

Connectors with press-in termination

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Solderless termination for connectors has proven to be reliable for decades. Today the use of press-in connectors encompasses all fields of electrical and electronical applications.

Pressing of electrical components, mainly connectors, is characterised through the matching of the connector pin and the plated through hole of the pcb. Whereas the desired electrical characteristics can be attained relatively independant from the design of the press-in zone, the mechanical characteristics of the press-in zone are crucial for the reliable assembly of connectors where pcb's have different surfaces.

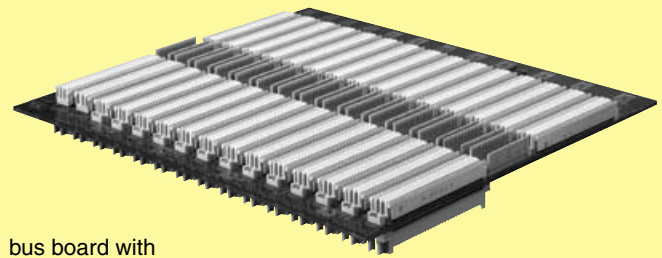
Although the scope of requirements at the press-in process is generally defined in time-tested specifications, the novel press-in zones should offer an optimal handling and a reliable termination. Essentially, this is guaranteed through the design of the press-in zone and the meticulous observance of tolerances. HARTING has been using FEM simulations for the calculation and optimisation of press-in zones for a long period of time. This expertise allows us to simulate various pcb configurations very accurate.

The processing of press-in connectors can be divided into 3 phases, containing both mechanical and metallurgical operations:

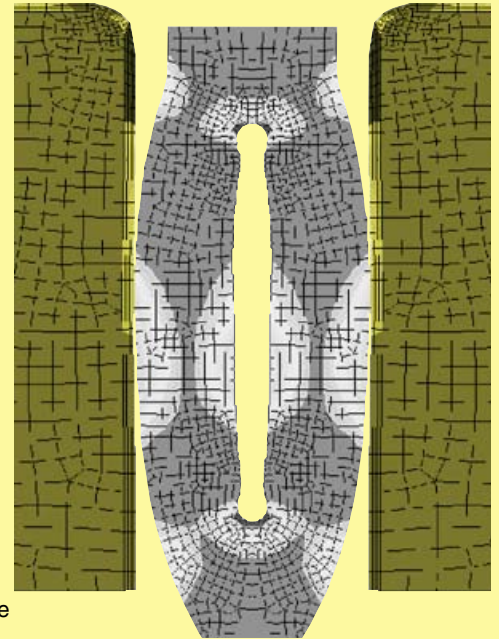
1. Centering and placing of the termination pins

The centering of connectors before pressing is important in order to prevent damage to the pcb and the termination pins. Centering can be omitted when connectors are pressed using a flat rock die.

HARTING offers insert blocks for male connectors to make the centering of connectors unnecessary.

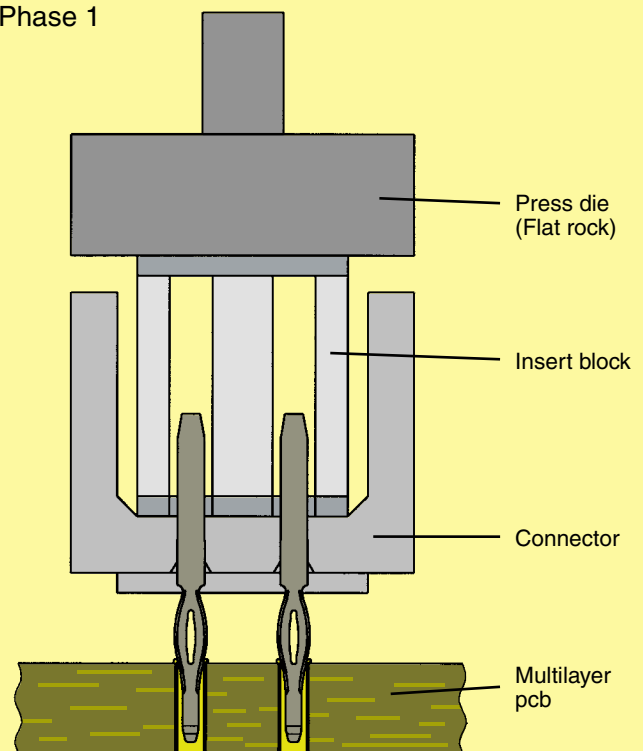


bus board with
press-in connectors



FEM simulation
of the needle eye
press-in zone

Phase 1



2. Pressing in the pins

In the press-in process the insertion force is continuously transformed into compression force. The resulting friction frees the contacting bars of insulating films. Superfluous plating (tin) is transferred within the plated through hole. A gas-tight connection of fresh non-oxidised metal surfaces is obtained.

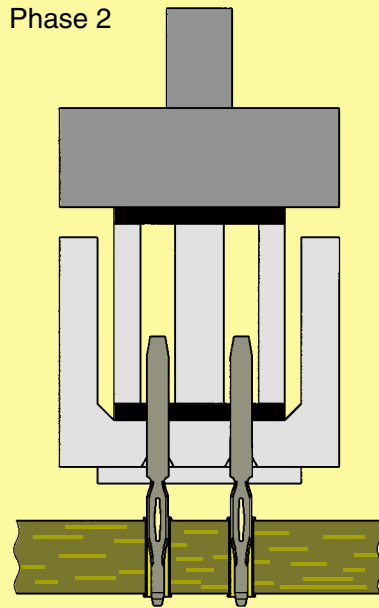
3. Obtaining the final position

The press-in operation should be terminated as soon as the connector obtains its final position on the pcb to avoid unnecessary compressive stress. The press-in machines of HARTING feature automatic termination of the press-in operation independent of pcb thickness and surface properties.

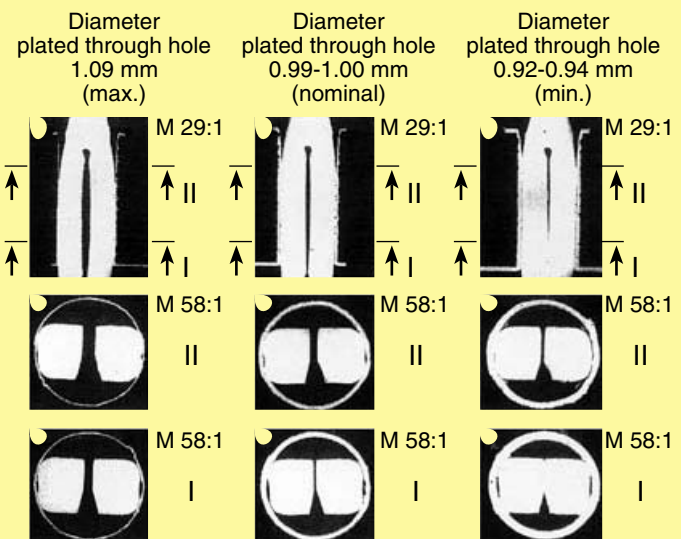
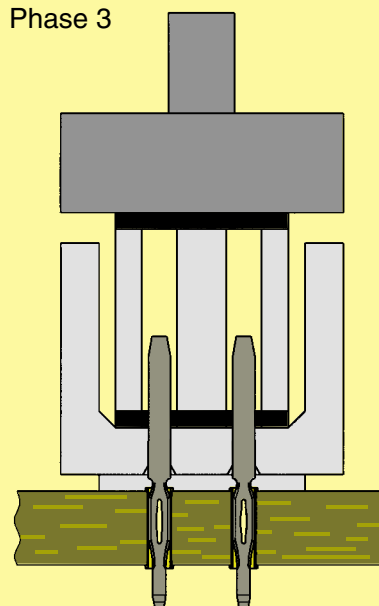
The entire dynamic press-in process is characterised through changes of the press-in force that can be statistically evaluated. HARTING records the changes of force with the help of special software. This is an important step towards permanent process control and documented manufacturing data.

The **har:press**-zone is based on the industry renowned needle eye technology. Its special design allows for compensation of tolerances of pcb surface properties (eg. superfluous tin plating). The excessive material is displaced within the plated through hole, whereby a gas-tight and corrosion resistant electrical connection is assured.

Phase 2



Phase 3



Cross section of a pcb 2.4 mm thick with various hole diameters

Due to the high deformation resistance and resilience of **harpress** contacts, they can be easily and repeatedly removed in case of repairs without impairment to their functioning.

harpress is extremely versatile and offers a reliable electrical contact, therefore it is especially well suited for applications with these surfaces.

Please contact us for detailed test reports.

Benefits of the press-in technology

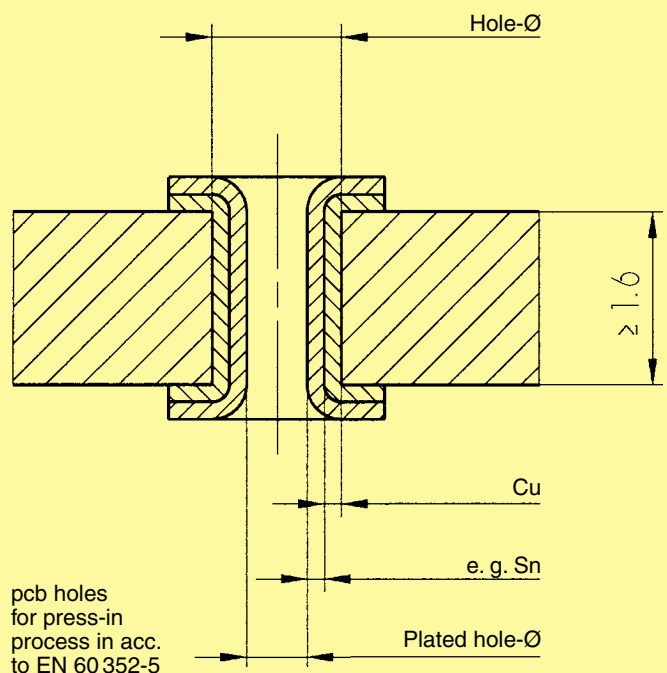
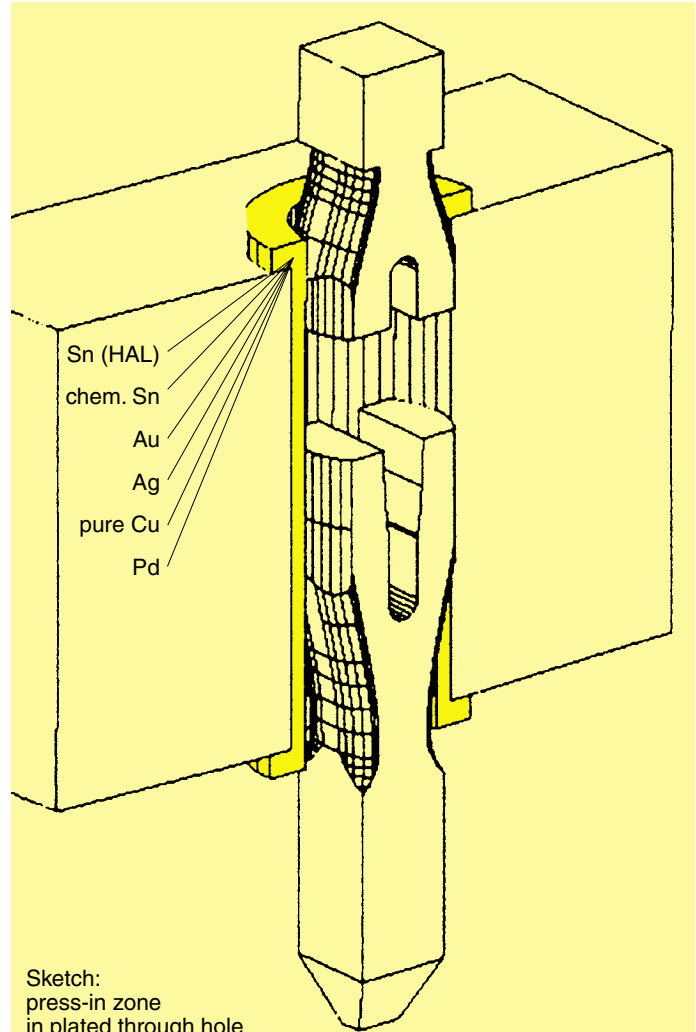
- Thermal shocks associated with the soldering process and the risk of the board malfunction are avoided.
- No need for the subsequent cleaning of the assembled pcb's
- Additional wrap connections are made possible by using connectors with long pins
- Unlimited and efficient processing of partially gold-plated pins for rear I/O - manual soldering is no longer necessary!

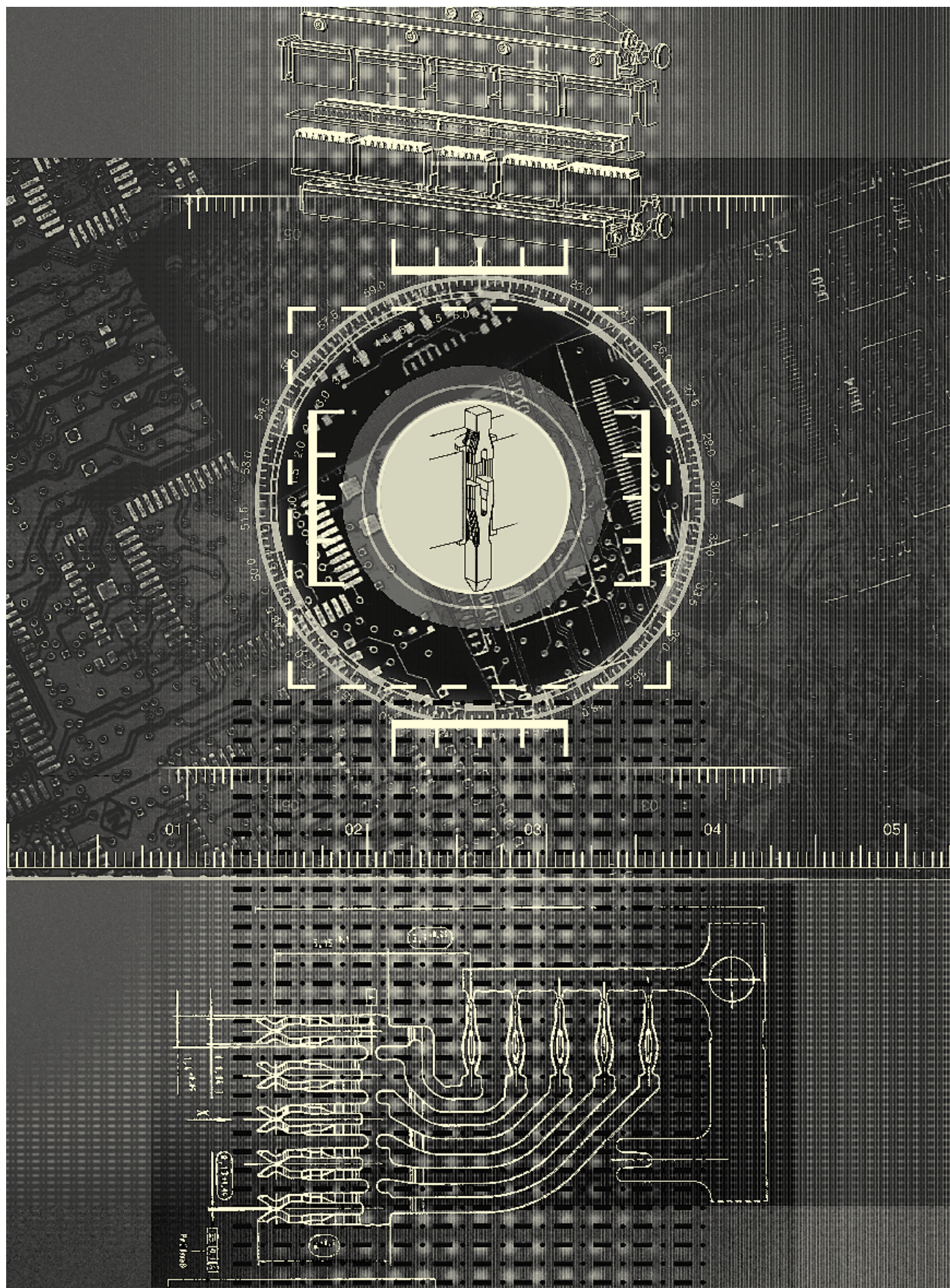
Recommended configuration of plated through holes

In addition to the hot-air-level (HAL) other pcb surfaces are getting more important. Due to their different properties, such as mechanical strength and coefficient of friction we recommend the following configuration of pcb through holes.

Tin-lead plated PCB (HAL) acc. EN 60352-5	Hole-Ø	1.15±0.025 mm
	Cu	min. 25 µm
	Sn	max. 15 µm
	Plated hole-Ø	0.94-1.09 mm
Chemical tin-plated PCB	Hole-Ø	1.15±0.025 mm
	Cu	min. 25 µm
	Sn	min. 0.8 µm
	Plated hole-Ø	1.00-1.10 mm
Au / Ni plated PCB	Hole-Ø	1.15±0.025 mm
	Cu	min. 25 µm
	Ni	3-7 µm
	Au	0.05-0.12 µm
	Plated hole-Ø	1.00-1.10 mm
Silver plated PCB	Hole-Ø	1.15±0.025 mm
	Cu	min. 25 µm
	Ag	0.1-0.3 µm
	Plated hole-Ø	1.00-1.10 mm
OSP copper plated PCB	Hole-Ø	1.15±0.025 mm
	Cu	min. 25 µm
	Plated hole-Ø	1.00-1.10 mm

PCB board thickness: ≥ 1.6 mm



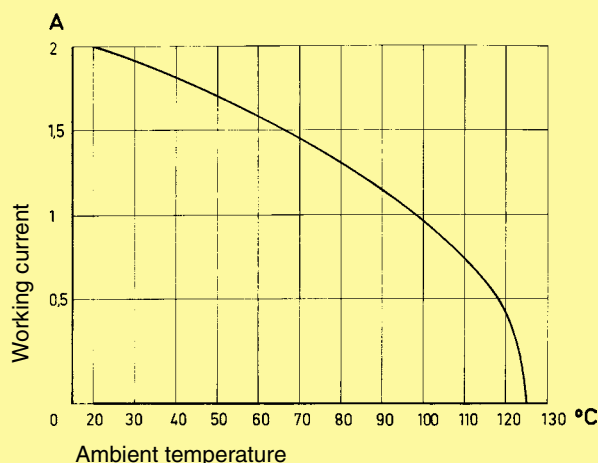


Number of contacts	30-96
Contact spacing (mm)	2.54
Working current see current carrying capacity chart	2 A max.
Clearance	≥ 1.2 mm
Creepage	≥ 1.2 mm
Working voltage The working voltage also depends on the clearance and creepage dimensions of the pcb itself and the associated wiring	according to the safety regulations of the equipment Explanations see chapter 00
Test voltage $U_{r.m.s.}$	1 kV
Contact resistance	≤ 15 m Ω
Insulation resistance	$\geq 10^{12}$ Ω
Temperature range The upper temperature is limited by the property of the pcb material	- 40 °C ... + 105 °C
Electrical termination Male and female connectors Diameter of pcb plated through holes pcb thickness Recommended pcb holes for press-in process in acc. to EN 60 352-5 ²⁾	Compliant press-in terminations See table on page 04.04 ≥ 1.6 mm
Insertion and withdrawal force	30pol. ≤ 30 N 32pol. ≤ 30 N 48pol. ≤ 45 N 64pol. ≤ 60 N 96pol. ≤ 90 N
Materials Mouldings Contacts	Thermoplastic resin, glass-fibre filled, UL 94-V0 Copper alloy
Contact surface Contact zone	Plated according to performance level ¹⁾

Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity curve is valid for continuous, non interrupted current loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512



¹⁾ Explanation of performance levels see chapter 00

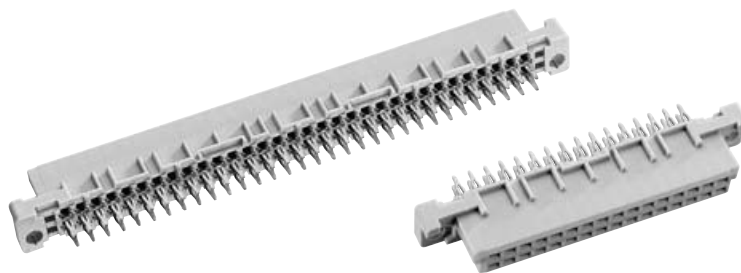
²⁾ for details see page 04.04

Mating conditions see chapter 00

Tooling see chapter 30

Number of contacts

64, 32

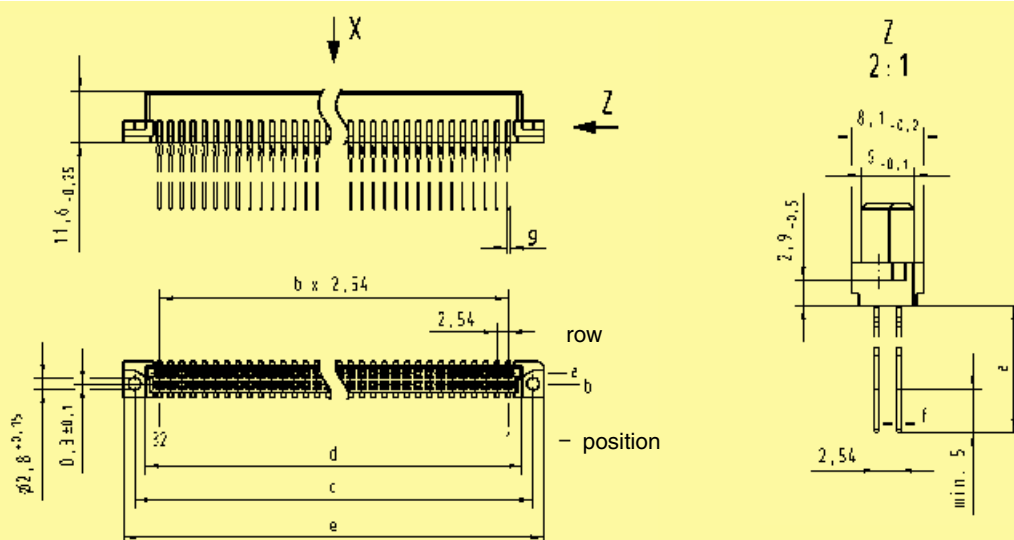


Female connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. Explanation chapter 00 2	1
Female connector Type B with press-in terminations 4.5 mm	64		Performance level 3 on request	09 02 264 6850	Performance level 1 on request
13.2 mm	64			09 02 264 6861*	
Female connector Type 2B with press-in terminations 4.5 mm	32			09 22 232 6850	

Press-in technology

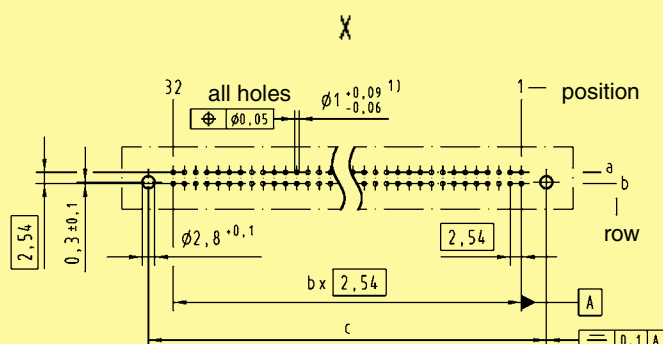
Dimensions



	a	b	c	d	e	f	g
Type B	4.5	31	90	85.0	94.9	0.3	0.75
Type B	13.2	31	90	85.0	94.9	0.6	0.60
Type 2B	4.5	15	50	44.4	54.9	0.3	0.75

Board drillings

Mounting side



Dimensions in mm

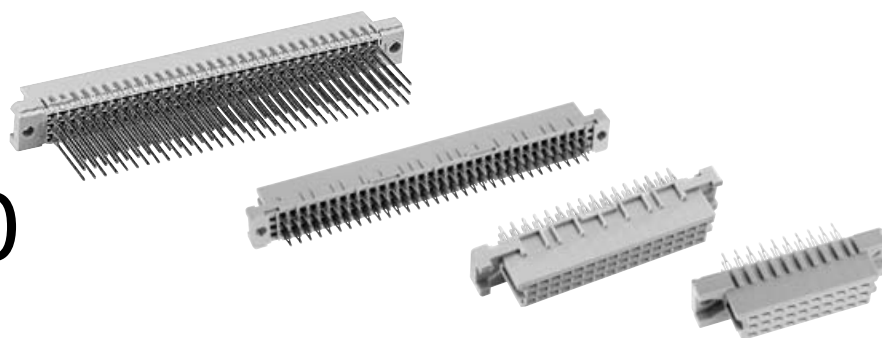
* Wrap posts for interfacing selectively gold plated (performance level 3)

Other contact arrangements on request

¹⁾ refer to recommended configuration of pcb holes, see page 04.04

Number of contacts

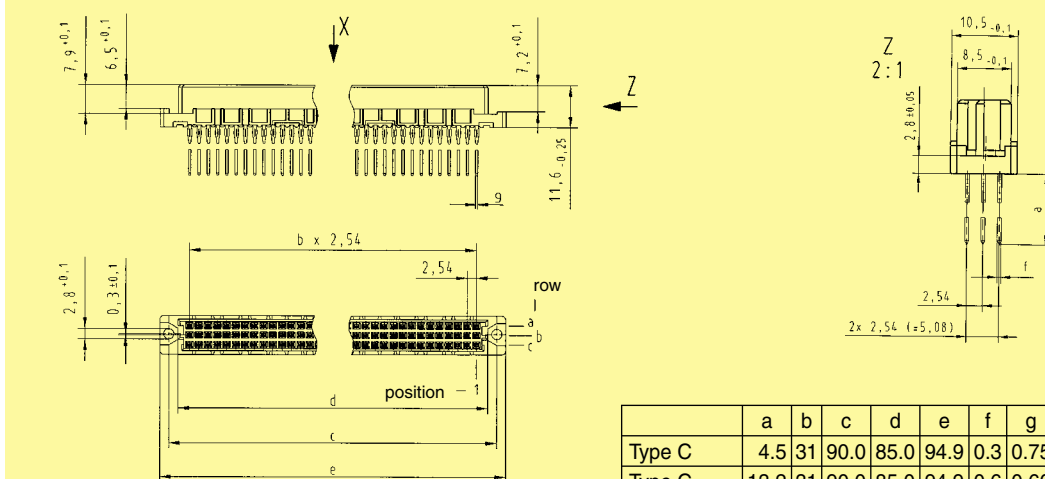
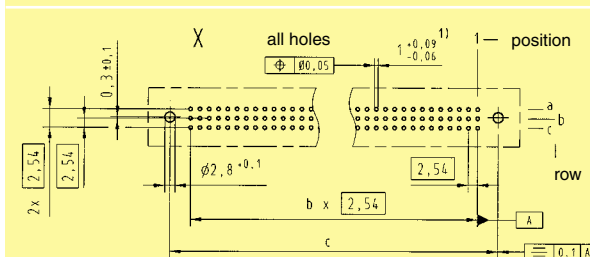
96, 64, 48, 32, 30



Female connectors

Identification	Number of contacts	Contact arrangement	Part No.	Performance levels according to IEC 60 603-2.	Explanation chapter 00
			3	2	1
Female connector Type C with press-in terminations 4.5 mm 13.2 mm 17 mm	96		09 03 296 7850	09 03 296 6850 09 03 796 6850 ^{c)}	09 03 296 2850
	64		09 03 264 7850	09 03 264 6850	09 03 264 2850
	32		09 03 232 7850	09 03 232 6850	09 03 232 2850
	96			09 03 296 6851 09 03 296 6861*	
	64			09 03 264 6851 09 03 264 6861*	
	96			09 03 296 6852 09 03 296 6862*	
	48			09 23 248 6866	
	48			09 23 248 6850	
	30			09 25 230 6850	

Dimensions

Board drillings
Mounting side

	a	b	c	d	e	f	g
Type C	4.5	31	90.0	85.0	94.9	0.3	0.75
Type C	13.2	31	90.0	85.0	94.9	0.6	0.60
Type C	17.0	31	90.0	85.0	94.9	0.6	0.60
Type 2C	3.7	15	50.0	44.4	54.9	0.3	0.75
Type 2C	4.5	15	50.0	44.4	54.9	0.3	0.75
Type 3C	5.3	10	34.8	29.2	39.8	0.6	0.60

Dimensions in mm

* Wrap posts for interfacing selectively gold plated (performance level 3)
Other contact arrangements on request

¹⁾ refer to recommended configuration of pcb holes, see page 04.04





^{c)} Connectors with coding see chapter 01, termination length 5.3 mm

Number of contacts

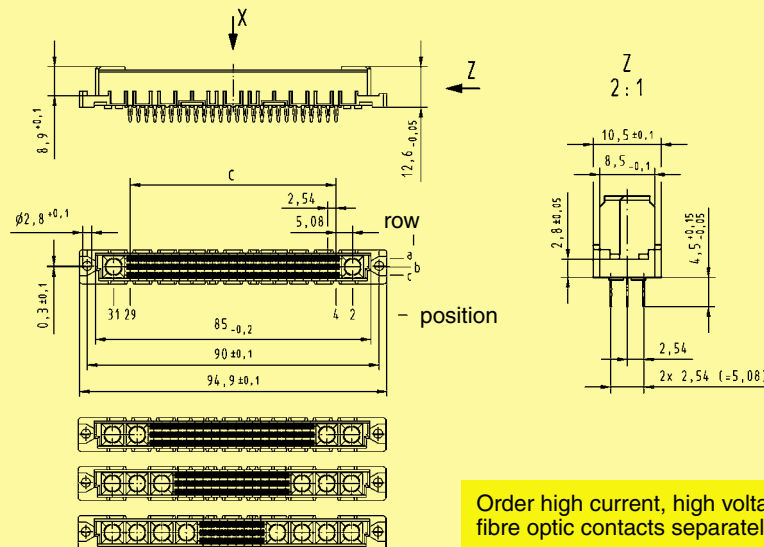
78+2, 60+4
42+6, 24+8



Female connectors

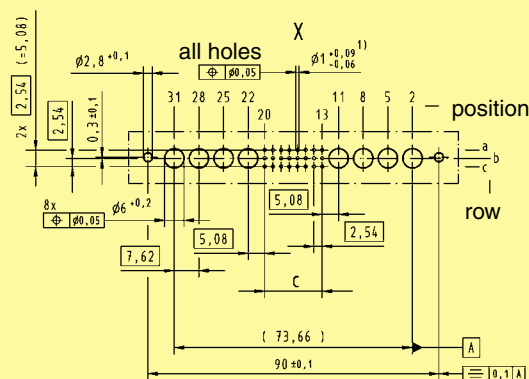
			Part No.	Performance levels according to IEC 60603-2. Explanation chapter 00	
Identification	Number of contacts	Contact arrangement	3	2	1
Female connector with press-in terminations 4.5 mm (without special contacts)	78 + 2		Performance level 3 on request	09 03 278 6850	Performance level 1 on request
	60 + 4			09 03 260 6850	
	42 + 6			09 03 242 6850	
	24 + 8			09 03 224 6850	

Dimensions



Board drillings

Mounting side



Type	c
78 + 2	25 x 2.54 = 63.5
60 + 4	19 x 2.54 = 48.26
42 + 6	13 x 2.54 = 33.02
24 + 8	7 x 2.54 = 17.78

Board drillings depend on type
and special contact loading

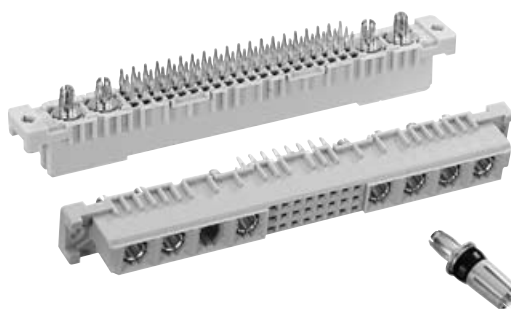
Dimensions in mm

Other contact arrangements on request

¹⁾ refer to recommended configuration of pcb holes, see page 04.04

Press-in
technology

78+2, 60+4
42+6, 24+8



Identification			Part No.	Performance levels according to IEC 60603-2. Explanation chapter 00		
Number of contacts			3	2	1	
Female connector with press-in terminations 4.5 mm (without special contacts)*	78 + 2		Performance level 3 on request	09 03 278 6830	Performance level 1 on request	
	60 + 4					
	42 + 6					
	24 + 8					
High current female contact with press-in termination				09 03 000 6250		

[illegible]

Technical drawing of a plate with 12 holes. The drawing includes the following dimensions and labels:

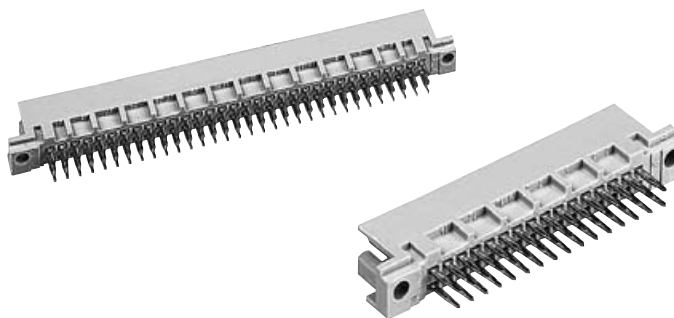
- Overall dimensions:**
 - Width: $90 \pm 0,1$
 - Height: $73,66$
- Hole dimensions:**
 - Top row: $\varnothing 2,8^{+0,1}_{-0,06}$ (left), $\varnothing 1^{+0,09}_{-0,06}$ (right)
 - Bottom row: $\varnothing 8^{+0,1}_{-0,06}$ (left), $\varnothing 5,08$ (middle), $\varnothing 2,54$ (right)
- Labels:**
 - all holes** (top center)
 - position** (top right)
 - row** (bottom right)
 - A** (bottom right corner)
 - 5,08** (bottom center)
 - 2,54** (bottom right)
 - 7,62** (bottom left)
 - 2x 2,54** (top left)
 - 2,54** (top left)
 - 0,3 ± 0,1** (top left)
 - 31, 28, 25, 22, 20, 13, 8, 5, 2** (top row hole numbers)
 - 8x** (bottom left)
 - C** (bottom center)

Type	c
78 + 2	$25 \times 2.54 = 63.5$
60 + 4	$19 \times 2.54 = 48.26$
42 + 6	$13 \times 2.54 = 33.02$
24 + 8	$7 \times 2.54 = 17.78$

Dimensions
in mm

Number of contacts

64, 32

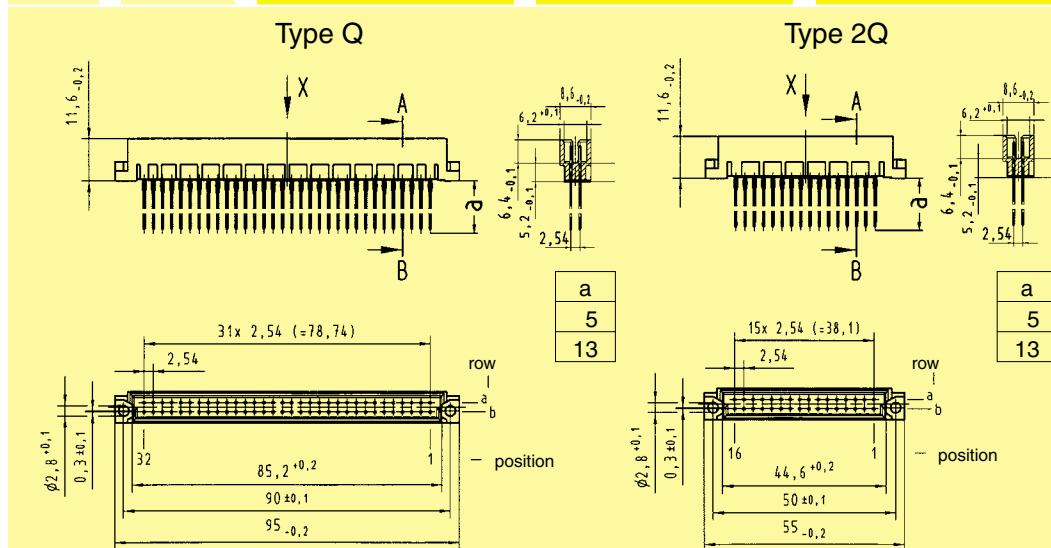


Male connectors

Identification	Number of contacts	Contact arrangement	Part No.	Performance levels according to IEC 60 603-2. Explanation chapter 00	
			3	2	1
Male connector Type Q with press-in terminations 5.0 mm	64 62 + 2▲			09 72 164 6904 09 72 164 6954	
13 mm	64 62 + 2▲		performance level 3 or special gold plating on request	09 72 164 6985 09 72 164 6974* 09 72 164 6995	performance level 1 or special gold plating on request
Male connector Type 2Q with press-in terminations 5.0 mm	32 30 + 2▲			09 27 132 6904 09 27 132 6954	

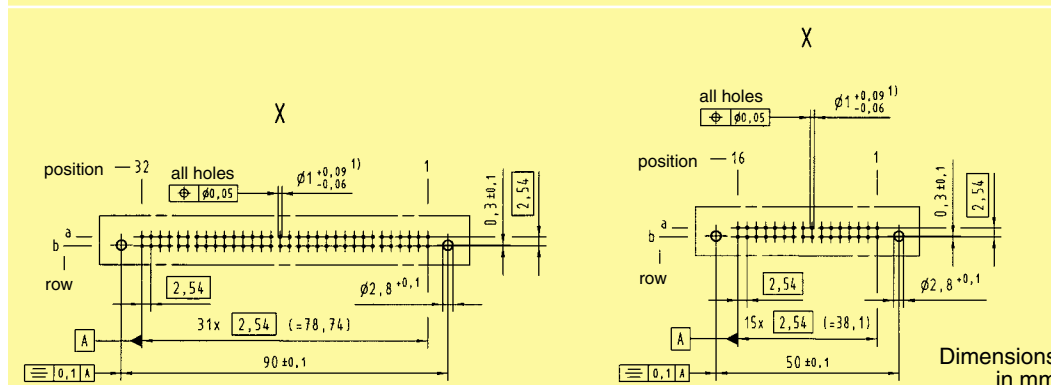
Press-in
technology

Dimensions



Board drillings

Mounting side



▲ Male connectors with 2 leading contacts (0.8 mm) pos. a1 and a32/a16

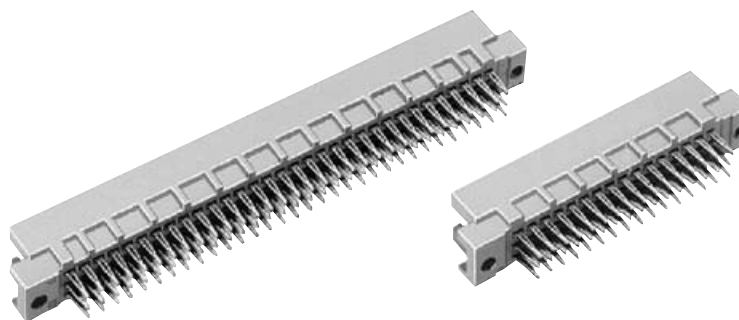
• Wrap posts for interfacing selectively gold plated (performance level 3)

1) refer to recommended configuration of pcb holes, see page 04.04

Other contact arrangements as
well with lagging pins on request

Number of contacts

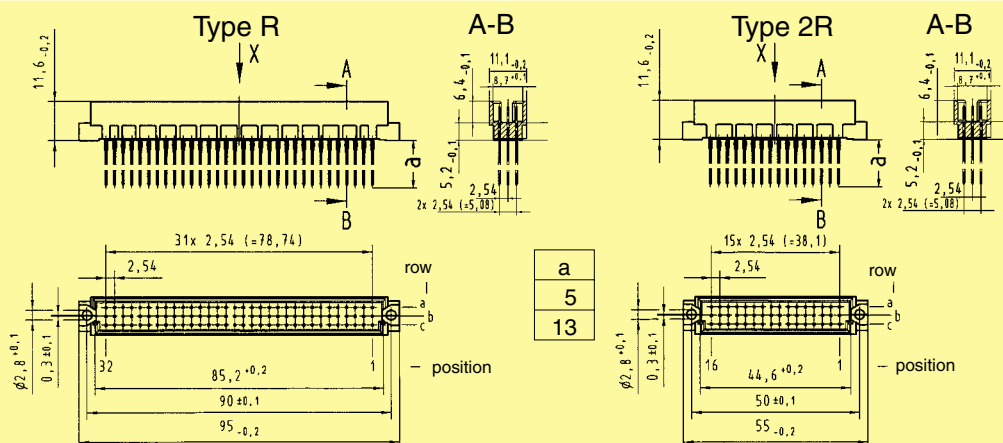
96, 64,
48, 32



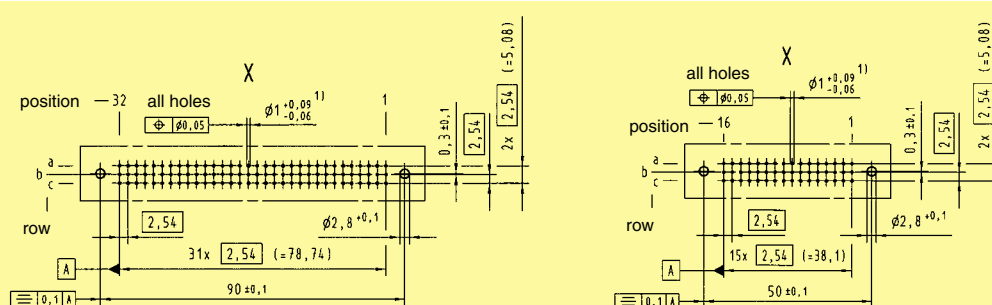
Male connectors

Identification	Number of contacts	Contact arrangement	Part No.	Performance levels according to IEC 60 603-2. Explanation chapter 00	
			3	2	1
Male connector Type R with press-in terminations 5.0 mm	96 94 + 2▲		09 73 196 7904	09 73 196 6904 09 73 196 6954	performance level 1 or special gold plating on request
	64		09 73 164 7904	09 73 164 6904	
13 mm	96 94 + 2▲		09 73 196 7974*	09 73 196 6985 09 73 196 6974* 09 73 196 6995	
	64			09 73 164 6985 09 73 164 6974*	
Male connector Type 2R with press-in terminations 5.0 mm	48		09 28 148 7904	09 28 148 6904	
	32			09 28 132 6904	
13 mm	48		09 28 148 7985	09 28 148 6985 09 28 148 6974*	
	32			09 28 132 6985	

Dimensions



Board drillings
Mounting side



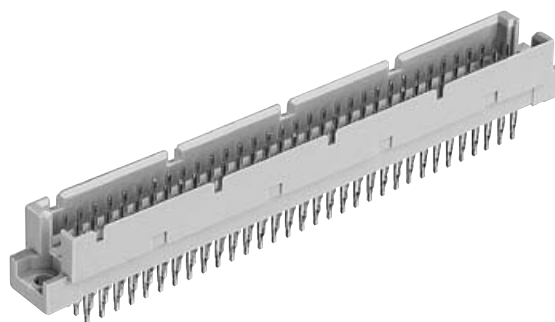
Dimensions in mm

▲ Male connectors with 2 leading contacts (0.8 mm) pos. a1 and a32/a16
• Wrap posts for interfacing selectively gold plated (performance level 3)
1) refer to recommended configuration of pcb holes, see page 04.04

Other contact arrangements also
with lagging pins on request

Number of contacts

96, 64

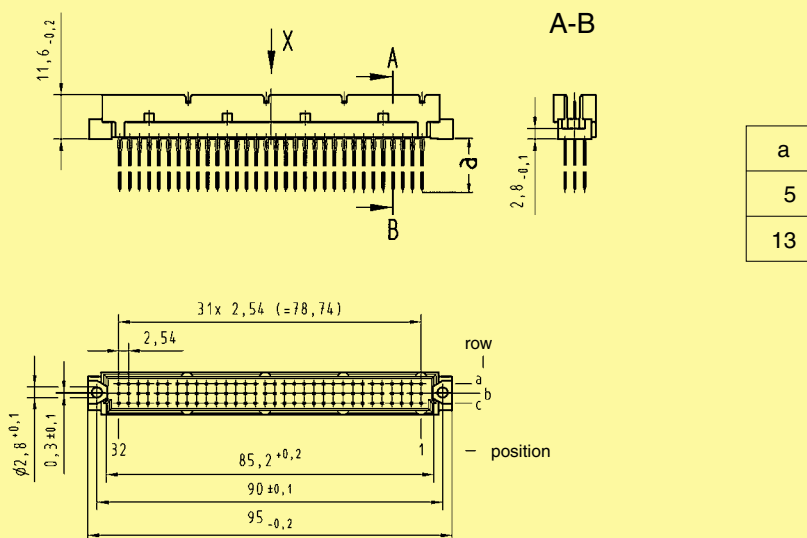


Male connectors

Identification	Number of contacts	Contact arrangement	Part No.	Performance levels according to IEC 60 603-2.	Explanation chapter 00
			3	2	1
Male connector with press-in terminations 5.0 mm	96		performance level 3 or special gold plating on request	performance level 2 or special gold plating on request	09 79 196 2950
	64				09 79 164 2950
13 mm	96				09 79 196 2961*

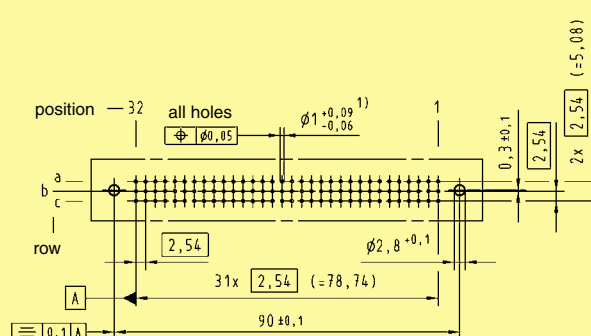
Press-in
technology

Dimensions



Board drillings

Mounting side



Dimensions in mm

* Wrap posts for interfacing selectively gold plated (performance level 2)

¹⁾ refer to recommended configuration of pcb holes, see page 04.04

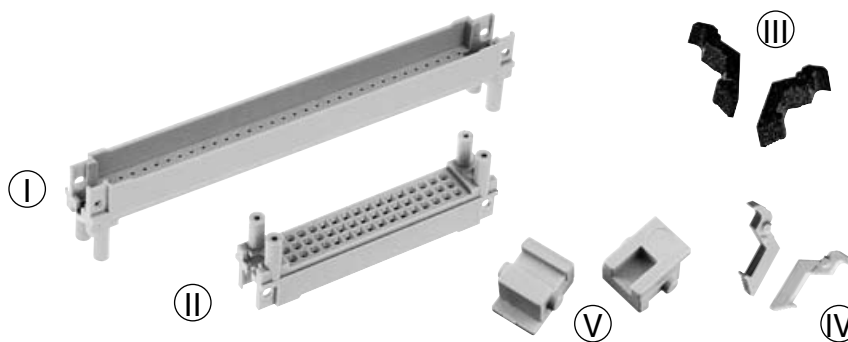
Other contact arrangements also
with lagging pins on request

Pin shroud



Number of contacts

96, 48



Pin shrouds
for types C, 2C, R, 2R

Identification	Termination length ± 0.3	pcb-thick- ness ± 0.4	Dimension a ± 0.1	Part No. – Pin shrouds with	
				press-in fixing ¹⁾	screw fixing
Pin shrouds for female connectors type C, R I	13.0/ 13.2	1.6	6.7	09 03 000 9956	09 03 000 9966
		2.4	5.9	09 03 000 9957	09 03 000 9967
		3.2	5.1	09 03 000 9958	09 03 000 9968
		4.0	4.3	09 03 000 9959	09 03 000 9969
	17.0	1.6	9.9	09 03 000 9952	09 03 000 9962
		2.4	9.1	09 03 000 9953	09 03 000 9963
		3.2	8.3	09 03 000 9954	09 03 000 9964
		4.0	7.5	09 03 000 9955	09 03 000 9965
		4.8	6.7	09 03 000 9956	09 03 000 9966
		5.6	5.9	09 03 000 9957	09 03 000 9967
		6.4	5.1	09 03 000 9958	09 03 000 9968
	20.0	3.2	11.5	09 03 000 9950	09 03 000 9960
		4.0	10.7	09 03 000 9951	09 03 000 9961
		4.8	9.9	09 03 000 9952	09 03 000 9962
		5.6	9.1	09 03 000 9953	09 03 000 9963
		6.4	8.3	09 03 000 9954	09 03 000 9964
		7.2	7.5	09 03 000 9955	09 03 000 9965
Pin shrouds for female connectors type 2C, 2R II	13.0/ 13.2	1.6	6.7	09 23 000 9956	09 23 000 9966
		2.4	5.9	09 23 000 9957	09 23 000 9967
		3.2	5.1	09 23 000 9958	09 23 000 9968
		4.0	4.3	09 23 000 9959	09 23 000 9969
	17.0	1.6	9.9	09 23 000 9952	09 23 000 9962
		2.4	9.1	09 23 000 9953	09 23 000 9963
		3.2	8.3	09 23 000 9954	09 23 000 9964
		4.0	7.5	09 23 000 9955	09 23 000 9965
		4.8	6.7	09 23 000 9956	09 23 000 9966
		5.6	5.9	09 23 000 9957	09 23 000 9967
		6.4	5.1	09 23 000 9958	09 23 000 9968
	20.0	3.2	11.5	09 23 000 9950	09 23 000 9960
		4.0	10.7	09 23 000 9951	09 23 000 9961
		4.8	9.9	09 23 000 9952	09 23 000 9962
		5.6	9.1	09 23 000 9953	09 23 000 9963
		6.4	8.3	09 23 000 9954	09 23 000 9964
		7.2	7.5	09 23 000 9955	09 23 000 9965

Identification	Part No.
Locking lever for female connectors type C, 2C* III	09 03 000 9914
Locking lever for female connectors type R, 2R* IV	09 03 000 9913
Fixing bracket for shell housing C* V	09 03 000 9921

* order 2 pieces per connector

¹⁾ Tooling see chapter 30

Application examples see chapter 01

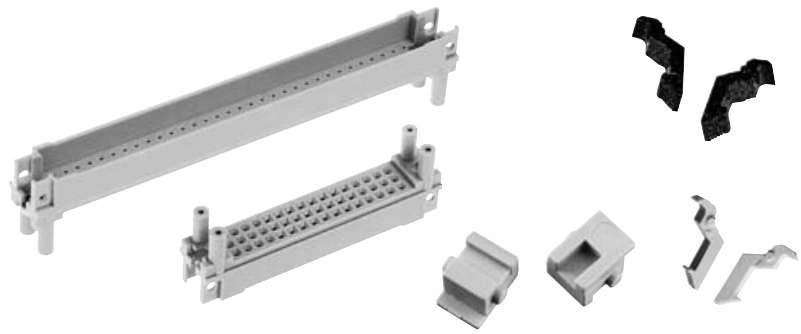
Pin shroud



Number of contacts

96, 48

Pin shrouds
for types C, 2C, R, 2R

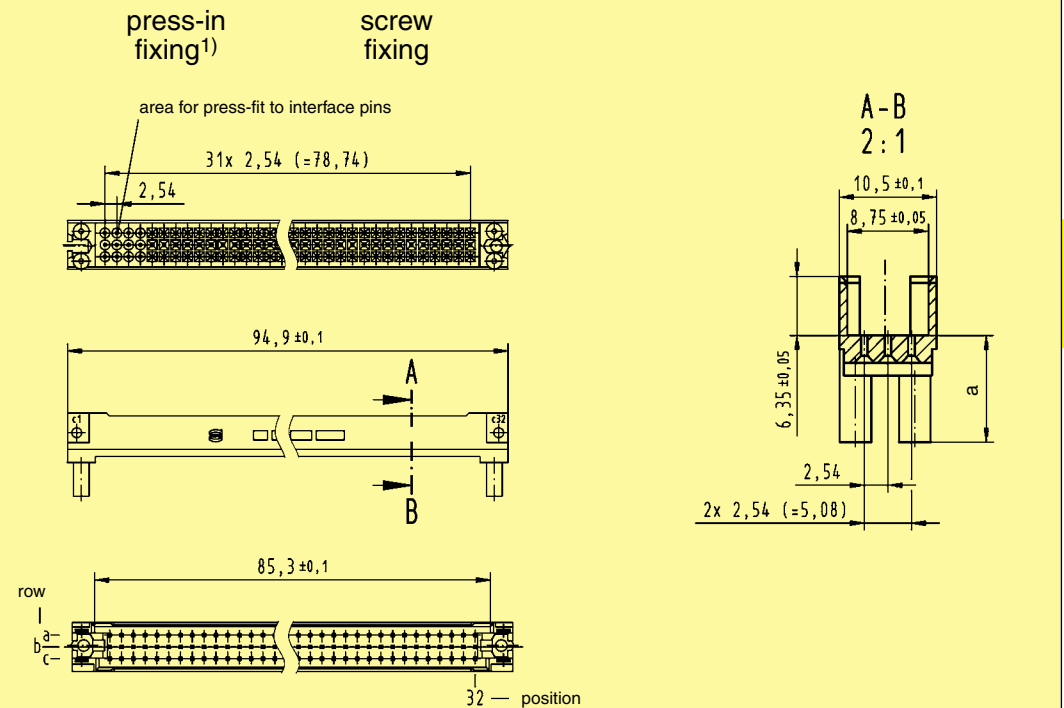


Identification

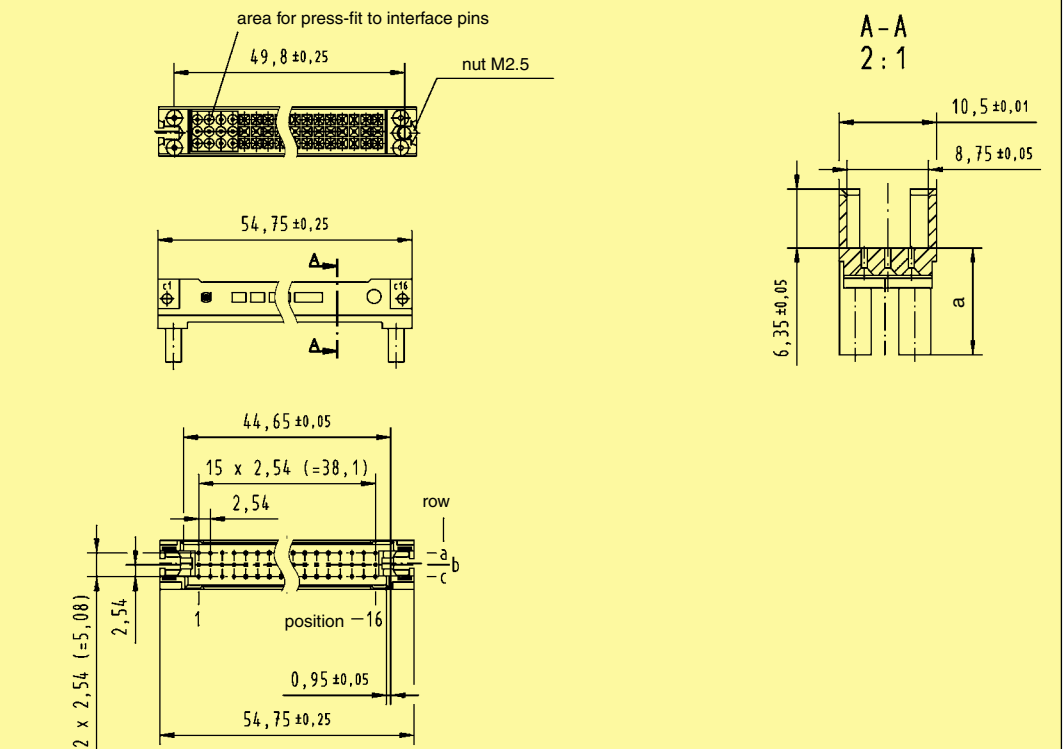
Drawing

Dimensions in mm

Pin shrouds
for female connectors
type C, R



Pin shrouds
for female connectors
type 2C, 2R



Press-in
technology

¹⁾ Tooling see chapter 30
Application examples see chapter 01

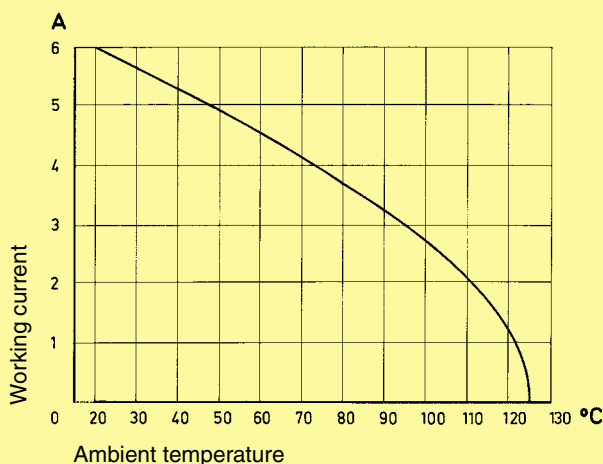
Number of contacts	32, 48
Contact spacing (mm)	5.08
Working current see current carrying capacity chart	Types E and F: 6 A max. for unpressed connectors*
Clearance	Type E: ≥ 3.0 mm Type F: ≥ 1.6 mm
Creepage	Types E, F: ≥ 3.0 mm
Working voltage	The working voltage also depends on the clearance and creepage dimensions of the pcb itself and the associated wiring according to the safety regulations of the equipment Explanations see chapter 00
Test voltage $U_{r.m.s.}$	Types E, F: 1.55 kV
Contact resistance	Types E, F: ≤ 15 m Ω
Insulation resistance	$\geq 10^{12}$ Ω
Temperature range	-40 °C ... $+105$ °C The upper temperature is limited by the property of the pcb material
Electrical termination	Female connectors Compliant press-in terminations Diameter of pcb plated through holes See table on page 04.04 pcb thickness ≥ 1.6 mm Recommended pcb holes for press-in process in acc. EN 60 352-5 ¹⁾
Insertion and withdrawal force	Types E, F: 32pol. ≤ 50 N 48pol. ≤ 75 N
Materials	Mouldings Thermoplastic resin, glass-fibre filled, UL 94-V0 Contacts Copper alloy
Contact surface	Contact zone Plated according to performance level ²⁾

Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity curve is valid for continuous, non interrupted current loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512

Types E and F



¹⁾ Details see page 04.04

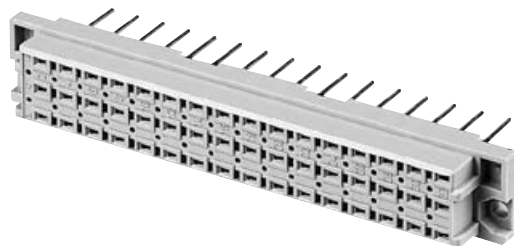
²⁾ Explanation of performance levels see chapter 00

Mating conditions see chapter 00

* Is limited by the property of the pbc material if the connector is pressed-in.
Tooling see chapter 30

Number of contacts

48

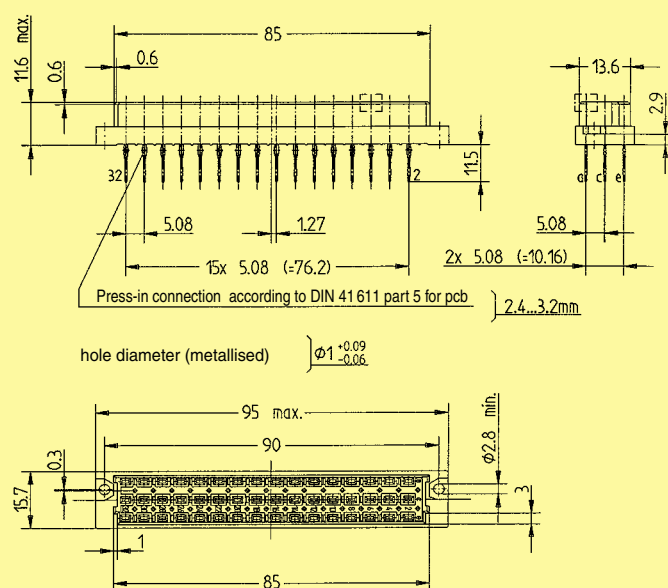


Female connectors

Identification	Number of contacts	Contact arrangement	Part No.	Performance levels according to IEC 60 603-2. Explanation chapter 00	
			3	2	1
Female connector with press-in terminations 11.5 mm	48		performance level 3 on request	09 05 248 6851*	09 05 248 2851*

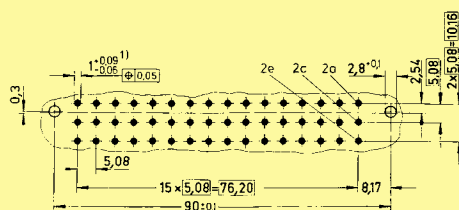
Press-in
technology

Dimensions



Board drillings

Mounting side



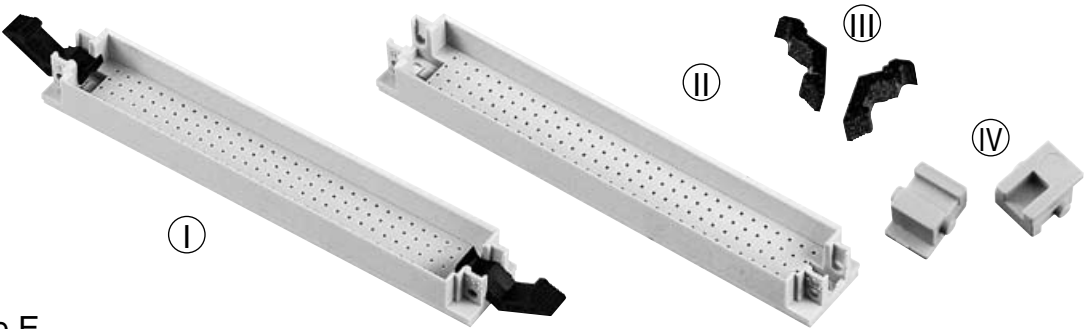
Dimensions in mm

* Wrap posts for interfacing selectively gold plated (performance level 2)

¹⁾ refer to recommended configuration of pcb holes, see page 04.04

Number of contacts

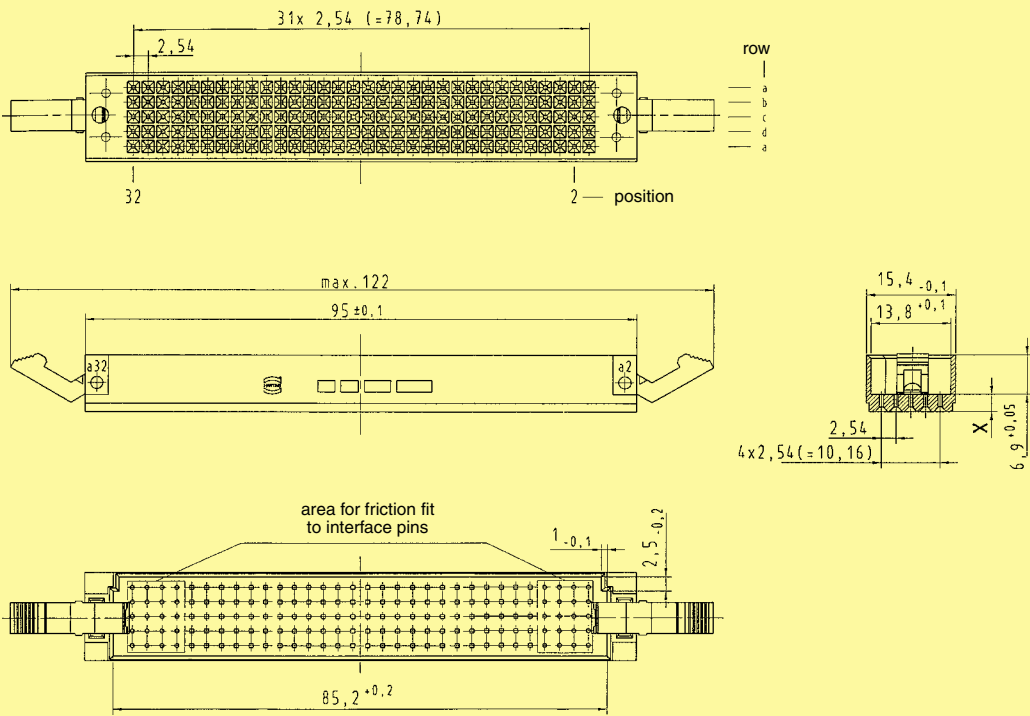
48



Pin shrouds for type E

Identification	pcb-thickness + 0.2 / - 0.3	Dimension X - 0.1	Part No.
Pin shrouds			
I with locking levers	2.8	3.6	09 05 000 9924
II without locking levers	2.8	3.6	09 05 000 9914
I with locking levers	3.4	3.0	09 05 000 9922
II without locking levers	3.4	3.0	09 05 000 9912
III Locking lever for female connector type E ¹⁾			09 03 000 9914
IV Fixing brackets for shell housing C ¹⁾			09 03 000 9921

Dimensions



Dimensions in mm

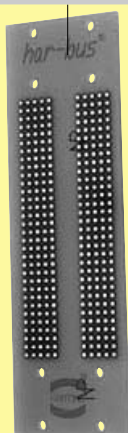
¹⁾ order 2 pieces per connector

Application 1

Female connector
09 05 248 6851



Backplane



Pin shroud
09 05 000 9912



Fixing brackets
09 03 000 9921



Shell housing C
09 05 048 0501



Female connector
with crimp contacts
09 05 048 3202



Locking lever
left 09 02 000 9902
right 09 02 000 9903

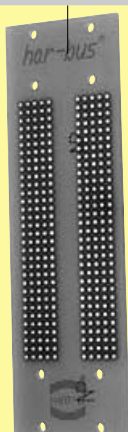


Application 2

Female connector
09 05 248 6851



Backplane



Pin shroud
09 05 000 9912



Locking lever
09 03 000 9914

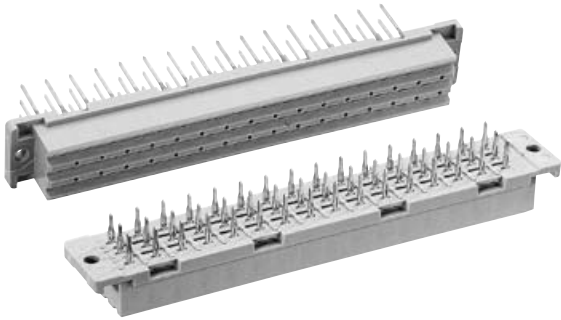


Female connector
for crimp contacts
09 05 048 3202



Number of contacts

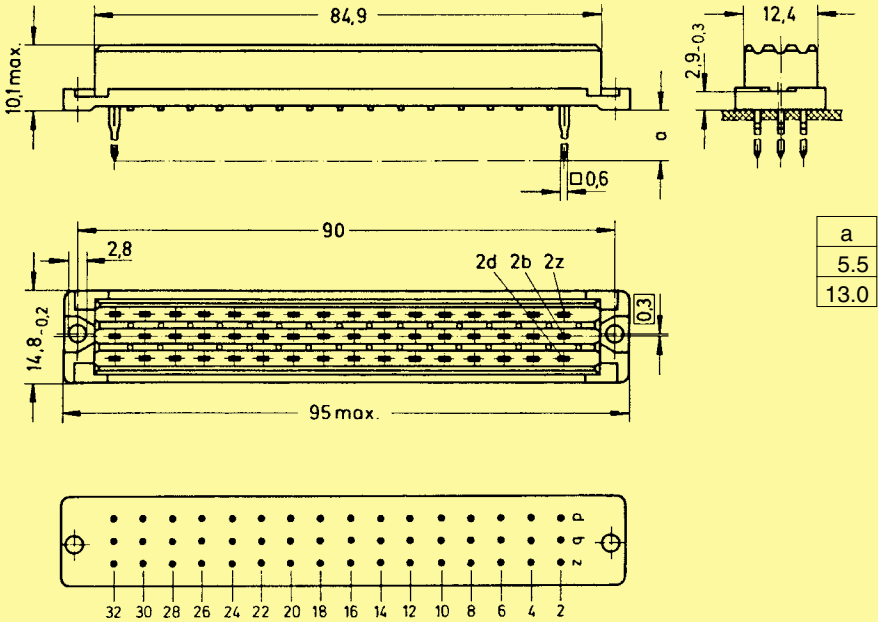
48, 32



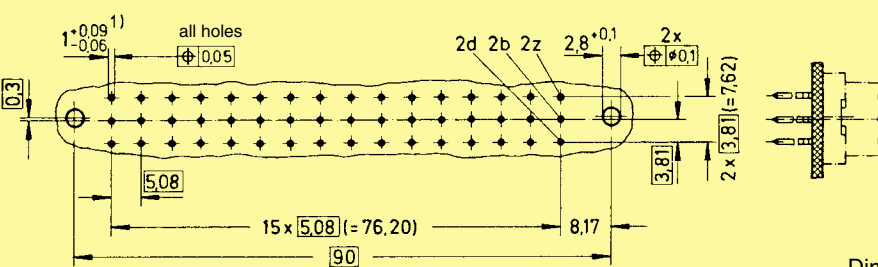
Female connectors

Identification	Number of contacts	Contact arrangement	Part No.	Performance levels according to IEC 60 603-2.	Explanation chapter 00
			3	2	1
Female connector "low profile" with press-in terminations 5.5 mm	48		09 06 248 7832	09 06 248 6832	performance level 1 or special gold plating on request
	32			09 06 232 6832	
	32			09 06 232 6892	
Female connector "low profile" with press-in terminations 13 mm	48			09 06 248 6837	
	32			09 06 232 6897	

Dimensions



Board drillings
Mounting side



Dimensions in mm

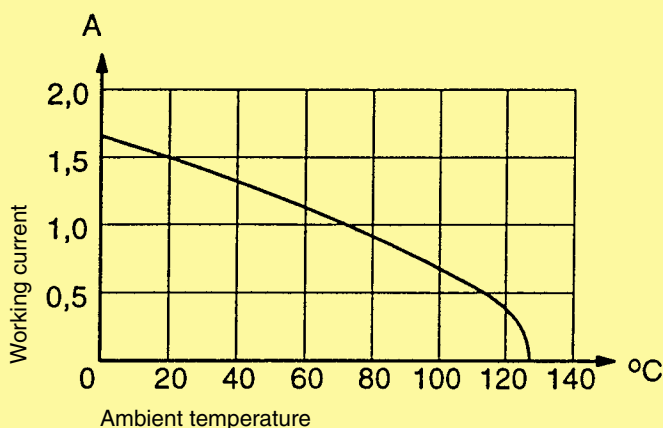
Selectively or fully gold plated wrap posts on request
Other contact arrangements on request
1) refer to recommended configuration of pcb holes, see page 04.04

Number of contacts		160	
Contact spacing (mm)		2.54	
Working current		1 A at 70 °C and all contacts are loaded	
see current carrying capacity chart			
Clearance and creepage distances			
minimal clearance and creepage distance		distance in mm	
		rows a, b, c	rows z, d
between two rows	clearance	1.2	1.2
	creepage	1.2	1.2
between two contacts (in a row)	clearance	1.2	1.0
	creepage	1.2	1.0
Working voltage			
The working voltage also depends on the clearance and creepage dimensions of the pcb itself and the associated wiring		according to the safety regulations of the equipment Explanations see chapter 00	
Test voltage $U_{r.m.s.}$		1 kV	
Contact resistance			
rows a, b, c		$\leq 20\text{ m}\Omega$	
rows z, d		$\leq 30\text{ m}\Omega$	
Insulation resistance		$\geq 10^{10}\Omega$ acc. to IEC 60512-2	
Temperature range		– 55 °C ... + 125 °C acc. to IEC 60512-11	
Electrical termination			
Female connectors		Compliant press-in terminations	
Diameter of pcb plated through holes		See table on page 04.04	
pcb thickness		$\geq 1.6\text{ mm}$	
Recommended pcb holes for press-in process acc. to EN 60352-5 ¹⁾			
Insertion and withdrawal force		$\leq 160\text{ N}$	
Materials			
Mouldings		<ul style="list-style-type: none">● Liquid Cristal Polymer (LCP), for female connectors, UL 94-V0● Thermoplastic resin, glass-fibre filled, for male connectors, UL 94-V0	
Contacts		Copper alloy	
Contact surface			
Contact zone		Plated acc. to performance level ²⁾	

Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity curve is valid for continuous, non interrupted current loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60512



With selective loading higher currents can be transmitted. The requirements according to VITA 1.7 are fulfilled.

harbus® 64 with switches

Deviating technical characteristics for the switching elements.

minimal clearance and creepage distance	distance in mm	
	switching positions	
between two rows	clearance	0.5
	creepage	0.7
between two contacts (in a row)	clearance	0.5
	creepage	0.7

Contact resistance

Switching elements $\leq 60 \text{ m}\Omega$

Insertion and withdrawal force

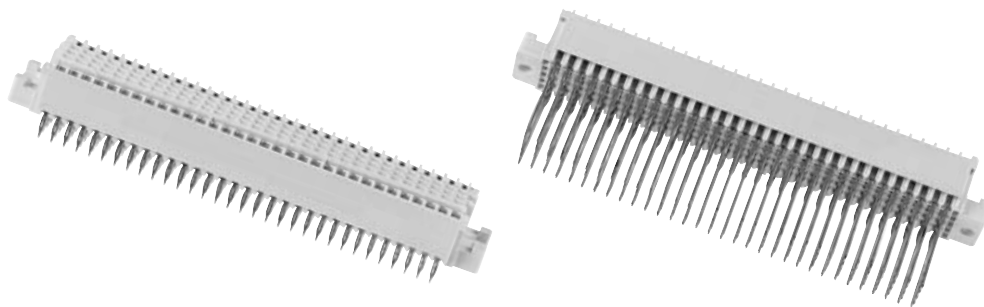
Complete connector $\leq 180 \text{ N}$

¹⁾ Details see page 04.04

²⁾ Explanation of performance levels see chapter 00

Number of contacts

160

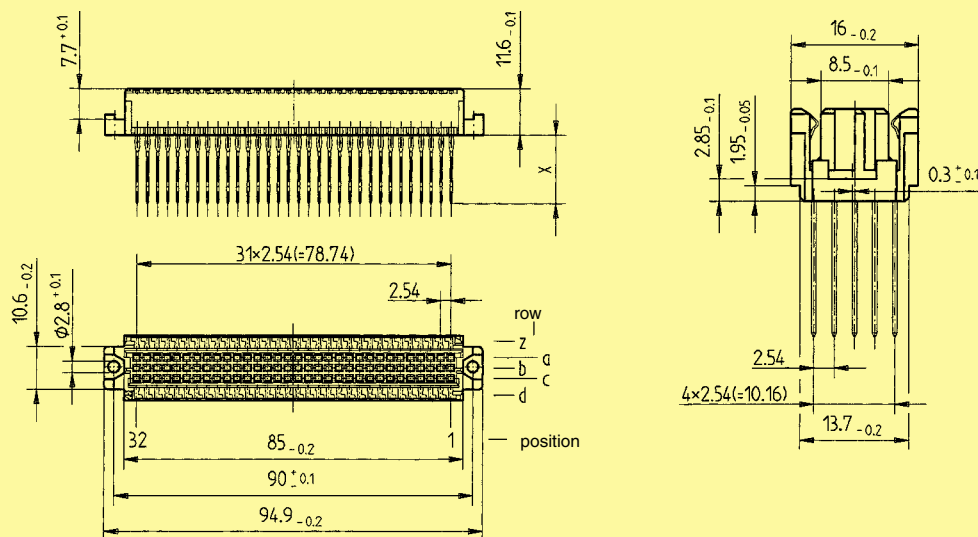


Female connectors

Identification	Number of contacts	Contact arrangement	Part No.	Performance levels according to IEC 61 076-4-113 Explanation chapter 00	1
Female connectors, straight ²⁾ with press-in terminations			2		
with 3.7 mm	160	z, a, b, c, d			02 02 160 1601
fixing flange 4.5/5 mm	160	z, a, b, c, d	02 02 160 2201		02 02 160 1201
17 mm*	160	z, a, b, c, d	02 02 160 2301		02 02 160 1301
with switches 4.5/5 mm	160	z, a, b, c, d	02 03 160 2201		
without 5 mm	160	z, a, b, c, d	02 02 160 2202		02 02 160 1202
fixing flange 17 mm*	160	z, a, b, c, d	02 02 160 2302		02 02 160 1302

Press-in
technology

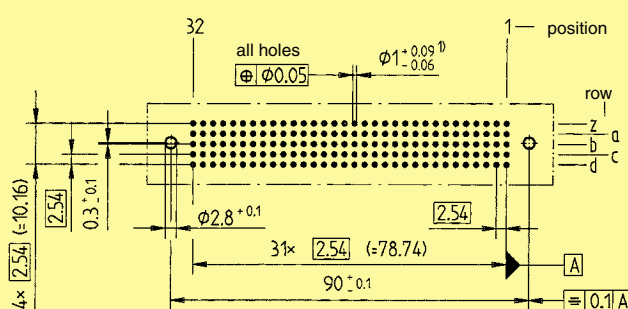
Dimensions



Part number	z	a	b	c	d
02 02 160 1601	3.7	3.7	3.7	3.7	3.7
02 02 160 2201 / 02 02 160 1201	5.0	4.5	4.5	4.5	5.0
02 02 160 2301 / 02 02 160 1301	17.0	17.0	17.0	17.0	17.0
02 03 160 2201	5.0	4.5	4.5	4.5	5.0
02 02 160 2202 / 02 02 160 1202	5.0	5.0	5.0	5.0	5.0
02 02 160 2302 / 02 02 160 1302	17.0	17.0	17.0	17.0	17.0

Board drillings

Mounting side



Dimensions in mm

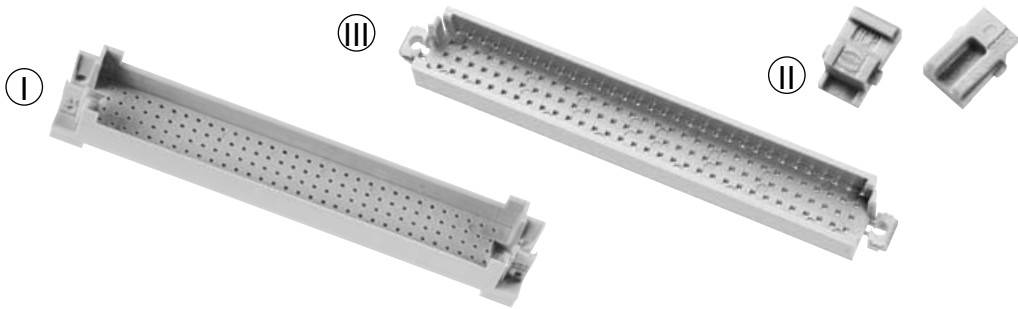
¹⁾ refer to recommended configuration of pcb holes, see page 04.04

²⁾ Additional components and informations see chapter 06

* selectively gold-plated

Number of contacts

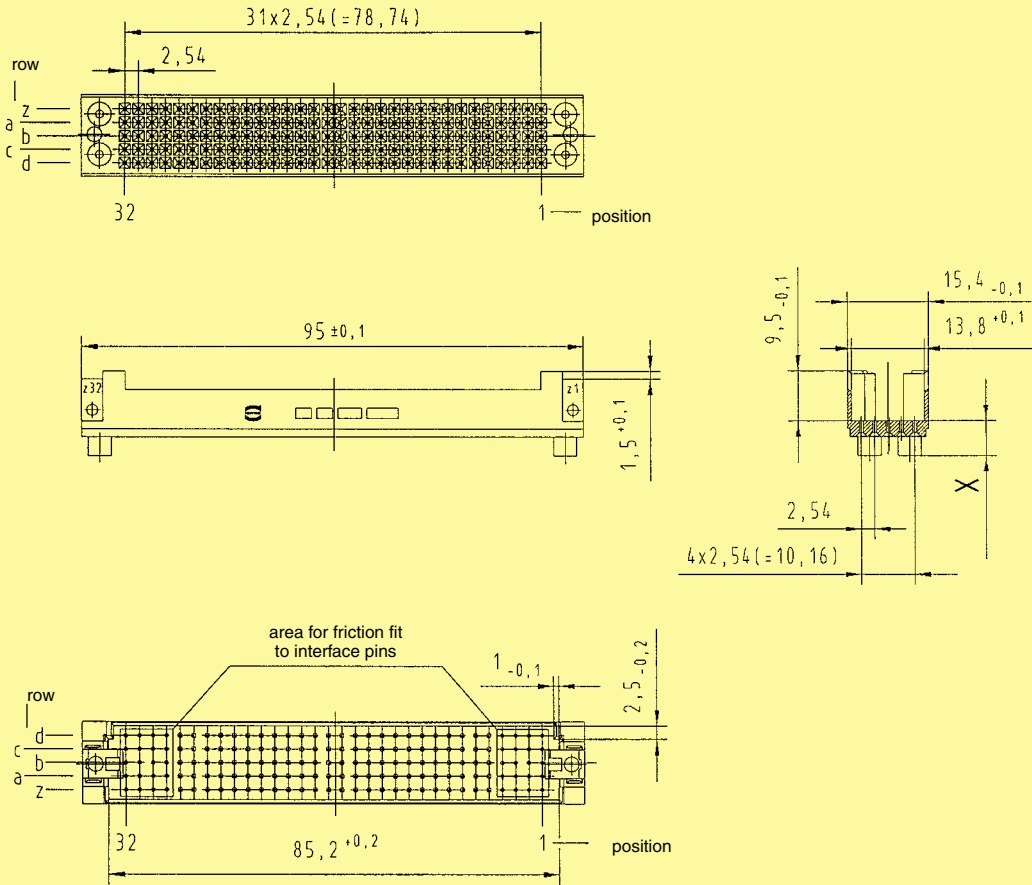
160



Pin shrouds

Identification	pcb-thickness ± 0.3	Dimension X - 0.1	Part No.
Pin shrouds ¹⁾			
I	2.8	6.6	02 44 000 0007
	3.4	6.0	02 44 000 0001
	4.0	5.4	02 44 000 0002
	4.6	4.8	02 44 000 0003
	5.2	4.2	02 44 000 0004
	5.8	3.6	02 44 000 0005
	6.4	3.0	02 44 000 0006
II Fixing brackets for shell housing C ²⁾			02 44 000 0009
III Shroud insert for 3 row female connectors			02 44 000 0008

Dimensions



Dimensions in mm

¹⁾ Insert block (02 09 000 0012) for assembly see chapter 30
²⁾ order 2 pieces per connector