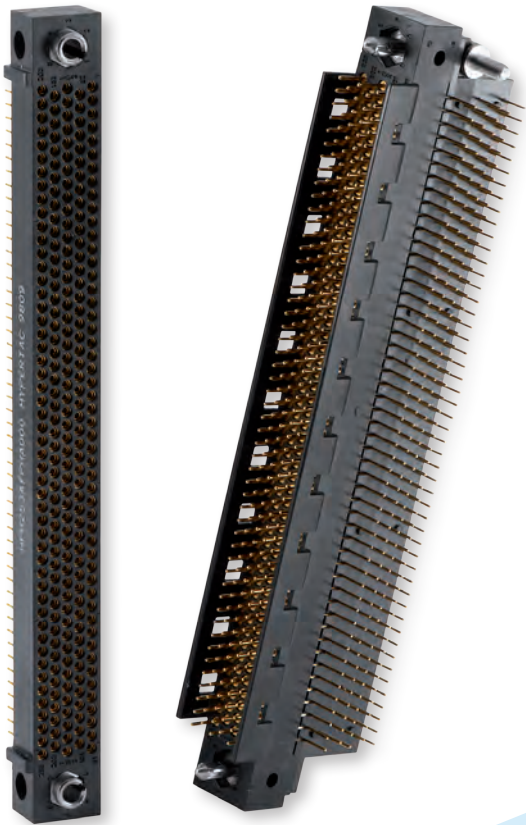


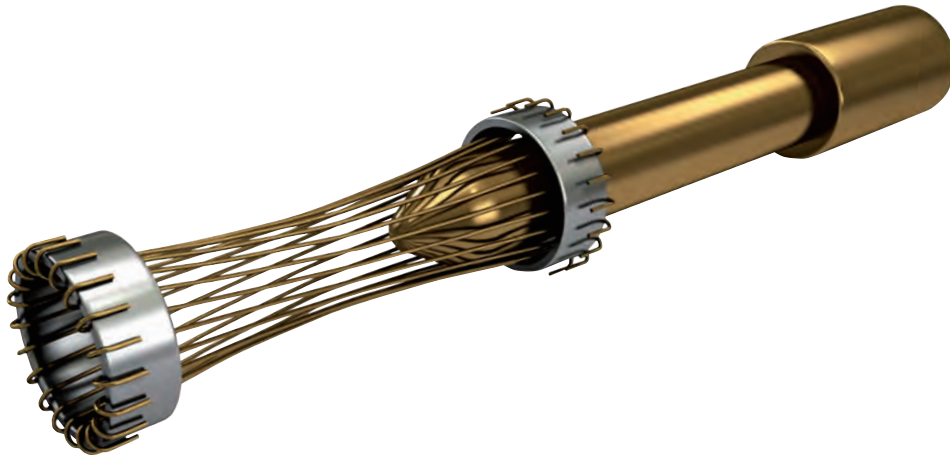
HPH CONNECTOR SERIES

High Density Signal Connectors



HYPERBOLOID TECHNOLOGY

Smiths Connectors 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.



FEATURE

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.

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 little degradation in performance.

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 half the resistance of conventional contact designs.

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.

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 degrees 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.

BENEFIT

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.

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.

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.

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.

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.

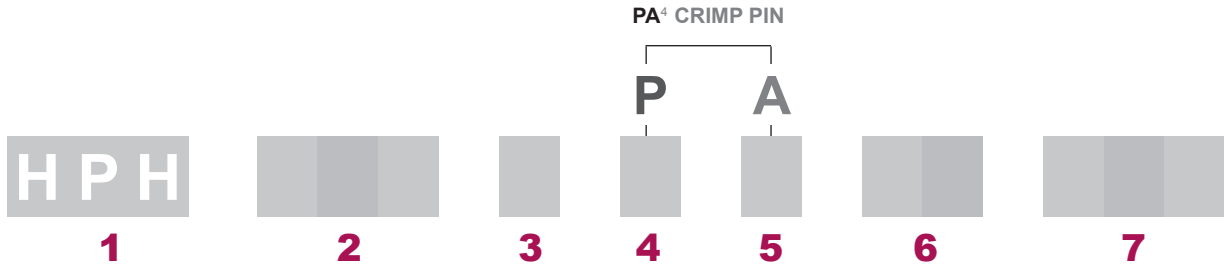
PRODUCT DESCRIPTION

High Density Signal PCB Connector, designed for Rail, Mil/Aero and Industrial applications.

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



1 > CONNECTOR FAMILY

2 > NO. OF CAVITIES

20⁴ **50**¹ **77**¹ **102**¹ **119**¹ **128**¹ **152**¹ **202**¹ **253**¹ **303**⁵

3 > CONTACT PLATING

U GOLD PLATE PER MIL-G-45204 **S** U PLATING WITH TIN DIPPED TERMINATION

4 > CONTACT GENDER

M MALE **F** FEMALE **D**⁵ SHROUDED PIN CARRIER **C**⁵ PIN CARRIER (*not shown*)

5 > CONTACT TERMINATION

B⁵ THROUGH BOARD SOLDER - 90° **L**² THROUGH BOARD SOLDER - 90° **P**¹ THROUGH BOARD SOLDER - STRAIGHT
P¹ USE ALSO FOR TERMINATING FEMALE STACKING CONNECTOR **K**³ THROUGH BOARD SOLDER - STRAIGHT
N³ PCB STACKING THROUGH BOARD SOLDER **Y**⁵ PIN CARRIER - MALE ONLY
F⁵ FLEX TERMINATIONS (*consult sales office*)

6 > POLARISING/GUIDES

AU¹ GUIDE SOCKET NON-POLARISED, VERTICAL MOUNTING (*for female stacking guide*)
HA **HD** **HN**¹ GUIDE SOCKET POLARISED, VERTICAL MOUNTING
SC¹ JACK SOCKET NON-POLARISED, VERTICAL MOUNTING
TJ **TP** **TT**¹ JACK SOCKET NON-POLARISED, TRANSVERSE MOUNTING (*T-Bracket*)
AT¹ GUIDE PIN NON-POLARISED, VERTICAL MOUNTING (*for male stacking guide*)
PE **PF** **PG** **PN** **PP** **PQ** **PT**¹ GUIDE PIN POLARISED, TRANSVERSE MOUNTING (*T-Bracket*)
QC **QF** **QQ** **Q3**⁵ GUIDE PIN POLARISED, TRANSVERSE MOUNTING (*L-Bracket*)
3C¹ JACKING NON-POLARISED, ROTATING FREE CONNECTOR
3F⁵ JACKING NON-POLARISED, VERTICAL MOUNTING
AM **GA**⁵ GUIDE SOCKET / PIN FOR NON-POLARISED SHROUDED PIN CARRIER APPLICATION
NA **NB**⁵ GUIDE PIN POLARISED VERTICAL MOUNTING

7 > STANDARD VARIATIONS

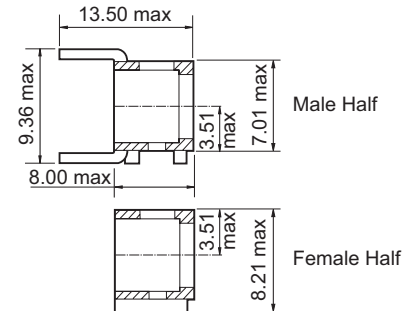
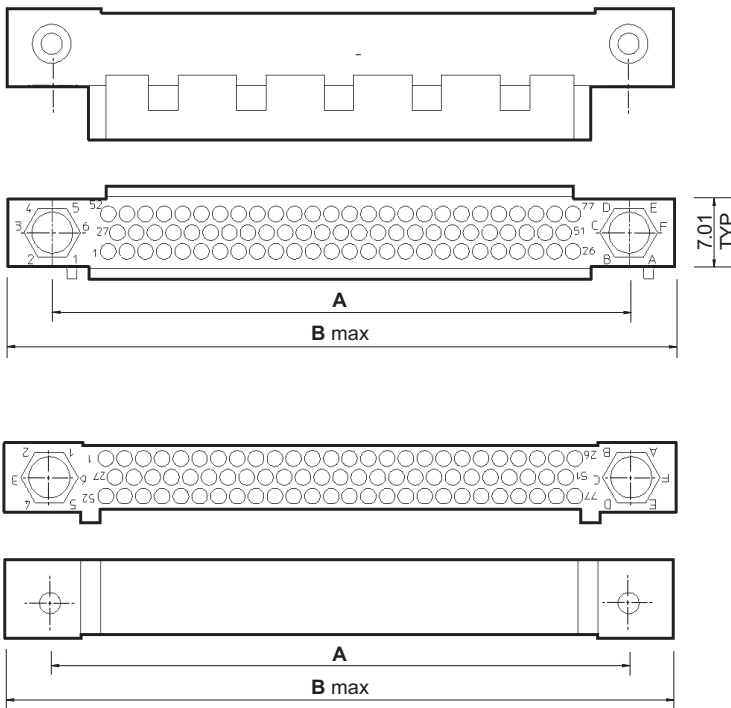
0P0 BACK POTTED **0S0** LOOSE SHROUD SUPPLIED (*for male stacking connector*) **000** NO POTTING

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.

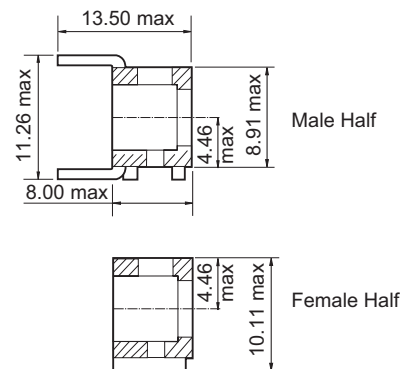
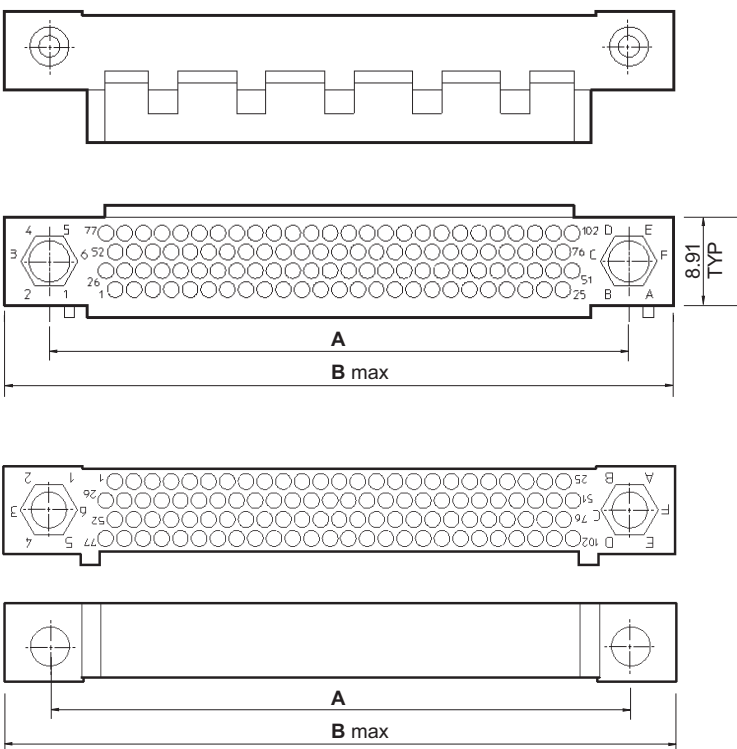
INSULATORS

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

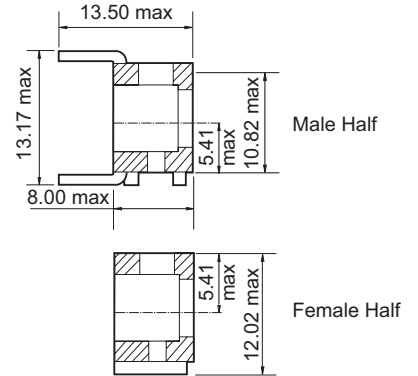
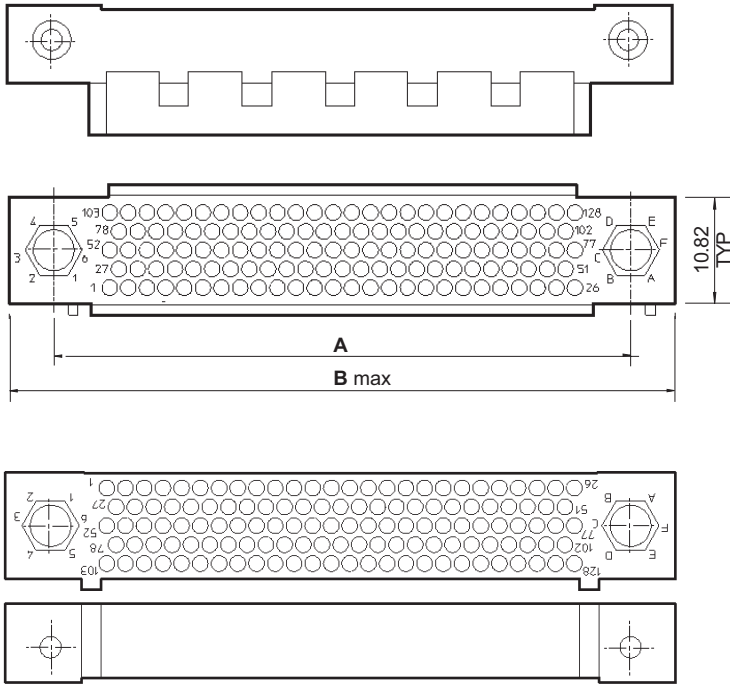


No. of positions	102	202
Dimension A	59.18 2.330"	106.68 4.200"
Dimension B	68.50 2.697"	116.50 4.567"

Dimension are in mm and inches

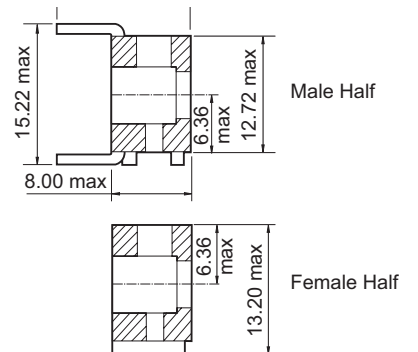
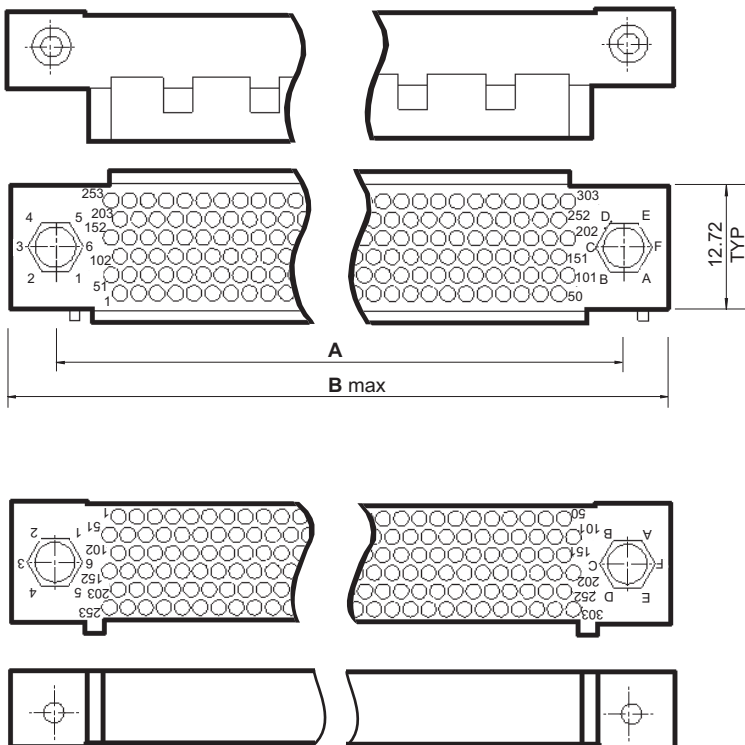
INSULATORS

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"

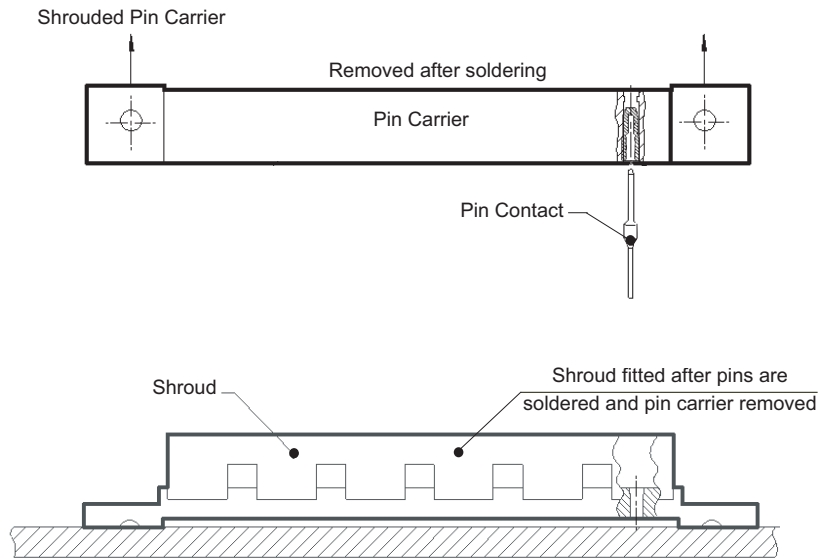
6 ROW MALE AND FEMALE HALF



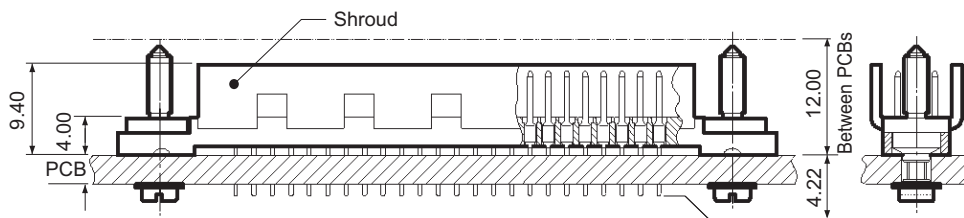
No. of positions	303
Dimension A	106.68 4.200"
Dimension B	116.50 4.567"

INSULATORS, PIN CARRIER AND GUIDES

SHROUDED PIN CARRIER



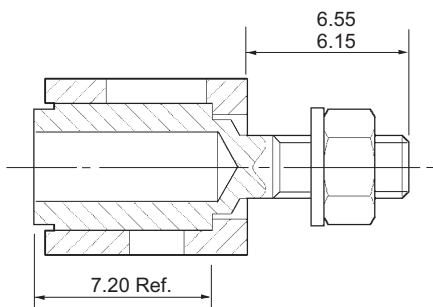
Shrouded insulator shown with pins and guides.
Ready to mate with standard female connector fitted with suitable female pin carrier guides.



SHROUDED PIN CARRIER GUIDES

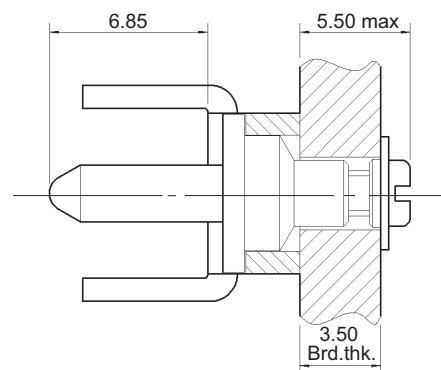
STYLE AM

Non Polarised Guide Socket. Vertical Mounting



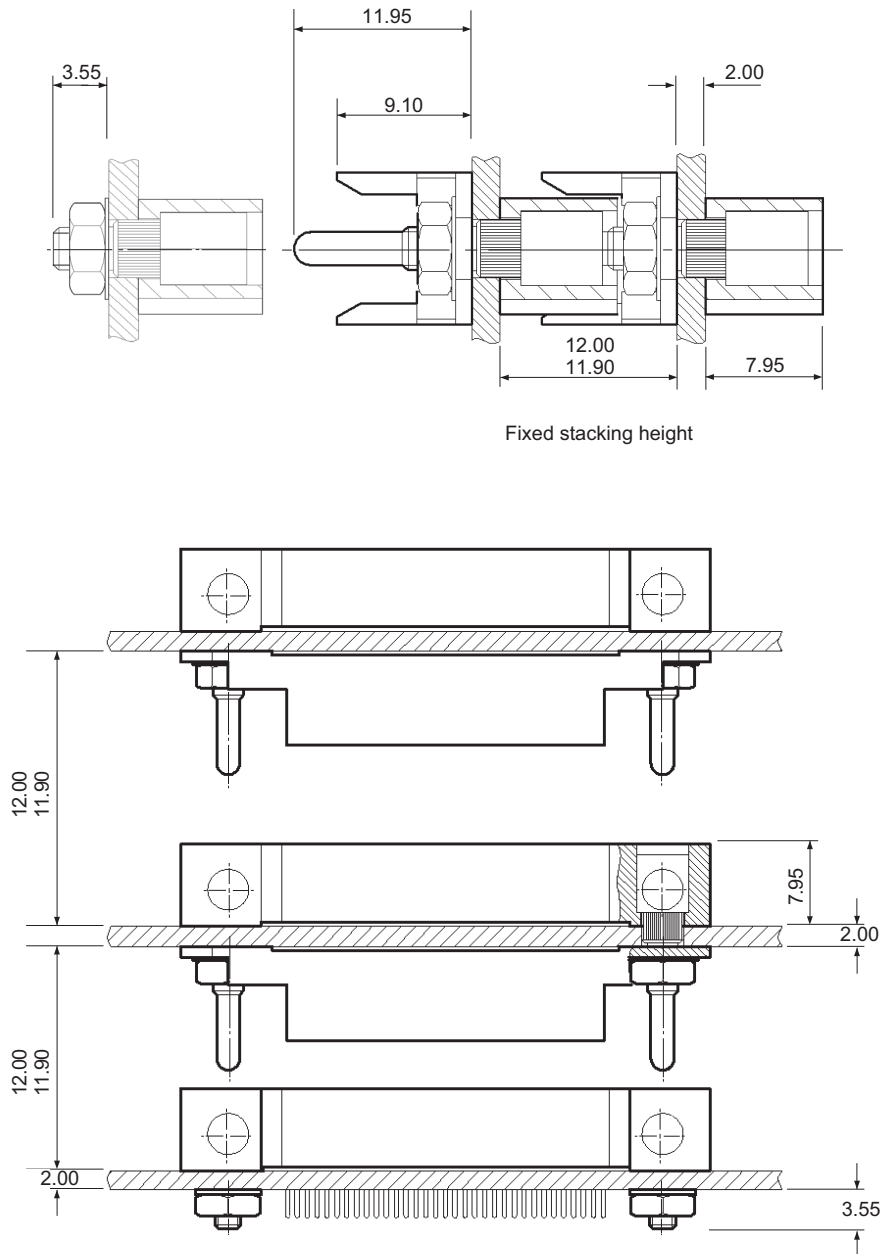
STYLE 9A

Non Polarised Guide Pin. Vertical Mounting



▶ HPH STACKING INSULATORS

STACKING CONNECTOR APPLICATION



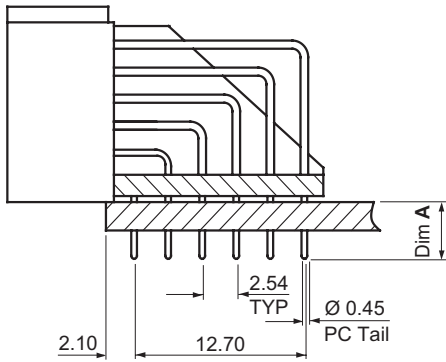
Fixed stacking height

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.

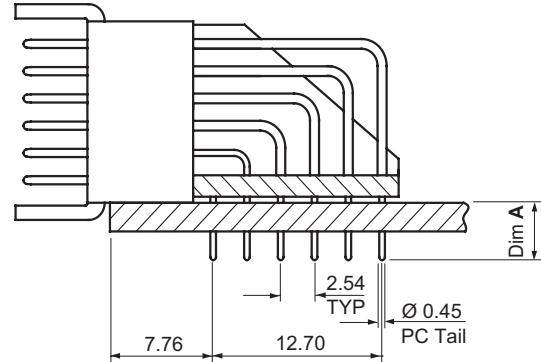
STANDARD PCB TERMINATIONS

FEMALE 90° PCB



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

MALE 90° PCB

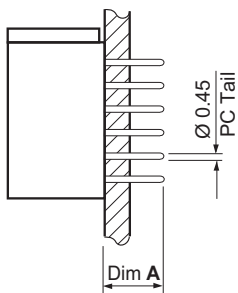


Dimensions applicable to 3, 4 and 5 row insulators also.

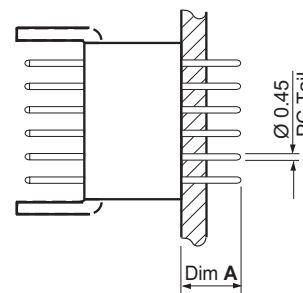
Termination	Dim A
B ⁽¹⁾	2.85 0.112"
L ⁽²⁾	4.00 0.157"

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

FEMALE VERTICAL PCB



MALE VERTICAL PCB

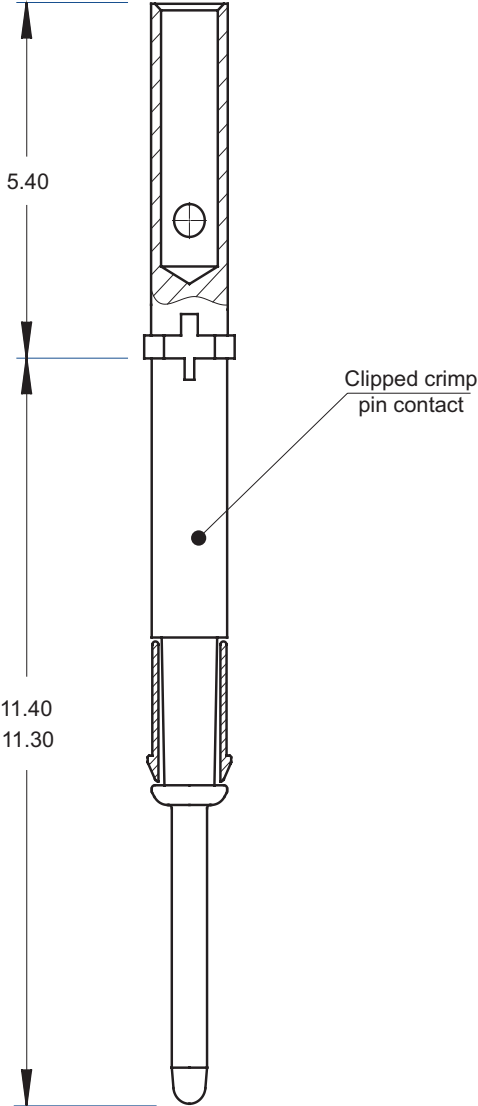


Termination	Dim A
P ⁽³⁾	4.50 0.177"
K ⁽⁴⁾	6.70 0.264"

⁽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

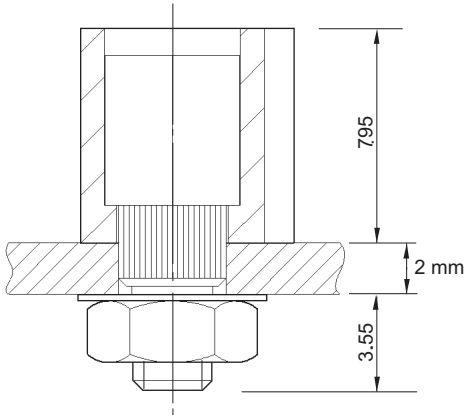
		Male guides															
		AT	PE	PF	PG	PN	PP	PQ	PT	QC	QF	QQ	Q3	3C	3F	NA	NB
Female guides	AU																
	HA																
	HD																
	HN																
	SC																
	TJ																
	TP																
	TT																

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

STANDARD GUIDES FEMALE

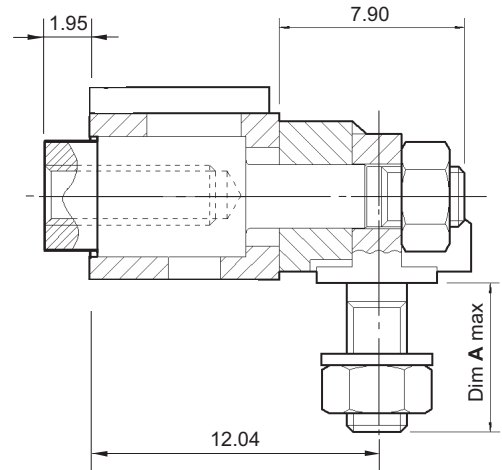
STYLE AU

Non-polarised Vertical Mounting Stacking



STYLE T

Jack Socket Non-polarised Transverse Mounting T-Bracket

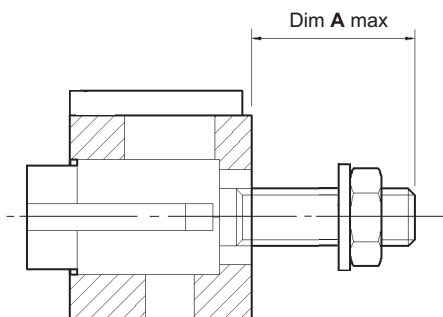


Above guides can also be used for male connectors

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

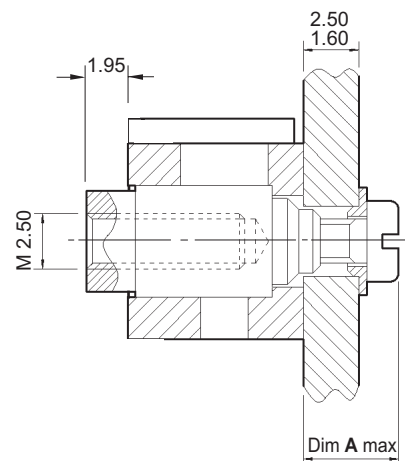
Polarised Vertical Mounting



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

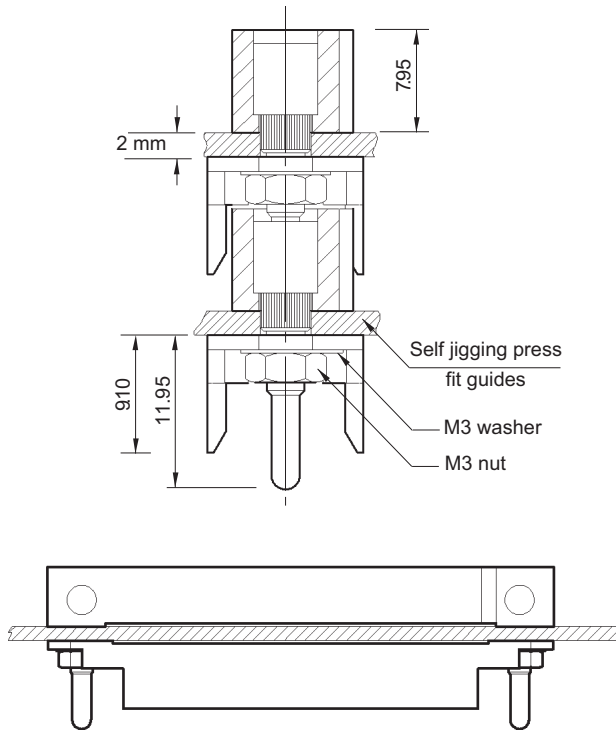


Style	Board thickness	Dim A max
SC	2.50 0.098"	4.30 0.169"

STANDARD GUIDES MALE

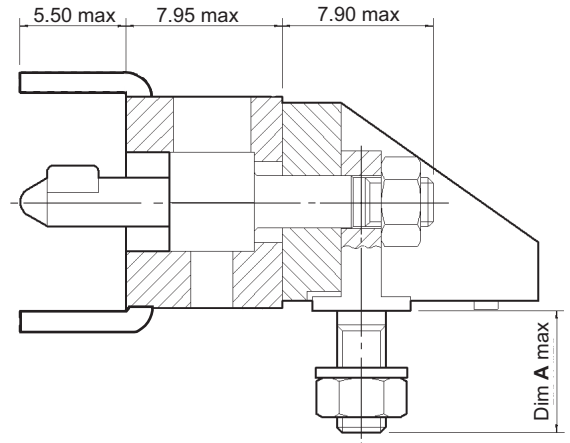
STYLE AT

Non-polarised Vertical Mounting Stacking



STYLE P

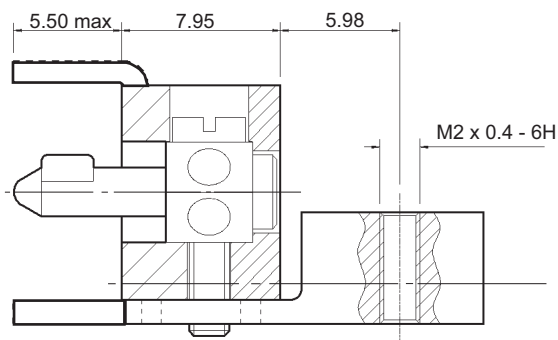
Polarised Transverse Mounting
(showing 5 row style)



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"

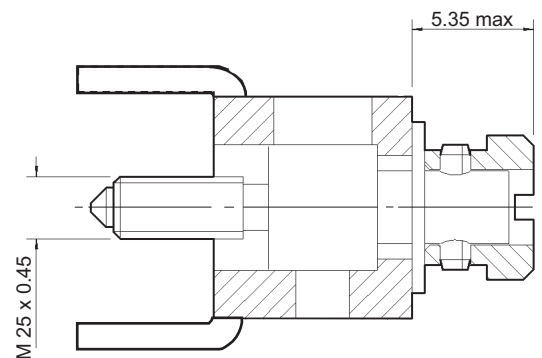
STYLE Q

Polarised Transverse Mounting L-Bracket



STYLE 3C

Jacking Guide Non-polarised Rotating Free Connector

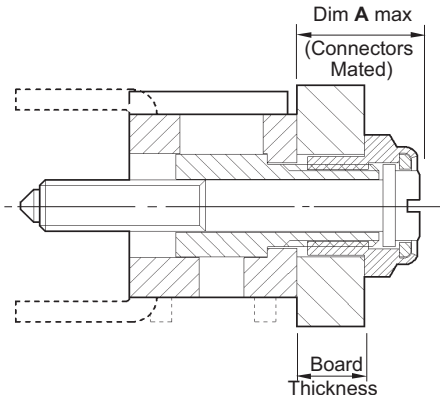


Style 3 row	Style 4 row	Style 5 row	Style 6 row	Board thickness
QC	QF	QQ		2.54 0.100"
			Q3	3.20 0.125"

STANDARD GUIDES MALE

STYLE 3F

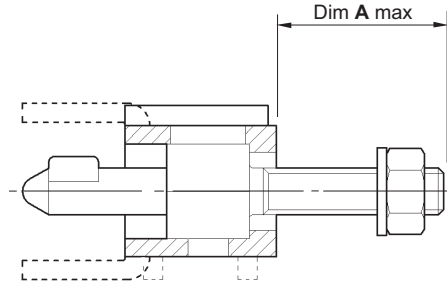
Jacking Guide Non-polarised
Vertical Mounting



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

STYLE N

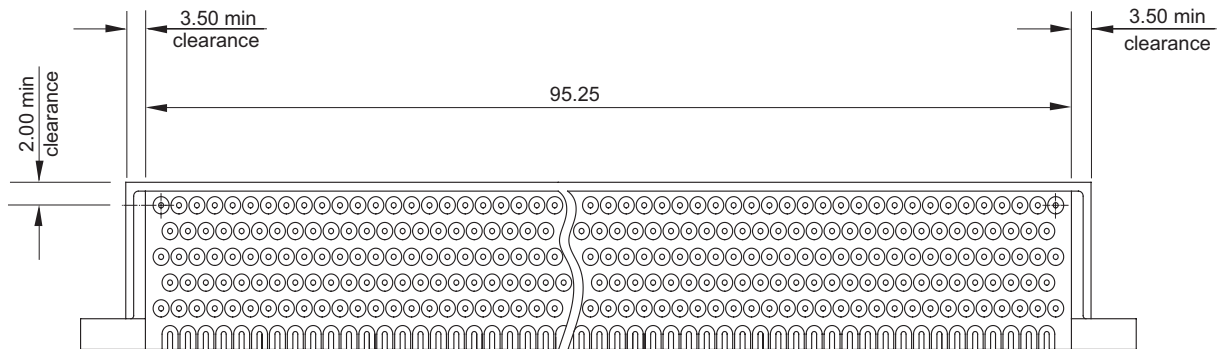
Polarised Vertical Mounting



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 PREPARATION DETAILS

PCB 90° ALIGNMENT COMB DETAILS



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

IMPORTANT

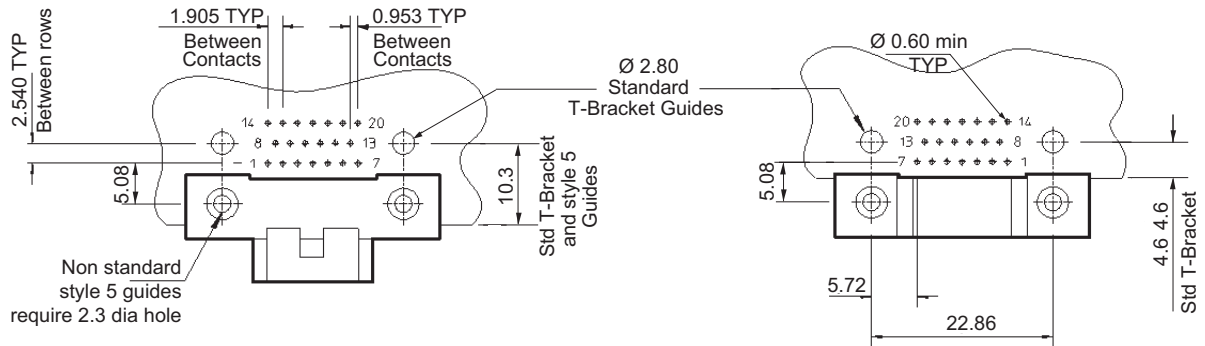
Please allow the following clearance dimensions around all 90° PCB layout configurations to accommodate the alignment comb shown below.

► PCB STANDARD 90° PREPARATIONS DETAILS

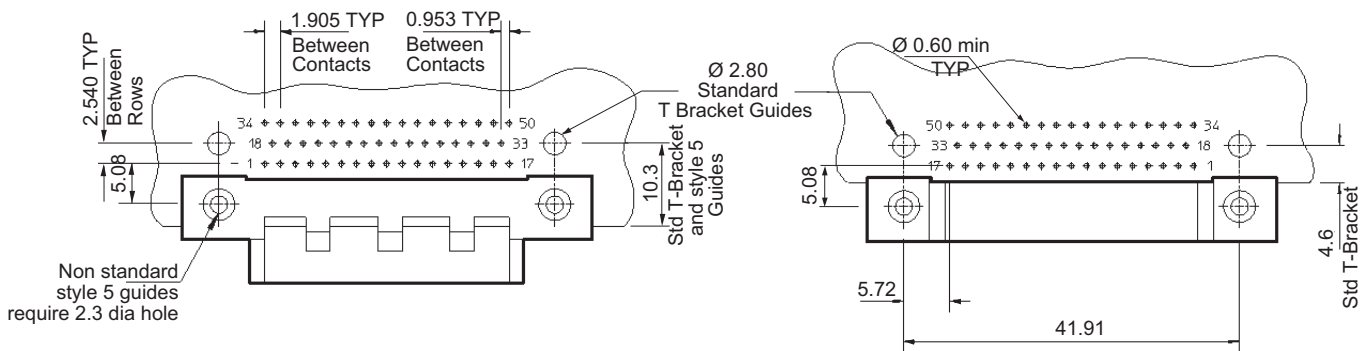
MALE

FEMALE

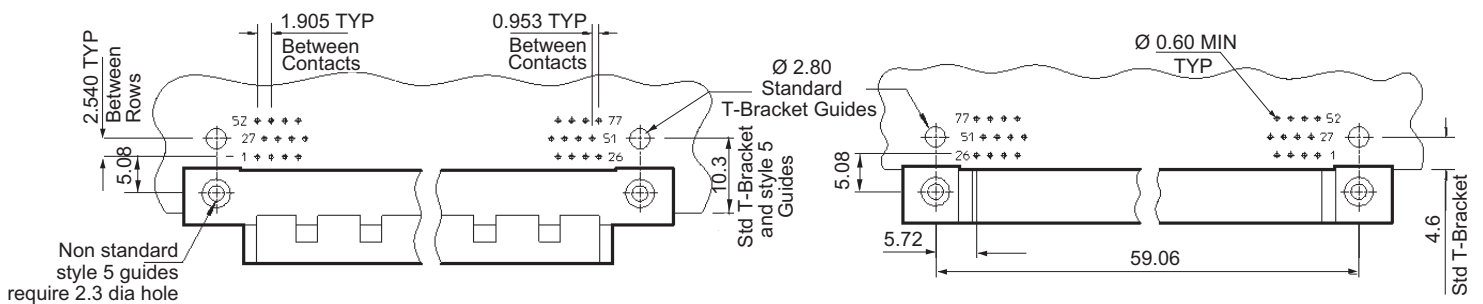
20 WAY 90° PCB LAYOUT



50 WAY 90° PCB LAYOUT



77 WAY 90° PCB LAYOUT

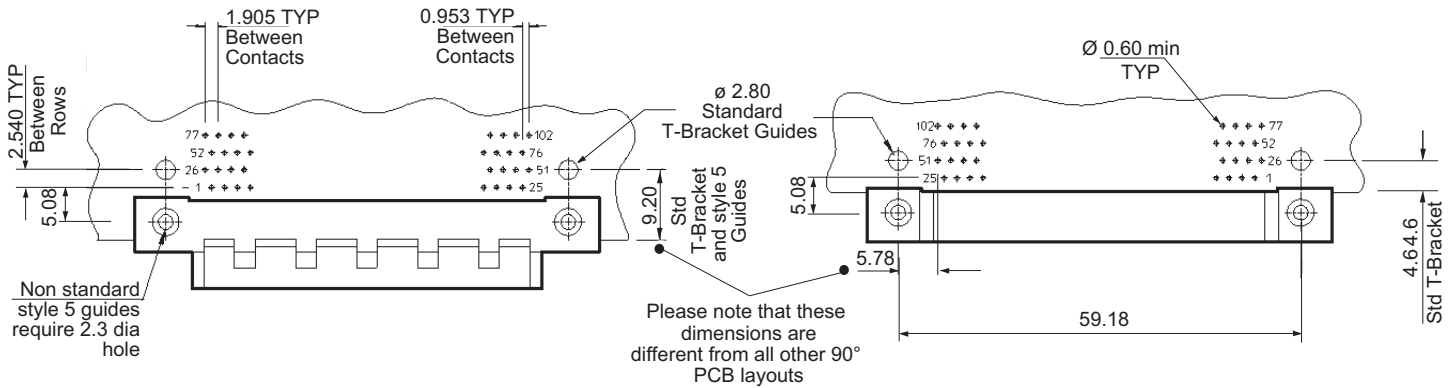


► PCB STANDARD 90° PREPARATIONS DETAILS

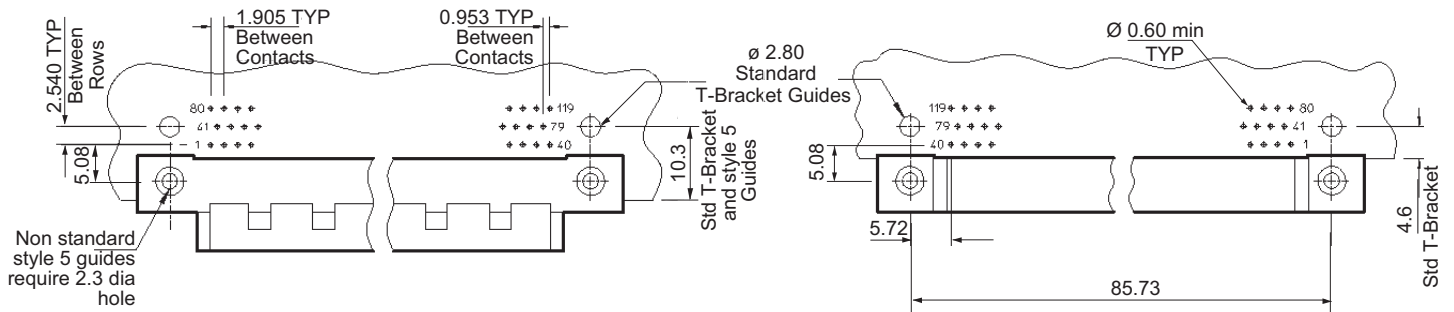
MALE

FEMALE

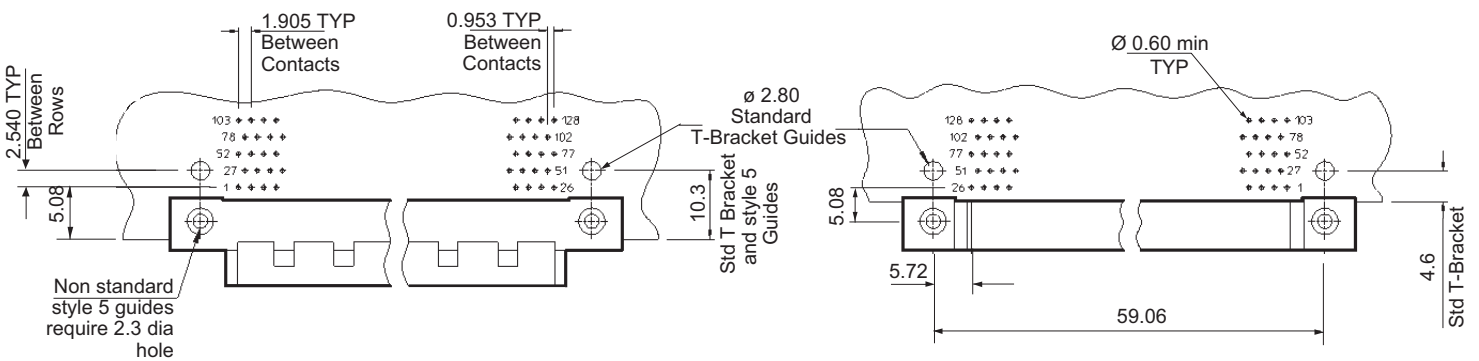
102 WAY 90° PCB LAYOUT



119 WAY 90° PCB LAYOUT



128 WAY 90° PCB LAYOUT

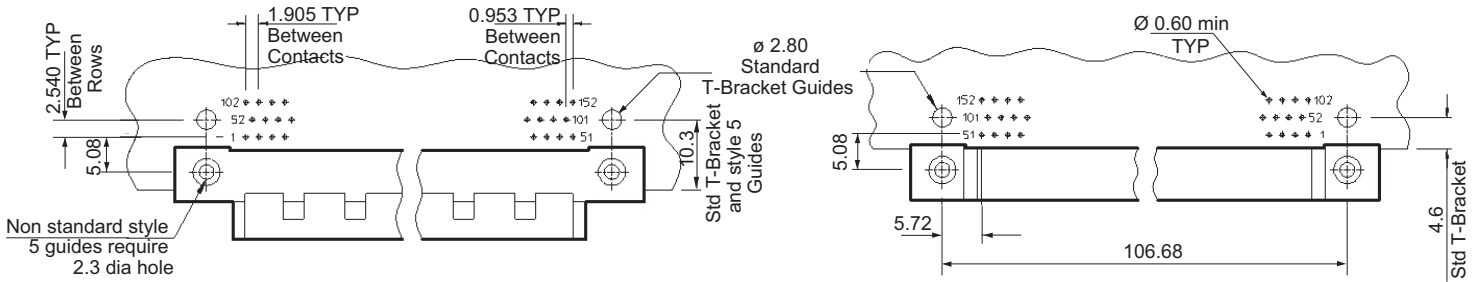


▶ PCB STANDARD 90° PREPARATIONS DETAILS

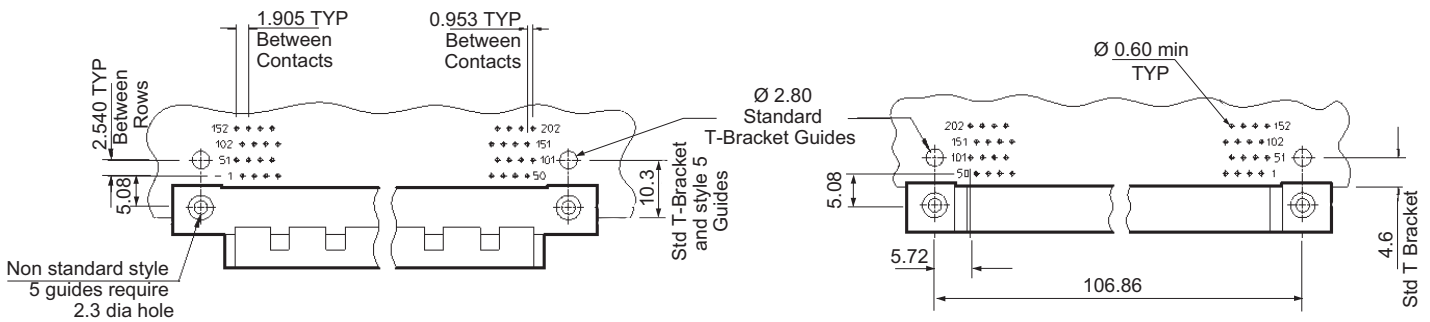
MALE

FEMALE

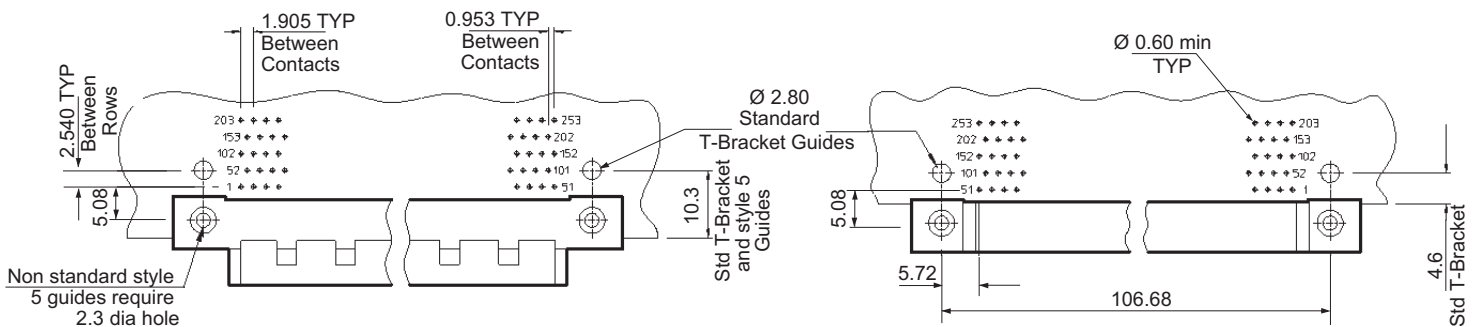
152 WAY 90° PCB LAYOUT



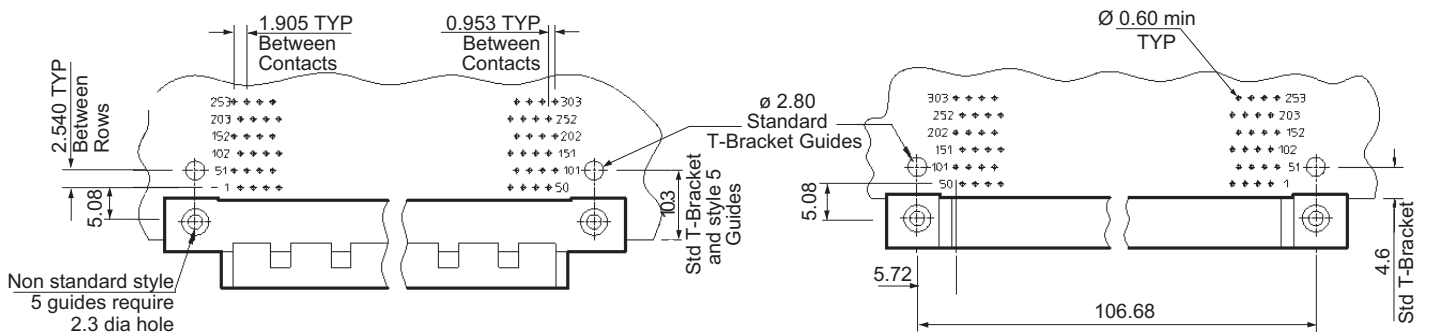
202 WAY 90° PCB LAYOUT



253 WAY 90° PCB LAYOUT



303 WAY 90° PCB LAYOUT

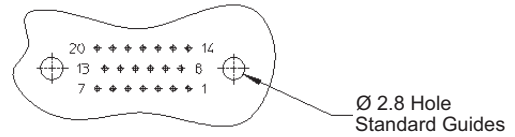
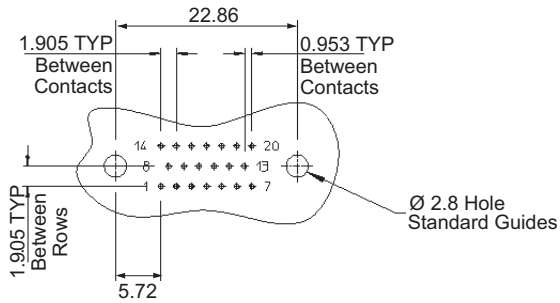


► PCB STANDARD VERTICAL PREPARATIONS DETAILS

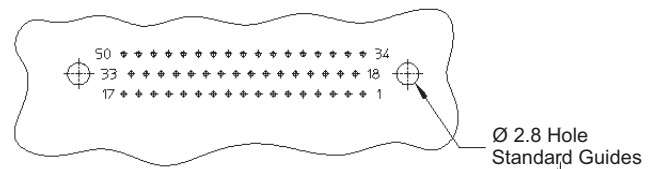
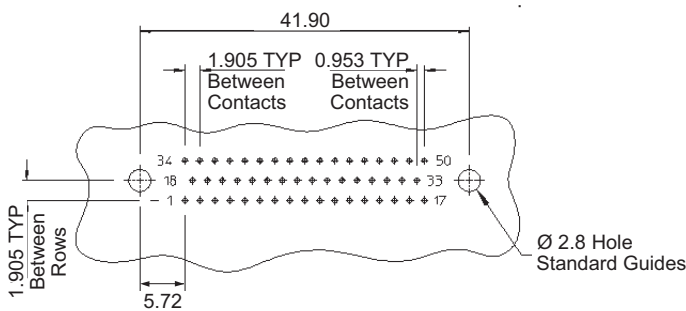
LAYOUT MALE

LAYOUT FEMALE

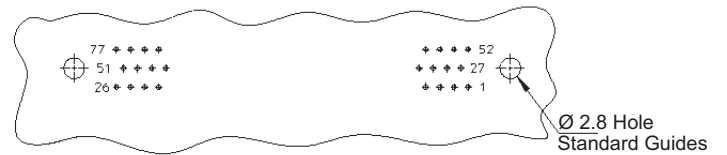
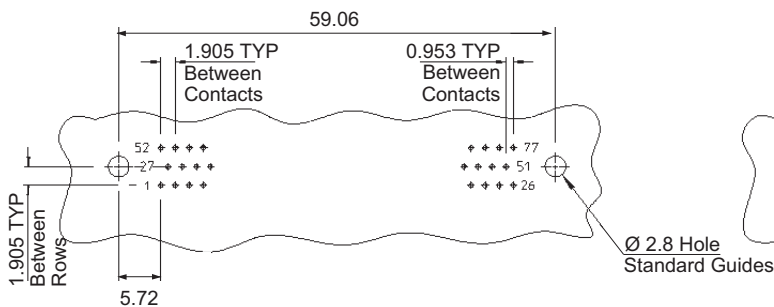
20 WAY VERTICAL PCB



50 WAY VERTICAL PCB



77 WAY VERTICAL PCB



NOTE

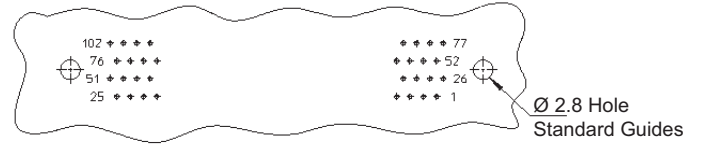
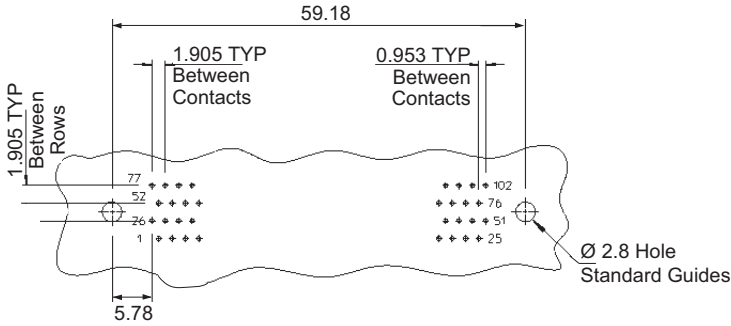
Vertical guide centres align with the centre of the PCB contact layout.

► PCB STANDARD VERTICAL PREPARATIONS DETAILS

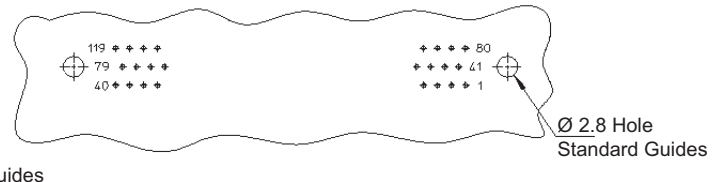
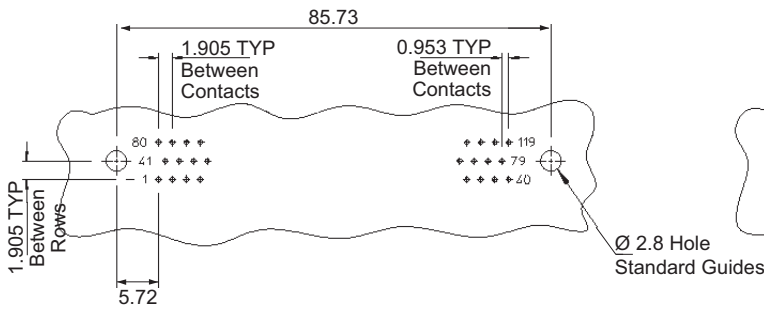
LAYOUT MALE

LAYOUT FEMALE

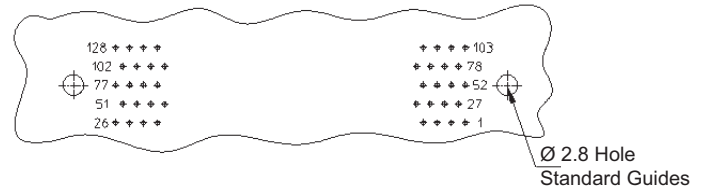
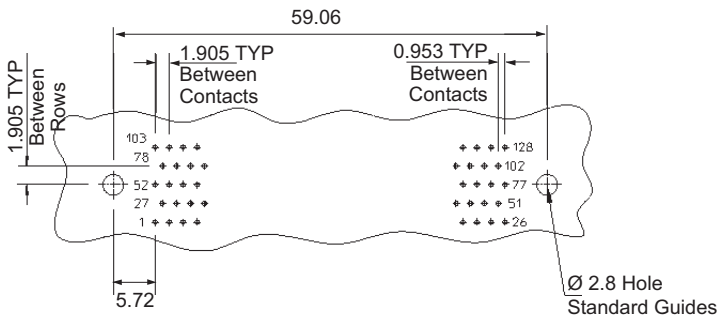
102 WAY VERTICAL PCB



119 WAY VERTICAL PCB



128 WAY VERTICAL PCB



NOTE

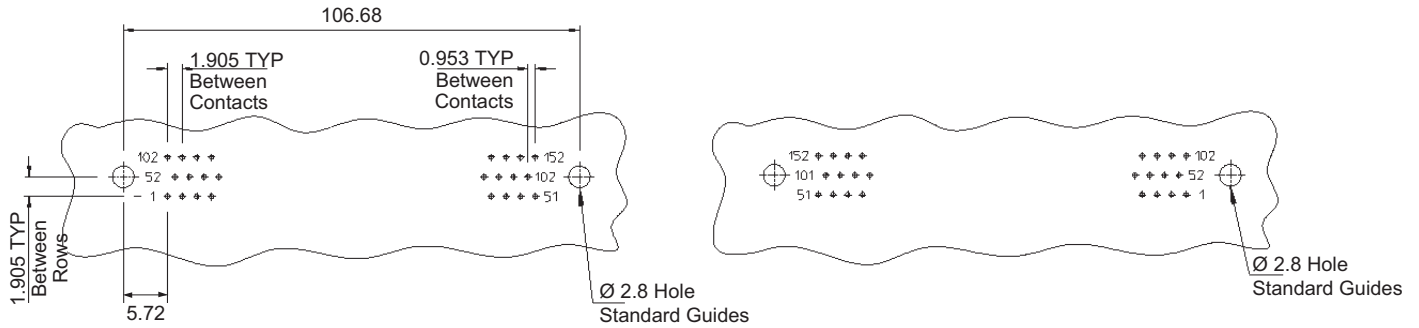
Vertical guide centres align with the centre of the PCB contact layout.

► PCB STANDARD VERTICAL PREPARATIONS DETAILS

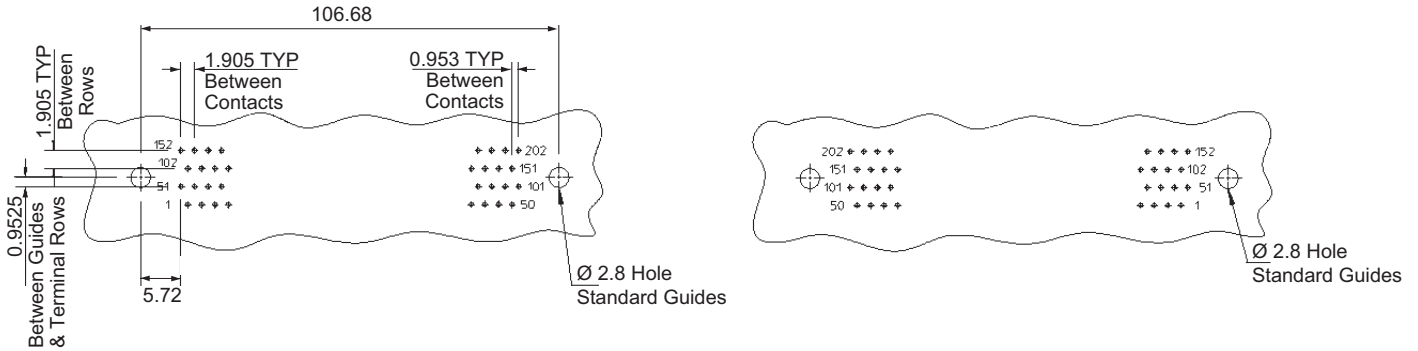
LAYOUT MALE

LAYOUT FEMALE

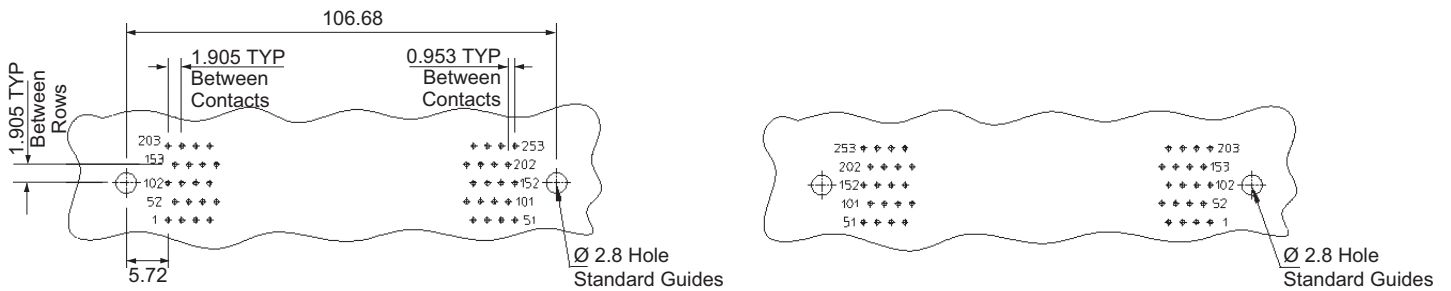
152 WAY VERTICAL PCB



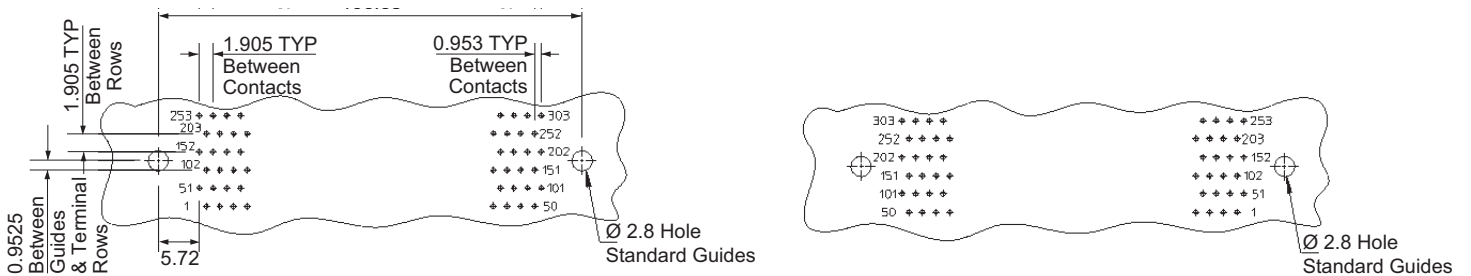
202 WAY VERTICAL PCB



253 WAY VERTICAL PCB



303 WAY VERTICAL PCB



NOTE

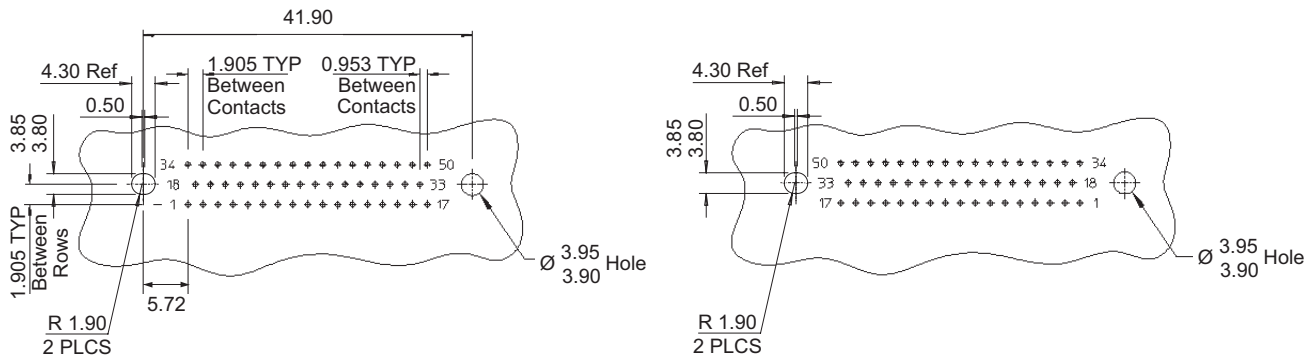
Vertical guide centres align with the centre of the PCB contact layout.

► PCB STACKING PREPARATIONS DETAILS

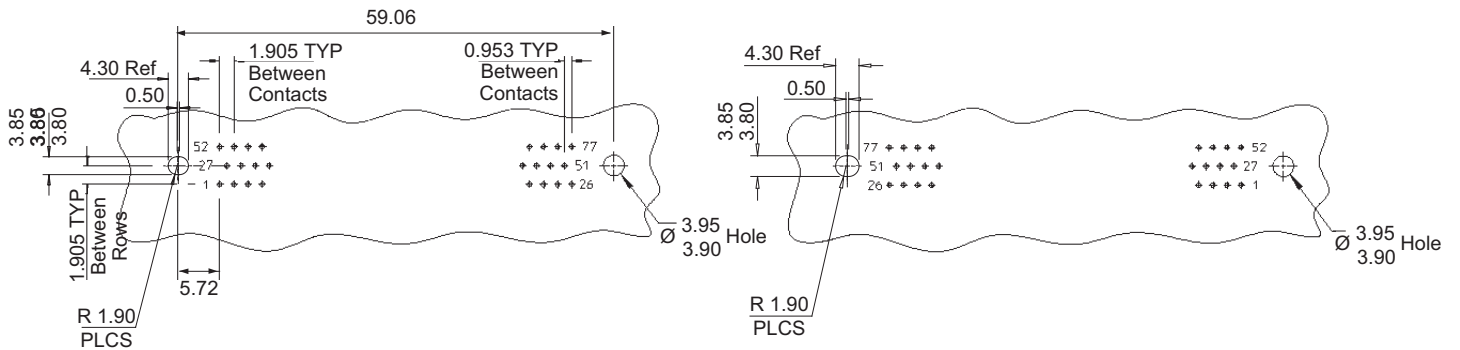
LAYOUT VIEWED FROM MALE SIDE

LAYOUT VIEWED FROM FEMALE SIDE

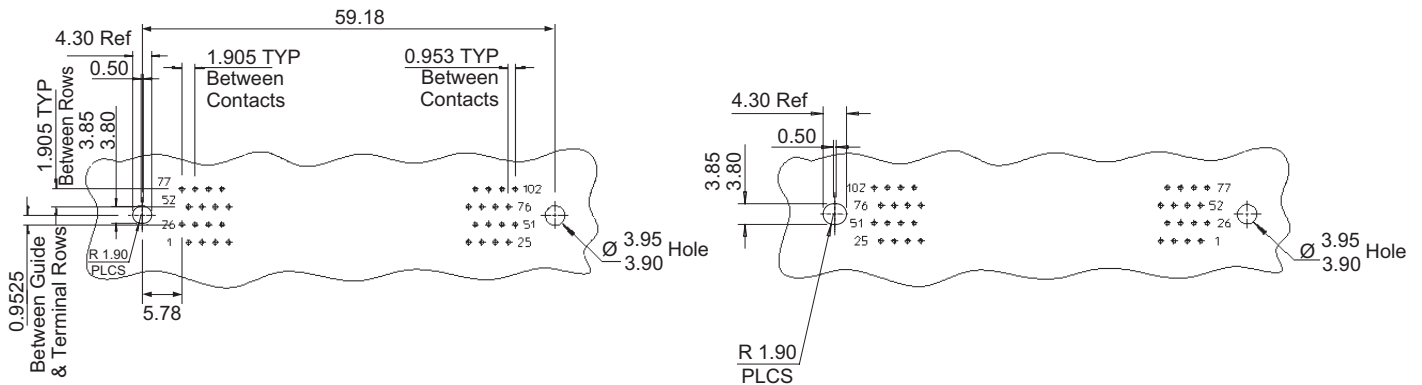
50 WAY VERTICAL PCB



77 WAY VERTICAL PCB



102 WAY VERTICAL PCB



NOTE

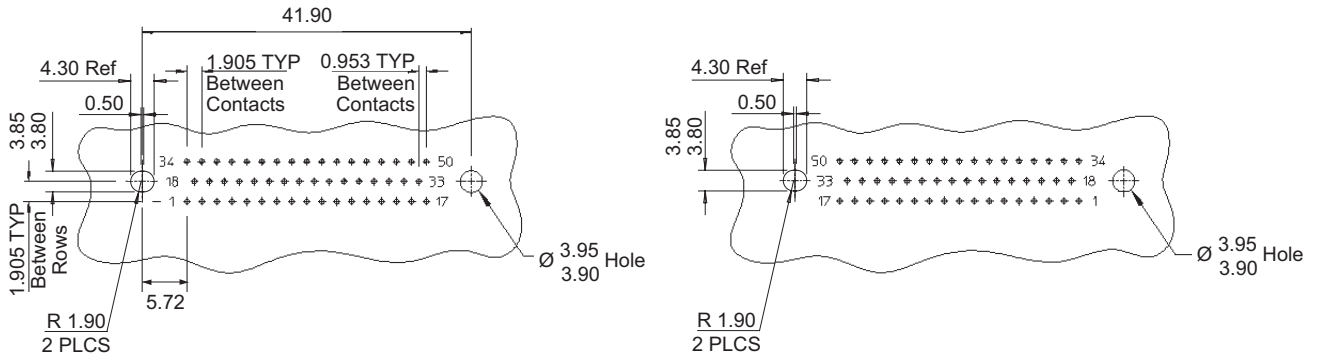
Stacking guide centres align with the centre of the PCB contact layout. Stacking connectors are currently only available in 50, 77 & 102 ways. If you have further requirements please contact our local sales offices.

► PCB STACKING PREPARATIONS DETAILS

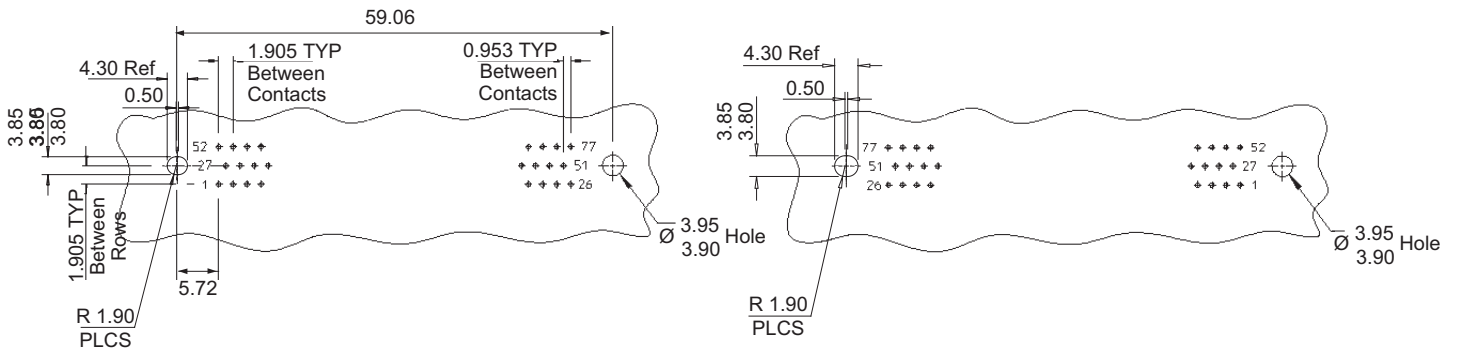
LAYOUT VIEWED FROM MALE SIDE

LAYOUT VIEWED FROM FEMALE SIDE

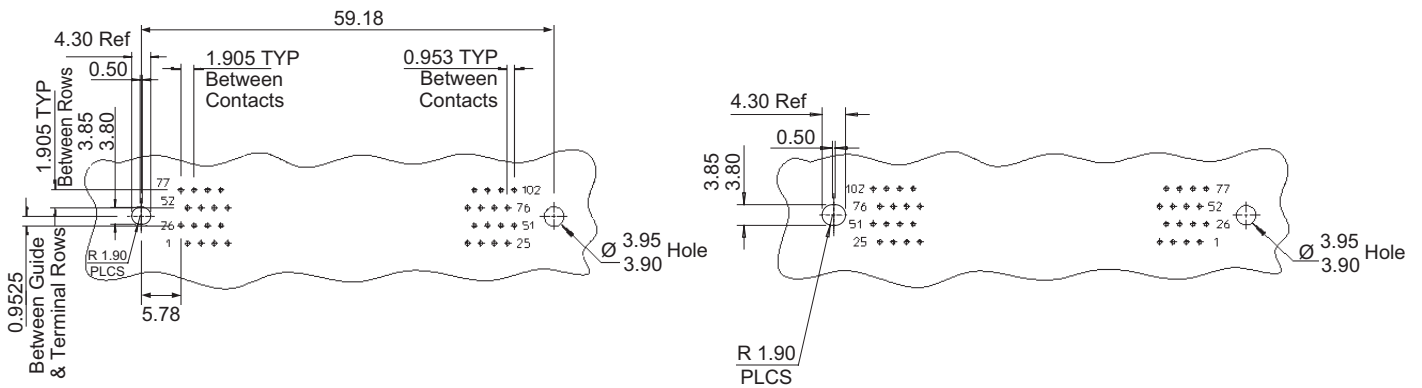
50 WAY VERTICAL PCB



77 WAY VERTICAL PCB



102 WAY VERTICAL PCB

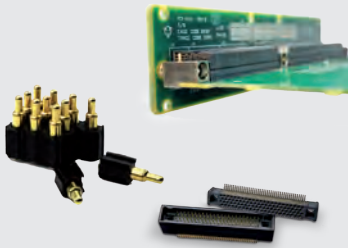


NOTE

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.

SMITHS CONNECTORS PRODUCT LINES

PCB



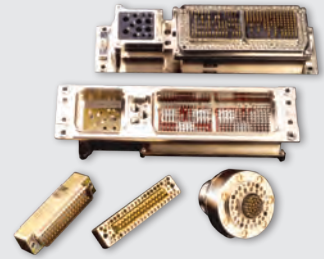
- ▶ Low, medium and high density board-to-board, cable to board and stacking
- ▶ Rugged standard
- ▶ Low profile
- ▶ Signal, power, coaxial & high speed configurations
- ▶ Self configurable board-to-board
- ▶ Spring probe connectors
- ▶ Mixed signal, power and coaxial contact connectors
- ▶ Different termination styles: solder cup, crimp, SMT and SMT flex, press fit, solder dip.

POWER



- ▶ Circular
- ▶ Configurable rectangular
- ▶ Ruggedized
- ▶ Single and Multi-Way Connectors
- ▶ Power contact up to 1,200 Amps
- ▶ Excellent performance in harsh environment conditions
- ▶ Cable assembling

EMI/EMP FILTER



- ▶ EMI/RFI filtering and transient protection
- ▶ RoHS compliant solderless filter connectors available
- ▶ Circular, ARINC, D-Subminiature Micro-D
- ▶ Filtered adapters for "bolt on" EMI /EMP solutions
- ▶ Filter hybrid capability

MODULAR/RECTANGULAR



- ▶ Configurable with modules for signal, power, coax, fiber optics and/or pneumatics
- ▶ Easy configuration in a single frame
- ▶ For rack & panel, and cable applications
- ▶ Guided hardware for blind
- ▶ D-sub connectors
- ▶ Micro-D style
- ▶ Signal connectors for hand held and docking stations

CIRCULAR



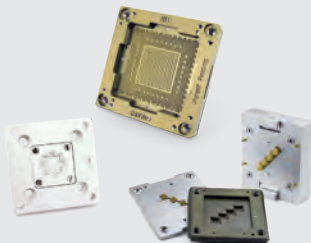
- ▶ Metal and Plastic
- ▶ Industrial M12, M23, M40, M58
- ▶ Crimp and solder terminations
- ▶ Various types of cable clamps
- ▶ Push Pull/ latch mechanism
- ▶ Color coding

HEAVY DUTY



- ▶ Ultra reliable hyperboloid contact
- ▶ Modular solution: signal, power, data contacts, and fiber optics
- ▶ High resistance in harsh environment
- ▶ EMC shielding
- ▶ Easy cable mounting
- ▶ High pressure up to 35K PSI, 250° C
- ▶ High temperature up to 440° C

SPRING PROBES



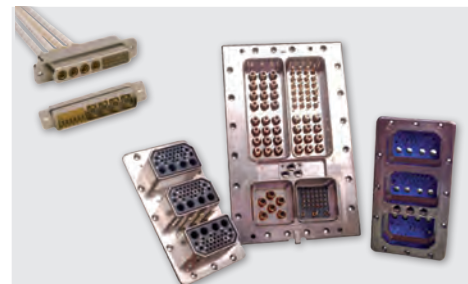
- ▶ Z-axis compliant
- ▶ Blind mate engagement
- ▶ Long cycle life
- ▶ High density
- ▶ Extreme miniaturization
- ▶ Printed circuit board test
- ▶ Bare board test
- ▶ Coaxial contacts

MIL/AERO STANDARD



- ▶ Standard military interface
- ▶ ARINC interface
- ▶ ARINC 801
- ▶ Custom inserts

HIGH SPEED COPPER/FIBER



- ▶ Quadrx and Twinax Connectors
- ▶ Rugged D-Sub Connectors
- ▶ ARINC and MIL-STD Contacts
- ▶ Micro Twinax/Quadrx
- ▶ Butt-Joint and Expanded Beam Contacts
- ▶ ARINC 801 Termini
- ▶ Floating Fiber Termini



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