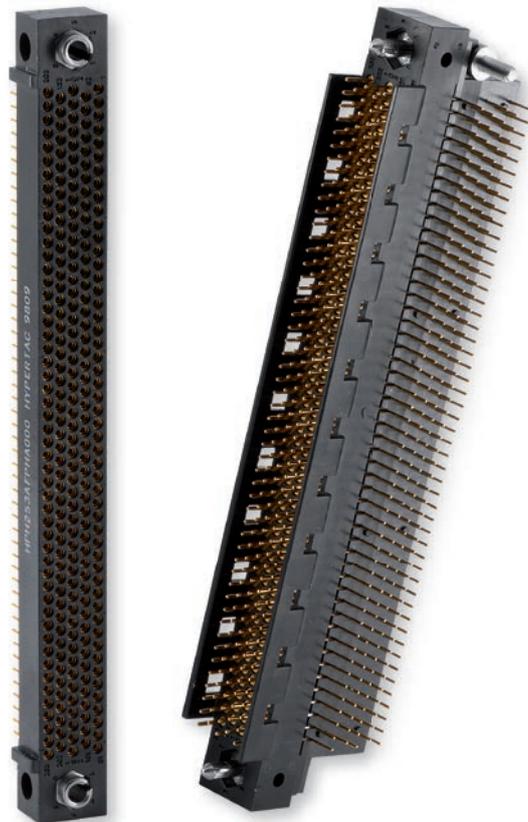


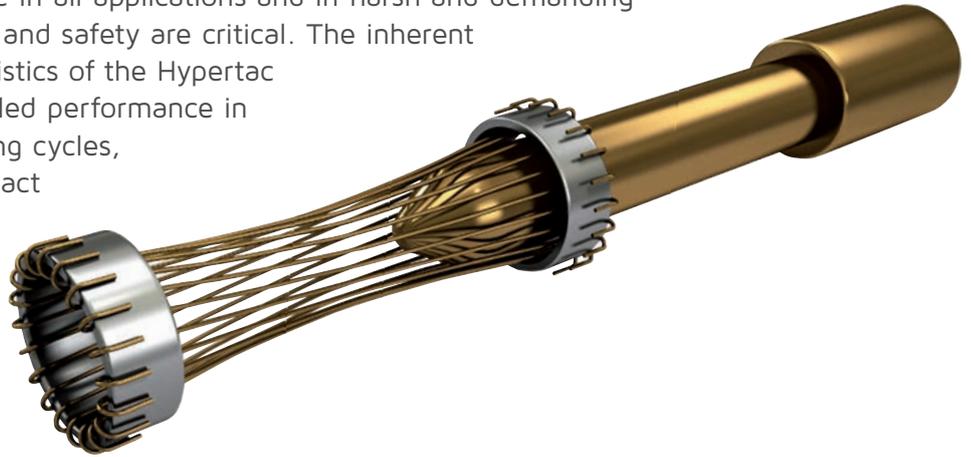
HPH Series

High Density Signal Connectors



Hypertac® Hyperboloid Technology

Smiths Interconnect offers an extensive range of superior contact technologies suitable for standard and custom solutions. Hypertac® (HYPERboloid conTACT) is the original superior performing hyperboloid contact technology designed for use in all applications and in harsh and demanding environments where high reliability and safety are critical. The inherent electrical and mechanical characteristics of the Hypertac hyperboloid contact ensures unrivalled performance in terms of reliability, number of mating cycles, low contact force and minimal contact resistance. The shape of the contact sleeve is formed by hyperbolically arranged contact wires, which align themselves elastically as contact lines around the pin, providing a number of linear contact paths.



Features

Benefits

Low insertion/extraction forces

The angle of the socket wires allows tight control of the pin insertion and extraction forces. The spring wires are smoothly deflected to make line contact with the pin.

High density interconnect systems

Significant reductions in size and weight of sub-system designs. No additional hardware is required to overcome mating and un-mating forces.

Long contact life

The smooth and light wiping action minimizes wear on the contact surfaces. Contacts perform up to 100,000 insertion/extraction cycles with minimal degradation in performance.

Low cost of ownership

The Hypertac contact technology will surpass most product requirements, thus eliminating the burden and cost of having to replace the connector or the entire subsystem.

Lower contact resistance

The design provides a far greater contact area and the wiping action of the wires insures a clean and polished contact surface. Our contact technology has about half the resistance of conventional contact designs.

Low power consumption

The lower contact resistance of our technology results in a lower voltage drop across the connector reducing the power consumption and heat generation within the system.

Higher current ratings

The design parameters of the contact (e.g., the number, diameter and angle of the wires) may be modified for any requirement. The number of wires can be increased so the contact area is distributed over a larger surface. Thus, the high current carried by each wire because of its intimate line contact, can be multiplied many times.

Maximum contact performance

The lower contact resistance of the Hypertac contact reduces heat build-up; therefore Hypertac contacts are able to handle far greater current in smaller contact assemblies without the detrimental effects of high temperature.

Immunity to shock & vibration

The low mass and resultant low inertia of the wires enable them to follow the most abrupt or extreme excursions of the pin without loss of contact. The contact area extends 360° around the pin and is uniform over its entire length. The 3 dimensional symmetry of the Hypertac contact design guarantees electrical continuity in all circumstances.

Reliability under harsh environments

Harsh environmental conditions require connectors that will sustain their electrical integrity even under the most demanding conditions such as shock and vibration. The Hypertac contact provides unmatched stability in demanding environments when failure is not an option.

Product Description

Smiths Interconnect's HPH Series is a high density signal PCB connector designed for harsh environments within the aerospace, defense and industrial market segments.

With a 0.6mm contact diameter, the HPH Series comes in 3-6 row configurations and is available up to 303 signal contacts on a 1.901mm staggered grid. Contacts are removable for ease of maintenance. Using the proven Hypertac® hyperboloid contact system, the connectors ensure a low contact resistance under high levels of shocks and vibrations and over 2000 mating cycles. They provide low engagement and withdrawal force; long life and low rate of wear for high reliability and enhanced quality performance.

Technical Characteristics

Current Rating	4 A
Contact Resistance	7 mΩ maximum
Insulation	5 GΩ minimum at 500 Vdc
Mechanical Endurance	In excess of 2000 operations
Engagement/withdrawal forces	0.42 N (1.5 oz) nominal per contact
Temperature	+55°C to +125°C
Voltage Rating	170 Vdc or ac peak nominal
Proof Voltage	800 V minimum
Male Pin Diameter	0.6 mm nominal
Material	
- Insulator	Polyphenylene sulphide
- Contact pin & socket	Copper alloy
- Socket wires	Beryllium copper
- Guides	Stainless steel
- Contact plating	MIL-G-45204 gold plate

How To Order



HPH

1

■ ■ ■

2

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4

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6

■ ■ ■

7

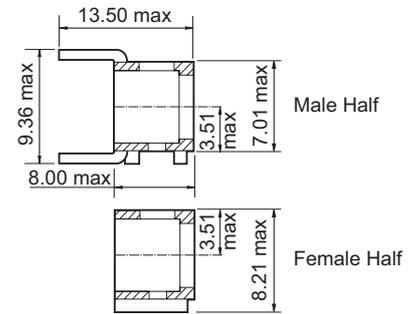
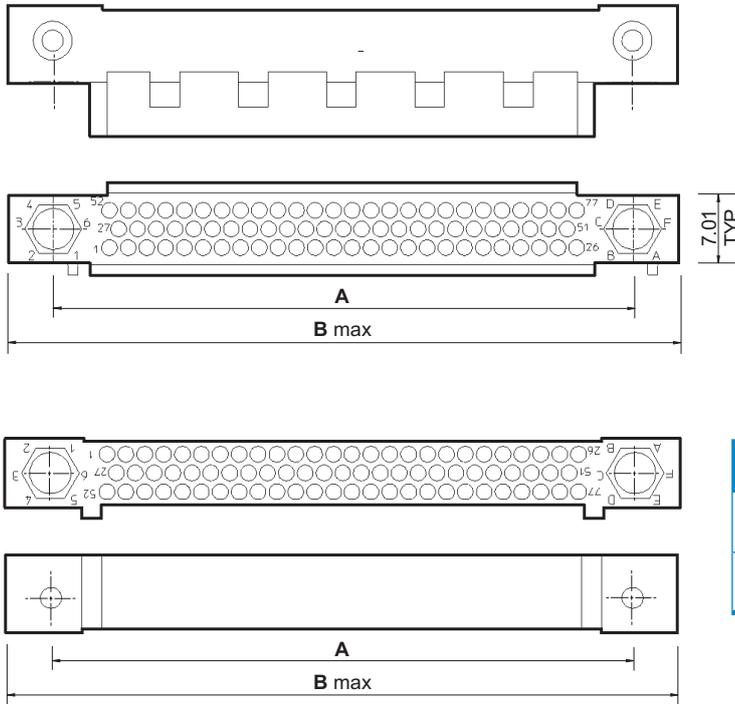
1 Connector family	
2 No. of cavities	<p>20⁴ 50¹ 77¹ 102¹ 119¹ 128¹ 152¹ 202¹</p> <p>253¹ 303⁵</p>
3 Contact plating	<p>U Gold plate per MIL-G-45204 S U plating with tin dipped termination</p>
4 Contact gender	<p>M Male F Female D⁵ Shrouded pin carrier C⁵ Pin carrier (not shown)</p>
5 Contact termination	<p>B⁵ Through board solder - 90° L² Through board solder - 90°</p> <p>P¹ Through board solder - Straight P¹ Use also for terminating female stacking connector</p> <p>K³ Through board solder - Straight N³ PCB stacking through board solder</p> <p>Y⁵ Pin carrier - Male only F⁵ Flex terminations (consult sales office)</p>
6 Polarising/Guides	<p>AU¹ Guide socket non-polarised, vertical mounting (for female stacking guide)</p> <p>HA HD HN¹ Guide socket polarised, vertical mounting</p> <p>SC¹ Jack socket non-polarised, vertical mounting</p> <p>TJ TP TT¹ Jack socket non-polarised, transverse mounting (T-Bracket)</p> <p>AT¹ Guide pin non-polarised, vertical mounting (for male stacking guide)</p> <p>PE PF PG PN PP PQ PT¹ Guide pin polarised, transverse mounting (T-Bracket)</p> <p>QC QF QQ Q3⁵ Guide pin polarised, transverse mounting (L-Bracket)</p> <p>3C¹ Jacking non-polarised, rotating free connector</p> <p>3F⁵ Jacking non-polarised, vertical mounting</p> <p>AM GA⁵ Guide socket/pin for non-polarised shrouded pin carrier application</p> <p>NA NB⁵ Guide pin polarised vertical mounting</p>
7 Standard variations	<p>OP0 Back potted OSO Loose shroud supplied (for male stacking connector)</p> <p>000 No potting</p>

1 Off the shelf 2 Off the shelf male 3 Off the shelf female 4 Subject to availability 5 Made to order

Other termination, guide and insulator styles exist but might carry a premium both in cost and lead time. Please consult the sales office for further information.

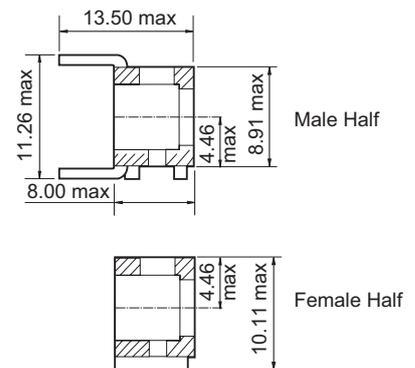
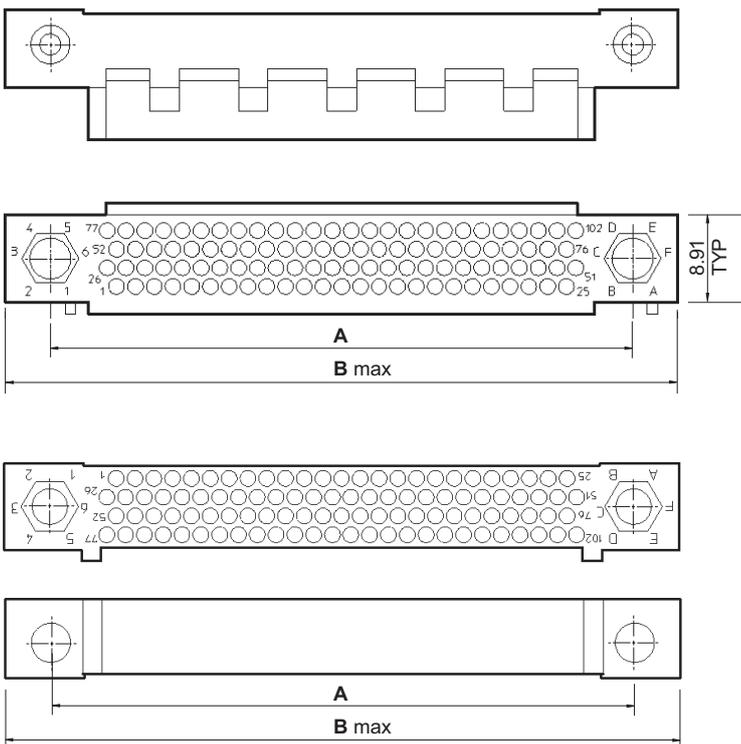
Insulators

3 row male and female half



No. of positions	20	50	77	119	152
Dimension A	22.86 0.901"	41.91 1.650"	59.06 2.325"	85.73 3.375"	106.68 4.200"
Dimension B	32.18 1.267"	51.23 2.017"	68.38 2.692"	95.05 3.742"	116.50 4.586"

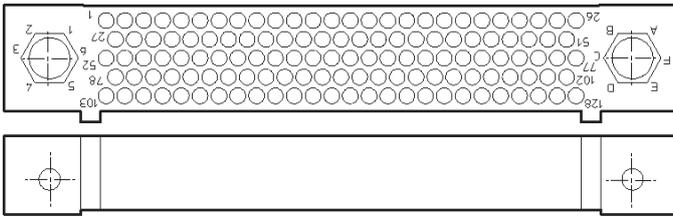
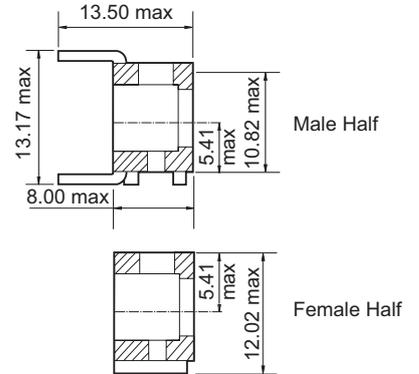
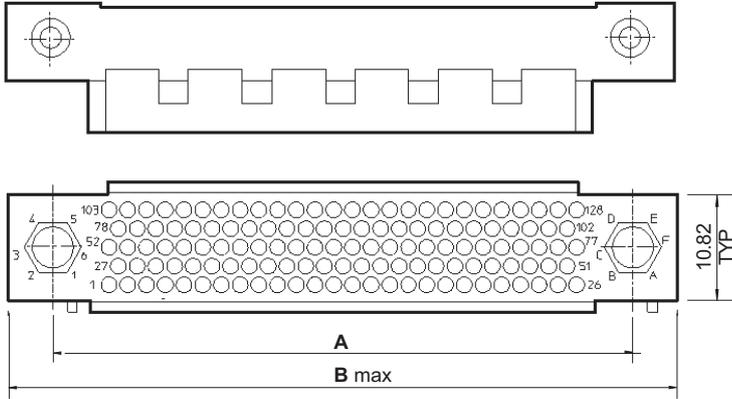
4 row male and female half



No. of positions	102	202
Dimension A	59.18 2.330"	106.68 4.200"
Dimension B	68.50 2.697"	116.50 4.567"

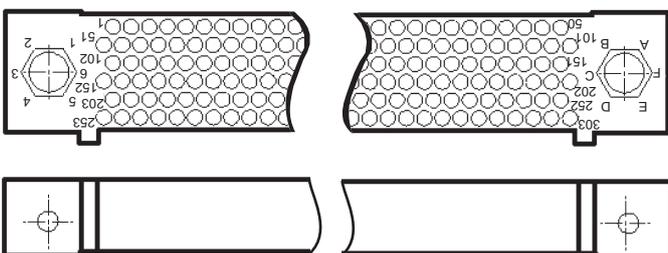
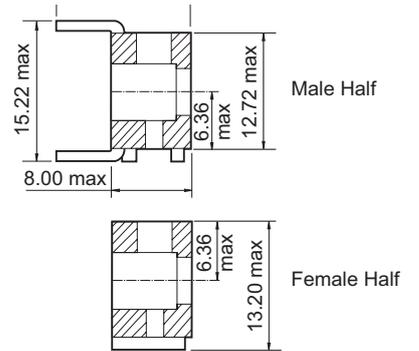
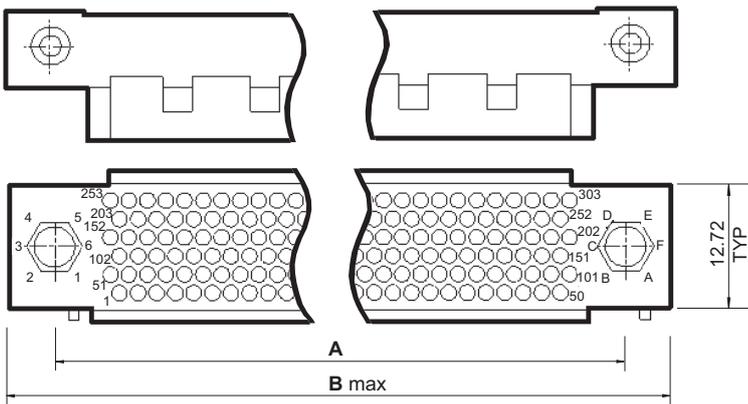
Insulators

5 row male and female half



No. of positions	128	253
Dimension A	59.06 2.322"	106.68 4.200"
Dimension B	68.23 2.685"	116.50 4.567"

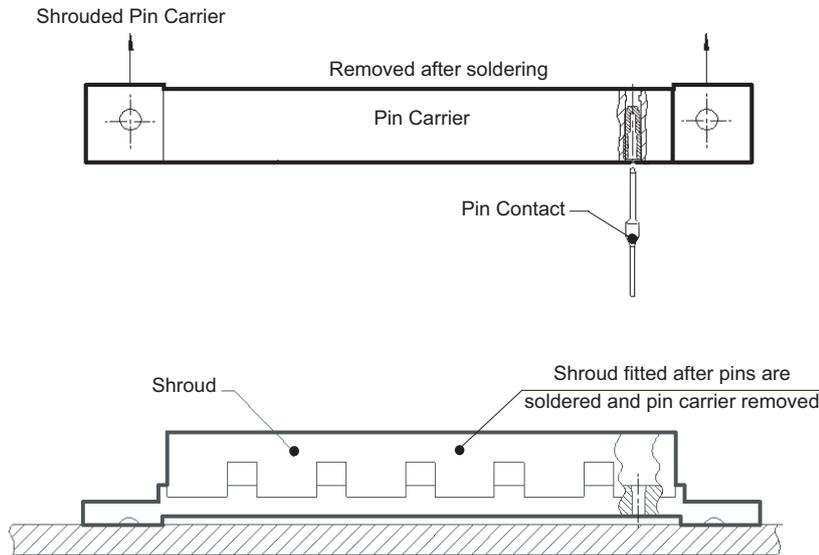
6 row male and female half



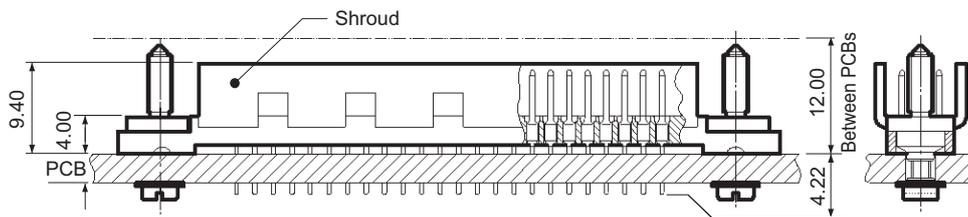
No. of positions	303
Dimension A	106.68 4.200"
Dimension B	116.50 4.567"

Insulators, Pin Carrier and Guides

Shrouded pin carrier



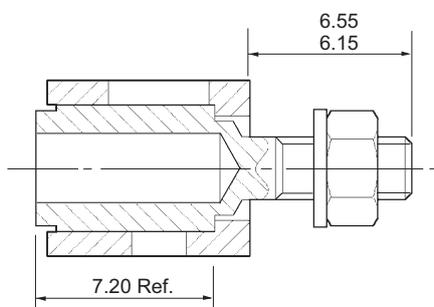
Shrouded insulator shown with pins and guides.
Ready to mate with standard female connector fitted with suitable female pin carrier guides.



Shrouded pin carrier guides

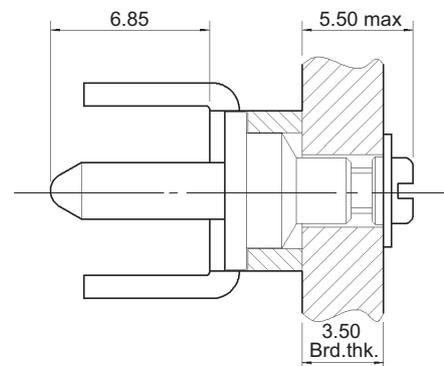
Style AM

Non Polarised Guide Socket. Vertical Mounting



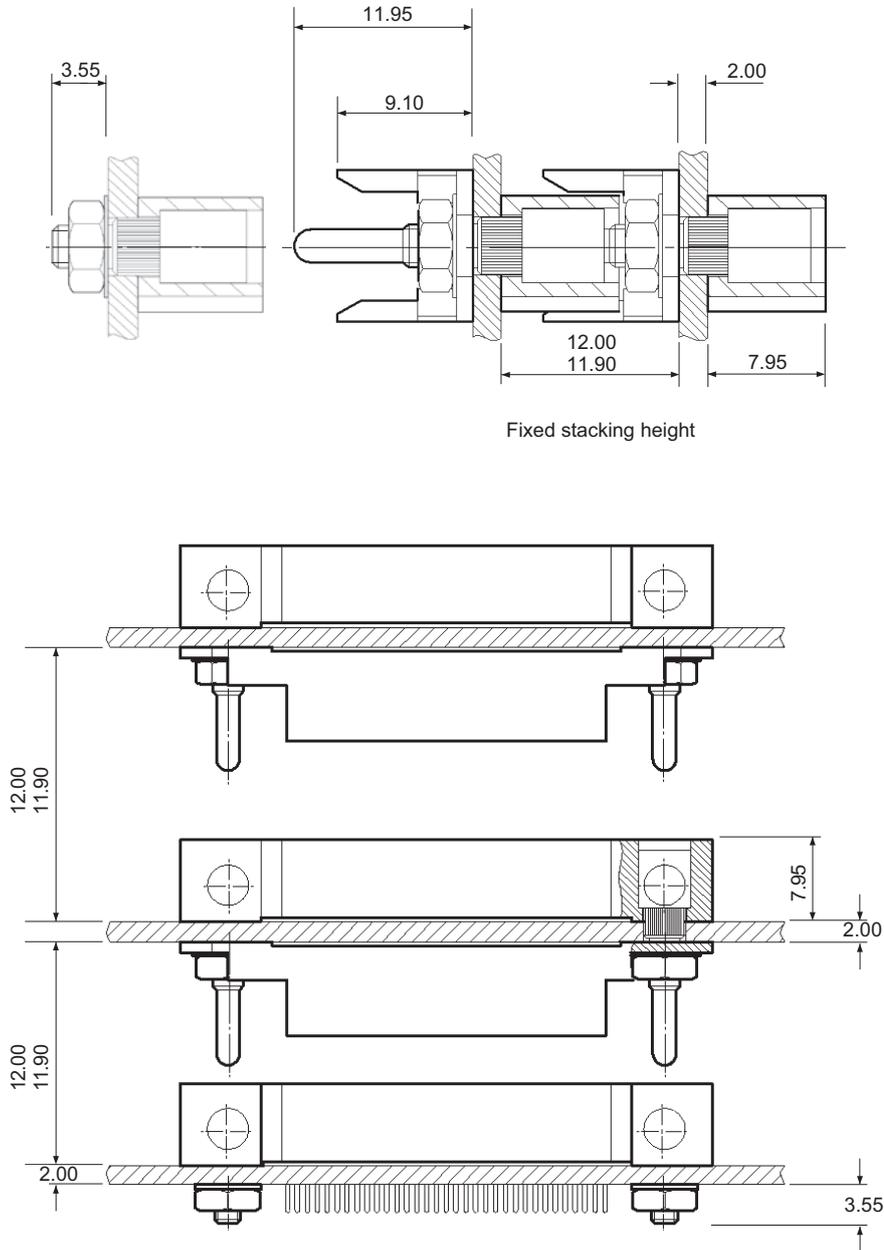
Style 9A

Non Polarised Guide Pin. Vertical Mounting



HPH Stacking Insulators

Stacking connector application

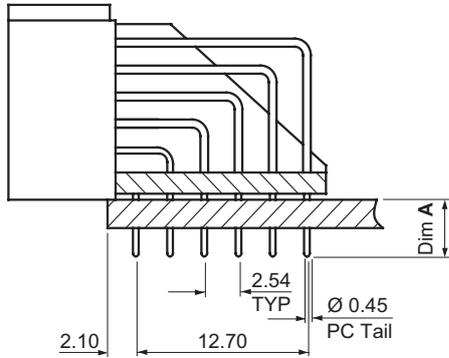


Stacking connectors are currently available in 50, 77 & 102 way only.
For insulator dimensions please refer to previous pages.

If you have further requirements please contact sales offices.

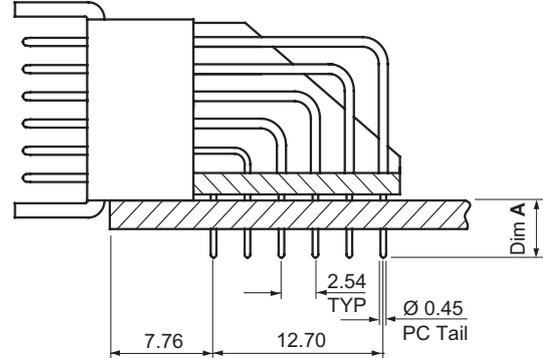
Standard PCB Terminations

Female 90° PCB



Dimensions applicable to 3, 4 and 5 row insulators also.

Male 90° PCB

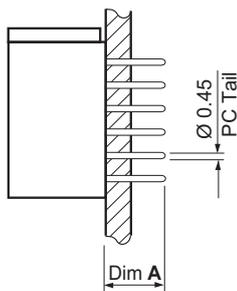


Dimensions applicable to 3, 4 and 5 row insulators also.

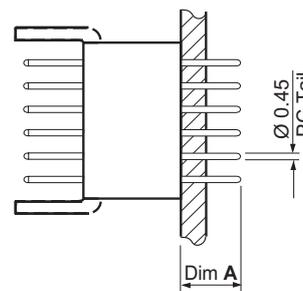
Termination	Dim A
B ⁽¹⁾	2.85 0.112"
L ⁽²⁾	4.00 0.157"

⁽¹⁾ Made to order ⁽²⁾ Off the shelf male

Female vertical PCB



Male vertical PCB

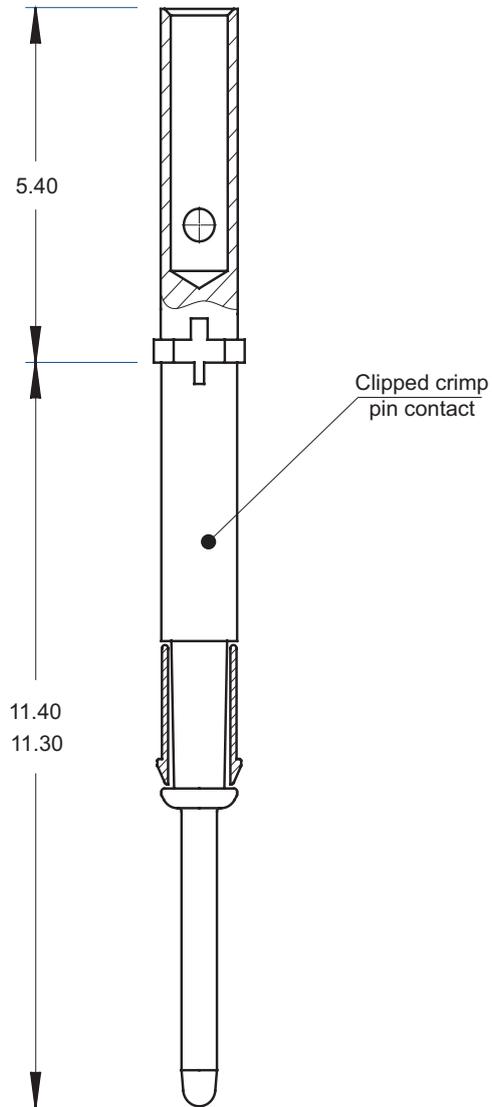


Termination	Dim A
P ⁽¹⁾	4.50 0.177"
K ⁽²⁾	6.70 0.264"

⁽³⁾ Off the shelf ⁽⁴⁾ Off the shelf female

Cable Terminations

Male crimp contact (26-22 AWG)



Standard Guides Male/Female

Female guide index

Style AU	Stacking	Non-polarised	Vertical mounting	page 10
Style HA		Polarised	Vertical mounting	page 10
Style HD		Polarised	Vertical mounting	page 10
Style HN		Polarised	Vertical mounting	page 10
Style SC	Jack socket	Non-polarised	Vertical mounting	page 10
Style TJ	T-Jack socket	Non-polarised	Transverse mounting	page 10
Style TP	T-Jack socket	Non-polarised	Transverse mounting	page 10
Style TT	T-Jack socket	Non-polarised	Transverse mounting	page 10

Male guide index

Style AT	Stacking	Non-polarised	Vertical mounting	page 11
Style PE	T-bracket	Polarised	Transverse mounting	page 11
Style PF	T-bracket	Polarised	Transverse mounting	page 11
Style PG	T-bracket	Polarised	Transverse mounting	page 11
Style PN	T-bracket	Polarised	Transverse mounting	page 11
Style PP	T-bracket	Polarised	Transverse mounting	page 11
Style PQ	T-bracket	Polarised	Transverse mounting	page 11
Style PT	T-bracket	Polarised	Transverse mounting	page 11
Style QC	L-bracket	Polarised	Transverse mounting	page 11
Style QF	L-bracket	Polarised	Transverse mounting	page 11
Style QQ	L-bracket	Polarised	Transverse mounting	page 11
Style Q3	L-bracket	Polarised	Transverse mounting	page 11
Style 3C	Jacking	Non-polarised	Rotating free connector	page 11
Style 3F	Jacking	Non-polarised	Vertical mounting	page 12
Style NA		Polarised	Vertical mounting	page 12
Style NB		Polarised	Vertical mounting	page 12

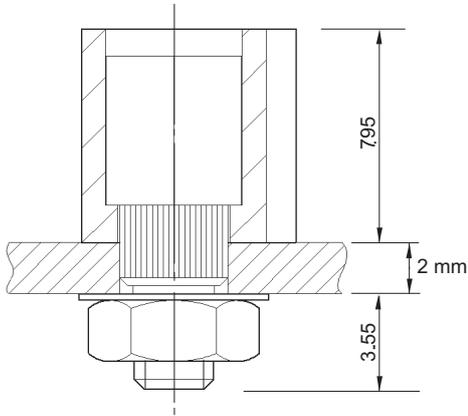
		Male guides															
		AT	PE	PF	PG	PN	PP	PQ	PT	QC	QF	QQ	Q3	3C	3F	NA	NB
Female guides	AU																
	HA																
	HD																
	HN																
	SC																
	TJ																
	TP																
	TT																

Note: For pin carrier guides please refer to: HPH Insulators/Pin Carrier/Guides

Standard Guide Female

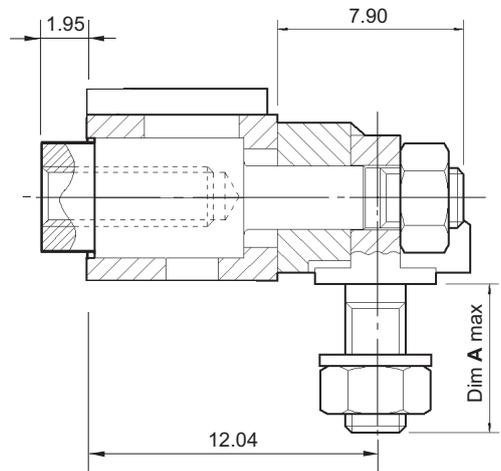
Style AU

Non-polarised Vertical Mounting Stacking



Style T

Jack Socket Non-polarised Transverse Mounting T-Bracket

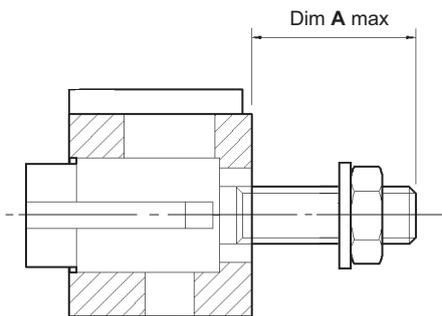


Above guides can also be used for male connectors

Style 3 row	Style 4 row	Style 5 row	Board thickness	Dim A max
TJ			2.54 0.100"	5.70 0.224"
	TP	TT	3.20 0.393"	6.30 0.248"

Style H

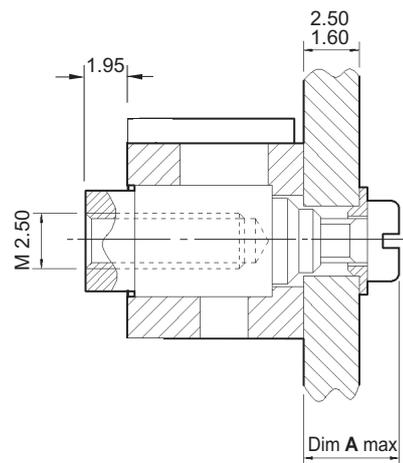
Polarised Vertical Mounting



Style	Board thickness	Dim A max
HA	2.54 0.100"	6.55 0.257"
HD	3.20 0.125"	7.20 0.283"
HN	4.00 0.157"	9.00 0.354"

Style SC

Jack Socket Non-polarised Transverse Vertical Mounting

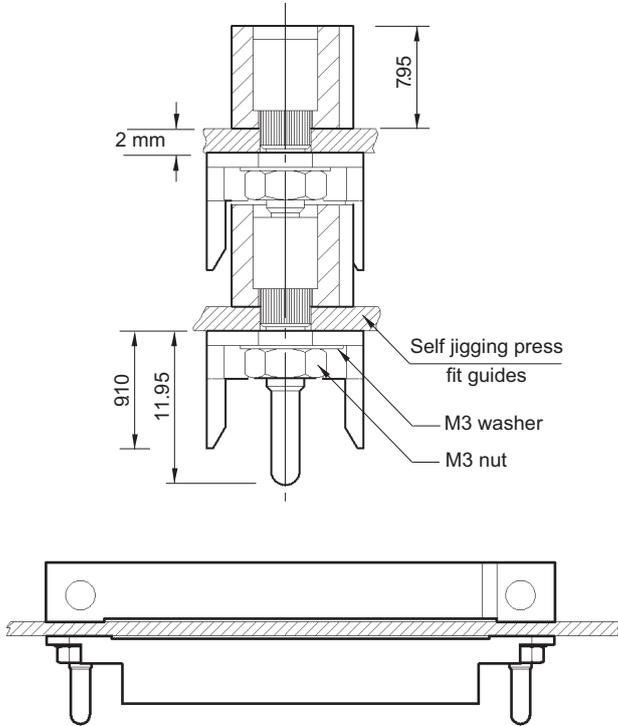


Style	Board thickness	Dim A max
SC	2.50 0.098"	4.30 0.169"

Standard Guide Male

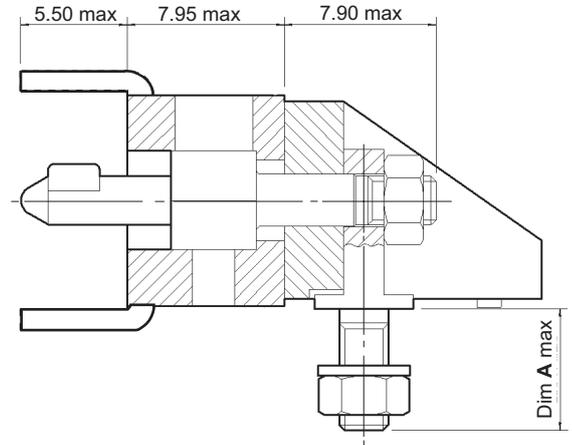
Style AT

Non-polarised Vertical Mounting Stacking



Style P

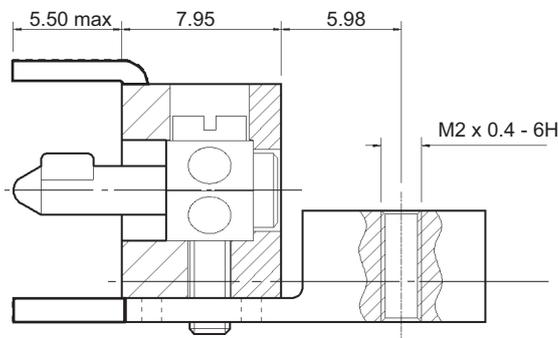
Polarised Transverse Mounting
(showing 5 row style)



Style	No. of rows	Board thickness	Dim A max
PE/PF/PG	3/4/5	2.00 0.078"	5.10 0.200"
PN/PP/PQ	3/4/5	3.20 0.125"	6.30 0.248"
PT	6	2.60 0.102"	5.70 0.224"

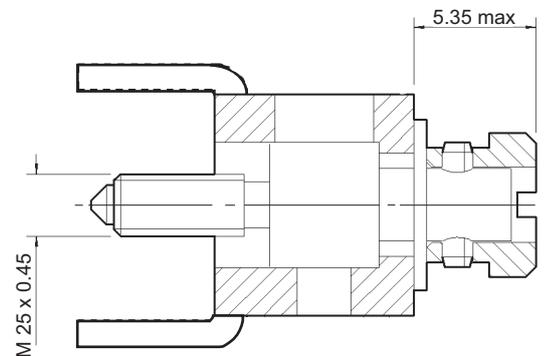
Style Q

Polarised Transverse Mounting L-Bracket



Style 9A

Jacking Guide Non-polarised Rotating Free Connector



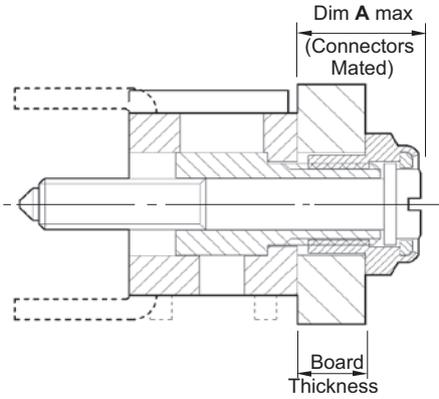
Style 3 row	Style 4 row	Style 5 row	Style 6 row	Board thickness
QC	QF	QQ		2.54 0.100"
			Q3	3.20 0.125"

Dimension are in mm and inches

Standard Guide Male

Style 3F

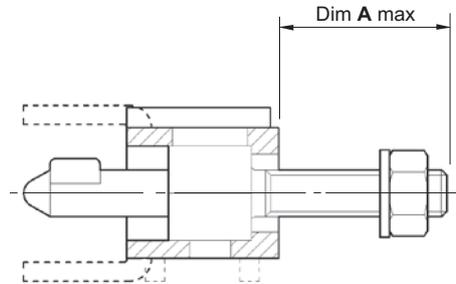
Jacking Guide Non-polarised
Vertical Mounting



Style	Board thickness	Dim A max
3F	2.95 - 3.45 0.116" - 0.136"	6.25 0.246"

Style N

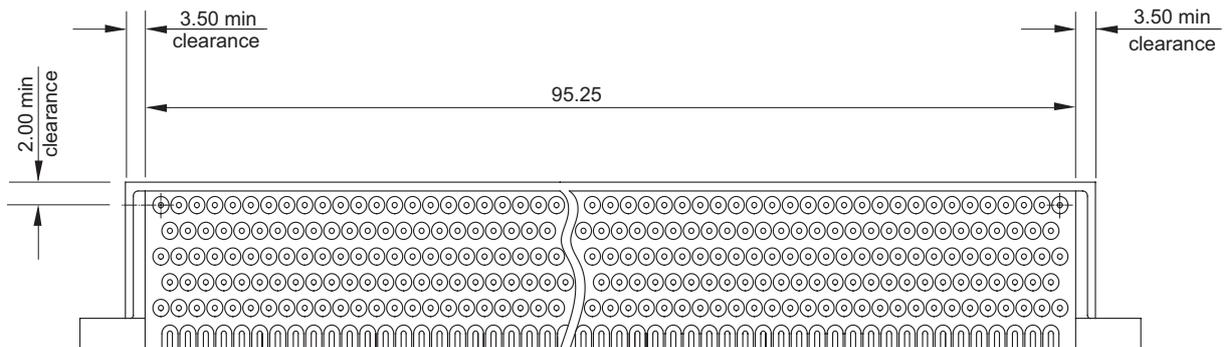
Polarised Vertical Mounting



Style	Board thickness	Dim A max
NA	2.54 0.100"	6.55 0.258"
NB	5.08 0.200"	9.00 0.354"

PCB Preparations Details

PCB 90° Alignment Comb Details



303 way showing typical clearance dimensions (applies to all 90° styles)

Important

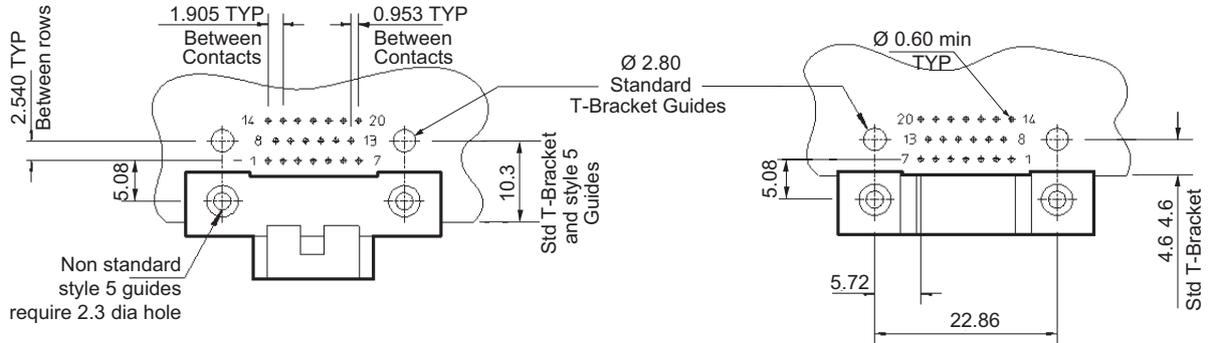
Please allow the following clearance dimensions around all 90° PCB layout configurations to accommodate the alignment comb shown below.

PCB Standard 90° Preparations Details

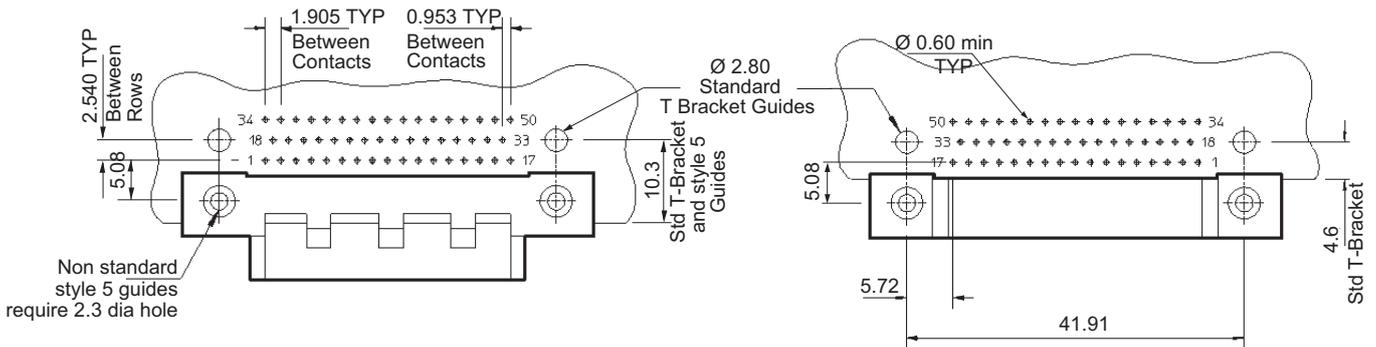
Male

Female

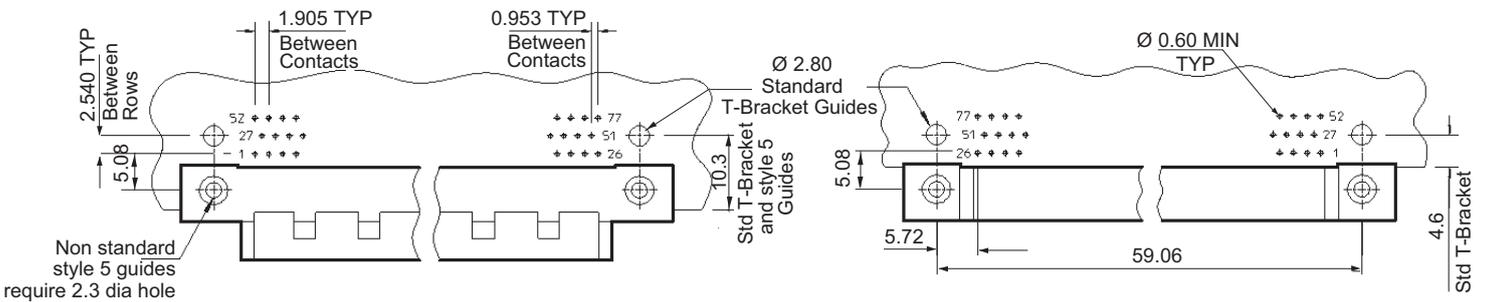
20 Way 90° PCB Layout



50 Way 90° PCB Layout



77 Way 90° PCB Layout

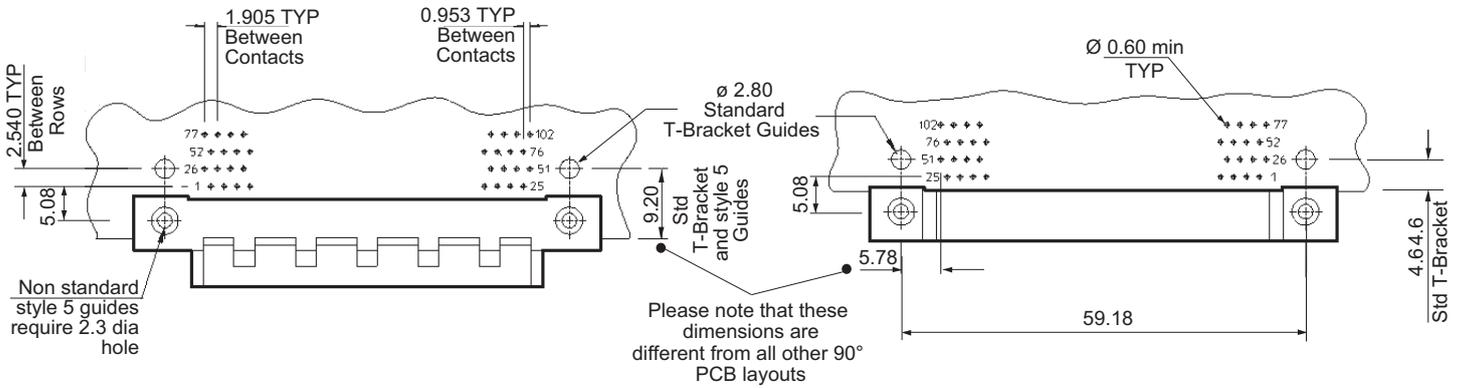


PCB Standard 90° Preparations Details

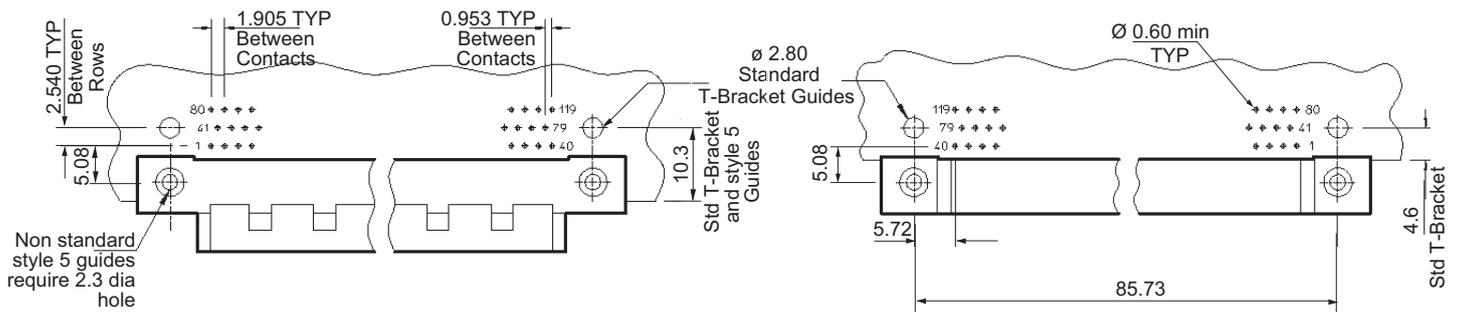
Male

Female

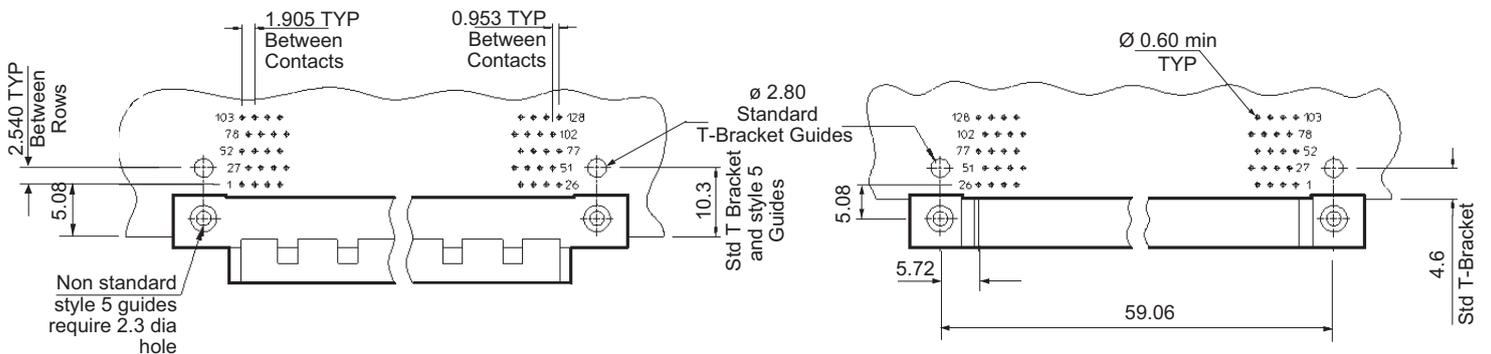
102 Way 90° PCB Layout



119 Way 90° PCB Layout



128 Way 90° PCB Layout

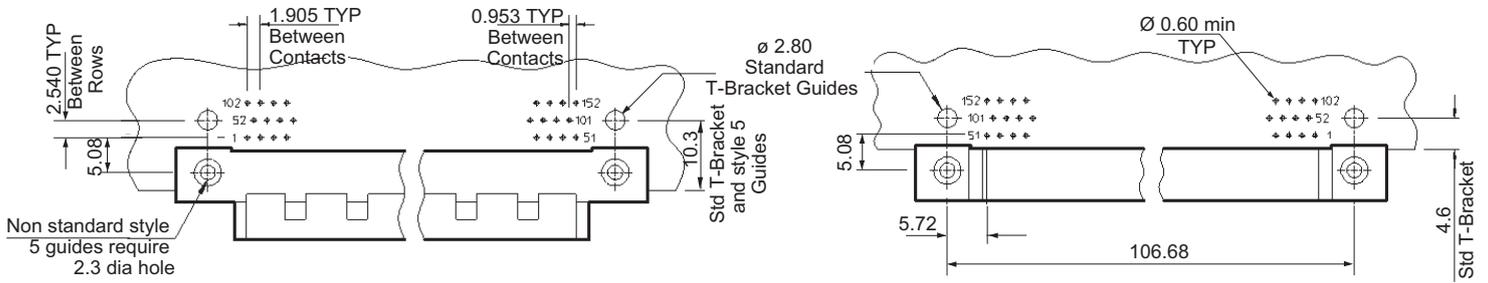


PCB Standard 90° Preparations Details

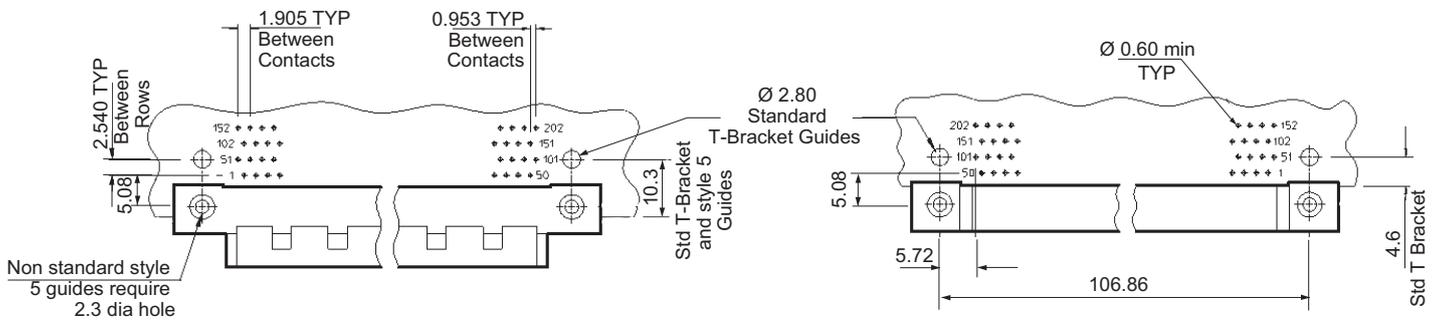
Male

Female

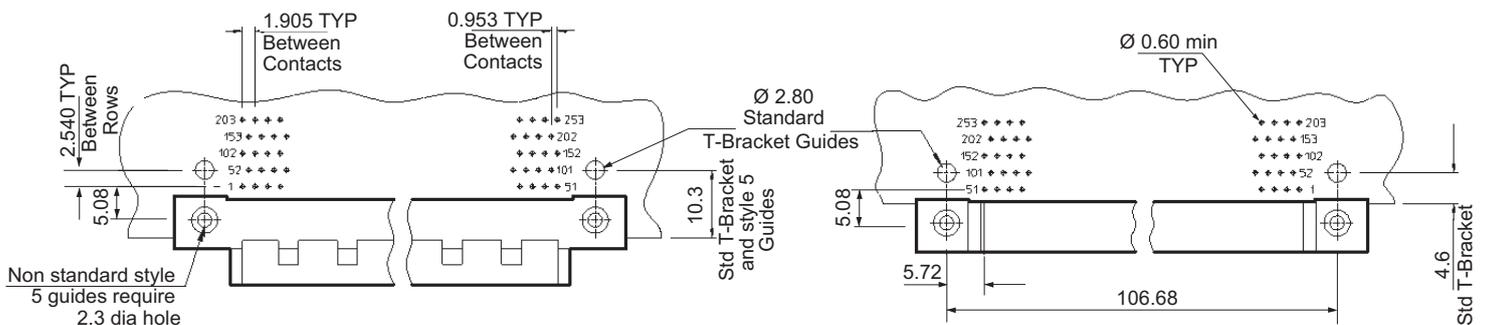
152 Way 90° PCB Layout



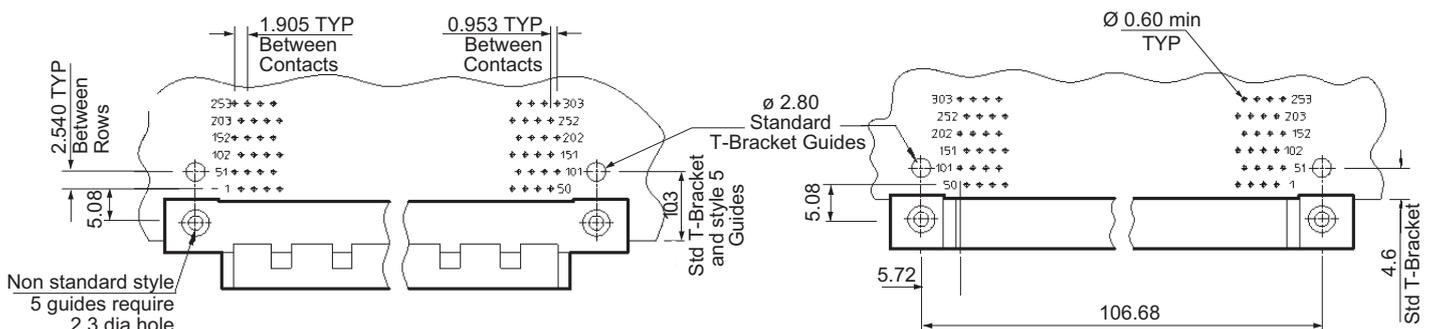
202 Way 90° PCB Layout



253 Way 90° PCB Layout



303 Way 90° PCB Layout



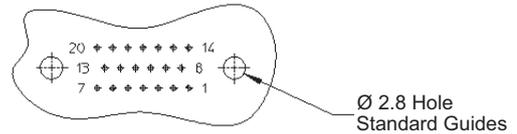
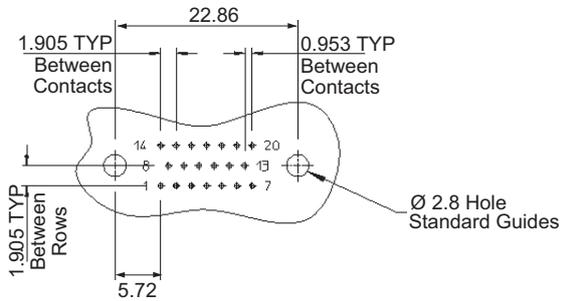
Dimension are in mm

PCB Standard Vertical Preparations Details

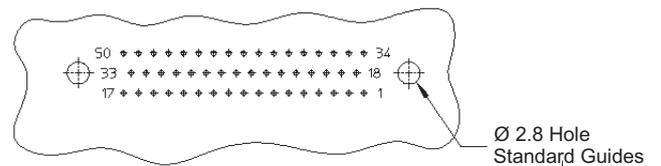
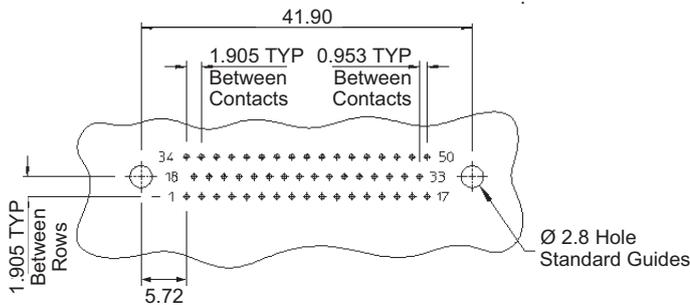
Layout Male

Layout Female

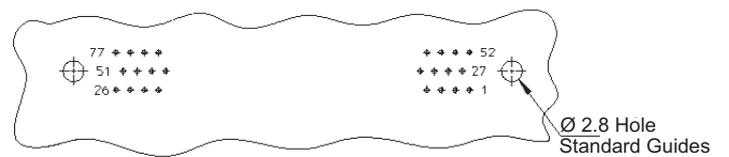
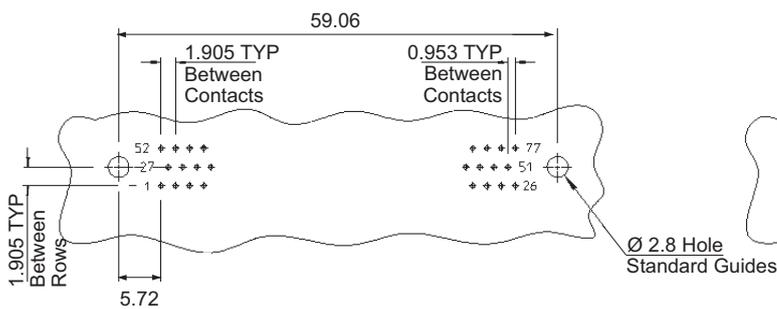
20 Way vertical PCB



50 Way vertical PCB



77 Way vertical PCB



Note

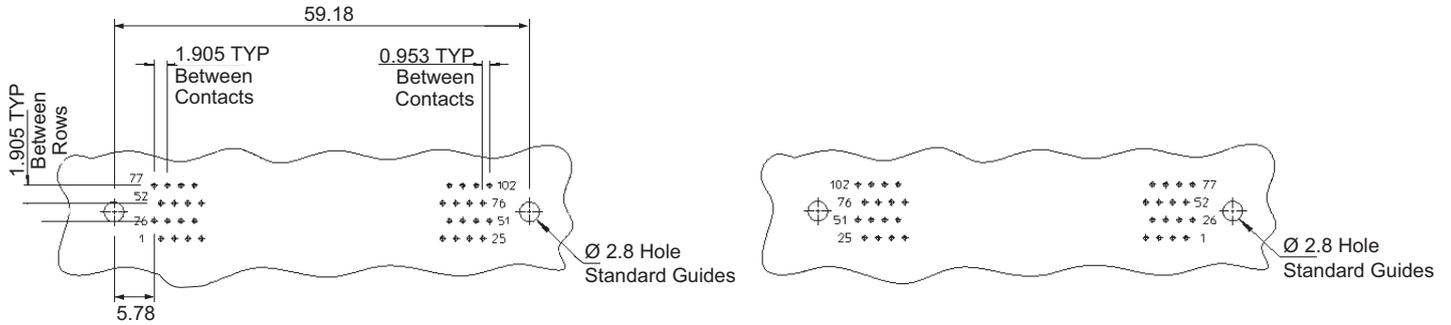
Vertical guide centres align with the centre of the PCB contact layout.

PCB Standard Vertical Preparations Details

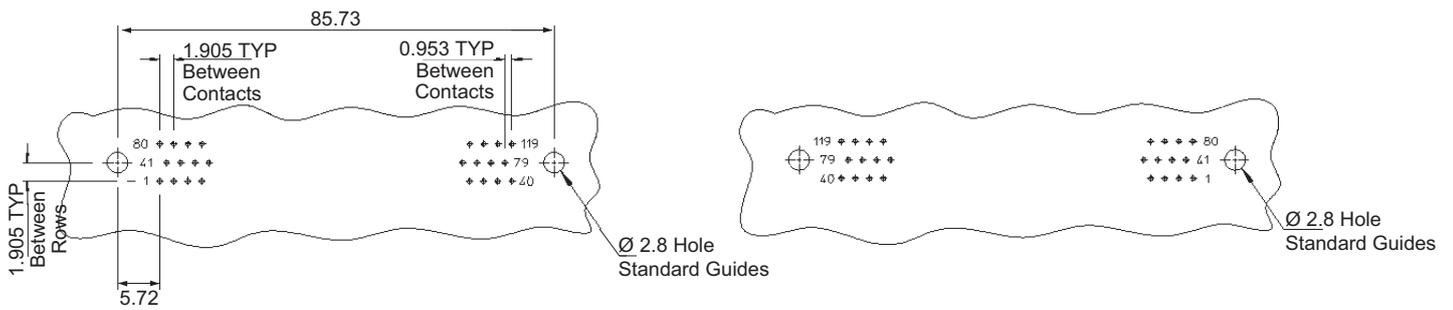
Layout Male

Layout Female

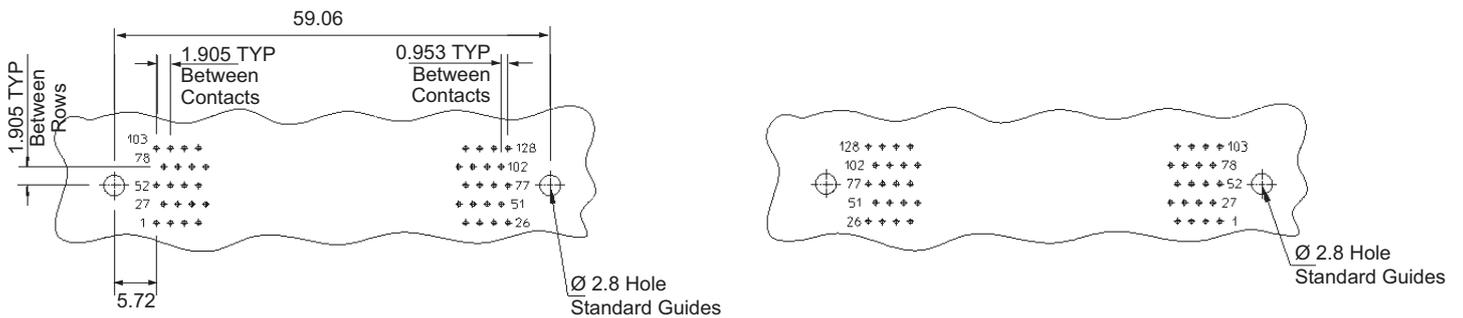
102 Way vertical PCB



119 Way vertical PCB



128 Way vertical PCB



Note

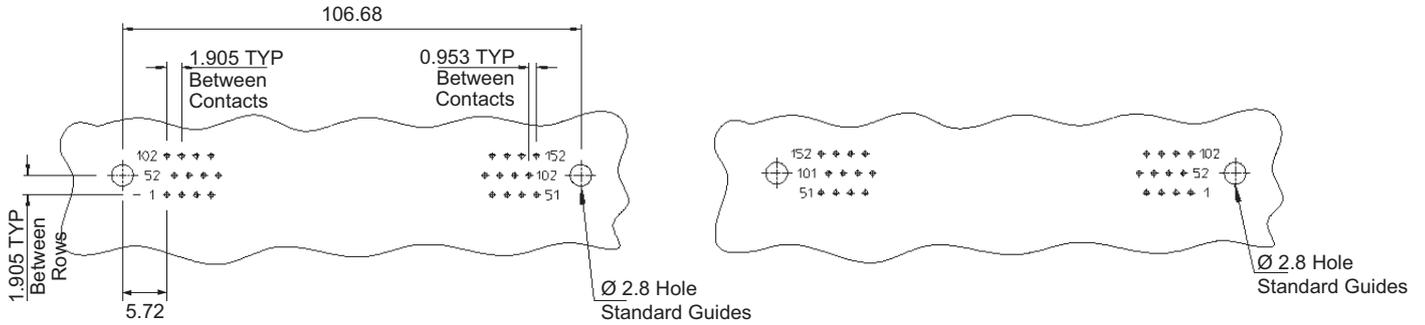
Vertical guide centres align with the centre of the PCB contact layout.

PCB Standard Vertical Preparations Details

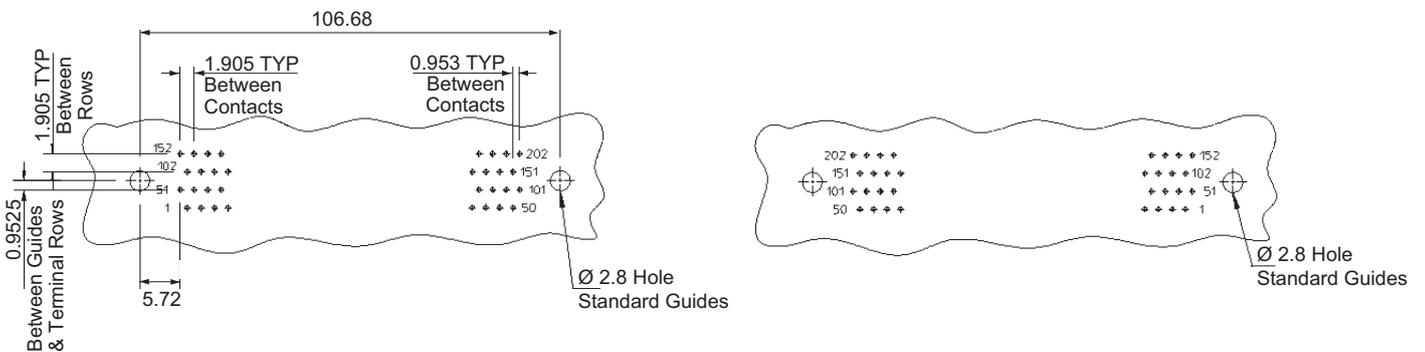
Layout Male

Layout Female

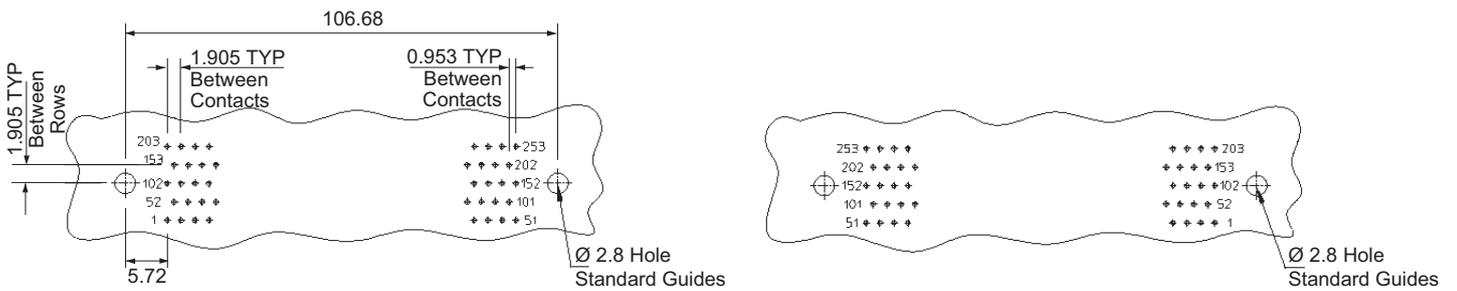
152 Way vertical PCB



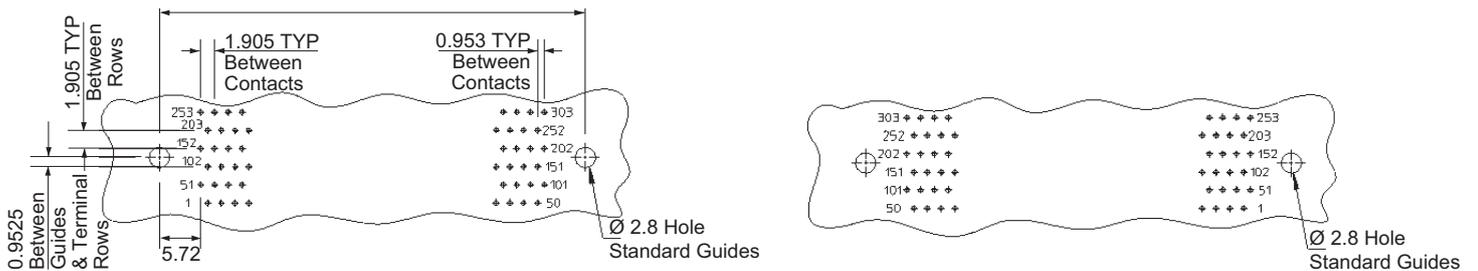
202 Way vertical PCB



253 Way vertical PCB



303 Way vertical PCB



Note

Vertical guide centres align with the centre of the PCB contact layout.

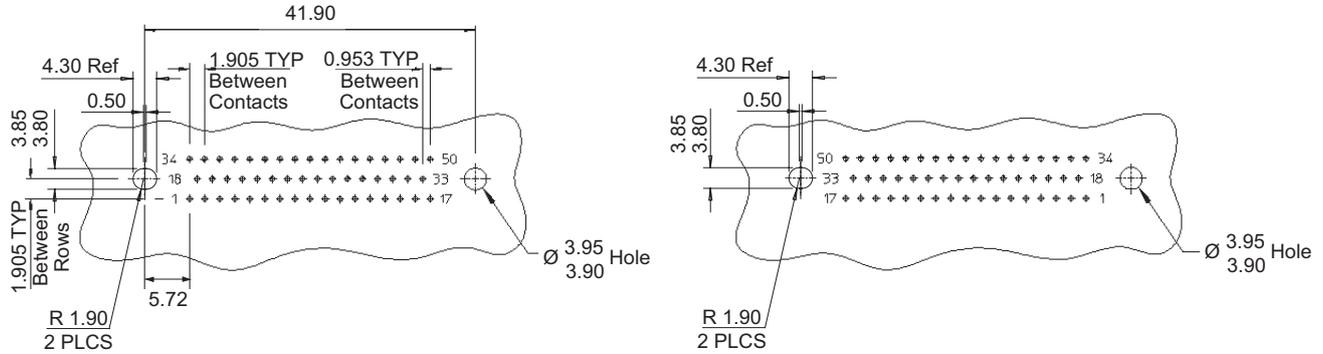
Dimension are in mm

PCB Stacking Preparations Details

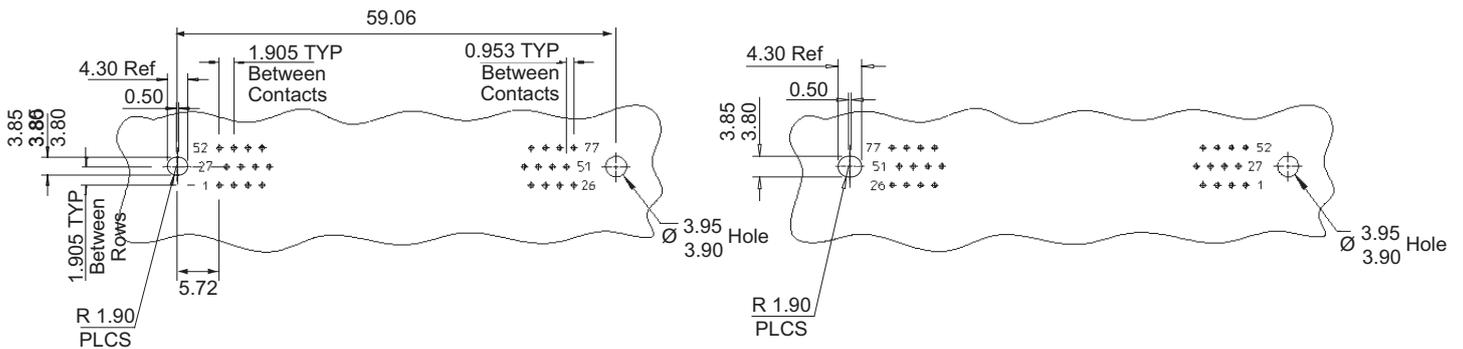
Layout viewed from Male side

Layout viewed from Female side

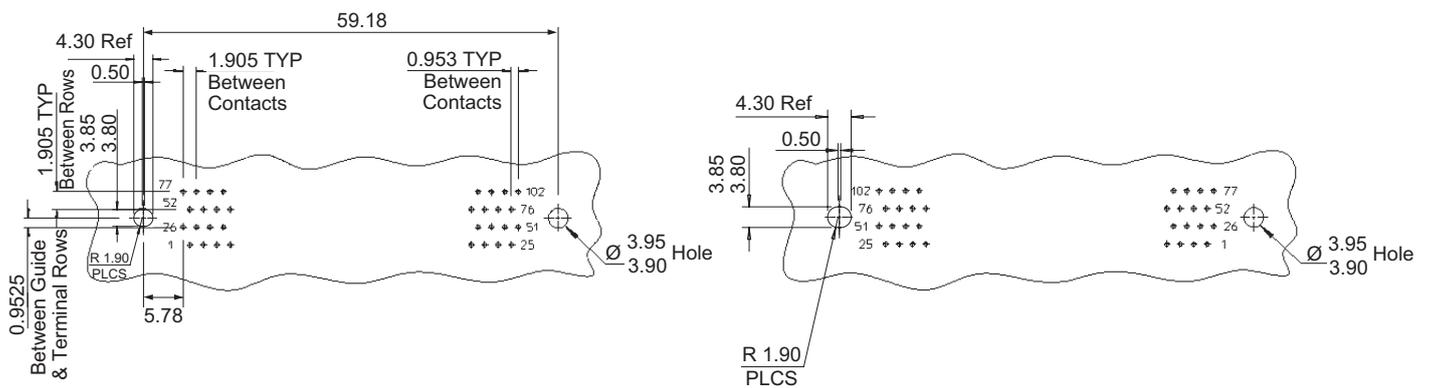
50 Way vertical PCB



77 Way vertical PCB



102 Way vertical PCB



Note

Stacking guide centres align with the centre of the PCB contact layout.
Stacking connectors are currently only available in 50, 77 & 102 ways.
If you have further requirements please contact our local sales offices.

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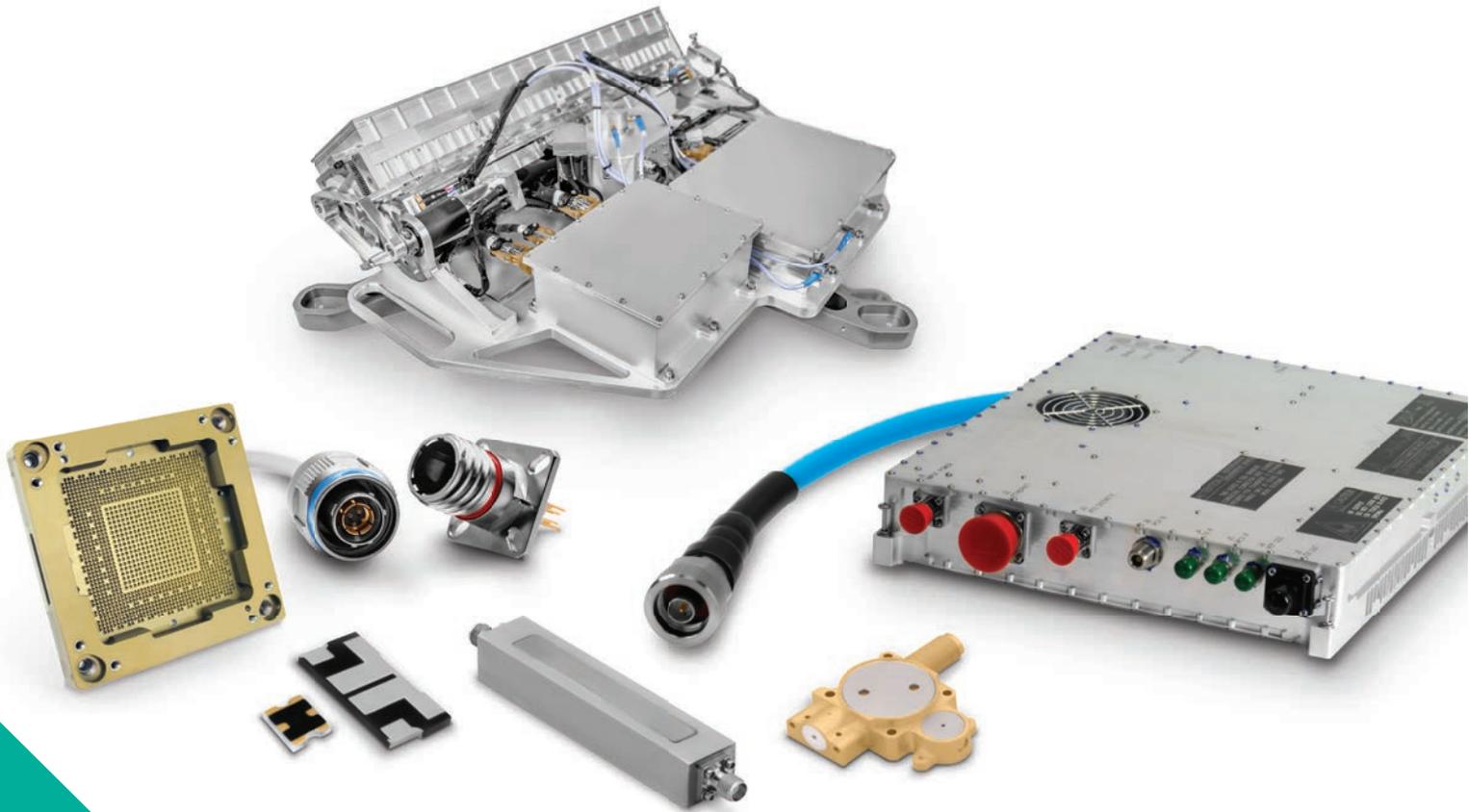
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