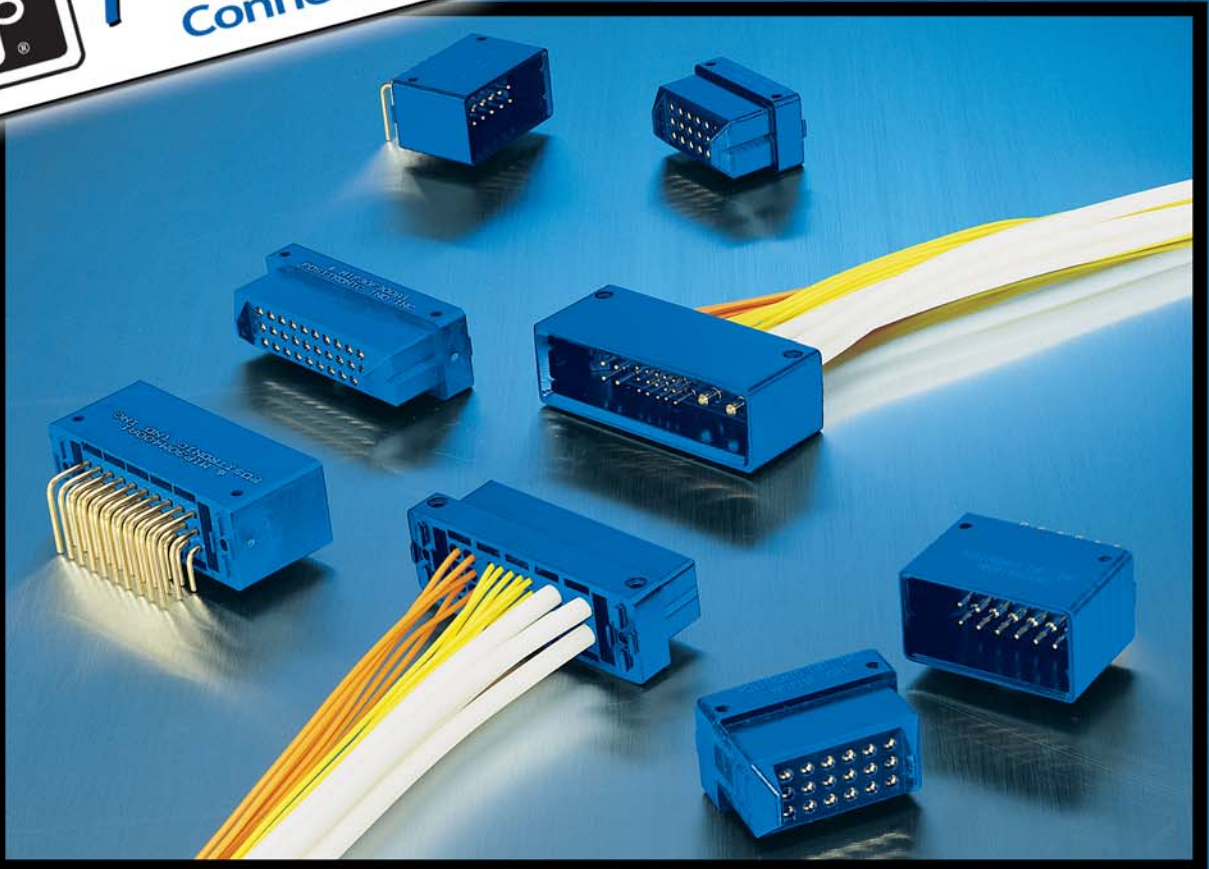




Positronic Industries

MINI-INFINITY SERIES



HIGH POWER CONNECTORS



RoHS Compliant
options available!

Catalog C-016 Rev. C

www.connectpositronic.com

Connector Excellence

POSITRONIC INDUSTRIES

ABOUT US

Founded in 1966, Positronic Industries is a vertically integrated manufacturer of high quality interconnect products. Positronic has earned the worldwide reputation as a service oriented, quick-reaction, top quality connector supplier. We are committed to maintaining this reputation by continuous implementation of our **Complete Capability** concept.

COMPLETE CAPABILITY

Design & Development

- Designs new connectors and modifies existing connectors to meet industry requirements
- Continuously conducts marketing studies to identify industry needs for new products
- Ongoing interest in unique connector designs

Tooling

- Tooling support for all manufacturing areas within company
- Provides 80% of new tooling, punch press dies, molds, jigs and fixtures used at Positronic factory locations worldwide

Machining

- Automatic screw machines produce finely crafted contacts and hardware for connector bodies
- Trained technicians operate machines from Tornos, Bechler and Brown & Sharpe

Molding

- Molds all plastic connector components such as insulators, hoods, angle brackets and more
- Overmold capability available

Plating

- Applies gold and other metal finishes to connector components to any required thickness
- Plating conforms to all military specifications

Quality Assurance Lab

- Quality assurance system certified to ISO 9001
- Maintains aggressive TQM program
- Able to test to IEC, EIA, UL, MIL-DTL-24308, MIL-DTL-28748, SAE AS 39029 and MIL-C-85049 requirements

Finished Stock Inventory

- Each main factory location maintains a large inventory of connector components and accessories
- Same day shipments available on many standard connector products
- Stocking agreements available for qualified customers

Worldwide Sales & Service

- Responsive attitude toward customer needs
- Fully trained sales staff located worldwide



Machining



Molding



Finished Stock Inventory

Products described within this catalog may be protected by one or more of the following US. patents:

#4,721,472 #4,900,261 #5,255,580
#5,329,697 #6,260,268 #6,835,079

Patented in Canada, 1992 Other Patents Pending

Unless otherwise specified, **dimensional tolerances** are:

- 1) ± 0.03 mm [0.001 inches] for male contact mating diameters.
- 2) ± 0.08 mm [0.003 inches] for contact termination diameters.
- 3) ± 0.13 mm [0.005 inches] for all other diameters.
- 4) ± 0.38 mm [0.015 inches] for all other dimensions.

Positronic Industries believes the data contained herein to be reliable. Since the technical information is given free of charge, the User employs such information at his own discretion and risk. Positronic Industries assumes no responsibility for results obtained or damages incurred from use of such information in whole or in part.

Positronic Industries' FEDERAL SUPPLY CODE (Cage Code) FOR MANUFACTURERS is 28198

MINI-INFINITY SERIES

The Mini-Infinity Power Connector series is offered to the electronics industry as a high power interface with a wide variety of features. The exceptional features of this series provide solutions for system design challenges created by increasing power consumption. Notable features of the Mini-Infinity include:

- Power contacts machined from solid copper alloy provide superior power density
- Single contact ratings up to 100 amperes continuous
- Hot-plug capability
- Outstanding blind mating capability
- Sequential contact mating options
- A.C. or D.C. input
- Recessed female contacts for safety considerations
- Multiple power contacts provide efficient current distribution for multi-voltage centralized power applications
- Multiple power contacts can be paralleled together for single voltage distributed power applications
- A wide variety of options, termination styles and contact variations
- Recognized by various safety agencies

These outstanding features make the Mini-Infinity an excellent choice as a power interface for many power applications including telecom, datacom, and computing platforms.



**RoHS Compliant
options available!**

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Mini-Infinity
High Power
Connector Series

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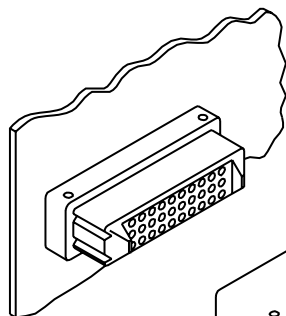
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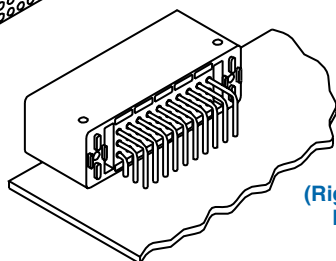
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CONNECTION SYSTEMS

Mini-Infinity
High Power
Connector Series



Straight Solder or
Press-Fit Contacts
Typical Part Number:
MIP30F300A1

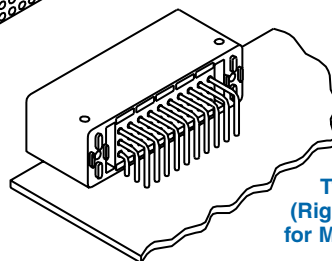
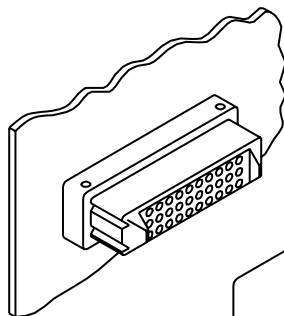


Right Angle Solder Contacts
Typical Part Number: MIP30M400A1
(Right Angle Press-Fit Contacts Available for
MIP30 and MMIP18 Variant Connectors)

SYSTEM 1 MOTHER BOARD/ DAUGHTER BOARD

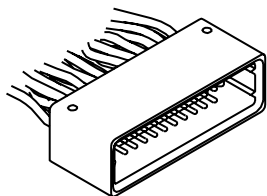
Crimp Contacts Installed
Typical Part Number:
MIP30F00830 with FC116N2
(Ordered Separately)*

Float mount
options available,
see page 26.

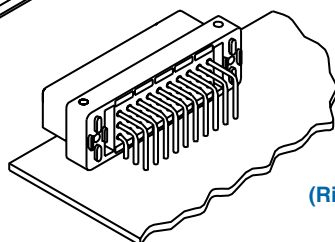


Right Angle Solder Contacts
Typical Part Number: MIP30M400A1
(Right Angle Press-Fit Contacts Available
for MIP30 and MMIP18 Variant Connectors)

SYSTEM 2 PANEL MOUNTED TO RIGHT ANGLE BOARD MOUNT CONNECTORS



Crimp Contacts installed
Typical Part Number:
MIP30M0000 with MC116N
(Ordered Separately)*



Right Angle Solder Contacts
Typical Part Number: MIP30F400A1
(Right Angle Press-Fit Contacts Available for
MIP30 and MMIP18 Variant Connectors)

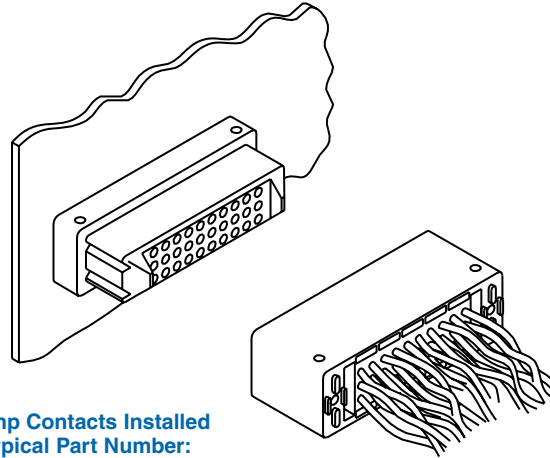
SYSTEM 3 RIGHT ANGLE BOARD MOUNT TO CABLE CONNECTORS

*** NOTE:**

Crimp removable contacts must be ordered separately.
See pages 27-29 of this catalog for contact ordering information.

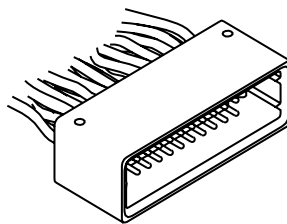
SYSTEM 4 STRAIGHT BOARD MOUNT TO CABLE CONNECTORS

Straight Solder or Press-Fit
Contacts
Typical Part Number:
MIP30F9300A1

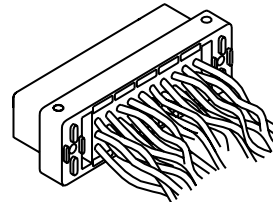


Crimp Contacts Installed
Typical Part Number:
MIP30M0000 with MC116N
(Ordered Separately)*

SYSTEM 5 CABLE TO CABLE CONNECTORS WITH REMOVABLE CRIMP CONTACTS



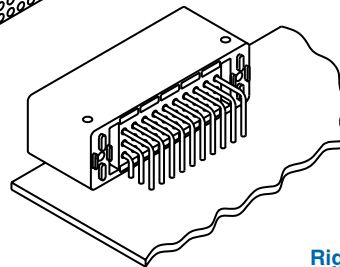
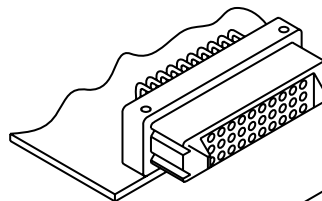
Crimp Contacts Installed
Typical Part Number:
MIP30M0000 with MC116N
(Ordered Separately)*



Crimp Contacts Installed
Typical Part Number:
MIP30F0000 with FC116N2
(Ordered Separately)*

SYSTEM 7 RIGHT ANGLE BOARD MOUNT TO RIGHT ANGLE BOARD MOUNT CONNECTORS

Right Angle Solder Contacts
Typical Part Number:
MIP30F400A1
(Right Angle Press-Fit Contacts Available
for MIP30 and MMIP18 Variant Connectors)



Right Angle Solder Contacts
Typical Part Number:
MIP30M400A1
(Right Angle Press-Fit Contacts Available for
MIP30 and MMIP18 Variant Connectors)

* NOTE:

Crimp removable contacts must be ordered separately.
See pages 27-29 of this catalog for contact ordering information.



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TECHNICAL INFORMATION

Mini-Infinity
High Power
Connector Series

STANDARD TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

Insulator:	Glass-filled polyester, UL 94V-0, blue color.
Contacts:	Precision-machined copper alloy with gold over nickel. Solder-coated terminations optional.
Mounting Screws:	Steel, zinc plated.
Push-on Fastener:	Spring-temper copper alloy, tin plated.
Float Mount Bushing:	Steel, zinc plated.

ELECTRICAL CHARACTERISTICS:

Contact Current Rating:	
Size 8 Contact:	60 amperes, continuous.
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 5 of this catalog for performance curves.
Initial Contact Resistance; maximum:	
Size 8 Contact:	0.0005 ohms.
Size 12 Contact:	0.001 ohms.
Size 16 Contact:	0.0016 ohms.
Size 20 Contact:	0.007 ohms.
	Per IEC 512-2, Test 2b.
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 8 Contact:	250 VAC at 25 amperes.
Size 12 Contact:	250 VAC at 25 amperes.
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:	Molded in guides allow for misalignment up to 7.62 mm [0.300 inch] for MIP or 4.19 [0.165] for MMIP.
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 8 Contact:	67N [15 lbs.] per IEC 512-8, Test 15a.
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. Size 8, 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 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 8, 12, 16 and 20 contacts are available with Compliant Press-Fit Contact Terminations. Consult Technical Sales for electrical and mechanical characteristics.

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.

Float Mount Shoulder Screw:

Provides up to 2.03 mm [0.080 inch] float.

Mechanical Operations:

Systems 1, 2 & 7:	200 couplings.
Systems 3, 4 & 5:	250 couplings.

CLIMATIC CHARACTERISTICS:

Working Temperature:	-55°C to +125°C.
----------------------	------------------

Recognized by various safety agencies.
Consult Technical Sales for updated list.

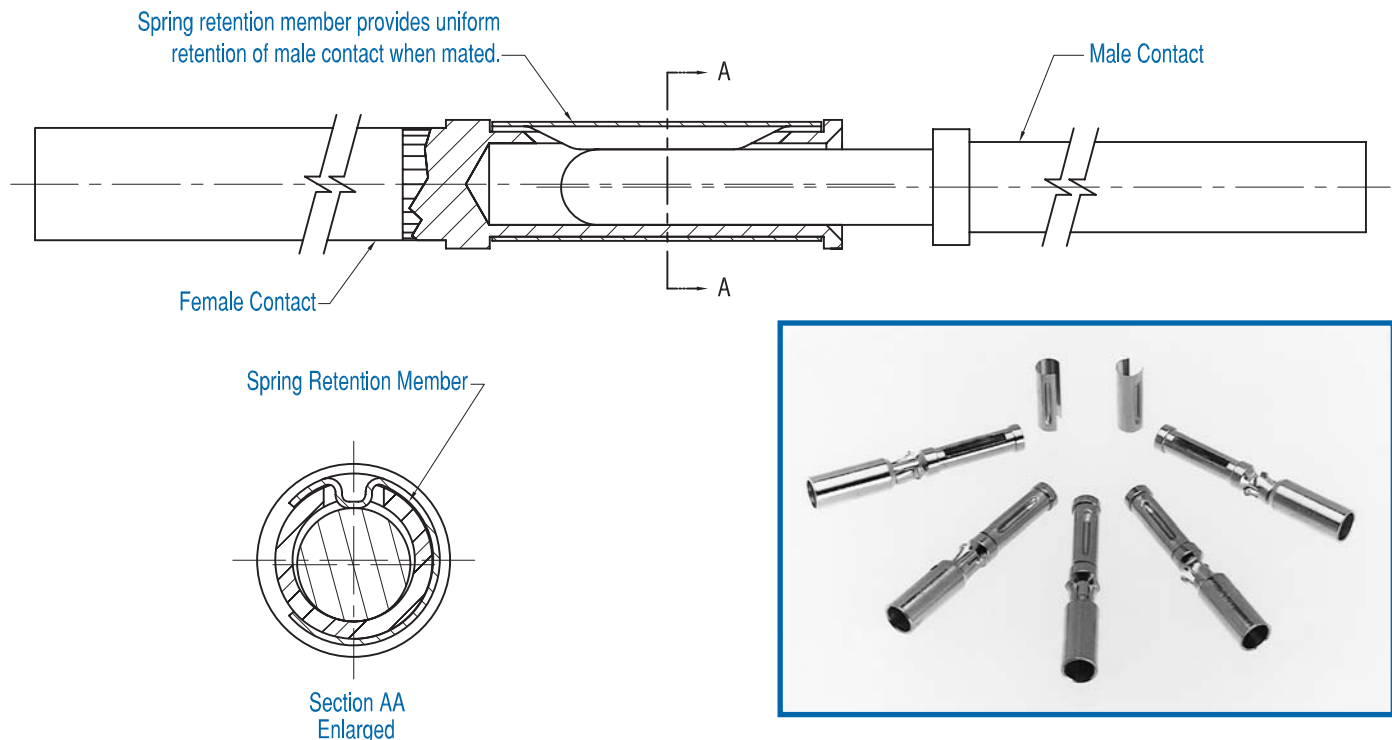


For RoHS options
see pages 18 & 24

THE MINI-INFINITY HIGH POWER CONNECTOR SERIES utilizes Positronic Industries'

“LARGE SURFACE AREA CONTACT MATING SYSTEM”

- Separates mechanical and electrical functions for superior performance
- “Closed Entry” design prevents damage to female contacts and will not allow misaligned or bent contacts to enter
- Precision machined from solid copper alloy
- Uniform insertion withdrawal forces through repeated mating cycles



WHY IS THE L.S.A. SYSTEM SUPERIOR?

The primary function of connector contacts is electrical conductivity. Also, a mechanical function is required to provide normal force between male and female contacts.

In order to provide for proper mechanical characteristics, material that has good memory or “springiness” must be chosen. This will ensure contact normal force in a coupled condition and allow for repeated coupling and uncoupling.

Unfortunately, many materials that have good memory characteristics have low electrical conductivity. For instance, beryllium copper is a good choice for mechanical function; however, some beryllium copper alloys are poor conductors and have relatively low conductivity ratings.

The conductivity path of many contact designs goes directly through materials that have been chosen based on mechanical need. If these materials have a low conductivity rating, increased contact resistance will result.

Positronic Industries' Large Surface Area Contact System separates the mechanical and electrical functions. A spring retention member provides normal forces, while the electrical conductivity path is through highly conductive contact material. See above detail.



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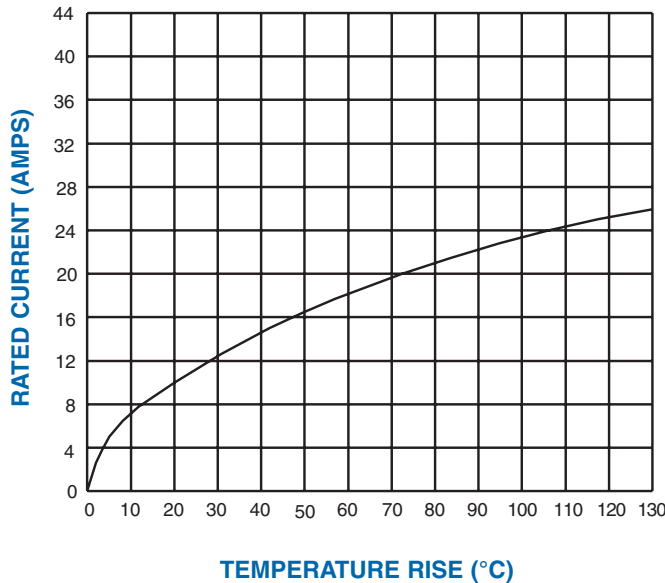
TEMPERATURE RISE CURVES

Mini-Infinity
High Power
Connector Series

CONNECTOR TEMPERATURE RISE CURVES

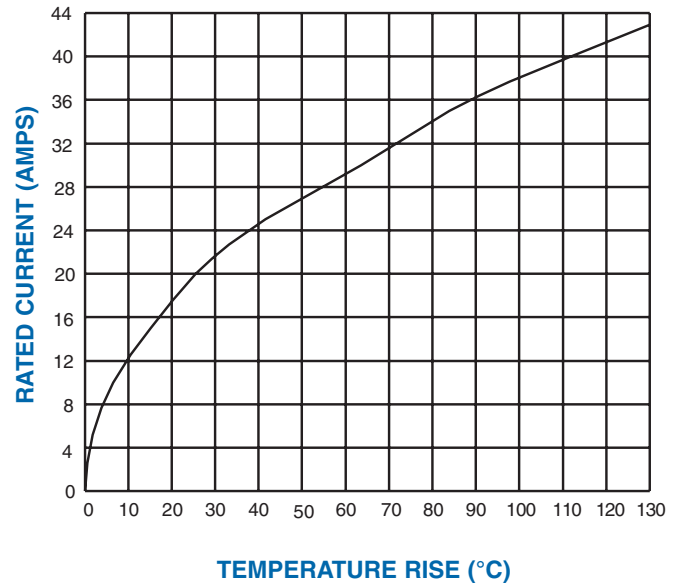
Tested per IEC Publication 512-3, Test 5a

SIZE 16 CONTACTS



Above curve developed using MIP30M0000 and MIP30F0000 connectors with MC112N and FC112N2 contacts and 12 AWG wire. All contacts under load.

SIZE 12 CONTACTS



Above curve developed using MIP30WA10M0000 and MIP30WA10F0000 connectors and MC612N with FC612N2 contacts and 12 AWG wire. All contacts under load. Size 20 contact positions not filled and tested.

NOTE:

- 1) 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.
- 2) Consult Technical Sales for Electrical and Mechanical characteristics of press-fit terminations.



DEMYSTIFYING CURRENT RATINGS

Connector current ratings seem to be shrouded in mystery at times. The user wonders how a listed current rating is relevant to a particular application. Perhaps more mysterious is how similar connectors from various manufacturers list different current rating values. While it is true that material choices and design can enhance a connector's current rating, the test method by which the rating was developed must be understood when evaluations are made.

Users of connectors for power applications are entitled to current rating test details in order to make an informed choice. Ideally, a connector's current rating should be developed within the application for which it is being considered. Although ideal, this approach is not always practical given the many differing applications. In order for connector manufacturers to give potential product users an idea of what can be expected, connectors are given current ratings based on a specific test method.

A wide variety of test methods are employed in order to develop current ratings for connectors. Some of these methods come from standards that are recognized industry-wide, while others are unique to the manufacturer or user. These various test methods can produce different results for the same product. It is no wonder confusion sometimes results.

There are key factors that, when understood, can help in choosing the right power connector. All test methods used to rate current have similarities; however, there are variables in applying the test methods which explain differing results.

Current ratings are usually established by first developing a temperature rise curve. This curve plots temperature rise against increasing current levels. The curve is a reliable tool in understanding heat generation of the connector at various currents. When a defined failure is reached, the test ends. The highest current level achieved is usually listed as the current rating.

The temperature rise curve, and therefore the current rating, will change when certain key factors are varied. These are:

- Where is the temperature sensing probe placed? If placed on the contact in the mating area (the hottest spot), the results will be quite different than if placed on the outside of the connector body.
- Are the contacts being tested and rated in free air or are they contained within the connector housing? Contacts will obviously be cooler in free air.
- Are all of the contacts in the connector under load? If only part of the contacts are under load, the temperature rise could be less.
- What is the defined failure? Does the test end when the temperature rise reaches 30°C, 40°C, or some other number? Does it end when the temperature rise plus ambient temperature equal the operating limit of the connector housing? The current rating will be fixed by the defined failure point.
- How were the test samples prepared? Were the samples energized through a P.C. board? How many layers? How large were the traces? What was the weight of the copper? Were the samples energized through wire? What size was the wire? How long was the wire? Was the sample tested in static or forced air conditions? All of these factors can affect cooling characteristics.

Clearly a current rating value alone is not enough, and must be viewed in the context of the test used to develop the rating. When the test method is understood, evaluating and comparing power connectors for specific applications becomes much less of a mystery.



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COMPLIANT PRESS-FIT

Mini-Infinity
High Power
Connector Series

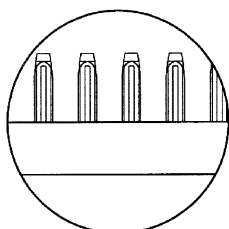
POSITRONIC INDUSTRIES' BI-SPRING POWER PRESS-FIT TERMINATIONS

The Next Evolution In Compliant Technology. Fully Compliant, Fully Reliable.

Reliable, solderless connections from connectors to backplanes started with solid press-fit technology. Although these are still used today, concerns about board damage led to the use of compliant press-fit technology. This technology allows the connection to be made through compliance of the contact termination along with P.C. board hole deformation. Although risk of damaged P.C. boards and backplanes is lessened, damage can still

occur due to relatively high insertion and extraction forces.

The next step in press-fit technology is a highly reliable connection between the contact termination and backplane that is accomplished with reduced insertion and extraction forces. This eliminates risk of P.C. board and backplane damage. **This technology exists today with Positronic Industries' Bi-Spring Power Press-Fit Termination.**



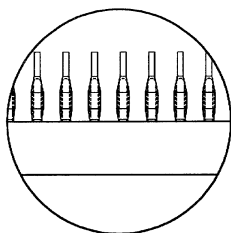
**Bi-Spring Power
Press-Fit Compliant
Terminations**

- The relatively low insertion and extraction forces of Bi-Spring Power Press-Fit contacts do not produce stresses in P.C. boards and backplanes that can occur with higher insertion forces. These stresses can cause board warpage and hole damage. Average insertion and extraction forces of size 16 contacts are 22 N (5 lbs.) per contact. Average insertion and extraction forces of size 12 contacts are 133 N (30 lbs.) per contact. Average insertions forces of size 8 contact are 133 N (30 lbs.) per contact.
- Connector systems utilizing Bi-Spring terminations use mounting screws to secure the connector to the P.C. board or backplane. Stresses that occur during coupling, uncoupling or shock and vibration of systems are not transferred to the P.C. boards or backplanes through the press-fit connection. The electrical integrity of the connector to board interface is maintained; this is particularly important in power applications. Bellcore GR1217 details a preference for mounting hardware when using press-fit terminations.
- Size 16 Bi-Spring terminations are designed to meet the performance requirements and hole diameters as listed in the internationally recognized specification IEC60352-5.
- Lower insertion and extraction forces eliminate the need for expensive pressing equipment.

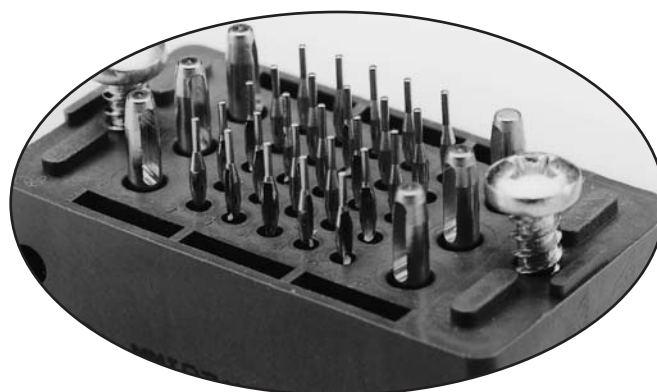
OMEGA SIGNAL LEVEL PRESS-FIT TERMINATIONS

Today's power supplies feature communication options with the host system. The power interface must have reliable signal level connections.

Positronic Industries' Omega Press-Fit terminations are the perfect solderless connection companion to Bi-Spring Power Press-Fit terminations.

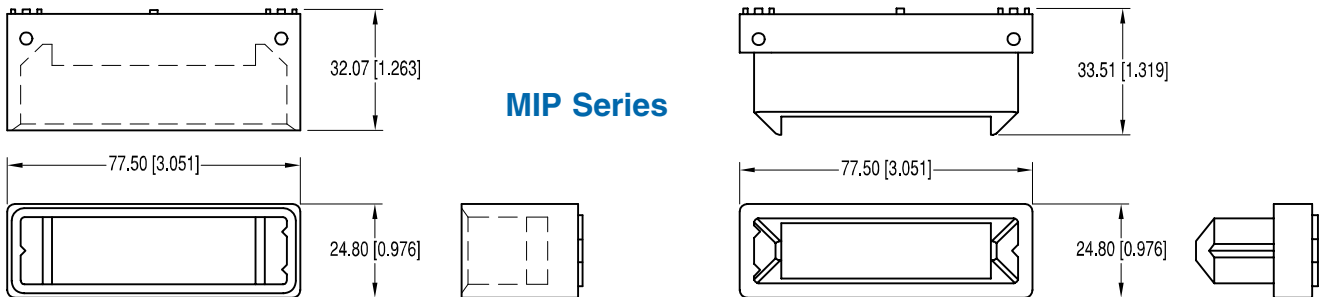


**Omega Signal Level Press-Fit
Compliant Terminations**

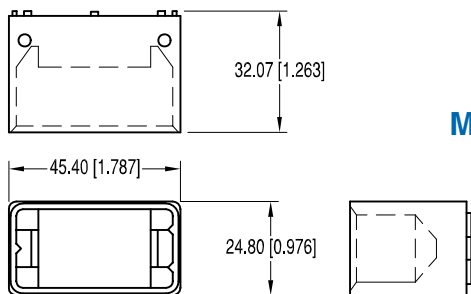


The Mini-Infinity Series design allows for the development of application specific contact arrangements in a timely manner and at a reasonable price. After reviewing the following basic information, contact Technical Sales with your current, voltage, and safety requirements. We look forward to working with you to develop a connector for your specific needs.

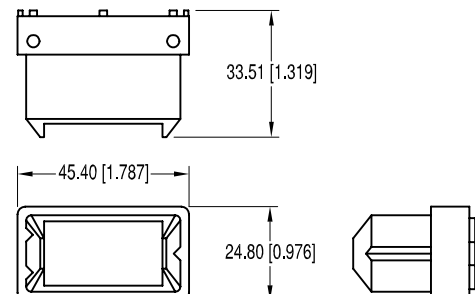
BASIC CONNECTOR DIMENSIONS



Male Connector Dimensions

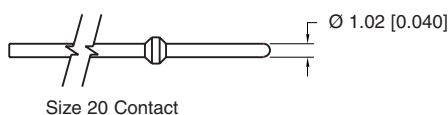
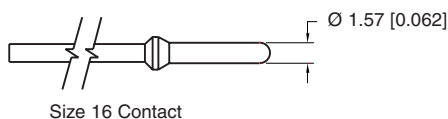
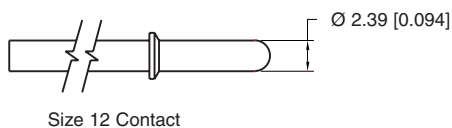
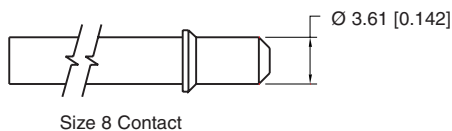


Female Connector Dimensions



FOUR CONTACT SIZES TO CHOOSE FROM

A high performance size 8 contact rated at 100 Amps is available for use with 6 AWG wire.



MANY TERMINATION TYPES CAN BE SUPPLIED

Straight Solder or Press-Fit
Right Angle Solder or Press-Fit
Crimp Removable
Different Termination Types can be mixed
within a single connector

Popular Options

Sequential Mating
Recessed Female Contacts
Selective Loading

Contact sizes may be mixed within a single connector.

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

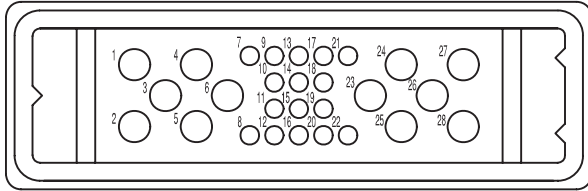


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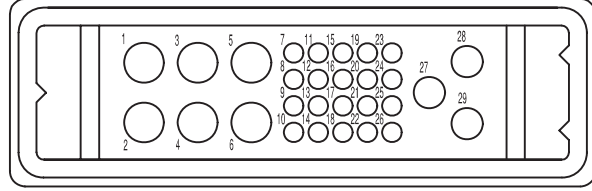
CONNECTOR VARIANTS

Mini-Infinity
High Power
Connector Series

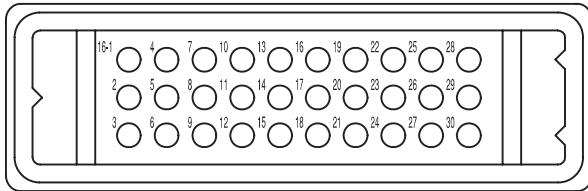
CONNECTOR VARIANTS FACE VIEW OF MALE OR REAR VIEW OF FEMALE



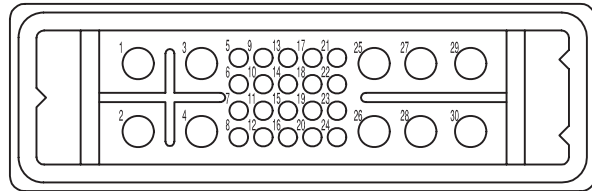
MIP28W12 VARIANT
12 Size 12 and 16 Size 20 Contacts



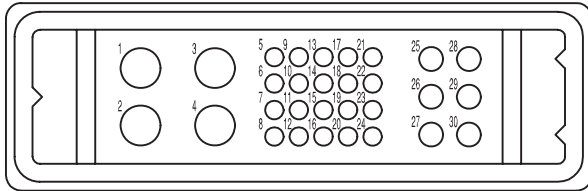
MIP29W9 VARIANT
3 Size 12, 20 Size 20, 6 Size 8 Contacts



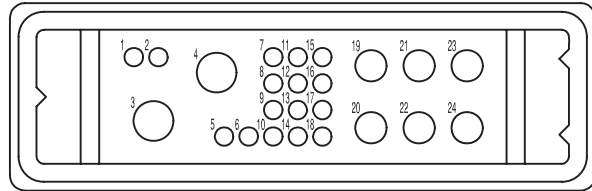
MIP30 VARIANT
30 Size 16 Contacts



MIP30WA10 VARIANT
10 Size 12 and 20 Size 20 Contacts



MIP30WB10 VARIANT
4 Size 8, 6 Size 16, 20 Size 20 Contacts

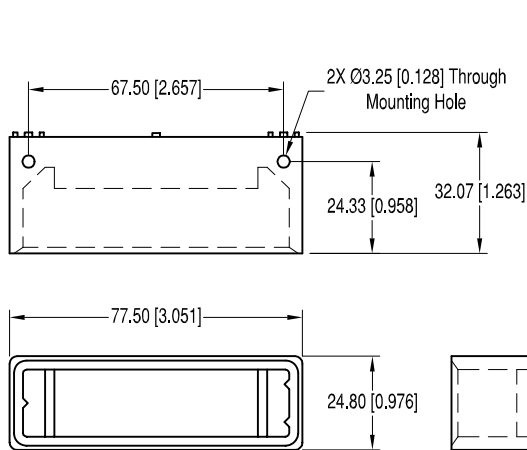


MIP24W8 VARIANT
2 Size 8 (*High performance or standard see page 27*),
6 Size 12, 16 Size 20 Contacts
Only available for use with crimp contacts.

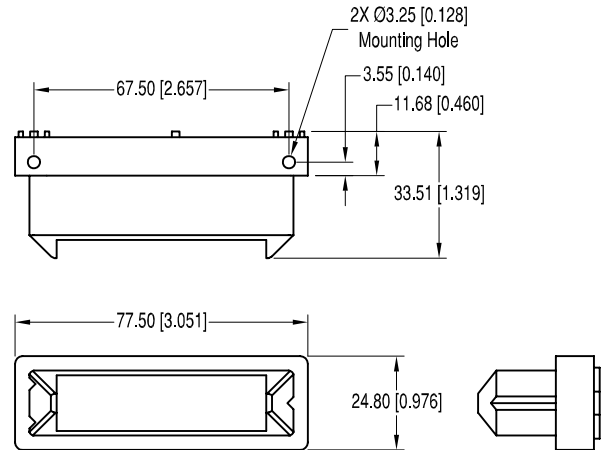
Refer to page 8 for Application Specific Arrangements.

MIP SERIES

CONNECTOR OUTLINE DIMENSIONS

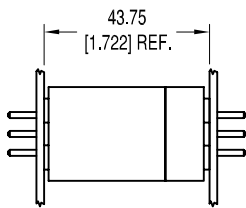


Male Connector Dimensions

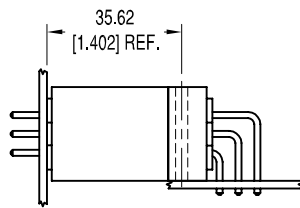


Female Connector Dimensions

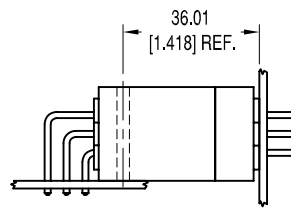
CONNECTOR MATING DIMENSIONS



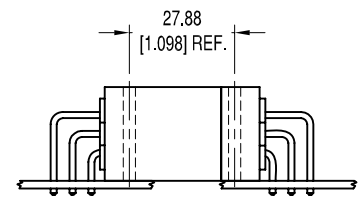
Straight Board Mount or
Panel Mount Female to
Straight Board Mount or
Panel Mount Male.



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



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



Right Angle Board Mount
Female to Right Angle
Board Mount Male.



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STRAIGHT SOLDER BOARD MOUNT CONNECTORS

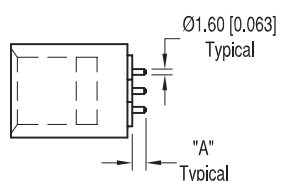
Mini-Infinity
High Power
Connector Series

STRAIGHT SOLDER BOARD MOUNT CONNECTORS

CODE 3 AND CODE 32

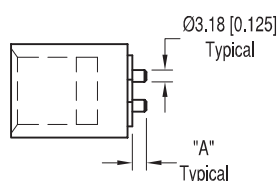
MALE CONNECTOR SHOWN FOR REFERENCE ONLY

CODE	"A" LENGTH
3	3.71 [0.146]
32	9.58 [0.377]

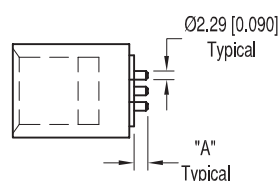


Size 16 contacts

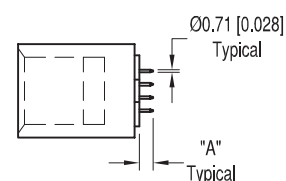
MIP30



Size 8 contacts

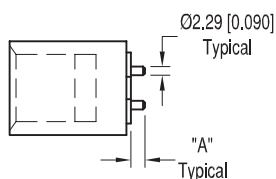


Size 12 contacts

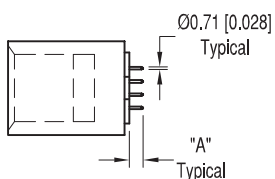


Size 20 contacts

MIP29W9

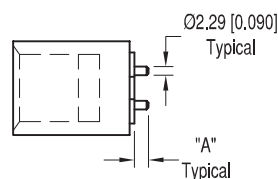


Size 12 contacts

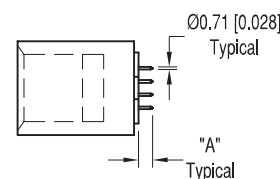


Size 20 contacts

MIP30WA10

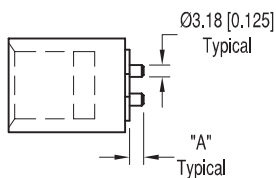


Size 12 contacts

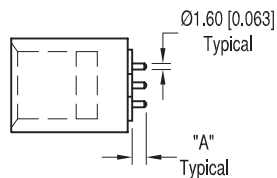


Size 20 contacts

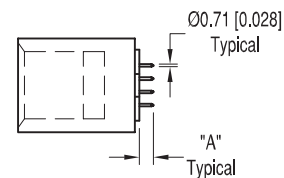
MIP28W12



Size 8 contacts



Size 16 contacts

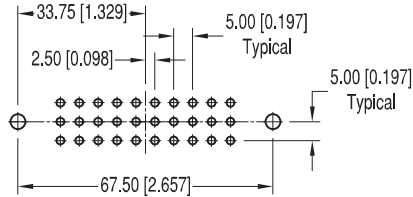


Size 20 contacts

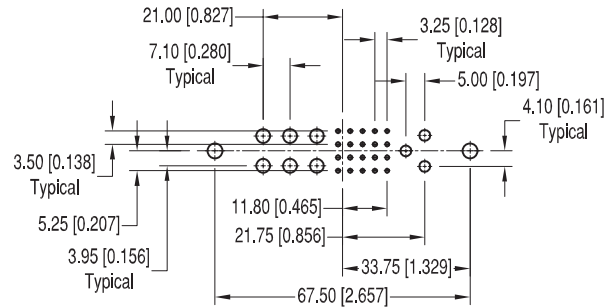
MIP30WB10

STRAIGHT SOLDER CONTACT HOLE PATTERNS

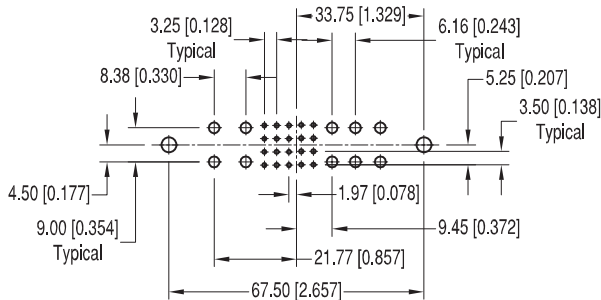
HOLE PATTERN SHOWN IS FOR MALE CONNECTOR
USE MIRROR IMAGE FOR FEMALE CONNECTOR



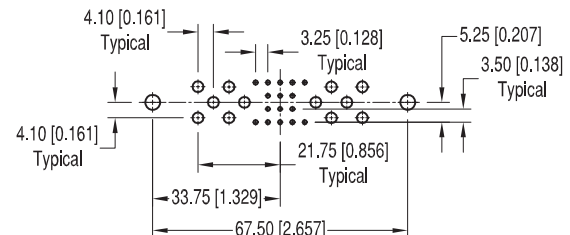
MIP30



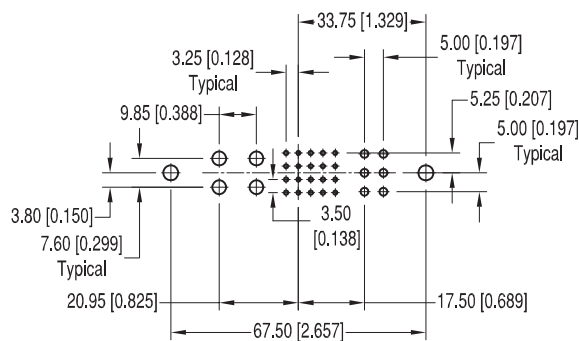
MIP29W9



MIP30WA10



MIP28W12



MIP30WB10

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 $\phi 3.68$ [0.145] holes for size 8 straight contact holes.
Suggested $\phi 3.96 \pm 0.08$ [0.156 $\pm$ 0.003] holes for connector mounting holes.



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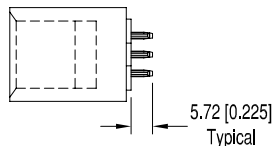
STRAIGHT COMPLIANT PRESS-FIT BOARD MOUNT CONNECTORS

Mini-Infinity
High Power
Connector Series

STRAIGHT COMPLIANT PRESS-FIT CONNECTORS

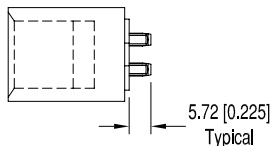
CODE 93

MALE CONNECTOR SHOWN FOR REFERENCE ONLY

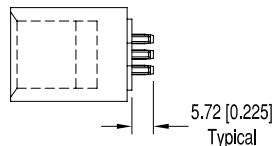


Size 16 contacts

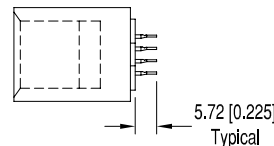
MIP30



Size 8 contacts

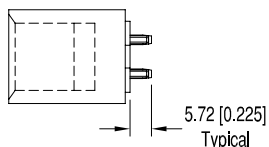


Size 12 contacts

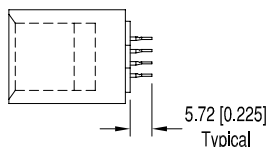


Size 20 contacts

MIP29W9

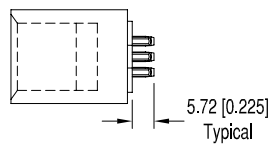


Size 12 contacts

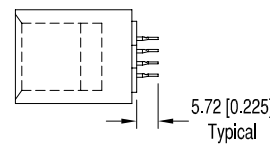


Size 20 contacts

MIP30WA10

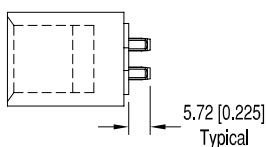


Size 12 contacts

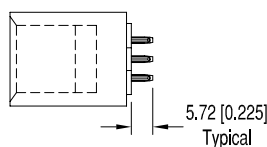


Size 20 contacts

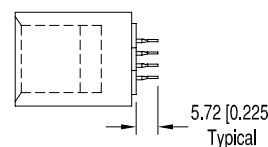
MIP28W12



Size 8 contacts



Size 16 contacts



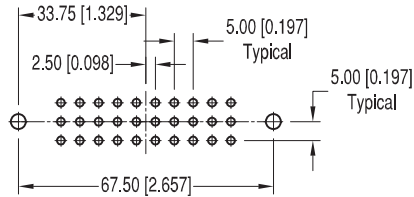
Size 20 contacts

MIP30WB10

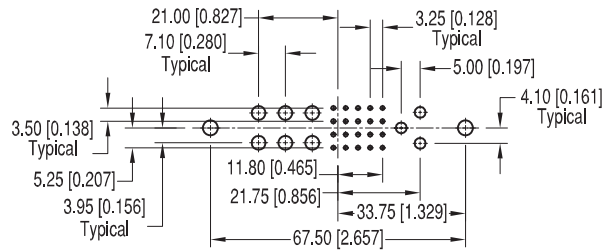
MIP SERIES

STRAIGHT COMPLIANT PRESS-FIT CONTACT HOLE PATTERNS

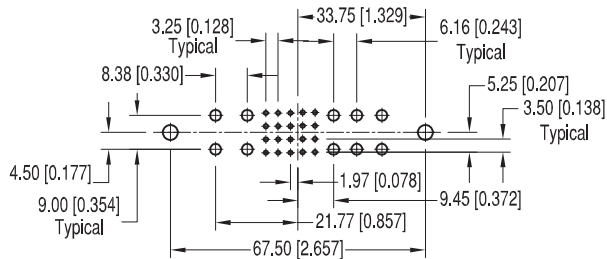
HOLE PATTERN SHOWN IS FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR



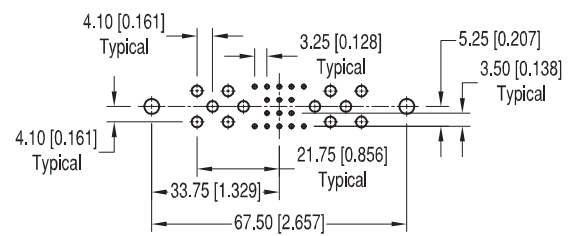
MIP30



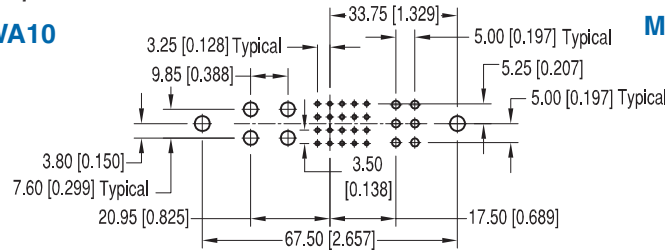
MIP29W9



MIP30WA10



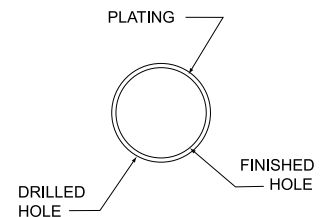
MIP28W12



MIP30WB10

SUGGESTED PRINTED BOARD HOLE SIZES FOR COMPLIANT PRESS-FIT CONNECTORS

COMPLIANT PRESS-FIT CONTACT HOLE				
BOARD TYPE	CONTACT SIZE	DRILL HOLE SIZE	RECOMMENDED PLATING	FINISHED HOLE SIZES
TIN-LEAD SOLDER PCB	8	$\phi 3.18 \pm 0.03$ [$\phi 0.125 \pm 0.001$]	15 μ [0.0006] minimum solder over 25 μ [0.0010] min. copper	$\phi 3.02 \pm 0.05$ [$\phi 0.119 \pm 0.002$]
	12	$\phi 2.54 \pm 0.03$ [$\phi 0.100 \pm 0.001$]		$\phi 2.39 \pm 0.05$ [$\phi 0.094 \pm 0.002$]
	16	$\phi 1.750 \pm 0.025$ [$\phi 0.0689 \pm 0.0010$]		$\phi 1.600 \pm 0.090 - 0.060$ [$\phi 0.0630 \pm 0.0035 - 0.0024$]
	20	$\phi 1.150 \pm 0.025$ [$\phi 0.0453 \pm 0.0010$]		$\phi 1.000 \pm 0.090 - 0.060$ [$\phi 0.0394 \pm 0.0035 - 0.0024$]
COPPER PCB	16	$\phi 1.73 \pm 0.05$ [$\phi 0.068 \pm 0.002$]	25 μ [0.0010] min. copper	$\phi 1.600 \pm 0.090 - 0.060$ [$\phi 0.0630 \pm 0.0035 - 0.0024$]
	20	$\phi 1.19 \pm 0.05$ [$\phi 0.047 \pm 0.002$]		$\phi 1.09 \pm 0.05$ [$\phi 0.043 \pm 0.002$]
IMMERSION TIN PCB	16	$\phi 1.73 \pm 0.05$ [$\phi 0.068 \pm 0.002$]	0.85 $\pm$ 0.15 μ [0.000033 $\pm$ 0.000006] immersion tin over 25 μ [0.0010] min. copper	$\phi 1.600 \pm 0.090 - 0.060$ [$\phi 0.0630 \pm 0.0035 - 0.0024$]
	20	$\phi 1.19 \pm 0.05$ [$\phi 0.047 \pm 0.002$]		$\phi 1.09 \pm 0.05$ [$\phi 0.043 \pm 0.002$]
IMMERSION SILVER PCB	16	$\phi 1.73 \pm 0.05$ [$\phi 0.068 \pm 0.002$]	0.34 $\pm$ 0.17 μ [0.000013 $\pm$ 0.000007] immersion silver over 25 μ [0.0010] min. copper	$\phi 1.600 \pm 0.090 - 0.060$ [$\phi 0.0630 \pm 0.0035 - 0.0024$]
	20	$\phi 1.19 \pm 0.05$ [$\phi 0.047 \pm 0.002$]		$\phi 1.09 \pm 0.05$ [$\phi 0.043 \pm 0.002$]
ELECTROLESS NICKEL/ IMMERSION GOLD PCB	16	$\phi 1.73 \pm 0.05$ [$\phi 0.068 \pm 0.002$]	0.05 μ [0.000002] min. immersion gold over 4.5 $\pm$ 1.5 μ [0.000177 $\pm$ 0.000059] electroless nickel per IPC-4552 over 25 μ [0.0010] min. copper	$\phi 1.600 \pm 0.090 - 0.060$ [$\phi 0.0630 \pm 0.0035 - 0.0024$]
	20	$\phi 1.19 \pm 0.05$ [$\phi 0.047 \pm 0.002$]		$\phi 1.09 \pm 0.05$ [$\phi 0.043 \pm 0.002$]



PRESS-FIT CONTACT HOLE

Note: For PCB plating compositions not shown, consult Technical Sales.



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RIGHT ANGLE SOLDER BOARD MOUNT CONNECTORS

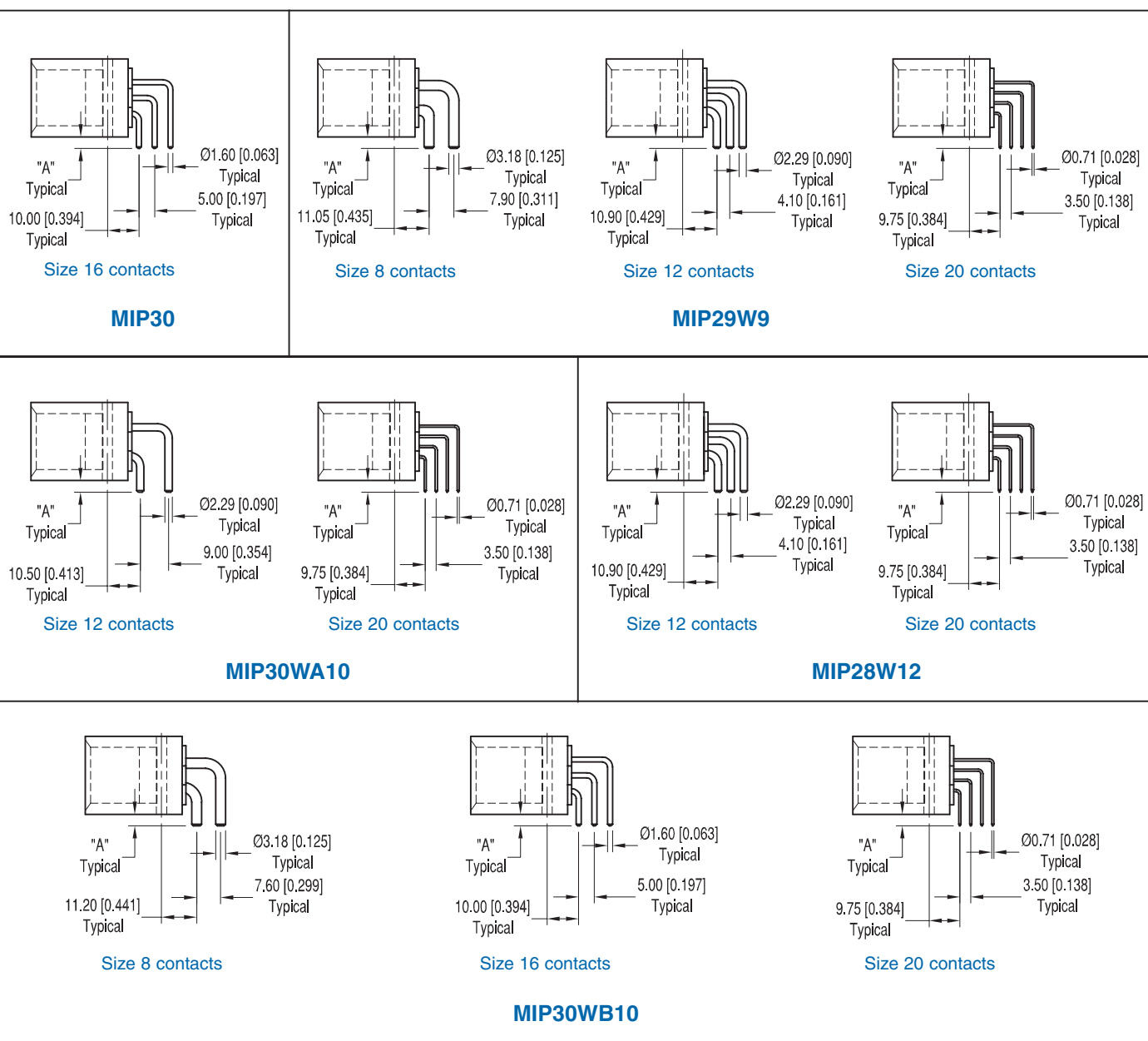
Mini-Infinity
High Power
Connector Series

RIGHT ANGLE SOLDER BOARD MOUNT CONNECTORS

CODE 4 AND CODE 42

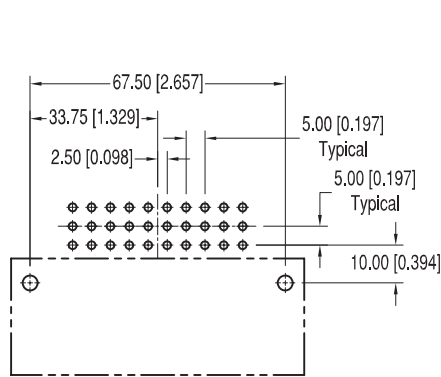
MALE CONNECTOR SHOWN FOR REFERENCE ONLY

CODE	"A" LENGTH
4	3.71 [0.146]
42	9.58 [0.377]

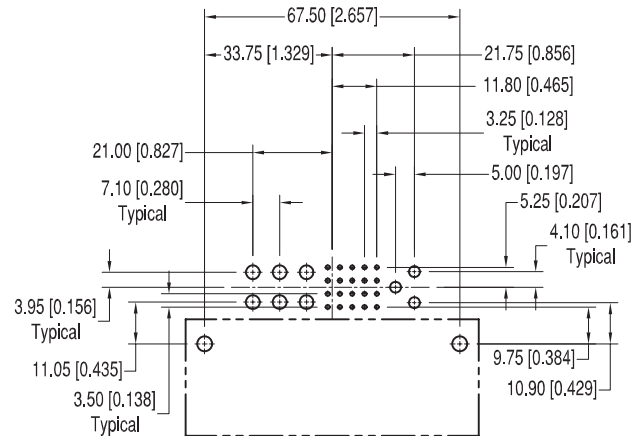


RIGHT ANGLE SOLDER CONTACT HOLE PATTERNS

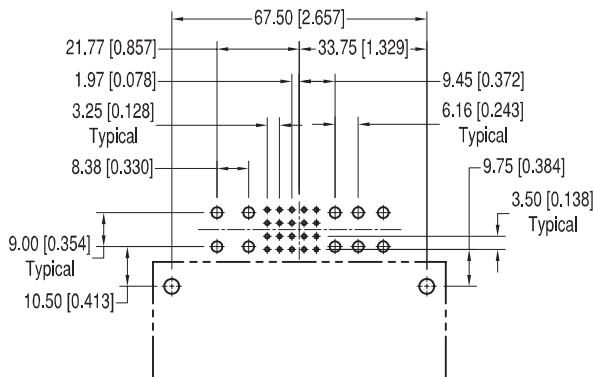
HOLE PATTERN SHOWN IS FOR MALE CONNECTOR
USE MIRROR IMAGE FOR FEMALE CONNECTOR



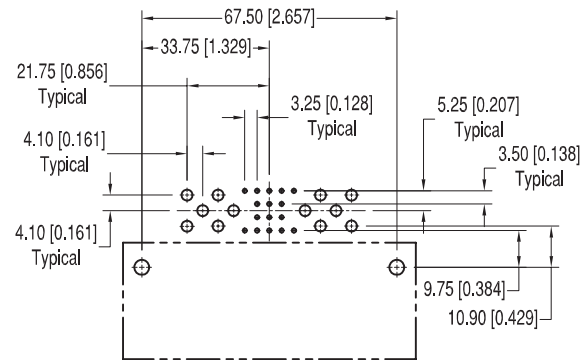
MIP30



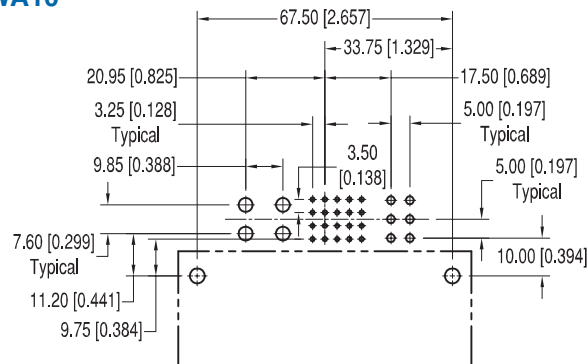
MIP29W9



MIP30WA10



MIP28W12



MIP30WB10

Suggested $\phi 1.14$ [0.045] holes for size 20 contact holes.
Suggested $\phi 2.11$ [0.083] holes for size 16 contact holes.
Suggested $\phi 2.90$ [0.114] holes for size 12 contact holes.
Suggested $\phi 3.68$ [0.145] holes for size 8 contact holes.
Suggested $\phi 3.96 \pm 0.08$ [0.156 $\pm$ 0.003] holes for connector mounting holes.



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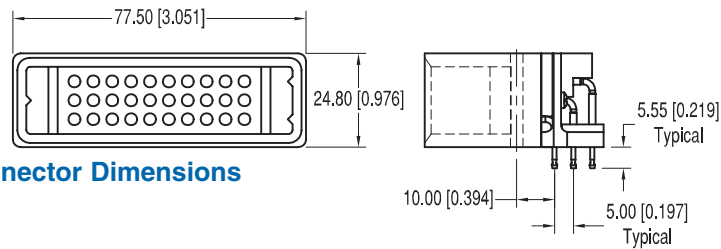
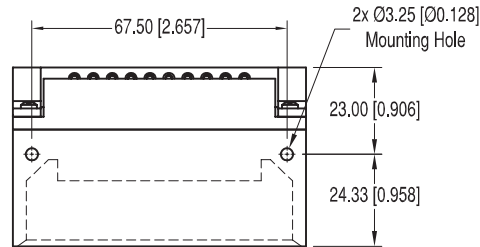
RIGHT ANGLE COMPLIANT PRESS-FIT BOARD MOUNT CONNECTORS AND HOLE PATTERN

Mini-Infinity
High Power
Connector Series

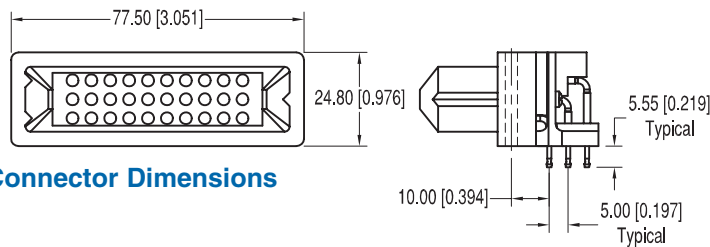
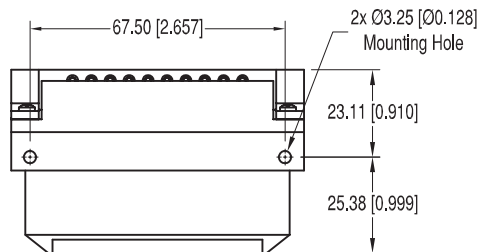
RIGHT ANGLE COMPLIANT PRESS-FIT BOARD MOUNT CONNECTORS

CODE 63

MALE AND FEMALE



Male Connector Dimensions

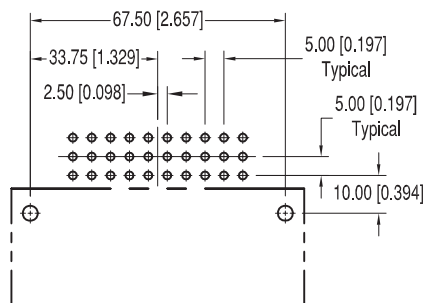


Female Connector Dimensions

RIGHT ANGLE COMPLIANT PRESS-FIT CONTACT HOLE PATTERN

MALE AND FEMALE

FOR SUGGESTED PRINTED BOARD
HOLE SIZES FOR COMPLIANT
PRESS-FIT CONNECTORS,
SEE CHART ON PAGE 14.



MIP30

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	MIP	29W9	F	32	0	0	A1	/AA	

STEP 1 - BASIC SERIES

MIP - Mini-Infinity

STEP 2 - CONNECTOR VARIANTS

- 24W8 - 2 high performance size 8, 6 size 12 and 16 size 20 contacts. Only available for use with crimp contacts.
- 28W12 - 12 size 12 and 16 size 20 contacts
- 29W9 - 3 size 12, 20 size 20, and 6 size 8 contacts
- 30 - 30 size 16 contacts
- 30WA10 - 10 size 12 and 20 size 20 contacts
- 30WB10 - 4 size 8, 6 size 16, and 20 size 20 contacts

STEP 3 - CONNECTOR GENDER

- M - Male
- F - Female

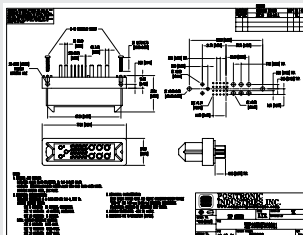
STEP 4 - CONTACT TERMINATION TYPE

- 0 - Order contacts separately for cable connectors for connection systems 2, 4 and 5.
- 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 Printed Board Mount with 3.70 [0.146] tail extension for connection systems 1, 2, 3 and 7.
- 42- Solder, Right Angle Printed Board Mount with 9.58 [0.377] tail extension for connection systems 1, 2, 3 and 7.
- 63 - Press-Fit, Compliant Termination Right Angle 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, 2, 3 and 7. Available on connector variant 30 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.

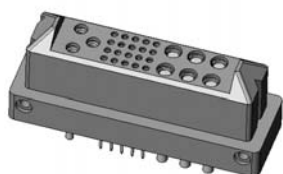
STEP 5 - MOUNTING STYLE

- 0 - None, mounting screws supplied with board mount connector.
- N - Push-on fasteners supplied installed on board mount connector. Not recommended for code 63 and 93.

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

STEP 9 - SPECIAL OPTIONS

CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS

- Sequential Mating
- Recessed Female Contacts
- Customer Specified Contact Arrangement
- * Hot Plug (see below)
- 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: MIP29W9F3200A1

STEP 7 - CONTACT PLATING

- 0 - Crimp contacts ordered separately
- A1 - Gold flash over nickel on mating end and termination end.
- A2 - Gold flash over nickel on mating end and 5.00 microns [0.000200 inch] tin-lead solder coat on termination end. Not available with code 63 and 93 in Step 4.
- C1 - 0.75 microns [0.000030 inch] gold over nickel on mating end and termination end.
- C2 - 0.75 microns [0.000030 inch] gold over nickel on mating end and 5.00 microns [0.000200 inch] tin-lead solder coat on termination end. Not available with code types 63 and 93 in Step 4.
- D1 - 1.27 microns [0.000050 inch] gold over nickel on mating end and termination end.
- D2 - 1.27 microns [0.000050 inch] gold over nickel on mating end and 5.00 microns [0.000200 inch] tin-lead solder coat on termination end. Not available with code types 63 and 93 in Step 4.

STEP 6 - PANEL MOUNT

- 0 - None.
- 82 - Panel Mount 1.52 [0.060] panel thickness
- 83 - Panel Mount 2.28 [0.090] panel thickness

Hot Plug Note: If UL approval is required for a Hot Plug connector, HP must be added to the part number. This is to be prior to any special plating or MOS requirements.

Example part numbers:
MIP28W12M300A1-HP
MIP30WA10M400A1-HP-294.0

DIMENSIONS ARE IN MILLIMETERS [INCHES].
ALL DIMENSIONS ARE SUBJECT TO CHANGE. **18**



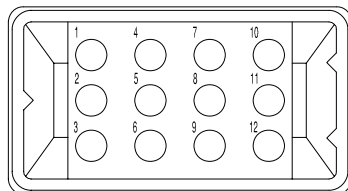
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CONNECTOR VARIANTS, OUTLINE AND MOUNTING DIMENSIONS

Mini-Infinity
High Power
Connector Series

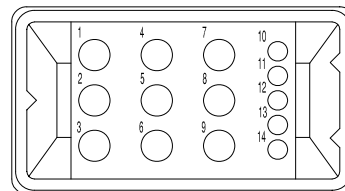
CONTACT VARIANTS

FACE VIEW OF MALE OR REAR VIEW OF FEMALE



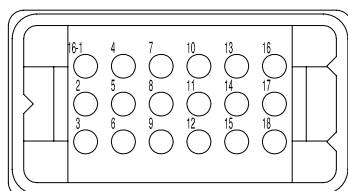
MMIP12W12 VARIANT

12 Size 12 Contacts



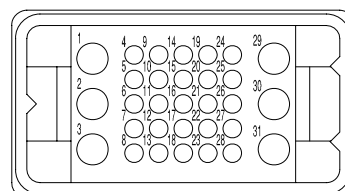
MMIP14W9 VARIANT

9 Size 12 and 5 Size 20 Contacts



MMIP18 VARIANT

18 Size 16 Contacts

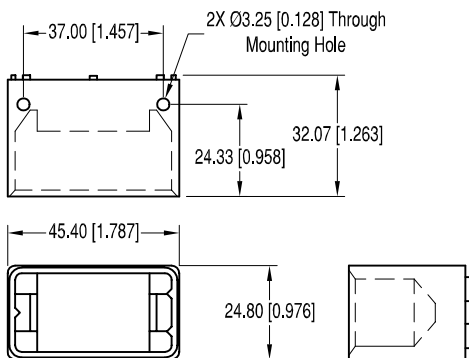


MMIP31W6 VARIANT

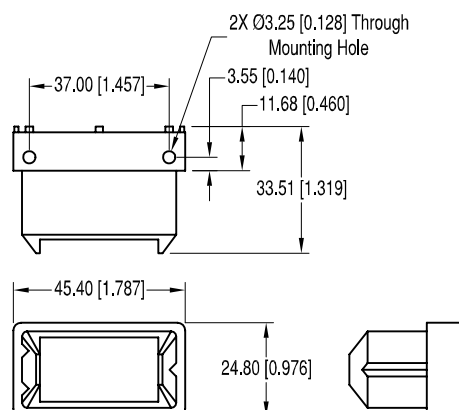
6 Size 12 and 25 Size 20 Contacts

Refer to page 8 for
Application Specific
Arrangements.

CONNECTOR OUTLINE DIMENSIONS

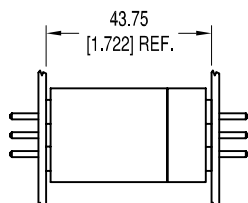


Male Connector Dimensions

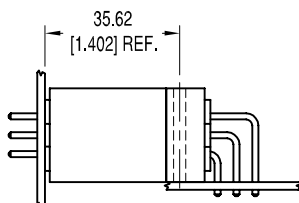


Female Connector Dimensions

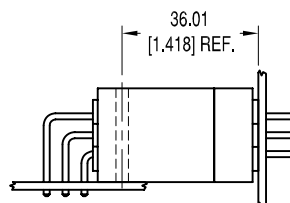
CONNECTOR MATING DIMENSIONS



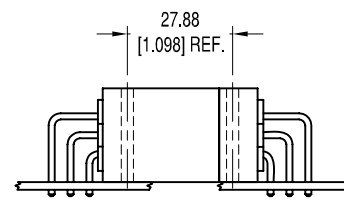
Straight Board Mount or
Panel Mount Female to
Straight Board Mount or
Panel Mount Male.



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



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



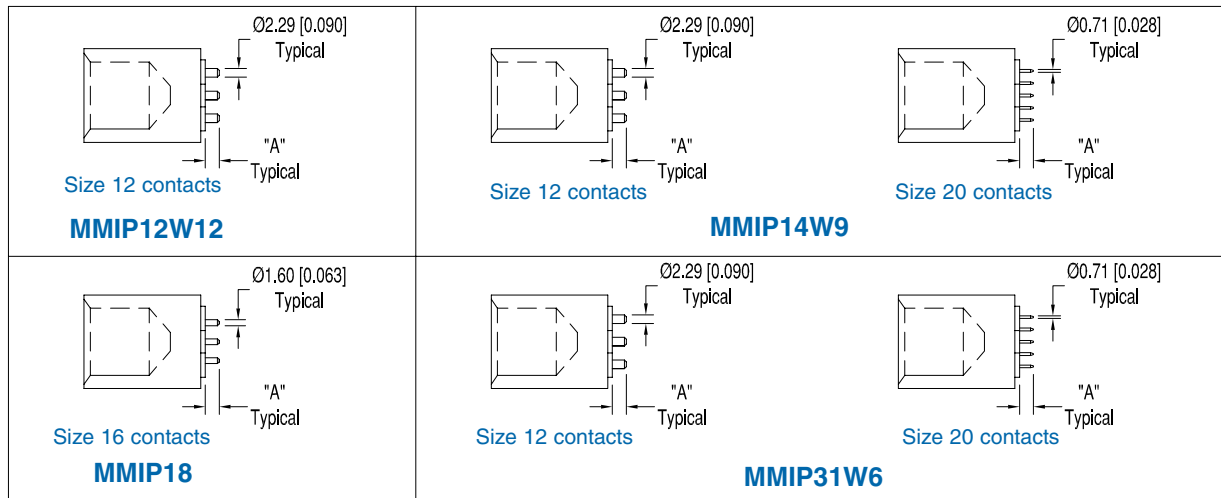
Right Angle Board Mount
Female to Right Angle
Board Mount Male.

CODE	"A" LENGTH
3	3.71 [0.146]
32	9.58 [0.377]

STRAIGHT SOLDER BOARD MOUNT CONNECTORS

CODE 3 AND CODE 32

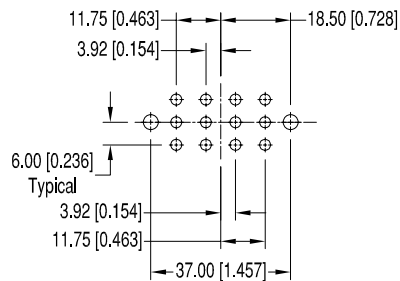
MALE CONNECTOR SHOWN FOR REFERENCE ONLY



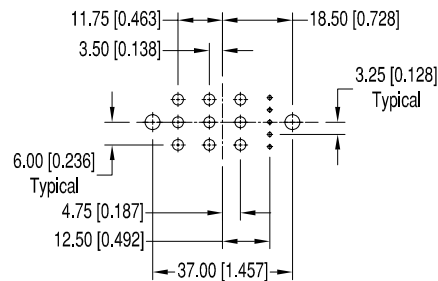
STRAIGHT SOLDER CONTACT HOLE PATTERNS

HOLE PATTERN SHOWN IS FOR MALE CONNECTOR

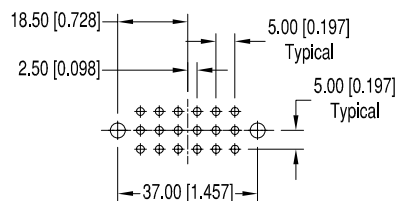
USE MIRROR IMAGE FOR FEMALE CONNECTOR



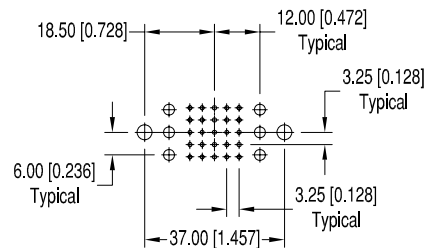
MMIP12W12



MMIP14W9



MMIP18



MMIP31W6

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

DIMENSIONS ARE IN MILLIMETERS [INCHES].
ALL DIMENSIONS ARE SUBJECT TO CHANGE. 20



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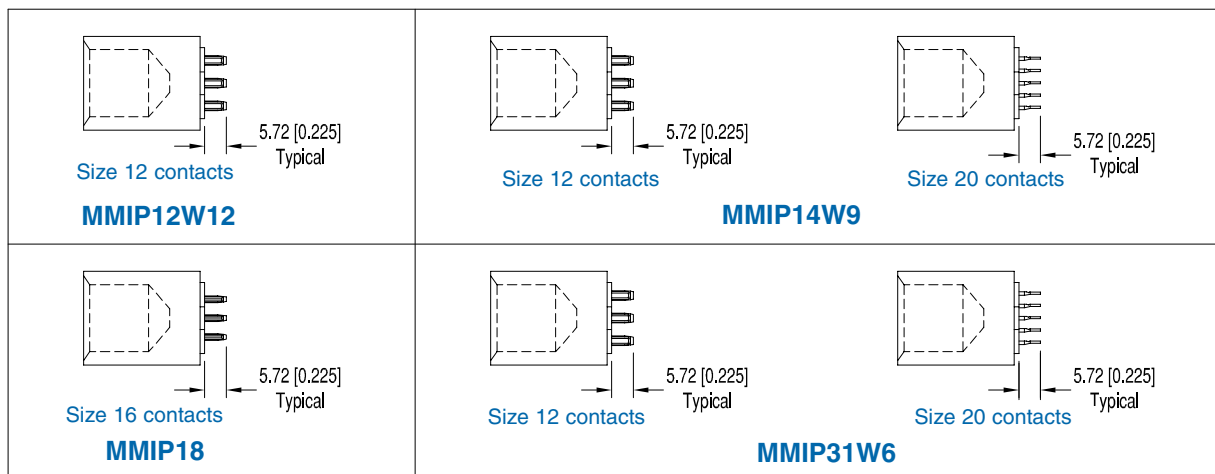
STRAIGHT COMPLIANT PRESS-FIT BOARD MOUNT CONNECTORS AND HOLE PATTERNS

Mini-Infinity
High Power
Connector Series

STRAIGHT COMPLIANT PRESS-FIT CONNECTORS

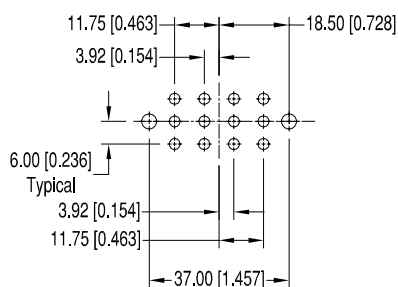
CODE 93

MALE CONNECTOR SHOWN FOR REFERENCE ONLY

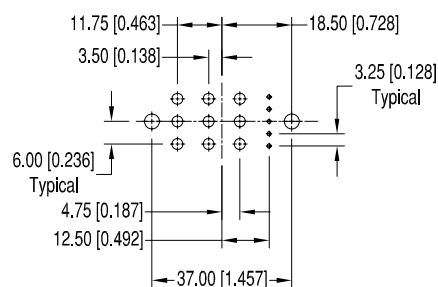


STRAIGHT COMPLIANT PRESS-FIT CONTACT HOLE PATTERNS

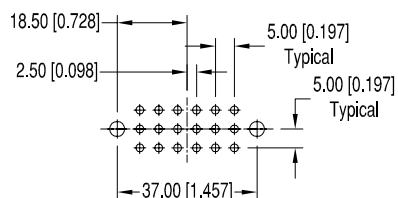
HOLE PATTERN SHOWN IS FOR MALE CONNECTOR
USE MIRROR IMAGE FOR FEMALE CONNECTOR



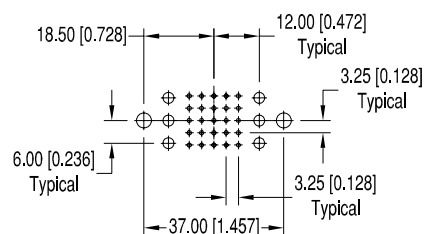
MMIP12W12



MMIP14W9



MMIP18



MMIP31W6

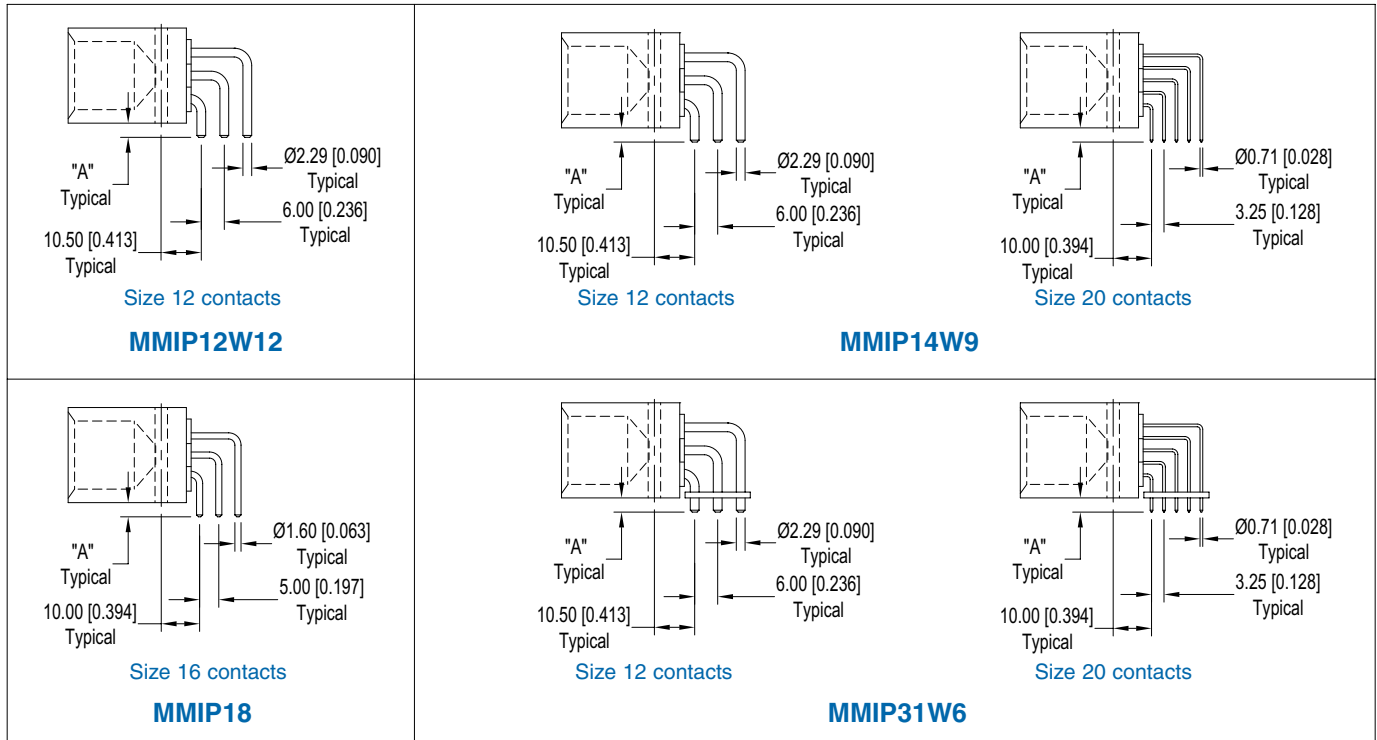
FOR SUGGESTED PRINTED BOARD HOLE SIZES FOR COMPLIANT
PRESS-FIT CONNECTORS, SEE CHART ON PAGE 14.

CODE	"A" LENGTH
4	3.71 [0.146]
42	9.58 [0.377]

RIGHT ANGLE SOLDER BOARD MOUNT CONNECTORS

CODE 4 AND CODE 42

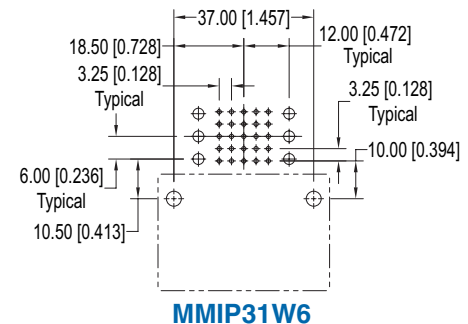
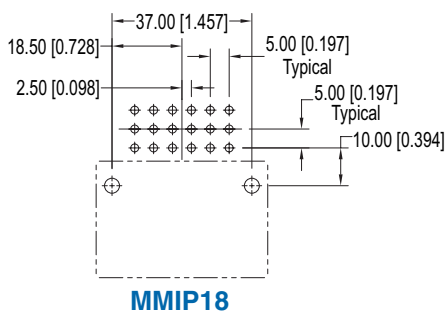
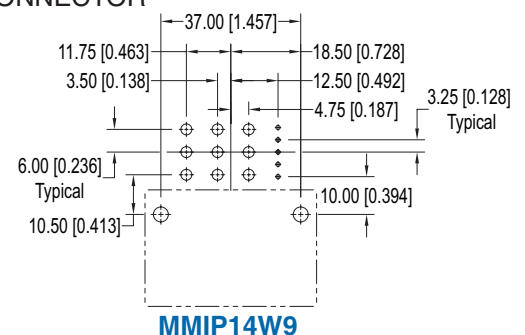
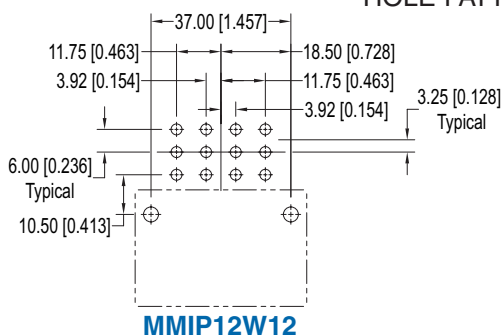
MALE CONNECTOR SHOWN FOR REFERENCE ONLY



RIGHT ANGLE SOLDER CONTACT HOLE PATTERNS

HOLE PATTERN SHOWN IS FOR MALE CONNECTOR

USE MIRROR IMAGE FOR
FEMALE CONNECTOR



Suggested ø1.14 [0.045] holes for size 20 contact holes.
Suggested ø2.11 [0.083] holes for size 16 contact holes.
Suggested ø2.90 [0.114] holes for size 12 contact holes.
Suggested ø3.68 [0.145] holes for size 8 contact holes.
Suggested ø3.96±0.08 [0.156±0.003] holes for connector mounting holes.

DIMENSIONS ARE IN MILLIMETERS [INCHES].
ALL DIMENSIONS ARE SUBJECT TO CHANGE. **22**



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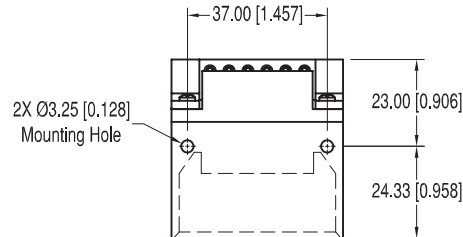
RIGHT ANGLE COMPLIANT PRESS-FIT BOARD MOUNT CONNECTORS AND HOLE PATTERN

Mini-Infinity
High Power
Connector Series

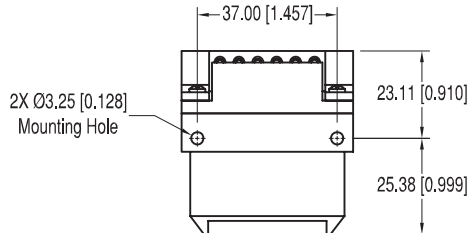
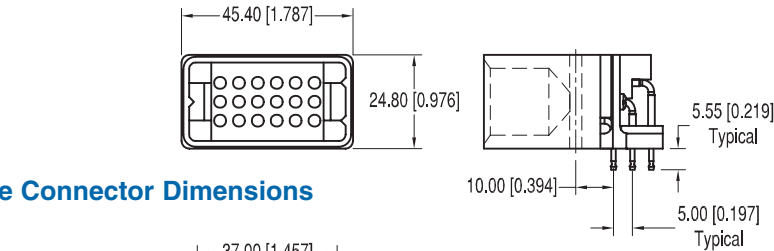
RIGHT ANGLE COMPLIANT PRESS-FIT BOARD MOUNT CONNECTORS

CODE 63

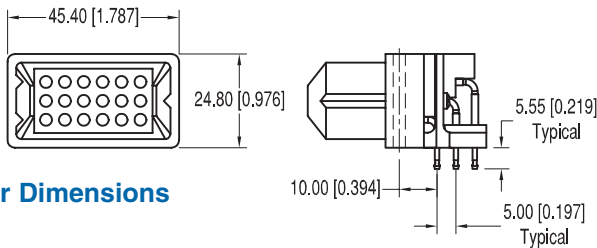
MALE AND FEMALE



Male Connector Dimensions



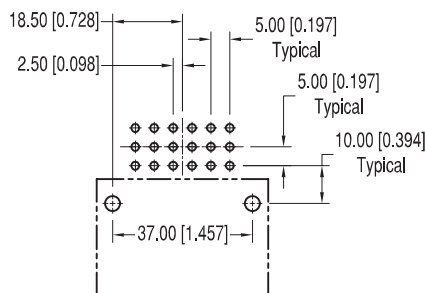
Female Connector Dimensions



RIGHT ANGLE COMPLIANT PRESS-FIT CONTACT HOLE PATTERN

MALE AND FEMALE

FOR SUGGESTED PRINTED BOARD
HOLE SIZES FOR COMPLIANT
PRESS-FIT CONNECTORS,
SEE CHART ON PAGE 14.



MMIP18

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	MMIP	12W12	F	32	0	0	A1	/AA	

STEP 1 - BASIC SERIES

MMIP - Mini-Mini-Infinity

STEP 2 - CONNECTOR VARIANTS

- 12W12- 12 size 12 contacts
- 14W9 - 9 size 12 and 5 size 20 contacts
- 18 - 18 size 16 contacts
- 31W6 - 6 size 12 and 25 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 2, 4 and 5.
- 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 Printed Board Mount with 3.70 [0.146] tail extension for connection systems 1, 2, 3 and 7.
- 42- Solder, Right Angle Printed Board Mount with 9.58 [0.377] tail extension for connection systems 1, 2, 3 and 7.
- 63 - Press-Fit, Compliant Termination Right Angle 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, 2, 3 and 7. Available on connector variant 18 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

- 0 - None, mounting screws supplied with board mount connector.
- N - Push-on fasteners supplied installed on board mount connector. Not recommended for code 63 and 93.

STEP 9 - SPECIAL OPTIONS

CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS

- Sequential Mating
- Recessed Female Contacts
- Customer Specified Contact Arrangement
- * Hot Plug (see below)
- 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:MMIP12W12F3200A1

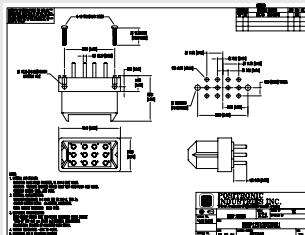
STEP 7 - CONTACT PLATING

- 0 - Crimp contacts ordered separately
- A1 - Gold flash over nickel on mating end and termination end.
- A2 - Gold flash over nickel on mating end and 5.00 microns [0.000200 inch] tin-lead solder coat on termination end. Not available with code 63 and 93 in Step 4.
- C1 - 0.75 microns [0.000030 inch] gold over nickel on mating end and termination end.
- C2 - 0.75 microns [0.000030 inch] gold over nickel on mating end and 5.00 microns [0.000200 inch] tin-lead solder coat on termination end. Not available with code types 63 and 93 in Step 4.
- D1 - 1.27 microns [0.000050 inch] gold over nickel on mating end and termination end.
- D2 - 1.27 microns [0.000050 inch] gold over nickel on mating end and 5.00 microns [0.000200 inch] tin-lead solder coat on termination end. Not available with code types 63 and 93 in Step 4.

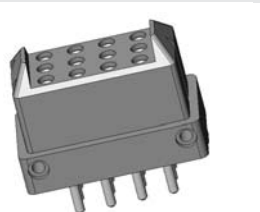
STEP 6 - PANEL MOUNT

- 0 - None.
- 82 - Panel Mount 1.52 [0.060] panel thickness
- 83 - Panel Mount 2.28 [0.090] panel thickness

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

Hot Plug Note: If UL approval is required for a Hot Plug connector, HP must be added to the part number. This is to be prior to any special plating or MOS requirements.

Example part numbers:
MMIP12W12M300A1-HP
MIP31W6M400A1-HP-294.0



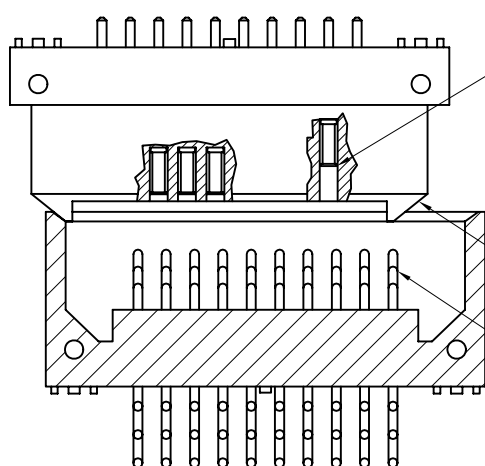
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BLIND MATING SYSTEMS AND SEQUENTIAL MATING CONTACTS

Mini-Infinity
High Power
Connector Series

- ◆ **BLIND MATING SYSTEM** molded in guides allow for misalignment up to 7.62 mm [0.300 inch] for MIP or 4.19 mm [0.165 inch] for MMIP.
- ◆ **SEQUENTIAL MATING MALE AND FEMALE CONTACTS** may be specified to provide steps in mating length.

MIP Series



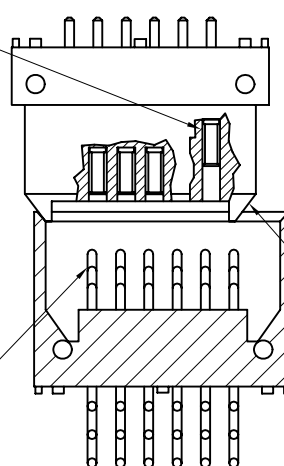
Safety recessed female contacts available.

Consult Technical Sales for assistance on recessed contacts.

Molded in guides up to 7.62 [0.300] misalignment.

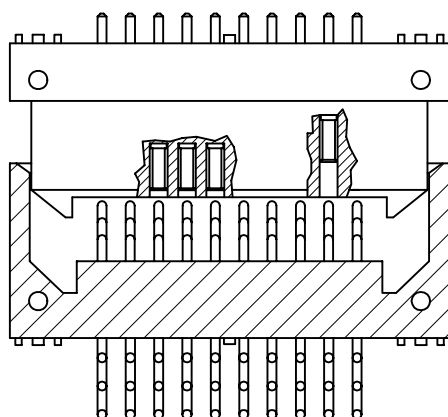
Up to three (3) mating lengths are available on the fixed contact male connector.

MMIP Series



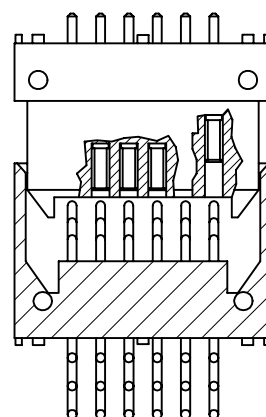
Molded in guides allow for up to 4.19 [0.165] misalignment.

MIP Series



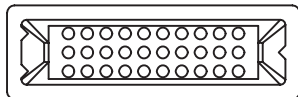
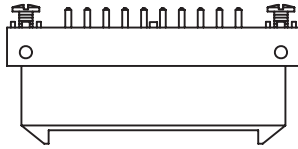
Consult Technical Sales for assistance when specifying sequential mate contacts.

MMIP Series



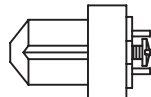
CONNECTOR MOUNTING STYLE OPTIONS

SELF-TAPPING MOUNTING SCREWS

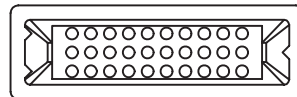
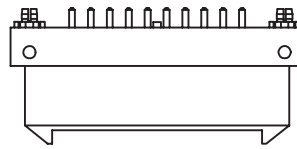


MIP30F300A1

SHOWN FOR REFERENCE

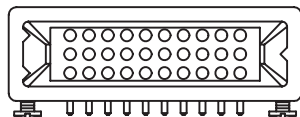
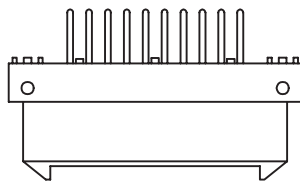
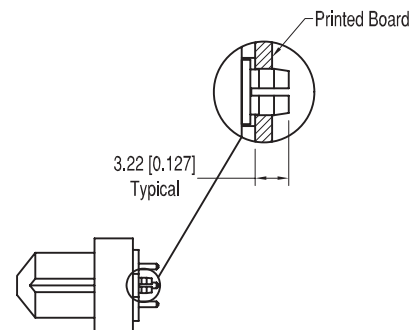


PUSH-ON FASTENER



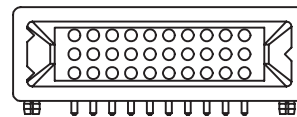
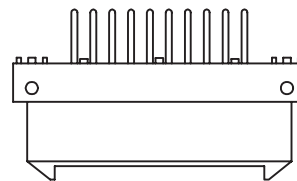
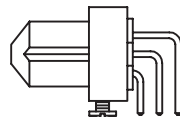
MIP30F3N0A1

SHOWN FOR REFERENCE



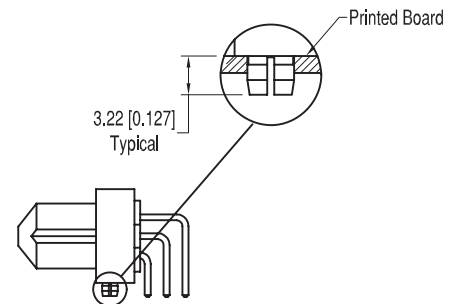
MIP30F400A1

SHOWN FOR REFERENCE

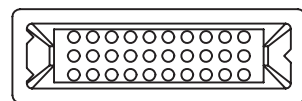
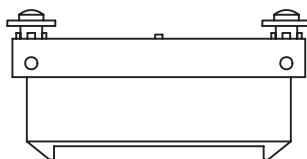


MIP30F4N0A1

SHOWN FOR REFERENCE

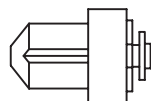


PANEL FLOAT MOUNT



MIP30F00820

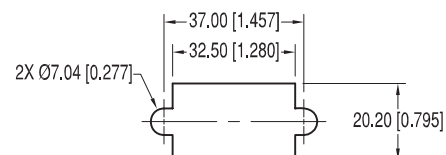
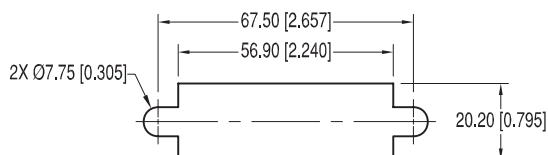
SHOWN FOR REFERENCE



PART NUMBER	PANEL THICKNESS
*IP****82*	1.52 [0.060]
*IP****83*	2.28 [0.090]

Panel float mount system provides lead-in for 2.03 [0.080] axial misalignment. Additional panel thickness may be available. Consult Technical Sales for availability.

FLOAT MOUNT PANEL CUTOUT





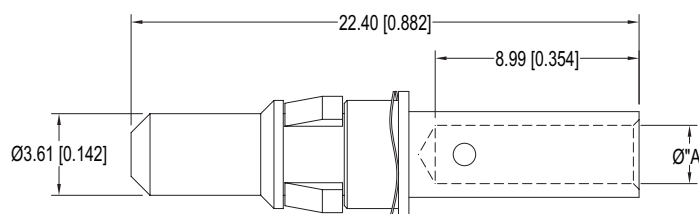
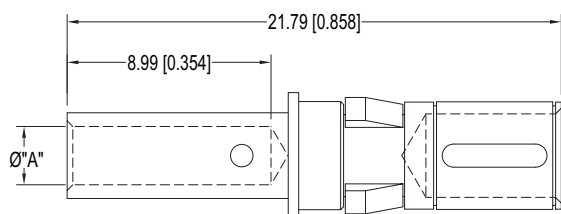
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REMOVABLE CONTACTS

Mini-Infinity
High Power
Connector Series

REMOVABLE CRIMP CONTACTS

SIZE 8

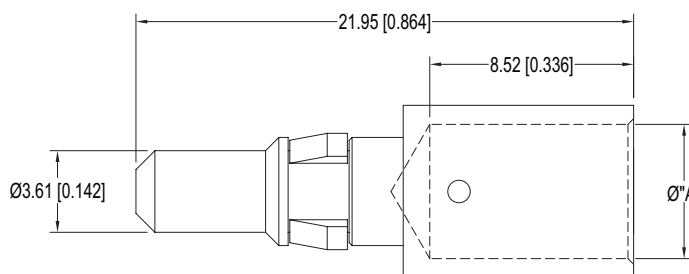
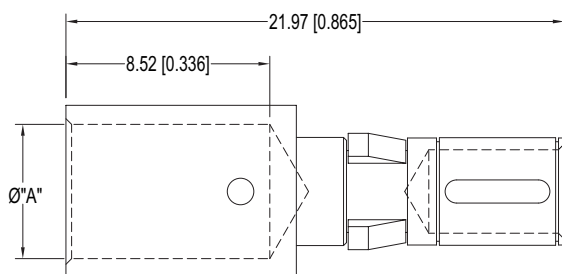


FEMALE CONTACT		
PART NUMBER	WIRE SIZE mm ² [AWG]	Ø "A"
FC4008D	10.0 [8]	4.60 [0.181]
FC4010D	5.3 [10]	3.10 [0.122]
FC4012D	4.0 [12]	2.57 [0.101]
FC4016D	1.5 [16]	1.70 [0.067]

MALE CONTACT		
PART NUMBER	WIRE SIZE mm ² [AWG]	Ø "A"
MC4008D	10.0 [8]	4.60 [0.181]
MC4010D	5.3 [10]	3.10 [0.122]
MC4012D	4.0 [12]	2.57 [0.101]
MC4016D	1.5 [16]	1.70 [0.067]

HIGH PERFORMANCE SIZE 8

For use with MIP24W8 connectors only.



FEMALE CONTACT		
PART NUMBER	WIRE SIZE mm ² [AWG]	Ø "A"
FC4006D	16.0 [6]	5.92 [0.233]

MALE CONTACT		
PART NUMBER	WIRE SIZE mm ² [AWG]	Ø "A"
MC4006D	16.0 [6]	5.92 [0.233]

CONSULT TECHNICAL SALES FOR ELECTRICAL CHARACTERISTICS.

MATERIALS:

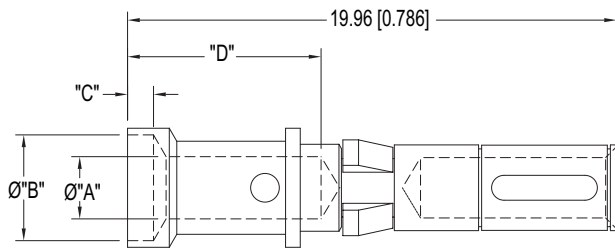
Contacts: Copper Alloy.
Retention Clips: Beryllium copper.

FINISH:

Gold flash over nickel plate.
0.000030 [0.75μ] gold over nickel available by adding -14 suffix onto part number. Example: FC4016D-14.
0.000050 [1.27μ] gold over nickel available by adding -15 suffix onto part number. Example: MC4006D-15.

CONTACTS ARE NOT SUPPLIED WITH CONNECTORS AND MUST BE ORDERED SEPARATELY

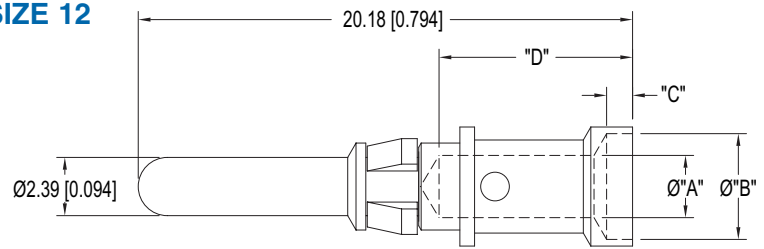
REMOVABLE CRIMP CONTACTS



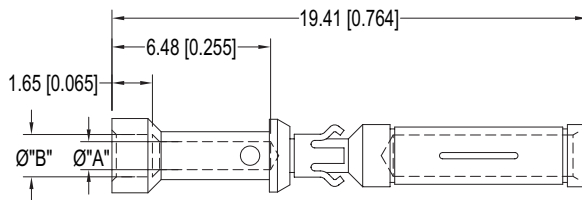
PART NUMBER	WIRE SIZE AWG [mm ²]	Ø A	Ø B	C	D
FC610N2S*	6.0 [10]	3.73 [0.147]	N/A	N/A	6.45 [0.254]
FC612N2	4.0 [12]	2.54 [0.100]	4.19 [0.165]	1.06 [0.042]	7.85 [0.309]

* "S" in part number indicates high conductivity material.

SIZE 12

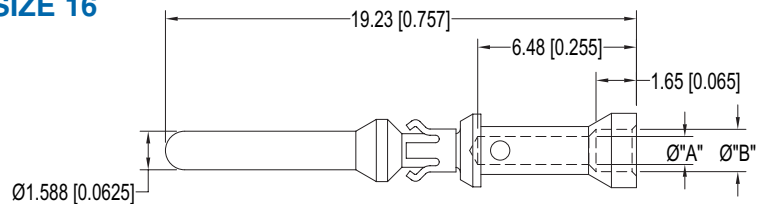


PART NUMBER	WIRE SIZE AWG [mm ²]	Ø A	Ø B	C	D
MC610NS*	6.0 [10]	3.73 [0.147]	N/A	N/A	6.45 [0.254]
MC612N	4.0 [12]	2.54 [0.100]	4.19 [0.165]	1.06 [0.042]	7.85 [0.309]

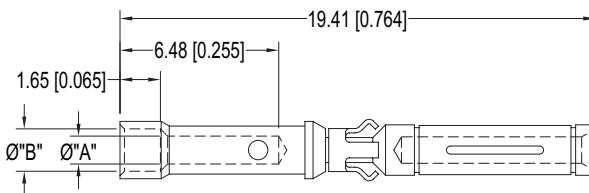


FEMALE CONTACT			
PART NUMBER	WIRE SIZE mm ² [AWG]	Ø "A"	Ø "B"
FC112N2	4.0 [12]	2.49 [0.098]	
FC114N2	2.5-1.5 [14-16]	2.06 [0.081]	2.64 [0.104]
FC116N2	1.5-1.0 [16-18]	1.70 [0.067]	2.36 [0.093]
FC120N2	0.5-0.3-0.25 [20-22-24]	1.14 [0.045]	1.73 [0.068]
FC124N2	0.25-0.12-0.08 [24-26-28]	0.69 [0.027]	1.40 [0.055]

SIZE 16

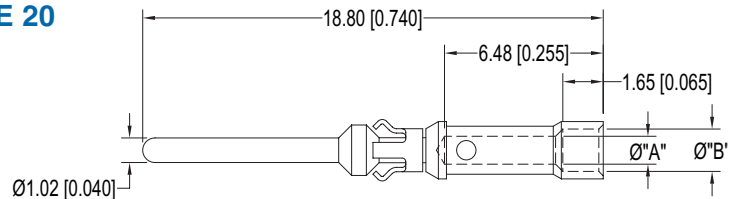


MALE CONTACT			
PART NUMBER	WIRE SIZE mm ² [AWG]	Ø "A"	Ø "B"
MC112N	4.0 [12]	2.49 [0.098]	
MC114N	2.5-1.5 [14-16]	2.06 [0.081]	2.67 [0.105]
MC116N	1.5-1.0 [16-18]	1.70 [0.067]	2.36 [0.093]
MC120N	0.5-0.3-0.25 [20-22-24]	1.14 [0.045]	1.73 [0.068]
MC124N	0.25-0.12-0.08 [24-26-28]	0.69 [0.027]	1.40 [0.055]



FEMALE CONTACT			
PART NUMBER	WIRE SIZE mm ² [AWG]	Ø "A"	Ø "B"
FC720N2	0.5-0.3-0.25 [20-22-24]	1.14 [0.045]	1.73 [0.068]

SIZE 20



MALE CONTACT			
PART NUMBER	WIRE SIZE mm ² [AWG]	Ø "A"	Ø "B"
MC720N	0.5-0.3-0.25 [20-22-24]	1.14 [0.045]	1.73 [0.068]

MATERIALS:
Contacts: Copper Alloy.
Retention Clips: Beryllium copper.

FINISH: Gold flash over nickel plate.
0.000030 [0.75µ] gold over nickel available by adding -14 suffix onto part number. Example: FC114N2-14.
0.000050 [1.27µ] gold over nickel available by adding -15 suffix onto part number. Example: MC720N-15.

**CONTACTS ARE NOT SUPPLIED WITH CONNECTORS
AND MUST BE ORDERED SEPARATELY**

DIMENSIONS ARE IN MILLIMETERS [INCHES].
ALL DIMENSIONS ARE SUBJECT TO CHANGE. 28

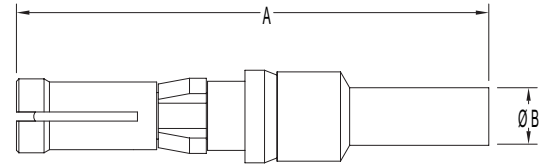
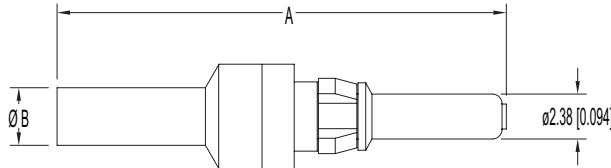


Positronic Industries
connectpositronic.com

REMOVABLE CONTACTS

Mini-Infinity
High Power
Connector Series

CRIMP SHIELDED CONTACTS SIZE 12



CONTACT DESIGNATION	PART NUMBER	"A"	Ø "B"	CABLE SIZE
MALE	MC601D	23.77 [0.936]	1.04 [0.041]	RG 178 B/U RG 196 B/U
FEMALE	FC601D	24.99 [0.984]	1.04 [0.041]	RG 178 B/U RG 196 B/U
MALE	MC602D	23.77 [0.936]	1.78 [0.070]	RG 179 B/U RG 316 /U
FEMALE	FC602D	24.99 [0.984]	1.78 [0.070]	RG 179 B/U RG 316 /U

CONTACTS ARE NOT SUPPLIED WITH CONNECTORS AND MUST BE ORDERED SEPARATELY

TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

Insulating Material: (Dielectric) PTFE, Teflon.
Inner Contacts: Brass & Phosphor bronze, 0.75 microns [0.000030 inch] gold over nickel and 1.25 microns [0.000050 inch] gold over nickel.

Contact Body: Brass and Phosphor bronze, gold flash over nickel.

ELECTRICAL CHARACTERISTICS:

Initial Contact Resistance: 0.010 ohms maximum.
Nominal Impedance: 50 ohms.
Insertion Loss: 0.35 dB at 1 GHz
1.35 dB at 2 GHz
1.53 dB at 3 GHz
VSWR: 1.20 average at 1 GHz
1.45 average at 2 GHz
1.63 average at 3 GHz
Proof Voltage: 600 V r.m.s.

Above values measured using frequency domain techniques.

MECHANICAL CHARACTERISTICS:

Removable Contacts: Rear insertion, front release.
Durability: 100 cycles minimum.
Vibration: 20g from 10 HZ to 500 HZ.
Shock: 30g - 11rms.

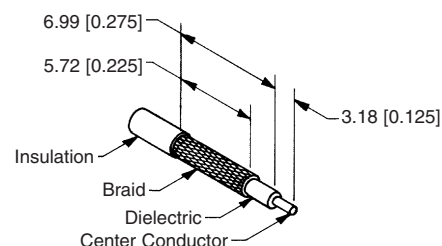
CLIMATIC CHARACTERISTICS:

Temperature Range: -55°C to +125°C.

CRIMP TOOL

Use 9504-0-0-0 Crimp Tool

SHIELDED CABLE STRIP LENGTH

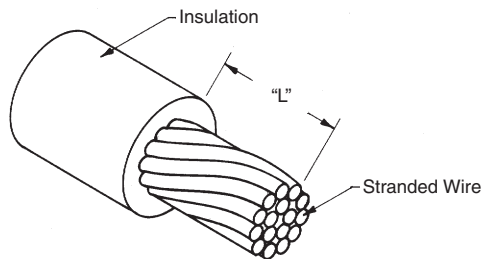


CRIMPING INFORMATION FOR MINI-INFINITY SERIES CRIMP CONTACTS

Step 1: Strip wire to indicated length.

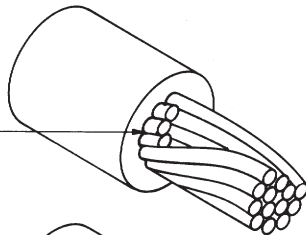
- Take care not to:
- Damage or remove strands.
 - Untwist or overtighten strands.
 - Leave insulation particles on strands.
 - Damage insulation.

Correctly
Stripped Wire:

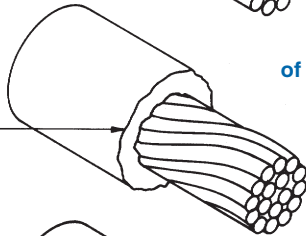


CONTACT SIZE	"L" ±0.51 [0.020]
8	8.38 [0.330]
12	7.37 [0.290]
16	5.84 [0.230]
20	5.84 [0.230]

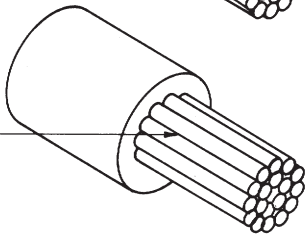
Strands damaged
or removed
by stripping tool.



Insulation cut
incorrectly.

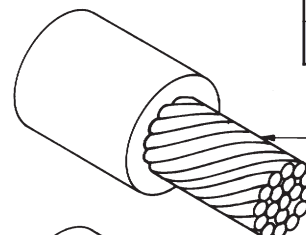


Strands untwisted.

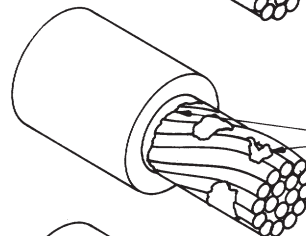


Examples
of Stripping Faults

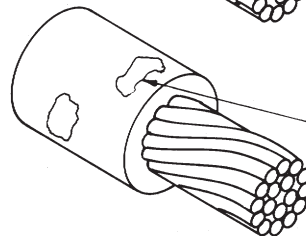
Strands overtightened.



Particles of
insulation left
on the stripped
part of the wire.



Wire insulation damaged.



Step 2: Crimp wire to contact.

- For hand crimp tool:
- Place contact into crimping tool.
 - Insert wire into contact.
 - Center contact by slowly closing crimping tool until crimp indenters make contact with crimp barrel.
 - Complete the cycle of the crimping tool in one smooth motion.
 - Remove the crimped contact.

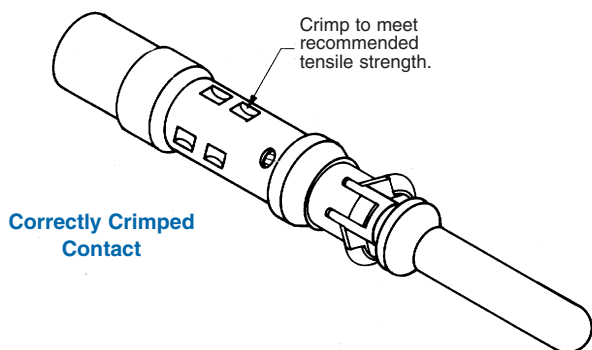
- For automatic crimp tool:
- Insert wire into the contact positioned in the crimp tool by the plastic carrier.
 - Depress the activating device of the crimping tool to start crimping cycle.
 - Remove the crimped contact.



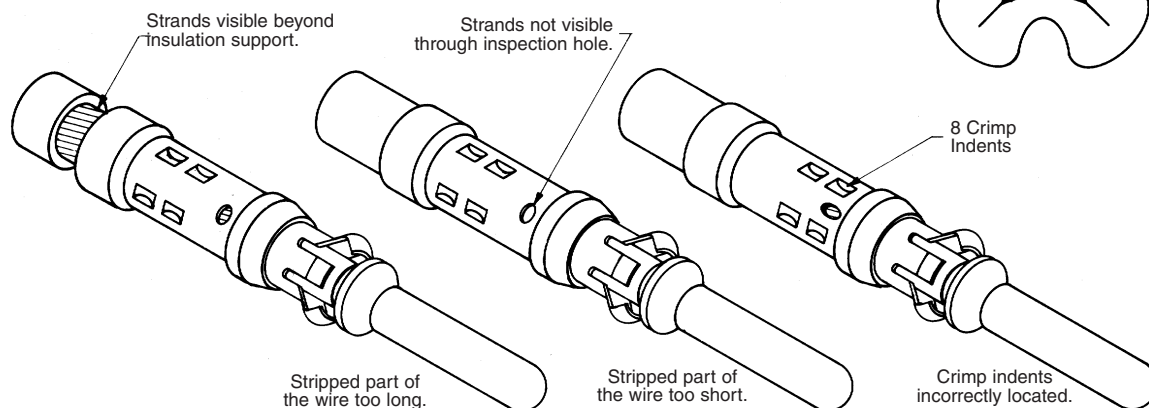
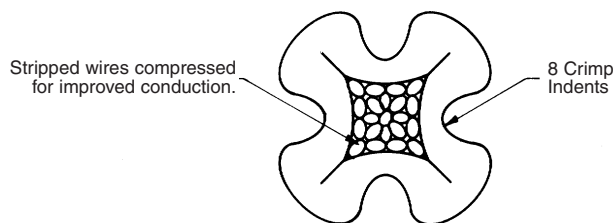
CRIMPING INFORMATION FOR MINI-INFINITY SERIES CRIMP CONTACTS

Step 3: Inspect crimp.

- For All Tools:**
- Strands to be visible through the inspection hole.
 - Strands not to be visible beyond the insulation support.
 - Crimped contact to meet recommended conductor tensile force shown in chart (below, left).
 - Check for peeled gold and bent contact.



**Cross-section of
Correctly Crimped
Contact**



Examples of Crimping Faults

Positronic Recommended Conductor Tensile Strength	
WIRE SIZE	AXIAL LOAD
4.0mm ² [12 AWG]	489N [110 lbs.]
2.5mm ² [14 AWG]	311N [70 lbs.]
1.5mm ² [16 AWG]	222N [50 lbs.]
1.0mm ² [18 AWG]	125N [28 lbs.]
0.5mm ² [20 AWG]	89N [20 lbs.]
0.3mm ² [22 AWG]	53N [12 lbs.]
0.25mm ² [24 AWG]	36N [8 lbs.]
0.12mm ² [26 AWG]	22N [5 lbs.]

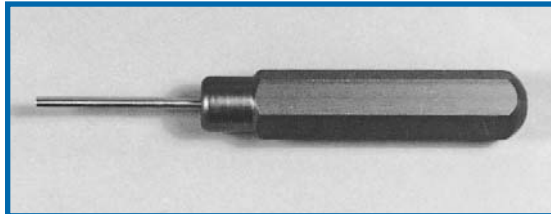
POSITRONIC RECOMMENDED TOOLS				
TOOL DESCRIPTION	CONTACT SIZES			
	SIZE 8	SIZE 12	SIZE 16	SIZE 20
Hand crimp tool	9504-17-0-0 for *C4008D Contacts or 9509-0-0-0 for *C4010D, *C4012D and *C4016D Contacts	9501 with 9502-19-0-0 Positioner	9501 with 9502-1 Positioner	9507 with 9502-21-0-0 Positioner for Male Contacts or 9502-22-0-0 Positioner for Female Contacts
Automatic crimp tool	---	---	9550-0	9550-1
Contact insertion tool	---	9099-3	9099	9099-4-0-0
Contact extraction tool	4311-0	2711-0	9081	9081-2

CONTACT INSERTION TOOLS

PART NO. 9099

SHOWN FOR REFERENCE ONLY

An easy-to-use contact insertion tool. Reference the photo below for recommended insertion procedure.

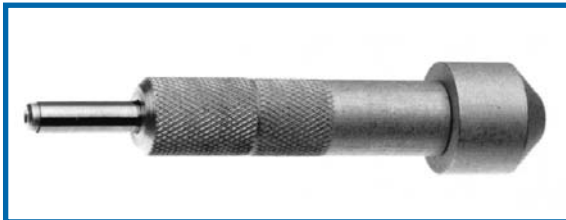


CONTACT EXTRACTION TOOLS

These spring-loaded contact extraction tools simplify the extraction of removable contacts from the connector insulators. Simply insert the hollow tool tip over the male or female contact from the front face of the insulator, rotate the tool slightly while increasing the pushing force against the butt of the extraction tool. The contact will be released from the insulator retention system and will "pop out" of the rear face of the insulator.

EXTRACTION TOOL PART NO. 2711-0-0

SHOWN FOR REFERENCE ONLY

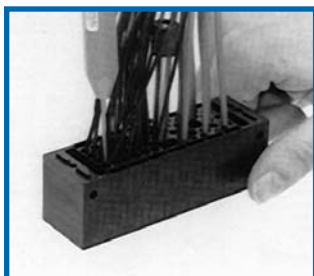


EXTRACTION TOOL PART NO. 9081

SHOWN FOR REFERENCE ONLY



CONTACT INSERTION



CONTACT EXTRACTION



CYCLE-CONTROLLED STEP ADJUSTABLE HAND CRIMP TOOLS

PART NO. 9501

SHOWN FOR REFERENCE ONLY

Features of this positive ratchet action tool includes eight (8) impression crimp on wires and contacts of various compositions. A positioner is required for use with this basic tool.



OMNICRIMP 9550 CRIMP TOOL, PNEUMATICALLY ACTIVATED

PART NO. 9550-0

SHOWN FOR REFERENCE ONLY

This fast cycling and reliable automatic crimp tool produces a four double-indent crimp, meeting Military Standard and proprietary specifications. Wire strip accessory can be added.

The tool is a bench mount unit of compact size and weight. Contacts must be ordered separately and are supplied on reels in quantity of 2000.

To order, specify part number see chart on page 31. A foot pedal control valve is supplied as a standard accessory.

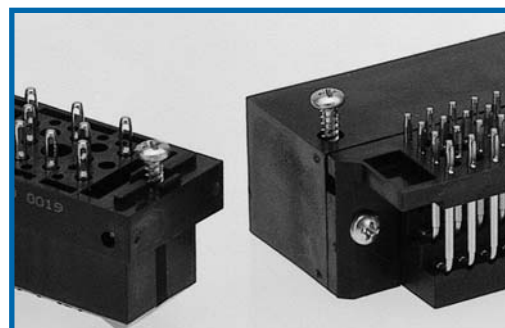


DIMENSIONS ARE IN MILLIMETERS [INCHES].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.



MOUNTING SCREWS

Stresses that occur during coupling and uncoupling of connectors or through shock and vibration of systems can be transferred to backplanes or P.C. boards through press-fit connector terminations. Avoid concern over electrical integrity of the connector to board interface by using mounting screws. Bellcore GR1217 details a preference for the use of mounting hardware and we recommend this practice.



* Mounting screws supplied with board mount connectors

Additional Mounting Screw Ordering Information *		
PART NUMBER	THREAD LENGTH	P.C. BOARD THICKNESS
2076-12-0-16	9.53±0.76 [0.375±0.030]	1.52-2.36 [0.060-0.093] Straight mount connectors
2076-12-1-16	12.70±0.76 [0.500±0.030]	All Right Angle mount connectors
2076-12-5-16	11.10±0.76 [0.437±0.030]	3.18 [0.125] Straight mount connectors

Screws are #6 self-tapping for plastic.

CONTACT CODE	SCREW PART NUMBER
3, 93	2076-12-0-16
32, 4, 42, 63	2076-12-1-16

Consult Technical Sales if an alternate screw is required.

PRESS-FIT USER INFORMATION

When properly used, Positronic Industries' Bi-Spring Power Press-Fit Terminations provide reliable service even under severe conditions.

Connectors utilizing this leading technology press-fit contact are easy to install:

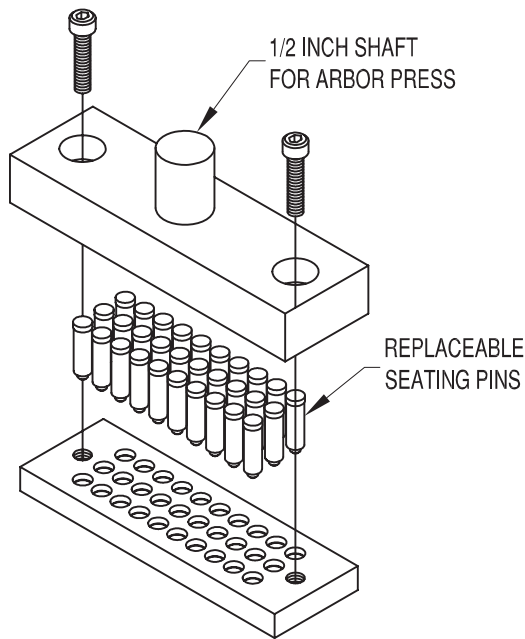
1. Choose the proper tooling. Inexpensive insertion tooling and single contact repair tooling are available from Positronic. See page 34 for ordering information.
2. Insert the connector into the P.C. board or backplane and seat connector fully.
3. Secure the connector to the P.C. board or backplane using two self-tapping screws. The screws should be number 6 self-tapping screws for plastic.

Need to repair a single contact because of damage in manufacturing, testing, or field use?

1. Choose the proper contact extraction tool. See page 34 for ordering information.
2. Push the contact out with a firm, steady force. Remember, excessive force is not required.
3. Install a new contact with the proper contact insertion tool. You are finished. Replacing a single contact instead of an entire connector can allow considerable cost savings. This is particularly true when considering the risk of damage to P.C. boards and backplanes that can occur if the entire connector must be replaced.

PRESS-FIT TERMINATION CONNECTOR INSTALLATION TOOLS

SEATING TOOL



Female Seating Tool shown for reference only.

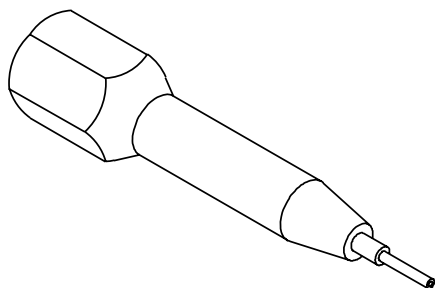
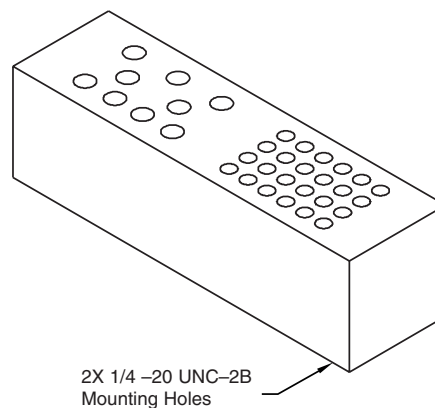
CONNECTOR VARIANT	CONNECTOR SEATING TOOL WITH ARBOR PRESS SHAFT	CONNECTOR SEATING TOOL WITHOUT ARBOR PRESS SHAFT	REPLACEMENT PINS
MIP28W12M93	9513-305-4	9513-305-14	NONE
MIP28W12F93	9513-304-4	9513-304-14	Positions 1-6 through 23-28: 855-347-11 Positions 7-22: 855-347-18
MIP29W9M93	9513-305-5	9513-305-15	NONE
MIP29W9F93	9513-304-5	9513-304-15	Positions 1-6: 855-347-17 Positions 7-26: 855-347-18 Positions 27-29: 855-347-11
MIP30M63	9513-305-1	9513-305-11	NONE
MIP30F63	9513-305-1	9513-305-11	NONE
MIP30M93	9513-305-1	9513-305-11	NONE
MIP30F93	9513-304-1	9513-304-11	855-347-3
MIP30WA10M93	9513-305-2	9513-305-12	NONE
MIP30WA10F93	9513-304-2	9513-304-12	Positions 1-4 through 25-30: 855-347-11 Positions 5-24: 855-347-18
MIP30WB10M93	9513-305-3	9513-305-13	NONE
MIP30WB10F93	9513-304-3	9513-304-13	Positions 1-4: 855-347-17 Positions 5-24: 855-347-18 Positions 25-30: 855-347-11
MMIP12W12M93	9513-307-2	9513-307-12	NONE
MMIP12W12F93	9513-306-4	9513-306-14	855-347-11
MMIP14W9M93	9513-307-1	9513-307-11	NONE
MMIP14W9F93	9513-306-1	9513-306-11	Positions 1-9: 855-347-11 Positions 10-14: 855-347-18
MMIP18M63	9513-307-2	9513-307-12	NONE
MMIP18F63	9513-307-2	9513-307-12	NONE
MMIP18M93	9513-307-2	9513-307-12	NONE
MMIP18F93	9513-306-2	9513-306-12	855-347-3
MMIP31W6M93	9513-307-3	9513-307-13	NONE
MMIP31W6F93	9513-306-3	9513-306-13	Positions 1-3 through 29-31: 855-347-11 Positions 4-28: 855-347-18



PRESS-FIT TERMINATION CONNECTOR INSTALLATION TOOLS

CONNECTOR VARIANT	CONNECTOR SUPPORT TOOL
MIP28W12	9513-402-4
MIP29W9	9513-402-5
MIP30	9513-402-1
MIP30WA10	9513-402-2
MIP30WB10	9513-402-3
MMIP14W9	9513-403-1
MMIP18	9513-403-2
MMIP31W6	9513-403-3

SUPPORT TOOL



SINGLE CONTACT INSERTION OR EXTRACTION TOOL

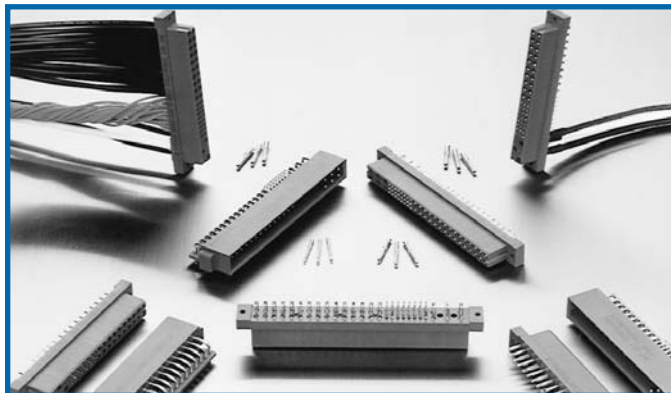
CONTACT SIZE	SINGLE CONTACT INSERTION TOOL		SINGLE CONTACT EXTRACTION TOOL
12	MALE	9513-104-0	9513-106-0
	FEMALE	9513-105-0	
16	MALE	9513-100-0	9513-102-0
	FEMALE	9513-101-0	
20	MALE	9512-100-0	9512-102-0
	FEMALE	9512-101-0	

Positronic Industries

has the widest variety of

Power Connector Solutions

COMPACT POWER CONNECTOR



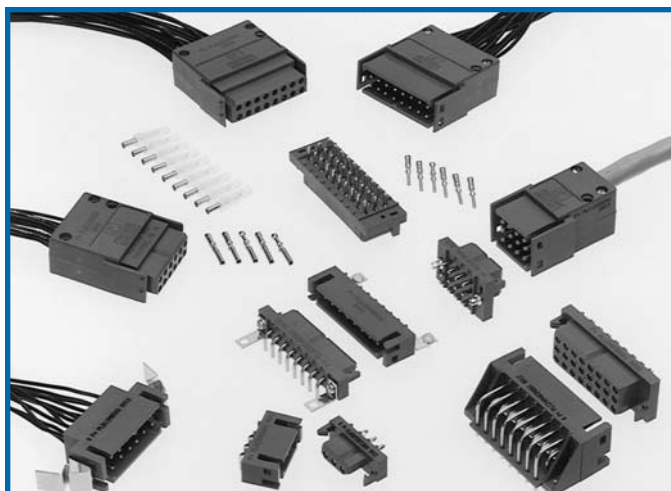
The Power interface for platforms utilizing Eurocard form factors including CompactPCI®, PICMG® 2.11 compliant. Multiple package sizes available.

INFINITY



Ideal for low, mid, and high power applications which demand outstanding blind mating capability.

POWER CONNECTION SYSTEMS



The industry standard for low and mid range power applications. Multiple package sizes available.

COMBO-D



Power, signal, coaxial, high voltage, and thermocouple contacts in an EMI/RFI shielded package.

FRONT RUNNER CIRCULAR



Power, signal, and thermocouple contacts in an environmental and/ or EMI/RFI shielded package.

EACH OF THESE SERIES HAVE ONE OR MORE OF THE FOLLOWING FEATURES:

- Hot swap capability
- A.C./ D.C. operation in a single connector
- Meets safety agency requirements
- Signal contacts for communication with host system
- Superior blind mating capability
- Cable and panel mount options
- Large surface area contact system
- Bi-Spring power press-fit terminations
- Single contact ratings up to 100 amperes
- Wide variety of variants & accessories

Positronic Industries is proud to participate in the important work of the following organizations....



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www.picmg.com



**Power Sources
Manufacturer's Association**

The Multinational Power Electronics Association

www.psma.com



VMEbus International Trade Association

www.vita.com

POSITRONIC PRODUCTS

Power

Contact Sizes: 0, 8, 12, 16, 20 and 22
Current Ratings: To 100 amperes
Terminations: Crimp, wire solder, straight solder, right angle solder, straight press-fit and right angle press-fit
Configurations: Multiple variants in a variety of package sizes
Compliance: PICMG 2.11, PICMG 3.0, VITA 41



FEATURES: Hot swap capability • AC/DC operation in a single connector • Signal contacts for hardware management • Blind mating • Sequential mating • Large surface area contact mating system • Wide variety of accessories • Customer specified contact arrangements

D-Subminiature

Contact Sizes: 8, 20 and 22
Current Ratings: To 40 amperes nominal
Terminations: Crimp, wire solder, straight solder, right angle solder and straight press-fit
Configurations: Multiple variants in both standard and high densities
Qualifications: MIL-DTL-24308, Goddard Space Flight 311P, SAE AS 39029, IP65, IP67



FEATURES: Three performance levels available: professional quality, military quality and space-flight quality provide multiple performance-to-cost choices • Options include thermocouple contacts, environmentally sealed and dual port package including mixed density • Broad selection of accessories

Rectangular

Contact Sizes: 16, 20 and 22
Current Ratings: To 13 amperes
Terminations: Crimp, wire solder, straight solder and right angle solder
Configurations: Multiple variants in both standard and high densities
Qualifications: MIL-DTL-28748, SAE AS 39029, CCITT V.35



FEATURES: Two performance levels available: industrial quality and military quality provide two performance to cost choices • Large surface area contact mating system • A wide variety of accessories • Broad selection of contact variants and package sizes

Circular

Contact Sizes: 12, 16, 20 and 22
Current Ratings: To 25 amperes nominal
Terminations: Crimp, wire solder, straight solder and right angle solder
Configurations: Multiple variants in two package sizes
Qualifications: Environmental protection to IP67



FEATURES: Non-corrodible / lightweight composite construction • EMI/RFI shielded versions • Thermocouple contacts • Environmentally sealed versions • Rear insertion/front release of removable contacts • Two level sequential mating • Overmolding available on full assemblies

Cable

All Positronic connector products can be supplied as part of cable assemblies whose technical characteristics would reflect those of the connectors being used within the assembly.



FEATURES: Shorten the supply chain and reduce additional costs and delays by "cabling" • Overmolding available • Shielded and environmentally sealed versions available • Power cables and access boxes which meet the SAE J2496 specification

Hermetic

Contact Sizes: 8, 12, 16, 20 and 22
Current Ratings: To 40 amperes nominal
Terminations: Feedthrough is standard; flying leads and board mount available upon request
Configurations: See D-Subminiature and Circular Configurations above
Qualifications: Space-D32



FEATURES: Intended for use as an electrical feedthrough in high vacuum applications • Leakage rate: 5×10^{-9} mbar.l/s @ vacuum 1.5×10^{-5} atm • Signal, power, coax and high voltage versions available • Connectors can be mounted on flange assembly per customer specification

For more information, visit www.connectpositronic.com or call your nearest Positronic sales office as given on the back of this catalog.

NORTH AMERICAN LOCATIONS

UNITED STATES, Springfield, Missouri, Corporate Headquarters

Factory Sales and Engineering Offices (800) 641-4054

PUERTO RICO, Ponce Factory

Factory Sales and Engineering Offices (800) 641-4054

MEXICO

Factory Sales and Engineering Offices (800) 872-7674

CANADA

Factory Sales and Engineering Offices (800) 327-8272

ASIA/PACIFIC LOCATIONS

SINGAPORE, Asia/Pacific Headquarters

Factory Sales and Engineering Offices (65) 6842-1419

ASIA, Direct Sales Offices

Taiwan Sales Office (88) 62-2937-8775

China Sales Office (86) 755-2643-7578

Korea Sales Office (82) 31-909-8047/8

JAPAN

Sales and Engineering Offices (81) 3-5812-7720

INDIA

Factory Sales and Engineering Offices (91) 20-2439-4810

ASIA/PACIFIC, Technical Agents

Technical Agents in Malaysia, Australia, New Zealand, Philippines,
Hong Kong, Vietnam, Thailand

EUROPEAN LOCATIONS

FRANCE, Auch Factory, European Headquarters

Factory Sales and Engineering Offices 33 (0)5 62 63 44 91

EUROPE, Direct Sales Offices

Northern France Sales Office 33 (0)1 45 88 13 88

Southern France Sales Office 33 (0)4 67 72 80 28

Italy Sales Office 39 (0)2 54 116 106

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