

Circular Connectors Supporting TÜV and MIL spec.

H/MS Series



■ Features

1. Compatible with MIL spec. standard products
2. A ground circuit is provided in the TÜV approved connectors
3. Waterproof

The mated plug/receptacle combinations and un-mated receptacles are compliant to IP67F and IP68F ratings.

IP67: Left in water at a depth of 1 m for 30 minutes
IP68: Left in water at a depth of 2 m for 14 days

■ Product Specifications

● Standard products

| | | | | | | | | | | | |
|---------------------------|--|----------------|--|--------|--|--------|--|---------|--|--------|--|
| Ratings | Shell size | 10SL | | 18 | | 20 | | 22 | | 24 | |
| | Contact arrangement | 4 | | 3 | | 10 | | 15 | | 29 | |
| | Number of contacts | 2 | | 3 | | 4 | | 7 | | 17 | |
| | Rated current (A)/contact | 13 | | 13 | | 23 | | 23 | | 13 | |
| | The figure in [] indicates the total capacity of the connector. | [24.5] | | [34.5] | | [76.2] | | [105.7] | | [44.2] | |
| | Rated voltage | AC500V, DC700V | | | | | | | | | |
| | Operation temperature range | -40 to +125°C | | | | | | | | | |
| Storage temperature range | -10 to +60°C | | | | | | | | | | |

● TÜV approved products

| | | | | | | | | | | | | | | | | |
|---------|------------------------------|---------------|------|------|-----|-----|----|-----|-----|-----|----|-----|-----|----|-----|-----|
| Ratings | Shell size | 10SL | | | 18 | | | | 22 | | | | 24 | | | |
| | Contact arrangement | 3 | | | 10 | | | | 22 | | | | 10 | | | |
| | Number of contacts | 3 | | | 4 | | | | 4 | | | | 7 | | | |
| | Rated current (A)/contact | 7 | 10 | 13 | 17 | 23 | 17 | 23 | 23 | 35 | 46 | 23 | 35 | 46 | 23 | 35 |
| | Wire size (mm ²) | 0.5 | 0.75 | 1.25 | 2 | 3.5 | 2 | 3.5 | 3.5 | 5.5 | 8 | 3.5 | 5.5 | 8 | 3.5 | 5.5 |
| | Rated voltage (V) | 200 | | | 500 | | | | 250 | | | | 500 | | | |
| | Degree of pollution | 3 | | | 2 | | | | 3 | | | | 2 | | | |
| | Conducting voltage category | III | | | II | | | | III | | | | II | | | |
| | Operation temperature range | -40 to +125°C | | | | | | | | | | | | | | |
| | Storage temperature range | -10 to +60°C | | | | | | | | | | | | | | |

■ Performance

| Items | Specifications | Conditions |
|--------------------------|---|---|
| 1. Contact resistance | 10SL, 20-29, 22-14: 5 mΩ max. 18-10, 20-15, 22-23: 3 mΩ max. 22-22, 24-10: 1 mΩ max. | Measured at DC 1 A |
| 2. Insulation resistance | 5,000 MΩ min. | Measured at DC 500 V |
| 3. Withstanding voltage | No flashover or dielectric breakdown | AC 2,250 V for one minute |
| 4. Vibration Resistance | No electrical discontinuity for 10 μs min. | 10 to 500 Hz/cycle, full amplitude: 0.75 mm, with 98 m/s ² , 3 directions, 3 hours each 10 to 500 Hz/cycle, full amplitude: 0.75 mm, with 98 m/s ² , 3 axis directions, 3 hours each |
| 5. Shock resistance | No electrical discontinuity for 10 μs min. | Acceleration: 490 m/s ² , duration: 11 ms, 3 axis directions, 3 cycles each |
| 6. Mating Cycles | Contact resistance : Initial value x for 1.5 mΩ max. | 500 times |
| 7. Temperature cycle | Insulation resistance: a minimum of 500 MΩ | -55°C: 30 minutes → Normal temperature: 10 to 15 minutes → 125°C: 30 minutes → Normal temperature: 10 to 15 minutes, left for 5 cycles |
| 8. Moisture resistance | Insulation resistance: a minimum of 50 MΩ (at high humidity min. 500 MΩ (when dry) min. | Temperature: 71°C, relative humidity: 95%, left for 336 hours |
| 9. Waterproof | No water penetration into the connector. | Left in water at a depth of 1 m for 0.5 hours in the mated state. |

Materials

| Material | | Finish | Remarks |
|-----------|--|--------------------------|--|
| Shell | Aluminum alloy (Zinc alloy: H/MS3108B plug cord tube) | Black chromate treatment | _____ |
| Insulator | PPS resin, PBT resin, or silicone rubber | Black | UL94V-0 (Excluding silicone rubber) |
| Contact | Copper alloy | Silver plating | _____ |
| Bushing | Acrylonitrile-butadiene rubber (Chloroprene rubber: H/MS08A plug) | Black | _____ |

Ordering information

● Plug and receptacle

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

1
2
3
4
5
6
7
8
9
11

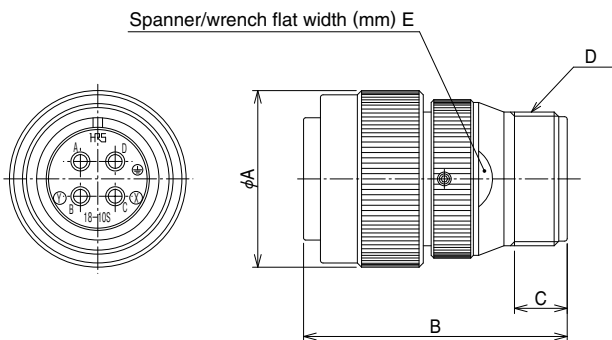
● Clamp

H/MSA 3057 - 4A (01)

1
2
10
11

| |
|---|
| 1 Model name: H/MS Series. |
| 2 Shape: Indicates the shape of the connector. 3102 : Receptacle 3106 : Straight plug 3108 : Right angle shaped plug 08: Low-profile, right angle shaped plug 3057 : Cord clamp |
| 3 Structure: Indicates the structure of the connector. A: Integrated shell B: Separated shell |
| 4 Shell size: This is the diameter of the screw (inches) at the termination end multiplied by the constant of 16. (Example: The shell size of 18 is calculated by 1 1/8" x 16 = 18.) |
| 5 Contact arrangement: See pages 10 and 11 for details on contact arrangement. |
| 6 Contact form: Indicates the termination style. P : Soldered, male contact S : Soldered, female contact PC: Crimped, male contact SC: Crimped, female contact |
| 7 Variations of insert position: The letters W, X, Y, or Z are used for any changes in the insert position from that of the standard type. |
| 8 Ground contact number: Notes the grounded contact for TÜV approved products. The ground contact position corresponds to contacts C, D, or G, and varies depending on shell size. Part numbers without this symbol indicate that the part does not include a ground contact. |
| 9 TÜV approved product: TÜV approved products that are compliant with DIN VDE 0627. |
| 10 Clamp size: Indicates both clamp size and structure. |
| 11 Other specifications: A two-digit number such as (01) or (02) is added to indicate other specifications. |

■Straight plug



(Representative example)

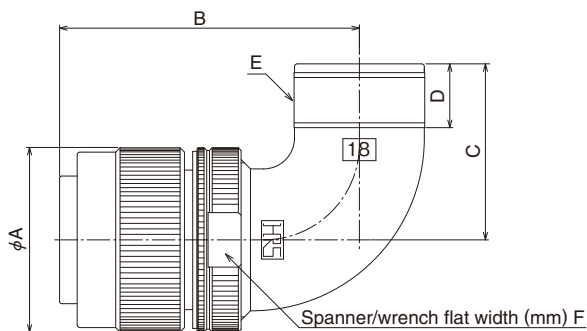
●Standard products

| HRS No. | Part No. | No. of contacts | ϕA | B | C | D | E |
|---------------|----------------------|-----------------|----------|------|----|------------------|----|
| 120-0601-3 73 | H/MS3106A10SL-4S(73) | 2 | 22 | 36.8 | 10 | 5/8-24UNEF-2A | — |
| 120-0603-9 73 | H/MS3106A10SL-3S(73) | 3 | | | | | |
| 120-0605-4 73 | H/MS3106A18-10S(73) | 4 | 33.5 | 50 | | 1-20UNEF-2A | 27 |
| 120-0611-7 73 | H/MS3106A20-29S(73) | 17 | 37 | 54.5 | | 1 3/16-18UNEF-2A | 32 |
| 120-0611-7 77 | H/MS3106A20-29SW(77) | | | | | | |
| 120-0613-2 73 | H/MS3106A22-14S(73) | 19 | 39.5 | 57.7 | | 1 7/16-18UNEF-2A | 37 |
| 120-0615-8 73 | H/MS3106A22-22S(73) | 4 | | | | | |
| 120-0619-9 73 | H/MS3106A24-10S(73) | 7 | 43 | 57.7 | | | |

●TÜV approved products

| HRS No. | Part No. | No. of contacts | ϕA | B | C | D | E |
|---------------|--------------------------|-----------------|----------|------|----|------------------|----|
| 120-0326-0 73 | H/MS3106A10SL-3S-C-T(73) | 3 | 22 | 36.8 | 10 | 5/8-24UNEF-2A | — |
| 120-0323-2 73 | H/MS3106A18-10S-D-T(73) | 4 | 33.5 | 50 | | 1-20UNEF-2A | 27 |
| 120-0324-5 73 | H/MS3106A22-22S-D-T(73) | | 39.5 | 54.5 | | 1 3/16-18UNEF-2A | 32 |
| 120-0325-8 73 | H/MS3106A24-10S-G-T(73) | 7 | 43 | 57.7 | | 1 7/16-18UNEF-2A | 37 |

■Right-angled plug



(Representative example)

●Standard products

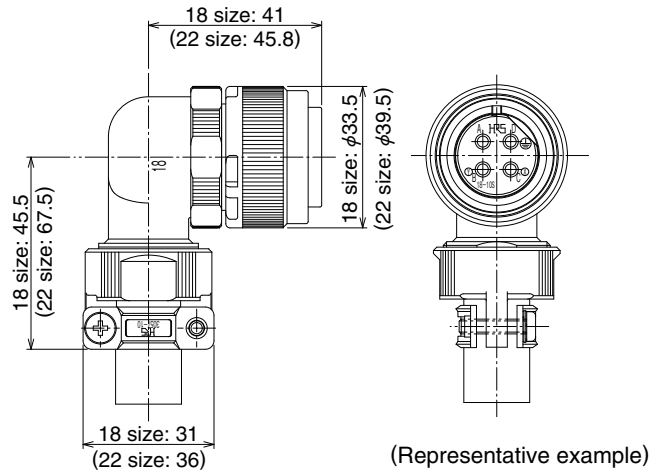
| HRS No. | Part No. | No. of contacts | ϕA | B | C | D | E | F |
|---------------|----------------------|-----------------|----------|------|------|------|------------------|----|
| 120-0701-8 73 | H/MS3108B10SL-4S(73) | 2 | 22 | 37.3 | 24.5 | 11.6 | 5/8-24UNEF-2A | 20 |
| 120-0703-3 73 | H/MS3108B10SL-3S(73) | 3 | | | | | | |
| 120-0705-9 73 | H/MS3108B18-10S(73) | 4 | 33.5 | 54.5 | 32 | | 1-20UNEF-2A | 32 |
| 120-0709-0 73 | H/MS3108B20-15S(73) | 7 | 37 | 60.7 | 34 | | 1 3/16-18UNEF-2A | 35 |
| 120-0711-1 73 | H/MS3108B20-29S(73) | 17 | | | | | | |
| 120-0711-1 74 | H/MS3108B20-29SW(74) | | | | | | | |
| 120-0713-7 73 | H/MS3108B22-14S(73) | 19 | 39.5 | 57.7 | 39.6 | | 1 7/16-18UNEF-2A | 41 |
| 120-0715-2 73 | H/MS3108B22-22S(73) | 4 | | | | | | |
| 120-0719-3 73 | H/MS3108B24-10S(73) | 7 | 43 | 67.1 | 39.6 | | | |

●TÜV approved products

| HRS No. | Part No. | No. of contacts | ϕA | B | C | D | E | F |
|---------------|--------------------------|-----------------|----------|------|------|------|------------------|----|
| 120-0421-1 73 | H/MS3108B10SL-3S-C-T(73) | 3 | 22 | 37.3 | 24.5 | 11.6 | 5/8-24UNEF-2A | 20 |
| 120-0422-4 73 | H/MS3108B18-10S-D-T(73) | 4 | 33.5 | 54.5 | 32 | | 1-20UNEF-2A | 32 |
| 120-0423-7 73 | H/MS3108B22-22S-D-T(73) | | 39.5 | 60.7 | 34 | | 1 3/16-18UNEF-2A | 38 |
| 120-0424-0 73 | H/MS3108B24-10S-G-T(73) | 7 | 43 | 67.1 | 39.6 | | 1 7/16-18UNEF-2A | 41 |

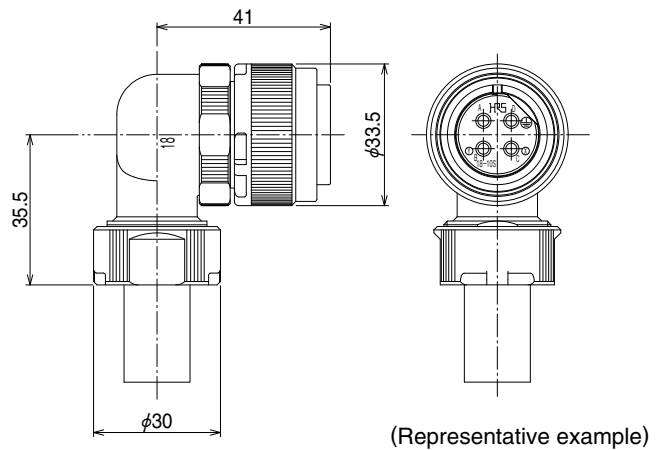
(Note) With some models it may be difficult to push the cable through the connector, even when the cable is within the applicable range. Waterproof performance and cable clamp capability may differ depending on the cable specification. Please make sure all specifications are met before actual use.

■ Low-profile, right-angled plug (with cord clamp)



● TÜV approved products

| HRS No. | Part No. | No. of contacts | Weight | Applicable cable diameter | Solder pot diameter |
|---------------|--------------------------|-----------------|--------|------------------------------|---------------------|
| 120-0476-3 73 | H/MS08A18-10S-DT10D(73) | 4 | 89g | $\phi 12 \sim 14.3\text{mm}$ | $\phi 2.5$ |
| 120-0481-3 73 | H/MS08A18-10S-DT10D1(73) | | | $\phi 10 \sim 12.5\text{mm}$ | |
| 120-0477-6 73 | H/MS08A22-22S-DT12D(73) | 4 | 127g | $\phi 13 \sim 15.9\text{mm}$ | $\phi 4.5$ |
| 120-0477-6 74 | H/MS08A22-22S-DT12D(74) | | | $\phi 10 \sim 13.5\text{mm}$ | |
| 120-0482-6 74 | H/MS08A22-22S-DT12D1(74) | | | | |



● TÜV approved products

| HRS No. | Part No. | No. of contacts | Weight | Applicable cable diameter | Solder pot diameter |
|---------------|-------------------------|-----------------|--------|------------------------------|---------------------|
| 120-0480-0 74 | H/MS08A18-10S-DT10C(74) | 4 | 77.6g | $\phi 13 \sim 14.3\text{mm}$ | $\phi 2.5$ |

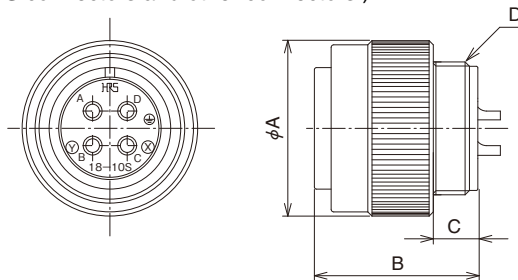
1.Part number suffix

- (73) Specification: products with a wire hole in the locking ring to prevent loosening of the ring.
- (74) Specification: products without a wire hole in the locking ring.

■ Single block (waterproof)



This connector is designed for use with flexible conduit or cable connectors. (See page 8 for the table of compatibilities for H/MS connectors and other connectors.)



(Representative example)

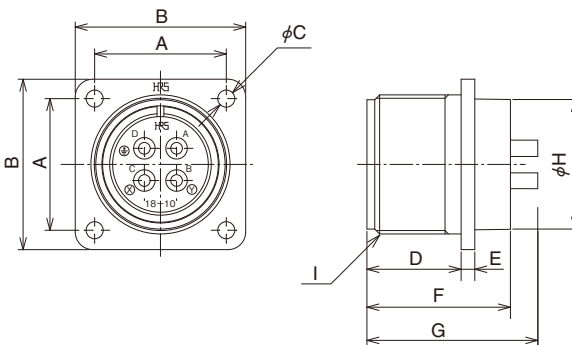
● Standard products

| HRS No. | Part No. | No. of contacts | φA | B | C | D |
|---------------|----------------------|-----------------|------|------|-----|-----------------|
| 120-0601-3 76 | H/MS3106A10SL-4S(76) | 2 | 22 | 24 | 6.5 | 9/16-24UNEF-2A |
| 120-0603-9 76 | H/MS3106A10SL-3S(76) | 3 | | | | |
| 120-0605-4 76 | H/MS3106A18-10S(76) | 4 | 33.5 | 31.2 | 8 | 1-20UNEF-2A |
| 120-0611-7 76 | H/MS3106A20-29S(76) | 17 | 37 | 33.2 | 10 | 1 1/8-18UNEF-2A |
| 120-0611-7 78 | H/MS3106A20-29SW(78) | | | | | 1 1/4-18UNEF-2A |
| 120-0613-2 76 | H/MS3106A22-14S(76) | 19 | 39.5 | 33.2 | 10 | 1 1/4-18UNEF-2A |
| 120-0615-8 76 | H/MS3106A22-22S(76) | 4 | | | | 1 3/8-18UNEF-2A |
| 120-0619-9 76 | H/MS3106A24-10S(76) | 7 | 43 | 34.7 | | |

● TÜV approved products

| HRS No. | Part No. | No. of contacts | φA | B | C | D |
|---------------|--------------------------|-----------------|------|------|-----|-----------------|
| 120-0326-0 76 | H/MS3106A10SL-3S-C-T(76) | 3 | 22 | 24 | 6.5 | 9/16-24UNEF-2A |
| 120-0323-2 76 | H/MS3106A18-10S-D-T(76) | 4 | 33.5 | 31.2 | 8 | 1-20UNEF-2A |
| 120-0324-5 76 | H/MS3106A22-22S-D-T(76) | | 39.5 | 33.2 | | 1 1/4-18UNEF-2A |
| 120-0325-8 76 | H/MS3106A24-10S-G-T(76) | 7 | 43 | 34.7 | 10 | 1 3/8-18UNEF-2A |

■ Receptacle (solder type)



(Representative example)

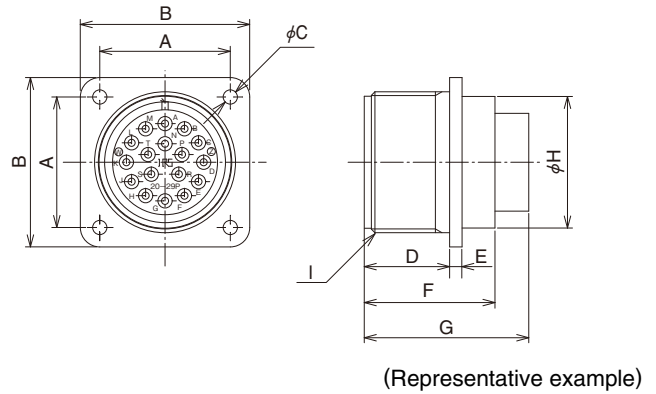
● Standard products

| HRS No. | Part No. | No. of contacts | A | B | φC | D | E | F | G | φH | I |
|---------------|----------------------|-----------------|-------|-------|------|-------|-------|------|------|-----------------|-----------------|
| 120-0111-4 73 | H/MS3102A10SL-4P(73) | 2 | 18.26 | 25.4 | 3.3 | 14.5 | 2.2 | 23.6 | 28.3 | 15.6 | 5/8-24UNEF-2A |
| 120-0113-0 73 | H/MS3102A10SL-3P(73) | 3 | | | | | | | | | |
| 120-0101-0 73 | H/MS3102A18-10P(73) | 4 | 26.97 | 34.92 | 3.3 | 19.3 | 2.8 | 30 | 35 | 26.6 | 1 1/8-18UNEF-2A |
| 120-0115-5 73 | H/MS3102A20-15P(73) | 7 | 29.36 | 38.1 | | | | 29.4 | 33 | 29.6 | 1 1/4-18UNEF-2A |
| 120-0103-6 73 | H/MS3102A20-29P(73) | | | | 4 | 31.75 | 41.28 | 38 | 32.6 | 1 3/8-18UNEF-2A | |
| 120-0103-6 74 | H/MS3102A20-29PW(74) | 4 | 34.92 | 44.45 | 3.75 | 21 | 2.8 | 29.4 | 38 | 32.6 | 1 3/8-18UNEF-2A |
| 120-0107-7 73 | H/MS3102A22-22P(73) | 7 | | | | | | | | | |
| 120-0109-2 73 | H/MS3102A24-10P(73) | 7 | 34.92 | 44.45 | 3.75 | 21 | 31.6 | 41 | 36 | 1 1/2-18UNEF-2A | |

● TÜV approved products

| HRS No. | Part No. | No. of contacts | A | B | φC | D | E | F | G | φH | I |
|---------------|--------------------------|-----------------|-------|-------|-------|------|------|------|------|-----------------|-----------------|
| 120-0231-6 73 | H/MS3102A10SL-3P-C-T(73) | 3 | 18.26 | 25.4 | 3.3 | 14.5 | 2.2 | 23.6 | 28.3 | 15.6 | 5/8-24UNEF-2A |
| 120-0259-5 73 | H/MS3102A18-10P-D-T1(73) | 4 | 26.97 | 34.92 | | | | | | | |
| 120-0227-9 73 | H/MS3102A22-22P-D-T(73) | | 7 | 34.92 | 44.45 | 3.75 | 21 | 31.6 | 41 | 36 | 1 1/2-18UNEF-2A |
| 120-0228-1 73 | H/MS3102A24-10P-G-T(73) | 7 | 34.92 | 44.45 | 3.75 | 21 | 31.6 | 41 | 36 | 1 1/2-18UNEF-2A | |

● Receptacle (crimp type)

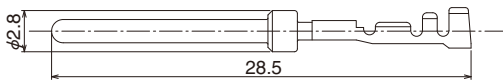


● Standard products

| HRS No. | Part No. | No. of contacts | A | B | φC | D | E | F | G | φH | I |
|---------------|----------------------|-----------------|-------|-------|-----|------|-----|------|----|------|-----------------|
| 120-0501-9 73 | H/MS3102A20-29PC(73) | 17 | 29.36 | 38.1 | 3.3 | 19.3 | 2.8 | 29.4 | 37 | 29.6 | 1 1/4-18UNEF-2A |
| 120-0502-1 73 | H/MS3102A22-14PC(73) | 19 | 31.75 | 41.28 | | | | | | 32.6 | 1 3/8-18UNEF-2A |

◆ Contact

● Male contact



| Type | HRS No. | Part No. | Applicable wire size |
|----------------------|------------|--------------|----------------------|
| Reel contacts | 120-0533-5 | H/MS-PC1-212 | AWG#24 ~ 28 |
| Loose piece contacts | 120-0534-8 | H/MS-PC1-112 | |

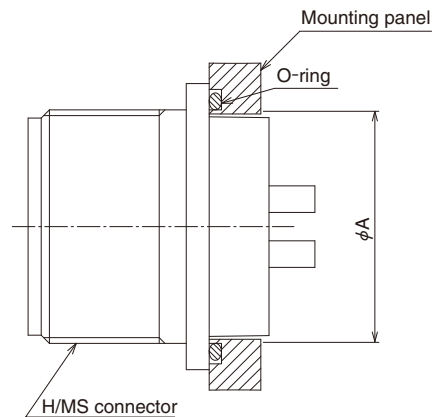
(Note) Reel contacts are packaged 7,000 pcs/reel. Loose piece contacts are packaged 100 pcs/pack.

◆ Receptacle mounting method

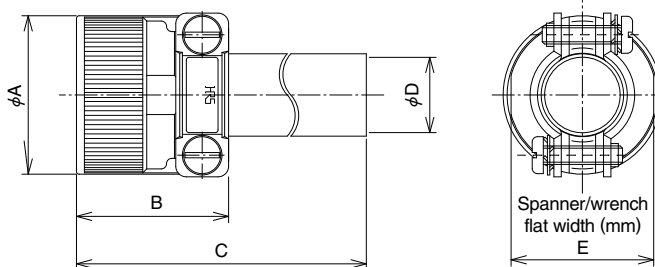
When installing a waterproof receptacle, please insert the appropriate O-ring (to be placed between the receptacle and panel), as shown in the figure on the right.

Recommended O-ring dimensions.

| Part No. | φA | Inner diameter of O-ring (φ) | Thickness of O-ring (φ) |
|------------------|------|------------------------------|-------------------------|
| H/MS3102A10SL-** | 17.5 | 17.5 | 2 |
| H/MS3102A18-** | 28.5 | 28.5 | |
| H/MS3102A20-** | 31.5 | 31.5 | |
| H/MS3102A22-** | 34.5 | 34.5 | |
| H/MS3102A-24 ** | 37.8 | 37.5 | |



■ Cord clamp



(Representative example)

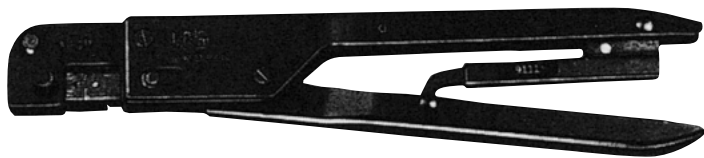
● Waterproof type

| HRS No. | Part No. | φA | B | C | φD | E | Range of applicable cable diameters (reference) | Applicable shell size |
|---------------|------------------|----|------|------|------|----|---|-----------------------|
| 120-0801-2 73 | H/MS3057-4A(73) | 20 | 26.8 | 83.8 | 5.6 | 17 | φ3.1 ~ 5.6 | 10SL |
| 120-0802-5 73 | H/MS3057-10A(73) | 30 | 28.8 | 72.8 | 14.3 | 27 | φ10.3 ~ 14.3 | 18 |
| 120-0803-8 73 | H/MS3057-12A(73) | 34 | 29.8 | 70.8 | 15.9 | 30 | φ11.4 ~ 15.9 | 20.22 |
| 120-0804-0 73 | H/MS3057-16A(73) | 40 | 33.8 | 69.3 | 19 | 36 | φ14 ~ 19 | 24 |

(Remarks) For various cable diameters, clamping force and waterproof performance may differ depending on the cable type selected. Please make sure all specifications are met before assembly.

◆ Applicable tools

| Type | Item | HRS No. | Part No. | Applicable contact | Applicable wire size |
|-----------------|--------------------------|------------|------------------|--------------------|----------------------|
| Manual | Manual crimping tool | 150-0206-0 | H/MS/CC-HT | H/MS-PC1-112 | AWG#24 ~ 28 |
| Auto | Automatic crimping press | 901-0005-4 | CM-105 | _____ | _____ |
| | Applicator | 901-2027-8 | AP105-H/MS-PC1-1 | H/MS-PC1-212 | AWG#24 ~ 28 |
| Extraction tool | | 150-0076-7 | H/MS-TP | H/MS-PC1-112 | _____ |
| | | | | H/MS-PC1-212 | |



Manual crimping tool

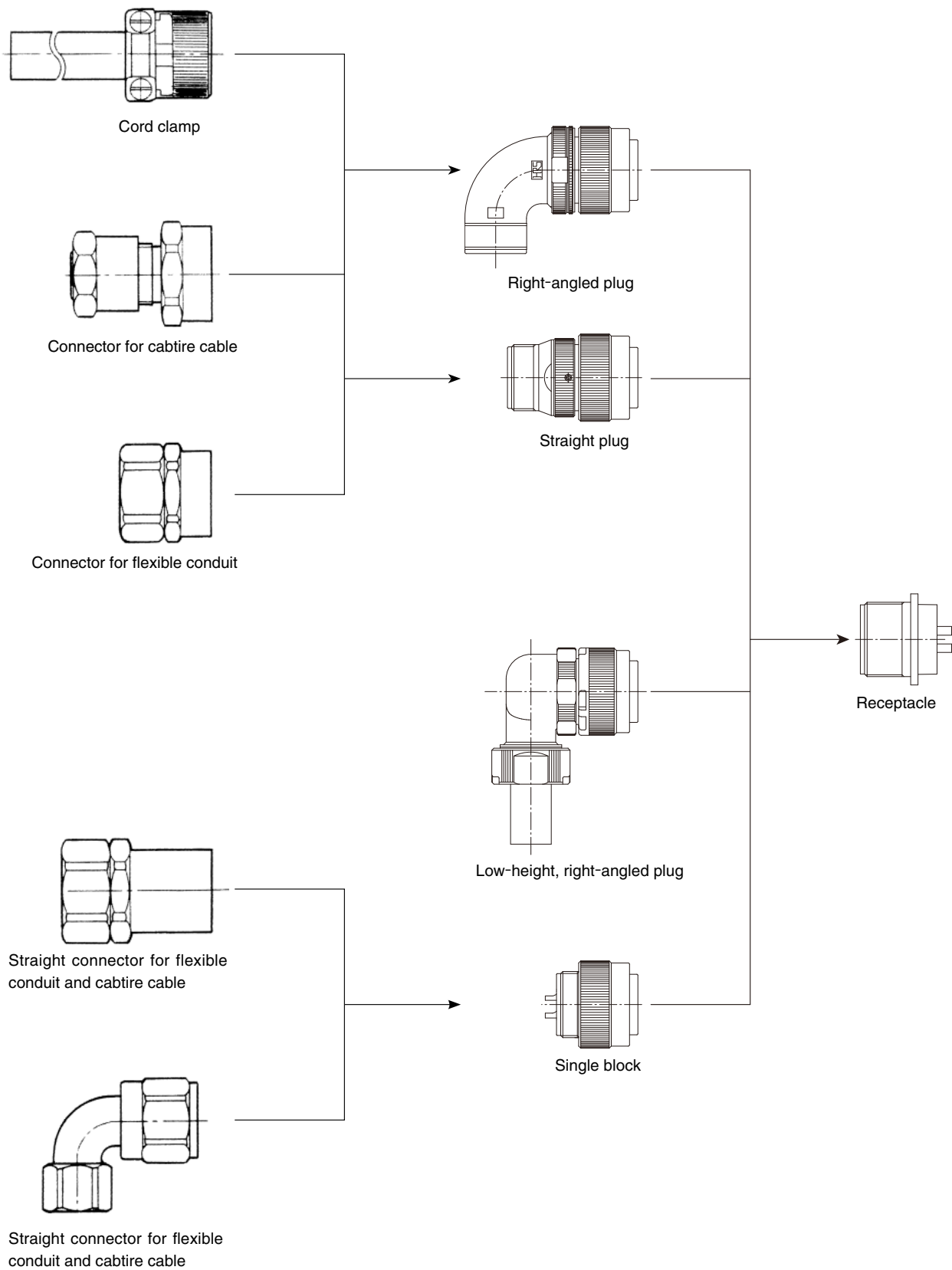


Extraction tool



Automatic crimping press (CM-105)

◆ Connector combinations



- (Remarks)
1. Illustration represents connectors for flexible conduit and cabtire cable as a reference example.
 2. The standard and TÜV approved products are compatible with each other.
When using the TÜV approved products for TÜV applications, make sure to use both TÜV approved plugs and receptacles together.

◆ Table of compatibilities for H/MS connectors and the connectors for conduit and cable

● Connectors for flexible conduit

| H/MS connector Part No. | Part number by Nippon Flex Co., Ltd. | | Part number by Daiwa Dengyo Co., Ltd. | |
|----------------------------|--------------------------------------|------------------|---------------------------------------|------------------|
| | Straight type | Right angle type | Straight type | Right angle type |
| H/MS3106A10SL-□□(73) | RCC10*CA12 (with O-ring) | — | NBDC 12S** (with O-ring) | — |
| H/MS3108B10SL-□□(73) | RCC10*CA12 | | NBDC 12S** | |
| H/MS3106A10SL-□□(76) | RCC10*RL-MS10F | RCC-30*RL-MS10F | BOS 10* | BOL 10* |
| H/MS3106A18-□□(73) | RCC10*CA18 (with O-ring) | — | NBDC 18** (with O-ring) | — |
| H/MS3108B18-□□(73) | RCC10*CA18 | | NBDC 18** | |
| H/MS3106A18-□□(76) | RCC10*RL-MS18F | RCC-30*RL-MS18F | BOS 18** | BOL 18** |
| H/MS3106A20-□□(73) | RCC10*CA2022 (with O-ring) | — | NBDC 20(22)** (with O-ring) | — |
| H/MS3106B20-□□(73) | RCC10*CA2022 | | NBDC 20(22)** | |
| H/MS3106A20-□□(76) | RCC10*RL-MS20F | RCC-30*RL-MS20F | BOS 22** | BOL 20** |
| H/MS3106A22-□□(73) | RCC10*CA2022 (with O-ring) | — | NBDC 20(22)** (with O-ring) | — |
| H/MS3108B22-□□(73) | RCC10*CA2022 | | NBDC 20(22) | |
| H/MS3106A22-□□(76) | RCC10*RL-MS22F | RCC-30*RL-MS22F | BOS 22** | BOL 22** |
| H/MS3106A24-□□(73) | CC10*CA2428 (with O-ring) | — | NBDC 24** (with O-ring) | — |
| H/MS3108B24-□□(73) | RCC10*CA2428 | | NBDC 24** | |
| H/MS3106A24-□□(76) | RCC10*RL-M524F | RCC-30*RL-MS24F | BOS 24** | BOL 24** |

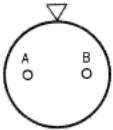
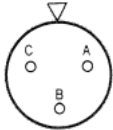
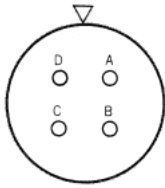
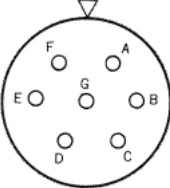
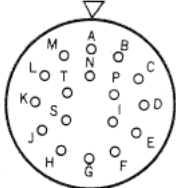
● Connectors for cable

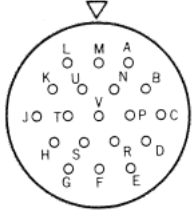
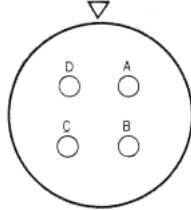
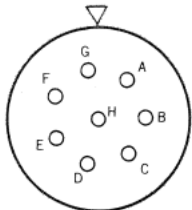
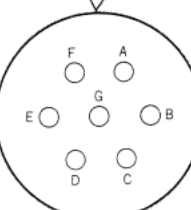
| H/MS connector Part No. | Part number by Nippon Flex Co., Ltd. | | Part number by Daiwa Dengyo Co., Ltd. | |
|----------------------------|--------------------------------------|------------------|---------------------------------------|------------------|
| | Straight type | Right angle type | Straight type | Right angle type |
| H/MS3106A-10SL□□(73) | — | — | YDC 12S* (with O-ring) | — |
| H/MS3108B-10SL□□(73) | | | YDC 12S* | |
| H/MS3106A-10SL□□(76) | ACS**RL-MS10F | ACA**RL-MS10F | YDO 10* | YLO 10* |
| H/MS3106A18-□□(73) | ACS**CA18 | — | YDC 18** (with O-ring) | — |
| H/MS3108B18-□□(73) | | | YDC 18** | |
| H/MS3106A18-□□(76) | ACS**RL-MS18F | ACA**RL-MS18F | YDO 18** | YLO 18* |
| H/MS3106A20-□□(73) | ACS**CA2022 | — | YDO 20(22)** (with O-ring) | — |
| H/MS3106B20-□□(73) | | | YDC 20(22)** | |
| H/MS3106A20-□□(76) | ACS**RL-MS20F | ACA**RL-MS20F | YDC 20** | YLO 20* |
| H/MS3106A22-□□(73) | ACS**CA2022 | — | YDC 20(22)** (with O-ring) | — |
| H/MS3108B22-□□(73) | | | YDC 20(22)** | |
| H/MS3106A22-□□(76) | ACS**RL-MS22F | ACA**RL-MS22F | YDO 22** | YLO 22* |
| H/MS3106A24-□□(73) | ACS**CA2428 | — | YDC 24** (with O-ring) | — |
| H/MS3108B24-□□(73) | | | YDC 24** | |
| H/MS3106A24-□□(76) | ACS**RL-MS24F | ACA**RL-MS24F | YDO 24** | YLO 24* |

(Remarks) 1. □□ : Indicates contact arrangement/count.

2. **: The values differ depending on the cable used.

◆ Contact arrangement and electrical performance

| Shell size | 10SL | | 18 | 20 | |
|------------------------------|---|---|---|---|---|
| | 4 | 3 | 10 | 15 | 29 |
| Contact arrangement |  |  |  |  |  |
| Number of contacts | 2 | 3 | 4 | 7 | 17 |
| Withstanding voltage | AC 1,000 V for one minute | | | AC 2,000 V for one minute | |
| Current capacity | 13A(24.5A) | 13A(34.5A) | 23A(76.2A) | 23A(105.7A) | 13A(44.2A) |
| Insulation resistance | 5,000 MΩ min. at 500V DC | | | | |
| Contact resistance | 5 mΩ max. | | 3 mΩ max. | | 5 mΩ max. |
| Inner diameter of solder pot | φ1.8 | | φ2.9 | | φ1.8 |
| Preliminary soldering | Not necessary | | Needed | | Not necessary |

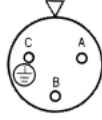
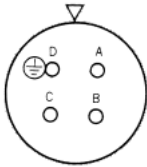
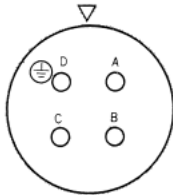
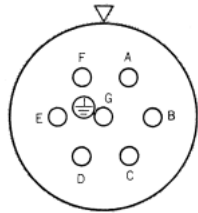
| Shell size | 22 | | 23 | 24 |
|------------------------------|---|---|---|---|
| | 14 | 22 | 23 | 10 |
| Contact arrangement |  |  |  |  |
| Number of contacts | 19 | 4 | 8 | 7 |
| Withstanding voltage | AC 2,000 V for one minute | | | |
| Current capacity | 13A(49.4A) | 46A(152.5A) | 23A(100.4A) | 46A(211.5A) |
| Insulation resistance | 5,000 MΩ min. at 500 V DC | | | |
| Contact resistance | 5 mΩ max. | 1 mΩ max. | 3 mΩ max. | 1 mΩ max. |
| Inner diameter of solder pot | φ1.8 | φ5.3 | φ2.9 | φ5.3 |
| Preliminary soldering | Not necessary | Needed | | |

Remarks

- Figure shows the receptacle contact arrangement as viewed from the interface mating side (plug's socket insert side).
- Withstanding voltages are derived from test voltages
- Current capacities are shown in a value per contact. The number in () indicates the connector's total capacity.
- Contact resistances are shown in a value when measured at DC 1 A.
- Please contact us for more information.

◆ Major specifications of TÜV approved products

● Applicable German standard: DIN VDE0627 (connector)

| Shell size | 10SL | | | 18 | | 22 | | | | 24 | | | | | |
|-----------------------------------|---|------|------|---|----|--|----|-----|-----|---|-----|-----|----|-----|-----|
| | 3 | | | 10 | | 22 | | | | 10 | | | | | |
| Contact arrangement |  | | |  | |  | | | |  | | | | | |
| Number of contacts | 3 | | | 4 | | 4 | | | | 7 | | | | | |
| Ground contact No. | C | | | D | | D | | | | G | | | | | |
| AC/DC rated voltage (V) | 200 | | | 500 | | 250 | | 500 | | 250 | | | | | |
| Rated current (A) | 7 | 10 | 13 | 17 | 23 | 17 | 23 | 23 | 35 | 46 | 23 | 35 | 46 | 23 | 46 |
| Wire size (mm ²) | 0.5 | 0.75 | 1.25 | 2 | 3 | 2 | 3 | 3.5 | 5.5 | 8 | 3.5 | 5.5 | 8 | 3.5 | 5.5 |
| Degree of Pollution | 3 | | | 2 | | 3 | | 2 | | 3 | | 2 | | | |
| Conducting voltage category | III | | | II | | III | | II | | III | | II | | | |
| Inner diameter of solder pot (mm) | φ1.8 | | | φ2.6 | | φ4.5 | | | | Plug: φ3.6 Receptacle: φ5.3 | | | | | |

Remarks

- Figure shows the receptacle contact arrangement as viewed from the interface mating side (plug's socket insert side).
- Current capacities are shown in a value per contact.
- The contact numbers with a mark "⊙" have contacts that are grounded to the outer shell, except for receptacles that are size 24-10.
- For the receptacles that are size 20-10, the ground contact (contact No.: G) does not ground with the outer shell. Please use these connectors after grounding the outer shell of the connector with the corresponding contact No.
- The degree of pollution and conducting voltage categories refer to the environmental condition in which a DIN VDE0110 (insulation coordination for the electric appliances in a constant voltage facility) electric appliance is used, and to the class of over voltage in the electric appliance.
- Performance values for other than those shown above are the same as those of the general H/MS series.

◆ Usage Recommendations

- The power to the circuit should always be off before mating/unmating a connector.
- Always use a female connector for the power side of the circuit; this will prevent the likelihood of electric shocks.
- Be sure to fully tighten the lock mechanism of the connectors.
- Connector performance features such as cable clamping force, cable rotation force, or waterproof performance may differ depending on the cable construction. Please make sure all specifications are met before assembly.
- This product uses silver-plated contacts. Please be aware that silver easily reacts to sulfur gases, causing discoloration or degradation when exposed to certain environmental conditions as shown below. These conditions include areas with:
 - A large amount of dust and dirt
 - High density of sulfur dioxide gas, hydrogen sulfide gas, nitrogen dioxide gas, or other gas (Emission gases from vehicles and factories, etc.)
 - Highly fluctuating temperatures, such as close to a heating apparatus

In addition, it is recommended to store the products in their original packaging or similar state in order to prevent discoloration.

 - Temperature: -10 to +60°C, relative humidity: 80% or lower (An environment where temperature and relative humidity are constant and there is less temperature difference is recommended.)
 - Please use the products within six months after delivery.

(For the products in which the storage period is expired, please confirm the ease of soldering for your application beforehand.)

USA:

HIROSE ELECTRIC (U.S.A.), INC. HEADQUARTERS
2688 Westhills Court, Simi Valley, CA 93065-6235
Phone : +1-805-522-7958
Fax : +1-805-522-3217
<http://www.hirose.com/us/>

USA:

HIROSE ELECTRIC (U.S.A.), INC. SAN JOSE OFFICE
3255 Scott Boulevard, Building 7, Suite 101
Santa Clara, CA 95054
Phone : +1-408-253-9640
Fax : +1-408-253-9641
<http://www.hirose.com/us/>

USA:

HIROSE ELECTRIC (U.S.A.), INC. CHICAGO OFFICE
580 Waters Edge Lane, Suite 205 Lombard IL
60148
Phone : +1-630-282-6706
Mail : inquiries@hirose.com
<http://www.hirose.com/us/>

USA:

HIROSE ELECTRIC (U.S.A.), INC. DETROIT OFFICE (AUTOMOTIVE)
37677 Professional Center Drive, Suite #100C
Livonia, MI 48154
Phone : +1-734-542-9963
Fax : +1-734-542-9964
<http://www.hirose.com/us/>

THE NETHERLANDS:

HIROSE ELECTRIC EUROPE B.V.
Hogehillweg #8 1101 CC Amsterdam Z-0
Phone : +31-20-6557460
Fax : +31-20-6557469
<http://www.hirose.com/eu/>

GERMANY:

HIROSE ELECTRIC EUROPE B.V. GERMAN BRANCH
Herzog-Carl-Strasse 4 D-73760 Ostfildern
(Scharnhäuser Park)
Phone : +49-711-4560-02-1
Fax : +49-711-4560-02-299
<http://www.hirose.com/eu/>

GERMANY:

HIROSE ELECTRIC EUROPE B.V. NUERNBERG OFFICE
Muggenhofer Str. 136 90429 Nuernberg
Phone : +49-911 32 68 89 63
Fax : +49-911 32 68 89 69
<http://www.hirose.com/eu/>

UNITED KINGDOM:

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

CHINA:

HIROSE ELECTRIC (SHANGHAI) CO., LTD.
1601, Henderson Metropolitan, NO.300, East Nanjing
Road, Huangpu District, Shanghai, China 200001
Phone : +86-21-6391-3355
Fax : +86-21-6391-3335
<http://www.hirose.com/cn/>

CHINA:

HIROSE ELECTRIC (SHANGHAI) CO.,LTD. BEIJING BRANCH
A1001, Ocean International Center, Building 56# East 4th
Ring Middle Road, ChaoYang District, Beijing, 100025
Phone : +86-10-5165-9332
Fax : +86-10-5908-1381
<http://www.hirose.com/cn/>

CHINA:

HIROSE ELECTRIC TECHNOLOGIES (SHENZHEN) CO., LTD.
Room 09-13, 19/F, Office Tower Shun Hing Square, Di Wang Commercial Centre,
5002 Shen Nan Dong Road, Shenzhen City, Guangdong Province, 518008
Phone : +86-755-8207-0851
Fax : +86-755-8207-0873
<http://www.hirose.com/cn/>

HONG KONG:

HIROSE ELECTRIC HONGKONG TRADING CO., LTD.
Room 1001, West Wing, Tsim Sha Tsui Centre, 66
Mody Road, Tsim Sha Tsui East, Kowloon, Hong Kong
Phone : +852-2803-5338
Fax : +852-2591-6560
<http://www.hirose.com/hk/>

TAIWAN:

HIROSE ELECTRIC TAIWAN CO., LTD.
103 8F, No.87, Zhengzhou Rd., Taipei
Phone : +886-2-2555-7377
Fax : +886-2-2555-7350
<http://www.hirose.com/cn/>

KOREA:

HIROSE KOREA CO., LTD.
1261-10, Jeoungwhang-Dong, Shihung-City,
Kyunggi-Do 429-450
Phone : +82-31-496-7000,7124
Fax : +82-31-496-7100
<http://www.hirose.co.kr/>

SINGAPORE:

HIROSE ELECTRIC SINGAPORE PTE. LTD.
10 Anson Road #26-1, International Plaza
079903, Singapore
Phone : +65-6324-6113
Fax : +65-6324-6123
<http://www.hirose.com/sg/>

INDIA:

HIROSE ELECTRIC SINGAPORE PTE. LTD. DELHI LIAISON OFFICE
Office NO.519, Regus-Green Boulevard, Level5, Tower C,
Sec62, Plot B-9A, Block B, Noida, 201301, Uttar Pradesh, India
Phone : +91-12-660-8018
Fax : +91-120-4804949
<http://www.hirose.com/sg/>

INDIA:

HIROSE ELECTRIC SINGAPORE PTE. LTD. BANGALORE LIAISON OFFICE
Unit No.03, Ground Floor, Explorer Building International Tech
Park Whitefield Road, Bangalore 560066 Karnataka, India
Phone : +91-80-4120 1907
Fax : +91-80-4120 9908
<http://www.hirose.com/sg/>

MALAYSIA:

HIROSE ELECTRIC SINGAPORE PTE. LTD. (REPRESENTATIVE OFFICE)
1-10-07, Suntech @ Penang Cybercity (1164),Lintang
Mayang Pasir 3,11950, Bayan Baru, Penang, Malaysia.
Phone : +604-619-2564
Fax : +604-619-2574
<http://www.hirose.com/sg/>



HIROSE ELECTRIC CO.,LTD.

2-6-3,Nakagawa Chuoh,Tsuzuki-Ku,Yokohama-Shi 224-8540,JAPAN
TEL: +81-45-620-3526 Fax: +81-45-591-3726
<http://www.hirose.com>
<http://www.hirose-connectors.com>