



TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

Insulator:	Glass-filled polyester, UL 94V-0, blue color.
Contacts:	Precision-machined copper alloy with gold flash over nickel, or 0.76 microns [0.000030 inch] gold over nickel, or 1.27 microns [0.000050 inch] gold over nickel. Solder-coated terminations optional.
Cable Adapter:	Thermoplastic and metallized plastic.
Mounting Screws:	Steel, zinc plated.
Jackscrews:	Stainless steel, passivated. Knobs are aluminum with black anodized coating.
Push-on Fastener:	Spring-temper copper alloy, tin plated.
Mounting Plate:	Steel with zinc plate.

ELECTRICAL CHARACTERISTICS:

Contact Current Rating:	
Size 12 Contact:	40 amperes, continuous
Size 16 Contact:	20 amperes, continuous.
Size 20 Contact:	5 amperes
	Temperature Rise Curves per IEC 512-3, Test 5a. See page 31 of this catalog for performance curves.
Initial Contact Resistance per IEC 512-2, Test 2b.:	
Size 12 Contact:	0.001 ohms, maximum.
Size 16 Contact:	0.0016 ohms, maximum.
Size 20 Contact:	0.007 ohms
Insulator Resistance:	5 G ohms per IEC 512-2, Test 3a.
Voltage Proof:	2000 V rms per IEC 512-2, Test 4a, Method C.
Hot Pluggable (50 Couplings per U.L. 1977, Paragraph 15):	
Size 12 Contact:	250 VAC at 25 amperes.
Primary Circuit Contact Positions:	12-2, 12-5, 12-9, 12-11, 12-14, and 12-18.
Secondary Circuit Contact Positions:	12-1, 12-3, 12-4, 12-6, 12-7, 12-8, 12-10, 12-12, 12-13, 12-15, 12-16, and 12-17.
Creepage Distances:	Consult Technical Sales for information about your specific connector choice.
Clearance Distance:	Consult Technical Sales for information about your specific connector choice.
Working Voltage:	Consult Technical Sales for information about your specific connector choice.

MECHANICAL CHARACTERISTICS:

Blind Mating System:	Male and female connector bodies provide "lead-in" for 7.62 mm [0.300 inch] diametral misalignment.
Polarization:	Provided by connector body design.
Removable Contacts:	Insert contact in rear face of insulator; release from front face of insulator. Female contacts feature "Closed Entry" design.
Removable Contact Retention in Connector Body:	
Size 12 Contact:	67N [15 lbs.] per IEC 512-8, Test 15a.
Size 16 Contact:	67N [15 lbs.] per IEC 512-8, Test 15a.
Size 20 Contact:	44N [10 lbs.] per IEC 512-8, Test 15a.
Fixed Contacts:	Printed board terminations, both straight and right angle (90°). Size 12 and 16 female contacts feature "Closed Entry" design. Size 20 female contacts feature "Rugged Open Entry" design.
Fixed Contact Retention in Connector Body:	44N (10 lbs.), minimum.
Resistance to Solder Heat:	260°C (500°F) for 10 seconds duration per IEC 512-6, Test 12e, 25-watt soldering iron.
Sequential Contact Mating System:	Two level and three level systems featured. Consult Technical Sales for application assistance with contact sequencing.
Safety "Recessed in Insulator" Contacts:	Size 12 and 16 female contacts may be recessed 5.00 mm [0.197 inch] below the face of the female connector insulator per safety requirements. Consult Technical Sales for ordering information.
Compliant Press-Fit Terminations:	Size 12, 16 and 20 contacts are available with Compliant Press-Fit Contact Terminations. Consult Technical Sales for electrical and mechanical characteristics.
Locking and Coupling System:	Center jackscrew, M4X0.7 thread. Long jackscrews for use with cable adapter or short jackscrews for use without cable adapter.
Printed Board and Panel Mounting Holes:	Mounting holes provided in connector body for both printed board and panel mounting. Self-tapping screws or push-on fastener options are available.
Mounting Plate with Float Bushings:	Provides up to 2.54 X 4.88 mm [0.100 X 0.192 inch] float.
Mechanical Operations:	
Systems 1 & 2:	200 couplings.
Systems 3, 4, 5, & 6:	500 couplings.
CLIMATIC CHARACTERISTICS:	
Working Temperature:	-55°C to +125°C.

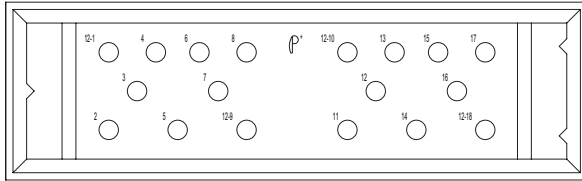


For RoHS options see page 40.

UL Recognized: File #E49351
CSA Recognized: File #LR54219

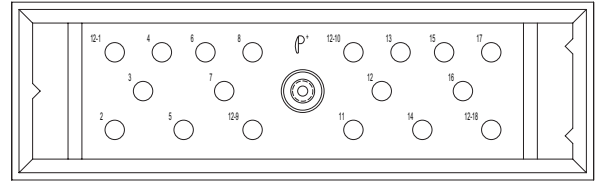
CONTACT VARIANTS

FACE VIEW OF MALE OR REAR VIEW OF FEMALE



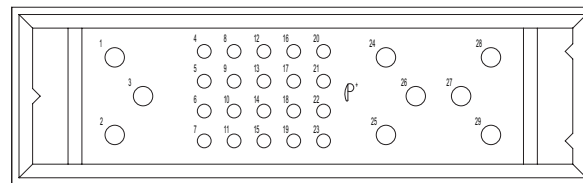
IP18 VARIANT

18 Size 12 Contacts



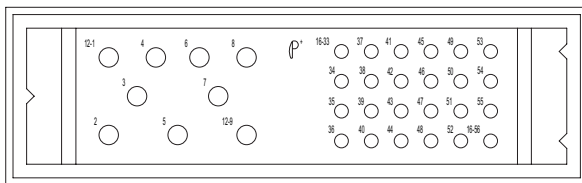
IP18 VARIANT

18 Size 12 Contacts with Jackscrew *



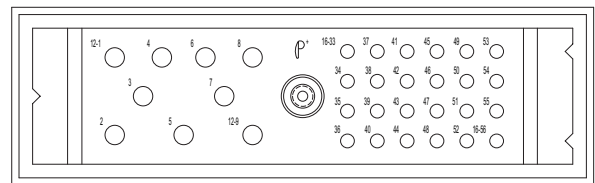
IP29W9 VARIANT

9 Size 12 and 20 Size 16 Contacts



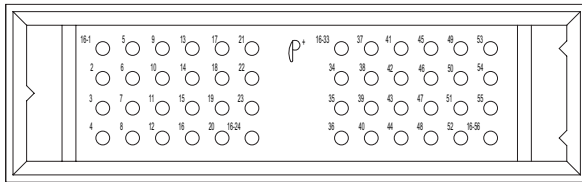
IP33W9 VARIANT

9 Size 12 and 24 Size 16 Contacts



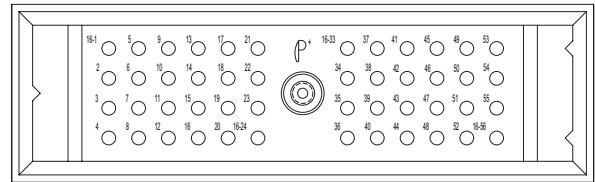
IP33W9 VARIANT

9 Size 12 and 24 Size 16 Contacts with Jackscrew *



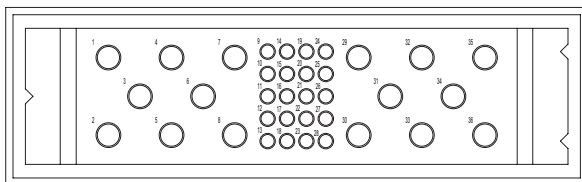
IP48 VARIANT

48 Size 16 Contacts



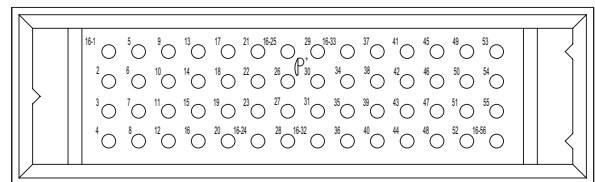
IP48 VARIANT

48 Size 16 Contacts with Jackscrew *



IP36W16 VARIANT

16 Size 12 and 20 Size 20 Contacts



IP56 VARIANT

56 Size 16 Contacts

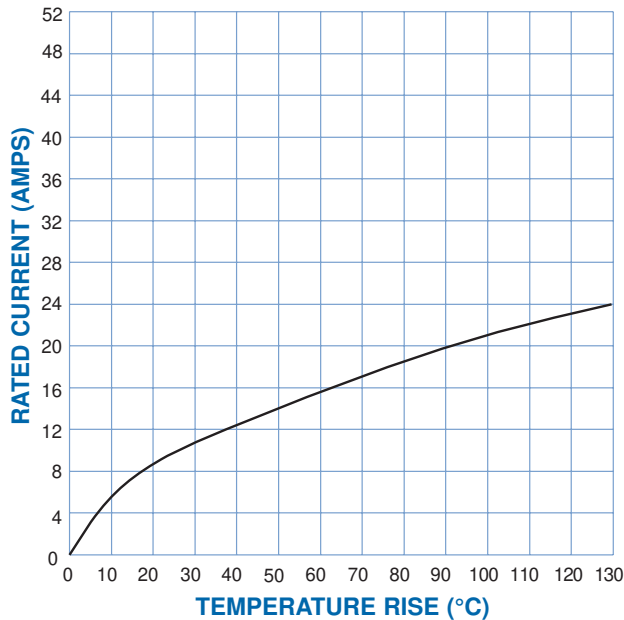
*** NOTE:**

Male connectors are offered with rotating jackscrews. Female connectors are offered with fixed jackscrews.



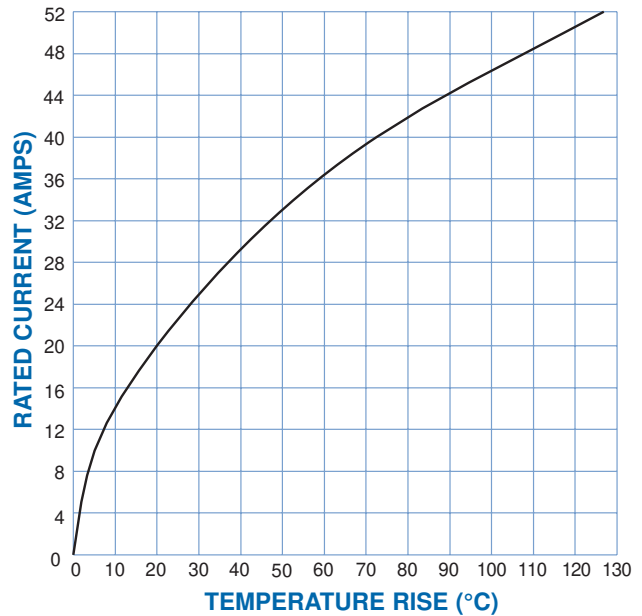
TEMPERATURE RISE CURVES TESTED PER IEC PUBLICATION 512-3, TEST 5A

SIZE 16 CONTACTS



Above curve developed using IP56M400A1 and IP56F300A1 connectors and 12 AWG wire. All contacts under load.

SIZE 12 CONTACTS

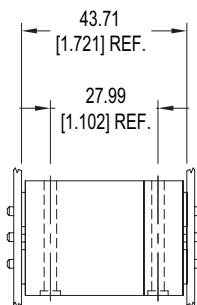


Above curve developed using a IP33W9M0000 connector with MC612N contacts and a IP33W9F0000 connector with FC612N2 contacts and 12 AWG wire on both. All contacts under load. Size 16 contact positions not filled and tested.

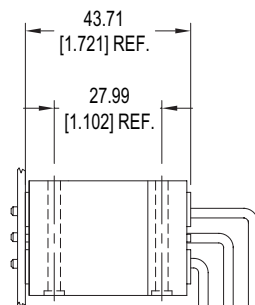
NOTE:

These temperature rise curves were developed using standard contact materials. High conductivity contact materials are available. These alternate materials allow for more favorable current carrying performance; consult Technical Sales for details.

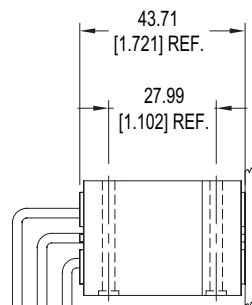
CONNECTOR MATING DIMENSIONS



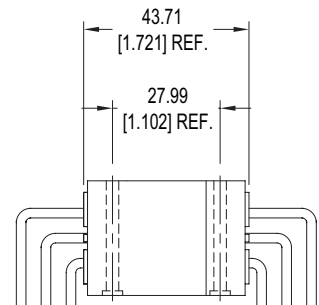
Straight Board Mount or Panel Mount Female to Straight Board Mount or Panel Mount Male.



Right Angle (90°) Board Mount Female to Straight Board Mount or Panel Mount Male.



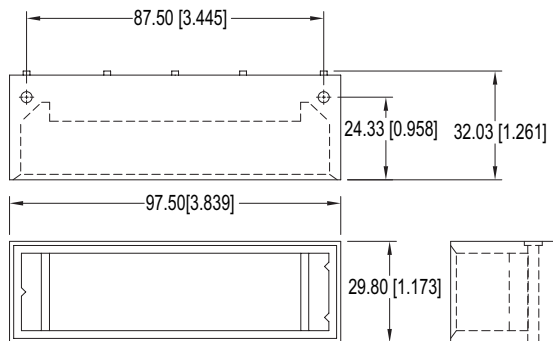
Straight Board Mount or Panel Mount Female to Right Angle (90°) Board Mount Male.



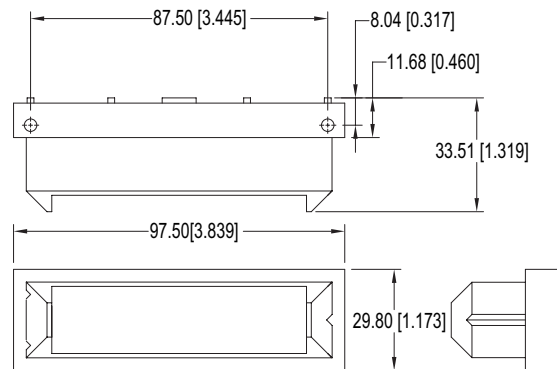
Right Angle (90°) Board Mount Female to Right Angle (90°) Board Mount Male.

CONNECTOR OUTLINE DIMENSIONS FOR USE WITH CODE 0, 3, 32, 93, 4, 42, AND 63

MALE



FEMALE

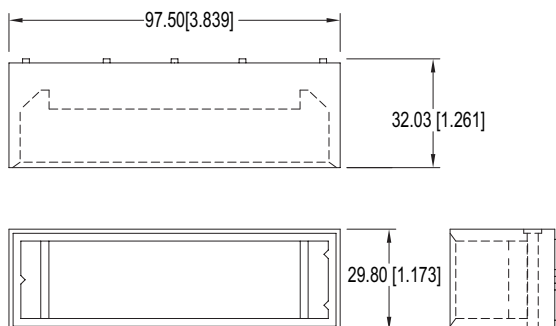


CABLE CONNECTOR

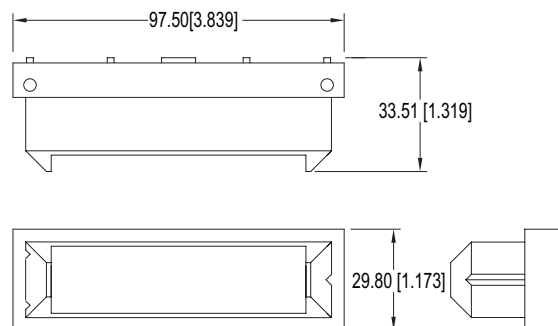
FOR USE WITH SIZE 12, 16 AND 20 REMOVABLE CONTACTS
CODE 0

CONTACTS ARE NOT SUPPLIED WITH CONNECTOR AND MUST BE ORDERED SEPARATELY

MALE



FEMALE

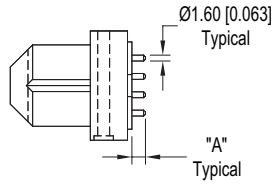
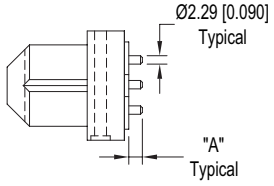
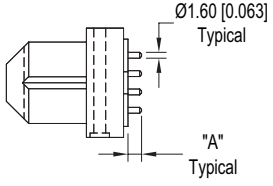
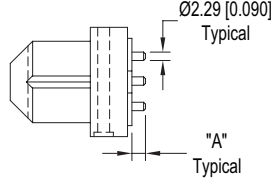
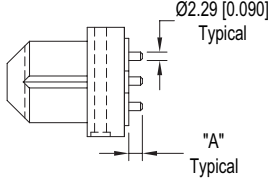
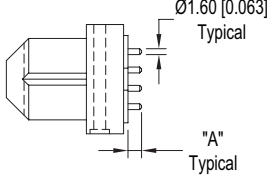
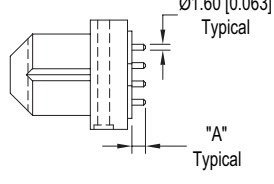
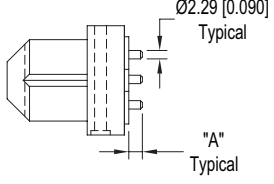
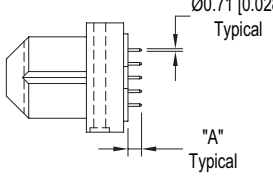


For information regarding size 12, 16 and 20 removable contacts, see Removable Contact section, pages 41-48.



STRAIGHT SOLDER BOARD MOUNT CONNECTORS CODE 3 AND CODE 32 FEMALE CONNECTOR SHOWN FOR REFERENCE ONLY

CODE	"A" LENGTH
3	3.70 [0.146]
32	9.58 [0.377]

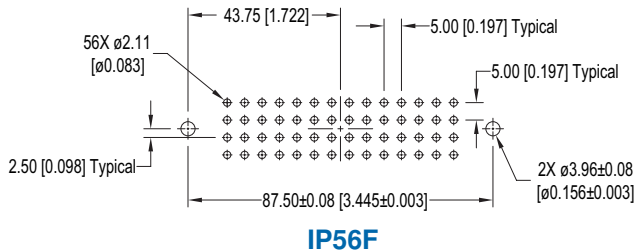
 <p>Size 16 contacts</p> <p>IP56</p>	 <p>Size 12 contacts</p> <p>IP33W9</p>	 <p>Size 16 contacts</p> <p>IP33W9</p>
 <p>Size 12 contacts</p> <p>IP18</p>	 <p>Size 12 contacts</p> <p>IP29W9</p>	 <p>Size 16 contacts</p> <p>IP29W9</p>
 <p>Size 16 contacts</p> <p>IP48</p>	 <p>Size 12 contacts</p> <p>IP36W16</p>	 <p>Size 20 contacts</p> <p>IP36W16</p>

NOTE:

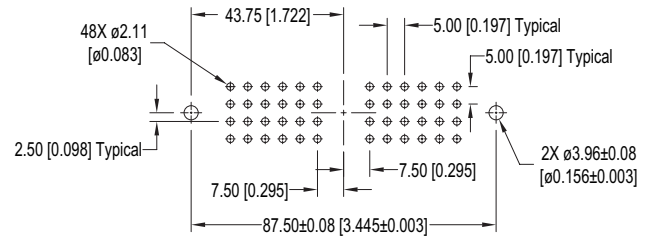
For customer specific contact extensions below the printed board, contact Technical Sales for ordering information.

STRAIGHT SOLDER CONTACT HOLE PATTERNS

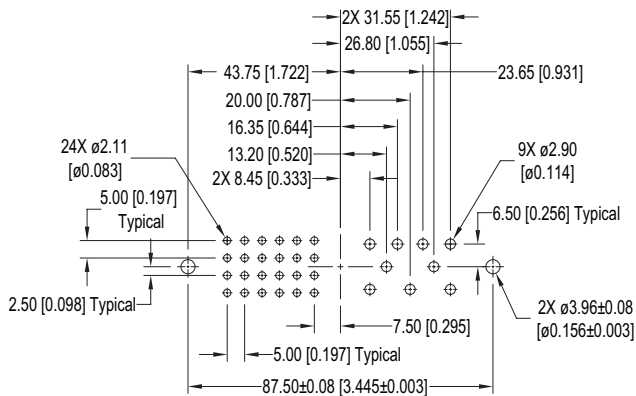
HOLE PATTERN SHOWN IS FOR FEMALE CONNECTOR
USE MIRROR IMAGE FOR MALE CONNECTOR



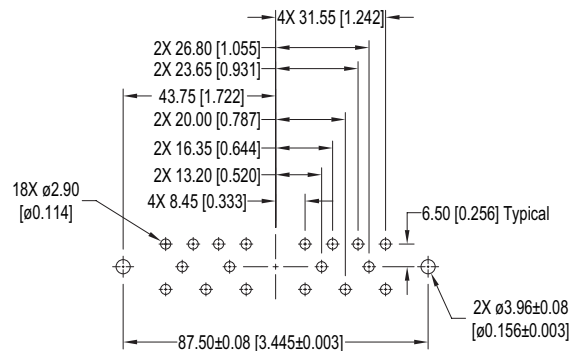
IP56F



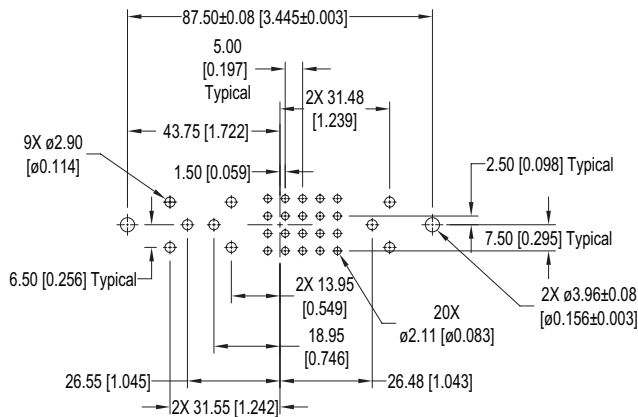
IP48F



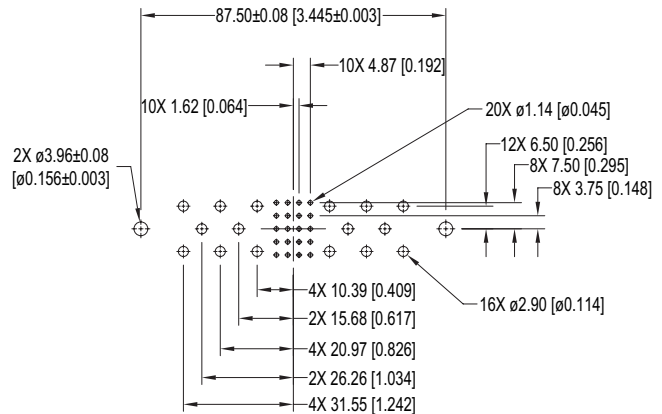
IP33W9F



IP18F



IP29W9F



IP36W16F

SUGGESTED PRINTED BOARD HOLE SIZES:

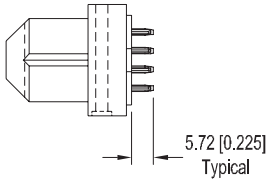
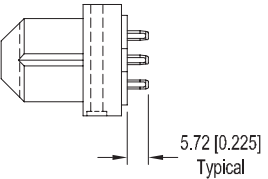
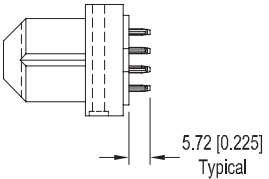
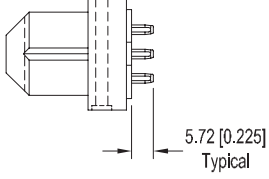
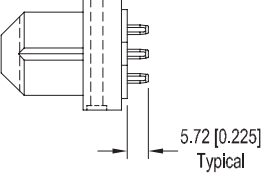
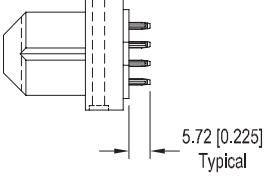
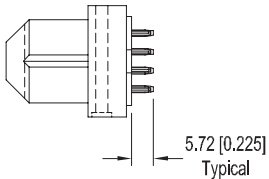
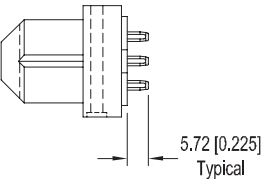
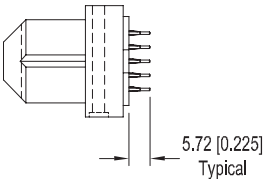
- Suggested $\phi 1.14$ [0.045] holes for size 20 straight contact holes.
- Suggested $\phi 2.11$ [0.083] holes for size 16 straight contact holes.
- Suggested $\phi 2.90$ [0.114] holes for size 12 straight contact holes.
- Suggested $\phi 3.96 \pm 0.08$ [0.156 ± 0.003] holes for connector mounting holes.



STRAIGHT COMPLIANT PRESS-FIT CONNECTORS

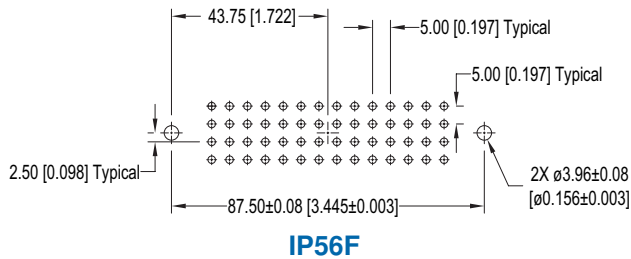
CODE 93

FEMALE CONNECTOR SHOWN FOR REFERENCE ONLY

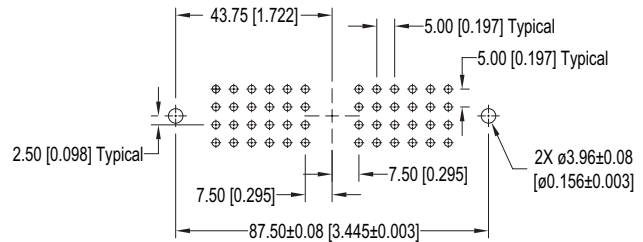
 <p>Size 16 contacts</p> <p>IP56</p>	 <p>Size 12 contacts</p>  <p>Size 16 contacts</p> <p>IP33W9</p>	
 <p>Size 12 contacts</p> <p>IP18</p>	 <p>Size 12 contacts</p>  <p>Size 16 contacts</p> <p>IP29W9</p>	
 <p>Size 16 contacts</p> <p>IP48</p>	 <p>Size 12 contacts</p>  <p>Size 20 contacts</p> <p>IP36W16</p>	

STRAIGHT COMPLIANT PRESS-FIT CONTACT HOLE PATTERNS

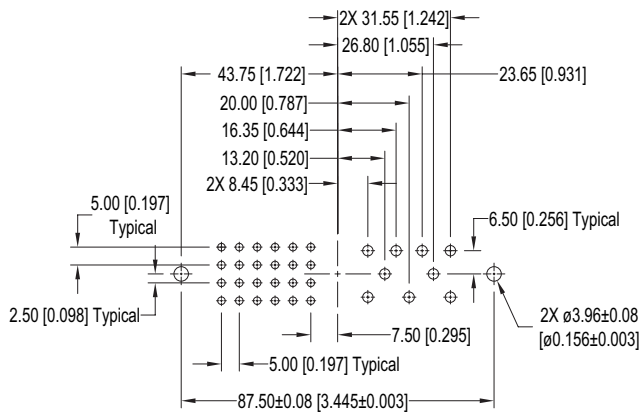
HOLE PATTERN SHOWN IS FOR FEMALE CONNECTOR; USE MIRROR IMAGE FOR MALE CONNECTOR



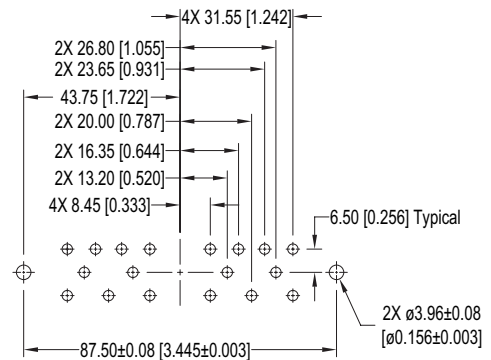
IP56F



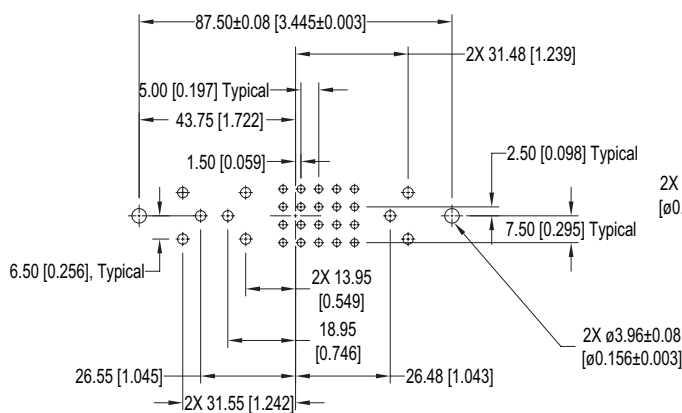
IP48F



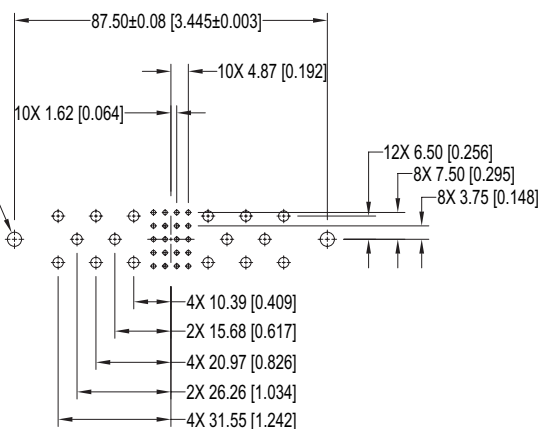
IP33W9F



IP18F



IP29W9F



IP36W16

SUGGESTED PRINTED BOARD HOLE SIZES:

NOTE: See page 57 for suggested printed board drill hole sizes, recommended plating and finished hole sizes for compliant contact termination positions.

For press-fit connector installation tools, see pages 55-57.

For mounting screw options, see page 55.



RIGHT ANGLE (90°) SOLDER BOARD MOUNT CONNECTORS

CODE 4 AND CODE 42

FEMALE CONNECTOR SHOWN FOR REFERENCE ONLY

CODE	"A" LENGTH
4	3.70 [0.146]
42	9.58 [0.377]

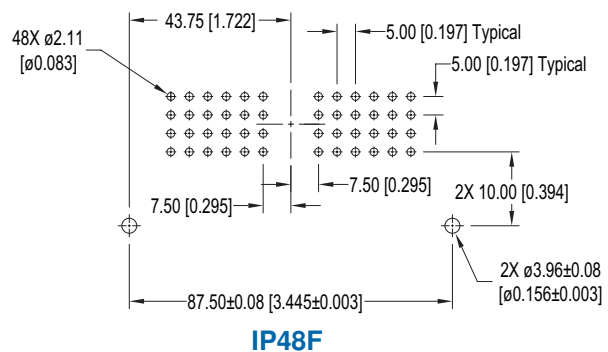
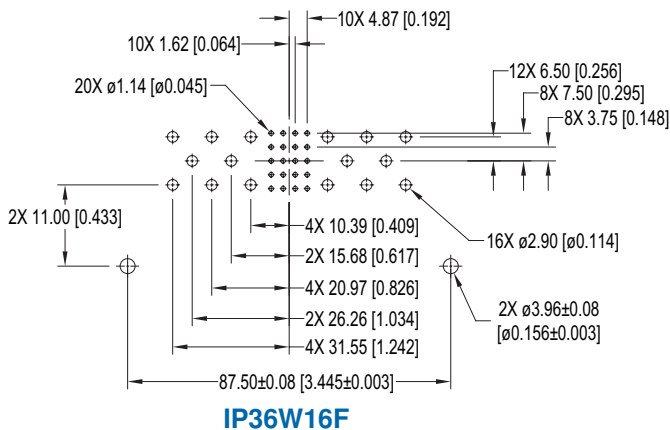
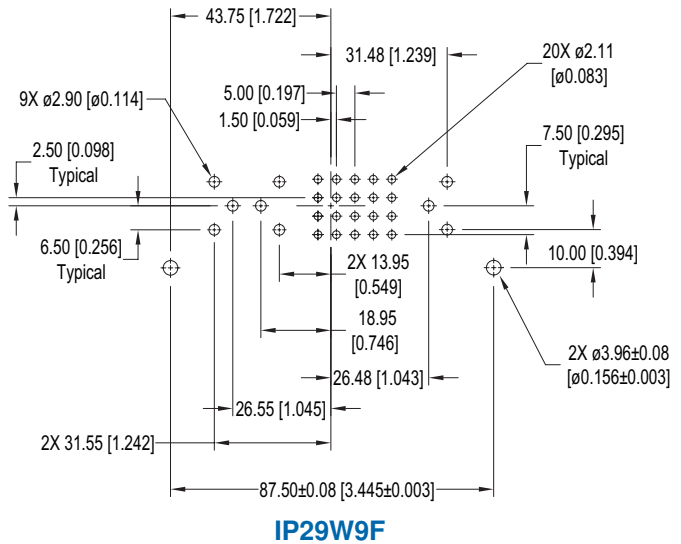
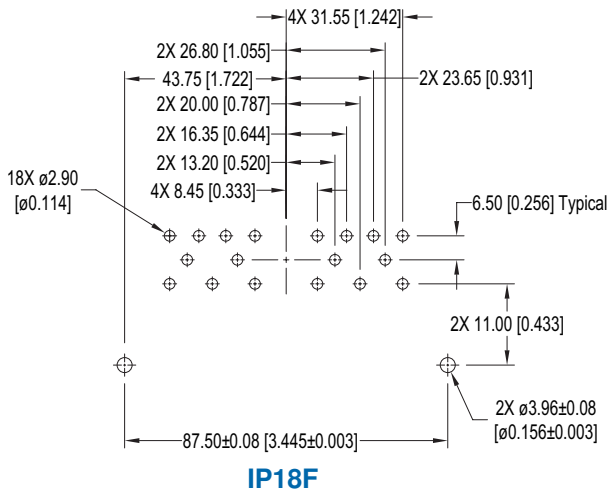
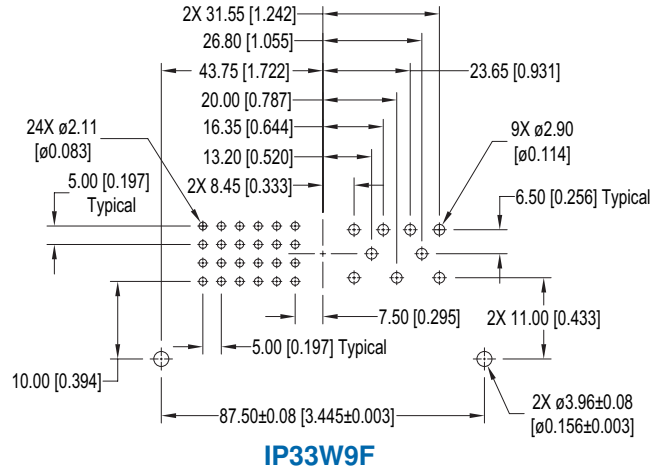
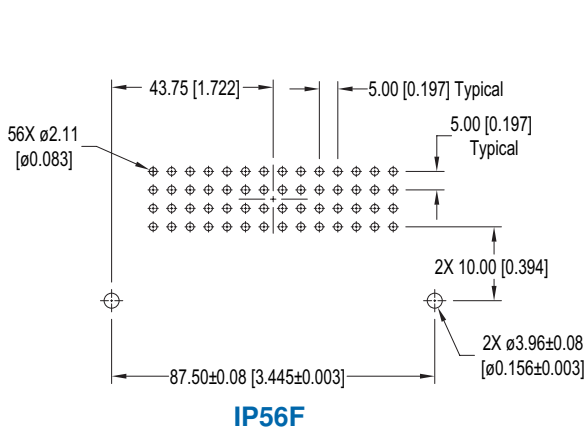


NOTE:

For customer specific contact extensions below the printed board, contact Technical Sales for ordering information.

RIGHT ANGLE (90°) SOLDER CONTACT HOLE PATTERNS

HOLE PATTERN SHOWN IS FOR FEMALE CONNECTOR
USE MIRROR IMAGE FOR MALE CONNECTOR



SUGGESTED PRINTED BOARD HOLE SIZES:

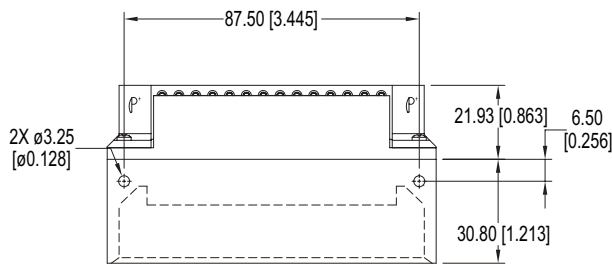
Suggested $\phi 1.14$ [0.045] holes for size 20 straight contact holes.
Suggested $\phi 2.11$ [0.083] holes for size 16 straight contact holes.
Suggested $\phi 2.90$ [0.114] holes for size 12 straight contact holes.
Suggested $\phi 3.96\pm 0.08$ [0.156±0.003] holes for connector mounting holes.

DIMENSIONS ARE IN MILLIMETERS [INCHES].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.

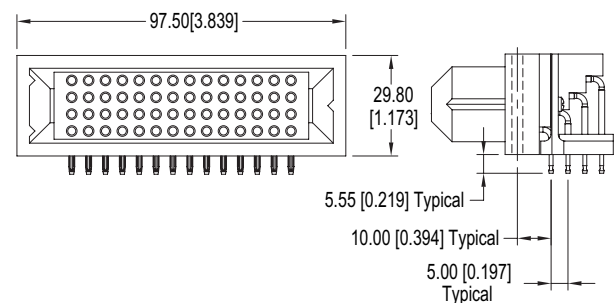
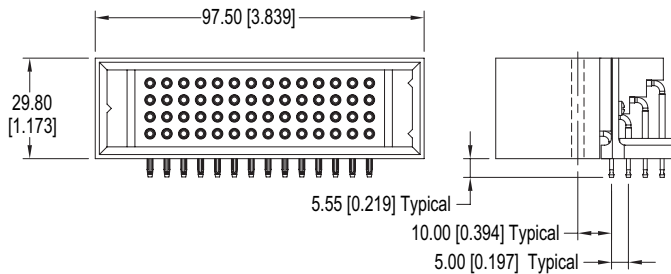
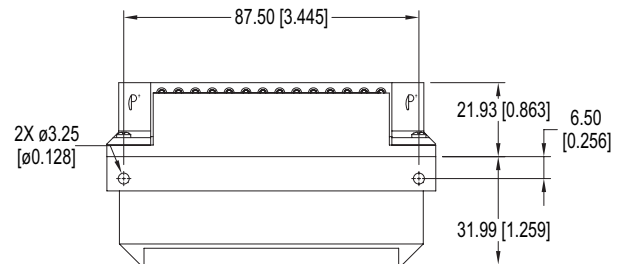


RIGHT ANGLE (90°) COMPLIANT PRESS-FIT BOARD MOUNT CONNECTORS CODE 63 MALE AND FEMALE

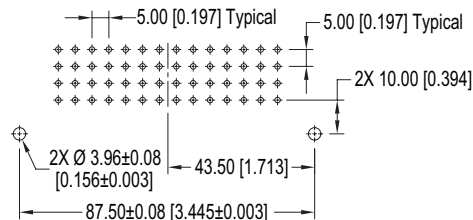
MALE



FEMALE



RIGHT ANGLE (90°) COMPLIANT PRESS-FIT CONTACT HOLE PATTERN MALE AND FEMALE



SUGGESTED PRINTED BOARD HOLE SIZES:

NOTE: See page 57 for suggested printed board drill hole sizes, recommended plating and finished hole sizes for compliant contact termination positions.

For press-fit connector installation tools, see pages 55-57.

For mounting screw options, see page 55.



ORDERING INFORMATION - CODE NUMBERING SYSTEM

Specify Complete Connector By Selecting An Option From Step 1 Through 7

STEP	1	2	3	4	5	6	7	8	9
EXAMPLE	IP	48	M	0	J	EL	0	/AA	—

STEP 1 - BASIC SERIES

IP - Infinity

STEP 2 - CONNECTOR VARIANTS

- 56 - 56 size 16 contacts
- 48 - 48 size 16 contacts
- 33W9 - 9 size 12 and 24 size 16 contacts
- 18 - 18 size 12 contacts
- 29W9 - 9 size 12 and 20 size 16 contacts
- 36W16 - 16 size 12 and 20 size 20 contacts

STEP 3 - CONNECTOR GENDER

- M - Male
- F - Female

STEP 4 - CONTACT TERMINATION TYPE

- 0 - Order contacts separately for cable connectors for connection systems 1, 2, 4, 5 and 6. See pages 41-48.
- 3 - Solder, Straight Printed Board Mount with 3.70 [0.146] tail extension for connection systems 1 and 4.
- 32 - Solder, Straight Printed Board Mount with 9.58 [0.377] tail extension for connection systems 1 and 4.
- 4 - Solder, Right Angle (90°) Printed Board Mount with 3.70 [0.146] tail extension for connection systems 1, 2 and 3.
- 42 - Solder, Right Angle (90°) Printed Board Mount with 9.58 [0.377] tail extension for connection systems 1, 2 and 3.
- 63 - Press-Fit, Compliant Termination Right Angle (90°) Printed Board Mount for use with board thicknesses of 2.29 to 4.45 [0.090 to 0.175]. With Cross Bar. Connection systems 1 and 2. Connector variant 48 and 56 connectors only.
- 93 - Press-Fit, Compliant Termination Straight Printed Board Mount for use with board thicknesses of 2.29 to 4.45 [0.090 to 0.175]. Connection systems 1 and 4.

STEP 5 - MOUNTING STYLE AND CABLE ADAPTER

- 0 - None, mounting screws supplied with board mount connector.
- H - Mounting Plate with Floating Bushings.
- J - Robust plastic cable adapter
- N - Push-on fasteners supplied installed on connector.

STEP 6 - JACKSCREWS

- 0 - None.
- *E - Rotating Male Jackscrew, for use with male connectors without cable adapter only.
- *EL - Rotating Male Jackscrew, for use with male connectors with cable adapter only.
- *T - Fixed Female Jackscrew, for use with female connectors only.

*Available on connector variants 48, 33W9, and 18 only.

STEP 9 - SPECIAL OPTIONS

CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS

- Sequential Mating Systems
- Recessed Female Contacts
- Customer Specified Contact Arrangement
- Other Customer Requirements

STEP 8 - ENVIRONMENTAL COMPLIANCE OPTIONS

/AA - Compliant per EU Directive 2002/95/EC (RoHS)

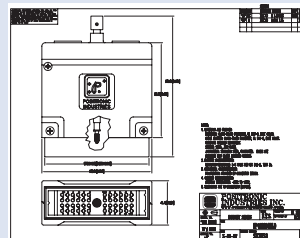


NOTE: If compliance to environmental legislation is not required, this step will not be used. Example: IP48M0JEL0

STEP 7 - CONTACT PLATING FOR PRINTED BOARD TYPE CONNECTORS

- 0 - Crimp contacts ordered separately, see pages 41-48.
- A1 - Gold flash over nickel on mating end and termination end.
- A2 - Gold flash over nickel on mating end and 5.00μ [0.00020 inch] tin-lead solder coat on termination end. Not available with code 63 and 93 in Step 4.
- C1 - 0.76μ [0.000030 inch] gold over nickel on mating end and termination end.
- C2 - 0.76μ [0.000030 inch] gold over nickel on mating end and 5.00μ [0.00020 inch] tin-lead solder coat on termination end. Not available with code types 63 and 93 in Step 4.
- D1 - 1.27μ [0.000050 inch] gold over nickel on mating end and termination end.
- D2 - 1.27μ [0.000050 inch] gold over nickel on mating end and 5.00μ [0.00020 inch] tin-lead solder coat on termination end. Not available with code types 63 and 93 in Step 4.

NOTE: Once you have made a connector selection, contact Technical Sales if you would like to receive a drawing in DXF, PDF format or a 3-dimensional IGES file.



SK Drawing



3-dimensional model