



PRODUCTS CATALOG

Professional Circular Connector Manufacturer
Cable Assembly Solutions Experts



RAYMO ELECTRONICS TECHNOLOGY LIMITED



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MIL-DTL-38999 I series electrical connector

Brief introduction

- Comply with MIL-DTL-38999 I series
- Quick bayonet coupling, small size, light weight and high density
- EMI/RFI shielding
- Removable crimp contact with scoop-proof design
- Various receptacle mounting: Box mounting, wall-through mounting, front mounting, rear mounting and jam nut mounting
- Withstand strong vibration
- Standard back accessories, comply with GJB1784; and special backshell (Ti-Ni ring) for shielding cable
- 9 housing sizes, 74 polarizations and various modification types
- 5 key leading structure to avoid mismatching
- Application: military systems such as aviation, aerospace, weapon, and other electronic equipment systems
- Enterprise standard: 21E0.204.102JT

Application

The product is used to connect current and signal.

Main technical characteristics

[Mechanical]

- Housing : Aluminum alloy/stainless steel
- Plating:
 - B class: olive green cadmium plating
 - E class: stainless steel passive
 - F class: electroless nickel plating
- Insulator: Thermoset plastic
- Grommet and seal: Silicon rubber
- Contact: Gold-plated copper alloy, crimping, soldering, PCB
- Endurance: 500 cycles
- Vibration:
 - Sinusoid vibration: frequency 10-2000Hz, acceleration: 294m/s^2
 - Random vibration: frequency 100-1000Hz, power spectral density: $1\text{g}^2/\text{Hz}$
- Shock: At 3 ms half sinusoid, peak value of acceleration: 300g

[Environmental]

- Operating temperature:
 - B class: $-65^\circ\text{C} \sim +175^\circ\text{C}$
 - E, F class: $-65^\circ\text{C} \sim +200^\circ\text{C}$
- Salt spray: According to method 1001 GJB1217
 - B class 500h, E class 1000h
 - F class 48h
- Relative humidity: 98% at 40°C
- Operating height: $\leq 30480\text{m}$
- Anti-moisture, salt spray, mould, rain, dust



Operating environment

The products can be used in harsh environments like strong vibration, rain, sand, damp heat and so on.

[Electrical]

- Contact resistance and rating current

Contact size	Operating dia.(mm)	Contact resistance(mΩ)	Rating current(A)
22D	Φ0.76	≤12	5
20#	Φ1.00	≤5	7.5
16#	Φ1.60	≤2.5	13
12#	Φ2.40	≤1.5	23
10#	Φ3.15	≤1.0	40

- EMI shielding:
 - 100MHz ~ 1GHz: minimum attenuation 85dB
 - 1GHz ~ 10GHz: minimum attenuation 50dB
- Withstanding voltage: V

Service rating	M	N	I	II
Sea level	1300	1000	1800	2300
21000m	800	600	1000	1000

*Different contact layouts have different service rating.
Please see the contact layouts table.

- Insulation resistance:
 - Normal $\geq 5000\text{M}\Omega$ Damp heat $\geq 100\text{M}\Omega$
- Electrical continuity between shells:
 - B class $\leq 2.5\text{m}\Omega$ F class $\leq 1.0\text{m}\Omega$
 - E class $\leq 50\text{m}\Omega$

Ordering information

Basic series*	MS	27467	T	17	F	35	P	N	-H
Type 27467 - Plug (T) 27466 - Wall-through square flange receptacle (front mounting) (T) 27656 - Wall-through square flange receptacle (rear mounting) (T) 27496 - Box square flange receptacle (front mounting) (E) 27505 - Box square flange receptacle (rear mounting) (E) 27468 - Jam nut receptacle (T)									
Housing type T- with thread for backshell E- without thread for backshell									
Housing size 09-11-13-15-17-19-21-23-25									
Housing plating B-olive green cadmium plating E-stainless steel passive F-electroless nickel plating									
Contact layout see contact layouts for details									
Contact type Crimping and soldering contact: P-pin, S-socket PCB contact: PL-long PCB pin SL-long PCB socket PC-short PCB pin SC-short PCB socket									
Polarization N-normal A, B, C, D-alternative If customer choose crimping contacts, N can be omitted in ordering. For other contacts, N should be stated clearly. (09# shell only has N, A and D polarization)									
Soldering contact type (only for soldering connectors) H-soldering contact									

Notes:

- GJB599A series are made according to the same standard with MIL-DTL-38999K series. The difference is that: the basic part number of GJB599A is JY, while MIL-DTL-38999K is MS. GJB599A series is interchangeable with MIL-DTL-38999K series.
- The applicable protective cap, backshell and square flange cushion details can be found in Page 12 ~ 20.
- If the operating environment requires oil resistance, the connector sealing components should choose fluorinated silicone rubber. When placing orders, plus C1 at the end of the original part number (for example: MS27467T17F35PNC1).

[Part number example]

MS27467T25E35SN-H

MS series plug, threaded shell end, can be mounted with accessory, 25# shell, stainless steel passive plating, 35# layout, filled with sockets, N polarization, soldering contacts.

Crimping contacts

Contact size	Dia. mm	Pin color	Socket color	Inner dia. of crimp boot(mm)	Outer dia. of crimp boot(mm)	Section of wire(mm)	AWG	Insulator Outer dia. of wire(mm)	Removal tool code	Crimping tool
22D	Φ0.76	Orange-blue-black	Orange-yellow-gray	0.85	1.20	0.08 0.125 0.2 0.3	28 26 24 22	0.76 ~ 1.37	M81969/ 14-01	YJQ-02
20#	Φ1.00	Orange-blue-orange	Orange-green-brown	1.17	1.78	0.2 0.3 0.5	24 22 20	1.02 ~ 2.11	M81969/ 14-10	YJQ-02 XCXY-01
16#	Φ1.60	Orange-blue-yellow	Orange-green-red	1.68	2.62	0.5 0.8 1.0 1.2	20 18 16	1.65 ~ 2.77	M81969/ 14-03	XCXY-01
12#	Φ2.4	Orange-blue-green	Orange-green-orange	2.49	3.84	2.0 3.0	14 12	2.46 ~ 3.61	M81969/ 14-04	XCXY-01
10#	Φ3.15	Green-red-gray	Green-orange-purple	3.40	4.65	4.8	10	3.42 ~ 4.12	M81969/ 14-05	XCXY-01 YTQ
8#	Φ3.6	---	---	4.55	6.4	8.37	8	6.4 ~ 6.9	M81969/ 14-12	YTQ

Notes:

- 1.For instructions of the applicable crimping tools please find page XX
- 2.Applicable for GJB599 I , III, IV series.

Soldering contacts

Contact size	Inner dia. of soldering cup	AWG
22D	φ0.9	22
20#	φ1.1	20
16#	φ1.9	16
12#	φ2.9	12
10#	φ3.6	10
8#	φ4.8	8

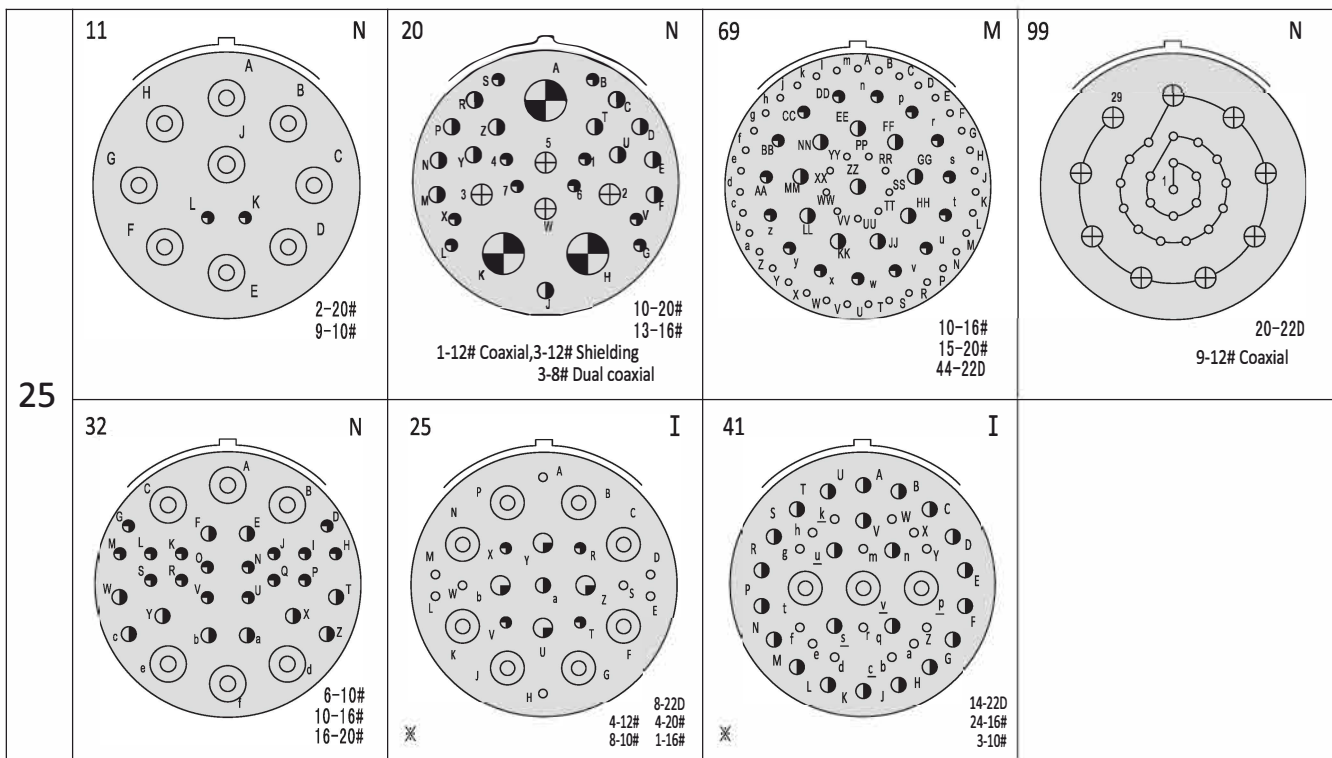
Contact layouts (viewed from front face of male insulator)

Housing size 09	35 M 6-22D	98 I 3-20#	03 I 3-20#				
11	35 M 13-22D	98 I 6-20#	05 I 5-20#	04 I 4-20#	01 I 1-12#	99 I 7-20#	02 I 2-16#
13	35 M 22-22D	98 I 10-20#	08 I 8-20#	04 I 4-16#	03 II 3-16#	12 N 1-12# 11-22#	13 I 3-16# 10-22#
15	35 M 37-22D	19 I 19-20#	18 I 18-20#	05 II 5-16#	97 I 8-20# 4-16#	15 I 14-20# 1-16#	03 II 2-12# 1-16#
17	35 M 55-22D	26 I 26-20#	06 I 6-12#	08 II 8-16#	99 I 21-20# 2-16#		
	12 N 3-12# Shielding 9-22D	03 N 2-10# 1-16#	05 I 5-12#	21 N 17-22D 4-12#	30 N 3-10# 3-20#	42 M 42-22D	57 I 2-8# 1-16#
19	35 M 66-22D	32 I 32-20#	11 II 11-16#	28 I 26-20# 2-16#	30 I 29-20# 1-16#		
	45 M 67-22D	18 M 14-22D 4-8# Dual coaxial	96 I 9-12#	18a M 4-8# 14-22D			
21	35 M 79-22D	41 I 41-20#	16 II 16-16#	39 I 37-20# 2-16#	11 II 11-12#		



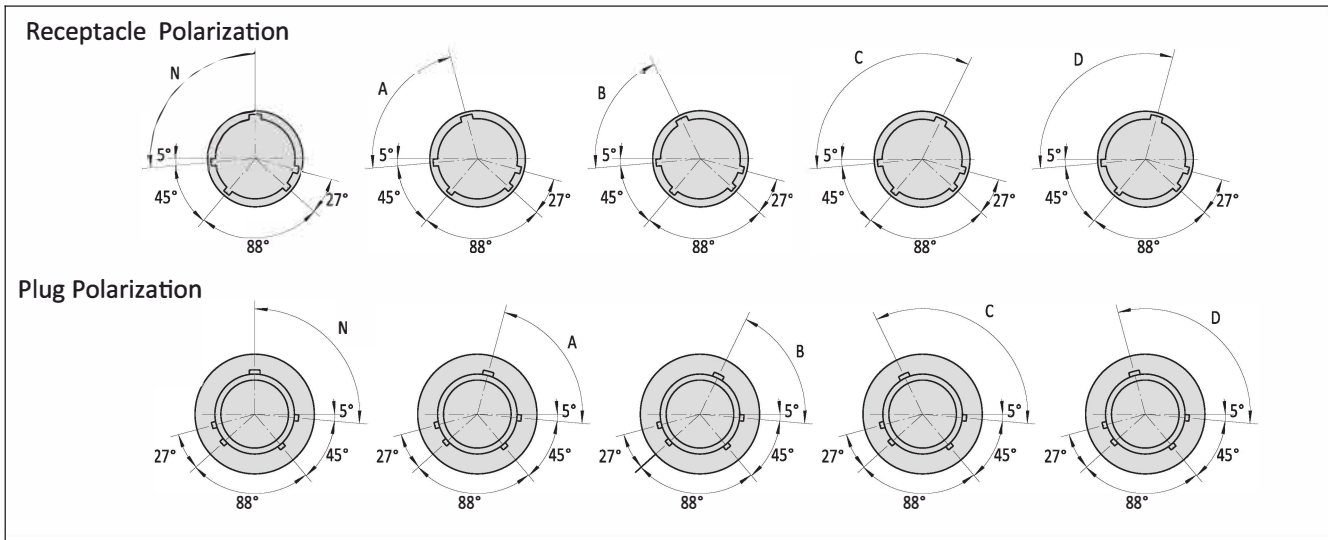
21	27 I 27-20#	25 I 25-20#	24 I 24-20#	15 I 13-20# 2-8# Dual coaxial	02 M 65-22D
	35 M 100-22D#	55 I 55-20#	53 I 53-20#	36 I 36-20#	
	34 I 34-20#	32 I 32-20#	21 II 21-16#	97 I 16-16#	
	99 II 11-16#	04 I 4-8#			
	35 M 128-22D	61 I 61-20#	46 I 40-20# 4-16# 2-8# Dual coaxial	29 I 29-16#	
24 I 12-16# 12-12#	43 I 23-20# 20-16#	19 I 19-12#	04 I 48-20# 8-16#		





Notes: "X" stands for derived inserts.

Polarization



Polarization code	09	11	13	15	17	19	21	23	25
N	95°	95°	95°	95°	95°	95°	95°	95°	95°
A	77°	81°	75°	74°	77°	77°	77°	80°	80°
B	non	67°	63°	61°	65°	65°	65°	69°	69°
C	non	123°	127°	129°	125°	125°	125°	121°	121°
D	113°	109°	115°	116°	113°	113°	113°	110°	110°

Outline dimensions

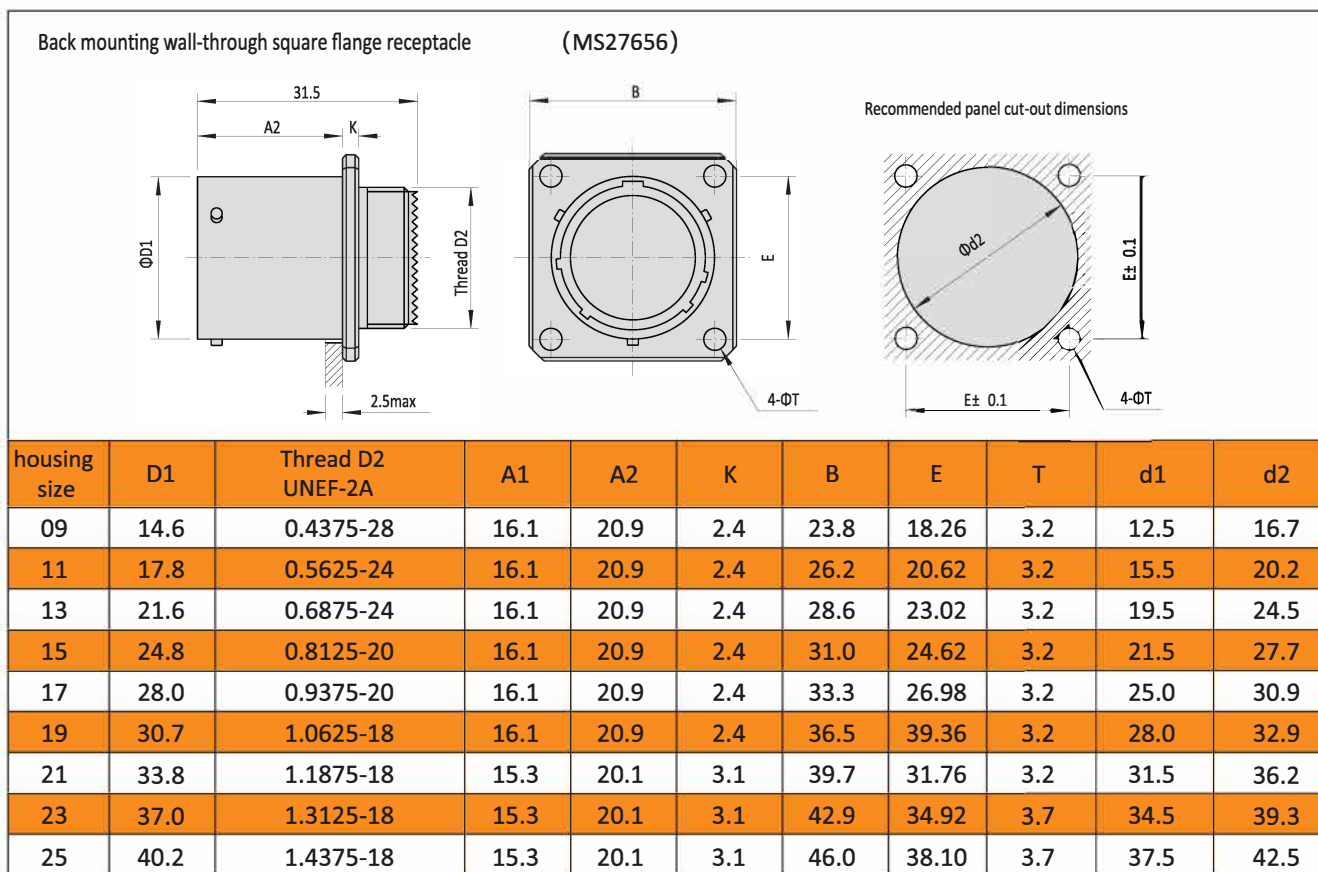
[Plug MS27467]

housing size	D1	Thread D2 UNEF-2A
09	21.7	0.4375-28
11	25.0	0.5625-24
13	28.2	0.6875-24
15	31.3	0.8125-20
17	34.4	0.9375-20
19	37.4	1.0625-18
21	40.5	1.1875-18
23	44.0	1.3125-18
25	46.8	1.4375-18

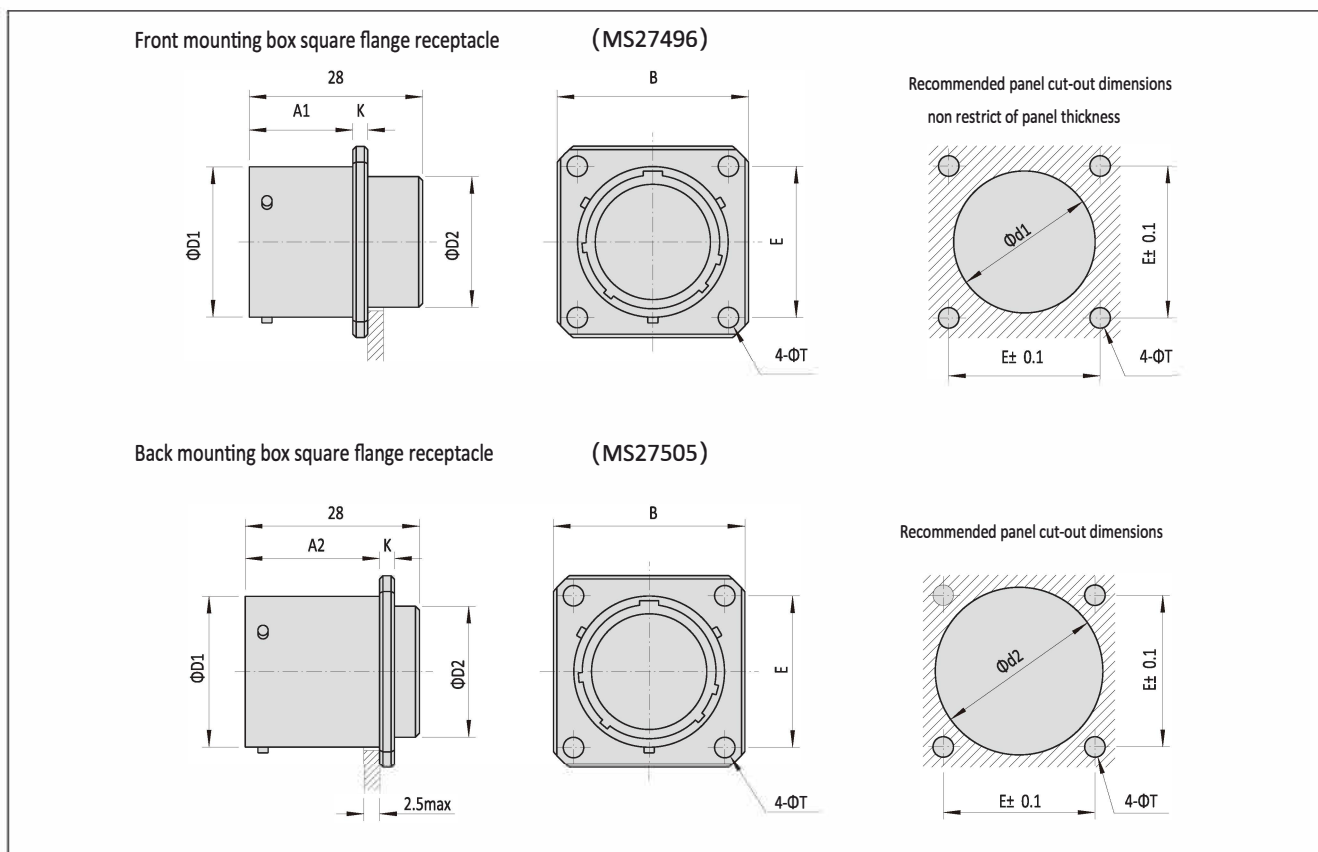
[Jam nut receptacle MS27468]

housing size	D1	Thread D2 UNEF-2A	D3	K	B	S	d	P
09	14.6	0.4375-28	30.2	2.8	27.0	22.3	17.7	17.0
11	17.8	0.5625-24	35.0	2.8	31.8	25.5	21.0	19.6
13	21.6	0.6875-24	38.1	2.8	35.0	30.2	25.6	24.3
15	24.8	0.8125-20	41.3	2.8	38.1	33.4	28.8	27.6
17	28.0	0.9375-20	44.5	2.8	41.3	36.6	32.0	30.7
19	30.7	1.0625-18	49.3	3.6	46.0	39.7	35.2	33.9
21	33.8	1.1875-18	52.4	3.6	49.2	42.9	38.3	37.1
23	37.0	1.3125-18	55.6	3.6	52.4	46.1	41.5	40.0
25	40.2	1.4375-18	58.8	3.6	55.6	50.8	44.7	43.4

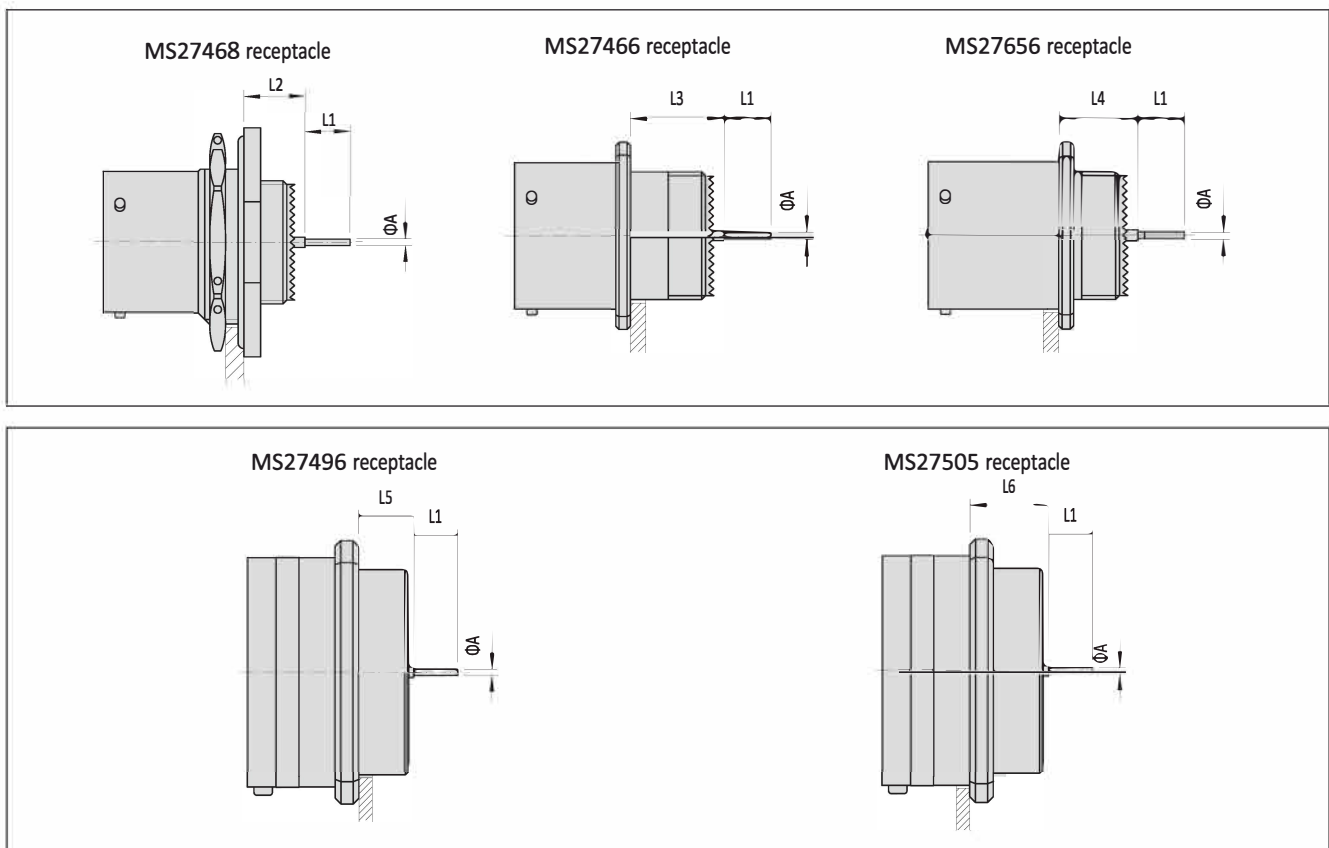
[Wall-through square flange receptacle MS27466 MS27656]



[Box square flange receptacle MS27496 MS27505]



housing size	D1	D2	A1	A2	K	B	E	T	d1	d2
09	14.6	11.2	16.1	20.9	2.4	23.8	18.26	3.2	12.5	16.7
11	17.8	14.5	16.1	20.9	2.4	26.2	20.62	3.2	15.5	20.2
13	21.6	18.0	16.1	20.9	2.4	28.6	23.02	3.2	19.5	24.5
15	24.8	20.5	16.1	20.9	2.4	31.0	24.62	3.2	21.5	27.7
17	28.0	23.8	16.1	20.9	2.4	33.3	26.98	3.2	25.0	30.9
19	30.7	26.5	16.1	20.9	2.4	36.5	29.36	3.2	28.0	32.9
21	33.8	29.7	15.3	20.1	3.1	39.7	31.76	3.2	31.5	36.2
23	37.0	32.8	15.3	20.1	3.1	42.9	34.92	3.7	34.5	39.3
25	40.2	36.0	15.3	20.1	3.1	46.0	38.10	3.7	37.5	42.5

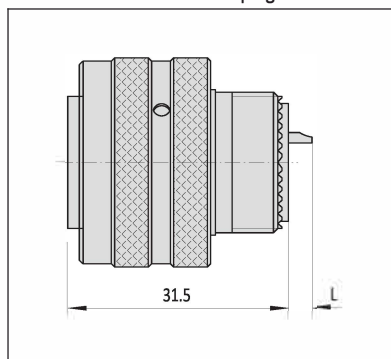
[GJB599 I series receptacle with PCB contacts]


PCB contact type		L1	A
22D	Long PCB contact	8.5	0.7
	Short PCB contact	4.0	
20#	Long PCB contact	8.5	0.7
	Short PCB contact	5.0	
16#	Long PCB contact	8.5	1.15
	Short PCB contact	5.0	

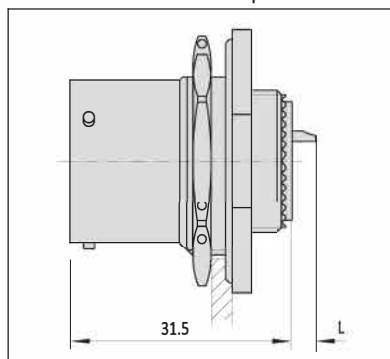
Dimensions with different contacts			Shell size 09-11-13-15-17-19	Shell size 21-23-25
L2	With 22D# pin	max	10.06	10.06
		min	9.06	9.06
	With 22D# socket	max	10.06	10.06
		min	8.74	8.74
	With 20# or 16# pin/socket	max	10.23	10.23
		min	9.24	9.24
L3	With 22D# pin	max	15.08	15.08
		min	13.91	13.91
	With 22D# socket	max	15.08	15.08
		min	13.58	13.58
	With 20# or 16# pin/socket	max	15.25	15.25
		min	14.08	14.08
L4	With 22D# pin	max	12.47	13.22
		min	11.60	12.35
	With 22D# socket	max	12.47	13.22
		min	11.27	12.02
	With 20# or 16# pin/socket	max	12.64	13.39
		min	11.77	12.52
L5	With 22D# pin	max	11.08	11.08
		min	9.91	9.91
	With 22D# socket	max	11.08	11.08
		min	9.58	9.58
	With 20# or 16# pin/socket	max	11.25	11.25
		min	10.08	10.08
L6	With 22D# pin	max	8.47	9.22
		min	7.60	8.35
	With 22D# socket	max	8.47	9.22
		min	7.27	8.02
	With 20# or 16# pin/socket	max	8.64	9.39
		min	7.77	8.52

[GJB599 I series soldering products outline dimensions]

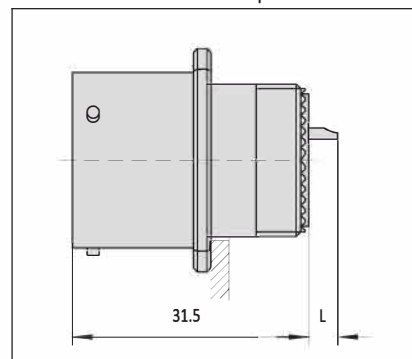
MS27467 plug



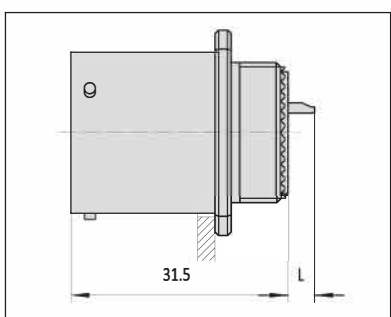
MS27468 receptacle



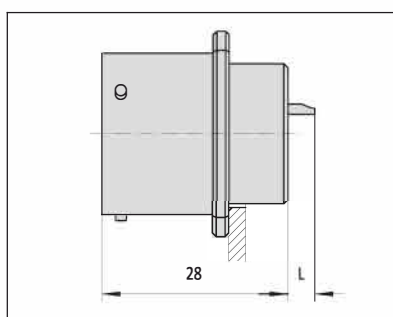
MS27466 receptacle



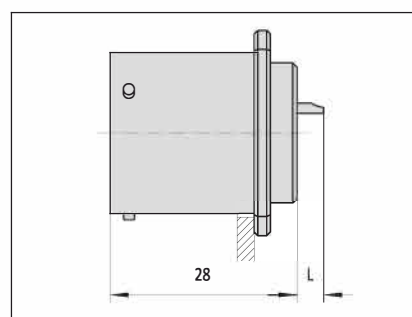
MS27656 receptacle



MS27496 receptacle



MS27505 receptacle

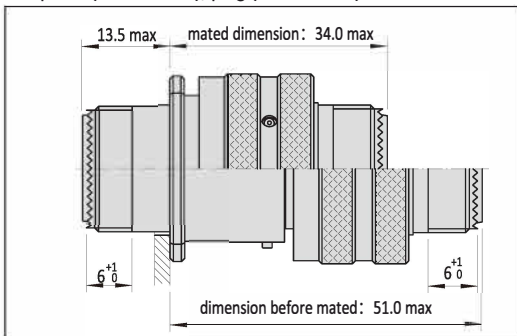


Soldering contact size	L	Inner dia. of soldering cup	AWG
22D	4	φ0.9	22
20#	4	φ1.1	20
16#	4	φ1.9	16
12#	4	φ2.9	12
10#	6	φ3.6	10
8#	6	φ4.8	8

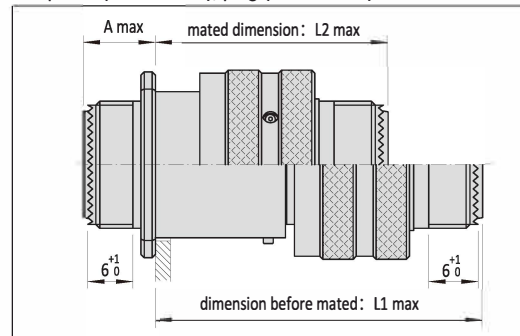
Notes: coaxial contacts don't have soldering types.

[dimension after mating]

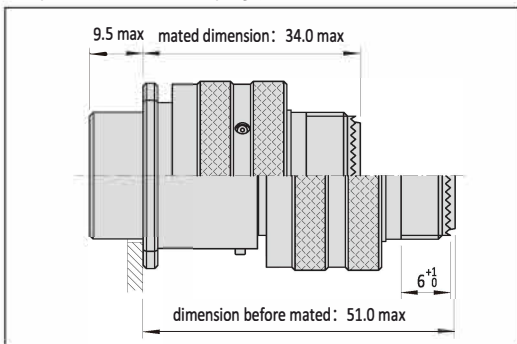
Wall-through square flange (front mounting) receptacle (MS27466)/plug (MS27467)



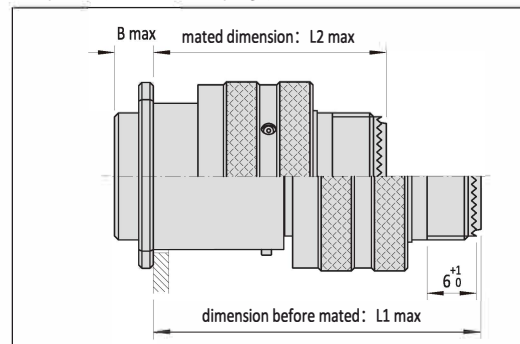
Wall-through square flange (rear mounting) receptacle (MS27656)/plug (MS27467)



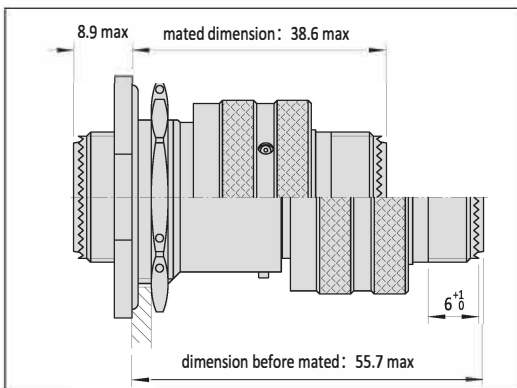
Box square flange front-mounting receptacle (MS27496)/plug (MS27467)



Box square flange rear-mounting receptacle (MS27505)/plug (MS27467)



Jam nut receptacle (MS27468)/plug (MS27467)



Notes: the total length of connectors that can be mounted with accessories refers to the connector length plus accessory length minus thread engagement length.

housing size		09	11	13	15	17	19	21	23	25
L1	max	53.3	53.3	53.3	53.3	53.3	53.3	52.5	52.5	52.5
L2	max	36.4	36.4	36.4	36.4	36.4	36.4	35.6	35.6	35.6
A	max	11.1	11.1	11.1	11.1	11.1	11.1	11.9	11.9	11.9
B	max	7.1	7.1	7.1	7.1	7.1	7.1	7.9	7.9	7.9

Protective caps for plug and receptacle

[Ordering information]

Basic series*	MS	27501	F	11	C	L
Type	MS27501-protective cap for plug MS27502-protective cap for receptacle					
Housing plating	B - olive green cadmium plating F - electroless nickel plating					
Housing size	09-11-13-15-17-19-21-23-25					
Fixing type	A - without chain N - stainless steel chain with ring S - stainless steel string with connecting lug C - stainless steel chain with connecting lug R - nylon cord with connecting plate E - nylon cord with ring					
Length mark	Omit - standard length L - 127mm of chain length M - 152.4mm of chain length (MS27501) N - 177.8mm of chain length (MS27501)					

Notes:

- MS27502 is composite-material protective cap. When ordering MS27502, “—” means no plating.
- The protective cap is ordered separately, not supplied with the connectors.
- Part number MS27502 plus (J) means metal-shell protective cap, E refers to stainless steel plating.

For example: MS27502E17C(J)

[Outline dimensions]

Plug protective cap MS27501											
		Type C				Type A					
		27.5				22					
		ØA				ØA					
		Ø4.2				Ø4.2					
		H				H					
Receptacle protective cap MS27502											
		Type C			Type N			Type A			
		18.2			18.2			18.2			
		ØD			ØD			ØD			
		Ø4.2			Ø4.2			Ød			
		H			H			H			
housing size		09	11	13	15	17	19	21	23	25	
A	max	20.5	23.7	26.9	30.1	33.2	36.4	39.6	42.8	45.9	
D	max	21.7	23.5	29.0	31.6	34.8	38.0	41.1	44.2	46.0	
d	min	18.0	21.1	26.0	29.0	32.4	35.5	38.6	42.0	44.7	
H	max	76.2	76.2	88.9	88.9	88.9	88.9	88.9	101.6	101.6	

Standard rear accessories (applicable for GJB599 I series and II series connectors)

Comply with GJB1784 (equivalent to MIL-C-85049)

Notes:

- 1) For the accessories listed below, part number "J1784" is the same with "J1784 A".
- 2) The below steps can help prevent looseness. When using the accessories, at least one step should be adapted.
 - ① Put the fuse through the socket to anti looseness;
 - ② Coat some thread glue at the product termination, and tighten the jam nut;
 - ③ Use heat shrink sleeve against looseness.
- 3) For the accessory which carries a set screw, coat some thread glue on the set screw first and then tighten the screw.
- 4) If the applicable products of the cable accessory is mounted with 8# contacts, please choose longer cable accessory, such as J1784/49H type or J1784/18A type; this is meant to prevent the contact positioner affects the cable accessory.
- 5) The table below is on the GJB599 series soldering products and crimping products with their correspondingly applicable cable accessories. As the modified products and accessories are so many that we can not list them one by one. The form below is only for reference, please consult our engineers for details.

Connector type	Applicable cable accessory type	Applicable cable accessory part number
GJB599 I & II series crimping connector	Non-clamping and non-shielding cable accessory	1、 J1784/27、 HA type
	Clamping and non-shielding cable accessory	1、 J1784/49、 HB type
		2、 J1784/49-xx (short)
		3、 J1784/47、 HC type
	Shielding and non-clamping cable accessory	1、 TJ1784/62、 HD type
		2、 J1784/62
		3、 J1784/85
		4、 J1784/87
		5、 MS599 I -FJA00
		6、 MS599 I -FJA90
		7、 MS599 I xxFJC00
		8、 MS599 I xxFJE00
	Shielding and clamping cable accessory	1、 TJ1784/62-xxB、 HE type
		2、 TJ1784/62-xxC-xx
		3、 J1784/18A series (rain-proof)
GJB599 I & II series soldering connector	Non-clamping and non-shielding cable accessory	1、 J1784/27、 HA type
	Clamping and non-shielding cable accessory	1、 J1784/49H
		2、 J1784/47、 HC type
	Shielding and non-clamping cable accessory	1、 TJ1784/62、 HD type
		2、 J1784/62
		3、 J1784/85
		4、 J1784/87
		5、 MS599 I -FJA00
		6、 MS599 I -FJA90
	Shielding and clamping cable accessory	1、 TJ1784/62-xxB、 HE type
		2、 TJ1784/62-xxC-xx
		3、 J1784/18A series (rain-proof)

[GJB1784 ordering information]

Basic series	J1784 /	27-	14	N					
27- A type back nut (Non-clamping and non-shielding cable accessory) 49- B type straight cable clamp (Clamping and non-shielding cable accessory) 47- C type elbow cable clamp (Clamping and non-shielding cable accessory) 62- D type screen-termination accessory (part number plus "T") (Shielding and non-clamping cable accessory) 62- heatshrink boot accessory (Shielding and non-clamping cable accessory)									
Accessory shell size	08	10	12	14	16	18	20	22	24
For MIL-C-38999 I series	09	11	13	15	17	19	21	23	25
For MIL-C-38999 II series	08	10	12	14	16	18	20	22	24
Plating	W - olive green cadmium plating				N - electroless nickel plating				
	S - stainless steel passive								

Notes:

- ① GJB 1784 series are made based on the same standard with MIL-C-85049. The difference is that: the basic part number of GJB 1784 series is "J1784", while the basic part number of MIL-C-85049 is "M85049". GJB1784 series are interchangeable with MIL-C-85049.
- ② The above cable accessory shell size should be marked with even number. Odd number is forbidden.

[Intra-industry accessory ordering information]

Type	HA – Boot-shaped backshell	HA-	F	18					
	HB – Straight cable clamp								
	HC – Right-angle cable clamp								
	HD – Shielding backshell								
	HE – Shielding straight cable clamp								
Plating	B - olive green cadmium plating								
	F - electroless nickel plating S- stainless steel passive								
Accessory shell size	08	10	12	14	16	18	20	22	24
For MIL-C-38999 I series	09	11	13	15	17	19	21	23	25
For MIL-C-38999 II series	08	10	12	14	16	18	20	22	24

[Part number comparison]

GJB1784 accessory type	Intra-industry accessory type
J1784/27-xW	HA-Bx
J1784/27-xN	HA-Fx
J1784/49-xW	HB-Bx
J1784/49-xN	HB-Fx
J1784/47-xW	HC-Bx
J1784/47-xN	HC-Fx
TJ1784/62-xW	HD-Bx
TJ1784/62-xN	HD-Fx
TJ1784/62-xWB	HE-Bx
TJ1784/62-xNB	HE-Fx

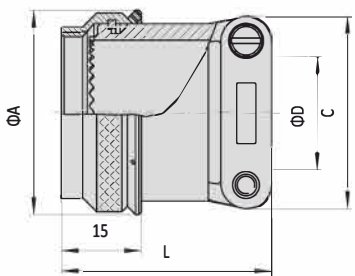
(In the table, "x" stands for shell size. We recommend that customers place orders according to GJB1784 accessory type. Intra-industry types can be used when necessary.)

[Outline dimensions]

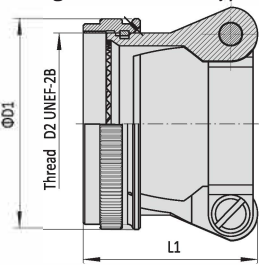
J1784/27- (HA type) Back nut	J1784/49- (HB type) Straight cable clamp	J1784/47- (HC type) elbow cable clamp	TJ1784/62- (HD type) Backshell for shielding termination
Anti-rotating accessory. This type tightens the grommet to ensure the connector's environmental characteristics. This type can not clamp the cable, applied in normal environment.	Anti-rotating, cable-clamping accessory. This type tightens the grommet and clamps the cable to insure the connector's environmental characteristics. It is applied in tensile force environment.	Anti-rotating, 90° cable clamping accessory. This type tightens the grommet and clamps the cable 90° to insure the connector's environmental characteristics. It is applied in tensile force environment.	Anti-rotating, crimping shielding net accessory. This type tightens the grommet and contains a shielding net to insure the connector's EMI shielding characteristics. It is applied in light tensile force environment.

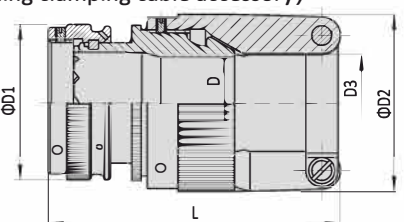
housing size		08	10	12	14	16	18	20	22	24
D1	max	15.6	18.6	21.8	25.0	28.2	31.0	34.2	37.3	40.5
D2	max	7.9	10.8	13.6	16.9	20.1	22.4	25.6	28.8	31.9
D3	min	2.49	3.87	4.83	6.6	7.19	8.26	8.71	9.68	10.62
	max	5.94	5.94	8.33	11.61	15.6	16.1	17.73	20.9	21.66
D4	min	3.2	4.0	4.8	5.5	6.4	7.9	9.5	10.3	14.3
	max	6.4	9.5	11.1	14.3	15.9	19.1	22.2	23.8	25.4
D5	max	7.0	9.7	12.8	14.9	18.0	20.0	23.2	26.3	28.9
D6	max	17.0	19.9	23.1	26.3	29.5	32.5	35.7	38.9	42.0
D7	max	16.9	19.9	23.1	26.3	29.5	32.3	35.5	38.6	41.8
F	max	20.0	20.0	23.4	26.6	30.6	34.0	35.8	39.0	40.6
L1	max	23.4	23.4	23.4	27.8	27.8	27.8	27.8	29.9	29.9
L2	max	29.0	32.0	33.5	36.5	38.5	41.5	44.5	46.0	48.0
L3	max	25.0	26.0	27.5	31.0	32.5	34.0	34.5	36.5	43.5
L4	max	31.2	31.2	31.2	33.2	33.2	33.2	36.2	36.2	36.2

J1784/62- backshell for heat shrink sleeve (Shielding and non-clamping cable accessory)	Part number	D1	D2	D3
<p>Anti-rotating, crimping shielding net accessory. This type tightens the grommet, connects the shielding net and backshell, and contains a shielding net to insure the connector's environmental and EMI shielding characteristics. This type can not clamp the cable. It is applied in light tensile force environment.</p>	J1784/62-08N	16.9	7.9	11.6
	J1784/62-10N	19.9	10.9	14.7
	J1784/62-12N	23.1	13.7	17.6
	J1784/62-14N	26.3	16.9	21.2
	J1784/62-16N	29.5	20.1	24.4
	J1784/62-18N	32.3	22.5	26.4
	J1784/62-20N	35.5	25.4	30.9
	J1784/62-22N	38.6	28.5	33.8
	J1784/62-24N	41.8	31.6	36.9

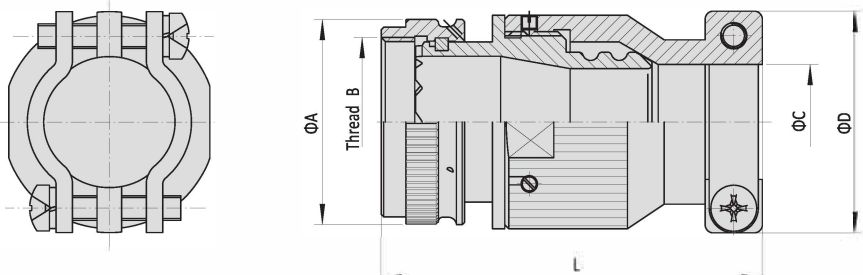
J1784/49H-soldering straight cable clamp (Clamping and non-shielding cable accessory)	Part number	A max	C	L max	D
 <p>The functions are the same with J1784/49. It can be mated with soldering products.</p>	J1784/49H-08N	18.0	20.0	26.4	2.49 ~ 5.94
	J1784/49H-10N	22.0	21.0	27.9	3.87 ~ 5.94
	J1784/49H-12N	25.1	23.4	29.4	4.83 ~ 8.33
	J1784/49H-14N	29.0	26.6	30.9	6.6 ~ 11.61
	J1784/49H-16N	32.1	30.6	33.1	7.19 ~ 15.6
	J1784/49H-18N	35.1	34.0	36.2	8.26 ~ 16.1
	J1784/49H-20N	38.1	35.8	39.4	8.71 ~ 17.73
	J1784/49H-22N	41.1	39.0	42.5	9.68 ~ 20.9
	J1784/49H-24N	44.1	40.6	44.6	10.62 ~ 21.66

[J1784/49-xxN(short)]

(Clamping and non-shielding cable accessory)	Accessory part number	D1	Thread D2	L1	Lead-out dia.
 <p>Anti-rotating, cable clamping accessory. This type tightens the grommet, clamps the cable and clamps the cable to insure the connector's environmental characteristics. It is applied in tensile force environment. The length is shorter compared with J1784/49 accessory.</p>	J1784/49-10N(short)	19.5	0.5625-24	20.8	5.1~10
	J1784/49-12N(short)	22.6	0.6875-24	19	6.7~12.9
	J1784/49-14N(short)	25.8	0.8125-20	25.2	8.4~16
	J1784/49-16N(short)	29	0.9375-20	25.3	8.2~18.5
	J1784/49-18N(short)	32.2	1.0625-18	26.7	10~21.5
	J1784/49-20N(short)	35.3	1.1875-18	26.8	11.2~24.75
	J1784/49-22N(short)	38.5	1.3125-18	32	11.6~22.6

TJ1784/62-NB (HE type) Shielding straight cable clamping backshell (Shielding clamping cable accessory)	Part number	D	D1	D2	D3	L
 <p>Anti-rotating, crimping shielding net and cable clamp accessory. This type tightens the grommet, connects the shielding net and backshell, clamps the cable and contains a shielding net to insure the connector's EMI shielding characteristics. It is applied in tensile force environment.</p>	TJ1784/62-08NB	6.5	16.3	19.4	6.8	39.0
	TJ1784/62-10NB	9.7	19.5	22.5	9.2	39.0
	TJ1784/62-12NB	12.8	22.6	25.7	12.6	39.0
	TJ1784/62-14NB	14.9	25.8	28.9	16	45.0
	TJ1784/62-16NB	18	29.0	32.1	17.5	45.0
	TJ1784/62-18NB	20	32.2	35.3	21.5	46.5
	TJ1784/62-20NB	23.2	35.3	38.4	24.8	51.3
	TJ1784/62-22NB	26.3	38.5	41.6	22.6	56.6
	TJ1784/62-24NB	28.9	41.7	44.8	23.1	57.3

[TJ1784/62- xx NC- xx]

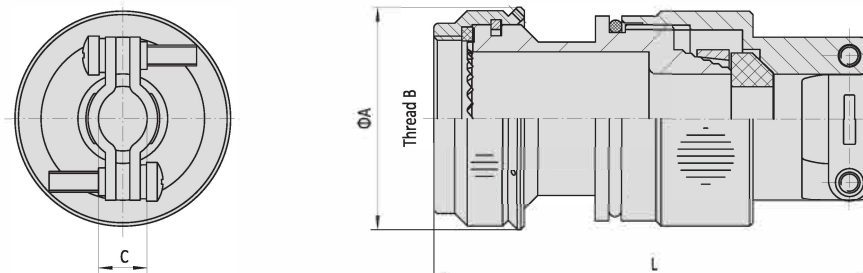
(Shielding clamping cable accessory)
 <p>Anti-rotating, crimping shielding net and cable clamp accessory. This type tightens the grommet, connects the shielding net and backshell, clamps the cable and contains a shielding net to insure the connector's EMI shielding characteristics. It is applied in tensile force environment.</p>

Accessory part number	A	Thread B UNEF	C	D	L
TJ1784/62-08NC-08	16.3	0.4375-28	8	20	39.7
TJ1784/62-10NC-08	19.5	0.5625-24	8	20	39.7
TJ1784/62-10NC-10			10	20	40.7
TJ1784/62-12NC-10	22.6	0.6875-24	10	20	40.7
TJ1784/62-12NC-12			12	25	47.4
TJ1784/62-14NC-12	25.8	0.8125-20	12	25	47.4
TJ1784/62-14NC-14			14	27	47.4
TJ1784/62-14NC-16			16	27	47.4
TJ1784/62-16NC-16	29	0.9375-20	16	27	47.4
TJ1784/62-16NC-19			19	32	47.4
TJ1784/62-18NC-19	32.2	1.0625-18	19	32	47.4
TJ1784/62-18NC-22			22	33	47.4
TJ1784/62-20NC-22	35.3	1.1875-18	22	33	47.4
TJ1784/62-20NC-25			25	36.5	47.4
TJ1784/62-22NC-25	38.5	1.3125-18	25	36.5	47.4
TJ1784/62-22NC-28			28	40	47.4
TJ1784/62-24NC-28	41.7	1.4375-18	28	40	47.4
TJ1784/62-24NC-31			31	44	47.4

[Ordering information]

J1784/18A series (Shielding clamping cable accessory)

Basic series	J1784/	18A-	25	N	09	A
Type	18A-straight shielding cable clamp (applied for GJB599 I、II series)					
Housing size	See form 1					
Housing plating	N- electroless nickel plating W- olive green cadmium plating S- stainless steel passive					
Lead-out dia.	See form 1 and form 2 for reference.					
Length	See form 3					



Anti-rotating, cable clamp accessory with crimping shielding net. This type tightens the grommet, connects the shielding net and backshell, clamps the cable, proof the rain and contains a shielding net to insure the connector's environmental and EMI shielding characteristics. It is applied in fierce environment. This accessory type of different length is available. It is applied in high & low frequency mixed environment that needs long-length accessory.

Form 1

housing size	Lead-out dia. No.	A	Thread B
09	01~02	18	0.4375-28UNEF
11	01~03	22	0.5625-24UNEF
13	02~04	25	0.6875-24UNEF
15	02~05	28	0.8125-20UNEF
17	02~06	32	0.9375-20UNEF
19	03~07	35	1.0625-18UNEF
21	03~08	38	1.1875-18UNEF
23	03~09	41	1.3125-18UNEF
25	04~10	44	1.4375-18UNEF

Form 2

Lead-out dia. No.	Applicable cable dia. range C
01	1.57~3.18
02	3.18~6.35
03	6.35~9.53
04	9.53~12.7
05	12.7~15.88
06	15.88~19.05
07	19.05~22.23
08	22.23~25.4
09	25.4~28.58
10	28.58~31.75

Form 3

Housing size	Length code	L
09~25	standard (omit)	62.7
09~25	A	88.1
15~25	B	113.5
21~25	C	138.9

Special backshell (for MIL-C-38999 series I and II series)

This type of backshells is designed to clamp tightly the shielding cable with shielding net, which falls into straight and right angle categories. The accessory can be used with Ti-Ni alloy memory ring. After heated, the ring will shrink and clamp shielding layer on the end of the accessory and achieve 360°EMI shielding.

* Ti-Ni alloy memory ring's heating and shrinking: using hot-wind gun to heat. The process takes about 45 seconds to 1 minute. When the temperature color indicator of memory ring change from green to black, it means that memory ring has been shrunk and heating should be stopped. At this time, the temperature of ring is about 165°C. Please note that memory ring should be symmetrically heated.

Ordering information

J1784/85, J1784/87 shielding backshell

Basic series	J1784/	85-	10	N	A	-05			
Type	85-straight, 87-right-angle (for MIL-C-38999 series I & II)								
Accessory shell size	08	10	12	14	16	18	20	22	24
For MIL-C-38999 I series	09	11	13	15	17	19	21	23	25
For MIL-C-38999 II series	08	10	12	14	16	18	20	22	24
Housing plating	W - olive green cadmium plating N - electroless nickel plating S - stainless steel passive								
Ti-Ni ring	omit- without Ti-Ni ring A - with Ti-Ni ring								
Leading-out diameter or Ti-Ni ring size	Without Ti-Ni ring, specify leading-out diameter With Ti-Ni ring, specify size of Ti-Ni ring								

JY599 I -FJA00, JY599 I -FJA90 shielding backshell

Basic series	JY599	I	15	FJA	00	F	A	-05	
Series code	I (Applied for GJB599 I、II series)								
Accessory shell size	09	11	13	15	17	19	21	23	25
For MIL-C-38999 I series	09	11	13	15	17	19	21	23	25
For MIL-C-38999 II series	08	10	12	14	16	18	20	20	24
Accessory type	FJA、FJC、FJE								
Structure	00 - straight 90 - 90°right-angle								
Housing plating	B - olive green cadmium plating F - electroless nickel plating E - stainless steel passive								
Ti-Ni ring	omit - without Ti-Ni ring A - with Ti-Ni ring (only for FJA, FJC)								
Outlet diameter or Ti-Ni ring size	Without Ti-Ni ring, specify outlet diameter With Ti-Ni ring, specify size of Ti-Ni ring								

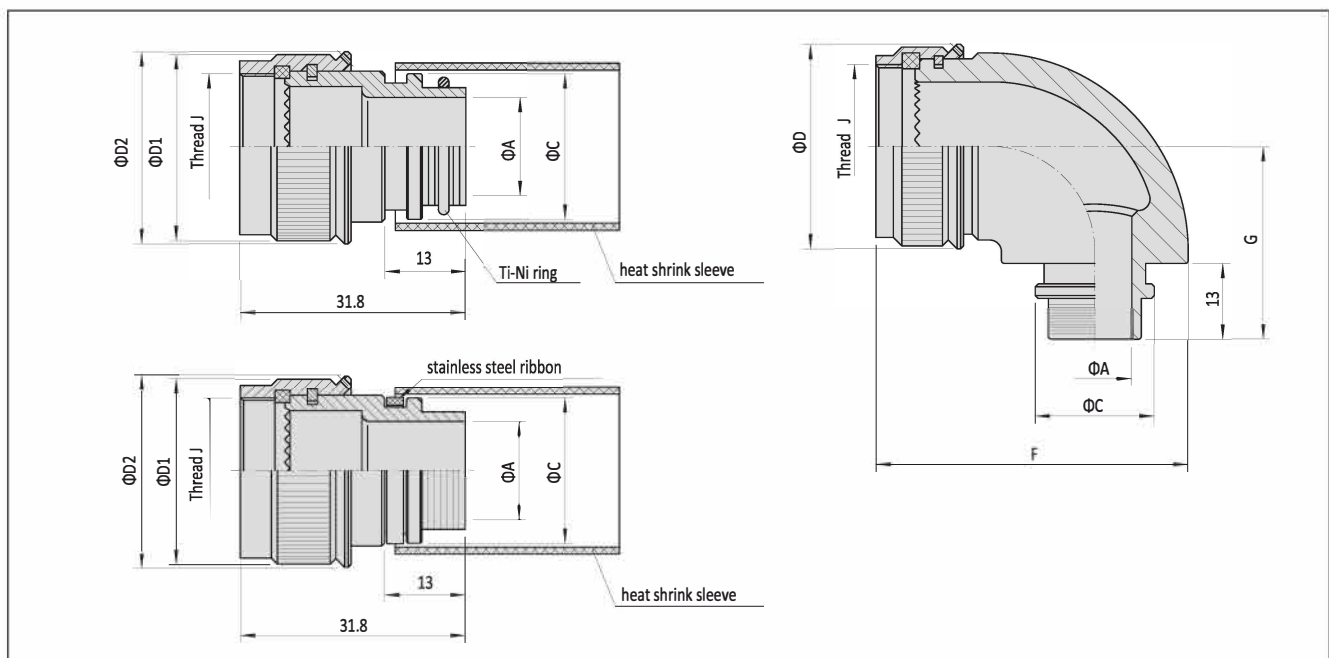
Notes:

1. This type of accessory is applied in harsh environment where disassembling is not frequently needed. It can achieve shielding both inside and outside.
2. the steel ribbon and bundling clamp need to be ordered separately if they are needed. The steel ribbon type is "A31189(07-08-221)", and the bundling clamp type is "A30199 TIE-DEX II (14-04-3216)".
3. J1784/85、J1784/87 is the same with JY599-FJA00 and JY599 I -FJA90. Only the naming is different.

Outline dimensions

Straight accessory (J1784/85 or JY599 I -FJA00)

Right-angle accessory (J1784/87 or JY599 I -FJA90)





No.	Housing No.	Ti-Ni ring size	Shielding standard (Tin-copper plating mark dia.)	A outlet dia.		C		F	D1	D2	G	Thread J UNEF-2B
				Straight	90°	Straight	90°					
1	09	TR-04	6×10 (0.15~0.20)	6.3	6.3	14	14	36.3	17	18	26	0.4375-28
		TR-05	10×16 (0.15~0.20)	7.9	7.9	15.5	15					
		TR-06	10×16 (0.15~0.20)	9.5	9.5	17.1	15					
2	11	TR-04	6×10 (0.15~0.20)	6.3	6.3	14	14	37.8	21	22	26	0.5625-24
		TR-05	10×16 (0.15~0.20)	7.9	7.9	15.5	15.5					
		TR-06	10×16 (0.15~0.20)	9.5	9.5	17.1	17.1					
		TR-07	10×16 (0.12~0.20)	11.1	11.1	18.7	18					
		TR-08	10×16 (0.12~0.25)	12.7	12.7	20.3	18					
3	13	TR-04	6×10 (0.15~0.20)	6.3	6.3	14	14	43.3	24	25	29	0.6875-24
		TR-05	10×16 (0.15~0.20)	7.9	7.9	15.5	15.5					
		TR-06	10×16 (0.15~0.20)	9.5	9.5	17.1	17.1					
		TR-07	10×16 (0.12~0.20)	11.1	11.1	18.7	18.7					
		TR-08	16×24 (0.12~0.25)	12.7	12.7	20.3	20.3					
		TR-10	16×24 (0.10~0.30)	16	16	23.5	23.0					
4	15	TR-05	10×16 (0.15~0.20)	7.9	-	15.5	-	45.1	27	28	29	0.8125-20
		TR-06	10×16 (0.15~0.20)	9.5	9.5	17.1	17.1					
		TR-07	10×16 (0.12~0.20)	11.1	11.1	18.7	18.7					
		TR-08	16×24 (0.12~0.25)	12.7	12.7	20.3	20.3					
		TR-10	16×24 (0.10~0.30)	16	16	23.5	23.5					
		TR-12	16×24 (0.10~0.30)	19	19	26.7	25.5					
5	17	TR-05	10×16 (0.15~0.20)	7.9	-	15.5	-	48.8	31	32	33	0.9375-20
		TR-06	10×16 (0.15~0.20)	9.5	10.5	17.1	17.1					
		TR-07	10×16 (0.12~0.20)	11.1	11.1	18.7	18.7					
		TR-08	16×24 (0.12~0.25)	12.7	12.7	20.3	20.3					
		TR-10	16×24 (0.10~0.30)	16	16	23.5	23.5					
		TR-12	16×24 (0.10~0.30)	19	19	26.7	26.7					
		TR-14	24×30 (0.10~0.30)	22.2	22.2	30	28					
6	19	TR-08	16×24 (0.12~0.25)	12.7	12.7	20.3	20.3	51.6	34	35	33	1.0625-18
		TR-10	16×24 (0.10~0.30)	16	16	23.5	23.5					
		TR-12	16×24 (0.10~0.30)	19	19	26.7	26.7					
		TR-14	24×30 (0.10~0.30)	22.2	22.2	30	30					
		TR-16	24×30 (0.10~0.30)	25.4	25.4	33	32					
7	21	TR-08	16×24 (0.12~0.25)	12.7	12.7	20.3	20.3	53.8	37	38	39	1.1875-18
		TR-10	16×24 (0.10~0.30)	16	16	23.5	23.5					
		TR-12	16×24 (0.10~0.30)	19	19	26.7	26.7					
		TR-14	24×30 (0.10~0.30)	22.2	22.2	30	30					
		TR-16	24×30 (0.10~0.30)	25.4	25.4	33	33					
		TR-18	30×40 (0.10~0.30)	28.5	-	36.2	-					
8	23	TR-10	16×24 (0.10~0.30)	16	16	23.5	23.5	56.3	40	41	39	1.3125-18
		TR-12	16×24 (0.10~0.30)	19	19	26.7	26.7					
		TR-14	24×30 (0.10~0.30)	22.2	22.2	30	30					
		TR-16	24×30 (0.10~0.30)	25.4	25.4	33	33					
		TR-18	30×40 (0.10~0.30)	28.5	28.5	36.2	36.2					
		TR-20	30×40 (0.10~0.30)	31.8	-	39.4	-					
9	25	TR-10	16×24 (0.10~0.30)	16	16	23.5	-	61.8	43	44	44	1.4375-18
		TR-12	16×24 (0.10~0.30)	19	19	26.7	26.7					
		TR-14	24×30 (0.10~0.30)	22.2	22.2	30	30					
		TR-16	24×30 (0.10~0.30)	25.4	25.4	33	33					
		TR-18	30×40 (0.10~0.30)	28.5	28.5	36.2	36.2					
		TR-20	30×40 (0.10~0.30)	31.8	31.8	39.4	39.4					
		TR-22	30×40 (0.10~0.30)	35	35	42.5	42					

[JY599 I xxFJC00] (Shielding and non-clamping cable accessory)

	Housing size	A	B	C	D	Thread J UNEF	L	Ti-Ni ring type
	11	8.3	11	15	18.6	0.5625-24	29	TR-05
	13	10	12.7	16.6	21.8	0.6875-24	29	TR-06
	15	11.1	14.3	18.5	25	0.8125-20	29	TR-07
	17	13.1	15.9	19.8	28.2	0.9375-20	29	TR-08
	19	16.2	19	23	30.9	1.0625-18	29	TR-10
	21	16.2	19	23	34.1	1.1875-18	29	TR-10
	23	19.5	22.2	26.2	37.5	1.3125-18	29	TR-12
	25	19.5	22.2	26.2	40.5	1.4375-18	29	TR-12

[JY599 I xxFJE00] (Shielding and non-clamping cable accessory)

	Housing size	A	Thread B UNEF	C Lead-out dia.	D
	09	22	0.4375-28	6.3, 7.9, 9.5	20
	11	25	0.5625-24	6.3, 7.9, 9.5, 11.1, 12.7	23
	13	28	0.6875-24	6.3, 7.9, 9.5, 11.1, 12.7, 16	27
	15	32	0.8125-20	7.9, 9.5, 11.1, 12.7, 16, 19	30
	17	35	0.9375-20	7.9, 9.5, 11.1, 12.7, 16, 19, 22.2	33
	23	44	1.3125-18	16, 19, 22.2, 25.4, 28.5, 31.8	42
	25	47	1.4375-18	19, 22.2, 25.4, 28.5, 31.8, 35	45

[Square flange cushion]

	Housing size	Square flange cushion code	Conductive square flange cushion code	A	B	C	D	R
	09	21E8-701-849-A1	21E8-701-850-A2	23.9	14.8	18.26	3.3	3.2
	11	21E8-701-851-A1	21E8-701-852-A2	26.3	18.0	20.62	3.3	3.2
	13	21E8-701-853-A1	21E8-701-854-A2	28.7	21.8	23.01	3.3	3.2
	15	21E8-701-855-A1	21E8-701-856-A2	31.1	25.0	24.61	3.3	3.2
	17	21E8-701-857-A1	21E8-701-858-A2	33.4	28.2	26.97	3.3	3.2
	19	21E8-701-859-A1	21E8-701-860-A2	36.6	30.9	29.36	3.3	3.2
	21	21E8-701-861-A1	21E8-701-862-A2	39.8	34.0	31.75	3.3	3.2
	23	21E8-701-863-A1	21E8-701-864-A2	43.0	37.2	34.93	3.8	3.7
	25	21E8-701-865-A1	21E8-701-866-A2	46.1	40.4	38.10	3.8	3.7

MIL-DTL-38999III series electrical connector

Brief introduction

- Comply with GJB 599A (MIL-DTL-38999K) III series
- Quick tri-start thread coupling with anti-decoupling mechanism
- Small volume, light weight, high contact density
- EMI/RFI shielding
- Removable crimping contact, scoop-proof pin
- 12 # , 16 # contact cavities can be filled with fiber optic contacts
- 12 # , 10 # , 8 # contact cavities can be filled with coaxial contacts or shielding contacts
- Fireproof shell, composite material shell, and aluminum alloy shell with various plating
- Withstanding high strength vibration under high temperature, and applied in harsh environment like wind, sand, moist, etc.
- Enterprise standard: 21E0.204.102JT



Application

The product is used to connect electrical signals.

Main technical characteristics

[Mechanical]

- Housing: Aluminum alloy, stainless steel
- Plating: W - olive green cadmium plating
F - electroless nickel plating
K - stainless steel passive
- Insulator: Thermoplastic or thermo-set
- Grommet and seal: Silicon rubber
- Contact: Gold plating copper alloy
- Endurance: 500 cycles
- Shock: 3ms half sinusoid
Peak value of acceleration: 300g

[Electrical]

- Withstanding voltage: V

Service rating	Sea level	21000 m
M	1300	800
N	1000	600
I	1800	1000
II	2300	1000

Remarks: Different contact layouts have different service rating. Please see the contact layout form for details.

- Contact resistance and rating current:

Contact size	Operating dia. mm	Contact resistance mΩ	Rating current A
22D	φ0.76	≤12	5
20#	φ1.00	≤5	7.5
16#	φ1.60	≤2.5	13
12#	φ2.40	≤1.5	23
10#	φ3.15	≤1.0	40

[Environmental]

- Operating temperature:
W class: -65°C ~ 175°C
F & K class: -65°C ~ 200°C
- Sealing: Comply with the requirement of MIL-DTL-38999K high altitude immersion

Operating environment

The products can be used in some harsh environments like strong vibration, rain, sand, damp heat and so on.

- Vibration:
Sinusoid: 60g, with temperature cycling and simulating accessories (36 hours)
Random: under high temperature, frequency 100 ~ 1000Hz, power spectrum density 1g²/Hz, rms 41.7g under ambient temperature, frequency 100 ~ 1000Hz, power spectrum density 5g²/Hz, rms 49.5g
- Contact retention (mini force in N)
22D#: 45N 20#: 67N 16#: 111N
12#: 111N 10#: 111N 8#: 111N
- Insulation resistance: ≥5000MΩ (at 500Vdc)
- Electricity of shell:
W class: 2.5 mΩ
F class: 1 mΩ K class: 10 mΩ
- EMI shielding:
100MHz ~ 1GHz, minimum attenuation 85dB (F class, W class)
1GHz ~ 10GHz, minimum attenuation 65dB (F class), 50dB (W class)
- 8# coaxial contact:
frequency bandwidth: 0 ~ 20MHz
Voltage rating: Max. 500VAC
21000 meter height: 125VAC
- Voltage drop:
inner and middle contact ≤55mV under 1A
outer contact ≤75mV under 12A
- Salt spray: According to method 1001 GJB 1217
W class: 500 hours F class: 48 hours
K class: 1000 hours
- Damp heat: 10 cycles in 24 hours according to MIL-DTL-38999K
- Resistance to fluids: Fuels, coolant, solvent

Ordering information

Basic series	J599/	20	W	B	35	P	N	-H
Housing type	20 - square flange receptacle 24 - jam nut receptacle 26 - RFI shielding plug							
Plating	W - olive green cadmium plating F - electroless nickel plating K - stainless steel passivation							
HousingSize Index No.	09 11 13 15 17 19 21 23 25 A to J A B C D E F G H J							
Contact layout	please see the contact layout figure							
Contact type	P -pin, crimping and soldering type S -socket, crimping and soldering type PL -pin, long PCB contact SL -socket, long PCB contact PC -pin, short PCB contact SC-socket, short PCB contact A -special pin contact B -special socket contact							
Polarization	N - normal A, B, C, D, E - alternative							
Soldering contact code (only for soldering connectors)	H - soldering contact							

Notes:

- GJB599A series is designed according to the same standard with MIL-DTL-38999K series. The difference is that: the basic part number of GJB599A is J599, while MIL-DTL-38999K is D38999. The two series are interchangeable with each other.
- A and B stand for the non-standard contacts that are different from the GJB1611 standard (For example: shielding, coaxial, optic contact, etc.). These contact types need to be ordered separately, the part number details can be found in the instruction of GJB599 III series special contacts.
- The applicable sealing cap, backshell and square flange rubber washer details can be found in Page 46 to 57
- If the operating environment requires high oil resistance, the connector sealing components should be fluorinated silicone rubber. When users order this product, add C1 at the end of the original part number (Example: J599/20FE35PNC1)

[Part number example]

J599/20KB35PN-H

J599 series square flange receptacle, stainless steel passivated shell, B# shell size, 35# insert arrangement, filled with pins, crimping and soldering, N polarization. Soldering contacts are only applicable for soldering connector types.

Crimping contacts

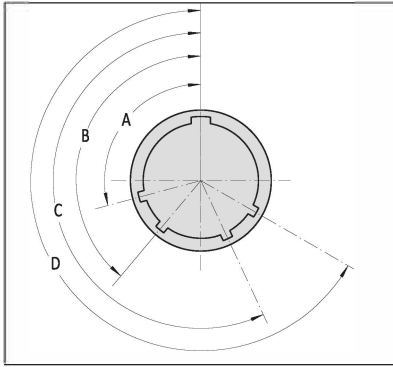
Contact size	Dia. mm	Pin color	Socket color	ID of crimp boot mm	OD of crimp boot mm	Section of wire mm ²	AWG	Wire insulator OD	Removal tool code	Crimping tool
22D	φ 0.76	Orange-blue-black	Orange-yellow-gray	0.85	1.20	0.08 0.125 0.2 0.3	28 26 24 22	0.76~1.37	M81969/ 14-01	YJQ-02
20#	φ 1.00	Orange-blue-orange	Orange-green-brown	1.17	1.78	0.2 0.3 0.5	24 22 20	1.02~2.11	M81969/ 14-10	YJQ-02 XCXY-01
16#	φ 1.60	Orange-blue-yellow	Orange-green-red	1.68	2.62	0.5 0.8 1.0 1.2	20 18 16	1.65~2.77	M81969/ 14-03	XCXY-01
12#	φ 2.40	Orange-blue-green	Orange-green-orange	2.49	3.84	2.0 3.0	14 12	2.46~3.61	M81969/ 14-04	XCXY-01
10#	φ 3.15	Green-red-gray	Green-orange-purple	3.40	4.65	4.8	10	3.42~4.12	M81969/ 14-05	YTQ
8#	φ 3.6	—	—	4.55	6.4	8.37	8	6.4~6.9	M81969/ 14-12	YTQ

Soldering contacts

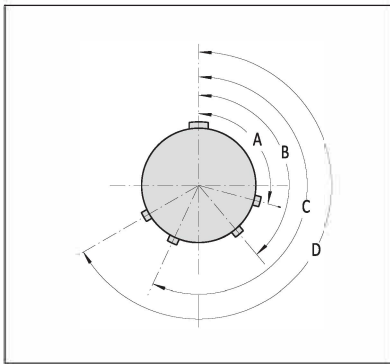
Contact size	Soldering cup ID	AWG
22D	φ 0.9	22
20#	φ 1.1	20
16#	φ 1.9	16
12#	φ 2.9	12
10#	φ 3.6	10
8#	φ 4.8	8

Polarization

[Front view of receptacle]



[Front view of plug]



Housing size	MS Shell	Polarization	N	A	B	C	D	E
9	A	A°	105	102	80	35	64	91
		B°	140	132	118	140	155	131
		C°	215	248	230	205	234	197
		D°	265	320	312	275	304	240
11	B	A°	95	113	90	53	119	51
		B°	141	156	145	156	146	141
		C°	208	182	195	220	176	184
		D°	236	292	252	255	298	242
13	C	A°	95	113	90	53	119	51
		B°	141	156	145	156	146	141
		C°	208	182	195	220	176	184
		D°	236	292	252	255	298	242
15	D	A°	95	113	90	53	119	79
		B°	141	156	145	156	146	153
		C°	208	182	195	220	176	197
		D°	236	292	252	255	298	272
17	E	A°	80	135	49	66	62	79
		B°	142	170	169	140	145	153
		C°	196	200	200	200	180	197
		D°	293	310	244	257	280	272
19	F	A°	80	135	49	66	62	79
		B°	142	170	169	140	145	153
		C°	196	200	200	200	180	197
		D°	293	310	244	257	280	272
21	G	A°	80	135	49	66	62	79
		B°	142	170	169	140	145	153
		C°	196	200	200	200	180	197
		D°	293	310	244	257	280	272
23	H	A°	80	135	49	66	62	79
		B°	142	170	169	140	145	153
		C°	196	200	200	200	180	197
		D°	293	310	244	257	280	272
25	J	A°	80	135	49	66	62	79
		B°	142	170	169	140	145	153
		C°	196	200	200	200	180	197
		D°	293	310	244	257	280	272

Outline dimensions

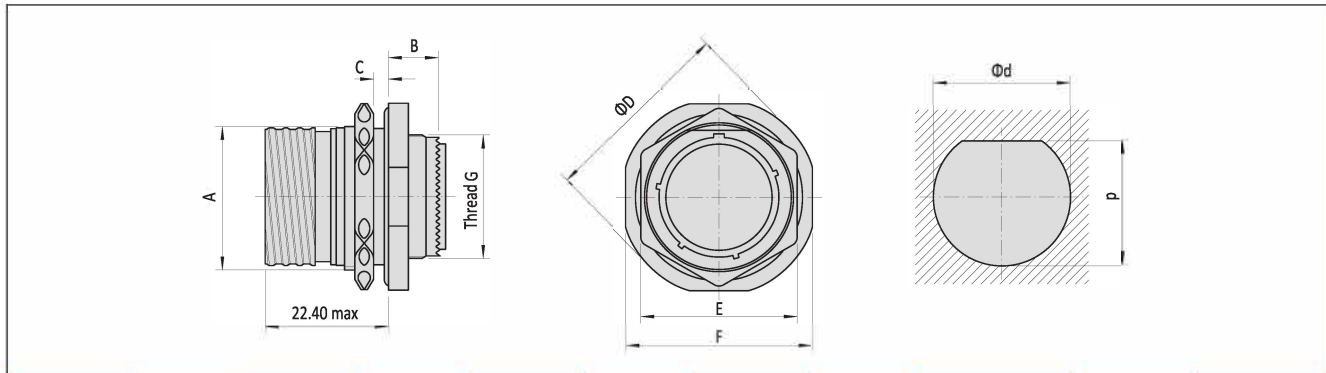
[Plug]

Housing size	MS housing	A max	Thread B	C max
9	A	31.00	M12×1-6g	21.80
11	B	31.00	M15×1-6g	25.00
13	C	31.00	M18×1-6g	29.40
15	D	31.00	M22×1-6g	32.40
17	E	31.00	M25×1-6g	35.60
19	F	31.00	M28×1-6g	38.50
21	G	31.00	M31×1-6g	41.70
23	H	31.00	M34×1-6g	44.90
25	J	31.00	M37×1-6g	48.00

[Square flange receptacle]

Housing size	MS housing	A max	B max	C max	Thread D	E	F	G	H	J	d1 min	d2 min
9	A	20.90	10.80	2.50	M12×1-6g	23.80	18.26	15.09	3.25	5.49	16.66	13.11
11	B	20.90	10.80	2.50	M15×1-6g	26.20	20.62	18.26	3.25	4.93	20.22	15.88
13	C	20.90	10.80	2.50	M18×1-6g	28.60	23.01	20.62	3.25	4.93	23.42	19.05
15	D	20.90	10.80	2.50	M22×1-6g	31.00	24.61	23.01	3.25	4.39	26.59	23.01
17	E	20.90	10.80	2.50	M25×1-6g	33.30	26.97	24.61	3.25	4.93	30.96	25.81
19	F	20.90	10.80	2.50	M28×1-6g	36.50	29.36	26.97	3.25	4.93	32.94	28.98
21	G	20.10	11.50	3.20	M31×1-6g	39.70	31.75	29.36	3.25	4.93	36.12	32.16
23	H	20.10	11.50	3.20	M34×1-6g	42.90	34.93	31.75	3.91	6.15	39.29	34.93
25	J	20.10	11.50	3.20	M37×1-6g	46.00	38.10	34.93	3.91	6.15	42.47	37.69

[Jam nut receptacle]

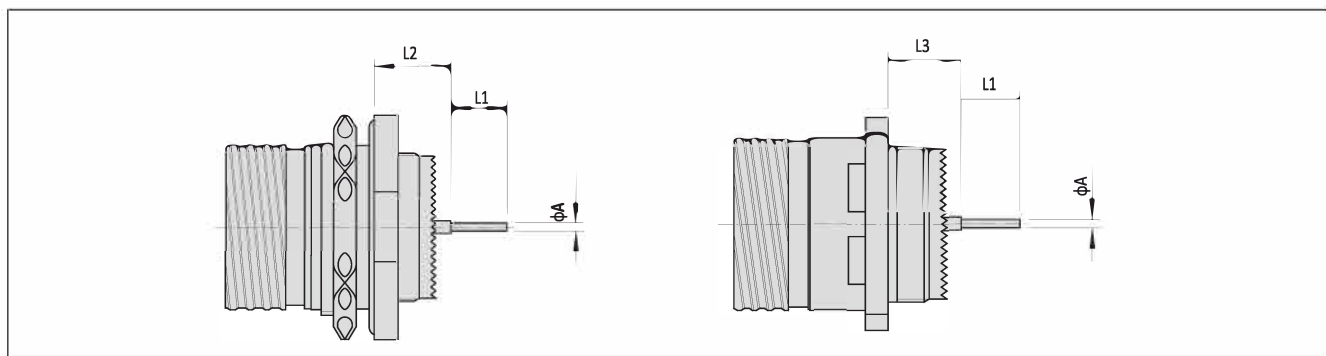


Housing size	MS housing	A	B max	C max	D max	E max	F	Thread G	d	p
9	A	16.50	9.90	3.20	30.50	24.00	27.00	M12×1-6g	17.70	16.99
11	B	19.30	9.90	3.20	35.20	27.00	31.80	M15×1-6g	20.88	19.53
13	C	24.00	9.90	3.20	38.40	32.00	34.90	M18×1-6g	25.58	24.26
15	D	27.20	9.90	3.20	41.60	36.00	38.10	M22×1-6g	28.80	27.53
17	E	30.40	9.90	3.20	44.80	37.00	41.30	M25×1-6g	31.98	30.68
19	F	33.40	9.90	3.20	49.30	41.00	46.00	M28×1-6g	35.15	33.86
21	G	36.50	9.90	3.20	52.70	46.00	49.20	M31×1-6g	38.28	37.06
23	H	39.70	9.90	3.20	55.90	50.00	52.40	M34×1-6g	41.50	40.24
25	J	42.80	9.90	3.20	59.00	51.23	55.60	M37×1-6g	44.68	43.41

[GJB599III series receptacle with PCB contacts]

J599/24 receptacle

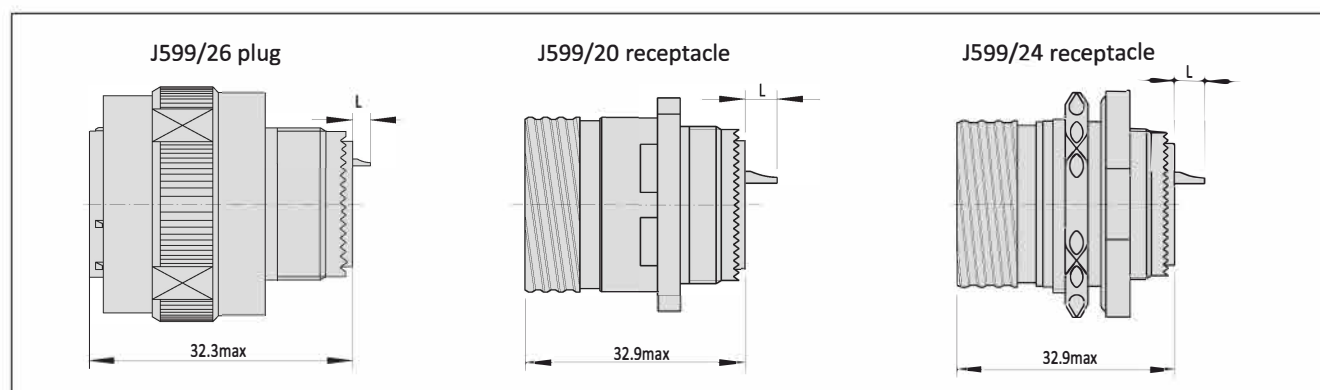
J599/20 receptacle



PCB contact type		L1	A
22D	Long PCB contact	8.5	0.7
	Short PCB contact	4.0	
20#	Long PCB contact	8.5	0.7
	Short PCB contact	5.1	
16#	Long PCB contact	8.5	1.15
	Short PCB contact	5.1	

Dimensions with different contacts			Shell size 09-11	Shell size 13-15-17-19-21-23-25
L2	With 22D# pin	min	10.52	10.34
		max	11.46	11.28
	With 22D# socket	min	10.19	10.01
		max	11.46	11.28
	With 20# or 16# pin/socket	min	10.69	10.51
		max	11.63	11.45
L3	With 22D# pin	min	9.48	9.48
		max	10.58	10.58
	With 22D# socket	min	9.15	9.15
		max	10.58	10.58
	With 20# or 16# pin/socket	min	9.65	9.65
		max	10.75	10.75

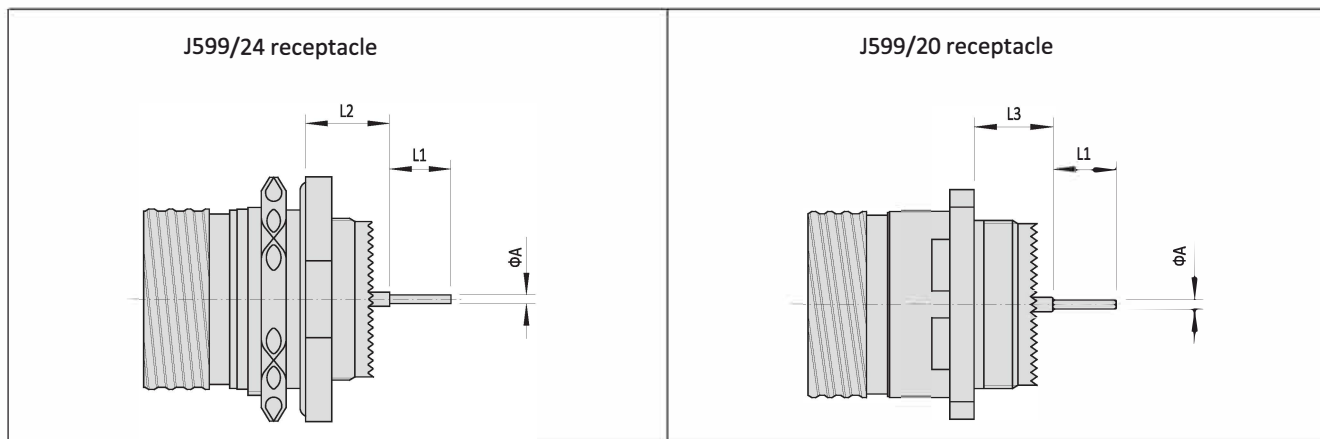
[GJB599 III series soldering connectors]



Soldering contact size	L
22D	4
20#	4
16#	4
12#	4
10#	6
8#	6

Remarks: there is no soldering type for coaxial contacts.

[GJB599III series receptacle with PCB contacts]



PCB contact type		L1	A
22D	Long PCB contact	8.5	0.7
	Short PCB contact	4.0	
20#	Long PCB contact	8.5	0.7
	Short PCB contact	5.1	
16#	Long PCB contact	8.5	1.15
	Short PCB contact	5.1	

Dimensions with different contacts			Housing size 09-11	Housing size 13-15-17-19-21-23-25
L2	With 22D# pin	min	10.52	10.34
		max	11.46	11.28
	With 22D# socket	min	10.19	10.01
		max	11.46	11.28
	With 20# or 16# pin/socket	min	10.69	10.51
		max	11.63	11.45
L3	With 22D# pin	min	9.48	9.48
		max	10.58	10.58
	With 22D# socket	min	9.15	9.15
		max	10.58	10.58
	With 20# or 16# pin/socket	min	9.65	9.65
		max	10.75	10.75

GJB599III series insert arrangement (mating view of insulator with pin)

Housing size 09 (A)	35 M 6-22D	98 I 3-20#	02 I 2-20#	03 I 3-20#	10 I 1-12#	11 I 1-16#	
	35 M 13-22D	98 I 6-20#	05 I 5-20#	04 I 4-20#	01 I 1-12#	99 I 7-20#	02 I 2-16#
11 (B)	15 N 4-22D 1-12#						
	35 M 22-22D	98 I 10-20#	08 I 8-20#	04 I 4-16#	12 N 1-12# 11-22D	50 M 4-20# 1-10#	60 I 4-16# 2-20#
13 (C)	03 II 3-16#	02 I 2-12#	05 I 1-16# 2-12#	24 II 1-12#	45 I 5-16#		
	35 M 37-22D	19 I 19-20#	18 I 18-20#	05 II 5-16#	97 I 8-20# 4-16#	15 I 14-20# 1-16#	
15 (D)	02 II 2-12#	14 N 8-22D 6-16#	31 M 30-22D 1-12#	38 I 4-12#			
	35 M 55-22D	26 I 26-20#	06 I 6-12#	08 II 8-16#	99 I 21-20# 2-16#		
17 (E)	16 3-20# 1-16# 2-10#	27 I 7-12#	42 I 42-22D				
	35 M 66-22D	32 I 32-20#	11 II 11-16#	28 I 26-20# 2-16#	30 I 29-20# 1-16#		
19 (F)							



19 (F)	45 M 67-22D	18 M 14-22D 4-8# Dual coaxial	05 1-20# 4-10#	22 I 22-20#	08 M 8-12#
	10 I 7-16# 1-12#, 2-10#	12 I 7-20# 1-16#, 2-10#			
21 (G)	35 M 79-22D	41 I 41-20#	16 I 16-16#	39 I 37-20# 2-16#	11 II 11-12#
	27 I 27-20#	25 I 25-20#	24 I 24-20#	29 I 26-20# 3-12# coaxial	70 M 20-16#
	80 II 12-16# 3-12# coaxial				
23 (H)	35 M 100-22D	55 I 55-20#	53 I 53-20#	36 I 36-20#	
	34 I 34-20#	32 I 32-20#	21 II 21-16#	97 I 16-16#	



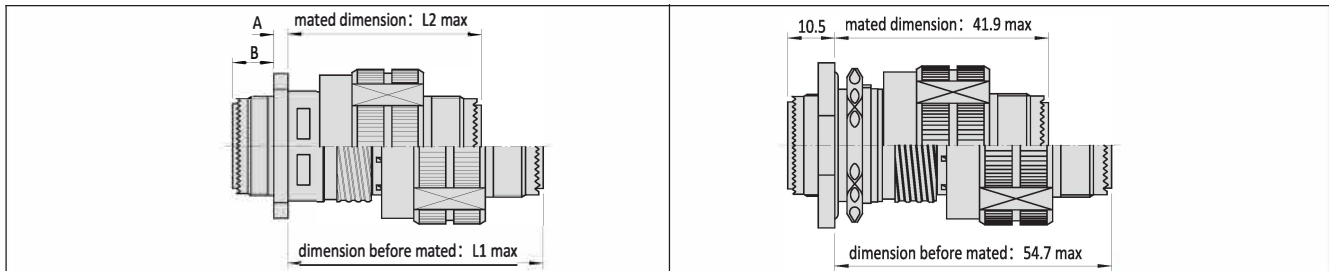
25 (J)	99 II	2 M	09a M	37 II
	35 M	61 I	46 I	29 I
	24 I	43 I	19 I	04 I
11 I	20 N	31 N	93 M	
2 M	37 I	30 N	32 N	



Dimensions after mating

Square flange receptacle (J599/20) /plug (J599/26)

Jam nut receptacle (J599/24) /plug (J599/26)



Housing size		09	11	13	15	17	19	21	23	25
L1	max	53.2	53.2	53.2	53.2	53.2	53.2	52.4	52.4	52.4
L2	max	40.3	40.3	40.3	40.3	40.3	40.3	39.6	39.6	39.6
A	max	2.5	2.5	2.5	2.5	2.5	2.5	3.2	3.2	3.2
B	max	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6

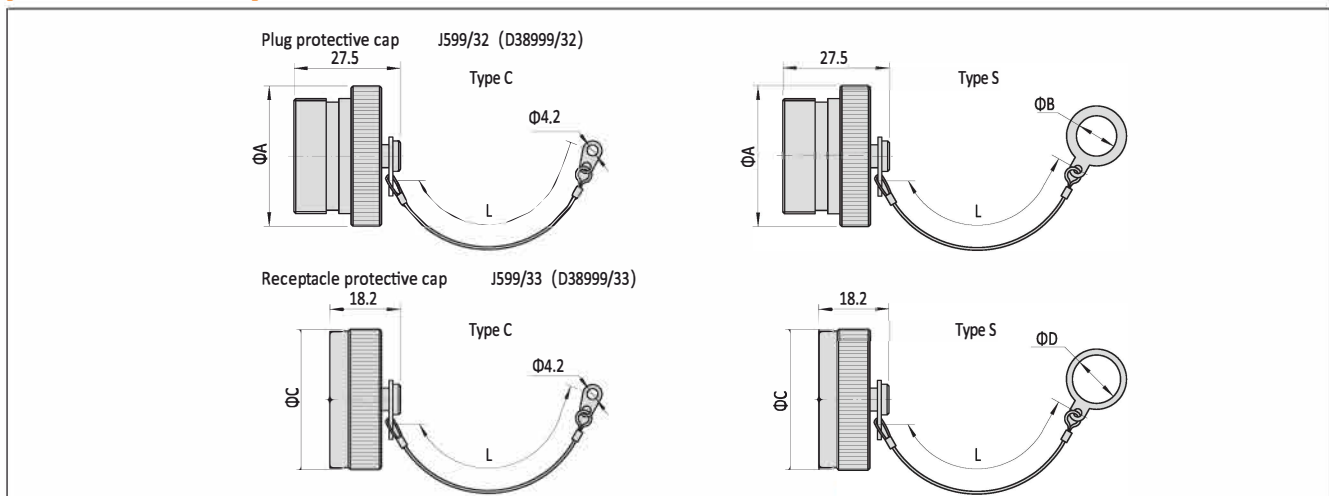
Sealing caps of plug and receptacle

[Ordering information]

Basic series	J599/	32	F	09	N
Type	32- sealing cap of plug (equivalent to D38999/32) 33- sealing cap of receptacle (equivalent to D38999/33)				
Plating	W- aluminum alloy shell, olive green cadmium plating F- aluminum alloy shell, electroless nickel plating K- stainless steel passive J- composite material shell, olive green cadmium plating M- composite material shell, electroless nickel plating				
Shell size	09-11-13-15-17-19-21-23-25				
Chain type	R-stainless steel string with connecting plate (for square flange receptacle) N-stainless steel string with ring (for jam nut receptacle) C-nylon string with connecting plate (for square flange receptacle) S-nylon string with ring (for jam nut receptacle)				

Remarks: The sealing cap is ordered separately, not supplied with the connectors.

[Outline dimensions]



Housing size		09	11	13	15	17	19	21	23	25
A	max	22.86	25.40	30.48	33.02	36.83	39.37	43.18	44.45	48.26
B	min	12.92	17.78	19.27	22.60	25.62	28.95	31.97	34.03	38.32
C	max	22.86	27.86	30.48	31.75	36.83	38.10	41.91	44.45	48.26
D	min	17.78	21.33	25.62	28.95	31.97	35.30	38.32	41.65	44.45
L	max	127.00	127.00	127.00	127.00	127.00	127.00	127.00	127.00	127.00

Standard back accessory (applicable for GJB599 III series connectors)

Comply with GJB1784 (equivalent to MIL-C-85049)

Notes:

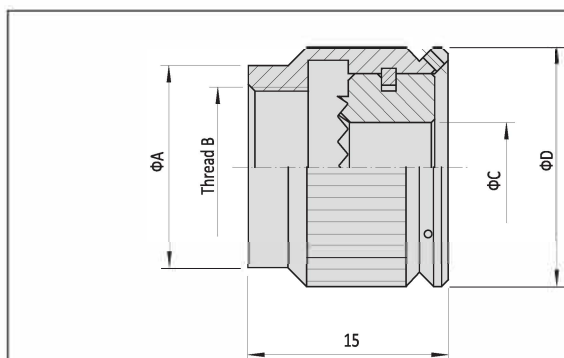
- 1) For the accessories listed below, part number "J1784" is the same with "J1784 A".
- 2) The below steps can help prevent looseness. When using the accessories, at least one step should be adapted.
 - ① Put the fuse through the socket to anti looseness;
 - ② Coat some thread glue at the product termination, and tighten the jam nut;
 - ③ Use heat shrink sleeve against looseness.
- 3) For the accessory which carries a set screw, coat some threadglue on the set screw first and then tighten the screw.
- 4) If the applicable products of the cable accessory is mounted with 8# contacts, please choose longer cable accessory, such as J1784/38H type or J1784/18 type; this is meant to prevent the contact positioner affects the cable accessory.
- 5) The table below is on the GJB599 series soldering products and crimping products with their correspondingly applicable cable accessories. As the modified products and accessories are so many that we can not list them one by one. The form below is only for reference, please consult our engineers for details.

Connector type	Applicable cable accessory type	Applicable cable accessory part number
GJB599 III series crimping connector	Non-clamping and non-shielding cable accessory	1、 J1784/14
	Clamping and non-shielding cable accessory	1、 J1784/38
		2、 J1784/39
		3、 J1784/16
		4、 J1784/91-xxJ (composite material)
		5、 J1784/92-xxJ (composite material)
	Shielding and non-clamping cable accessory	1、 J1784/20
		2、 J1784/20-xxJ (composite material)
		3、 J1784/69
		4、 J1784/88
		5、 J1784/90
		6、 JY599III-FJA00
		7、 JY599III-FJA90
		8、 JY599III-xxFJB00F
		9、 JY599IIIxxFJC00
10、 JY599IIIxxFJE00		
Shielding and clamping cable accessory	1、 J1784/38-xxNB	
	2、 J1784/18 series (rain-proof)	
GJB599 III series soldering connector	Non-clamping and non-shielding cable accessory	1、 J1784/14
	Clamping and non-shielding cable accessory	1、 J1784/38H
		2、 J1784/16H
		3、 J1784/91H-xxJ (composite material)
	Shielding and non-clamping cable accessory	1、 J1784/20
		2、 J1784/69
		3、 J1784/88
		4、 J1784/90
		5、 JY599III-FJA00
		6、 JY599III-FJA90
	Shielding and clamping cable accessory	1、 J1784/18 series (rain-proof)

[Ordering information]

Basic series	J1784 /	38 –	15	N
Type	14-back nut 16- right-angle cable clamp 20- shielding backshell 38- straight cable clamp 39- right-angle cable clamp 69- heat shrink sleeve backshell			
Housing size	09-11-13-15-17-19-21-23-25			
Housing plating	W- olive green cadmium plating N-electroless nickel plating S- stainless steel passive			

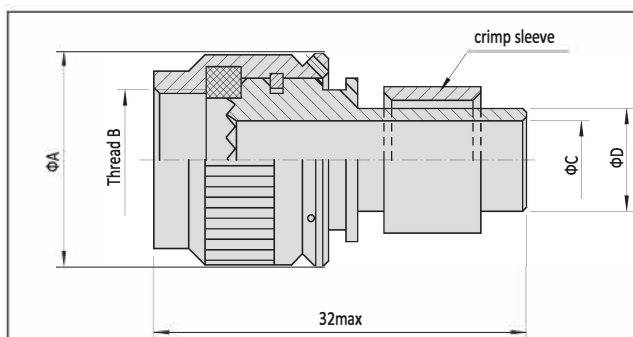
[J1784/14 - back nut] (Non-clamping cable accessory, non shielding)



Anti-rotating accessory. This type tightens the grommet to insure the connector's environmental characteristics. This type can not clamp the cable. It is applied in normal environment.

Housing size	A	Thread B	C	D
09	15.2	M12×1	7.9	19
11	18.2	M15×1	10.8	22
13	21.2	M18×1	13.6	25.1
15	25.1	M22×1	16.9	29
17	28.1	M25×1	20.1	32.1
19	31.1	M28×1	22.1	35.1
21	34.0	M31×1	25.2	38.1
23	37.0	M34×1	28.3	41.1
25	40.0	M37×1	31.6	44.1

[J1784/20 - shielding back accessory] (Shielding non-clamping cable accessory)



Anti-rotating, crimping shielding net accessory. This type tightens the grommet and contains a shielding net to insure the connector's environmental and EMI shielding characteristics. This type can not clamp the cable. It is applied in light tensile force environment.

Housing size	A	Thread B	C	D	Compression block
09	19	M12×1	6.55	8.81	08
11	22	M15×1	8.63	12.65	10
13	25.1	M18×1	10.90	12.95	12
15	29	M22×1	14.10	16.00	14
17	32.1	M25×1	17.25	19.30	16
19	35.1	M28×1	20.40	22.61	18
21	38.1	M31×1	23.60	25.65	20
23	41.1	M34×1	26.40	28.70	22
25	44.1	M37×1	28.40	30.53	24

Note: The crimp sleeve is needed to be crimped by special crimp tool. YTQ crimp tool is applicable for size 09-19 and YTQ-01 for size 09-25 must be ordered separately.

[J1784/69 - heat shrink sleeve back c] (Shielding non-clamping cable accessory)

Housing size	A	Thread B	C	D
09	19.0	M12×1	6.7	13.5
11	22.0	M15×1	9.9	15.3
13	25.1	M18×1	12.8	19.6
15	29.0	M22×1	16.0	21.2
17	32.1	M25×1	19.2	24.4
19	35.1	M28×1	21.4	26.4
21	38.1	M31×1	24.6	30.9
23	41.1	M34×1	27.7	34.4
25	44.1	M37×1	30.9	36.6

Anti-rotating, crimping shielding net accessory. This type tightens the grommet and contains a shielding net to insure the connector's environmental and EMI shielding characteristics. This type can not clamp the cable. It is applied in light tensile force environment.

[J1784/38 - Straight cable clamp] (Clamping cable accessory, non shielding)

Housing size	A max	Thread B	C max	D min	D max	L max
09	19.0	M12×1	20.0	2.49	5.94	27.0
11	22.0	M15×1	21.0	3.87	5.94	28.5
13	25.1	M18×1	23.4	4.83	8.33	30.0
15	29.0	M22×1	26.6	6.60	11.61	31.5
17	32.1	M25×1	30.6	7.19	15.60	33.5
19	35.1	M28×1	34.0	8.26	16.10	36.6
21	38.1	M31×1	35.8	8.71	17.73	39.8
23	41.1	M34×1	39.0	9.68	20.90	42.9
25	44.1	M37×1	40.6	10.62	21.66	45.0

Anti-rotating, cable clamping accessory. This type tightens the grommet and clamps the cable to insure the connector's environmental characteristics. It is applied in tensile force environment.

[J1784/38H - Soldering straight cable clamp] (Clamping cable accessory, non shielding)

Housing size	A max	Thread B	C max	D min	D max	L max
09	19.0	M12×1	20.0	2.49	5.94	27.0
11	22.0	M15×1	21.0	3.87	5.94	28.5
13	25.1	M18×1	23.4	4.83	8.33	30.0
15	29.0	M22×1	26.6	6.60	11.61	31.5
17	32.1	M25×1	30.6	7.19	15.60	33.5
19	35.1	M28×1	34.0	8.26	16.10	36.6
21	38.1	M31×1	35.8	8.71	17.73	39.8
23	41.1	M34×1	39.0	9.68	20.90	42.9
25	44.1	M37×1	40.6	10.62	21.66	45.0

The function is the same with J1784/38, it is mated with soldering products.

[J1784/39 - Right-angle cable clamp] (Clamping cable accessory, non shielding)

Housing size	A max	Thread B	C max	D		E max	L max
				min	max		
09	19.0	M12×1	20.60	2.49	5.94	21.6	29.5
11	22.0	M15×1	22.00	3.87	5.94	22.8	29.5
13	25.1	M18×1	23.60	4.83	8.33	26.0	31.9
15	29.0	M22×1	25.20	6.60	11.61	29.0	35.1
17	32.1	M25×1	26.80	7.19	15.60	30.6	39.1
19	35.1	M28×1	31.30	8.26	16.10	37.0	41.5
21	38.1	M31×1	32.90	8.71	17.73	39.0	43.3
23	41.1	M34×1	34.50	9.68	20.90	41.0	46.5
25	44.1	M37×1	36.10	10.62	21.66	42.0	47.1

Anti-rotating, 90° cable clamping accessory. This type tightens the grommet and clamps the cable 90° to insure the connector's environmental characteristics. It is applied in tensile force environment.

[J1784/16 - Right-angle cable clamp] (Clamping cable accessory, non shielding)

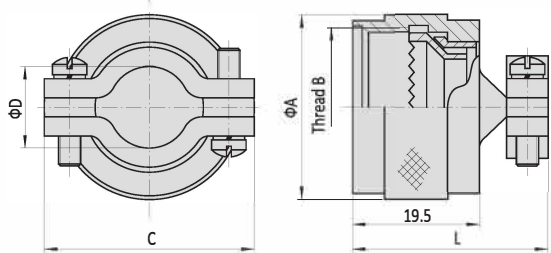
Housing size	A max	Thread B	C max	D		E max	L max
				min	max		
09	19.0	M12×1	20.0	2.85	6.71	21	25.9
11	22.0	M15×1	21.5	6	9.96	26.5	29.2
13	25.1	M18×1	23.0	8.45	12.85	31.5	32
15	29.0	M22×1	25.0	12	16.03	36.5	35.2
17	32.1	M25×1	27.0	11.1	19.2	31	36.4
19	35.1	M28×1	28.5	13.75	21.46	37	40.7
21	38.1	M31×1	29.5	19.3	24.64	35	43.8
23	41.1	M34×1	31.0	21.4	27.81	35	43
25	44.1	M37×1	33.0	23.5	30.99	37	44.2

Anti-rotating, 90° cable clamping accessory. Compared with J1784/39 accessory, the difference is that the lead-out dia. (D) is larger.

[J1784/38-x×NB] (Shielding clamping cable accessory)

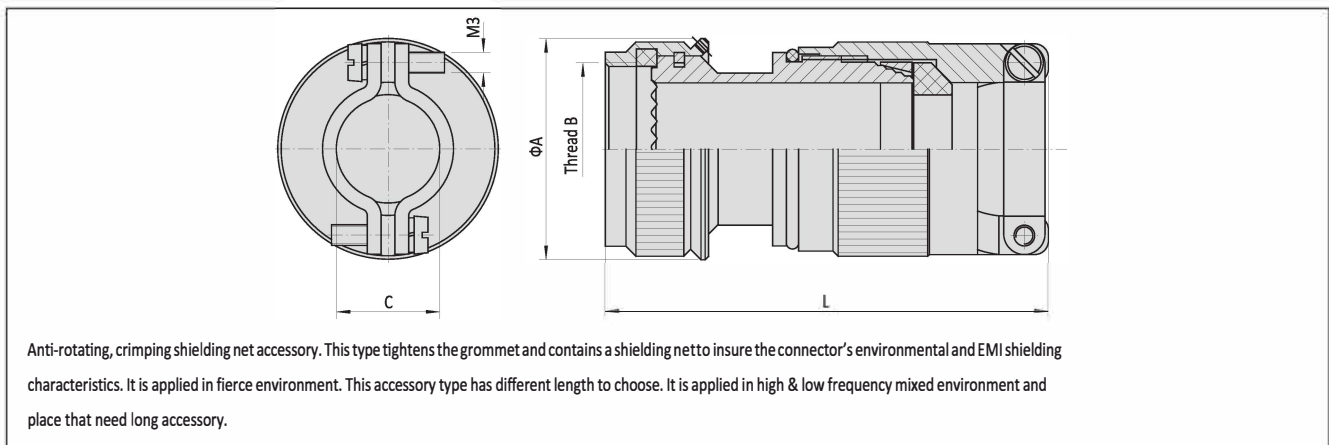
Accessory type	A	Thread B	C	D min	D max	L
J1784/38-09NB	16.4	M12×1	18.6	3.5	5.7	29.2
J1784/38-11NB	19.2	M15×1	20.6	5.0	7.9	29.2
J1784/38-13NB	23.0	M18×1	24.5	7.4	11.4	29.2
J1784/38-15NB	25.7	M22×1	26.0	9.0	12.9	29.8
J1784/38-17NB	29.0	M25×1	33.0	12.8	17.0	31.0
J1784/38-19NB	31.5	M28×1	36.3	13.2	17.9	32.0
J1784/38-21NB	34.7	M31×1	39.0	14.8	21.1	32.0
J1784/38-23NB	37.5	M34×1	41.4	16.4	24.3	32.0
J1784/38-25NB	41.0	M37×1	44.5	18.0	27.5	32.0

Not available for soldering products.



[J1784/18-x×N] (Shielding clamping cable accessory)

Basic series	J1784 /	18-	25	N	09	A
Type	18-straight shielding cable clamp					
Housing size	see form 1					
Housing plating	N- electroless nickel plating W- olive green cadmium plating S- stainless steel passive					
Lead-out dia.	See form 1 and form 2 for reference.					
Length code	See form 3					


Form 1

Housing size	Lead-out dia. No.	B	Thread B
09	01~02	19	M12×1
11	01~03	22	M15×1
13	02~04	25.1	M18×1
15	02~05	29	M22×1
17	02~06	32	M25×1
19	03~07	35	M28×1
21	03~08	38	M31×1
23	03~09	41.1	M34×1
25	04~10	44.1	M37×1

Form 2

Lead-out dia. No.	Cable dia. range (C)
01	1.57~3.18
02	3.18~6.35
03	6.35~9.53
04	9.53~12.7
05	12.7~15.88
06	15.88~19.05
07	19.05~22.23
08	22.23~25.4
09	25.4~28.58
10	28.58~31.75

Form 3

Housing size	Length code	L
09~25	Standard (omit)	64.4
09~25	A	89.8
15~25	B	115.2
21~25	C	140.6

Composite material back accessory

[Ordering information]

Basic series	J1784 /	91-	15	J
Type	20-shielding backshell 91-straight cable clamp (only for crimping products) 91H-straight cable clamp (for soldering and crimping products) 92- Right-angle cable clamp			
Housing size	09-11-13-15-17-19-21-23-25			
Housing plating	J - olive green cadmium plating M - electroless nickel plating			

[J1784/20-xxJ (composite material)] (Shielding non-clamping cable accessory)

Not available for soldering connectors, only available for crimping connectors. 	Housing size	A	Thread B	C	D
	09	21.8	M12×1	6.73	12.65
	11	25	M15×1	8.71	12.95
	13	29.5	M18×1	11.1	16
	15	32.5	M22×1	14.27	19.3
	17	35.5	M25×1	17.45	22.61
	19	38.5	M28×1	20.62	25.65
	21	41.5	M31×1	23.8	28.7
	23	45	M34×1	26.57	30.53
	25	48	M37×1	28.58	34.52

[J1784/91-xxJ (composite material)] (Clamping cable accessory, non shielding)

Not available for soldering connectors, only available for crimping connectors. 	Housing size	A max	Thread B	C max	D min	D max	L max
	09	21.8	M12×1	20.0	4.00	5.94	27.0
	11	25	M15×1	20.0	4.00	5.94	28.5
	13	29.5	M18×1	23.4	4.83	8.33	30.0
	15	32.5	M22×1	26.6	6.60	11.61	31.5
	17	35.5	M25×1	30.6	7.19	15.60	33.5
	19	38.5	M28×1	34.0	8.26	16.10	36.6
	21	41.5	M31×1	35.8	8.71	17.73	39.8
	23	45	M34×1	39.0	9.68	20.90	42.9
	25	48	M37×1	40.6	10.62	21.66	45.0

[J1784/91H-xxJ (soldering, composite material)] (Clamping cable accessory, non shielding)

Available for both soldering connectors and crimping connectors. 	Housing size	A max	Thread B	C max	D min	D max	L max
	09	21.8	M12×1	20.0	4.00	5.94	27.0
	11	25	M15×1	20.0	4.00	5.94	28.5
	13	29.5	M18×1	23.4	4.83	8.33	30.0
	15	32.5	M22×1	26.6	6.60	11.61	31.5
	17	35.5	M25×1	30.6	7.19	15.60	33.5
	19	38.5	M28×1	34.0	8.40	16.10	36.6
	21	41.5	M31×1	35.8	8.80	17.73	39.8
	23	45	M34×1	39.0	9.80	20.90	42.9
	25	48	M37×1	40.6	10.60	21.66	45.0

[J1784/92-xxJ (composite material)] (Clamping cable accessory, non shielding)

Not available for soldering connectors, only available for crimping connectors. 	Housing size	A max	Thread B	C max	D min	D max	L max
	09	21.8	M12×1	20.6	2.49	5.94	29.5
	11	25	M15×1	22.0	3.87	5.94	29.5
	13	29.5	M18×1	23.6	4.83	8.33	31.9
	15	32.5	M22×1	25.2	6.60	11.61	35.1
	17	35.5	M25×1	26.8	7.19	15.60	39.1
	19	38.5	M28×1	31.3	8.26	16.10	41.5
	21	41.5	M31×1	32.9	8.71	17.73	43.3
	23	45	M34×1	34.5	9.68	20.90	46.5
	25	48	M37×1	36.1	10.62	21.66	47.1

Special back accessory

It is especially suit for clamping tightly the shielding cable with shielding layer, which has two classes, that is straight and right angle. The accessory has adopted Ti-Ni alloy memory ring. After heated, the ring would shrink and clamp shielding layer on the end of accessory and realize the function of 360°EMI shielding..

* Ti-Ni alloy memory ring's heating and shrinking: using hot-wind gun to heat. The process takes about 45 seconds to 1 minute. When the temperature color indicator of memory ring change from green to black, it means that memory ring has finished the shrinkage. At this time, the temperature of ring is about 165°C. Stop heating. Please note that memory ring should be symmetrically heated during heating.

[Ordering information]

J1784/88,J1784/90 backshell (Shielding non-clamping cable accessory)

Basic series	J1784/										88-	11	N	A
Type	88-straight		90- right-angle											
Accessory shell size	09	11	13	15	17	19	21	23	25					
Connector shell size	A	B	C	D	E	F	G	H	J					
Housing plating	W - olive green cadmium plating N - electroless nickel plating S - stainless steel passive													
Ti-Ni ring	omit - without Ti-Ni ring A - with Ti-Ni ring													
Leading-out diameter or Ti-Ni ring size	Without Ti-Ni ring, specify leading-out diameter With Ti-Ni ring, specify size of Ti-Ni ring													

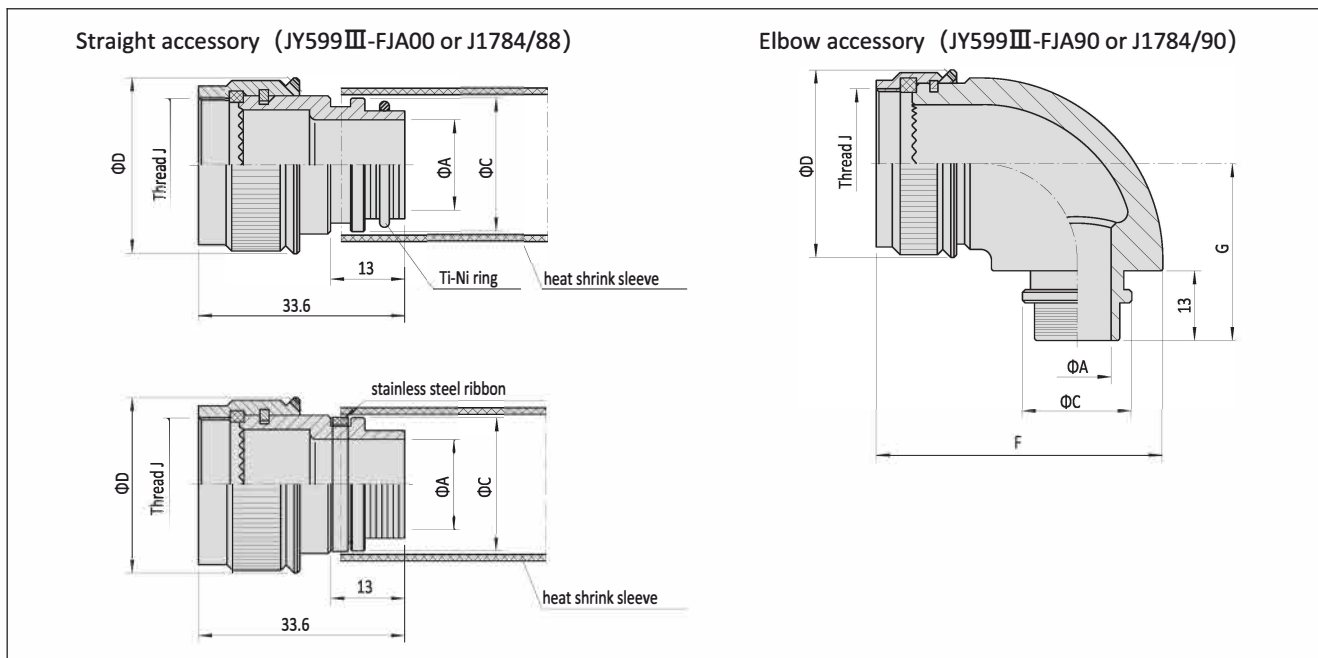
JY599III-FJA00, JY599III-FJA90 outside shielding backshell (Shielding non-clamping cable accessory)

Basic series	JY599	III	15	FJA	00	F	A	-05
Series code	III							
Housing size	09-11-13-15-17-19-21-23-25							
Accessory type	FJA、FJB、FJC、FJE							
Type	00 - straight backshell 90 - 90°right-angle backshell							
Housing plating	W - olive green cadmium plating F - electroless nickel plating K - stainless steel passive							
Ti-Ni ring	omit - without Ti-Ni ring A - with Ti-Ni ring (only for FJA, FJC)							
Leading-out diameter or Ti-Ni ring size	Without Ti-Ni ring, specify leading-out diameter With Ti-Ni ring, specify size of Ti-Ni ring							

Remarks:

1. This accessory type is applied in some fierce environment and the place doesn't need to disassemble frequently. It can realize shielding both inside and outside.
2. If the operating environment needs steel ribbon to bundle it, the steel ribbon and bundling clamp need to be ordered separately. The steel ribbon type is "A31189(07-08-221)", the bundling clamp type is "A30199 TIE-DEX II (14-04-3216)".
3. J1784/88、J1784/90 is the same with JY599III-FJA00、JY599III-FJA90, only the naming is different.

[Outline dimension]



No.	Housing No.	Ti-Ni ring size	Shielding standard (Tin-copper plating mark dia.)	A outlet dia.		C		F	D	G	Thread J
				Straight	90°	Straight	90°				
1	09	TR-04	6×10(0.15~0.20)	6.3	6.3	14	14	38.2	19	26	M12×1-6H
		TR-05	10×16(0.15~0.20)	7.9	7.9	15.5	15				
		TR-06	10×16(0.15~0.20)	9.5	-	17.1	-				
2	11	TR-04	6×10(0.15~0.20)	6.3	6.3	14	14	39.7	22	26	M15×1-6H
		TR-05	10×16(0.15~0.20)	7.9	7.9	15.5	15.5				
		TR-06	10×16(0.15~0.20)	9.5	9.5	17.1	17.1				
		TR-07	10×16(0.12~0.20)	11.1	11.1	18.7	18				
		TR-08	16×24(0.12~0.25)	12.7	-	20.3	-				
3	13	TR-04	6×10(0.15~0.20)	6.3	6.3	14	14	45.2	25.1	29	M18×1-6H
		TR-05	10×16(0.15~0.20)	7.9	7.9	15.5	15.5				
		TR-06	10×16(0.15~0.20)	9.5	9.5	17.1	17.1				
		TR-07	10×16(0.12~0.20)	11.1	11.1	18.7	18.7				
		TR-08	16×24(0.12~0.25)	12.7	12.7	20.3	20.3				
		TR-10	16×24(0.10~0.30)	16	16	23.5	23				
4	15	TR-05	10×16(0.15~0.20)	7.9	-	15.5	-	47.0	29	29	M22×1-6H
		TR-06	10×16(0.15~0.20)	9.5	9.5	17.1	17.1				
		TR-07	10×16(0.12~0.20)	11.1	11.1	18.7	18.7				
		TR-08	16×24(0.12~0.25)	12.7	12.7	20.3	20.3				
		TR-10	16×24(0.10~0.30)	16	16	23.5	23.5				
		TR-12	16×24(0.10~0.30)	19	19	26.7	25.5				
5	17	TR-05	10×16(0.15~0.20)	7.9	-	15.5	-	50.7	32.1	33	M25×1-6H
		TR-06	10×16(0.15~0.20)	9.5	-	17.1	-				
		TR-07	10×16(0.12~0.20)	11.1	11.1	18.7	18.7				
		TR-08	16×24(0.12~0.25)	12.7	12.7	20.3	20.3				
		TR-10	16×24(0.10~0.30)	16	16	23.5	23.5				
		TR-12	16×24(0.10~0.30)	19	19	26.7	26.7				
		TR-14	24×30(0.10~0.30)	22.2	-	30	-				
6	19	TR-08	16×24(0.12~0.25)	12.7	12.7	20.3	20.3	53.5	35.1	33	M28×1-6H
		TR-10	16×24(0.10~0.30)	16	16	23.5	23.5				
		TR-12	16×24(0.10~0.30)	19	19	26.7	26.7				
		TR-14	24×30(0.10~0.30)	22.2	22.2	30	30				
		TR-16	24×30(0.10~0.30)	25.4	25.4	33	32				
7	21	TR-08	16×24(0.12~0.25)	12.7	12.7	20.3	20.3	55.7	38.1	39	M31×1-6H
		TR-10	16×24(0.10~0.30)	16	16	23.5	23.5				
		TR-12	16×24(0.10~0.30)	19	19	26.7	26.7				
		TR-14	24×30(0.10~0.30)	22.2	22.2	30	30				
		TR-16	24×30(0.10~0.30)	25.4	25.4	33	33				
		TR-18	30×40(0.10~0.30)	28.5	-	36.2	-				
8	23	TR-10	16×24(0.10~0.30)	16	16	23.5	23.5	58.2	41.1	39	M34×1-6H
		TR-12	16×24(0.10~0.30)	19	19	26.7	26.7				
		TR-14	24×30(0.10~0.30)	22.2	22.2	30	30				
		TR-16	24×30(0.10~0.30)	25.4	25.4	33	33				
		TR-18	30×40(0.10~0.30)	28.5	28.5	36.2	36.2				
		TR-20	30×40(0.10~0.30)	31.8	-	39.4	-				
9	25	TR-10	16×24(0.10~0.30)	16	-	23.5	-	63.7	44.1	44	M37×1-6H
		TR-12	16×24(0.10~0.30)	19	19	26.7	26.7				
		TR-14	24×30(0.10~0.30)	22.2	22.2	30	30				
		TR-16	24×30(0.10~0.30)	25.4	25.4	33	33				
		TR-18	30×40(0.10~0.30)	28.5	28.5	36.2	36.2				
		TR-20	30×40(0.10~0.30)	31.8	31.8	39.4	39.4				
		TR-22	30×40(0.10~0.30)	35	35	42.5	42				

JY599III-xxFJB00F] (Shielding non-clamping cable accessory)

	Accessory P/N	A	Thread B	D
	JY599III-11FJB00F	23	M15×1	6.5
	JY599III-15FJB00F	30	M22×1	12.5
	JY599III-17FJB00F	33	M25×1	19.5
	JY599III-21FJB00F	39	M31×1	25.5

[JY599IIIxxFJC00] (Shielding non-clamping cable accessory)

	Housing size	A Lead-out dia.	Thread B	D	Ti-Ni ring type
	11	7.9	M15×1	19.0	TR-05
	13	9.5	M22×1	22.8	TR-06
	15	12.7	M25×1	25.8	TR-08
	17	16.0	M31×1	29.2	TR-10
	19	19.0	M28×1	32.0	TR-12
	21	22.2	M31×1	35.1	TR-14
	23	25.4	M34×1	38.2	TR-16

[Part number example]

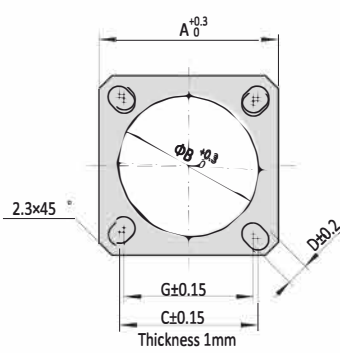
JY599III11FJC00F-7.9 is the part number without a Ti-Ni ring;

If customers need Ti-Ni ring, the part number is JY599III11FJC00FA-05.

[JY599IIIxxFJE00] (Shielding non-clamping cable accessory)

		Housing size	A	Thread B UNEF	C Lead-out dia.	D
		09	22	M12×1	6.3, 7.9, 7.5	20
		11	25	M15×1	6.3, 7.9, 9.5, 11.1, 12.7	23
		13	28	M22×1	6.3, 7.9, 9.5, 11.1, 12.7, 16	27
		15	32	M25×1	7.9, 9.5, 11.1, 12.7, 16, 19	30
		17	35	M31×1	7.9, 9.5, 11.1, 12.7, 16, 19, 22.2	33
		19	38	M28×1	12.7, 16, 19, 22.2, 25.4	36
		21	41	M31×1	12.7, 16, 19, 22.2, 25.4, 28.5	39
		23	44	M34×1	16, 19, 22.2, 25.4, 28.5, 31.8	42
		25	47	M37×1	19, 22.2, 25.4, 28.5, 31.8, 35	45

[Square flange cushion]

	Housing size	Square flange cushion code	Conductive square flange cushion code	A	B	C	G	D
	A	21E8-701-885-A1	21E8-701-886-A2	23.9	16.1	18.26	15.09	3.3
B	21E8-701-887-A1	21E8-701-888-A2	26.3	19.2	20.62	18.26	3.3	
C	21E8-701-889-A1	21E8-701-890-A2	28.7	22.4	23.01	20.62	3.3	
D	21E8-701-891-A1	21E8-701-892-A2	31.1	25.6	24.61	23.01	3.3	
E	21E8-701-893-A1	21E8-701-894-A2	33.4	30.4	26.97	24.61	3.3	
F	21E8-701-895-A1	21E8-701-896-A2	36.6	32.0	29.36	26.97	3.3	
G	21E8-701-897-A1	21E8-701-898-A2	39.8	34.9	31.75	29.36	3.3	
H	21E8-701-899-A1	21E8-701-900-A2	43.0	38.3	34.93	31.75	4.0	
J	21E8-701-901-A1	21E8-701-902-A2	46.1	41.4	38.10	34.93	4.0	

Remarks: the product is supplied with normal square flange cushion.
If customers need conductive square flange cushion, please state it in ordering.

Special contacts for GJB599 III series

Type	MIL P/N	GJB P/N	Remarks
12# pin	M39029/58-365	J1216/58-365	
12# socket	M39029/56-353	J1216/56-353	
12# pin	M39029/107-623	J1216/107-623	Endurance 1500 cycles
12# socket	M39029/106-617	J1216/106-617	Endurance 1500 cycles
12# shielding pin	M39029/28-211	J1216/28-211	
	M39029/28-412	J1216/28-412	
12# shielding socket	M39029/75-416	J1216/75-416	
	M39029/75-422	J1216/75-422	
12# coaxial pin	M39029/102-558	J1216/102-558	
12# coaxial socket	M39029/103-559	J1216/103-559	
8# dual coaxial pin	M39029/90-529	J1216/90-529	
8# dual coaxial pin	M39029/91-530	J1216/91-530	
8# simulate contact		J1784A/80-8	
12# simulate contact		J1784A/80-12	
8# sealing contact	MS27488-8 (red)	MS27488-8 (red)	
10# sealing contact	MS27488-10 (white)	MS27488-10 (white)	
12# sealing contact	MS27488-12 (yellow)	MS27488-12 (yellow)	
16# sealing contact	MS27488-16 (blue)	MS27488-16 (blue)	
20# sealing contact	MS27488-20 (red)	MS27488-20 (red)	
20D sealing contact	MS27488-22 (black)	MS27488-22 (black)	

GJB599 series PCB cut-out dimension (insulator with pins section view)

Applicable to GJB 599 I、II、III series PCB products. The contact layout code takes 599 I series for example.

PCB cut-out diameter: 22D# min 0.9mm, 20# min 1.0mm, 16# min 1.3mm (for reference)

9-35 (6-22D)	Cavity No	Coordinate	
		X	Y
	1	+1.14	+1.98
	2	+1.98	-1.14
	3	0.00	-2.29
	4	-1.98	-1.14
	5	-1.14	+1.98
	6	0.00	0.00

9-98 (3-20#)	Cavity No	Coordinate	
		X	Y
	A	+1.65	+0.97
	B	0.00	-1.91
	C	-1.65	+0.97

11-35 (13-22D)	Cavity No	Coordinate		Cavity No	Coordinate	
		X	Y		X	Y
	1	0.00	+3.71	8	-3.51	-1.14
	2	+2.16	+3.00	9	-3.51	+1.14
	3	+3.51	+1.14	10	-2.16	+3.00
	4	+3.51	-1.14	11	0.00	+1.42
	5	+2.16	-3.00	12	+1.24	-0.89
	6	0.00	-3.71	13	-1.24	-0.89
	7	-2.16	-3.00			

11-04 (4-20#)	Cavity No	Coordinate	
		X	Y
	A	+1.65	+1.65
	B	+1.65	-1.65
	C	-1.65	-1.65
	D	-1.65	+1.65

11-05 (5-20#)	Cavity No	Coordinate	
		X	Y
	A	+1.65	+1.42
	B	+2.87	-1.65
	C	0	-3.30
	D	-2.87	-1.65
	E	-1.65	+1.42

11-98 (6-20#)	Cavity No	Coordinate	
		X	Y
	A	0.00	+3.30
	B	+3.30	0.00
	C	+1.65	-2.87
	D	-1.65	-2.87
	E	-3.30	0.00
	F	0.00	0.00

11-99 (7-20#)	Cavity No	Coordinate	
		X	Y
	A	+1.65	+2.87
	B	+3.30	0.00
	C	+1.65	-2.87
	D	-1.65	-2.87
	E	-3.30	0.00
	F	-1.65	+2.87
	G	0.00	0.00

11-02 (2-16#)

Cavity No	Coordinate	
	X	Y
A	+2.41	0.00
B	-2.41	0.00

11-01 (1-12#)

Cavity No	Coordinate	
	X	Y
A	0.00	0.00

13-35 (22-22D)

Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
1	+1.14	+5.00	9	-3.20	-4.01	17	+2.36	-1.91
2	+3.20	+4.01	10	-4.62	-2.24	18	0.00	-3.05
3	+4.62	+2.24	11	-5.16	0.00	19	-2.36	-1.91
4	+5.16	0.00	12	-4.62	+2.24	20	-2.97	+0.66
5	+4.62	-2.24	13	-3.20	+4.01	21	-1.14	+2.72
6	+3.20	-4.01	14	-1.14	+5.00	22	0.00	-0.76
7	+1.14	-5.00	15	+1.14	+2.72			
8	-1.14	-5.00	16	+2.97	+0.66			

13-98 (10-20#)

Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y
A	0.00	+4.95	F	-4.17	-2.67
B	+3.18	+3.81	G	-4.90	+0.76
C	+4.90	0.76	H	-3.18	+3.81
D	+4.17	-2.67	J	+1.65	-0.38
E	0.00	-3.43	K	-1.65	-0.38

13-08 (8-20#)

Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y
A	+1.65	+3.99	E	-3.05	-3.05
B	+4.32	0.00	F	-4.32	0.00
C	+3.05	-3.05	G	-1.65	+3.99
D	0.00	-4.32	H	0.00	+1.12

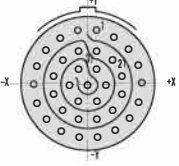
13-04 (4-16#)

Cavity No	Coordinate	
	X	Y
A	0.00	+3.81
B	+3.71	+0.89
C	0.00	-2.11
D	-3.71	+0.89

13-03 (3-16#)

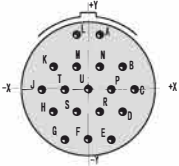
Cavity No	Coordinate	
	X	Y
A	+2.39	+1.47
B	0.00	-2.82
C	-2.39	+1.47

15-35 (37-22D)



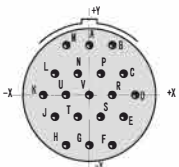
Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
1	+1.14	+6.65	14	-6.76	-0.25	27	-4.32	-1.27
2	+3.12	+5.51	15	-6.45	+2.03	28	-4.32	+1.02
3	+5.36	+4.06	16	-5.36	+4.06	29	-3.12	+3.02
4	+6.45	+2.03	17	-3.12	+5.51	30	-1.14	+4.37
5	+6.76	-0.25	18	-1.14	+6.65	31	+1.14	+1.88
6	+6.27	-2.49	19	+1.14	+4.37	32	+2.29	-0.10
7	+5.08	-4.45	20	+3.12	+3.02	33	+1.14	-2.08
8	+3.30	-5.89	21	+4.32	+1.02	34	-1.14	-2.08
9	+1.14	-6.65	22	+4.32	-1.27	35	-2.29	-0.10
10	-1.14	-6.65	23	+3.12	-3.23	36	-1.14	+1.88
11	-3.30	-5.89	24	+1.14	-4.37	37	0.00	-0.10
12	-5.08	-4.45	25	-1.14	-4.37			
13	-6.27	-2.49	26	-3.12	-3.23			

15-18 (18-22#)



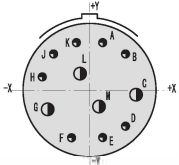
Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	+1.65	+6.40	H	-4.95	-2.87	R	+1.65	-2.87
B	+4.95	+2.87	J	-6.60	0.00	S	-1.65	-2.87
C	+6.60	0.00	K	-4.95	+2.87	T	-3.30	0.00
D	+4.95	-2.87	L	-1.65	+6.40	U	0.00	0.00
E	+3.30	-5.72	M	-1.65	+2.87			
F	0.00	-5.72	N	+1.65	+2.87			
G	-3.30	-5.72	P	+3.30	0.00			

15-19 (19-20#)



Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	0.00	+5.72	H	-3.30	-5.72	R	+3.30	0.00
B	+3.30	+5.72	J	-4.95	-2.87	S	+1.65	-2.87
C	+4.95	+2.87	K	-6.60	0.00	T	-1.65	-2.87
D	+6.60	0.00	L	-4.95	+2.87	U	-3.30	0.00
E	+4.95	-2.87	M	-3.30	+5.72	V	0.00	0.00
F	+3.30	-5.72	N	-1.65	+2.87			
G	0.00	-5.72	P	+1.65	+2.87			

15-97 (8-20#,4-16#)



Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y
A	+1.65	+5.94	G	-5.26	-2.41
B	+4.52	+4.52	H	-5.94	+1.65
C	+5.84	-0.58	J	-4.52	+4.52
D	+4.52	-4.52	K	-1.65	+5.94
E	+1.65	-5.94	L	-1.19	+2.06
F	-2.26	-5.97	M	+1.19	-2.06

15-15
(14-20#,1-16#)

Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y
A	+2.54	+5.72	J	-6.20	+0.36
B	+5.13	+3.56	K	-5.13	+3.56
C	+6.20	+0.36	L	-2.54	+5.72
D	+5.54	-2.87	M	0.00	+3.56
E	+3.20	-5.31	N	+2.79	+1.02
F	0.00	-6.22	P	0.00	-1.96
G	-3.20	-5.31	R	-2.79	+1.02
H	-5.54	-2.87			

15-05
(5-16#)

Cavity No	Coordinate	
	X	Y
A	0.00	+2.54
B	+4.42	+0.61
C	+2.39	-3.76
D	-2.39	-3.76
E	-4.42	+0.61

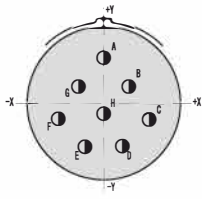
17-35
(55-22D)

Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
1	-7.92	+2.18	20	-1.98	+1.04	39	+1.98	-8.10
2	-7.92	0.10	21	-1.98	-1.24	40	+4.37	+7.09
3	-7.92	-2.39	22	-1.98	-3.53	41	+3.96	+4.47
4	-6.15	+5.61	23	-1.98	-5.82	42	+3.96	+2.18
5	-5.94	+3.33	24	-1.98	-8.10	43	+3.96	-0.10
6	-5.94	+1.04	25	0.00	+8.36	44	+3.96	-2.39
7	-5.94	-1.24	26	0.00	+4.47	45	+3.96	-4.67
8	-5.94	-3.53	27	0.00	+2.18	46	+3.96	-6.96
9	-5.94	-5.82	28	0.00	-0.10	47	+6.15	+5.61
10	-4.37	+7.09	29	0.00	-2.39	48	+5.94	+3.33
11	-3.96	+4.47	30	0.00	-4.67	49	+5.94	+1.04
12	-3.96	+2.18	31	0.00	-6.96	50	+5.94	-1.24
13	-3.96	-0.10	32	+2.26	+8.03	51	+5.94	-3.53
14	-3.96	-2.39	33	+1.98	+5.61	62	+5.94	-5.82
15	-3.96	-4.67	34	+1.98	+3.33	53	+7.92	+2.18
16	-3.96	-6.96	35	+1.98	+1.04	54	+7.92	-0.10
17	-2.26	+8.03	36	+1.98	-1.24	55	+7.92	-2.39
18	-1.98	+5.61	37	+1.98	-3.53			
19	-1.98	+3.33	38	+1.98	-5.82			

17-26
(26-20#)

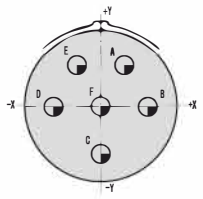
Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	0.00	+8.15	K	-4.80	-6.60	V	+4.52	-0.91
B	+3.33	+7.44	L	-7.06	-4.09	W	+3.02	-3.84
C	+6.07	+5.44	M	-8.10	-0.86	X	0.00	-5.16
D	+7.75	+2.51	N	-7.75	+2.51	Y	-3.02	-3.84
E	+8.10	-0.86	P	-6.07	+5.44	Z	-4.52	-0.91
F	+7.06	-4.09	R	-3.33	+7.44	a	-4.45	+2.39
G	+4.80	-6.60	S	-1.78	+4.50	b	0.00	+1.65
H	+1.70	-7.98	T	+1.78	+4.50	c	0.00	-1.65
J	-1.70	-7.98	U	+4.45	+2.39			

17-08
(8-16#)



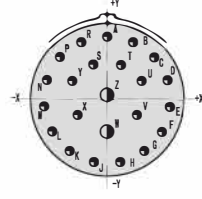
Cavity No	Coordinate	
	X	Y
A	0.00	+5.99
B	+3.25	+2.18
C	+5.84	-1.98
D	+2.39	-5.49
E	-2.39	-5.49
F	-5.84	-1.98
G	-3.25	+2.18
H	0.00	-1.32

17-06
(6-12#)



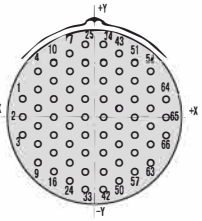
Cavity No	Coordinate	
	X	Y
A	+3.07	+5.31
B	+6.12	0.00
C	0.00	-6.12
D	-6.12	0.00
E	-3.07	+5.31
F	0.00	0.00

17-99
(21-20#, 2-16#)



Cavity No			Coordinate			Cavity No			Coordinate		
No	X	Y	No	X	Y	No	X	Y	No	X	Y
A	0.00	+8.15	J	-1.70	-7.98	T	+1.78	+4.50			
B	+3.33	+7.44	K	-4.80	-6.60	U	+4.45	+2.39			
C	+6.07	+5.44	L	-7.06	-4.09	V	+3.81	-1.91			
D	+7.75	+2.51	M	-8.10	-0.86	W	0.00	-4.09			
E	+8.10	-0.86	N	-7.75	+2.51	X	-3.81	-1.91			
F	+7.06	-4.09	P	-6.07	+5.44	Y	-4.45	+2.39			
G	+4.80	-6.60	R	-3.33	+7.44	Z	0.00	+0.64			
H	+1.70	-7.98	S	-1.78	+4.50						

19-35
(66-22D)



Cavity No			Coordinate			Cavity No			Coordinate		
No	X	Y	No	X	Y	No	X	Y	No	X	Y
1	-9.07	+2.29	23	-3.12	-5.72	45	+3.12	+3.43			
2	-9.07	0	24	-3.12	-8.00	46	+3.12	+1.14			
3	-9.07	-2.29	25	-1.14	+9.14	47	+3.12	-1.14			
4	-7.09	+5.72	26	-1.14	+6.86	48	+3.12	-3.43			
5	-7.09	+3.43	27	-1.14	+4.57	49	+3.12	-5.72			
6	-7.09	+1.14	28	-1.14	+2.29	50	+3.12	-8.00			
7	-7.09	-1.14	29	-1.14	0	51	+5.11	+6.86			
8	-7.09	-3.43	30	-1.14	-2.29	52	+5.11	+4.57			
9	-7.09	-5.72	31	-1.14	-4.57	53	+5.11	+2.29			
10	-5.11	+6.86	32	-1.14	-6.86	54	+5.11	0			
11	-5.11	+4.57	33	-1.14	-9.14	55	+5.11	-2.29			
12	-5.11	+2.29	34	+1.14	+9.14	56	+5.11	-4.57			
13	-5.11	0	35	+1.14	+6.86	57	+5.11	-6.86			
14	-5.11	-2.29	36	+1.14	+4.57	58	+7.09	+5.72			
15	-5.11	-4.57	37	+1.14	+2.29	59	+7.09	+3.43			
16	-5.11	-6.86	38	+1.14	0	60	+7.09	+1.14			
17	-3.12	+8.00	39	+1.14	-2.29	61	+7.09	-1.14			
18	-3.12	+5.72	40	+1.14	-4.57	62	+7.09	-3.43			
19	-3.12	+3.43	41	+1.14	-6.86	63	+7.09	-5.72			
20	-3.12	+1.14	42	+1.14	-9.14	64	+9.07	+2.29			
21	-3.12	-1.14	43	+3.12	+8.00	65	+9.07	0			
22	-3.12	-3.43	44	+3.12	+5.72	66	+9.07	-2.29			

19-32 (32-20#)

Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	+1.68	+8.97	M	-8.15	-4.06	Z	+1.65	-5.61
B	+4.80	+7.75	N	-9.07	-0.84	a	-1.65	-5.61
C	+7.26	+5.51	P	-8.76	+2.49	b	-4.42	-3.84
D	+8.76	+2.49	R	-7.26	+5.51	c	-5.79	-0.84
E	+9.07	-0.84	S	-4.80	+7.75	d	-5.31	+2.41
F	+8.15	-4.06	T	-1.68	+8.97	e	-3.15	+4.90
G	+6.15	-6.73	U	0	+5.84	f	0	+2.44
H	+3.30	-8.51	V	+3.15	+4.90	g	+2.44	0
J	0	-9.12	W	+5.31	+2.41	h	0	-2.44
K	-3.30	-8.51	X	+5.79	-0.84	j	-2.44	0
L	-6.15	-6.73	Y	+4.42	-3.84			

19-11 (11-16#)

Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y
A	+2.67	+6.60	G	-6.99	-1.35
B	+6.35	+3.35	H	-6.35	+3.35
C	+6.99	-1.35	J	-2.67	+6.60
D	+4.55	-5.46	K	0	+2.67
E	0	-7.14	L	0	-2.34
F	-4.55	-5.46			

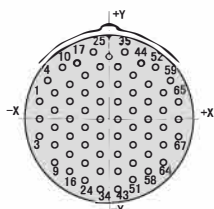
19-28 (26-20#, 2-16#)

Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	+1.68	+8.97	L	-6.15	-6.73	X	+5.79	-0.84
B	+4.80	+7.75	M	-8.15	-4.06	Y	+4.42	-3.84
C	+7.26	5.51	N	-9.07	-0.84	Z	0	-4.85
D	+8.76	+2.49	P	-8.76	+2.49	a	-4.42	-3.84
E	+9.07	-0.84	R	-7.26	+5.51	b	-5.79	-0.84
F	+8.15	-4.06	S	-4.80	+7.75	c	-5.31	+2.41
G	+6.15	-6.73	T	-1.68	+8.97	d	-3.15	+4.90
H	+3.30	-8.51	U	0	+5.84	e	0	+1.57
J	0	-9.12	V	+3.15	+4.90			
K	-3.30	-8.51	W	+5.31	+2.41			

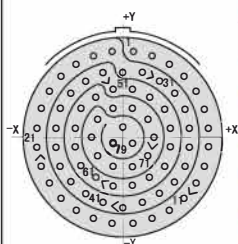
19-30 (29-20#, 1-16#)

Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	+1.65	+8.79	L	-8.00	-4.01	X	+2.44	-5.16
B	+4.72	+7.59	M	-8.92	-0.84	Y	0	-7.37
C	+7.16	+5.33	N	-8.64	+2.36	Z	-2.44	-5.16
D	+8.64	+2.36	P	-7.16	+5.33	a	-4.90	-2.97
E	+8.92	-0.84	R	-4.72	+7.59	b	-5.79	+0.20
F	+8.00	-4.01	S	-1.65	+8.79	c	-4.60	+3.28
G	+5.99	-6.63	T	+2.13	+5.51	d	-2.13	+5.51
H	+3.15	-8.38	U	+4.60	+3.28	e	0	+1.83
J	-3.15	-8.38	V	+5.79	+0.20	f	+1.75	-1.93
K	-5.99	-6.63	W	+4.90	-2.97	g	-1.75	-1.93

19-45 (67-22D#)	Cavity		Coordinate		Cavity	Coordinate		Cavity	Coordinate			
	No		X	Y		No	X		Y	No	X	Y
	1		-9.07	+2.06	24		-3.12	-8.23	47		+3.12	+0.91
	2		-9.07	-0.23	25		-2.24	+9.14	48		+3.12	-1.37
	3		-9.07	-2.51	26		0	+8.61	49		+3.12	-3.66
	4		-7.72	+5.41	27		-1.14	+6.63	50		+3.12	-5.94
	5		-7.09	+3.20	28		-1.14	+4.34	51		+3.12	-8.23
	6		-7.09	+0.91	29		-1.14	+2.06	52		+6.20	+7.11
	7		-7.09	-1.37	30		-1.14	-0.23	53		+5.11	+4.34
	8		-7.09	-3.66	31		-1.14	-2.51	54		+5.11	+2.06
	9		-7.09	-5.94	32		-1.14	-4.80	55		+5.11	-0.23
	10		-6.20	+7.11	33		-1.14	-7.09	56		+5.11	-2.51
	11		-5.11	+4.34	34		-1.14	-9.37	57		+5.11	-4.80
	12		-5.11	+2.06	35		+2.24	+9.14	58		+5.11	-7.09
	13		-5.11	-0.23	36		+1.14	+6.63	59		+7.72	+5.41
	14		-5.11	-2.51	37		+1.14	+4.34	60		+7.09	+3.20
	15		-5.11	-4.80	38		+1.14	+2.06	61		+7.09	+0.91
	16		-5.11	-7.09	39		+1.14	-0.23	62		+7.09	-1.37
	17		-3.96	+7.65	40		+1.14	-2.51	63		+7.09	-3.66
	18		-3.12	+5.49	41		+1.14	-4.80	64		+7.09	-5.94
	19		-3.12	+3.20	42		+1.14	-7.09	65		+9.07	+2.06
	20		-3.12	+0.91	43		+1.14	-9.37	66		+9.07	-0.23
	21		-3.12	-1.37	44		+3.96	+7.65	67		+9.07	-2.51
	22		-3.12	-3.66	45		+3.12	+5.49				
	23		-3.12	-5.94	46		+3.12	+3.20				



21-35 (79-22D)	Cavity		Coordinate		Cavity	Coordinate		Cavity	Coordinate		Cavity	Coordinate				
	No		X	Y		No	X		Y	No		X	Y	No	X	Y
	1		+1.35	+10.82	21		-10.85	-1.22	41		-2.49	-8.18	61		-3.40	-5.05
	2		+3.71	+10.26	22		-10.85	+1.22	42		-4.67	-7.11	62		-5.28	-3.53
	3		+5.89	+9.19	23		-10.31	+3.58	43		-6.55	-5.59	63		-6.02	-1.22
	4		+7.77	+7.67	24		-9.27	+5.77	44		-7.90	-3.58	64		-6.02	+1.22
	5		+9.27	+5.77	25		-7.77	+7.67	45		-8.43	-1.22	65		-5.28	+3.53
	6		+10.31	+3.58	26		-5.89	+9.19	46		-8.43	+1.22	66		-3.40	+5.05
	7		+10.85	+1.22	27		-3.71	+10.26	47		-7.90	+3.58	67		-1.22	+3.71
	8		+10.85	-1.22	28		-1.35	+10.82	48		-6.55	+5.59	68		+1.22	+3.71
	9		+10.31	-3.58	29		0	+8.20	49		-4.67	+7.11	69		+3.18	+2.29
	10		+9.27	-5.77	30		+2.49	+8.18	50		-2.49	+8.18	70		+3.94	0
	11		+7.77	-7.67	31		+4.67	+7.11	51		-1.22	+6.12	71		+3.18	-2.29
	12		+5.89	-9.19	32		+6.55	+5.59	52		+1.22	+6.12	72		+1.22	-3.71
	13		+3.71	-10.26	33		+7.90	+3.58	53		+3.40	+5.05	73		-1.22	-3.71
	14		+1.35	-10.82	34		+8.43	+1.22	54		+5.28	+3.53	74		-3.18	-2.29
	15		-1.35	-10.82	35		+8.43	-1.22	55		+6.02	+1.22	75		-3.94	0
	16		-3.71	-10.26	36		+7.90	-3.58	56		+6.02	-1.22	76		-3.18	+2.29
	17		-5.89	-9.19	37		+6.55	-5.59	57		+5.28	-3.53	77		0	+1.33
	18		-7.77	-7.67	38		+4.67	-7.11	58		+3.40	-5.05	78		+1.22	-0.74
	19		-9.27	-5.77	39		+2.49	-8.18	59		+1.22	-6.12	79		-1.22	-0.74
	20		-10.31	-3.58	40		0	-8.81	60		-1.22	-6.12				

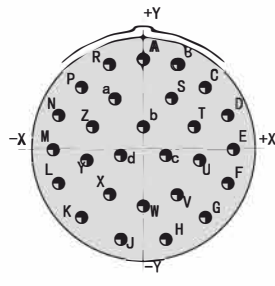


21-41 (41-20#)	Cavity		Coordinate		Cavity		Coordinate		
	No	X	Y	No	X	Y	No	X	Y
	A	0	+10.60	R	-10.09	-3.28	f	-4.78	-5.39
	B	+3.28	+10.09	S	-10.60	0	g	-6.73	-2.55
	C	+6.23	+8.58	T	-10.09	+3.28	h	-7.15	+0.87
	D	+8.58	+6.23	U	-8.58	+6.23	i	-5.92	+4.09
	E	+10.09	+3.28	V	-6.23	+8.58	j	-3.35	+6.38
	F	+10.60	0	W	-3.28	+10.09	k	0	+3.81
	G	+10.09	-3.28	X	0	+7.20	m	+2.98	+2.38
	H	+8.58	-6.23	Y	+3.35	+6.38	n	+3.71	-0.85
	J	+6.23	-8.58	Z	+5.92	+4.09	p	+1.66	-3.43
	K	+3.28	-10.09	a	+7.15	+0.87	q	-1.66	-3.43
	L	0	-10.60	b	+6.73	-2.55	r	-3.71	-0.85
	M	-3.28	-10.09	c	+4.78	-5.39	s	-2.98	+2.38
	N	-6.23	-8.58	d	+1.73	-6.99	t	0	0
	P	-8.58	-6.23	e	-1.73	-6.99			

21-16 (16-16#)	Cavity		Coordinate		Cavity		Coordinate		
	No	X	Y	No	X	Y	No	X	Y
	A	+3.00	+8.18	G	-4.62	-7.37	N	+3.91	+1.57
	B	+6.88	+5.36	H	-7.82	-3.81	P	+2.39	-3.10
	C	+8.66	+0.91	J	-8.66	+0.91	R	-2.39	-3.10
	D	+7.82	-3.81	K	-6.88	+5.36	S	-3.91	+1.57
	E	+4.62	-7.37	L	-3.00	+8.18			
	F	0	-8.71	M	0	+4.45			

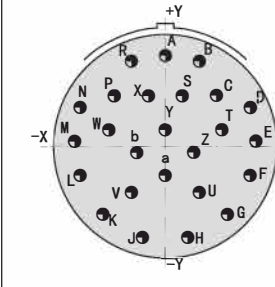
21-39 (37-20#, 2-16#)	Cavity		Coordinate		Cavity		Coordinate		
	No	X	Y	No	X	Y	No	X	Y
	A	+1.65	+10.44	P	-9.42	-4.80	d	+2.84	-6.73
	B	+4.80	+9.42	R	-10.44	-1.65	e	-2.84	-6.73
	C	+7.47	+7.47	S	-10.44	+1.65	f	-5.51	-4.80
	D	+9.42	+4.80	T	-9.42	+4.80	g	-7.11	-1.88
	E	+10.44	+1.65	U	-7.47	+7.47	h	-7.11	+1.45
	F	+10.44	-1.65	V	-4.80	+9.42	i	-5.89	+4.55
	G	+9.42	-4.80	W	-1.65	+10.44	j	-3.20	+6.50
	H	+7.47	-7.47	X	0	+7.49	k	0	+4.17
	J	+4.80	-9.42	Y	+3.20	+6.50	m	+2.90	+1.22
	K	+1.65	-10.44	Z	+5.89	+4.55	n	+2.69	-2.72
	L	-1.65	-10.44	a	+7.11	+1.45	p	0	-4.80
	M	-4.80	-9.42	b	+7.11	-1.88	q	-2.69	-2.72
	N	-7.47	-7.47	c	+5.51	-4.80	r	-2.90	+1.22

21-27 (27-20#)



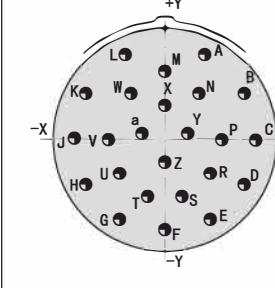
Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	0	+10.16	K	-6.99	-7.62	V	+3.81	-5.08
B	+3.81	+9.53	L	-9.53	-3.81	W	0	-6.35
C	+6.99	+6.99	M	-10.16	0	X	-3.81	-5.08
D	+9.53	+3.81	N	-9.53	+3.81	Y	-6.35	-1.27
E	+10.16	0	P	-6.99	+6.99	Z	-5.72	+2.54
F	+9.53	-3.81	R	-3.81	+9.53	a	-3.18	+5.72
G	+6.99	-7.62	S	+3.18	+5.72	b	0	+2.54
H	+2.54	-10.16	T	+5.72	+2.54	c	+2.54	-0.64
J	-2.54	-10.16	U	+6.35	-1.27	d	-2.54	-0.64

21-25 (25-20#)

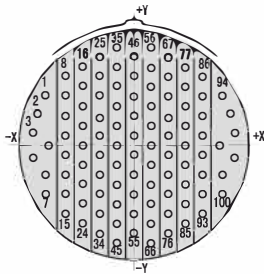


Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	0	+10.16	K	-6.99	-7.62	V	-3.81	-5.08
B	+3.81	+9.53	L	-9.53	-3.81	W	-6.35	+1.91
C	+5.72	+5.72	M	-10.16	+0.64	X	-1.91	+5.72
D	+9.53	+4.45	N	-9.53	+4.45	Y	0	+1.91
E	+10.16	+0.64	P	-5.72	+5.72	Z	+3.18	-0.64
F	+9.53	-3.81	R	-3.81	+9.53	a	0	-3.18
G	+6.99	-7.62	S	+1.91	+5.72	b	-3.18	-0.64
H	+2.54	-10.16	T	+6.35	+1.91			
J	-2.54	-10.16	U	+3.81	-5.08			

21-24 (24-20#)

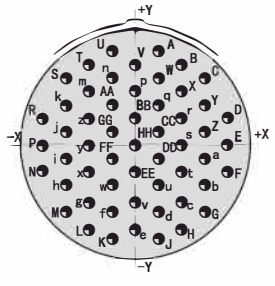


Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	+4.45	+9.53	J	-10.16	0	T	-1.91	-6.35
B	+8.89	+5.08	K	-8.89	+5.08	U	-5.08	-3.81
C	+10.16	0	L	-4.45	+9.53	V	-6.35	0
D	+8.89	-5.08	M	0	+7.62	W	-3.81	+5.08
E	+5.08	-8.89	N	+3.81	+5.08	X	0	+3.81
F	0	-10.16	P	+6.35	0	Y	+2.54	+0.64
G	-5.08	-8.89	R	+5.08	-3.81	Z	0	-2.54
H	-8.89	-5.08	S	+1.91	-6.35	a	-2.54	+0.64

23-35
(100-22D)


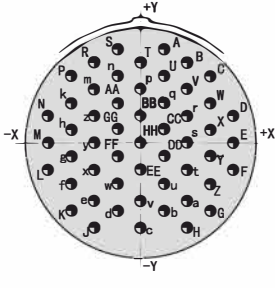
Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
1	-10.87	+6.12	35	-2.11	+12.07	69	+4.22	+6.05
2	-11.86	+3.91	36	-2.11	+9.65	70	+4.22	+3.63
3	-12.40	+1.55	37	-2.11	+7.24	71	+4.22	+1.22
4	-10.54	0	38	-2.11	+4.83	72	+4.22	-1.19
5	-12.40	-1.55	39	-2.11	+2.41	73	+4.22	-3.61
6	-10.87	-3.61	40	-2.11	0	74	+4.22	-6.02
7	-10.87	-6.02	41	-2.11	-2.41	75	+4.22	-8.43
8	-8.43	+8.46	42	-2.11	-4.83	76	+4.22	-10.85
9	-8.43	+6.05	43	-2.11	-7.24	77	+6.32	+9.65
10	-8.43	+3.63	44	-2.11	-9.65	78	+6.32	+7.24
11	-8.43	+1.22	45	-2.11	-12.07	79	+6.32	+4.83
12	-8.43	-1.19	46	0	+10.87	80	+6.32	+2.41
13	-8.43	-3.61	47	0	+8.46	81	+6.32	0
14	-8.43	-6.02	48	0	+6.05	82	+6.32	-2.41
15	-8.43	-8.43	49	0	+3.63	83	+6.32	-4.83
16	-6.32	+9.65	50	0	+1.22	84	+6.32	-7.24
17	-6.32	+7.24	51	0	-1.19	85	+6.32	-9.65
18	-6.32	+4.83	52	0	-3.61	86	+8.43	+8.46
19	-6.32	+2.41	53	0	-6.02	87	+8.43	+6.05
20	-6.32	0	54	0	-8.43	88	+8.43	+3.63
21	-6.32	-2.41	55	0	-10.85	89	+8.43	+1.22
22	-6.32	-4.83	56	+2.11	+12.07	90	+8.43	-1.19
23	-6.32	-7.24	57	+2.11	+9.65	91	+8.43	-3.61
24	-6.32	-9.65	58	+2.11	+7.24	92	+8.43	-6.02
25	-4.22	+10.87	59	+2.11	+4.83	93	+8.43	-8.43
26	-4.22	+8.46	60	+2.11	+2.41	94	+10.87	+6.12
27	-4.22	+6.05	61	+2.11	0	95	+11.86	+3.91
28	-4.22	+3.63	62	+2.11	-2.41	96	+12.40	+1.55
29	-4.22	+1.22	63	+2.11	-4.83	97	+10.54	0
30	-4.22	-1.19	64	+2.11	-7.24	98	+12.40	-1.55
31	-4.22	-3.61	65	+2.11	-9.65	99	+10.87	-3.61
32	-4.22	-6.02	66	+2.11	-12.07	100	+10.87	-6.02
33	-4.22	-8.43	67	+4.22	+10.87			
34	-4.22	-10.85	68	+4.22	+8.46			

23-55
(55-20#)



Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	+2.84	+11.56	W	+2.84	+8.26	r	+5.72	+3.30
B	+5.72	+9.91	X	+5.72	+6.60	s	+5.72	0
C	+8.53	+8.26	Y	+8.53	+4.95	t	+5.72	-3.30
D	+11.43	+3.30	Z	+8.53	+1.65	u	+2.84	-4.95
E	+11.43	0	a	+8.53	-1.65	v	0	-6.60
F	+11.43	-3.30	b	+8.53	-4.95	w	-2.84	-4.95
G	+8.53	-8.26	c	+5.72	-6.60	x	-5.72	-3.30
H	+5.72	-9.91	d	+2.84	-8.26	y	-5.72	0
J	+2.84	-11.56	e	0	-9.91	z	-5.72	+3.30
K	-2.84	-11.56	f	-2.84	-8.26	AA	-2.84	+4.95
L	-5.72	-9.91	g	-5.72	-6.60	BB	0	+3.30
M	-8.53	-8.26	h	-8.53	-4.95	CC	+2.84	+1.65
N	-11.43	-3.30	i	-8.53	-1.65	DD	+2.84	-1.65
P	-11.43	0	j	-8.53	+1.65	EE	0	-3.30
R	-11.43	+3.30	k	-8.53	+4.95	FF	-2.84	-1.65
S	-8.53	+8.26	m	-5.72	+6.60	GG	-2.84	+1.65
T	-5.72	+9.91	n	-2.84	+8.26	HH	0	0
U	-2.84	+11.56	p	0	+6.60			
V	0	+9.91	q	+2.84	+4.95			

23-53
(53-20#)



Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	+2.84	+11.56	V	+5.72	+6.60	r	+5.72	+3.30
B	+5.72	+9.91	W	+8.53	+4.95	s	+5.72	0
C	+8.53	+8.26	X	+8.53	+1.65	t	+5.72	-3.30
D	+11.43	+3.30	Y	+8.53	-1.65	u	+2.84	-4.95
E	+11.43	0	Z	+8.53	-4.95	v	0	-6.60
F	+11.43	-3.30	a	+5.72	-6.60	w	-2.84	-4.95
G	+8.53	-8.26	b	+2.84	-8.26	x	-5.72	-3.30
H	+5.72	-10.41	c	0	-9.91	y	-5.72	0
J	-5.72	-10.41	d	-2.84	-8.26	z	-5.72	+3.30
K	-8.53	-8.26	e	-5.72	-6.60	AA	-2.84	+4.95
L	-11.43	-3.30	f	-8.53	-4.95	BB	0	+3.30
M	-11.43	0	g	-8.53	-1.65	CC	+2.84	+1.65
N	-11.43	+3.30	h	-8.53	+1.65	DD	+2.84	-1.65
P	-8.53	+8.26	k	-8.53	+4.95	EE	0	-3.30
R	-5.72	+9.91	m	-5.72	+6.60	FF	-2.84	-1.65
S	-2.84	+11.56	n	-2.84	+8.26	GG	-2.84	+1.65
T	0	+9.91	p	0	+6.60	HH	0	0
U	+2.84	+8.26	q	+2.84	+4.95			

23-36 (36-20#)

Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	+ 2.54	+ 11.43	N	-11.43	-1.27	b	-3.81	-6.99
B	+6.35	+10.16	P	-11.43	+2.54	c	-6.99	-4.45
C	+ 8.89	+ 6.99	R	-8.89	+ 6.99	d	-7.62	-0.64
D	+11.43	+2.54	S	-6.35	+10.16	e	-7.62	+3.18
E	+ 11.43	-1.27	T	-2.54	+ 11.43	f	-3.81	+ 6.99
F	+10.80	-5.08	U	0	+8.26	g	0	+3.81
G	+ 7.62	-8.89	V	+ 3.81	+ 6.99	h	+ 3.81	+ 3.18
H	+3.81	-10.80	W	+7.62	+3.18	j	+3.81	-0.64
J	0	-11.43	X	+ 7.62	-0.64	k	0	-3.81
K	-3.81	-10.80	Y	+6.99	-4.45	i	-3.81	-0.64
L	-7.62	-8.89	Z	+ 3.81	-6.99	m	-3.81	+ 3.18
M	-10.80	-5.08	a	0	-7.62	n	0	0

23-34 (34-20#)

Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	0	+ 11.43	N	-11.43	-3.18	b	-7.62	-2.54
B	+4.45	+10.80	P	-11.43	+0.64	c	-7.62	+1.27
C	+ 8.26	+ 8.26	R	-10.80	+ 4.45	d	-5.08	+ 5.72
D	+10.80	+4.45	S	-8.26	+8.26	e	0	+3.81
E	+ 11.43	+ 0.64	T	-4.45	+ 10.80	f	+ 3.81	+ 1.27
F	+11.43	-3.18	U	0	+7.62	g	+3.81	-2.54
G	+ 9.53	-6.99	V	+ 5.08	+ 5.72	h	0	-3.81
H	+6.35	-9.53	W	+7.62	+1.27	j	-3.81	-2.54
J	+ 2.54	-11.43	X	+ 7.62	-2.54	k	-3.81	+ 1.27
K	-2.54	-11.43	Y	+3.81	-6.35	r	0	0
L	-6.35	-9.53	Z	0	-7.62			
M	-9.53	-6.99	a	-3.81	-6.35			

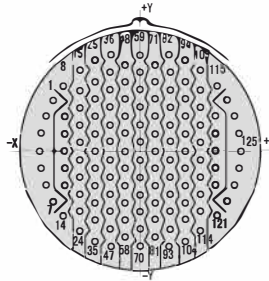
23-32 (32-20#)

Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y
A	+ 2.54	+ 11.43	M	-8.26	+ 8.26	Z	-8.26	+ 0.64
B	+8.26	+8.26	N	-2.54	+11.43	a	-6.35	+4.45
C	+ 10.8	+ 3.81	P	0	+ 8.26	b	-3.81	+ 7.62
D	+11.43	-1.91	R	+3.81	+7.62	c	+2.54	+3.81
E	+ 9.53	-6.99	S	+ 6.35	+ 4.45	d	+ 3.81	0
F	+ 5.08	-10.16	T	+8.26	+0.64	e	+1.91	-3.81
G	0	-11.43	U	+ 7.62	-3.18	f	-1.91	-3.81
H	-5.08	-10.16	V	+ 5.08	-6.35	g	-3.81	0
J	-9.53	-6.99	W	0	-7.62	h	-2.54	+ 3.81
K	-11.43	-1.91	X	-5.08	-6.35	j	0	0
L	-10.8	+ 3.81	Y	-7.62	-3.18			

23-21 (21-16#)	Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
		X	Y		X	Y		X	Y
	A	+3.25	-9.78	H	-4.65	-9.19	R	-4.06	+3.71
	B	+7.34	+7.24	J	-8.33	-6.07	S	+5.44	-0.89
	C	+9.80	+3.12	K	-10.16	-1.65	T	+2.39	-4.93
	D	+10.16	-1.65	L	-9.80	+3.12	U	-2.39	-4.93
	E	+8.33	-6.07	M	-7.34	+7.24	V	-5.44	-0.89
	F	+4.65	-9.19	N	-3.25	+9.78	W	-4.06	+3.71
	G	0	-10.31	P	0	+6.22	X	0	0

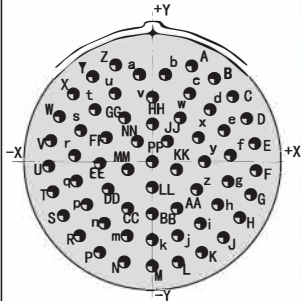
23-97 (16-16#)	Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
		X	Y		X	Y		X	Y
	A	0	+8.74	G	0	-10.31	N	0	+3.96
	B	+5.33	+6.86	H	-4.65	-9.19	P	-3.05	-0.76
	C	+9.80	+3.12	J	-8.33	-6.07	R	0	-5.54
	D	+10.16	-1.65	K	-10.16	-1.65	S	-3.05	-0.76
	E	+8.33	-6.07	L	-9.80	+3.12			
	F	+4.65	-9.19	M	-5.33	+6.86			

23-99 (11-16#)	Cavity No	Coordinate		Cavity No	Coordinate	
		X	Y		X	Y
	A	0	+10.26	G	-10.26	0
	B	+7.62	+6.86	H	-7.62	+6.86
	C	+10.26	0	J	+3.05	+3.81
	D	+6.10	-5.33	K	0	-1.52
	E	0	-7.62	L	-3.05	+3.81
	F	-6.10	-5.33			

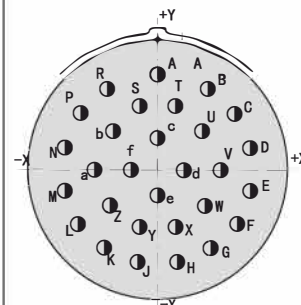
25-35
 (128-22D)


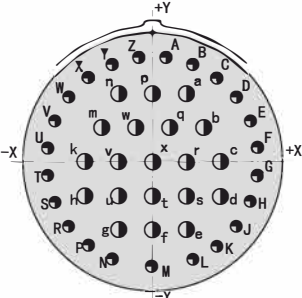
Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate		Cavity No	Coordinate	
	X	Y		X	Y		X	Y		X	Y
1	-12.17	+7.09	33	-6.32	-7.24	65	0	-1.19	97	+6.32	+4.83
2	-13.21	+4.83	34	-6.32	-9.65	66	0	-3.61	98	+6.32	+2.41
3	-13.87	+2.41	35	-6.32	-12.07	67	0	-6.02	99	+6.32	0
4	-14.10	0	36	-4.06	+13.49	68	0	-8.43	100	+6.32	-2.41
5	-13.87	-2.41	37	-4.22	+10.85	69	0	-10.85	101	+6.32	-4.83
6	-13.21	-4.83	38	-4.22	+8.43	70	0	-14.10	102	+6.32	-7.24
7	-12.17	-7.09	39	-4.22	+6.02	71	+2.11	+12.07	103	+6.32	-9.65
8	-10.54	+9.07	40	-4.22	+3.61	72	+2.11	+9.65	104	+6.32	-12.07
9	-10.54	+4.83	41	-4.22	+1.19	73	+2.11	+7.24	105	+8.43	+11.28
10	-10.54	+2.41	42	-4.22	-1.19	74	+2.11	+4.83	106	+8.43	+8.43
11	-10.54	0	43	-4.22	-3.61	75	+2.11	+2.41	107	+8.43	+6.02
12	-10.54	-2.41	44	-4.22	-6.02	76	+2.11	0	108	+8.43	+3.61
13	-10.54	-4.83	45	-4.22	-8.43	77	+2.11	-2.41	109	+8.43	+1.19
14	-10.77	-9.07	46	-4.22	-10.85	78	+2.11	-4.83	110	+8.43	-1.19
15	-8.43	+11.28	47	-4.22	-13.26	79	+2.11	-7.24	111	+8.43	-3.61
16	-8.43	+8.43	48	-2.11	+12.07	80	+2.11	-9.65	112	+8.43	-6.02
17	-8.43	+6.02	49	-2.11	+9.65	81	+2.11	-12.07	113	+8.43	-8.43
18	-8.43	+3.61	50	-2.11	+7.24	82	+4.06	+13.49	114	+8.43	-10.85
19	-8.43	+1.19	51	-2.11	+4.83	83	+4.22	+10.85	115	+10.77	+9.07
20	-8.43	-1.19	52	-2.11	+2.41	84	+4.22	+8.43	116	+10.54	+4.83
21	-8.43	-3.61	53	-2.11	0	85	+4.22	+6.02	117	+10.54	+2.41
22	-8.43	-6.02	54	-2.11	-2.41	86	+4.22	+3.61	118	+10.54	0
23	-8.43	-8.43	55	-2.11	-4.83	87	+4.22	+1.19	119	+10.54	-2.41
24	-8.43	-10.85	56	-2.11	-7.24	88	+4.22	-1.19	120	+10.54	-4.83
25	-6.32	+12.60	57	-2.11	-9.65	89	+4.22	-3.61	121	+10.77	-9.07
26	-6.32	+9.65	58	-2.11	-12.07	90	+4.22	-6.02	122	+12.17	+7.09
27	-6.32	+7.24	59	0	+13.26	91	+4.22	-8.43	123	+13.21	+4.83
28	-6.32	+4.83	60	0	+10.85	92	+4.22	-10.85	124	+13.87	+2.41
29	-6.32	+2.41	61	0	+8.43	93	+4.22	-13.26	125	+14.10	0
30	-6.32	0	62	0	+6.02	94	+6.32	+12.60	126	+13.87	-2.41
31	-6.32	-2.41	63	0	+3.61	95	+6.32	+9.65	127	+13.21	-4.83
32	-6.32	-4.83	64	0	+1.19	96	+6.32	+7.24	128	+12.17	-7.09

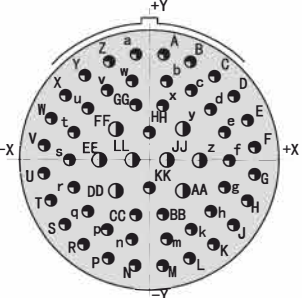
25-61 (61-20#)	Cavity	Coordinate		Cavity	Coordinate		Cavity	Coordinate	
	No	X	Y	No	X	Y	No	X	Y
	A	+4.98	+12.70	Y	-7.98	+11.05	v	0	+8.59
	B	+7.98	+11.05	Z	-4.98	+12.70	w	+3.73	+5.66
	C	+10.49	+8.71	a	-1.73	+11.53	x	+6.02	+3.10
	D	+12.32	+5.84	b	+1.73	+11.53	y	+6.78	-0.25
	E	+13.39	+2.57	c	+4.39	+9.22	z	+5.79	-3.53
	F	+13.61	-0.76	d	+7.24	+7.19	AA	+3.33	-5.92
	G	+12.98	-4.17	e	-9.19	+4.45	BB	0	-6.78
	H	+11.53	-7.29	f	+10.13	+1.17	CC	-3.33	-5.92
	J	+9.35	-9.93	g	+9.96	-2.24	DD	-5.79	-3.53
	K	+6.58	-11.94	h	+8.66	-5.41	EE	-6.78	-0.25
	L	+3.40	-13.18	i	+6.38	-7.98	FF	-6.02	+3.10
	M	0	-13.64	j	+3.38	-9.63	GG	-3.73	+5.66
	N	-3.40	-13.18	k	0	-10.21	HH	0	+5.08
	P	-6.58	-11.94	m	-3.38	-9.63	JJ	+2.67	+2.39
	R	-9.58	-9.93	n	-6.38	-7.98	KK	+3.43	-1.04
	S	-11.53	-7.29	p	-8.66	-5.41	LL	0	-3.35
	T	-12.98	-4.17	q	-9.96	-2.24	MM	-3.43	-1.04
	U	-13.61	-0.76	r	-10.13	+1.17	NN	-2.67	+2.39
	V	-13.39	+2.57	s	-9.19	+4.45	PP	0	0
	W	-12.32	+5.84	t	-7.24	+7.19			
	X	-10.49	+8.71	u	-4.39	+9.22			



25-29 (29-16#)	Cavity	Coordinate		Cavity	Coordinate		Cavity	Coordinate	
	No	X	Y	No	X	Y	No	X	Y
	A	0	-12.22	L	-10.03	-7.04	X	+2.31	-7.37
	B	+6.55	+10.31	M	-11.91	-2.77	Y	-2.31	-7.37
	C	+10.03	+7.04	N	-11.91	+2.77	Z	-6.10	-4.60
	D	+11.91	+2.77	P	-10.03	+7.04	a	-8.10	0
	E	+11.91	-2.77	R	-6.55	+10.31	b	-5.79	+4.93
	F	+10.03	-7.04	S	-2.31	+8.15	c	0	+4.09
	G	+6.68	-10.31	T	+2.31	+8.15	d	+3.40	0
	H	+2.31	-11.99	U	+5.79	+4.93	e	0	-3.30
	J	-2.31	-11.99	V	+8.10	0	f	-3.40	0
	K	-6.68	-10.31	W	+6.10	-4.60			



25-43 (23-20#,20-16#)	Cavity	Coordinate		Cavity	Coordinate		Cavity	Coordinate	
	No	X	Y	No	X	Y	No	X	Y
	A	+1.75	+13.49	S	-12.52	-5.21	h	-8.74	-4.37
	B	+5.16	+12.57	T	-13.49	-1.75	k	-8.74	0
	C	+8.23	+10.80	U	-13.49	+1.75	m	-6.55	+4.37
	D	+10.77	+8.28	V	-12.52	+5.21	n	-4.37	+8.74
	E	+12.52	+5.21	W	-10.77	+8.28	p	0	+8.74
	F	+13.49	+1.75	X	-8.23	+10.80	q	+2.18	+4.37
	G	+13.49	-1.75	Y	-5.16	+12.57	r	+4.37	0
	H	+12.52	-5.21	Z	-1.75	+13.49	s	+4.37	-4.37
	J	+10.77	-8.28	a	+4.37	+8.74	t	0	-4.37
	K	+8.23	-10.80	b	+6.55	+4.37	u	-4.37	-4.37
	L	+5.16	-12.57	c	+8.74	0	v	-4.37	0
	M	0	-13.49	d	+8.74	-4.37	w	-2.18	+4.37
	N	-5.16	-12.57	e	+4.37	-8.74	x	0	0
	P	-8.25	-10.80	f	0	-8.74			
	R	-10.77	-8.28	g	-4.37	-8.74			

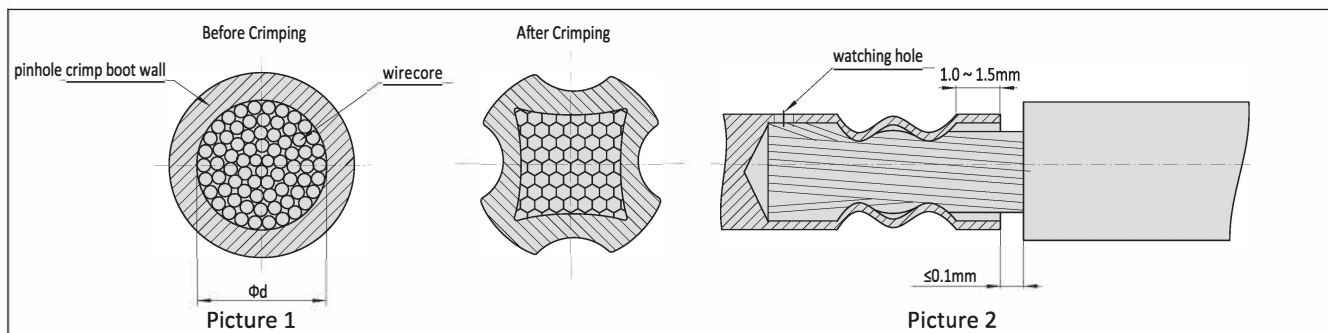
25-04 (48-20#,8-16#)	Cavity	Coordinate		Cavity	Coordinate		Cavity	Coordinate	
	No	X	Y	No	X	Y	No	X	Y
	A	+1.75	+13.49	W	+12.52	+5.21	t	-9.58	+3.35
	B	+5.16	+12.57	X	-10.77	+8.28	u	-7.90	+6.38
	C	+8.23	+10.80	Y	-8.23	+10.80	v	-5.38	+8.74
	D	+10.77	+8.28	Z	-5.16	+12.57	w	-2.18	+10.08
	E	+12.52	+5.21	a	-1.75	+13.49	x	+1.75	+6.68
	F	+13.49	+1.75	b	+2.18	+10.08	y	+4.37	+3.78
	G	+13.49	-1.75	c	+5.38	+8.74	z	+6.55	0
	H	+12.52	-5.21	d	+7.90	+6.38	AA	+4.37	-3.78
	J	+10.77	-8.28	e	+9.58	+3.35	BB	+1.75	-6.68
	K	+8.23	-10.80	f	+10.46	0	CC	-1.75	-6.68
	L	+5.16	-12.57	g	+9.58	-3.35	DD	-4.37	-3.78
	M	+1.75	-13.49	h	+7.90	-6.38	EE	-6.55	0
	N	-1.75	-13.49	k	+5.38	-8.74	FF	-4.37	+3.78
	P	-5.16	-12.57	m	+2.18	-10.08	GG	-1.75	+6.68
	R	-8.23	-10.80	n	-2.18	-10.08	HH	0	+3.35
	S	-10.77	-8.28	p	-5.38	-8.74	JJ	+2.18	0
	T	-12.52	-5.21	q	-7.90	-6.38	KK	0	-3.35
	U	-13.49	-1.75	r	-9.58	-3.35	LL	-2.18	0
	V	-13.49	+1.75	s	-10.46	0			

GJB599 series products matched crimping tools

1 Crimping principle

Crimping is a permanent connection type. The crimping step is that: use the metal crimp boot of the wiring termination to encase the bare wire, and then use manual or automatic crimp tool to crimp the boot. Crimping connects the wire with the contact through changing the metal shape in a set limit. Crimping connection includes metal flow, twisted wire and contact material transforms symmetrically. Crimping is similar to cold welding, and has good mechanical strength and electrical continuity.

As the wire is twisted of several cores, each core has a small gap with each other. If the twisted circular transform \leq the circular diameter (picture 1), the original wire twisted rules would be destroyed, and the gap would be filled. When the gap is fulfilled and continues to transform, the wire cores and the crimp boot will transform and forms a static friction force, the metal molecule inter-infiltrates, and then results in the cold welding phenomenon. Because crimping has a wider contact section between the contact and the wire, it has smaller contact resistance and higher tensile strength.



2 Crimping characteristics

For those connectors mounted with crimping contacts, the contacts can be changed if necessary; for example: change the circuit loop, replace some broken contacts or change another contact type. The crimping process can be achieved by manual tools, electronic tools or automatic crimping machine. The crimping tools need to be adjusted regularly to ensure the crimping strength reliable. For each contact, the twisted wire head can be seen from the watching hole; it ensures the wires to be crimped at correct position.

3 Crimping tool

Crimping tool is a special tool to deliver crimping force; it ensures the crimping reliability. Taking manual crimping tool as example, it usually contains four parts: crimping top, self-lock mechanism, locator and the handle. Crimping top—consists of crimping top, reset spring and frame. The shape of crimping top decides the shape of crimping trace. The strength and abrasive resistance is very important.

Self-lock mechanism—this part includes the teeth; adjust cam, spring, etc. Self-lock mechanism ensures the crimping strength, and keeps the handle until crimp to the right position. For different contact sizes, the adjust cam is used to control the crimping strength.

Locator—It is an axial locator mechanism to ensure the crimping position, and can be removed.

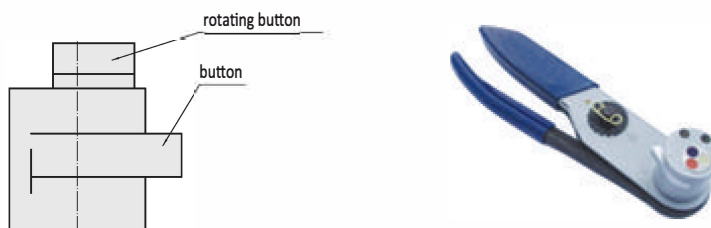
Handle—used to add the force.

According to the contact size of GJB599 and MIL-C-22520 and GJB5020-2001 standard, our company developed two crimp clamp types: XCXY-01 and YJQ-02. The difference is that: XCXY-01 crimp clamp is used for large size contacts of GJB599 series (20 #, 16 #, 12 #); YJQ-02 is a small crimp clamp type and used for small size contacts (22D #, 20 #).

3.1 XCXY-01 crimp clamp

3.1.1 Axial locator

Axial locator is applied to fix the contacts in axial direction so that to ensure the correct crimping position. XCXY-01 crimp clamp has 3 applicable locator types, see picture 3. The 3 locator types are suitable for different contact sizes. See figure 1 for details:



Picture 3: Applicable locators for XCXY-01 crimp clamp (DWQ-10, 13, 14)

Figure 1

Crimp clamp P/N	Locator P/N	Applicable contact size
XCXY-01	DWQ-10	GJB599I, III, IV series, 20#, 16#, 12# sockets
	DWQ-13	GJB599I, II, III, IV series 20#, 16#, 12# pins
	DWQ-14	GJB599II series 20#, 16#, 12# sockets

3.1.2 Radial locator

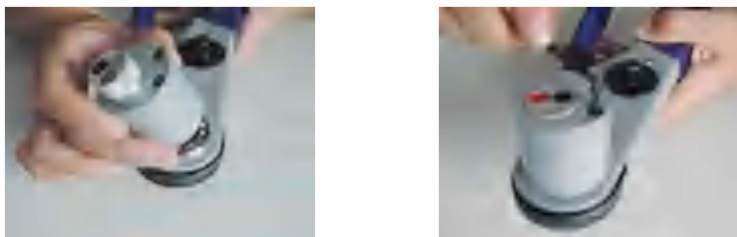
Radial locator is a rotate flange with 8 gears; different gears stand for different crimping force. For different contacts, different wires, adjust the gear to choose suitable crimping force. For details see figure 2:

Figure 2

Contact size	20#			16#			12#	
Crimp boot OD (mm)	1.78			2.62			3.84	
Crimp boot ID (mm)	1.17			1.68			2.49	
Radial gear number	8			6			4	3
Applicable wire (AWG)	24	22	20	20	18	16	14	12
Contact resistance (mΩ)	1.0	0.8	0.7	0.7	0.5	0.4	0.3	0.2
Crimping force (N)	30	49	74	74	167	206	314	471

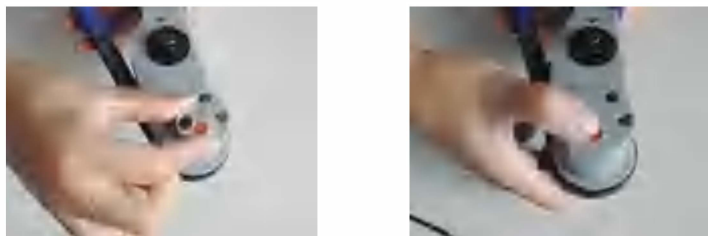
3.1.3 Crimping steps

① Mount axial locator: use a hex wrench to mount the axial locator on the crimp clamp.



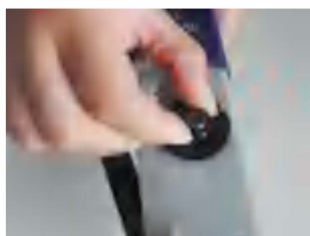
② Axial locator illustration: Locators suitable for different contact sizes are mounted on the rotating button of the axial locator. The locator can be moved to the central position through rotating the eccentric mounted button.

- a. Rotate the button, and push the locator needed to the central position.
- b. Press the button, with a clear clerk, the button fixed the axial locator to the right position.



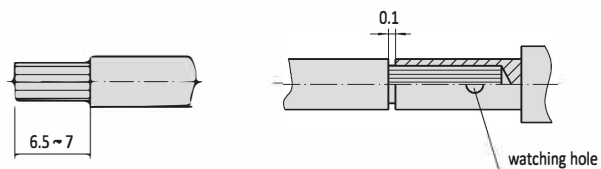
③ Radial locator illustration: The radial locator is adjusted with a rotate flange. There are 8 different gears which are suitable for different contacts and wires on the rotate flange.

- a. According to the contact size, choose suitable wire type and the radial number. See figure 2.
- b. Remove the locking pin, pull the rotate flange, and rotate the needed number to the arrow mark.
- c. Put down the rotate flange, tighten the locking pin, then the radial adjusting is finished.



④ Crimping steps

a.Prepare the parts: choose suitable wires according to figure 2, strip the insulation cover for 6.5~7.0mm length, and then put the stripped wire core into the crimp boot. The wire core should surpass the watching hole on the crimp boot (picture 4).



Picture 4

b.Crimping: put the crimping part into the pliers hole, make the termination of contact to the bottom of the locate hole and hold the handle to the closest position. Then release the handle, and pick out the crimping part.



⑤ Check the crimping quality

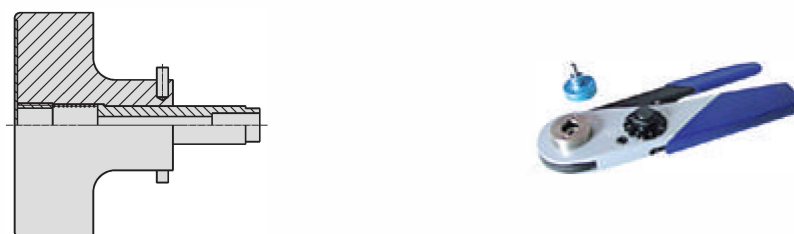
After crimping, please check the following places (see figure 2):

- a.Outlook: check whether the crimp point is even, whether the crimp place bent or not.
- b.Crimp force: Check whether the crimp force complies with the standard.
- c.Contact resistance: check whether the contact resistance complies with the standard.

3.2 YJQ-02 crimp clamp

3.2.1 Axial locator

Axial locator is applied to fix the contacts in axial direction so that to ensure the correct crimping position. YJQ-02 crimp clamp has 4 applicable locator types (see picture 5), suitable for different contact sizes. See figure 3 for details:



Picture 5: applicable locators for YJQ-02 crimp clamp (XDWQ-02Z, 02K, 03Z, 03K, 06, 07)

Crimp clamp P/N	Locator P/N	Applicable contact size
YJQ-02	XDWQ-02Z	GJB599I, II, III, IV series 20# pins
	XDWQ-02K	GJB599I, III, IV series 20# sockets
	XDWQ-03Z	GJB599I, II, III, IV series 22D# pins
	XDWQ-03K	GJB599I, III, IV series 22D# sockets
	XDWQ-06	GJB599II series 22D# sockets
	XDWQ-07	GJB599II series 20# sockets

3.2.2 Radial locator

Radial locator is a rotate flange with 8 gears and different gears stand for different crimping force. For different contacts, different wires, adjust the gear to choose suitable crimping force. For details see figure 4 and figure 5:

Figure 4: Crimp tensile strength and crimp resistance

No.	Section (mm ²)	AWG	Tensile strength (N)		Crimp resistance (mΩ)	
			Ag/Sn plating wire	Ni plating wire	Ag/Sn plating wire	Ni plating wire
1	0.08	28	14	9	3.3	12.3
2	0.1		16	10	2.6	10.6
3	0.13	26	23	14	2.0	8.5
4	0.2	24	36	27	1.3	5.3
5	0.3		51	33	0.89	4.0
6	0.32	22	54	36	0.8	4.5
7	0.5		85	56	0.57	2.3
8	0.52	20	89	58	0.53	2.0

Figure 5: Crimp boot dimension, applicable wire and locator P/N

No.	Locator P/N	Product	Contact	Crimp boot		Strip length (mm)	AWG (mm ²)	Domestic wire (mm ²)	Gear
				OD (mm)	ID (mm)				
1	XDWQ-02 _k ^z	JY599I series	20# pin & socket	1.78	1.1	6~6.5	24(0.2)	0.2	5
							22(0.32)	0.3	6
							20(0.52)	0.5	6
2	XDWQ-03 _k ^z	JY599I series	20D pin & socket	1.23	0.8	5.0~5.5	28(0.08)	0.08	2
							26(0.13)	0.125	2
							24(0.2)	0.2	3
							22(0.32)	0.3	4
3	XDWQ-06	JY599II series	20D socket	1.22	0.85	3.5~4.0	28(0.08)	0.08	2
							26(0.13)	0.125	2
							24(0.2)	0.2	3
4	XDWQ-07	JY599II series	20# socket	1.78	1.17	5.0~5.5	24(0.2)	0.2	5
							22(0.32)	0.3	6

3.2.3 Crimping steps

The crimping steps are generally the same with that of XCRY-01 crimp clamp. The difference is that the YJQ-02 axial locator mounting is more convenient; customers only need to rotate the locator for 90°.

4 Notice for crimping

- ① The wire section should be chosen according to the standard in figure 2 and figure 5. Choose suitable wire section for contacts.
- ② Use stripping pliers to stripping, do not destroy the wire or break the wire. Check the quality after stripping; the strip length should be in accordance with the standard in figure 4.
- ③ Adjust the crimp clamp first, and then press it twice without wires to check the flexibility.
- ④ Don't put large diameter contacts at small size contact crimp position so that the handle may not press to the close position. If the handle is forced to the close position, the crimp clamp would be destroyed. If it happens, please contact the supplier to repair it.
- ⑤ When crimping sockets, please check the crimp position. Don't use the socket contact end as crimp boot.
- ⑥ Suitable crimping tools should be chosen during crimping process.
- ⑦ To ensure the quality of each lot, test crimping is suggested for some samples before crimping each lot, and the tensile strength test is also suggested. After the test is qualified, crimp the lot products.
- ⑧ The crimping site should keep clean. Crimp the wires after being stripped. During crimping process, protection caps should be used to protect the connection surface of the plug and receptacle from dust.
- ⑨ Crimping tools should be checked regularly, and use qualified crimping tools.

GJB599 high frequency contacts illustration

The contact types listed following are applicable to GJB599 I, III, IV series connectors. 16#, 12# shielding contacts, 12# coaxial contacts, 8# dual coaxial shielding contacts comply with GJB2293-95; 8# differential contacts developed by our company.

1 High frequency contacts P/N correspondence and applicable wire

Figure 1: P/N correspondence and applicable wire

Contact size	China P/N	International P/N	Applicable wire	
			China	International
16# shielding pin	J1216/76-424	M39029/76-424	SFF-50-1.5-1	M17/113-RG316
16# shielding socket	J1216/77-428	M39029/77-428	SFF-75-1.5-1	
12# shielding pin	J1216/28-211	M39029/28-211	SFF-50-1.5-1	M17/113-RG316
	J1216/28-412	M39029/28-412		M17/173-RG316D
12# shielding socket	J1216/75-416	M39029/75-416	SFF-50-1.5-1	M17/113-RG316
	J1216/75-422	M39029/75-422		M17/173-RG316
12# coaxial pin	J1216/102-558	M39029/102-558	SFF-50-1.5-1	M17/113-RG316
12# coaxial socket	J1216/103-559	M39029/103-559	SFF-75-1.5-1	
8# dual coaxial shielding pin	J1216/90-529	M39029/90-529	SEFF-78-1-51	M17/176-00002
8# dual coaxial shielding socket	J1216/91-530	M39029/91-530		
TDB4 high frequency pin	TDB4-Ka	-	670-141	
TDB4 high frequency socket	TDB4-Ja	-	670-141	
8# differential 2-core pin 100Ω	CF81-211-01	-		HDP700001070
8# differential 2-core socket 100Ω	CF82/211-01	-		
8# differential 4-core pin 100Ω	CF81/411-01	-		CEC-RWC-18664 ABS1503KD24
8# differential 4-core socket 100Ω	CF82/411-01	-		

Figure 2: Tensile strength after crimping

Wire P/N	Max tensile strength (N)		
	Central contact	Inner contact	Outer contact
SYV-50-2-513	66.72	-	66.72
SFF-50-1.5-51	44.48	-	66.72
SFF-75-1.5-51	15.57	-	66.72
M17/113-RG316	66.72	-	66.72
SEFF-78-1-51	35.59	35.59	111.21
M17/176-00002	35.59	35.59	111.21

2 Matched tools for contacts and the mounting

2.1 Matched tools for contacts

Removal tool comply with MIL-C-81969 standard; crimp tool comply with MIL-C-22520 standard.

Figure 3

Contact type	Plastic remove tool	Crimp clamp		Locator or mould	
				Pin	Socket
16# shielding	M81969/14-03	Inner	M22520/2-01	M22520/2-35	
		Outer	M22520/4-01	M22520/4-02	
12# shielding	M81969/14-04	Inner	M22520/2-01	M22520/2-34	
		Outer	M22520/31-01	M22520/31-01	
12# coaxial	M81969/14-04	Inner	MH992	K1303S	K1304
		Outer	M22520/5-01	M22520/5-03	
8# dual coaxial shielding	M81969/14-12	Inner	M22520/2-01	K709	
		Middle	M22520/5-01	Y631B(mould)	
		Outer	M22520/5-01	Y631A(mould)	
8# differential 2-core pin 100Ω	M81969/14-12	Inner	M22520/2-01	K709	
		Outer	M22520/5-01	Y631A(mould)	
8# differential 2-core socket 100Ω	M81969/14-12	Inner	M22520/2-01	K709	
		Outer	M22520/5-01	Y631A(mould)	
8# differential 4-core pin 100Ω	M81969/14-12	Inner	M22520/2-01	K709	
		Outer	M22520/5-01	Y631A(mould)	
8# differential 4-core socket 100Ω	M81969/14-12	Inner	M22520/2-01	K709	
		Outer	M22520/5-01	Y631A(mould)	

2.2 Contacts mounted

2.2.1 Mount the contacts

To mount the contact, customers need to use the according standard plastic remove tool, IN end. The operation step is: first, put the wire into the IN end of the remove tool, and then push the tool IN end to the contact rear end, insert it into the cavity to the stop position, pull out the tool. Pull the wires out softly by hand, don't pull out the contacts.

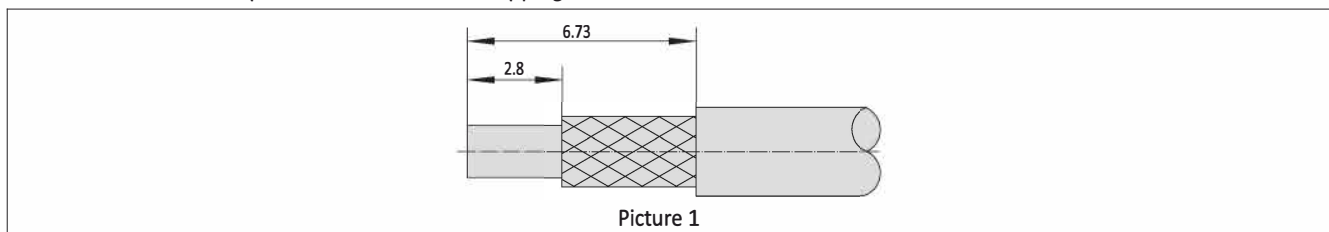
2.2.2 Remove the contacts

The "EX" end of plastic removal tool with corresponding standard is used to remove the contact. The operation step is as following: first, put the wire into the EX end of the removal tool, and then insert the tool into the contact rear end till it can't move. Pull the wires to remove the contacts.

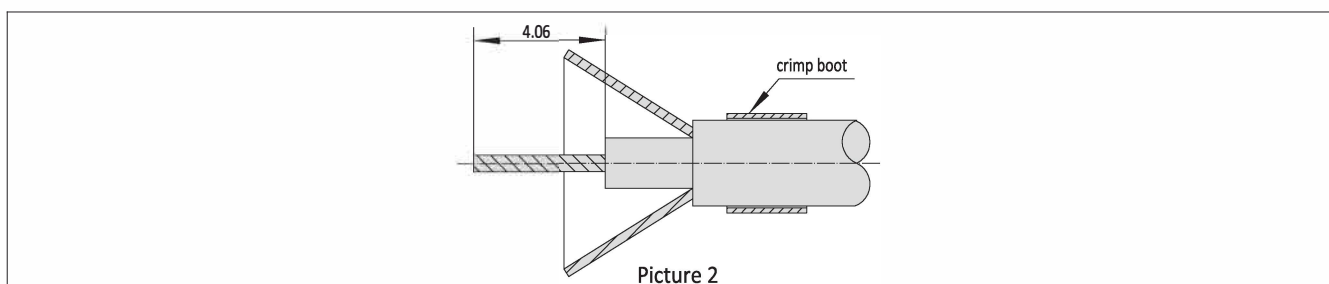
2.3 16# shielding contacts mounting

2.3.1 16# shielding pin mounting illustration (RG316)

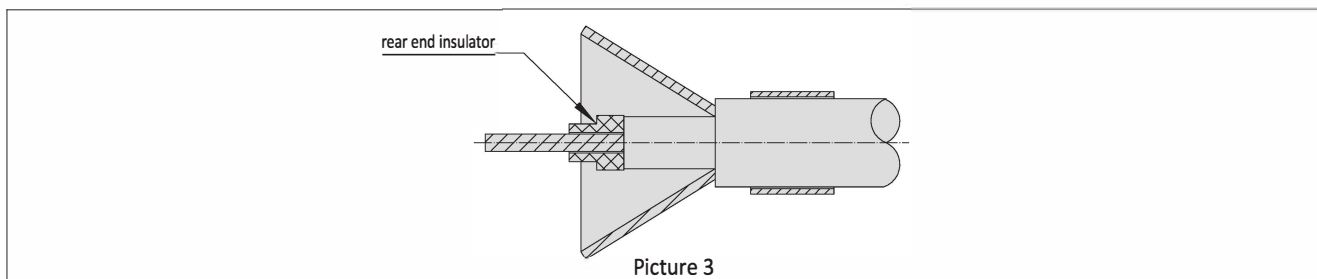
① Strip the cable (see picture 1); the end surface should be clean and perpendicular to the cable coaxial surface. The cables should not be out of shape when it is cut. Hot stripping is recommended.



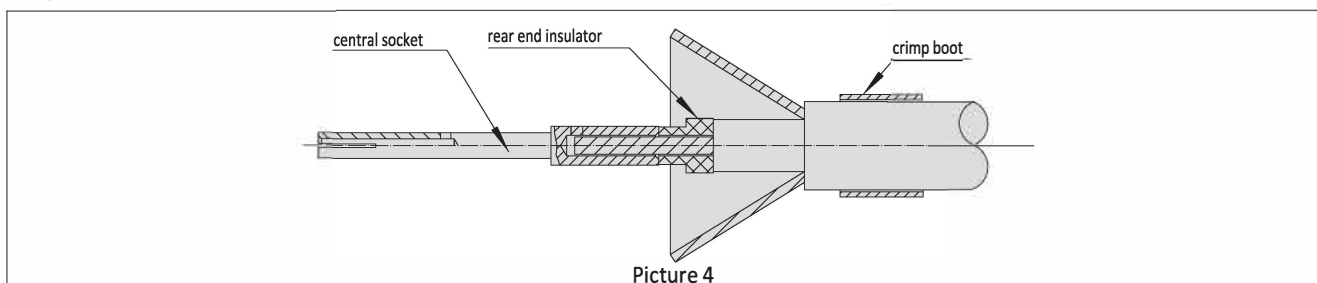
② Slip the crimp boot back to the cable sleeve (see picture 2), extend the shielding layer, and then strip the insulation medium of cable.



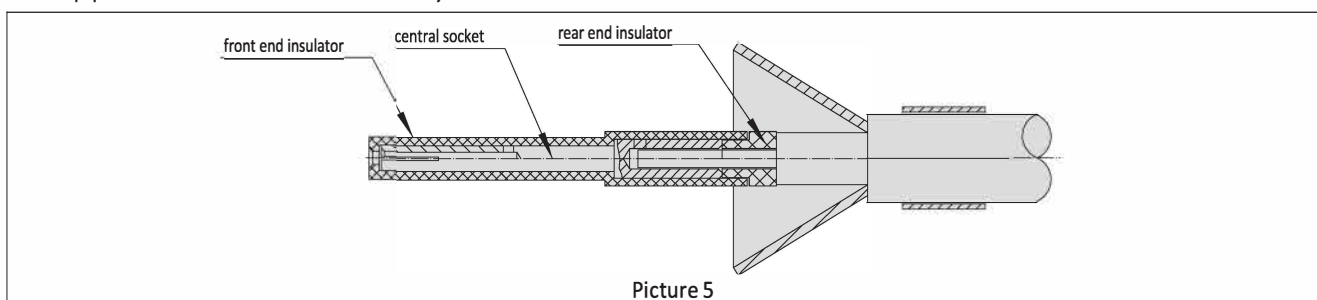
③ Mount the rear end insulator on the central conductor of the cable (see picture 3), the rear end insulator should be connected with the cable insulation medium.



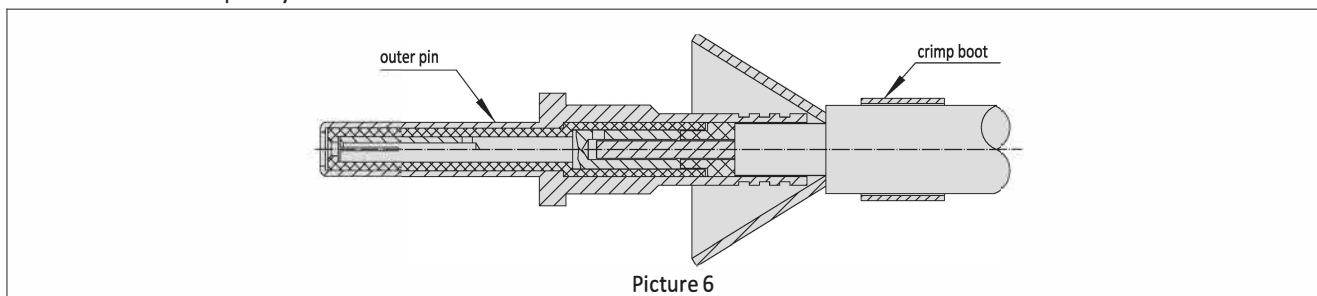
④ Mount the central socket on the central conductor of the cable (see picture 4), the central conductor could be seen through the watching hole of the socket end, and then use crimp clamp M22520/2-01, gear 5, locator M22520/2-35 to crimp.



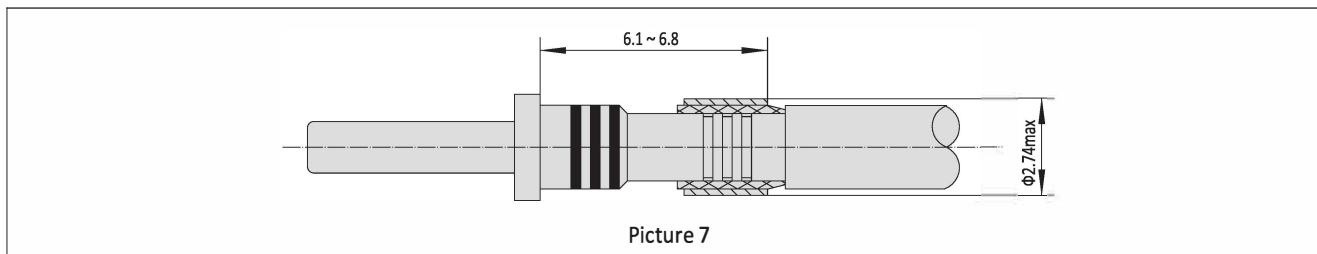
⑤ Mount the front end insulator on the central socket (see picture 5), the end of the front insulator should connect with the step part of the rear end insulator closely.



⑥ Mount the outer pin on the central hole which is crimped with insulator (see picture 6), until the inner contacts connect with the insulator completely.

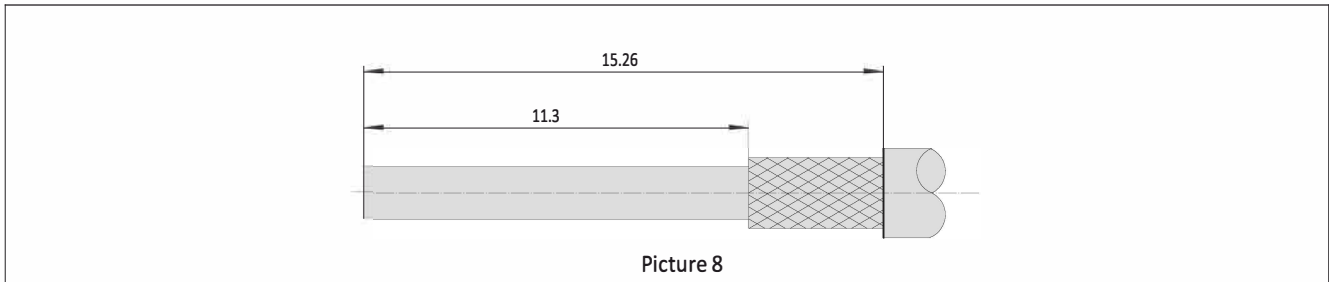


⑦ Push the crimp boot ahead over the cable shielding layer (see picture 7) and position dimension is 6.1~6.8, then cut the rest shielding net exceed the crimp boot; use M22520/4-01 tool and M22520/4-02 locator to crimp. Crimp for once and rotate the contact 45° and then crimp it again. After the second crimping, the diameter of the shielding crimp boot should be more than 2.74.

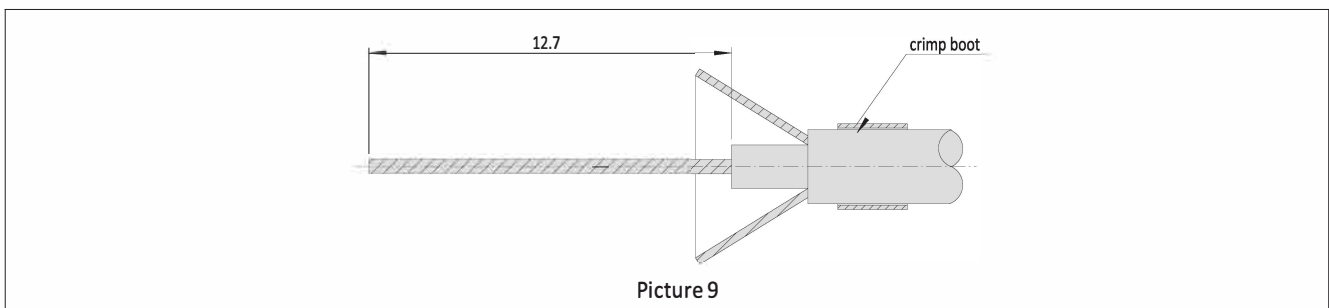


2.3.2 16# shielding socket mounting

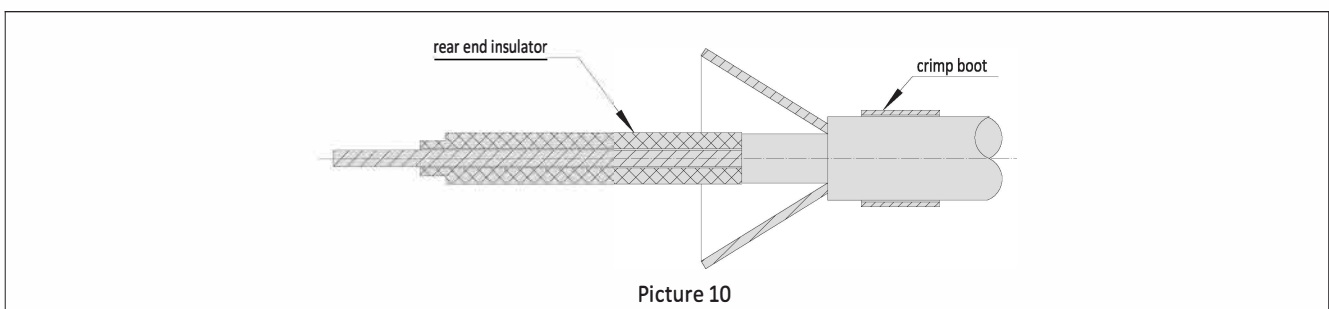
① Strip the cable according to picture 8, the end surface need to be clean and perpendicular to the cable coaxial surface. In cutting, the cables should not be out of shape. We recommend hot stripping.



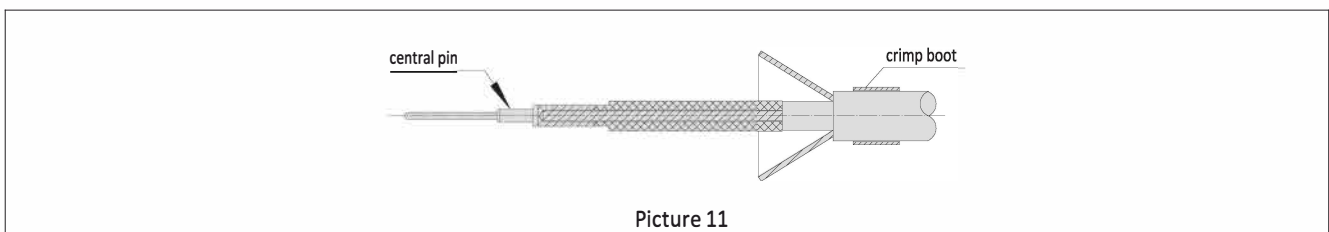
② Slip the crimp boot back to the cable sleeve (see picture 9), extend the shielding layer, and then strip the cable medium.



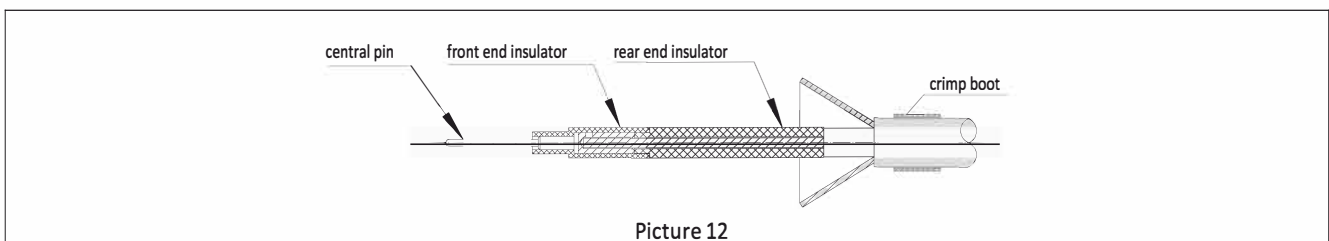
③ Slip the rear end insulator on the cable central conductor (see picture 10), the rear insulator end connect with the cable insulation medium closely.



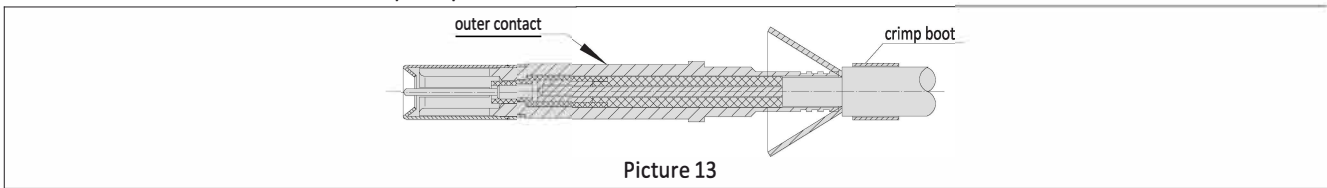
④ Mount the central pin on the central conductor of the cable (see picture 11), the central conductor could be seen through the watching hole of the socket end, use crimp clamp M22520/2-01, gear 5, locator M22520/2-35 to crimp.



⑤ Mount the front end insulator on the central pin (see picture 12), the two insulators should connect with each other.

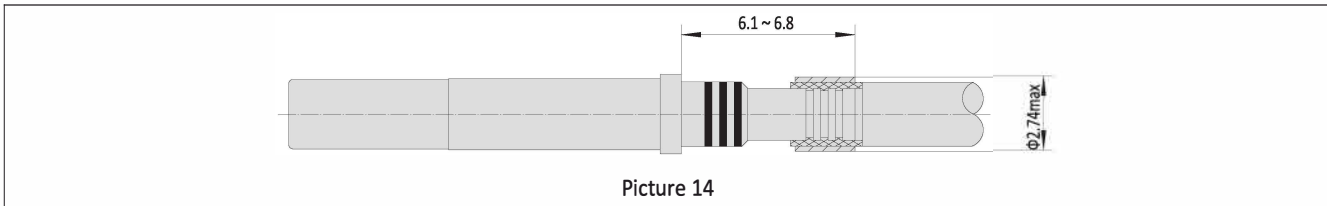


⑥ Mount the outer contact on the central contact, under the cable shielding layer (see picture 13), until the central contacts connect with the insulator completely.



Picture 13

⑦ Push the crimp boot ahead over the cable shielding layer (see picture 14); the position dimension is 6.1~6.8; cut the rest shielding net exceed the crimp boot; use M22520/4-01 tool and M22520/4-02 locator to crimp. Crimp once and rotate the contact 45°, and then crimp it again. After the second crimping, the diameter of the shielding crimp boot should be no more than 2.74mm.

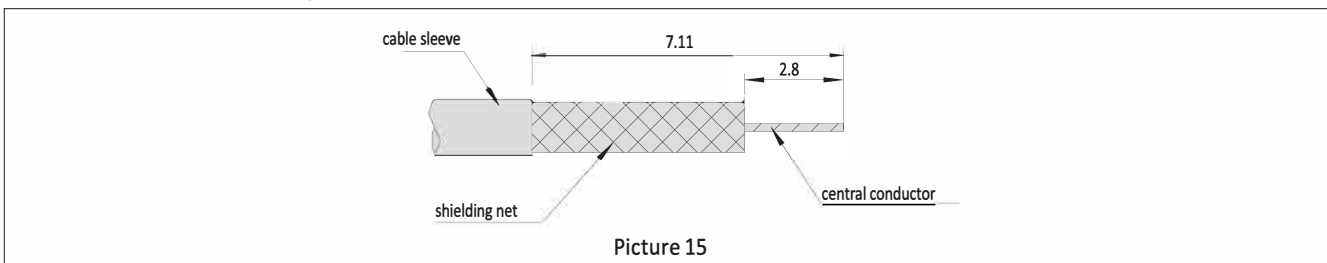


Picture 14

2.4 12 # shielding contact mounting

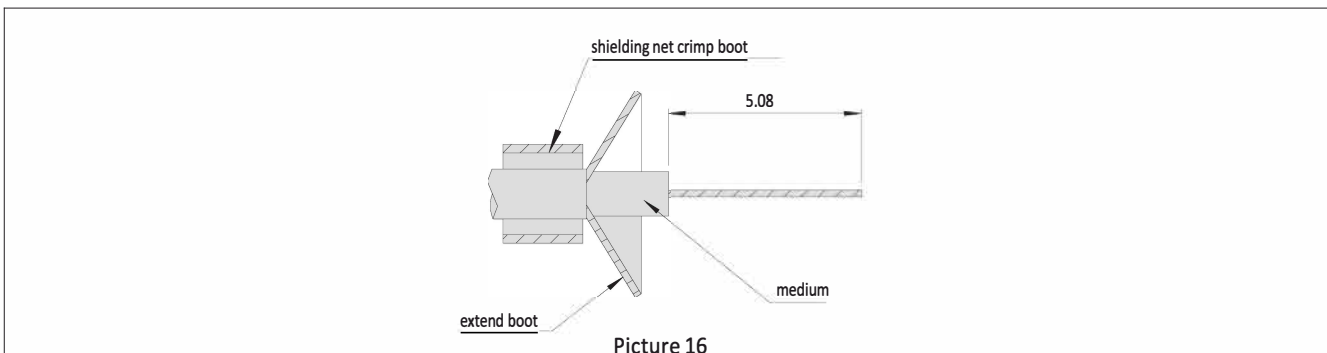
2.4.1 12 # shielding pin mounting

① Strip the cable (see picture 15); the end surface should be clean and perpendicular to the cable coaxial surface. The cables should not be out of shape when it is cut.



Picture 15

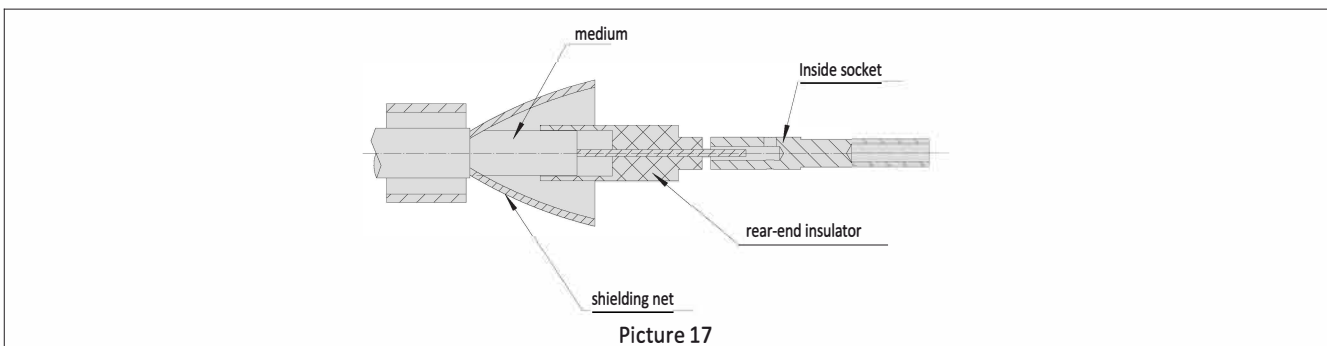
② Put the shielding net crimp boot over cable sleeve (see picture 16).



Picture 16

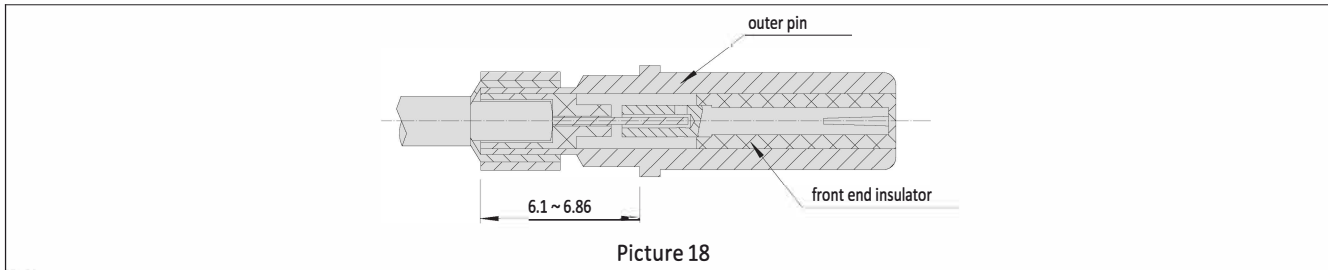
③ Extend the shielding layer, strip the cable medium.

④ Put the central conductor through the insulator, until the insulator end contacts the bottom of the medium, and under the cable shielding net. (See picture 17)



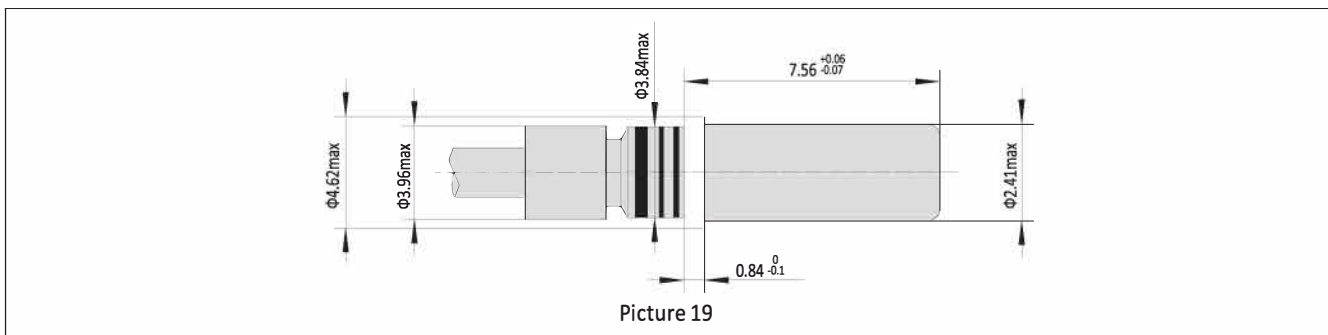
Picture 17

- ⑤ Put the cable central conductor through socket contact, the cable central conductor could be seen through the watching hole of the central socket. The contact must connect with the rear end insulator.
- ⑥ Use crimp tool M22520/2-01 and locator M22520/2-34 to crimp inner sockets.
- ⑦ Mount the inner components of picture 17 into the outer pins, and under the cable shielding net, until the inner sockets be mounted completely. See picture 18.



Picture 18

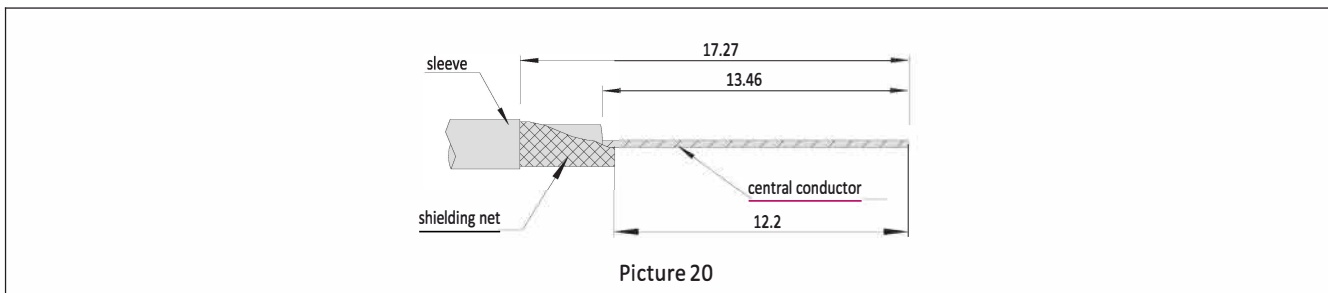
- ⑧ Push the shielding net crimp boot ahead to ensure 6.1~6.8mm of dimension; cut the rest shielding net exceeding the crimp boot. Use M22520/31-01 crimp tool and M22520/31-02 locator to crimp. Crimp once and rotate the contact 45°, and then crimp it again. After the second crimping, the outer diameter of the shielding net crimp boot should be less than 3.96mm.
- ⑨ Picture 19 is the 12# shielding pin crimped.



Picture 19

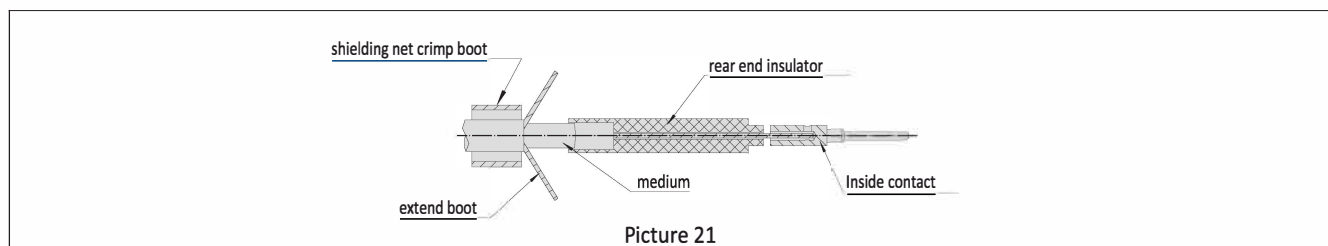
2.4.2 12 # shielding socket mounting

- ① Strip the cable (see picture 20); the end surface should be clean and perpendicular to the cable coaxial surface. The cable should not be out of shape, when it is cut.



Picture 20

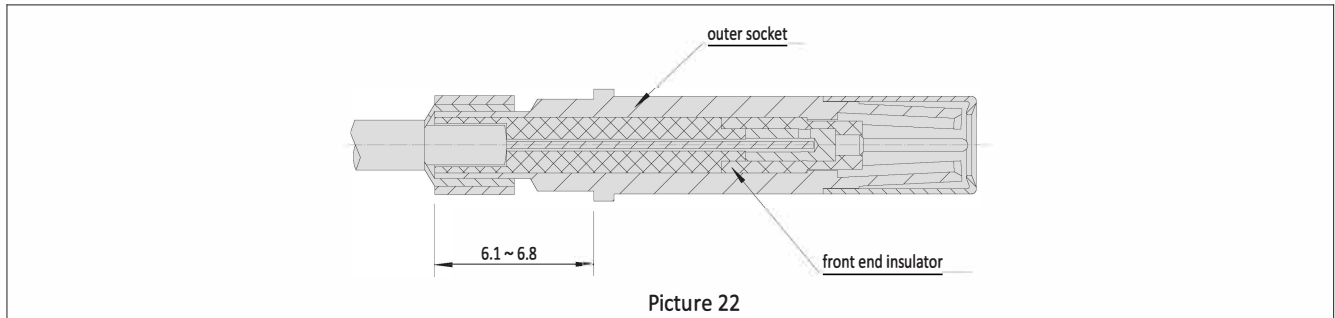
- ② See picture 21, operate as following steps:
 - a. Put the shielding net crimp boot over the cable sleeve.
 - b. Extend the shielding layer, strip the cable medium layer.
 - c. Put the central conductor through the insulator, until the medium bottom contact the rear end of insulator.
 - d. Put the cable central conductor through inner pin, the inner conductor could be seen through the watching hole of the inner pin. The contacts should connect with the insulator front end.
 - e. Use crimp tool M22520/2-01 and locator M22520/2-34 to crimp inner pins.



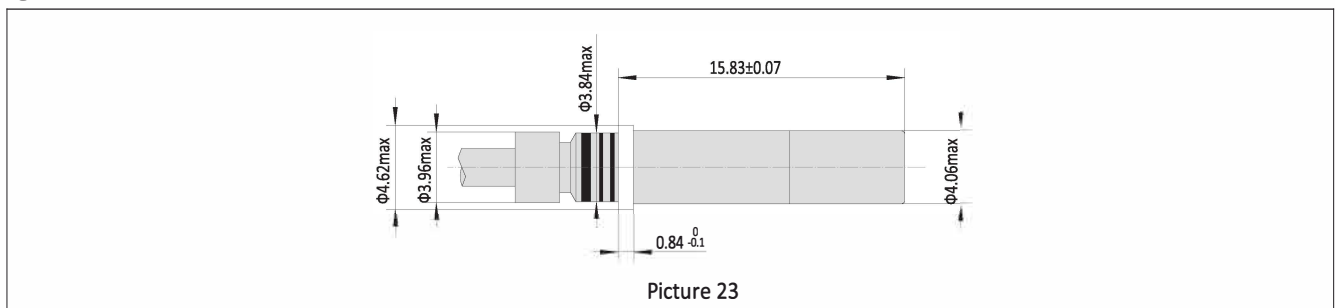
Picture 21

③ See picture 22, operate as following steps:

- a. Mount the inner components of picture 7 into the outer sockets, until the inner pins are mounted completely.
- b. Push the shielding net crimp boot ahead to ensure 6.1~6.8mm of dimension. Cut the rest shielding net of the crimp boot.
- c. Use the crimp tool and locator in figure 3 to crimp. Crimp once; then rotate the contact 45°, and then crimp it again. After the second crimping, the outer diameter of the shielding net crimp boot should be no more than 3.96mm.



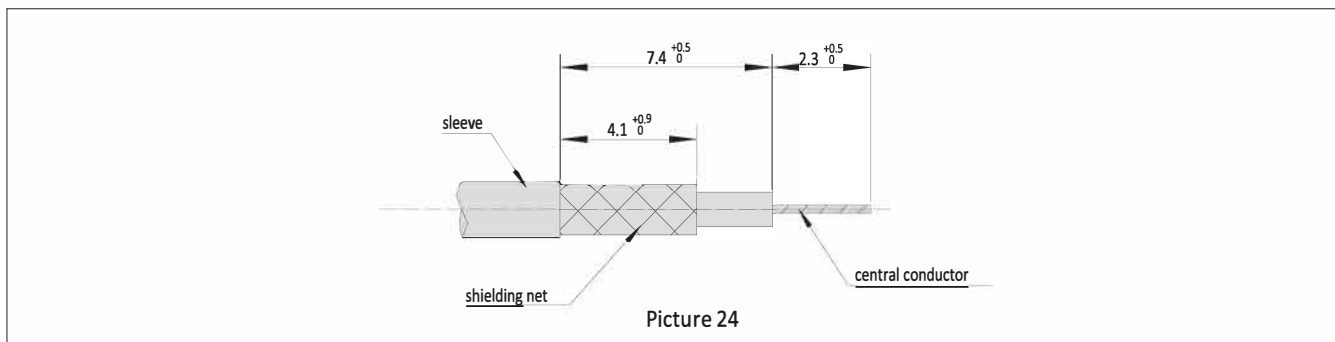
④ Picture 23 is the 12 #shielding socket crimped.



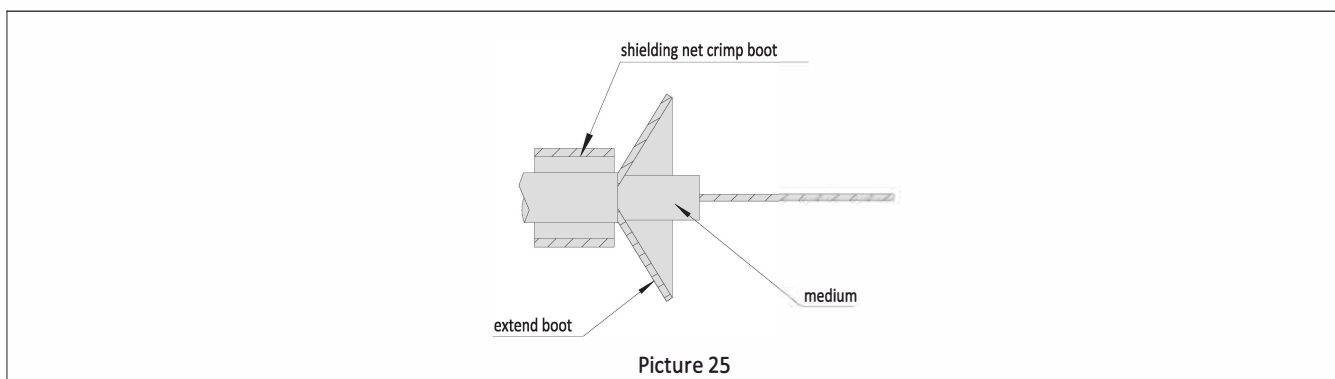
2.5 12# coaxial contacts mounting

2.5.1 12# coaxial pin mounting

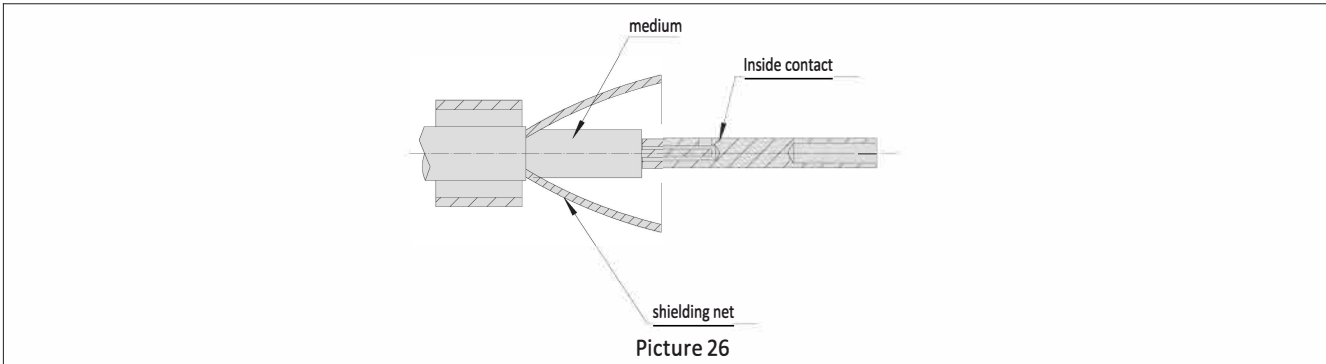
① Strip the cable (see picture 24), the end surface should be clean and perpendicular to the cable coaxial surface. The cable should not be out of shape, when it is cut.



② Put the shielding net crimp boot over the cable sleeve. See picture 25.

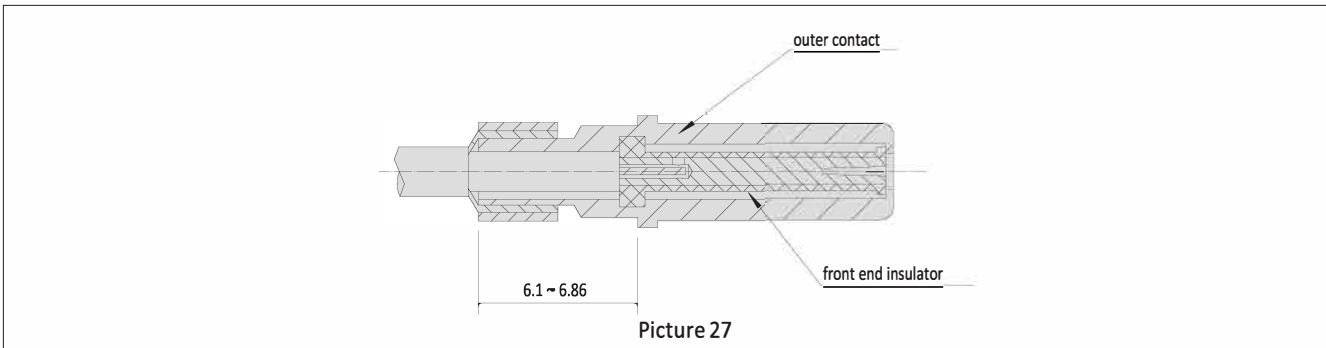


- ③ Extend the shielding layer, strip the cable medium part.
- ④ See picture 26. Put the cable central conductor through the socket and it could be seen through the watching hole of the central socket. The contacts should connect with the rear insulator.



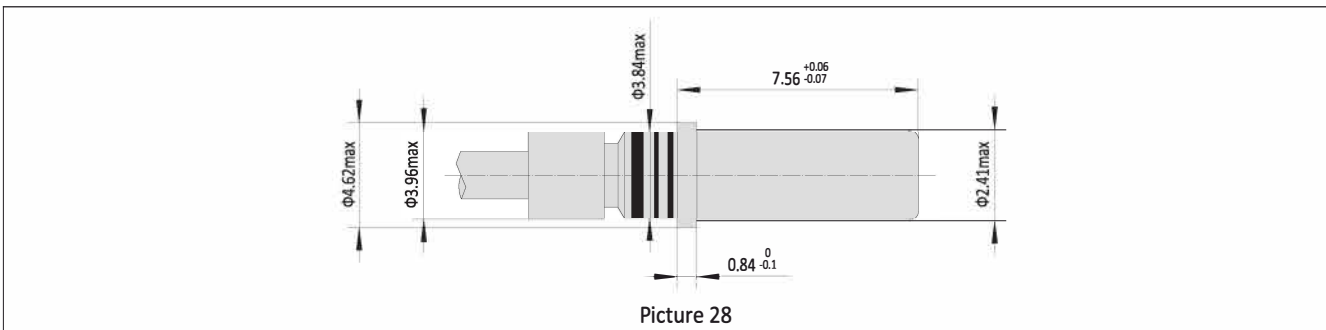
Picture 26

- ⑤ Use crimp tool MH992 and locator K1303S to crimp inner sockets.
- ⑥ Mount the inner components of picture 26 into outer pins, under the cable shielding net, until the inner socket is mounted completely.(see picture 27)



Picture 27

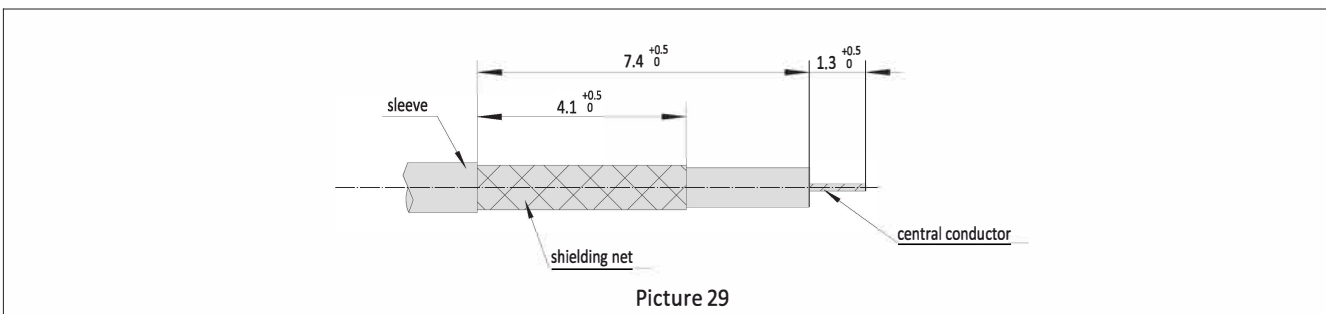
- ⑦ Push the shielding net crimp boot ahead to ensure 6.1~6.8mm dimension. Cut the rest shielding net of the crimp boot. Use the crimp tool M22520/5-01 and locator M22520/5-03 in figure 3 to crimp. The outer diameter of the shielding net crimp boot should be less than 3.96mm.
- ⑧ Picture 28 is the 12# coaxial pin crimped.



Picture 28

2.5.2 12 # coaxial socket mounting

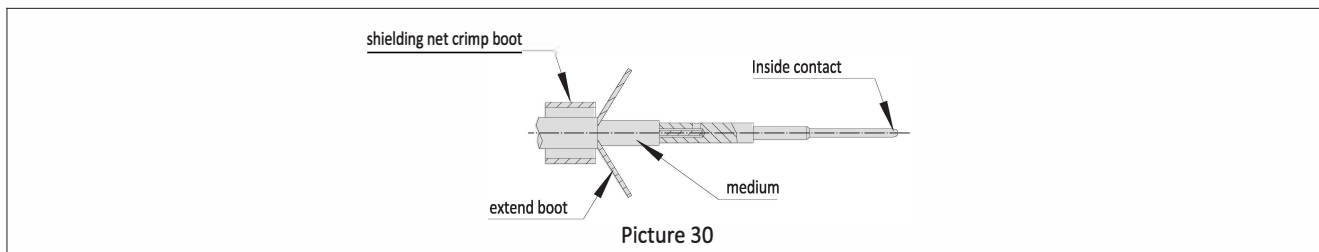
- ① Strip the cable according (picture 29); the end surface should be clean and perpendicular to the cable coaxial surface. The cables should not be out of shape, when it is cut.



Picture 29

② See picture 30, operate as following steps:

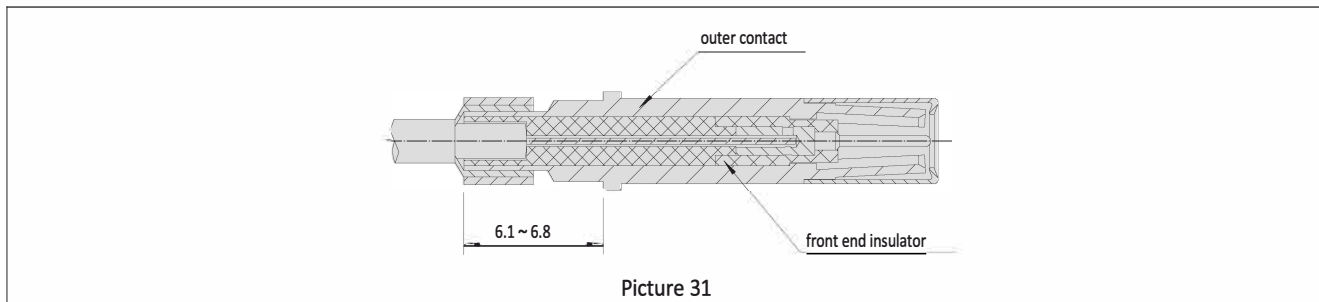
- a. Put the shielding net crimp boot over the cable sleeve.
- b. Extend the shielding layer.
- c. Put the cable central conductor through the inner pin; the inner conductor could be seen through the watching hole of the inner pin. The contacts should contact the medium front end.
- d. Use crimp tool MH992 and locator K1304 to crimp inner pins.



Picture 30

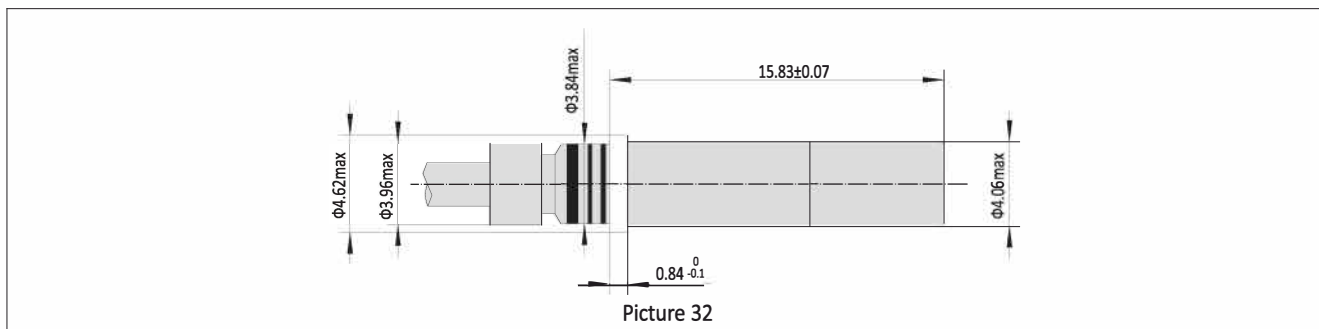
③ See picture 31, operate as following steps:

- a. Mount the inside components of picture 30 into outer socket, until the inner pins be mounted completely.
- b. Push the shielding net crimp boot ahead, ensures 6.1 ~ 6.8mm dimension. Cut the rest shielding net of the crimp boot.
- c. Use the crimp tool M22520/5-01 and locator M22520/5-03 in picture 3 for crimping. The outer diameter of the sleeve crimp boot should be less than 96mm.



Picture 31

④ Picture 32 is the 12# coaxial socket fully crimped.



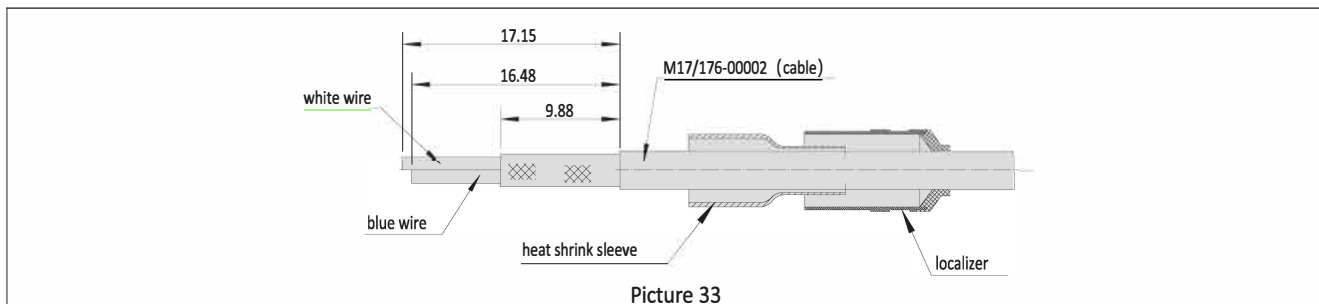
Picture 32

2.6 8 # dual coaxial shielding contacts mounting

2.6.1 8 # dual coaxial shielding pin mounting

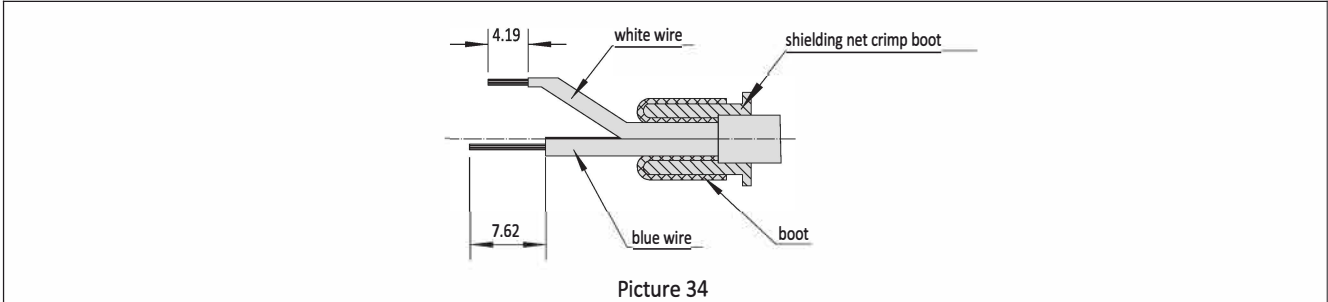
① See picture 33, follow the below steps:

- a. Put the heat shrink sleeve over the cable.
- b. Strip the cable sleeve to the position in picture 33, the end surface need to be clean and perpendicular to the cable coaxial surface. In cutting, the cables should not be out of shape.



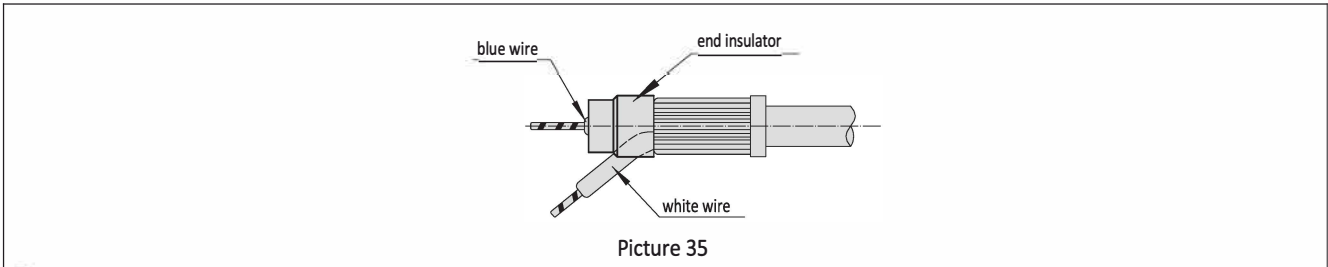
Picture 33

② Follow the step in picture 34. Put the shielding crimp boot over the cable sleeve. Strip the inner wires (the filled material near to the shielding layer can be cut).



Picture 34

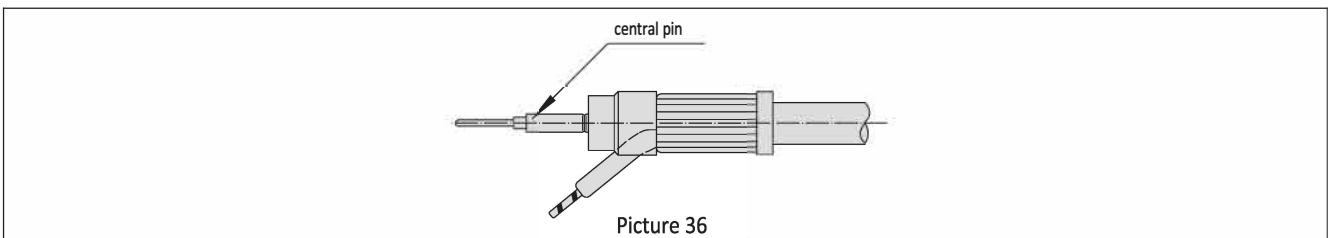
③ See picture 35. Bend the white wire to the outside direction, and put it into the insulator groove. Put the blue wire through the insulator. The insulator end should contact the shielding layer.



Picture 35

④ See picture 36, follow the below steps:

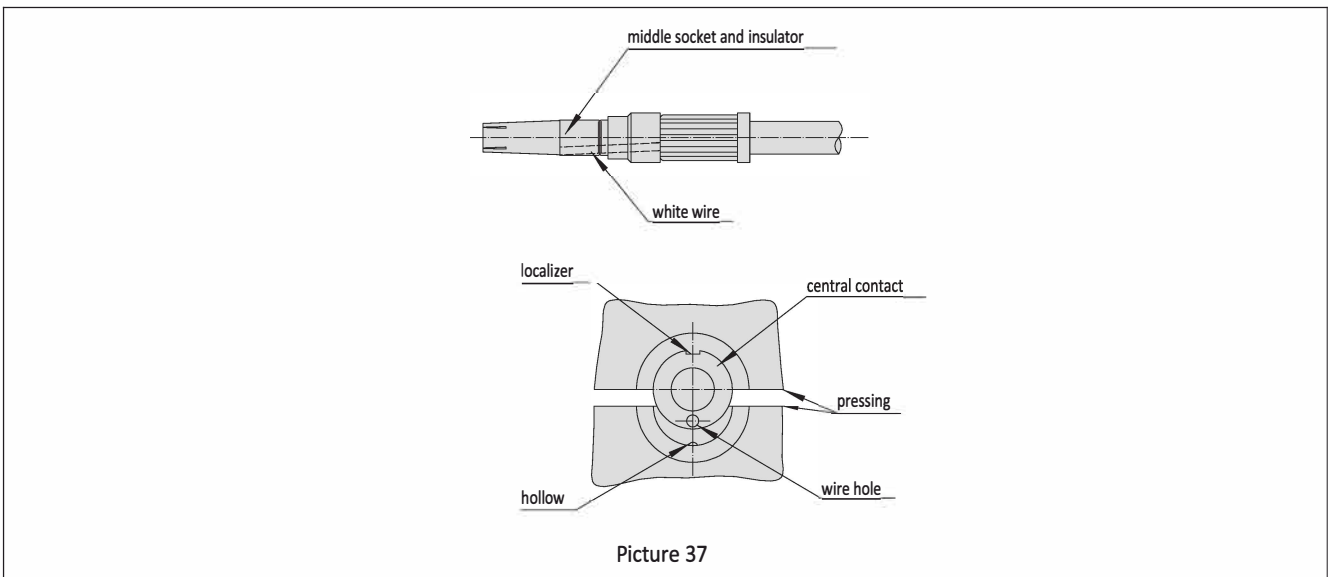
- a. Mount the inner conductor of the blue wire into the central pin, the conductor could be seen from the watching hole. The contacts should connect with the insulator end, and the insulator end should connect with the metal ring.
- b. Use the crimp tool M22520/2-01 and locator K709 in figure 3 for crimping. Crimp the central pin to the blue wire.



Picture 36

⑤ See picture 37, operate as following steps:

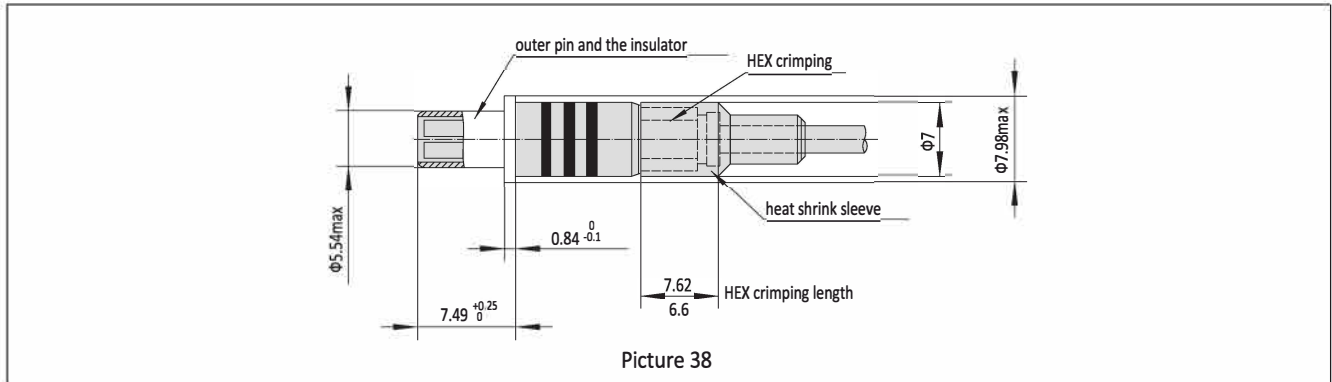
- a. Sleeve the middle pin and the insulator on the central pin.
- b. Insert the inner conductor of the white wire into the hole of the middle contact. The conductor could be seen through the wire watching hole. The middle contact should connect with the insulator.
- c. Use crimp tool M22520/5-01 and mould Y631B in picture 3 for crimping. Crimp the middle contact on the white wire.



Picture 37

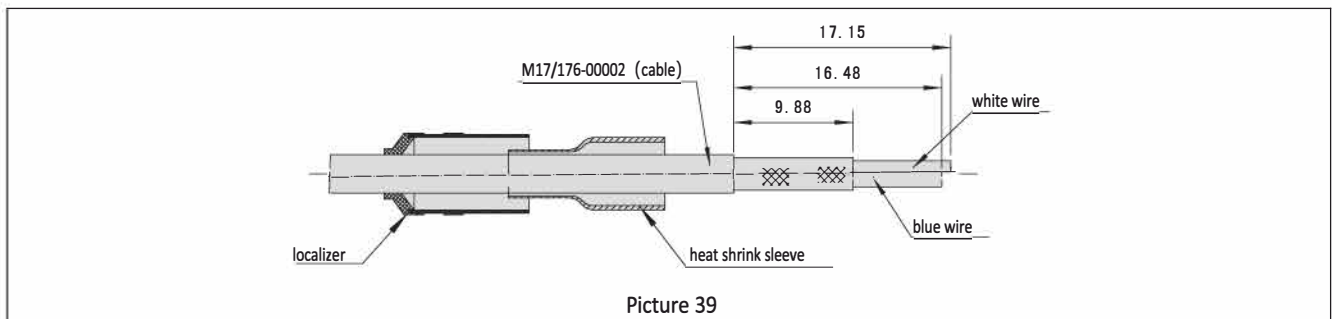
⑥ See picture 38, operate as following steps:

- a. Sleeve the outer pin and the insulator on the middle socket.
- b. Use crimp tool M22520/5-01 and mould Y631A in figure 3 for crimping. Crimp the terminal part of the shell, hex crimping.
- c. Slip the heat shrink sleeve to the crimped part of the contact; heat the sleeve of the contact and cable.

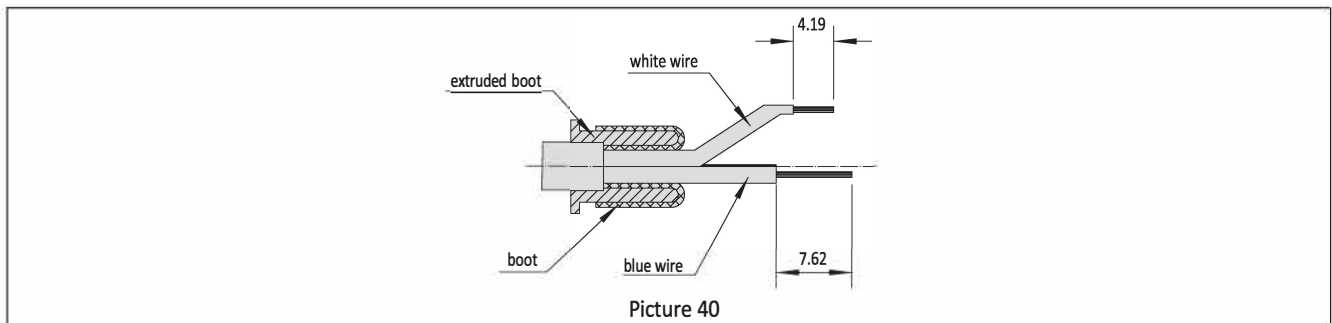


2.6.2 8 # dual coaxial shielding socket mounting

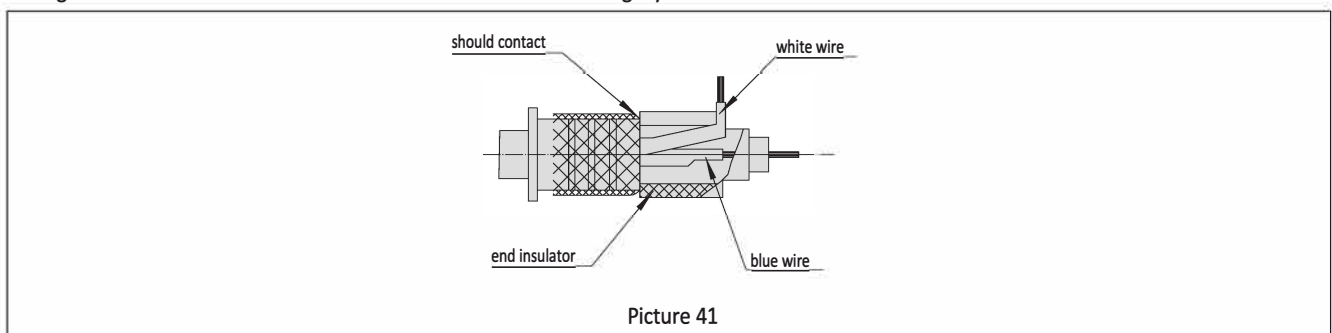
- ① See picture 39. Slip the heat shrink sleeve and the locator to the cable sleeve (start from the smaller diameter end).
- ② Strip the cable sleeve to the position in picture 39, the end surface should be clean and perpendicular to the cable coaxial surface. The cables should not be out of shape, when it is cut.



- ③ Put the shielding crimp boot over the cable sleeve, strip the inner wires (the filled material near to the shielding layer can be cut) (see picture 40).

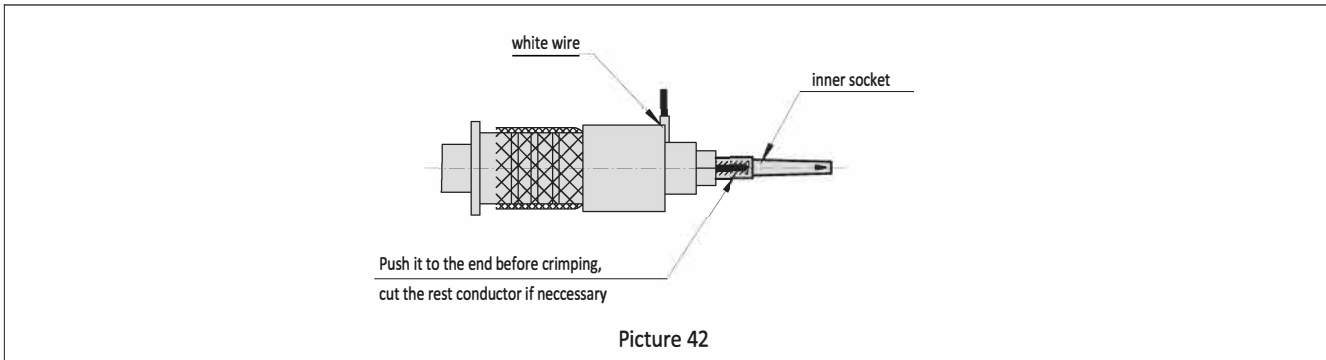


- ④ See picture 41. Bend the white wire to the outside direction, and put it into the insulator groove. Put the blue wire through the insulator. The insulator end should contact the shielding layer.

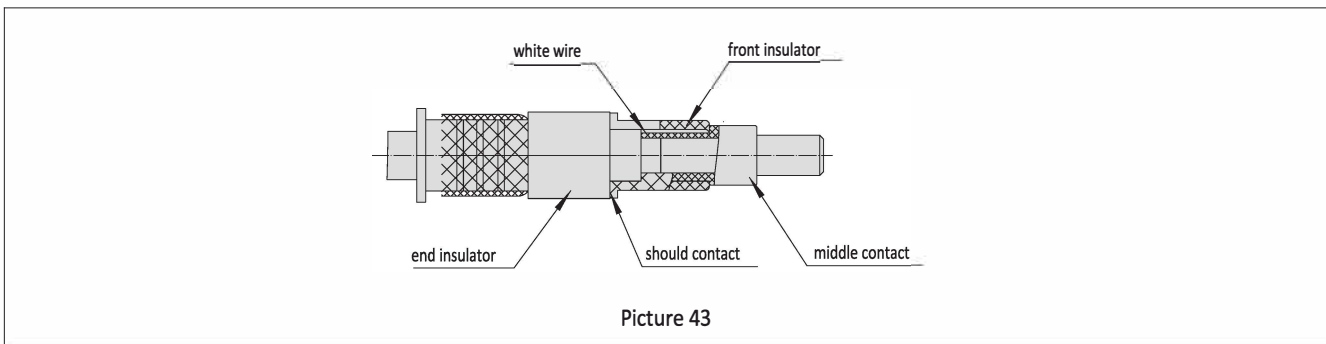


⑤ See picture 42, operate as following steps:

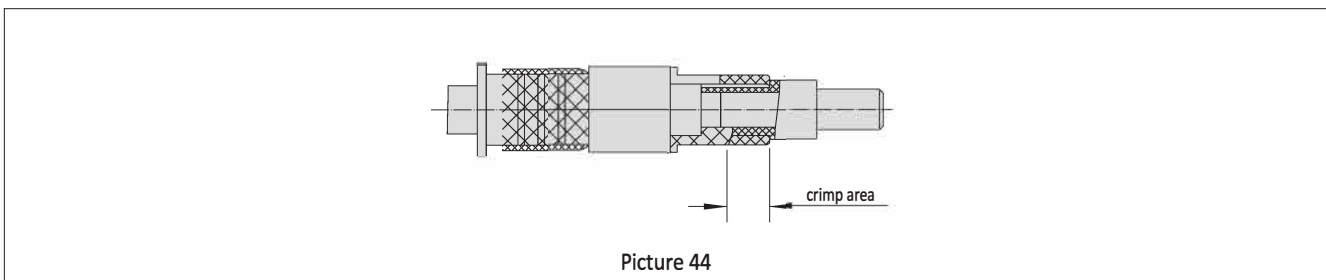
- a. Slip the socket to the blue wire. The conductor could be seen through the watching hole on the inner socket.
- b. Use crimp tool M22520/2-01 and locator K709 to crimp the contact.



⑥ Sleeve the middle pin and the insulator on the inner socket. The conductor could be seen through the contact watching hole. The middle contact should connect with the insulator end (see picture 43).

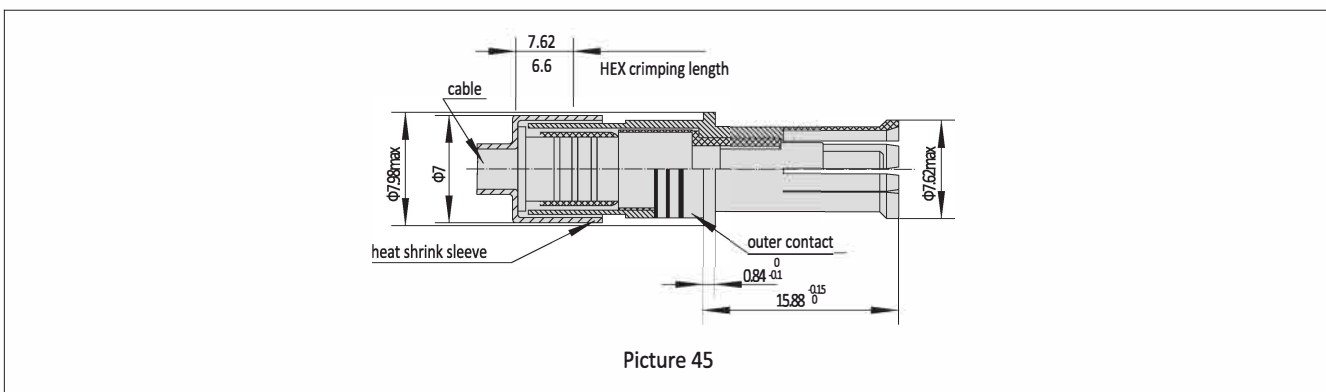


⑦ Follow the step in picture 44. Use crimp tool M22520/5-01 to crimp the middle pin, use mould Y631B to crimp the middle contact on the white wire.



⑧ Follow the step in picture 45. Slip the outer socket and the front insulator to the inner components. There will be a small gap on the sleeve.

- a. Use crimp tool M22520/5-01 and mould Y631A to crimp outer components (sleeve and outer contacts).
- b. Slip the pre-shaped heat shrink sleeve to the contact, shrink the sleeve.





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