cables.
Plug Crimp Terminal (Power)

![Diagram of Plug Crimp Terminal (Power)]

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Material</th>
<th>Finish</th>
<th>Core cable size</th>
<th>Outer Diameter</th>
<th>Sales Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVH-280-1214PCF</td>
<td>778-0501-0</td>
<td>Copper Alloy</td>
<td>Tin plating</td>
<td>12 to 14 AWG</td>
<td>2.176 to 3.619mm²</td>
<td>3.6 to 4.4</td>
</tr>
</tbody>
</table>

Note 1: The core cable cross-sectional area is a reference value. Please reference it when selecting electrical wires. Contact a Hirose sales representative for cross-section areas of cables other than those listed above.

Note 2: Please contact a Hirose sales representative regarding whether crimping tools made by other companies can be used.

Plug detection crimp terminal (Signal)

![Diagram of Plug detection crimp terminal (Signal)]

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Material</th>
<th>Finish</th>
<th>Core cable size</th>
<th>Outer Diameter</th>
<th>Sales Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZE05-2022SCF</td>
<td>752-2001-0</td>
<td>Copper alloy</td>
<td>Tin plating</td>
<td>20 to 22 AWG</td>
<td>0.35 to 0.517mm²</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Note 1: The core cable cross-sectional area is a reference value. Please reference it when selecting electrical wires. Contact a Hirose sales representative for cross-section areas of cables other than those listed above.

Note 2: Please contact a Hirose sales representative regarding whether crimping tools made by other companies can be used.
HVH-280 Series (Waterproof)●Automotive High Voltage Waterproof Connector

**Socket crimp terminal**

![Socket crimp terminal diagram]

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Material</th>
<th>Finish</th>
<th>Core cable size</th>
<th>Outer Diameter</th>
<th>Sales Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVH-280-1214SCF</td>
<td>778-0502-0</td>
<td>Copper alloy</td>
<td>Tin plating</td>
<td>12 to 14 AWG</td>
<td>Ø3.6 to 4.4</td>
<td>1 reel (1,700 rolls)</td>
</tr>
</tbody>
</table>

**Note 1**: The core cable cross-sectional area is a reference value. Please reference it when selecting electrical wires. Contact a Hirose sales representative for cross-section areas of cables other than those listed above.

**Note 2**: Please contact a Hirose sales representative regarding whether crimping tools made by other companies can be used.

**Ground crimp terminal for socket**

![Ground crimp terminal diagram]

<table>
<thead>
<tr>
<th>Part No.</th>
<th>HRS No.</th>
<th>Material</th>
<th>Finish</th>
<th>Braided Outside Diameter</th>
<th>Outer Diameter</th>
<th>Sales Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVH-280-4.2CF</td>
<td>778-0503-0</td>
<td>Copper alloy</td>
<td>Tin plating</td>
<td>Approx Ø4.3</td>
<td>Ø5.0 to 5.4</td>
<td>1 reel (1,400 rolls)</td>
</tr>
</tbody>
</table>

**Note 1**: Please contact a Hirose representative regarding the use of cables other than the sizes listed above.

**Note 2**: Please contact a Hirose sales representative regarding whether crimping tools made by other companies can be used.

**Applicable Adapter Tool**

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
<th>HRS No.</th>
<th>Applicable contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicator</td>
<td>AP105-HVH-280-1214P</td>
<td>901-5245-0</td>
<td>HVH-280-1214PCF</td>
</tr>
<tr>
<td></td>
<td>AP105-HVH-280-1214S</td>
<td>901-5244-0</td>
<td>HVH-280-1214SCF</td>
</tr>
<tr>
<td></td>
<td>AP105-HVH-280-4.2CF</td>
<td>901-5246-0</td>
<td>HVH-280-4.2CF</td>
</tr>
<tr>
<td></td>
<td>AP105-ZE05-2022S</td>
<td>901-5239-0</td>
<td>ZE05-2022SCF</td>
</tr>
<tr>
<td>Extraction</td>
<td>HVH-280-ZE05/RE-MD</td>
<td>902-5158-0</td>
<td>ZE05-2022SCF</td>
</tr>
</tbody>
</table>

**Note 1**: Please use a press machine of 2t or more.

**Note 2**: Please contact a Hirose sales representative regarding whether crimping tools made by other companies can be used.

**Note 3**: Crimping work shall be conducted in accordance with the "Crimping Standard" and "Crimping Conditions Table".
How to Extract the Terminal

● Terminal extraction tools: Precision screwdriver (flathead screwdriver), HVH-280-ZE05/RE-MD
● Applicable crimp terminals: HVH-280-1214 PCF, HVH-280-1214SCF, ZE05-2022SCF

Repair Method

To repair, press the mold lance with the terminal extraction tool in the direction shown in the diagram below. While pressing extract the terminal. Make sure not to deform the terminal lock part or contact part.

Caution: Do not push the terminal locking part or contact. It may lead to deformation or damage to the housing and other parts. When damaged, please replace it with a new one.

Usage Precautions

1. Pulling out the connector with force may result in damage. If it is difficult to pull out, lightly push it once and then operate the lock to pull it out.
2. When inserting or extracting the terminal, always disconnect from the power source first.
3. Do not touch the terminals while the power is on since it is very dangerous.
4. Contact a sales representative for harness instructions and handling manuals.
5. Do not perform insertion or extraction with a live wire. (Live wire insertion/extraction refers to inserting/extracting while electricity is running)

Usage Environment

Please consult with your Hirose Electric sales representative if your system environmental conditions repeat high and low temperatures.
HVH-280 Series (Waterproof)●Automotive High Voltage Waterproof Connector

USA: HIROSE ELECTRIC (U.S.A.), INC. CHICAGO OFFICE
2300 Warrenville Road, Suite 150,
Downers Grove, IL 60515
Phone: +1-630-282-6700
http://www.hirose.com/us/

USA: HIROSE ELECTRIC (U.S.A.), INC. SAN JOSE OFFICE
2841 Junction Ave, Suite 200
San Jose, CA. 95134
Phone: +1-408-253-9640
Fax: +1-408-253-9641
http://www.hirose.com/us/

USA: HIROSE ELECTRIC (U.S.A.), INC. DETROIT OFFICE (AUTOMOTIVE)
17197 N. Laurel Park Drive, Suite 253,
Livonia, MI 48152
Phone: +1-734-542-9963
Fax: +1-734-542-9964
http://www.hirose.com/us/

USA: HIROSE ELECTRIC (U.S.A.), INC. BOSTON OFFICE
300 Brickstone Square Suite 201,
Andover, MA 01810
Phone: +1-978-662-5255

THE NETHERLANDS: HIROSE ELECTRIC EUROPE B.V.
Hogeheilweg # 8 1101 CC Amsterdam Z-O
Phone: +31-20-6557460
Fax: +31-20-6557469
http://www.hirose.com/eu/

GERMANY: HIROSE ELECTRIC EUROPE B.V. GERMAN BRANCH
Schoenbergerstr. 20, 73760 ostfildern
Phone: +49-711-456002-1
Fax: +49-711-456002-299
http://www.hirose.com/eu/

GERMANY: HIROSE ELECTRIC EUROPE B.V. NUREMBERG OFFICE
Neumeyerstrasse 22-26, 90411 Nurnberg
Phone: +49-1908 202050
Fax: +49-1908 202058
http://www.hirose.com/eu/

UNITED KINGDOM: HIROSE ELECTRIC EUROPE BV (UK BRANCH)
4 Newton Court, Kelvin Drive, Knowhill,
Milton Keynes, MK5 8NH
Phone: +44-1908 202050
Fax: +44-1908 202058
http://www.hirose.com/eu/

CHINA: HIROSE ELECTRIC (CHINA) CO., LTD. (SHANGHAI, HEADQUARTERS)
18, Enterprise Center Tower 2, 209# Gong He Road, Jing’an District, Shanghai, CHINA 200070
Phone: +86-21-6391-3355
Fax: +86-21-6391-3335
http://www.hirose.com/cn/

CHINA: HIROSE ELECTRIC (CHINA) CO., LTD. BEIJING BRANCH
Room 1001, West Wing, Tsim Sha Tsui Centre, 66 Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong
Phone: +852-2591-5533
Fax: +852-2591-6560
http://www.hirose.com/hk/

KOREA: HIROSE KOREA CO.,LTD.
143, Gongdan 1-daero, Siheung-si, Gyeonggi-do, 15084, Korea
Phone: +82-31-496-7000
Fax: +82-31-496-7100
http://www.hirose.co.kr/

INDIA: HIROSE ELECTRIC SINGAPORE PTE. LTD. BANGALORE LIASON OFFICE
Unit No-403, 4th Floor, No-84, Barton Centre, Mahatma Gandhi (MG) Road, Bangalore 560 001, Karnataka, India
Phone: +91-80-4120 1907
Fax: +91-80-4120 9908
http://www.hirose.com/sg/

SINGAPORE: HIROSE ELECTRIC SINGAPORE PTE. LTD.
03, Anson Road, #20-01, Spring Leaf Tower,
Singapore 079909
Phone: +65-6324-6113
Fax: +65-6324-6123
http://www.hirose.com/sg/

MALAYSIA: PENANG REPRESENTATIVE OFFICE
73-3-1, Ideal@The One, Jalan Mahsuri, Bayan Lepas Penang, 11990, Malaysia
Phone: +604-648-5536
http://www.hirose.com/mg/

INDIA: HIROSE ELECTRIC SINGAPORE PTE. LTD. DELHI LIASON OFFICE
Office NO.552, Regus-Green Boulevard, Level5, Tower C,
03, Anson Road, #20-01, Spring Leaf Tower,
Singapore 079909
Phone: +91-120-4804949
Fax: +91-120-4804949
http://www.hirose.com/sg/

THAILAND: BANGKOK OFFICE (REPRESENTATIVE OFFICE)
Unit 4703, 47th F L., 1 Empire Tower, South Sathorn Road, Yannawa, Sathorn, Bangkok 10120 Thailand
Phone: +66-2-686-1255
Fax: +66-2-686-3433
http://www.hirose.com/sg/

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

The characteristics and the specifications contained herein are for reference purpose. Please refer to the latest customer drawings prior to use. The contents of this catalog are current as of date of 08/2019. Contents are subject to change without notice for the purpose of improvements.