

Waterproof Circular Connectors

JR-W Series



■ Features

1. Waterproof

The JR-W series is a rugged, waterproof connector series that is IP67 and IP68 rated in the mated condition.

IP67: Left in water at a depth of 1 m for 30 minutes

IP68: Left in water at a depth of 2 m for 14 days

2. Corrosion resistance

The outer shell is plated to improve corrosion resistance, allowing this connector to be used in various environments.

■ Product Specifications

Ratings	Current rating	Shell size	No. of contacts	Current rating
		13	3	10A
			5	5A
		16	7	10A
			10	5A (Crimp type 3A)
		21	10	10A
			16	5A
		25	4	30A
			16	10A
24	5A (Crimp type 3A)			
Ratings	Voltage rating	Shell size	No. of contacts	Voltage rating
		13	3	100V AC, 140V DC
			5	
		16	7	100V AC, 140V DC
			10	
		21	10	100V AC, 140V DC
			16	
		25	4	300V AC, 420V DC
			16, 24	100V AC, 140V DC
Ratings	Operating temperature range	-25 to +85°C		
	Storage temperature range	-10 to +60°C		

Item	Specifications	Conditions
1. Contact resistance	5 mΩ max. JR16-10 contact crimping type: 10 mΩ max. JR25-24 contact crimping type: 10 mΩ max.	Measured at DC 1A
2. Insulation resistance	1000 MΩ min. JR25-4 contacts: 10,000 mΩ min.	Measured at DC 500V
3. Withstanding voltage	No flashover or dielectric breakdown.	AC 1,000V for one minute JR25-4 contacts: AC 3,000 V for one minute
4. Vibration resistance	No electrical discontinuity for 10 μs or greater.	10 to 55 Hz/cycle, amplitude: 0.75 mm, 3 axis directions, 2 hours each.
5. Shock resistance	No electrical discontinuity for 10 μs or greater.	Acceleration: 490 m/s ² , duration: 11 ms 6 directions, 3 times each.
6. Mating cycles	Contact resistance: 5 mΩ max. JR16-10 contact crimping type: 10 mΩ max. JR25-24 contact crimping type: 10 mΩ max.	500 times
7. Temperature cycle	Insulation resistance: 1,000 MΩ min. JR25-4 contacts: 10,000 mΩ min.	-40°C: 30 minute → Normal temperature: 10 to 15 minutes → 100°C: 30 minutes → Normal temperature: 10 to 15 minutes, left for 5 cycles
8. Moisture resistance	Insulation resistance: 10 MΩ min. (at high humidity) 100 MΩ min. (when dry) JR25-4 contacts: 100 MΩ min. (at high humidity) 1,000 MΩ min. (when dry)	Temperature: 40°C, relative humidity: 90 to 95%, leave 96 hours Temperature: 40°C, relative humidity: 90 to 95%, left for 96 hours
9. Waterproof	No water penetration into the connector.	Mated connectors left in water at a depth of 1.8m for 48 hours.

Materials

Parts	Material	Finish	Remarks
Outer shell	Aluminium alloy, brass	Black chromium plating	————
Insulator	Phenol resin, PPS resin	————	UL94V-0
Contact	Copper alloy	Silver plating	————
Waterproof packing	Nitrile rubber, silicone rubber	————	————

Product Number Structure

● Plug and receptacle

JR 13 WP A - 3 P C ()**

① ② ③ ④ ⑤ ⑥ ⑦ ⑨

● Cord clamp

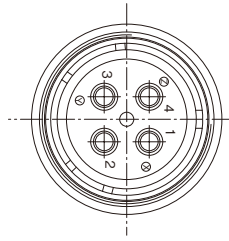
JR 13 WCC A - 4 ()**

① ② ③ ④ ⑧ ⑨

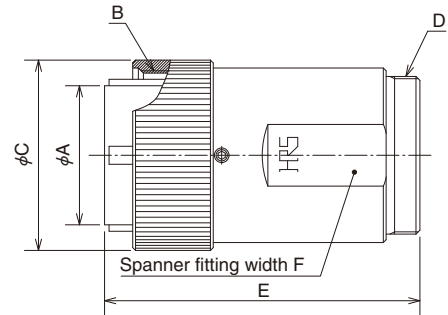
① Model name: JR Series
② Shell size : Shell size is the outer shell diameter of the mating end of the plug.
③ Shell type WP: Waterproof plug WR: Waterproof receptacle WCC: Waterproof clamp
④ Shell variation : Connectors are distinguished by A, B, or C if a shell variation is applied in the same form.
⑤ Number of contacts.
⑥ Contact form P: Male Contact S: Female Contact
⑦ Contact termination method None : Solder termination C : Crimp termination
⑧ Applicable cable diameter
⑨ Other specifications: A two-digit number is added to indicate other specifications.

■ Soldering type

● Plug



(Representative example)

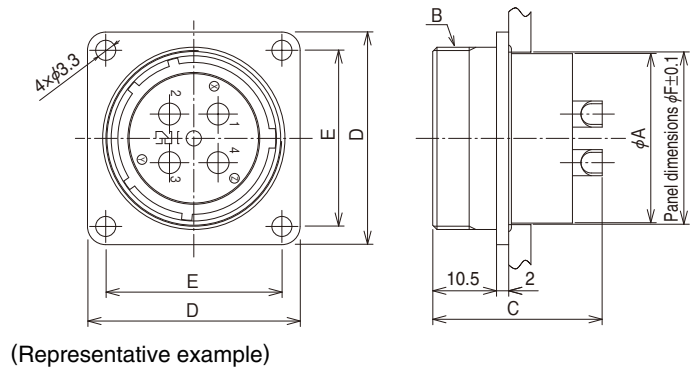


Part No.	HRS No.	No. of contacts	φA	B	φC	D	E	F	Remarks
JR13WP-3P(71)	114-2001-5 71	3	12.7	M18×1	21.8	M16×0.75	44.7	17	
JR13WP-5P(71)	114-2002-8 71	5							
JR16WP-7P(71)	114-2003-0 71	7	16.3	M22×1	25.8	M20×0.75	46.5	21	
JR16WP-10P(71)	114-2004-3 71	10							
JR21WP-10P(71)	114-2005-6 71	10	20.5	M26×1	29.8	M24×0.75	51	25.4	
JR21WP-16P(71)	114-2006-9 71	16							
JR25WPH-4P	114-2185-0	4	24.7	M30×1	33.8	M28×0.75	56	29	☆
JR25WP-16P(71)	114-2010-6 71	16							
JR25WP-24P(71)	114-2011-9 71	24							
JR13WP-3S(71)	114-2012-1 71	3	12.7	M18×1	21.8	M16×0.75	44.7	17	
JR13WP-5S(71)	114-2013-4 71	5							
JR16WP-7S(71)	114-2014-7 71	7	16.3	M22×1	25.8	M20×0.75	46.5	21	
JR16WP-10S(71)	114-2015-0 71	10							
JR21WP-10S(71)	114-2016-2 71	10	20.5	M26×1	29.8	M24×0.75	51	25.4	
JR21WP-16S(71)	114-2017-5 71	16							
JR25WPH-4S	114-2183-4	4	24.7	M30×1	33.8	M28×0.75	56	29	☆
JR25WP-16S(71)	114-2021-2 71	16							
JR25WP-24S(71)	114-2022-5 71	24							

Note 1: Plugs must be used with cord clamps.

Note 2: ☆: Denotes waterproof gaskets with a silicone rubber specification

● Receptacle (Flange type)

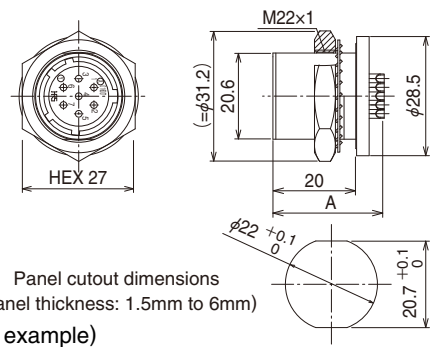


Part No.	HRS No.	No. of contacts	φA	B	C	D	E	φF	Remarks
JR13WR-3P(71)	114-2023-8 71	3	15.9	M18×1	26.6	26	20	16.3	
JR13WR-5P(71)	114-2024-0 71	5			26.1				
JR16WR-7P(71)	114-2025-3 71	7	19.9	M22×1	26.6	29	23	20.3	
JR16WR-10P(71)	114-2026-6 71	10			26.1				
JR21WR-10P(71)	114-2027-9 71	10	23.9	M26×1	26.6	32	26	24.3	
JR21WR-16P(71)	114-2028-1 71	16			26.1				
JR25WRH-4P	114-2184-7	4	27.9	M30×1	28	35	29	28.3	☆
JR25WR-16P(71)	114-2032-9 71	16			26.6				
JR25WR-24P(71)	114-2033-1 71	24			26.1				
JR13WR-3S(71)	114-2034-4 71	3	15.9	M18×1	28	26	20	16.3	
JR13WR-5S(71)	114-2035-7 71	5			27				
JR16WR-7S(71)	114-2036-0 71	7	19.9	M22×1	28	29	23	20.3	
JR16WR-10S(71)	114-2037-2 71	10			27				
JR21WR-10S(71)	114-2038-5 71	10	23.9	M26×1	28	32	26	24.3	
JR21WR-16S(71)	114-2039-8 71	16			27				
JR25WRH-4S	114-2186-2	4	27.9	M30×1	28	35	29	28.3	☆
JR25WR-16S(71)	114-2043-5 71	16			28				
JR25WR-24S(71)	114-2044-8 71	24			27				

Note 1: ☆ : Denotes waterproof gaskets with a silicone rubber specification

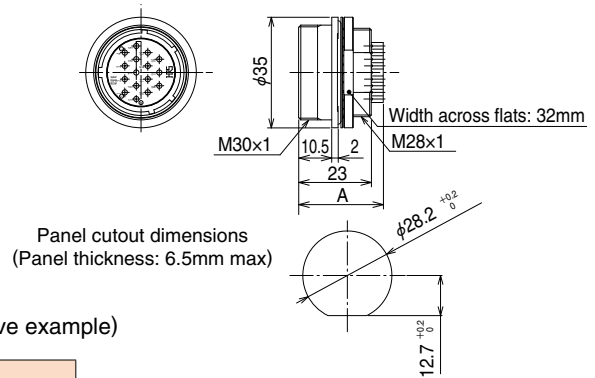
■ Soldering type

● Receptacle (Front nut-tightening type)



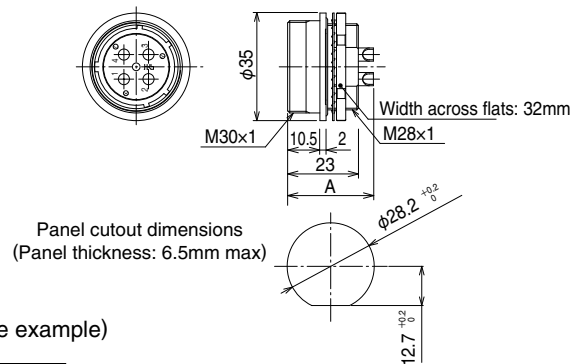
Part No.	HRS No.	No. of contacts	A
JR16WRA-7P(71)	114-2143-0 71	7	26.6
JR16WRA-10P(71)	114-2096-1 71	10	26.1
JR16WRA-10S(71)	114-2145-5 71		27

● Receptacle (Rear nut-tightening type)



Part No.	HRS No.	No. of contacts	A
JRC25WRG-16P(74)	114-1032-3 74	16	26.8
JRC25WRG-24P(74)	114-1033-6 74	24	26.1
JRC25WRG-16S(74)	114-1043-0 74	16	27.8
JRC25WRG-24S(74)	114-1044-2 74	24	26.5

● Receptacle (Rear nut-tightening type with hex nut)

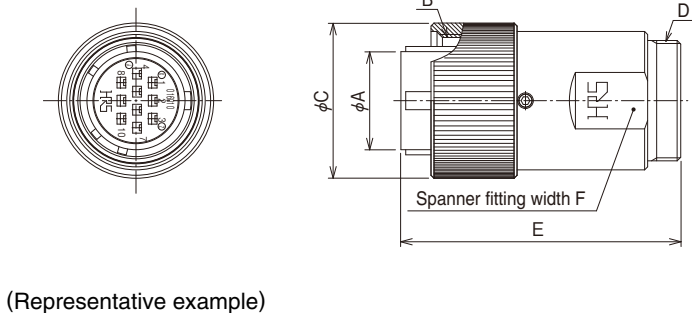


Part No.	HRS No.	No. of contacts	A	Remarks
JR25WRHA-4P	114-1136-9	4	28	☆
JR25WRHA-4S	114-1135-6			

Note 1: ☆: Denotes waterproof gaskets with a silicone rubber specification

■ Crimp type

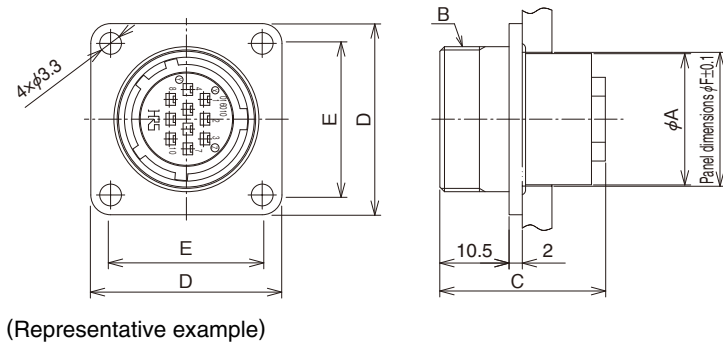
● Plug



Part No.	HRS No.	No. of contacts	φA	B	φC	D	E	F	Contact dia.
JR16WP-10PC(71)	114-2114-1 71	10	16.3	M22×1	25.8	M20×0.75	46.5	21	1
JR21WP-10PC(71)	114-2115-4 71	10	20.5	M26×1	29.8	M24×0.75	51	25.4	1.6
JR25WP-24PC(71)	114-2118-2 71	24	24.7	M30×1	33.8	M28×0.75	56	29	1
JR16WP-10SC(71)	114-2122-0 71	10	16.3	M22×1	25.8	M20×0.75	46.5	21	
JR25WP-24SC(71)	114-2126-0 71	24	24.7	M30×1	33.8	M28×0.75	56	29	

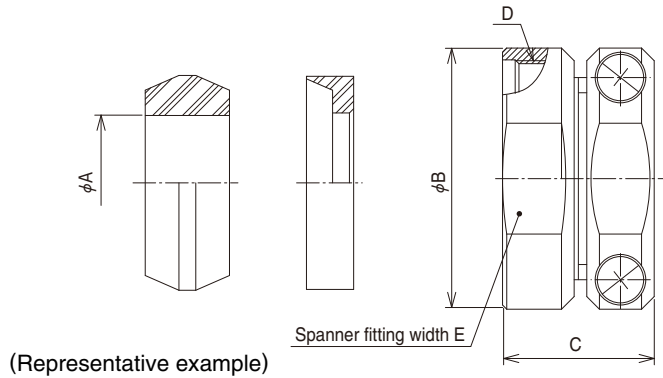
Note 1: Plugs must be used with cord clamps.

● Receptacle(Flange type)



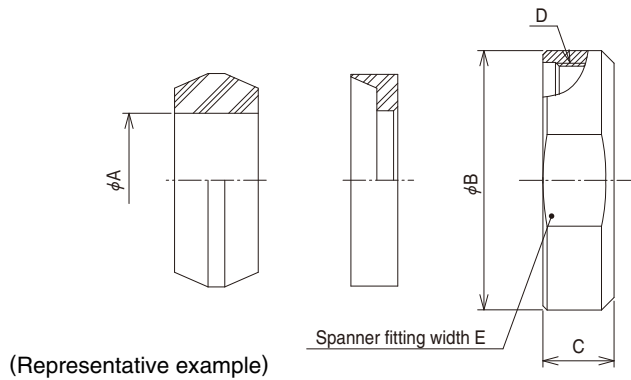
Part No.	HRS No.	No. of contacts	φA	B	C	D	E	φF	Contact dia.
JR16WR-10PC(71)	114-2130-8 71	10	19.9	M22×1	25.1	29	23	20.3	1
JR25WR-24PC(71)	114-2134-9 71	24	27.9	M30×1		35	29	28.3	
JR25WR-24SC(71)	114-2142-7 71				23				

● Cable clamp (Standard type)



Part No.	HRS No.	ϕA	ϕB	C	D	E
JR13WCC-4(71)	114-2045-0 71	4	20	17	M16×0.75	17
JR13WCC-5(71)	114-2046-3 71	5				
JR13WCC-6(71)	114-2047-6 71	6				
JR13WCC-7(71)	114-2048-9 71	7				
JR13WCC-8(71)	114-2049-1 71	8				
JR13WCC-9(71)	114-2050-0 71	9				
JR13WCC-10(71)	114-2051-3 71	10				
JR16WCC-4(71)	114-2052-6 71	4	23	17.5	M20×0.75	21
JR16WCC-6(71)	114-2053-9 71	6				
JR16WCC-8(71)	114-2054-1 71	8				
JR16WCC-10(71)	114-2055-4 71	10				
JR16WCC-12(71)	114-2056-7 71	12				
JR21WCC-6(71)	114-2057-0 71	6	27	17.5	M24×0.75	25.4
JR21WCC-8(71)	114-2058-2 71	8				
JR21WCC-10(71)	114-2059-5 71	10				
JR21WCC-12(71)	114-2060-4 71	12				
JR21WCC-14(71)	114-2061-7 71	14				
JR21WCC-16(71)	114-2062-0 71	16				
JR25WCC-8(71)	114-2063-2 71	8	31	18	M28×0.75	29
JR25WCC-10(71)	114-2064-5 71	10				
JR25WCC-12(71)	114-2065-8 71	12				
JR25WCC-14(71)	114-2066-0 71	14				
JR25WCC-16(71)	114-2067-3 71	16				
JR25WCC-18(71)	114-2068-6 71	18				

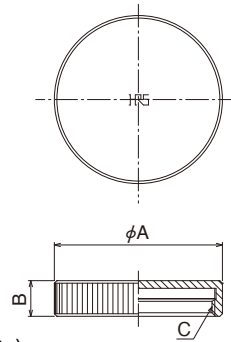
● Cable clamp (Simple type)



Part No.	HRS No.	ϕA	ϕB	C	D	E
JR13WCCA-4(71)	114-2069-9 71	4	19	7.5	M16×0.75	17
JR13WCCA-5(71)	114-2070-8 71	5				
JR13WCCA-6(71)	114-2071-0 71	6				
JR13WCCA-7(71)	114-2072-3 71	7				
JR13WCCA-8(71)	114-2073-6 71	8				
JR13WCCA-9(71)	114-2074-9 71	9				
JR13WCCA-10(71)	114-2075-1 71	10				
JR16WCCA-4(71)	114-2076-4 71	4	23	8	M20×0.75	21
JR16WCCA-6(71)	114-2077-7 71	6				
JR16WCCA-8(71)	114-2078-0 71	8				
JR16WCCA-10(71)	114-2079-2 71	10				
JR16WCCA-12(71)	114-2080-1 71	12				
JR21WCCA-6(71)	114-2081-4 71	6	27	8	M24×0.75	25.4
JR21WCCA-8(71)	114-2082-7 71	8				
JR21WCCA-10(71)	114-2083-0 71	10				
JR21WCCA-12(71)	114-2084-2 71	12				
JR21WCCA-14(71)	114-2085-5 71	14				
JR21WCCA-16(71)	114-2086-8 71	16				
JR25WCCA-8(71)	114-2087-0 71	8	31	8.5	M28×0.75	29
JR25WCCA-10(71)	114-2088-3 71	10				
JR25WCCA-12(71)	114-2089-6 71	12				
JR25WCCA-14(71)	114-2090-5 71	14				
JR25WCCA-16(71)	114-2091-8 71	16				
JR25WCCA-18(71)	114-2092-0 71	18				

Note: The simple cord clamp does not have the cable clamping ability as the standard cable clamp does. We recommend that you make sure that the clamping capability of the simple cord clamp is sufficient for your application.

●Cap (Without a chain)

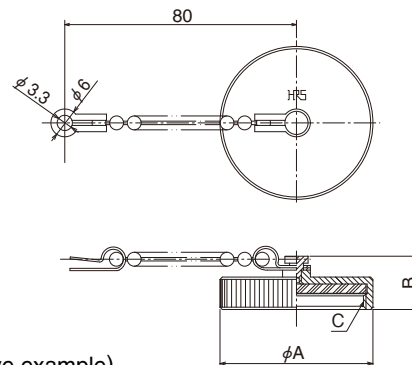


(Representative example)

Part No.	HRS No.	φA	B	C	Remarks
JR16WRC(71)	114-2162-4 71	25	7	M22×1	☆
JR16WRC(75)	114-2162-4 75				
JR25WRC(71)	114-2163-7 71	33	7.5	M30×1	☆
JR25WRC(75)	114-2163-7 75				
JR25WRC5	114-2175-6		☆, Plastic shell		

Note 1: ☆: Denotes waterproof gaskets with a silicone rubber specification

●Cap (With a chain)



(Representative example)

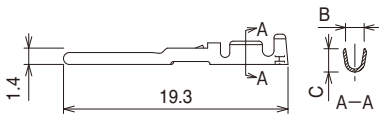
Part No.	HRS No.	φA	B	C	Remarks
JR13WRC3	114-2170-2	21	11.5	M18×1	☆
JR16WRC3	114-2171-5	25		M22×1	
JR25WRC3	114-2172-8	33		M30×1	

Note 1: ☆: Denotes waterproof gaskets with a silicone rubber specification

◆ Crimp contacts

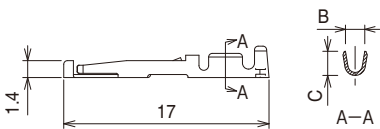
■ Contact diameter $\phi 1.0$ mm

● Male contact



Type	Part No.	HRS No.	B	C	Applicable wire
Loose contacts	JRC-PC2-112	114-0243-3	1.6	2.0	AWG#20 to 24
	JRC-PC2-122	114-0244-6	1.45	1.5	AWG#24 to 28
Reel contacts	JRC-PC2-212	114-0245-9	1.6	2.0	AWG#20 to 24
	JRC-PC2-222	114-0246-1	1.45	1.5	AWG#24 to 28

● Female contact

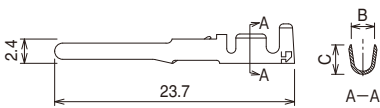


Type	Part No.	HRS No.	B	C	Applicable wire
Loose contacts	JRC-SC2-112	114-0247-4	1.6	2.0	AWG#20 to 24
	JRC-SC2-122	114-0248-7	1.45	1.5	AWG#24 to 28
Reel contacts	JRC-SC2-212	114-0249-0	1.6	2.0	AWG#20 to 24
	JRC-SC2-222	114-0250-9	1.45	1.5	AWG#24 to 28

Note: Loose contacts come in packages of 100 pcs.
Reel contacts come in reels of 8,000 pcs.

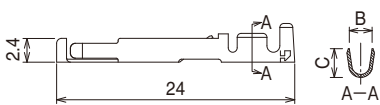
■ Contact diameter $\phi 1.6$ mm

● Male contact



Type	Part No.	HRS No.	B	C	Applicable wire
Loose contacts	JRC-PC-112	114-0239-6	2.3	2.9	AWG#16 to 20
Reel contacts	JRC-PC-212	114-0240-5			

● Female contact



Type	Part No.	HRS No.	B	C	Applicable wire
Loose contacts	JRC-SC-112	114-0241-8	2.3	2.9	AWG#16 to 20
Reel contacts	JRC-SC-212	114-0242-0			

Note: Loose contacts come in packages of 100 pcs.
Reel contacts come in reels of 5,000 pcs.

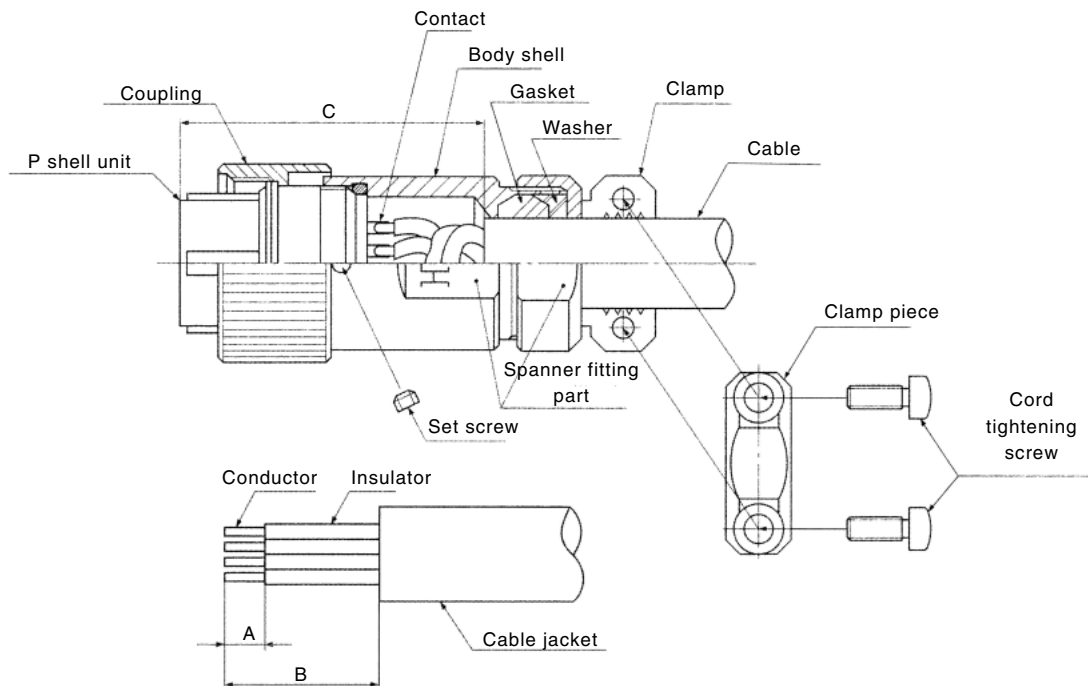
◆ Tools

Contact dia.	Type	Item	Part No.	HRS No.	Applicable contact	Applicable wire	
$\phi 1$	Manual	Manual crimping tool	RM-TC-11	150-0006-1	JRC-PC2-112 JRC-SC2-112	AWG#20 to 24	
			RM-TC-12	150-0007-4	JRC-PC2-122 JRC-SC2-122	AWG#24 to 28	
	Automatic	Automatic crimping machine body	CM-105	901-0005-4	—	—	
			Applicator	AP105-JRC2-1	901-2037-1	JRC-PC2-212 JRC-SC2-212	AWG#20 to 24
				AP105-JRC2-2	901-2038-4	JRC-PC2-222 JRC-SC2-222	AWG#24 to 28
	Extractor	RM-TP	150-0008-7	—	—		
$\phi 1.6$	Manual	Manual crimping tool	JRC-TC-11	150-0033-4	JRC-PC-112 JRC-SC-112	AWG#16	
			JRC-TC-12	150-0034-7	JRC-PC-112 JRC-SC-112	AWG#18 to 20	
	Automatic	Automatic crimping machine body	CM-105	901-0005-4	—	—	
			Applicator	AP105-JRC-1	901-2039-7	JRC-PC-212 JRC-SC-212	AWG#16 to 20
	Extractor	JRC-TP	150-0035-0	—	—		

◆ Plug assemblies procedure

○ The receptacle side is omitted because no special procedures are required.

● Diagrammatical view



○ Work procedure

1. Disassembly of connector

- (1) To remove the plug, remove the set screw, fit a receptacle adaptive to the P shell unit to fix, and remove the cord tube.
- (2) To remove the cord clamp, remove the cord tightening screws. (Note 1)

2. Connection

2.1 Soldering type

- (1) Use the cable so that the conductor can be soldered properly into the solder cup with the cable sheath diameter adaptive to each cord clamp.
- (2) After the terminal treatment of the cable with a size given in Table 1, thread on the cable the clamp, washer, gasket, cord tube and coupling in this order and direction as shown above.
- (3) Solder to connect the conductors to the terminals of the P shell unit. Shrinkable tube is recommended to be used at the connecting part because insulating performance might deteriorate due to solder whiskers or dewing. After connecting, adjust to meet the C size. (Note 2)

2.2 For crimping type connectors

- (1) Please make sure to use a cable with the correct outer diameter for the cord clamp. It is also important that the wire and its outer diameter are appropriate for the crimp contacts.
- (2) Pass the cables in order through the 1) tightening fitting, 2) washer, 3) gasket, 4) cord tube, and 5) coupling in the direction shown on the above figure, following terminal treatment as shown in Table-2.
- (3) After crimping the applicable crimping contacts onto the conductor, insert the crimping contacts into the contact holes of the P-shell unit. After inserting, please make adjustments so that the dimension for Section C shall be satisfied. (Note 2)

3. Assembly of connector

- (1) Fit the connected P shell unit to the receptacle fixed with a vice or the like. Torque the cord tube to the level as given in Table-3.
- (2) Fit the gasket, washer and clamp. Torque the clamp to the level as given in Table-3 while preventing the cable from being rotated. And, Loctite Japan Co Ltd. is recommended to be applied as locking. (Note 3)
- (3) Torque the set screw to 0.2 to 0.25 N·m.
- (4) Torque the cord tightening screw (two positions) to 0.65 to 0.7 N·m. (Note 1, 3)

Note 1: Not required if a simple type cord clamp is used.

Note 2: Please maintain this dimension until assembly is complete.

Note 3: Cable clamping force, cable rotation force, and others aspects may differ depending on the cable construction.

We recommend that you verify the suitability of the cable assembly before use or production.

Table 1 (Solder type) [unit: mm]

Shell size	A	B	C
13	(3)	(12)	37 MAX.
16	(3)	(14)	39 MAX.
21	(3)	(17)	42 MAX.
25	(3)	(20)	45 MAX.

Table 2 (Crimp type) [unit: mm]

Shell size	No. of contacts	A	B	C
16	10	3.5 to 4	(19)	39 MAX.
		4 to 4.5	(22)	42 MAX.
21	16			
25	24	3.5 to 4	(25)	45 MAX.

Table 3 [unit: N·m]

Shell size	Tightning torque
13	2 to 2.5
16	3 to 3.5
21	4 to 4.5
25	5 to 5.5

◆ Contact position arrangement

Shell size 13, 16	13		16	
No. of contacts	3	5	7	10
Withstand voltage	1,000V AC for 1 minute			
Current capacity	10A	5A	10A	5A(Crimp type)
Insulation resistance	1000 MΩ MIN.			
Contact resistance	5 mΩ MAX.			5 mΩ MAX. (Crimp type 10 mΩ)
Solderpot inner diameter	1.7 mm dia.	1.1 mm dia.	1.7 mm dia.	1.1 mm dia.

Shell size 21	21	
No. of contacts	10	16
Withstand voltage	1,000 V AC for 1 minute	
Current capacity	10A	5A
Insulation resistance	1000 MΩ MIN.	
Contact resistance	5 mΩ MAX.	
Solderpot inner diameter	1.7 mm dia.	1.1 mm dia.

Shell size 25	25		
No. of contacts	4	16	24
Withstand voltage	3,000V AC for 1 minute	1,000 V AC for 1 minute	
Current capacity	30A	10 A	5A (Crimp type 3A)
Insulation resistance	10,000MΩ MIN.q	1000 MΩ MIN.	
Contact resistance	5 mΩ MAX.		5mΩ MAX. (Crimp type 10 mΩ)
Solderpot inner diameter	3.4 mm dia.	1.7 mm dia.	1.1 mm dia.

Remarks 1. Figures are views of contact arrays of the mating end of male connectors.
2. The withstand voltage indicates the test voltage value.

◆ Precautions

1. Switch off the power of the circuit before disconnecting or plugging-in the connectors.
2. Use connectors with socket contacts at the power side of the circuit.
3. Make sure that the coupling is in completely cocked position.
4. Use the connector as the combination of water-proof types.



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