

**NEW**

# MS type Lower Profile Plug

H/MS Series

Circular connector conforming to MIL-C-5015

PAT.P



## ■ Features

### 1. 20% Height Reduction

When compared with existing H/MS Series connectors the overall height of plug assemblies is lower, allowing it to be used in space constrained applications.

### 2. Cable Exit in 360° Directions

The cable can exit in any of the 8 fixed direction, in 45° increments.

### 3. Simple Assembly

The 2-piece design consisting of the contact/insulator assembly and the back-shell assembly allows termination without the use of any specialized tools.

### 4. Water and Dust Protection

IP 67 rating when fully terminated and mated with corresponding part.

### 5. TUV Certification

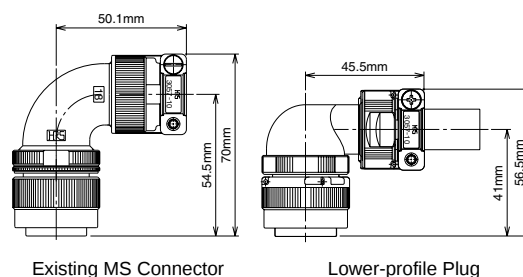
Provided with a protective circuit function for TUV certification. The (D) pin is directly connected to the outside metal case.

## ■ Applications

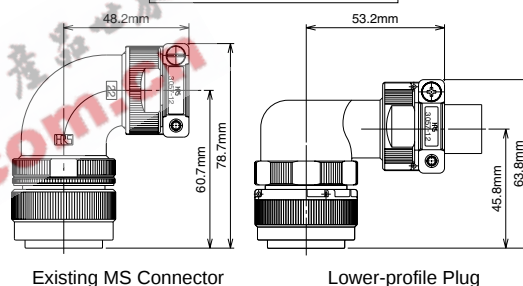
Factory automation equipment, robotic equipment, servo motors, and a wide variety of industrial and measuring instruments.

## Connector Height Comparison

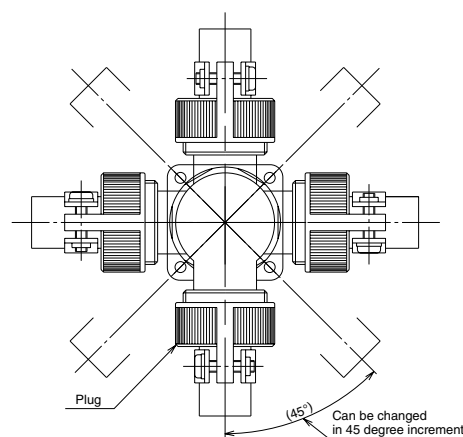
### 18-10 Size



### 22-22 Size



## Cable Exit Direction of 360°



## ■Product Specifications

|        |                |                                                                                                                                      |                                              |
|--------|----------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Rating | Voltage rating | 250VAC, 250V DC (pollution degree: 3, overvoltage category: III)<br>500V AC, 500V DC (pollution degree: 2, overvoltage category: II) | Operating temperature range<br>-25℃ to +125℃ |
|        | Current rating | 23A Max. (18-10 size)<br>46A Max. (22-22 size)                                                                                       | Storage temperature range<br>-25℃ to +125℃   |

| Item                                     | Specification                                                                         |                                        | Conditions                                                                                                                     |
|------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
|                                          | 18-10 size                                                                            | 22-22 size                             |                                                                                                                                |
| 1. Contact resistance                    | 3 m ohms max.                                                                         | 1 m ohms max.                          | 1A DC                                                                                                                          |
| 2. Insulation resistance                 | 5000 M ohms min.                                                                      |                                        | 500 V DC                                                                                                                       |
| 3. Withstanding voltage                  | No flashover or insulation breakdown.                                                 |                                        | 2250V AC/one minute.                                                                                                           |
| 4. Vibration                             | No electrical discontinuity for 10 ms max.                                            |                                        | Frequency: 10 to 500 Hz, single amplitude of 0.75 mm, acceleration of 98 m/s <sup>2</sup> for 3 hours in 3 axis.               |
| 5. Shock                                 |                                                                                       |                                        | Acceleration of 490 m/s <sup>2</sup> , 11ms duration, sine half-wave waveform, 3 cycles in each of the 3 axis.                 |
| 6. Durability<br>(insertion/ withdrawal) | Contact resistance:<br>4.5 m ohms max.                                                | Contact resistance:<br>1.5 m ohms max. | 500 cycles                                                                                                                     |
| 7. Temperature cycle                     | Insulation resistance: 5000 M ohms min.                                               |                                        | Temperature: -55℃ → Room temperature to +125℃ → Room temperature<br>Time: 30 → 10 to 15 → 30 → 10 to 15 (Minutes)<br>5 cycles. |
| 8. Humidity                              | Insulation resistance: 50 M ohms min. (Humidity state)<br>500 M ohms min. (Dry state) |                                        | 96 hours at temperature of 71℃ and humidity of 95% .                                                                           |
| 9. Water/dust protection                 | When mated with corresponding connector.                                              |                                        | No dust penetration.<br>No water penetration when submerged for 0.5 hour at the depth of 1 meter.                              |

## ■Materials

| Item            | Material           | Finish         | Remarks |
|-----------------|--------------------|----------------|---------|
| Body            | Aluminum alloy     | Black chromate | _____   |
| Insulator       | PPS                | Color: Black   | UL94V-0 |
| Socket Contacts | Copper alloy       | Silver plating | _____   |
| Gasket          | Silicone Rubber    | Color: Black   | _____   |
| Bushing         | Chloroprene rubber | Color: Black   | _____   |

## ■Additional Product Information

### 1. Product number suffixes

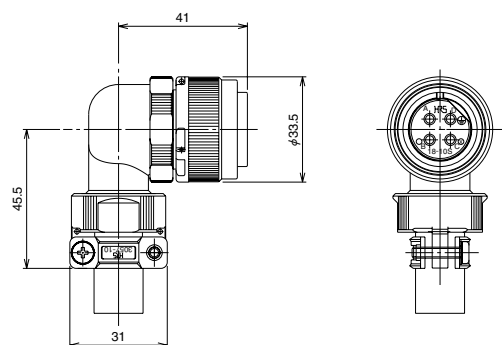
- (10) Supplied with a wire hole in the locking ring (to prevent loosening of the ring).  
(11) Supplied without the wire hole in the locking ring.

### 2. Corresponding receptacles.

- 18-10 Size: Part number H/MS3102A18-10P-D-T1(10)  
22-22 Size: Part number H/MS3102A22-22P-D-T(10)

## ■ Plug

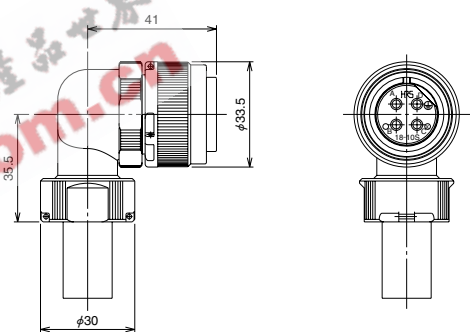
### H/MS08A18-10S-DT10D(10)



Shown one type.

| Part Number              | CL No.        | Number of Contacts | Weight | Applicable Cable Diameter         | Contact solder pot inner diameter |
|--------------------------|---------------|--------------------|--------|-----------------------------------|-----------------------------------|
| H/MS08A18-10S-DT10D(10)  | 120-0476-3-10 | 4                  | 89g    | $\phi 12 \sim \phi 14.3\text{mm}$ | 2.5mm                             |
| H/MS08A18-10S-DT10D(11)  | 120-0476-3-11 |                    |        |                                   |                                   |
| H/MS08A18-10S-DT10D1(10) | 120-0481-3-10 |                    |        | $\phi 10 \sim \phi 12.5\text{mm}$ |                                   |
| H/MS08A18-10S-DT10D1(11) | 120-0481-3-10 |                    |        |                                   |                                   |

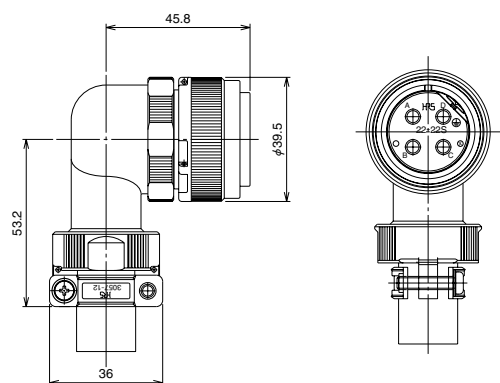
### H/MS08A18-10S-DT10C(10)



Shown one type.

| Part Number             | CL No.        | Number of Contacts | Weight | Applicable Cable Diameter         | Contact solder pot inner diameter |
|-------------------------|---------------|--------------------|--------|-----------------------------------|-----------------------------------|
| H/MS08A18-10S-DT10C(10) | 120-0480-0-10 | 4                  | 77.6g  | $\phi 13 \sim \phi 14.3\text{mm}$ | 2.5mm                             |
| H/MS08A18-10S-DT10C(11) | 120-0480-0-11 |                    |        |                                   |                                   |

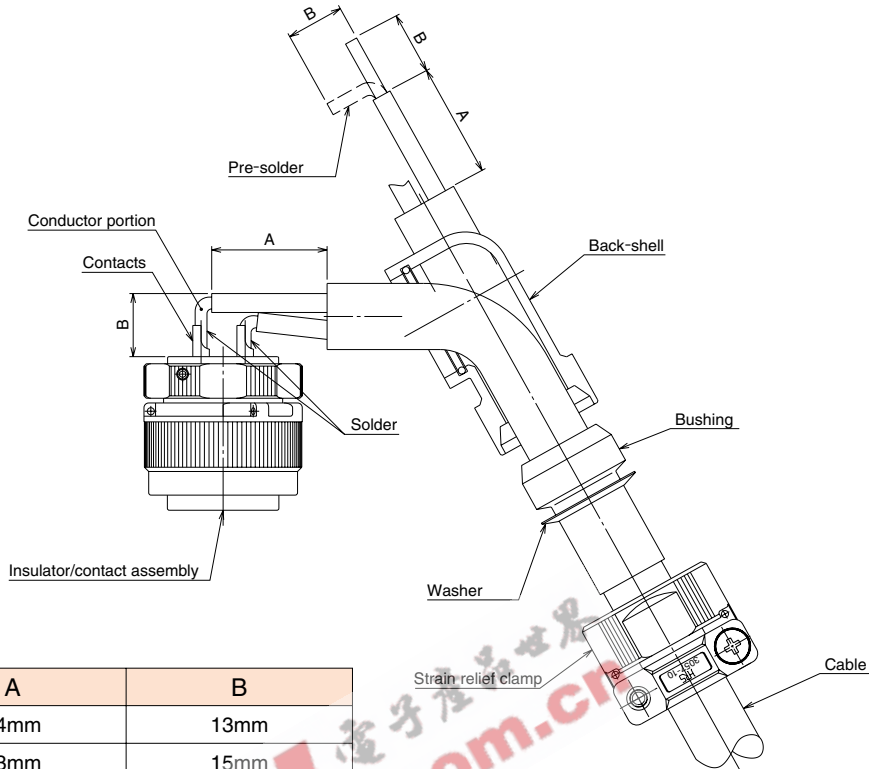
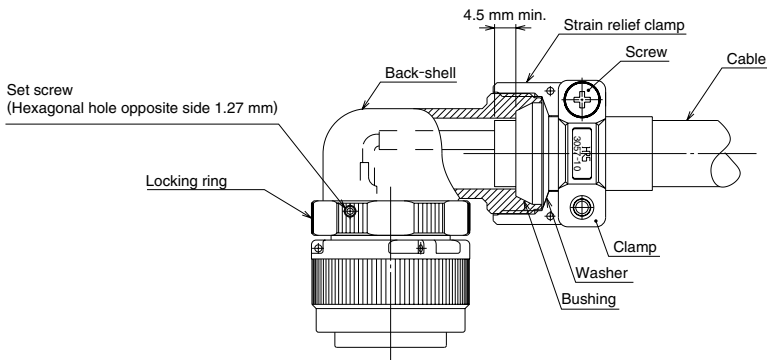
### H/MS08A22-22S-DT12D(10)



Shown one type.

| Part Number              | CL No.        | Number of Contacts | Weight | Applicable Cable Diameter         | Contact solder pot inner diameter |
|--------------------------|---------------|--------------------|--------|-----------------------------------|-----------------------------------|
| H/MS08A22-22S-DT12D(10)  | 120-0477-6-10 | 4                  | 127g   | $\phi 13 \sim \phi 15.9\text{mm}$ | 4.5mm                             |
| H/MS08A22-22S-DT12D(11)  | 120-0477-6-11 |                    |        |                                   |                                   |
| H/MS08A22-22S-DT12D1(10) | 120-0482-6-10 |                    |        | $\phi 10 \sim \phi 13.5\text{mm}$ |                                   |
| H/MS08A22-22S-DT12D1(11) | 120-0482-6-11 |                    |        |                                   |                                   |

## ◆ Assembly Procedures

| Process       | Outline of assembly                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |              |             |               |             |      |      |            |      |      |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------|---------------|-------------|------|------|------------|------|------|
| 1             | <div></div> <div><p>Table 1</p><table><tr><th></th><th>A</th><th>B</th></tr><tr><td>18-10 Size</td><td>24mm</td><td>13mm</td></tr><tr><td>22-22 Size</td><td>33mm</td><td>15mm</td></tr></table></div> <div><p>a. Pass the strain relief clamp, washer, bushing, and hood over the cable, in this order.</p><p>b. Prepare the cable and conductors per the dimensions in Table 1.</p><p>c. Bend the exposed conductor to the B dimension as indicated in Table 1.</p><p>d. Pre-solder the exposed conductor and solder it as shown to the exposed contact.</p><p>Note: Use care not to damage the conductor's insulation.</p></div>                                          |              | A           | B             | 18-10 Size  | 24mm | 13mm | 22-22 Size | 33mm | 15mm |
|               | A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | B            |             |               |             |      |      |            |      |      |
| 18-10 Size    | 24mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 13mm         |             |               |             |      |      |            |      |      |
| 22-22 Size    | 33mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 15mm         |             |               |             |      |      |            |      |      |
| 2             | <div></div> <div><p>Table 2</p><table><tr><th>Locking Ring</th><th>Cable Clamp</th></tr><tr><td>3 to 3.5N · m</td><td>5 to 6N · m</td></tr></table></div> <div><p>a. Place over the contact/insulator assembly (in the following order:Back shell, bushing, washer, strain relief clamp).</p><p>b. Tighten the Locking ring and Cable clamp to the torque values per Table 2.</p><p>c. Tighten the set screw to a torque value of 0.3-0.4 N·m<br/>HRS recommended tool: PB205/1.27 (CL150-0066-3) or equivalent.</p><p>d. Using screwdriver tighten the two strain relief clamp screws until both sides of the moveable part are in contact with the cable clamp.</p></div> | Locking Ring | Cable Clamp | 3 to 3.5N · m | 5 to 6N · m |      |      |            |      |      |
| Locking Ring  | Cable Clamp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |              |             |               |             |      |      |            |      |      |
| 3 to 3.5N · m | 5 to 6N · m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |              |             |               |             |      |      |            |      |      |



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# **H/MS SERIES CIRCULAR CONNECTORS**

## **H/MS SERIES CIRCULAR CONNECTORS COMPLYING WITH JIS B 6015 & MIL GENERAL**

### ■ Scope

The H/MS Series are circular multi-contact connectors meeting the MIL-C-5015 requirements, developed by HIROSE over long years of experience. Connectors complying with TÜV (DIN VDE 0627) and JIS B 6015 (Electric Equipment (electric Equipment for Machine Tools) are not only equipped with protective circuits (grounding terminals), but also compatible with the MS connectors. Thus, the H/MS Series can replace conventional MS connectors easily without any modification on the set side, thus meeting the increasing requirements for safety worldwide.



### ■ Features

1. **Waterproof plugs available**  
Waterproof plugs are available in L-shaped and straight types. The L-shaped type ensures waterproof mating with the sectioned receptacles. Its waterproof performance satisfies IP67F or more.
2. **Waterproof separate receptacle**  
Receptacles are available in models complying with JIS or not complying with JIS, preventing water from entering. Their waterproof performance satisfies exceeds IP67F.
3. **Models complying with TÜV and JIS B 6015 are equipped with protective circuits (grounding)**  
During insertion or extraction, the connector is grounded before the other circuits are connected, and disconnected after all other circuits are disconnected. The protective circuit is designed such that it is connected directly to the outer metal case of the connector.
4. **Available in a variety of models**  
Plugs are available in Right Angle or straight types, waterproof or non-waterproof, and complying or not complying with JIS and TÜV.

## Material Finish

| Part No.        | Material                     | Finish                               |
|-----------------|------------------------------|--------------------------------------|
| Shell           | Aluminum alloy or zinc alloy | Zinc — plated + OD — colored + Black |
| Insulator       | PPS RESIN, PBT, SIR, NBR     | (Black)                              |
| Male terminal   | Copper alloy                 | Silver-plated                        |
| Female terminal | Copper alloy                 | Silver-plated                        |

## Ordering Information

### • Plug & receptacle

**H/MSA 3102 A 18 — 10 P X — D — T (01)**

- (1) Model
- (2) Form
- (3) Construction
- (4) Shell size
- (5) Terminal arrangement
- (6) Terminal shape
- (7) Changes in inserting position against standard model
- (8) Grounding-terminal number
- (9) Parts approved by TÜV
- (11) Other specifications

### • Clamp

**H/MSA 3057 — 4A (01)**

- (1) Model
- (2) Form
- (10) Clamp size
- (11) Other specifications

#### (1) Model:

H/MS Series

H/MS: Waterproof

H/MSA: Non-waterproof

#### (2) Form:

Connector forms are classified as follows:

3102: Receptacle

3106: Straight plug

3108: Right angle plug

3057: Cord clamp

#### (3) Construction:

Stands for connector construction

A: Integrated shell

B: Sectioned shell

#### (4) Shell size:

Represented by the nominal diameter (in inches) of thread at mating portion multiplied by 16.

Example: A shell with the nominal thread diameter of 1-1/8 inches in called "18" in size. 1-1/8 x 16 = 18 (size 18)

#### (5) Terminal arrangement:

See page 184.

#### (6) Terminal shape:

Represented as follows.

P: Solder male terminal

S: Solder female terminal

PC: Crimp male terminal

#### (7) Changes in inserting position against standard model:

Represented by W, X, Y, or Z. For details, see the Table on page 181.

#### (8) Grounding-terminal number:

Represented by C, D, G, and N standing for the numbers of grounding terminals of the connectors complying with JIS. The terminal numbers vary depending on shell size. Product numbers without symbols have no grounding terminal.

#### (9) Parts approved by TÜV:

Inhibits parts approved by TÜV corresponding to DIN VDE 0627.

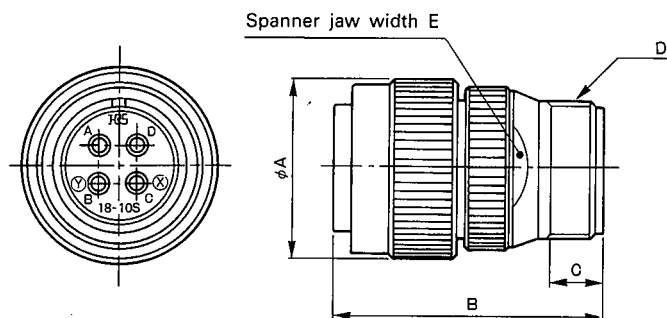
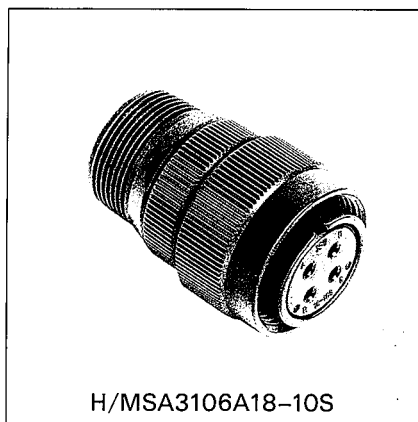
#### (10) Clamp size:

Stands for the size and construction of clamps.

#### (11) Other specifications:

Any change to the above specifications will be shown by a two-digit numeric suffix (01), (02), .....

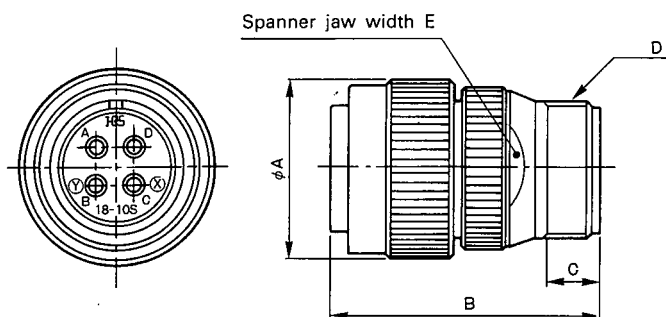
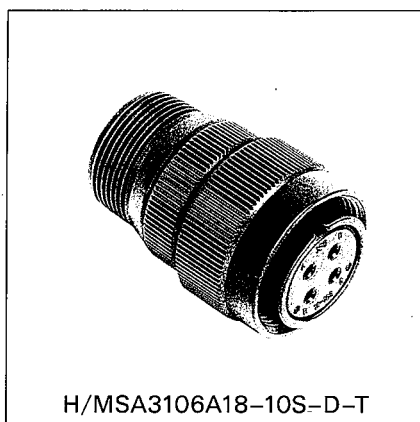
## ■ Straight Plug



(An example in shape)

| HRS No.       | Part No.              | No. of pins | φA   | B    | C  | D                | E  | Remarks |
|---------------|-----------------------|-------------|------|------|----|------------------|----|---------|
| 120-0651-1    | H/MSA3106A10SL-4S     | 2           | 22   | 36.8 | 10 | 5/8-24UNEF-2A    | —  |         |
| 120-0653-7    | H/MSA3106A10SL-3S     | 3           | 22   | 36.8 | 10 | 5/8-24UNEF-2A    | —  |         |
| 120-0653-7-10 | H/MSA3106A10SL-3S(10) | 3           | 22   | 36.8 | 10 | 5/8-24UNEF-2A    | —  | Black   |
| 120-0655-2    | H/MSA3106A18-10S      | 4           | 33.5 | 50   | 10 | 1-20UNEF-2A      | 27 |         |
| 120-0655-2-10 | H/MSA3106A18-10S(10)  | 4           | 33.5 | 50   | 10 | 1-20UNEF-2A      | 27 | Black   |
| 120-0657-8    | H/MSA3106A18-12S      | 6           | 33.5 | 50   | 10 | 1-20UNEF-2A      | 27 |         |
| 120-0659-3    | H/MSA3106A20-15S      | 7           | 37   | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0661-5    | H/MSA3106A20-29S      | 17          | 37   | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0661-5-01 | H/MSA3106A20-29SW(01) | 17          | 37   | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0661-5-11 | H/MSA3106A20-29SW(11) | 17          | 37   | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 | Black   |
| 120-0663-0    | H/MSA3106A22-14S      | 19          | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0665-6    | H/MSA3106A22-22S      | 4           | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0665-6-10 | H/MSA3106A22-22S(10)  | 4           | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 | Black   |
| 120-0667-1    | H/MSA3106A22-23S      | 8           | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0669-7    | H/MSA3106A24-10S      | 7           | 43   | 57.7 | 10 | 1 7/16-18UNEF-2A | 37 |         |
| 120-0669-7-10 | H/MSA3106A24-10S(10)  | 7           | 43   | 57.7 | 10 | 1 7/16-18UNEF-2A | 37 | Black   |

## ■ Straight Plug

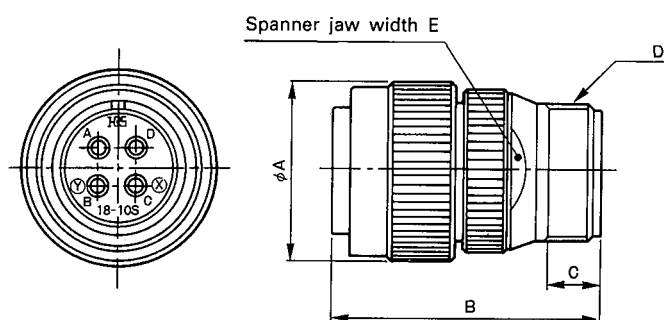
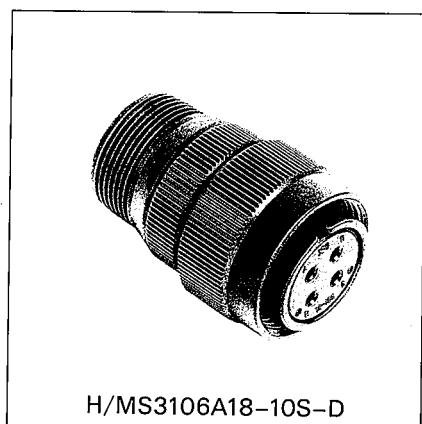


(An example in shape)

### [Parts approved by TÜV]

| HRS No.       | Part No.                  | No. of pins | $\phi A$ | B    | C  | D                | E  | Remarks |
|---------------|---------------------------|-------------|----------|------|----|------------------|----|---------|
| 120-0370-2    | H/MSA3106A10SL-3S-C-T     | 3           | 22       | 36.8 | 10 | 5/8-24UNEF-2A    | —  |         |
| 120-0370-2-10 | H/MSA3106A10SL-3S-C-T(10) | 3           | 22       | 36.8 | 10 | 5/8-24UNEF-2A    | —  | Black   |
| 120-0371-5    | H/MSA3106A18-10S-D-T      | 4           | 33.5     | 50   | 10 | 1-20UNEF-2A      | 27 |         |
| 120-0371-5-10 | H/MSA3106A18-10S-D-T(10)  | 4           | 33.5     | 50   | 10 | 1-20UNEF-2A      | 27 | Black   |
| 120-0372-8    | H/MSA3106A22-22S-D-T      | 4           | 39.5     | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0372-8-10 | H/MSA3106A22-22S-D-T(10)  | 4           | 39.5     | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 | Black   |

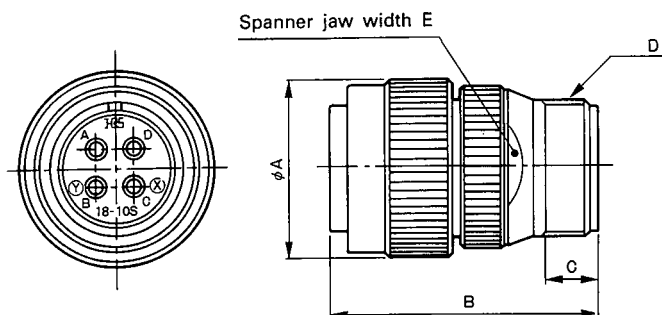
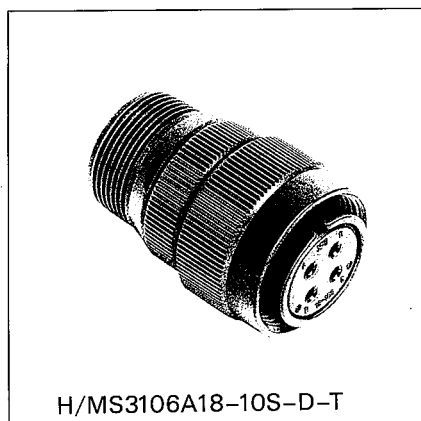
## ■ Straight Plug (Waterproof Type)



(An example in shape)

| HRS No.       | Part No.             | No. of pins | φA   | B    | C  | D                | E  | Remarks |
|---------------|----------------------|-------------|------|------|----|------------------|----|---------|
| 120-0601-3    | H/MS3106A10SL-4S     | 2           | 22   | 36.8 | 10 | 5/8-24UNEF-2A    | —  |         |
| 120-0603-9    | H/MS3106A10SL-3S     | 3           | 22   | 36.8 | 10 | 5/8-24UNEF-2A    | —  |         |
| 120-0603-9-10 | H/MS3106A10SL-3S(10) | 3           | 22   | 36.8 | 10 | 5/8-24UNEF-2A    | —  | Black   |
| 120-0605-4    | H/MS3106A18-10S      | 4           | 33.5 | 50   | 10 | 1-20UNEF-2A      | 27 |         |
| 120-0605-4-10 | H/MS3106A18-10S(10)  | 4           | 33.5 | 50   | 10 | 1-20UNEF-2A      | 27 | Black   |
| 120-0607-0    | H/MS3106A18-12S      | 6           | 33.5 | 50   | 10 | 1-20UNEF-2A      | 27 |         |
| 120-0609-5    | H/MS3106A20-15S      | 7           | 37   | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0611-7    | H/MS3106A20-29S      | 17          | 37   | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0611-7-01 | H/MS3106A20-29SW(01) | 17          | 37   | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0611-7-11 | H/MS3106A20-29SW(11) | 17          | 37   | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 | Black   |
| 120-0613-2    | H/MS3106A22-14S      | 19          | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0615-8    | H/MS3106A22-22S      | 4           | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0615-8-10 | H/MS3106A22-22S(10)  | 4           | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 | Black   |
| 120-0617-3    | H/MS3106A22-23S      | 8           | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0619-9    | H/MS3106A24-10S      | 7           | 43   | 57.7 | 10 | 1 7/16-18UNEF-2A | 37 |         |
| 120-0619-9-10 | H/MS3106A24-10S(10)  | 7           | 43   | 57.7 | 10 | 1 7/16-18UNEF-2A | 37 | Black   |

## ■ Straight Plug (Waterproof Type)

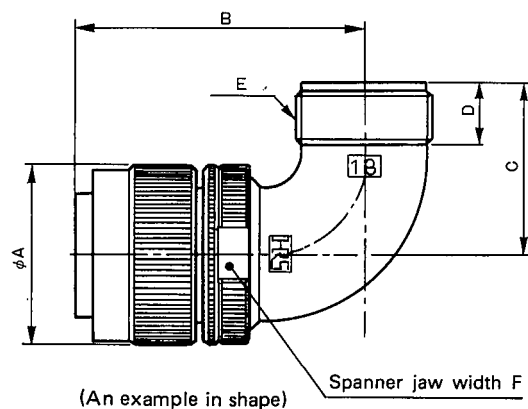
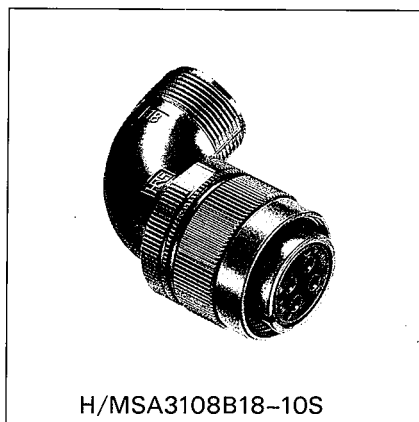


(An example in shape)

[Parts approved by TÜV]

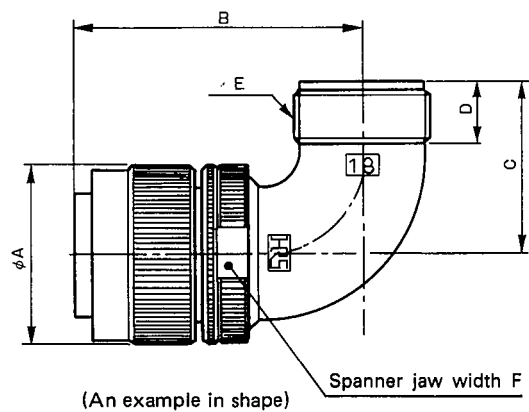
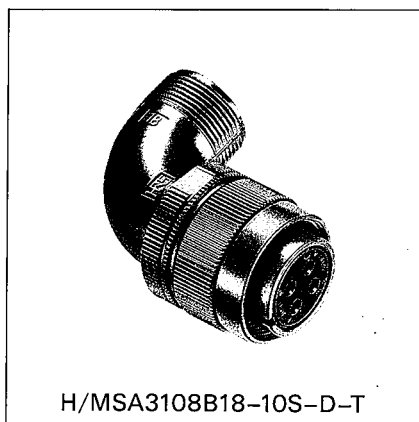
| HRS No.       | Part No.                 | No. of pins | φA   | B    | C  | D                | E  | Remarks |
|---------------|--------------------------|-------------|------|------|----|------------------|----|---------|
| 120-0326-0    | H/MS3106A10SL-3S-C-T     | 3           | 22   | 36.8 | 10 | 5/8-24UNEF-2A    | —  |         |
| 120-0326-0-10 | H/MS3106A10SL-3S-C-T(10) | 3           | 22   | 36.8 | 10 | 5/8-24UNEF-2A    | —  | Black   |
| 120-0323-2    | H/MS3106A18-10S-D-T      | 4           | 33.5 | 50   | 10 | 1-20UNEF-2A      | 27 |         |
| 120-0323-2-10 | H/MS3106A18-10S-D-T(10)  | 4           | 33.5 | 50   | 10 | 1-20UNEF-2A      | 27 | Black   |
| 120-0324-5    | H/MS3106A22-22S-D-T      | 4           | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-0324-5-10 | H/MS3106A22-22S-D-T(10)  | 4           | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 | Black   |
| 120-0325-8    | H/MS3106A24-10S-G-T      | 7           | 43   | 57.7 | 10 | 1 7/16-18UNEF-2A | 37 |         |
| 120-0325-8-10 | H/MS3106A24-10S-G-T(10)  | 7           | 43   | 57.7 | 10 | 1 7/16-18UNEF-2A | 37 | Black   |

## ■ Right-Angle Plug



| HRS No.       | Part No.              | No. of pins | φA   | B    | C    | D    | E                | F  | Remarks |
|---------------|-----------------------|-------------|------|------|------|------|------------------|----|---------|
| 120-0751-6    | H/MSA3108B10SL-4S     | 2           | 22   | 37.3 | 24.5 | 11.6 | 5/8-24UNEF-2A    | 20 |         |
| 120-0753-1    | H/MSA3108B10SL-3S     | 3           | 22   | 37.3 | 24.5 | 11.6 | 5/8-24UNEF-2A    | 20 |         |
| 120-0753-1-10 | H/MSA3108B10SL-3S(10) | 3           | 22   | 37.3 | 24.5 | 11.6 | 5/8-24UNEF-2A    | 20 | Black   |
| 120-0755-7    | H/MSA3108B18-10S      | 4           | 33.5 | 54.5 | 32   | 11.6 | 1-20UNEF-2A      | 32 |         |
| 120-0755-7-10 | H/MSA3108B18-10S(10)  | 4           | 33.5 | 54.5 | 32   | 11.6 | 1-20UNEF-2A      | 32 | Black   |
| 120-0757-2    | H/MSA3108B18-12S      | 6           | 33.5 | 54.5 | 32   | 11.6 | 1-20UNEF-2A      | 32 |         |
| 120-0761-0    | H/MSA3108B20-29S      | 17          | 37   | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 35 |         |
| 120-0761-0-01 | H/MSA3108B20-29SW(01) | 17          | 37   | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 35 |         |
| 120-0761-0-11 | H/MSA3108B20-29SW(11) | 17          | 37   | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 35 | Black   |
| 120-0763-5    | H/MSA3108B22-14S      | 19          | 39.5 | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 38 |         |
| 120-0765-0    | H/MSA3108B22-22S      | 4           | 39.5 | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 38 |         |
| 120-0765-0-10 | H/MSA3108B22-22S(10)  | 4           | 39.5 | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 38 | Black   |
| 120-0767-6    | H/MSA3108B22-23S      | 8           | 39.5 | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 38 |         |
| 120-0769-1    | H/MSA3108B24-10S      | 7           | 43   | 67.1 | 39.6 | 11.6 | 1 7/16-18UNEF-2A | 41 |         |
| 120-0769-1-10 | H/MSA3108B24-10S(10)  | 7           | 43   | 67.1 | 39.6 | 11.6 | 1 7/16-18UNEF-2A | 41 | Black   |

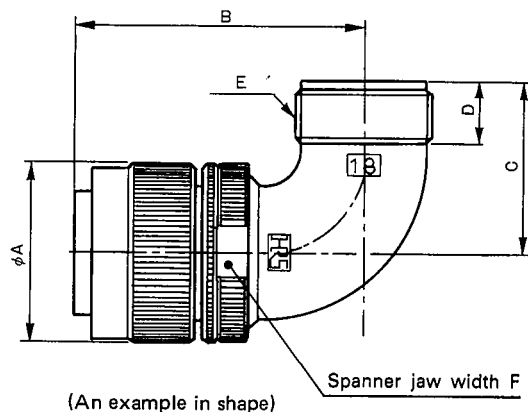
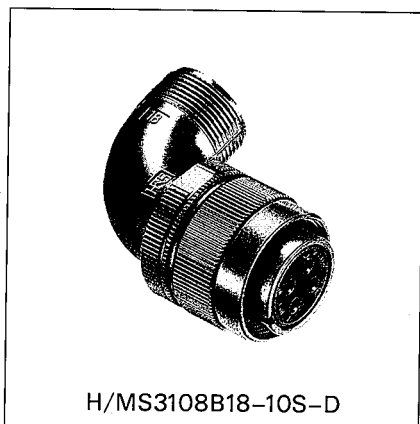
## ■ Right-Angle Plug



[Parts approved by TÜV]

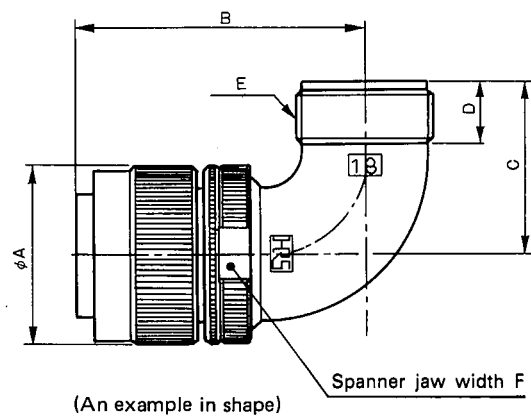
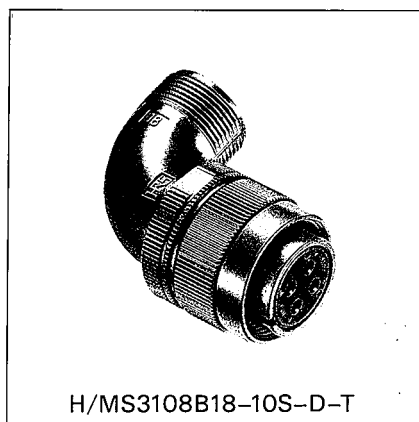
| HRS No.       | Part No.                 | No. of pins | $\phi$ A | B    | C  | D    | E           | F  | Remarks |
|---------------|--------------------------|-------------|----------|------|----|------|-------------|----|---------|
| 120-0471-0    | H/MSA3108B18-10S-D-T     | 4           | 33.5     | 54.5 | 32 | 11.6 | 1-20UNEF-2A | 32 |         |
| 120-0471-0-10 | H/MSA3108B18-10S-D-T(10) | 4           | 33.5     | 54.5 | 32 | 11.6 | 1-20UNEF-2A | 32 | Black   |

## ■ Right-Angle Plug (Waterproof Type)



| HRS No.       | Part No.             | No. of pins | φA   | B    | C    | D    | E                | F  | Remarks |
|---------------|----------------------|-------------|------|------|------|------|------------------|----|---------|
| 120-0701-8    | H/MS3108B10SL-4S     | 2           | 22   | 37.3 | 24.5 | 11.6 | 5/8-24UNEF-2A    | 20 |         |
| 120-0703-3    | H/MS3108B10SL-3S     | 3           | 22   | 37.3 | 24.5 | 11.6 | 5/8-24UNEF-2A    | 20 |         |
| 120-0703-3-10 | H/MS3108B10SL-3S(10) | 3           | 22   | 37.3 | 24.5 | 11.6 | 5/8-24UNEF-2A    | 20 | Black   |
| 120-0705-9    | H/MS3108B18-10S      | 4           | 33.5 | 54.5 | 32   | 11.6 | 1-20UNEF-2A      | 32 |         |
| 120-0705-9-10 | H/MS3108B18-10S(10)  | 4           | 33.5 | 54.5 | 32   | 11.6 | 1-20UNEF-2A      | 32 | Black   |
| 120-0707-4    | H/MS3108B18-12S      | 6           | 33.5 | 54.5 | 32   | 11.6 | 1-20UNEF-2A      | 32 |         |
| 120-0709-0    | H/MS3108B20-15S      | 7           | 37   | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 35 |         |
| 120-0711-1    | H/MS3108B20-29S      | 17          | 37   | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 35 |         |
| 120-0711-1-01 | H/MS3108B20-29SW(01) | 17          | 37   | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 35 |         |
| 120-0711-1-11 | H/MS3108B20-29SW(11) | 17          | 37   | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 35 | Black   |
| 120-0713-7    | H/MS3108B22-14S      | 19          | 39.5 | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 38 |         |
| 120-0715-2    | H/MS3108B22-22S      | 4           | 39.5 | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 38 |         |
| 120-0715-2-10 | H/MS3108B22-22S(10)  | 4           | 39.5 | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 38 | Black   |
| 120-0717-8    | H/MS3108B22-23S      | 8           | 39.5 | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 38 |         |
| 120-0719-3    | H/MS3108B24-10S      | 7           | 43   | 67.1 | 39.6 | 11.6 | 1 7/16-18UNEF-2A | 41 |         |
| 120-0719-3-10 | H/MS3108B24-10S(10)  | 7           | 43   | 67.1 | 39.6 | 11.6 | 1 7/16-18UNEF-2A | 41 | Black   |

## ■ Right-Angle Plug (Waterproof Type)

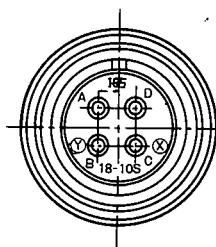


[Parts approved by TÜV]

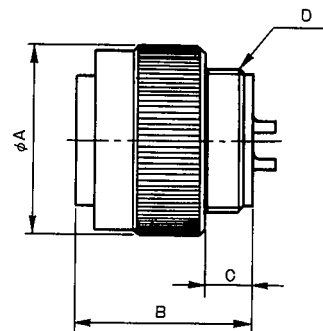
| HRS No.       | Part No.                 | No. of pins | $\phi A$ | B    | C    | D    | E                | F  | Remarks |
|---------------|--------------------------|-------------|----------|------|------|------|------------------|----|---------|
| 120-0421-1    | H/MS3108B10SL-3S-C-T     | 3           | 22       | 37.3 | 24.5 | 11.6 | 5/8-24UNEF-2A    | 20 |         |
| 120-0421-1-10 | H/MS3108B10SL-3S-C-T(10) | 3           | 22       | 37.3 | 24.5 | 11.6 | 5/8-24UNEF-2A    | 20 | Black   |
| 120-0422-4    | H/MS3108B18-10S-D-T      | 4           | 33.5     | 54.5 | 32   | 11.6 | 1-20UNEF-2A      | 32 |         |
| 120-0422-4-10 | H/MS3108B18-10S-D-T(10)  | 4           | 33.5     | 54.5 | 32   | 11.6 | 1-20UNEF-2A      | 32 | Black   |
| 120-0423-7    | H/MS3108B22-22S-D-T      | 4           | 39.5     | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 38 |         |
| 120-0423-7-10 | H/MS3108B22-22S-D-T(10)  | 4           | 39.5     | 60.7 | 34   | 11.6 | 1 3/16-18UNEF-2A | 38 | Black   |
| 120-0424-0    | H/MS3108B24-10S-G-T      | 7           | 43       | 67.1 | 39.6 | 11.6 | 1 7/16-18UNEF-2A | 41 |         |
| 120-0424-0-10 | H/MS3108B24-10S-G-T(10)  | 7           | 43       | 67.1 | 39.6 | 11.6 | 1 7/16-18UNEF-2A | 41 | Black   |

## ■ Separate Unit

Use this unit in combination with connectors for flexible conduit tubes or tough-rubber sheathed cables.



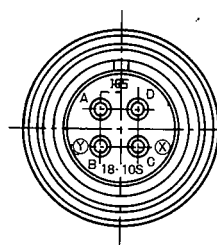
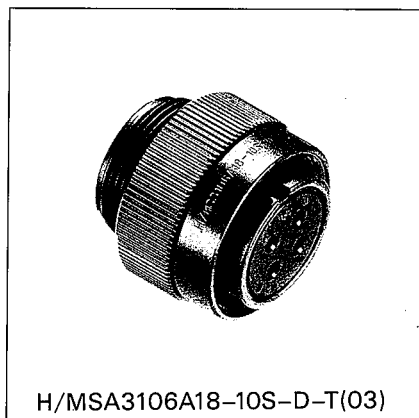
(An example in shape)



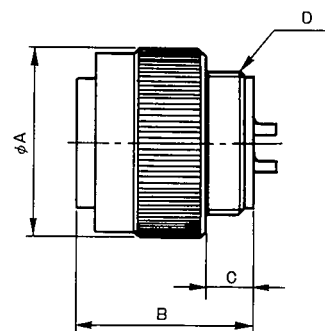
| HRS No.       | Part No.              | No. of pins | $\phi A$ | B    | C   | D               | Remarks |
|---------------|-----------------------|-------------|----------|------|-----|-----------------|---------|
| 120-0651-1-03 | H/MSA3106A10SL-4S(03) | 2           | 22       | 24   | 6.5 | 9/16-24UNEF-2A  |         |
| 120-0653-7-03 | H/MSA3106A10SL-3S(03) | 3           | 22       | 24   | 6.5 | 9/16-24UNEF-2A  |         |
| 120-0655-2-03 | H/MSA3106A18-10S(03)  | 4           | 33.5     | 31.2 | 8   | 1-20UNEF-2A     |         |
| 120-0659-3-03 | H/MSA3106A20-15S(03)  | 7           | 37       | 33.2 | 10  | 1 1/8-18UNEF-2A |         |
| 120-0661-5-03 | H/MSA3106A20-29S(03)  | 17          | 37       | 33.2 | 10  | 1 1/8-18UNEF-2A |         |
| 120-0663-0-03 | H/MSA3106A22-14S(03)  | 19          | 39.5     | 33.2 | 10  | 1 1/4-18UNEF-2A |         |
| 120-0665-6-03 | H/MSA3106A22-22S(03)  | 4           | 39.5     | 33.2 | 10  | 1 1/4-18UNEF-2A |         |
| 120-0669-7-03 | H/MSA3106A24-10S(03)  | 7           | 43       | 34.7 | 10  | 1 3/8-18UNEF-2A |         |

## ■ Separate Unit

Use this unit in combination with connectors for flexible conduit tubes or tough-rubber sheathed cables.



(An example in shape)

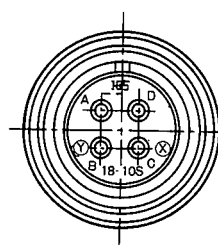


### [Parts approved by TÜV]

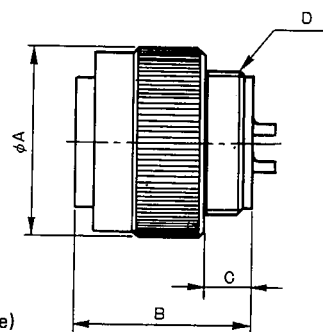
| HRS No.       | Part No.                  | No. of pins | φ A  | B    | C   | D               | Remarks |
|---------------|---------------------------|-------------|------|------|-----|-----------------|---------|
| 120-0370-2-03 | H/MSA3106A10SL-3S-C-T(03) | 3           | 22   | 24   | 6.5 | 9/16-24UNEF-2A  |         |
| 120-0370-2-13 | H/MSA3106A10SL-3S-C-T(13) | 3           | 22   | 24   | 6.5 | 9/16-24UNEF-2A  | Black   |
| 120-0371-5-03 | H/MSA3106A18-10S-D-T(03)  | 4           | 33.5 | 31.2 | 8   | 1-20UNEF-2A     |         |
| 120-0371-5-13 | H/MSA3106A18-10S-D-T(13)  | 4           | 33.5 | 31.2 | 8   | 1-20UNEF-2A     | Black   |
| 120-0372-8-03 | H/MSA3106A22-22S-D-T(03)  | 4           | 39.5 | 33.2 | 10  | 1-1/4-18UNEF-2A |         |
| 120-0372-8-13 | H/MSA3106A22-22S-D-T(13)  | 4           | 39.5 | 33.2 | 10  | 1-1/4-18UNEF-2A | Black   |

## ■ Separate Unit (Waterproof Type)

Use this unit in combination with connectors for flexible conduit tubes or tough-rubber sheathed cables.



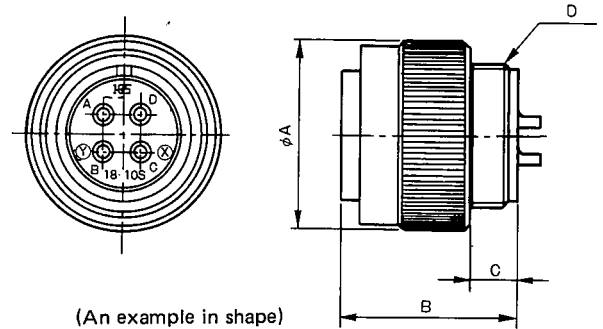
(An example in shape)



| HRS No:       | Part No.             | No. of pins | $\phi$ A | B    | C   | D               | Remarks |
|---------------|----------------------|-------------|----------|------|-----|-----------------|---------|
| 120-0601-3-03 | H/MS3106A10SL-4S(03) | 2           | 22       | 24   | 6.5 | 9/16-24UNEF-2A  |         |
| 120-0603-9-03 | H/MS3106A10SL-3S(03) | 3           | 22       | 24   | 6.5 | 9/16-24UNEF-2A  |         |
| 120-0603-9-13 | H/MS3106A10SL-3S(13) | 3           | 22       | 24   | 6.5 | 9/16-24UNEF-2A  | Black   |
| 120-0605-4-03 | H/MS3106A18-10S(03)  | 4           | 33.5     | 31.2 | 8   | 1-20UNEF-2A     |         |
| 120-0605-4-13 | H/MS3106A18-10S(13)  | 4           | 33.5     | 31.2 | 8   | 1-20UNEF-2A     | Black   |
| 120-0609-5-03 | H/MS3106A20-15S(03)  | 7           | 37       | 33.2 | 10  | 1 1/8-18UNEF-2A |         |
| 120-0611-7-03 | H/MS3106A20-29S(03)  | 17          | 37       | 33.2 | 10  | 1 1/8-18UNEF-2A |         |
| 120-0611-7-04 | H/MS3106A20-29SW(04) | 17          | 37       | 33.2 | 10  | 1 1/8-18UNEF-2A |         |
| 120-0611-7-14 | H/MS3106A20-29SW(14) | 17          | 37       | 33.2 | 10  | 1 1/8-18UNEF-2A | Black   |
| 120-0613-2-03 | H/MS3106A22-14S(03)  | 19          | 39.5     | 33.2 | 10  | 1 1/4-18UNEF-2A |         |
| 120-0615-8-03 | H/MS3106A22-22S(03)  | 4           | 39.5     | 33.2 | 10  | 1 1/4-18UNEF-2A |         |
| 120-0615-8-13 | H/MS3106A22-22S(13)  | 4           | 39.5     | 33.2 | 10  | 1 1/4-18UNEF-2A | Black   |
| 120-0617-3-03 | H/MS3106A22-23S(03)  | 8           | 39.5     | 33.2 | 10  | 1 1/4-18UNEF-2A |         |
| 120-0619-9-03 | H/MS3106A24-10S(03)  | 7           | 43       | 34.7 | 10  | 1 3/8-18UNEF-2A |         |
| 120-0619-9-13 | H/MS3106A24-10S(13)  | 7           | 43       | 34.7 | 10  | 1 3/8-18UNEF-2A | Black   |

## ■ Separate Unit (Waterproof Type)

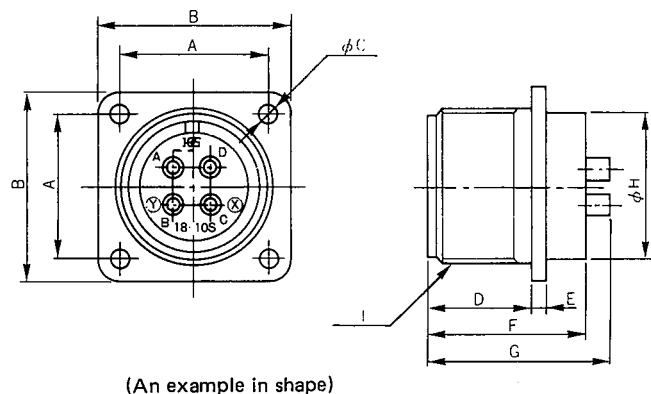
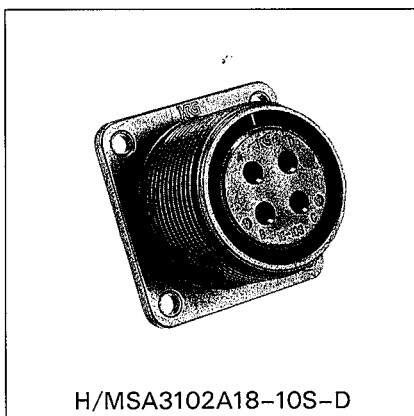
Use this unit in combination with connectors for flexible conduit tubes or tough-rubber sheathed cables.



### [Parts approved by TÜV]

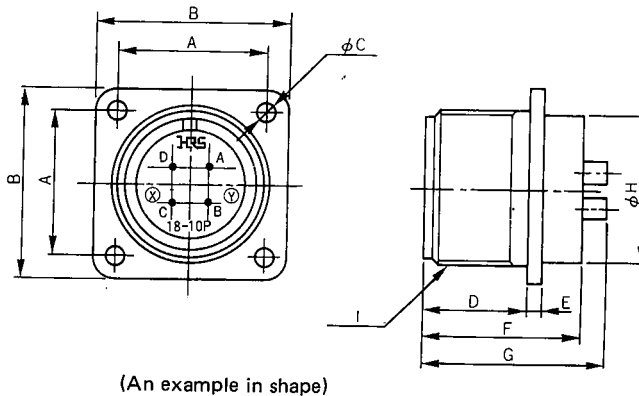
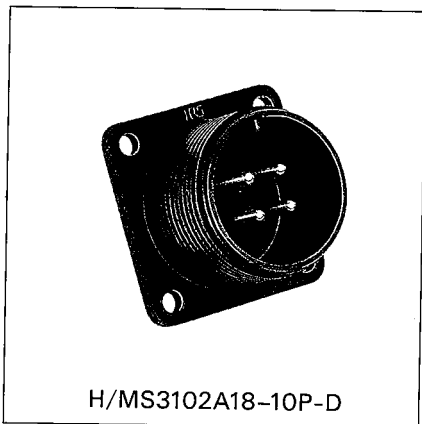
| HRS No.       | Part No.                 | No. of pins | $\phi A$ | B    | C   | D               | Remarks |
|---------------|--------------------------|-------------|----------|------|-----|-----------------|---------|
| 120-0326-0-03 | H/MS3106A10SL-3S-C-T(03) | 3           | 22       | 24   | 6.5 | 9/16-24UNEF-2A  |         |
| 120-0326-0-13 | H/MS3106A10SL-3S-C-T(13) | 3           | 22       | 24   | 6.5 | 9/16-24UNEF-2A  | Black   |
| 120-0323-2-03 | H/MS3106A18-10S-D-T(03)  | 4           | 33.5     | 31.2 | 8   | 1-20UNEF-2A     |         |
| 120-0323-2-13 | H/MS3106A18-10S-D-T(13)  | 4           | 33.5     | 31.2 | 8   | 1-20UNEF-2A     | Black   |
| 120-0324-5-03 | H/MS3106A22-22S-D-T(03)  | 4           | 39.5     | 33.2 | 10  | 1 1/4-18UNEF-2A |         |
| 120-0324-5-13 | H/MS3106A22-22S-D-T(13)  | 4           | 39.5     | 33.2 | 10  | 1 1/4-18UNEF-2A | Black   |
| 120-0325-8-03 | H/MS3106A24-10S-G-T(03)  | 7           | 43       | 34.7 | 10  | 1 3/8-18UNEF-2A |         |
| 120-0325-8-13 | H/MS3106A24-10S-G-T(13)  | 7           | 43       | 34.7 | 10  | 1 3/8-18UNEF-2A | Black   |

## ■ Receptacle



| HRS No.    | Part No.           | No. of pins | A     | B     | $\phi C$ | D    | E   | F    | G    | $\phi H$ | I               | Remarks |
|------------|--------------------|-------------|-------|-------|----------|------|-----|------|------|----------|-----------------|---------|
| 120-0254-1 | H/MSA3102A18-10S-D | 4           | 26.97 | 34.92 | 3.3      | 19.3 | 2.8 | 30.7 | 35.5 | 26.8     | 1 1/8-18UNEF-2A |         |
| 120-0258-2 | H/MSA3102A20-15S-G | 7           | 29.36 | 38.1  | 3.3      | 19.3 | 2.8 | 30.7 | 37.7 | 29.6     | 1 1/4-18UNEF-2A |         |

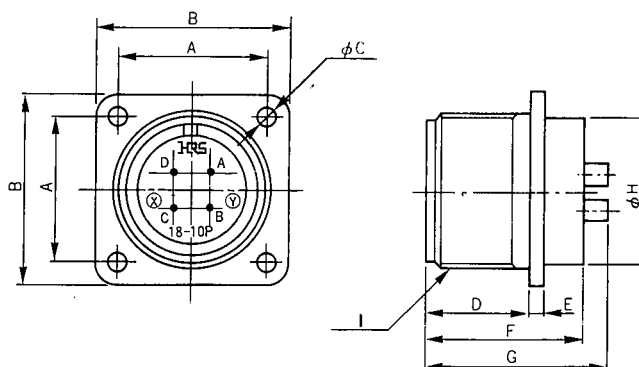
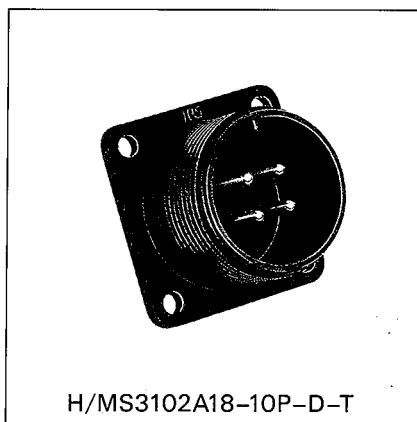
## ■ Receptacle (Waterproof Type)



| HRS No.       | Part No.             | No. of pins | A     | B     | φC   | D    | E   | F    | G    | φH   | I               | Remarks |
|---------------|----------------------|-------------|-------|-------|------|------|-----|------|------|------|-----------------|---------|
| * 120-0111-4  | H/MS3102A10SL-4P     | 2           | 18.26 | 25.4  | 3.3  | 14.5 | 2.2 | 23.6 | 28.3 | 15.6 | 5/8-24UNEF-2A   |         |
| * 120-0113-0  | H/MS3102A10SL-3P     | 3           | 18.26 | 25.4  | 3.3  | 14.5 | 2.2 | 23.6 | 28.3 | 15.6 | 5/8-24UNEF-2A   |         |
| 120-0113-0-10 | H/MS3102A10SL-3P(10) | 3           | 18.26 | 25.4  | 3.3  | 14.5 | 2.2 | 23.6 | 28.3 | 15.6 | 5/8-24UNEF-2A   | Black   |
| 120-0101-0    | H/MS3102A18-10P      | 4           | 26.97 | 34.92 | 3.3  | 19.3 | 2.8 | 30   | 35   | 26.6 | 1 1/8-18UNEF-2A |         |
| 120-0101-0-10 | H/MS3102A18-10P(10)  | 4           | 26.97 | 34.92 | 3.3  | 19.3 | 2.8 | 30   | 35   | 26.6 | 1 1/8-18UNEF-2A | Black   |
| * 120-0117-0  | H/MS3102A18-12P      | 6           | 26.97 | 34.92 | 3.3  | 19.3 | 2.8 | 30   | 35   | 26.6 | 1 1/8-18UNEF-2A |         |
| 120-0115-5    | H/MS3102A20-15P      | 7           | 29.36 | 38.1  | 3.3  | 19.3 | 2.8 | 29.4 | 35   | 29.6 | 1 1/4-18UNEF-2A |         |
| * 120-0103-6  | H/MS3102A20-29P      | 17          | 29.36 | 38.1  | 3.3  | 19.3 | 2.8 | 29.4 | 33   | 29.6 | 1 1/4-18UNEF-2A |         |
| 120-0103-6-11 | H/MS3102A20-29PW(11) | 17          | 29.36 | 38.1  | 3.3  | 19.3 | 2.8 | 29.4 | 33   | 29.6 | 1 1/4-18UNEF-2A | Black   |
| * 120-0105-1  | H/MS3102A22-14P      | 19          | 31.75 | 41.28 | 3.3  | 19.3 | 2.8 | 29.4 | 33   | 32.6 | 1 3/8-18UNEF-2A |         |
| 120-0107-7    | H/MS3102A22-22P      | 4           | 31.75 | 41.28 | 3.3  | 19.3 | 2.8 | 29.4 | 38   | 32.6 | 1 3/8-18UNEF-2A |         |
| 120-0107-7-10 | H/MS3102A22-22P(10)  | 4           | 31.75 | 41.28 | 3.3  | 19.3 | 2.8 | 29.4 | 38   | 32.6 | 1 3/8-18UNEF-2A | Black   |
| * 120-0119-6  | H/MS3102A22-23P      | 8           | 31.75 | 41.28 | 3.3  | 19.3 | 2.8 | 29.4 | 35   | 32.6 | 1 3/8-18UNEF-2A |         |
| 120-0109-2    | H/MS3102A24-10P      | 7           | 34.92 | 44.45 | 3.75 | 21   | 2.8 | 31.6 | 41   | 36   | 1 1/2-18UNEF-2A |         |
| 120-0109-2-10 | H/MS3102A24-10P(10)  | 7           | 34.92 | 44.45 | 3.75 | 21   | 2.8 | 31.6 | 41   | 36   | 1 1/2-18UNEF-2A | Black   |

Note: Models marked with \* are available in NBR (acrylonitrile-rubber). Others are available in SIR.

## ■ Receptacle (Waterproof Type)



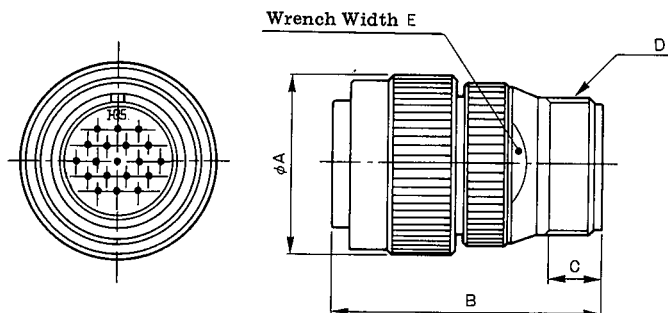
(An example in shape)

### [Parts approved by TÜV]

| HRS No.       | Part No.                 | No. of pins | A     | B     | φC   | D    | E   | F    | G    | φH   | I               | Remarks |
|---------------|--------------------------|-------------|-------|-------|------|------|-----|------|------|------|-----------------|---------|
| 120-0231-6    | H/MS3102A10SL-3P-C-T     | 3           | 18.26 | 25.4  | 3.3  | 14.5 | 2.2 | 23.6 | 28.3 | 15.6 | 5/8-24UNEF-2A   |         |
| 120-0231-6-10 | H/MS3102A10SL-3P-C-T(10) | 3           | 18.26 | 25.4  | 3.3  | 14.5 | 2.2 | 23.6 | 28.3 | 15.6 | 5/8-24UNEF-2A   | Black   |
| 120-0226-6    | H/MS3102A18-10P-D-T      | 4           | 26.97 | 34.92 | 3.3  | 19.3 | 2.8 | 30   | 35   | 26.6 | 1 1/8-18UNEF-2A |         |
| 120-0226-6-10 | H/MS3102A18-10P-D-T(10)  | 4           | 26.97 | 34.92 | 3.3  | 19.3 | 2.8 | 30   | 35   | 26.6 | 1 1/8-18UNEF-2A | Black   |
| 120-0227-9    | H/MS3102A22-22P-D-T      | 4           | 31.75 | 41.28 | 3.3  | 19.3 | 2.8 | 29.4 | 38   | 32.6 | 1 3/8-18UNEF-2A |         |
| 120-0227-9-10 | H/MS3102A22-22P-D-T(10)  | 4           | 31.75 | 41.28 | 3.3  | 19.3 | 2.8 | 29.4 | 38   | 32.6 | 1 3/8-18UNEF-2A | Black   |
| 120-0228-1    | H/MS3102A24-10P-G-T      | 7           | 34.92 | 44.45 | 3.75 | 21   | 2.8 | 31.6 | 41   | 36   | 1 1/2-18UNEF-2A |         |
| 120-0228-1-10 | H/MS3102A24-10P-G-T(10)  | 7           | 34.92 | 44.45 | 3.75 | 21   | 2.8 | 31.6 | 41   | 36   | 1 1/2-18UNEF-2A | Black   |

## ■ Straight Plug

(Crimp Type)

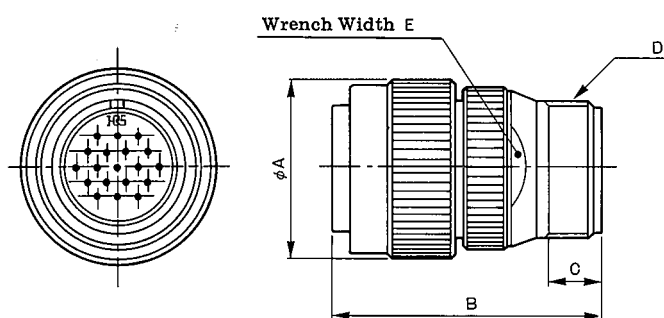


(An example in shape)

| HRS No.    | Part No.          | No. of pins | φA   | B    | C  | D                | E  | Remarks |
|------------|-------------------|-------------|------|------|----|------------------|----|---------|
| 120-1661-0 | H/MSA3106A20-29SC | 17          | 37   | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-1663-6 | H/MSA3106A22-14SC | 19          | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |

## ■ Straight Plug (Waterproof Type)

(Crimp Type)

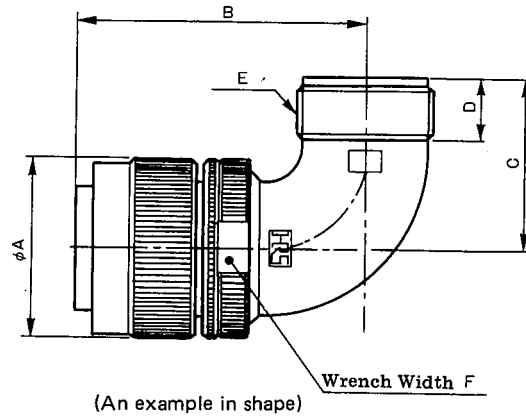
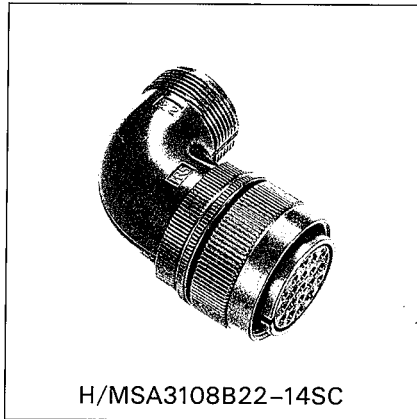


(An example in shape)

| HRS No.    | Part No.         | No. of pins | φA   | B    | C  | D                | E  | Remarks |
|------------|------------------|-------------|------|------|----|------------------|----|---------|
| 120-1611-2 | H/MS3106A20-29SC | 17          | 37   | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |
| 120-1613-8 | H/MS3106A22-14SC | 19          | 39.5 | 54.5 | 10 | 1 3/16-18UNEF-2A | 32 |         |

## ■ Right-Angle Plug

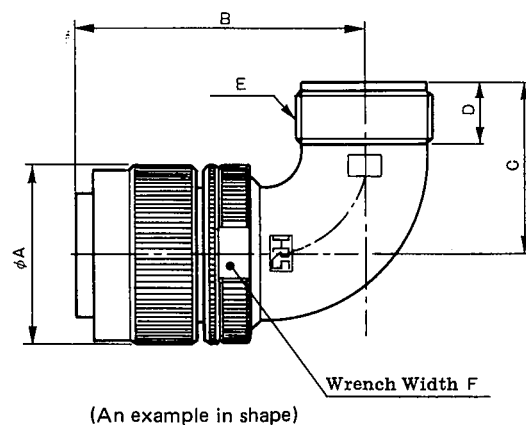
(Crimp Type)



| HRS No.    | Part No.          | No. of pins | $\phi A$ | B    | C  | D    | E                | F  | Remarks |
|------------|-------------------|-------------|----------|------|----|------|------------------|----|---------|
| 120-1761-5 | H/MSA3108B20-29SC | 17          | 37       | 60.7 | 34 | 11.6 | 1 3/16-18UNEF-2A | 35 |         |

## ■ Right-Angle Plug (Waterproof Type)

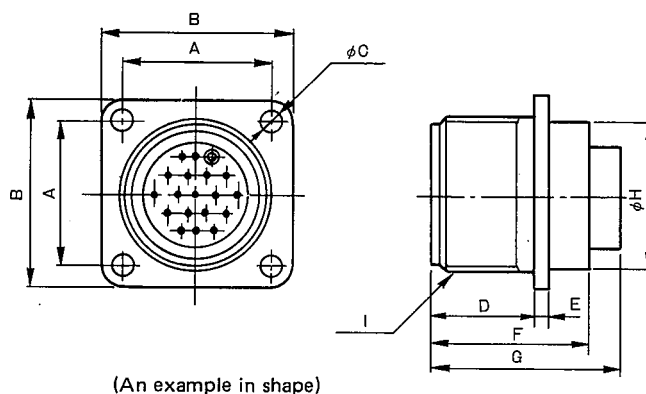
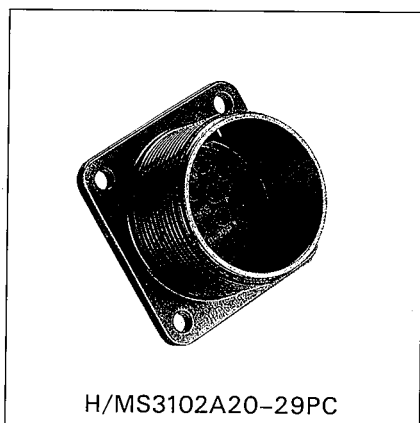
(Crimp Type)



| HRS No.    | Part No.          | No. of pins | $\phi A$ | B    | C  | D    | E                | F  | Remarks |
|------------|-------------------|-------------|----------|------|----|------|------------------|----|---------|
| 120-1711-7 | H/MSA3108B20-29SC | 17          | 37       | 60.7 | 34 | 11.6 | 1 3/16-18UNEF-2A | 35 |         |
| 120-1713-2 | H/MSA3108B22-14SC | 19          | 39.5     | 60.7 | 34 | 11.6 | 1 3/16-18UNEF-2A | 38 |         |

## ■ Receptacle (Waterproof Type)

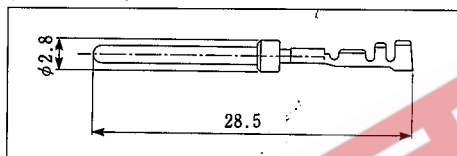
(Crimp Type)



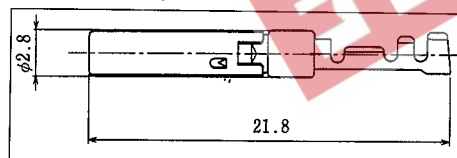
| HRS No.    | Part No.         | No. of pins | A     | B     | φC  | D    | E   | F    | G  | φH   | I               |
|------------|------------------|-------------|-------|-------|-----|------|-----|------|----|------|-----------------|
| 120-0501-9 | H/MS3102A20-29PC | 17          | 29.36 | 38.1  | 3.3 | 19.3 | 2.8 | 29.4 | 37 | 29.6 | 1 1/4-18UNEF-2A |
| 120-0502-1 | H/MS3102A22-14PC | 19          | 31.75 | 41.28 | 3.3 | 19.3 | 2.8 | 29.4 | 37 | 32.6 | 1 3/8-18UNEF-2A |

## ■ Contact

(Male Pin)



(Female Pin)



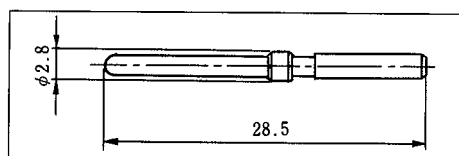
| Type                 | HRS No.    | Part No.     | Applicable cable |
|----------------------|------------|--------------|------------------|
| Strip terminal       | 120-0533-5 | H/MS-PC1-212 | AWG#24~28        |
| Loose piece terminal | 120-0534-8 | H/MS-PC1-112 | AWG#24~28        |

Note: Strip terminals are available in a reel of 7,000 units, and loose piece terminals in a pack of 100 units.

| Type           | HRS No.    | Part No.    | Applicable cable |
|----------------|------------|-------------|------------------|
| Strip terminal | 120-1531-5 | H/MS-SC-212 | AWG#24~28        |

Note: Strip terminals are available in a reel of 7,000 units.

## ■ Dummy Pin



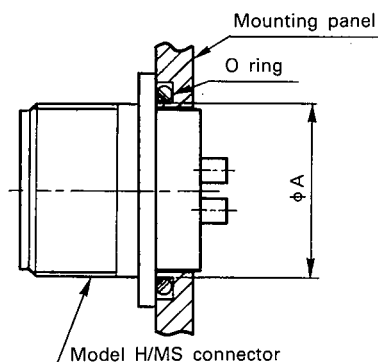
| HRS No.    | Part No. |
|------------|----------|
| 120-0532-2 | H/MS-PDC |

Note: This is designed to be used for waterproof receptacles (crimp type). Do not fail to plug unused wiring holes using it.

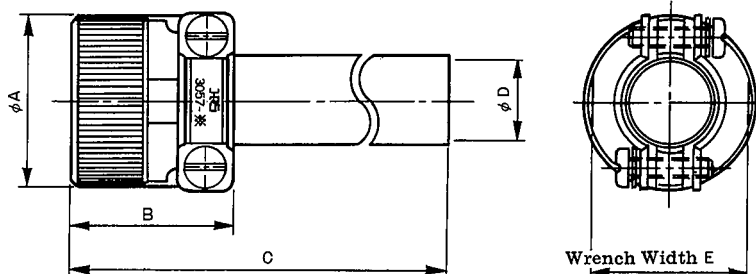
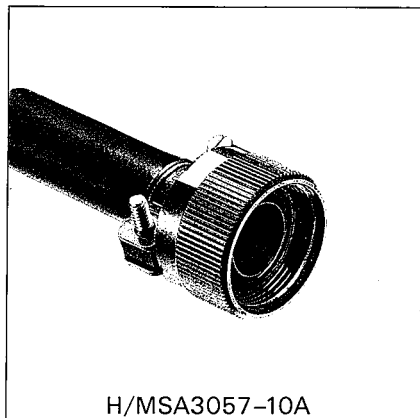
## ◆ Installing receptacles

Use an O ring or similar material when installing a waterproof receptacle as shown in the Fig. on the right. Recommendable dimensions of O rings are shown in the Table below.

| Part No.         | φA   | O-ring inside dia. (φ) | O-ring size (φ) |
|------------------|------|------------------------|-----------------|
| H/MS3102A10SL-□□ | 17.5 | 17.5                   | 1.5             |
| H/MS3102A18-□□   | 28.5 | 28.5                   | 2               |
| H/MS3102A20-□□   | 31.5 | 31.5                   | 2               |
| H/MS3102A22-□□   | 34.5 | 34.5                   | 2               |
| H/MS3102A24-□□   | 37.8 | 37.5                   | 2               |



## ■ Cord Clamp



| HRS No.       | Part No.           | φA | B    | C    | φD   | E  | Applicable cable dia.<br>range (reference) | Applicable<br>shell size | Remarks |
|---------------|--------------------|----|------|------|------|----|--------------------------------------------|--------------------------|---------|
| 120-0851-0    | H/MSA3057-4A       | 20 | 26.8 | 85.3 | 5.6  | 17 | φ 3.1 ~ φ 5.6                              | 10SL                     |         |
| 120-0851-0-10 | H/MSA3057-4A(10)   | 20 | 26.8 | 85.3 | 5.6  | 17 | φ 3.1 ~ φ 5.6                              | 10SL                     | Black   |
| 120-0852-3    | H/MSA3057-10A      | 30 | 28.8 | 74.3 | 14.3 | 27 | φ10.3 ~ φ14.3                              | 18                       |         |
| 120-0852-3-10 | H/MSA3057-10A(10)  | 30 | 28.8 | 74.3 | 14.3 | 27 | φ10.3 ~ φ14.3                              | 18                       | Black   |
| 120-0853-6    | H/MSA3057-12A      | 34 | 29.8 | 72.8 | 15.9 | 30 | φ11.4 ~ φ15.9                              | 20, 22                   |         |
| 120-0853-6-10 | H/MSA3057-12A(10)  | 34 | 29.8 | 72.8 | 15.9 | 30 | φ11.4 ~ φ15.9                              | 20, 22                   | Black   |
| 120-0855-1    | H/MSA3057-12A1     | 34 | 29.8 | 72.8 | 11.6 | 30 | φ 8 ~ φ11.6                                | 20, 22                   |         |
| 120-0855-1-10 | H/MSA3057-12A1(10) | 34 | 29.8 | 72.8 | 11.6 | 30 | φ 8 ~ φ11.6                                | 20, 22                   | Black   |
| 120-0854-9    | H/MSA3057-16A      | 40 | 33.8 | 71.3 | 19   | 36 | φ14 ~ φ19                                  | 24                       |         |
| 120-0854-9-10 | H/MSA3057-16A(10)  | 40 | 33.8 | 71.3 | 19   | 36 | φ14 ~ φ19                                  | 24                       | Black   |
| 120-0856-4    | H/MSA3057-16A1     | 40 | 33.8 | 71.3 | 14.2 | 36 | φ10 ~ φ14.2                                | 24                       |         |
| 120-0856-4-10 | H/MSA3057-16A1(10) | 40 | 33.8 | 71.3 | 14.2 | 36 | φ10 ~ φ14.2                                | 24                       | Black   |

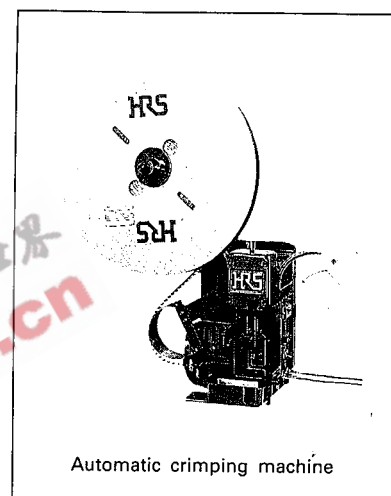
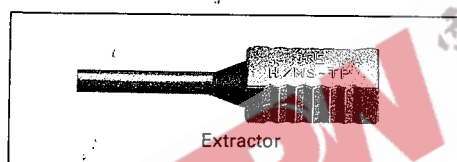
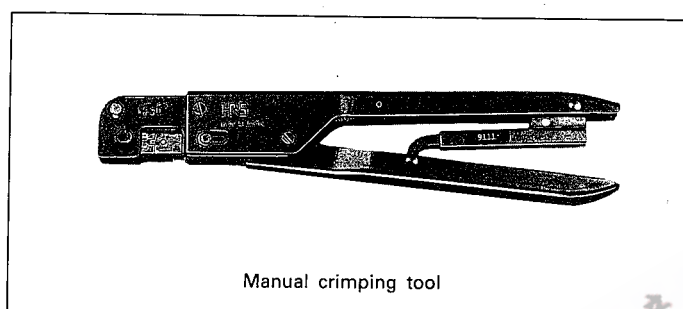
[Waterproof type]

| HRS No.       | Part No.          | φA | B    | C    | φD   | E  | Applicable cable dia.<br>range (reference) | Applicable<br>shell size | Remarks |
|---------------|-------------------|----|------|------|------|----|--------------------------------------------|--------------------------|---------|
| 120-0801-2    | H/MS3057-4A       | 20 | 26.8 | 83.8 | 5.6  | 17 | φ 3.1 ~ φ 5.6                              | 10SL                     |         |
| 120-0801-2-10 | H/MS3057-4A(10)   | 20 | 26.8 | 83.8 | 5.6  | 17 | φ 3.1 ~ φ 5.6                              | 10SL                     | Black   |
| 120-0802-5    | H/MS3057-10A      | 30 | 28.8 | 72.8 | 14.3 | 27 | φ10.3 ~ φ14.3                              | 18                       |         |
| 120-0802-5-10 | H/MS3057-10A(10)  | 30 | 28.8 | 72.8 | 14.3 | 27 | φ10.3 ~ φ14.3                              | 18                       | Black   |
| 120-0803-8    | H/MS3057-12A      | 34 | 29.8 | 70.8 | 15.9 | 30 | φ11.4 ~ φ15.9                              | 20, 22                   |         |
| 120-0803-8-10 | H/MS3057-12A(10)  | 34 | 29.8 | 70.8 | 15.9 | 30 | φ11.4 ~ φ15.9                              | 20, 22                   | Black   |
| 120-0805-3    | H/MS3057-12A1     | 34 | 29.8 | 70.8 | 11.6 | 30 | φ 8 ~ φ11.6                                | 20, 22                   |         |
| 120-0805-3-10 | H/MS3057-12A1(10) | 34 | 29.8 | 70.8 | 11.6 | 30 | φ 8 ~ φ11.6                                | 20, 22                   | Black   |
| 120-0804-0    | H/MS3057-16A      | 40 | 33.8 | 69.3 | 19   | 36 | φ14 ~ φ19                                  | 24                       |         |
| 120-0804-0-10 | H/MS3057-16A(10)  | 40 | 33.8 | 69.3 | 19   | 36 | φ14 ~ φ19                                  | 24                       | Black   |
| 120-0806-6    | H/MS3057-16A1     | 40 | 33.8 | 69.3 | 14.2 | 36 | φ10 ~ φ14.2                                | 24                       |         |
| 120-0806-6-10 | H/MS3057-16A1(10) | 40 | 33.8 | 69.3 | 14.2 | 36 | φ10 ~ φ14.2                                | 24                       | Black   |

Remarks: Check cable dia. carefully before using cables because clamping force and waterproofness vary depending on their types.

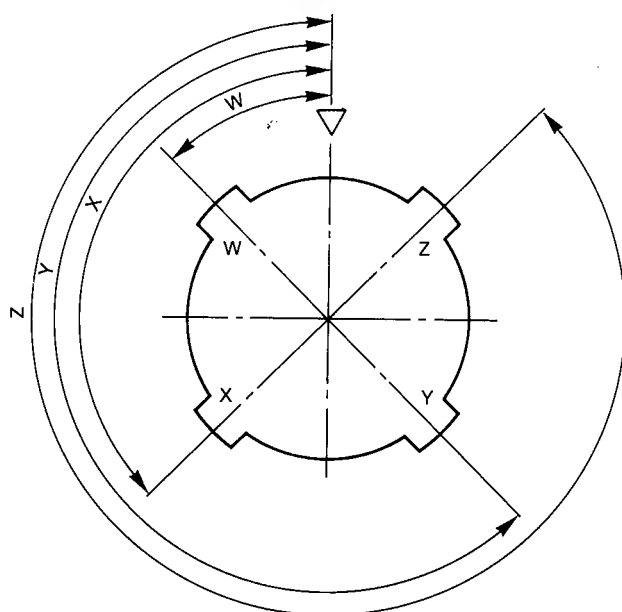
## ◆ Applicable tools

| Type      | Item                            | HRS No.    | Part No.          | Applicable terminal                         | Applicable wire |
|-----------|---------------------------------|------------|-------------------|---------------------------------------------|-----------------|
| Manual    | Manual crimping tool            | 150-0206-0 | H/MS/CC-HT        | H/MS-PC1-112                                | AWG # 24～ # 28  |
| Automatic | Automatic crimping machine body | 901-0005-4 | CM-105            | —                                           | —               |
|           | Applicator                      | 901-2027-8 | AP105-H/MS-PC1-1  | H/MS-PC-212                                 | AWG # 24～ # 28  |
|           |                                 | 901-2032-8 | AP105-H/MS-SC-212 | H/MS-SC-212                                 | AWG # 24～ # 28  |
| Extractor |                                 | 150-0076-7 | H/MS-TP           | H/MS-PC1-112<br>H/MS-PC1-212<br>H/MS-SC-212 | —               |



## ◆ Changes in insert position

Changes in insert position are shown as viewed from the mating side with the receptacle pin inserted. For details, see the Table and Figure below.



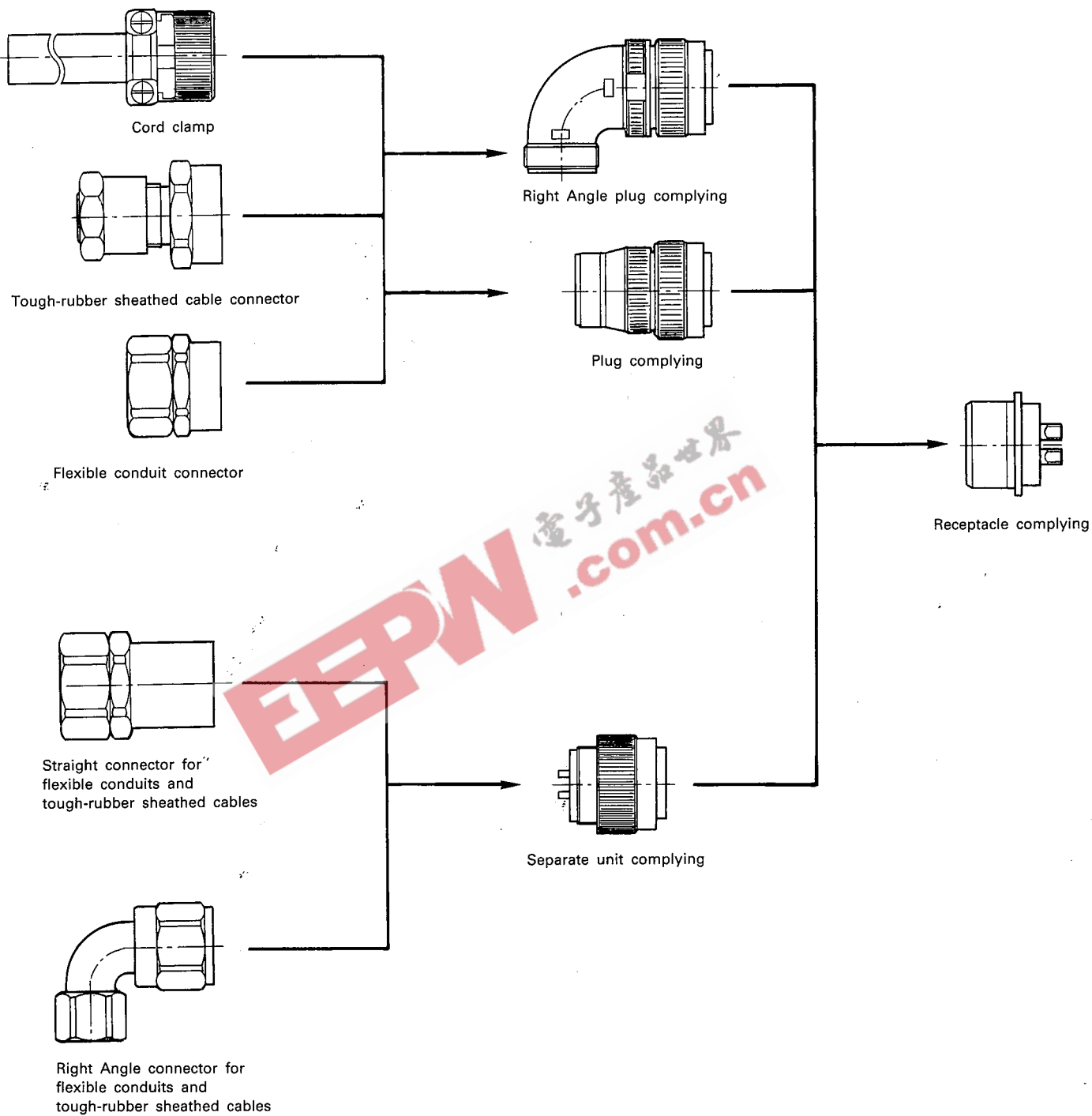
| Sign of position<br>Product No. | W   | X    | Y    | Z    |
|---------------------------------|-----|------|------|------|
| H/MS※※18-10※                    | —   | 120° | 240° | —    |
| H/MS※※18-12※                    | 80° | —    | —    | 280° |
| H/MS※※20-15※                    | 80° | —    | —    | 280° |
| H/MS※※20-29※                    | 80° | —    | —    | 280° |
| H/MS※※22-14※                    | 80° | —    | —    | 280° |
| H/MS※※22-22※                    | —   | 110° | 250° | —    |
| H/MS※※22-23※                    | 35° | —    | 250° | —    |
| H/MS※※24-10※                    | 80° | —    | —    | 280° |

Remarks: The numbers of products that require changes in insert position are given as follows:

Example: H/MS3102A18-10PX-D

— Add the sign of the insert position you desire to the product number.

## ◆ Connector combinations



Remarks: The shapes of connectors for flexible conduit tubes and tough-rubber sheathed cables are just examples.

## ◆ Application List of H/MS Connectors and Connectors for Conduit Tubes and Tough-rubber sheathed cables

### ● Connectors for flexible conduit tubes

| H/MS connector product No. | Nippon Flex (product No.)   |                 | Daiwa Dengyo (size)          |             |
|----------------------------|-----------------------------|-----------------|------------------------------|-------------|
|                            | Straight                    | Right Angle     | Straight                     | Right Angle |
| H/MS3106A10SL-□□           | RCC-10※CA12 (with O ring)   | —               | NBDC 12S-※※ (with O ring)    | —           |
| H/MS3108B10SL-□□           | RCC-10※CA12                 | —               | NBDC 12S-※※                  | —           |
| H/MS3106A10SL-□□(03)       | RCC-10※RL-MS10F             | RCC-30※RL-MS10F | BOS 10-※                     | BOL 10-※    |
| H/MS3106A18-□□             | RCC-10※CA18 (with O ring)   | —               | NBDC 18-※※ (with O ring)     | —           |
| H/MS3108B18-□□             | RCC-10※CA18                 | —               | NBDC 18-※※                   | —           |
| H/MS3106A18-□□(03)         | RCC-10※RL-MS18F             | RCC-30※RL-MS18F | BOS 18-※※                    | BOL 18-※※   |
| H/MS3106A20-□□             | RCC-10※CA2022 (with O ring) | —               | NBDC 20(22)-※※ (with O ring) | —           |
| H/MS3108B20-□□             | RCC-10※CA2022               | —               | NBDC 20(22)-※※               | —           |
| H/MS3106A20-□□(03)         | RCC-10※RL-MS20F             | RCC-30※RL-MS20F | BOS 20-※※                    | BOL 20-※※   |
| H/MS3106A22-□□             | RCC-10※CA2022 (with O ring) | —               | NBDC 20(22)-※※ (with O ring) | —           |
| H/MS3108B22-□□             | RCC-10※CA2022               | —               | NBDC 20(22)-※※               | —           |
| H/MS3106A22-□□(03)         | RCC-10※RL-MS22F             | RCC-30※RL-MS22F | BOS 22-※※                    | BOL 22-※※   |
| H/MS3106A24-□□             | RCC-10※CA2428 (with O ring) | —               | NBDC 24-※※ (with O ring)     | —           |
| H/MS3108B24-□□             | RCC-10※CA2428               | —               | NBDC 24-※※                   | —           |
| H/MS3106A24-□□(03)         | RCC-10※RL-MS24F             | RCC-30※RL-MS24F | BOS 24-※※                    | BOL 24-※※   |

### ● Connectors for Tough-rubber sheathed cables

| H/MS connector product No. | Nippon Flex (product No.) |                | Daiwa Dengyo (size)         |             |
|----------------------------|---------------------------|----------------|-----------------------------|-------------|
|                            | Straight                  | Right Angle    | Straight                    | Right Angle |
| H/MS3106A10SL-□□           | —                         | —              | YDC 12S-※ (with O ring)     | —           |
| H/MS3108B10SL-□□           | —                         | —              | YDC 12S-※                   | —           |
| H/MS3106A10SL-□□(03)       | ACS-※※RL-MS10F            | ACA-※※RL-MS10F | YSO 10-※                    | YLO 10-※    |
| H/MS3106A18-□□             | ACS-※※CA18                | —              | YDC 18-※※ (with O ring)     | —           |
| H/MS3108B18-□□             | —                         | —              | YDC 18-※※                   | —           |
| H/MS3106A18-□□(03)         | ACS-※※RL-MS18F            | ACA-※※RL-MS18F | YSO 18-※※                   | YLO 18-※※   |
| H/MS3106A20-□□             | ACS-※※CA2022              | —              | YDC 20(22)-※※ (with O ring) | —           |
| H/MS3108B20-□□             | —                         | —              | YDC 20(22)-※※               | —           |
| H/MS3106A20-□□(03)         | ACS-※※RL-MS20F            | ACA-※※RL-MS20F | YSO 20-※※                   | YLO 20-※※   |
| H/MS3106A22-□□             | ACS-※※CA2022              | —              | YDC 20(22)-※※ (with O ring) | —           |
| H/MS3108B22-□□             | —                         | —              | YDC 20(22)-※※               | —           |
| H/MS3106A22-□□(03)         | ACS-※※RL-MS22F            | ACA-※※RL-MS22F | YSO 22-※※                   | YLO 22-※※   |
| H/MS3106A24-□□             | ACS-※※CA2428              | —              | YDC 24-※※ (with O ring)     | —           |
| H/MS3108B24-□□             | —                         | —              | YDC 24-※※                   | —           |
| H/MS3106A24-□□(03)         | ACS-※※RL-MS24F            | ACA-※※RL-MS24F | YSO 24-※※                   | YLO 24-※※   |

#### Remarks

1. □□ : Terminal arrangement sign
2. ※※ : Different depending on cables used

## ◆ Terminal arrangement and main performance

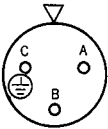
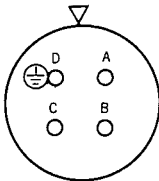
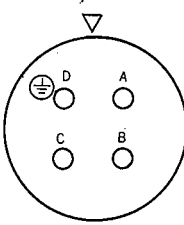
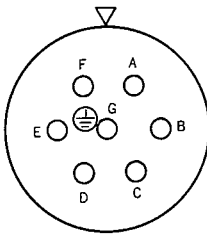
| Shell size             | 10SL                |                     | 18                  |                     | 20                  |
|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|                        | 4                   | 3                   | 10                  | 12                  | 15                  |
| Terminal arrangement   |                     |                     |                     |                     |                     |
| No. of contacts        | 2                   | 3                   | 4                   | 6                   | 7                   |
| Withstanding voltage   | 1000 VAC for 1 min. | 1000 VAC for 1 min. | 2000 VAC for 1 min. | 2000 VAC for 1 min. | 2000 VAC for 1 min. |
| Rated current          | 13A (24.5A)         | 13A (34.5A)         | 23A (76.2A)         | 13A (55.6A)         | 23A (105.7A)        |
| Insulation resistance  | DC500V 5000MΩ MIN.  | DC500V 5000MΩ MIN.  | DC500V 5000MΩ MIN.  | DC500V 5000MΩ MIN.  | DC500V 5000MΩ MIN.  |
| Contact resistance     | 5mΩ MAX             | 5mΩ MAX             | 3mΩ MAX             | 5mΩ MAX             | 3mΩ MAX             |
| Solder pot inside dia. | φ 1.8               | φ 1.8               | φ 2.9               | φ 1.8               | φ 2.9               |
| Spare solder           | Not provided        | Not provided        | Provided            | Not provided        | Provided            |

| Shell size             | 20                  | 22                  |                     | 24                  |                     |
|------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|                        | 29                  | 14                  | 22                  | 23                  | 10                  |
| Terminal arrangement   |                     |                     |                     |                     |                     |
| No. of contacts        | 17                  | 19                  | 4                   | 8                   | 7                   |
| Withstanding voltage   | 2000 VAC for 1 min. | 2000 VAC for 1 min. | 2000 VAC for 1 min. | 2000 VAC for 1 min. | 2000 VAC for 1 min. |
| Rated current          | 13A (44.2A)         | 13A (49.4A)         | 46A (152.5A)        | 23A (100.4A)        | 46A (211.5A)        |
| Insulation resistance  | DC500V 5000MΩ MIN.  | DC500V 5000MΩ MIN.  | DC500V 5000MΩ MIN.  | DC500V 5000MΩ MIN.  | DC500V 5000MΩ MIN.  |
| Contact resistance     | 5mΩ MAX             | 5mΩ MAX             | 1mΩ MAX             | 3mΩ MAX             | 1mΩ MAX             |
| Solder pot inside dia. | φ 1.8               | φ 1.8               | φ 5.3               | φ 2.9               | φ 5.3               |
| Spare solder           | Not provided        | Not provided        | Provided            | Provided            | Provided            |

### Remarks:

- The above figures show the receptacle pin inserts as viewed from the mating side (socket insert termination side of the plugs).
- Withstand voltage shows the testing voltage.
- Rate current shows the capacity per terminal.  
Figure in ( ) shows the total current capacity of a connector.
- Contact resistance is as measured at 1 ADC.
- For details, please contact us.

◆ (CONTACT) Approved by German specification DIN, VDE 0627

| Shell size                   | 10SL                                                                              |      |      | 18                                                                                |     | 22                                                                                 |     |    | 24                                                                                  |     |
|------------------------------|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|-----|------------------------------------------------------------------------------------|-----|----|-------------------------------------------------------------------------------------|-----|
|                              | 3                                                                                 |      |      | 10                                                                                |     | 22                                                                                 |     |    | 10                                                                                  |     |
| Contact arrangement          |  |      |      |  |     |  |     |    |  |     |
| No. of pins                  | 3                                                                                 |      |      | 4                                                                                 |     | 4                                                                                  |     |    | 7                                                                                   |     |
| Grounding terminal No.       | C                                                                                 |      |      | D                                                                                 |     | D                                                                                  |     |    | G                                                                                   |     |
| AC, DC rated voltage (V)     | 200                                                                               |      |      | 500                                                                               |     | 500                                                                                |     |    | 250                                                                                 |     |
| Current rating (A)           | 7                                                                                 | 10   | 13   | 17                                                                                | 23  | 23                                                                                 | 35  | 46 | 23                                                                                  | 35  |
| Wire size (mm <sup>2</sup> ) | 0.5                                                                               | 0.75 | 1.25 | 2                                                                                 | 3.5 | 3.5                                                                                | 5.5 | 8  | 3.5                                                                                 | 5.5 |
| Pollution degree             | 3                                                                                 |      |      | 2                                                                                 |     | 2                                                                                  |     |    | 2                                                                                   |     |
| Over current range           | III                                                                               |      |      | II                                                                                |     | II                                                                                 |     |    | II                                                                                  |     |

Remarks:

1. The figure shows the contact arrangements viewed from the fitting side of socket insert (connecting side of pin inserts).
2. Current rating is the capacity per terminal.
3. In case of size 24-10 receptacles are non-conducted between grounding terminal and shell of connectors, other size and size 24-10 plug are conducted between earth and shell of connectors.
4. The pollution degree and over current range is mean DIN VDE 0110 (coordination of insulation for low voltage equipment of an electrical appliance) classified for using of an electrical appliances of environment condition and classified for over voltage of an electrical appliances.
5. Performances excluding above tables are in accordance with general H/MS.