Automotive High Voltage Waterproof Connector

HVH-280 Series (Waterproof)



●Low Profile and Small Size

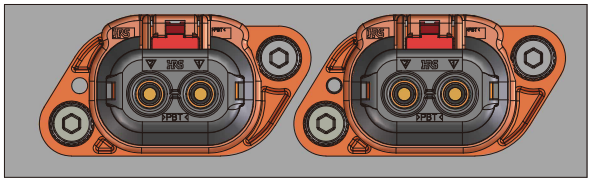


Fig.1

■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℃.

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.

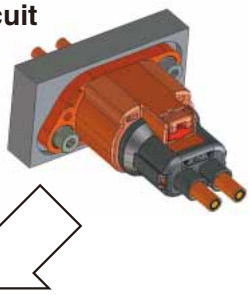
9. Mating Detection Circuit

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.

●Mating Detection Circuit

When the power terminal comes into contact, no current flows through the detection signal terminal.



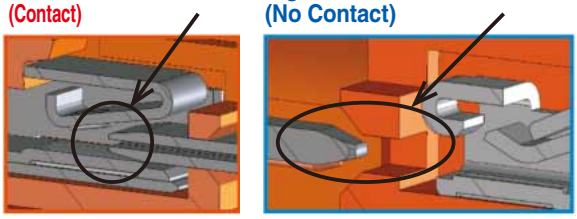


Fig.2

●EMI Prevention

Noise is transmitted through a metal shield to the panel, creating effective shielding.

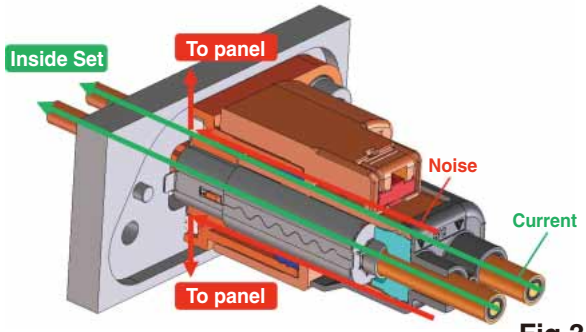


Fig.3

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■Product Specifications

Ratings	Rated Current	30A (Note 1)	Operating Temperature	-40℃ to +120℃
			Storage Temperature Range	-10℃ to +60℃ (Note 2)
	Rated Voltage	600V AC/DC	Storage Humidity Range	Relative humidity 85% or less (No condensation)

Items	Specifications	Conditions
1. Contact resistance	Power 3mΩ/ Signal 10mΩ/Shield 50mΩ max.	Measured at 10A DC
2. Insulation resistance	100MΩ min	Measured at 1000V DC
3. Withstanding Voltage	There shall be no flashover or dielectric breakdown.	Apply 2500V AC for 1 minute.
4. Mating Durability	Contact Resistance : Power 5mΩ/ Signal 20mΩ Max.	30 mating cycles (insertion/extraction)
5. Vibration Resistance	No electrical discontinuity of 1μs or more.	Frequency : 20 to 200Hz (acceleration : 88m/s^2) 3 minutes per cycle (Repeated) 3 directions, 3 cycles each.
6. Lock Strength	98N Min.	Breaking strength of the lock is measured while tensile in the direction of the mating axis
7. Breakage torque	No breakage	Tightened at 2.88N･m (Max.) using an M4 screw
8. Humidity Resistance	Contact resistance : Power 5mΩ/ Signal 20mΩ Max. Insulation resistance : 100MΩ Min.	Left at a temperature of 85℃ for 96 hours with a relative humidity of 90 to 95%
9. Thermal shock	Contact Resistance : Power 5mΩ Max. Insulation Resistance : 100MΩ Min.	Temperature -40°C → Room temperature → 120°C → Room temperature Time : 30 → 5 → 30 → 5 minutes for 1000 cycles
10. Heat resistance	Contact Resistance : Power 5mΩ/ Signal 20mΩ Max.	Left at a temperature of 125℃ for 300 hours
11. Cold resistance	Contact Resistance : Power 5mΩ/ Signal 20mΩ Max.	Left at a temperature of -40℃ for 120 hours
12. Sulfurous Acid Resistance	Contact Resistance : Power 5mΩ/ Signal 20mΩ Max.	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
13. Water resistance	No water immersion	After leaving the panel assembled in 125℃, flooding and cooling

Note 1 : Ambient temperature of 105℃ 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.

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■Materials / Finish

Product Component	Part	Material	Finish	UL Standard
Plug	Housing	PBT resin	Orange	UL94V-0
	Holder	PBT resin	Black	———
	Seal	Silicone rubber	White	———
	Shield Terminal	Stainless steel	Tin plating	———
	Terminal	Copper alloy	Tin plating	———
	Collar	SWCH	Nickel plating	———
Socket	Housing	PBT resin	Orange	UL94V-0
	CPA	PBT resin	Red	UL94V-0
	Holder	PBT resin	Black	———
	Seal	Silicone rubber	Blue, rouge	———
	Shield terminal	Stainless steel	Tin plating	———
	Terminal	Copper alloy	Tin 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.

●**Plug Housing**

HVH – 280 – 2 / 2 P – HU
❶ ❷ ❸ ❹ ❺ ❻

●**Socket Holder**

HVH – 280 – 2 / 2 S – HO
❶ ❷ ❸ ❹ ❺ ❻

❶Series Name : HVH	
❷Series No. : 280	
❸Number of contacts	Power : 2
❹Signal : 2	
❺Connector type	P : Plug type S : Socket type
❻Form type	HU : Housing HO : Holder

●**Terminal**

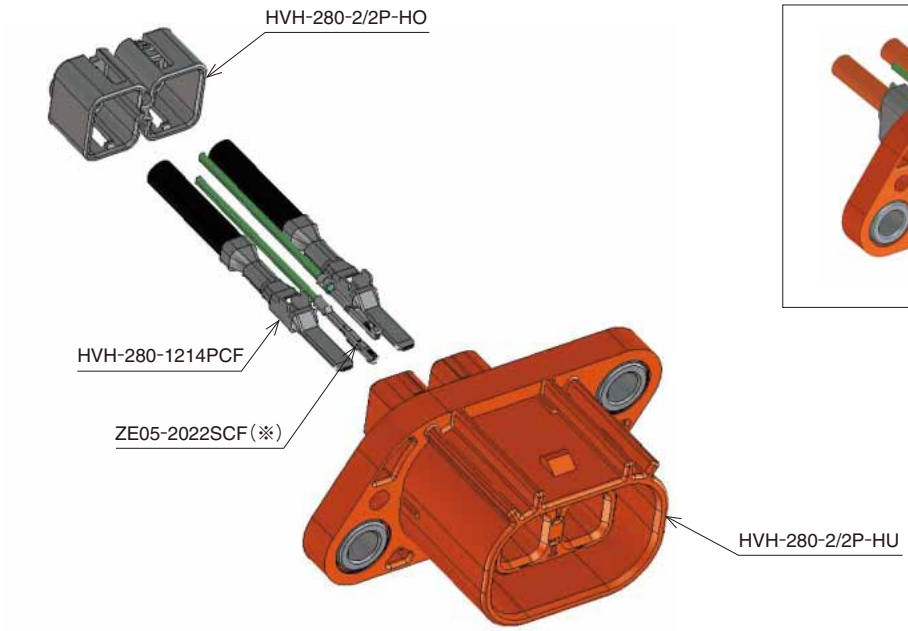
HVH – 280 – 1214 SCF
❶ ❷ ❸ ❹

❶Series Name : HVH	
❷Series No. : 280	
❸Applicable Wire size	1214 : 12 to 14 AWG
❹Form Type	PCF : Plug crimp terminal/reel SCF : Socket crimp terminal/reel

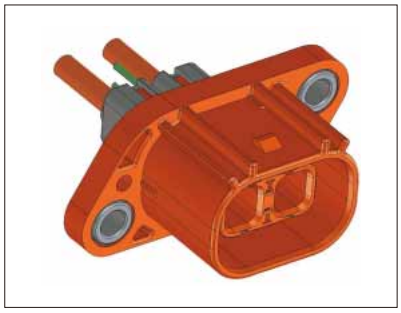
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■Product Configurations

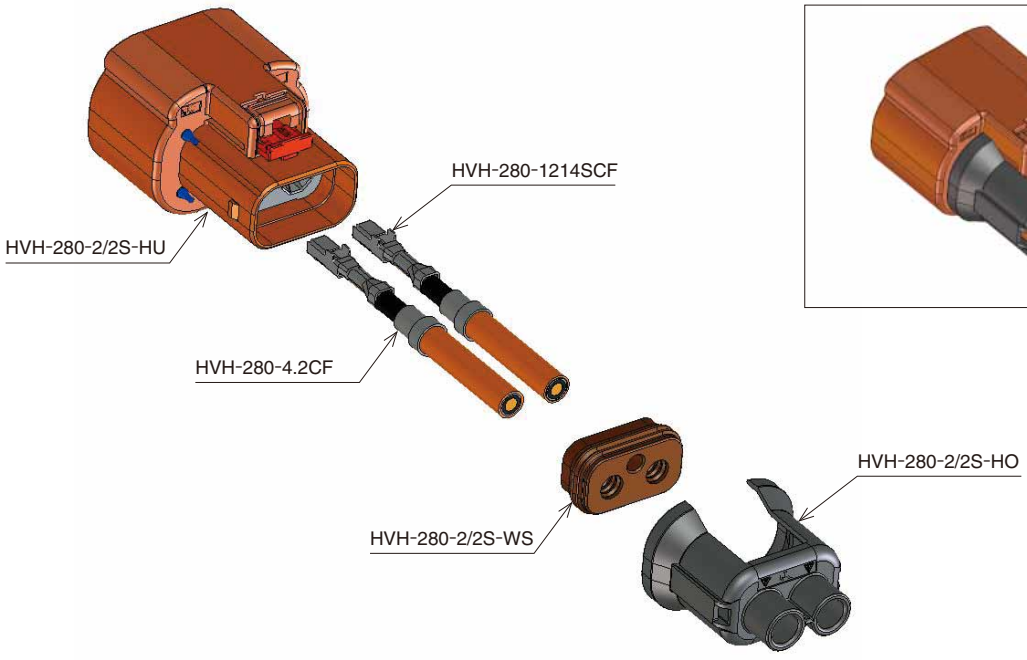
●Plug connector



■Plug connector (assembled)



●Socket connector



■Socket connector (assembled)

■HVH-280 Series Mating Table

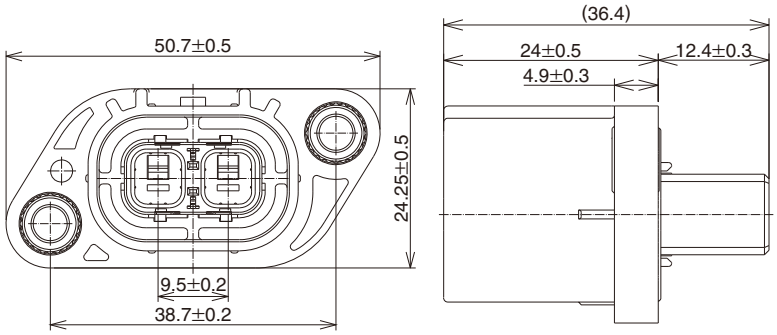
Plug connector		Socket connector	
HVH-280 2pos. Plug connector	Configuration Product Name	HVH-280 2pos. Socket Connector	Configuration Product Name
	HVH-280-2/2P-HU		HVH-280-2/2S-HU
	HVH-280-2/2P-HO		HVH-280-2/2S-HO
	HVH-280-1214PCF		HVH-280-2/2S-WS
	ZE05-2022SCF(※)		HVH-280-1214SCF
			HVH-280-4.2CF

✻Required only for when using the mating detection feature.

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■Plug





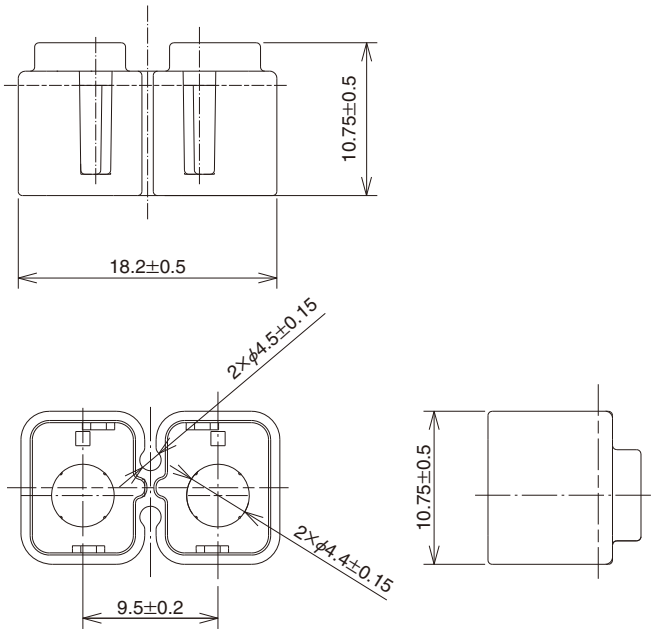
Part No.	HRS No.	Key Position
HVH-280-2/2P-HU	778-0500-0	Standard key
HVH-280-2/2P-HU(A)	778-0510-0	(A) Key
HVH-280-2/2P-HU(B)	Under development (Note 2)	(B) Key

Standard Key	(A) Key	(B) Key (Note 2)
		

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





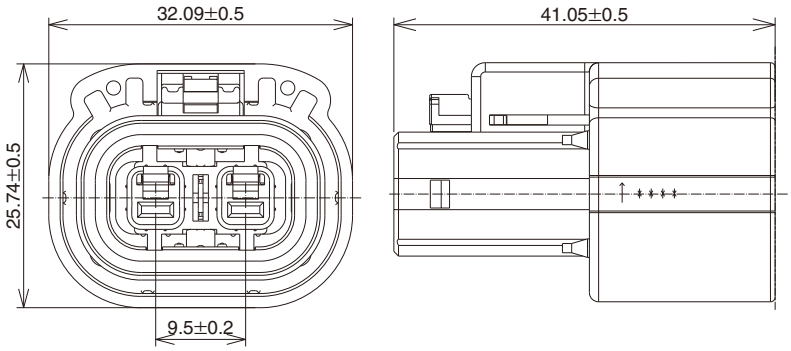
Part No.	HRS No.
HVH-280-2/2P-HO	778-0506-0

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 ϕ4.0 to 4.4mm Interface cable : ϕ1.5mm max.
Please contact a Hirose sales representative regarding other cables.

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■Socket





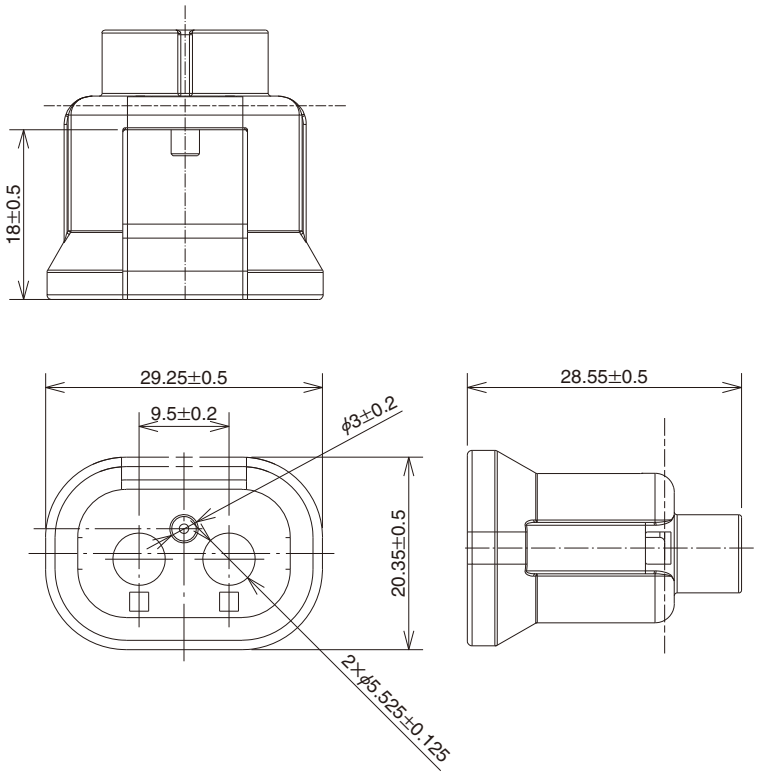
Part No.	HRS No.	Key Position
HVH-280-2/2S-HU	778-0504-0	Standard Key
HVH-280-2/2S-HU(A)	778-0508-0	(A) Key
HVH-280-2/2S-HU(B)	Under development (Note 2)	(B) Key

Standard Key	(A) Key	(B) Key (Note 2)
		

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





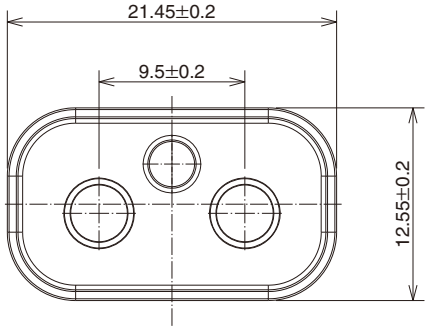
Part No.	HRS No.
HVH-280-2/2S-HO	778-0507-0

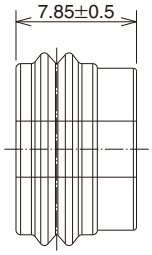
Note 1 : The product is sold in packs (100 pieces per pack) so please order based on number of packs.
Note 2 : This product is compatible with wires that have an outer diameter of φ5.0 to 5.4mm.
Please contact a Hirose sales representative regarding other cables.

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■Seal





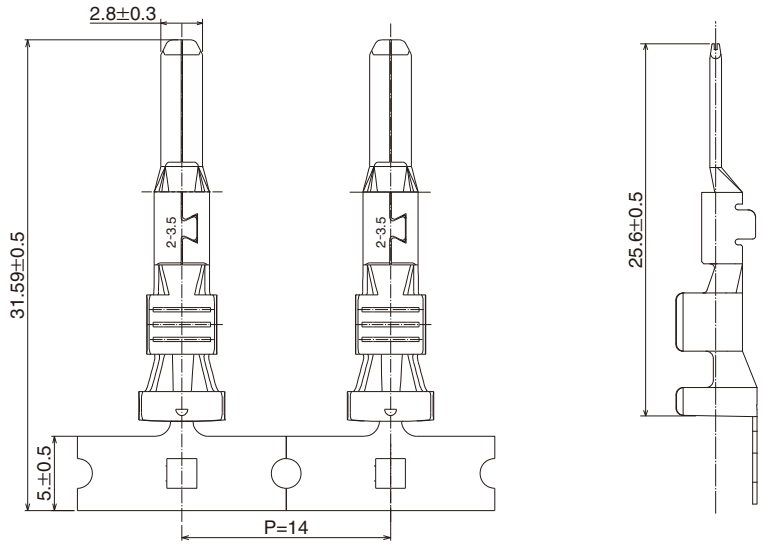


Part No.	HRS No.
HVH-280-2/2S-WS	778-0505-0

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 ϕ5.0 to 5.4mm.
Please contact a Hirose sales representative regarding other cables.

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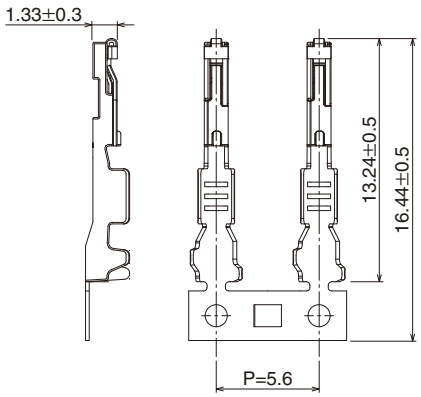
■Plug Crimp Terminal (Power)



Part No.	HRS No.	Material	Finish	Core cable size	Outer Diameter	Sales Unit
HVH-280-1214PCF	778-0501-0	Copper Alloy	Tin plating	12 to 14 AWG 2.176 to 3.619mm^2	ϕ3.6 to 4.4	1 Reel (2,000 rolls)

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 : Any problems that occur from using tools other than those specified by Hirose are not covered by warranty.

■Plug detection crimp terminal (Signal)

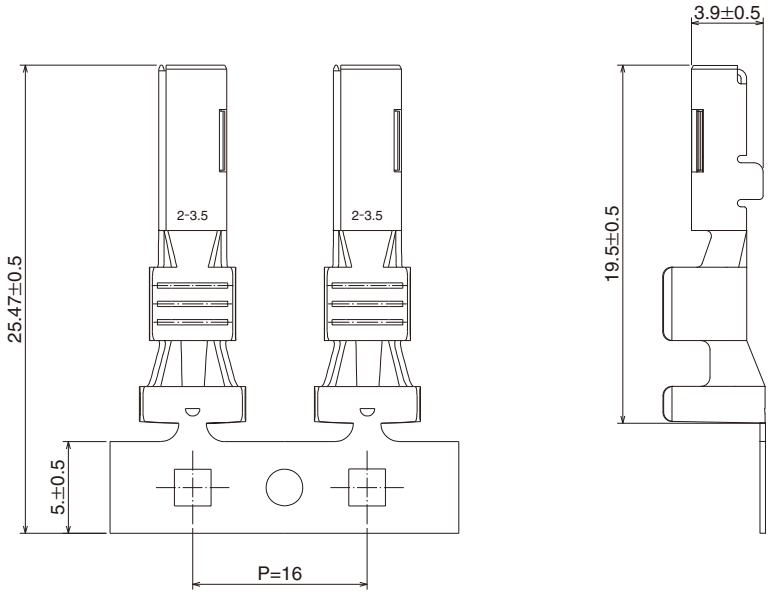


Part No.	HRS No.	Material	Finish	Core cable size	Outer Diameter	Sales Unit
ZE05-2022SCF	752-2001-0	Copper alloy	Tin plating	20 to 22 AWG 0.35 to 0.517mm^2	ϕ1.5	1 Reel (10,000 rolls)

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 : Any problems that occur from using tools other than those specified by Hirose are not covered by warranty.

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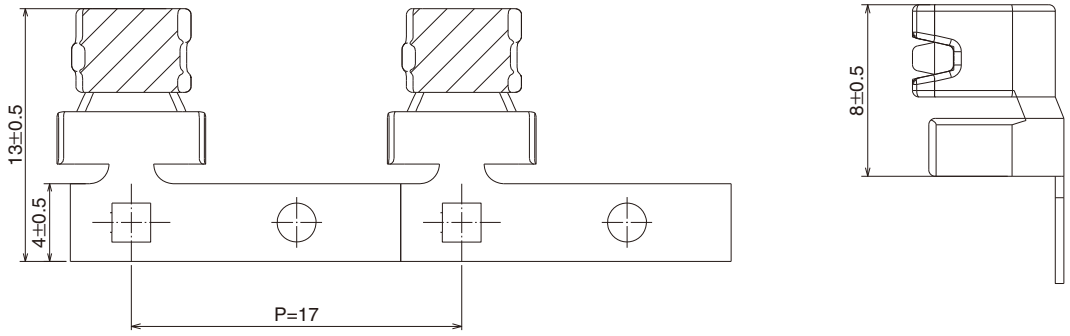
■Socket crimp terminal



Part No.	HRS No.	Material	Finish	Core cable size	Outer Diameter	Sales Unit
HVH-280-1214SCF	778-0502-0	Copper alloy	Tin plating	12 to 14 AWG 2.176 to 3.619mm²	ϕ3.6 to 4.4	1 reel (1,700 rolls)

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 : Any problems that occur from using tools other than those specified by Hirose are not covered by warranty.

■Ground crimp terminal for socket



Part No.	HRS No.	Material	Finish	Braided Outside Diameter	Outer Diameter	Sales Unit
HVH-280-4.2CF	778-0503-0	Copper alloy	Tin plating	Approx ϕ4.3	ϕ5.0 to 5.4	1 reel (1,400 rolls)

Note 1 : Please contact a Hirose representative regarding the use of cables other than the sizes listed above.
Note 2 : Any problems that occur from using tools other than those specified by Hirose are not covered by warranty.

◆Applicable Adapter Tool

Type	Part No.	HRS No.	Applicable contact
Applicator	AP105-HVH-280-1214P	901-5245-0	HVH-280-1214PCF
	AP105-HVH-280-1214S	901-5244-0	HVH-280-1214SCF
	AP105-HVH-280-4.2CF	901-5246-0	HVH-280-4.2CF
	AP105-ZE05-2022S	901-5239-0	ZE05-2022SCF
Extraction tool	HVH-280-ZE05/RE-MD	902-5158-0	ZE05-2022SCF

Note 1 : Please use a press machine of 2t or more.
Note 2 : Any problems that occur from using tools other than those specified by Hirose are not covered by warranty.
Note 3 : Crimping work shall be conducted in accordance with the "Crimping Standard" and "Crimping Conditions Table".

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◆How to Extract the Terminal

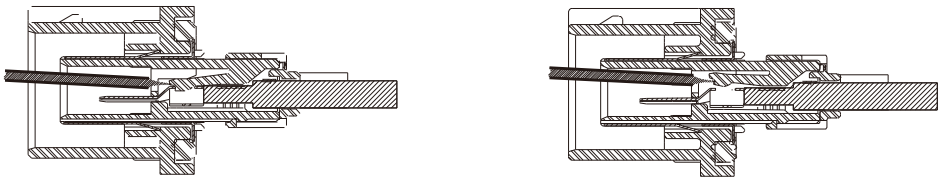
●Terminal extraction tools : Precision screwdriver (flathead screwdriver), HVH-280-ZE05/RE-MD
●Applicable crimp terminals : HVH-280-1214 PCF, HVH-280-1214SCF, ZE05-2022SCF
●Operation Method

・**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.

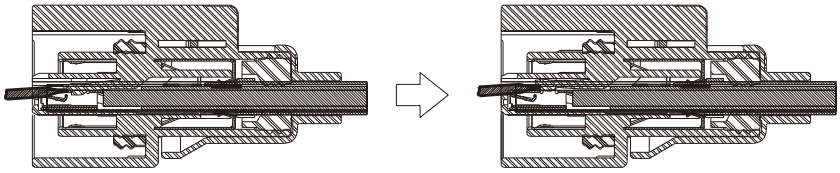
Caution : Do not push the terminal locking part or contact. It may lead to deformation or damage to the housing and other parts. When damaged, please replace it with a new one.

Housing cross-section diagram

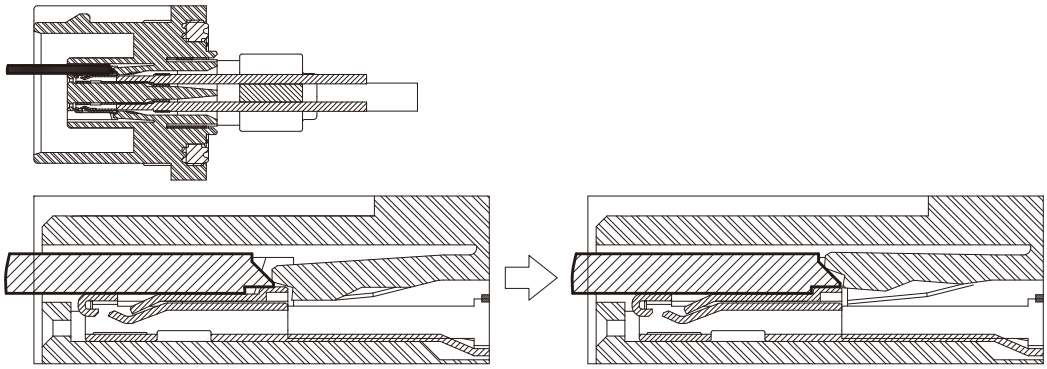
HVH-280-1214PCF
(Precision screwdriver)



HVH-280-1214SCF
(Precision screwdriver)



ZE05-2022SCF
(HVH-280-ZE05/RE-MD)



◆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.

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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 07/2022. Contents are subject to change without notice for the purpose of improvements.