

NEW

**Outdoor Use Waterproof I/O Connectors
(Optical / Modular / Electrical)**

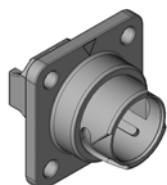
CONNECTOR

MB-0226-2

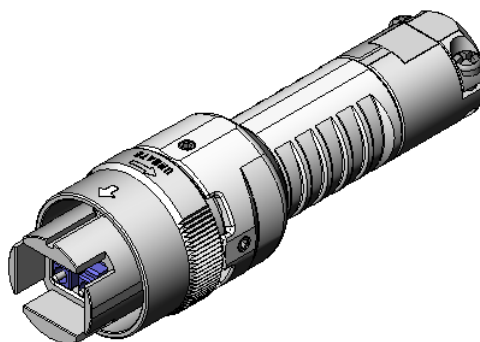
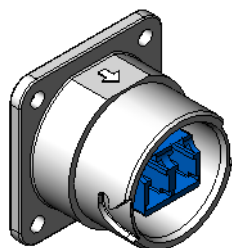
FO-BH, FO-BC, NT5, JN2 / W Series

July 2013

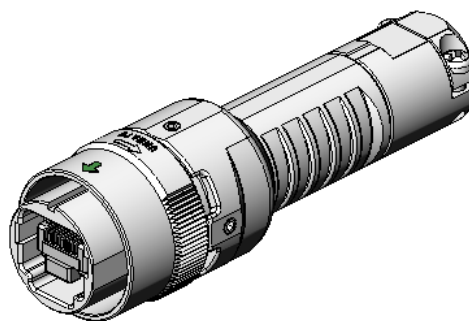
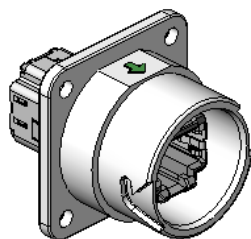
Optical FO-BH Series (Compact Type)



Optical FO-BC Series (LC Type)

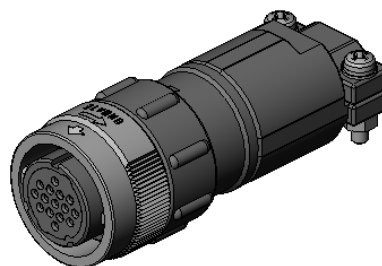


Modular NT5 Series





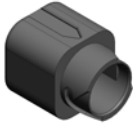





Electrical JN2/W Series

(Please refer to "MB-0178" for industrial use JN1/2W Series)



Receptacle (for panel attachment)

Plug

Series	Accessory	
Optical FO-BH	LC Conversion Adapter for Receptacle	
	Waterproof Cap for Receptacle	
	Waterproof Cap for Plug	
Used for both Optical FO-BC Modular NT5	Waterproof Cap for Receptacle	
	Rubber Cap for Receptacle	
	Waterproof Cap for Plug	
Electrical JN2/W	Waterproof Cap for Receptacle	
	Rubber Cap for Receptacle	

These I/O connectors are ideal for outdoor equipments, incorporating various connector types: optical, modular and electrical. They feature superior waterproof and dustproof performance in addition to operability with a one-touch lock, for use in a wide range of outdoor applications.

Features

Series		Features	
Features Common to all Series		<ul style="list-style-type: none"> - Easy and secure mating is possible with the one-touch lock, push-to-mate and twist-to-release structure. - High robustness - Strong cable retention force - Environmental resistance (Dustproof, waterproof: IP67, high corrosion resistance: corrosion resistance of 720 hours in salt spray) 	
Optical	FO-BH	Compact Outdoor Optical Connector <ul style="list-style-type: none"> - High robustness with metallic outer shell - Receptacle device internal side: connection for LC plug Plug mating side: connection for LC plug also possible using LC conversion adapter (not waterproof) - Can accommodate a cable retention wire 	
	FO-BC	Outdoor Waterproof Optical Connector with LC Connector <ul style="list-style-type: none"> - High robustness with metallic outer shell - LC adapter incorporated into receptacle (Connection for LC plug on both device internal side and plug mating side) - Double lock of LC connector and outer shell ensures highly reliable connection - Can accommodate a cable retention wire 	<p>Panel attachment hole dimensions are the same.</p> <p>Both (Optical / Modular) can be selected for the same panel cut out.</p> <p>The same dustproof and waterproof caps for both series.</p>
Modular	NT5	Outdoor Waterproof Connector With Modular Connector <ul style="list-style-type: none"> - High robustness with metallic outer shell - Modular adapter incorporated into receptacle (Connection for modular plug on both device internal side and plug mating side) - Transmission Characteristic: Cat5e - STP (Shielded twisted pair cable) compatible - Receptacle can be used as maintenance port with attachable caps 	
Electrical	JN2/W	Compact Outdoor Electrical Connector <ul style="list-style-type: none"> - Outdoor type of JN2WSeries (MB-0178) for industrial application - Secures robustness and light weight with metallic mating area of outer shell and combination of weather resistant resin parts - 15 position - Rated Current: 3A / position - Crimp Connection 	

General Specifications

Series	Items	Specification and Performance
Specifications in common for all Series	Operating Temperature	-40 Deg. C to 85 Deg. C
	Repeated Mating	500 times
	Dustproof Waterproof Performance	IP67 (When mated)
	Corrosion Resistance	Corrosion resistance of 720 hours in salt spray
Optical FO-BH FO-BC	Mating Area	LC connector (IEC 61754-20 compliant) - FO-BH: Device inner side - FO-BC: Device inner side, plug mating area
	No. of Fibers	- FO-BH: 1 optical fiber / 2 optical fibers - FO-BC: 2 optical fibers
	Insertion Loss	0.5dB max. / 1 connection
	Return Loss	40dB min. (SM10 / 125: AdPC Polished) 25dB min. (GI50 / 125: PC Polished)
	Cable Clamp Force	200N min. (when tension member of cable center is fixed to plug)
Modular NT5	Mating Area	8-contact modular connector (IEC 60603-7 compatible)
	Transmission Characteristic	Cat 5e (TIA/EIA-568-B.1)
	Conductor	AWG24 Single Cable
	Shield	Compatible
	Cable Clamp Force	100N min.
Electrical JN2/W	No. of Contacts	15 position
	Rated Current	3A / position (#22 size contact)
	Rated Voltage	200VAC
	Dielectric Withstanding Voltage	900VAC (for 1 minute)
	Insulation Resistance	1000M Ω min. (500VDC applied voltage)
	Terminal Specification	Receptacle: Crimp connection 20 to 28 AWG Plug: Crimp connection 20 to 28 AWG
	Cable Clamp Force	100N min.
	Weather Resistance	Xenon arc lamp light test: 1,500 hours

- Specifications of harnessed products also depend on the specifications of the selected cables.
- For more information, please refer to the specifications and drawings of each product.

Materials and Finishes

FO-BH

■ Receptacle

Component	Material and Finish
Shell	Zinc alloy / Trivalent chromate treatment over zinc plating
O-Ring	Synthetic rubber

■ Plug

Component	Material and Finish
Barrel	Zinc alloy / Trivalent chromate treatment over zinc plating
O-Ring	Synthetic rubber
Coupling Nut	Zinc alloy / Trivalent chromate treatment over zinc plating
Endbell	Zinc alloy / Trivalent chromate treatment over zinc plating
Spring	Stainless steel
Ferrule	Zirconia, Stainless steel
Bushing	Synthetic rubber
Grand Nut	Zinc alloy / Trivalent chromate treatment over zinc plating
Clamp Saddle	Zinc alloy / Trivalent chromate treatment over zinc plating
Slide Ring	Stainless steel
Split Sleeve	Zirconia
Hexagon Socket Set Screw (Flat point)	Stainless steel
Cross Recess Pan Head Machine Screw	Stainless steel
Stopper	Synthetic resin
Hexagon Socket Set Screw (Truncated cone point)	Steel / Trivalent chromate treatment over zinc plating
Dustproof Cap	Synthetic resin

Materials and Finishes

FO-BH

■ Receptacle LC Conversion Adapter

Component	Material and Finish
Coupling Nut	Zinc alloy / Trivalent chromate treatment over zinc plating
Spring	Stainless steel
Housing	Synthetic resin
Slit Sleeve	Zirconia
Ferrule	Zirconia
Housing Ferrule	Brass
Optical Fiber	Quarts, others
Flange	Zinc alloy / Trivalent chromate treatment over zinc plating
Stopper	Synthetic resin
Label	Synthetic resin
Dust Cap	Synthetic resin

■ Waterproof Cap for Receptacle

Component	Material and Finish
Barrel	Synthetic resin
Coupling Nut	Zinc alloy / Trivalent chromate treatment over zinc plating
Spring	Stainless steel
O-Ring	Synthetic rubber
Flange	Zinc alloy / Trivalent chromate treatment over zinc plating
Cap	Synthetic resin
Cross Recessed Head Tapping Screw	Copper alloy / Nickel plating

■ Waterproof Cap for Plug

Component	Material and Finish
Cap	Synthetic resin

Materials and Finishes

FO-BC

■ Receptacle

Component	Material and Finish
Receptacle Shell	Zinc alloy / Chromium plating*
O-Ring	Synthetic rubber
LC Adapter	Synthetic resin, Zirconia

■ Plug

Component	Material and Finish
Barrel	Zinc alloy / Chromium plating*
Coupling Nut	Zinc alloy / Chromium plating*
O-Ring	Synthetic rubber
Spring	Stainless steel
Endbell	Zinc alloy / Chromium plating*
Stopper	Synthetic resin
Spring	Stainless steel
Hexagon Socket Set Screw	Stainless steel
Stopper	Aluminum
Bushing	Synthetic rubber
Grand Nut	Zinc alloy / Chromium plating*
Slide Ring	Stainless steel
Clamp Saddle	Zinc alloy / Chromium plating*
Cross Recess Pan Head Machine Screw	Stainless steel
LC Plug (2 optical fibers)	Synthetic resin, Zirconia, Others
Sleeve	Copper alloy / Nickel plating
Pin	Stainless steel

* Chromium plating: chromium plating (hexavalent chromium free) over nickel over copper

Materials and Finishes

NT5

■ Receptacle

Component	Material and Finish
Receptacle Shell	Zinc alloy / Chromium plating*
O-Ring	Synthetic rubber
Shell	Copper alloy / Tin plating
Insulator	Synthetic resin
Locator	Synthetic resin
Contact	Copper alloy / Contact area: Gold plating over nickel Terminal area: Tin plating over nickel
Board	Epoxy resin

■ Plug

Component	Material and Finish	
Barrel	Zinc alloy / Chromium plating*	
Coupling Nut	Zinc alloy / Chromium plating*	
O-Ring	Synthetic rubber	
Spring	Stainless steel	
Endbell	Zinc alloy / Chromium plating*	
Hexagon Socket Set Screw	Stainless steel	
Bushing	Synthetic rubber	
Grand Nut	Zinc alloy / Chromium plating*	
Slide Ring	Stainless steel	
Clamp Saddle	Zinc alloy / Chromium plating*	
Cross Recess Pan Head Machine Screw	Stainless steel	
Modular Plug	Shell	Copper alloy / Tin plating over nickel
	Housing	Synthetic resin
	Contact	Copper alloy / Gold plating over nickel
	Locator	Synthetic resin

* Chromium plating: chromium plating (hexavalent chromium free) over nickel over copper

Materials and Finishes

Same for FO-BC and NT5

■ Waterproof Cap for Receptacle

Component	Material and Finish
Barrel	Synthetic resin
Coupling Nut	Zinc alloy / Chromium plating*
O-Ring	Synthetic rubber
Spring	Stainless steel
Cap	Synthetic resin
Cross Recess Tapping Screw	Copper alloy / Nickel plating

* Chromium plating: chromium plating (hexavalent chromium free) over nickel over copper

■ Rubber Cap for Receptacle

Component	Material and Finish
Cap	Synthetic rubber

■ Waterproof Cap for Plug

Component	Material and Finish
Cap	Synthetic resin

Materials and Finishes

JN2/W

■ Receptacle

Component	Material and Finish
Pin Insulator	Synthetic resin
Shell	Zinc alloy / Trivalent chromate treatment over zinc plating
Retaining Ring	Zinc alloy / Trivalent chromate treatment over zinc plating
O-Ring	Synthetic rubber
Contact	Copper alloy / Gold plating

■ Plug

Component	Material and Finish
Front Insulator	Synthetic resin
Rear Insulator	Synthetic resin
O-Ring	Synthetic rubber
Coupling Nut	Zinc alloy / Trivalent chromate treatment over zinc plating
Spring	Stainless steel
Assembly Nut	Synthetic resin
Endbell	Synthetic resin
Bushing	Synthetic rubber
Grand Nut	Synthetic resin
Fixation Pin	Copper alloy / Nickel plating
Flange	Zinc alloy / Chromium plating*
Clamp Saddle	Synthetic resin
Cross Recessed Head Machine Screw With Captive Washer	Stainless steel
Hexavalent Nut	Stainless steel
Contact	Copper alloy / Gold plating

* Chromium plating: chromium plating (hexavalent chromium free) over nickel over copper

Materials and Finishes

JN2/W

■ Waterproof Cap for Receptacle

Component	Material and Finish
Barrel	Synthetic resin
Coupling Nut	Zinc alloy / Trivalent Chromate treatment over zinc plating
O-Ring	Synthetic rubber
Spring	Stainless steel
Cap	Synthetic resin
Tapping countersunk head (machine) screw with LR hole	Copper alloy / Nickel plating

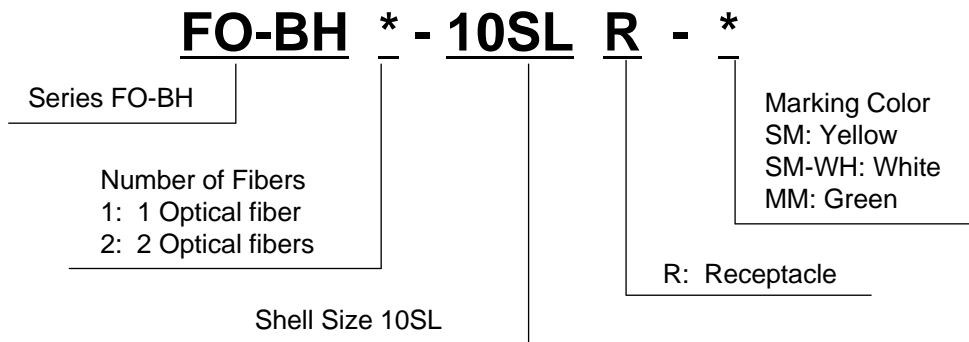
■ Rubber Cap for Receptacle

Component	Material and Finish
Cap	Synthetic rubber

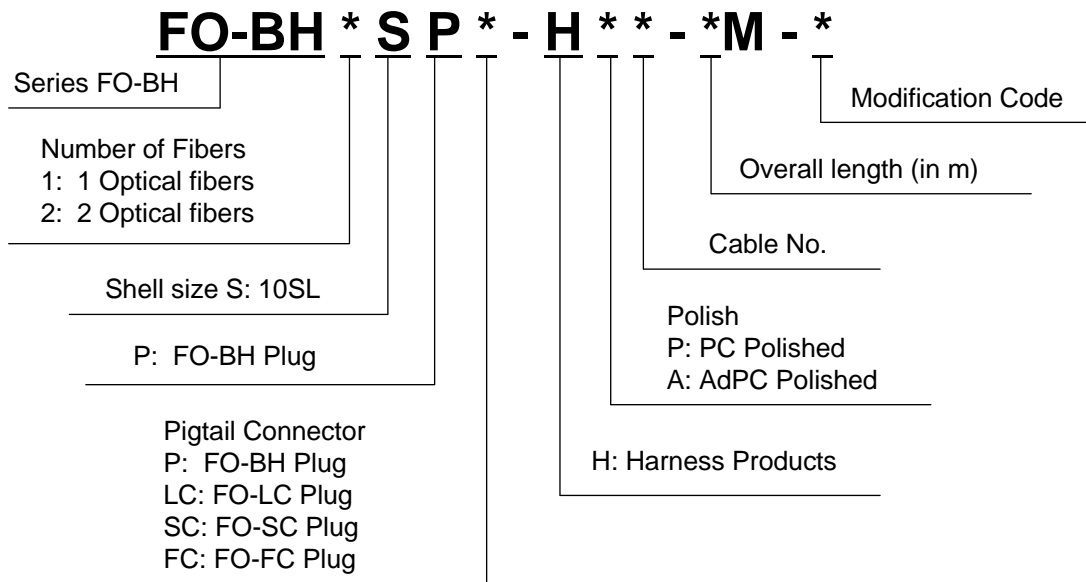
Ordering Information

FO-BH

■ Receptacle



■ Plug Harness



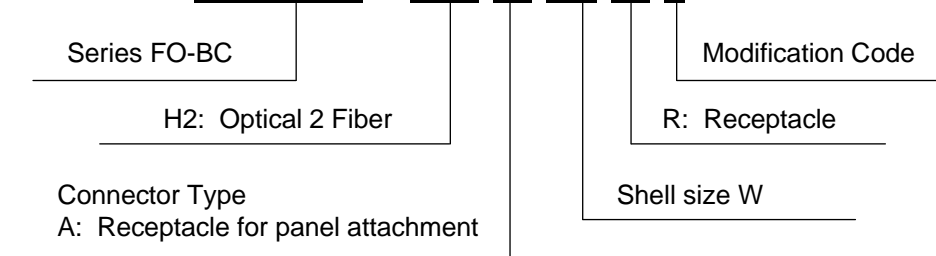
Type		Part Number		SJ Drawing	Specification	
Receptacle	No. of Fibers 1	Marking Color	Yellow	FO-BH1-10SLR-SM	SJ109157	JACS-70076-1
			Green	FO-BH1-10SLR-MM		
			White	FO-BH1-10SLR-SM-WH		
	No. of Fibers 2		Yellow	FO-BH2-10SLR-SM	SJ109158	
			Green	FO-BH2-10SLR-MM		
			White	FO-BH2-10SLR-SM-WH		
Plug Harness		Please contact us				
Receptacle LC conversion adapter	For SMF	FO-BH-ADLC-SM	SJ110822	JACS-70114		
	For MMF	FO-BH-ADLC-MM	SJ110823			
Waterproof Cap for Receptacle		FO-BH-10SLR-DC1	SJ109462	JACS-70084		
Waterproof Cap for Plug		FO-BH-10SLP-DC1	SJ110707	JACS-70109		

Ordering Information

FO-BC

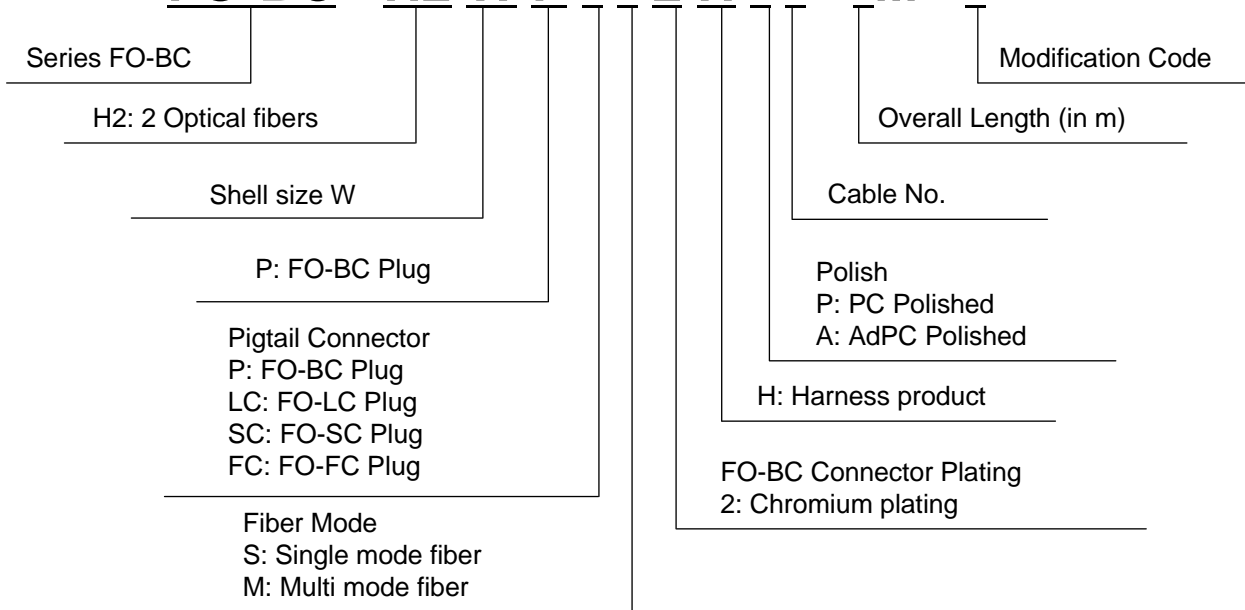
■ Receptacle

FO-BC - H2 A W R *



■ Plug Harness

FO-BC - H2 W P * * 2 H * * - * M - *



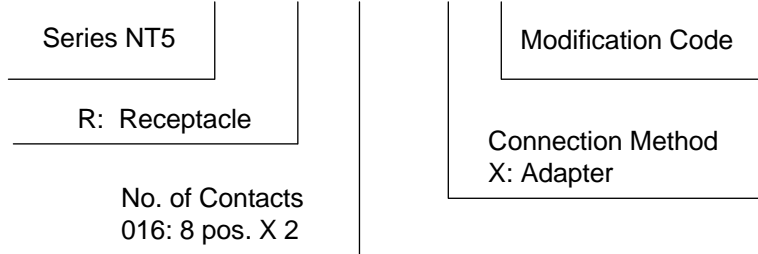
Type	Part Number	SJ Drawing	Specification
Receptacle	FO-BC-H2AWRG2	SJ113491	JACS-70214
Plug Harness	Please contact us		

Ordering Information

NT5

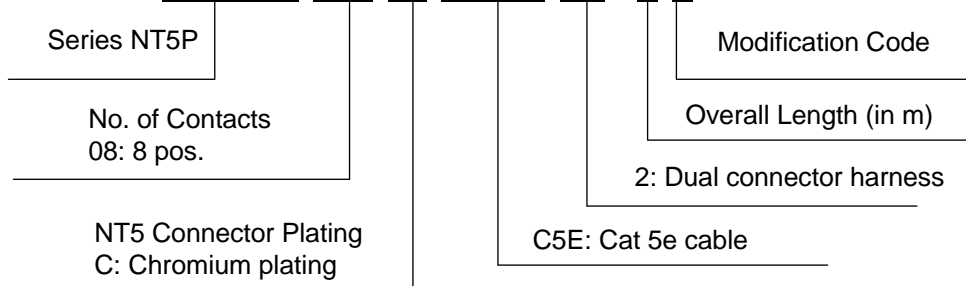
■ Receptacle

NT5 R 016 X **



■ Plug Harness

NT5P 08 C C5E 2 L* *



Type	Part Number	SJ Drawing	Specification
Receptacle	NT5R016XPB	SJ110837	JACS-30167
Plug Harness	Please contact us		

Part Number List

Same for FO-BC and NT5

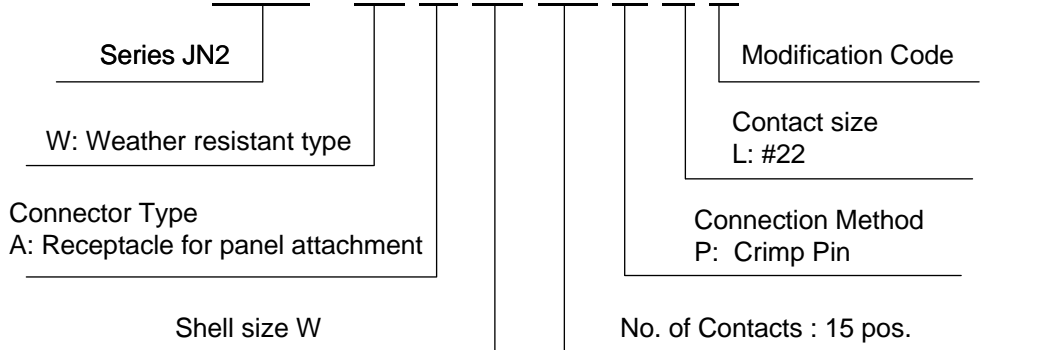
Type	Part Number	SJ Drawing	Specification
Waterproof Cap for Receptacle	FO-BC-R-DC3	SJ111292	JACS-70118
Rubber Cap for Receptacle	FO-BC-R-DC2	SJ110640	JACS-70108
Waterproof Cap for Plug	FO-BC-P-DC-1	SJ113476	JACS-70211

Ordering Information

JN2/W

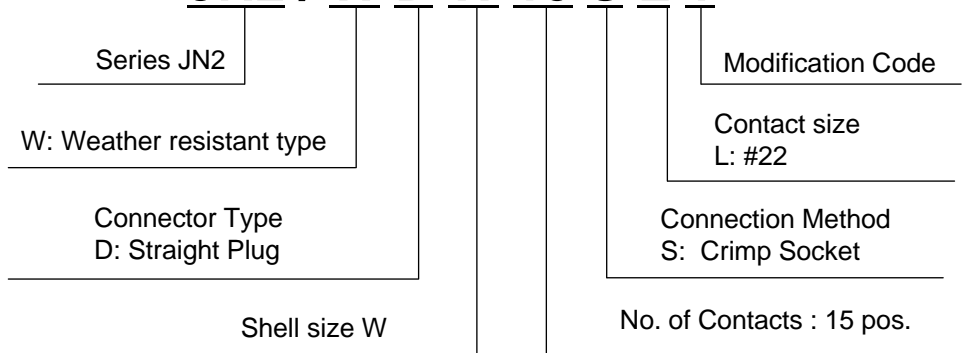
■ Receptacle

JN2 / W A W 15 P L 1



■ Plug

JN2 / W D W 15 S L 1



Type	Part Number	SJ Drawing	Specification
Receptacle (Contacts sold separately)	JN2/WAW15PL1	SJ111163	JACS-50034
Plug (Contacts sold separately)	JN2/WDW15SL1	SJ111164	
Plug Harness	Please contact us		
Waterproof Cap for Receptacle	JN2-AW-DC3	SJ111719	JACS-50034-1
Rubber Cap for Receptacle	JN2-AW-DC1A	SJ113127	-

Ordering Information

JN2/W

■ Applicable Contact (Sold separately) (The same as JN1 / 2 Series)

Type	Configuration	Part Number	SJ Drawing	Applicable Wire	Outer Diameter
Socket Contact (Crimp)	Contacts in pieces (100 pcs.)	JN1-22-20S-R-PKG100	SJ035503	20, 21AWG	Dia. 1.5 max.
		JN1-22-22S-PKG100		21 to 25AWG	Dia. 1.5 max.
		JN1-22-26S-PKG100		26 to 28AWG	Dia. 1.1 max.
	Contacts in reel (10,000 pcs.)	JN1-22-20S-R-10000	SJ035504	20, 21AWG	Dia. 1.5 max.
		JN1-22-22S-10000		21 to 25AWG	Dia. 1.5 max.
		JN1-22-26S-10000		26 to 28AWG	Dia. 1.1 max.
Pin Contact (Crimp)	Contacts in pieces (100 pcs.)	JN1-22-20P-R-PKG100	SJ037430	20, 21AWG	Dia. 1.5 max.
		JN1-22-22P-PKG100		21 to 25AWG	Dia. 1.5 max.
		JN1-22-26P-PKG100		26 to 28AWG	Dia. 1.1 max.
	Contacts in reel (10,000 pcs.)	JN1-22-20P-R-10000	SJ037431	20, 21AWG	Dia. 1.5 max.
		JN1-22-22P-10000		21 to 25AWG	Dia. 1.5 max.
		JN1-22-26P-10,000		26 to 28AWG	Dia. 1.1 max.

■ Chart of Crimp Tool (The same as JN1 / 2 Series)

Type of Tool	Instruction Manual for Tooling	Applicable Tooling	Applicable Wire	Outer Diameter	Part Number of Applicable Crimp Contact (Note 1)
Hand Crimp (for contacts in pieces)	T700253	CT150-2-JN1-D	20, 21AWG	Dia.1.3 to 1.5	JN1-22-20*-R-PKG100
			25AWG	Dia.0.8 to 1.0	JN1-22-22*-PKG100
		CT150-2-JN1-E	21, 23AWG	Dia.1.0 to 1.5	JN1-22-22*-PKG100
			25AWG	Dia.0.8 to 1.0	
	T700238	CT150-2-JN1-B	22, 24AWG	Dia.1.0 to 1.3	JN1-22-22*-PKG100
			26, 28AWG	Dia.0.8 to 1.0	JN1-22-26*-PKG100
Semi-automatic Crimp (for contacts in reel)	T703294	350-JN1-2C	20 to 28AWG	Dia.0.8 to 1.5	JN1-22-20*-R-10000 JN1-22-22*-10000 JN1-22-26*-10000
	T703413	350-D02-2 (Note 3)			

Note 1: The * in the part number will stand for P: Pin Contact, S: Socket Contact.

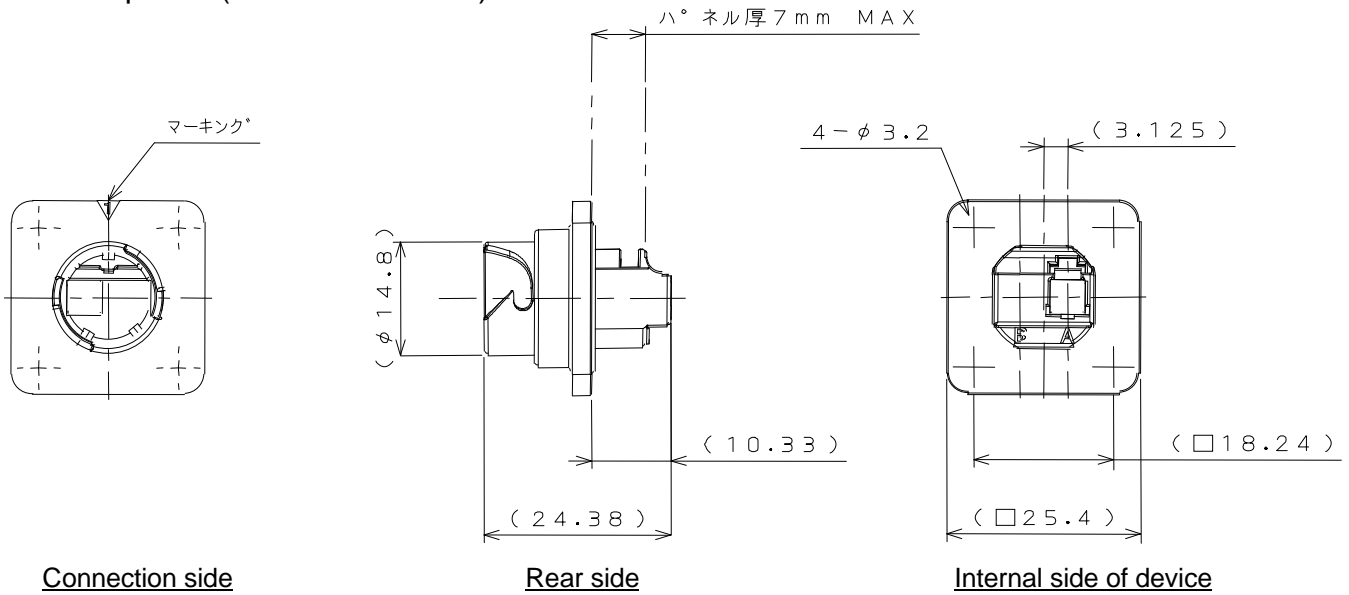
Note 2: Please contact us concerning connection tool, contact removal tool and the RoHS compliance of the tools for this series.

Note 3: When using 350-D02-2, adjustment of tool will be needed.

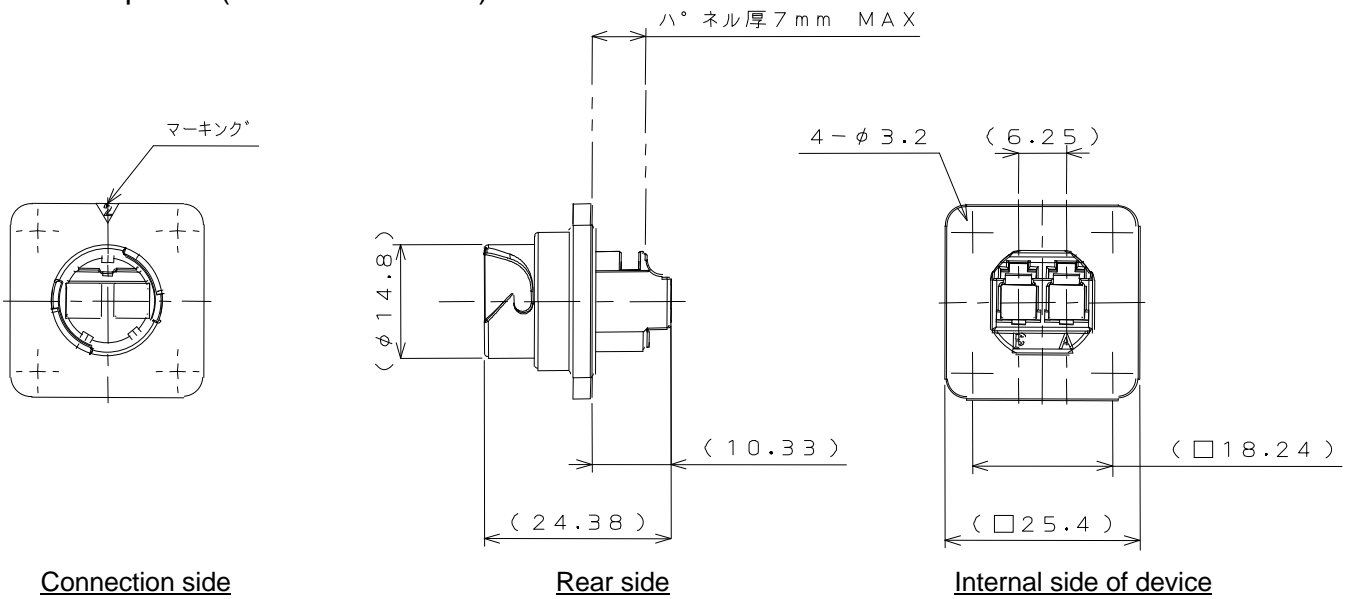
Outer Dimensions

FO-BH

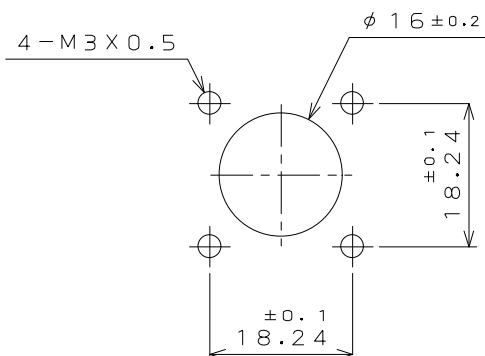
■ Receptacle (FO-BH1-10SLR-*)



■ Receptacle (FO-BH2-10SLR-*)



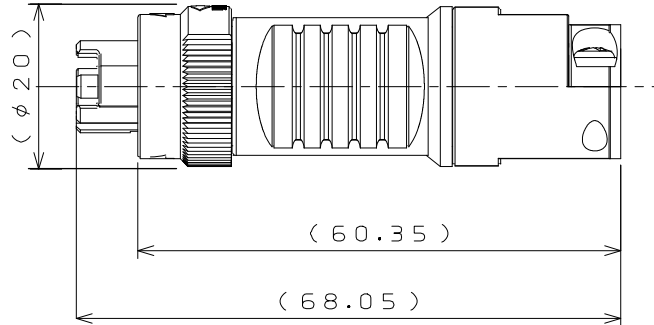
Panel attachment hole dimensions (for reference)



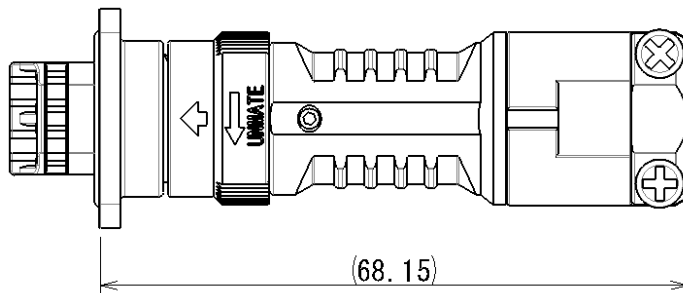
Outer Dimensions

FO-BH

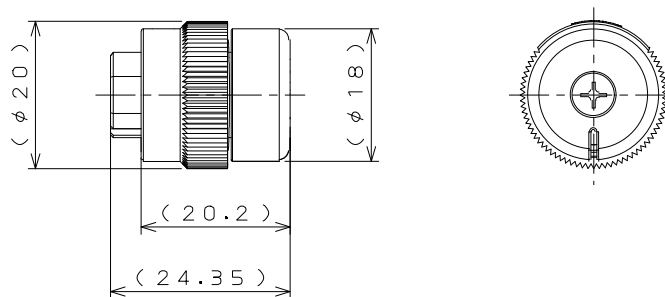
■ Plug



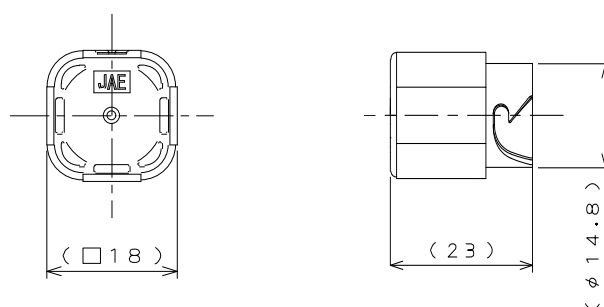
■ When Mated



■ Waterproof Cap for Receptacle



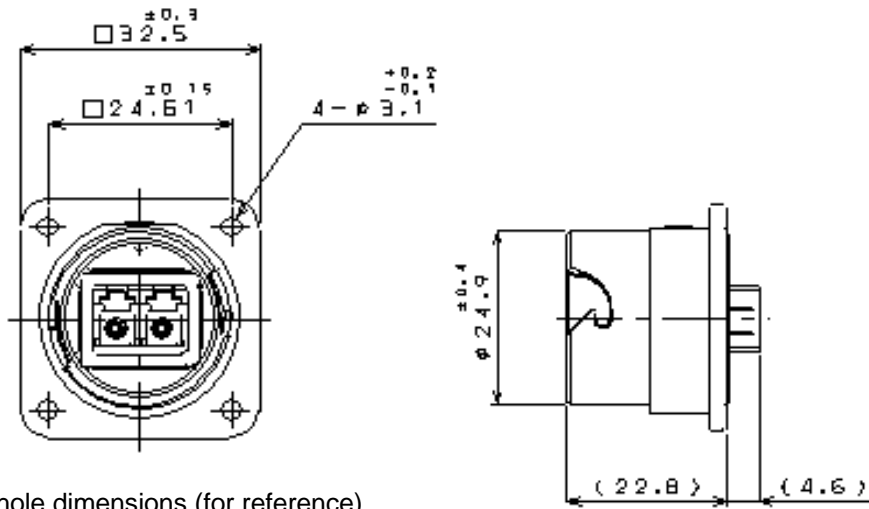
■ Waterproof Cap for Plug



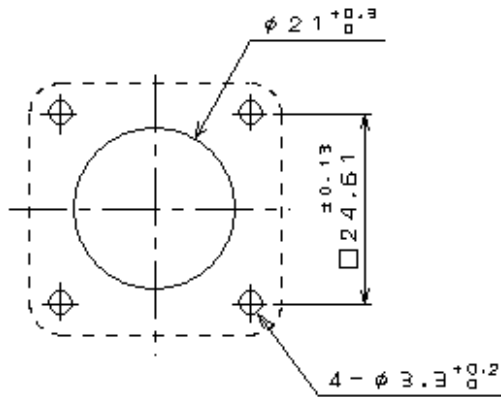
Outer Dimensions

FO-BC

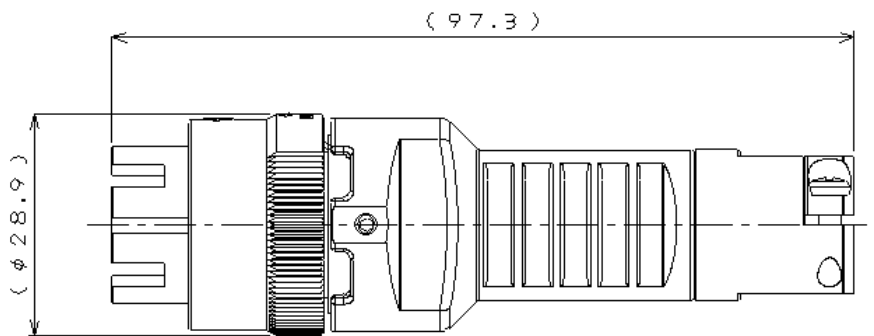
■ Receptacle



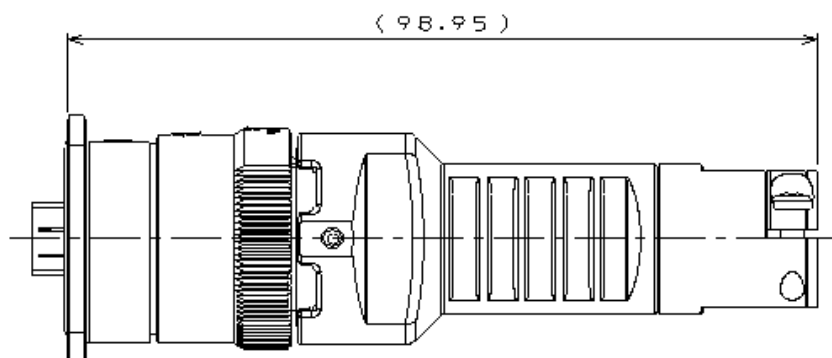
Panel attachment hole dimensions (for reference)



■ Plug



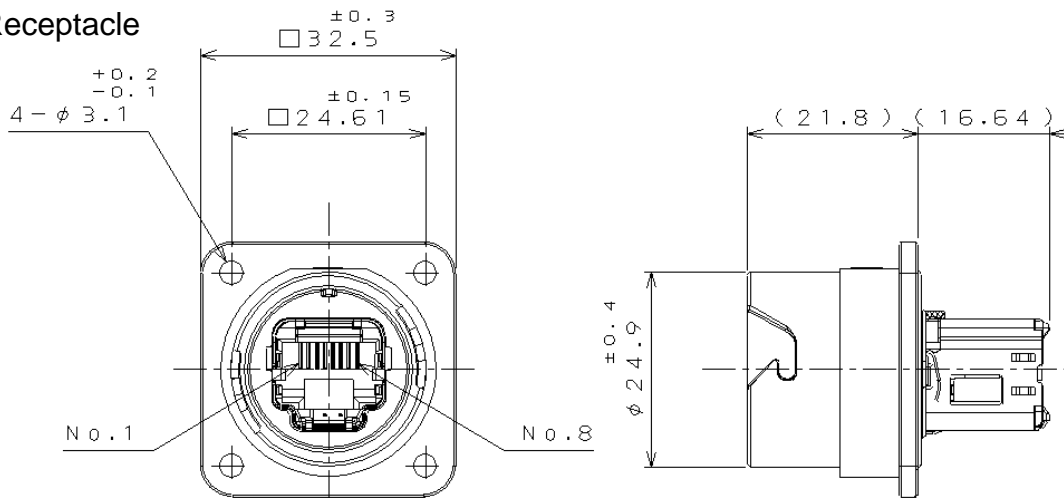
■ When Mated



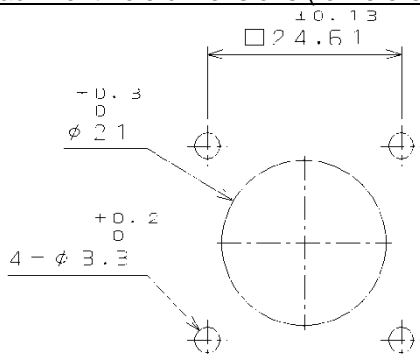
Outer Dimensions

NT5

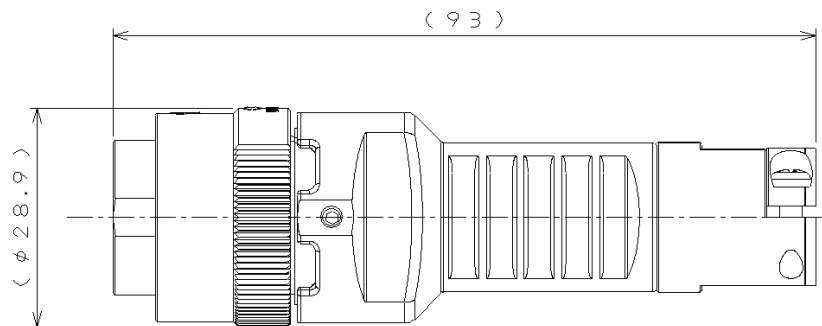
■ Receptacle



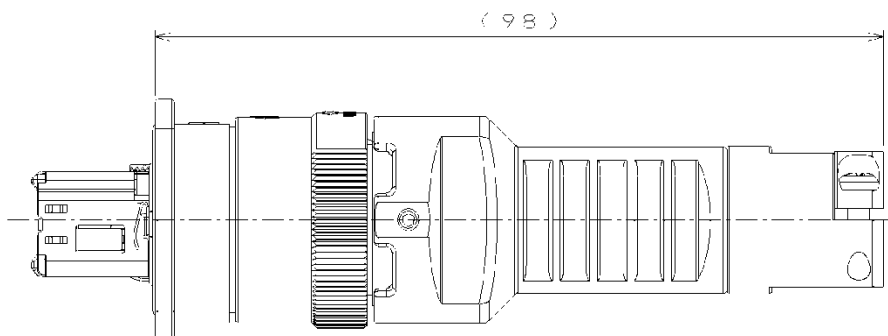
Panel attachment hole dimensions (for reference)



■ Plug



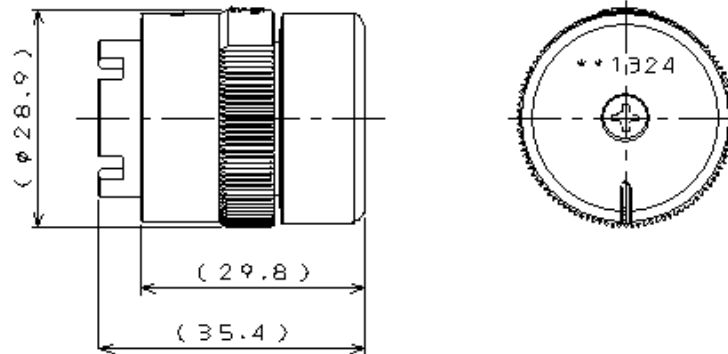
■ When Mated



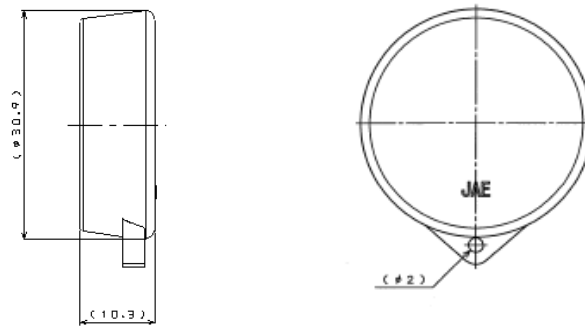
Outer Dimensions

FO-BC / NT5 in common

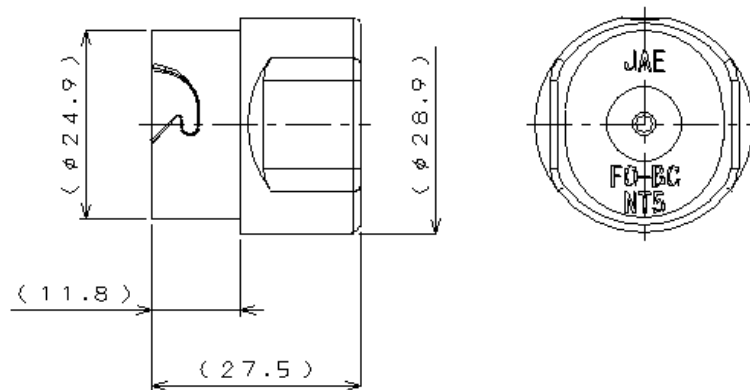
■ Waterproof Cap for Receptacle



■ Rubber Cap for Receptacle



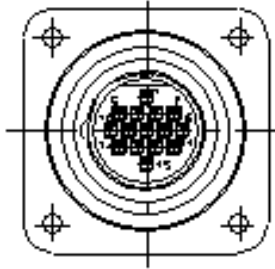
■ Waterproof Cap for Plug



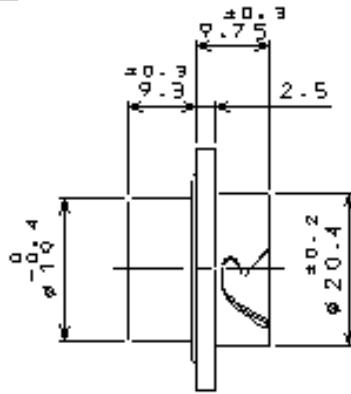
Outer Dimensions

JN2/W

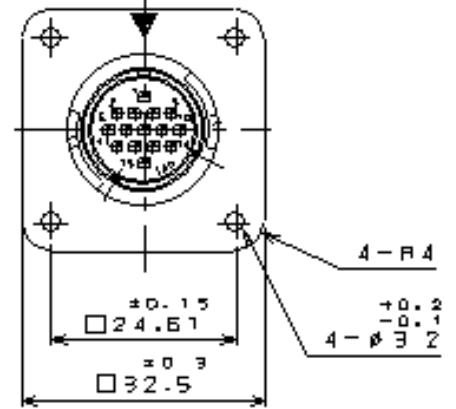
■ Receptacle



View from wire connection side

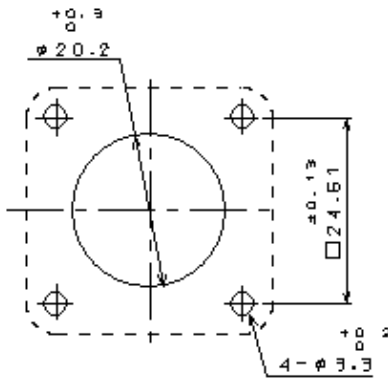


Rear side

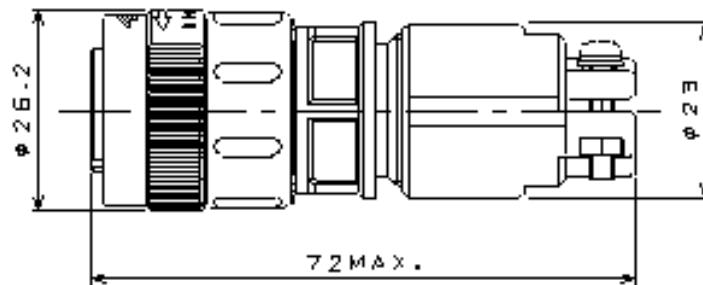


Connection side

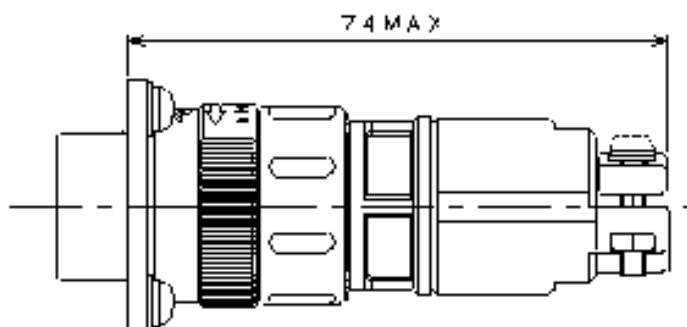
Panel attachment hole dimensions (for reference)



■ Plug

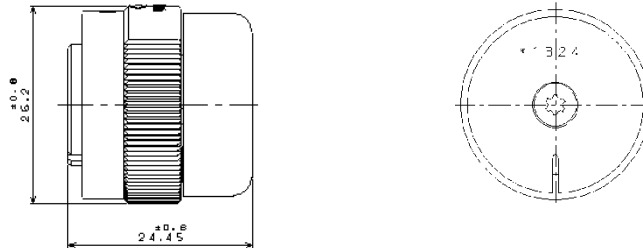


■ When Mated

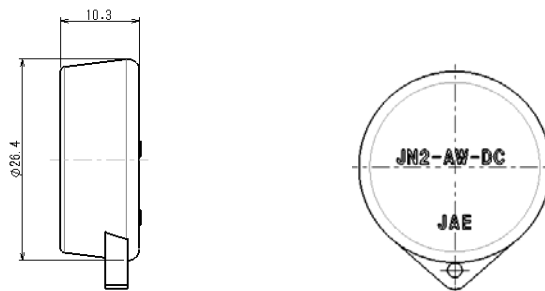


Outer Dimensions	JN2/W
-------------------------	--------------

■ Waterproof Cap for Receptacle



■ Rubber Cap for Receptacle



Notice:

1. The values specified in this brochure are only for reference. The products and their specifications are subject to change without notice. Contact our sales staff for further information before considering or ordering any of our products. For purchase, a product specification must be agreed upon.
2. Users are requested to provide protection circuits and redundancy circuits to ensure safety of the equipment, and sufficiently review the suitability of JAE's products to the equipment.
3. The products presented in this brochure are designed for the uses recommended below. We strongly suggest you contact our sales staff when considering use of any of the products in any other way than the recommended applications or for a specific use that requires an extremely high reliability.
 - (1) Applications that require consultation:
 - (i) Please contact us if you are considering use involving a quality assurance program that you specify or that is peculiar to the industry, such as:
Automotive electrical components, train control, telecommunications devices (mainline), traffic light control, electric power, combustion control, fire prevention or security systems, disaster prevention equipment, etc.
 - (ii) We may separately give you our support with a quality assurance program that you specify, when you think of a use such as :
Aviation or space equipment, submarine repeaters, nuclear power control systems, medical equipment for life support, etc.
 - (2) Recommended applications include:
Computers, office appliances, telecommunications devices (terminals, mobile units), measuring equipment, audiovisual equipment, home electric appliances, factory automation equipment, etc

Japan Aviation Electronics Industry, Limited

Product Marketing Division
 Aobadai Building, 3-1-19, Aobadai, Meguro-ku, Tokyo 153-8539
 Phone: +81-3-3780-2882 FAX: +81-3-3780-2946

* The specifications in this brochure are subject to change without notice. Please contact JAE for information.