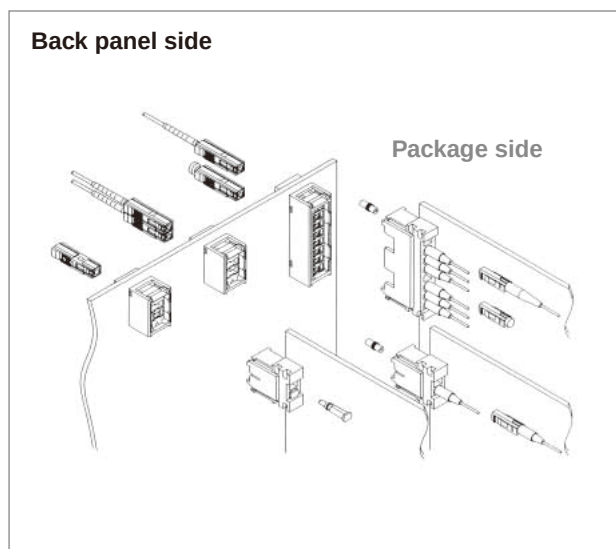
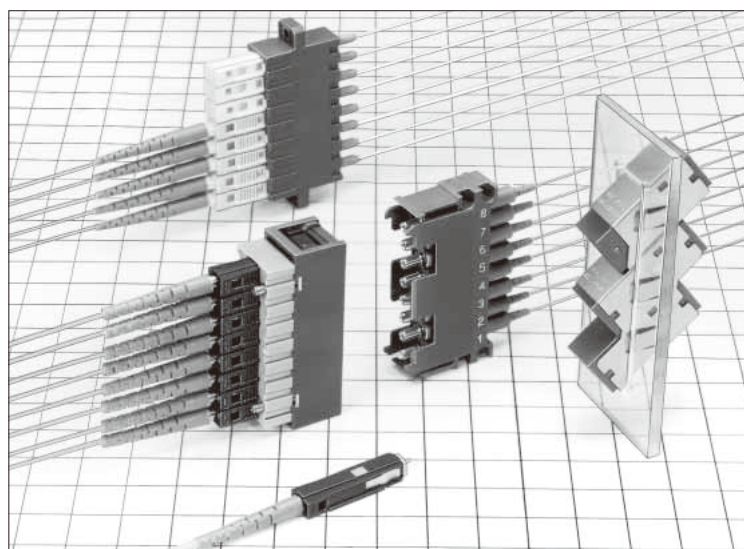


# MU Type Fiber Optic Connectors

## HMU Series



### ■Features

#### 1. IEC, JIS standard compliant and intermateability test certified.

Comply with JIS C 5983 (F14 type fiber optic connectors) and IEC 61754-6.

MU intermate test by NTT certified connector.

#### 2. Flame resistant

Satisfies flammability rating UL94V-0

#### 3. Backplane

MU Backplane connector has a self-holding mechanism which does not transfer any force on the back panel when both side of connector assemblies are fully connected. Back panel side connectors can be removed or inserted even both sides are mated.

#### 4. Wide Variety of adapter type

| Type                                          | Number of Fiber connections |        |                     |       |        |
|-----------------------------------------------|-----------------------------|--------|---------------------|-------|--------|
|                                               | Single                      | Duplex | 4 way               | 8 way | 16 way |
| Board Mounting                                | ✓                           | ✓      | —                   | ✓     | —      |
| Snap-in Panel Mounting & Screw Panel Mounting | ✓                           | ✓      | ✓<br>(Only Snap-in) | ✓     | ✓      |

#### 5. Simplified plugs and Receptacles

Extremely small size (only 13.75mm Plug length). MU simplified plug is designed for equipments inside connection.

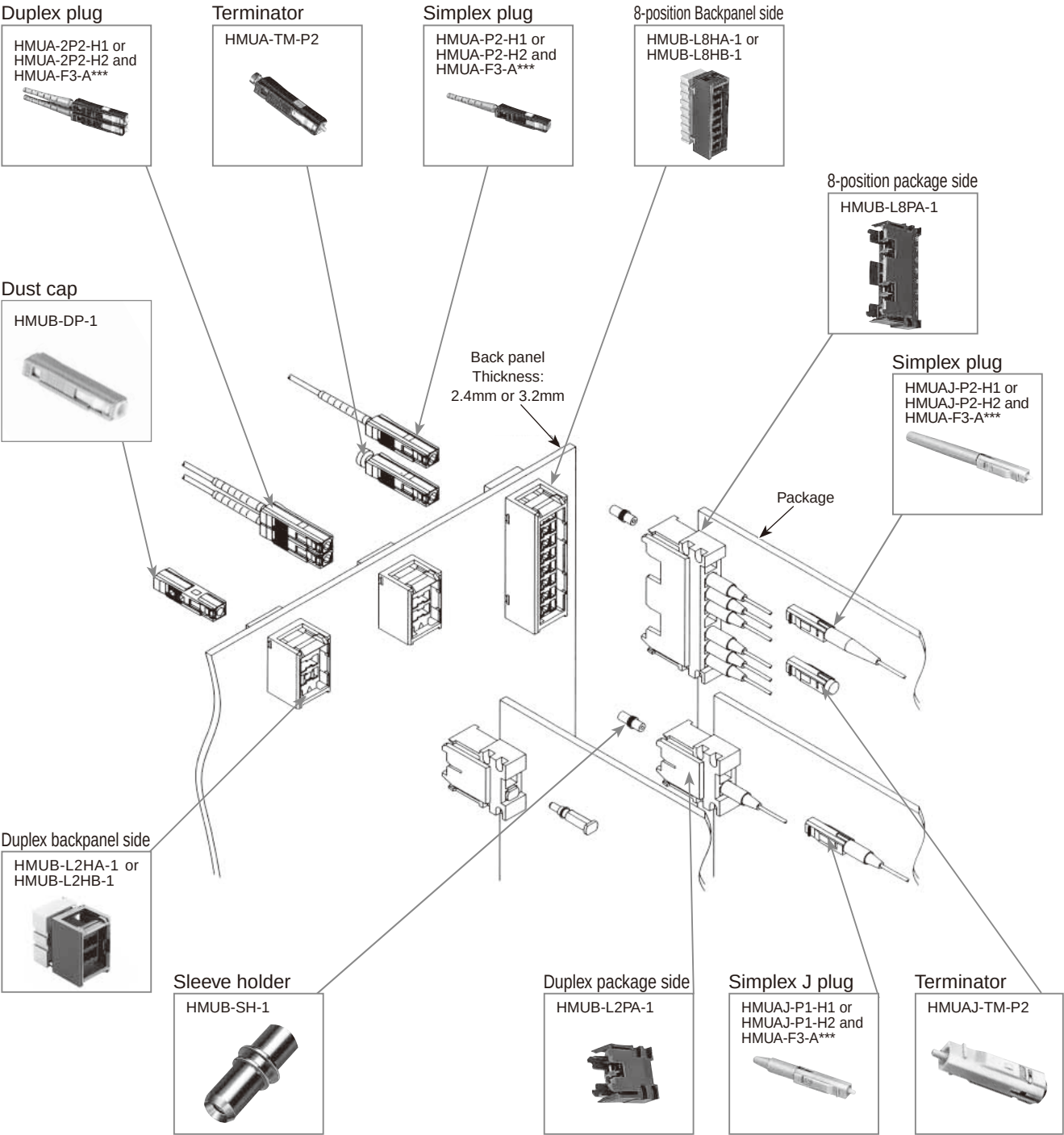
# Product Specifications

| Ratings                       |                                          | Operating temperature range |                                                                                                   | -25°C to +70°C | Storage temperature range                                                                                    |                                                            | -25°C to +70°C |
|-------------------------------|------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------|
| Item                          |                                          |                             | Test Method (IEC 61300)                                                                           |                | Specifications                                                                                               |                                                            |                |
| Optical Characteristics       | Insertion Loss                           | SM                          | Wavelength 1310nm (LD)                                                                            |                | 0.5dB max. (AdPC)                                                                                            |                                                            |                |
|                               |                                          | MM(GI)                      | Wavelength 1310nm (LED)                                                                           |                | 0.3dB max. (PC)                                                                                              |                                                            |                |
|                               | Return Loss                              | SM                          | Wavelength 1310nm (LD)                                                                            |                | 40dB min.(AdPC)                                                                                              |                                                            |                |
|                               |                                          | MM(GI)                      |                                                                                                   |                | 22dB min.(PC)                                                                                                |                                                            |                |
| Mechanical Characteristics    | Engagement and Separation forces         |                             | Measured with corresponding connector.                                                            |                | Simplex plug                                                                                                 | Engagement force: 20 N max.<br>Separation force: 20 N max. |                |
|                               | Ferrule with drawal force                |                             | Extract zirconia gauge 1.249 ±0.0005 mm diameter from split sleeve.                               |                | Duplex plug                                                                                                  | Engagement force: 30 N max.<br>Separation force: 30 N max. |                |
|                               | Cable retention (Straight pull)          |                             | 70N tensile loads for one minute.                                                                 |                | Copper alloy split sleeve 1N to 3N<br>Zirconia split sleeve 1N to 2.5N                                       |                                                            |                |
|                               | Durability (cycles, mating/un-mating)    |                             | 200 times (Backplane)<br>500 times (Plug)                                                         |                | 1) Insertion loss fluctuation after test: 0.2dB max.<br>2) No visible damage, dislocation of clamp or cable. |                                                            |                |
|                               | Vibration                                |                             | Frequency: 10 to 55 Hz, single amplitude of 0.75 mm, 2 hours in each of the 3 axis.               |                | 1) Insertion loss fluctuation after test: 0.2dB max.<br>2) No visible damage, cracks or part dislocation.    |                                                            |                |
|                               | Shock                                    |                             | Acceleration of 981 m/s², 6 ms duration, sin half-wave waveform, 10 cycles in each of the 3 axis. |                |                                                                                                              |                                                            |                |
| Environmental Characteristics | Humidity (Temperature/ humidity- cycles) |                             | -10°C to 65°C, humidity: 90% to 96%<br>10 cycles                                                  |                | No significant corrosion.                                                                                    |                                                            |                |
|                               | Change of temperature                    |                             | -25°C to +70°C 100 cycles                                                                         |                |                                                                                                              |                                                            |                |
|                               | Dry heat                                 |                             | 960 hours at 85°C                                                                                 |                |                                                                                                              |                                                            |                |
|                               | Cold                                     |                             | 960 hours at -25°C                                                                                |                |                                                                                                              |                                                            |                |
|                               | Salt mist                                |                             | 48 hours in a 5% concentration of salt mist                                                       |                |                                                                                                              |                                                            |                |

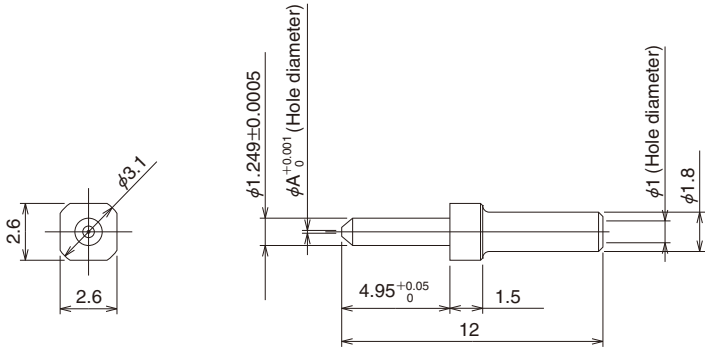
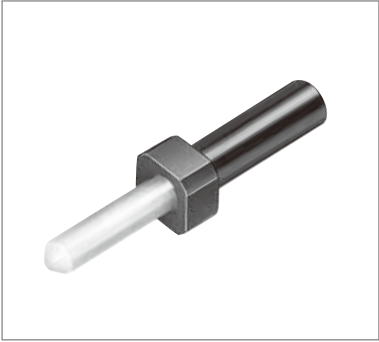
## Materials

| Part                          | Material                                         |
|-------------------------------|--------------------------------------------------|
| Simplex plug housing          | Synthetic resin                                  |
| Spring                        | Steel                                            |
| Ferrule                       | Zirconia                                         |
| Simplex adapter housing       | Synthetic resin                                  |
| Adapter metal fittings        | Stainless steel or copper alloy (Nickel plating) |
| Simplified receptacle housing | Synthetic resin                                  |
| Simplified plug               | Zirconia                                         |
| Backplane connector housing   | Synthetic resin                                  |
| Split sleeve                  | Zirconia or copper alloy                         |
| Dust cap                      | Synthetic resin                                  |

■Function diagram



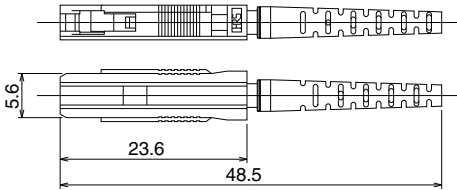
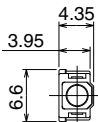
Ferrules



| Part Number       | CL No.        | A dimension | Applicable Fiber cable  |
|-------------------|---------------|-------------|-------------------------|
| HMUA-F3-A125(10)  | 710-0024-3-10 | 0.125       | SM-9.5/125<br>GI-50/125 |
| HMUA-F3-A1255(10) | 710-0121-0-10 | 0.1255      |                         |
| HMUA-F3-A126(10)  | 710-0025-6-10 | 0.126       |                         |

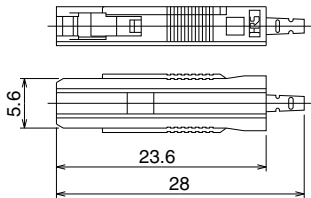
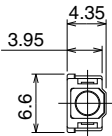
■Plug Housings

●Simplex Plug Housing for 2mm cable



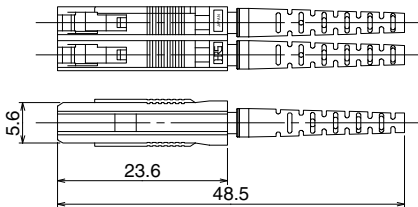
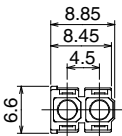
| Part Number    | CL No.        | Boot color   |
|----------------|---------------|--------------|
| HMUA-P2-H1(61) | 710-0047-9-61 | Blue         |
| HMUA-P2-H2(61) | 710-0001-8-61 | Light purple |

●Simplex Plug Housing for 0.9mm fiber



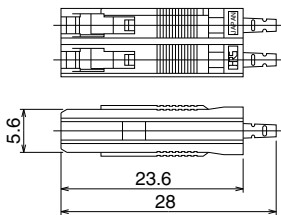
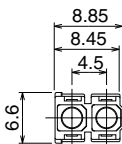
| Part Number      | CL No.        | Boot color   |
|------------------|---------------|--------------|
| HMUA-P0.9-H1(60) | 710-0158-0-60 | Blue         |
| HMUA-P0.9-H2(60) | 710-0159-2-60 | Light purple |

●Duplex Plug Housing for 2mm cable



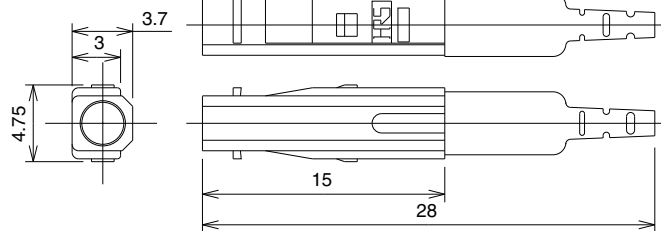
| Part Number     | CL No.        | Boot color   |
|-----------------|---------------|--------------|
| HMUA-2P2-H1(61) | 710-0048-1-61 | Blue         |
| HMUA-2P2-H2(61) | 710-0002-0-61 | Light purple |

●Duplex Plug Housing for 0.9mm fiber



| Part Number       | CL No.        | Boot color   |
|-------------------|---------------|--------------|
| HMUA-2P0.9-H1(60) | 710-0162-7-60 | Blue         |
| HMUA-2P0.9-H2(60) | 710-0163-0-60 | Light purple |

## ●Simplex J Plug Housing for 0.9mm fiber



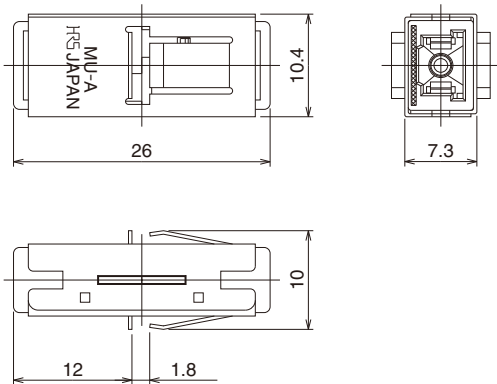
| Part Number       | CL No.        | Boot color   |
|-------------------|---------------|--------------|
| HMUAJ-P0.9-H1(60) | 710-0160-1-60 | Blue         |
| HMUAJ-P0.9-H2(60) | 710-0161-4-60 | Light purple |

Notes : This connector is the product for MU backplane solution, and is plugged into Package side Connector Housing with Sleeve Holder.  
But can't mate with standard MU adapter.

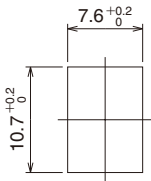
Notes : Option for this products  
Sleeve for temporary mating  
Part Number : HMUA-RH-1  
CL No. : CL710-0085-8  
Available to mate with standard adapter.  
(Usage example : Optical measurement)

Adapters

●Simplex Adapter / Snap-in Panel Mounting



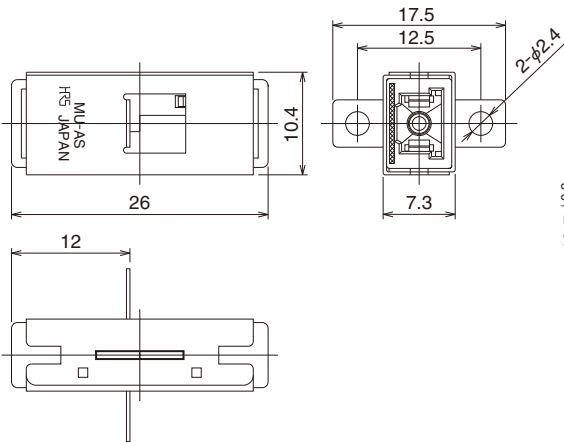
Panel Cutout



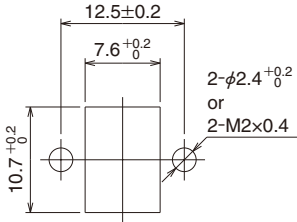
Panel thickness:1.6mm

| Part Number | CL No.        | Split sleeve |
|-------------|---------------|--------------|
| HMUA-A-3    | 710-0103-8-00 | Zirconia     |

●Simplex Adapter / Screw Panel Mounting

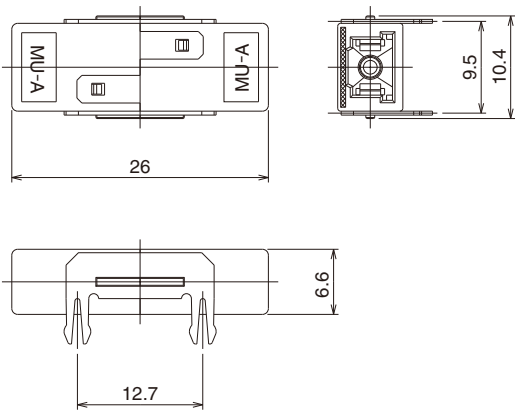


Panel Cutout

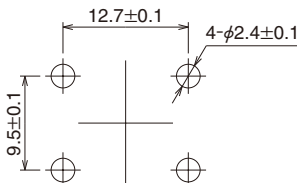


| Part Number | CL No.        | Split sleeve |
|-------------|---------------|--------------|
| HMUA-AS-3   | 710-0104-0-00 | Zirconia     |

●Simplex Adapter / Board Mounting



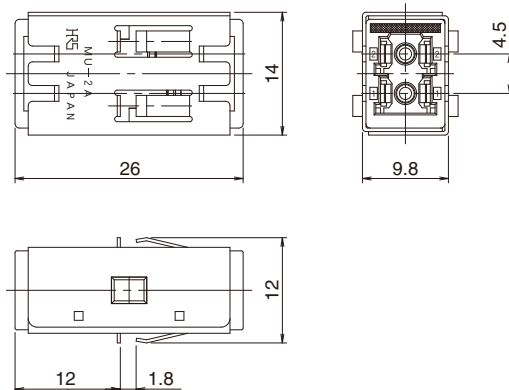
Board Mounting Pattern



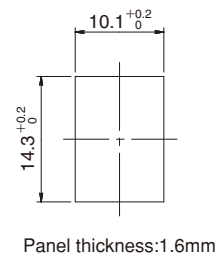
Board thickness:1.6mm

| Part Number   | CL No.        | Split sleeve |
|---------------|---------------|--------------|
| HMUA-AH-3(40) | 710-0105-3-40 | Zirconia     |

## ●Duplex adapter / Snap-in Panel Mounting

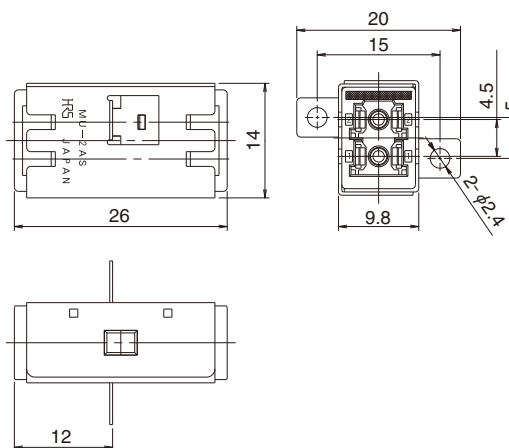


### ■Panel Cutout

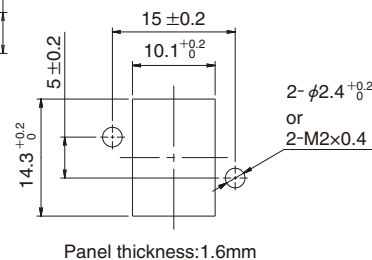


| Part Number | CL No.        | Split sleeve |
|-------------|---------------|--------------|
| HMUA-2A-4   | 710-0187-8-00 | Zirconia     |

## ●Duplex Adapter / Screw Panel Mounting

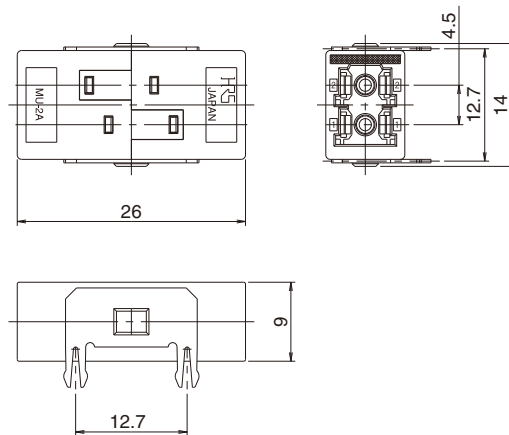
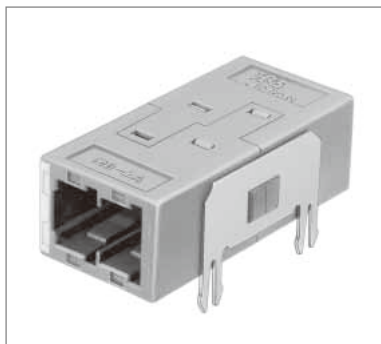


### ■Panel Cutout

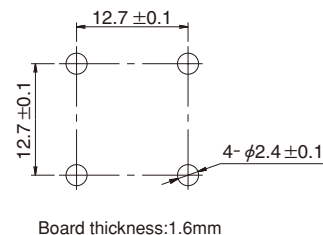


| Part Number | CL No.        | Split sleeve |
|-------------|---------------|--------------|
| HMUA-2AS-4  | 710-0188-0-00 | Zirconia     |

## ●Duplex Adapter / Board Mounting

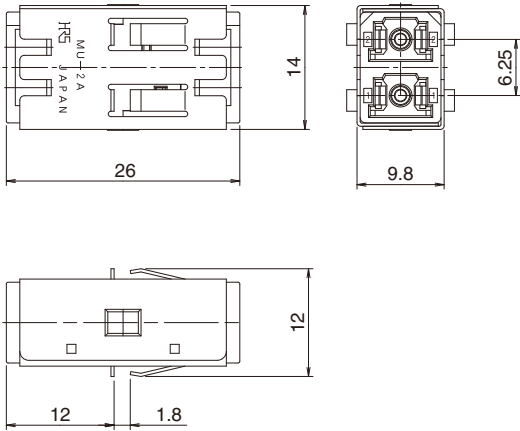
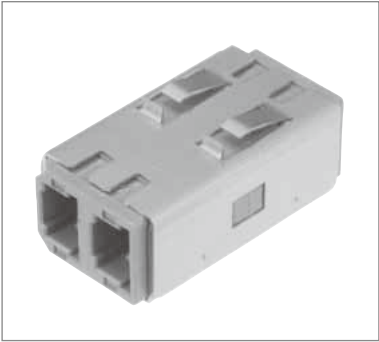


### ■Board Mounting Pattern

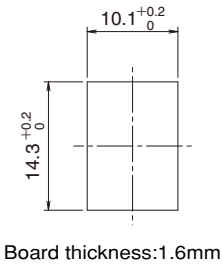


| Part Number    | CL No.        | Split sleeve |
|----------------|---------------|--------------|
| HMUA-2AH-4(40) | 710-0189-3-40 | Zirconia     |

●Duplex Adapter / Snap-in Panel Mounting  
6.25mm Type



■Panel Cutout



| Part Number | CL No.        | Split sleeve |
|-------------|---------------|--------------|
| HMUA-2AK-1  | 710-0196-9-00 | Zirconia     |

- Notes :
- Available to 6.25mm pitch MU-PJ attenuators.
  - The outer dimension (and panel cutout) is same as the above "HMUA-2A-4".

SC

FC

MU

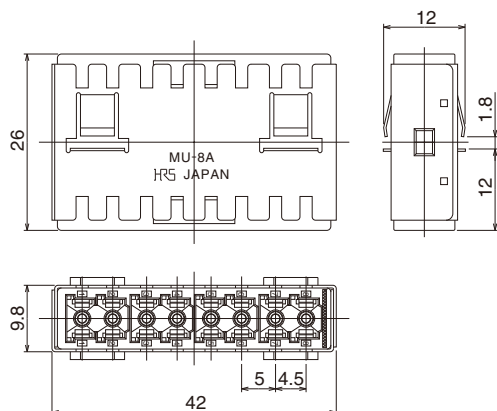
Harsh  
Environment

Attenuators

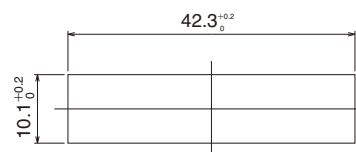
Terminators

POF / PCF

# 8-Position Adapter / Snap-in Panel Mounting



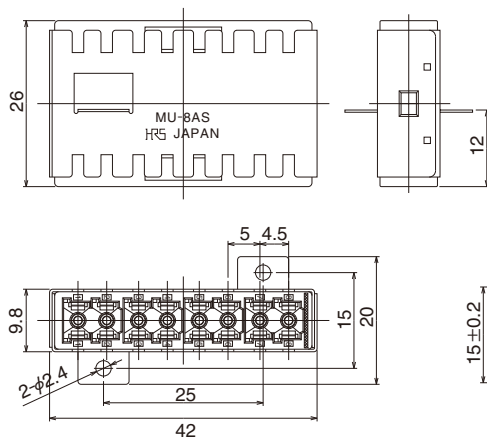
## Panel Cutout



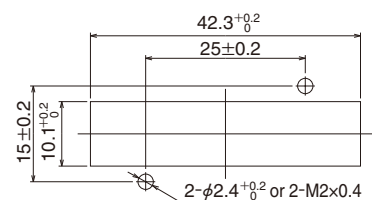
Panel thickness: 1.6mm

| Part Number | CL No.        | Split sleeve |
|-------------|---------------|--------------|
| HMUA-8A-3   | 710-0174-6-00 | Zirconia     |

# 8-Position Adapter / Screw Panel Mounting

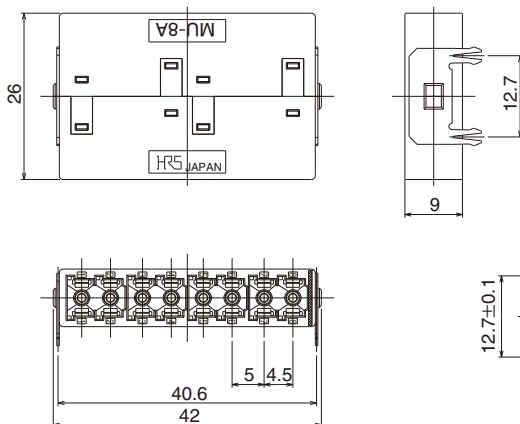


## Panel Cutout

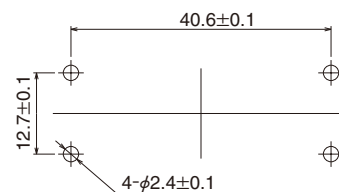


| Part Number | CL No.        | Split sleeve |
|-------------|---------------|--------------|
| HMUA-8AS-3  | 710-0175-9-00 | Zirconia     |

# 8-Position Adapter / Board Mounting



## Board Mounting Pattern

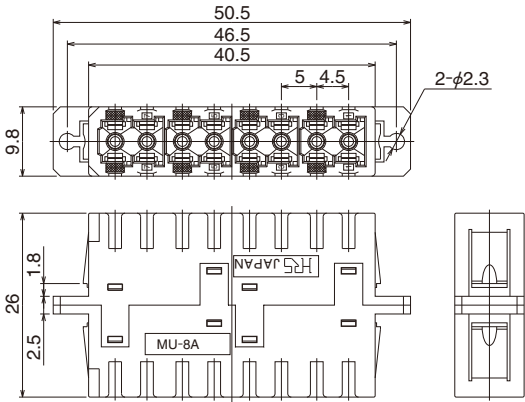


Board thickness: 1.6mm

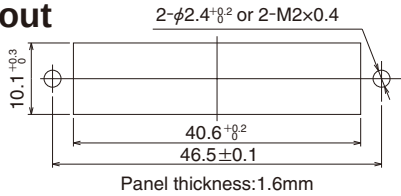
| Part Number    | CL No.        | Split sleeve |
|----------------|---------------|--------------|
| HMUA-8AH-3(40) | 710-0176-1-40 | Zirconia     |

■Cost effective adapters

●8-Position Adapter / Screw Panel Mounting

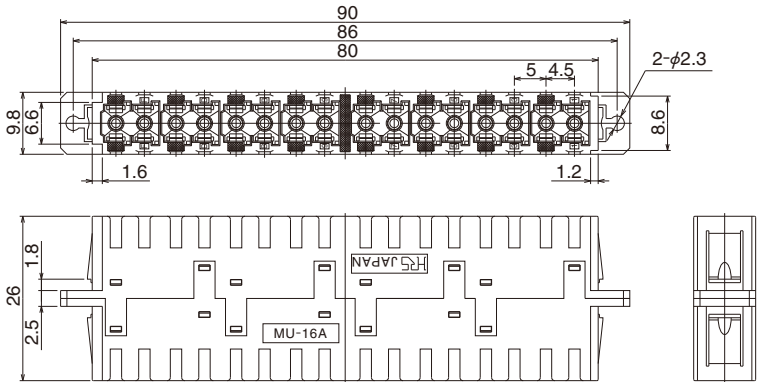


■Panel Cutout

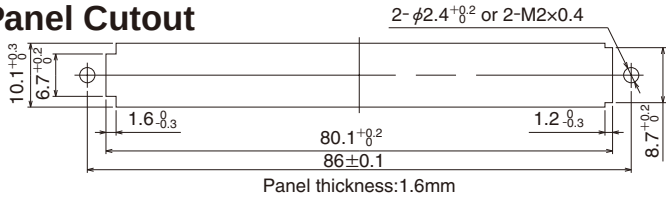


| Part Number   | CL No.        | Split sleeve |
|---------------|---------------|--------------|
| HMUA-8A-2(40) | 710-0155-1-40 | Zirconia     |
| HMUA-8A-B2    | 710-0119-8-00 | Copper alloy |

●16-Position Adapter / Screw Panel Mounting



■Panel Cutout

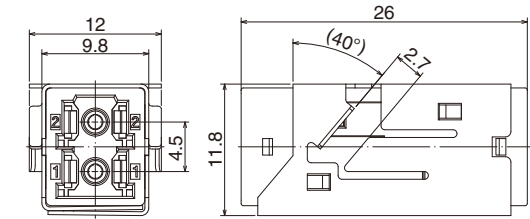


| Part Number     | CL No.        | Split sleeve |
|-----------------|---------------|--------------|
| HMUA-16A-2      | 710-0143-2-00 | Zirconia     |
| HMUA-16A-B2(40) | 710-0113-1-40 | Copper alloy |

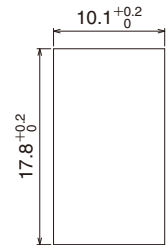
Angled Adapters

Special design for angled mount.(The installation angle is 40 degrees. )

●Duplex Angled Adapter / Snap-in Panel Mounting



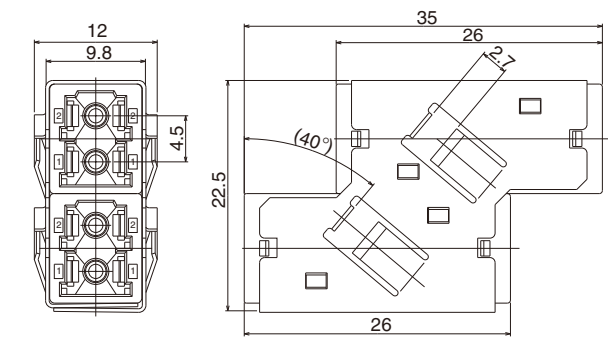
■Panel Cutout



Panel thickness: 2.5mm

| Part Number   | CL No.        | Split sleeve | Mounting Angle |
|---------------|---------------|--------------|----------------|
| HMUA-2A-40A-4 | 710-0243-7-00 | Zirconia     | 40°            |

●4-Position Angled Adapter / Snap-in Panel Mounting



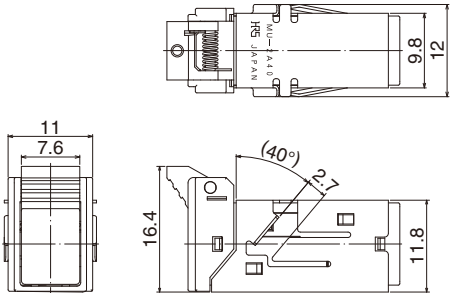
■Panel Cutout



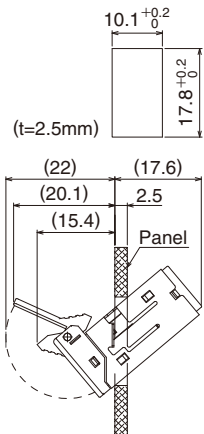
Panel thickness: 2.5mm

| Part Number  | CL No.        | Split sleeve | Mounting Angle |
|--------------|---------------|--------------|----------------|
| HMUA-4A-40-4 | 710-0178-7-00 | Zirconia     | 40°            |

●Duplex Angled Adapter with Shutter / Snap-in Panel Mounting



■Panel Cutout



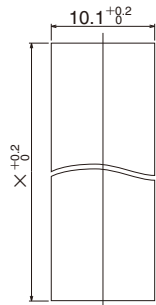
| Part Number      | CL No.        | Split sleeve | Mounting Angle |
|------------------|---------------|--------------|----------------|
| HMUA-2A-40A-4-S1 | 710-0242-4-00 | Zirconia     | 40°            |

Note:  
1)Under no circumstances look into the inside of shutter when the laser device is operational. The laser radiation is not visible to the human eye, but it can seriously damage your eyesight.  
2)Please indicate the necessary safety labels when using high power light source.

Panel Cutout dimensions  
Only the angled adapter without shutter.

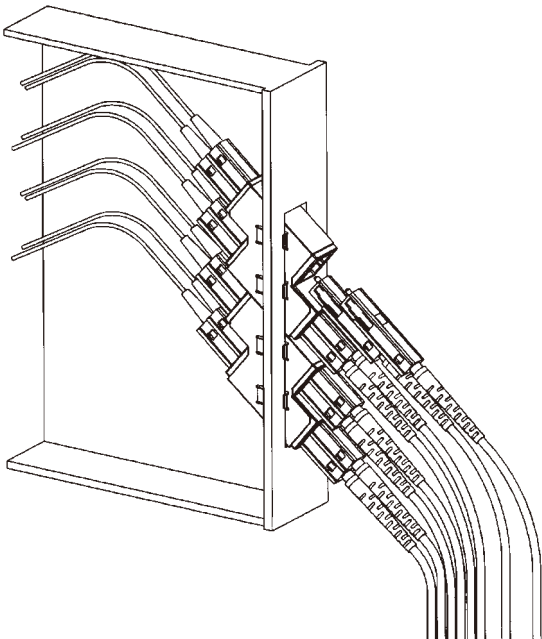
| Fiber Position          | Panel cutout:Xmm |
|-------------------------|------------------|
| 06(Duplex+4 position)   | 47.4             |
| 08(4 position×2)        | 61.4             |
| 10(Duplex+4 position×2) | 77.1             |
| 12(4 position×3)        | 91.0             |
| 14(Duplex+4 position×3) | 106.7            |
| 16(4 position×4)        | 120.7            |
| 18(Duplex+4 position×4) | 136.3            |
| 20(4 position×5)        | 150.3            |

■Panel Cutout



Panel thickness: 2.5mm

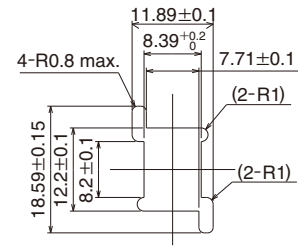
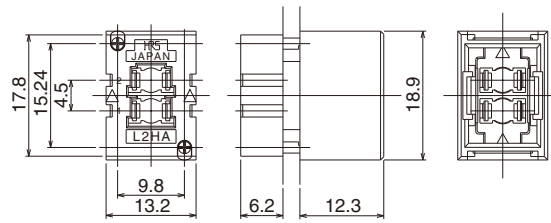
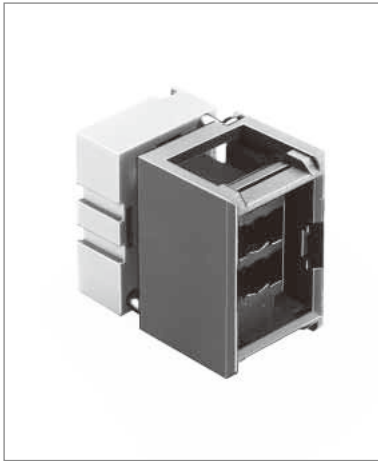
■Usage Example



# Backpanel side Connector Housings

## Duplex Backpanel side Connector Housing

## Panel Cutout

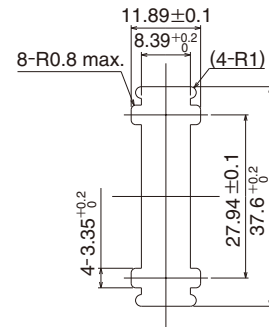
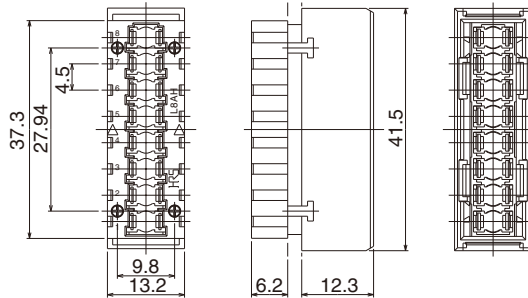


| Part Number     | CL No.        | Panel thickness |
|-----------------|---------------|-----------------|
| HMUB-L2HA-1(40) | 710-0017-8-40 | 2.4mm           |
| HMUB-L2HB-1(40) | 710-0018-0-40 | 3.2mm           |

Note: Screw fastening torque: 0.0185Nm

## 8-Position Backpanel side Connector Housing

## Panel Cutout



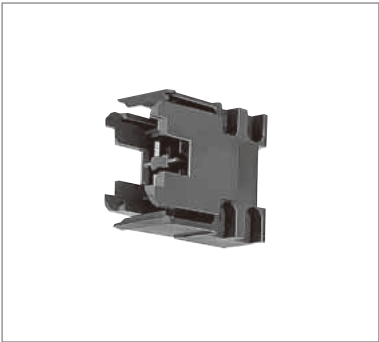
| Part Number     | CL No.        | Panel thickness |
|-----------------|---------------|-----------------|
| HA-1(40)        | 710-0019-3-40 | 2.4mm           |
| HMUB-L8HB-1(40) | 710-0020-2-40 | 3.2mm           |

Note: Screw fastening torque: 0.0185Nm

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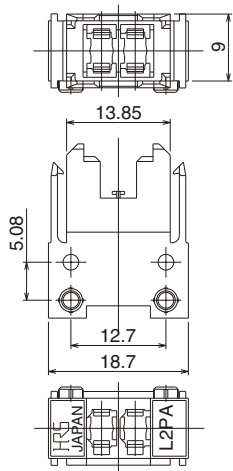
■Package side Connector Housings

●Duplex Package side Connector Housing

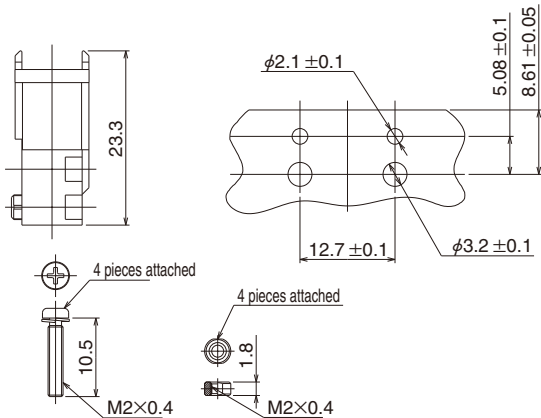


| Part Number     | CL No.        |
|-----------------|---------------|
| HMUB-L2PA-1(40) | 710-0015-2-40 |

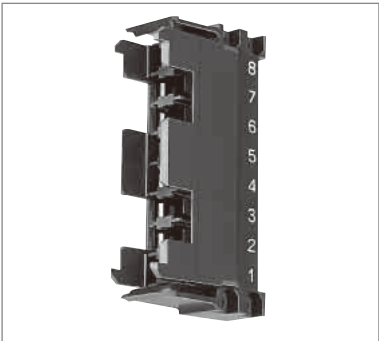
Note : Screw fastening torque : 0.08Nm



■Board Mounting Pattern

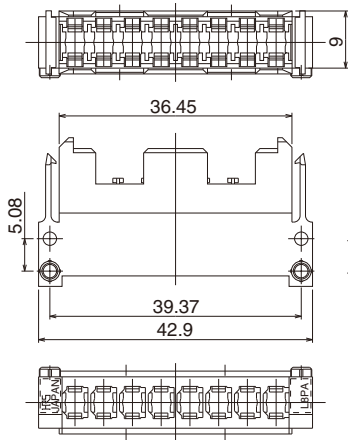


●8-Position Package side Connector Housing

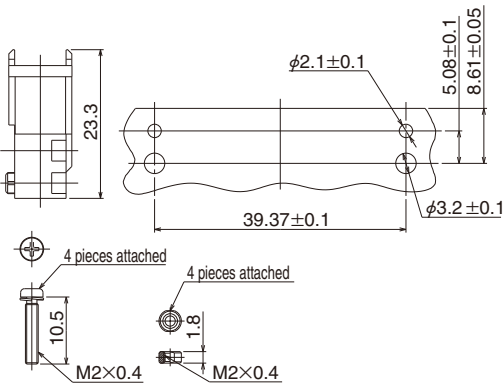


| Part Number     | CL No.        |
|-----------------|---------------|
| HMUB-L8PA-1(40) | 710-0016-5-40 |

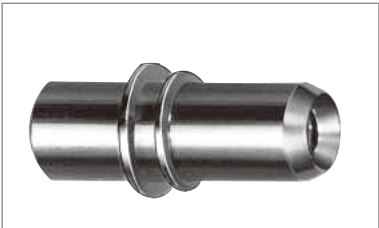
Note : Screw fastening torque : 0.08Nm



■Board Mounting Pattern

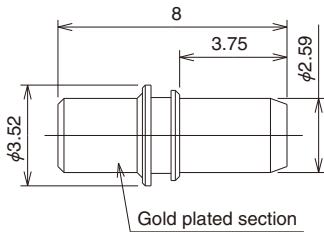


■Sleeve Holder



| Part Number   | CL No.        | Split sleeve |
|---------------|---------------|--------------|
| HMUB-SH-1(40) | 710-0021-5-40 | Zirconia     |

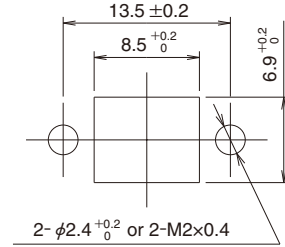
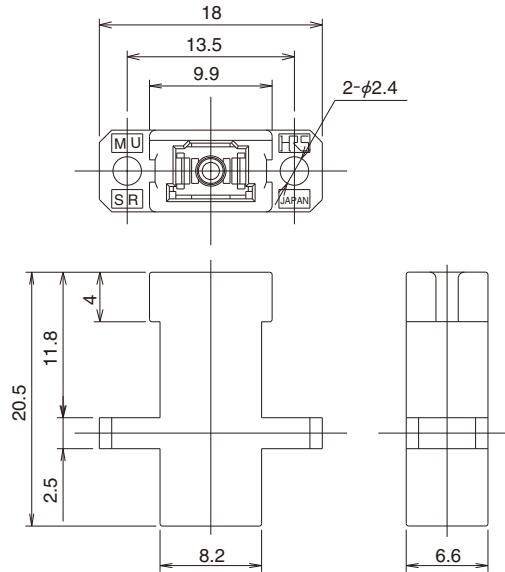
Note: This Sleeve Holder should be used for duplex and 8-position package side connector housing and J Plug Housing connector plug.  
Insert the Sleeve Holder using dedicated tool #HMUB-TS-1.  
The gold plated section of the Sleeve Holder should be inserted into the package side connector housing.



## Simplified Receptacles

### Simplex Simplified Receptacle / Screw Panel Mounting

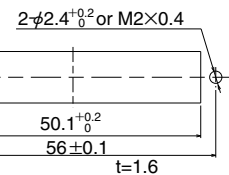
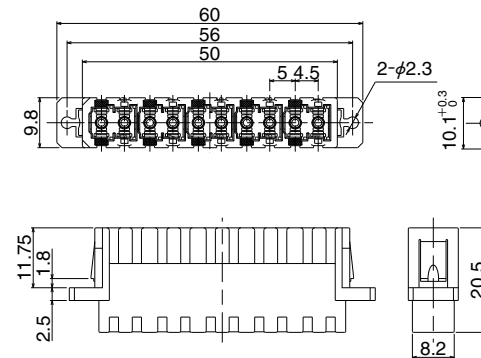
### Panel Cutout



| Part Number   | CL No.        | Split sleeve |
|---------------|---------------|--------------|
| HMUA-SR-1(40) | 710-0094-9-40 | Zirconia     |
| HMUA-SR-B1    | 710-0182-4-00 | Copper alloy |

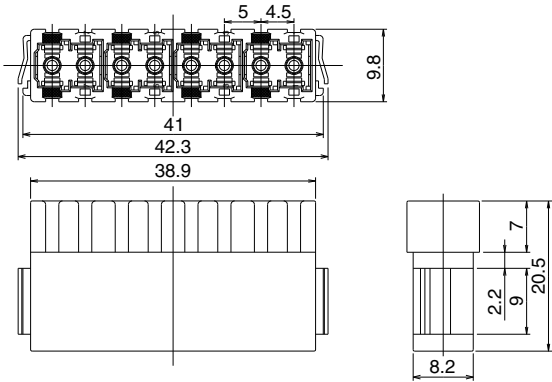
### 10-position Simplified Receptacle / Screw Panel Mounting

### Panel Cutout



| Part Number  | CL No.        | Split sleeve |
|--------------|---------------|--------------|
| HMUA-10SR-4  | 710-0193-0-00 | Zirconia     |
| HMUA-10SR-B4 | 710-0201-7-00 | Copper alloy |

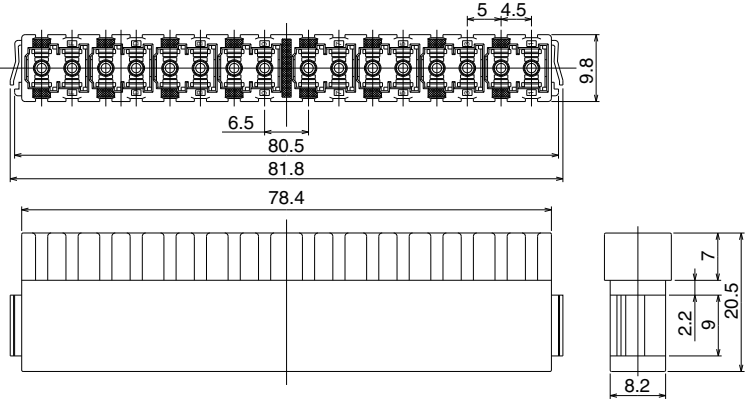
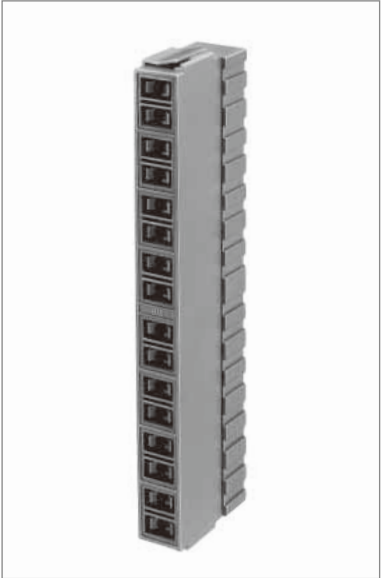
●8-position Simplified Receptacle - for extremely high density applications



| Part Number     | CL No.        | Split sleeve |
|-----------------|---------------|--------------|
| HMUA-8SR-3(40)  | 710-0168-3-40 | Zirconia     |
| HMUA-8SR-B3(40) | 710-0117-2-40 | Copper alloy |

Please contact to HIROSE for the mounting dimension.

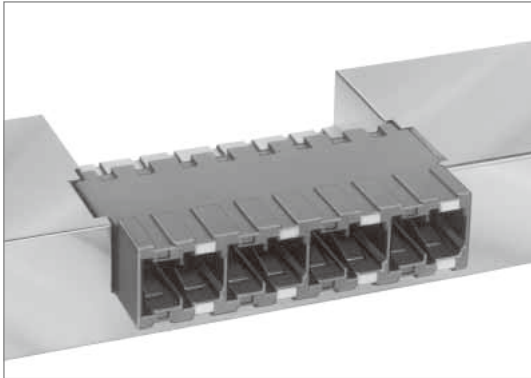
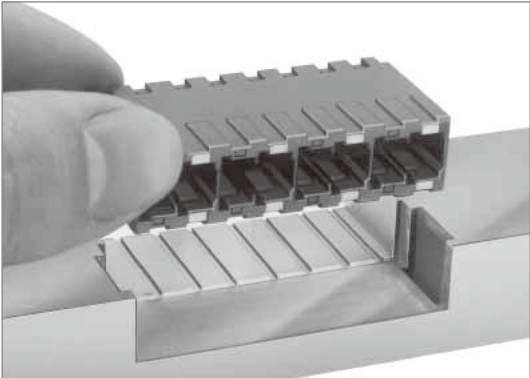
●16-Position Simplified Receptacle - for extremely high density applications



| Part Number  | CL No.        | Split sleeve |
|--------------|---------------|--------------|
| HMUA-16SR-5  | 710-0173-3-00 | Zirconia     |
| HMUA-16SR-B5 | 710-0122-2-00 | Copper alloy |

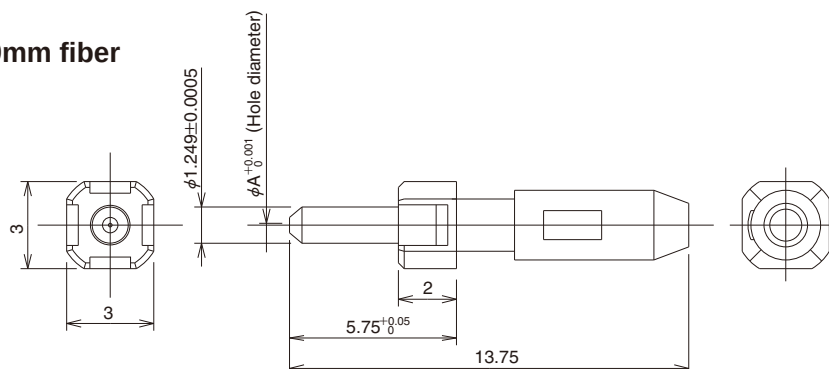
Please contact to HIROSE for the mounting dimension.

■Mounting Example



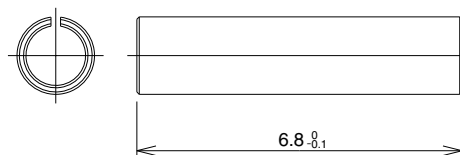
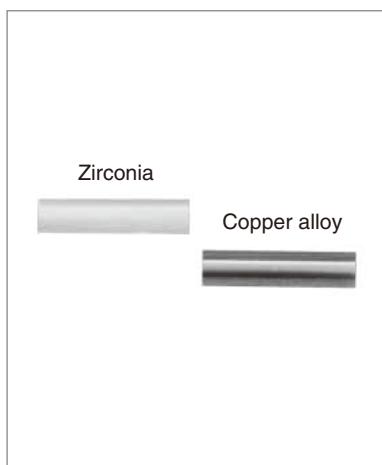
## Simplified Plug

### Simplex simplified Plug for 0.9mm fiber



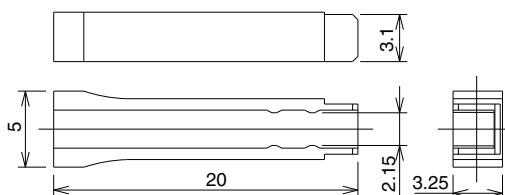
| Part Number       | CL No.        | A dimension | Applicable Fiber cable  | Ferrule  |
|-------------------|---------------|-------------|-------------------------|----------|
| HMUA-FK-A125(04)  | 710-0099-2-04 | 0.125       | SM-9.5/125<br>GI-50/125 | Zirconia |
| HMUA-FK-A1255(04) | 710-0107-9-04 | 0.1255      |                         |          |
| HMUA-FK-A126(04)  | 710-0100-0-04 | 0.126       |                         |          |

## Split Sleeve



| Part Number          | CL No.        | Split sleeve |
|----------------------|---------------|--------------|
| HMUA-D               | 710-0147-3-00 | Zirconia     |
| HMUA-SLIT-SLEEVE(01) | 710-0130-0-01 | Copper alloy |

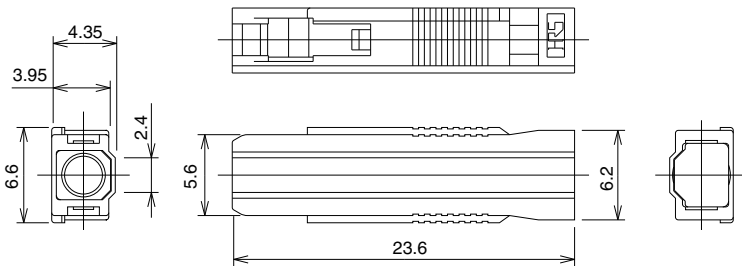
## Extraction Tool for Simplified Plug



| Part Number | CL No.        |
|-------------|---------------|
| HMUA-FK-T3  | 710-0148-6-00 |

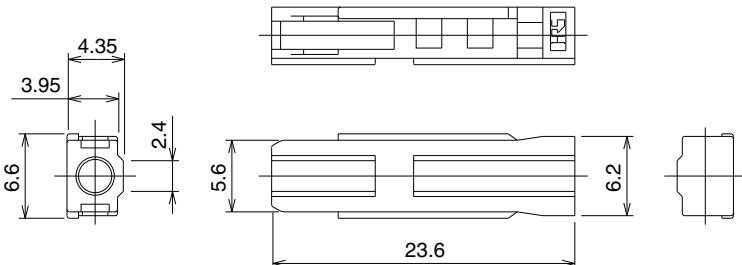
Dust Caps

●Dust Cap for Backpanel side connector housings



| Part Number   | CL No.        | Applicable connector    |
|---------------|---------------|-------------------------|
| HMUB-DP-1(40) | 710-0135-4-40 | Back panel side housing |

●Dust Cap for Adapters



| Part Number | CL No.        | Applicable connector           |
|-------------|---------------|--------------------------------|
| HMUA-DP-2   | 710-0131-3-00 | Adapter, simplified receptacle |

## Tools

### ● Insertion / Extraction Tool for Plug



| Part Number | CL No.     | Color of Tip | Remarks                   |
|-------------|------------|--------------|---------------------------|
| HMUA-TP-1   | 710-0074-1 | Blue         | For Conventional Adapters |
| HMUB-TP-1   | 710-0075-4 | Brown        | For MU Backplane system   |

### ● Insertion / Extraction Tool for Plug Cost effective type



| Part Number | CL No.     | Remarks                                           |
|-------------|------------|---------------------------------------------------|
| HMU/HEMD-1P | 902-6045-8 | For Conventional Adapters and MU Backplane system |

### ● Extraction Tool for J Plug



| Part Number | CL No.     | Remarks             |
|-------------|------------|---------------------|
| HMUB-TJ-1   | 710-0076-7 | HMUB-L2PA-1, L8PA-1 |

### ● Insertion / Extraction Tool for Sleeve Holder



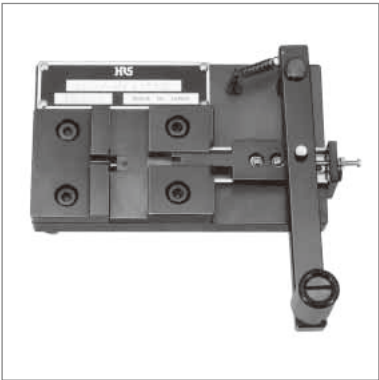
| Part Number | CL No.     | Remarks             |
|-------------|------------|---------------------|
| HMUB-TS-1   | 710-0077-0 | HMUB-L2PA-1, L8PA-1 |

●Crimp Tools



| Part Number      | CL No.     | Applicable plug housing |
|------------------|------------|-------------------------|
| HT402/HMUA-P2-H2 | 902-6040-4 | HMUA-P2-H2,H1           |
|                  |            | HMUA-2P2-H2,H1          |

●Stop Ring Insertion Tool



| Part Number | CL No.     | Applicable connector                 |
|-------------|------------|--------------------------------------|
| HMUA.J/PRMD | 902-6019-8 | MU plug housings except HMUA-P1.1-H2 |

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Authorized Distributor

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[HMUB-L8PA-1\(40\)](#) [HMUB-L2HA-1\(40\)](#) [HMUB-L2HB-1\(40\)](#) [HMUB-L8HA-1\(40\)](#) [HMUB-L8HB-1\(40\)](#) [HMUA-F3-A125](#)  
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[A126\(01\)](#) [HMUA-FK-A126\(04\)](#) [HMUA-FK-A1255\(04\)](#) [HMUB-L2HA-2\(40\)](#) [HMUA-16A-B2\(40\)](#) [HMUA-16A-B2\(51\)](#)  
[HMUA-8SR-B3\(02\)](#) [HMUA-8SR-B3\(40\)](#) [HMUA-8A-B2](#) [HMUA-16SR-B5\(01\)](#) [HMUA-16SR-B5\(51\)](#) [HMUA-DP-2](#)  
[HMUA-DP-3\(01\)](#) [HMUB-DP-1\(01\)](#) [HMUA-F3A2-A125\(10\)](#) [HMUA-F3A2-A126\(10\)](#) [HMUA-F3A2-A1255\(10\)](#) [HMUA-](#)  
[D\(01\)](#) [HMUA-FK-T3](#) [HMUA-FK-T4](#) [HMUB-L4PA-CAP](#) [HMUA-8A-3](#) [HMUA-8AH-3\(40\)](#) [HMUA-2A-40-4-S1](#) [HMUA-](#)  
[AM-3](#) [HMUA-10SR-B4\(51\)](#) [HMUA-2AS-6](#) [HMUA-AP2-H5\(40\)](#) [HMUA-A-3-SZ](#) [HMU-PJAT1K-A00R1](#) [HMU-PJAT1K-](#)  
[A01R1](#) [HMU-PJAT1K-A03R1](#) [HMU-PJAT1K-A04R1](#) [HMU-PJAT1K-A06R1](#) [HMU-PJAT1K-A07R1](#) [HMU-PJAT1K-](#)  
[A15R1](#) [HMU-PJAT1K-A20R1](#) [HMUA-2A-40A-4-S1](#) [HMUA-2P2-H1\(62\)](#) [HMUA-P2-H1-HOOD\(20\)](#) [HMUB-L2HA-](#)  
[CAP\(40\)](#) [HMUB-L2PA-CAP\(40\)](#) [HMUB-L8PA-CAP\(40\)](#) [HMUA-2P2-H2\(60\)](#) [HMUA-2P2-H2\(61\)](#) [HMUA-2P2-H2\(62\)](#)  
[HMUAJ-P1-H2\(46\)](#) [HMUAJ-P1-H2\(60\)](#) [HMUA-P2-H1\(63\)](#) [HMUAJ-P1-H1\(60\)](#) [HMUA-P1-H1\(60\)](#) [HMUA-P1-H1\(63\)](#)  
[HMUA-P1-H4\(60\)](#) [HMUA-P1-H4\(62\)](#) [HMUA-P1-H4\(63\)](#) [HMUA-2P1-H4\(60\)](#) [HMUA-P1.1-H2\(60\)](#) [HMUA-C1\(20\)](#)  
[HMUA-2P0.9-H1\(60\)](#) [HMUA-P2-H6\(60\)](#) [HMUA-P1.7-H1-B\(60\)](#) [HMUA-2A-40A-4-S2](#) [HMUA-AP2-H5\(60\)](#) [HMUA-P2-](#)  
[H2\(61\)](#) [HMUA-P2-H2\(63\)](#) [HMUA-2P0.9-H2\(60\)](#) [HMUA-P1-H4\(61\)](#) [HMUAJ-P1-H2\(61\)](#) [HMUA-P2-H1\(60\)](#)