

# Amphenol® 97 Series Connectors

provide the interconnection solution for low cost, general duty applications

Amphenol offers the 97 Series Connector Family - A general duty standard cylindrical connector, MIL-5015 style.

The 97 Series is a widely used connector series for the automotive, robotics, machine tool and welding industries, as well as numerous other commercial applications from heavy equipment to ECG monitoring cables.

Shell components are fabricated from high grade aluminum alloy to provide strength and environmental protection. This family of connectors offers a wide variety of shell styles, contact patterns and accessory options.

The Amphenol® 97 Series design features and benefits:

- **Low cost, general duty non-environmental**
- **Environmental capability with the 417 suffix plus 9767 cable clamp (see page 34)**
- **Solder or crimp termination**
- **UL Recognized, CSA Recognized**
- **Wide selection of shell styles and insert patterns**
- **Wide selection of connector finishes - cadmium or non-cadmium (environmentally friendly zinc alloy)**
- **Threaded coupling, hard dielectric inserts**
- **Solid or split shell construction**
- **Accessories for both individual wire seal and jacketed cable**



**RoHS COMPLIANT PRODUCT AVAILABLE** – Consult Amphenol Industrial Operations.



# Amphenol® 97 Series Connectors with rear release crimp contacts



## DESIGN CHARACTERISTICS

- Rugged metal shell
- Conductive finish
- Stamped & formed crimp contacts
- Closed entry socket contacts
- Plastic retention
- Utilizes standard 97 Series hardware
- 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

- Positive self-centering of contacts; pins bent up to 20° will pick up
- Reduced user cost due to high speed termination
- Less equipment down-time due to fatigue failure at wire contact junction or handling damage
- Greater contact to contact insulation, lighter weight, higher reliability
- No costly re-design or rework necessary on existing equipment
- Complete flexibility through multi-source product availability

The Amphenol 97-410X connector design incorporates Poke Home® Rear Release contacts. The 97 Series Rear Release line is intermateable and intermountable with existing 97 Series and MIL-5015 type shell styles in both plugs and receptacles. The connectors utilize 97 Series bright cadmium plated shells and standard insert configurations.

The connector is designed to be used with stamped and formed type crimp contacts. Contact design (size 16 only) incorporates insulation crimp support for greater strength at wire termination end. Contacts are available on reel assemblies for use with the high speed Amphenol strip-er crimper capable of crimping 1500 contacts per hour. Hand crimp tools and bulk packaged contacts are also available.

Standard hardware available for the 97 Series connector can be used with the 97 Series crimp contact rear release line. Accessories should be ordered with the appropriate deviation number to match the bright cadmium connector finish. See how to order, page 27, for 97 Series connectors with crimp contacts.

# 97 series crimp type specifications, insert availability, alternate insert positioning

## Specifications

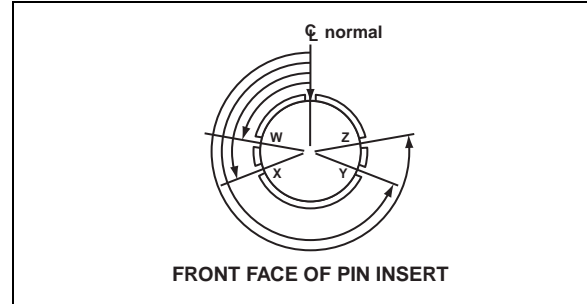
Standard shell finish - clear chromate over cadmium plate (optional plating available, see how to order page 27).

Inserts - molded of a 94V-O Underwriters Laboratory rated material.

Contacts - copper alloy formed, silver plated (gold plating is also available, see how to order page 28).

Wire sizes - 12 AWG through 30 AWG.

All constructions perform satisfactorily from -55°C to +125°C (-67°F to +257°F).



## Insert Availability

Insert Number	Total Contacts	Mechanical Spacing		Service Rating	Contact Size	
		Inches	mm		12	16
10SL-3	3	1/16	1.57	A		3
10SL-4	2	1/16	1.57	A		2
12S-3	2	1/16	1.57	A		2
14S-1	3	1/16	1.57	A		3
14S-2	4			INST.		4
14S-5	5			INST.		5
14S-7	3	1/16	1.57	A		3
16S-1	7	1/16	1.57	A		7
16S-8	5	1/16	1.57	A		5
18-1	10	1/16	1.57	A		4
				INST.		6
18-4	4	1/8	3.18	D		4
18-11	5	1/16	1.57	A	5	
18-12	6	1/16	1.57	A		6
18-19	10	1/16	1.57	A		10
18-20	5	1/16	1.57	A		5
20-4	4	1/8	3.18	D	4	
20-7	8	1/8	3.18	D		4
		1/16	1.57	A		4
20-27	14	1/16	1.57	A		14
20-29	17	1/16	1.57	A		17
22-14	19	1/16	1.57	A		19
24-2	7	1/8	3.18	D	7	
28-11	22	1/16	1.57	A	4	18
28-12	26	1/16	1.57	A		26
28-20	14	1/16	1.57	A	10	4
28-21	37	1/16	1.57	A		37
32-414	52	1/16	1.57	A		52
36-10	48	1/16	1.57	A		48

## Alternate Insert Positioning

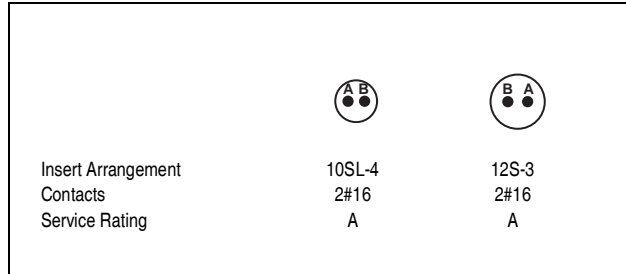
Insert Arrangement	Degrees			
	W	X	Y	Z
12S-3	70	145	215	290
14S-2	-	120	240	-
14S-5	-	110	-	-
14S-7	90	180	270	-
16S-1	80	-	-	280
16S-8	-	170	265	-
18-1	70	145	215	290
18-4	35	110	250	325
18-11	-	170	265	-
18-12	80	-	-	280
18-19	-	120	240	-
18-20	90	180	270	-
20-4	45	110	250	-
20-7	80	110	250	280
20-27	35	110	250	325
20-29	80	-	-	280
22-14	80	-	-	280
24-2	80	-	-	280
28-9	80	110	250	280
28-11	80	110	250	280
28-12	90	180	270	-
28-20	80	110	250	280
28-21	80	110	250	280
32-8	80	125	235	280
32-414*	80*	110*	250*	280*
36-10	80	125	235	280

\* Rotates opposite above illustration.

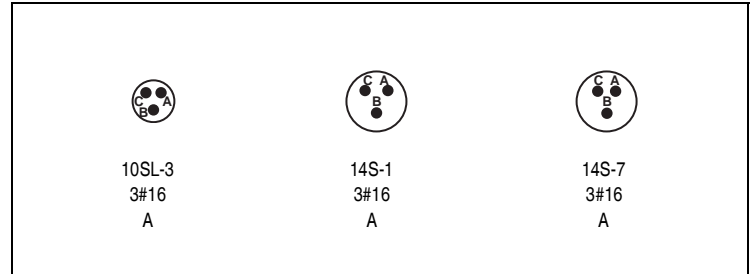
# 97 series crimp type insert arrangements

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

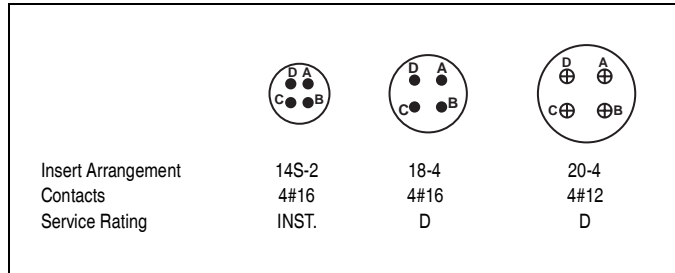
## 2 Contacts



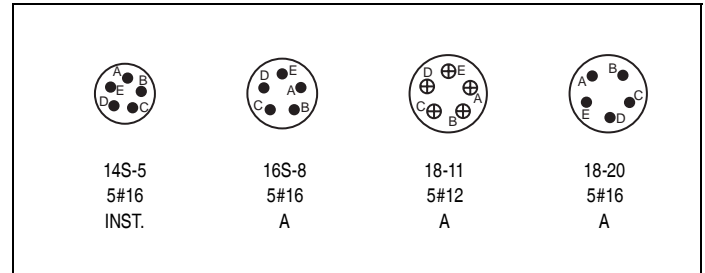
## 3 Contacts



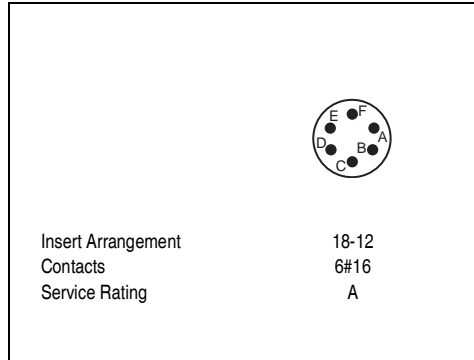
## 4 Contacts



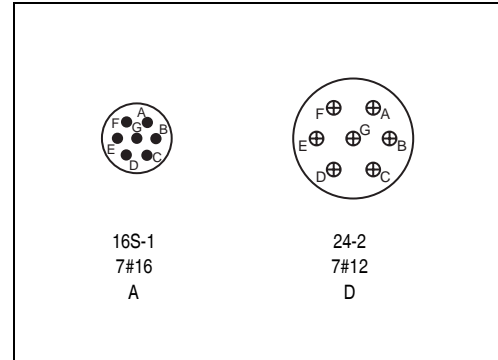
## 5 Contacts



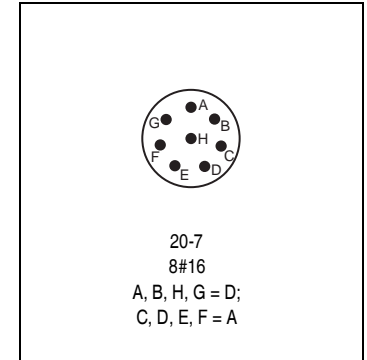
## 6 Contacts



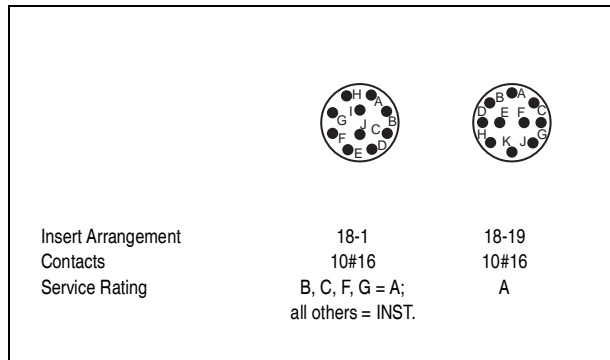
## 7 Contacts



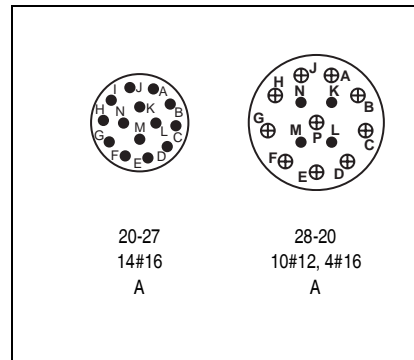
## 8 Contacts



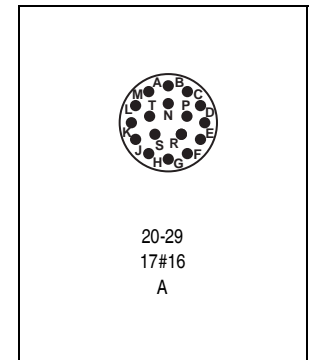
## 10 Contacts



## 14 Contacts



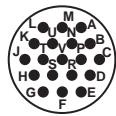
## 17 Contacts



# 97 series crimp type insert arrangements, cont.


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

## 19 Contacts



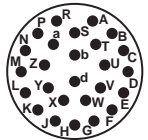
Insert Arrangement      22-14  
 Contacts                    19#16  
 Service Rating            A

## 22 Contacts



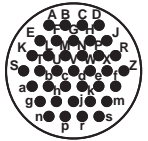
22-11  
 4#12, 18#16  
 A

## 26 Contacts



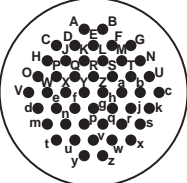
28-12  
 26#16  
 A

## 37 Contacts



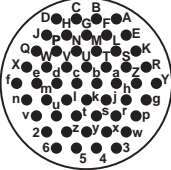
Insert Arrangement      28-21  
 Contacts                    37#16  
 Service Rating            A

## 48 Contacts



36-10  
 48#16  
 A

## 52 Contacts



32-414  
 52#16  
 A

### CONTACT LEGEND

●	⊕
16	12

### Current Ratings

Wire Size	12	14	16	18	20	22	26	28	30
Amperes	23	17	13	10	7.5	5	2	1.5	1.0

NOTE: Design specifications subject to change.  
 Consult Amphenol, Sidney, NY for the latest specifications  
 and UL and CSA recognition.

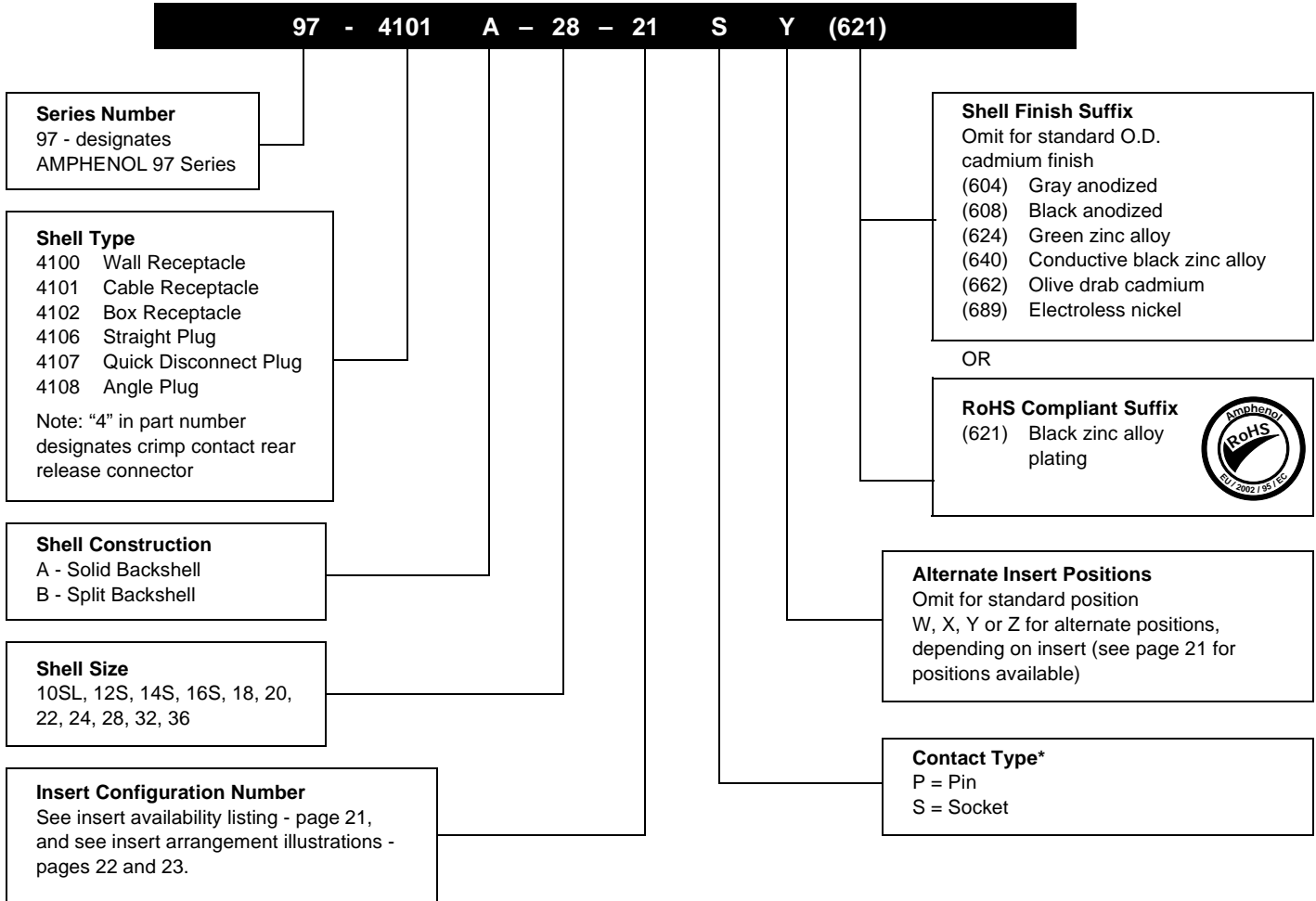
### Service Rating

Service Rating	Recommended Operating Voltage* at Sea Level	
	DC	AC (RMS)
INST.	250	200
A	700	500
D	1250	900

\* The values listed represent operating values which include a generous safety factor.

# 97 series crimp type how to order

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



\* Contacts are not supplied with connectors, and must be ordered separately. See following pages for contact information.

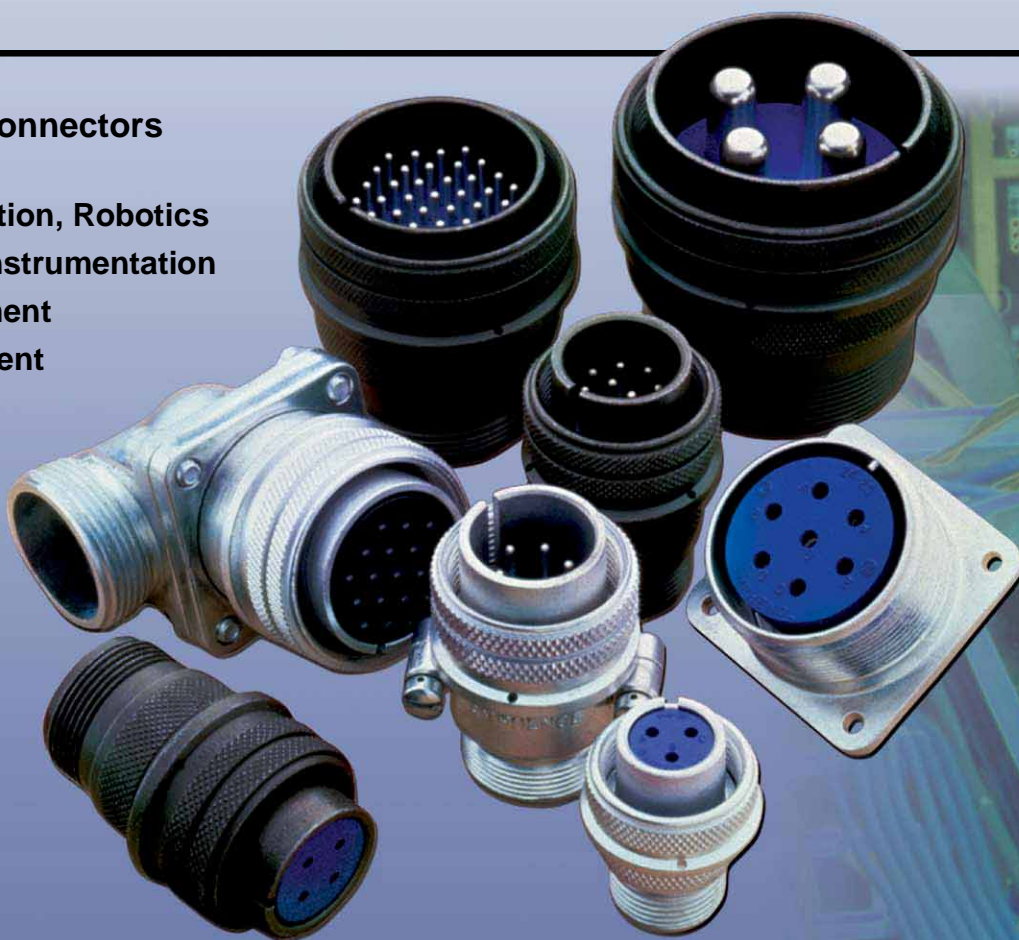
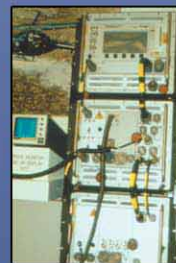
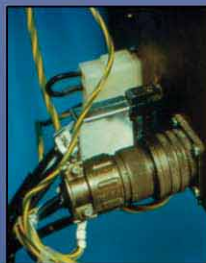
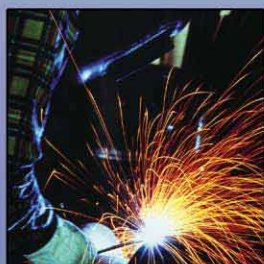
Note:  
Accessories for 97 Series Connectors should be ordered with matching connector plating. See accessory pages 33-39.

# Amphenol® 97 Series Standard Cylindrical Connector

12-022-15

**MIL-5015 Style Connectors  
widely used for:**

- Factory Automation, Robotics
- Machine Tool, Instrumentation
- Welding Equipment
- Medical Equipment



Amphenol® 97 Series Connectors are  
UL recognized and CSA recognized.

# Amphenol

# Amphenol Industrial 97 Series

## **97 Series Industrial Cylindrical Connectors**

Amphenol's 97 Series is the lowest cost, cylindrical interconnect solution utilizing the proven 5015 family connector style. 97 Series offers: six shell options, solid and split, 128 different contact arrangements, 1 to 52 circuits, one of the largest selections of insert patterns on the connector market, crimp, solder, thermocouple and PCB (100 suffix) contacts, all which makes 97 Series one of the most versatile of Amphenol's connector with utilization in many markets.



## Applications

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>▪ <b>Machine Tool/Factory Automation</b><ul style="list-style-type: none"><li>○ Power and Cutting Tools</li><li>○ Instrumentation Distribution</li><li>○ Control Panels</li><li>○ CNC Milling Machines</li></ul></li><li>▪ <b>Welding Equipment</b><ul style="list-style-type: none"><li>○ Station, Robotic and Portable</li><li>○ Factory Construction</li><li>○ Garage Welders</li><li>○ Auxiliary Equipment<ul style="list-style-type: none"><li>▪ Spool Guns</li><li>▪ Wire Feeders</li></ul></li></ul></li><li>▪ <b>Motors</b><ul style="list-style-type: none"><li>○ Servo Motors</li><li>○ Motion Control</li><li>○ Power Motors</li><li>○ Stepper Motors</li><li>○ Encoders</li></ul></li><li>▪ <b>Mining Equipment</b><ul style="list-style-type: none"><li>○ Mining Shovels</li><li>○ Seismic Sensing Equipment</li><li>○ Seismic Geophones</li></ul></li><li>▪ <b>Robotics</b><ul style="list-style-type: none"><li>○ Power and Multi Axis Control Equipment</li><li>○ Factory Automation</li></ul></li></ul> | <ul style="list-style-type: none"><li>▪ <b>Semiconductor Equipment</b><ul style="list-style-type: none"><li>○ Automated Assembly and Test Equipment</li><li>○ Equipment Specifically for CEM Assembly</li><li>○ Semiconductor Test Equipment Mfg'ers</li></ul></li><li>▪ <b>Off Road Vehicles</b><ul style="list-style-type: none"><li>○ Concrete Road Building</li><li>○ Precision Farm Monitoring Equipment</li><li>○ GPS in Heavy Duty Trucks</li></ul></li><li>▪ <b>Test &amp; Measurement</b><ul style="list-style-type: none"><li>○ Temperature Chambers</li><li>○ Vibration Controllers and Shakers</li><li>○ RF Amplifiers</li><li>○ Power Supplies</li></ul></li><li>▪ <b>Medical Equipment</b><ul style="list-style-type: none"><li>○ Medical X-Ray/Ultrasound Equipment</li><li>○ Blood Analyses</li><li>○ Medical Coaches/Vehicles</li><li>○ ECG Monitoring Cables</li></ul></li><li>▪ <b>Motion Sensors</b><ul style="list-style-type: none"><li>○ Bar Code Scanners</li><li>○ Flame Sensors</li><li>○ Temperature Controls</li></ul></li></ul> |
|--|--|

## Key Benefits

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>▪ <b>Keyway Polarization</b><ul style="list-style-type: none"><li>○ Prevents incorrect mating</li></ul></li><li>▪ <b>Inserts easily removed from shell</b><ul style="list-style-type: none"><li>○ Minimizes repair time thus saving money</li></ul></li><li>▪ <b>Non-Rotating Contacts</b><ul style="list-style-type: none"><li>○ Increases productivity by ease of soldering</li></ul></li><li>▪ <b>Solder, Crimp, Thermocouple and PCB contacts</b><ul style="list-style-type: none"><li>○ Provides wide range of connector solutions</li></ul></li><li>▪ <b>Multiple Wire Gauges: 0 to 30 AWG</b><ul style="list-style-type: none"><li>○ Flexibility in Design</li></ul></li><li>▪ <b>Pre-filled Solder Cup</b><ul style="list-style-type: none"><li>○ Increase productivity by reducing preparation work.</li></ul></li></ul> | <ul style="list-style-type: none"><li>▪ <b>Multiple finishes including RoHS compliant</b><ul style="list-style-type: none"><li>○ O.D. Cadmium, <b>Black Zinc Cobalt</b>, Clear Cadmium, <b>Electroless Nickel</b> and more offer large variety of environmental finishes for any application.</li></ul></li><li>▪ <b>Alternative Insert Rotations</b><ul style="list-style-type: none"><li>○ Increase design options within shell size.</li></ul></li><li>▪ <b>Hard Plastic (Diallyl-Phthalate) Inserts</b><ul style="list-style-type: none"><li>○ Resists breakage and extends connector life.</li></ul></li><li>▪ <b>Many Connector Accessories</b><ul style="list-style-type: none"><li>○ Cable clamps</li><li>○ Gaskets and Protection Caps</li><li>○ Cap and Chain Assemblies</li></ul></li></ul> |
|---|--|

## Electrical Features

Current Rating	13 to 150 Amperage	Contact Size	30 AWG to 0 AWG
Operating Temperature	-55°C to +125°C	UL and CSA Approval	E115497 & LR69183
Voltage Rating	200 VAC to 3000 VAC 250 DAC to 4200 VDC	Durability	500 mating cycles 10,000 cycles with <b>Radsok®</b> contacts



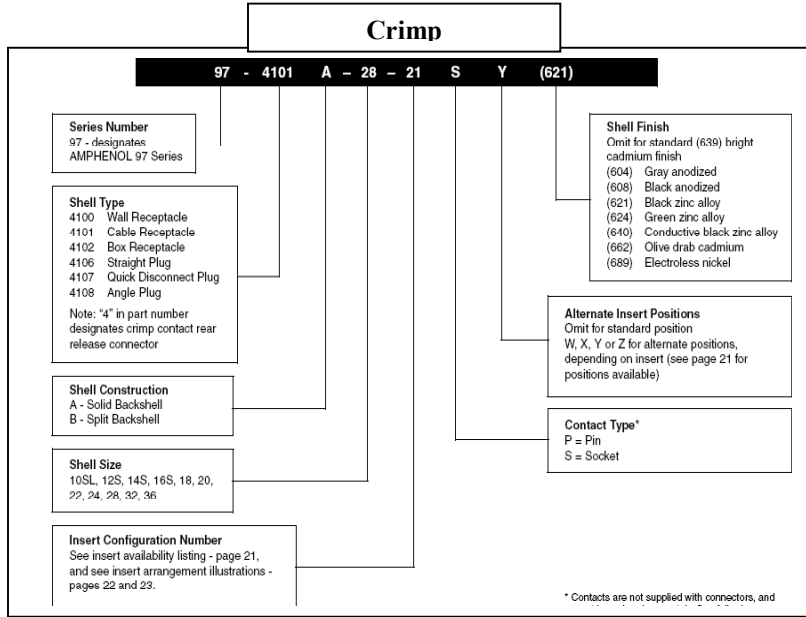
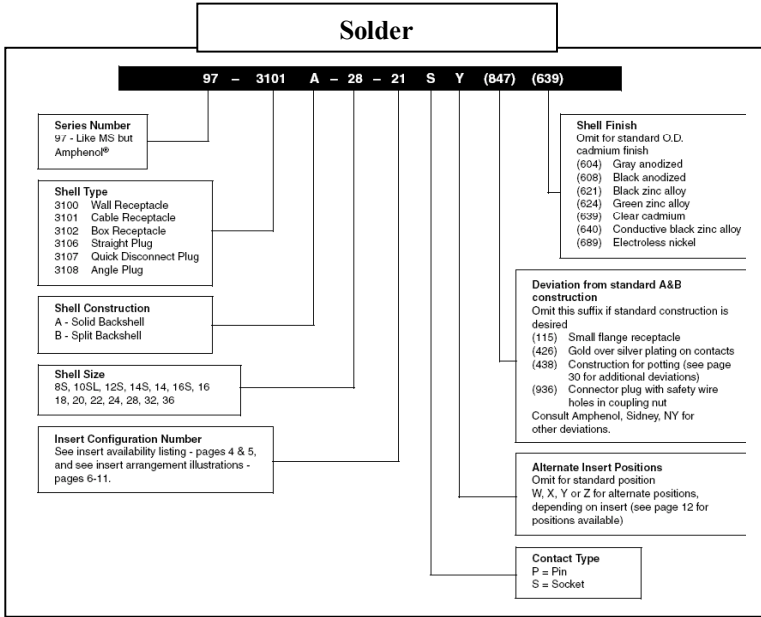
# 97 Series RoHS Compliant

Amphenol Industrial is **RoHS** compliant - 1 year before the European Union directive! Existing products that do not meet these requirements can easily be changed to meet these environmental guidelines through simple modifications.

ROHS Compliant Mod Code	
(431) Solder Contacts less pre filled solder cup	
(621) Black Zinc Cobalt connector plating	
(689) Electroless Nickel connector plating	

Part Number Identification	
Non-ROHS Solder P/N	97-3106A14S-6P
ROHS Solder P/N	97-3106A14S-6P (431)(621)
Non-ROHS Crimp P/N	97-4106A14S-6P
ROHS Crimp P/N	97-4106A14S-6P (621)

## How to build a part number

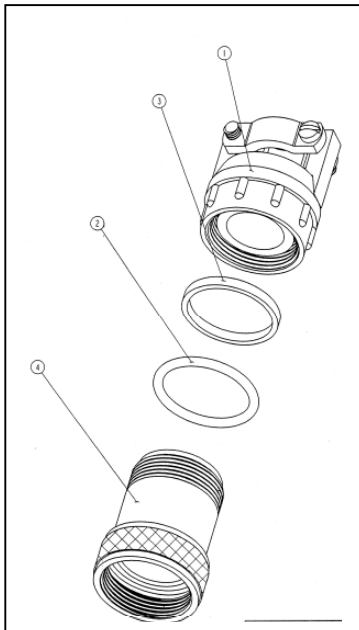


## Breaking 97 Series part numbers down to component level

Example:

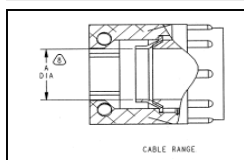
	Top Level Part	Shell	Insert
Solder P/N	97-3106A-18-1S becomes 97-3101A-28-21SY(639)	97-3106A-18(850) 97-3101A-28(639)	97-18-1S 97-28-21S
Crimp Part	97-4106A-20-27P(639) 97-4101A-28-21SY(621)	97-3106A-20(639)(850) 97-3101A-28(621)(850)	97-420-27P 97-428-21S

## 97 Series Environmental Adapter Kit 97-283-XX



POS	QTY	PART NUMBER	DESCRIPTION	NOTE
4	1	SEE NOTE 1	ADAPTER, LONG	
3	1		WASHER, SEALING, PLUG SHELL	(7)
2	1		GASKET, ADAPTER, SEALING	(5)
1	1		BACKSHELL	

- DIAMETER INDICATED IS THE MINIMUM FREE INSIDE DIAMETER OF EITHER THE CABLE CLAMP OR GLAND AND DETERMINES THE MAXIMUM ACCEPTABLE CABLE DIAMETER.
- INDICATED ITEM USED WITH 97-3106E, 97-3107E, 97-4106E, AND 97-4107E ASSEMBLIES ONLY.
- ADD APPLICABLE DEVIATION FOR DESIRED PLATING:  
DEVIATION PLATING:  
--- OLIVE DRAB CADMIUM  
(604) GREY ANODIZE  
(608) BLACK ANODIZE  
(621) BLACK ZINC ALLOY  
(624) GREEN ZINC ALLOY  
(639) CLEAR CADMIUM  
(676) BRIGHT NICKEL  
(689) ELECTROLESS NICKEL
- INDICATED ITEM TO BE INSTALLED INTO ADAPTER (10-61705-XXX) OF 97-3106A-XX (850).
- IDENTIFY PACKAGE WITH APPLICABLE 97- PART NUMBER.
- PACKAGE PER PRODUCTION PROCESS SHEET.
- SEE WORK ORDER FOR PERMISSIBLE ADDITIONAL OR ALTERNATE STAMPING.
- SEE SEPARATE PARTS LIST FOR COMPONENT PART NUMBERS AND QUANTITIES.



Amphenol Part Number	Size	A DIA	
		Free	Closed
97-283-10SL (XXX)	10SL	.302	.094
97-283- 12 (XXX)	12S & 12	.302	.094
97-283- 14 (XXX)	14S & 14	.428	.230
97-283- 16 (XXX)	16S & 16	.515	.316
97-283- 18 (XXX)	18	.614	.378
97-283- 28 (XXX)	20	.738	.445
97-283- 22 (XXX)	22	.738	.445
97-283- 28 (XXX)	24	.926	.611
97-283- 32 (XXX)	32	1.20	.922
97-283- 36 (XXX)	36	1.363	.922

Assembly Instruction Sheet for Environmental 97E Connectors is L-2089