

Amphenol® 97 Series Connectors with solder contacts



DESIGN CHARACTERISTICS

- Medium to heavy weight cylindrical
- Durable, field-proven design
- Single key/keyway polarization
- Threaded coupling, hard dielectric inserts
- Non-rotating contacts
- Operating temperatures from -55°C to $+125^{\circ}\text{C}$
- Cost effective
- Intermateable and intermountable with existing 97 Series and MIL-5015 connectors
- Underwriters Laboratories approved recognition File E115497
- Canadian Standards Association Certification File LR69183

CUSTOMER OPTIONS

- Solid or split shell construction
- Six shell styles
- 128 contact arrangements, from 1 to 52 circuits
- Alternate insert positioning
- High temperature and potting constructions
- Special plating finishes including black and green zinc alloy
- Optional gold plating on MS contacts
- Thermocouple arrangements available

Connector components are fabricated from high grade aluminum alloy, with a conductive cadmium plate finish and an olive drab chromate after-treatment. Some cable clamps are a zinc alloy with an olive drab/green chromate finish. See how to order page 19 for other finish variations.

Contacts are silver plated with pre-tinned solder cups. Optional gold over silver plating is also available. Inserts for solder style contacts are diallyl-phthalate.

Users should be aware that classes "A" and "B" of MIL-5015 have been cancelled, and these products are no longer qualified.

97 series solder type insert availability

Insert Number	Total Contacts	Mechanical Spacing		Service Rating	Contact Size				
		Inches	mm		0	4	8	12	16
8S-1+	1	1/16	1.57	INST.					1
10SL-3	3	1/16	1.57	A					3
10SL-4	2	1/16	1.57	A					2
12SL-844+*	4	1/16	1.57	A					4
12S-3	2	1/16	1.57	A					2
12-5+	1	1/8	3.18	D				1	
12S-6+*	2	1/16	1.57						2 Thermo-couple
14S-1†	3	1/16	1.57	A					3
14S-2	4			INST.					4
14S-4+†	1	1/8	3.18	D					1
14S-5	5			INST.					5
14S-6	6			INST.					6
14S-7	3	1/16	1.57	A					3
14S-9†	2	1/16	1.57	A					2
16S-1	7	1/16	1.57	A					7
16S-4+	2	1/8	3.18	D					2
16S-5	3	1/16	1.57	A					3
16S-6+†	3	1/16	1.57	A					3
16-7	3	1/16	1.57	A			1		2
16S-8	5	1/16	1.57	A					5
16-9	4	1/16	1.57	A				2	2
16-10	3	1/16	1.57	A				3	
16-11+†	2	1/16	1.57	A				2	
16-12	1	1/16	1.57	A		1			
16-13	2	1/16	1.57	A					2 Thermo-couple
18-1	10	1/16	1.57	A INST.					4 6
18-3†	2	1/8	3.18	D				2	
18-4	4	1/8	3.18	D					4
18-5+	3	1/8	3.18	D				2	1
18-8	8	1/16	1.57	A				1	7
18-9+	7			INST.				2	5
18-10†	4	1/16	1.57	A				4	
18-11	5	1/16	1.57	A				5	
18-12†	6	1.16	1.57	A					6
18-13	4	1/16	1.57	A			1	3	
18-16	1	5/16	7.92	C				1	
18-19†	10	1/16	1.57	A					10
18-20	5	1/16	1.57	A					5
18-22†	3	1/8	3.18	D					3
18-29+†	5	1/16	1.57	A					5
18-420*	1								1 Hi-Volt-age**
20-3†	3	1/8	3.18	D				3	

Insert Number	Total Contacts	Mechanical Spacing		Service Rating	Contact Size				
		Inches	mm		0	4	8	12	16
20-4	4	1/8	3.18	D				4	
20-6†	3	1/8	3.18	D					3
20-7	8	1/8	3.18	D					4
		1/16	1.57	A					4
20-8	6			INST.			2		4
20-11†	13			INST.					13
20-14	5	1/16	1.57	A			2	3	
20-15	7	1/16	1.57	A				7	
20-16	9	1/16	1.57	A				2	7
20-17	6	1/16	1.57	A				5	1
20-18	9	1/16	1.57	A				3	6
20-19†	3	1/16	1.57	A			3		
20-21	9	1/16	1.57	A				1	8
20-23	2	1/16	1.57	A			2		
20-24	4	1/16	1.57	A			2		2
20-27	14	1/16	1.57	A					14
20-29	17	1/16	1.57	A					17
20-33	11	1/16	1.57	A					11
22-1†	2	1/8	3.18	D			2		
22-2	3	1/8	3.18	D			3		
22-4†	4	1/16	1.57	A			2	2	
22-5	6	1/8	3.18	D			2	4	
22-8†	2	3/16	4.75	E				2	
22-9	3	3/16	4.75	E				3	
22-10	4	3/16	4.75	E					4
22-11	2	1/4	6.35	B					2
22-12	5	1/8	3.18	D			2		3
22-13†	5	1/8	3.18	D					1
		1/16	1.57	A				4	
22-14	19	1/16	1.57	A					19
22-15	6	3/16	4.75	E					1
		1/16	1.57	A				5	
22-16†	9	1/16	1.57	A				3	6
22-18	8	1/8	3.18	D					5
		1/16	1.57	A					3
22-19	14	1/16	1.57	A					14
22-20†	9	1/16	1.57	A					9
22-22	4	1/16	1.57	A			4		
22-23	8	1/8	3.18	D				1	
		1/16	1.57	A					7

Not all insert arrangements are currently available for environmental individual wire seal. Consult Amphenol, Sidney, NY for availability.

† Inactive for new military design, but available for replacement or for non-military purposes.

* "MS" number not assigned. Use "97" prefix in place of "MS" in completing catalog number. See how to order, page 19.

** Hi-Voltage = 17KVAC/24KVDC

‡ Molded-in pin (MIP) insert requires (910) deviation. See how to order, pg. 19.

97 series solder type insert availability, cont.

Insert Number	Total Contacts	Mechanical Spacing		Service Rating	Contact Size				
		Inches	mm		0	4	8	12	16
22-26*	7	1/8	3.18				2	5	
22-27	9	1/8	3.18	D			1		
		1/16	1.57	A				8	
22-28†	7	1/16	1.57	A			7		
22-34	5	1/8	3.18	D			3	2	
24-2	7	1/8	3.18	D			7		
24-5†	16	1/16	1.57	A				16	
24-6	8	1/8	3.18	D			3		
		1/16	1.57	A			5		
24-7	16	1/16	1.57	A			2	14	
24-9†	2	1/16	1.57	A	2				
24-10	7	1/16	1.57	A		7			
24-11	9	1/16	1.57	A		3	6		
24-12	5	1/16	1.57	A	2		3		
24-16	7	1/8	3.18	D		1		3	
		1/16	1.57	A			3		
24-19†	12	1/16	1.57					12	
24-20*	11	1/8	3.18	D			2	9	
24-21	10	1/8	3.18	D		1		9	
24-22*	4	1/8	3.18	D		4			
24-27	7	3/16	4.75	E				7	
24-28	24	1/16	1.57	INST.					24
28-1	9	1/8	3.18	D		1	2		
		1/16	1.57	A		2	4		
28-2	14	1/8	3.18	D			2	12	
28-3	3	3/16	4.75	E		3			
28-6†	3	1/8	3.18	D	3				
28-8	12	1/16	1.57	A				9	
		1/8	3.18	D				1	
		3/16	4.75	E			2		
28-9	12	1/8	3.18	D			6	6	
28-10	7	1/8	3.18	D			1		
		1/16	1.57	A	2	2	2		
28-11	22	1/16	1.57	A			4	18	
28-12	26	1/16	1.57	A				26	
28-15†	35	1/16	1.57	A				35	
28-16†	20	1/16	1.57	A				20	
28-17	15	1/4	6.35	B				1	
		1/8	3.18	D				3	
		1/16	1.57	A				11	
28-18	12	5/16	7.92	C				1	
		1/8	3.18	D				5	
		1/16	1.57	A				2	
				INST.				4	
28-19	10	1/4	6.35	B				2	
		1/8	3.18	D				2	
		1/16	1.57	A			4	2	

Insert Number	Total Contacts	Mechanical Spacing		Service Rating	Contact Size				
		Inches	mm		0	4	8	12	16
28-20	14	1/16	1.57	A				10	4
28-21	37	1/16	1.57	A					37
32-5†	2	1/8	3.18	D	2				
32-6	23	1/16	1.57	A		2	3	2	16
32-7	35	1/16	1.57	A				7	24
				INST.					4
32-8†	30	1/16	1.57	A				6	24
32-13	23	1/8	3.18	D				5	18
32-17	4	1/8	3.18	D		4			
32-414	52	1/16	1.57	A					52
36-1†	22	1/8	3.18	D				4	18
36-5	4	1/16	1.57	A	4				
36-6	6	1/16	1.57	A	2	4			
36-7	47	1/16	1.57	A				7	40
36-8	47	1/16	1.57	A				1	46
36-9	31	1/16	1.57	A		1	2	14	14
36-10	48	1/16	1.57	A					48
36-15	35	1/16	1.57	A					34
		1/8	3.18	D					1
36-403*	52	1/16	1.57	A					52

Not all insert arrangements are currently available for environmental individual wire seal. Consult Amphenol, Sidney, NY for availability.

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* "MS" number not assigned. Use "97" prefix in place of "MS" in completing catalog number. See how to order, page 19.

♦ Molded-in pin (MIP) insert requires (910) deviation. See how to order, pg. 19.

97 series solder type insert arrangements

Front view of pin insert or rear of socket insert illustrated.

Items highlighted are most popular and most readily available.

1 Contact

Insert Arrangement	8S-1	12-5	14S-4†	16-12	18-16	18-420*
Contacts	1#16	1#12	1#16	1#4	1#12	1#12
Service Rating	INST.	D	D	A	C	High Voltage 17KVAC/24KVDC

2 Contacts

Insert Arrangement	10SL-4	12S-3	12S-6*	14S-9†	16S-4	16-11†	16-13
Contacts	2#16	2#16	2#16 Thermocouple	2#16	2#16	2#12	2#12
Service Rating	A	A		A	D	A	A

Insert Arrangement	18-3†	20-23†	22-1†	22-8†	22-11	24-9†	32-5†
Contacts	2#12	2#8	2#8	2#12	2#16	2#4	2#0
Service Rating	D	A	D	E	B	A	D

3 Contacts

Insert Arrangement	10SL-3	14S-1†	14S-7	16S-5†	16S-6†	16-7	16-10	18-22†
Contacts	3#16	3#16	3#16	3#16	3#16	1#8, 2#16	3#12	3#16
Service Rating	A	A	A	A	A	A	A	D

Insert Arrangement	20-3†	20-6†	20-19†	22-2	22-9	28-3	28-6†
Contacts	3#12	3#16	3#8	3#8	3#12	3#8	3#4
Service Rating	D	D	A	D	E	E	D

97 series solder type insert arrangements, cont.

Front view of pin insert or rear of socket insert illustrated.

Items highlighted are most popular and most readily available.

4 Contacts

Insert Arrangement	12SL-844*	14S-2†	16-9	18-4	18-10†	18-13	20-4
Contacts	4#16	4#16	2#12, 2#16	4#16	4#12	3#12, 1#8	4#12
Service Rating	1/16" spacing	INST.	A	D	A	A	D
Insert Arrangement	20-24	22-4†	22-10	22-22	24-22	32-17	36-5
Contacts	2#8, 2#16	2#8, 2#12	4#16	4#8	4#8	4#4	4#0
Service Rating	A	A	E	A	D	D	A

5 Contacts

Insert Arrangement	14S-5	16S-8	18-11	18-20†	18-29†	20-14
Contacts	5#16	5#16	5#12	5#16	5#16	3#12, 2#8
Service Rating	INST.	A	A	A	A	A
Insert Arrangement	22-12	22-13†	22-34†	24-12		
Contacts	2#8, 3#16	1#16, 4#12	3#12, 2#16	2#4, 3#12		
Service Rating	D	E = D; A, B, C, D = A	D	A		

MIL-SPEC SERVICE RATING

		INST.	A	D	E	B	C
Limiting Operating	DC	250	700	1250	1750	2450	4200
Voltages at Sea Level	AC (rms)	200	500	900	1250	1750	3000

See notes 1 and 2 under TEST CURRENT.

INST. service normally for low voltage and currents.

Effective Creepage (nominal)	Inch	1/16	1/8	3/16	1/4	5/16	1
	mm	1.57	3.18	4.75	6.35	7.92	25.40
Mechanical Spacing (nominal)	Inch	1/16	1/8	3/16	1/4	5/16	
	mm	1.57	3.18	4.75	6.35	7.92	

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TEST CURRENT

Contact Size	16	12	8	4	0
Amperes	13	23	46	80	150

NOTE 1: Transients were not considered in calculating these values.

NOTE 2: Limiting operating voltages at 50,000 feet altitude are approximately 25% of the sea level values.

CONTACT LEGEND

16	12	8	4	0	16	12	16 12
				IRON		CONSTANTAN	

97 series solder type insert arrangements, cont.

Front view of pin insert or rear of socket insert illustrated.

Items highlighted are most popular and most readily available.

6 Contacts

Insert Arrangement	14S-6	18-12†	20-8	20-17	22-5	22-15	36-6
Contacts	6#16	6#16	4#16, 2#8	5#12, 1#16	2#12, 4#16	5#12, 1#16	2#0, 4#4
Service Rating	INST.	A	INST.	A	D	D = E; A, B, C, E, F = A	A

7 Contacts

Insert Arrangement	16S-1	18-9	20-15	22-26*	22-28†
Contacts	7#16	5#16, 2#12	7#12	2#12, 5#16	7#12
Service Rating	A	INST.	A	1/8" spacing	A

Insert Arrangement	24-2	24-10	24-16	24-27	28-10
Contacts	7#12	7#8	3#16, 1#8, 3#12	7#16	3#12, 2#8, 2#4
Service Rating	D	A	A, B, F, G = D; C, D, E = A	E	G = D; all others = A

8 Contacts

Insert Arrangement	18-8	20-7	22-18	22-23	24-6
Contacts	1#12, 7#16	8#16	8#16	8#12	8#12
Service Rating	A	A, B, H, G = D; C, D, E, F = A	A, B, H, F, G = D; all others = A	H = D; all others = A	A, G, H = D; all others = A

97 series solder type insert arrangements, cont.

Front view of pin insert or rear of socket insert illustrated.

Items highlighted are most popular and most readily available.

9 Contacts

Insert Arrangement	20-16	20-18	20-21	22-16†	22-20†
Contacts	7#16, 2#12	3#12, 6#16	1#12, 8#16	3#12, 6#16	9#16
Service Rating	A	A	A	A	A
Insert Arrangement	22-27	24-11	28-1		
Contacts	1#8, 8#16	3#8, 6#12	3#8, 6#12		
Service Rating	J = D; all others = A	A	A, J, E = D; all others = A		

10 Contacts

Insert Arrangement	18-1	18-19	24-21	28-19
Contacts	10#16	10#16	1#8, 9#16	4#12, 6#16
Service Rating	B, C, F, G = A; all others = INST.	A	D	H, M = B; A, B = D; all others = A

11 Contacts

Insert Arrangement	20-33	24-20
Contacts	11#16	2#12, 9#16
Service Rating	A	D

12 Contacts

Insert Arrangement	24-19†	28-8	28-9	28-18
Contacts	12#16	2#12, 10#16	6#12, 6#16	12#16
Service Rating	1/16" spacing	L, M = E; B = D; all others = A	D	M = C; A, B = A C, D, E, F = INST.; all others = D

13 Contacts

Insert Arrangement	20-11†
Contacts	13#16
Service Rating	INST.

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See Service Rating and Test Current information on page 7.

CONTACT LEGEND

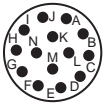
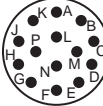
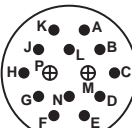
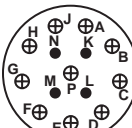
16	12	8	4	0

97 series solder type insert arrangements, cont.

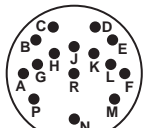
Front view of pin insert or rear of socket insert illustrated.

Items highlighted are most popular and most readily available.

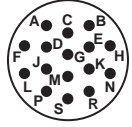
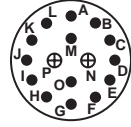
14 Contacts

				
Insert Arrangement	20-27	22-19	28-2	28-20
Contacts	14#16	14#16	2#12, 12#16	10#12, 4#16
Service Rating	A	A	D	A


15 Contacts

	
Insert Arrangement	28-17
Contacts	15#16
Service Rating	R = B; M, N, P = D; all others = A

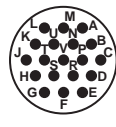
16 Contacts

		
Insert Arrangement	24-5†	24-7
Contacts	16#16	2#12, 14#16
Service Rating	A	A

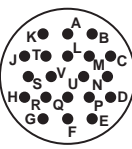
17 Contacts

	
Insert Arrangement	20-29
Contacts	17#16
Service Rating	A

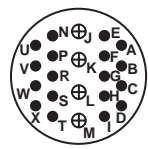
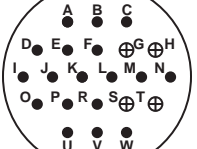
19 Contacts

	
Insert Arrangement	22-14
Contacts	19#16
Service Rating	A

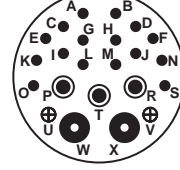
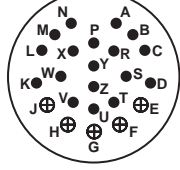
20 Contacts

	
Insert Arrangement	28-16†
Contacts	20#16
Service Rating	A


22 Contacts

		
Insert Arrangement	28-11	36-1†
Contacts	4#12, 18#16	4#12, 18#16
Service Rating	A	D


23 Contacts

		
Insert Arrangement	32-6	32-13
Contacts	2#4, 3#8, 2#12, 16#16	5#12, 18#16
Service Rating	A	D

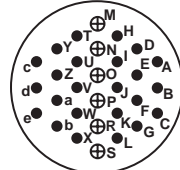
24 Contacts

	
Insert Arrangement	24-28
Contacts	24#16
Service Rating	INST.

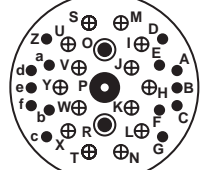
26 Contacts

	
Insert Arrangement	28-12
Contacts	26#16
Service Rating	A

30 Contacts

	
Insert Arrangement	32-8†
Contacts	6#12, 24#16
Service Rating	A

31 Contacts

	
Insert Arrangement	36-9
Contacts	1#4, 2#8, 14#12, 14#16
Service Rating	A

97 series solder type insert arrangements, cont.

Front view of pin insert or rear of socket insert illustrated.

Items highlighted are most popular and most readily available.

35 Contacts

Insert Arrangement	28-15†	32-7	36-15
Contacts	35#16	7#12, 28#16	35#16
Service Rating	A	A, B, h, j = INST; all others = A	m = D; all others = A

37 Contacts

Insert Arrangement	28-21
Contacts	37#16
Service Rating	A

47 Contacts

Insert Arrangement	36-7	36-8
Contacts	7#12, 40#16	1#12, 46#16
Service Rating	A	A

48 Contacts

Insert Arrangement	36-10
Contacts	48#16
Service Rating	A

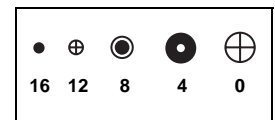
52 Contacts

Insert Arrangement	32-414*	36-403*
Contacts	52#16	52#16
Service Rating	A	A

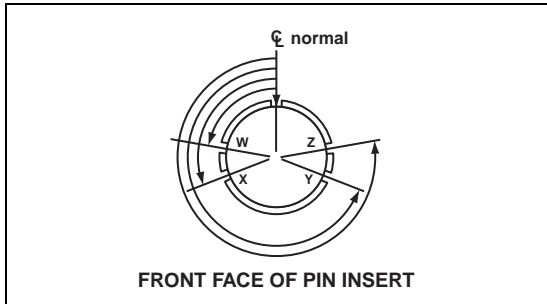
† Inactive for new military design, but available for replacement or for non-military purposes.

* "MS" number not assigned. Use "97" prefix in place of "MS" in completing catalog number. See how to order, page 19.
See Service Rating and Test Current information on page 7.

CONTACT LEGEND



97 series solder type alternate insert positioning



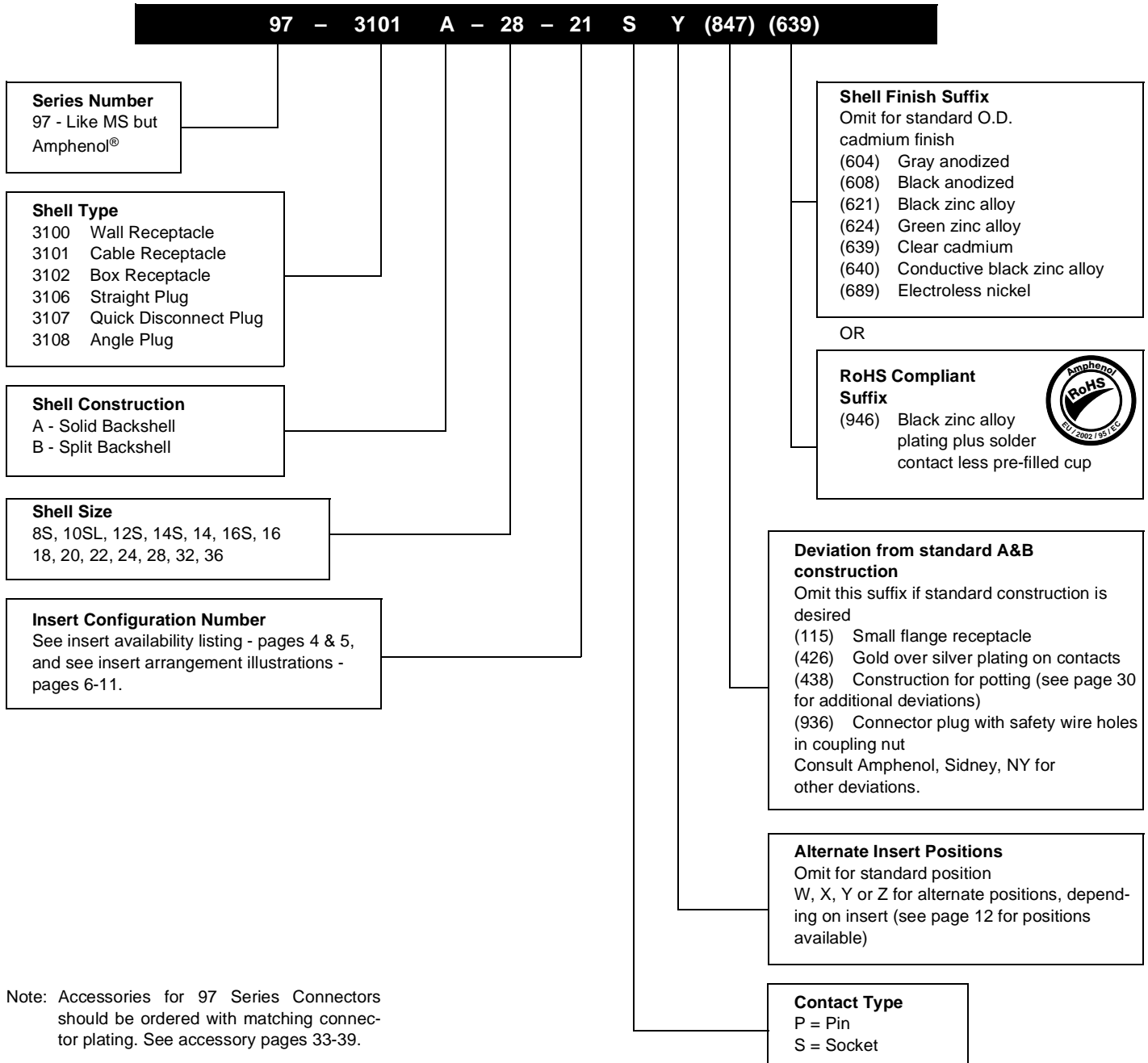
Insert Arrangement	Degrees			
	W	X	Y	Z
12S-3	70	145	215	290
14S-2	—	120	240	—
14S-5	—	110	—	—
14S-7	90	180	270	—
14S-9	70	145	215	290
16S-1	80	—	—	280
16S-4	35	110	250	325
16S-5	70	145	215	290
16S-6	90	180	270	—
16-7	80	110	250	280
16S-8	—	170	265	—
16-9	35	110	250	325
16-10	90	180	270	—
16-11	35	110	250	325
16-13	35	110	250	325
18-1	70	145	215	290
18-3	35	110	250	325
18-4	35	110	250	325
18-5	80	110	250	280
18-8	70	—	—	290
18-9	80	110	250	280
18-10	—	120	240	—
18-11	—	170	265	—
18-12	80	—	—	280
18-13	80	110	250	280
18-19	—	120	240	—
18-20	90	180	270	—
18-22	70	145	215	290
18-29	90	180	270	—
20-3	70	145	215	290
20-4	45	110	250	—
20-6	70	145	215	290
20-7	80	110	250	280
20-8	80	110	250	280
20-14	80	110	250	280
20-15	80	—	—	280
20-16	80	110	250	280
20-17	90	180	270	—
20-18	35	110	250	325
20-19	90	180	270	—
20-21	35	110	250	325
20-23	35	110	250	325
20-24	35	110	250	325
20-27	35	110	250	325
20-29	80	—	—	280

Insert Arrangement	Degrees			
	W	X	Y	Z
22-1	35	110	250	325
22-2	70	145	215	290
22-4	35	110	250	325
22-5	35	110	250	325
22-8	35	110	250	325
22-9	70	145	215	290
22-10	35	110	250	325
22-11	35	110	250	325
22-12	80	110	250	280
22-13	35	110	250	325
22-14	80	110	250	280
22-15	80	110	250	280
22-16	80	110	250	280
22-18	80	110	250	280
22-19	80	110	250	280
22-20	35	110	250	325
22-22	—	110	250	—
22-23	35	—	250	—
22-27	80	—	250	280
22-28	80	—	—	280
22-34	80	110	250	280
24-2	80	—	—	280
24-5	80	110	250	280
24-6	80	110	250	280
24-7	80	110	250	280
24-9	35	110	250	325
24-10	80	—	—	280
24-11	35	110	250	325
24-12	80	110	250	280
24-16	80	110	250	280
24-20	80	110	250	280
24-21	80	110	250	280
24-22	45	110	250	—
24-27	80	—	—	280
24-28	80	110	250	280
28-1	80	110	250	280
28-2	35	110	250	325
28-3	70	145	215	290
28-6	70	145	215	290
28-8	80	110	250	280
28-9	80	110	250	280
28-10	80	110	250	280
28-11	80	110	250	280
28-12	90	180	270	—
28-15	80	110	250	280
28-16	80	110	250	280
28-17	80	110	250	280
28-18	70	145	215	290
28-19	80	110	250	280
28-20	80	110	250	280
28-21	80	110	250	280
32-5	35	110	250	325
32-6	80	110	250	280
32-7	80	125	235	280
32-8	80	125	235	280
32-13	80	110	250	280
32-17	45	110	250	—
32-414*	80*	110*	250*	280*
36-1	80	110	250	280
36-5	—	120	240	—
36-6	35	110	250	325
36-7	80	110	250	280
36-8	80	110	250	280
36-9	80	125	235	280
36-10	80	125	235	280
36-15	60	125	245	305

*Rotates opposite above illustration.

97 series solder type how to order

Example of part number for solder type connectors is given below.



Note: Accessories for 97 Series Connectors should be ordered with matching connector plating. See accessory pages 33-39.