

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.)

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.

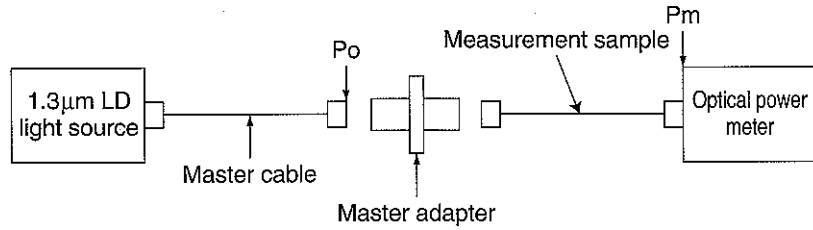
MU connectors use an optical terminal of very small diameter (1.25 mm) and a special cleaning device (i.e., product name: Cletop reel type) should be used for the cleaning of the optical terminal.

5 Measurement System for Insertion Loss and Reflection Attenuation

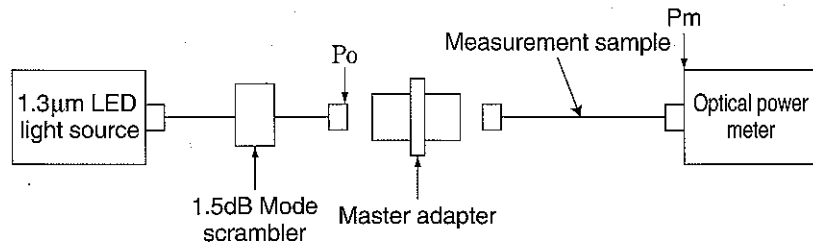
The measurement system illustrated in the diagrams below was used to obtain the measured values for the standard values of insertion loss and reflection attenuation which are listed for each series.

(1) Insertion Loss

● SM Fiber

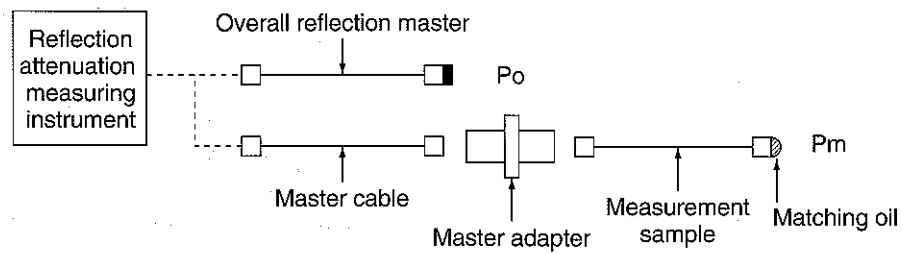


● GI Fiber



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

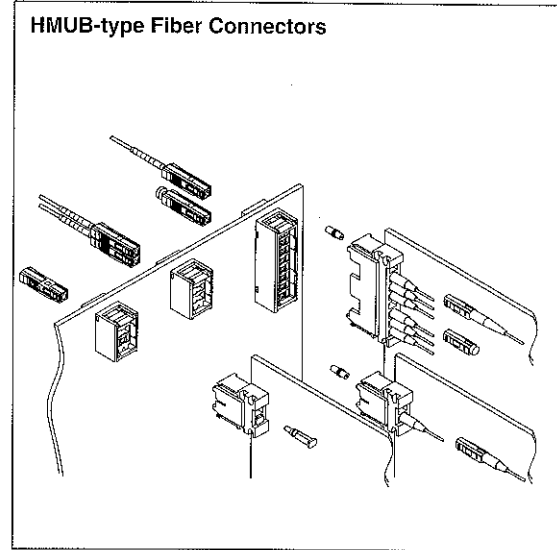
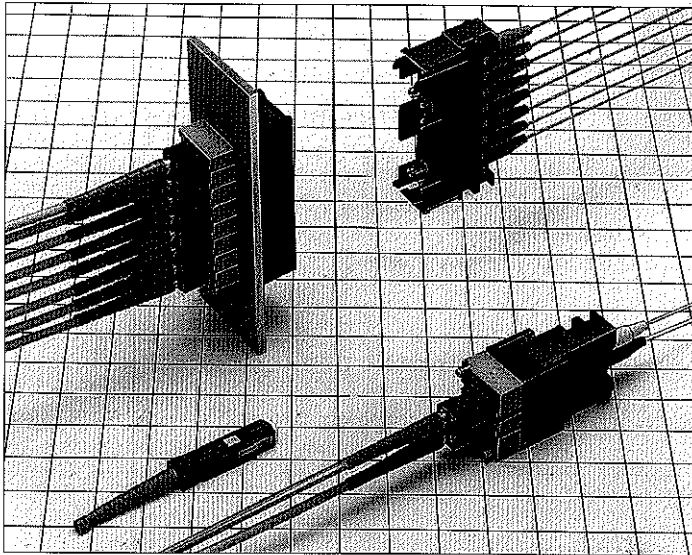
(2) Reflection Attenuation



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

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 ² 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	
			8		—	—	HMUB-L8PA-1
		2	—	For back panel side 2.4mm panel	—	HMUB-L2HA-1	
			—	For 3.2mm panel	—	HMUB-L2HB-1	
		8	—	For 2.4mm panel	—	HMUB-L8HA-1	
			—	For 3.2mm panel	—	HMUB-L8HB-1	
	Sleeve holder	1	—	—	—	HMUB-SH-1	
	Ferrule		—	Small-diameter zirconia ferrule	—	HMUA-F3-A []	
Package side	Plug housing	1	$\phi 2$	Without knob	PC	HMUAJ-P2-H1	
			$\phi 0.9$		AdPC	HMUAJ-P2-H2	
Terminator		—	—	Without knob	—	HMUAJ-TM-1	
			—	—	—	—	
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		

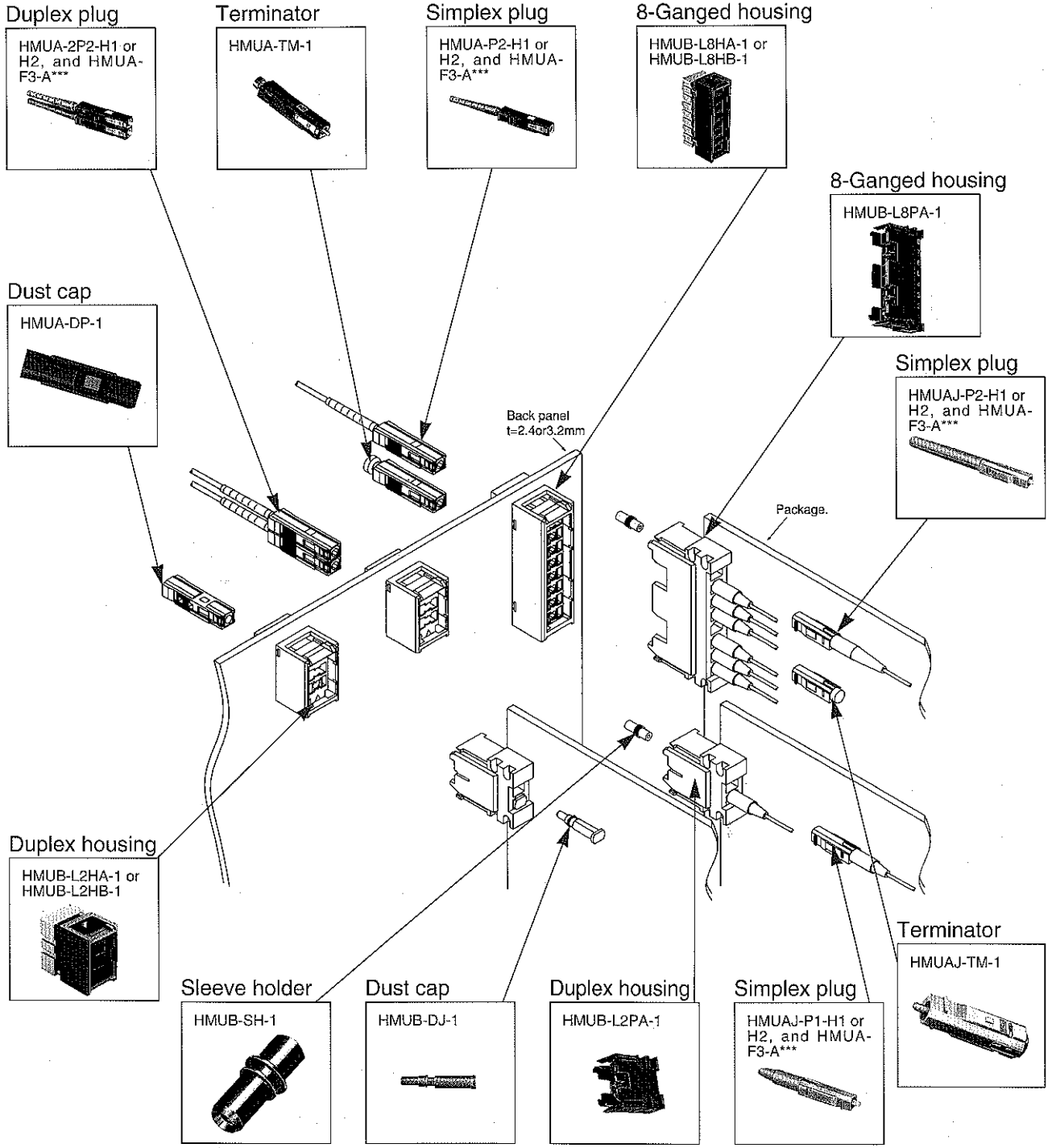
Usage Precautions

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.

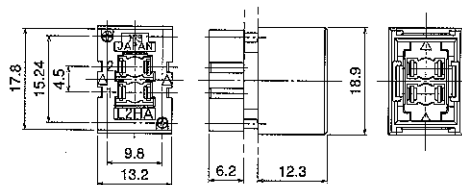
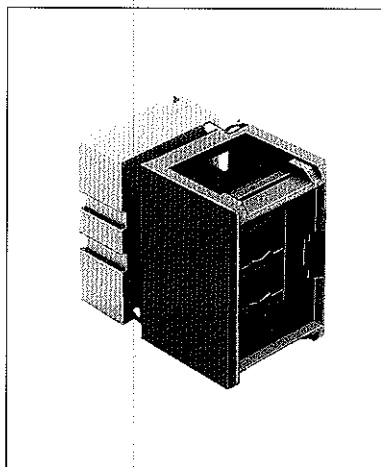
Application	Applicable Adapter and Connector Housing	Applicable Plug (Plug housing name listed)	Tool Product Number
Insertion and withdrawal of plugs	HMUA-A-1,2A-1,8A-1,AS-1,2AS-1,8AS-1	HMUA-P1-H1·2,2P1-H1·2 HMUA-P2-H1·2,2P2-H1·2	HMUA-TP-1
	HMUB-L2HA-1,L2HB-1,L8HA-1,L8HB-1	HMUA-P1-H1·2,2P1-H1·2 HMUA-P2-H1·2,2P2-H1·2	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

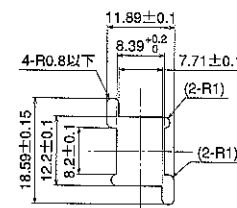


■Back Panel Side Connector Housing

●Duplex Back Panel Side Connector Housing



◆Mounting Hole Dimensions Diagram

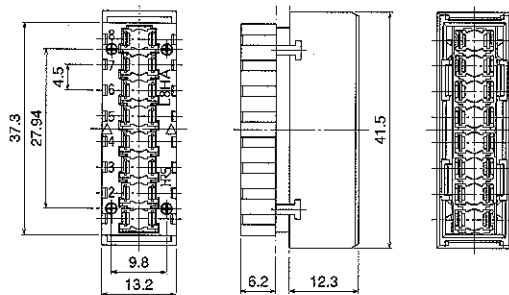
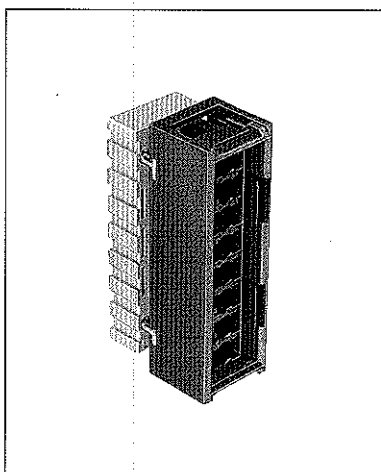


Product Number	HRS No.	Mounting Panel Thickness
HMUB-L2HA-1	CL710-0017-8	2.4mm
HMUB-L2HB-1	CL710-0018-0	3.2mm

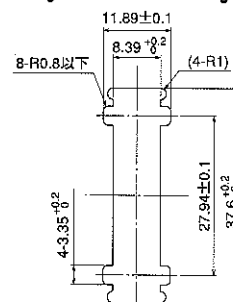
(NOTE 1) This duplex back panel side connector housing should be used in conjunction with a simplex or duplex plug housing furnished with a knob (for 2 cable, and for core wire).

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

●8-Ganged Back Panel Side Connector Housing



◆Mounting Hole Dimensions Diagram

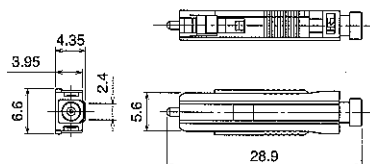
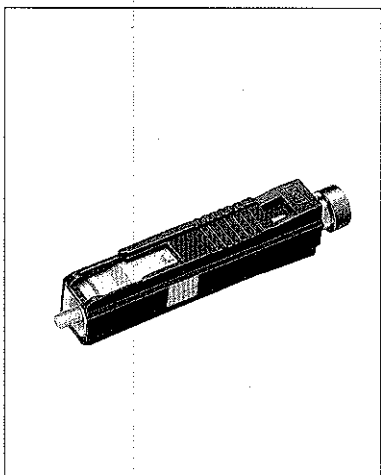


Product Number	Product Number	Mounting Panel Thickness
HMUB-L8HA-1	CL710-0019-3	2.4mm
HMUB-L8HB-1	CL710-0020-2	3.2mm

(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

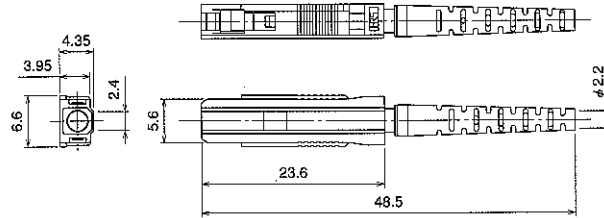
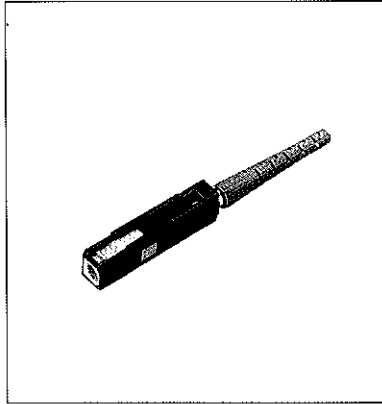
Specifications

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

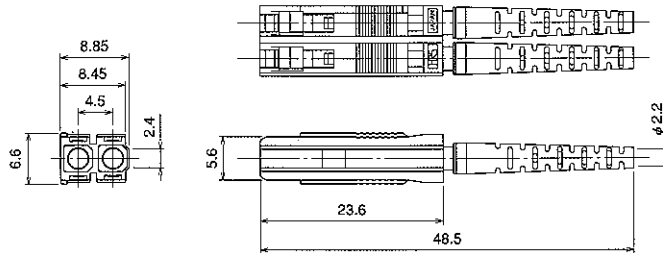
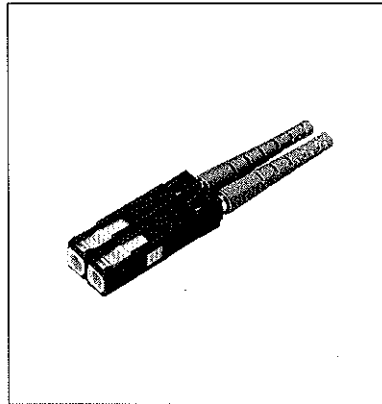
■ Back Panel Side Plug Housing

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



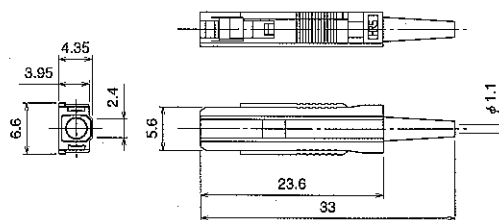
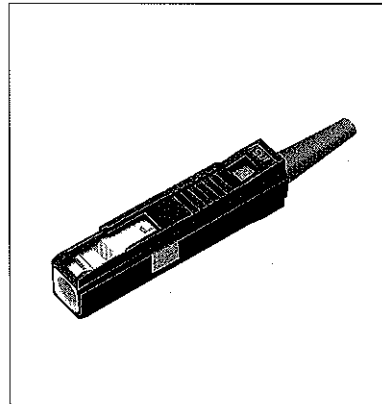
Product Number	HRS No.	Applicable Cable Diameter	Hood Color	Polishing Specification
HMUA-P2-H1	CL710-0047-9	$\phi 2$ mm	Blue	For PC polishing
HMUA-P2-H2	CL710-0001-8	$\phi 2$ mm	Light purple	For AdPC polishing

● 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

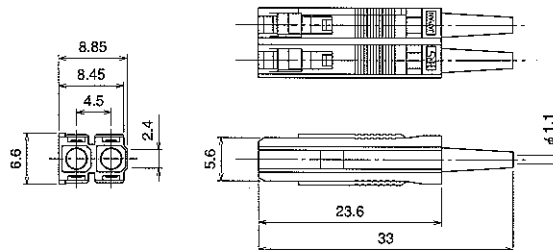
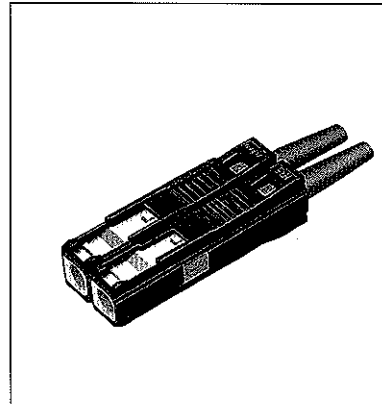
● Plug Housing for Simplex $\phi 0.9$ Cable With Knob



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



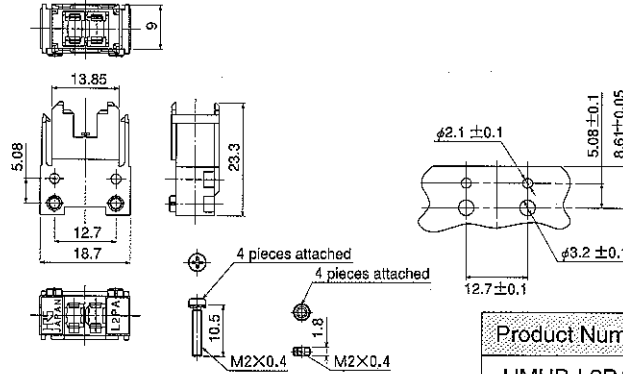
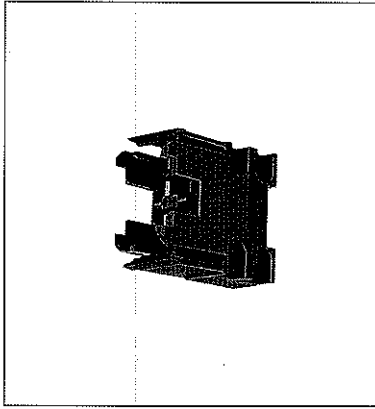
Product Number	HRS No.	Applicable Cable Diameter	Hood Color	Polishing Specification
HMUA-2P1-H1	CL710-0070-0	$\phi 0.9$ mm	Blue	For PC polishing
HMUA-2P1-H2	CL710-0071-3	$\phi 0.9$ mm	Light purple	For AdPC polishing

NOTE: Full length 28mm product also available.

■ Package Side Connector Housing

● Duplex Package Side Connector Housing

◆ Mounting Hole Dimensions Diagram



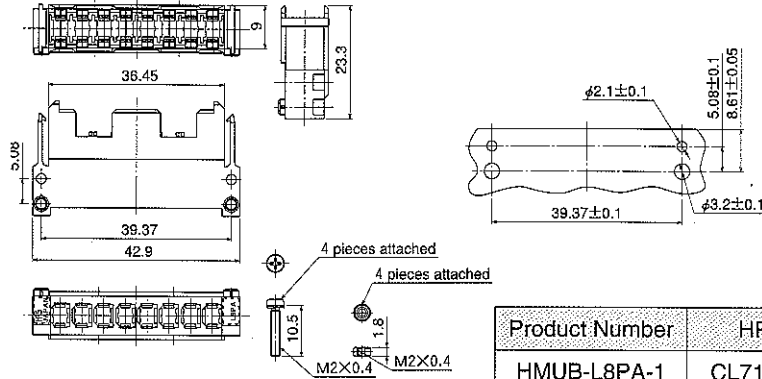
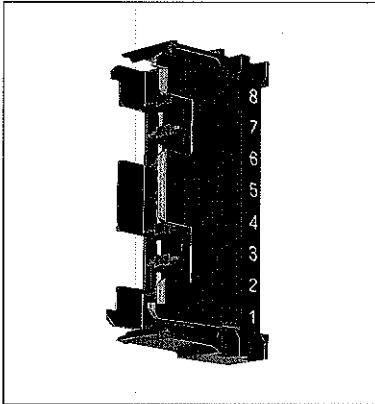
Product Number	HRS No.
HMUB-L2PA-1	CL710-0015-2

(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

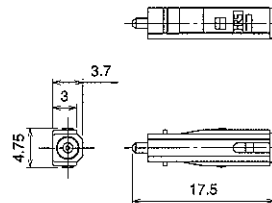
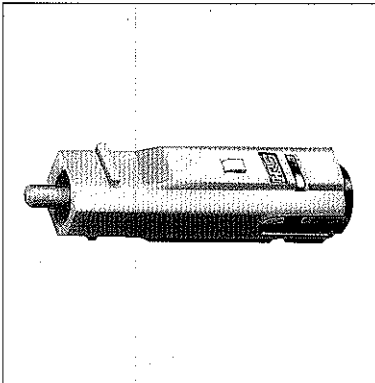


Product Number	HRS No.
HMUB-L8PA-1	CL710-0016-5

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

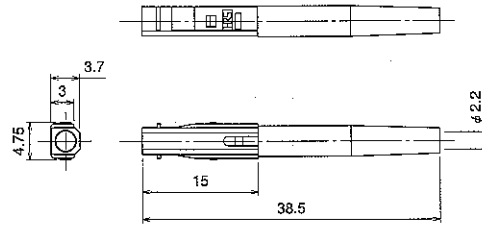
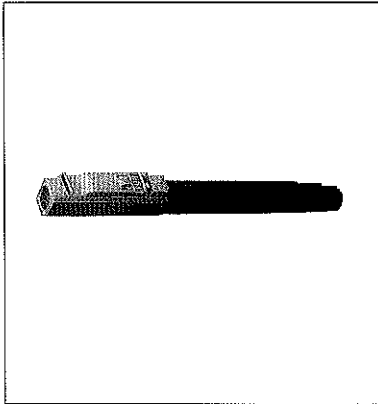
Specifications

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

(NOTE) See page 87 in detail

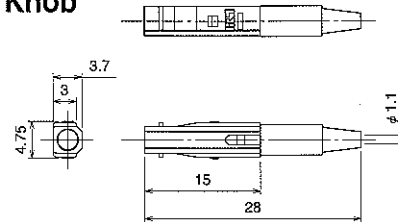
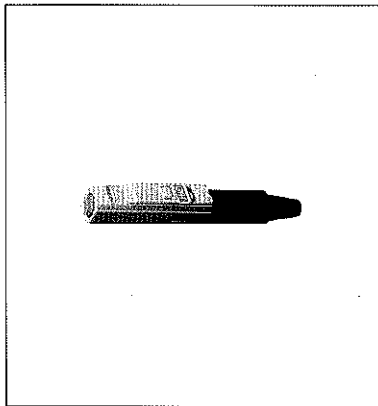
■ Package Side Connector Housing

● 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

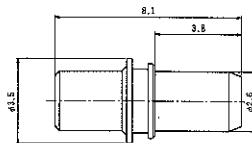
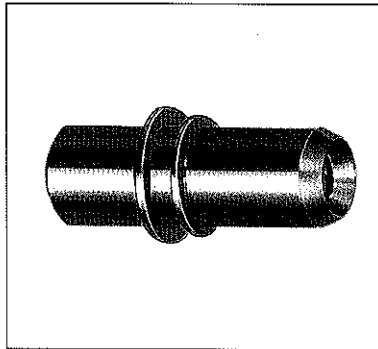
● Plug Housing for Simplex $\phi 0.9$ Cable Without Knob



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)

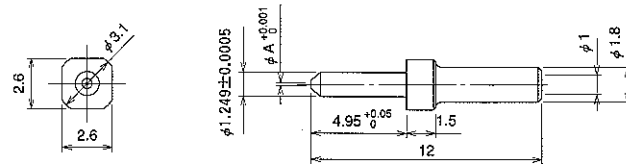
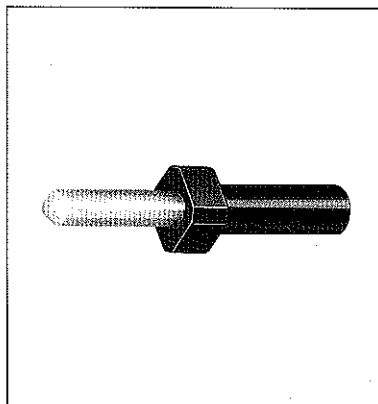
■ Simplex Sleeve Holder



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

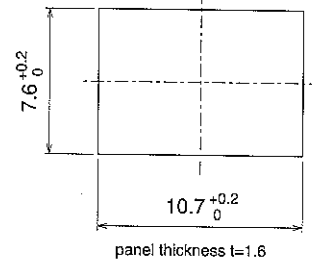
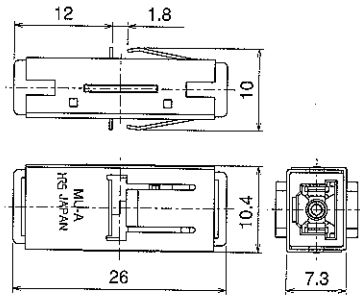
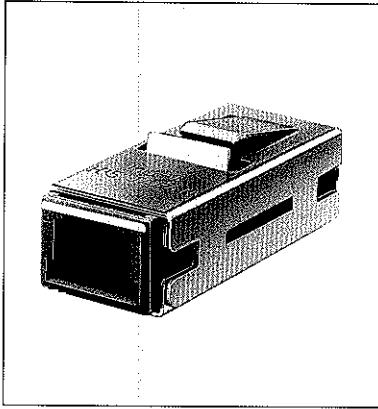


Product Number	HRS No.	Dimension A	Applicable Optical Fiber
HMUA-F3-A123	CL710-0022-8	0.123	SM-9.5/125 GI-50/125
HMUA-F3-A124	CL710-0023-0	0.124	
HMUA-F3-A125	CL710-0024-3	0.125	
HMUA-F3-A126	CL710-0025-6	0.126	
HMUA-F3-A127	CL710-0026-9	0.127	
HMUA-F3-A128	CL710-0027-1	0.128	

■ Adapters

● Simplex Adapter Panel Mounting Type

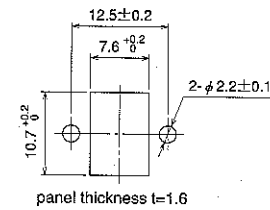
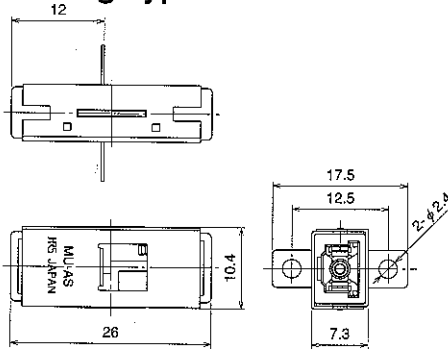
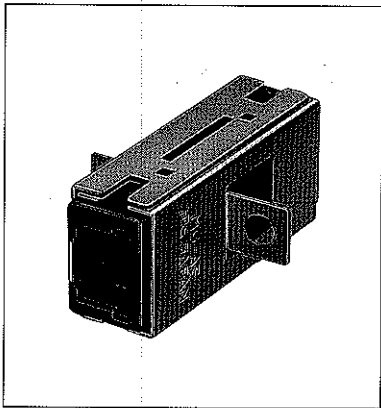
◆ Mounting Hole Dimensions Diagram



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

● Simplex Adapter Screw Mounting Type

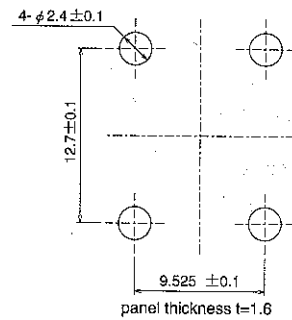
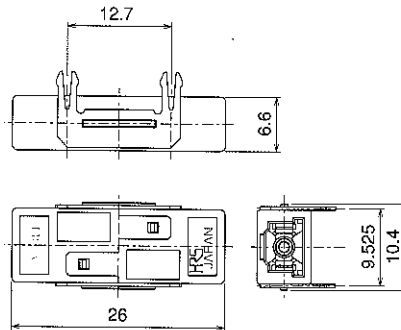
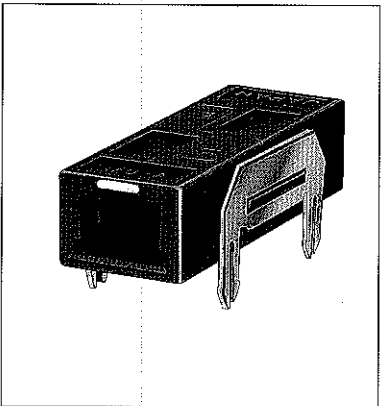
◆ Mounting Hole Dimensions Diagram



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

● Simplex Adapter Board Mounting Type

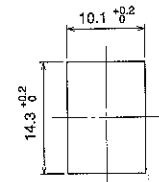
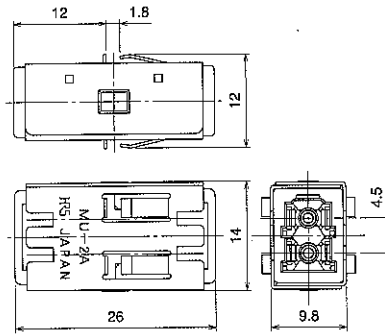
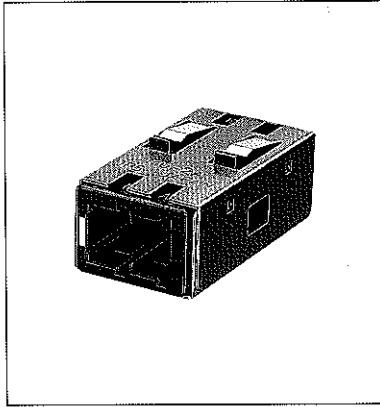
◆ Mounting Hole Dimensions Diagram



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

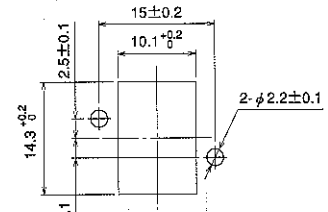
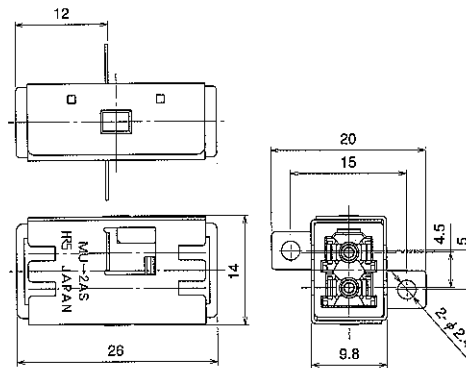
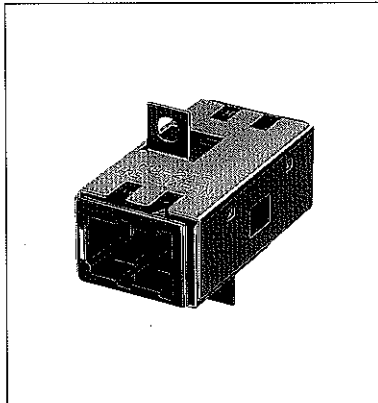


panel thickness t=1.6

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

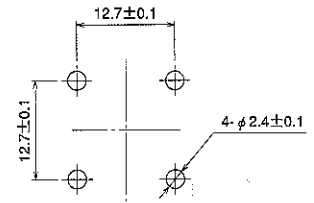
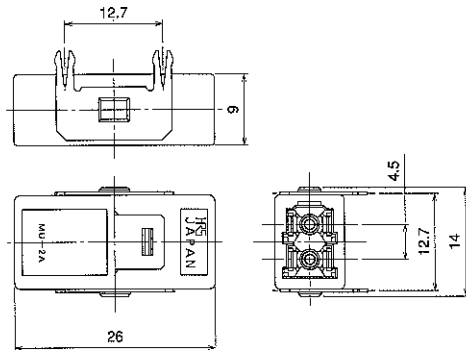
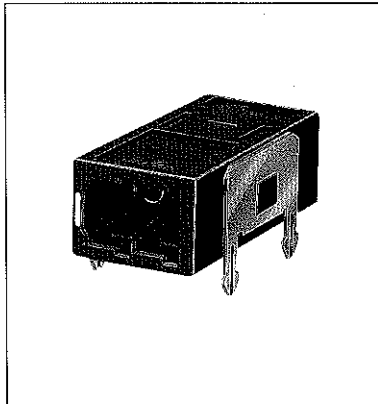


panel thickness t=1.6

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

● Duplex Adapter Board Mounting Type

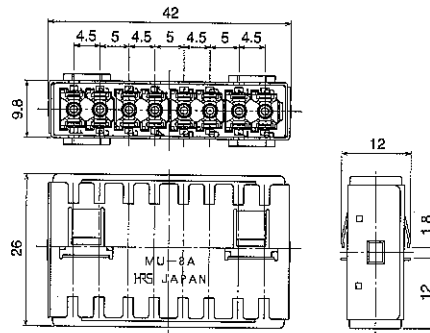
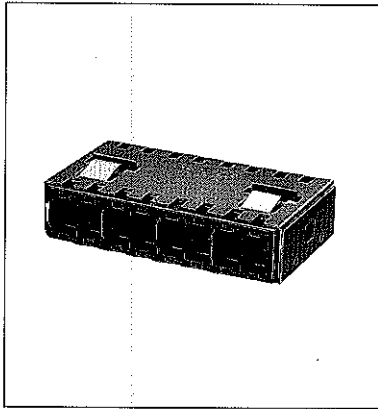
◆ Mounting Hole Dimensions Diagram



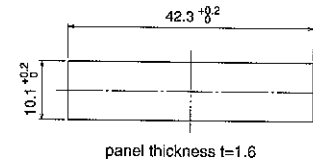
panel thickness t=1.6

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

●8-Ganged Adapter Panel Mounting Type

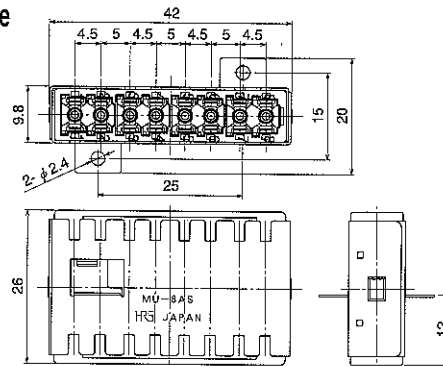
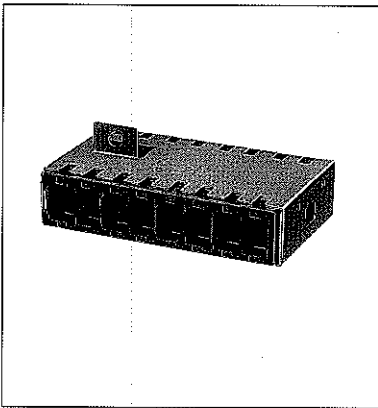


◆ Mounting Hole Dimensions Diagram

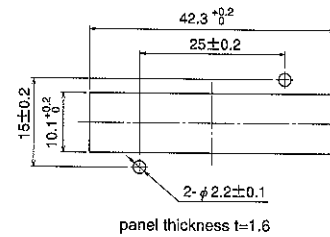


Product Number	HRS No.	Type of Mounting
HMUA-8A-1	CL710-0011-1	Panel (1.6mm thick)

●8-Ganged Adapter Screw Mounting Type

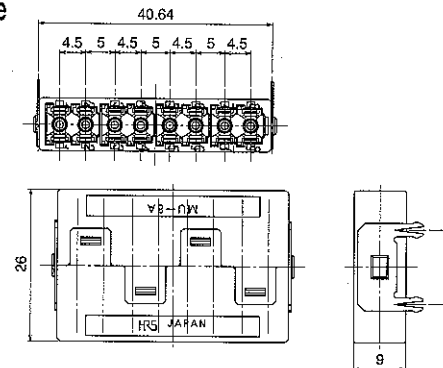
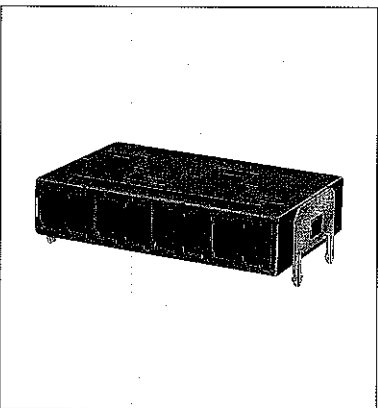


◆ Mounting Hole Dimensions Diagram

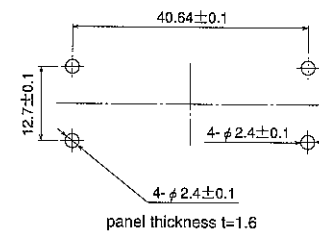


Product Number	HRS No.	Type of Mounting
HMUA-8AS-1	CL710-0012-4	Panel (screw)

●8-Ganged Adapter Board Mounting Type

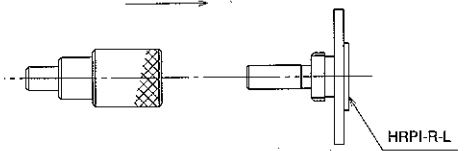
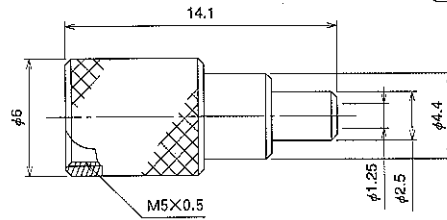
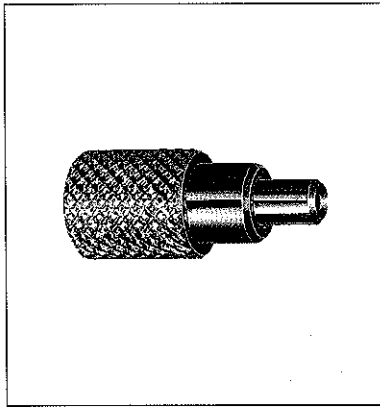


◆ Mounting Hole Dimensions Diagram



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

■ Simplex Receptacle Attachment



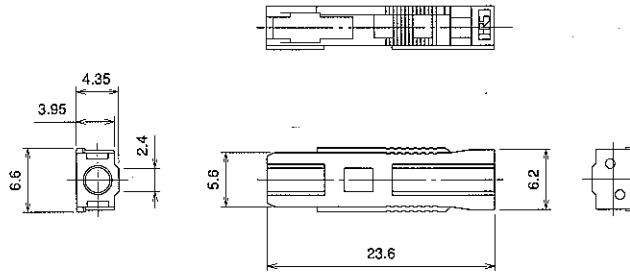
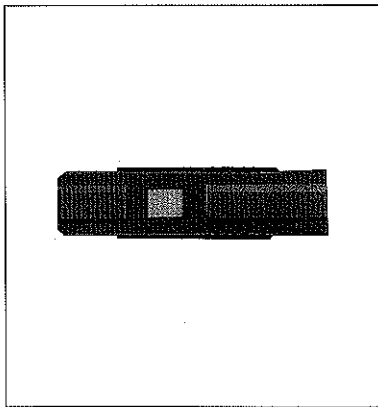
Insert the MU-RA-type receptacle attachment straight on, tighten the screw and fix.

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.

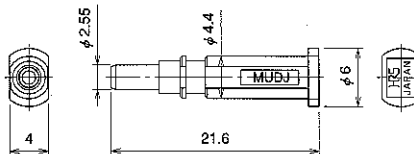
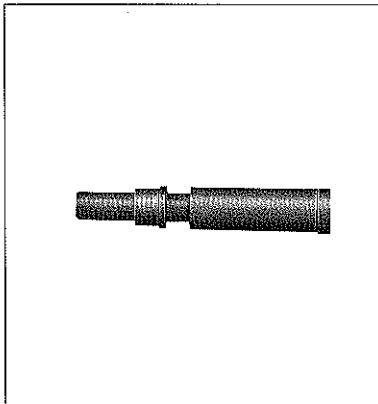
■ Dust Caps

● 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

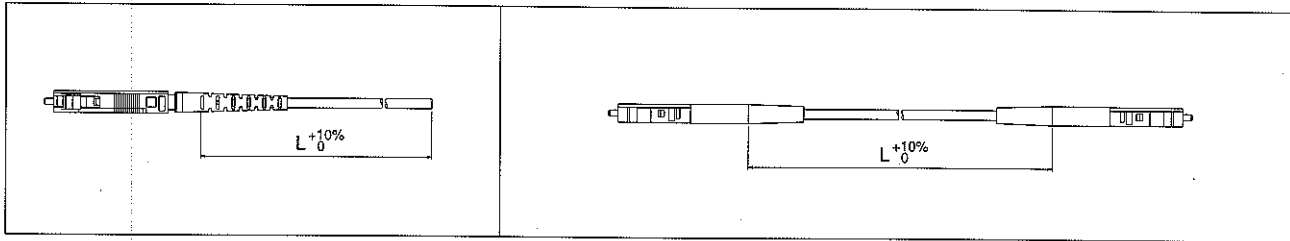
● Plug Dust Cap (Back Panel Side)



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

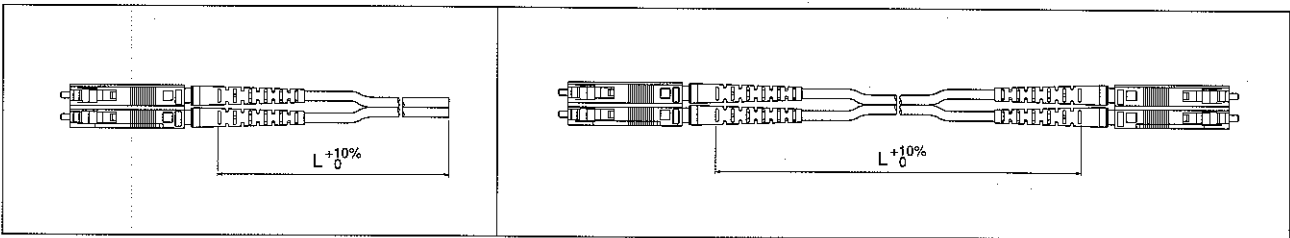
■ Connectors with Cable Attached

● 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		AdPC 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	
HMUA-SP2-F3P-L	CL710-0031-9	Both ends		AdPC polishing	
HMUA-ASP1-F3P-L	CL710-0051-6	One end		AdPC polishing	
HMUA-ASP2-F3P-L	CL710-0052-9	Both ends		AdPC polishing	

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

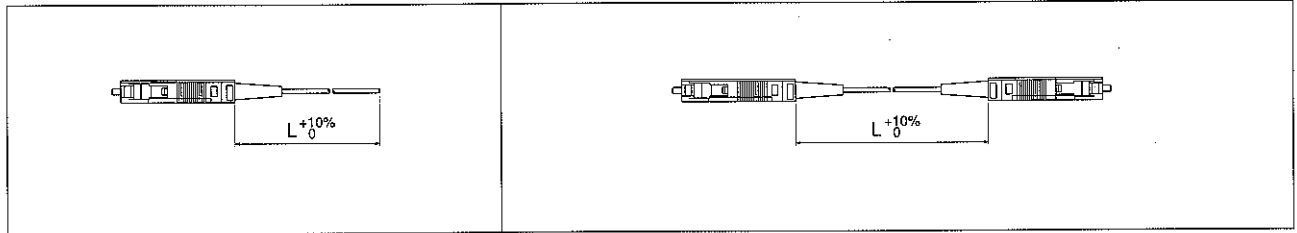


Product Number	HRS No.	Notes	Applicable Optical Fiber	Type of Polishing	Cable Diameter
HMUA-S2P1-F3QW-L	—	One end	SM-9.5/125	PC polishing	$\phi 2\text{mm}$
HMUA-S2P2-F3QW-L	—	Both ends		AdPC polishing	
HMUA-AS2P1-F3QW-L	CL710-0061-0	One end		AdPC polishing	
HMUA-AS2P2-F3QW-L	CL710-0062-2	Both ends		AdPC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

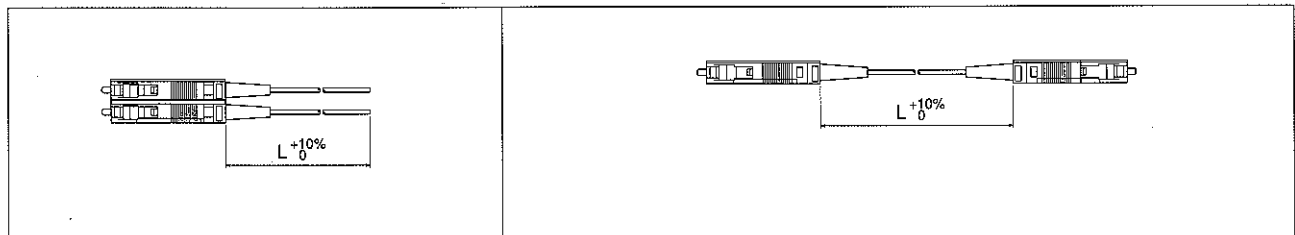
(NOTE 2) We will custom manufacture a great variety of conversion cables and products other than the aforementioned items to suit your needs.

● 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

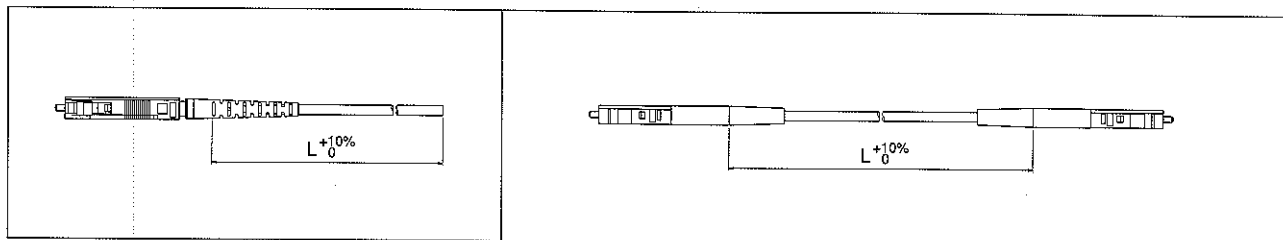


Product Number	HRS No.	Notes	Applicable Optical Fiber	Type of Polishing	Cable Diameter	
HMUA-S2P1-F3L-L	—	One end	SM-9.5/125	PC polishing	$\phi 0.9\text{mm}$	
HMUA-S2P2-F3L-L	—	Both ends		AdPC polishing		
HMUA-AS2P1-F3L-L	CL710-1007-0	One end		GI-50/125		PC polishing
HMUA-AS2P2-F3L-L	CL710-1008-2	Both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

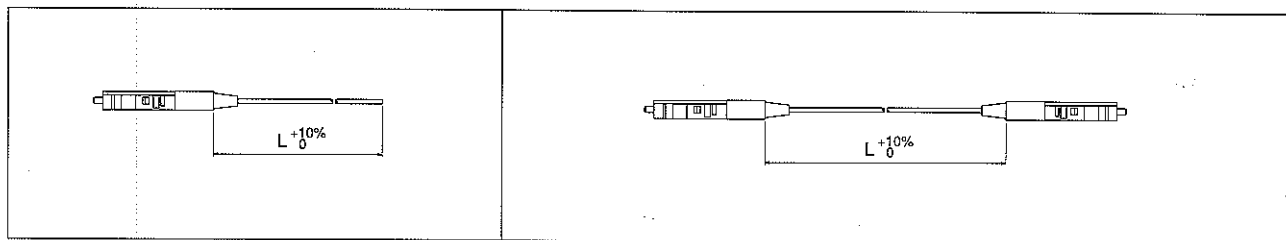
(NOTE 2) We will custom manufacture a great variety of conversion cables and products other than the aforementioned items to suit your needs.

●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				
HMUAJ-ASP2-F3P-L	CL710-0058-5	Both ends				

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



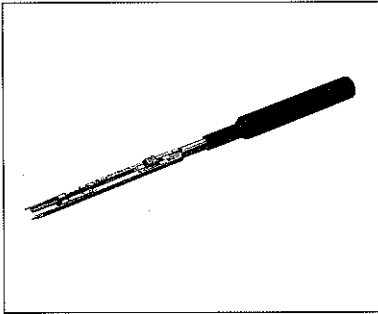
Product Number	HRS No.	Notes	Applicable Optical Fiber	Type of Polishing	Cable Diameter	
HMUAJ-SP1-F3A3-L	—	One end	SM-9.5/125	PC polishing	$\phi 0.9\text{mm}$	
HMUAJ-SP2-F3A3-L	—	Both ends		AdPC polishing		
HMUAJ-ASP1-F3A3-L	CL710-0036-2	One end		GI-50/125		PC polishing
HMUAJ-ASP2-F3A3-L	CL710-0037-5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

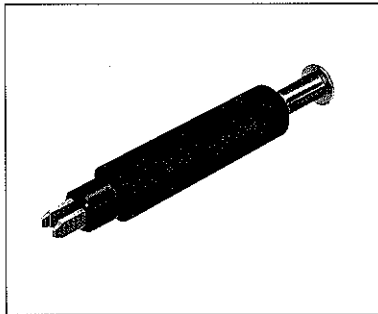
■Tools

●Optical Plug Insertion and Withdrawal Tool



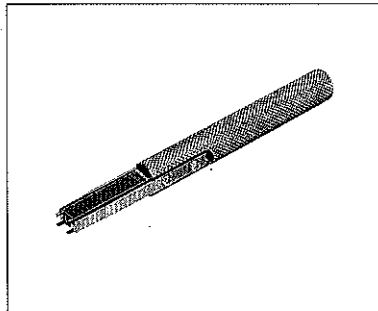
Product Number	HRS No.	Color of Tip	Applicable Connector Housing
HMUA-TP-1	CL710-0074-1	Blue	HMUA-A-1,2A-1,8A-1
HMUB-TP-1	CL710-0075-4	Brown	HMUB-L2HA-1,L2HB-1 HMUB-L8HA-1,L8HB-1

●Optical Plug Extraction Tool



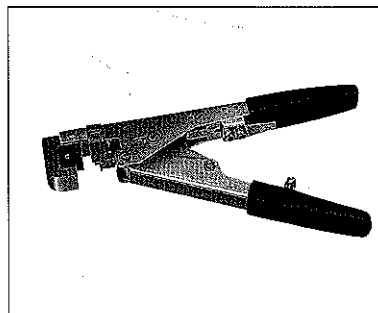
Product Number	HRS No.	Applicable Connector Housing
HMUB-TJ-1	CL710-0076-7	HMUB-L2PA-1,L8PA-1

●Sleeve Holder Insertion and Withdrawal Tool

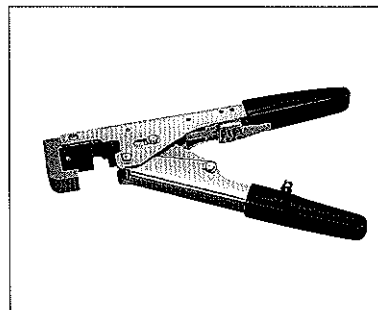


Product Number	HRS No.	Applicable Connector Housing
HMUB-TS-1	CL710-0077-0	HMUB-L2PA-1,L8PA-1

●Locking Tools for Optical Plug Assembly



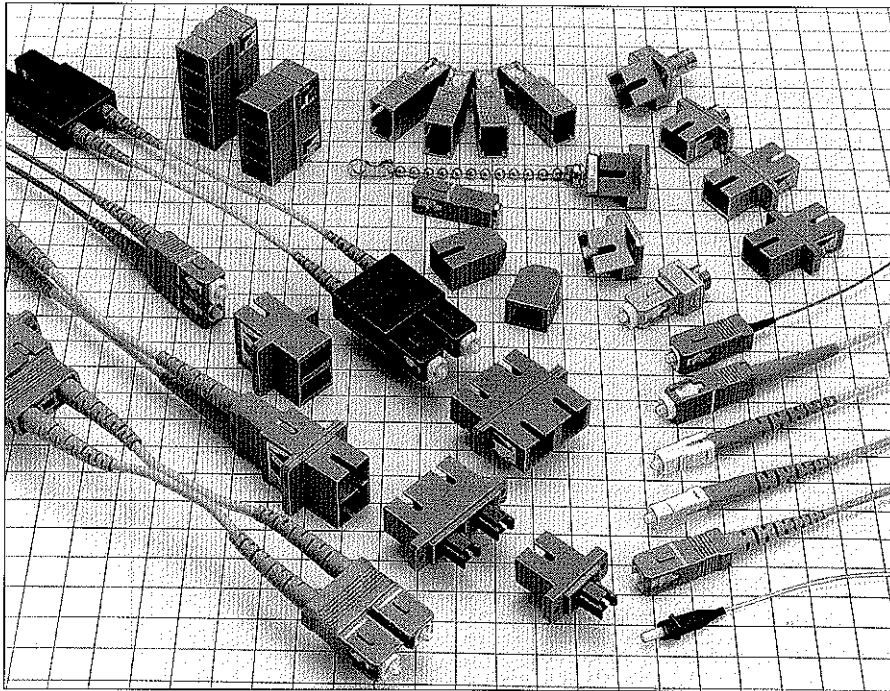
Product Number	HRS No.	Applicable Connector Housing
HMUA-TK-1	CL710-0080-4	HMUA-P2-H2,H1 HMUA-2P2-H2,H1



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 ² acceleration, in 3-axis directions, 2 hours each	
	Shock resistance		Acceleration of 981 m/s ² , 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

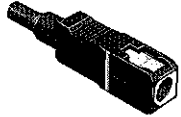
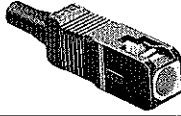
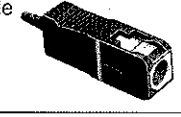


Component	Material	Notes
Simplex plug casing	Polybutylene terephthalate	Plastic items NTT, SC corresponding items
Coil spring	Stainless steel	
Ferrule	Zirconia	
Simplex adapter casing	Polybutylene terephthalate or zinc die cast	
4-ganged adapter housing	Polybutylene terephthalate	
5-ganged adapter housing	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>

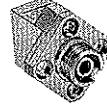
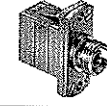
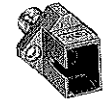
Plug Housing

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	

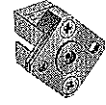
Adapters(panel mounting type)

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


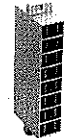
Conversion Adapters

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

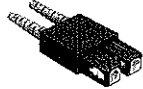
(4-Ganged) Panel mounting type	
HSC2-4A,HSC2-4A-D1	
(5-Ganged) Panel mounting type	
HSC2-5A,HSC2-5A-D1	

Duplex Type

<Flexible Type ANSI Standard>

<Flexible Type ANSI Standard>

φ2 mm and φ3 mm for single mode



HSCM-2PH2,3-B1
HSCM-2PH2,3-B2

φ2 mm and φ3 mm for multimode



HSCM-2GPH2,3-B1

F-type

Plug housing (φ2 mm and φ3 mm)



HSCF-2PH2,3-※

Adapter

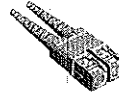
Panel mounting type



HSCF-2A※

H-type

Plug housing (φ2 mm and φ3 mm)



HSCH-2PH2,3-※

Adapter

Panel mounting type



HSCH-2A1(P)

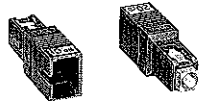
Screw mounting type



HSCH-2A※

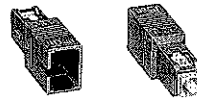
Fixed Attenuators

For multimode (5 dB, 10 dB, 15 dB, and 20 dB)



HSC-AT※S-B※※A

For single mode (5 dB, 10 dB, 15 dB, and 20 dB)



HSC-AT※S-A※※A

See page 91 in detail.

Terminators

Plug Type

Manual coupling/decoupling type



HSC-TM-P1

Jig coupling/decoupling type



HSC2-TM-P1

Receptacle Type

Manual coupling/decoupling type



HSC-TM-R1

Jig coupling/decoupling type



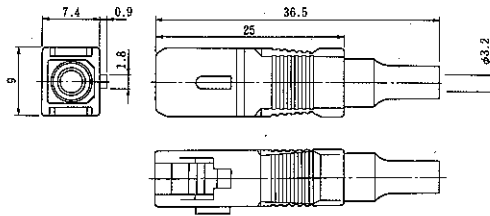
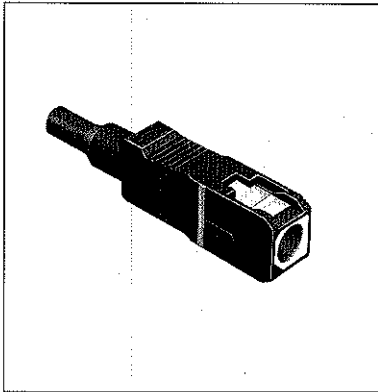
HSC2-TM-R1

See page 87 in detail.

Simplex Type

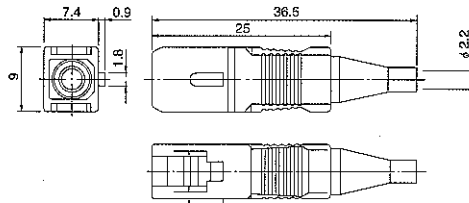
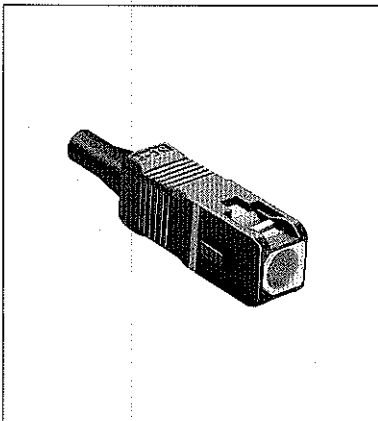
Manual Coupling / Decoupling Type Plug Housing

Short Boot Type (Applicable cable diameter: 3 mm)



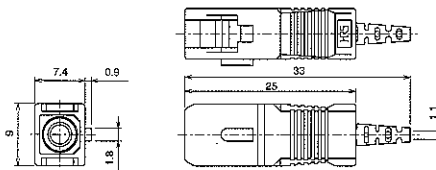
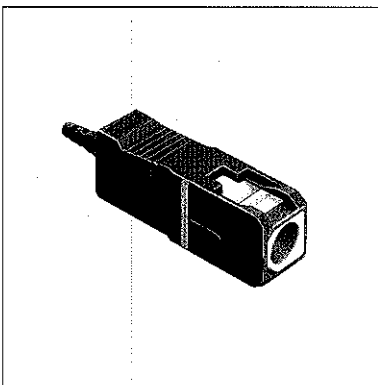
HRS NO.	Product Number	Applicable Cable Diameter	Color of Boot	Polishing
CL704-0245-0 (01)	HSC-PH3-A4 (01)	$\phi 3\text{mm}$	Blue	PC
CL704-0245-0 (02)	HSC-PH3-A4 (02)		Light purple	AdPC

Short Boot Type (Applicable cable diameter: 2 mm)



HRS NO.	Product Number	Applicable Cable Diameter	Color of Boot	Polishing
CL704-0244-8	HSC-PH2-A4	$\phi 2\text{mm}$	Blue	PC
CL704-0244-8 (01)	HSC-PH2-A4 (01)		Light purple	AdPC
CL704-3021-0	HSC-PH2-A41		Green	APC

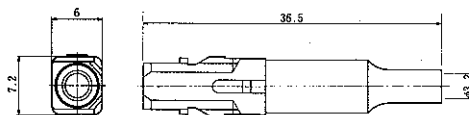
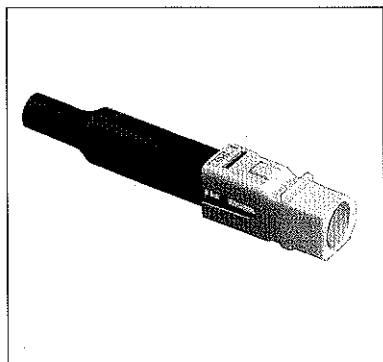
For $\phi 0.9\text{-mm}$ Optical Fiber Cable diameter: 3 mm)



HRS NO.	Product Number	Applicable Cable Diameter	Color of Boot	Polishing
CL704-0339-2	HSC-PH0.9-E1	$\phi 0.9\text{mm}$ Optical fiber cable	Blue	PC
CL704	HSC-PH0.9-E5		Green	APC
CL704-0354-6	HSC-PH0.9-E2		Light purple	AdPC

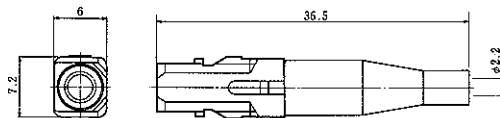
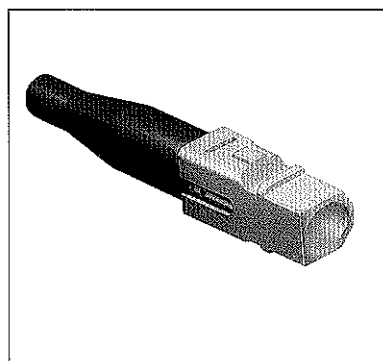
Manual Coupling / Decoupling Type Plug Housing

Short Boot Type (Applicable cable diameter: 3 mm)



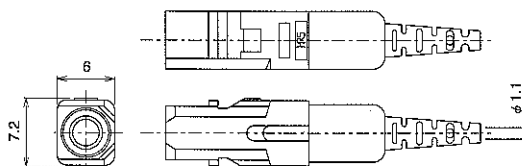
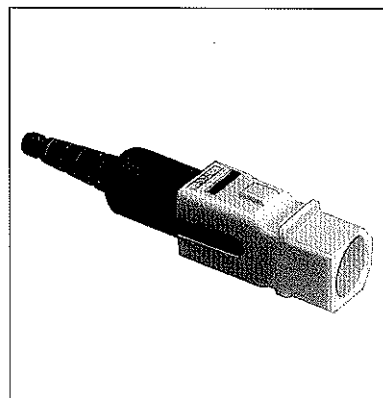
HRS NO.	Product Number	Applicable Cable Diameter	Color of Boot
CL704-0015-0	HSC2-PH3-A	φ3mm	Yellow

Short Boot Type (Applicable cable diameter: 2 mm)



HRS NO.	Product Number	Applicable Cable Diameter	Color of Boot
CL704-0014-8	HSC2-PH2-A	φ2mm	Blue

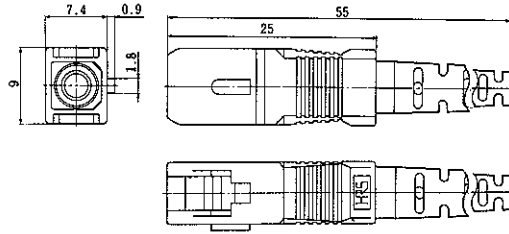
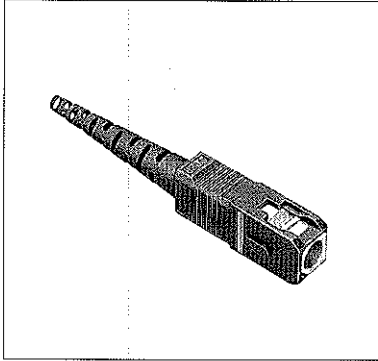
For φ0.9-mm Optical Fiber Cable



HRS NO.	Product Number	Applicable Cable Diameter	Color of Boot
—	HSC2-PH0.9-E1	φ0.9mm Optical fiber cable	Blue
—	HSC2-PH0.9-E2		Light purple

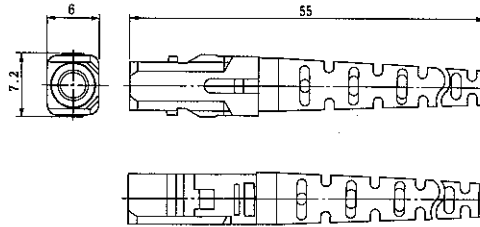
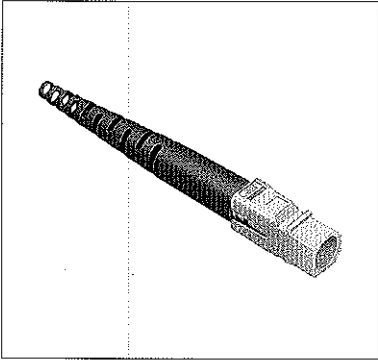
■Reinforced-type Cable Clamp Plug Housing

●Manual Coupling / Decoupling Type



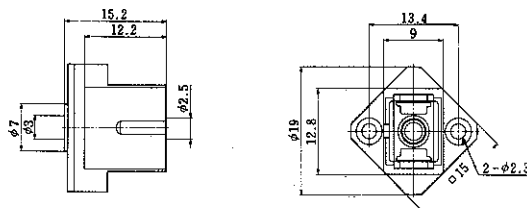
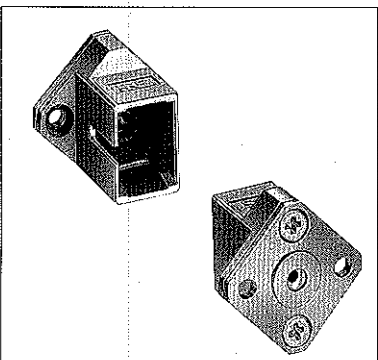
HRS NO.	Product Number	Applicable Cable Diameter	Color of Boot	Polishing	Notes
CL704-0327-3	HSC-PH2-E1	φ2mm	Blue	PC	NTT SC corresponding items
CL704-0328-6	HSC-PH2-E2		Light purple	AdPC	
CL704-0220-0	HSC-PH2-B1		Green	PC	NTT SC corresponding items
CL704-0221-2	HSC-PH2-B2		Light purple	AdPC	
CL704-3019-8	HSC-PH2-B5		Green	APC	—
CL704-0281-4	HSC-PH2-B6		White	AdPC	
CL704-0376-9	HSC-PH2-E5	φ2mm	Green	APC	NTT SC corresponding items
CL704-0222-5	HSC-PH3-B1	φ3mm	Blue	PC	
CL704-0223-8	HSC-PH3-B2		Light purple	AdPC	
CL704-3020-7	HSC-PH3-B5		Green	APC	
CL704-0282-7	HSC-PH3-B6		White	AdPC	

●For Jig Coupling / Decoupling



HRS NO.	Product Number	Applicable Cable Diameter	Color of Boot	Polishing	Notes
CL704-0329-9	HSC2-PH2-E1	φ2mm	Blue	PC	NTT SC corresponding items
CL704-0330-8	HSC2-PH2-E2		Light purple	AdPC	
CL704-0224-0	HSC2-PH2-B1		Green	PC	NTT SC corresponding items
CL704-0225-3	HSC2-PH2-B2		Light purple	AdPC	
—	HSC2-PH2-B5		Green	APC	—
CL704-0283-0	HSC2-PH2-B6		White	AdPC	
—	HSC2-PH2-E5	φ2mm	Green	APC	NTT SC corresponding items
CL704-0226-6	HSC2-PH3-B1	φ3mm	Blue	PC	
CL704-0227-9	HSC2-PH3-B2		Light purple	AdPC	
—	HSC2-PH3-B5		Green	APC	
CL704-0284-2	HSC2-PH3-B6		White	AdPC	

■Receptacles

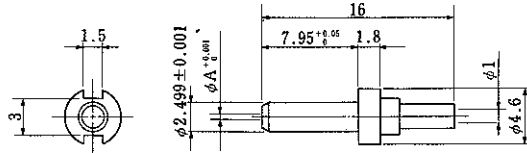
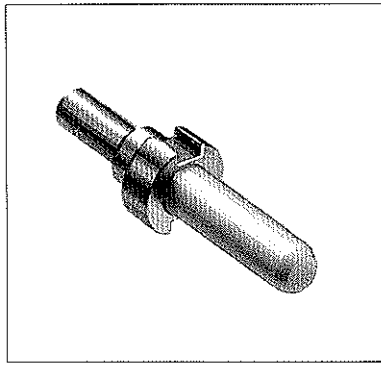


NOTE: This product is for power meter sensor application.

HRS NO.	Product Number	φ2.5mm Dimension Tolerance	Notes
CL704-0022-6	HSC-R1-B	+0.011 +0.001	MM
CL704-0023-9	HSC-R2-B	+0.006 +0.001	SM

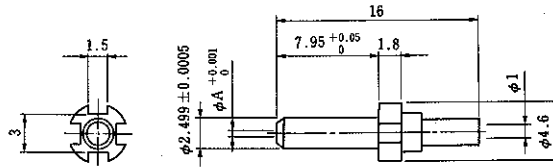
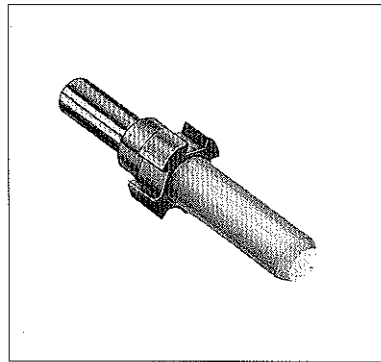
■ Ferrules

● GI



HRS NO.	Product Number	Dimension A	Applicable Optical Fiber	Fiber Entrance Angle
CL704-0103-6	HSC-F321-B124	0.124	GI-50/125	60°
CL704-0104-9	HSC-F321-B125	0.125		
CL704-0105-1	HSC-F321-B126	0.126		
CL704-0106-4	HSC-F321-B127	0.127		
CL704-0107-7	HSC-F321-B128	0.128		

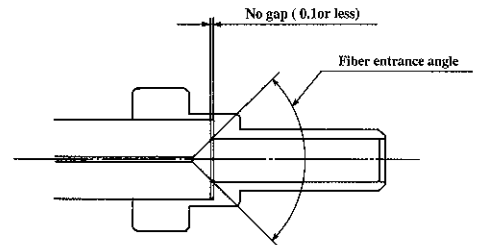
● SM



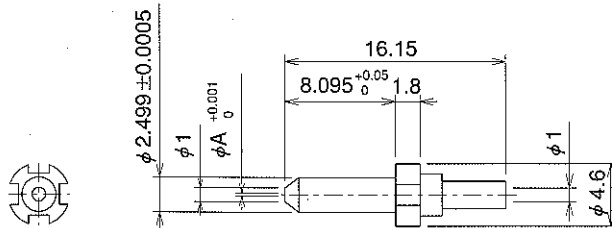
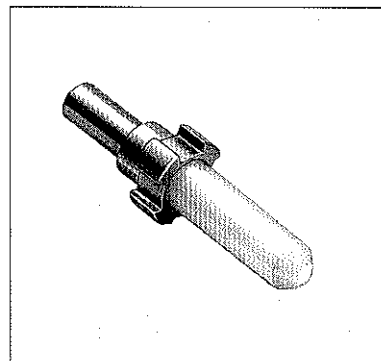
HRS NO.	Product Number	Dimension A	Applicable Optical Fiber	Fiber Entrance Angle
CL704-0068-7	HSC-F321-A123	0.123	SM-9.5/125	60°
CL704-0069-0	HSC-F321-A124	0.124		
CL704-0070-9	HSC-F321-A125	0.125		
CL704-0200-2	HSC-F321-A1255	0.125		
CL704-0071-1	HSC-F321-A126	0.126		
CL704-0072-4	HSC-F321-A127	0.127		
CL704-0073-7	HSC-F321-A128	0.128		

NOTE: Please select a ferrule that suits the fiber diameter.

- ① The ferrules are designed without a gap at the push-on portion to reduce disconnections at the time of wiring.
- ② The entrance angle of the fiber has been set at 60° to improve the entrance of the fiber. (A 90° product is also available.)
- ③ A 4-groove type is available for single mode. This offers easier adjustment of the offset direction at time of wiring. (See diagram at right.)



● APC



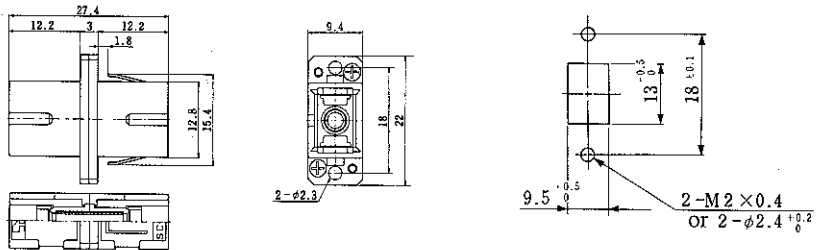
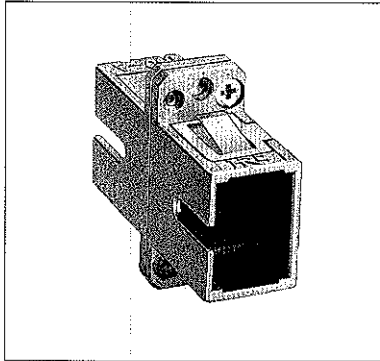
HRS NO.	Product Number	Dimension A	Applicable Optical Fiber	Fiber Entrance Angle
CL704-0371-5	HSC-F391-A125	0.125	SM-9.5/125	60°
CL704-0373-0	HSC-F391-A126	0.126		
CL704-0374-3	HSC-F391-A127	0.127		

NOTE: Please select a ferrule that suits the fiber diameter.

Adapters Panel Mounting Type

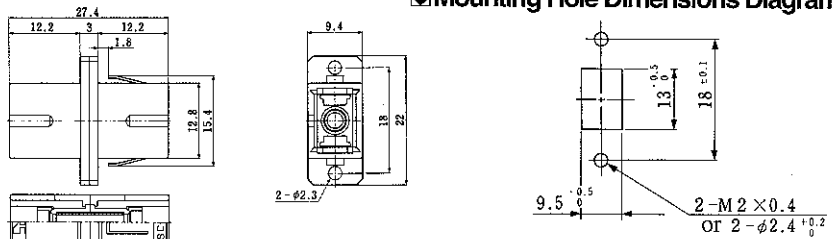
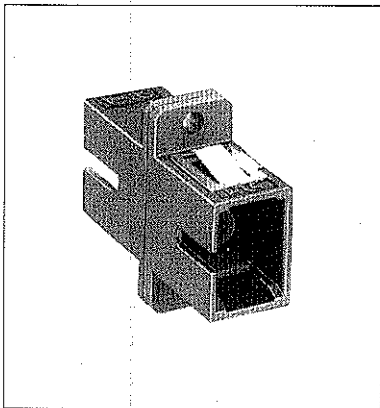
Manual Coupling / Decoupling Type

Die Cast Products



HRS NO	Product Number	Split Sleeve	Notes
CL704-0020-0-10	HSC-A2 (10)	Copper alloy	NTT SC corresponding items, and die cast products
CL704-0258-2	HSC-A2-D1	Zirconia	

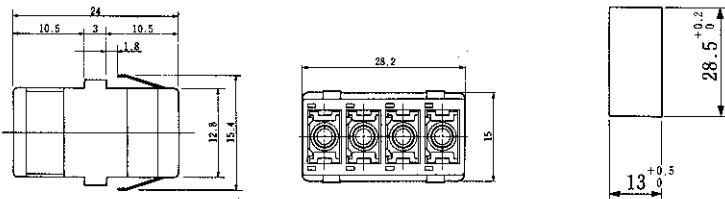
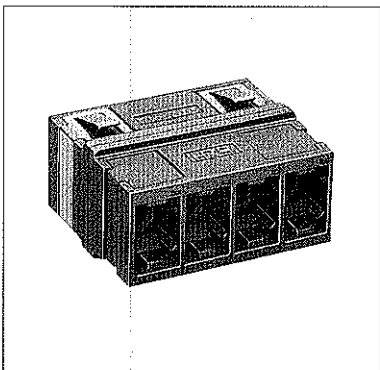
Plastic Products



HRS NO	Product Number	Split Sleeve	Notes
CL704-0092-1	HSC-A3	Copper alloy	NTT SC corresponding items, and die cast products
CL704-0217-5	HSC-A3-D1	Zirconia	
CL704-3007-9	HSC-A3-D2	Zirconia	Green(APC)

Jig Coupling / Decoupling Type

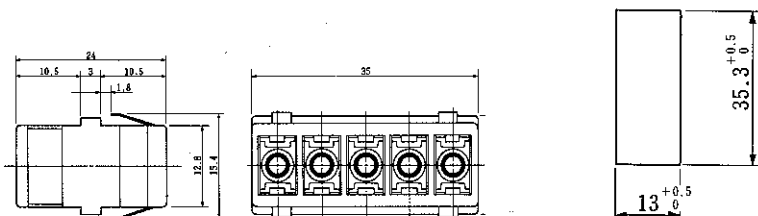
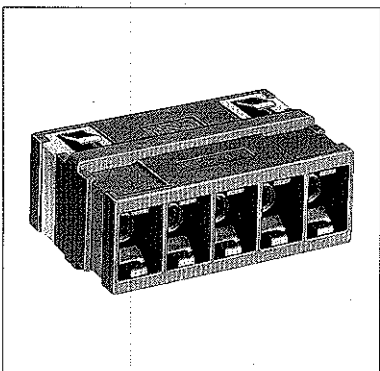
4-Ganged Type



HRS NO	Product Number	Split Sleeve	Notes
CL704-0024-1	HSC2-4A	Copper alloy	NTT SC corresponding items, and die cast products
CL704-0290-5	HSC2-4A-D1	Zirconia	

Jig Mounting Type

5-Ganged Type (GI)

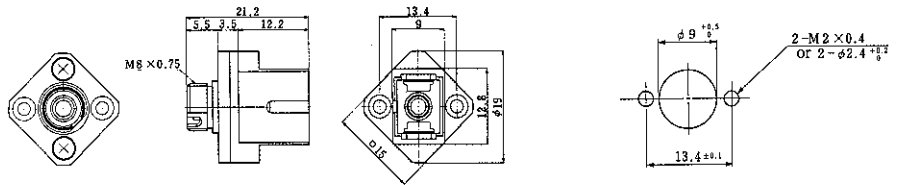
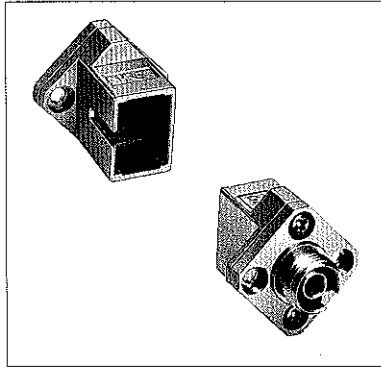


HRS NO	Product Number	Split Sleeve	Notes
CL704-0025-4	HSC2-5A	Copper alloy	NTT SC corresponding items, and die cast products
CL704-0219-0	HSC2-5A-D1	Zirconia	

■ Conversion Adapters

● FC Conversion Type Screw Mounting Type

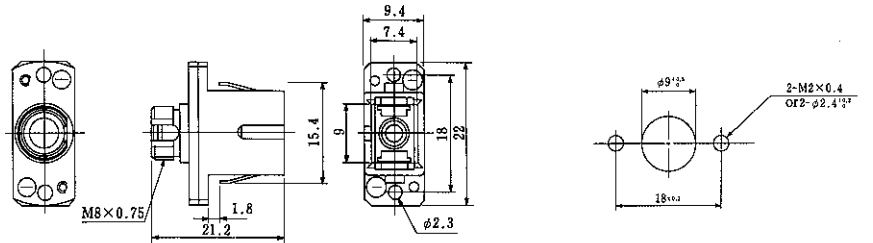
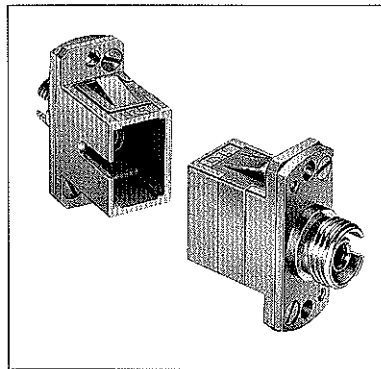
◆ Mounting Hole Dimensions Diagram



HRS NO.	Product Number	Split Sleeve	Notes
CL704-0021-3	HSCJ-HRFCJ-B	Copper alloy	SC to FC conversion adapter

● FC Conversion Type Screw Mounting Type

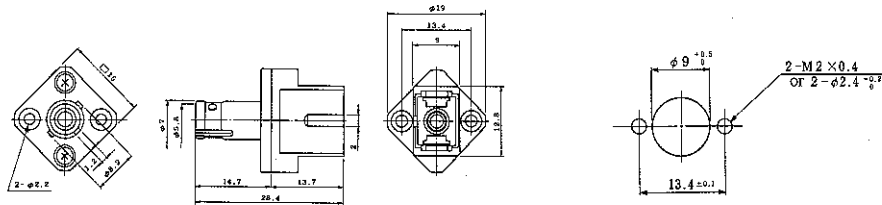
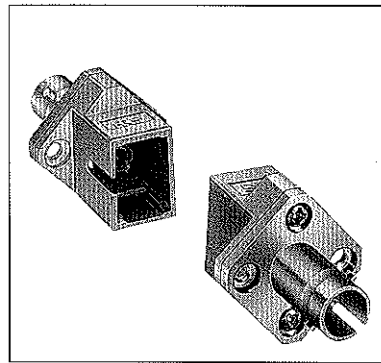
◆ Mounting Hole Dimensions Diagram



HRS NO.	Product Number	Split Sleeve	Notes
CL704-0206-9	HSCJ-HRFCJ-C	Copper alloy	SC to FC conversion adapter

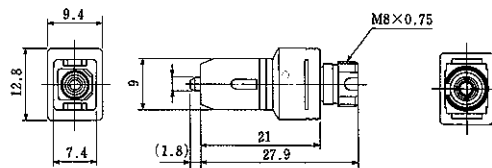
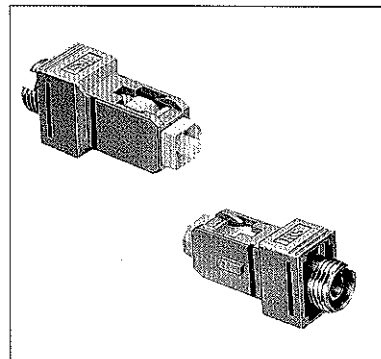
● ST Conversion Type

◆ Mounting Hole Dimensions Diagram



HRS NO.	Product Number	Split Sleeve	Notes
CL704-0102-3	HSCJ-HSTJ-B	Copper alloy	SC to FC conversion adapter

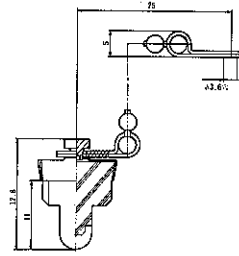
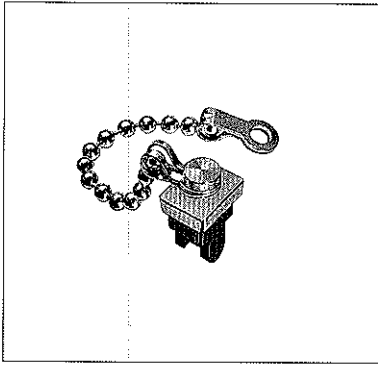
■ FC Conversion Plug



HRS NO.	Product Number	Split Sleeve	Polishing	Optical Fiber
CL704-0203-0	HSCP-HRFCJ-1	Copper alloy	PC	GI 50/125
CL704-0288-3	HSCP-HRFCJ-1AS		AdPC	
CL704-0204-3	HSCP-HRFCJ-2		PC	SM 9.5/125
CL704-0289-6	HSCP-HRFCJ-2AS		AdPC	

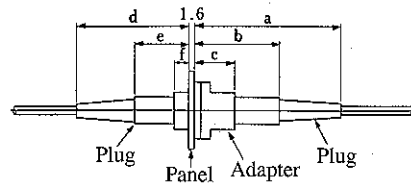
● The guide key of the SC plug end and the guide groove of the FC adapter do not necessarily match.

■ Cap



HRS NO.	Product Number	Applicable Products
CL704-0061-8	HSC-C2	HSC-A2, HSC-A3, HSCJ-HRFCJ-B, C HSCJ-HSTJ-B, HSC-R1-B, HSC-R2-B

◆ Mounting Dimensions Diagram



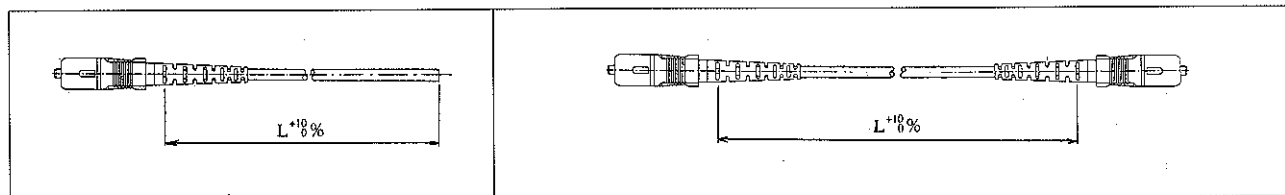
Unit : mm

Combination		Dimensions						
Adapter	Housing	a	b	c	d	e	f	
HSC-A2 HSC-A2-D1 HSC-A3 HSC-A3-D1	HSC-PH2-A2	58	28	15.2	53.4	23.4	10.6	
	HSC-PH2-B1							
	HSC-PH2-B2							
	HSC-PH2-A4 HSC-PH3-A4	HSC-PH2-A4	39.5	28	15.2	31.4	23.5	10.6
		HSC-PH3-A4						
		HSC-PH1-A	36	26	15.2	31.4	21.4	8.9
	HSC2-4A HSC2-4A-D1 HSC2-5A HSC2-5A-D1	HSC2-PH2-A2	58	—	13.5	53.4	—	8.9
HSC2-PH2-B1								
HSC2-PH2-B2								
HSC2-PH3-B1 HSC2-PH3-B2		HSC2-PH3-B1	39.5	—	13.5	34.9	—	8.9
		HSC2-PH3-B2						
HSC2-PH3-A		39.5	—	13.5	34.9	—	8.9	
HSC2-PH1-A		36	—	13.5	31.4	—	8.9	
HSC-R1-B	HSC-PH2-A	57.5	27.5	14.7	—	—	—	
HSC-R2-B	HSC-PH3-A							

Note : Recommended panel thickness to be 1.6mm

■ Connectors with Cable Attached

● Manual Coupling / Decoupling Type Screw Mounting Type



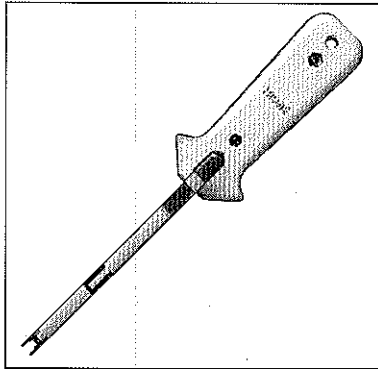
HRS NO.	Ends with Connectors	Optical Fiber	Type of Polishing	Reflection Attenuation	Cable Diameter	Housing Used
HSC-SPC1-F3A-L	One end	SM-9.5/125	PC	$\geq 22\text{dB}$	$\phi 3$	HSC-PH3-B1
HSC-SPC2-F3A-L	Both ends					
HSC-SPC1-F3B-L	One end	GI-50/125				
HSC-SPC2-F3B-L	Both ends					
HSC-SPC1-F3Q-L	One end	SM-9.5/125	PC	$\geq 22\text{dB}$	$\phi 2$	HSC-PH2-B1
HSC-SPC2-F3Q-L	Both ends					
HSC-SPC1-F3P-L	One end	GI-50/125				
HSC-SPC2-F3P-L	Both ends					
HSC-ASPC1-F3A-L	One end	SM-9.5/125	AdPC	$\geq 40\text{dB}$ (Low reflection)	$\phi 3$	HSC-PH3-B2
HSC-ASPC2-F3A-L	Both ends				$\phi 2$	HSC-PH2-B2
HSC-ASPC1-F3Q-L	One end					
HSC-ASPC2-F3Q-L	Both ends					
HSC-CSPR1-F3A-L	One end		APC	$\geq 60\text{dB}$ (Ultra-low reflection)	$\phi 3$	HSC-PH3-B5
HSC-CSPR2-F3A-L	Both ends				$\phi 2$	HSC-PH2-E5
HSC-CSPE1-F3Q-L	One end					
HSC-CSPE2-F3Q-L	Both ends					
HSC-SPE1-F3Q-L	One end	SM-9.5/125	PC	$\geq 22\text{dB}$	$\phi 2$	HSC-PH2-E1
HSC-SPE2-F3Q-L	Both ends					
HSC-SPE1-F3P-L	One end	GI-50/125				
HSC-SPE2-F3P-L	Both ends					
HSC-ASPE1-F3Q-L	One end	SM-9.5/125	AdPC	$\geq 40\text{dB}$ (Low reflection)	$\phi 2$	HSC-PH2-E2
HSC-ASPE2-F3Q-L	Both ends					
HSC-TSPE1-F3Q-L	One end		APC	$\geq 60\text{dB}$ (Ultra-low reflection)	$\phi 2$	HSC-PH2-E5
HSC-TSPE2-F3Q-L	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 jig coupling/decoupling products other than the aforementioned items as well as a great variety of conversion cables to suit your needs.

■Tools

●Coupling / Decoupling Tool

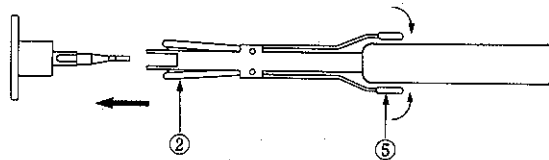


HRS NO	Product Number	Applicable Products
CL704-0286-8	HSC-T1-L	HSC2-PH2-A2,HSC2-PH3-A2,HSC2-PH2-A, HSC2-PH3-A,HSC2-PH1-A,HSC2-PH2-B1, HSC2-PH2-B2,HSC2-PH3-B1,HSC2-PH3-B2,HSC2-PH2-E1, HSC2-PH2-E2 (PLUG),HSC2-4A,HSC2-4A-D1,HSC2-5A, HSC2-5A-D1,HSC2-8SR-1,HSC2-8SR-D1 (ADAPTER)

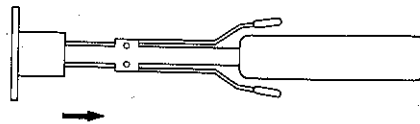
(ATTENTION) Handle carefully not to damage the top of the tool.

<Method of Operation>

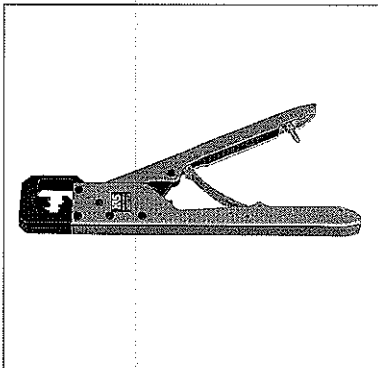
1. Push lever portion of the reference diagram in the direction of the arrow. Portion will open when lever portion is lowered.



2. Insert the HSC coupling/decoupling jig into the adapter, release your hand from portion (5), and pull in the direction of the arrow. Removal is completed.



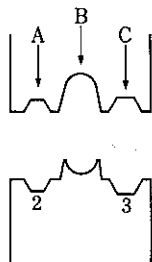
●Crimping Tool



HRS NO	Product Number	Applicable Products
CL704-0287-0	HSC-T3	HSC-PH2-A2,HSC-PH3-A2,HSC-PH2-A4, HSC-PH3-A4,HSC2-PH2-A2,HSC2-PH3-A2, HSC2-PH2-A,HSC2-PH3-A2,HSC-PH2-A5, HSC-PH3-A5,HSC-PH2-B1,HSC-PH3-B1, HSC-PH2-B2,HSC-PH3-B2,HSC2-PH2-B1, HSC2-PH3-B1,HSC2-PH2-B2,HSC2-PH2-B2, HSC-PH2-E1,HSC-PH2-E2,HSC2-PH2-E1, HSC2-PH2-E2

(A crimping tool is required for cable attachment with the exception of cable housing HSC-PH1-A and HSC2-PH1-A.)

<Method of Operation>



- (1) Cable jacket crimping

φ2mm cable : Use part A (The part marked "2")

φ3mm cable : Use part C (The part marked "3")

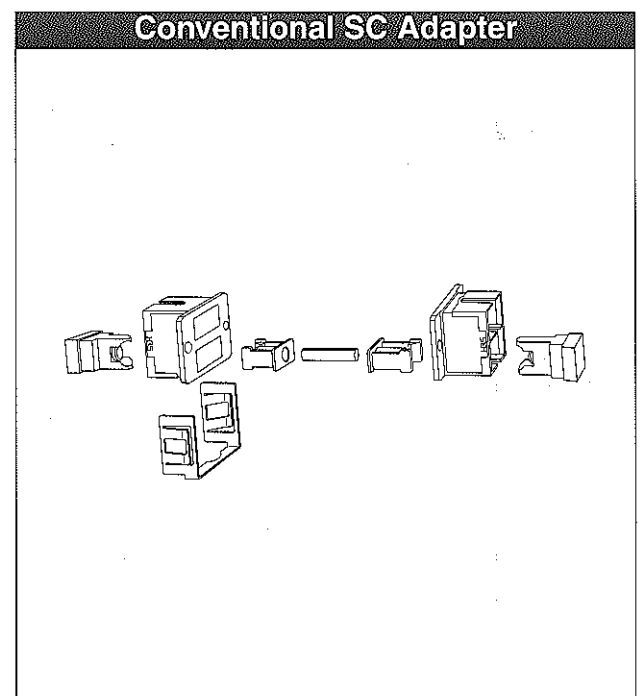
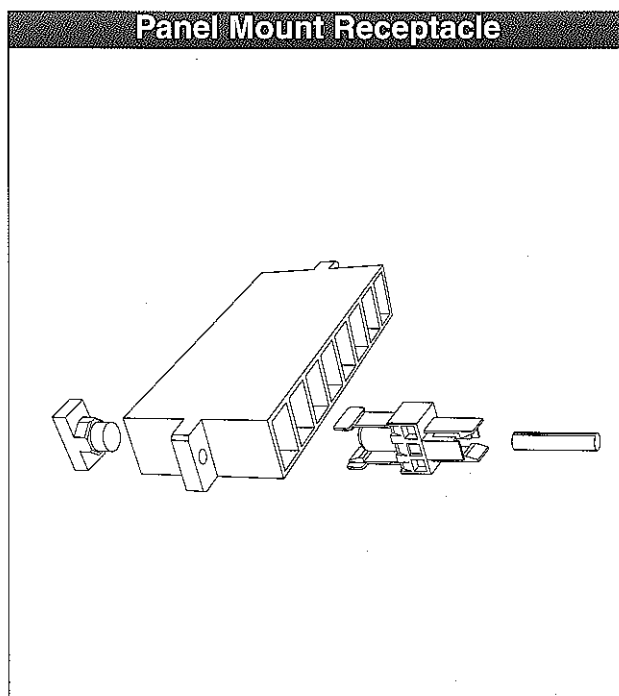
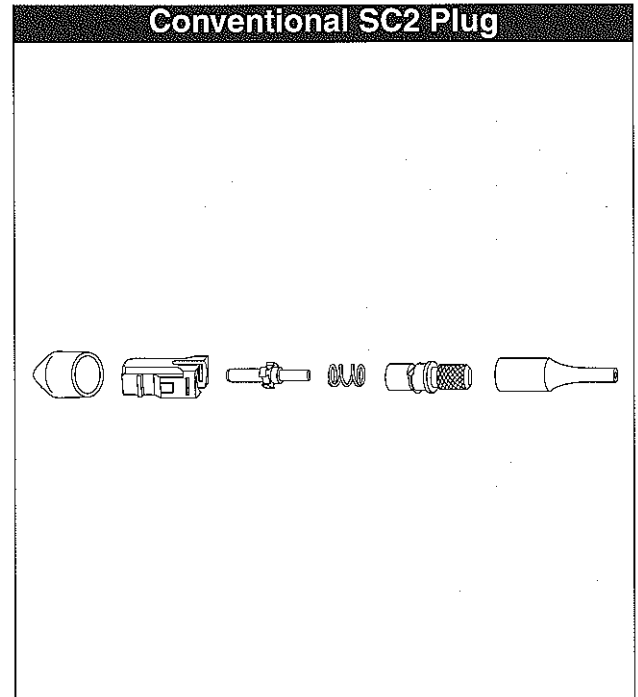
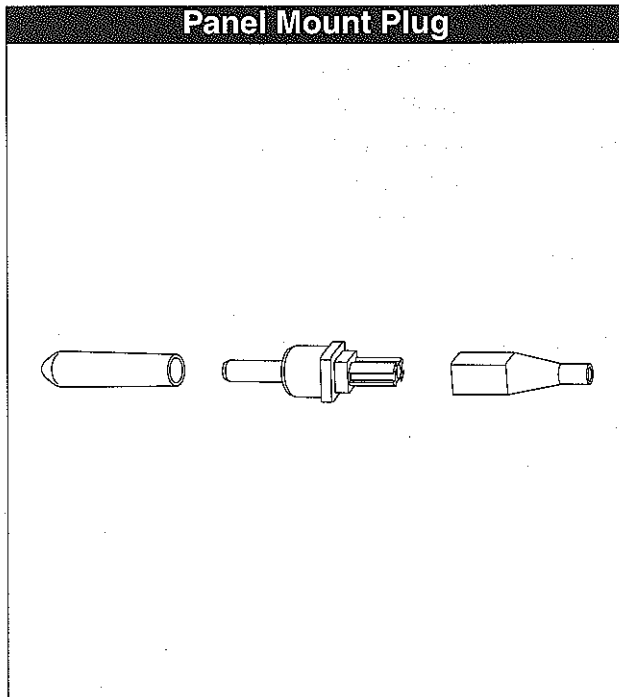
- (2) Cables crimping : Use part B

Panel Mount Receptacles

■ Features

1. Low Cost

Compared with the SC(SC2) conventional adapter, this product has a greatly reduced number of components which is reflected in the new low cost.



2.

The wiring method for the front side of the device uses SC connectors and SC2 connectors, whereas the back side uses panel mount plugs which are of a semi-fixed coupling structure.

Note that an extraction jig is required when removing panel mount plugs.

■ 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	Insertion loss	(SM)	1300nm wavelength (LD)	0.5 dB or less (PC, AdPC)
		(GI)	1300nm wavelength (LED)	0.3 dB or less(PC, AdPC)
Performance	Reflection attenuation	(SM)	1300/-nm wavelength (LD)	22 dB or greater (PC)
		(GI)		40 dB or greater (AdPC)
Mechanical Performance	Gauge holding force	φ2.499 ±0.0005mm zirconia gauge		Phosphor bronze 2 to 5.9 N Zirconia 2 to 3.9 N
	Repetitive operation	1,000 times		1) Insertion loss fluctuation after test: 0.2 dB or less 2) No damage, cracks, or component looseness
	Vibration resistance	Vibration range of 10 to 55 Hz, in 3-axis directions, 2 hours each		
	Shock resistance	Acceleration of 981 m/s ² , in 3 directions, 10 times each (Total of 30 times)		
Environmental performance	Humidity resistance (Temperature and humidity cycle)	Temperature -10°C to 65°C, humidity 90 to 96% 20 cycles		
	Temperature cycle	Temperature -40°C to 75°C 42 cycles (Bellcore TR-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		

■ Materials

● Panel Mount Receptacles

Component	Material
Housing	Synthetic resin
Sleeve	Synthetic resin
Split sleeve	Phosphor bronze or zirconia
Plate	Stainless steel
Cap	Synthetic rubber or Synthetic resin

● Panel Mount Plugs

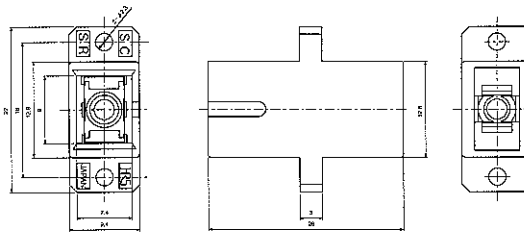
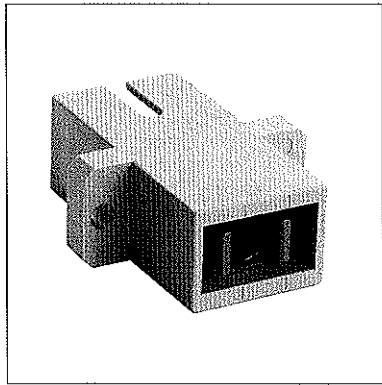
Component	Material
Ferrule	Zirconia and synthetic resin
Boot	Synthetic rubber
Ferrule cap	Polyethylene

● Panel Mount Plug Extraction Tool

Product Name	Material
Extraction jig	Synthetic resin

■ Panel Mount Receptacles(Manual Coupling/Decoupling Type)

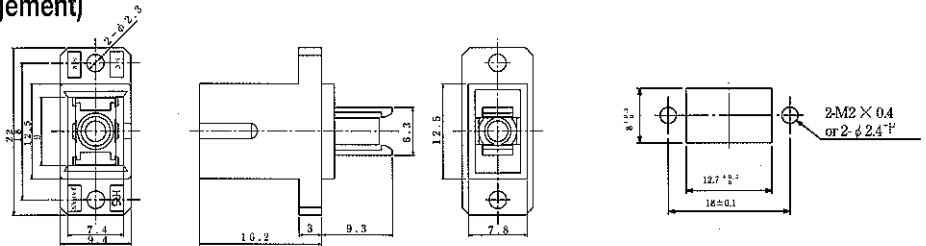
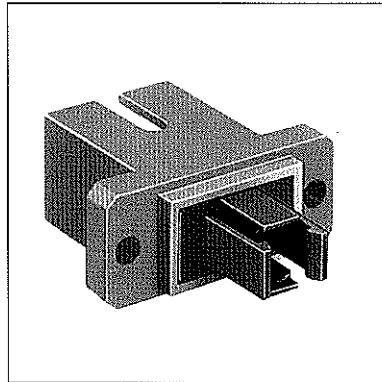
● SC Simplex



HRS NO.	Product Number	Split Sleeve
CL704-0320-4	HSC-SR-1	Copper alloy
CL704-0321-7	HSC-SR-D1	Zirconia
CL704-0320-4-01	HSC-SR-1(01)	—

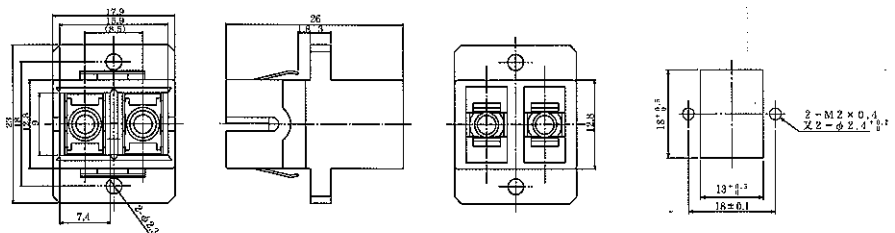
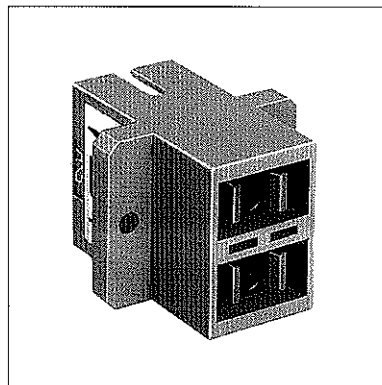
◆ Mounting Hole Dimensions Diagram

● SC Duplex H-type (R-type Key Arrangement)



HRS NO.	Product Number	Split Sleeve
CL704-0291-8	HSC-SR-2	Copper alloy
CL704-0292-0	HSC-SR-D2	Zirconia
CL704-0291-8-01	HSC-SR-2(01)	—

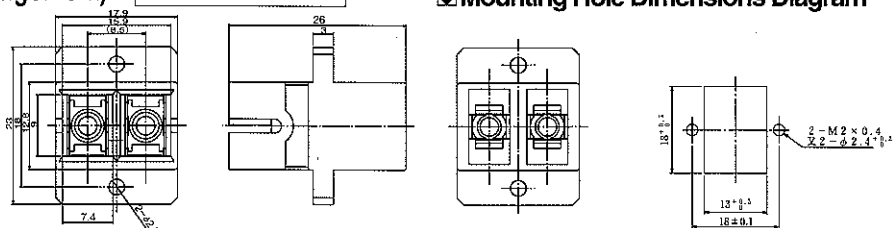
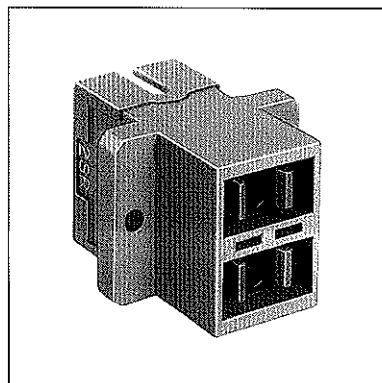
● SC Duplex H-type(R-type Key Arrangement)



◆ Mounting Hole Dimensions Diagram

HRS NO.	Product Number	Split Sleeve
CL704-0293-3	HSCH-2SR-1(R)	Copper alloy
CL704-0294-6	HSCH-2SR-D1(R)	Zirconia
CL704-0293-3-01	HSCH-2SR-1(R) (01)	—

● SC Duplex F-type(P-type Key Arrangement) Without Plate

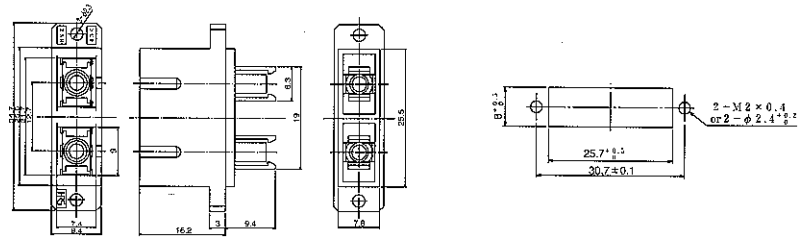
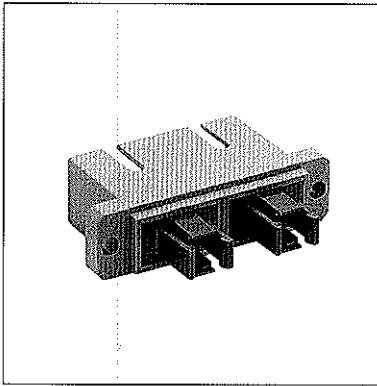


◆ Mounting Hole Dimensions Diagram

HRS NO.	Product Number	Split Sleeve
CL704-0300-7	HSCH-2SR-3(R)	Copper alloy
CL704-0301-0	HSCH-2SR-D3(R)	Zirconia
CL704-0300-7-01	HSCH-2SR-3(R) (01)	—

●SC Duplex F-type(P-type Key Arrangement)

◆Mounting Hole Dimensions Diagram

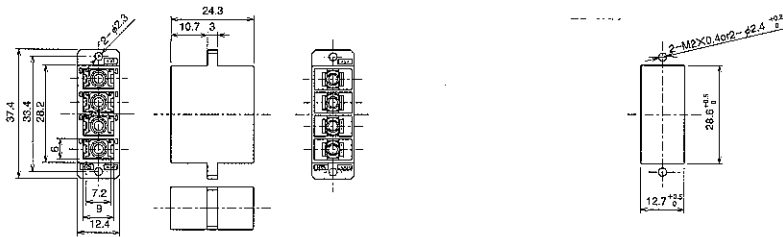
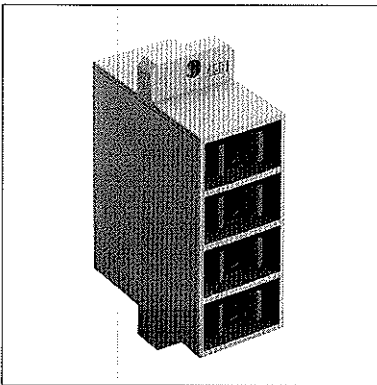


HRS No.	Product Number	Split Sleeve
CL704-0295-9	HSCF-2SR-2(P)	Copper alloy
CL704-0296-1	HSCF-2SR-D2(P)	Zirconia
CL704-0295-9-01	HSCF-2SR-2(P)(01)	None

■Panel Mount Receptacles(Jig Coupling/Decoupling Type)

●SC2 Type(4-Ganged)

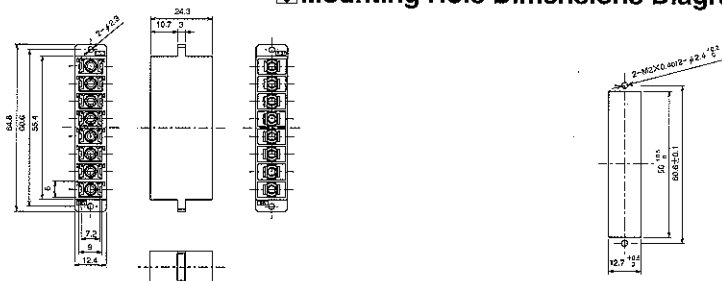
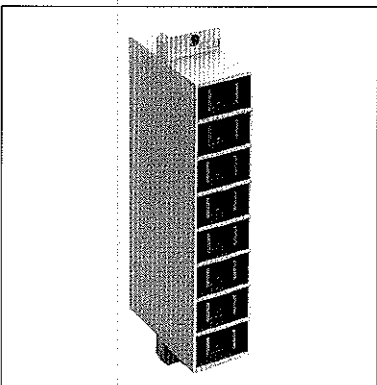
◆Mounting Hole Dimensions Diagram



HRS No.	Product Number	Split Sleeve
CL704-0311-3	HSC2-4SR-1	Copper alloy
CL704-0312-6	HSC2-4SR-D1	Zirconia

●SC2 Type(8-Ganged)

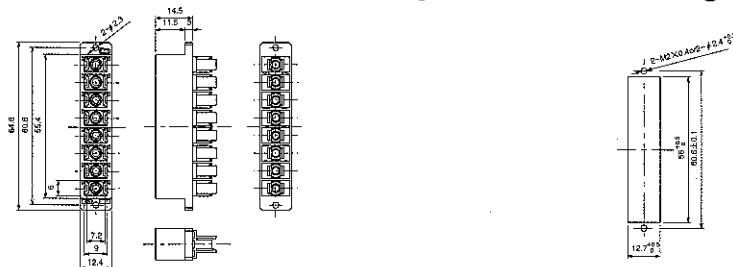
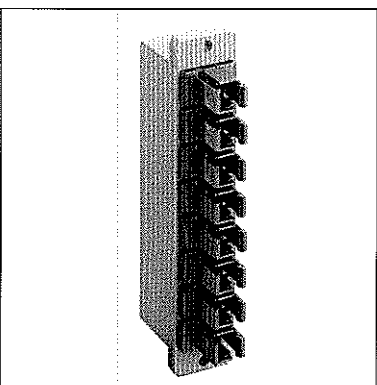
◆Mounting Hole Dimensions Diagram



HRS No.	Product Number	Split Sleeve
CL704-0266-0	HSC2-8SR-1	Copper alloy
CL704-0270-8	HSC2-8SR-D1	Zirconia
CL704-0266-0-01	HSC2-8SR-1(01)	None

●SC2 Type(8-Ganged no partition type.)

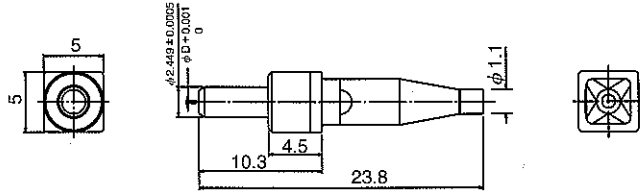
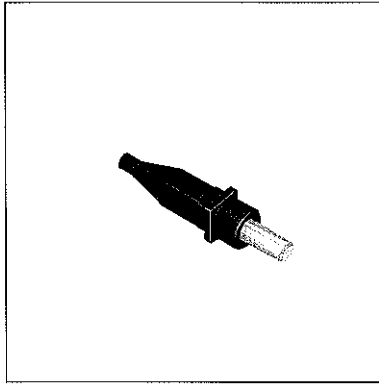
◆Mounting Hole Dimensions Diagram



HRS No.	Product Number	Split Sleeve
—	HSC2-8SR-2	Copper alloy
—	HSC2-8SR-D2	Zirconia
—	HSC2-8SR-2(01)	None

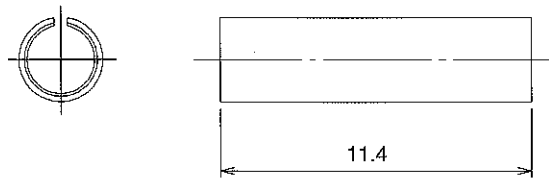
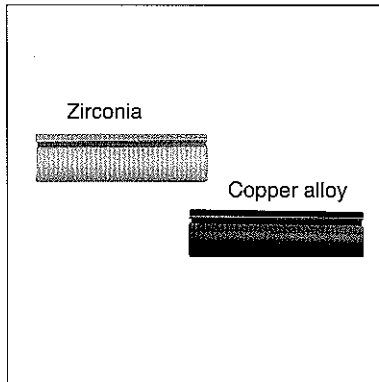
■ Panel Mount Plugs

● For ϕ 0.9mm Cable and ϕ 0.25 UV Fiber



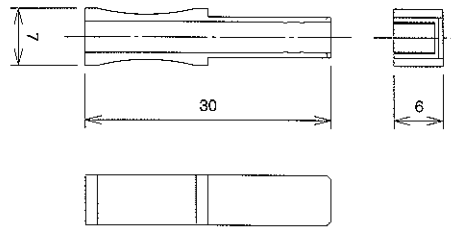
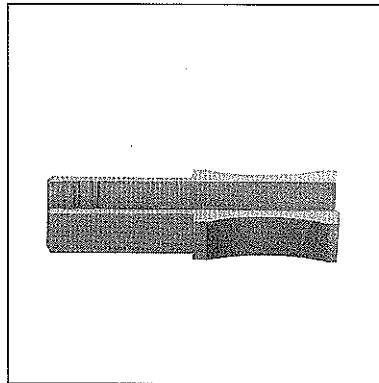
HRS No.	Product Number	Ferrule Hole Diameter
CL704-0267-3	HSC2-FK-A125	125 μ m
CL704-0268-6	HSC2-FK-A126	126 μ m

■ Split Sleeve

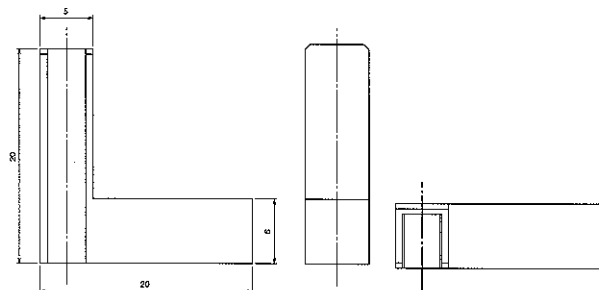
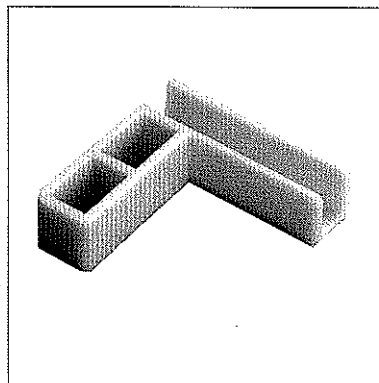


HRS No.	Product Number	Split Sleeve
CL704-0275-1	HSC-SLIT-SLEEVE	Copper alloy
CL704-0264-5	HSC-D	Zirconia

■ Panel Mount Plug Extraction Jig



HRS No.	Product Number
CL704-0299-0	HSC-T4



HRS No.	Product Number
CL704-0322-0	HSC-T5

SC-type Duplex

Types

SC Duplex

F-type(HSCF)

H-type (HSCH)

key type:Plug

Adapter

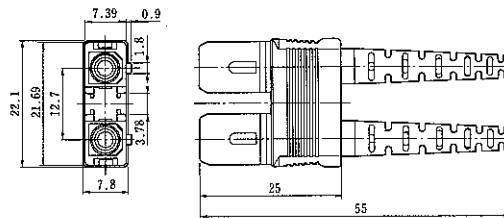
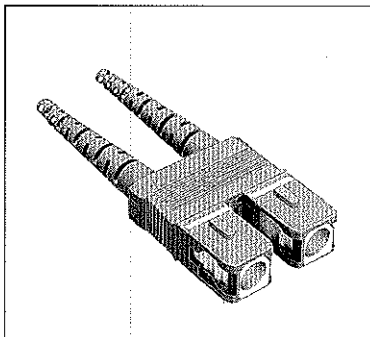
- P:HSCF-2PH * -B# (P), HSCF-2A (P)
- R:HSCF-2PH * -B# (R), HSCF-2A (R)
- A:HSCF-2PH * -B# (A), HSCF-2A (A)
- B:HSCF-2PH * -B# (B), HSCF-2A (B)

- P:HSCH-2PH * -B# (P), HSCH-2A (P)
- HSCH-2A1 (P)
- R:HSCH-2PH * -B# (R), HSCH-2A (R)
- A:HSCH-2PH * -B# (A), HSCH-2A (A)
- B:HSCH-2PH * -B# (B), HSCH-2A (B)

NOTE: Depending on the cable diameter, "*" in the plug item name is substituted with 2 (for 2 mm) or 3 (for 3 mm). The "#" at the end of the item name indicates the color of the boot. 1 is for blue and 2 is for light purple.

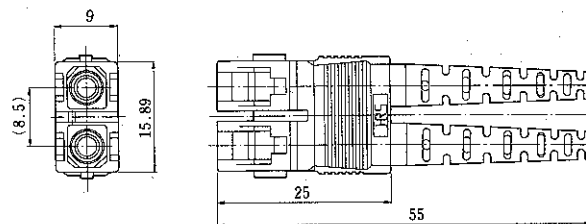
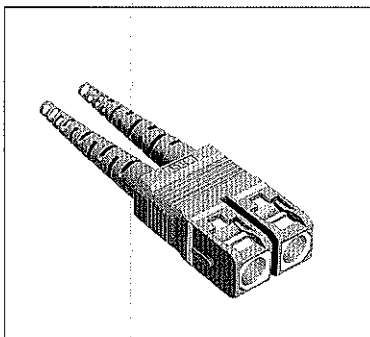
Plug Housing

F-type Duplex



HRS No.	Product Number	Applicable Cable Diameter	Form of Guide Key	Color of Boot	Polishing	Notes
CL704-2024-2	HSCF-2PH2-B1 (P)	φ 2mm	P	Blue	PC	NTT SC Corresponding items
CL704-2028-3	HSCF-2PH2-B2 (P)		P	Light purple	AdPC	
CL704-2032-0	HSCF-2PH3-B1 (P)	φ 3mm	P	Blue	PC	
CL704-2036-1	HSCF-2PH3-B2 (P)		P	Light purple	AdPC	

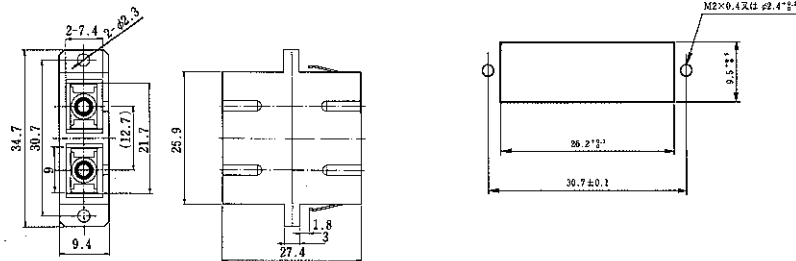
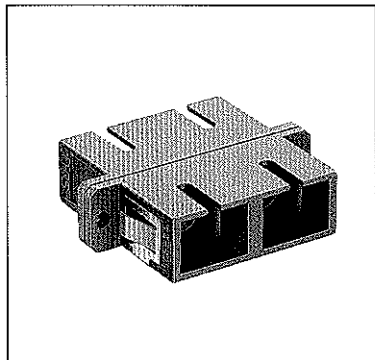
H-type Duplex



HRS No.	Product Number	Applicable Cable Diameter	Form of Guide Key	Color of Boot	Polishing	Notes
CL704-2046-5	HSCH-2PH2-B1 (P)	φ 2mm	P	Blue	PC	—
CL704-2054-3	HSCH-2PH3-B1 (P)	φ 3mm	P	Blue	PC	—

Adapters

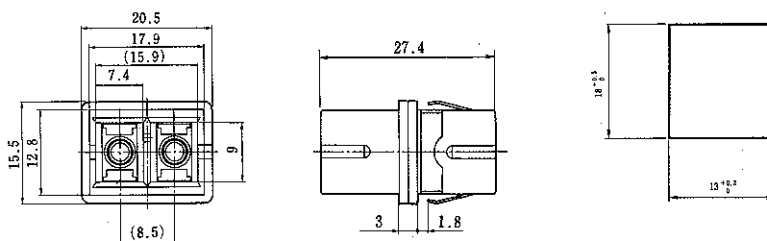
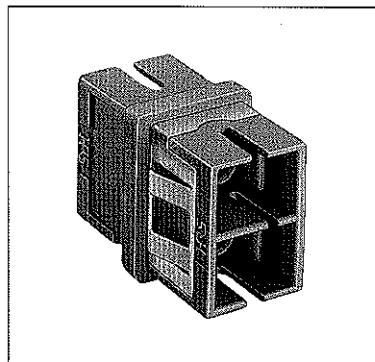
F-type



HRS No.	Product Number	Split Sleeve
CL704-2008-6	HSCF-2A(P)	Copper alloy
CL704-2040-9	HSCF-2A-D(P)	Zirconia

* Standard mounting thickness is 1.6mm.

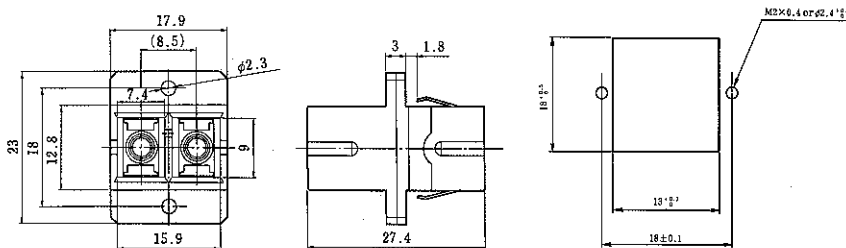
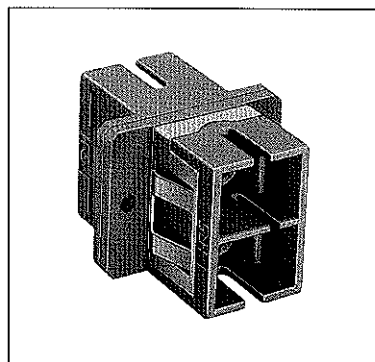
H-type Panel-only Mounting Type



HRS No.	Product Number	Split Sleeve
CL704-2066-2	HSCH-2A1(P)	Copper alloy

* Standard mounting thickness is 1.6mm.

H-type



HRS No.	Product Number	Notes
CL704-2020-1	HSCH-2A(P)	Copper alloy
CL704-2062-1	HSCH-2A-D(P)	Zirconia
CL704-2108-0	HSCH-2A-D2(P)	Zirconia green

* Standard mounting thickness is 1.6mm.

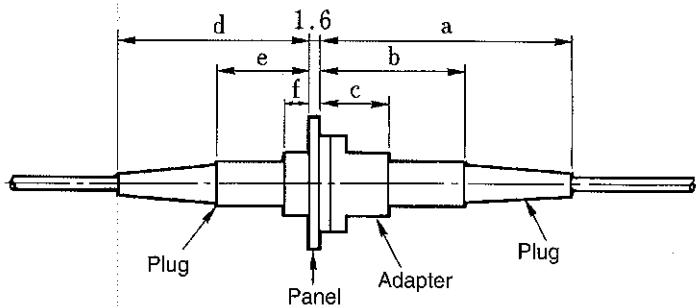
◆ Duplex Connectors with Cables Attached

Product number	Optical Fiber	Polishing	Cable	Housing	Reflection Attenuation
HSCF-SP2 ** -F3A-L	SM-9.5/125	PC	φ 3mm	HSCF-2PH3-B1	≥22dB
HSCF-SP2 ** -F3AW-L			φ 3mm Zip		
HSCF-SP2 ** -F3B-L	φ 3mm				
HSCF-SP2 ** -F3BW-L	φ 3mm Zip				
HSCF-ASP2 ** -F3A-L	SM-9.5/125	AdPC	φ 3mm	HSCF-2PH3-B2	≥40dB
HSCF-ASP2 ** -F3AW-L			φ 3mm Zip		
HSCH-SP2 ** -F3A-L	SM-9.5/125	PC	φ 3mm	HSCH-2PH3-B1	≥22dB
HSCH-SP2 ** -F3AW-1			φ 3mm Zip		
HSCH-SP2 ** -F3B-L	GI-50/125		φ 3mm		
HSCH-SP2 ** -F3BW-L			φ 3mm Zip		
HSCH-ASP2 ** -F3A-L	SM-9.5/125	AdPC	φ 3mm	HSCH-2PH3-P2	≥40dB
HSCH-ASP2 ** -F3AW-L			φ 3mm Zip		
HSCF-SP2 ** -F3Q-L	SM-9.5/125	PC	φ 2mm	HSCF-2PH2-B1	≥22dB
HSCF-SP2 ** -F3P-L	GI-50/125				
HSCH-SP2 ** -F3Q-L	SM-9.5/125				
HSCH-SP2 ** -F3P-L	GI-50/125				

NOTE 1: The "L" within the Product Number indicates the length of the cable. Please specify values in meter units,

NOTE 2: We will custom manufacture SC, FC and other types of simplex optical connectors other than the aforementioned items as well as a great variety of conversion cables to suit your needs.

◆ Mounting Dimensions Diagram



<F-type>

Unit : mm

Combination		Dimensions					
Adapter	Housing	a	b	c	d	e	f
HSCF-2A (P) HSCF-2A-D (P)	HSC-PH※-B※1	58	28	15.2	53.4	23.4	10.6
	HSCF-PH※-B※1 (P)						
	HSC-PH※-A2	39.5	28	15.2	31.4	23.4	10.6
	HSC-PH※-A4						
	HSC-PH1-A	36	26	15.2	31.4	21.4	10.6

<H-type>

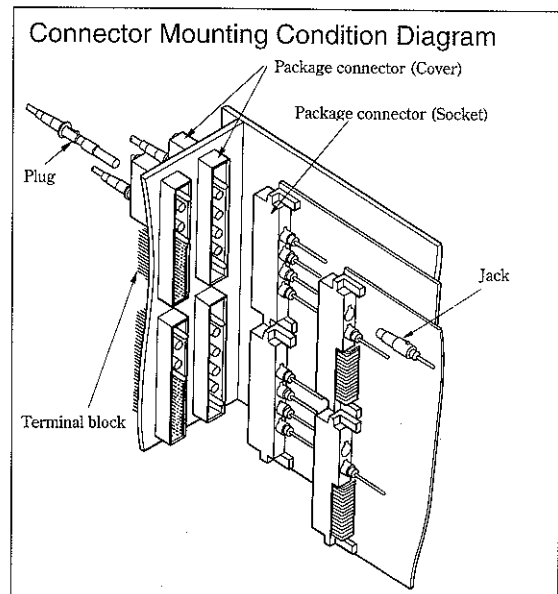
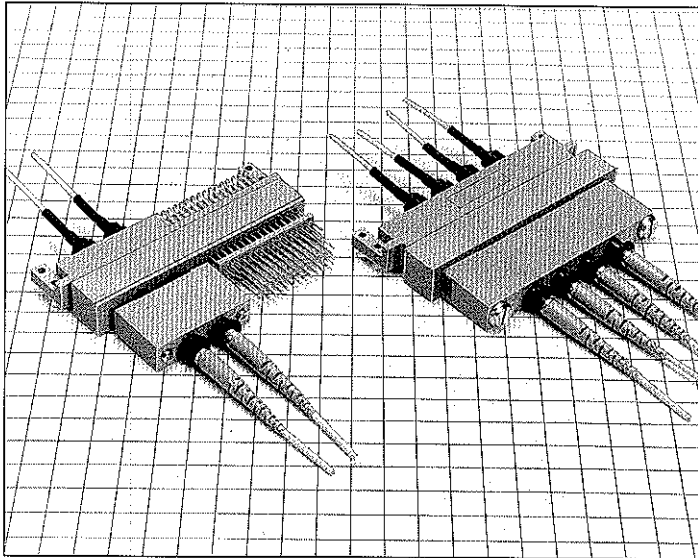
Combination		Dimensions					
Adapter	Housing	a	b	c	d	e	f
HSCH-2A (P) HSCH-2A-D (P) HSCH-2A1 (P)	HSC-PH※-B※1	58	28	15.2	53.4	23.4	10.6
	HSCH-2PH※-B※1 (P)						
	HSC-PH※-A2	39.5	28	15.2	31.4	23.4	10.6
	HSC-PH※-A4						
	HSC-PH1-A	36	26	15.2	31.4	21.4	10.6

NOTE 1: "※" Indicates the optical fiber cable diameter. φ 2:3, φ 3:3

NOTE 2: "※" indicates the type of polishing at the housing. 1:For PC polishing,2:For AdPC polishing.

Plug-in D-type Optical Fiber Connectors for Terminal Equipment Mounting

HRPI Series



■ Features

1. Compliant with D-type Optical Fiber Connector Standards

These connectors are compliant with NTT D-type optical fiber connector standards.

JIS C 5980 (CF11-type optical fiber connectors)

2. Zirconia Ferrules

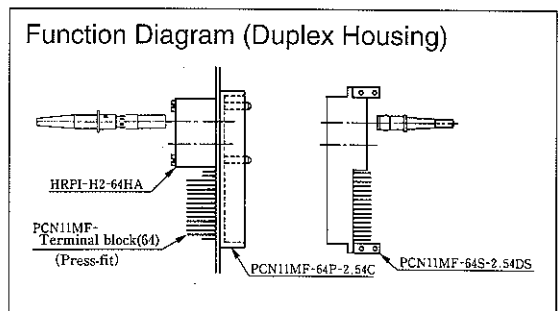
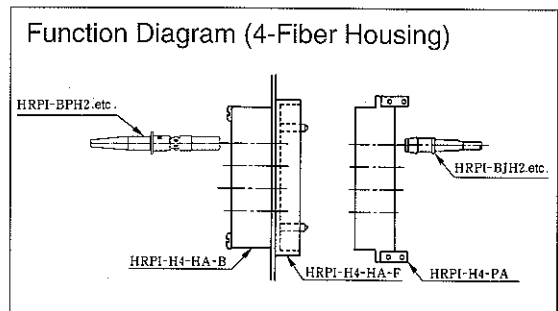
Zirconia ferrules that are the same shape as those of the HSC Series are used.

3. Housing

Optical terminals and coaxial terminals can be used in the same connector housing.

4. Removal of Optical Terminals

Removal from the optical terminal housing is performed with a slider operation from the back side in the case of the plug side, and by using a special tool from the front in the case of the jack side.



■ Applications

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

Product Standards

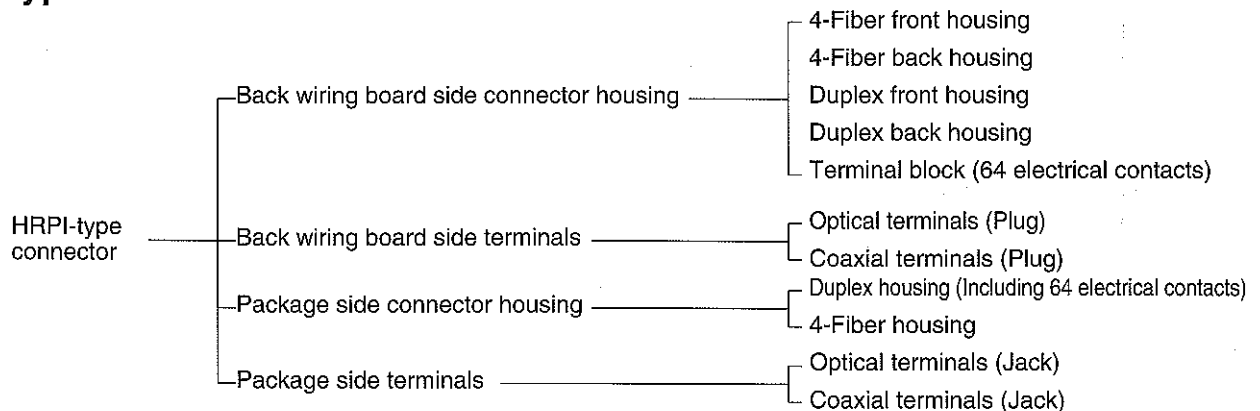
Rating	Operating temperature range	-25°C~70°C	Storage temperature range	-25°C~70°C
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Item		Test Method (JIS C 5961)	Standard
Optical Performance	Insertion loss	(SM) 1,300nm wavelength (LD)	0.5 dB or less (PC, AdPC)
		(GI) 1,300nm wavelength (LED)	0.3 dB or less (PC, AdPC)
	Reflection attenuation	(SM) 1,300nm wavelength (LD)	22 dB or greater (PC) 40 dB (AdPC)
		(GI)	22 dB or greater (PC)
Mechanical Performance	Split sleeve holding force of the adapter	φ2.499 ±0.0005mm zirconia gauge	Phosphor bronze 2 to 5.9 N Zirconia 2 to 3.9 N
	Cable clamp strength (Pulling in direction of axis)	98 N of pulling force between connector and cable for one minute (Bellcore TA-TSY-00326)	① Insertion loss fluctuation after test: 0.2dB or less ② No irregularity in clamp section or cable
	Repetitive operation	1,000 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 Test in 3 directions, 2 hours each	
	Shock resistance	Acceleration of 981 m/s ² , in 3 directions, 10 times each (Total of 30 times)	
Environmental performance	Humidity resistance (Temperature and humidity cycle)	Temperature -10°C to 65°C, humidity 90 to 96% 10 cycles	No conspicuous corrosion
	Temperature cycle	Temperature -40 to 75°C 42 cycles (Bellcore TA-NWT-00326)	
	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

Part name	Material
Plug housing	Polybutylene terephthalate
Coil spring	Steel
Ferrule	Zirconia
Jack housing	Polybutylene terephthalate
Split sleeve	Copper alloy or zirconia
Housing	Polybutylene terephthalate

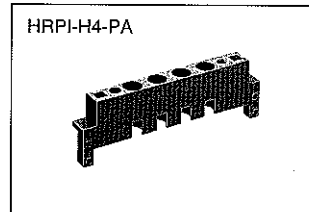
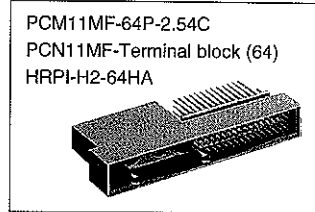
Types



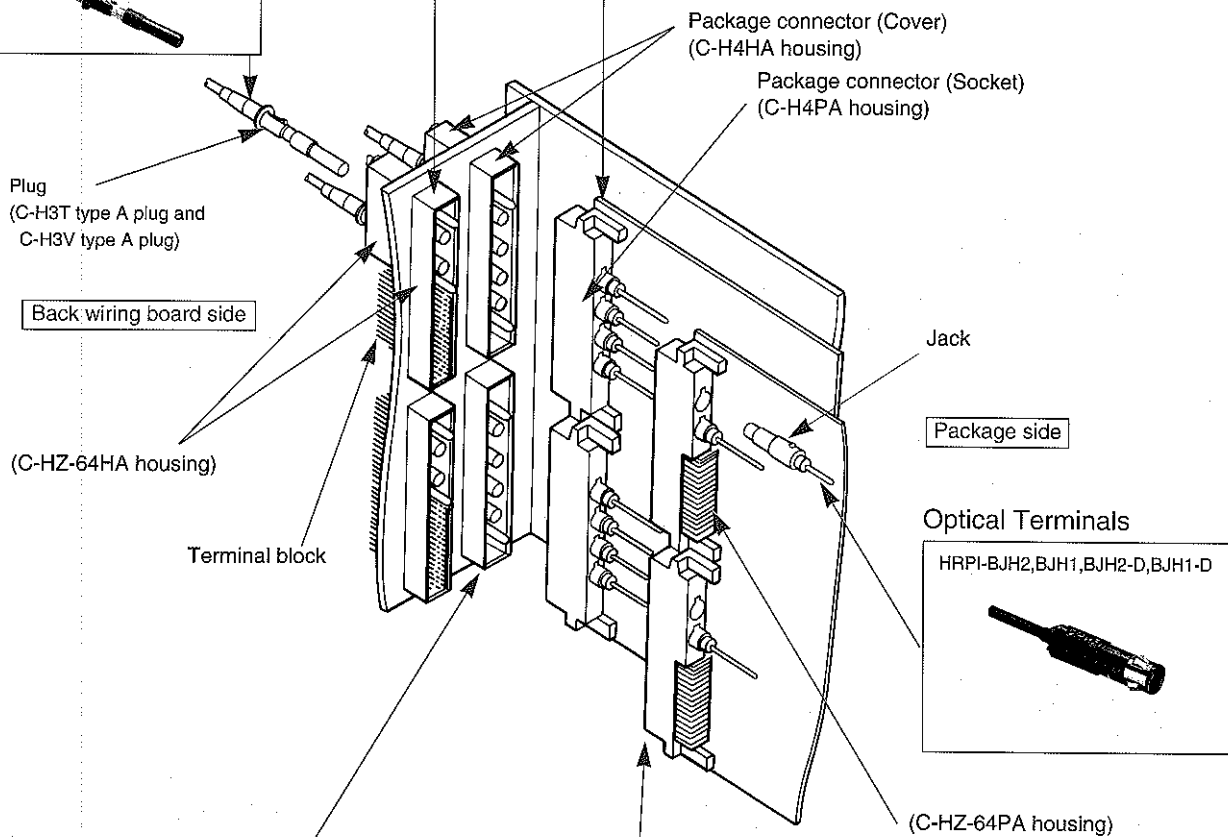
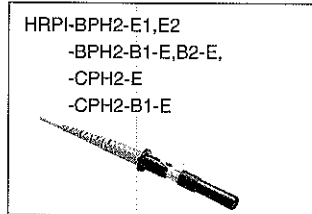
HRPI Connector Function Diagram

Duplex HousingDiagram

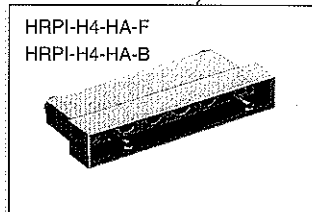
4-Fiber Housing



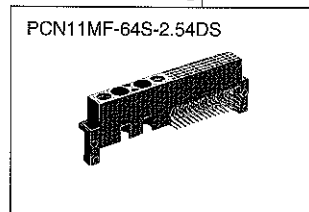
Optical Terminals



4.Fiber Housing



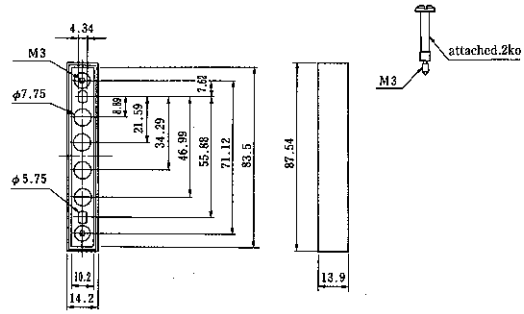
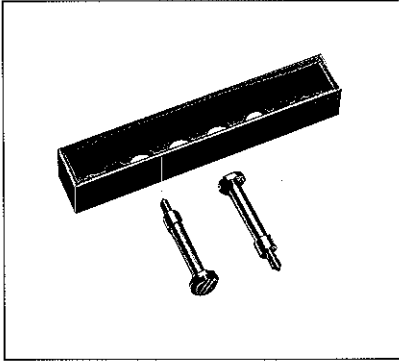
Duplex Housing



※ NTT product names are in parentheses ()

Back Wiring Board Side Connector Housing

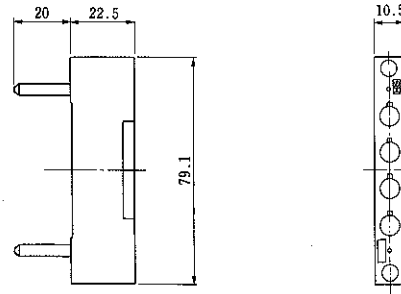
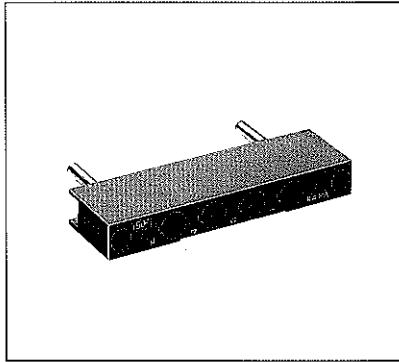
4-Fiber Front Housing



HRS No.	Product Number	Suitable Optical Terminals
CL707-0001-5	HRPI-H4-HA-F	HRPI-BPH2-E1, etc.

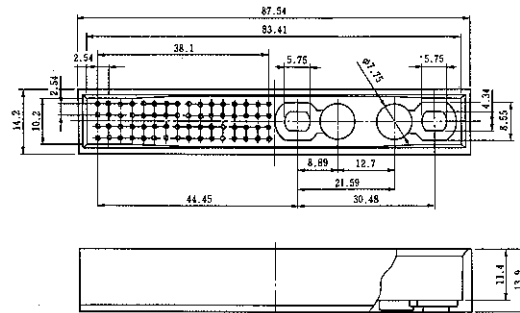
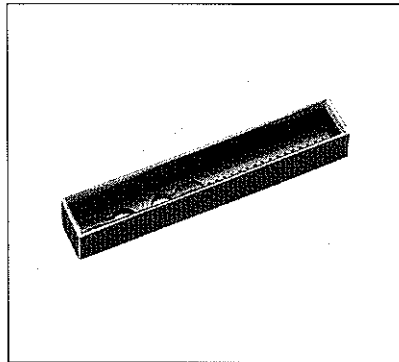
(NOTE)The recommended clamp torque to be 58.8 N

4-Fiber Back Housing



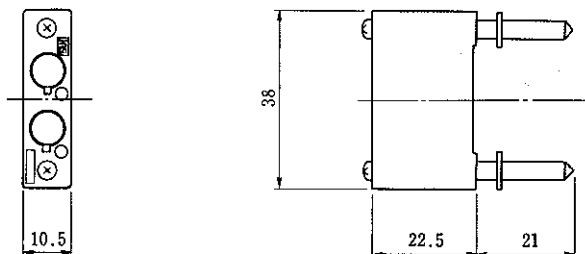
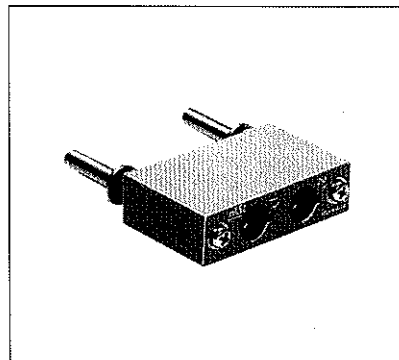
HRS No.	Product Number	Suitable Optical Terminals
CL707-0002-8	HRPI-H4-HA-B	HRPI-BPH2-E1, etc.

Duplex Front Housing



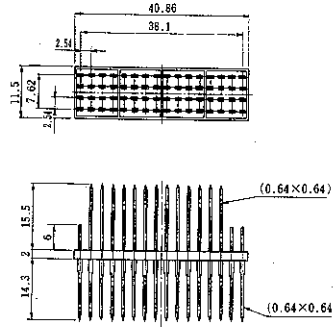
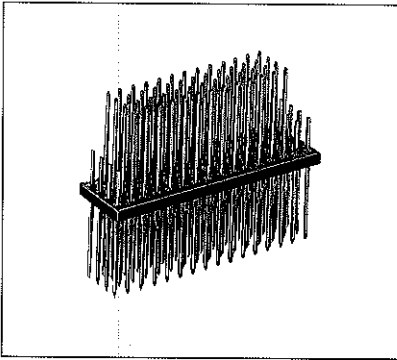
HRS No.	Product Number	Suitable Optical Terminals
CL583-1230-4	PCN11MF-64P-2.54C	HRPI-BPH2-E1, etc.

Duplex Back Housing



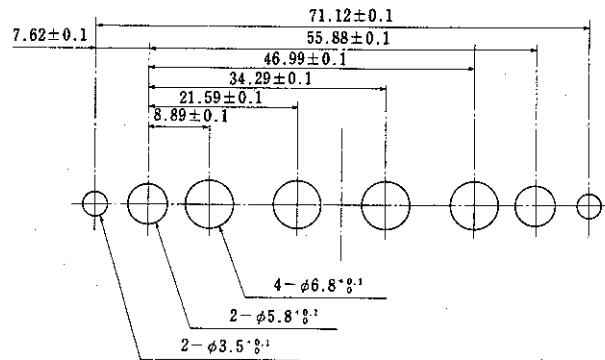
HRS No.	Product Number	Suitable Optical Terminals
CL707-0004-3	HRPI-H2-64HA	HRPI-BPH2-E1, etc.

Terminal Block

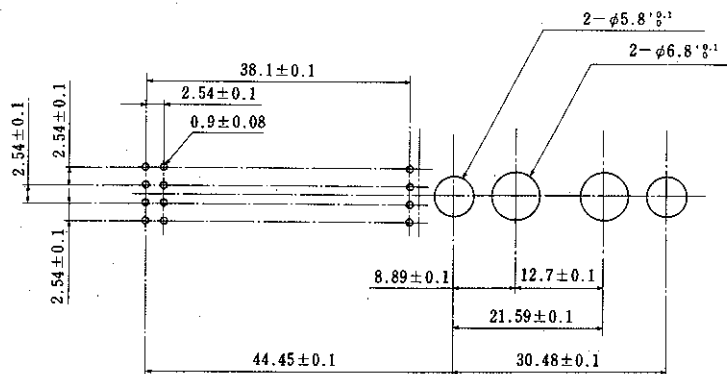


HRS No.	Product Number
CL583-1229-5	PCN11MF-Terminal Block (64)

Reference Mounting Dimensions Diagram



- HRPI-H4-HA-F
- HRPI-H4-HA-B



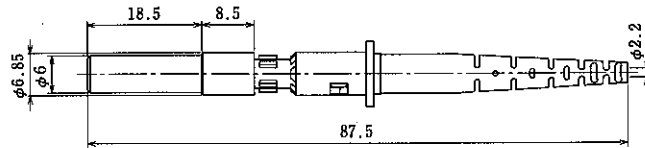
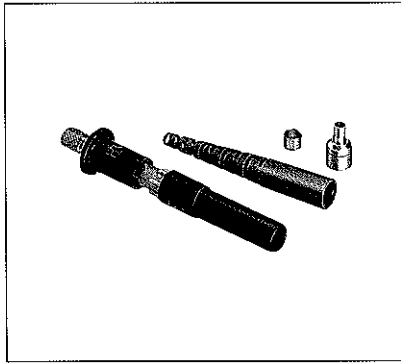
- PCN11MF-64P-2.54C
- PCN11MF-Terminal Block (64)
- HRPI-H2-64HA

Note : Recommended panel thickness to be 2.4mm

■ Back Wiring Board Side Plastic Type Optical Terminals

● Plug for Multimode Fiber

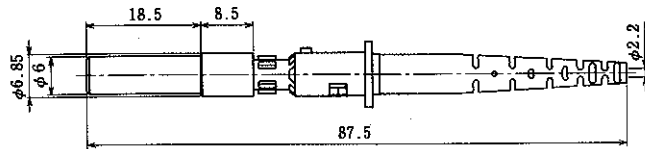
Reinforced Cable Clamp



HRS No.	Product Number	Suitable Fiber	Suitable Cable Diameter	Color of Boot	Polishing Specification
CL707-0041-0	HRPI-CPH2-B1-E	GI-50/125	φ2mm	Blue	PC

● Plug for Single Mode Fibe

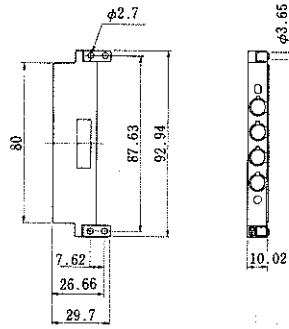
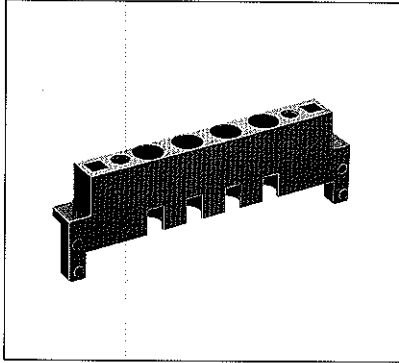
Reinforced Cable Clamp



HRS No.	Product Number	Suitable Fiber	Suitable Cable Diameter	Color of Boot	Polishing Specification
CL707-0038-5	HRPI-BPH2-B1-E	SM-9.5/125	φ2mm	Blue	PC
CL707-0039-8	HRPI-BPH2-B2-E	SM-9.5/125	φ2mm	Light purple	AdPC

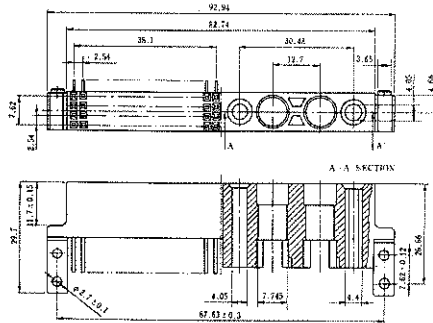
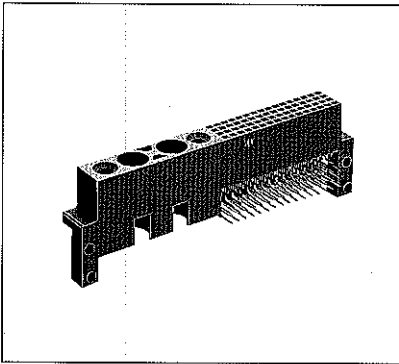
■ Package Side Connector Housing

● 4-Fiber Housing



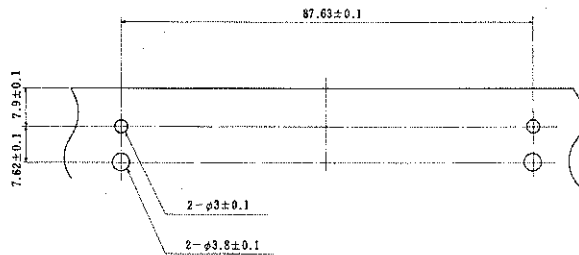
HRS No.	Product Number	Suitable Optical Terminals
CL707-0003-0	HRPI-H4-PA	HRPI-BJH2

● Duplex Housing

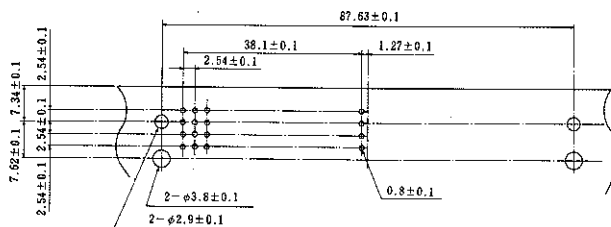


HRS No.	Product Number	Suitable Optical Terminals
CL583-1238-6	PCN11MF-64S-2.54DS	HRPI-BJH2

◆ Reference Mounting Dimensions Diagram



● HRPI-H4-PA

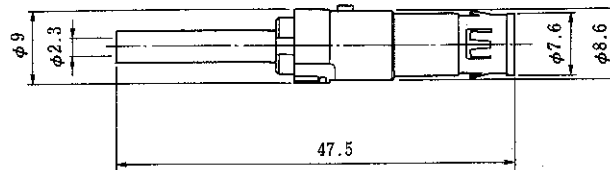
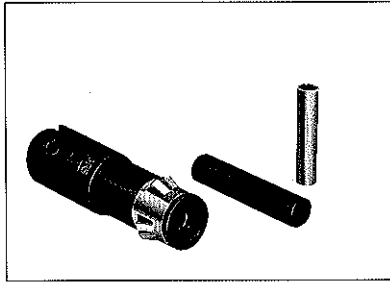


● PCN11MF-64S-2.54DS

Note : Recommended panel thickness to be 2.4mm

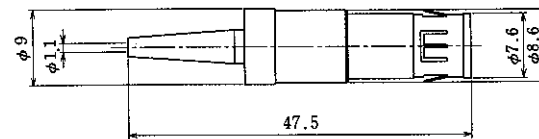
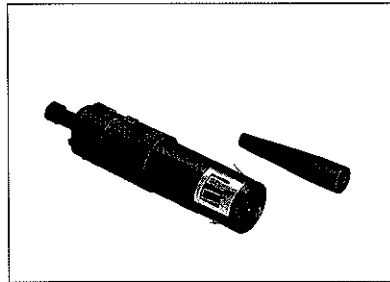
■ Package Side Terminals

● Optical Terminals (Jack)



HRS No.	Product Number	Suitable Fiber	Suitable Cable	Split Sleeve Specification
CL707-0007-1	HRPI-BJH2	SM-9.5/125,GI-50/125	$\phi 2$ mm	Copper alloy
CL707-0016-2	HRPI-BJH2-D	SM-9.5/125,GI-50/125	$\phi 2$ mm	Zirconia

● Optical Terminals for Cable (Jack)



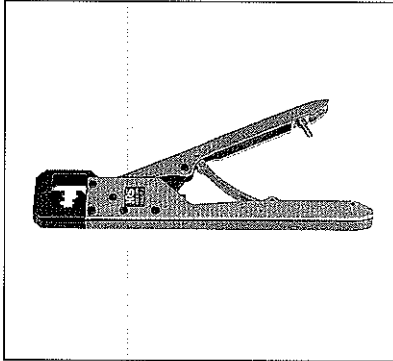
HRS No.	Product Number	Suitable Fiber	Suitable Cable	Split Sleeve Specification
CL707-0042-2	HRPI-BJH1	SM-9.5/125,GI-50/125	$\phi 0.9$ mm	Copper alloy
CL707-0029-4	HRPI-BJH1-D	SM-9.5/125,GI-50/125	$\phi 0.9$ mm	Zirconia

■ Ferrules

Please use a zirconia ferrule that suits to the SC type optical fiber connector. (See page 28.)

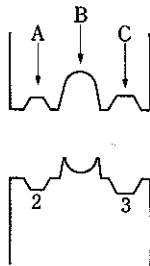
■Tools

●Crimping Tool



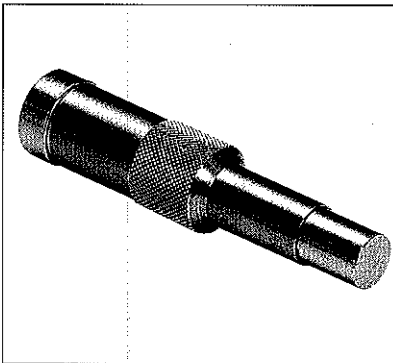
HRS No.	Product Number	Suitable Connectors	Notes
CL704-0287-0	HSC-T3	HRPI-BPH2 HRPI-CPH2	Same as the SC tool

<Usage>



- (1)Area "A" for 2mm dia. cable jacket crimping (indicated at "2")
Area "C" for 3mm dia. cable jacket crimping (indicated at "3")
(2)Area "B" for Kevlar crimping

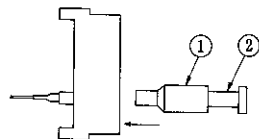
●Terminal Extraction Tool



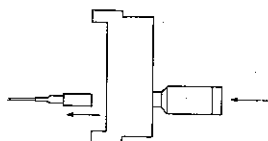
HRS No.	Product Number	Suitable Connectors
CL350-0104-7	PO73-T-HPJRMV	HRPI-BJH2, PO73-J-2.5CV

Usage : Used when removing the HRPI-BJH2 from the package side housing. (See diagram below.)

1. Insert the PO73-T-HPJRMV, from which piston ② has already been retracted, into the package side housing (into which HRPI-BJH2 is mounted).

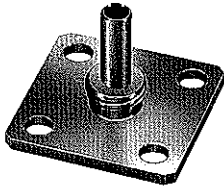


2. Press piston ② while portion ① remains pressed into the package side housing.



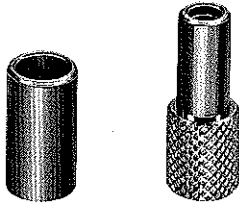
■ Connectors for Measurement Applications

HRPI-R-L

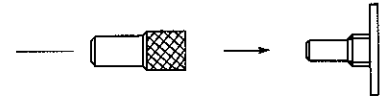


Usage : Attach the connector to a measuring instrument such as a sensor and use for making measurements such as optical power. (See diagram below.)

HRPI-R-A



● For HRPI-BPH2-E, CPH2-E and other measurements



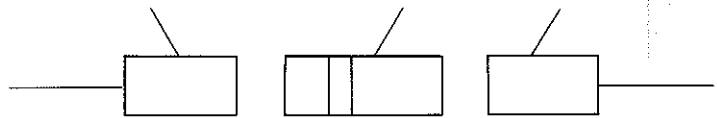
● For HRPI-BJH2



HRS.No.	Product Number	Notes
—	HRPI-R-L	For main unit with lens attached, and optical power measurements
CL707-0043-5	HRPI-R-A	Plug and jack attachment

Usage : Used in performance measurements of wired plug-in connectors. (See diagram below.)

HRPI-BPH2-E or HRPI-CPH2 HRPI-A-T1 HRPI-BJH2

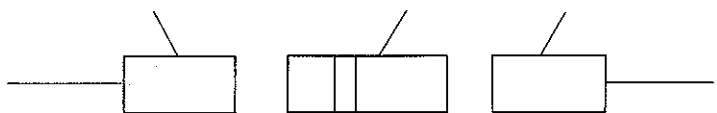


HRS No.	Product Number	Notes
CL707-0008-4	HRPI-A-T1	For loss measurements

NOTE: A special terminal extraction tool, PO73-T-HPJRMV (CL350-0104-7) is required when removing HRPI-BJH2 from HRPI-A-T1.

Usage : Used in the adjustment of the offset direction of the wired plug-in connector. (See diagram below.)

HRPI-BPH2 HRPI-A-T2 HRPI-BJH2

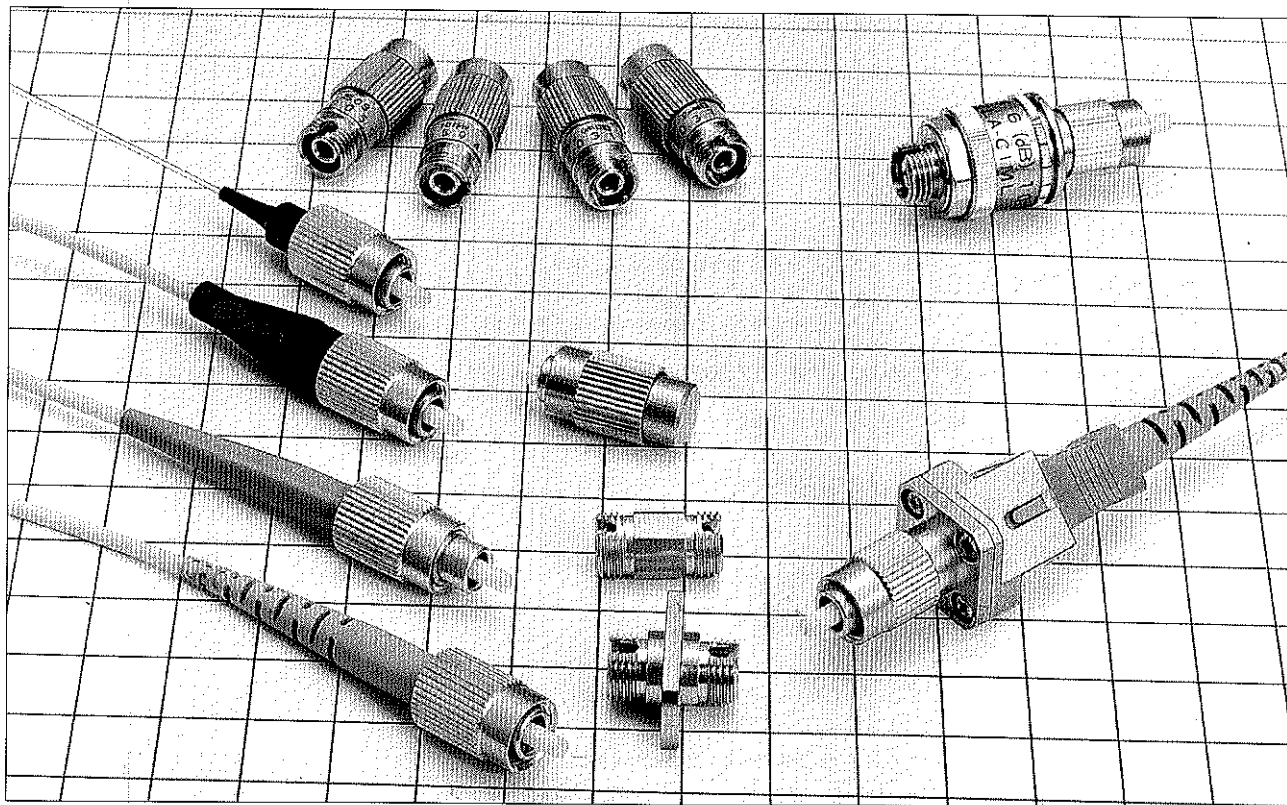


HRS No.	Product Number	Notes
CL707-0009-7	HRPI-A-T2	For adjustment of the offset direction

NOTE: A special terminal extraction tool, PO73-T-HPJRMV (CL350-0104-7) is required when removing HRPI-BJH2 from HRPI-A-T2.

FC-type Optical Fiber Connectors

HRFC Series



■ Features

1. JIS C 5970 (CF01-type Simplex Optical Fiber Connector)

Standard Compliance

These connectors correspond to the NTT FC-type optical fiber connectors.

JIS C 5970 (CF01-type simplex optical fiber connectors)

IEC 60874-7

2. Cost Effective Type

A single-body, cost-effective type is available in which the frame and key ring are made of zinc die cast.

3. Polishing

Available with PC polishing, Advanced PC (AdPC) polishing, and Angle PC (APC) polishing.

■ Applications

Public communications lines, CATV, measuring instruments, etc.

Product Standards

Rating	Operating temperature range	-25°C~70°C	Storage temperature range	-25°C~70°C
--------	-----------------------------	------------	---------------------------	------------

	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, AdPC)
	Reflection attenuation	(SM) 1,300nm wavelength (LD)	22 dB or greater (PC) 40 dB or greater (AdPC) 60 dB or greater (APC)
		(GI)	22 dB or greater (PC)
Mechanical Performance	Split sleeve holding force of the adapter	φ2.499 ±0.0005mm zirconia gauge	Phosphor bronze 2 to 5.9 N Zirconia 2 to 3.9 N
	Cable clamp strength (Pulling in direction of axis)	98 N of pulling force between connector and cable for one minute (Bellcore TA-TSY-00326)	1) Insertion loss fluctuation after test: 0.2dB or less 2) No irregularity in clamp section or cable
	Repetitive operation	1,000 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 Test in 3 directions, 2 hours each	
	Shock resistance	Acceleration of 981 m/s ² , in 3 directions, 10 times each (Total of 30 times)	
Environmental performance	Humidity resistance (Temperature and humidity cycle)	Temperature -10°C to 65°C, humidity 90 to 96% 20 cycles	1) Insertion loss fluctuation after test: 0.2 dB or less 2) No damage, cracks, or part looseness
	Temperature cycle	Temperature -40 to 75°C 42 cycles (Bellcore TA-NWT-00326)	
	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	No conspicuous corrosion

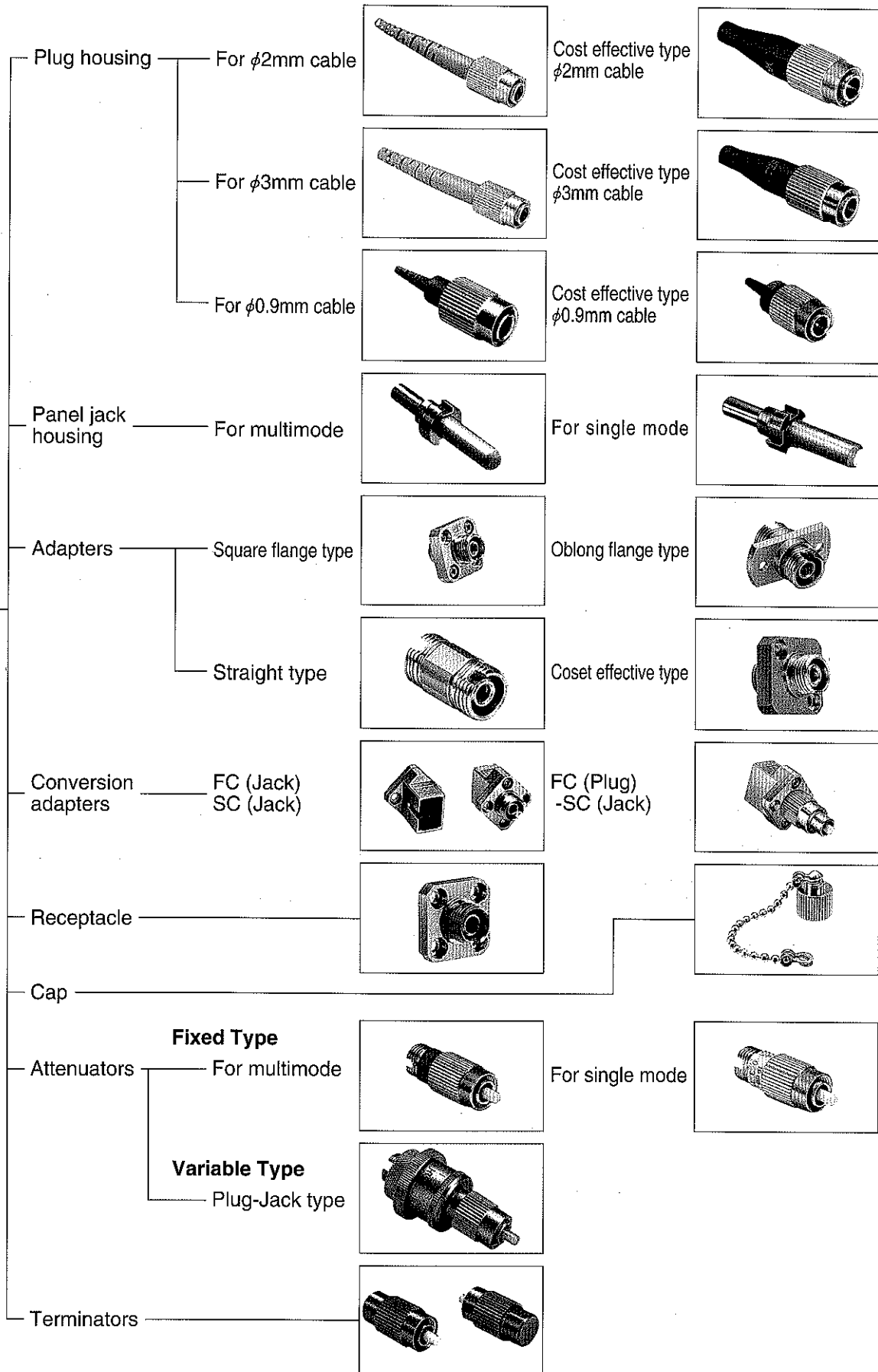
See Page 91 for fixed attenuators, and Page 97 for variable attenuators.

Materials

Part name	Material
Plug housing	Brass
Coil spring	Stainless steel
Ferrule	Stainless steel + Alumina Zirconia
Adapter housing	Brass
Split sleeve	Copper alloy
Receptacle housing	Brass
Attenuator housing	Stainless steel

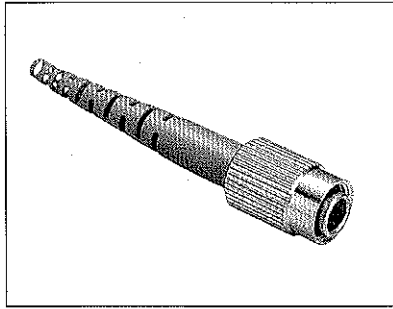
Types

HRFC-type Connectors

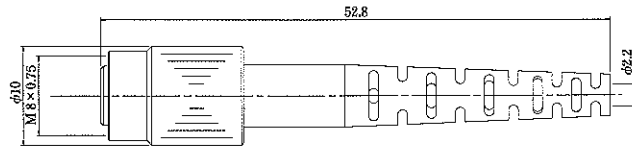


■ Plug Housing Cost effective Type

● For $\phi 2\text{mm}$ Cable

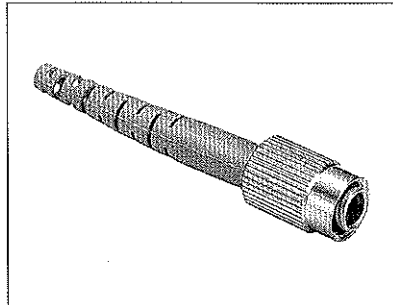


NOTE: For cable mounting tools, see page 57.

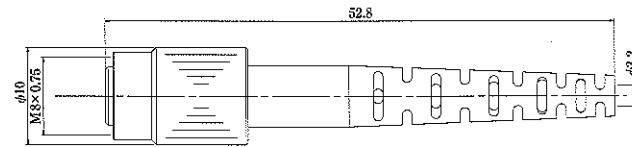


HRS No.	Product Number	Color of Boot	Polishing Specification
CL701-0075-3	HRFC-P8-H2	Blue	PC
CL701-0077-9	HRFC-P8-L2	Light purple	AdPC

● For $\phi 3\text{mm}$ Cable

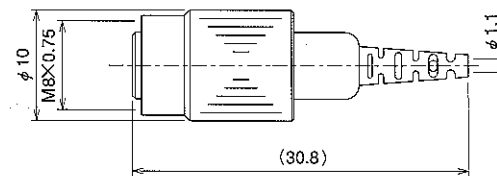
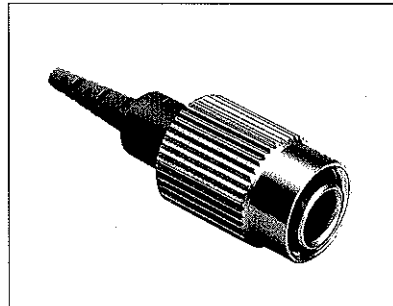


NOTE: For cable mounting tools, see page 57.



HRS No.	Product Number	Color of Boot	Polishing Specification
CL701-0074-0	HRFC-P8-H3	Blue	PC
CL701-0078-1	HRFC-P8-L3	Light purple	AdPC

● For $\phi 0.9\text{mm}$ Cable

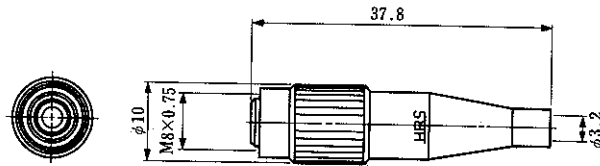
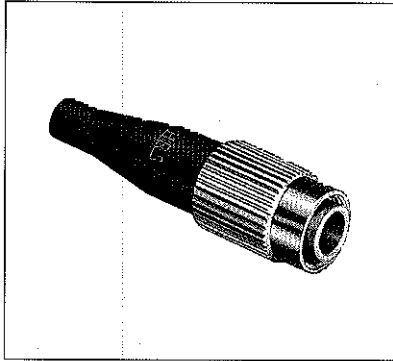


HRS No.	Product Number
CL701-0095-0	HRFC-P12-H

■ Plug Housing General Product (JIS Standard Correspondence)

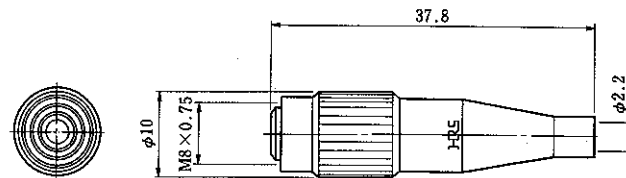
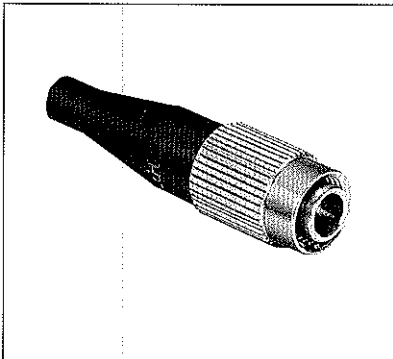
NOTE: These plug housings should be used in conjunction with ferrules.

● Plug Housing



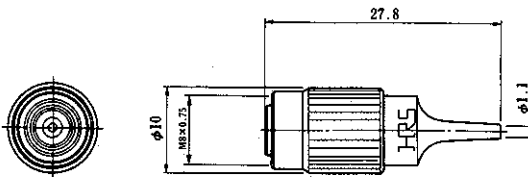
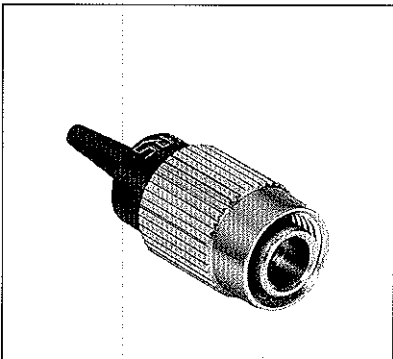
HRS No.	Product Number	Suitable Cable Diameter
CL701-0001-7	HRFC-P1-H	φ3mm

● Plug Housing



HRS No.	Product Number	Suitable Cable Diameter
CL701-0001-7-04	HRFC-P1-H(04)	φ2mm

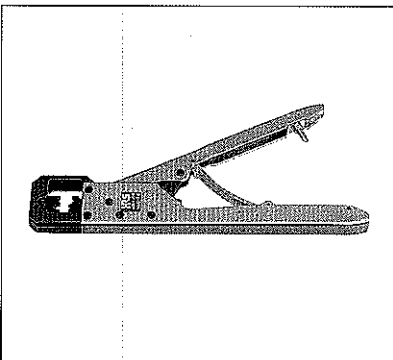
● Plug Housing



HRS No.	Product Number	Suitable Cable Diameter
CL701-0041-1	HRFC-P6-H	φ0.9mm

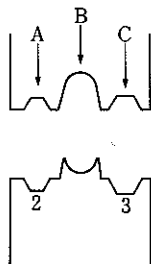
■ Tool

● Crimping Tool



HRS No.	Product Number	Suitable Connector	Notes
CL704-0287-0	HSC-T3	HRFC-P8-H2,L2,G2, HRFC-P8-H3,L3,G3, HRFC-P1-H, HRFC-P1-H (04)	same tool as SC

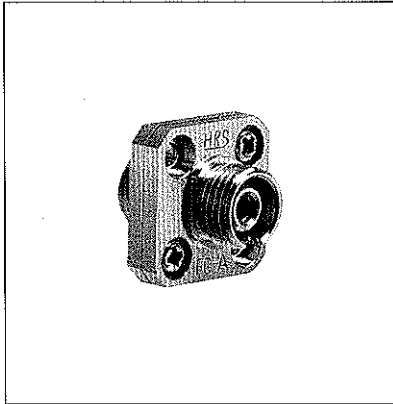
<Usage>



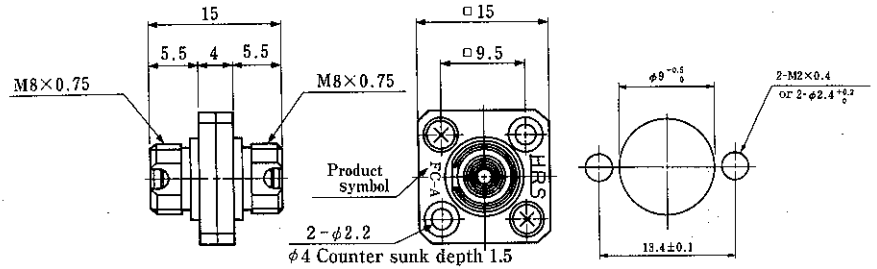
- (1) Area "A" for 2mm dia. cable jacket crimping
Area "C" for 3mm dia. cable jacket crimping
(2) Area "B" for kevlar crimping

■ Features

● Plug Housing



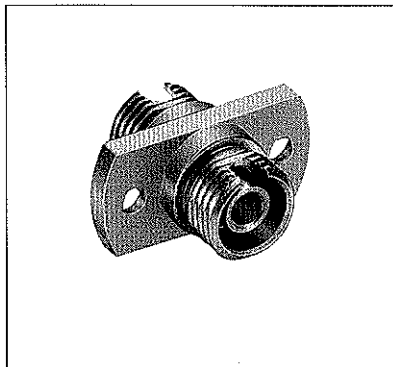
◆ Mounting Hole Dimensions Diagram



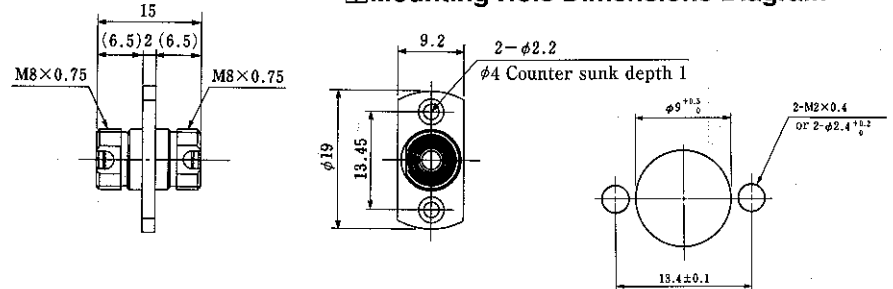
HRS No.	Product Number	Symbol	Spilt sleeve	Polishing Specification	Notes
CL701-0014-9-02	HRFC-PA1-G1(02)	FC-A	Copper alloy	Pc. Adpc	
CL701-2000-5	HRFC-PA15-D1	FC-AA	Zirconia	APC	Note

NOTE : To couple the plug, don't give an excessive force.

● Plug Housing

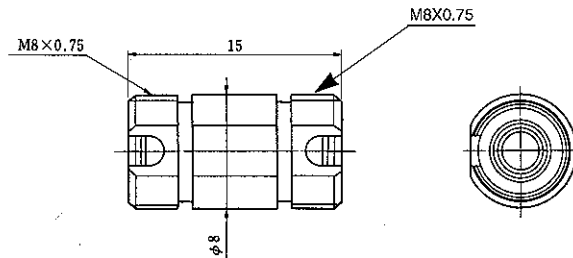
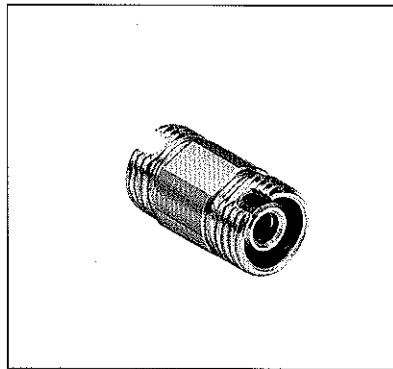


◆ Mounting Hole Dimensions Diagram



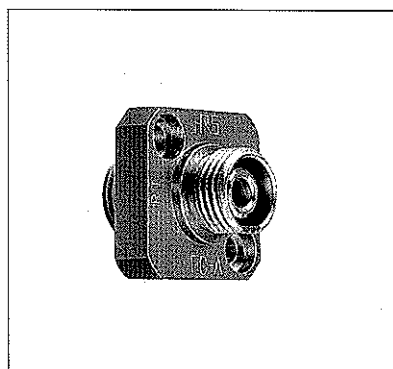
HRS No.	Product Number	Spilt sleeve
CL701-0068-8	HRFC-PA4-G1	Copper alloy

● Plug Housing

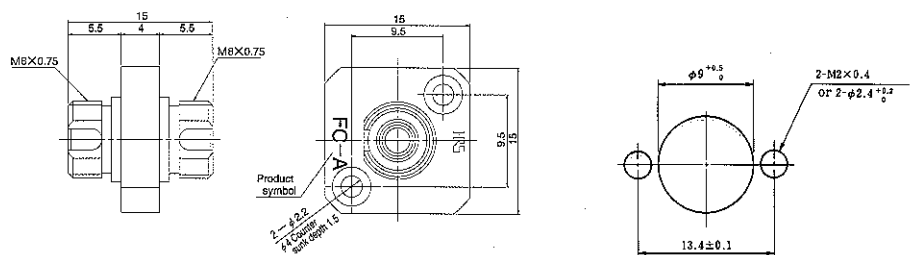


HRS No.	Product Number	Spilt sleeve
CL701-0039-0	HRFC-A2-SF	Copper alloy

● Plug Housing



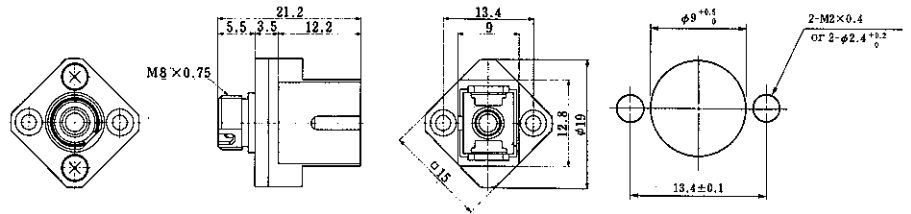
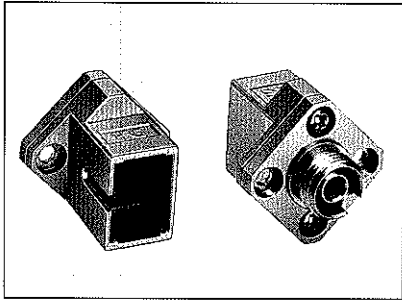
◆ Mounting Hole Dimensions Diagram



HRS No.	Product Number	Spilt sleeve
701-0071-2	HRFC-PA11-G1	Copper alloy

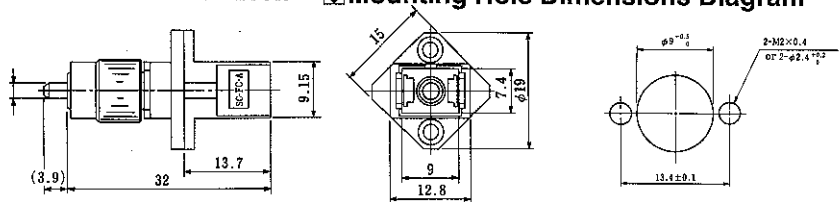
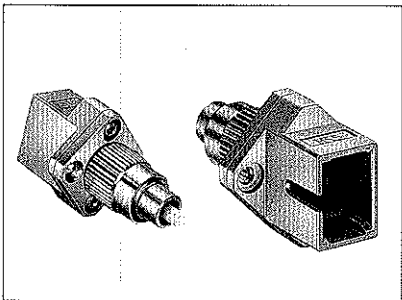
■ Conversion Adapters

● Form of Coupling Portion: FC (Jack) to SC (Jack) ◆ Mounting Hole Dimensions Diagram



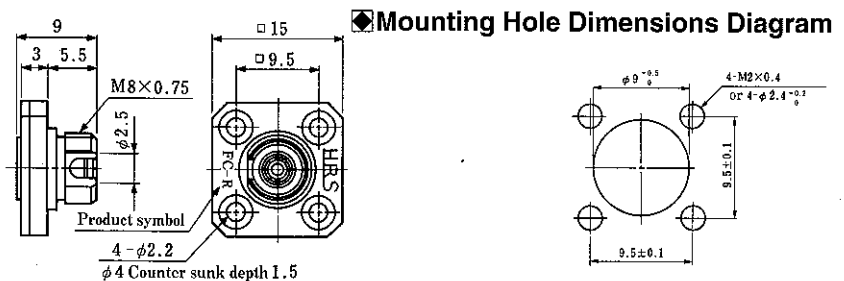
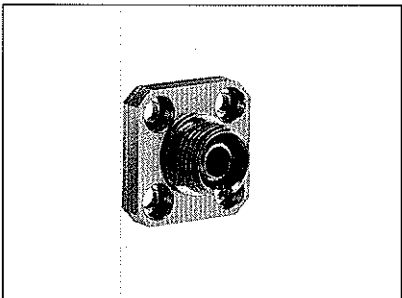
HRS No.	Product Number	Spilt sleeve	Notes
CL704-0021-3	HSCJ-HRFCJ-B	Copper alloy	SC to FC conversion adapter

● Form of Coupling Portion: FC (Plug) to SC (Jack) ◆ Mounting Hole Dimensions Diagram



HRS No.	Product Number	Polishing Type	Optical Fiber	Spilt sleeve	Notes
CL701-0065-0	HRFCP-HSCJ-1	PC	GI-50/125	Copper alloy	The guide key of the FC plug end and the guide of the SC adapter end do not necessarily match.
CL701-0108-0	HRFCP-HSCJ-1AS	AdPC			
CL701-0085-7	HRFCP-HSCJ-2	PC	SM-9.5/125		
CL701-0109-3	HRFCP-HSCJ-2AS	AdPC			

■ Receptacles

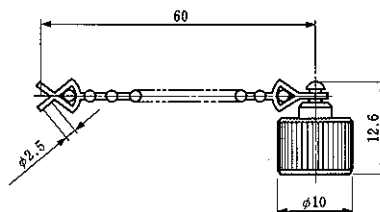
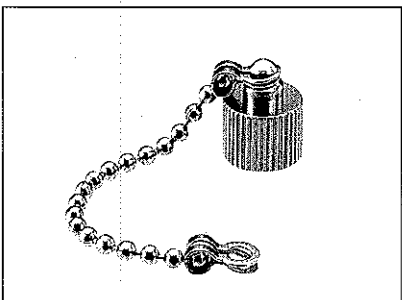


HRS No.	Product Number	φ2.5 Dimension Tolerance	NOTE
CL701-0016-4	HRFC-R1	+0.011 +0.001	GI
CL701-0023-0	HRFC-R2	+0.003 0	SM

■ Ferrules

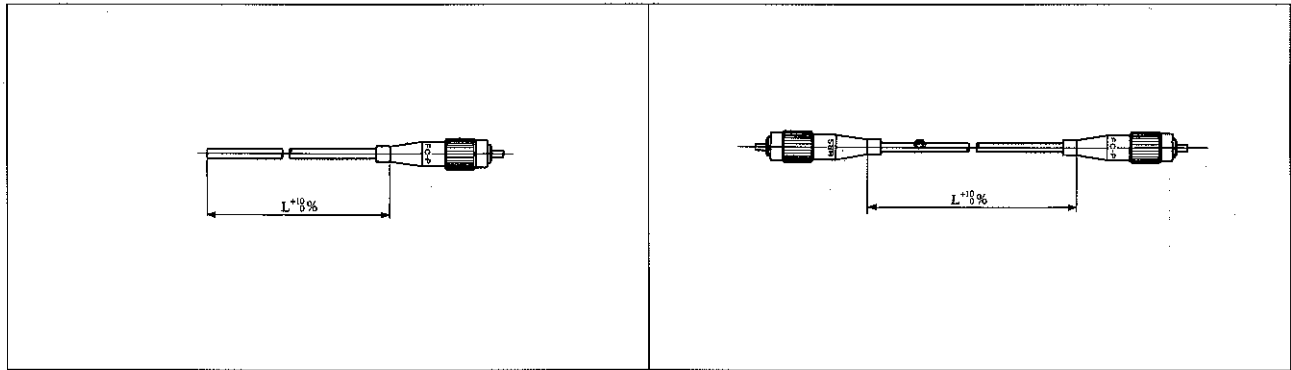
Please use zirconia ferrules for use with SC-type optical fiber connectors. We also have stainless capillary ferrules available. Please contact us about these.

■ Caps



HRS No.	Product Number
CL701-0019-2	HRFC-C1

■ Connectors with Cable Attached



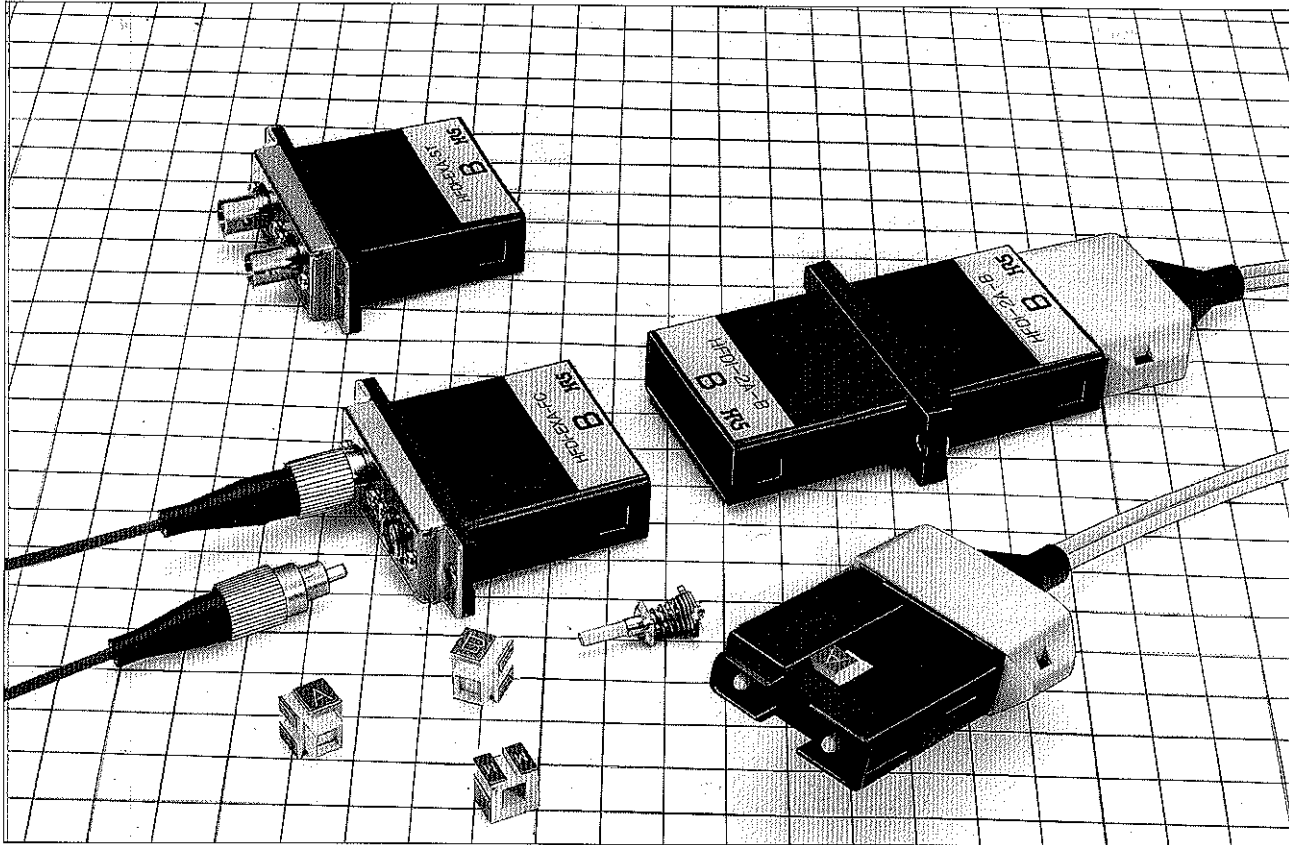
HRS No.	Product Number	Connector Mounting End	Optical Fiber	Type of Polishing	Cable Diameter	Ferrule Used
CL701-1027-6	HRFC-SP2-F3B-L	Both ends	GI-50/125	PC	φ3	Zirconia
CL701-1026-3	HRFC-SP2-F3A-L	Both ends	SM-9.5/125		φ2	
CL701-1028-9	HRFC-SP2-F3P-L	Both ends	GI-50/125			
CL701-1029-1	HRFC-SP2-F3Q-L	Both ends	SM-9.5/125			
-	HRFC-ASP1-F3A-L	One end	SM-9.5/125	AdPC	φ3	Zirconia
-	HRFC-ASP2-F3A-L	Both ends				
-	HRFC-ASP1-F3Q-L	One end			φ2	
-	HRFC-ASP2-F3Q-L	Both ends				

NOTE1: The "L" within the Product Number indicates the length of the cable illustrated in the diagram. Please specify values in meter units.

NOTE2: We will custom manufacture a great variety of conversion cables and products other than the aforementioned items to suit your needs.

Optical Connectors for 100Mbps Backbone LAN

HFDI Series



■ Features

1. FDDI Specification

These duplex connectors for use with multimode optical fiber are suited to 100 Mbps backbone LAN based on the FDDI specification.

2. Simple Field Work, Simple Product Inventory

Use of a key block permits one type of main unit to correspond to 4 types of keys (A, B, M, and S). This convenience offers the following advantages:

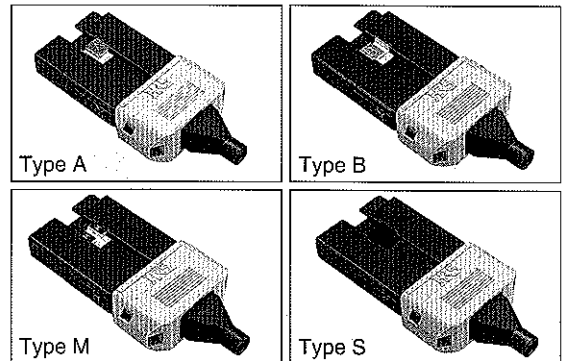
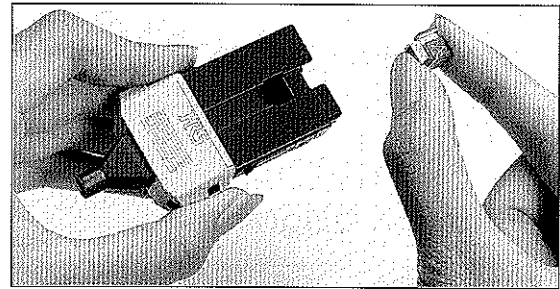
(1) In field work, having one kind of main unit and one key block will permit correspondence with all 4 types of keys (A, B, M, and S).

(2) Also in product inventory, stocking one kind of main unit and key blocks will permit correspondence with the various keys and simplify inventory work.

3. Lock Structure

A slide lock cover system has been used which allows operation from whichever direction is desired. In this design the lock cover is not exposed which means the lock will not be accidentally released even if it is bumped.

Key-Conversion Type



■ Applications

LAN, computer transfer systems, etc.

Product Standards

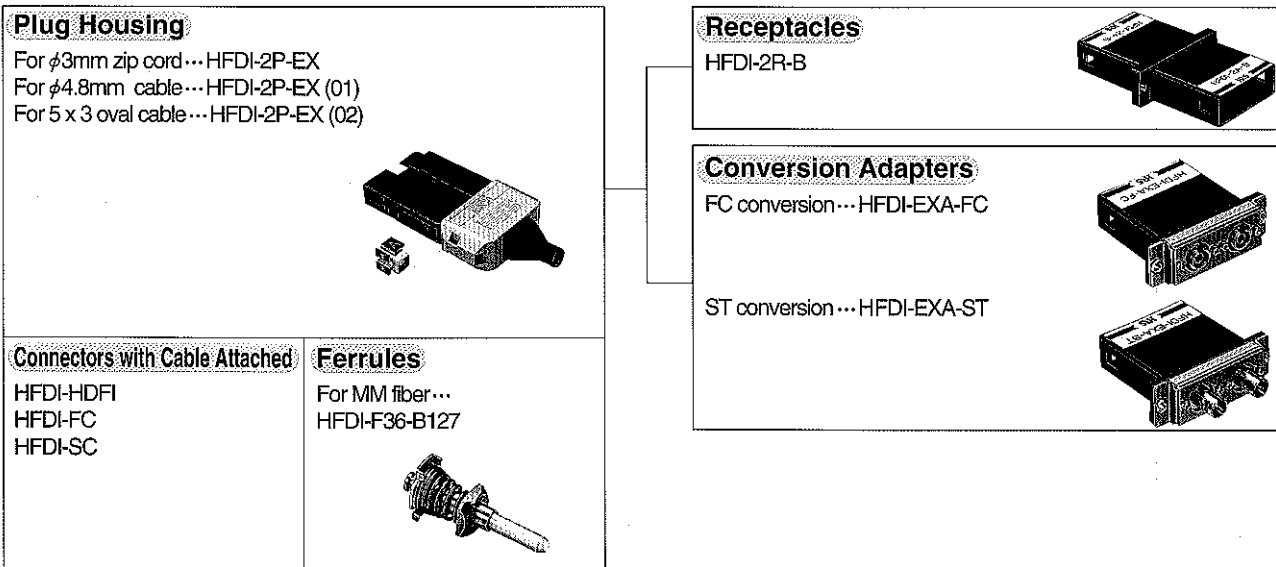
Rating	Operating temperature range	-25°C~70°C	Storage temperature range	-25°C~85°C
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	Item	Test Method (JIS C 5961)	Standard
Optical Performance	Insertion loss	1,300nm wavelength (LD)	0.3 dB or less (PC) 0.7 dB or less (flat)
	Reflection attenuation	1,300nm wavelength (LED)	22 dB or greater (PC)
Mechanical Performance	Coupling force and separation force	Measure when connectors are coupled and separated in the direction of the axis.	Coupling force 39.2 N or less Separation force 39.2 N or less
	Cable clamp strength (Pulling in direction of axis)	70 N of pulling force between connector and cable	1) Insertion loss fluctuation after test:0.2 dB or less 2) No irregularity in clamp section or cable
	Repetitive Operation	500 times	
	Vibration resistance	Vibration range of 10 to 55 Hz, in 3 directions, 3 hours each	
	Shock resistance	Acceleration of 981 m/s ² , in 3 directions, 3 times each	1) Insertion loss fluctuation after test:0.2 dB or less 2) No damage, cracks, or part looseness
Environmental performance	Humidity resistance (Temperature and humidity cycle)	Temperature, -10°C to 65°C Humidity 90 to 96% 10 cycles	
	Temperature cycle	Temperature -25 to 70°C 100 cycles	
	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	No conspicuous corrosion

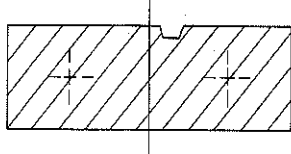
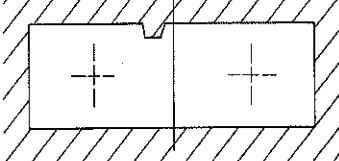
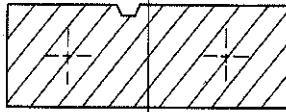
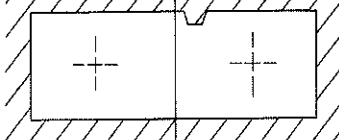
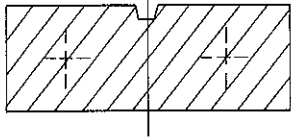
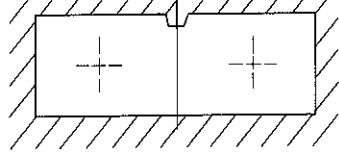

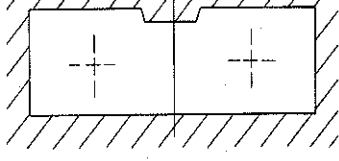
Materials

Part name	Material
Plug housing	Polybutylene terephthalate
Coil spring	Stainless steel
Ferrule	Zirconia
Adapter housing	Polybutylene terephthalate
Split sleeve	Copper alloy

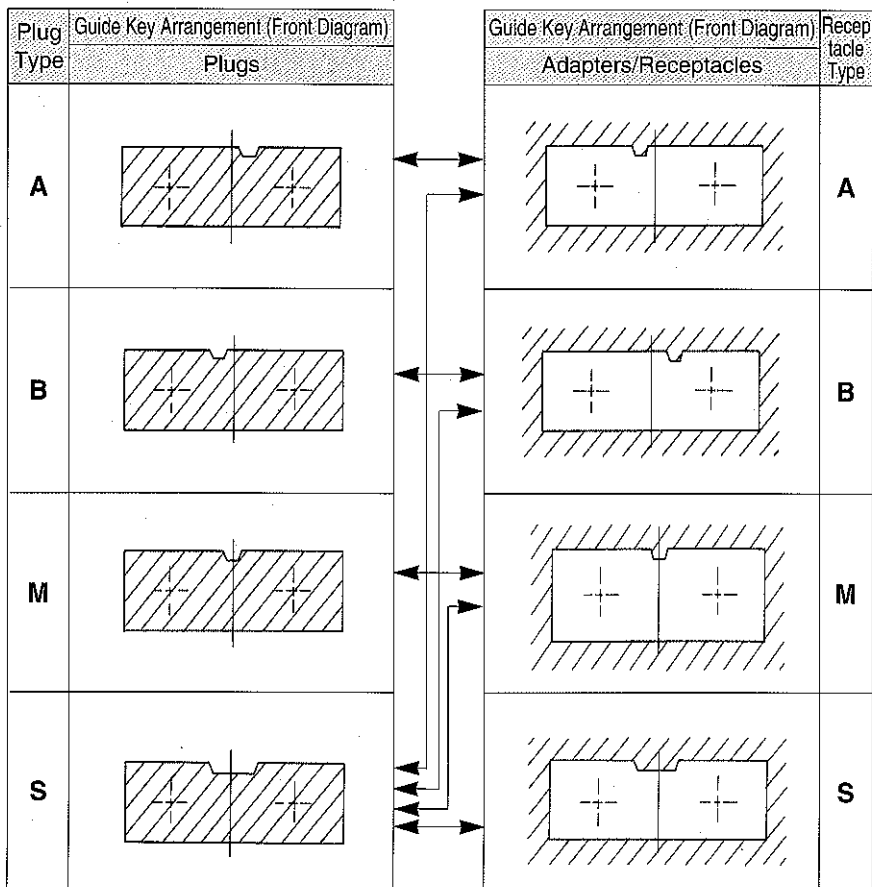
Function Diagram



■ Guide Key Arrangement

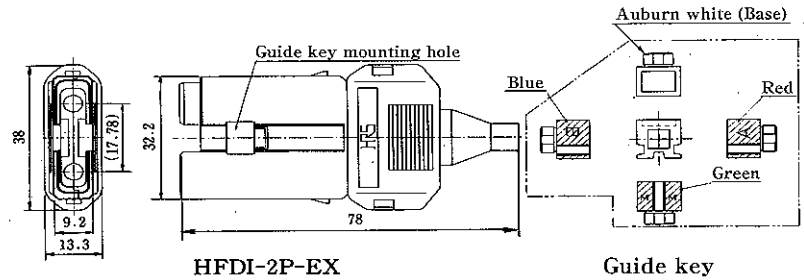
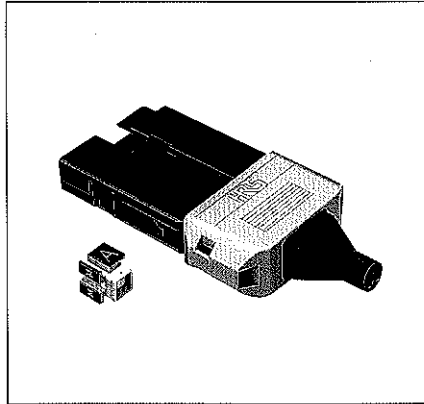
Type	Guide Key Arrangement (Front Diagram)	
	Plugs	Adapters/Receptacles
A		
B		
M		
S		

■ Connection Pattern



■ Plug Housing

● Key-Conversion Type



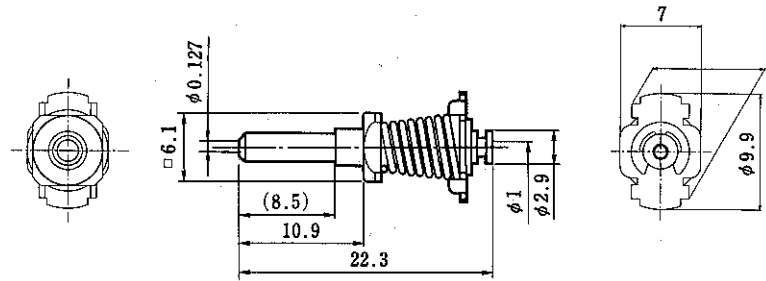
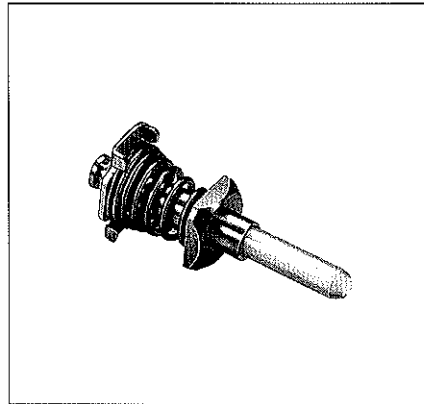
HFDI-2P-EX

Guide key

HRS No.	Product Number	Suitable Cable
CL705-0057-7	HFDI-2P-EX	φ3mm zip cable
CL705-0057-7-01	HFDI-2P-EX(01)	φ4.8mm cable
CL705-0057-7-02	HFDI-2P-EX(02)	5 x 3 oval cable

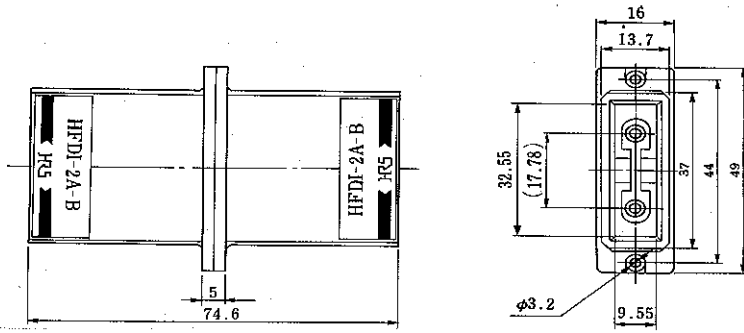
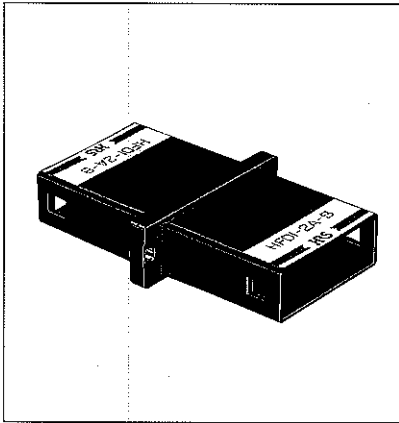
NOTE: When using with guide key S, remove the guide key from the housing.

■ Ferrule



HRS No.	Product Number	Suitable Optical Fiber
CL705-0043-2-01	HFDI-F36-B127	GI-50/125, GI-62.5/125

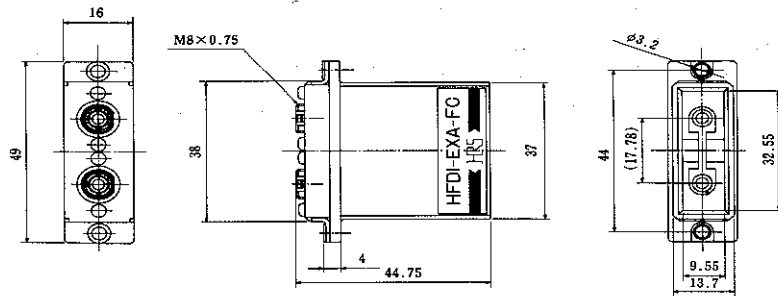
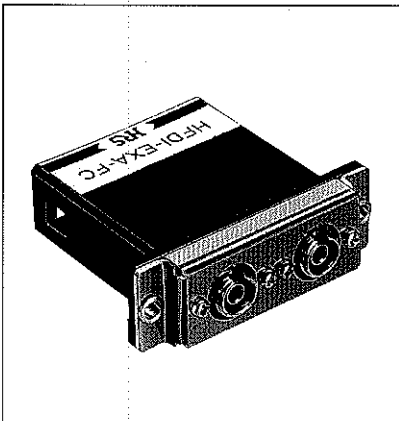
Adapters



HRS No.	Product Number	Guide Key Type
CL705-0024-8	HFDI-2A-B	None
CL705-0025-0	HFDI-2A-B (A)	A
CL705-0026-3	HFDI-2A-B (B)	B
CL705-0027-6	HFDI-2A-B (M)	M
CL705-0028-9	HFDI-2A-B (S)	S

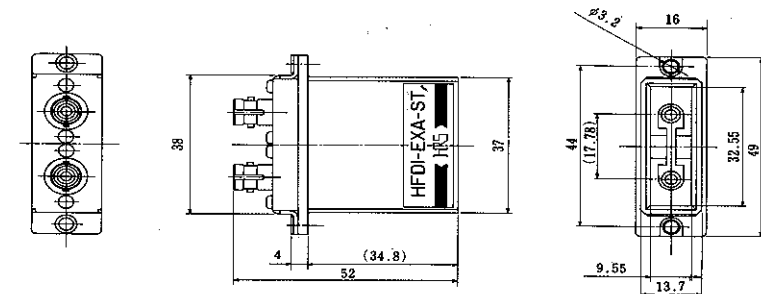
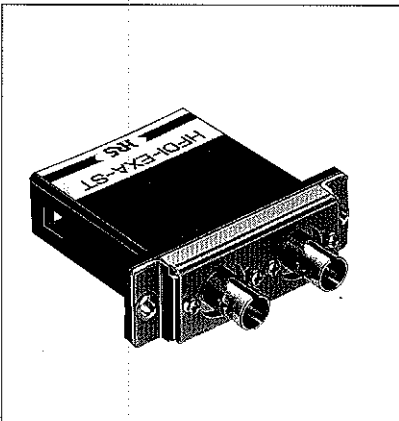
Conversion Adapters

FC Conversion Type



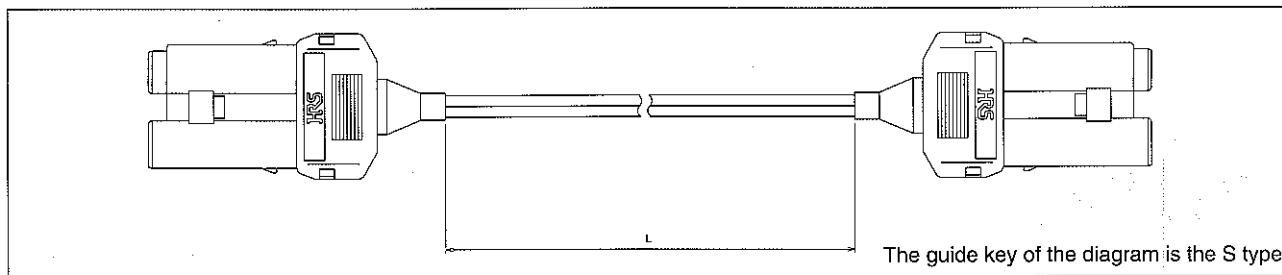
HRS No.	Product Number	Guide Key Type	Notes
CL705-0016-0	HFDI-EXA-FC	None	FDDI to FC conversion adapter
CL705-0017-2	HFDI-EXA-FC (A)	A	
CL705-0018-5	HFDI-EXA-FC (B)	B	
CL705-0019-8	HFDI-EXA-FC (M)	M	
CL705-0020-7	HFDI-EXA-FC (S)	S	

ST Conversion Type



HRS No.	Product Number	Guide Key Type	Notes
CL705-0029-1	HFDI-EXA-ST	None	FDDI to ST conversion adapter
CL705-0030-0	HFDI-EXA-ST (A)	A	
CL705-0031-3	HFDI-EXA-ST (B)	B	
CL705-0032-6	HFDI-EXA-ST (M)	M	
CL705-0033-9	HFDI-EXA-ST (S)	S	

■Connectors with Cable Attached



Product Number	Connector Mounting End	Suitable Optical Fiber	Type of Polishing	Reflection Attenuation	Cable Diameter	Housing
HFDI-FP1-F3BW-L	One end	GI-50/125	Flat	—	φ3 zip cord	HFDI-2P-EX
HFDI-FP2-F3BW-L	Both ends					
HFDI-FP1-F3CW-L	One end	GI-62.5/125				
HFDI-FP2-F3CW-L	Both ends					
HFDI-SP1-F3BW-L	One end	GI-50/125	PC	≥22		
HFDI-SP2-F3BW-L	Both ends					
HFDI-SP1-F3CW-L	One end	GI-62.5/125				
HFDI-SP2-F3CW-L	Both ends					

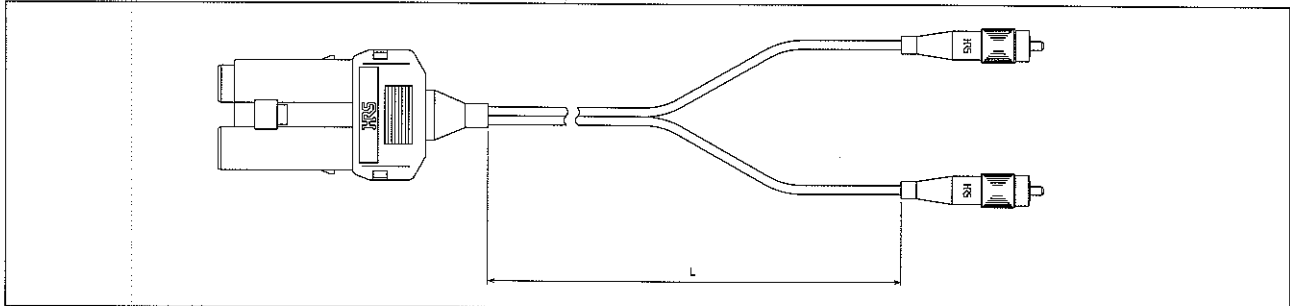
※The guide key part will be appended.

※The "L" within the Product Number indicates the length of the cable illustrated in the diagram.

Please specify values in meter units.

■ Conversion Cables

● FC Conversion Type



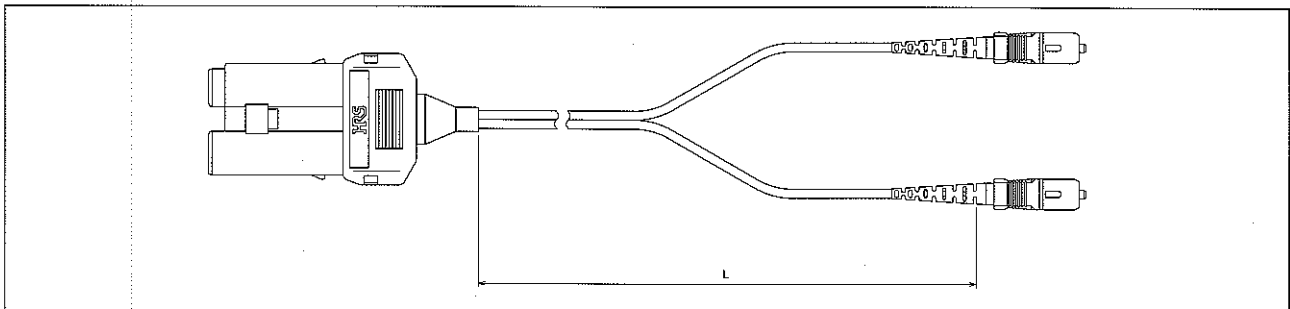
The guide key of the diagram is the S type.

HRS No.	Suitable Optical Fiber	Type of Polishing	Reflection Attenuation	Cable Diameter	Housing
CA011055-FBW-L	GI-50/125	Flat	-	φ3 zip cord	HFDI-2P-EX or HRFC-P1-H
CA011055-FCW-L	GI-62.5/125				
CA011055-SBW-L	GI-50/125	PC	≥22		
CA011055-SCW-L	GI-62.5/125				

※The guide key part will be appended.

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

● SC Conversion Type



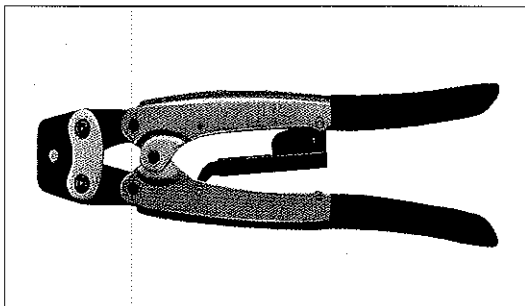
The guide key of the diagram is the S type.

HRS No.	Suitable Optical Fiber	Type of Polishing	Reflection Attenuation	Cable Diameter	Housing
CA041055-FBW-L	GI-50/125	Flat	-	φ3 zip cord	HFDI-2P-EX or HSC-PH3-A2
CA041055-FCW-L	GI-62.5/125				
CA041055-SBW-L	GI-50/125	PC	≥22		
CA041055-SCW-L	GI-62.5/125				

※The guide key part will be appended.

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

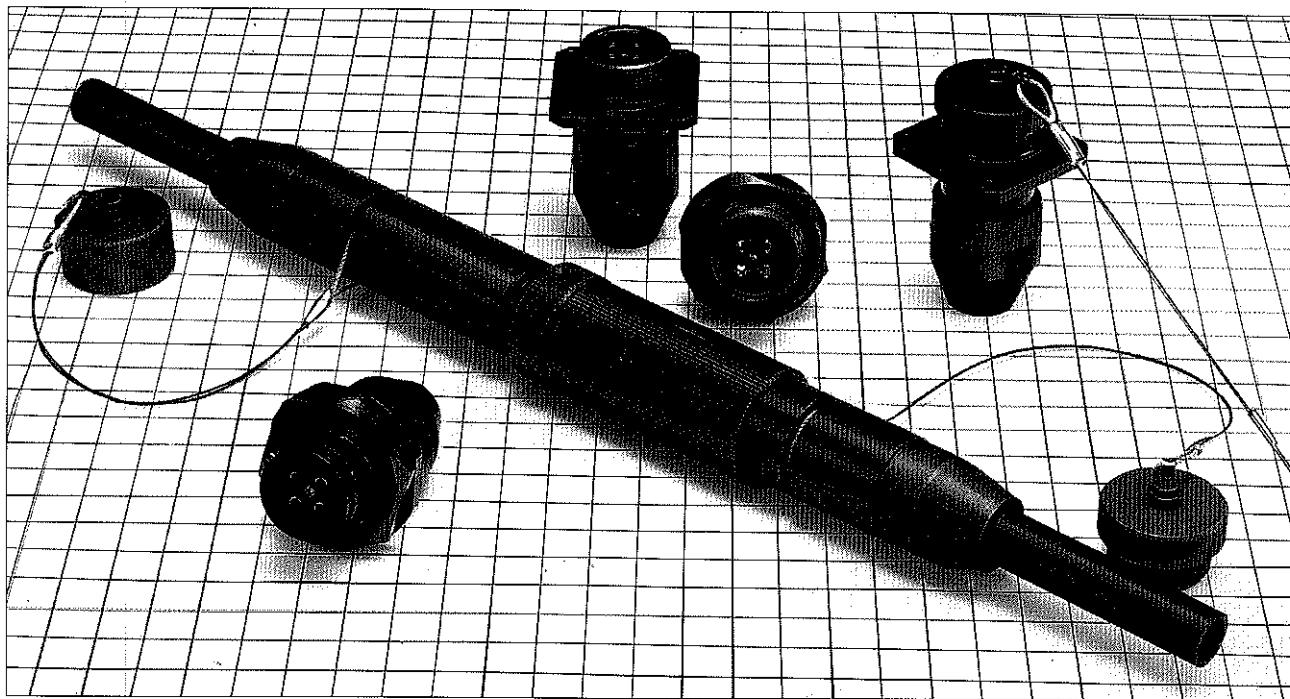
■ Crimping Tool (For Cable Crimping)



Product Number	Product Number
HFDI-T1	HFDI-2P-EX

Waterproof Optical Multiple-Fiber Connectors

MF Series



■ Features

Waterproof Structure

These waterproof optical multiple-fiber connectors are ideal for outdoor optical fiber transmission systems.

■ Applications

Outdoor optical fiber transfer systems, LAN, CATV, CPU optical channels, etc.

Product Standards

Rating	Operating temperature range	-25°C~70°C	Storage temperature range	-25°C~70°C
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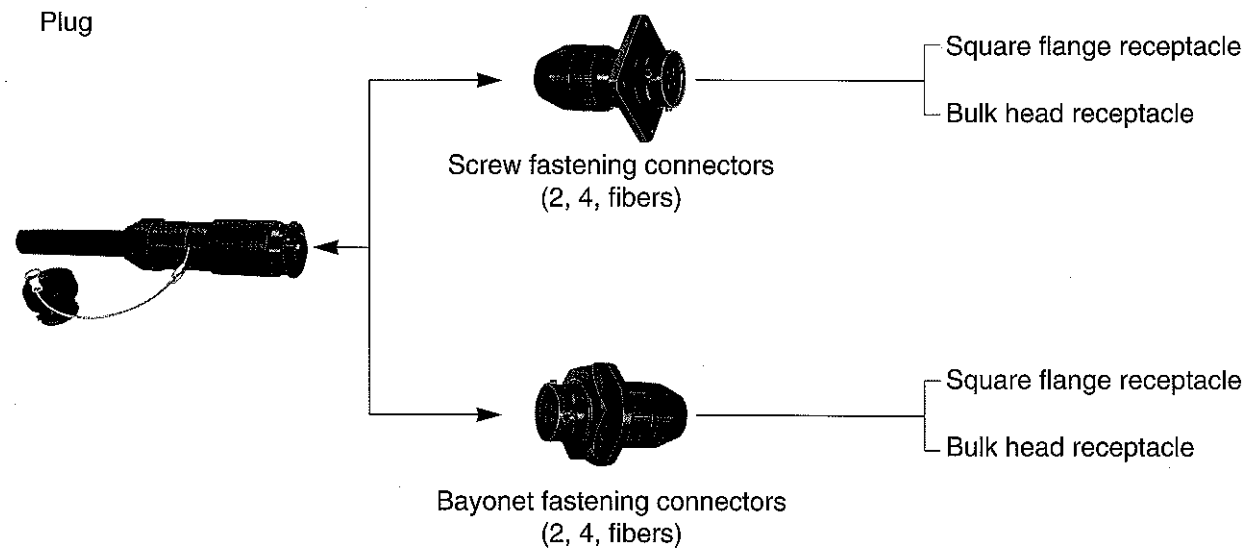
	Item	Test Method (JIS C 5961)	Standard
※	Insertion loss	1,300nm wavelength (LED)	1 dB or less
Mechanical Performance	Cable clamp strength (Pulling in direction of axis)	Apply 148 N of pulling force between connector and cable.	1) Insertion loss fluctuation after test: 0.3 dB or less 2) No irregularity in clamp section or cable.
	Repetitive operation	50 times	
	Vibration resistance	Vibration range of 10 to 55 Hz, in 2 directions, 2 hours each	
	Shock resistance	Acceleration of 981 m/s ² , in the direction of 2 axes, 10 times each	
Environmental performance	Temperature cycle	Temperature -40 to 75°C, 42 cycles	1) Insertion loss fluctuation after test: 0.3 dB or less 2) No damage, cracks, or part looseness
	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	

※Optical performance is for GI-50/125 fiber.

Materials

Part Name	Material
Plug housing	Brass/Aluminum
Coil spring	Stainless steel
Ferrule	Zirconia
Jack housing	Brass/Aluminum
Split sleeve	Copper alloy
Receptacle housing	Brass/Aluminum
Ferrule case	Polybutylene terephthalate

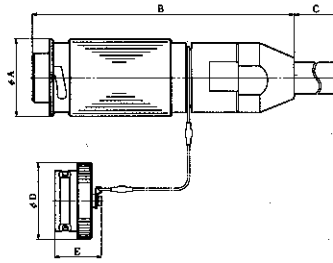
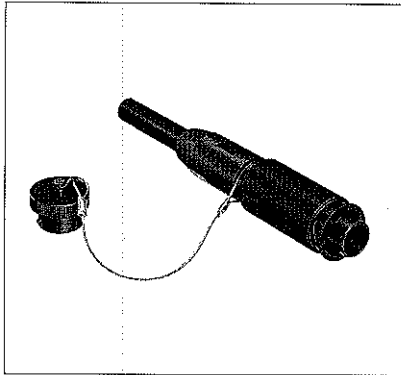
Types



※Cabling for use with plugs and jacks consists of group spacers and layer-type cable.

■ Bayonet Fastening Type

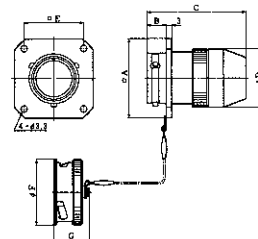
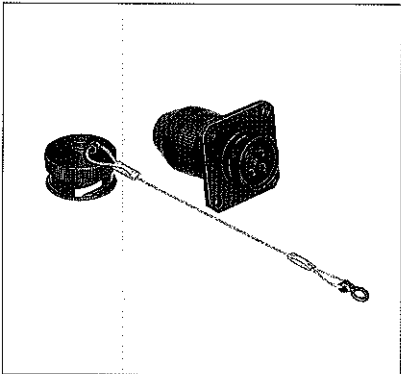
● Plug Housing



Product Number	Number of Fibers	ϕA	B	C	ϕD	E
MF14B-WP※S01-0200	2	24	84.7	69	24	21
MF17B-WP※S01-0400	4	27	116.5	69	27	21

※indicates the cable diameter. Please specify $\phi 8$, 9, or 10mm dia.

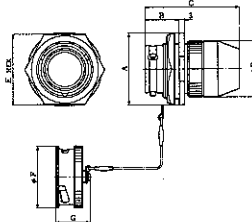
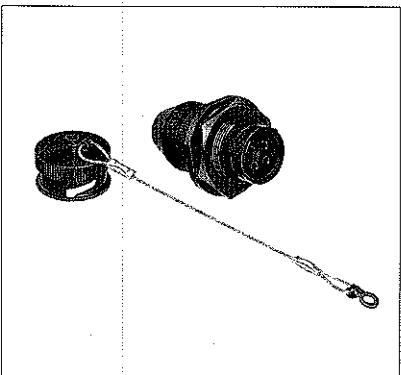
● Square Flange Receptacle Housing



Product Number	Number of Fibers	$\square A$	B	C	ϕD	$\square E$	ϕF	G
MF14B-WRF01-0200	2	30	9	45.5	20.5	23	24	18.8
MF17B-WRF01-0400	4	35	9	51.5	25.5	27	27	18.7

NOTE: $\phi 2$ to 3mm simplex cable is suitable.

● Bulk Head Receptacle Housing

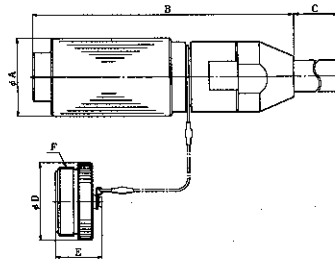
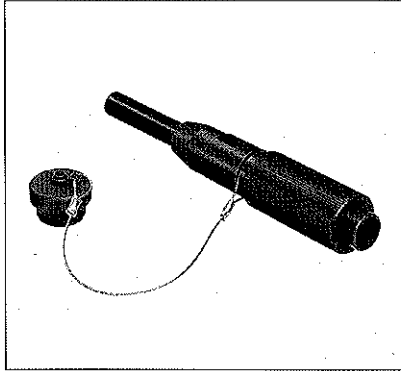


Product Number	Number of Fibers	$\square A$	B	C	ϕD	$\square E$	ϕF	G
MF14B-WRB01-0200	2	30	17.5	45.5	20.5	28	24	18.8
MF17B-WRB01-0400	4	34	17.5	51.5	25.5	32	27	18.7

NOTE: $\phi 2$ to 3mm simplex cable is suitable.

■ Screw Fastening Type

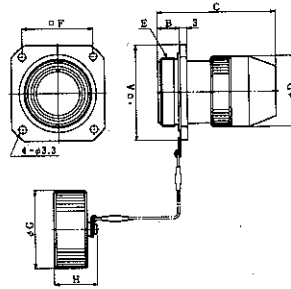
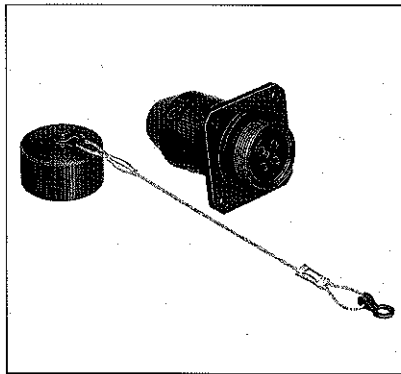
● Plug Housing



Product Number	Number of Fibers	φA	B	C	D	φE	F
MF14S-WP※S01-0200	2	24	84.7	69	24	20.7	M20X1
MF17S-WP※S01-0400	4	27	116.5	69	27	20.7	M22X1

※ indicates the cable diameter.

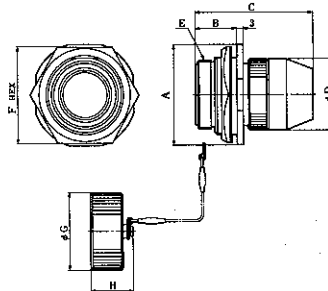
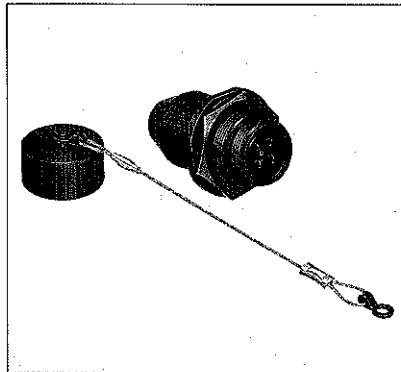
● Square Flange Receptacle Housing



Product Number	Number of Fibers	□A	B	C	φD	E	□F	φG	H
MF14S-WRF01-0200	2	30	10	45.5	20.5	M20X1	23	24	18.5
MF17S-WRF01-0400	4	35	10	51.5	25.5	M22X1	27	27	18.5

NOTE: φ2 to 3mm simplex cable is suitable.

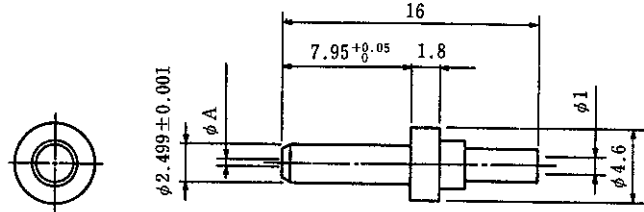
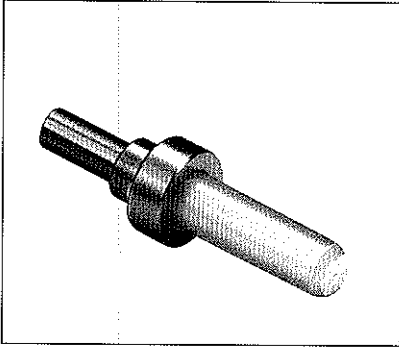
● Bulk Head Receptacle Housing



Product Number	Number of Fibers	□A	B	C	φD	E	□F	φG	H
MF14S-WRB01-0200	2	31	17.5	45.5	20.5	M20X1	32	24	18.5
MF17S-WRB01-0400	4	34	17.5	51.5	25.5	M22X1	32	27	18.5

NOTE: φ2 to 3mm simplex cable is suitable.

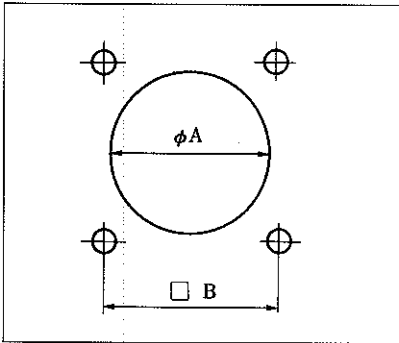
■ Ferrules



HRS No.	Product Number	Dimension A	Suitable Optical Fiber
CL709-0009-0	MF-F3-B124	0.124 ₀ ^{+0.001}	GI-50/125
CL709-0010-9	MF-F3-B125	0.125 ₀ ^{+0.001}	
CL709-0011-1	MF-F3-B126	0.126 ₀ ^{+0.001}	
CL709-0012-4	MF-F3-B127	0.127 ₀ ^{+0.001}	
CL709-0013-7	MF-F3-B128	0.128 ₀ ^{+0.001}	
CL709-0014-0	MF-F3-E253	0.253 ₀ ^{+0.003}	
CL709-0015-2	MF-F3-E233	0.233 ₀ ^{+0.003}	

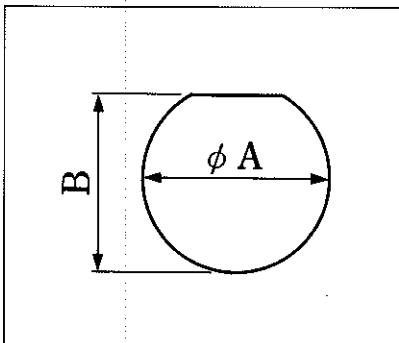
◆ Panel Mounting Hole Dimensions

● Square Flange Receptacle



Product Number	A	B
MF14B-WRF01-0200	21	23
MF14S-WRF01-0200	21	23
MF17B-WRF01-0400	26	27
MF17S-WRF01-0400	26	27

● Bulk Head Receptacle



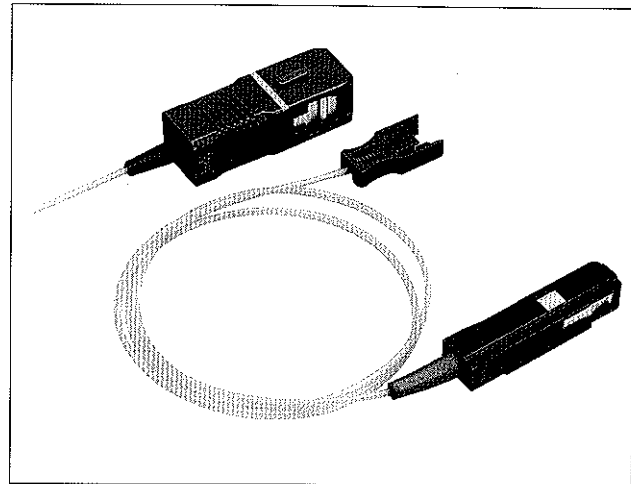
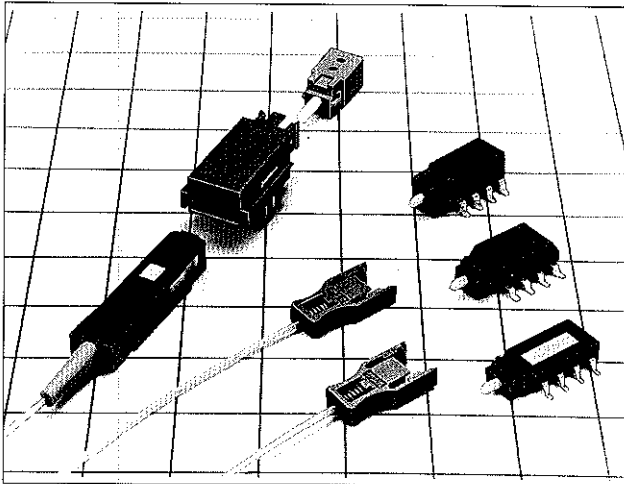
Product Number	A	B
MF14B-WRB01-0200	22.2	21.2
MF14S-WRB01-0200	24.2	23.2
MF17B-WRB01-0400	24.2	23.2
MF17S-WRB01-0400	24.2	23.2

NEW

Fiberoptic Interface Connector for Surface Mount Optical Module

EZ Series

Patents pending



■ Features

1. Specifications.

Complies with surface mount optical module interface specification, as standardized by the following companies

(Patent pending):

- Oki Electric Industry Co., Ltd.,
- Sumitomo Electric Industries, Ltd.
- Fujitsu Limited
- Hirose Electric Co., Ltd.

(※)Please ask the company above for EZ module.

2. Detachable structure

Detachable connector/module interface (See Figure 1.), with easy to use simple tools.

- Surface mounted module can be re-soldered
- Module is packaged separating from interface connector
- Easy replaceable interface connector

3. Self aligning mating to the module

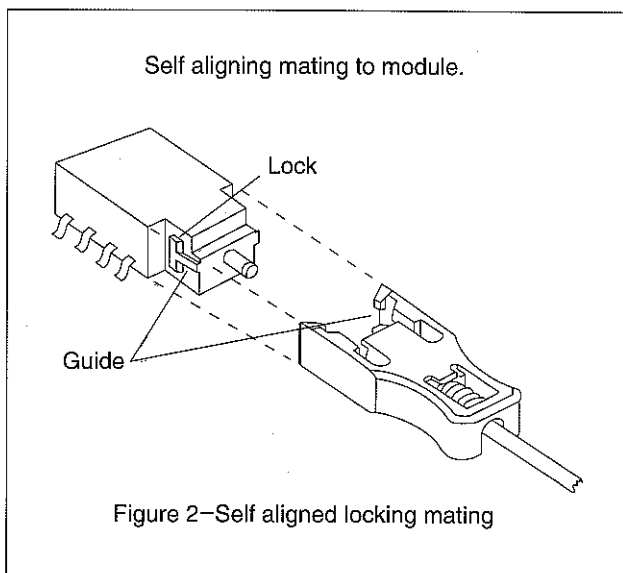
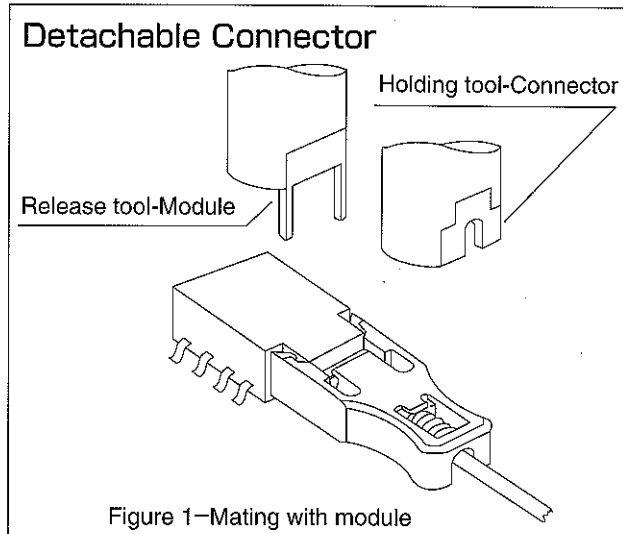
Built-in guide rails assure correct alignment and hold of all components. (See Figure 2.)

4. Reduced number of parts

The number of parts has been greatly reduced compared with existing optical connectors (e.g., FC, SC and MU).

■ Applications

Optical terminal equipment, optical relays, optical modules for measuring instruments, etc.



■ Specifications (Note1)

Rating	Operation temperature	-40°C to 85°C	Storage temperature	-40°C to 85°C
Optical performance	Insertion loss (Note2)	Wavelength 1310 nm (LD)		0.5 dB or less(※Note1)
	Return loss	Wavelength 1310 nm (LD)		40 dB or greater
Mechanical performance	Engagement force	Engagement in axial direction		19.6 N or less
	Holding force of adapter split sleeve	1.249 ±0.0005 mm diameter of ceramic gauge		0.98 N to 3.5 N
	Durability(Mating/Unmating)	30 times		Optical performance must be met after the test.
	Vibration	Vibration frequency range: 10 to 55 Hz, single amplitude of 0.75 mm Acceleration: 98.1 m/s ² , for 2 hours in each of 3 directions		
Shock	Acceleration of 981 m/s ² , 6 ms operation time Sine half-wave waveform, for 10 cycles in each of the 3 axes		No damage, cracks, or loose parts.	
Environmental performance	Humidity resistance	85%, 85°C		
	Rapid change of temperature	Temperature: -40°C to 85°C, 42 cycles		
	Heat resistance	Temperature: 85°C		
	Cold resistance	Temperature: -40°C		
	Salt-fog test	48 hours exposure to 5% brine		No excessive corrosion observed

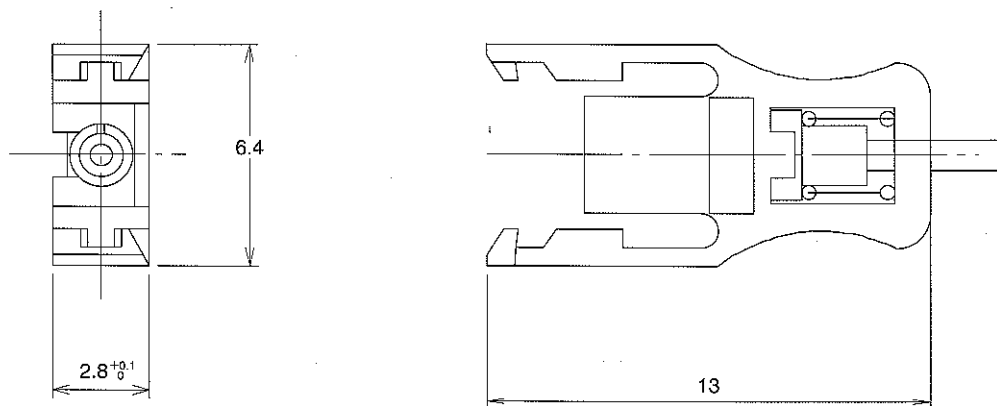
(※Note1): Specified in the temperature of 25°C, humidity 60% or less.

Note2: When connected with master cable or measurements.

■ Materials

Part name	Material	Notes
Plug casing	PPS	UL94V-0
Spring	Piano wire or stainless steel	
Split sleeve	Copper alloy or zirconia	
Ferrule	Zirconia	

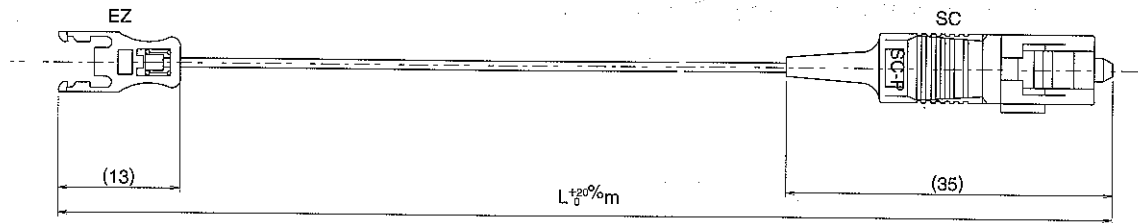
■ Dimensions



※ All dimensions in mm.

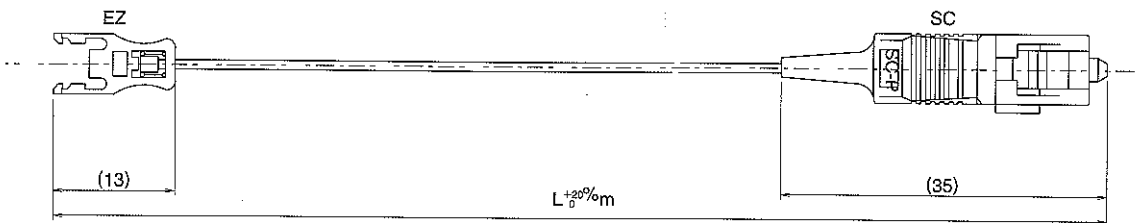
■ Cable assemblies

1. With SC connector



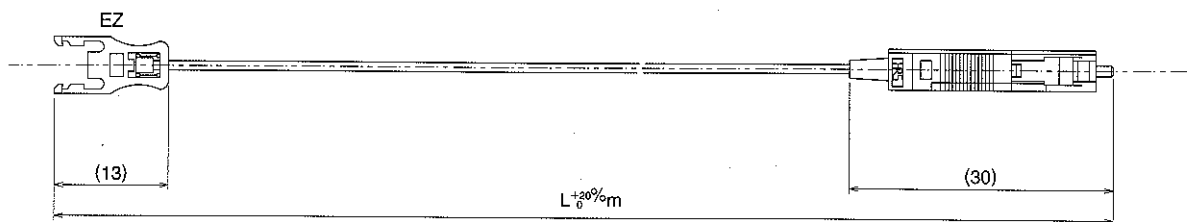
Product No.	Optical fiber	Polishing form	Length	Notes
EZ-H1-SC-0.5M	SM-9.5/125	AdPC	0.5m	SC connector
EZ-H1-SC-1.0M	SM-9.5/125	AdPC	1m	SC connector

2. With FC connector



Product No.	Optical fiber	Polishing form	Length	Notes
EZ-H1-FC-0.5M	SM-9.5/125	AdPC	0.5m	FC connector
EZ-H1-FC-1.0M	SM-9.5/125	AdPC	1m	FC connector

3. With MU connector

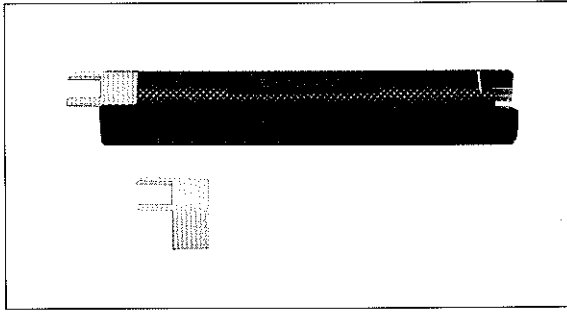


Product No.	Optical fiber	Polishing form	Length	Notes
EZ-H1-MU-0.5M	SM-9.5/125	AdPC	0.5m	MU connector
EZ-H1-MU-1.0M	SM-9.5/125	AdPC	1m	MU connector

•Shown are examples of the series.

For information on specific lengths or connectors, contact Hirose Sales Office nearest you.

■ Release / Holding tool

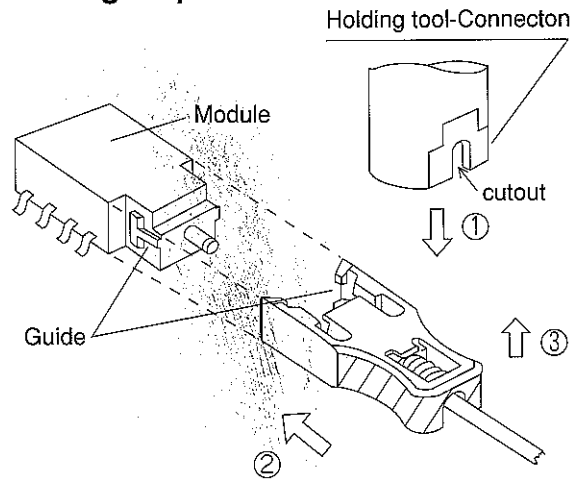


Product No.	Notes
EZ-T1-001	Release/Holding tool
EZ-T1-001-H	Replacement part of release tool

※If the release tool (EZ-T-001) is damaged, replace it with replacement part (EZ-T1-001-H).

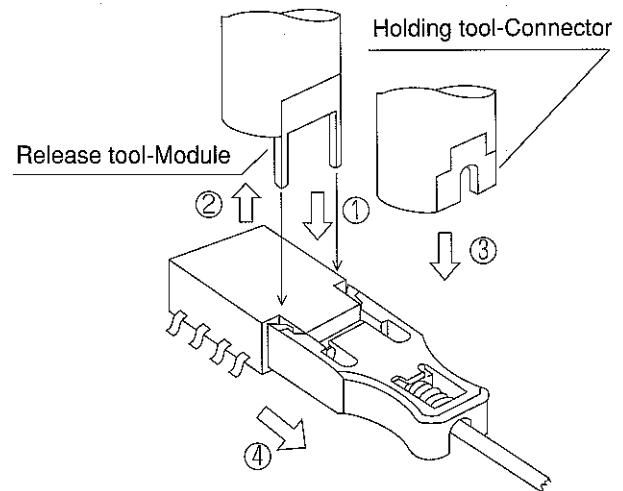
◆ Usage of the tools

1. Mating sequence



- ① Place the holding tool (in the direction shown) over the EZ connector, making sure that the FO cable clears the cutout.
- ② Mate the connector with the module until firm locking.
- ③ Remove the holding tool in the direction opposite to the initial direction.

2. Unmating sequence



- ① Insert both pins of the release tool between the module and the EZ connector as shown in the figure. This will release the latches on the connector.
- ② Remove the release tool in an upward direction.
- ③ Place the connector holding tool over the EZ connector as shown in the figure.
- ④ Unmate the connector from the module by holding the connector holding tool.
- ⑤ Remove the holding tool in an upward direction.

◆ Usage precautions

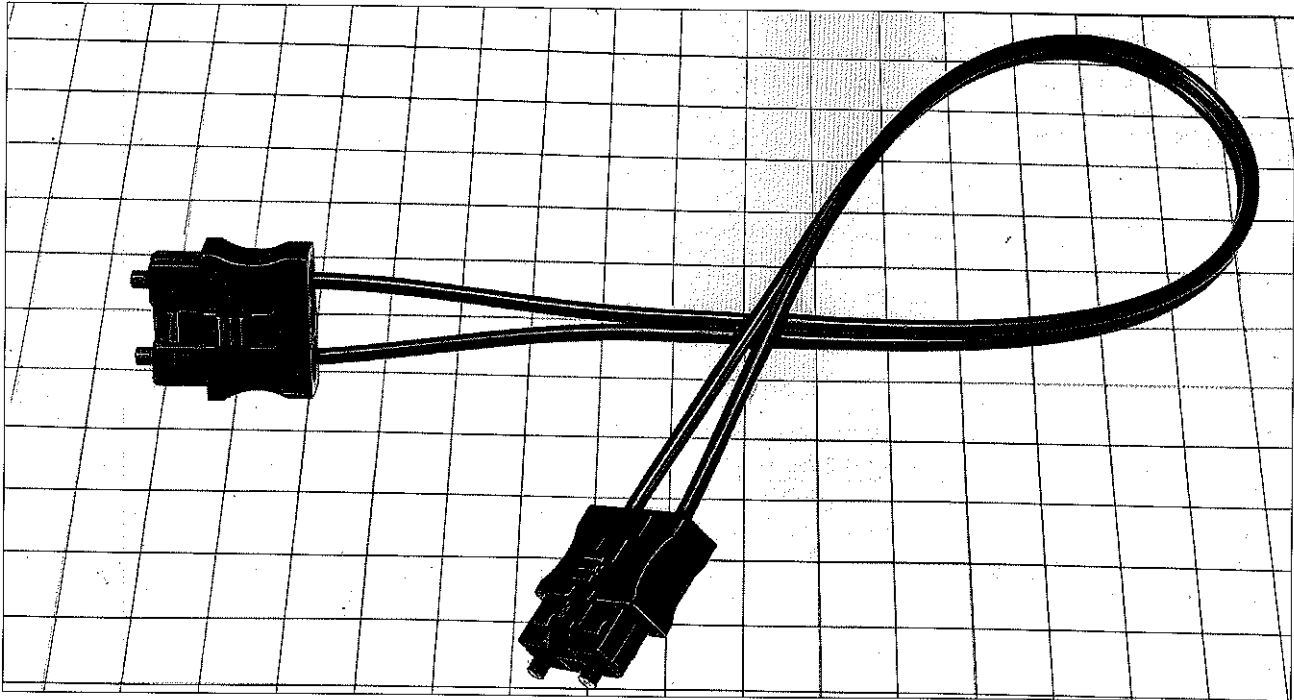
1. When separating the connector from the optical module, use the special jig so as not to apply an excessive load to the optical module and the connector.
2. Do not apply a pulling force of 4.9 N or greater to the cable.
3. Do not bend the cable at a radius less than the permissible curve.
4. Use a ferrule tip cleaner for 0.125 mm diameter to clean the ferrule surface.
After cleaning, be careful that industrial paper waste or other dirt does not remain on the ferrule tip.

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ATM P/N

In Conformity with IEEE1394b

H07 Series



■ Features

1. The performance of this connector is in conformity with IEEE1394b.

2. Connectors for Use with POF (Plastic Fiber)

These connectors have a single body design which includes the ferrules. The connectors are suited to transfer systems that are tens of meters in length.

3. Connectors for Use with PCF (Plastic-Clad Silica Fiber)

These connectors are of the floating ferrule type and are suited to transfer systems that are hundreds of meters in length.

4. Ferrules

These ferrules are metal parts and are economical compared to ones that use ceramics.

■ Applications

Between equipment such as audio/video, factory automation, and office equipment, and short data links such as transfer systems within equipment.

■ Postscript These connectors are based on JIS C 5976 F07-type duplex optical fiber connectors and reflect the addition of a friction lock mechanism and improved coupling stability. The connectors are ideal for use in transfer between equipment that is separated by short distances such as LAN and factory automation.

Connectors are available in a POF (plastic fiber) type suited to transfer systems that are tens of meters in length and PCF (plastic-clad silica fiber) type suited to transfer systems that are hundreds of meters in length.

Compatibility with the existing F07 connectors:

Connectors for POF: Not compatible

Connectors for PCF: Compatible

Note that revision discussions are planned for the current JIS to move in the direction of acquiring compatibility in 1997.

Product Standards

Rating	Operating temperature range	-25°C~85°C	Storage temperature range	-25°C~85°C
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Item		Test Method (JIS C 5961)	Standard
Mechanical	Coupling force and separation force	Measure when connectors are coupled and separated in the direction of the axis at a speed of 50 mm/s.	Coupling force 39.2 N or less
	Repetitive operation	500 times	
Performance	Vibration resistance	Vibration range of 10 to 55 Hz, in 3 directions, 24 cycles each	No damage, cracks, or part looseness
	Shock resistance	Acceleration of 981 m/s ² , in the both directions along 3 axes, 3 times each (For a total of 18 times)	
Environmental performance	Humidity resistance (Temperature and humidity cycle)	Temperature: -10°C to 65°C Humidity 90 to 96% 10 cycles	
	Temperature cycle	Temperature -40 to 100°C, 100 cycles	
	Heat resistance	Leave for 240 hours at a temperature of 85°C	
	Cold resistance	Leave for 240 hours at a temperature of -40°C	
	Salt fog	Left in a 5% concentration of salt fog for 48 hours	No conspicuous corrosion

Materials

Part name	Material
Plug casing	Polybutylene terphthalate
Ferrule	Copper alloy
Spring	Stainless steel

Structure of the Product Number

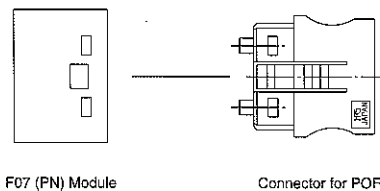
H07 — **CP** — **P1**

① ② ③

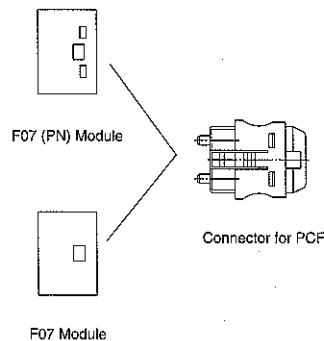
① Series Name
② CP: For PCF AP: For POF
③ P1: Plug 1 EP1: Plug 2

Function Diagram

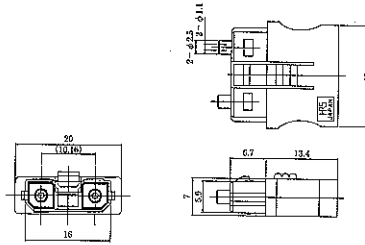
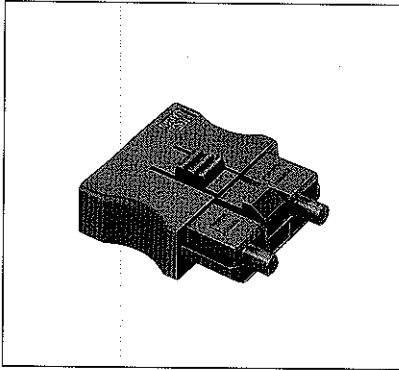
(1) Connectors for POF



(2) Connectors for PCF

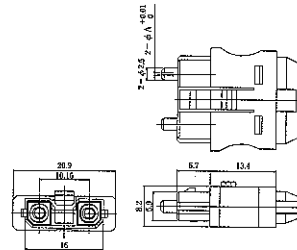
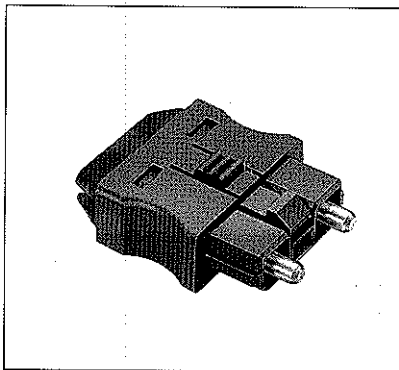


■Connectors for POF



HRS No.	Product Number	Suitable Cable Diameter	Suitable Fiber Diameter	Notes
CL822-0001-6	H07-AP-P1	φ2.2mm	φ1mm	With ferrule

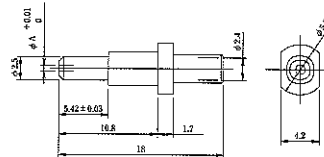
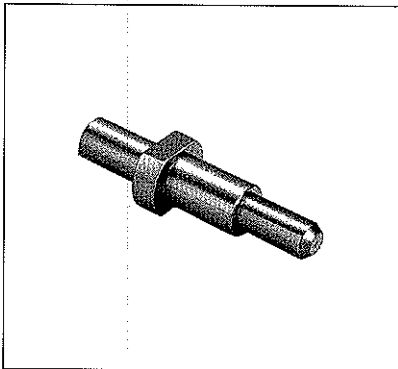
■Connectors for PCF



HRS No.	Product Number	φA Dimension	Suitable Cable Diameter	Suitable Fiber Diameter	Notes
CL822-0002-9	H07-CP-P1	—	—	—	No ferrule ※
CL822-0004-8	H07-CP-P1(F0235)	0.235	φ2.2mm	φ0.235	With ferrule
CL822-0015-0	H07-CP-P1(F0230)	0.230	φ2.2mm	φ0.23	With ferrule
CL822-0019-0	H07-CP-P1(F0300)	0.300	φ2.2mm	φ0.30	With ferrule

※ The photograph and the dimensions diagram show the type with ferrule.
Please contact us about the type without a ferrule for details.

■Ferrules for PCF



HRS No.	Product Number	φA Dimension	Suitable Cable Diameter	Suitable Fiber Diameter	Notes
CL822-0004-4	H07-CP-F0235	0.235	φ2.2mm	φ0.235	PCPCF
CL822-0006-6	H07-CP-F0230	0.230	φ2.2mm	φ0.23	
CL822-0018-9	H07-CP-F0300	0.300	φ2.2mm	φ0.30	

■Cable with Connector Attached

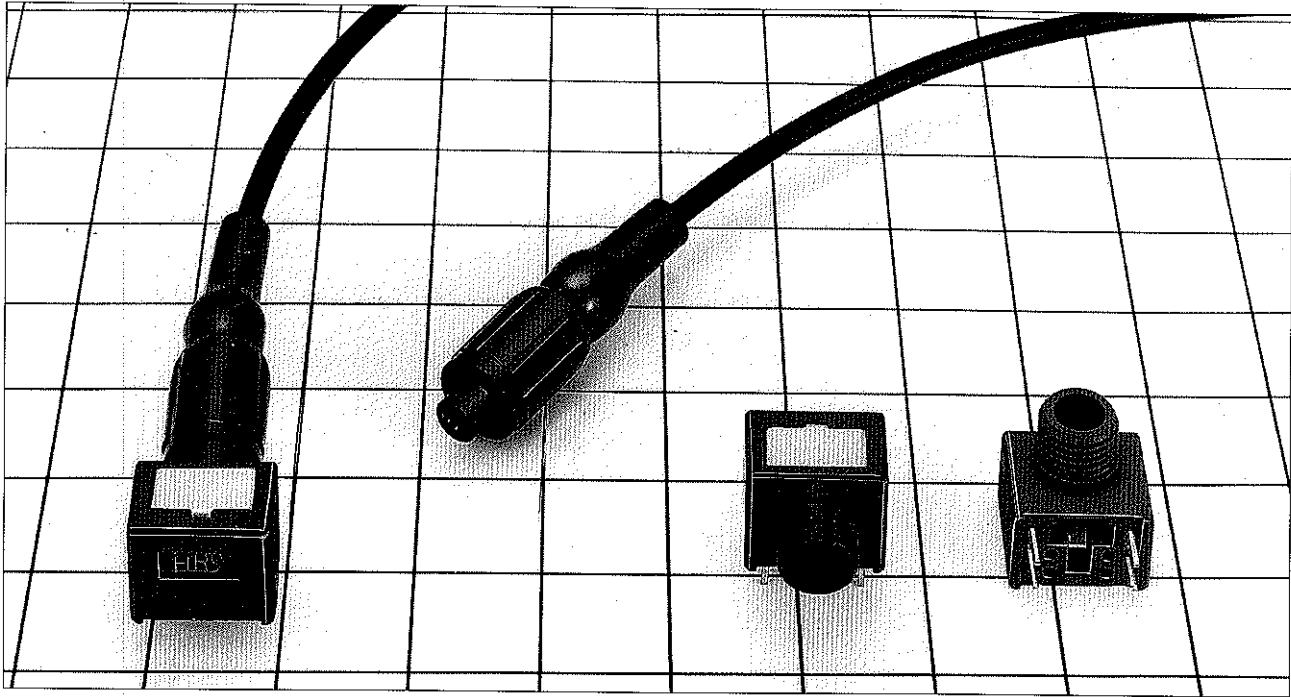
●Connectors for POF

HRS No.	Product Number	Suitable Fiber Diameter	Ferrule End Processing	Notes
CL822-2001-7	H07-P22-F2V2-L	SI-980/1000	Heat processing	Both ends

The "L" within the Product Number indicates the length of the cable. Please contact us for information about cable length. Please specify values of "L" in meter units.

Plastic Optical Fiber Connectors

PF Series



■ Features

1. Standard Compliant

These simplex connectors can be used between equipment and for transfer systems within equipment.

2. Screw Fastening Construction

The lock uses a screw fastening construction which permits solid coupling.

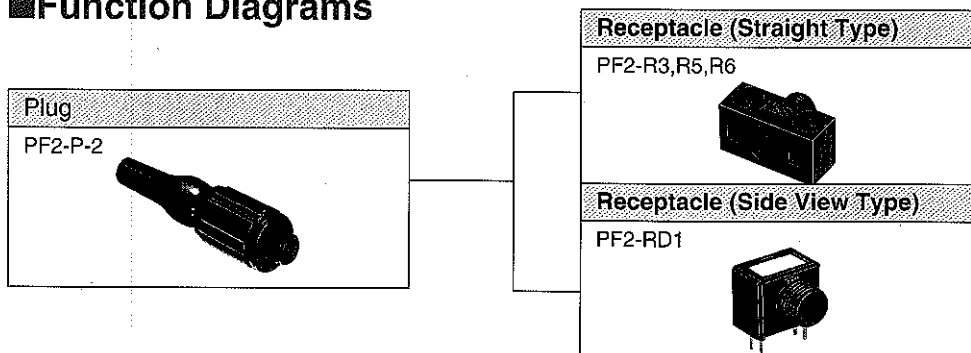
3. Receptacles

Two types of receptacles are available, a straight and a side view type.

■ Applications

Between equipment such as used in factory automation and office automation, and for transfer systems within equipment.

■ Function Diagrams



■ Product Standards

Rating	Operating temperature range	-25°C~70°C	Storage temperature range	-25°C~70°C
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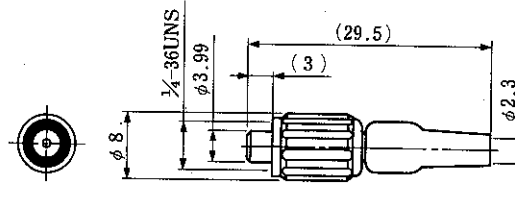
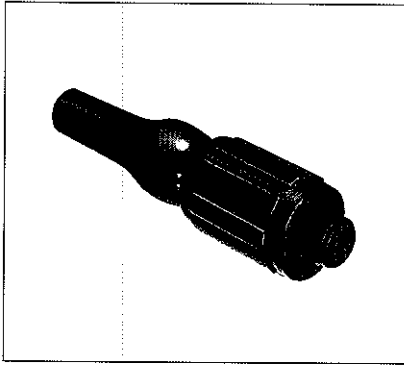
	Item	Test Method (JIS C 5961)	Standard
※	Insertion loss	650nm wavelength (LED)	2 dB or less
Mechanical Performance	Repetitive operation	500 times	1) Insertion loss fluctuation after test: 0.3 dB or less 2) No damage, cracks, or part looseness
	Vibration resistance	Vibration range of 10 to 55 Hz, in 3 directions, 3 hours each	
	Shock resistance	Acceleration of 981 m/s ² , in both directions along 3 axes, 3 times each (Total of 18 times)	
Environmental performance	Temperature cycle	Temperature -25°C to 70°C 10 cycles	

※ Optical performance

■ Materials

Part Name	Material
Plug housing	Polycarbonate
Receptacle housing	

■ Plug



HRS No.	Product Number
CL702-0018-6	PF2-P-2

■ Receptacles (Straight Type)

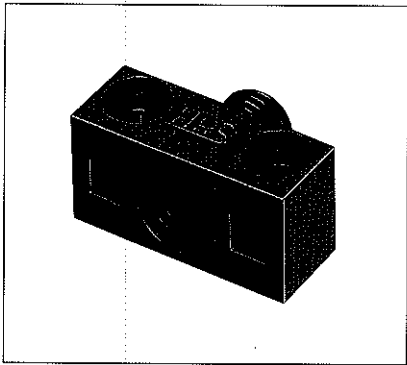


Figure 1

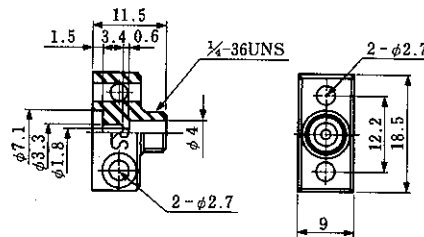


Figure 2

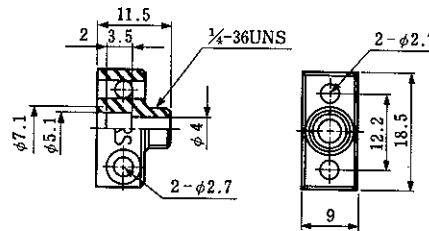
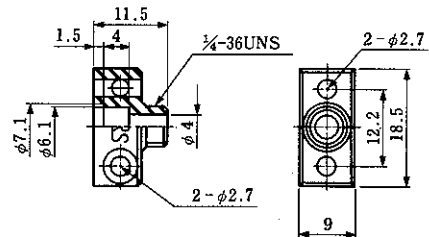
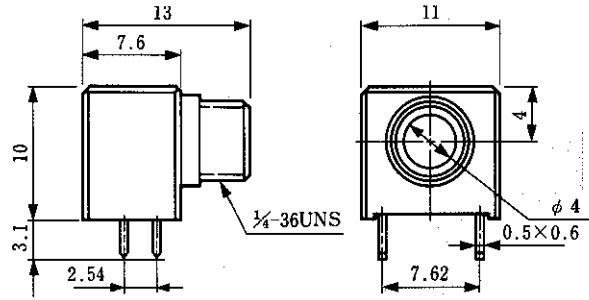
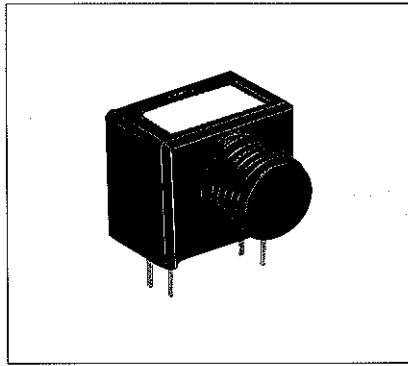


Figure 3



HRS NO.	Product Number	Diameter of the Optical Receive/Emil Element	Diagram No.
CL702-0002-6	PF2-R3	$\phi 3$	Figure 1
CL702-0003-9	PF2-R5	$\phi 5$	Figure 2
CL702-0004-1	PF2-R6	$\phi 6$	Figure 3

■Receptacles (Side View Type)



HRS No.	Product Number	Color of Casing
CL702-0006-7	PF2-RD1	Black
CL702-0006-7(01)	PF2-RD1(01)	Blue

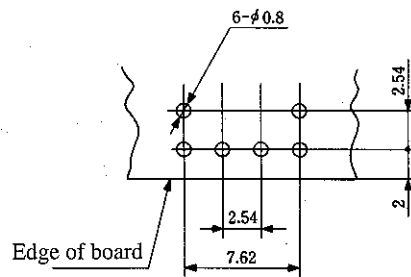
Suitable Optical Receive/Emit Elements

LED: LN145W (Matsushita Electronics Corporation)

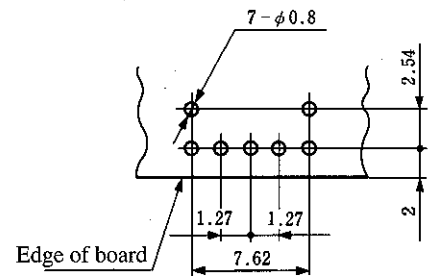
Photodiode: PN335 (Matsushita Electronics Corporation)

Phototransistor: PN116 (Matsushita Electronics Corporation)

◆Printed Circuit Board Dimensions Diagram

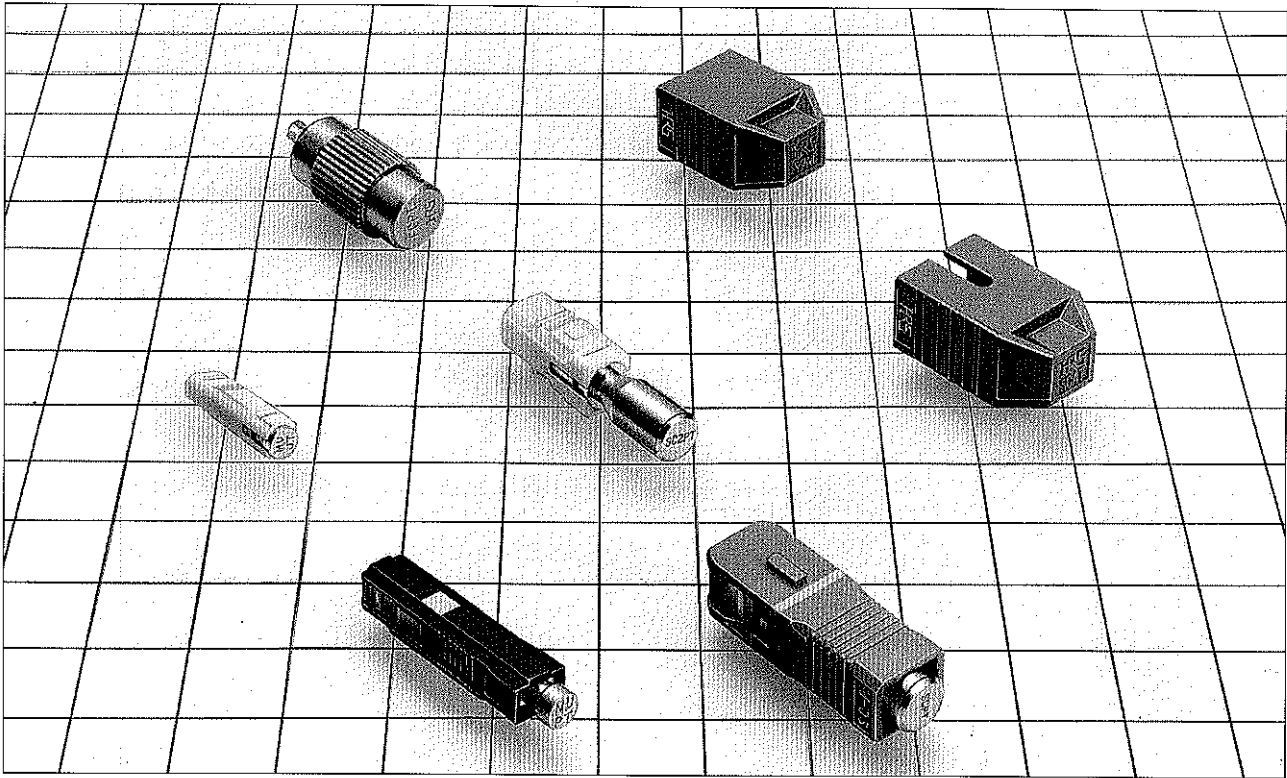


LN145W, PN335



PN116

Optical Terminators



1. Terminators are available in a plug type and a receptacle type.
2. The plug type uses a termination angle of 15° and achieves a reflection attenuation of 40dB or greater.
3. Designed for suitable wavelengths of 1,300nm and 1,550nm.

■ Applications

Termination of optical coupler terminals, termination processing of front ends, etc.

■ Product Standards

Rating	Operating temperature range	-25°C to +70°C	Storage temperature range	-25°C to 85°C
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	Item	Test Method (JIS C 5961)	Standard
※	Insertion loss	1300nm wavelength (LD)	40 dB or greater
Mechanical performance	Repetitive operation	500 times	1) The standard for reflection attenuation after test must be satisfied. 2) No damage, cracks, or part looseness
	Vibration resistance	Vibration range of 10 to 55 Hz, in 3 directions, 3 hours each	
	Shock resistance	Acceleration of 981 m/s ² , in both directions along 3 axes, 3 times each (Total of 18 times)	
Environmental performance	Humidity resistance (Temperature and humidity cycle)	Temperature -10°C to 65°C, humidity 90 to 96% 10 cycles	
	Temperature cycle	Temperature -25°C to 70°C 100 cycles	
	Heat resistance	Leave for 500 hours at a temperature of 85°C	
	Cold resistance	Leave for 500 hours at a temperature of -25°C	
	Salt fog	Left in a 5% concentration of salt fog for 48 hours	No conspicuous corrosion

※ Optical performance

■ Product Standards

● HRFC Plug Type

Part Name	Material
Coupling	Copper alloy
Housing	Stainless steel
Ferrule	Zirconia

● HSC Plug Type

Part Name	Material
Housing	Polybutylene terephthalate
Ferrule	Zirconia

● HSC Receptacle Type

Part Name	Material
Housing	Polybutylene terephthalate

● HMU Plug Type

Part Name	Material
Housing	Polybutylene terephthalate
Ferrule	Zirconia

■ Structure of the Product Number

HSC — TM — P1

① ② ③

① Optical Connector : H S C...Applicable to JIS C 5973 (F04)
H R F C...Applicable to JIS C 5970 (F01)
H M U A...With knob
H M U A J...Without knob

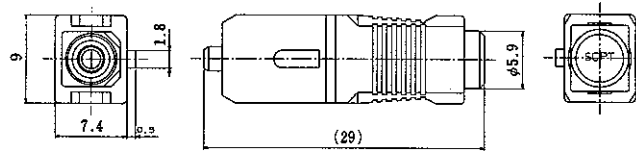
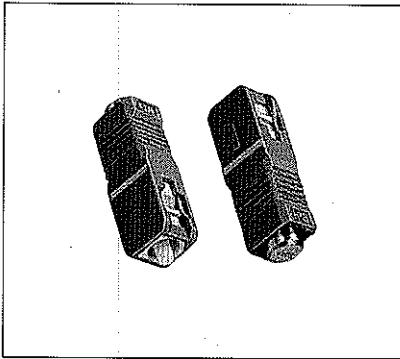
② Indicates a terminator.

③ Form : P...Plug type

R...Receptacle type

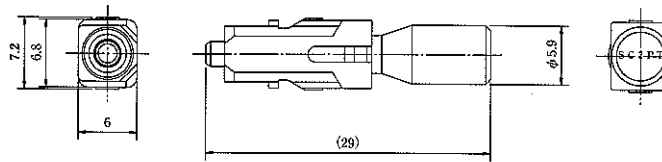
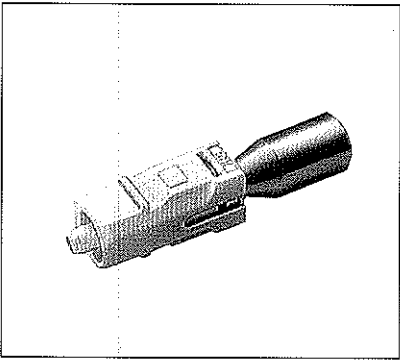
■ Plug Type

● SC Type Manual Coupling/Decoupling Type



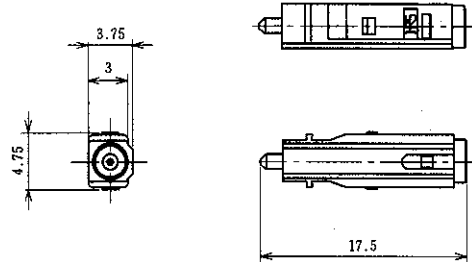
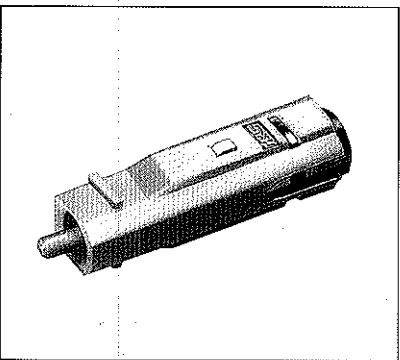
HRS No.	Product Number	Reflection Attenuation	Rated Input Power	Suitable Fiber
CL821-0005-0	HSC-TM-P1	$\geq 40\text{dB}$	30mW	SM-9.5/125

● SC Type Jig Coupling/Decoupling Type



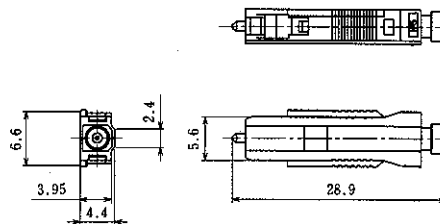
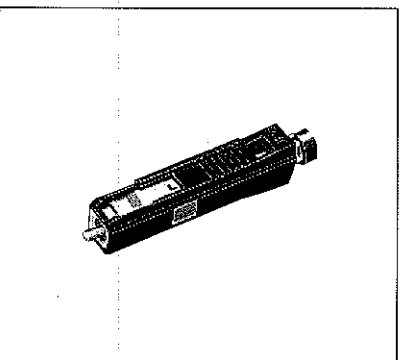
HRS No.	Product Number	Reflection Attenuation	Rated Input Power	Suitable Fiber
CL821-0004-8	HSC2-TM-P1	$\geq 40\text{dB}$	30mW	SM-9.5/125

● MU Type Without Knob



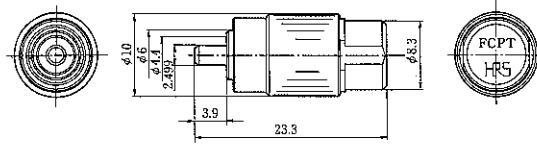
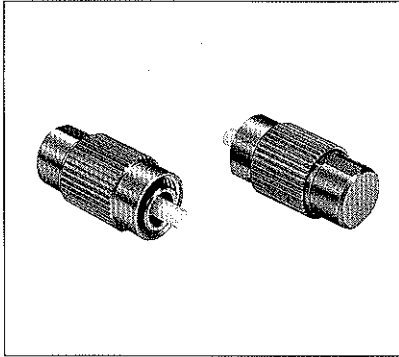
HRS No.	Product Number	Reflection Attenuation	Rated Input Power	Suitable Fiber
CL821-0008-9	HMUAJ-TM-P1	$\geq 40\text{dB}$	30mW	SM-9.5/125

● MU Type With Knob



HRS No.	Product Number	Reflection Attenuation	Rated Input Power	Suitable Fiber
CL821-0007-6	HMUA-TM-P1	$\geq 40\text{dB}$	30mW	SM-9.5/125

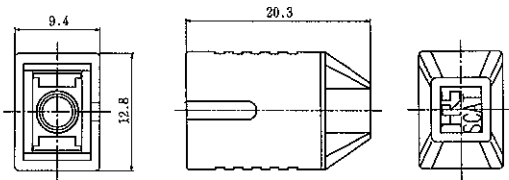
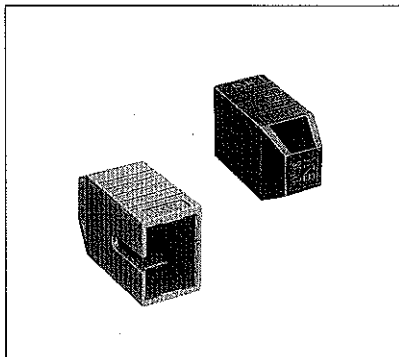
●FC Type



HRS No.	Product Number	Reflection Attenuation	Rated Input Power	Suitable Fiber
CL821-0006-3	HRFC-TM-P1	$\geq 45\text{dB}$	30mW	SM-9.5/125

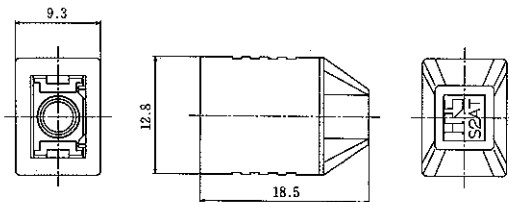
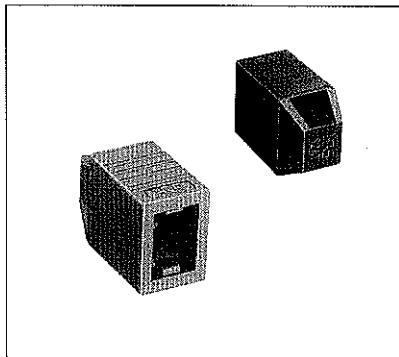
■Receptacle Type

●SC Type Manual Coupling/Decoupling Type



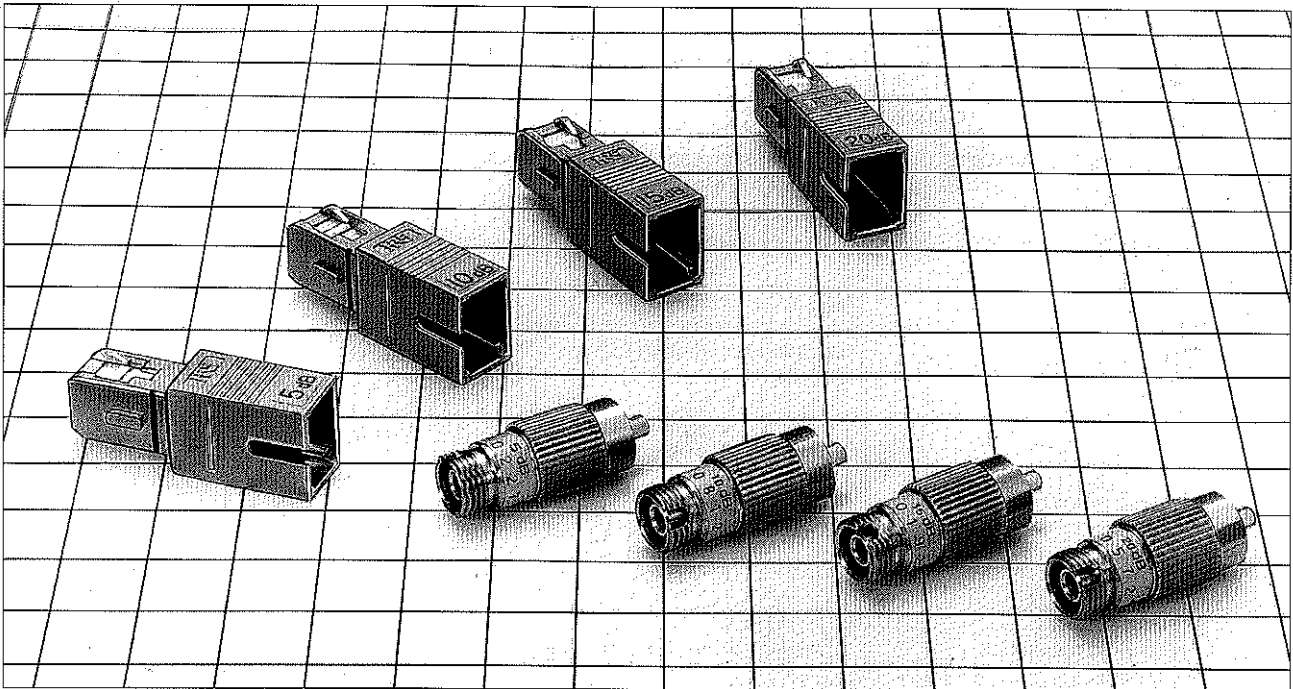
HRS No.	Product Number	Reflection Attenuation	Rated Input Power	Suitable Fiber
CL821-0001-0	HSC-TM-R1	$\geq 40\text{dB}$	10mW	SM-9.5/125

●SC Type Manual Coupling/Decoupling Type



HRS No.	Product Number	Reflection Attenuation	Rated Input Power	Suitable Fiber
CL821-0003-5	HSC-TM-R1	$\geq 40\text{dB}$	10mW	SM-9.5/125

Optical Fixed Attenuators



■ Features

1. Superb operational qualities.

These fixed attenuators are of the Plug-Jack type and offer superb operational qualities in comparison to the Jack-Jack type when mounted to panel interfaces and in other applications.

2. Two types are available, one that uses an evaporated metal attenuation film and another that uses a dielectric multi-layer film.

3. The attenuation tolerance can be specified by grade.

4. We would be pleased to discuss your needs for other kinds of attenuators, reflection attenuators, fiber, and other products.

■ Applications

Power level adjustment of optical fiber transfer backbones, and fiber applications.

Product Standards

Rating	Operating temperature range	-25°C ~ 85°C	Storage temperature range	-25°C ~ 85°C
Item		Test Method (JIS C 5961)	Standard	
Optical Performance	Reflection attenuation	(SM)	22 dB or greater (PC), 40 dB (AdPC), 60 dB (Angled PC)	
		(GI)	22 dB or greater (PC)	
	Attenuation	(S grade)	Nominal value ±1.0 dB	
		(A grade)	Nominal value ±1.5 dB	
Mechanical performance	Coupling force and separation force (SC type)	Measure when connectors are coupled and separated in the direction of the axis.	Coupling force 19.6 N or less Separation force 19.6 N or less	
	Split sleeve holding force of the adapter	φ2.499 ±0.0005-mm zirconia gauge	Phosphor bronze 2 to 5.9 N Zirconia @2 to 3.9 N	
	Repetitive operation	500 times	1) The standard for attenuation after test must be satisfied. 2) No damage, cracks, or part looseness	
	Vibration resistance	Vibration range of 10 to 55 Hz, in 3 directions, 3 hours each		
	Shock resistance	Acceleration of 981 m/s ² , in both directions along 3 axes, 3 times each (Total of 18 times)		
Environmental performance	Humidity resistance (Temperature and humidity cycle)	Temperature -10°C to 65°C, humidity 90 to 96% 10 cycles	No conspicuous corrosion	
	Temperature cycle	Temperature -25°C to 70°C 100 cycles		
	Heat resistance	Leave for 500 hours at a temperature of 85°C		
	Cold resistance	Leave for 500 hours at a temperature of -25°C		
	Salt fog	Left in a 5% concentration of salt fog for 48 hours		

Materials

HRFC Plug Type

Part Name	Material	Notes
Coupling	Copper alloy	NTT FC corresponding item
Housing	Stainless steel	
Ferrule	Zirconia	
Split sleeve	Zirconia, copper alloy	

HRFC Plug Type

Part Name	Material	Notes
Housing	Polybutylene terephthalate	NTT FC corresponding item
Ferrule	Zirconia	
Split sleeve	Zirconia, copper alloy	

Structure of the Product Number

HSC - AT 1 S - A 03 S

① ② ③ ④ ⑤ ⑥ ⑦

① Series name:

H S C...Applicable to JIS C 5973 (F04)

HRFC...Applicable to JIS C 5970 (F01)

② Indicates an attenuator.

③ Specification : 1...Split sleeve made of copper alloy

4...Split sleeve made of zirconia

5...Copper alloy sleeve, cost effective type

8...Zirconia sleeve, cost effective type

④ Polishing : S...PC polishing (≥22 dB)

K...AdPC polishing (≥40 dB)

TS...angled physical contact polishing (≥60 dB)

⑤ Optical fiber : A...SM-9.5/125

B...GI-50/125

B...Doped fiber

⑥ Attenuation :

02..... 2dB

03..... 3dB

05..... 5dB

07..... 7dB

10.....10dB

15.....15dB

20.....20dB

25.....25dB

30.....30dB

⑦ Attenuation

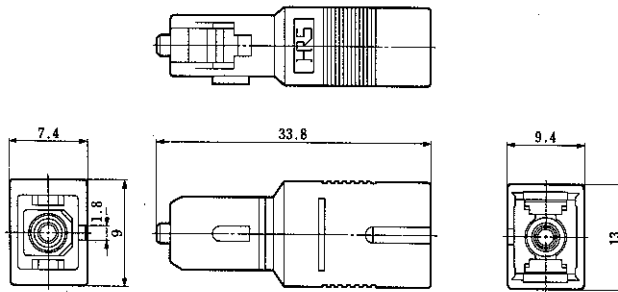
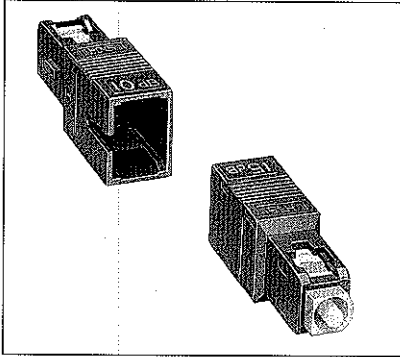
tolerance : S.....±1dB

A.....±1.5dB

B.....±2dB

Product Specifications List

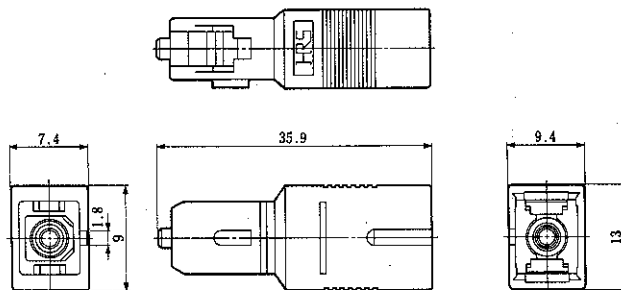
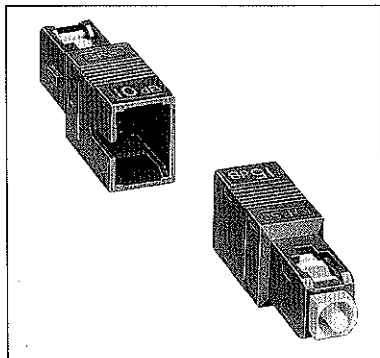
SC-type Attenuators



HRS No.	Product Number	Attenuation	Split Sleeve Specification	Reflection Attenuation	Notes
CL820-0075-0-01	HSC-AT1S-B05A(01)	5dB	Copper alloy	≥22dB	GI-50/125
CL820-0076-2-01	HSC-AT1S-B10A(01)	10dB			
CL820-0077-5-01	HSC-AT1S-B15A(01)	15dB			
CL820-0078-8-01	HSC-AT1S-B20A(01)	20dB			
CL820-0094-4	HSC-AT4S-B05A	5dB	Zirconia	≥22dB	GI-50/125
CL820-0095-7	HSC-AT4S-B10A	10dB			
CL820-0096-0	HSC-AT4S-B15A	15dB			
CL820-0097-2	HSC-AT4S-B20A	20dB			
CL820-0093-1	HSC-AT1S-A03S	3dB	Copper alloy	≥22dB	
CL820-0071-9-01	HSC-AT1S-A05A(01)	5dB			
CL820-0072-1-01	HSC-AT1S-A10A(01)	10dB			
CL820-0073-4-01	HSC-AT1S-A15A(01)	15dB			
CL820-0092-9	HSC-AT1S-A20A(01)	20dB		≥40dB	
CL820-0074-7-01	HSC-AT1K-A03S	3dB			
CL820-0079-0	HSC-AT1K-A05A	5dB			
CL820-0080-0	HSC-AT1K-A10A	10dB			
CL820-0081-2	HSC-AT1K-A15A	15dB	Zirconia	≥22dB	SM-9.5/125
CL820-0082-5	HSC-AT1K-A20A	20dB			
CL820-0054-0	HSC-AT4S-A05A	5dB			
CL820-0055-2	HSC-AT4S-A10A	10dB			
CL820-0056-5	HSC-AT4S-A15A	15dB		≥40dB	
CL820-0057-8	HSC-AT4S-A20A	20dB			
CL820-0083-8	HSC-AT4K-A05A	5dB			
CL820-0084-0	HSC-AT4K-A10A	10dB			
CL820-0085-3	HSC-AT4K-A15A	15dB	≥60dB		
CL820-0086-6	HSC-AT4K-A20A	20dB			
CL820-0087-9	HSC-AT4TS-A02S	2dB			
CL820-0088-1	HSC-AT4TS-A05S	5dB			
CL820-0089-4	HSC-AT4TS-A07S	7dB			
CL820-0090-3	HSC-AT4TS-A10S	10dB			

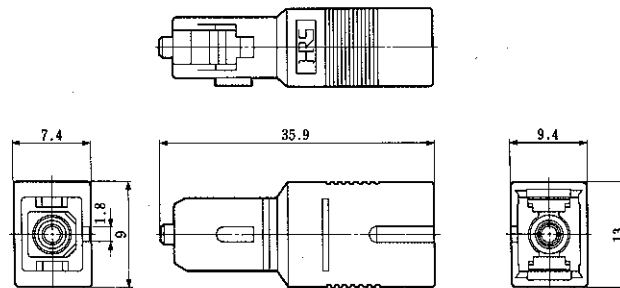
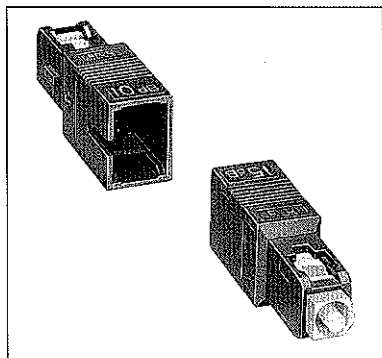
NOTE : Allowable power: 10 mW

●VA-type SC-type Attenuators (maximum permitted power 10mW)



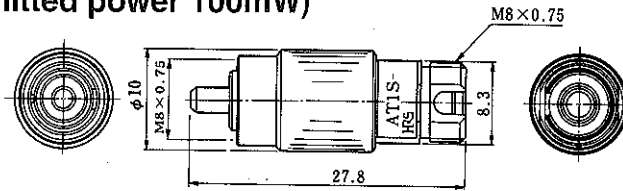
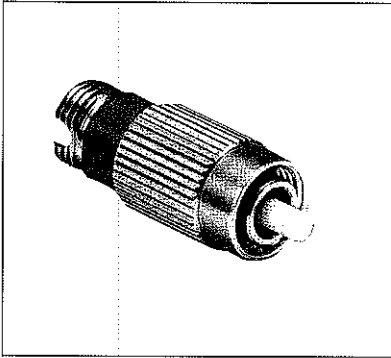
HRS No.	Product Number	Attenuation	Split Sleeve Specification	Reflection Attenuation	Notes	
CL820-3022-0	HSC-AT5S-B05A	5dB	Copper alloy	≧22dB	GI-50/125	
CL820-3023-2	HSC-AT5S-B10A	10dB				
CL820-3024-5	HSC-AT5S-B15A	15dB				
CL820-3025-8	HSC-AT5S-B20A	20dB				
CL820-3026-0	HSC-AT5S-A03S	3dB				
CL820-3005-0	HSC-AT5S-A05A	5dB				
CL820-3006-3	HSC-AT5S-A10A	10dB				
CL820-3007-6	HSC-AT5S-A15A	15dB		Zirconia	≧20dB	SM-9.5/125
CL820-3008-9	HSC-AT5S-A20A	20dB				
CL820-3017-0	HSC-AT5K-A03S	3dB				
CL820-3018-2	HSC-AT5K-A05S	5dB				
CL820-3019-5	HSC-AT5K-A10S	10dB				
CL820-3020-4	HSC-AT5K-A15S	15dB				
CL820-3021-7	HSC-AT5K-A20S	20dB				
CL820-3001-0	HSC-AT5K-A05A	5dB				
CL820-3002-2	HSC-AT5K-A10A	10dB				
CL820-3003-5	HSC-AT5K-A15A	15dB				
CL820-3004-8	HSC-AT5K-A20A	20dB	≧40dB			
CL820-3009-1	HSC-AT8S-A05A	5dB				
CL820-3010-0	HSC-AT8S-A10A	10dB				
CL820-3011-3	HSC-AT8S-A15A	15dB				
CL820-3012-6	HSC-AT8S-A20A	20dB				
CL820-3013-9	HSC-AT8K-A05A	5dB				
CL820-3014-1	HSC-AT8K-A10A	10dB				
CL820-3015-4	HSC-AT8K-A15A	15dB				
CL820-3016-7	HSC-AT8K-A20A	20dB				

●highpower SC-type Attenuators (maximum permitted power 100mW)



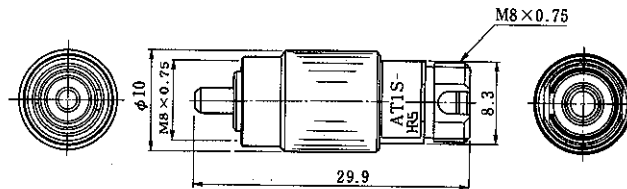
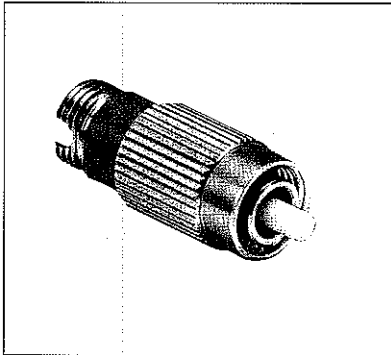
HRS No.	Product Number	Attenuation	Split Sleeve Specification	Reflection Attenuation	Notes
CL820-1001-9	HSC-AT4K-DF03S	3dB	Zirconia	≧40dB	doped singlemode fiber
CL820-1002-1	HSC-AT4K-DF05A	5dB			
CL820-1003-4	HSC-AT4K-DF10A	10dB			
CL820-1004-7	HSC-AT4K-DF15A	15dB			
CL820-1005-0	HSC-AT4K-DF20A	20dB			
CL820-1006-2	HSC-AT4K-DF25A	25dB			
CL820-1007-5	HSC-AT4K-DF30B	30dB			

●FC-type Attenuators (maximum permitted power 100mW)



HRS No.	Product Number	Attenuation	Polarizing form	Split Sleeve Specification	Reflection Attenuation	Notes		
820-0063-0	HRFC-AT1S-B05A	5dB	PC	≧22	10	GI-50/125		
820-0064-3	HRFC-AT1S-B10A	10dB						
820-0065-6	HRFC-AT1S-B15A	15dB						
820-0066-9	HRFC-AT1S-B20A	20dB						
820-0058-0	HRFC-AT1S-A05A	5dB				AdPC	≧40	SM-9.5/125
820-0060-2	HRFC-AT1S-A10A	10dB						
820-0061-5	HRFC-AT1S-A15A	15dB						
820-0062-8	HRFC-AT1S-A20A	20dB						
820-0067-1	HRFC-AT1K-A05A	5dB						
820-0068-4	HRFC-AT1K-A10A	10dB						
820-0069-7	HRFC-AT1K-A15A	15dB						
820-0070-6	HRFC-AT1K-A20A	20dB						

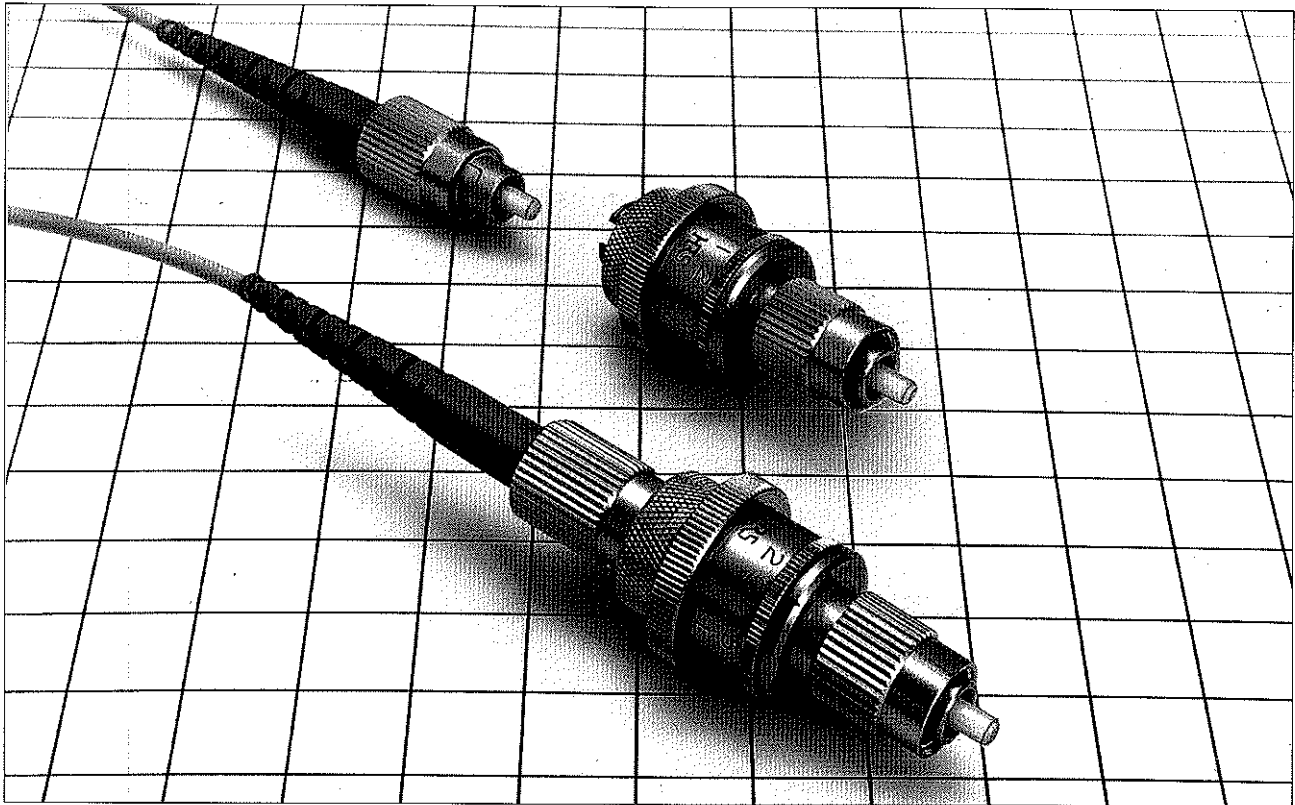
●VA-type FC-type Attenuators (maximum permitted power 10mW)



HRS No.	Product Number	Attenuation	Split Sleeve Specification	Reflection Attenuation	Notes	
CL820-5000-8	HRFC-AT5S-A05A	5dB	Copper alloy	≧22dB	SM-9.5/125	
CL820-5001-0	HRFC-AT5S-A10A	10dB				
CL820-5002-3	HRFC-AT5S-A15A	15dB				
CL820-5003-6	HRFC-AT5S-A20A	20dB				
CL820-5004-9	HRFC-AT5K-A05S	5dB		≧40dB		
CL820-5005-1	HRFC-AT5K-A10S	10dB				
CL820-5006-4	HRFC-AT5K-A15S	15dB				
CL820-5007-7	HRFC-AT5K-A20S	20dB				
CL820-5008-0	HRFC-AT5K-A05A	5dB				
CL820-5009-2	HRFC-AT5K-A10A	10dB				
CL820-5010-1	HRFC-AT5K-A15A	15dB				
CL820-5011-4	HRFC-AT5K-A20A	20dB				

Optical Variable Attenuators

HRLA Series



■ Features

1. Variable Attenuation

Attenuation can be set as desired within a range of attenuation of 1 to 6dB and 5 to 20dB.

2. The air gap system used in these attenuators provides effective attenuation.

3. These attenuators are of the plug-Jack type and offer superb operational qualities. (The Jack-Jack type is also available.)

4. We would be pleased to discuss your needs for other kinds of attenuators as well as other products.

■ Applications

Power level adjustment of optical fiber transfer backbones, and buffer.

Product Standards

Rating	Operating temperature range	0°C~+30°C	Storage temperature range	-40°C~60°C
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	Item	Test Method (JIS C 5961)	Standard
Optical Performance	Reflection attenuation	1,300nm wavelength (LD)	40dB or greater
	Maximum attenuation	1,300nm wavelength (LD)	According to particular specifications.
Mechanical Performance	Split sleeve holding force of the adapter	φ2.499 ±0.0005mm zirconia gauge	2.0 to 5.9 N
Environmental performance	Temperature cycle	Temperature 0 → 0 to 30 → 30 → 30 to 0°C Time 60 → 60 → 60 → 60 min for 100 cycles	1) The standard for attenuation after test must be satisfied. 2) No damage, cracks, or part looseness

Materials

Part Name	Material
Housing	Stainless steel
Ferrule	Zirconia
Split sleeve	Copper alloy

Structure of the Product Number

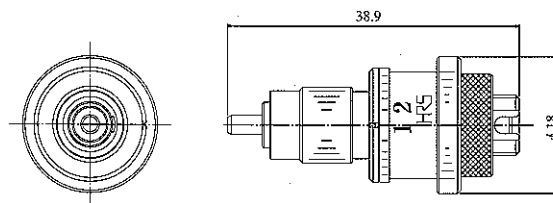
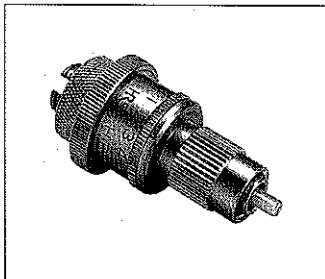
HRLA - C 1 M L - 06 - PJ

① ② ③ ④ ⑤ ⑥ ⑦

① Indicates the attenuator.
② Form : C...Continuously variable attenuator
③ Optical connector : 1...Applicable to JIS C 5970 (F01)
④ Optical fiber : M...Applicable to SM-9.5/125
⑤ Specification wavelength band : L...1.0 to 1.8 μm
⑥ Maximum nominal attenuation (dB)
⑦ Classification : PJ...Plug-Jack type JJ...Jack-Jack type

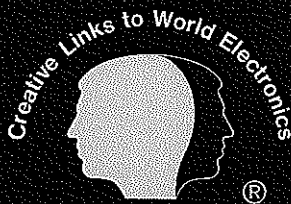
Optical Variable Attenuators

SC-type Attenuators



HRS No.	Product Number	Maximum Attenuation	Attenuation Variable Range	Reflection Attenuation	Notes
CL820-2001-4	HRLA-C1ML-06-PJ	6dB of greater	5dB of greater	≥40dB	Plug-Jack type

※Please use the scale as a guide.



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The contents of this catalog are current as of July 2000.
Contents are subject to change without notice for the purpose of improvements.

Printed in Japan