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**HRS**®

2000.7  
Ver.2

**FIBER OPTIC  
CONNECTOR  
CATALOGUE**

**HIROSE ELECTRIC CO.,LTD.**

## Greetings

We appreciate you for particular support and patronage.

This catalogue describes our optical fiber connectors and contains new products in addition to longstanding, representative products. With the rapid development of electronics and technological innovation, high-level requirements are sought in new methods, performance, and precision of the connectors used in all types of equipment. Hirose Electric continues to develop and supply new advanced technology products to fully serve these needs.

Hirose Electric has established reputation in the industry for its excellent ideas, preeminent technology, and quality. This catalogue will be of serve you for excellent design and purchasing information. In addition to the products listed here, we manufacture many other optical fiber connectors. If required, contact us.

## Company Overview

**Number of employees** ● 1,200

**Business items** ● The manufacture and sale of a wide variety of high-performance connectors for applications which include computers, peripheral equipment, terminal equipment, mobile/wired/wireless communications equipment, consumer equipment, and automotive uses.

**Capital** ● 8,639,880,000 yen (as of the end of Feb 2000) (On the First Section of the Tokyo Stock Exchange)

**Major banks dealt with** ● Sumitomo Bank (Gotanda Branch), The Sumitomo Trust & Banking Co., Ltd. (Shibuya Branch)

**Affiliated Groups** ● Electronic Industries Association of Japan (EIAJ), Communication Industry Association of Japan (CIAJ), Optoelectronics Industry Development Association (OITDA), Reliability Center for Electronic Components of Japan (RCJ), Institute of Electronics, Information and Communication Engineers (IEICE), Japan Electronic Industry Development Association (JEIDA), Association of Electronic Technology for Automobile Traffic and Driving, and Japan Electric Vehicle Association (JEVA).

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HIROSE ELECTRIC CO.,LTD.

# Connectors for OPTICAL FIBER CATALOGUE



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# Handling Precautions for Cables with Optical Connectors

## 1 General Precautions

Optical fiber cable has many characteristics, but it essentially uses glass, which is a dangerous material. Improper handling can lead to breakage accidents. Greater care must be given to handling optical fiber cable than general (metal) communications cable so as not to apply excessive tensile force or bending when laying it or in general handling.

## 2 Laying Method (for $\phi 2$ and $\phi 3$ Cable)

Laying of cable should be performed with attention paid to the following points:

- a. Do not pull the cable with a force exceeding the allowable tensile force. (70 N or less)
- b. Do not twist the cable when pulling it.
- c. Be careful not to momentarily apply excessive tensile force. Also, do not apply sudden tensile force when the cable is in a loop.
- d. Be sure to release the tensile force after laying. Attention is especially warranted for the tensile force at corners. (20 N or less in the direction of bending)
- e. Do not bend the cable at less than the allowable bending radius. (Regular cables of  $\phi 2$  and  $\phi 3$ : 40-mm radius or greater)

## 3 Connector (Ferrule End) Cleaning Method

### a. MU-type Connectors (HMU)

Please use a Cletop reel type cleaning device for the cleaning. (Manufactured by NTT International Co., Ltd.)

Note that moist cleaning using alcohol or other agents may leave a residue of industrial paper rag or other dirt on the ferrule end.

### b. FC-type Connectors (HRFC) and SC-type Connectors (HSC)

Dirt adhering to the end of the ferrule should be removed by moistening industrial paper rag (e.g., product name: Kim Wipe) or gauze with alcohol and wiping away with a rubbing motion.

(NOTE: Rubbing too hard at this point might scratch the fiber tip.)

### c. C-HFC-type Plug and Jack Connectors (HRPI)

Dirt adhering to the end of the ferrule should be removed by moistening a cotton swab with alcohol and wiping away with a rubbing motion. (NOTE: Rubbing too hard at this point might scratch the fiber tip.)

### d. Adaptor

Dirt adhered to the adaptor sleeve should be cleaned repeatedly, using a special cleaning tool dipped in anhydrous alcohol, as if it penetrates through the sleeve.

## 4 Connector Handling Precautions

### 1. FC-type Connectors (HRFC)

FC-type connectors use a twist-coupling system. Align the guide groove of the adaptor and the protruding guide of the plug when joining these connectors.

(NOTE: These connectors can be coupled even though the guides have not been aligned. Optical coupling will not be obtained in this condition.)

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## 2. SC-type Connectors (HSC)

SC-type connectors use a push-pull coupling system. Align the guide groove of the adapter and the protruding guide of the plug when joining these connectors.

When connecting or disconnecting, hold the (blue) knob of the movable part of the casing and perform the connection or disconnection.

Coupling completion can be checked by listening for the coupling sound or by noting that the white line printed on the knob is hidden by the casing of the adapter. (NOTE: Leaving the connector in a condition of incomplete coupling will result in the deformation of the lock portion of the adapter and locking will no longer be possible.)

## 3. C-HFC-type Connectors (HRPI)

C-HFC-type connectors use a plug-in system. The connectors take the form of a plug and jack. The connectors themselves are not furnished with a lock to maintain the coupling of the plug and jack.

### a. C-HFC-type and C-HFCS-type Plugs (HRPI-APH, HRPI-BPH, and HRPI-CPH)

To mount the plug to the housing, slide the snap-out ring of the movable portion of the casing all the way in the direction opposite that of the coupling direction and insert.

Mounting completion can be checked by listening for the mounting sound or by pulling lightly after mounting.

To remove the plug from the housing, slide the snap-out ring of the movable portion of the casing all the way in the direction of coupling and pull the main unit portion.

To mount the C-HFCS-type plug to the housing, in addition to the aforementioned procedure, align the guide groove of the housing and the protruding guide of the C-HFCS-type plug.

(NOTE: Leaving the connector in a condition of incomplete mounting will result in the deformation of the housing lock portion and locking will no longer be possible. If insertion is made without aligning the guides in the case of the C-HFCS-type plug, the mounting will be incomplete and attention is particularly warranted for this reason.)

### b. C-HFC-type Jacks (HRPI-BJH)

To mount the jack to the housing, align the guide groove of the housing and the protruding guide of the jack. Mounting completion can be checked by listening for the mounting sound or by pulling lightly after mounting.

To remove the jack from the housing, a special tool (i.e., terminal extraction tool) should be used. (NOTE: The housing is furnished with a groove other than the guide groove and although the jack can be mounted with this groove, the optical characteristics may deteriorate and attention is particularly warranted for this reason. Also note that removal of the jack without the use of the special tool will not be possible.)

## 4. MU-type Connectors (HMU)

MU-type connectors use a push-pull coupling system and can also be used in the form of a plug-in system. To couple, align the recessed guide groove of the adapter, receptacle, back panel side housing, and package side housing with the protruding portion of the guide key of the plug side, then join.

When connecting or disconnecting, hold the (brown) knob of the (plastic) movable part of the casing and perform the connection or disconnection.

Coupling completion can be checked by listening for the coupling sound or by noting that the white line printed on the knob is hidden by the casing part of the adapter or receptacle.

(NOTE: Leaving the connector in a condition of incomplete coupling will result in the deformation of the lock portion of the adapter or receptacle and the original optical characteristics and mechanical characteristics will no longer be obtainable.)

To couple the back panel side housing and the package side housing, join the jack (i.e., the item from which the movable part of the plug has been removed) with the package side housing and mount the sleeve holder to the optical terminal (ferrule) portion. To extract the jack, use the special tool (HMUB-TJ-1). The sleeve (i.e., split sleeve) located inside the sleeve holder uses zirconia ceramic. Mechanical loads such as twisting could lead to damage and caution is warranted.

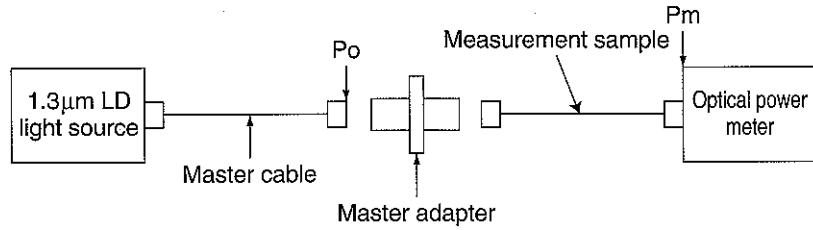
MU connectors use an optical terminal of very small diameter (1.25 mm) and a special cleaning device (i.e., product name: Cletop reel type) should be used for the cleaning of the optical terminal.

# 5 Measurement System for Insertion Loss and Reflection Attenuation

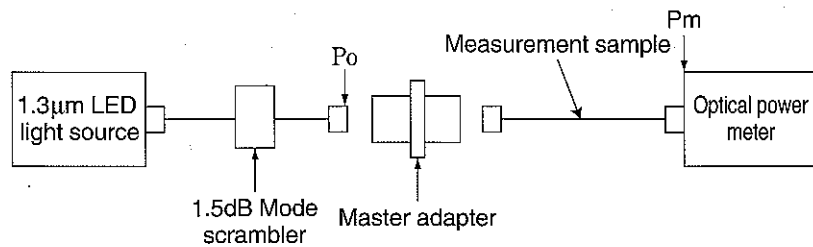
The measurement system illustrated in the diagrams below was used to obtain the measured values for the standard values of insertion loss and reflection attenuation which are listed for each series.

## (1) Insertion Loss

### ● SM Fiber

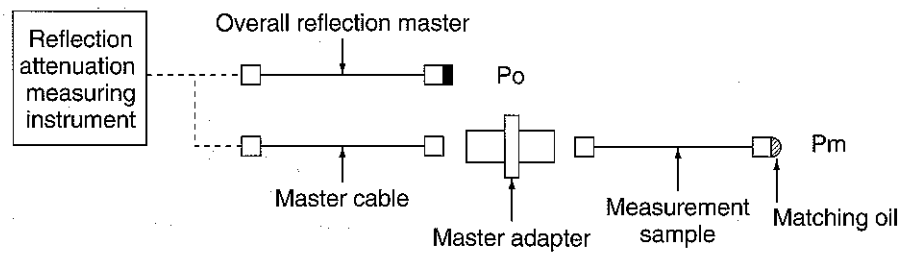


### ● GI Fiber



$$\text{Insertion loss} = 10 \log \frac{P_m}{P_o}$$

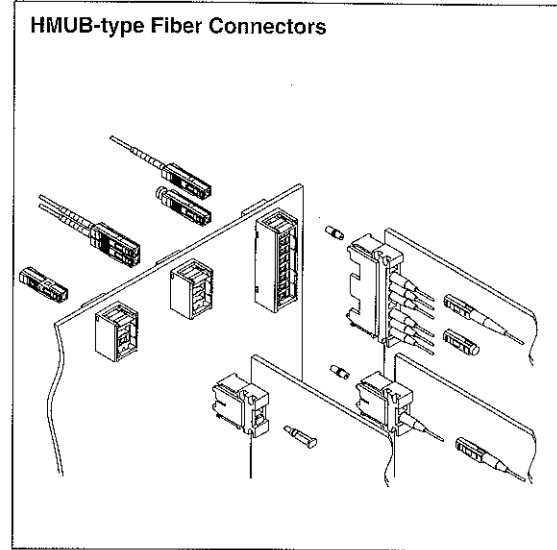
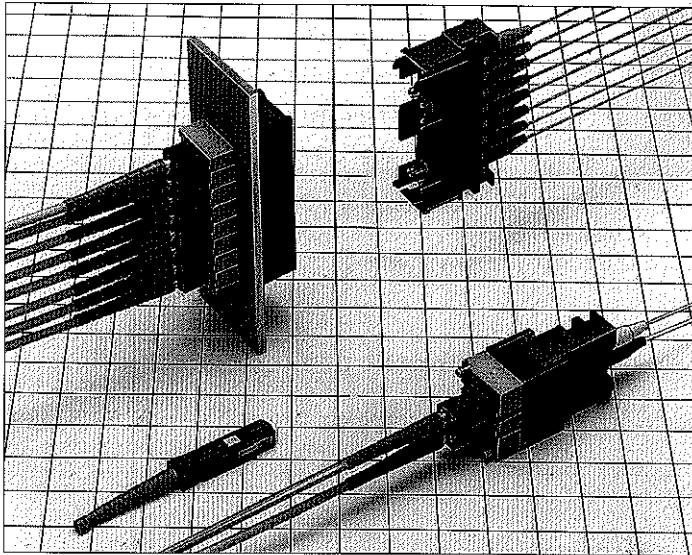
## (2) Reflection Attenuation



$$\text{Reflection attenuation} = 10 \log \frac{P_m}{P_o}$$

# MU-type High-Density Plug-in Optical Fiber Connectors

## HMU Series



### ■ Features

#### 1. MU-type Correspondence

These connectors can be used with the NTT, MU-type optical fiber connectors.  
JIS C5983 (F14 optical fiber connectors)  
IEC 61754-6

#### 2. Plug-in Housing

The plug-in housing has a self-holding mechanism which does not exert a pushing force on the back panel when in the coupled condition.

#### 3. Back Panel Side Optical Terminals

Insertion and withdrawal of back panel side optical terminals is even possible when the back panel and the package are in the coupled condition.

#### 4. Wide Variation of Connectors for Junction Applications

Type \ No. of Gangs	1	2	3
Board mounting	○	○	○
Junction panel mounting	○	○	○

#### 5. Optical Terminals

The optical terminals (optical connectors) are ultra-miniature optical fiber connectors that use the same fastening mechanism as the SC-type optical fiber connectors (JIS C 5973).

### ■ Applications

Optical terminal equipment, optical relay racks, measuring instruments, etc.



## Product Standards

Rating	Operating temperature range	-25°C~70°C	Storage temperature range	-25°C~70°C
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Item		Test Method (JIS C 5961)		Standard
Optical Performance	Insertion loss	(SM)	1,300nm wavelength (LD)	0.5 dB or less (PC, AdPC)
		(GI)	1,300nm wavelength (LED)	0.3 dB or less (PC)
	Reflection attenuation	(SM)	1,300nm wavelength (LD)	22 dB or greater (PC) 40 dB (AdPC)
		(GI)		22 dB or greater (PC)
Mechanical Performance	Coupling force and decoupling force	Measure when connectors are coupled and separated in the direction of the axis.		Simplex plugs Coupling force 20N or less Separation force 20N or less Duplex plugs Coupling force 30N or less Separation force 30N or less
	Split sleeve holding force of the sleeve holder and the adapter	Zirconia gauge of $\phi 1.249 \pm 0.0005$ mm		Zirconia 1~2.5N
	Cable clamp strength (Pulling in direction of axis)	70 N of pulling force between connector and cable for one minute		1) Insertion loss fluctuation after test: 0.2dB or less 2) No irregularity in clamp section or cable
	Repetitive operation	200 times (Plug-in housing) 500 times (Plug)		1) Insertion loss fluctuation after test: 0.2 dB or less 2) No damage, cracks, or part looseness
	Vibration resistance	Vibration range of 10 to 55 Hz Test in 3 directions, 2 hours each		
	Shock resistance	Acceleration of 981 m/s <sup>2</sup> 3 axes, both directions, 5 times each (Total of 15 times)		
Humidity resistance (Temperature and humidity cycle)	Temperature -10°C to 65°C, humidity 90 to 96% 10 cycles			
Environmental performance	Temperature cycle	Temperature -25°C to 70°C 100 cycles		No conspicuous corrosion
	Heat resistance	Leave for 960 hours at a temperature of 85°C		
	Cold resistance	Leave for 960 hours at a temperature of -25°C		
	Salt fog	Left in a 5% concentration of salt fog for 48 hours		

## Materials

Component	Material	Notes
Simplex plug casing	Polybutylene terephthalate	NTT, MU corresponding item
Coil spring	Piano wire	
Ferrule	Zirconia	
Simplex adapter casing	Polyphenylene sulfide	
Duplex adapter casing	Polyphenylene sulfide	
8-ganged adapter casing	Polyphenylene sulfide	
Plug-in connector casing	Polyphenylene sulfide	
Split sleeve	Zirconia or Copper alloy	

## Types

Types		No. of gangs	Cable Diameter	Notes	Polishing	Product Number	
Back Panel Side	Plug housing	1	$\phi 2$	With knob	PC	HMUA-P2-H1	
			$\phi 0.9$		AdPC	HMUA-P2-H2	
		2	$\phi 2$	With knob	PC	HMUA-P1-H1	
			$\phi 0.9$		AdPC	HMUA-P1-H2	
		Receptacle attachment Terminator	1	—	—	—	HMUA-RA-1
				—	With knob	—	HMUA-TM-1
	Connector housing	2	—	Package side	—	HMUB-L2PA-1	
			—		—	HMUB-L8PA-1	
		8	—	For back panel side 2.4mm panel	—	HMUB-L2HA-1	
			—	For 3.2mm panel	—	HMUB-L2HB-1	
	Sleeve holder Ferrule	1	—	For 2.4mm panel	—	HMUB-L8HA-1	
			—	For 3.2mm panel	—	HMUB-L8HB-1	
	Small-diameter zirconia ferrule	1	—	—	—	HMUB-SH-1	
			—	—	—	HMUA-F3-A [ ]	
Package side	Plug housing Terminator	1	$\phi 2$	Without knob	PC	HMUAJ-P2-H1	
			$\phi 0.9$		AdPC	HMUAJ-P2-H2	
Without knob	1	—	—	—	HMUAJ-P1-H1		
		—	—	—	HMUAJ-P1-H2		
Adapter	1	—	For panel mounting	—	HMUA-A-1		
		—	For screw mounting	—	HMUA-AS-1		
		—	For board mounting	—	HMUA-AH-1		
	2	—	For panel mounting	—	HMUA-2A-1		
		—	For screw mounting	—	HMUA-2AS-1		
		—	For board mounting	—	HMUA-2AH-1		
	8	—	For panel mounting	—	HMUA-8A-1		
		—	For screw mounting	—	HMUA-8AS-1		
		—	For board mounting	—	HMUA-8AH-1		
		—	For board mounting	—	HMUA-8AH-1		

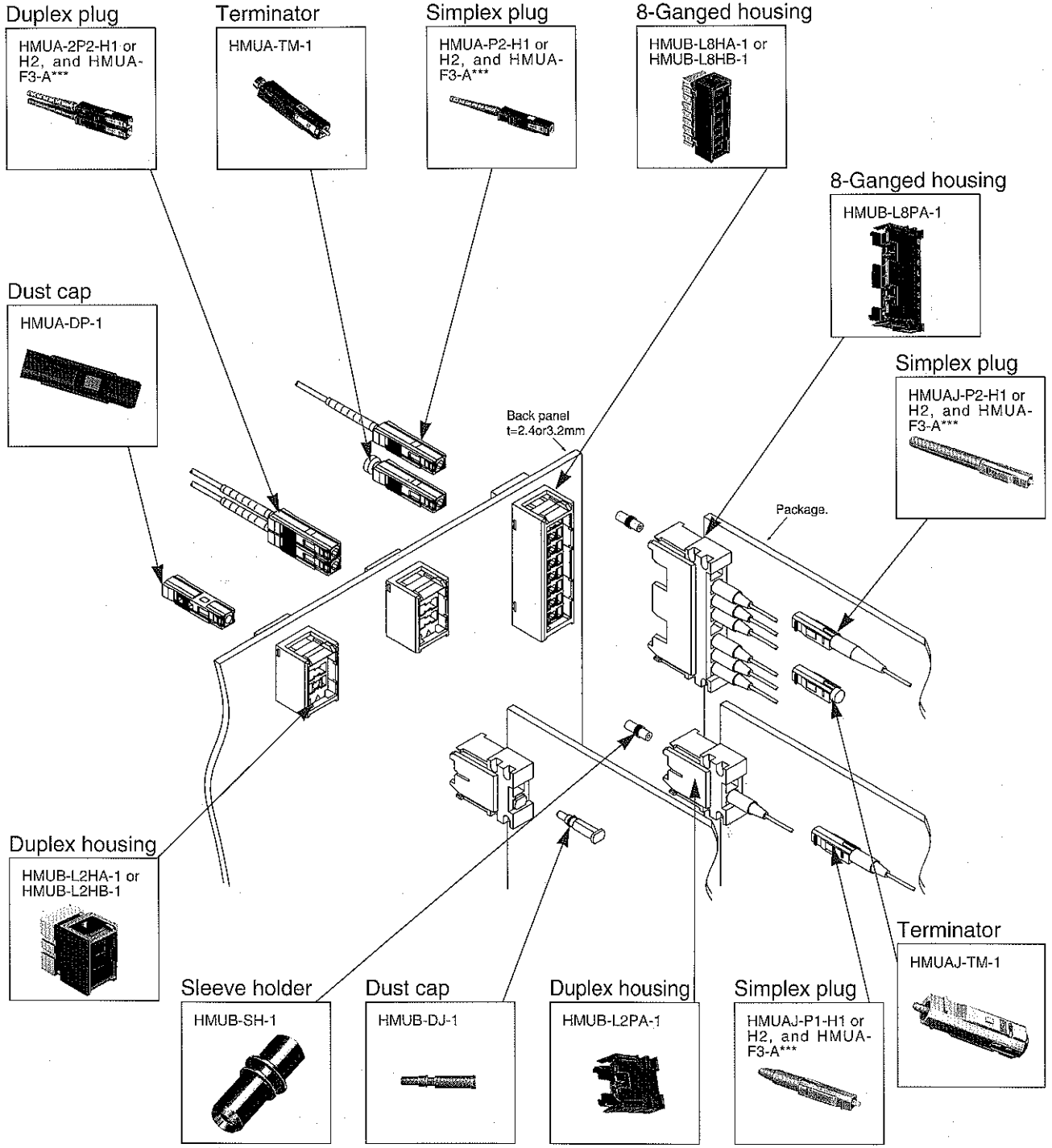
## Usage Precautions

### Insertion and Withdrawal of Plugs by Tool

The various tools should be used properly according to the Application, Suitable Adapter and Connector Housing, and Suitable Plug as listed in the table below. These connectors are mounted in high density and require a reliable operation to be performed with a tool. Instruction manuals are available. Please request them.

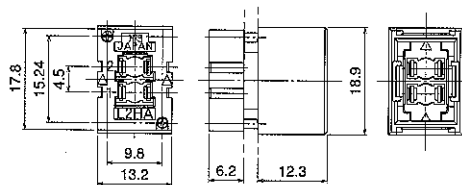
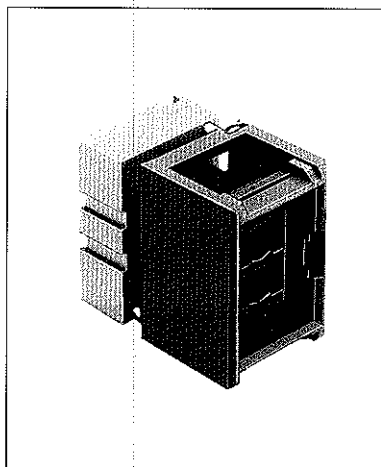
Application	Applicable Adapter and Connector Housing	Applicable Plug (Plug housing name listed)	Tool Product Number
Insertion and withdrawal of plugs	HMUA-A-1,2A-1,8A-1,AS-1,2AS-1,8AS-1	HMUA-P1-H1·2,2P1-H1·2 HMUA-P2-H1·2,2P2-H1·2	HMUA-TP-1
	HMUB-L2HA-1,L2HB-1,L8HA-1,L8HB-1	HMUA-P1-H1·2,2P1-H1·2 HMUA-P2-H1·2,2P2-H1·2	HMUB-TP-1
Plug extraction	HMUB-L2PA-1,L8PA-1	HMUAJ-P1-H1·2,P2-H1·2	HMUB-TJ-1
Insertion and withdrawal of sleeve holders	HMUB-L2PA-1,L8PA-1	HMUAJ-P1-H1·2,P2-H1·2	HMUB-TS-1
Locking of plugs	—	HMUA-P2-H1·2,2P2-H1·2	HMUA-TK-1
	—	HMUAJ-P2-H1·2	HMUA-TK-2

# Functions Diagram

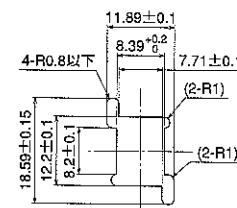


## ■Back Panel Side Connector Housing

### ●Duplex Back Panel Side Connector Housing



◆Mounting Hole Dimensions Diagram

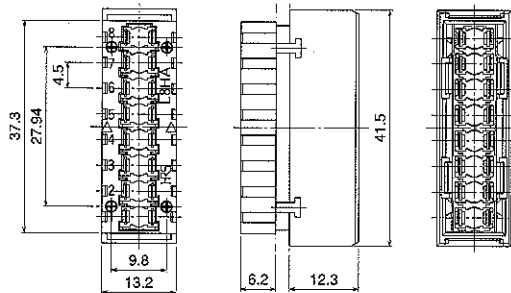
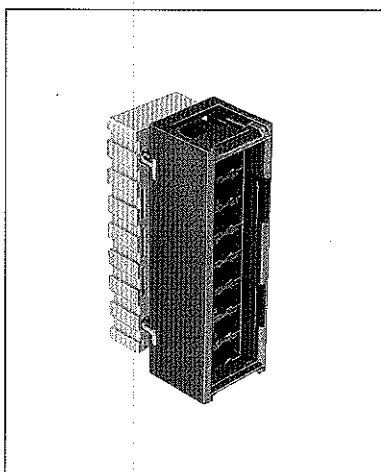


Product Number	HRS No.	Mounting Panel Thickness
HMUB-L2HA-1	CL710-0017-8	2.4mm
HMUB-L2HB-1	CL710-0018-0	3.2mm

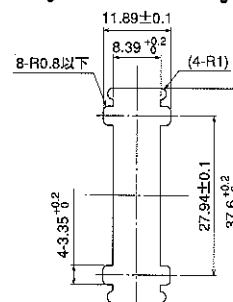
(NOTE 1) This duplex back panel side connector housing should be used in conjunction with a simplex or duplex plug housing furnished with a knob (for 2 cable, and for core wire).

(NOTE 2) The recommended clamp torque to be 3.1N

### ●8-Ganged Back Panel Side Connector Housing



◆Mounting Hole Dimensions Diagram

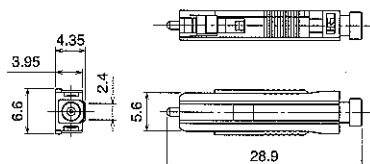
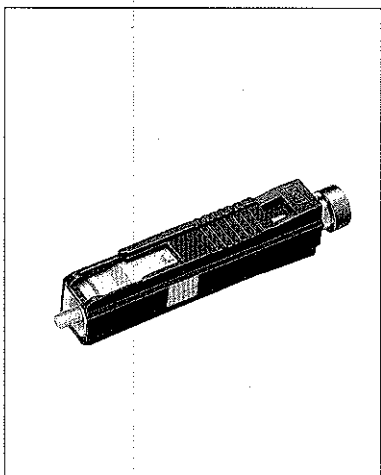


Product Number	Product Number	Mounting Panel Thickness
HMUB-L8HA-1	CL710-0019-3	2.4mm
HMUB-L8HB-1	CL710-0020-2	3.2mm

(NOTE 1) This 8-ganged back panel side connector housing should be used in conjunction with a simplex or duplex plug housing furnished with a knob (for 2 cable, and for core wire).

(NOTE 2) The recommended clamp torque to be 3.1N

## ■Terminator (Back Panel Side)



Product Number	HRS No.	Reflection Attenuation	Applicable Optical Fiber
HMUA-TM-P1	CL821-0007-6	≧40dB	SM-9.5/125

### Specifications

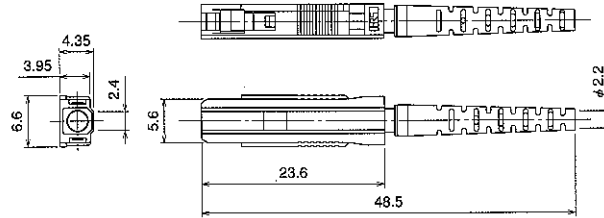
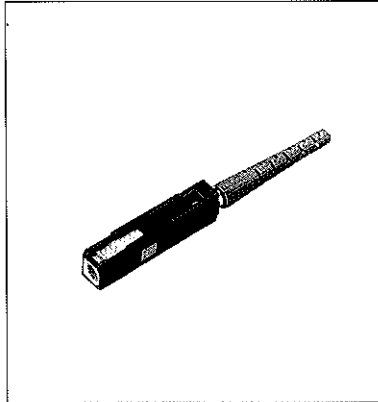
Item	Standard Value
Rated input power	≦30mW
Reflection attenuation	≧40dB(48dB TYP.)
Suitable wavelength band	1.3μm, 1.55μm
Operating temperature	-25℃~70℃
Humidity	≧95%
Storage temperature	-40℃~80℃

(NOTE) See page 87 in detail



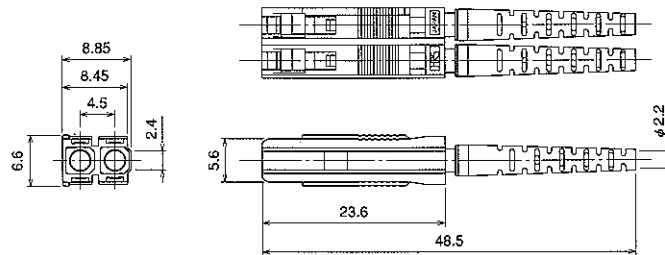
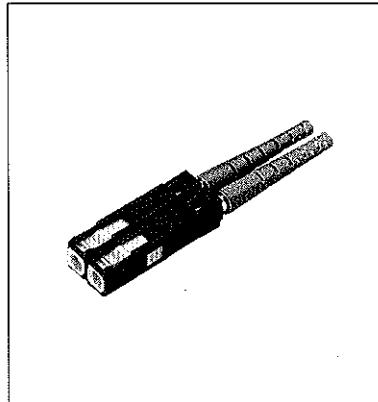
## ■ Back Panel Side Plug Housing

### ● Plug Housing for Simplex $\phi 2$ Cable With Knob



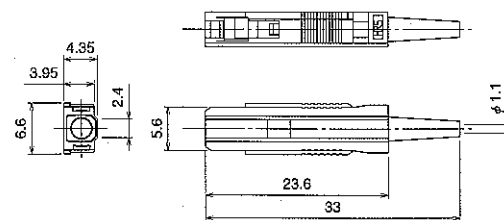
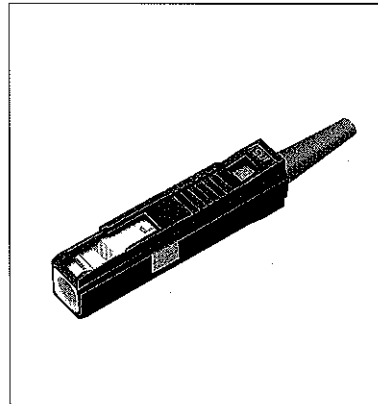
Product Number	HRS No.	Applicable Cable Diameter	Hood Color	Polishing Specification
HMUA-P2-H1	CL710-0047-9	$\phi 2$ mm	Blue	For PC polishing
HMUA-P2-H2	CL710-0001-8	$\phi 2$ mm	Light purple	For AdPC polishing

### ● Plug Housing for Duplex $\phi 2$ Cable With Knob



Product Number	HRS No.	Applicable Cable Diameter	Hood Color	Polishing Specification
HMUA-2P2-H1	CL710-0048-1	$\phi 2$ mm	Blue	For PC polishing
HMUA-2P2-H2	CL710-0002-0	$\phi 2$ mm	Light purple	For AdPC polishing

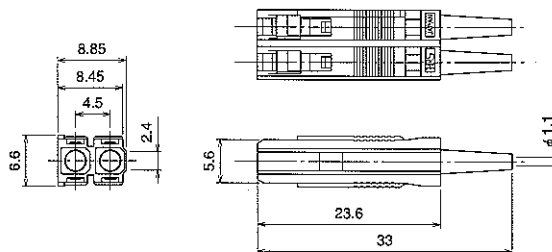
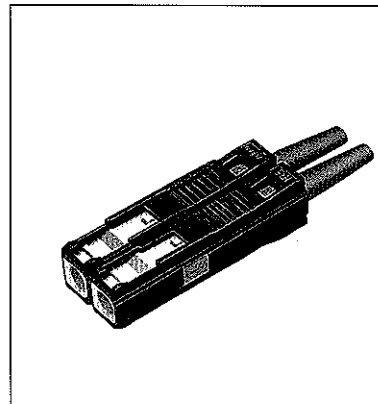
### ● Plug Housing for Simplex $\phi 0.9$ Cable With Knob



Product Number	HRS No.	Applicable Cable Diameter	Hood Color	Polishing Specification
HMUA-P1-H1	CL710-0068-9	$\phi 0.9$ mm	Blue	For PC polishing
HMUA-P1-H2	CL710-0069-1	$\phi 0.9$ mm	Light purple	For AdPC polishing

NOTE: Full length 28mm product also available.

### ● Plug Housing for Duplex $\phi 0.9$ Cable With Knob



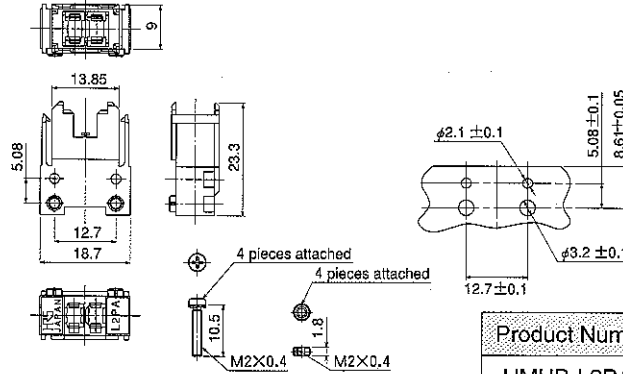
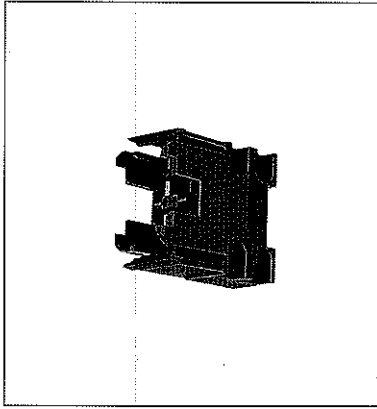
Product Number	HRS No.	Applicable Cable Diameter	Hood Color	Polishing Specification
HMUA-2P1-H1	CL710-0070-0	$\phi 0.9$ mm	Blue	For PC polishing
HMUA-2P1-H2	CL710-0071-3	$\phi 0.9$ mm	Light purple	For AdPC polishing

NOTE: Full length 28mm product also available.

## ■ Package Side Connector Housing

### ● Duplex Package Side Connector Housing

#### ◆ Mounting Hole Dimensions Diagram



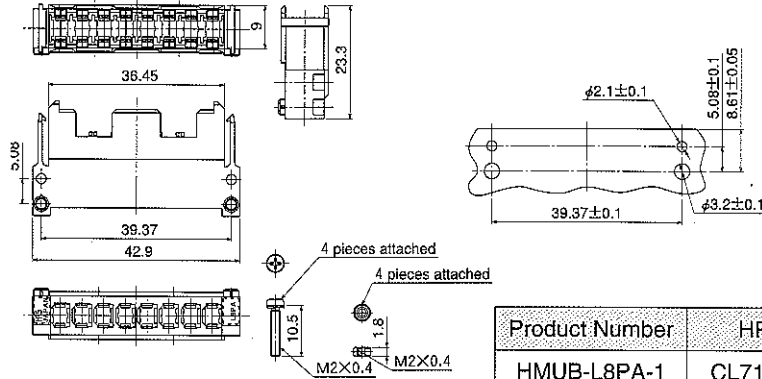
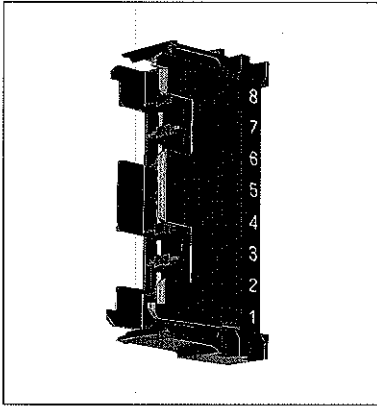
Product Number	HRS No.
HMUB-L2PA-1	CL710-0015-2

(NOTE 1) This duplex package side connector housing should be used in conjunction with a simplex sleeve holder and simplex plug housing without a knob (for  $\phi 2$  cable, and for core wire).

(NOTE 2) The recommended clamp torque to be 14.9N

### ● 8-Ganged Package Side Connector Housing

#### ◆ Mounting Hole Dimensions Diagram

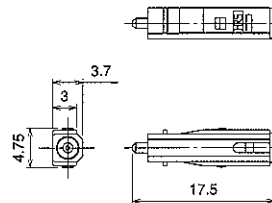
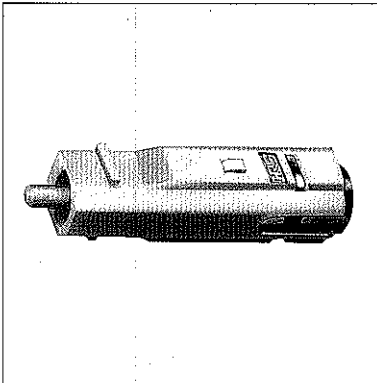


Product Number	HRS No.
HMUB-L8PA-1	CL710-0016-5

NOTE: This 8-ganged package side connector housing should be used in conjunction with a simplex sleeve holder and simplex plug housing without a knob (for  $\phi 2$  cable, and for core wire).

(NOTE 2) The recommended clamp torque to be 14.9N

## ■ Terminator (Package Side)



Product Number	HRS No.	Reflection Attenuation	Suitable Optical Fiber
HMUAJ-TM-P1	CL821-0008-9	$\geq 40\text{dB}$	SM-9.5/125

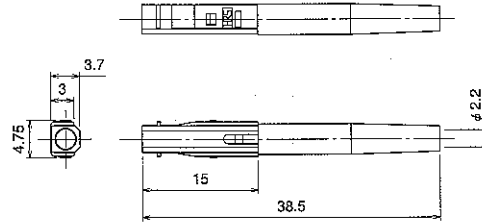
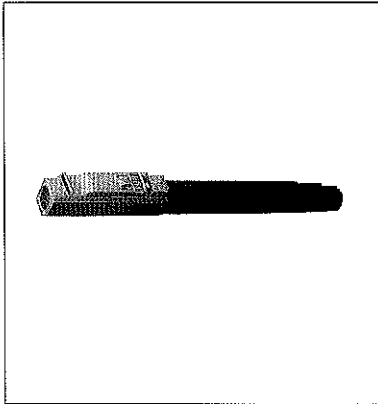
### Specifications

Item	Standard Value
Rated input power	$\leq 30\text{mW}$
Reflection attenuation	$\geq 40\text{dB}$ (48dB TYP.)
Suitable wavelength band	1.3 $\mu\text{m}$ , 1.55 $\mu\text{m}$
Operating temperature	-25°C~70°C
Humidity	$\leq 95\%$
Storage temperature	-40°C~80°C

(NOTE) See page 87 in detail

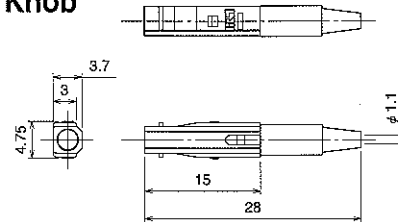
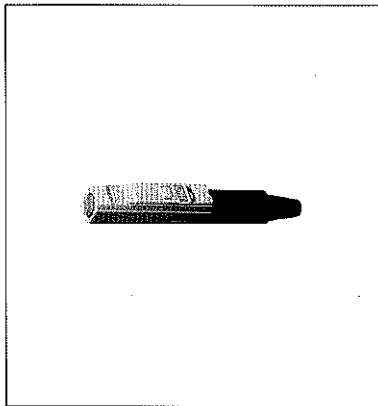
## ■ Package Side Connector Housing

### ● Plug Housing for Simplex $\phi 2$ Cable Without Knob



Product Number	HRS No.	Applicable Cable Diameter	Hood Color	Polishing Specification
HMUAJ-P2-H1	CL710-0050-3	$\phi 2\text{mm}$	Blue	For PC polishing
HMUAJ-P2-H2	CL710-0004-6	$\phi 2\text{mm}$	Light purple	For AdPC polishing

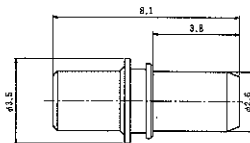
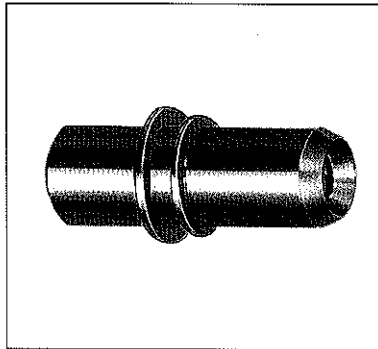
### ● Plug Housing for Simplex $\phi 0.9$ Cable Without Knob



Product Number	HRS No.	Applicable Cable Diameter	Hood Color	Polishing Specification
HMUAJ-P1-H1	CL710-0049-4	$\phi 0.9\text{mm}$	Blue	For PC polishing
HMUAJ-P1-H2	CL710-0003-3	$\phi 0.9\text{mm}$	Light purple	For AdPC polishing

NOTE: A jig is available for measuring the optical characteristics of a knobless plug through the use of an adapter. (HRS No. and Product Number: CL710-0085-8, HMUA-RH-1)

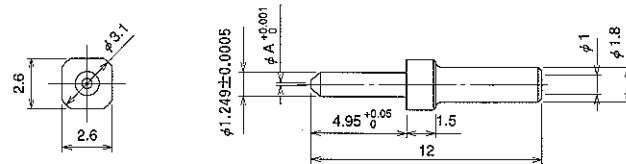
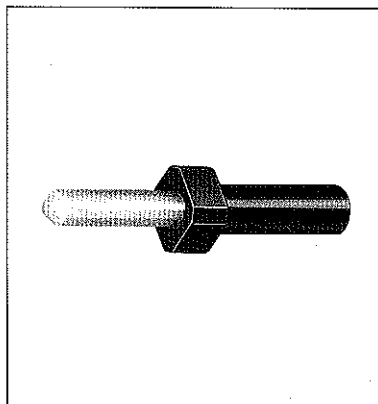
## ■ Simplex Sleeve Holder



Product Number	HRS No.
HMUB-SH-1	CL710-0021-5

NOTE: This sleeve holder should be used in conjunction with a duplex and 8-ganged package side connector housing and a simplex 2cable/simplex 0.9 cable plug housing without a knob. Also note that assembly should be performed using a sleeve holder insertion and withdrawal tool (HMUB-TS-1), having the gold plated portion facing the direction of the package side connector housing.

## ■ Ferrule

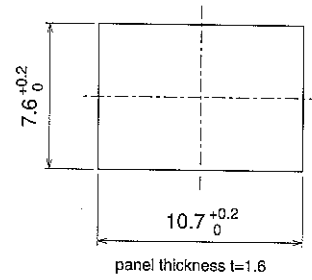
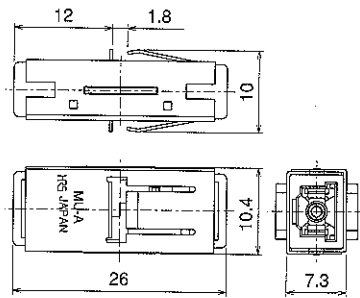
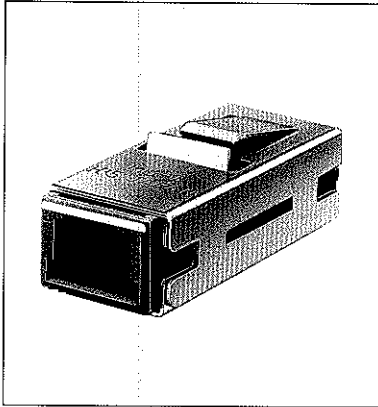


Product Number	HRS No.	Dimension A	Applicable Optical Fiber
HMUA-F3-A123	CL710-0022-8	0.123	SM-9.5/125 GI-50/125
HMUA-F3-A124	CL710-0023-0	0.124	
HMUA-F3-A125	CL710-0024-3	0.125	
HMUA-F3-A126	CL710-0025-6	0.126	
HMUA-F3-A127	CL710-0026-9	0.127	
HMUA-F3-A128	CL710-0027-1	0.128	

## ■ Adapters

### ● Simplex Adapter Panel Mounting Type

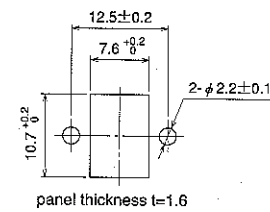
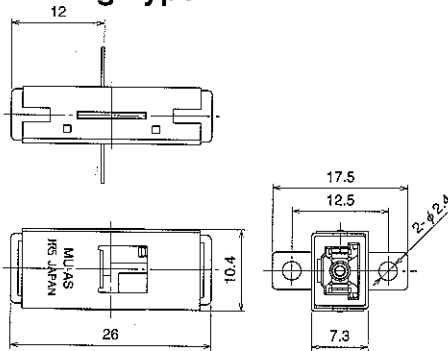
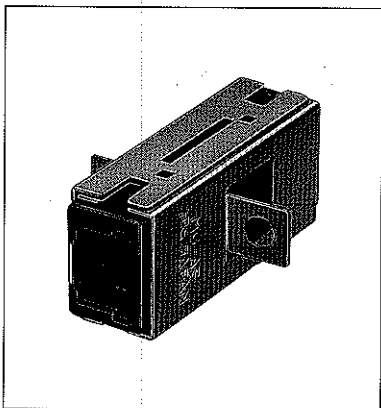
◆ Mounting Hole Dimensions Diagram



Product Number	HRS No.	Type of Mounting
HMUA-A-1	CL710-0005-9	Panel (1.6mm thick)

### ● Simplex Adapter Screw Mounting Type

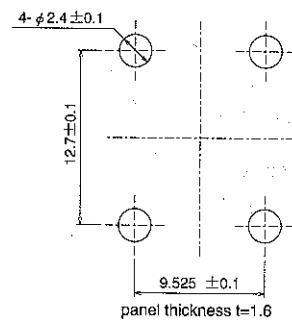
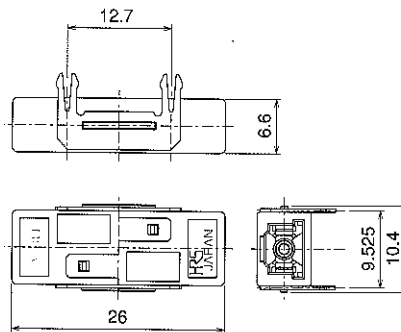
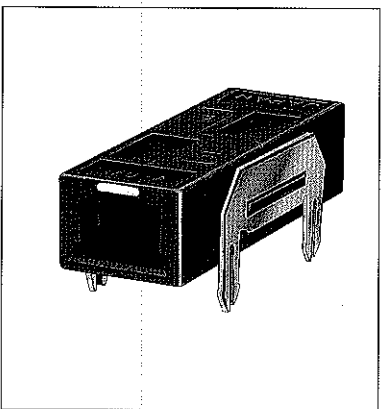
◆ Mounting Hole Dimensions Diagram



Product Number	HRS No.	Type of Mounting
HMUA-AS-1	CL710-0006-1	Panel (screw)

### ● Simplex Adapter Board Mounting Type

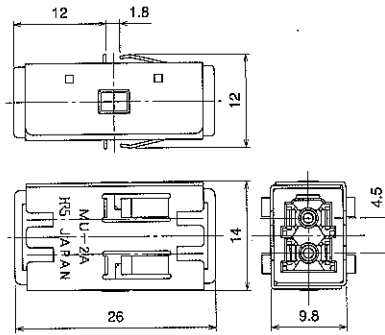
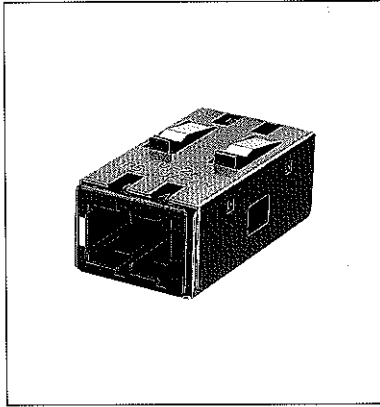
◆ Mounting Hole Dimensions Diagram



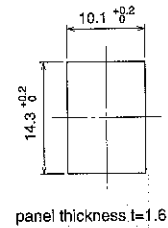
Product Number	HRS No.	Type of Mounting
HMUA-AH-1	CL710-0007-4	Board (1.6mm thick)



### ● Duplex Adapter Panel Mounting Type

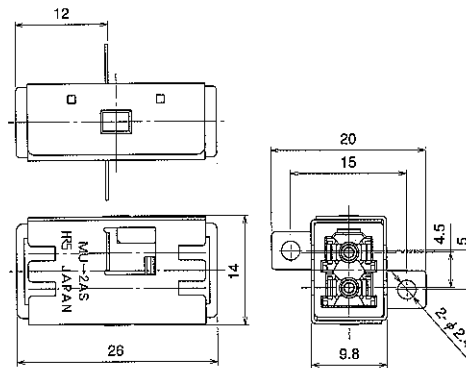
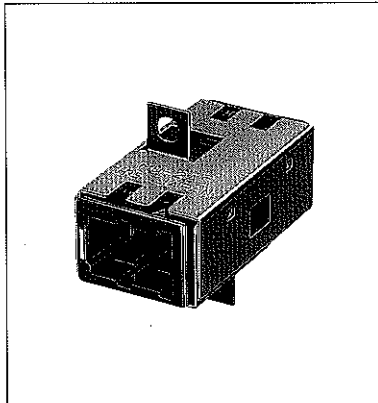


### ◆ Mounting Hole Dimensions Diagram

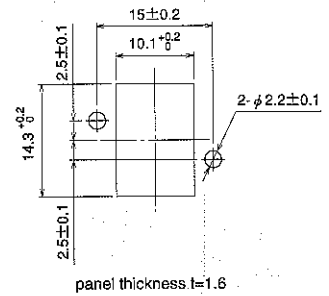


Product Number	HRS No.	Type of Mounting
HMUA-2A-1	CL710-0008-7	Panel (1.6mm thick)

### ● Duplex Adapter Screw Mounting Type

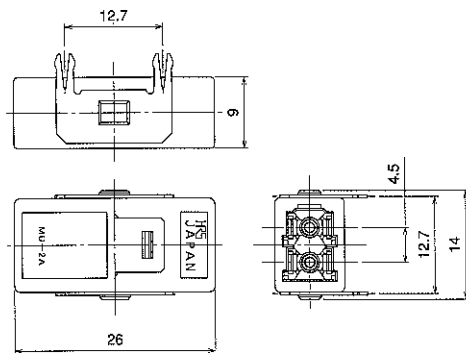
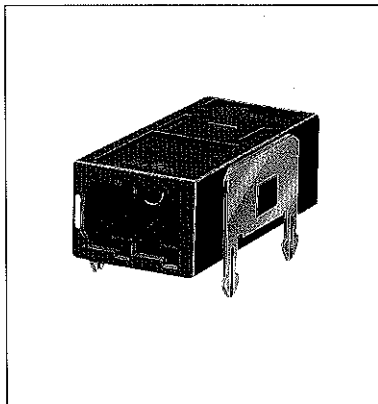


### ◆ Mounting Hole Dimensions Diagram

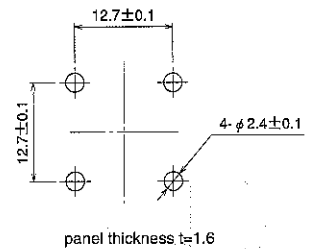


Product Number	HRS No.	Type of Mounting
HMUA-2AS-1	CL710-0009-0	Panel (screw)

### ● Duplex Adapter Board Mounting Type

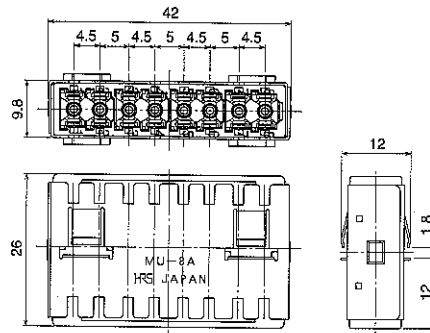
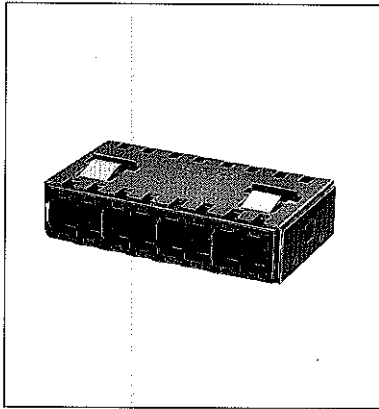


### ◆ Mounting Hole Dimensions Diagram

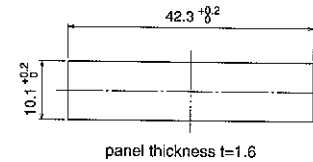


Product Number	HRS No.	Type of Mounting
HMUA-2AH-1	CL710-0010-9	Board (1.6mm thick)

### ●8-Ganged Adapter Panel Mounting Type

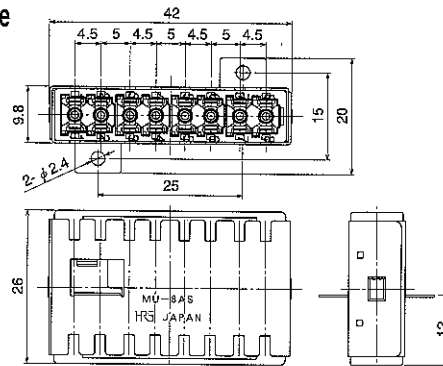
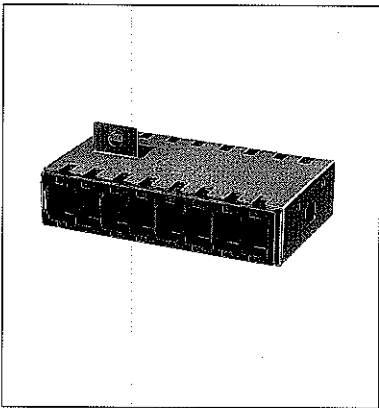


◆ Mounting Hole Dimensions Diagram

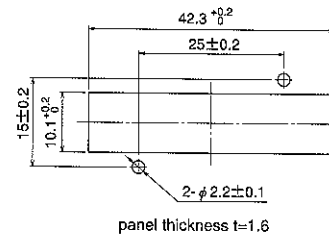


Product Number	HRS No.	Type of Mounting
HMUA-8A-1	CL710-0011-1	Panel (1.6mm thick)

### ●8-Ganged Adapter Screw Mounting Type

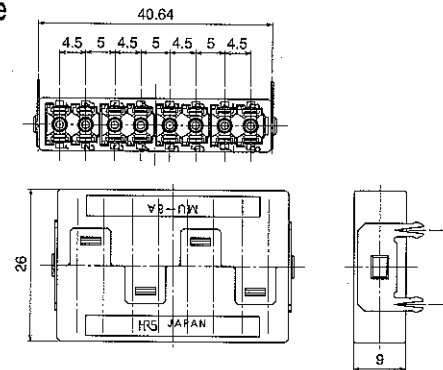
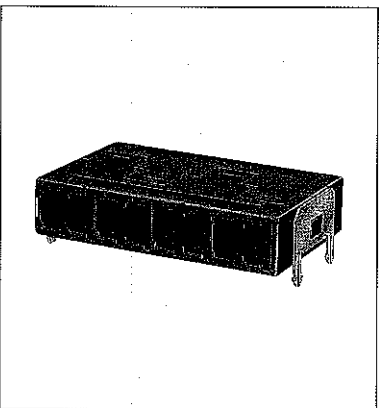


◆ Mounting Hole Dimensions Diagram

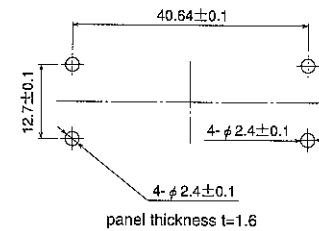


Product Number	HRS No.	Type of Mounting
HMUA-8AS-1	CL710-0012-4	Panel (screw)

### ●8-Ganged Adapter Board Mounting Type

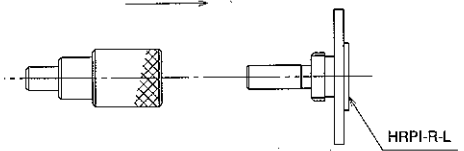
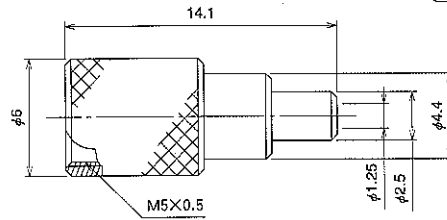
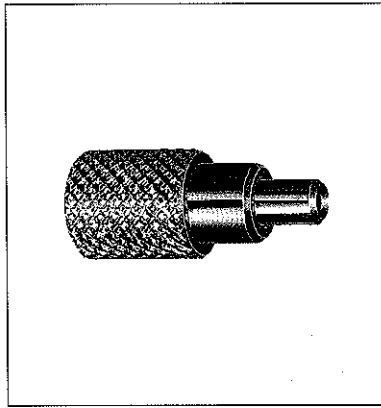


◆ Mounting Hole Dimensions Diagram



Product Number	HRS No.	Type of Mounting
HMUA-8AH-1	CL710-0013-7	Board (1.6mm thick)

## ■ Simplex Receptacle Attachment



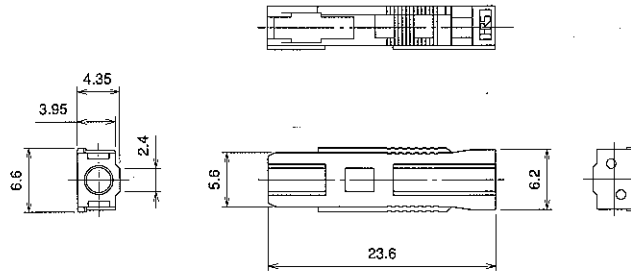
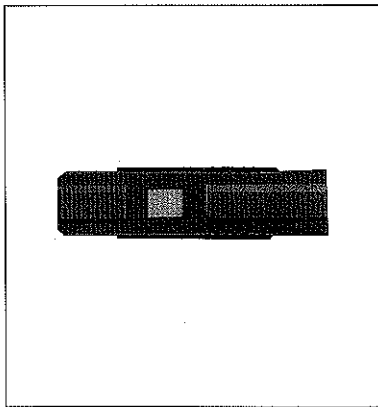
Insert the MU-RA-type receptacle attachment straight on, tighten the screw and fix.

Product Number	HRS No.	Notes
HMUA-RA-1	CL710-0014-0	For measurement of optical characteristics

NOTE: This receptacle attachment is used with HRPI-R-L as a set and attached to a measuring instrument such as a sensor for measurements of such as the optical power.

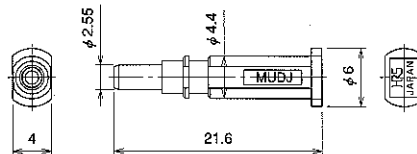
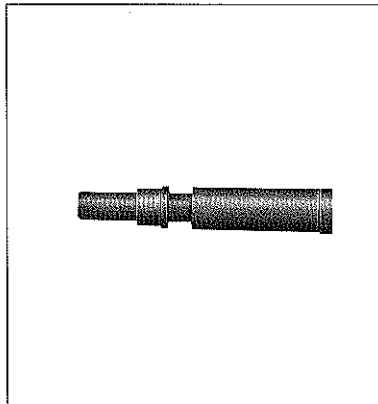
## ■ Dust Caps

### ● Plug Dust Cap (Back Panel Side)



Product Number	HRS No.	Applicable Adapter and Connector Housing
HMUA-DP-1	CL710-0059-8	HMUA-A-1,AS-1,AH-1 HMUA-2A-1,2AS-1,2AH-1 HMUA-8A-1,8AS-1,8AH-1 HMUB-L2HA-1,L2HB-1 HMUB-L8HA-1,L8HB-1

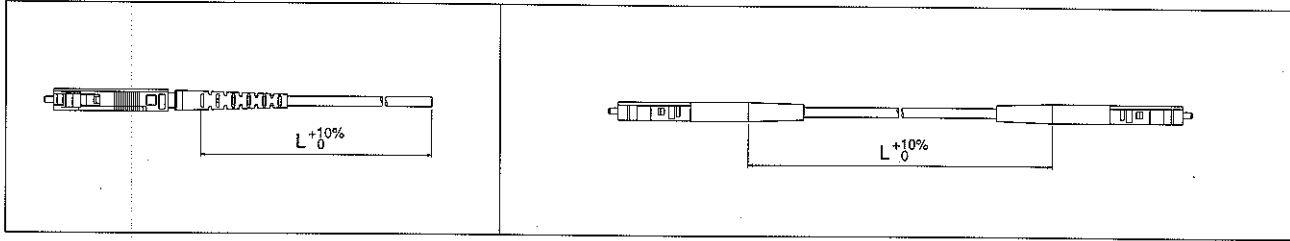
### ● Plug Dust Cap (Back Panel Side)



Product Number	HRS No.	Applicable Connector Housing
HMUB-DJ-1	CL710-0060-7	HMUB-L2PA-1 HMUB-L8PA-1

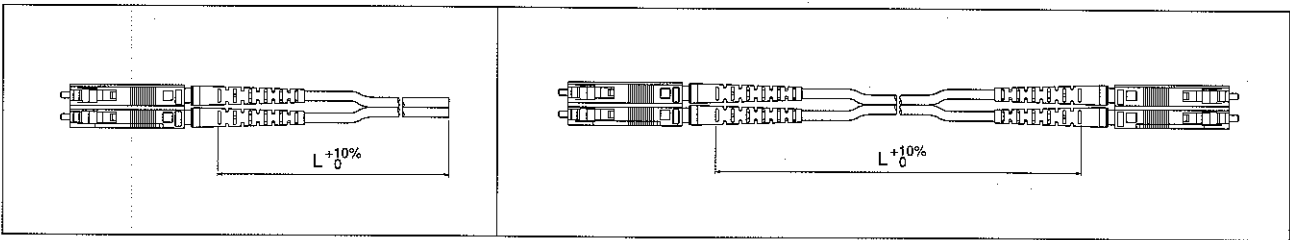
## ■ Connectors with Cable Attached

### ● Plug Housing for Simplex $\phi 2$ Cable With Knob



Product Number	HRS No.	Notes	Applicable Optical Fiber	Type of Polishing	Cable Diameter		
HMUA-SP1-F3Q-L	—	One end	SM-9.5/125	PC polishing	$\phi 2\text{mm}$		
HMUA-SP2-F3Q-L	—	Both ends		AdPC polishing			
HMUA-ASP1-F3Q-L	CL710-0028-4	One end		GI-50/125		PC polishing	
HMUA-ASP2-F3Q-L	CL710-0029-7	Both ends				AdPC polishing	
HMUA-SP1-F3P-L	CL710-0030-6	One end	GI-50/125	PC polishing		$\phi 2\text{mm}$	
HMUA-SP2-F3P-L	CL710-0031-9	Both ends		AdPC polishing			
HMUA-ASP1-F3P-L	CL710-0051-6	One end		GI-50/125			PC polishing
HMUA-ASP2-F3P-L	CL710-0052-9	Both ends					AdPC polishing

### ● Plug Housing for Duplex $\phi 2$ Cable With Knob



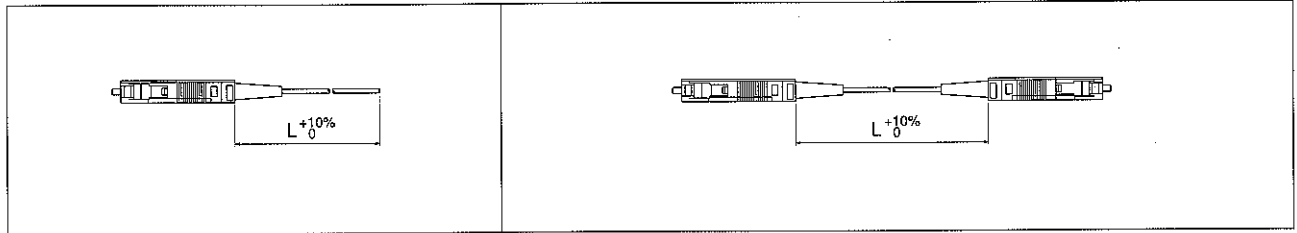
Product Number	HRS No.	Notes	Applicable Optical Fiber	Type of Polishing	Cable Diameter		
HMUA-S2P1-F3QW-L	—	One end	SM-9.5/125	PC polishing	$\phi 2\text{mm}$		
HMUA-S2P2-F3QW-L	—	Both ends		AdPC polishing			
HMUA-AS2P1-F3QW-L	CL710-0061-0	One end		GI-50/125		PC polishing	
HMUA-AS2P2-F3QW-L	CL710-0062-2	Both ends				AdPC polishing	
HMUA-S2P1-F3PW-L	CL710-0034-7	One end	GI-50/125	PC polishing		$\phi 2\text{mm}$	
HMUA-S2P2-F3PW-L	CL710-0035-0	Both ends		AdPC polishing			
HMUA-AS2P1-F3PW-L	CL710-0053-1	One end		GI-50/125			PC polishing
HMUA-AS2P2-F3PW-L	CL710-0054-4	Both ends					AdPC polishing

(NOTE 1) The "L" within the Product Number indicates the length of the cable illustrated in the diagram. Please specify values in meter units.

(NOTE 2) We will custom manufacture a great variety of conversion cables and products other than the aforementioned items to suit your needs.

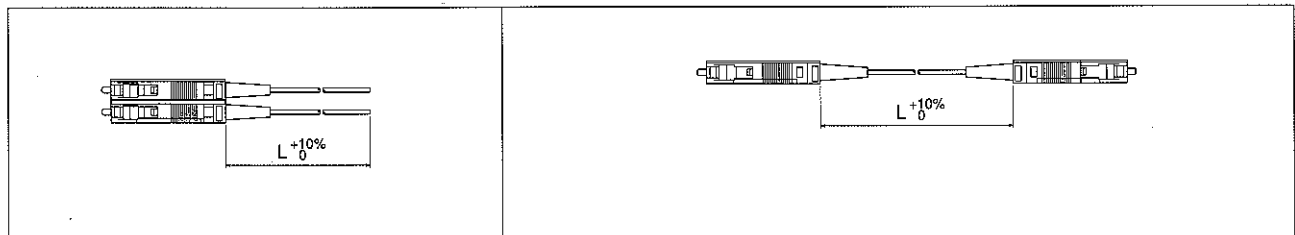


## ● Plug Housing for Simplex $\phi 0.9$ Cable With Knob



Product Number	HRS No.	Notes	Applicable Optical Fiber	Type of Polishing	Cable Diameter	
HMUA-SP1-F3L-L	—	One end	SM-9.5/125	PC polishing	$\phi 0.9\text{mm}$	
HMUA-SP2-F3L-L	—	Both ends		AdPC polishing		
HMUA-ASP1-F3L-L	CL710-1001-3	One end		GI-50/125		PC polishing
HMUA-ASP2-F3L-L	CL710-1002-6	Both ends				AdPC polishing
HMUA-SP1-F3M-L	CL710-1003-9	One end	GI-50/125			PC polishing
HMUA-SP2-F3M-L	CL710-1004-1	Both ends				AdPC polishing
HMUA-ASP1-F3M-L	CL710-1005-4	One end		GI-50/125		PC polishing
HMUA-ASP2-F3M-L	CL710-1006-7	Both ends				AdPC polishing

## ● Plug Housing for Duplex $\phi 0.9$ Cable With Knob

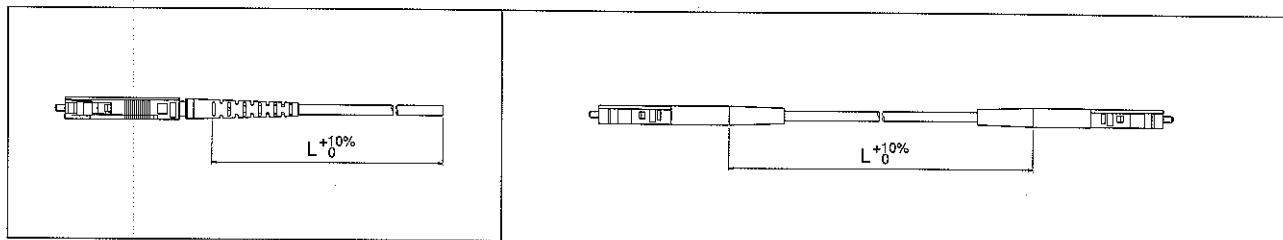


Product Number	HRS No.	Notes	Applicable Optical Fiber	Type of Polishing	Cable Diameter	
HMUA-S2P1-F3L-L	—	One end	SM-9.5/125	PC polishing	$\phi 0.9\text{mm}$	
HMUA-S2P2-F3L-L	—	Both ends		AdPC polishing		
HMUA-AS2P1-F3L-L	CL710-1007-0	One end		GI-50/125		PC polishing
HMUA-AS2P2-F3L-L	CL710-1008-2	Both ends				AdPC polishing
HMUA-S2P1-F3M-L	CL710-1009-5	One end	GI-50/125			PC polishing
HMUA-S2P2-F3M-L	CL710-1010-4	Both ends				AdPC polishing
HMUA-AS2P1-F3M-L	CL710-1011-7	One end		GI-50/125		PC polishing
HMUA-AS2P2-F3M-L	CL710-1012-0	Both ends				AdPC polishing

(NOTE 1) The "L" within the Product Number indicates the length of the cable illustrated in the diagram. Please specify values in meter units.

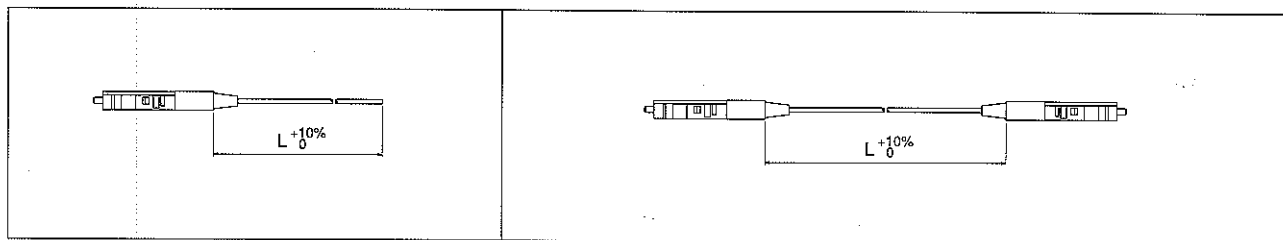
(NOTE 2) We will custom manufacture a great variety of conversion cables and products other than the aforementioned items to suit your needs.

### ●Plug Housing for Simplex $\phi 2$ Cable Without Knob



Product Number	HRS No.	Notes	Applicable Optical Fiber	Type of Polishing	Cable Diameter	
HMUJ-SP1-F3Q-L	—	One end	SM-9.5/125	PC polishing	$\phi 2\text{mm}$	
HMUJ-SP2-F3Q-L	—	Both ends		AdPC polishing		
HMUAJ-ASP1-F3Q-L	CL710-0040-0	One end		GI-50/125		PC polishing
HMUAJ-ASP2-F3Q-L	CL710-0041-2	Both ends				AdPC polishing
HMUAJ-SP1-F3P-L	CL710-0042-5	One end	GI-50/125			PC polishing
HMUAJ-SP2-F3P-L	CL710-0043-8	Both ends				AdPC polishing
HMUAJ-ASP1-F3P-L	CL710-0057-2	One end		AdPC polishing		
HMUAJ-ASP2-F3P-L	CL710-0058-5	Both ends				

### ●Plug Housing for Simplex $\phi 0.9$ Cable Without Knob



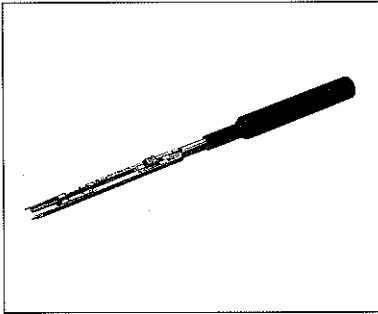
Product Number	HRS No.	Notes	Applicable Optical Fiber	Type of Polishing	Cable Diameter	
HMUAJ-SP1-F3A3-L	—	One end	SM-9.5/125	PC polishing	$\phi 0.9\text{mm}$	
HMUAJ-SP2-F3A3-L	—	Both ends		AdPC polishing		
HMUAJ-ASP1-F3A3-L	CL710-0036-2	One end		GI-50/125		PC polishing
HMUAJ-ASP2-F3A3-L	CL710-0037-5	Both ends				AdPC polishing
HMUAJ-SP1-F3B3-L	CL710-0038-8	One end	GI-50/125			PC polishing
HMUAJ-SP2-F3B3-L	CL710-0039-0	Both ends				AdPC polishing
HMUAJ-ASP1-F3B3-L	CL710-0055-7	One end		AdPC polishing		
HMUAJ-ASP2-F3B3-L	CL710-0056-0	Both ends				

(NOTE 1) The "L" within the Product Number indicates the length of the cable illustrated in the diagram. Please specify values in meter units.

(NOTE 2) We will custom manufacture a great variety of conversion cables and products other than the aforementioned items to suit your needs.

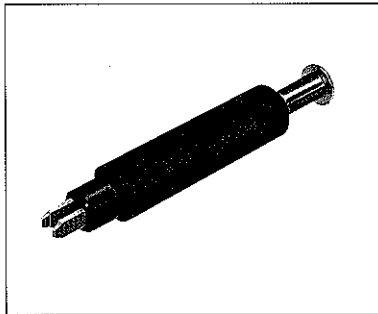
## ■Tools

### ●Optical Plug Insertion and Withdrawal Tool



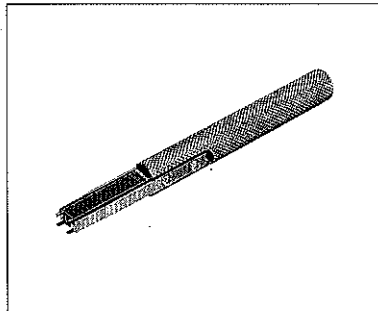
Product Number	HRS No.	Color of Tip	Applicable Connector Housing
HMUA-TP-1	CL710-0074-1	Blue	HMUA-A-1,2A-1,8A-1
HMUB-TP-1	CL710-0075-4	Brown	HMUB-L2HA-1,L2HB-1 HMUB-L8HA-1,L8HB-1

### ●Optical Plug Extraction Tool



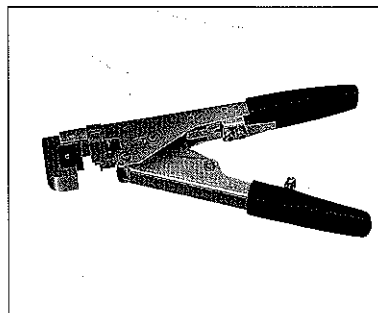
Product Number	HRS No.	Applicable Connector Housing
HMUB-TJ-1	CL710-0076-7	HMUB-L2PA-1,L8PA-1

### ●Sleeve Holder Insertion and Withdrawal Tool

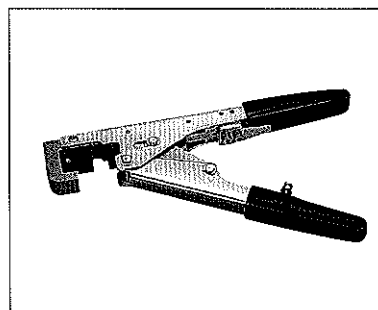


Product Number	HRS No.	Applicable Connector Housing
HMUB-TS-1	CL710-0077-0	HMUB-L2PA-1,L8PA-1

### ●Locking Tools for Optical Plug Assembly



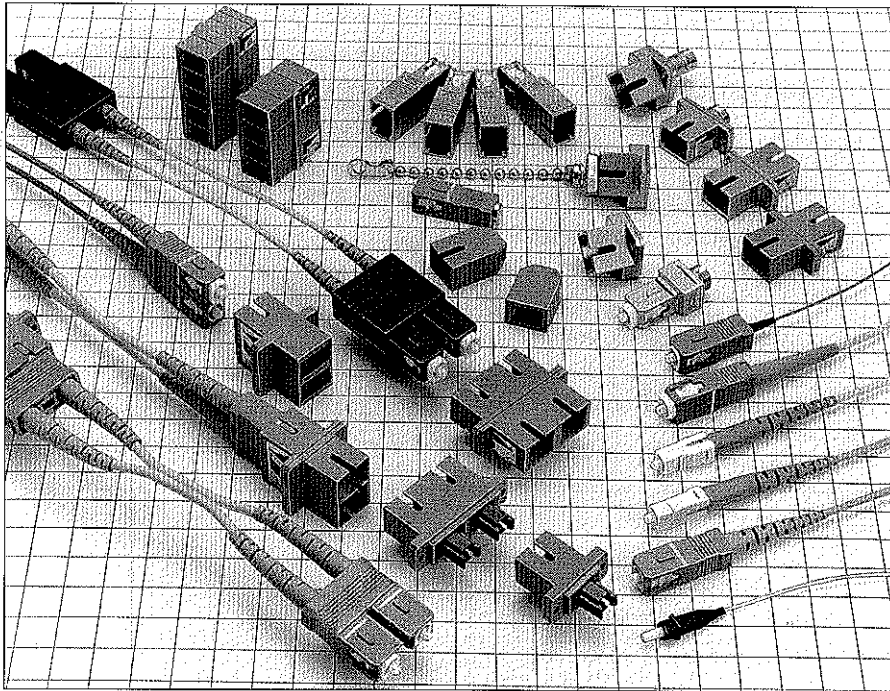
Product Number	HRS No.	Applicable Connector Housing
HMUA-TK-1	CL710-0080-4	HMUA-P2-H2,H1 HMUA-2P2-H2,H1



Product Number	HRS No.	Applicable Connector Housing
HMUA-TK-2	CL710-0081-7	HMUAJ-P2-H2,H1

# SC-type Optical Fiber Connectors

## HSC Series



### ■ Features

#### 1. SC-Type Correspondence

These connectors can be used with the NTT.

SC-Type optical fiber connectors.

JIS C5973 (F04 optical fiber connectors)

IEC 60874-14C

IEC 60874-19C

#### 2. Plugs With Strengthened Cable Clamps

These plugs suppress the increase in cable loss that results from a pulling force in the vertical bend direction of the cable clamp portion.

The color coding of the boot permits identification of polishing such as PC polishing, Advanced PC (AdPC) polishing and Angled PC polishing.

(PC polishing: blue, Advanced PC (AdPC) polishing: light purple, Angled PC polishing (APC): green)

#### 3. Zirconia Split Sleeve Adapter

Reduces the powder caused by the insertion and withdrawal abrasion within the split sleeve and improves the repetitive optical reproducibility.

#### 4. Duplex SC-type: Flexible Type -- Compliant With ANSI Standards

Dimensions between the plug pitch are flexible and parallel mounting of receptacle is made easier.

There is also compatibility with the HSCF rigid type.

#### 5. Duplex SC-type: Rigid Type

Available in the H-type which has an 8.5-mm pitch between terminals and is suited for high-density mounting, and in the F-type which features a low profile and a 12.7mm pitch between terminals and is suited to LAN applications. Please see Pages 40 to 43.

#### 6. Panel Mount Receptacle

By greatly reducing the number of components compared with the conventional receptacles, space savings and cost-reduction have been achieved. Please see Pages 35 to 38.

### ■ Applications

LAN, public communications lines, CATV, computer transmission systems, measuring instruments, etc.

## Product Standards

Rating	Operating temperature range	-25°C~70°C	Storage temperature range	-25°C~70°C
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Item		Test Method (JIS C 5961)		Standard
Optical Performance	Insertion loss	(SM)	1300nm wavelength (LD)	0.5 dB or less (PC, AdPC, APC)
		(GI)	1300nm wavelength (LED)	0.3 dB or less (PC)
	Reflection attenuation	(SM)	1300-nm wavelength (LD)	22 dB or greater (PC) 40 dB (AdPC) 60 dB or greater (APC)
		(GI)		22 dB or greater (PC)
Mechanical Performance	Coupling force and decoupling force		Measure when connectors are coupled and separated in the direction of the axis.	Simplex plugs Coupling force 19.6 N or less Separation force 19.6 N or less Duplex plugs Coupling force 39 N or less Separation force 39 N or less
	Split sleeve holding force of the adapter		Ceramic gauge of $\phi 2.499 \pm 0.0005$ mm	Phosphor bronze 2 to 5.9 N Zirconia 2 to 3.9 N
	Split sleeve holding force of the adapter		98 N of pulling force between connector and cable for one minute (Bellcore TA-TSY-00326)	1) Insertion loss fluctuation after test: 0.2 dB or less 2) No irregularity in clamp section or cable
	Repetitive operation		1000 times	1) Insertion loss fluctuation after test: 0.2 dB or less 2) No damage, cracks, or part looseness
	Vibration resistance		Vibration range of 10 to 55 Hz, 0.75mm single amplitude 98.1 m/s <sup>2</sup> acceleration, in 3-axis directions, 2 hours each	
	Shock resistance		Acceleration of 981 m/s <sup>2</sup> , operation time of 6 ms, sine half wave in X, Y, and Z axes, 10 times each (Total of 30 times)	
Humidity resistance (Temperature and humidity cycle)		Temperature -10°C to 65°C, humidity 90 to 96% 20 cycles		
Environmental performance	Temperature cycle		Temperature -40°C to 75°C 42 cycles (Bellcore TA-NWT-00326)	
	Heat resistance		Left for 960 hours at a temperature of 85°C	
	Cold resistance		Left for 960 hours at a temperature of -25°C	
	Salt fog		Left in a 5% concentration of salt fog for 48 hours	No conspicuous corrosion

## Materials

Component	Material	Notes
Simplex plug casing	Polybutylene terephthalate	Plastic items NTT, SC corresponding items
Coil spring	Stainless steel	
Ferrule	Zirconia	
Simplex adapter casing	Polybutylene terephthalate or zinc die cast	
4-ganged adapter housing	Polybutylene terephthalate	
5-ganged adapter housing	Polybutylene terephthalate	
Receptacle casing	Zinc die cast	
Attenuator casing	Zinc die cast	
Split sleeve	Copper alloy or zirconia	

# HSC-type Connectors Function Diagrams

## Simplex Type

### <Manual Coupling / Decoupling Connectors>

#### Plug Housing

φ3mm short-type boot	
HSC-PH3-A4	
φ2mm short-type boot	
HSC-PH2-A4	
For φ0.9mm cable	
HSC-PH0.9-A	
Reinforced-type cable clamp	
HSC-PH2, E1, E2 HSC-PH2-B1, B2 HSC-PH2-B5 HSC-PH3-B1, B2 HSC-PH3-B5	
Conversion plug SC (plug) to FC (jack)	
HSCP-HRFCJ-1,2	

### <Jig Coupling / Decoupling Connectors>

#### Plug Housing

φ3mm short-type boot	
HSC2-PH3-A	
• φ2mm short-type boot	
HSC2-PH2-A	
For φ0.9mm cable	
HSC2-PH0.9-A	
Reinforced-type cable clamp	
HSC2-PH2 E1, E2 HSC2-PH2-B1, B2, B5 HSC2-PH3-B1, B2, B5	

#### Adapters (panel mounting type)

Adapter panel mounting	
HSC-A2, HSC-A2-D1	
Adapter panel mounting	
HSC-A2, HSC-A2-D1	

#### Conversion Adapters

SC (jack) to FC (jack) screw mounting	
HSCJ-HRFCJ-B HSCJ-HRFCJ-A	
SC (jack) to FC (jack) panel mounting	
HSCJ-HRFCJ-C	
ST conversion type screw mounting	
HSCJ-HSTJ-B	

#### Receptacle

ST conversion type screw mounting	
HSC-R1-B, R2-B HSC-R1-A, R2-A	

#### Panel Mount Receptacle

	HSC-SR-2
	HSC2-8SR-1 HSC2-8SR-D1 HSC2-8SR-1(01)

( see page 36 to 38 for variety of PanelMount Plug. )

#### Adapters

(4-Ganged) Panel mounting type	
HSC2-4A, HSC2-4A-D1	
(5-Ganged) Panel mounting type	
HSC2-5A, HSC2-5A-D1	