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


97-4100A


97-4107A


97-4101A


97-4107B


97-4102A


97-4108A


97-4106A


97-4108B


97-4106B

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 stripper 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

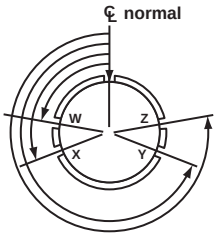
Standard shell finish - clear chromate over cadmium plate (optional plating available, see how to order page 27).

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).



FRONT FACE OF PIN INSERT

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.

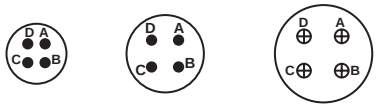
2 Contacts

Insert Arrangement	10SL-4	12S-3
Contacts	2#16	2#16
Service Rating	A	A

3 Contacts

Insert Arrangement	10SL-3	14S-1	14S-7
Contacts	3#16	3#16	3#16
Service Rating	A	A	A

4 Contacts



Insert Arrangement	14S-2	18-4	20-4
Contacts	4#16	4#16	4#12
Service Rating	INST.	D	D

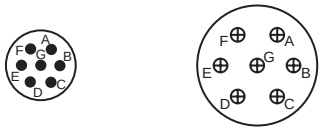
5 Contacts

Insert Arrangement	14S-5	16S-8	18-11	18-20
Contacts	5#16	5#16	5#12	5#16
Service Rating	INST.	A	A	A

6 Contacts

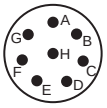
Insert Arrangement	18-12
Contacts	6#16
Service Rating	A

7 Contacts



Insert Arrangement	16S-1	24-2
Contacts	7#16	7#12
Service Rating	A	D

8 Contacts

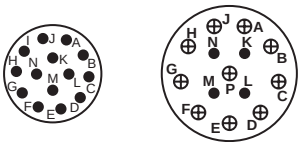


Insert Arrangement	20-7
Contacts	8#16
Service Rating	A, B, H, G = D; C, D, E, F = A

10 Contacts

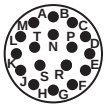
Insert Arrangement	18-1	18-19
Contacts	10#16	10#16
Service Rating	B, C, F, G = A; all others = INST.	A

14 Contacts



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

17 Contacts

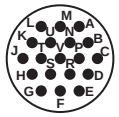


Insert Arrangement	20-29
Contacts	17#16
Service Rating	A

97 series crimp type
insert arrangements, cont.

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

19 Contacts

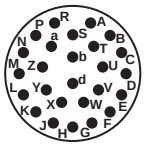


Insert Arrangement	22-14
Contacts	19#16
Service Rating	A

22 Contacts

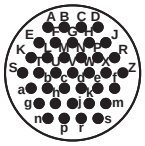
28-11	
4#12, 18#16	
A	

26 Contacts



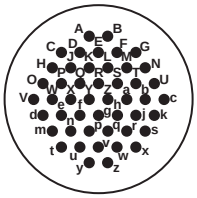
28-12	
26#16	
A	

37 Contacts



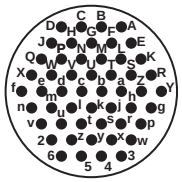
Insert Arrangement	28-21
Contacts	37#16
Service Rating	A

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.

97 - 4101 A – 28 – 21 S Y (621)

Series Number
97 - designates
AMPHENOL 97 Series

Shell Type
4100 Wall Receptacle
4101 Cable Receptacle
4102 Box Receptacle
4106 Straight Plug
4107 Quick Disconnect Plug
4108 Angle Plug

Note: “4” in part number designates crimp contact rear release connector

Shell Construction
A - Solid Backshell
B - Split Backshell

Shell Size
10SL, 12S, 14S, 16S, 18, 20, 22, 24, 28, 32, 36

Insert Configuration Number
See insert availability listing - page 21, and see insert arrangement illustrations - pages 22 and 23.

Shell Finish Suffix
Omit for standard O.D. cadmium finish
(604) Gray anodized
(608) Black anodized
(624) Green zinc alloy
(640) Conductive black zinc alloy
(662) Olive drab cadmium
(689) Electroless nickel

OR

RoHS Compliant Suffix
(621) Black zinc alloy plating

Alternate Insert Positions
Omit for standard position
W, X, Y or Z for alternate positions, depending on insert (see page 21 for positions available)

Contact Type*
P = Pin
S = Socket

* 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.

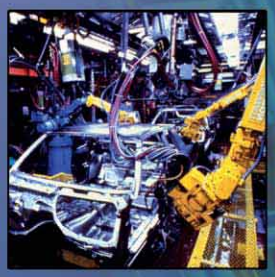
Amphenol® 97 Series Standard Cylindrical Connector

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

- **Machine Tool/Factory Automation**
  - Power and Cutting Tools
  - Instrumentation Distribution
  - Control Panels
  - CNC Milling Machines
- **Welding Equipment**
  - Station, Robotic and Portable
  - Factory Construction
  - Garage Welders
  - Auxiliary Equipment
    - Spool Guns
    - Wire Feeders
- **Motors**
  - Servo Motors
  - Motion Control
  - Power Motors
  - Stepper Motors
  - Encoders
- **Mining Equipment**
  - Mining Shovels
  - Seismic Sensing Equipment
  - Seismic Geophones
- **Robotics**
  - Power and Multi Axis Control Equipment
  - Factory Automation
- **Semiconductor Equipment**
  - Automated Assembly and Test Equipment
  - Equipment Specifically for CEM Assembly
  - Semiconductor Test Equipment Mfg'ers
- **Off Road Vehicles**
  - Concrete Road Building
  - Precision Farm Monitoring Equipment
  - GPS in Heavy Duty Trucks
- **Test & Measurement**
  - Temperature Chambers
  - Vibration Controllers and Shakers
  - RF Amplifiers
  - Power Supplies
- **Medical Equipment**
  - Medical X-Ray/Ultrasound Equipment
  - Blood Analyses
  - Medical Coaches/Vehicles
  - ECG Monitoring Cables
- **Motion Sensors**
  - Bar Code Scanners
  - Flame Sensors
  - Temperature Controls

Key Benefits

- **Keyway Polarization**
  - Prevents incorrect mating
- **Inserts easily removed from shell**
  - Minimizes repair time thus saving money
- **Non-Rotating Contacts**
  - Increases productivity by ease of soldering
- **Solder, Crimp, Thermocouple and PCB contacts**
  - Provides wide range of connector solutions
- **Multiple Wire Gauges: 0 to 30 AWG**
  - Flexibility in Design
- **Pre-filled Solder Cup**
  - Increase productivity by reducing preparation work.
- **Multiple finishes including RoHS compliant**
  - O.D. Cadmium, Black Zinc Cobalt, Clear Cadmium, Electroless Nickel and more offer large variety of environmental finishes for any application.
- **Alternative Insert Rotations**
  - Increase design options within shell size.
- **Hard Plastic (Diallyl-Phthalate) Inserts**
  - Resists breakage and extends connector life.
- **Many Connector Accessories**
  - Cable clamps
  - Gaskets and Protection Caps
  - Cap and Chain Assemblies

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 **Radsok®** 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

Solder

97 – 3101 A – 28 – 21 S Y (847) (639)

Series Number
97 - Like MS but Amphenol®

Shell Type
3100 Wall Receptacle
3101 Cable Receptacle
3102 Box Receptacle
3106 Straight Plug
3107 Quick Disconnect Plug
3108 Angle Plug

Shell Construction
A - Solid Backshell
B - Split Backshell

Shell Size
8S, 10SL, 12S, 14S, 14, 16S, 16 18, 20, 22, 24, 28, 32, 36

Insert Configuration Number
See insert availability listing - pages 4 & 5, and see insert arrangement illustrations - pages 6-11.

Shell Finish
Omit for standard O.D. cadmium finish
(604) Gray anodized
(608) Black anodized
(621) Black zinc alloy
(624) Green zinc alloy
(639) Clear cadmium
(640) Conductive black zinc alloy
(689) Electroless nickel

Deviation from standard A&B construction
Omit this suffix if standard construction is desired
(115) Small flange receptacle
(426) Gold over silver plating on contacts
(438) Construction for potting (see page 30 for additional deviations)
(936) Connector plug with safety wire holes in coupling nut
Consult Amphenol, Sidney, NY for other deviations.

Alternate Insert Positions
Omit for standard position
W, X, Y or Z for alternate positions, depending on insert (see page 12 for positions available)

Contact Type
P = Pin
S = Socket

Crimp

97 - 4101 A – 28 – 21 S Y (621)

Series Number
97 - designates AMPHENOL 97 Series

Shell Type
4100 Wall Receptacle
4101 Cable Receptacle
4102 Box Receptacle
4106 Straight Plug
4107 Quick Disconnect Plug
4108 Angle Plug
Note: "4" in part number designates crimp contact rear release connector

Shell Construction
A - Solid Backshell
B - Split Backshell

Shell Size
10SL, 12S, 14S, 16S, 18, 20, 22, 24, 28, 32, 36

Insert Configuration Number
See insert availability listing - page 21, and see insert arrangement illustrations - pages 22 and 23.

Shell Finish
Omit for standard (639) bright cadmium finish
(604) Gray anodized
(608) Black anodized
(621) Black zinc alloy
(624) Green zinc alloy
(640) Conductive black zinc alloy
(662) Olive drab cadmium
(689) Electroless nickel

Alternate Insert Positions
Omit for standard position
W, X, Y or Z for alternate positions, depending on insert (see page 21 for positions available)

Contact Type*
P = Pin
S = Socket

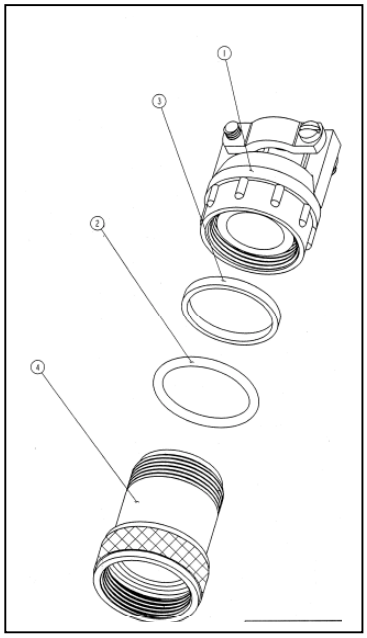
* Contacts are not supplied with connectors, and

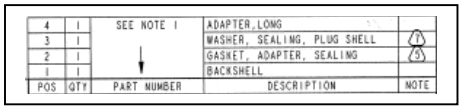
Breaking 97 Series part numbers down to component level

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





8. DIAMETER INDICATED IS THE MINIMUM FREE INSIDE DIAMETER OF EITHER THE CABLE CLAMP OR GLAND AND DETERMINES THE MAXIMUM ACCEPTABLE CABLE DIAMETER.

7. INDICATED ITEM USED WITH 97-3106E, 97-3107E, 97-4106E, AND 97-4107E ASSEMBLIES ONLY.

6. 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

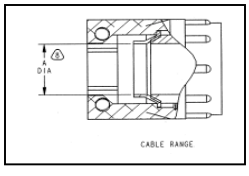
5. INDICATED ITEM TO BE INSTALLED INTO ADAPTER (10-617705-XXX) OF 97-3106A-XX (850).

4. IDENTIFY PACKAGE WITH APPLICABLE 97- PART NUMBER.

3. PACKAGE PER PRODUCTION PROCESS SHEET.

2. SEE WORK ORDER FOR PERMISSIBLE ADDITIONAL OR ALTERNATE STAMPING.

1. SEE SEPARATE PARTS LIST FOR COMPONENT PART NUMBERS AND QUANTITIES.



Amphenol Part Number	Size	A DIA Free	A DIA 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