

## Nylon Connector Use Handbook

### 1. Part No. designation and Specifications of Connectors

#### 1-1. Part No.

Hirose products are identified using two number designations: Part number and HRS number. The meaning of each is explained below:

Item	Example	Purpose Meaning
Part No.	DF1B-2S-2.5R	This identifies the connector series and it's specific characteristics.
HRS No.	CL541-0200-6	This number is used by Hirose for product management purpose.

When ordering connectors please specify both numbers!

#### 1-2. Packaging Specification Codes

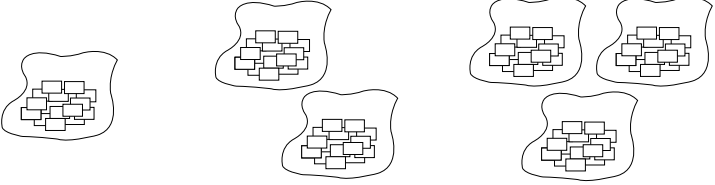
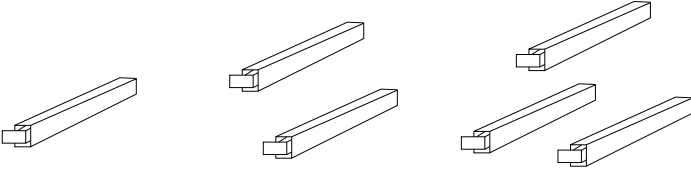
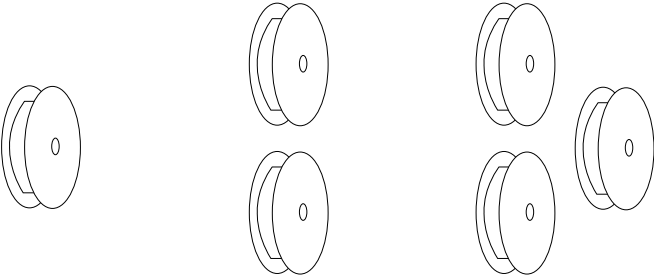
Additional code letters, numbers or symbols at the end of the Part Number may designate specific connector feature or specific type of packaging.

Examples

Packaging type	Part No./HRS No. (Example)	Packaging Specification Details (Example)
Standard- no code Without Packaging Spec. Code	DF1B-2S-2.5R CL541-0200-6	Standard 1 bag containing 100 pieces
With packaging code With Packaging Spec. Code	DF1B-2S-2.5R(40) CL541-0200-6-40	Change in quantity per package 500 pieces packaged in 1 bag

### 2. Connector Sales Quantities

The connectors are sold in three (3) forms of packaging:

<p>① <b>Package Unit Sales</b></p> <p>Object</p> <ul style="list-style-type: none"> <li>■ No packaging code. Products without specification codes</li> </ul> <p>[ 1 bag is a packaging containing 100 pieces ]                      [ Ordering is by the bag unit. ]</p>	 <p>1 bag (100 pieces) → 2 bags (200 pieces) → 3 bags (300 pieces)</p>
<p>② <b>Pieces Unit</b></p> <p>Object</p> <ul style="list-style-type: none"> <li>■ Items packaged in tube magazines</li> </ul> <p>[ Ordering is by multiples of the number of pieces contained in a single tube magazine. ]</p>	 <p>20 pieces → 40 pieces → 60 pieces</p>
<p>③ <b>Reel Unit</b></p> <p>Object</p> <ul style="list-style-type: none"> <li>■ Reeled contacts</li> <li>■ Reel packaging items</li> </ul> <p>[ Ordering is by the reel unit. ]</p> <p>Note: See the catalog for the package quantity per reel.</p>	 <p>1 reel → 2 reels → 3 reels</p>

### 3. Guideline of Plating Selection for contact mating areas.

Hirose Electric offers choices of plating types on the contacts mating and termination areas.

The choice of type of plating is dictated by conditions under which the connector is intended to be used.

■ Conditions under which the use of gold plating is recommended

Feature	Recommended use of gold plating
Number of connector mating /un-mating cycles	When 30 or more cycles is anticipated.
Vibration / Shock	Equipment exposed to continuous or intermittent vibration or shocks. Note: Excluding cases where the vibration or shock does not directly affect the connector. Except cases when shock / vibration is not transmitted directly to the connector. E.g. Connector mounted on PC board cushioned by rubber grommets or pads.
Environmental Conditions	When the usage environment is unfavorable, or when there is the effect of hydrogen sulfide, salt water, or sulfur dioxide. When connector is placed in corrosive environment (hydrogen sulfide, salt, sulfur dioxide) or is exposed to outdoor conditions.
Current	When connector is used to transmit very small electrical currents, 100 mA or less.

Note 1: Avoid mating of connectors with gold plated contacts in engagement areas with connectors having tin plated contacts in corresponding areas. This is specially true when connectors may encounter humid or corrosive environments.

Each plating has different electrical potential and may create galvanic corrosion, leading to intermittent or permanent conductivity interruption at contact points.

### 4. Cable termination – crimp contact.

#### 4-1. Information Required Prior to Starting Cable Termination.

It is recommended that prior to starting of the cable termination the following information be obtained from Hirose (\*\* indicates required documents).

All documents may be requested from the nearest Hirose sales office.

Document Name	Listed Contents	Automatic Crimping Machine	Hand Crimping Tool	Automatic ID Machine	Hand ID Tool
① Instruction Manual – Contact crimp termination	· Description of the press	●	—	—	—
② Installation Table – Applicator parts	· Installation instruction- Applicator	●	—	—	—
③ Table of crimp conditions	· Crimp height · Tensile strength	● —	— —	— —	— —
④ Manual of Crimp Quality Standards	· Outer insulation jacket position · Conductor tip position · Bell-mouth dimensions · Bend up · Bend down · Twist · Rolling · Lance height · Cutoff tab · Strip length · Crimp burr height	●	—	—	—
Manual Crimping Tool Instruction Manual	· Crimp height · Tensile strength · Other inspection items	—	●	—	—

## 4-2. Precautions Related to Crimp Height

Correct crimp height is very critical for performance of crimped terminations. Incorrect crimp height may affect the performance of terminated conductors and may lead to failures in the field. Please follow all recommended procedures. Obtain and follow recommendations of Table of Crimp Conditions when any change in cables or contacts is expected.

Example of changes of Crimp Height
<ul style="list-style-type: none"><li>● There may be difference between gold plated and tin plated the same wire gage conductors.</li><li>● There may be difference between non-coated stranded conductors and tin coated stranded conductors</li><li>● There may be difference between conductors of different structure.</li></ul>

■ When ordering the Table of Crimp Conditions please provide the following information:

(1) Contact part number and description: (2) Specification of the cable (dimensional, construction, individual conductor size, outer insulation jacket diameter and material) and manufacturer name.

Note: a, Crimping of the following types of cables should be avoided:

- Cables with individual solid conductors.
- Cables with individual conductors iterlayered with Tetron tape.
- Cables with tin coated conductors of size AWG 28 or smaller.

Note: b, Individual conductors using stranded wire of 0.08 mm diameter may exhibit pronounced drop in the pulling strength and obtaining of correct crimp height may be impossible.

## 4-3. When using other than Hirose recommended cable.

Hirose catalog lists recommended applicable cables for crimp terminations with applicable contacts.

When considering use of other cables, please request and refer to Table of Crimp Conditions.

The parameters listed in it should be used for verifications of terminations where crimps are already made.

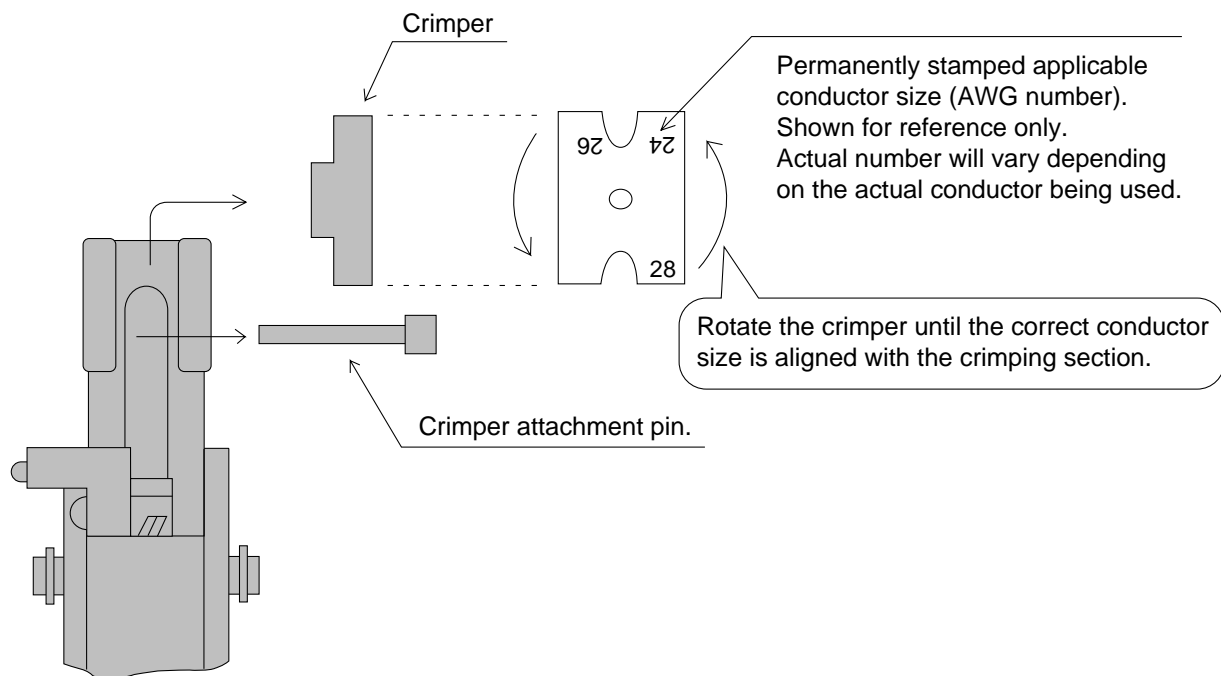
If the crimp terminations are not made and user is seeking recommendations from Hirose on the specific cable/conductor termination, we will perform evaluation test and provide needed data.

Evaluation test will require user to provide Hirose with a 20m long sample of the cable, as well as the available cable specification.

■ Wire required for evaluation test: 20 m

## 4-4. Recommendations when selecting correct crimp in the Hand Crimping Tool.

Rotating of the crimper allows selection of one of several AWG wire sizes to be terminated. Selection of correct position for applicable wire size (AWG) is critical.



[Hand Crimping Tool Crimping Portion]

Note: The hand crimping tool cannot accommodate any adjustments of crimp height. When crimping cables that are larger than the specified for Hand Crimping Tool and fine adjustment of crimp height is required it is recommended to use Automatic Crimping Machine.

#### 4-5. Insulation Displacement Height Gauge

Use the special height gauge listed below for insulation displacement height measurements.  
The measuring tip of the gage is designed for this specific measurement

Product name: DF1B Height Gauge

Dealer: Yokoyama Machine Co., Ltd.

〒2-1-19 Omorihoncho, Ota-ku, Tokyo

TEL: 03-3765-6621

FAX: 03-3765-6603

Note: This gage has to be ordered directly from the dealer.

Note: In addition to the DF1B series, this height gauge can also be used with DF3, DF4, and DF11 series connectors.



#### 4-6. Recommendations Related to the Electrical Inspection of the terminated wiring.

The inspection of electrical continuity is conducted by connecting to applicable mating connectors. It is critical that the pins of this connector be of correct size, length, straight and without any damage.  
Incorrect pin size may damage the contact, resulting in poor electrical connection.

### 5. Recommendations for surface mounting

#### 5-1. Temperature Profile

The solder temperature requirements for board installation should follow the "Temperature Profile" recommended by Hirose (listed in the applicable catalog).

#### 5-2. Solder Mask Thickness

Use Hirose recommended solder mask thickness to determine the required thickness of the solder paste (listed in the applicable catalog).

#### 5-3. Silk Screen Printing

Care should be taken so that silk screen printing is not applied at the bottom surface of the connectors. The connector may be raised off the board by the thickness of the silk screen print. This may make soldering difficult.



#### 5-4. Discoloration of the insulator housing after solder reflow.

Slight discoloration of the insulator housing will not affect connector quality or performance.  
Severe discoloration may indicate that the recommended maximum solder temperature of 240C has been exceeded. Verify the solder temperature profile.

## 6. Cleaning recommendations

### 6-1. Organic Solvent cleaning

[Table 1. ] Organic Solvent Cleaning of the Contacts Only.

Solvent type	Normal Temperature Cleaning	Heated Cleaning
IPA (Isopropyl alcohol)	✓	✓
HCFC (Hydrochlorofluorocarbon)	✓	✓

[Table 2. ] Organic Solvent Cleaning of Contacts with attached and terminated conductors. (Note 1)

Solvent type	Normal Temperature Cleaning
IPA (Isopropyl alcohol)	✓  5 minutes max.

Note 1: This applies to connector terminations where individual conductors are exposed to cleaning solutions.

✓ : Cleaning permitted

### 6-2. Water Based Cleaning

When using water based cleaning agents (e.g., terpene, and alkali saponifiers), select the cleaning agent based on the documentation issued by the various manufacturers of cleaning agents. Special attention should be focused on the effect of cleaning agent on metals, platings and plastics.  
 Any moisture left on connectors after the cleaning should be removed.

Also be careful that parts are not left with moisture remaining on them.

## 7. Electrical Current Ratings

The rated current listed in the catalog indicates the allowable current per contact. However, in applications requiring current transmission through all the contacts, about one-third of the listed rating should be applied.

When the rated current for the connector is 3 A, and the allowable current of the conductor being used is 1 A, then rating of 1 A will be used for the entire assembly.

The connectors should not be connected/disconnected when the electrical current is being applied.

Hot swap should not be performed.



## Attention!

Read, understand and follow recommendations given in Connector Use Handbook for Hirose's DF, MDF and HNC Series connectors.



## CAUTION

### ■ Injury

1. Improper handling of the jigs, fixtures and tools could result in accidents and injury. Read, understand and follow the applicable Instruction Manual!
2. Exercise extreme caution when handling connectors with exposed terminals, metal hardware or exposed conductors. Most damages and injuries happen when trying to connect/disconnect small connectors not mounted on board or in restricted areas.
3. Contacts on reels and separation paper should be handled carefully as not to cause injuries.

### ■ Intermating

1. Hirose can not guarantee performance when our connectors are mated with other manufacturers connectors.
2. Avoid mating of connectors having different plating on contact mating areas.
3. Use with cables other than recommended by Hirose cannot be guaranteed. However, should such consideration be required, please contact us in advance.
4. Any performance, termination or placement problems caused by use of any tools not recommended by Hirose will not be covered by product warranty.

### ■ Specific applications

1. Performance can not be guaranteed when connectors are used in aviation, space and nuclear applications.
2. Contact Hirose when considering use of connectors in automotive or marine environments.
3. Contact Hirose when considering use of connectors in outdoor or harsh environments.

### ■ Electrical Current Rating.

Do not exceed specified current rating.

### ■ Damage

Do not apply excessive force to terminated or mounted connectors. Shock, vibration, strain, twist or pull on the conductors may cause intermittent or permanent electrical discontinuity.

### ■ Short Circuits

Assure that the connectors do not come in direct contact with electrically conductive surfaces.