

MIL-DTL-38999 III Series Electrical Connector

Brief Introduction

- Meet the US military standard: MIL-DTL-38999K
- Quick tri-start thread coupling with anti-decoupling mechanism
- Small size, light weight and high density
- EMI/RFI shielding
- Withstand strong vibration
- Removable crimp contact with scoop-proof design
- Withstanding high strength vibration under high temperature, and applied in harsh environment like wind, sand, moist etc..



Technical Performance

Mechanical characteristic

Shell	Aluminum alloy/stainless steel
Plating	W class: olive green cadmium plating K class: stainless steel passive F class: electroless nickel plating
Insulator	Thermoset plastic
Grommet and seal	Silicon rubber
Contact	Gold-plated copper alloy
Vibration	Sinusoid: 60g, with temperature cycling and simulating accessories (36 hours) Random: under high temperature, frequency 100-1000Hz, power spectral density: 1g ² /Hz, rms 41.7g under ambient temperature, frequency 100-1000Hz, power spectrum density 5g ² /Hz, rms 49.5g
Shock	At 3 ms half sinusoid, peak value of acceleration: 300g
Endurance	500 cycles

Environmental characteristic

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

Salt spray	W class 500h,K class 1000h,F class 48h
Damp heat	10 cycles in 24 hours according to MIL-DTL-38999K
Resistance to fluids	Fuels,coolant,solvent

Electrical characteristics

EMI shielding	100MHz~1GHz:minimum attenuation 85dB(F class,W class) 1GHz~10GHz:minimum attenuation 65dB(F class),50dB(W class)
Insulation resistance	≥5000MΩ(at 500Vdc)
Electrical continuity between shells	W class ≤2.5mΩ;F class ≤1.0mΩ;K class ≤10mΩ
Voltage drop	Inner and middle contact≤55mV under 1A Outer contact≤75mV under 12A

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

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.

How To Order

D38999/ 20 W B 35 P N -H
(1) (2) (3) (4) (5) (6) (7) (8)

1:Basic series—D38999

2:Shell type: 20-square flange receptacle

24-jam nut receptacle

26-RFI shielding plug

3:Plating: W-olive green cadmium plate

K-stainless steel passive

F-electroless nickel plating

L&Y Electronics

Web:www.lyelectronics.com

Email:info@lyelectronics.com

4:Shell size :09 – 11 – 13 – 15 – 17 – 19 – 21 – 23 - 25

A - B - C - D - E - F - G - H - J

5. Contact arrangement : see contact arrangements for details

6: Contact type :P-pin,crimping and soldering type

S- socket,crimping and soldering type

PL-long PCB pin

SL- long PCB socket

PC-short PCB pin

SC- short PCB socket

A- special pin contact

B- special socket contact

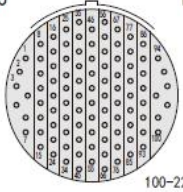

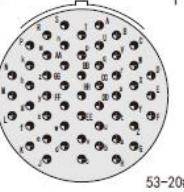

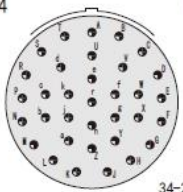
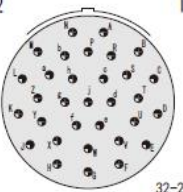
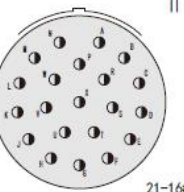
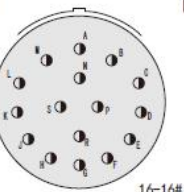
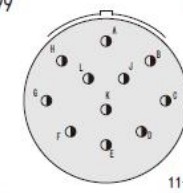
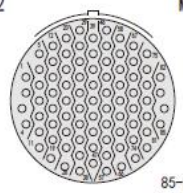
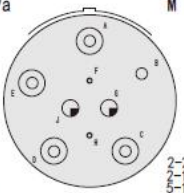
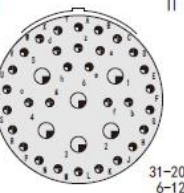
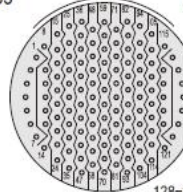
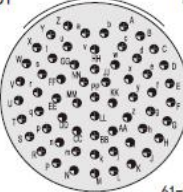
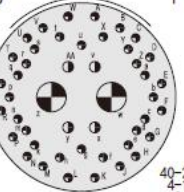
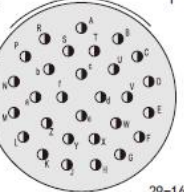
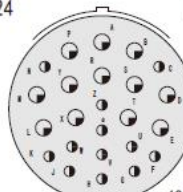

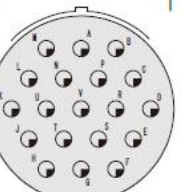

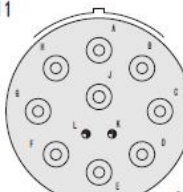
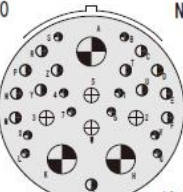
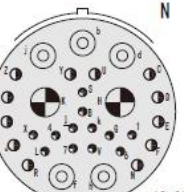
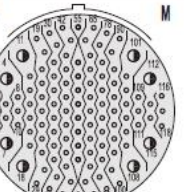
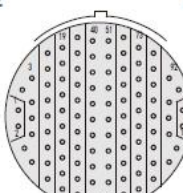
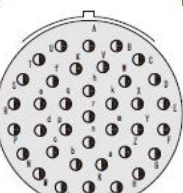
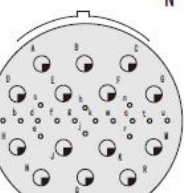
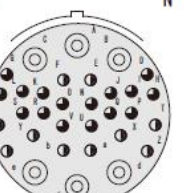
8:Key: N- normal key;A,B,C,D-Alternative

9.Soldering contact code:H-soldering contact

Contact Arrangement

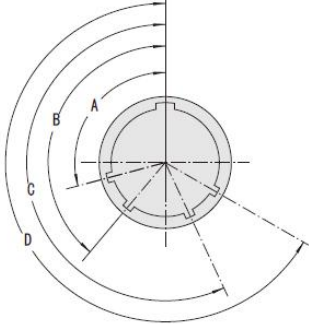
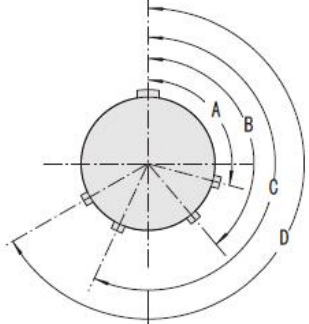
Housing size 09 (A)	35 M 6-22D	98 I 3-20#	02 I 2-20#	03 I 3-20#	10 I 1-12#	11 I 1-16#	
	35 M 13-22D	98 I 6-20#	05 I 5-20#	04 I 4-20#	01 I 1-12#	99 I 7-20#	02 I 2-16#
11 (B)	15 N 4-22D 1-12#						
	35 M 22-22D	98 I 10-20#	08 I 8-20#	04 I 4-16#	12 N 1-12# 11-22D	50 M 4-20# 1-10#	60 I 4-16# 2-20#
13 (C)	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#			

17 (E)	35 M 55-22D	26 I 26-20#	06 I 6-12#	08 II 8-16#	99 I 21-20# 2-16#	
	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)	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#				
	35 M 79-22D	41 I 41-20#	16 I 16-16#	39 I 37-20# 2-16#	11 II 11-12#	
21 (G)	27 I 27-20#	25 I 25-20#	24 I 24-20#	29 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#
	99 II  11-16#	2 M  85-22D	09a M  2-22D 2-12# 5-10#	37 II  31-20# 6-12#
	35 M  128-22D	61 I  61-20#	46 I  40-20# 4-16# 2-6#	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#	
25 (J)	11  2-20# 9-10#	20 N  10-20# 13-16# 1-12#Coaxial, 3-12#Shielding 3-6#Dual coaxial	31 N  12-20# 12-16# 5-10# 2-8#Dual coaxial	93 M  110-22D 8-16#
	2 M  100-22D	37 I  37-16#	30 N  16-22D 14-12#	32 N  16-20# 10-16# 6-10#



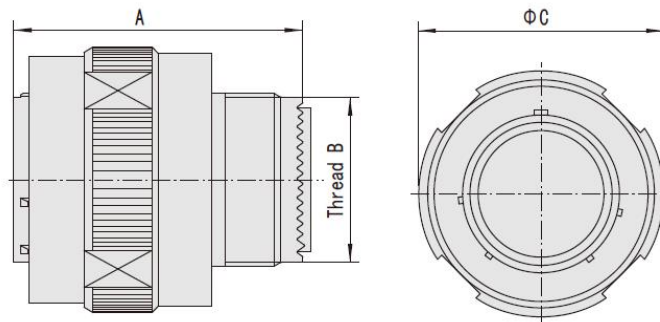
Polarization

			From view of receptacle		From view of plug				
									
Shell 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

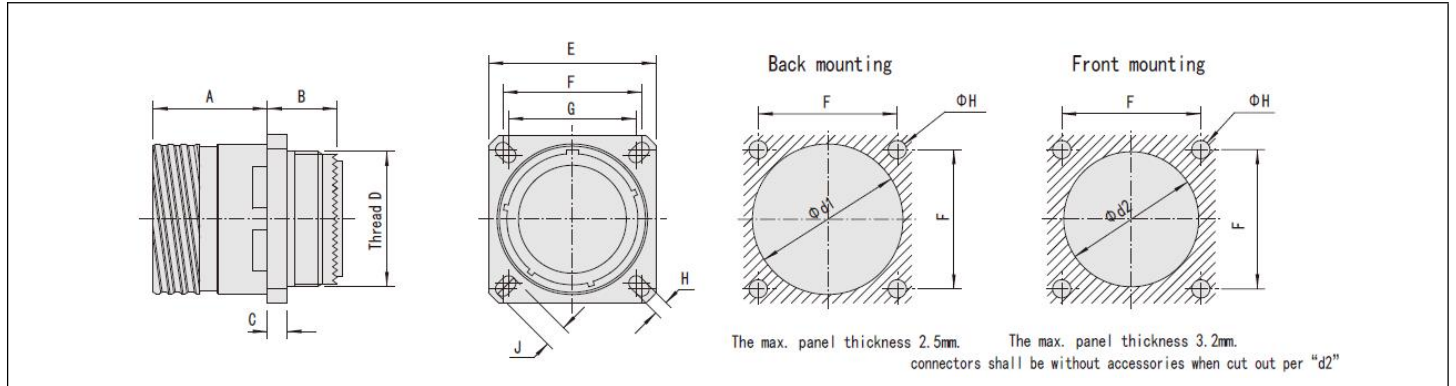
Plug



Shell size	MS Shell	A max	Thread B	C max
9	A	31.00	M12×1-6g	21.8
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

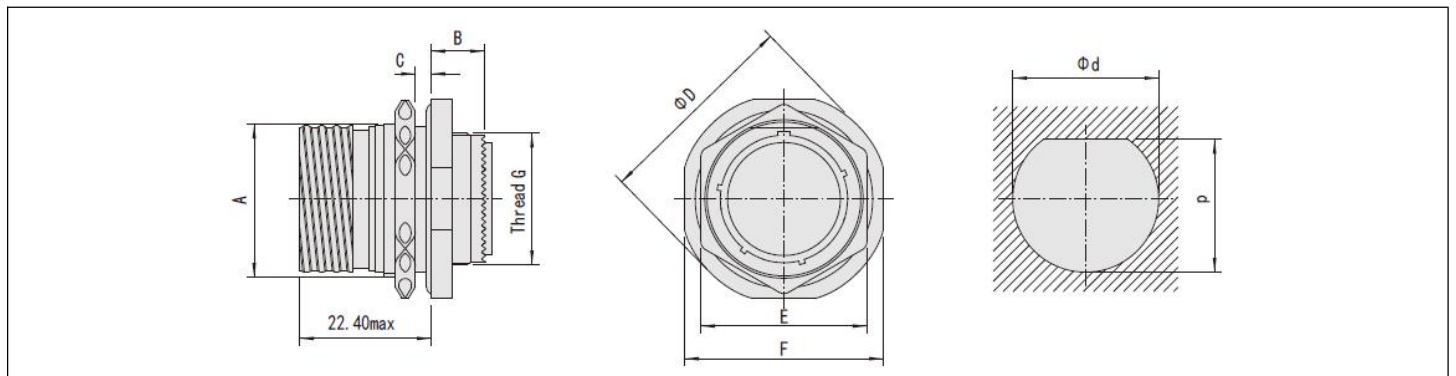
23	H	31.00	M34×1-6g	44.90
25	J	31.00	M37×1-6g	48.00

Square flange receptacle



Shell Size	MS Shell	A max	B max	C max	Thread D	E	F	G	H	J	d 1 min	d 2 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	4.93	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

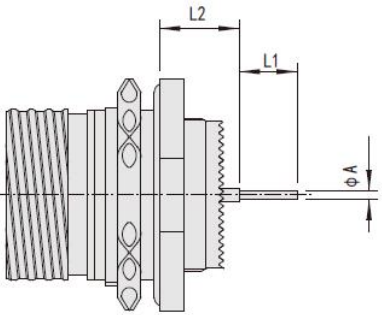
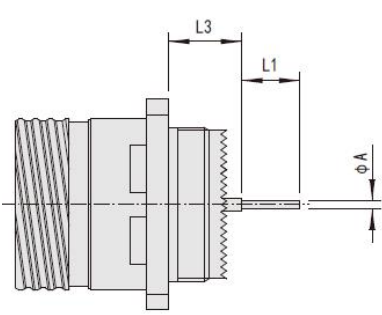
Jam nut receptacle



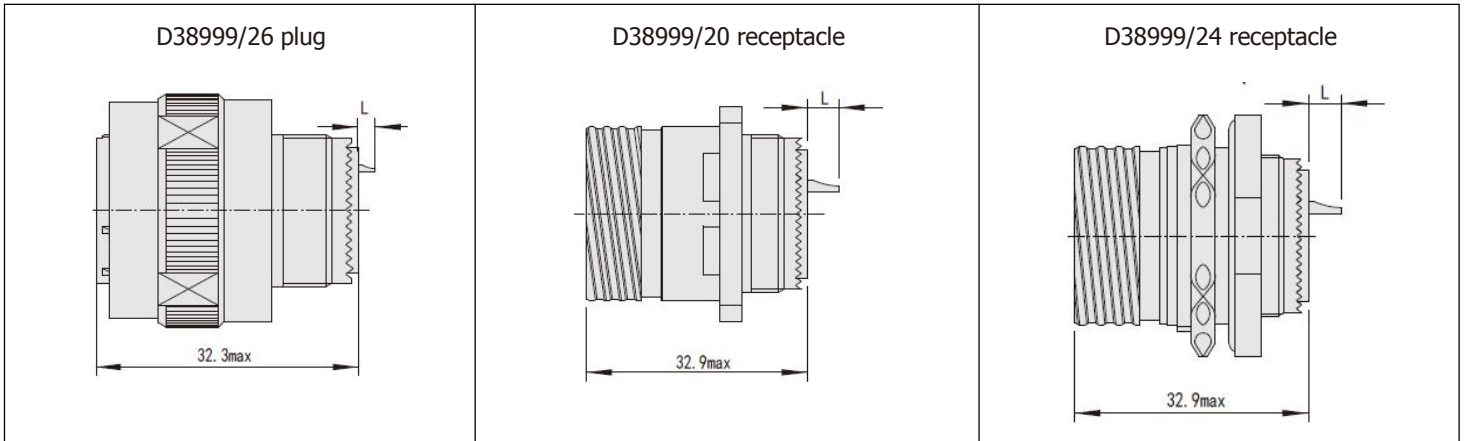
Shell size	Ms Shell	A	B max	C max	D max	E max	F	Thread G	d	P
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9	A	16.50	9.90	3.20	30.50	24.00	27.00	M12×1-6g	17.70	16.99
11	B	19.30	9.90	3.20	35.20	27.00	31.80	M15×1-6g	20.88	19.53
13	C	24.00	9.90	3.20	38.40	32.00	34.90	M18×1-6g	25.58	24.26
15	D	27.20	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

Receptacle with PCB contacts

D38999/24 receptacle		D38999/20 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		Shell size	
				09-11		12-15-17-19-21-23-25	
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	

Soldering products outline dimension



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

Standard Rear Accessories(MIL-C-85049)

How To Order

M85049/ 38- 15 N
 (1) (2) (3) (4)

(1)Basic series:M85049

(2)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

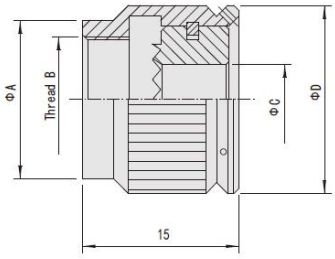
(3)Shell size:09,11,13,15,17,19,21,23,25

(4)Shell plating:W-olive green cadmium plating

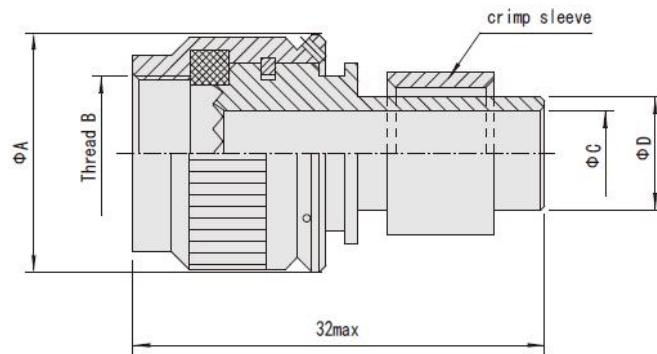
N-electroless nickel plating

S-stainless steel passive

Outline Dimensions

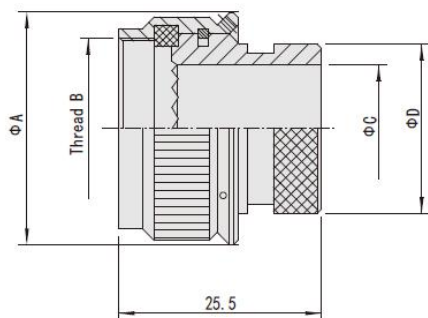
 <p>M85049/14- back nut</p>	Shell size	A	Thread B	C	D
		09	15.2	M12×1	7.9
	11	18.2	M15×1	10.8	22
	13	21.2	M18×1	13.6	25.1
	15	25.1	M22×1	16.9	29
	17	28.1	M25×1	20.1	32.1
	19	31.1	M28×1	22.1	35.1
	21	34.0	M31×1	25.2	38.1
	23	37.0	M34×1	28.3	41.1
	25	40.0	M37×1	31.6	44.1

M85049/20- shielding back accessory

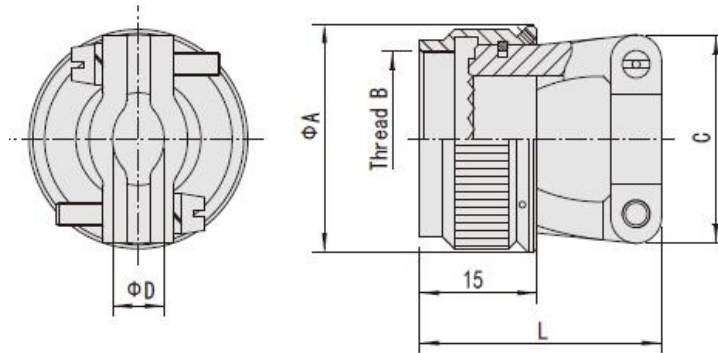


Shell size	A	Thread B	C	D	Compression block
09	19	M12×1	6.55	8.18	08
11	22	M15×1	8.63	12.65	10
13	25.1	M18×1	10.90	12.95	12
15	29	M22×1	14.10	16.00	14
17	32.1	M25×1	17.25	19.30	16
19	35.1	M28×1	20.40	22.61	18
21	38.1	M31×1	23.60	25.65	20
23	41.1	M34×1	26.40	28.70	22
25	44.1	M37×1	28.40	30.53	24

M85049/69- heat shrink sleeve back clamp	Shell 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	

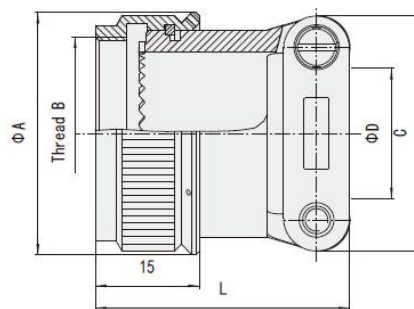


M85049/38- straight cable clamp



Shell size	A max	Thread B	C max	D min	D max	L max
09	19.0	M12×1	2.49	2.49	5.94	27.0
11	22.0	M15×1	3.87	3.87	5.94	28.5
13	25.1	M18×1	4.83	4.83	8.33	30.0
15	29.0	M22×1	6.60	6.60	11.61	31.5
17	32.1	M25×1	7.19	7.19	15.60	33.5
19	35.1	M28×1	8.26	8.26	16.10	36.6
21	38.1	M31×1	8.71	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

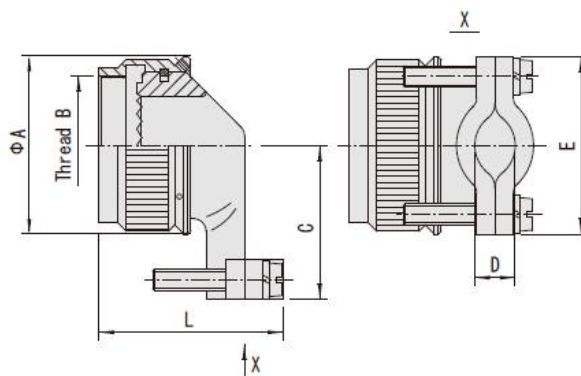
M85049/38H- soldering straight cable clamp



Shell 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

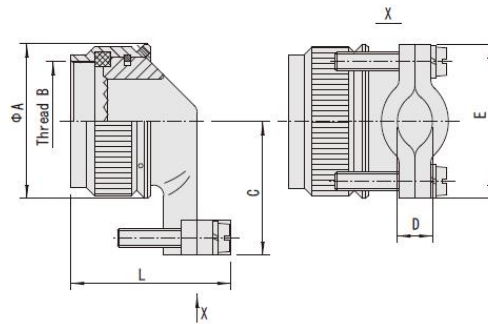
13	25.1	M18×1	23.4	4.83	8.33	30.0
15	29.0	M22×1	26.6	6.60	11.61	31.5
17	32.1	M25×1	30.6	7.19	15.60	33.5
19	35.1	M28×1	34.0	8.26	16.10	36.6
21	38.1	M31×1	35.8	8.71	17.73	39.8
23	41.1	M34×1	39.0	9.68	20.90	42.9
25	44.1	M37×1	40.6	10.62	21.66	45.0

M85049/39- right-angle cable clamp



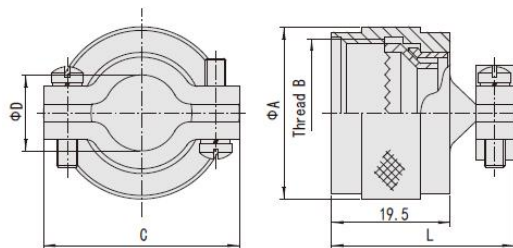
Shell size	A max	Thread B	C max	D		E max	L max
				min	max		
09	19.0	M12×1	20.60	2.49	5.94	21.6	29.5
11	22.0	M15×1	22.00	3.87	5.94	22.8	29.5
13	25.1	M18×1	23.60	4.83	8.33	26.0	31.9
15	29.0	M22×1	25.20	6.60	11.61	29.0	35.1
17	32.1	M25×1	26.80	7.19	15.60	30.6	39.1
19	35.1	M28×1	31.30	8.26	16.10	37.0	41.5
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

M85049/16- right-angle cable clamp



Shell 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	37	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

M85049/38-X X NB shielding clamping cable accessory



Accessory type	A	Thread B	C	D		L
				min	max	
M85049/38-09NB	16.4	M12×1	18.6	3.5	5.7	29.2
M85049/38-11NB	19.2	M15×1	20.6	5.0	7.9	29.2
M85049/38-13NB	23.0	M18×1	24.5	7.4	11.4	29.2
M85049/38-15NB	25.7	M22×1	26.0	9.0	12.9	29.8
M85049/38-17NB	29.0	M25×1	33.0	12.8	17.0	31.0

M85049/38-19NB	31.5	M28×1	36.3	13.2	17.9	32.0
M85049/38-21NB	34.7	M31×1	39.0	14.8	21.1	32.0
M85049/38-23NB	37.5	M34×1	41.4	16.4	24.3	32.0
M85049/38-25NB	41.0	M37×1	44.5	18.0	27.5	32.0

Protective caps for plug and receptacle

D38999/ 32 F 09 N
 (1) (2) (3) (4) (5)

(1) Basic series: D38999

(2) Type: 32-protective cap for plug

33-protective cap for receptacle

(3) Shell plating: W-olive green cadmium plating

F-electroless nickel plating

K-stainless steel passive

(4) Shell size: 09,11,13,15,17,19,21,23,25

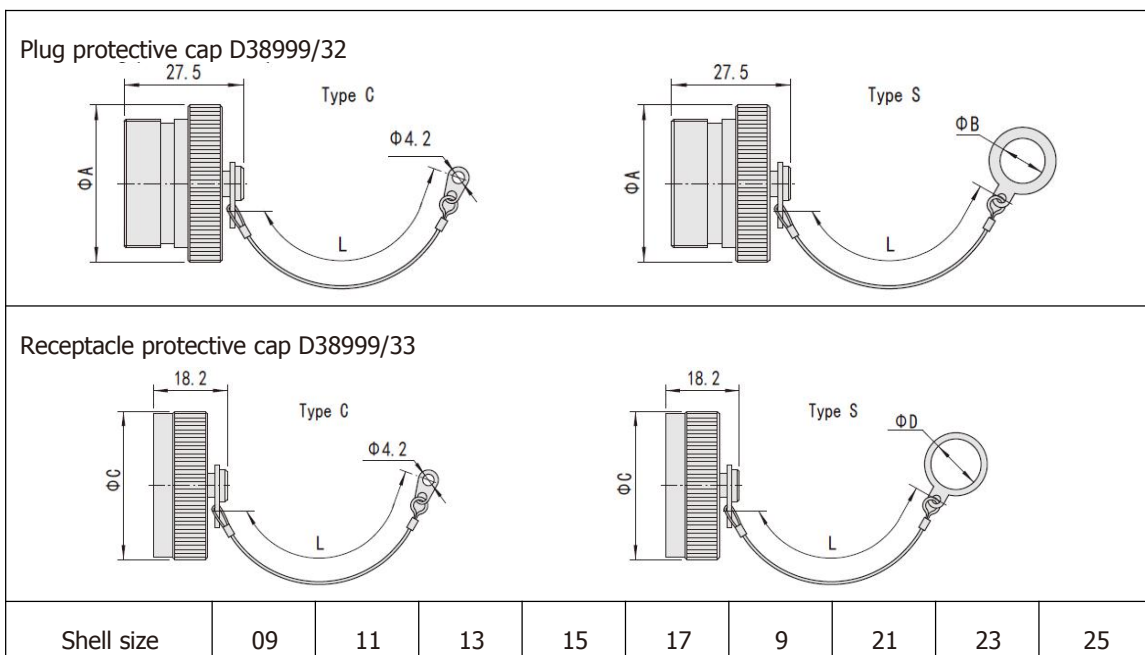
(5) Fixing type: R-stainless steel string with connecting plate

N-stainless steel chain with ring

C- nylon string with connecting plate

S- nylon string with ring

Outline Dimensions



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	27.00	127.00	127.00	127.00	127.00	127.00