



Yonggui Electric Equipment

QAL Series Connector

***Product
Description
2020 Edition***



Zhejiang Yonggui Electric Equipment Co., Ltd.

Yonggui Connector Connector Expert

-[HTTP://UUUUUU.VONGGUI-SC.COM/](http://UUUUUU.VONGGUI-SC.COM/)-

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QAL Series Connector

Product Description:

This series of products comply with the relevant provisions of MIL-DTL-5015, VG95234 and NFF61030. This series of electrical connectors adopts bayonet connection and crimp structure, which is featured with quick connection and separation, vibration resistance, shock resistance, etc. They are widely used in railroads, aviation, industry and electronic fields.



Technical Parameters

Technical Parameters

The parameters are listed below:

Type Parameters

①Electrical Parameters

- Rated voltage:	220V AC
- Rated current:	13A
- Contact resistance:	$\leq 2.5m\Omega$
- Insulation resistance:	$\geq 5000 M\Omega$
- Pressure resistance:	2550V AC 50Hz No breakdown or flashover in 1 minute

②Mechanical Parameters

- Mechanical life:	7,500 times
-Vibration:	Meet GB/T21563 ClassII vibration requirements
-Impact:	Meet GB/T21563 Class II impact requirements

③Other parameters

- Operating temperature:	-55°C~+125°C
- Humidity:	95% (at 40°C)
- Protection class:	IP67 (with suitable tail accessories)
Environmental protection:	RoHS
- Material:	outer housing-aluminum alloy
	Insulator - engineering plastics; Flame retardant rating: EN 45545
	Pinhole parts - steel alloy
- Finish:	Outer housing - oxidized/galvanized nickel alloy
	Pinhole parts - gold plated

2. Model Definition

2.1 Connector Model Definition

Model Definition Description:

Model Definition

	QAL	R	G	22	-14	S	A	W
①Series Name: QAL								
②Connector Type: R:Socket P:Plug								
③ Plating: G-Oxidized army green; B-oxidized black; Z-zinc-nickel alloy								
④ Housing number: 10SL, 14S, 16S, 18, 20, 22, 28, 40								
⑤ Layout of contact: <See page 8 (layout of contact) for details>								
⑥Type of contacts: P:Pin S:Jack								
⑦ Extended model: Basic (omitted), A, B.....								
⑧:Key change: N, W, X, Y, Z; and N-standard keystrokes, omitted								

**Note: Contacts are procured separately, see 5.3 Contact Specifications and Matching Wire Requirements for a list of options.*

2. Model Definition

2.2 Definition of Tail Accessory Model

Tail Accessories Type Definition Table:

Model Definition

	QAL	MS	G	22	-14	P	(xx)
①Series Name:	QAL						
②:Tail Accessories							
MS-Straight Threaded Tail Accessory							
CS-Straight Wire Clamping Tail Accessory							
CE-Bent Wire Clamping Tail Accessory							
ME- Bent Threaded End Accessory							
③ Plating:							
G-Oxidized army green;							
B-oxidized black;							
Z- Zinc-nickel alloy							
④Housing number:							
10SL, 14S, 16S, 18, 20,							
22,28, 40							
⑤ Layout of contact:							
Layout Number: with sealed Body, see <Page 8 Layout of Contacts for details>;							
Omitted: without sealed body;							
⑥ Sealed boy type							
P: Pin							
S: Hole							
Omitted: Without seald body							
⑦ Specifications:							
MS/ME thread size; e.g.: (M16*1.5) <See page 6, 3.2 MS/ME Adaptor Options Table for details>.							
CS/CE Maximum wire clamping range; e.g.: (φ19) <See Page 7 Tail Accessory CS/CE Wire Clip Range A List for details>.							

*Note: MS/ME adapters are purchased separately, see <Page 6, 3.2 MS/ME Adapter Options Table> for ordering information.

2 .Model Definition

2.3 Definition of Dust Cover Model

Dust Cover Model Definition Table:
Model Definition

	QAL	-MR	-	22	B
① Series Name:	QAL				
② Dust Cover Type:	MR-Metal socket dust cover; PR- Plastic socket dust cover; MP-Metal plug dust cover; PP- Plastic plug dust cover;				
③ Housing number:	10SL, 14S, 16S, 18, 20, 22, 28, 40				
④ Plating:	G-Oxidized army green forMR, MP; B- Oxidized black, for MR, MP. Omitted: For PR and PP				

Note: IP67for metal dust cover and IP3X for Plastic dust cover (dustproof only).

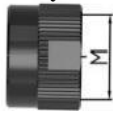
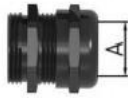
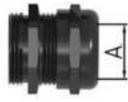
3 .Ordering Instructions

3.1 Ordering Method

Ordering Method Description:

Ordering Method

Ordering Method	① Connector	②Dust Cover	③Contact	④Tail Accessories	⑤ MS/ME Adaptor Connector
①+③	√		√		
①+③+④	√		√	√	
①+③+④+⑤	√		√	√	√
①+②+③	√	√	√		
①+②+③+④	√	√	√	√	
①+②+③+④+⑤	√	√	√	√	√

②Dust Cover		① Connector		④Tail Accessory		⑤MS/ME Adapter Connector	
				10	 MS- Straight Threaded Tail Accessory	10	 Hose Connector
				10	 ME- Bent Threaded Tail Accessory	10	 Cable Connector
				10	 CS- Straight Wire Clamping Tail Accessory	10	 Hose Connector
				10	 CE- Bent Wire Clamping Tail Accessory	10	 Cable Connector

*Note:

1. ④ M: Thread specification in the tail accessories diagram;
2. ④ A: Maximum wire clamping size in the tail accessories diagram;
3. ⑤ A: wire clamping range in the diagram of MS/ME adaptor.

3 Ordering Instructions

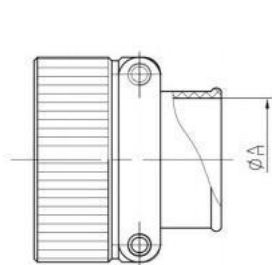
3.2 MS/ME Adaptor Option Table

HousingNumber	M	M Adaptive Connector ※Note: The connector in the table is domestic brand. If you need other brands, please contact us.				
		Hose Connector			Cable Connector	
		Applicable Bellow O.D.	Wire Clip Range (mm)	Ordering No.	Wire Clip Range (mm)	Ordering No.
10SL	M12*1.5	AD10	3 to 6.5	501020400263	3 to 6.5	501021100027
	M16*1.5				3 to 6.5	501021100120
		AD13	4 to 8	501020400035	4 to 8	501021100031
		AD15.8	5~10	501020400036	5 to 10	501021100032
14S	M16*1.5	/	/	/	3 to 6.5	501021100120
		AD13	4~8	501020400035	4 to 8	501021100031
		AD15.8	5 to 10	501020400036	5 to 10	501021100032
	M20*1.5	AD15.8	5 to 10	501020400033	5 to 10	501021100040
		AD18.5	6 to 12	501020400032	6 to 12	501021100034
		AD21.2	8~14	501020400034	8~14	501021100035
	M25*1.5	/	/	/	8 to 14	501021100038
		AD21.2	10~16	501020400040	10 to 16	501021100039
		AD28.5	13~18	39	13~18	501021100037
16S	M16*1.5	/	/	/	3~6.5	501021100120
		AD13	4 to 8	501020400035	4 to 8	501021100031
		AD15.8	5~10	501020400036	5 to 10	501021100032
	M20*1.5	AD15.8	5~10	50 2040 0033	5~10	501021100040
		AD18.5	6~12	501020400032	6~12	501021100034
		AD21.2	8~14	501020400034	8 to 14	501021100035
18	M16*1.5	/	/	/	3~6.5	501021100120
		AD13	4~8	501020400035	4~8	501021100031
		AD15.8	5~10	501020400036	5 to 10	501021100032
	M20*1.5	AD15.8	5~10	501020400033	5~10	501021100040
		18 5	2	501020400032	6~12	501021100034
		0				
	M25*1.5	AD21.2	8~14	501020400034	8~14	501021100035
		/	/	/	8 to 14	501021100038
		AD21.2	10~16	0 2040	10~16	501021100039
20	M20*1.5	AD28.5	13-18	501020400039	13~18	501021100037
		AD15.8	5~10	501020400033	5~10	501021100040
		AD18.5	6~12	501020400032	6~12	501021100034
	M25*1.5	AD21.2	8~14	501020400034	8~14	501021100035
		/	/	/	8 to 14	501021100038
		AD21.2	10~16	501020400040	10 to 16	501021100039
22	M25*1.5	AD28.5	13~18	501020400039	13~18	501021100037
		/	/	/	8 to 14	501021100038
		AD21.2	10~16	501020400040	10~16	501021100039
	M32*1.5	/	/	/	13~18	501021100281
		/	/	/	15~22	501021100071
		AD34.5	18~25	501020400038	18~25	501021100070
28	M25*1.5	/	/	/	8~14	501021100038
		AD21.2	10~16	501020400040	10~16	501021100039
		AD28.5	13-18	501020400039	13-18	501021100037
	M32*1.5	/	/	/	13~18	501021100281
		/	/	/	15-22	501021100071
		AD34.5	18~25	501020400038	18~25	501021100070
40	M25*1.5	/	/	/	8 to 14	501021100038
		AD21.2	10~16	501020400040	10~16	0 21
		AD28.5	13-18	501020400039	13-18	501021100037
	M32*1.5	/	/	/	13~18	501021100281
		/	/	/	15~22	501021100071
		AD34.5	18~25	501020400038	18~25	501021100070
	M40*1.5	AD42.5	22-32	501020400159	22-32	501021100050

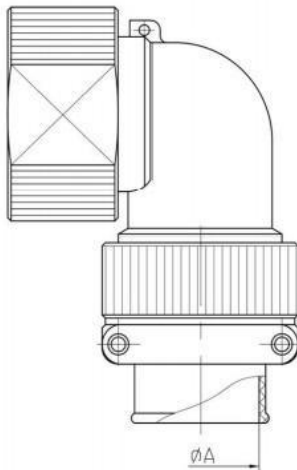
3 .Ordering Instructions

3.3 Tail Accessory CS/CE Wire Clip Range A List

Tail Accessory Wire Clip Range:
Tail Accessories



CS-Straight Wire Clamping Tail Accessory

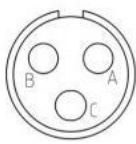
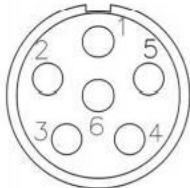
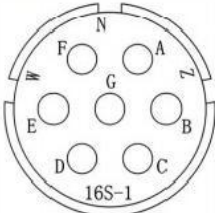
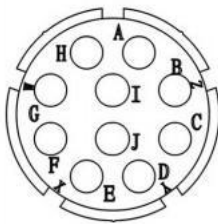
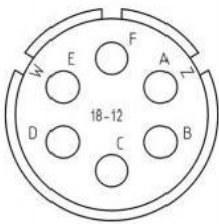
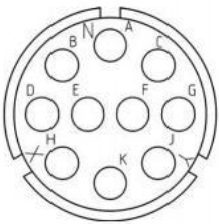
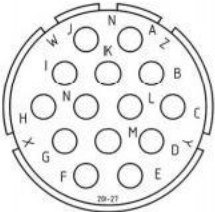
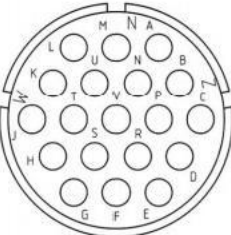
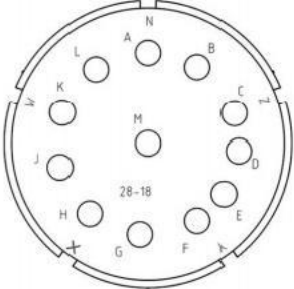
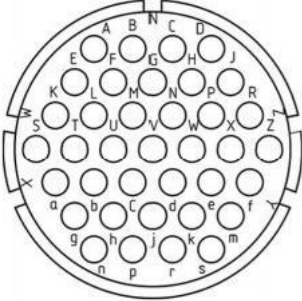
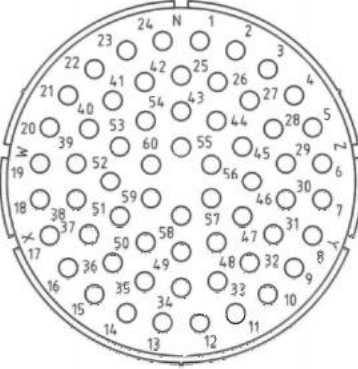


CE-Bent Wire Clamping Tail Accessory

Housing Nnumber	10SL	14S	16S	18	20	22	28	40
ϕA	$\phi 10.5$	$\phi 10.5$	$\phi 10.5$	$\phi 14$	$\phi 16.5$	$\phi 19$	$\phi 19$	$\phi 19$

4 .Layout of Contact

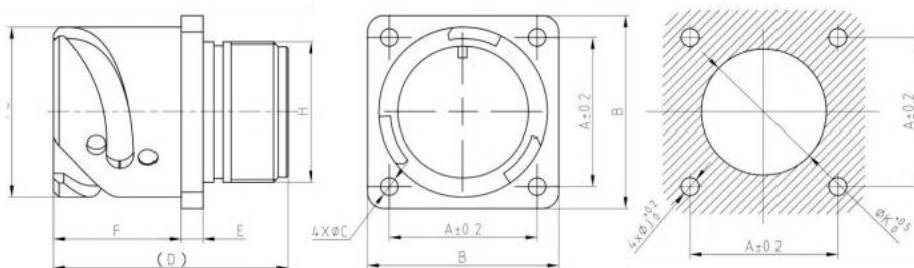
Layout of Contact (viewed from the front of the pin insulator)

Model Code	10SL-3	14S-60	16S-1
Models			
Number of Contacts and specifications	3-16#	6-16#	7-16#
Model Code	18-1	18-12	18-19
Models			
Number of Contacts and specifications	10-16#	6-16#	10-16#
Model Code	20-27	22-14	28-18
Models			
Number of Contacts and specifications	14-16#	19-16#	12-16#
Model Code	28-21	40-A60	
Models			
Number of Contacts and specifications	37-16#	60-16#	

Note: 10SL-3, 16S-1, 20-27, 28-18 adaptable cable O.D. <φ4mm/pin, the rest adaptable cable O.D. <φ3.6mm/pin.

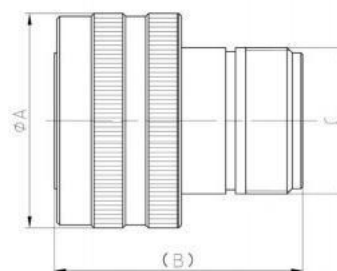
5. Connector Shape and Mounting Dimensions

5.1 Shape and Installation Dimensions of Socket



HousingNo.	A	B	C	D	E	F	G	H	J	K	
										Front	Back
10SL	18.2	25.4	3.2	39.5	3.2	18.3	18.2	0.5625-24UNEF-2A	3.2	14.5	18.7
14S	23	30	3.2	36	2.5	18.2	24.6	0.75-20UNEF-2A	3.2	15.8	25.1
16S	24.6	32.5		37.5	3	18.3	27.4	0.875-20UNEF-2A	3.2	22.5	
18	27	35	3.2	43	4	23.3	30.8	1-20UNEF-2A	3.2	25.7	27.9
20	29.4	38	3.2	42.5	4	23	34.2	1.125-18UNEF-2A	3.2	29.1	31.3
22	31.8	41	3.3	45	4.2	233	37.4	1.25-18UNEF-2A	3.4	32.3	34.7
28	39.7	51	3.8	47.5	4.2	24.3	46.6	1.625-18UNEF-2A	3.9	41.7	37.9
40	55.5	69.5	4.4	47.5	4.2	24.3	65.4	2.3125-16UN-2A	4.5	59.1	47.2
											65.9

5.2 Plug Shape and Dimensions



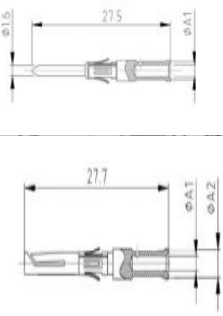
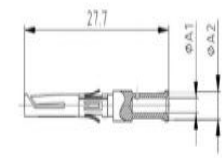
Housing Number	A	B	C
10SL	23.4	39.5	0.5625-24UNEF-2A
14S	30	35	0.75-20UNEF-2A
16S	33	37.5	0.875-20UNEF-2A
18	37.3	43	1-20UNEF-2A
20	40	42.2	1.125-18UNFF-24
22	44	45	1.25-18UNEF-2A
28	54	45	1.625-18UNEF-2A
40	72.8	47.5	2.3125-16UN-2A

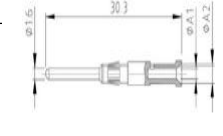
5. Connector Shape and Mounting Dimensions

5.3 Contact Specifications and Matching Wire Requirements (purchased separately)

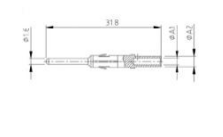
Contact specification and matching wire table:

Contact Requirements

Contact Requirements								
 *Note: General	Type	Ordering No.	Adapted Wire mm ²	φ A1	φ A2	Disassembly Tools	Crimping Tool	
	Pin	113020100998	0.17-0.34	0.9	1.8	RT-3	M22520/2-01	
		113020100999	0.5	1.1	2.1		M22520/1-01	
		113020101000	0.75-1	1.4	2.4			
		113020100872	1.5	1.8	2.8			
		113020100873	2-2.5	2.2	3.2			
 *Note: General	Type	Ordering No.	Adapted Wire mm ²	φA1 φA2		Disassembly Tools	Crimping Tool	
	Hole	113020601443	0.17-0.34	0.9	1.8	RT-3	M22520/2-01	
		113020601444	0.5	1.1	2.1		M22520/1-01	
		113020601445	0.75-1	1.4	2.4			
		113020601265	1.5	1.8	2.8			
		113020601266	2-2.5	2.2	3.5			

	Type		Ordering No.	Adapted Wire mm ²	φA1 φA2		Disassemb ly Tools	Crimping Tool	
	Pin	115210004004	0.5	1.1	2.1	RT-3	M22520/2-01		
		115210004003	0.75 to 1	1.3	2.6		M22520/1-01		
		115210004001	1.5	1.8	3				
		115210004002	2.5	2.2	3.2				

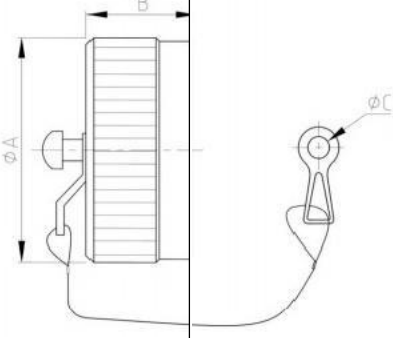
 *Note: For 40-A60	Type		Ordering No.	Adapted Wire mm ²	φA1	φA2	Disassemb ly Tools	Crimping Tool	
	Hole	115310005204	0.5	1.1	2.1	RT-3	M22520/2-01		
		115310005203	0.75 to 1	1.3	2.6		M22520/1-01		
		115310005201	1.5	1.8	3				
		115310005202	2.5	2.2	3.2				

 ※Note: 28-21 special	Type		Ordering No.	Adapted Wire mm ²	φA1	φA2	Disassemb ly Tools	Crimping Tool	
	Pin	115210003605	0.17-0.34	0.9	1.8	RT-4	M22520/2-01		
		115210003603	0.5	1.1	2		M22520/1-01		
		115210003604	0.75-1	1.4	2.4				
		115210003601	1.5	1.8	2.8				
		115210003602	2.5	2.2	3.2				

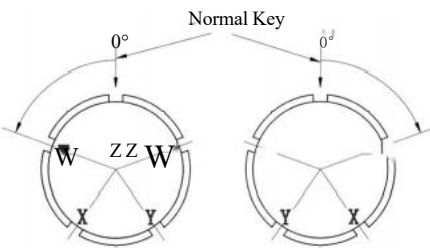
	Type		Ordering No.	Adapted wire mm ²	φA1	φA2	Disassemb ly Tools	Crimping Tool	
	Hole	115310000205	0.17-0.34	0.9	1.8	RT-4	M22520/2-01		
		115310000203	0.5	1.1	2				
		115310000204	0.75-1	1.4	2.4		M22520/1-01		
		115310000201	1.5	1.8	2.8				
		115310000202	2.5	2.2	3.2				

5. Connector Shape and Mounting Dimensions

5.4 Dust Cover (purchased separately)

		Housing No.	Dust Cover Model	Ordering No.	Color	A	B	C
	Socket Dust Cover	10SL	VGEL-MR-10SLG	113011600703	Army green	23.4	17.4	3.5
		14S	VGEL-MR-14SB	113011600812	Black	30	17.2	3.5
		16S		113011600466	Army green	33	16.3	3.5
		18	VGEL-MR-16SG	113011600244	Black	37.6	23.7	3.5
		18	VGE1-MR-18B	113011600192	Army green	37.6	23.7	3.5
		20	VGE1-MR-18G	113011600103	Black	40	20.5	3.5
		22	VGE1-MR-20B	113011600407	Black	44	22.3	3.5
		22	VGE1-MR-22B	113011600248	Army green	44	22.3	3.5
		28	VGE1-MR-22G	113011600603	Army green	54	21.8	5.6
		40	VGE1-MR-28G	113011600430	Black	73	20	4.3
			VGE1-MR-40B					

5.5 Key Transformation

Key Transformation Table	Models	Key Angle				
		N	W	X	Y	Z
 Pin Mounting Panel Insertion Side Jack Mounting Panel Insertion Side	10SL-3	0				
	14S	0				
	16S-1	0	80			280
	18-1	0	70	145	215	290
	18-12	0	80			280
	18-19	0		120	240	
	20-27	0	35	110	250	325
	22-14	0	80			280
	28-18	0	70	145	215	290
	28-21	0	80	110	250	280
	40-A60	0	80	110	250	280

6. Instructions for Use

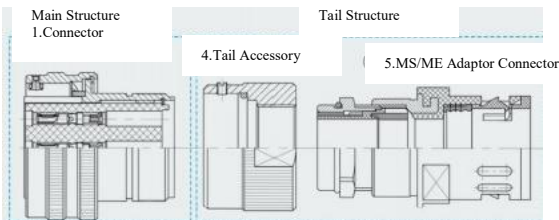
6.1 Stripping Size and Tensile Strength Requirements:

Wire Specification	Stripped Wire Length	Tensile Strength
0.5 mm ² /20#	6.5 to 7.5mm	>70N
0.75 mm ² /18#	6.5 to 7.5mm	>100N
1 mm ²	6.5 to 7.5mm	>130N
1.5 mm ²	6.5 to 7.5mm	>200N
2.5 mm ²	6.5~7.5mm	>250N

6.3 Instructions for Use

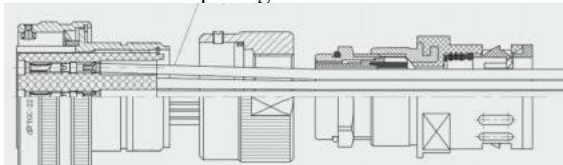
6.3.1 Installation Instructions

① Split the connector into the main structure and the tail structure as follows:

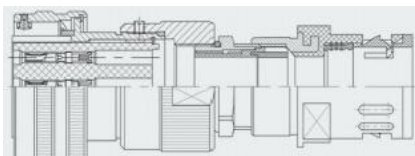


② Thread the wire cable of the crimped contact in turn from right to left through the parts in the above figure, apply a little force to push the contact piece into the insulating plate, first you will hear a slight "click" sound, and then pull back the wire with a force of about 10N. if the contact piece does not exit, it proves that the contact is loaded into the place:

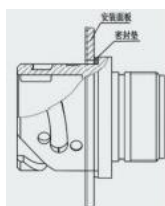
The wire does not exit after pulling backward with a force of 10N



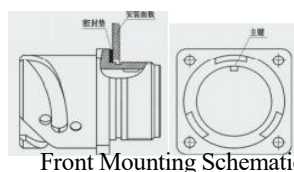
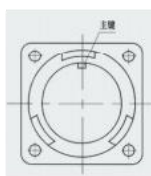
③ Assemble the parts from step ① as shown in the figure below, where thread sealant is recommended to be applied to the threads:



④ Fix the assembled socket on the mounting panel (panel thickness ≤ 4mm), the general position of the main key should be on the top when installing, as shown in the figure:



Back Mounting Schematic



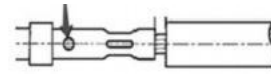
Front Mounting Schematic

※Note: Panel thickness for front-of-panel installation ≤ 4mm, Panel thickness for rear-of-panel installation ≤ 2mm.

6.2 Crimping:

After crimping, the core of the wire is visible through the observation hole of the contactor.

Core is visible through the observation hole



6.3.2 Connector connection

To connect the connectors, align the main keyway of the plug with the main keyway of the socket, then turn the connecting sleeve on the plug right (clockwise) to the in-place mark to lock it (you should hear a crisp "click" when the connection is in place).

Clockwise rotation of the coupling sleeve - Plug main keyway - Socket main keyway



6.3.3 Separation of connectors

Separate the connector, push forward the connecting sleeve, turn the sleeve left (counterclockwise) to realize separation of the connector



Tool structure: (When disassembling, it is necessary to loosen the connector's tail structure first)

To disassemble, insert the disassembly tool into the corresponding hole of the mounting panel from the direction of the contact head. (Hold part 1 and leave part 2 in a free position during pushing), a slight click sound will be heard when the tooth sleeve is closed at the end of the insertion (this is when the disassembly tool is in place).

Then push part 2, push the contact out of position, and then pull the wire and contact out by hand.

Before using the disassembly tool, test disassembly with an unwired contact to see if the disassembly tool head can fully retract the tooth sleeve. If not, partially rotate the disassembly head out of part 1 and partially rotate part 1 out of part 2 until the tooth sleeve can be fully retracted by the disassembly head. It must be ensured that the disassembly head is still connected to part 1 and part 1 is still connected to piece 2.





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