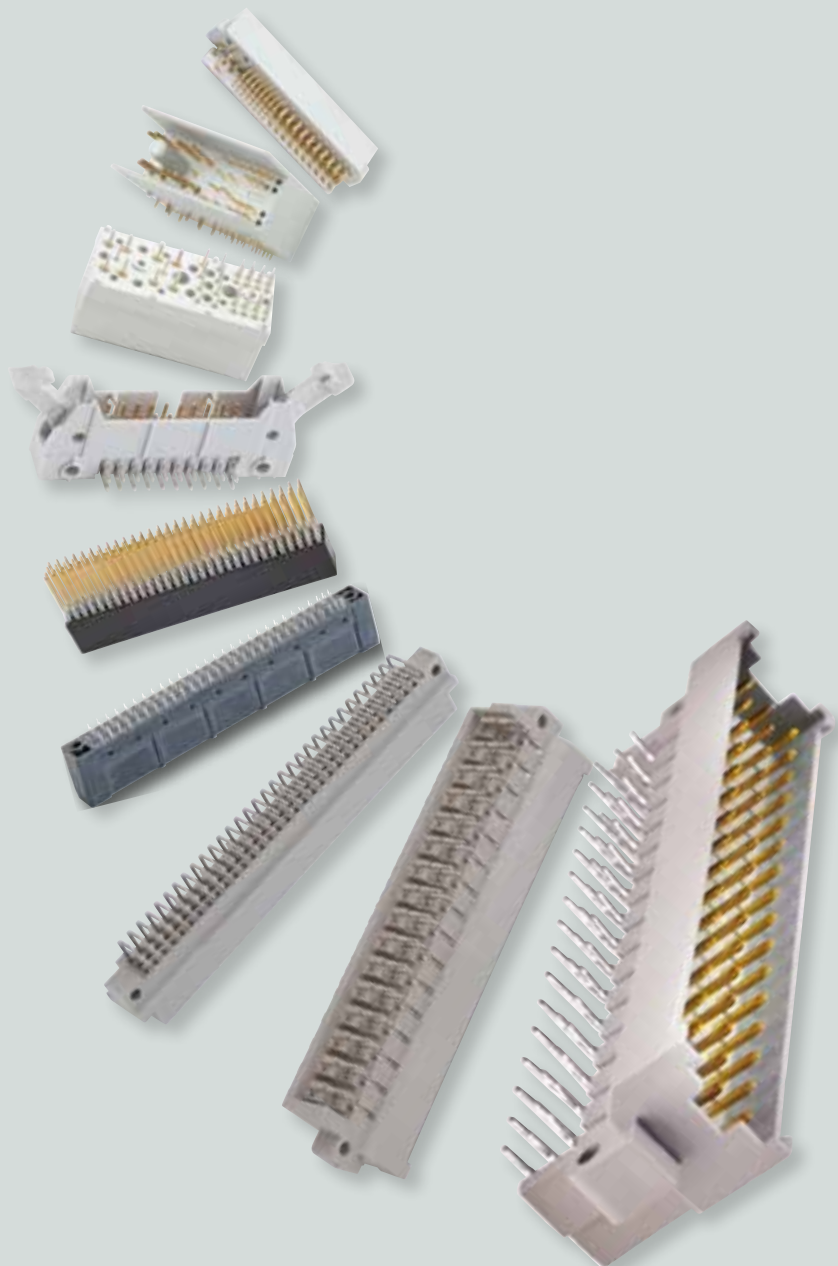




TECHNOLOGY IN CONNECTORS™

## PCB CONNECTORS



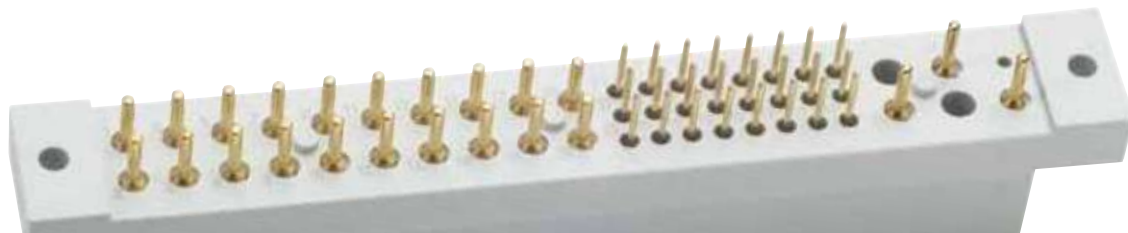


GERMANY

As a leading manufacturer of connectors, CONEC develops, produces and markets its products around the world to customers in the machine-tool, electronics and communications industries.

CONEC has dedicated itself to make a contribution to progress in the connector industry and to satisfy its customers through innovation, quality and excellent service. Around the world, our organization operates as a customer-oriented team.

CONEC is present in numerous countries with its own branch offices and representatives. Our local sales consultants transmit all information directly to the responsible departments to keep the paths of communication short. This provides support in the local language, quick response and competent consulting.



CANADA



USA

CONEC designs and manufactures products in modern facilities. The products are made in accordance to the highest quality standards and industry specifications.

CONEC provides reliable and effective solutions to OEM, EMS and cable houses.



## OUR PHILOSOPHY – CUSTOMER SATISFACTION.



Quality is realized right from the beginning with Total Quality Management concept. Therefore our customers are included into all our processes, starting with design phase, first sampling, series production release and continuous sales support. The phases will be accompanied by drawings, samples and test reports. The entire quality process is documented and approved. CONEC is certified to ISO/TS16949:2002.

CONEC inhouse is equipped with modern test systems. We can verify the requirements and implement a continuous product improvement process to meet and exceed future requirements. To fulfill international and national requirements most of CONEC product series are registered by UL, CSA or VDE.



## CONEC IS YOUR SPECIALIST FOR DESIGN AND PRODUCTION OF SPECIAL CUSTOMIZED PRODUCTS.

Flexibility, assurance and rapid response are required in today's market more than ever before. CONEC fulfills these demands with central order-processing and well implemented quality control systems. Statistical process control as well as just in time deliveries are a common practice. Numerous customers honored this performance by approving CONEC to a "Preferred Supplier" status.



Are you looking for application-specific solutions?  
Standard products do not meet your needs?  
The implementation deadline is tight?

CONEC experienced design team can create your solution for you:

- Special Interconnect solutions to customers specifications
- Prototypes and small series production batches
- Connectors with increased IP ratings for harsh environments.

Contact us to discuss your special requirements.



## PRODUCT LINES



### I/O Connectors

D-SUB Connectors, Standard, Combination and Water Resistant; D-SUB Hoods and D-SUB accessories; Filter D-SUB Connectors, Standard, Combination and Water Resistant; Filter Adapters; Filter Plates; RJ45-IP67 Industrial Ethernet Connector System; USB 2.0-IP67 Connector System; RJ45 Magnetic Modular Jacks



### PCB Connectors

DIN 41617 Connectors; DIN EN 60603-2 Connectors; DIN 41651 Insulation Displacement Connectors CompactPCI Connectors; AdvancedTCA Connectors; MicroTCA Connectors; PC104-, PC104plus Connectors; Pin Header and Socket Connectors



### Sensor Actor Line / Circular Connectors

M12x1 Connectors, Overmolded and Field Attachable, Sockets, Junction Boxes, M12x1 Connector Systems for High Temperature, Food+Beverage, Bus Systems; M8x1 Overmolded Connectors; 7/8" Connectors; Rund24 Connectors; Valve Connectors



### Fiber Optic Connectors

Adapter; Hybrid Adapter; Outdoor Connectors; Patch cords



### Coaxial Connectors

SMA, SSMA, MMCX, TNC, N, MCX, Mixed Adapters and BNC Connectors; D-SUB and DIN Coaxial Contacts; D-SUB and DIN High-Current Contacts

# INDEX

## SECTION 1

AdvancedTCA Connectors \_\_\_\_\_



## SECTION 2

MicroTCA Connectors \_\_\_\_\_



## SECTION 3

CompactPCI Connectors \_\_\_\_\_



## SECTION 4

Connectors DIN EN 60603-2 (DIN 41612) \_\_\_\_\_



## SECTION 5

Combination Connectors DIN EN 60603-2 (DIN 41612) \_\_\_\_\_



## SECTION 6

PC104 and PC104plus Connectors \_\_\_\_\_



## SECTION 7

Connectors DIN 41617 \_\_\_\_\_



## SECTION 8

Flatcable Connectors DIN 41651 \_\_\_\_\_



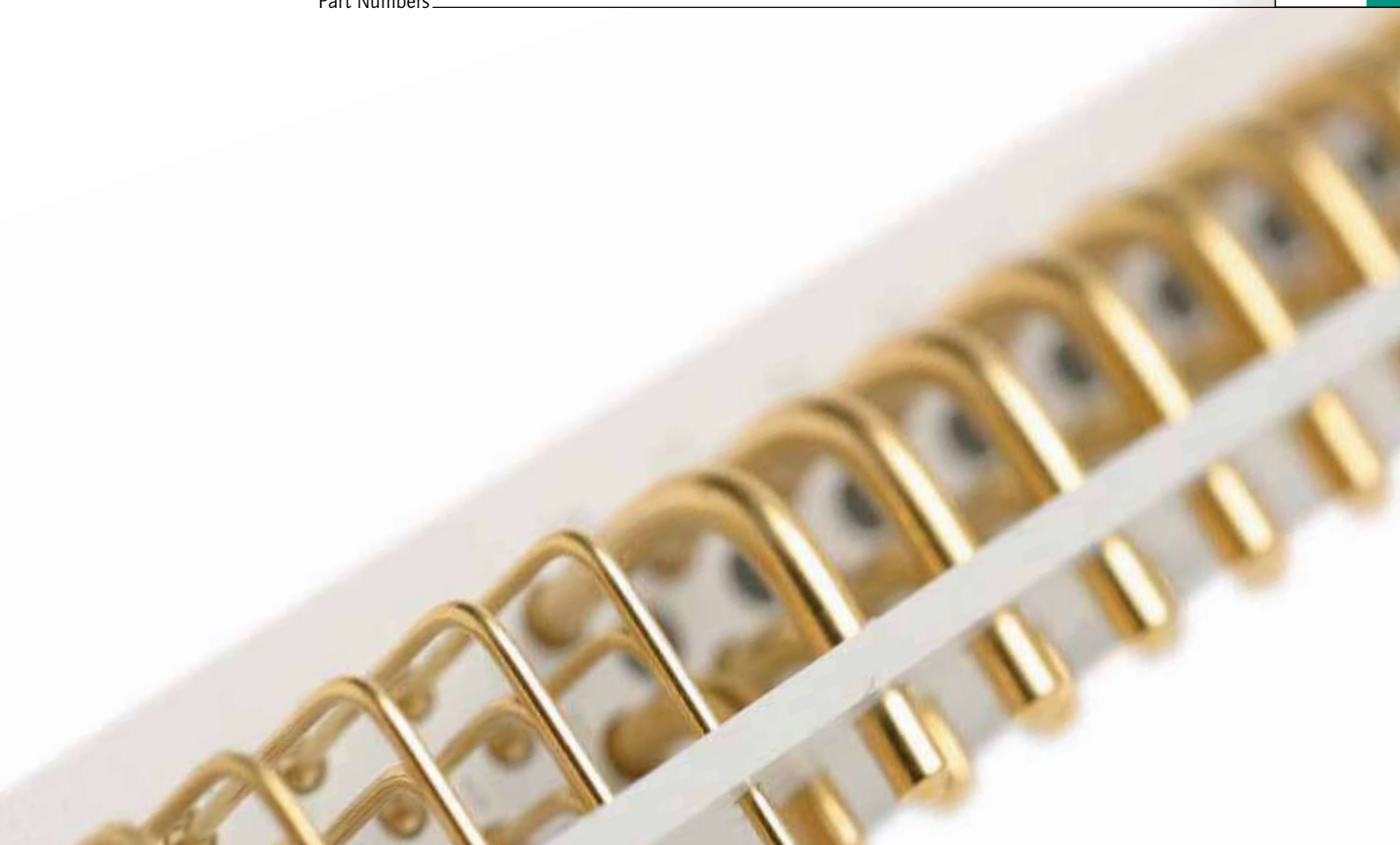
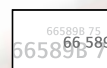
## SECTION 9

Installation and Assembly Tools \_\_\_\_\_



## SECTION 10

Part Numbers \_\_\_\_\_



## SECTION 5

# COMBINATION CONNECTORS DIN EN

The combination connectors in accordance with DIN EN 60603-2 offer a variety of applications. The design allows a combination of signal, high current, high voltage and coaxial contacts.

Standard termination types such as solder cup, PCB solder tails, straight right angle and wire wrap tails are available.



# 60603-2

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**Product features:**

- Saves space on your PCB
- Various termination method
- Cost factor, one item as compared with separate connectors
- Easy assembly of high power and coaxial contacts
- High power and coaxial contacts are screw-machine types
- Gold plating options available

Fully assembled connectors with high power or coaxial contacts are available.



PART NUMBER CREATOR

9 0 7 8 M 2 M A T 1 1 X 9 0 X

Type  
9 = Type M - DIN EN 60603-2

Variations  
Type M = 40+4, 42+6, 52+2, 60+4, 78+2  
Type M = 16+8, 24+8, 28+6  
Mini type M = 8+4, 12+4, 20+2, 30+2  
+ = to substitute "M" (look at example)

Type of contact  
M = Male connector  
F = Female connector

Quality class for contacts  
A = Quality class 3 = 50 cycles  
B = Quality class 2 = 400 cycles  
C\* = Quality class 1 = 500 cycles \*on request

Termination only for signal contacts  
N\* = Wire Wrap \*not available as male connector  
R = solder pin straight  
T\* = solder pin angled \*not available as female connector

Termination for high power and coaxial contacts

|                                  |                                   |
|----------------------------------|-----------------------------------|
| 11/27 = Solder lug 10 A          | 26/13 = 4 solder pins angled 40 A |
| 12/28 = Solder lug 20 A          | 31 = 5 solder pins straight 50 Ω  |
| 14/29 = Solder lug 40 A          | 32 = 5 solder pins straight 50 Ω  |
| 19/39 = Solder pin straight 20 A | 33 = 5 solder pins straight 75 Ω  |
| 20/40 = Solder pin straight 40 A | 35 = 5 solder pins angled 50 Ω    |
| 18/17 = Solder pin angled 10 A   | 36 = 5 solder pins angled 75 Ω    |
| 21/16 = Solder pin angled 20 A   | 99 = without contacts             |
| 23/15 = Solder pin angled 40 A   |                                   |

Mounting style  
X9 = Mounting hole for screwed or rivet

Standard  
OX = Standard

## TECHNICAL INFORMATION

### SKIN EFFECT

Alternating currents do not uniformly occupy the entire cross section of the conductor, rather inductance effect in the conductor deflects the current towards the surface of the conductor, whereby this deflection increases with the frequency.

The resistive attenuation of a transmission line increases with the frequency as a result of this skin effect.

The skin depth (equivalent thickness of the layer in which current flows) can be determined using

$$\delta = \frac{1}{\sqrt{f \pi \sigma \mu_0 \mu_r}}$$

$f$  = frequency

$\sigma$  = conductivity of the conductor material

$\sigma_{Ag} = 62 \times 10^6 \text{ S/m}$

$\sigma_{Cu} = 58 \times 10^6 \text{ S/m}$

$\mu_0 = 1,256 \times 10^{-6} \text{ Vs / Am}$

$\mu_r$  ... relative permeability constant for the employed material

### VSWR-VALUE

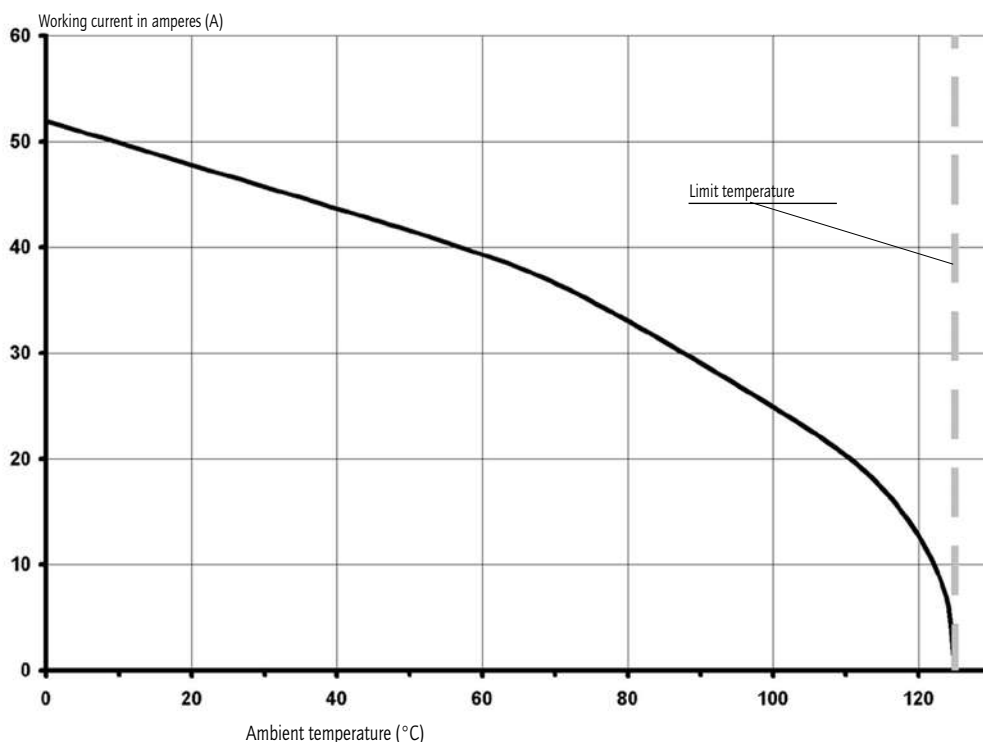
The ration between the value of the largest and the smallest voltages on a loss-free line is known as the ripple or voltage standing wave ratio  $s$  (with  $1 \leq s < \infty$ ). The reciprocal value of the VSWR is known as the inverse voltage standing wave ratio  $m$  (with  $0 < m \leq 1$ ). (VSWR = Voltage standing wave ratio). The value of  $s$  is linked with the  $\rightarrow$  reflection coefficient  $r$  on  $s$  transmissionline according to the equation.

$$s = \frac{(1 + |r|)}{(1 - |r|)}$$

### CURRENT RATING / DERATING CURVE

Measurement is according to DIN 41640 part 3 whereas all power contacts are connected in series.

For test procedure - product-no. 9024M8FCR14X90X has been equipped with 124C10069X and 9024M8MCR14X90X with 123C10069X.

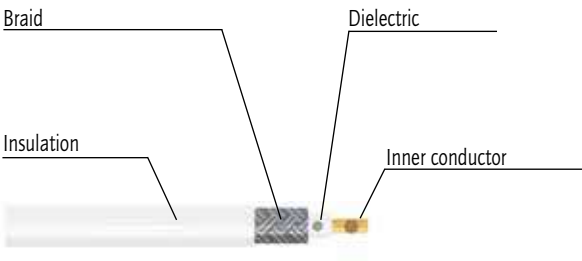


TECHNICAL DATA

| Materials                           |                 | Type M               | Coaxial contacts   | High power contacts | High voltage contacts |
|-------------------------------------|-----------------|----------------------|--------------------|---------------------|-----------------------|
| Insulator                           |                 | PBT GF<br>UL94V-0    | PTFE/PBT/PI        |                     | PTFE                  |
| Contact plating                     |                 | gold over nickel     |                    |                     |                       |
| Contact material                    |                 | copper alloy         |                    |                     |                       |
| Retaining clip                      |                 |                      | copper alloy       |                     |                       |
| Current rating (DC)                 |                 | 2 A                  | 2 A                | 10 to 40 A          | 2 A                   |
| Test voltage                        |                 | 1000 V, 50 Hz        |                    |                     |                       |
| Resistance between mated contacts   |                 | ≤ 2.7 mΩ             |                    |                     |                       |
| Insulation resistance               |                 |                      | 10 <sup>7</sup> MΩ |                     | ≥2x10 <sup>7</sup> MΩ |
| Volume resistivity                  |                 | 10 <sup>16</sup> Ωcm |                    |                     |                       |
| Dielectric strength                 |                 | 50 KV/ mm            |                    |                     |                       |
| Characteristic impedance            |                 |                      | 50/75 Ω            |                     |                       |
| Contact resistance                  | inner conductor |                      | ≤ 2.7 mΩ           |                     | ≤ 2.7 mΩ              |
|                                     | outer conductor | ≤ 2.7 mΩ             | ≤ 2.7 mΩ           | ≤ 1 mΩ              |                       |
| VSWR-value according to MIL-C-39012 | 1.2 GHz         |                      | ≤ 1.2              |                     |                       |
|                                     | 1.5 GHz         |                      | ≤ 1.3              |                     |                       |
|                                     | 2.0 GHz         |                      | ≤ 1.5              |                     |                       |
| Dielectric voltage                  |                 |                      | 750 V 50 Hz        |                     | 3.8 kV                |
| Frequency range                     |                 |                      | 0 to 2 GHz         |                     |                       |
| Working voltage                     |                 | 250 V                | 250 V              |                     | max. 2.8 kV           |
| Temperature range                   |                 | -55°C to +125°C      | -55°C to +135°C    | -55°C to +155°C     | -55°C to +125°C       |
| Mating force per signal contact     |                 | ≤ 3.4 N              | ≤ 7 N              | ≤ 7 N               | ≤ 5 N                 |
| Withdrawal force per signal contact |                 | ≥ 0.2 N              | ≤ 7 N              | ca. 5 N             | ca. 2.5 N             |
| Mating cycles                       |                 | depending on plating |                    |                     |                       |

Technical alterations are subjects to change without notice.

# CRIMPING INSTRUCTIONS FOR COAXIAL CONTACTS



Strip the wire



Slide sleeve over coax cable



Crimp the inner contact on the inner conductor



Snap the inner contact into the outer contact



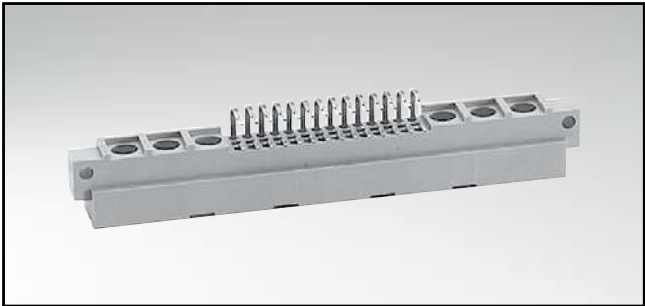
Slide braid over outer contact



Crimp the sleeve on to outer contact

TYPE M

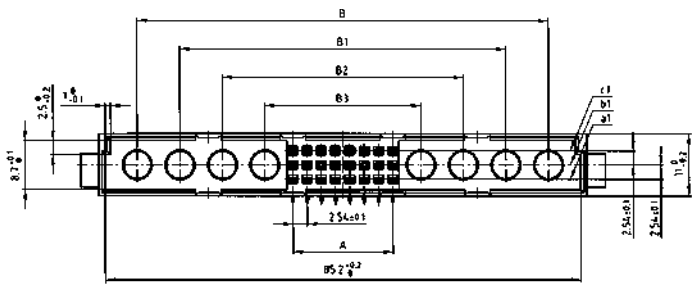
Male connector – straight and angled



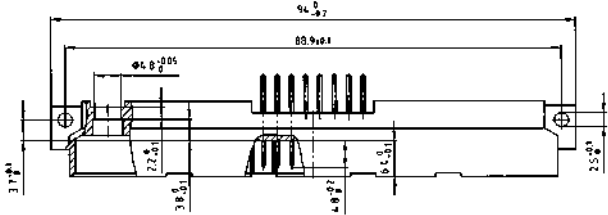
RoHS compliant

- DESCRIPTION
- Solder pin
  - No. of Pos. 16+8 - 24+8 - 28+6 - 40+4 - 42+6 - 52+2 - 60+4 - 78+2
  - Quality class 3 (also available in quality class 2 or 1)
  - Part number creator on page 5 | 2
  - For assembly with PCB power and coaxial contacts please contact factory

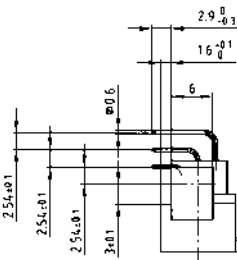
PRODUCT DRAWING



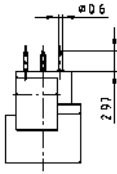
| No. of Pos. | A ± 0.1       | B ± 0.1       | B <sub>1</sub> ± 0.1 | B <sub>2</sub> ± 0.1 | B <sub>3</sub> ± 0.1 |
|-------------|---------------|---------------|----------------------|----------------------|----------------------|
| 78 + 2      | 25x2.54=63.50 | 29x2.54=73.66 | –                    | –                    | –                    |
| 52 + 2      | 25x2.54=63.50 | 29x2.54=73.66 | –                    | –                    | –                    |
| 60 + 4      | 19x2.54=48.26 | 29x2.54=73.66 | 23x2.54=58.42        | –                    | –                    |
| 40 + 4      | 19x2.54=48.26 | 29x2.54=73.66 | 23x2.54=58.42        | –                    | –                    |
| 42 + 6      | 13x2.54=33.02 | 29x2.54=73.66 | 23x2.54=58.42        | 17x2.54=43.18        | –                    |
| 28 + 6      | 13x2.54=33.02 | 29x2.54=73.66 | 23x2.54=58.42        | 17x2.54=43.18        | –                    |
| 24 + 8      | 7x2.54=17.78  | 29x2.54=73.66 | 23x2.54=58.42        | 17x2.54=43.18        | 11x2.54=27.94        |
| 16 + 8      | 7x2.54=17.78  | 29x2.54=73.66 | 23x2.54=58.42        | 17x2.54=43.18        | 11x2.54=27.94        |



Solder pin angled **T**



Solder pin straight **R**



   = Ordering code

ORDER DATA

(Dim. = mm)

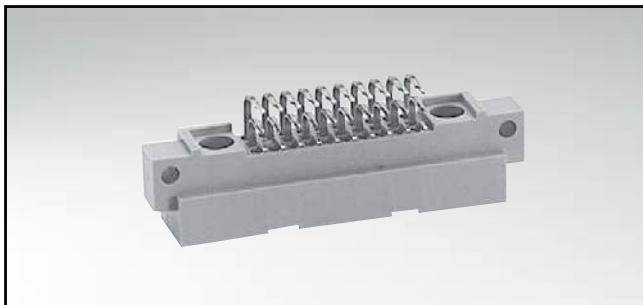
| No. of Pos. | Version<br>• = contact, + = no contact |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |   |
|-------------|----------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|
|             | 1                                      | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |   |   |
| 78 + 2      | a                                      | ⊕ | • | • | • | • | • | • | • | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | ⊕ |   |
|             | b                                      |   | • | • | • | • | • | • | • | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |   |   |
|             | c                                      | • | • | • | • | • | • | • | • | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | • |   |
| 52 + 2      | a                                      | ⊕ | • | • | • | • | • | • | • | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | ⊕ |   |
|             | b                                      |   | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  |   |   |
|             | c                                      | + | + | + | + | + | + | + | + | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | +  | + |   |
| 60 + 4      | a                                      | ⊕ | • | • | • | • | • | • | • | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | ⊕ | ⊕ |
|             | b                                      |   | • | • | • | • | • | • | • | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |   |   |
|             | c                                      | • | • | • | • | • | • | • | • | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | • | • |
| 40 + 4      | a                                      | ⊕ | • | • | • | • | • | • | • | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | ⊕ | ⊕ |
|             | b                                      |   | • | • | • | • | • | • | • | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |   |   |
|             | c                                      | • | • | • | • | • | • | • | • | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | • | • |

| No. of Pos. | Version<br>• = contact, + = no contact |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|-------------|----------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
|             | 1                                      | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |  |
| 42 + 6      | a                                      | + |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|             | b                                      | + |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|             | c                                      |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 28 + 6      | a                                      | + |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|             | b                                      | + |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|             | c                                      |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 24 + 8      | a                                      | + |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|             | b                                      | + |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|             | c                                      |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 16 + 8      | a                                      | + |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|             | b                                      | + |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|             | c                                      |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |



## TYPE M/2

## Male connector – straight and angled

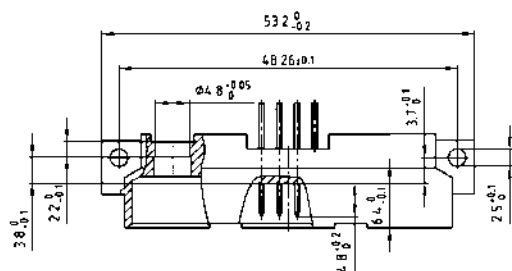
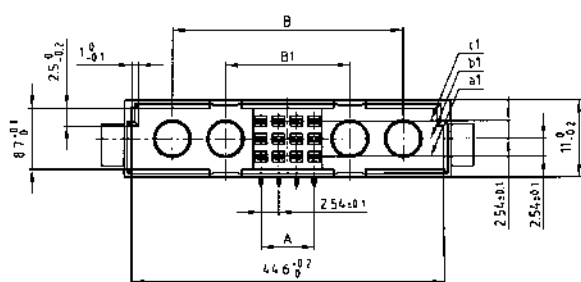


RoHS compliant

## DESCRIPTION

- Solder pin
- No. of Pos. 8+4 - 12+4 - 20+2 - 30+2
- Quality class 3 (also available in quality class 2 or 1)
- Part number creator on page 5 | 2
- For assembly with PCB power and coaxial contacts  
please contact factory

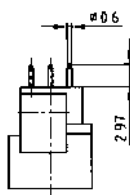
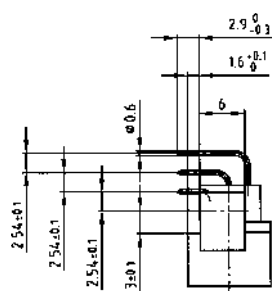
## PRODUCT DRAWING



Solder pin angled ☐ T

Solder pin straight R

| No. of Pos. | A $\pm 0.1$  | B $\pm 0.1$   | B <sub>1</sub> $\pm 0.1$ |
|-------------|--------------|---------------|--------------------------|
| 30 + 2      | 9x2.54=22.86 | 13x2.54=33.02 | —                        |
| 20 + 2      | 9x2.54=22.86 | 13x2.54=33.02 | —                        |
| 12 + 4      | 3x2.54=7.62  | 13x2.54=33.02 | 7x2.54=17.78             |
| 8 + 4       | 3x2.54=7.62  | 13x2.54=33.02 | 7x2.54=17.78             |



 = Ordering code

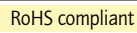
## ORDER DATA

(Dim. = mm)

[illegible]

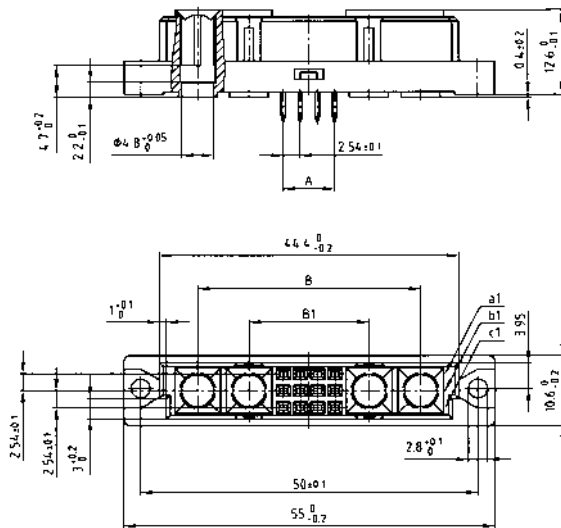
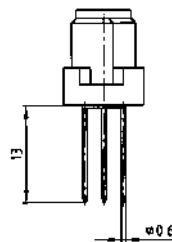
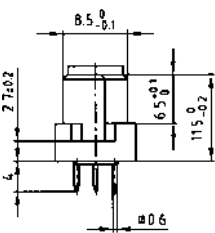
| No. of Pos. | Version                     |     |   |   |   |     |   |   |   |    |    |     |    |    |    |     |
|-------------|-----------------------------|-----|---|---|---|-----|---|---|---|----|----|-----|----|----|----|-----|
|             | • = contact, + = no contact |     |   |   |   |     |   |   |   |    |    |     |    |    |    |     |
|             | 1                           | 2   | 3 | 4 | 5 | 6   | 7 | 8 | 9 | 10 | 11 | 12  | 13 | 14 | 15 | 16  |
| 12 + 4      | a                           |     |   |   |   |     |   |   |   |    |    |     |    |    |    |     |
|             | b                           | (+) |   |   |   | (+) |   |   |   |    |    |     |    |    |    |     |
|             | c                           |     |   |   |   |     | • | • | • | •  |    | (+) |    |    |    | (+) |
| 8 + 4       | a                           |     |   |   |   |     |   |   |   |    |    |     |    |    |    |     |
|             | b                           | (+) |   |   |   | (+) |   |   |   |    |    |     |    |    |    |     |
|             | c                           |     |   |   |   |     | + | + | + | +  |    | (+) |    |    |    | (+) |

## Female connector – straight



- Solder pin and Wire Wrap
- No. of Pos. 8+4 - 12+4 - 20+2 - 30+2
- Quality class 3 (also available in quality class 2 or 1)
- Part number creator on page 5|2
- For assembly with PCB power and coaxial contacts  
please contact factory

| No. of Pos. | A $\pm 0.1$  | B $\pm 0.1$   | B <sub>1</sub> $\pm 0.1$ |
|-------------|--------------|---------------|--------------------------|
| 30 + 2      | 9x2.54=22.86 | 13x2.54=33.02 | –                        |
| 20 + 2      | 9x2.54=22.86 | 13x2.54=33.02 | –                        |
| 12 + 4      | 3x2.54=7.62  | 13x2.54=33.02 | 7x2.54=17.78             |
| 8 + 4       | 3x2.54=7.62  | 13x2.54=33.02 | 7x2.54=17.78             |

Wire Wrap **N**

 = Ordering code

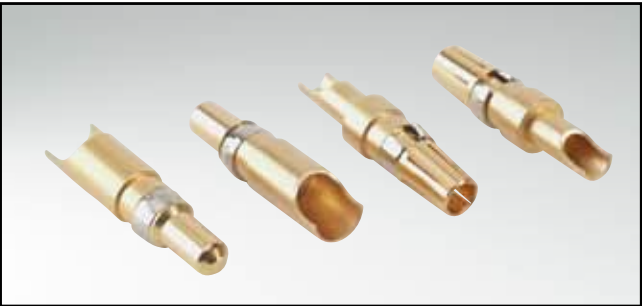
## (Dim. = mm)

[illegible]

| No. of Pos. | Version                     |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
|-------------|-----------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
|             | • = contact, + = no contact |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
|             | 1                           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 12 + 4      | a                           |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
| b           |                             | + |   |   |   | + |   |   |   |    |    |    |    |    |    |    |
| c           |                             |   |   |   |   |   | • | • | • | •  |    | +  |    |    | +  |    |
|             |                             |   |   |   |   |   | • | • | • | •  |    |    |    |    |    |    |
|             |                             |   |   |   |   |   | • | • | • | •  |    |    |    |    |    |    |
| 8 + 4       | a                           |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
| b           |                             | + |   |   |   | + |   |   |   |    |    |    |    |    |    |    |
| c           |                             |   |   |   |   |   | + | + | + | +  |    | +  |    |    | +  |    |
|             |                             |   |   |   |   |   | • | • | • | •  |    |    |    |    |    |    |
|             |                             |   |   |   |   |   | • | • | • | •  |    |    |    |    |    |    |

TYPE M

High power contacts – solder cup – straight

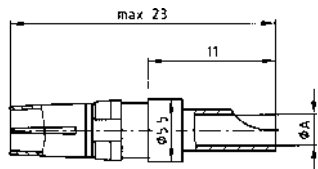


RoHS compliant

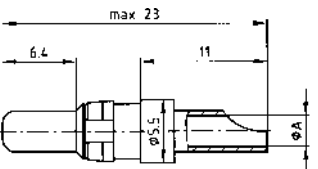
- DESCRIPTION
- Precision machined contacts
  - Quality class 3: gold flash
  - Quality class 1: 0.8µm gold on mating side
  - Other quality classes on request
  - Assembled contacts available on request

PRODUCT DRAWING

Socket contact

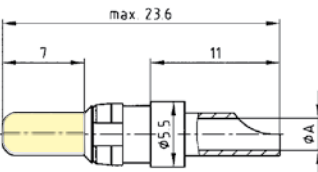


Plug contact



| AWG     | Current Rating | ØA <sup>+0.15</sup> |
|---------|----------------|---------------------|
| 16 - 20 | 10 A           | 1,80                |
| 12 - 14 | 20 A           | 2,70                |
| 8 - 10  | 30 A           | 4,80                |

Premating contact



ORDER DATA

(Dim. = mm)

| SOCKET CONTACT |                |               |             |               |
|----------------|----------------|---------------|-------------|---------------|
| AWG            | Current rating | Quality class | Termination | Part number   |
| 16 - 20        | 10 A           | 1             | 11          | 124 C 10039 X |
| 16 - 20        | 10 A           | 3             | 27          | 124 A 10039 X |
| 12 - 14        | 20 A           | 1             | 12          | 124 C 10049 X |
| 12 - 14        | 20 A           | 3             | 28          | 124 A 10049 X |
| 8 - 10         | 40 A           | 1             | 14          | 124 C 10069 X |
| 8 - 10         | 40 A           | 3             | 29          | 124 A 10069 X |

| PLUG CONTACT |                |               |             |               |
|--------------|----------------|---------------|-------------|---------------|
| AWG          | Current rating | Quality class | Termination | Part number   |
| 16 - 20      | 10 A           | 1             | 11          | 123 C 10039 X |
| 16 - 20      | 10 A           | 3             | 27          | 123 A 10039 X |
| 12 - 14      | 20 A           | 1             | 12          | 123 C 10049 X |
| 12 - 14      | 20 A           | 3             | 28          | 123 A 10049 X |
| 8 - 10       | 40 A           | 1             | 14          | 123 C 10069 X |
| 8 - 10       | 40 A           | 3             | 29          | 123 A 10069 X |

| PREMATING CONTACT |                |               |               |
|-------------------|----------------|---------------|---------------|
| AWG               | Current rating | Quality class | Part number   |
| 16 - 20           | 10 A           | 1             | 123 C 10139 X |
| 12 - 14           | 20 A           | 1             | 123 C 10149 X |
| 8 - 10            | 40 A           | 1             | 123 C 10169 X |

## TYPE M

### High power contacts – crimp – straight



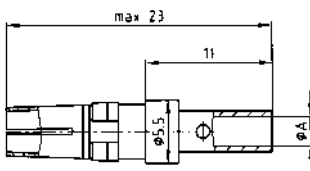
RoHS compliant

#### DESCRIPTION

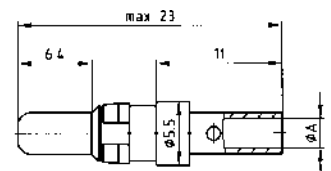
- Precision machined contacts
- Quality class 3: gold flash
- Quality class 1: 0.8µm gold on mating side
- Other quality classes on request

#### PRODUCT DRAWING

Socket contact

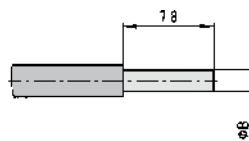


Plug contact

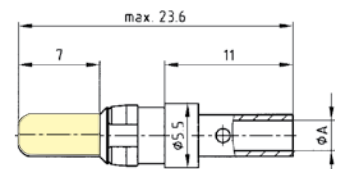


| AWG     | Current Rating | ØA <sup>+0.15</sup> | ØB max. |
|---------|----------------|---------------------|---------|
| 16 - 20 | 10 A           | 1,70                | 1,70    |
| 12 - 14 | 20 A           | 2,60                | 2,60    |
| 10 - 12 | 30 A           | 3,70                | 3,70    |
| 8 - 10  | 40 A           | 4,60                | 4,60    |

Wire stripping



Premating contact



#### ORDER DATA

(Dim. = mm)

| SOCKET CONTACT |                |               |               | PLUG CONTACT |                |               |               | PREMATING CONTACT |                |               |               |
|----------------|----------------|---------------|---------------|--------------|----------------|---------------|---------------|-------------------|----------------|---------------|---------------|
| AWG            | Current rating | Quality class | Part number   | AWG          | Current rating | Quality class | Part number   | AWG               | Current rating | Quality class | Part number   |
| 16 - 20        | 10 A           | 1             | 124 C 11019 X | 16 - 20      | 10 A           | 1             | 123 C 11019 X | 16 - 20           | 10 A           | 1             | 123 C 11119 X |
| 16 - 20        | 10 A           | 3             | 124 A 11019 X | 16 - 20      | 10 A           | 3             | 123 A 11019 X | 12 - 14           | 20 A           | 1             | 123 C 11129 X |
| 12 - 14        | 20 A           | 1             | 124 C 11029 X | 12 - 14      | 20 A           | 1             | 123 C 11029 X | 10 - 12           | 30 A           | 1             | 123 C 11139 X |
| 12 - 14        | 20 A           | 3             | 124 A 11029 X | 12 - 14      | 20 A           | 3             | 123 A 11029 X | 8 - 10            | 40 A           | 1             | 123 C 11149 X |
| 10 - 12        | 30 A           | 1             | 124 C 11039 X | 10 - 12      | 30 A           | 1             | 123 C 11039 X |                   |                |               |               |
| 10 - 12        | 30 A           | 3             | 124 A 11039 X | 10 - 12      | 30 A           | 3             | 123 A 11039 X |                   |                |               |               |
| 8 - 10         | 40 A           | 1             | 124 C 11049 X | 8 - 10       | 40 A           | 1             | 123 C 11049 X |                   |                |               |               |
| 8 - 10         | 40 A           | 3             | 124 A 11049 X | 8 - 10       | 40 A           | 3             | 123 A 11049 X |                   |                |               |               |

TYPE M

High power contacts – solder pin – straight

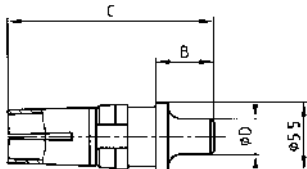


RoHS compliant

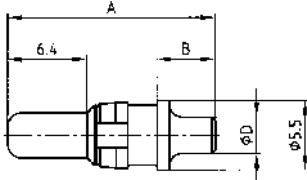
- DESCRIPTION
- Precision machined contacts
  - Quality class 3: gold flash
  - Quality class 1: 0.8µm gold on mating side
  - Other quality classes on request
  - Assembled contacts available on request

PRODUCT DRAWING

Socket contact

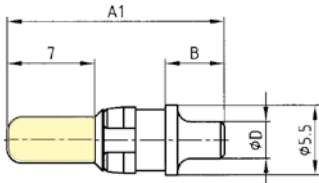


Plug contact



| Current rating | A     | A <sub>1</sub> | B    | C     | ØD   |
|----------------|-------|----------------|------|-------|------|
| 20 A           | 16.70 | 17.30          | 4.70 | 16.10 | 2.90 |
| 40 A           | 17.75 | 18.35          | 5.75 | 17.15 | 3.80 |

Premating contact



ORDER DATA

(Dim. = mm)

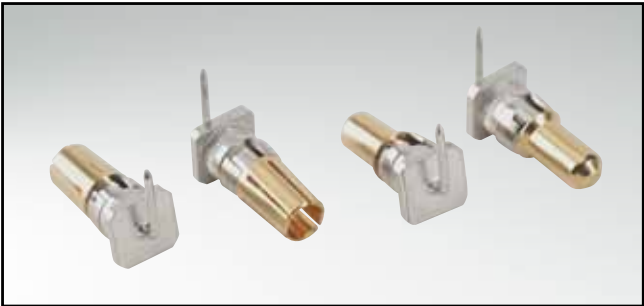
| SOCKET CONTACT |               |             |               |
|----------------|---------------|-------------|---------------|
| Current rating | Quality class | Termination | Part number   |
| 20 A           | 1             | 19          | 124 C 14029 X |
| 20 A           | 3             | 39          | 124 A 14029 X |
| 40 A           | 1             | 20          | 124 C 14049 X |
| 40 A           | 3             | 40          | 124 A 14049 X |

| PLUG CONTACT   |               |             |               |
|----------------|---------------|-------------|---------------|
| Current rating | Quality class | Termination | Part number   |
| 20 A           | 1             | 19          | 123 C 14029 X |
| 20 A           | 3             | 39          | 123 A 14029 X |
| 40 A           | 1             | 20          | 123 C 14049 X |
| 40 A           | 3             | 40          | 123 A 14049 X |

| PREMATING CONTACT |               |             |               |
|-------------------|---------------|-------------|---------------|
| Current rating    | Quality class | Termination | Part number   |
| 20 A              | 1             | 19          | 123 C 14129 X |
| 40 A              | 1             | 20          | 123 C 14149 X |

# TYPE M

High power contacts – solder pin – angled

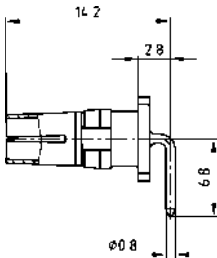


RoHS compliant

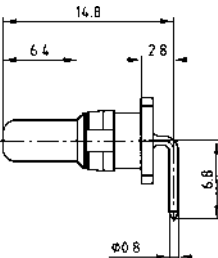
- DESCRIPTION**
- Precision machined contacts
  - Quality class 3: gold flash
  - Quality class 1: 0.8µm gold on mating side
  - Other quality classes on request
  - Assembled contacts available on request

**PRODUCT DRAWING**

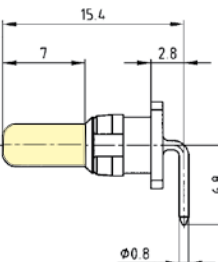
Socket contact



Plug contact



Premating contact



**ORDER DATA** (Dim. = mm)

| SOCKET CONTACT |               |             |               |
|----------------|---------------|-------------|---------------|
| Current rating | Quality class | Termination | Part number   |
| 10 A           | 1             | 18          | 124 C 12019 X |
| 10 A           | 3             | 17          | 124 A 12019 X |

| PLUG CONTACT   |               |             |               |
|----------------|---------------|-------------|---------------|
| Current rating | Quality class | Termination | Part number   |
| 10 A           | 1             | 18          | 123 C 12019 X |
| 10 A           | 3             | 17          | 123 A 12019 X |

| PREMATING CONTACT |               |               |
|-------------------|---------------|---------------|
| Current rating    | Quality class | Part number   |
| 10 A              | 1             | 123 C 12119 X |

TYPE M

High power contacts – solder pin – angled



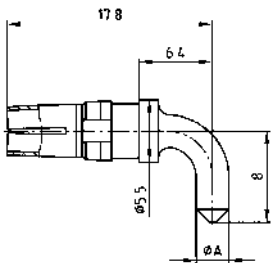
RoHS compliant

DESCRIPTION

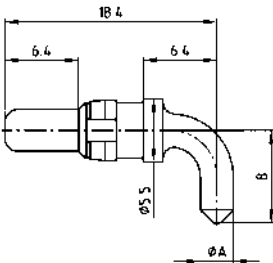
- Precision machined contacts
- Quality class 3: gold flash
- Quality class 1: 0.8µm gold on mating side
- Other quality classes on request
- Assembled contacts available on request

PRODUCT DRAWING

Socket contact

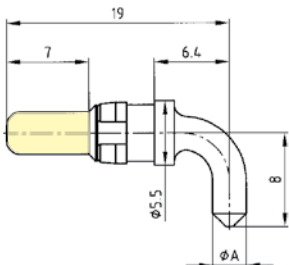


Plug contact



| Current Rating | ØA   |
|----------------|------|
| 20 A           | 2.90 |
| 40 A           | 3.80 |

Premating contact



ORDER DATA

(Dim. = mm)

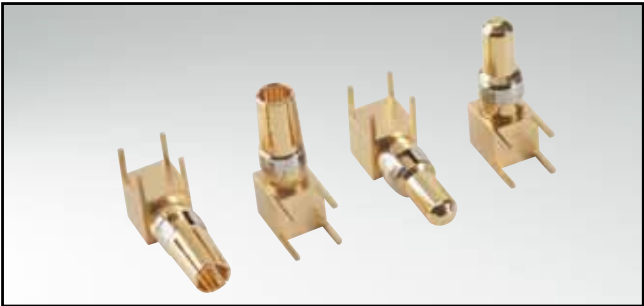
| SOCKET CONTACT |               |             |               |
|----------------|---------------|-------------|---------------|
| Current rating | Quality class | Termination | Part number   |
| 20 A           | 1             | 21          | 124 C 13019 X |
| 20 A           | 3             | 16          | 124 A 13019 X |
| 40 A           | 1             | 23          | 124 C 13039 X |
| 40 A           | 3             | 15          | 124 A 13039 X |

| PLUG CONTACT   |               |             |               |
|----------------|---------------|-------------|---------------|
| Current rating | Quality class | Termination | Part number   |
| 20 A           | 1             | 21          | 123 C 13019 X |
| 20 A           | 3             | 16          | 123 A 13019 X |
| 40 A           | 1             | 23          | 123 C 13039 X |
| 40 A           | 3             | 15          | 123 A 13039 X |

| PREMATING CONTACT |               |               |
|-------------------|---------------|---------------|
| Current rating    | Quality class | Part number   |
| 20 A              | 1             | 123 C 13119 X |
| 40 A              | 1             | 123 C 13139 X |

# TYPE M

High power contactcs – solder pin – angled

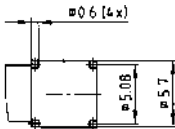
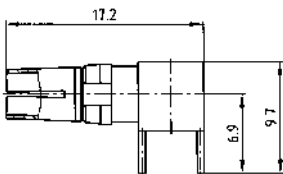


RoHS compliant

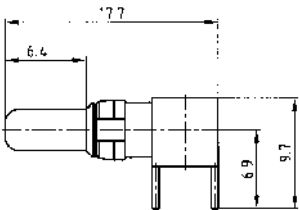
- DESCRIPTION**
- Precision machined contacts
  - Quality class 3: gold flash
  - Quality class 1: 0.8µm gold on mating side
  - Other quality classes on request
  - Assembled contacts available on request

**PRODUCT DRAWING**

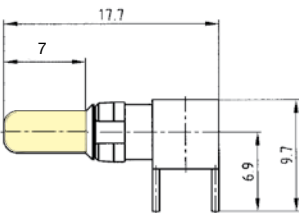
Socket contact



Plug contact



Premating contact



**ORDER DATA** (Dim. = mm)

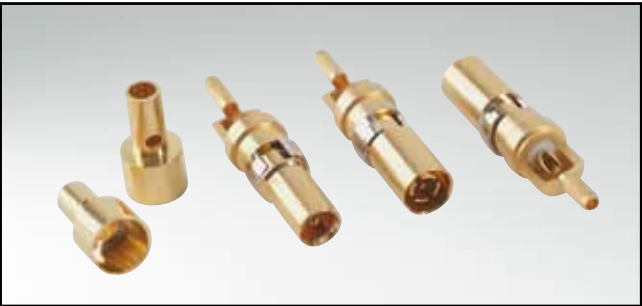
| SOCKET CONTACT |               |             |               |
|----------------|---------------|-------------|---------------|
| Current rating | Quality class | Termination | Part number   |
| 40 A           | 1             | 26          | 124 C 10019 X |
| 40 A           | 3             | 13          | 124 A 10019 X |

| PLUG CONTACT   |               |             |               |
|----------------|---------------|-------------|---------------|
| Current rating | Quality class | Termination | Part number   |
| 40 A           | 1             | 26          | 123 C 10019 X |
| 40 A           | 3             | 13          | 123 A 10019 X |

| PREMATING CONTACT |               |               |
|-------------------|---------------|---------------|
| Current rating    | Quality class | Part number   |
| 40 A              | 1             | 123 C 10029 X |

TYPE M

Coaxial contacts – straight – inner conductor solder – outer conductor crimp/solder termination



RoHS compliant

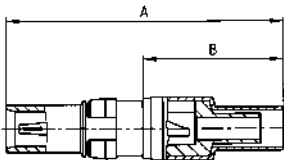
DESCRIPTION

- 50 and 75 Ω Version
- Socket contact suitable for male connectors
- Plug contact suitable for female connectors
- Contact platings:
  - 0.8µm gold mating side inner conductor
  - other platings on request
- Delivery includes: contacts and sleeve supplied loose

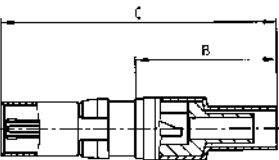
PRODUCT DRAWING

50 Ω Version

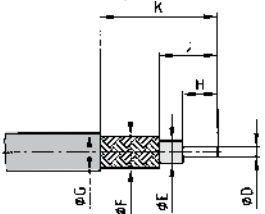
Socket contact



Plug contact



Wire stripping

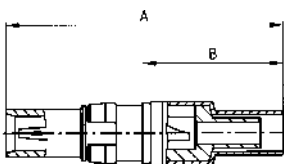


| usable cable RG                      | A    | B    | C    | ØD max. | ØE max. | ØF max. | ØG max. | H   | J   | K    |
|--------------------------------------|------|------|------|---------|---------|---------|---------|-----|-----|------|
| 178 B/U, 196 A/U, 404 U <sup>+</sup> | 24.2 | 12.3 | 23.9 | 0.90    | 1.2     | 1.4     | 2.3     | 2.5 | 5.0 | 10.0 |
| 174 U, 188 A/U, 316 U                | 24.2 | 12.3 | 23.9 | 0.80    | 1.9     | 2.3     | 3.2     | 2.5 | 5.0 | 10.0 |
| 316 U*                               | 24.2 | 12.3 | 23.9 | 0.90    | 1.9     | 2.7     | 3.5     | 2.5 | 5.0 | 10.0 |
| 58 C/U, 141 A/U                      | 25.4 | 13.5 | 25.2 | 0.90    | 3.0     | 4.1     | 5.2     | 3.0 | 5.0 | 9.5  |

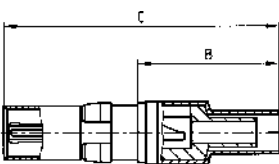
\* = double braided - <sup>+</sup> = low noise

75 Ω Version

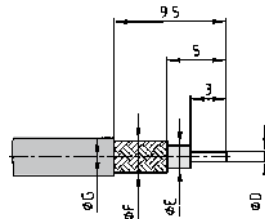
Socket contact



Plug contact



Wire stripping



| usable cable RG  | A    | B    | C    | ØD max. | ØE max. | ØF max. | ØG max. |
|------------------|------|------|------|---------|---------|---------|---------|
| 179 B/U, 187 A/U | 24.2 | 12.3 | 23.9 | 0.50    | 1.9     | 2.3     | 3.2     |
| 180 B/U          | 23.1 | 11.2 | 22.8 | 0.90    | 2.8     | 3.1     | 4.5     |

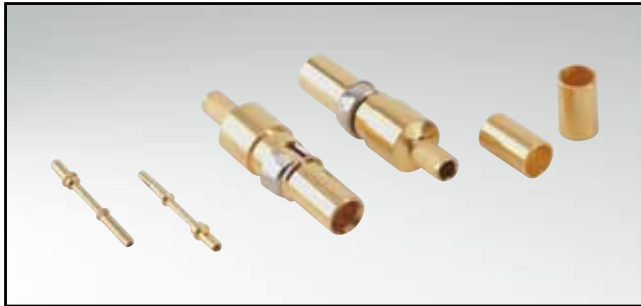
ORDER DATA

(Dim. = mm)

| SOCKET CONTACT |                                      |               | PLUG CONTACT |                                      |               |
|----------------|--------------------------------------|---------------|--------------|--------------------------------------|---------------|
| Version        | Usable cable RG                      | Part number   | Version      | Usable cable RG                      | Part number   |
| 50 Ω           | 178 B/U, 196 A/U, 404 U <sup>+</sup> | 124 C 20059 X | 50 Ω         | 178 B/U, 196 A/U, 404 U <sup>+</sup> | 123 C 20059 X |
| 50 Ω           | 174 U, 188 A/U, 316 U                | 124 C 20069 X | 50 Ω         | 174 U, 188 A/U, 316 U                | 123 C 20069 X |
| 50 Ω           | 316 U *                              | 124 C 20079 X | 50 Ω         | 316 U *                              | 123 C 20079 X |
| 50 Ω           | 58 C/U, 141 A/U                      | 124 C 20089 X | 50 Ω         | 58 C/U, 141 A/U                      | 123 C 20089 X |
| 75 Ω           | 179 B/U, 187 A/U                     | 124 C 30039 X | 75 Ω         | 179 B/U, 187 A/U                     | 123 C 30039 X |
| 75 Ω           | 180 B/U                              | 124 C 30049 X | 75 Ω         | 180 B/U                              | 123 C 30049 X |

## TYPE M

### Coaxial contacts – straight – inner and outer conductor crimp termination



RoHS compliant

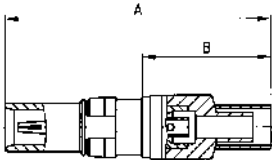
#### DESCRIPTION

- 50 Ω Version
- Socket contact suitable for male connectors
- Plug contact suitable for female connectors
- Contact platings:
  - 0.8µm gold mating side inner conductor
  - other platings on request
- Delivery includes: contacts and sleeve supplied loose

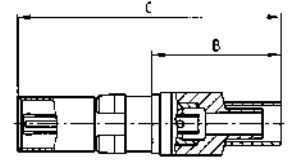
#### PRODUCT DRAWING

#### 50 Ω Version

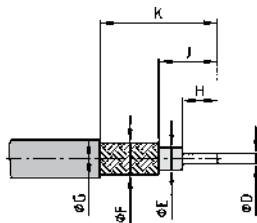
Socket contact



Plug contact



Wire stripping



| usable cable RG       | A    | B    | C    | ØD max. | ØE max. | ØF max. | ØG max. | H   | J   | K   |
|-----------------------|------|------|------|---------|---------|---------|---------|-----|-----|-----|
| 174 U, 188 A/U, 316 U | 23.1 | 11.2 | 22.9 | 0.60    | 1.9     | 2.3     | 3.2     | 3.0 | 4.3 | 9.3 |
| 58 C/U, 141 A/U       | 22.8 | 10.9 | 22.6 | 1.30    | 3.7     | 4.4     | 5.2     | 3.8 | 5.3 | 9.0 |
| 316 U*                | 23.1 | 11.2 | 22.9 | 0.60    | 1.9     | 3.0     | 3.8     | 3.0 | 4.3 | 9.3 |

\* = double braided

(Dim. = mm)

#### ORDER DATA

| SOCKET CONTACT |                       |               | PLUG CONTACT |                       |               |
|----------------|-----------------------|---------------|--------------|-----------------------|---------------|
| Version        | Usable cable RG       | Part number   | Version      | Usable cable RG       | Part number   |
| 50 Ω           | 174 U, 188 A/U, 316 U | 124 C 21049 X | 50 Ω         | 174 U, 188 A/U, 316 U | 123 C 21049 X |
| 50 Ω           | 58 C/U, 141 A/U       | 124 C 21059 X | 50 Ω         | 58 C/U, 141 A/U       | 123 C 21059 X |
| 50 Ω           | 316 U *               | 124 C 21069 X | 50 Ω         | 316 U *               | 123 C 21069 X |

TYPE M

Coaxial contacts – angled – inner conductor solder – outer conductor crimp/solder termination



RoHS compliant

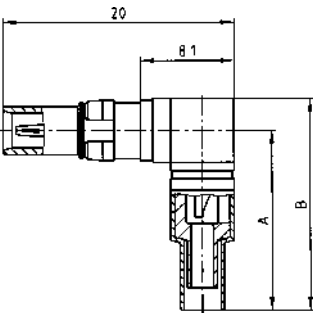
DESCRIPTION

- 50 and 75 Ω Version
- Socket contact suitable for male connectors
- Plug contact suitable for female connectors
- Contact platings:
  - 0.8µm gold mating side inner conductor
  - other platings on request
- Delivery includes: contacts and sleeve supplied loose

PRODUCT DRAWING

50 Ω Version

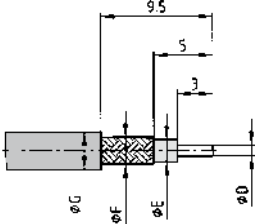
Socket contact



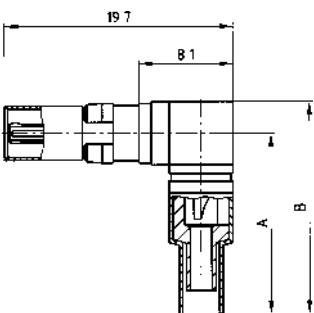
| usable cable RG                      | A    | B    | ØD max. | ØE max. | ØF max. | ØG max. |
|--------------------------------------|------|------|---------|---------|---------|---------|
| 178 B/U, 196 A/U, 404 U <sup>+</sup> | 15.7 | 18.5 | 0.90    | 1.2     | 1.4     | 2.3     |
| 174 U, 188 A/U, 316 U                | 15.7 | 18.5 | 0.90    | 1.9     | 2.3     | 3.2     |
| 122 U                                | 15.7 | 18.5 | 0.90    | 2.8     | 3.1     | 4.5     |
| 316 U*                               | 16.8 | 19.5 | 0.90    | 1.9     | 2.7     | 3.5     |
| 58 C/U, 141 A/U                      | 18.0 | 20.8 | 0.90    | 3.0     | 4.1     | 5.2     |

\* = double braided - + = low noise

Wire stripping

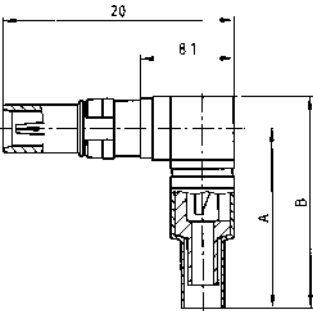


Plug contact



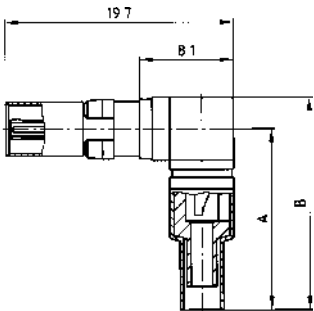
75 Ω Version

Socket contact



| usable cable RG  | A    | B    | ØD max. | ØE max. | ØF max. | ØG max. |
|------------------|------|------|---------|---------|---------|---------|
| 196 A/U          | 15.7 | 18.5 | 0.90    | 1.2     | 1.4     | 2.3     |
| 179 B/U, 187 A/U | 15.7 | 18.5 | 0.90    | 1.9     | 2.3     | 3.2     |
| 180 B/U          | 15.7 | 18.5 | 0.90    | 2.8     | 3.1     | 4.5     |

Plug contact



ORDER DATA

(Dim. = mm)

| SOCKET CONTACT |                                      |               | PLUG CONTACT |                                      |               |
|----------------|--------------------------------------|---------------|--------------|--------------------------------------|---------------|
| Version        | Usable cable RG                      | Part number   | Version      | Usable cable RG                      | Part number   |
| 50 Ω           | 178 B/U, 196 A/U, 404 U <sup>+</sup> | 124 C 22069 X | 50 Ω         | 178 B/U, 196 A/U, 404 U <sup>+</sup> | 123 C 22069 X |
| 50 Ω           | 174 U, 188 A/U, 316 U                | 124 C 22079 X | 50 Ω         | 174 U, 188 A/U, 316 U                | 123 C 22079 X |
| 50 Ω           | 316 U *                              | 124 C 22089 X | 50 Ω         | 316 U *                              | 123 C 22089 X |
| 50 Ω           | 122 U                                | 124 C 22099 X | 50 Ω         | 122 U                                | 123 C 22099 X |
| 50 Ω           | 58 C/U, 141 A/U                      | 124 C 22109 X | 50 Ω         | 58 C/U, 141 A/U                      | 123 C 22109 X |
| 75 Ω           | 196 A/U                              | 124 C 32049 X | 75 Ω         | 196 A/U                              | 123 C 32049 X |
| 75 Ω           | 179 B/U, 187 A/U                     | 124 C 32059 X | 75 Ω         | 179 B/U, 187 A/U                     | 123 C 32059 X |
| 75 Ω           | 180 B/U                              | 124 C 32069 X | 75 Ω         | 180 B/U                              | 123 C 32069 X |

## TYPE M

### Coaxial contacts – angled – inner and outer conductor crimp termination



RoHS compliant

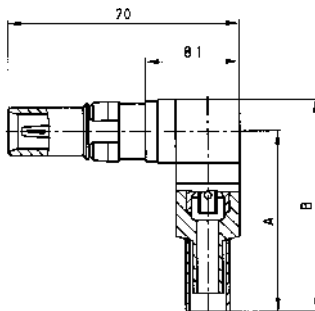
#### DESCRIPTION

- 50 and 75 Ω Version
- Socket contact suitable for male connectors
- Plug contact suitable for female connectors
- Contact platings:
  - 0.8µm gold mating side inner conductor
  - other platings on request
- Delivery includes: contacts and sleeve supplied loose

#### PRODUCT DRAWING

##### 50 Ω Version

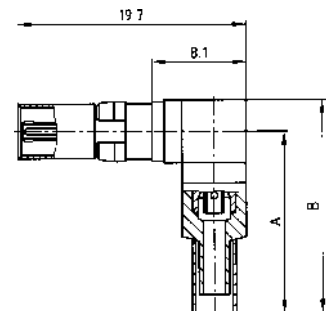
Socket contact



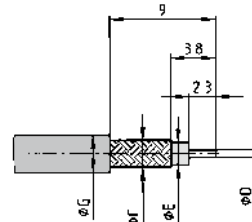
| usable cable RG       | A    | B    | ØD max. | ØE max. | ØF max. | ØG max. |
|-----------------------|------|------|---------|---------|---------|---------|
| 174 U, 188 A/U, 316 U | 15.7 | 18.5 | 0.60    | 1.9     | 2.3     | 2.3     |
| 316 U*                | 15.7 | 18.5 | 0.60    | 1.9     | 3.0     | 3.8     |
| 58 C/U, 141 A/U       | 15.4 | 18.2 | 1.00    | 3.7     | 4.4     | 5.2     |

\* = double braided

Plug contact

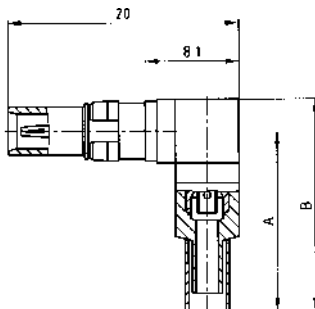


Wire stripping



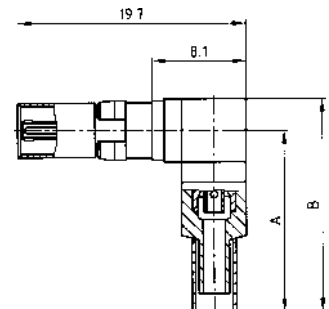
##### 75 Ω Version

Socket contact



| usable cable RG  | A    | B    | ØD max. | ØE max. | ØF max. | ØG max. |
|------------------|------|------|---------|---------|---------|---------|
| 179 B/U, 187 A/U | 15.7 | 18.5 | 0.60    | 1.9     | 2.3     | 3.2     |
| 180 B/U          | 14.9 | 17.7 | 0.60    | 2.8     | 3.2     | 4.5     |

Plug contact



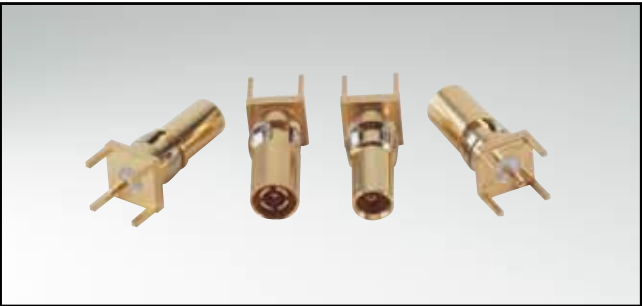
#### ORDER DATA

(Dim. = mm)

| SOCKET CONTACT |                       |               | PLUG CONTACT |                       |               |
|----------------|-----------------------|---------------|--------------|-----------------------|---------------|
| Version        | Usable cable RG       | Part number   | Version      | Usable cable RG       | Part number   |
| 50 Ω           | 174 U, 188 A/U, 316 U | 124 C 23049 X | 50 Ω         | 174 U, 188 A/U, 316 U | 123 C 23049 X |
| 50 Ω           | 316 U *               | 124 C 23059 X | 50 Ω         | 316 U *               | 123 C 23059 X |
| 50 Ω           | 58 C/U, 141 A/U       | 124 C 23069 X | 50 Ω         | 58 C/U, 141 A/U       | 123 C 23069 X |
| 75 Ω           | 179 B/U, 187 A/U      | 124 C 33039 X | 75 Ω         | 179 B/U, 187 A/U      | 123 C 33039 X |
| 75 Ω           | 180 B/U               | 124 C 33049 X | 75 Ω         | 180 B/U               | 123 C 33049 X |

TYPE M

Coaxial contacts – straight – PCB termination – 5 solder pins



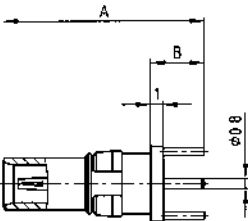
RoHS compliant

- DESCRIPTION**
- 50 and 75 Ω Version
  - Socket contact suitable for male connectors
  - Plug contact suitable for female connectors
  - Contact platings:
    - 0.8µm gold mating side inner conductor
    - other platings on request

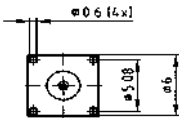
PRODUCT DRAWING

50 Ω Version

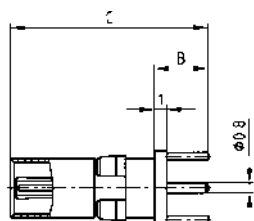
Socket contact



| Termination type | A    | B   | C    |
|------------------|------|-----|------|
| 31               | 16.2 | 4.3 | 16.0 |
| 32               | 17.7 | 5.8 | 17.5 |

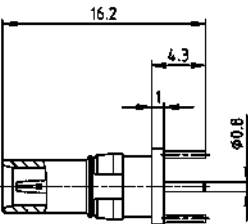


Plug contact

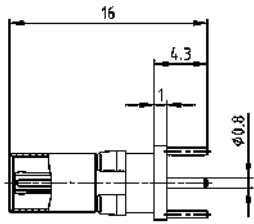


75 Ω Version

Socket contact



Plug contact



ORDER DATA

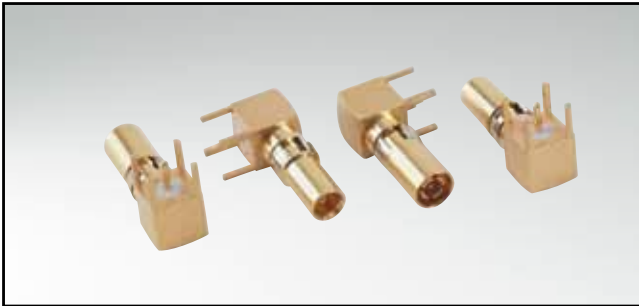
(Dim. = mm)

| SOCKET CONTACT |             |               |
|----------------|-------------|---------------|
| Version        | Termination | Part number   |
| 50 Ω           | 31          | 124 C 24039 X |
| 50 Ω           | 32          | 124 C 24049 X |
| 75 Ω           | 33          | 124 C 34029 X |

| PLUG CONTACT |             |               |
|--------------|-------------|---------------|
| Version      | Termination | Part number   |
| 50 Ω         | 31          | 123 C 24039 X |
| 50 Ω         | 32          | 123 C 24049 X |
| 75 Ω         | 33          | 123 C 34029 X |

## TYPE M

Coaxial contacts – angled – PCB termination – 5 solder pins



RoHS compliant

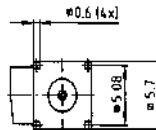
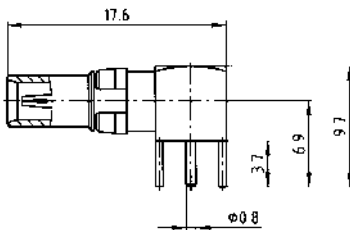
### DESCRIPTION

- 50 and 75  $\Omega$  Version
- Socket contact suitable for male connectors
- Plug contact suitable for female connectors
- Contact platings:
  - 0.8  $\mu$ m gold mating side inner conductor
  - other platings on request

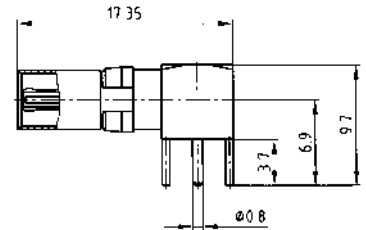
### PRODUCT DRAWING

#### 50 $\Omega$ Version

Socket contact

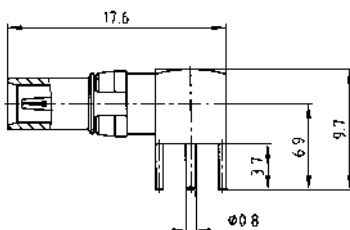


Plug contact

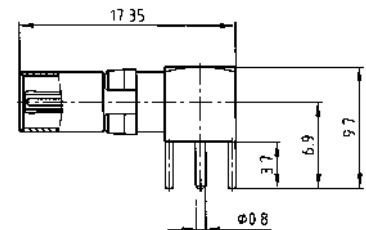


#### 75 $\Omega$ Version

Socket contact



Plug contact



### ORDER DATA

(Dim. = mm)

| SOCKET CONTACT |             |               | PLUG CONTACT |             |               |
|----------------|-------------|---------------|--------------|-------------|---------------|
| Version        | Termination | Part number   | Version      | Termination | Part number   |
| 50 $\Omega$    | 35          | 124 C 25029 X | 50 $\Omega$  | 35          | 123 C 25029 X |
| 75 $\Omega$    | 36          | 124 C 35029 X | 75 $\Omega$  | 36          | 123 C 35029 X |

## SECTION 6

# PC104 AND PC104PLUS CONNECTORS

Numerous manufacturers now use these standards for system architecture. This has promoted the triumphant march of the "personal computer" to be carried over into the field of industrial production, in the form of IPCs (industrial personal computers).

Prerequisite for this was an adaptation of these well-known "office world" systems to the requirements and conditions prevailing in industrial production environments.

Among the most important development goals incorporated into the specifications were

- a compact form-factor of about 90 mm x 96 mm (3.6 x 3.8 inches) for individual, low-profile function modules,
- a universal, self-building bus system to achieve superior modularity and compatibility,
- the definition of a robust, reliable connector system capable of replacing the edge connectors common to the PC world,
- reduced power requirements for modules.

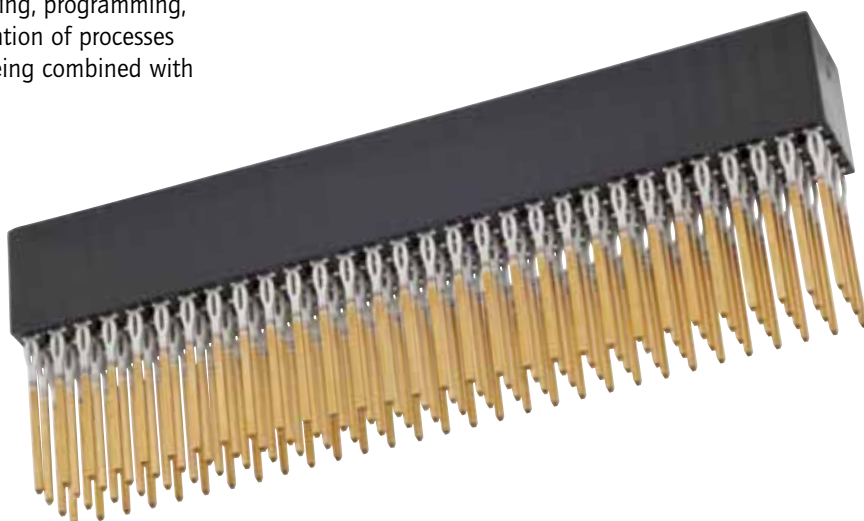
Realization of these goals has made it possible for today's industrial PCs to be deployed in the operating, programming, visualization, long-term archival and simulation of processes – and beyond this – they are capable of being combined with conventional industrial controllers or PLCs.

Specification-compliant bus connectors play a key role in PC104 and PC104plus system architecture interconnections.

In order to form a 104-pole ISA bus, the standard defines two, two-row connectors having a 2.54 mm contact grid; one connector with 64 contacts, the other with 40 contacts. These connectors must be located on the circuit board at prescribed positions.

In order to achieve a self-building system through the stacking of modules, these connectors are designed as "stack-through" and "non-stack-through" (terminating) connectors.

Stack through connectors have 12.2 mm and 17.0 mm long contacts and they function both as a pin connector and as a socket connector for signals routed from level-to-level in the module stack.





Press-fit contacts are the preferred technology for circuit board stack-through connectors. Terminating connectors with short contacts are used on the first stack level. These are often available either as solder or press-fit versions.

The PC104plus specification defines a connector for implementing a PCI bus. It is a 4 x 30 positions connector with a 2.00 mm contact grid pattern.

Because of the smaller grid spacing and increased contact density exhibited by these connectors, the specification describes an additional shroud that is to be plugged onto the circuit board's underside. This shroud stabilizes the stack-through contacts and ensures they are properly guided when modules are stacked.

PC104 and PC104plus connectors are specified to be compatible so that a mix of modules, compliant with either specification, can be used together in a single system configuration— which is often the case.

CONEC uses for its PC104 and PC104plus connectors a flexible press fit termination. This Eye of the needle design preserves the circuit board during the press-fit process and it ensures good retention force for the mounted component.



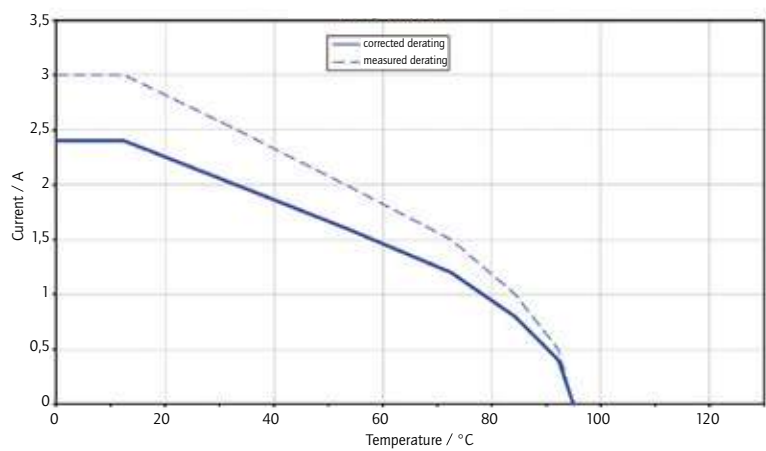
# TECHNICAL DATA

## PC104 Connectors

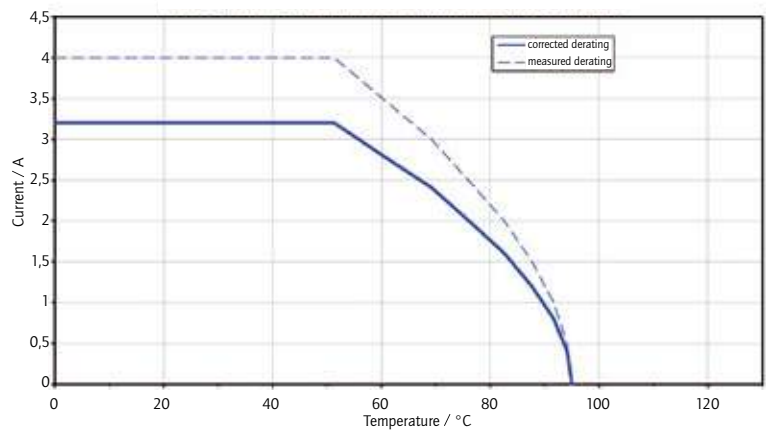
| Materials                  |                                         |
|----------------------------|-----------------------------------------|
| Insulator                  | PBT, GF, UL94 V-O                       |
| Contacts                   | Copper alloy                            |
| Electrical Characteristics |                                         |
| Current rating             | 2.2 A in acc. to IEC 60512-5-2          |
| Contact resistance         | < 20 mΩ                                 |
| Working temperature        | -55°C to +95°C                          |
| Mechanical characteristics |                                         |
| Mating force               | max. 0.9 N / Pin with test Pin Ø 0.6 mm |
| Withdrawal force           | min. 0.3 N / Pin with test Pin Ø 0.6 mm |
| Press-in force             | max. 80 N / Pin                         |
| PCB thickness              | 1.6 mm                                  |
| Creepage distance          | min. 1.2 mm                             |

Technical alterations are subjects to change without notice.

Derating curve 100-pos. connector – all contacts loaded



Derating curve 64-pos. connector – contacts loaded in acc. to PC104 specification



# TECHNICAL DATA

## PC104plus Connectors

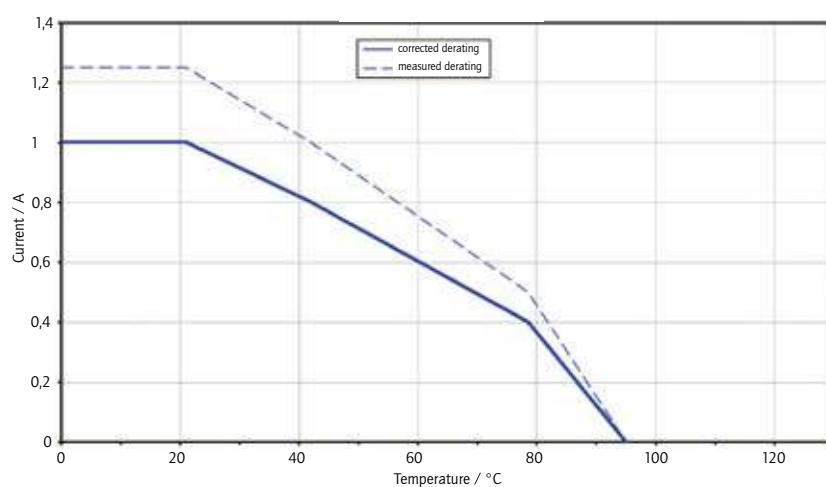
| Materials |                   |
|-----------|-------------------|
| Insulator | PBT, GF, UL94 V-0 |
| Contacts  | Copper alloy      |

| Electrical Characteristics |                        |
|----------------------------|------------------------|
| Current rating             | 1 A ref. IEC 60512-5-2 |
| Contact resistance         | < 20 mΩ                |
| Working temperature        | -55°C to +95°C         |

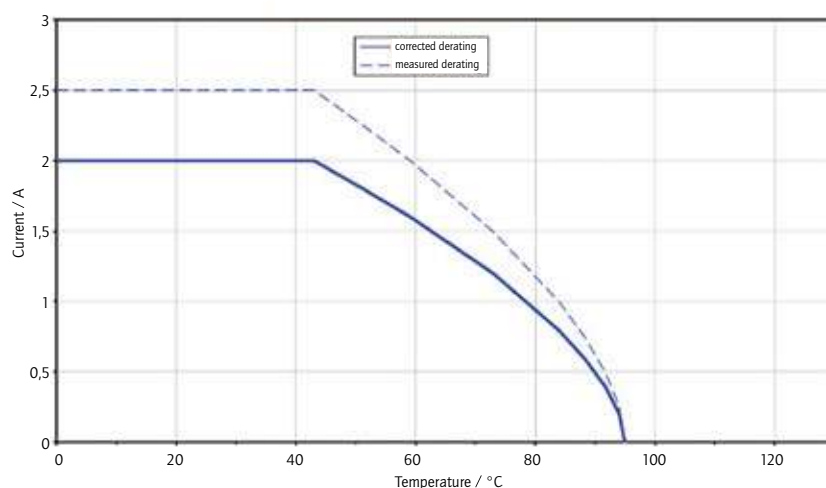
| Mechanical characteristics |                                         |
|----------------------------|-----------------------------------------|
| Mating force               | max. 1.5 N / Pin with test Pin Ø 0.5 mm |
| Withdrawal force           | min. 0.3 N / Pin with test Pin Ø 0.5 mm |
| Press-in force             | max. 80 N / Pin                         |
| PCB thickness              | 1.4 mm                                  |
| Creepage distance          | min. 0.6 mm                             |

Technical alterations are subjects to change without notice.

Derating curve 120-pos. connector – all contacts loaded

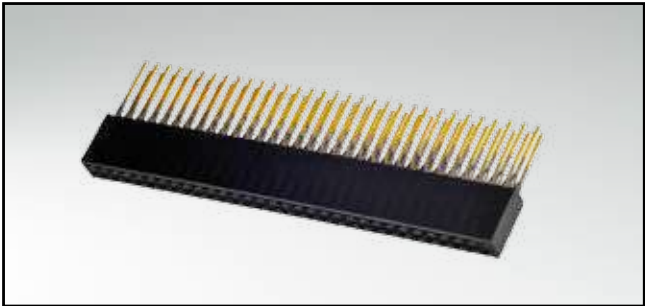


Derating curve 120-pos. connector – contacts loaded in acc. to PC104 specification



# PC104 STACK-THROUGH VERSION

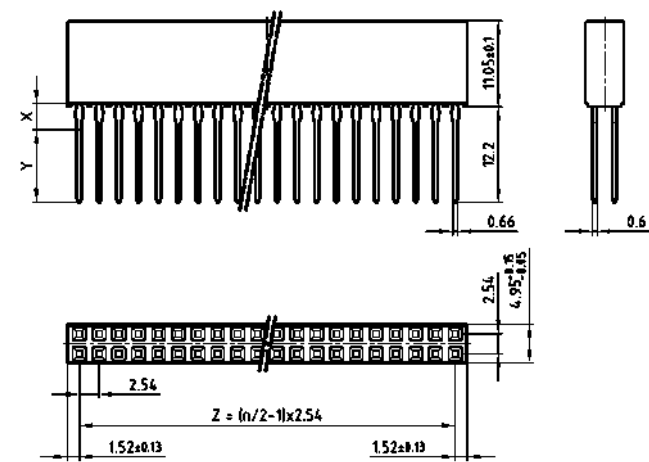
Female connector – straight – press fit contact – contact length 12.2 mm



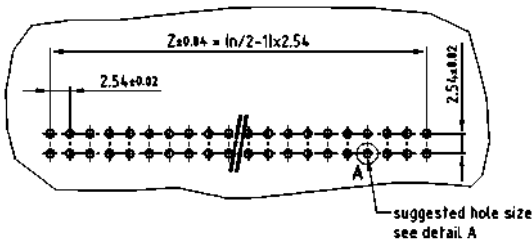
RoHS compliant

- DESCRIPTION**
- Standard version for PC104 module height 15.0 mm
  - Flexible press fit design
  - Double beam contacts
  - 40 / 64 / 100 positions version (further versions on request)
  - Quality class 3 and alternative quality class 2 available on request
  - Delivered as a set with "spacer"

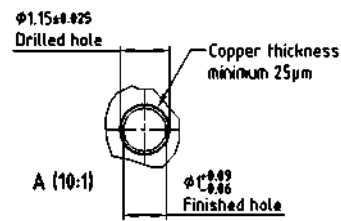
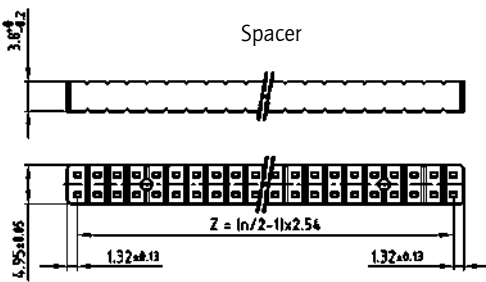
**PRODUCT DRAWING**



**PCB-hole pattern**



| Quality Class | Plating                   |                    |               |
|---------------|---------------------------|--------------------|---------------|
|               | Underplate min. 1.3 µm Ni |                    |               |
|               | Mating Area               | Post Area "X"      | Post Area "Y" |
| 3             | 0.25 µm Au                | 1.3 µm Sn 100 matt | 0.10 µm Au    |
| 2             | 0.40 µm Au                | 1.3 µm Sn 100 matt | 0.25 µm Au    |



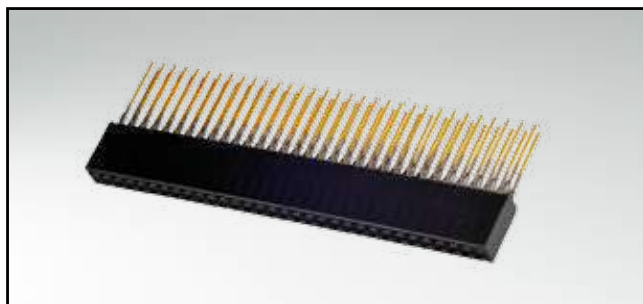
**ORDER DATA**

(Dim. = mm)

| Number of positions | Quality class 3 | Quality class 2 |
|---------------------|-----------------|-----------------|
| 40                  | 49-000023       | 49-000022       |
| 64                  | 49-000103       | 49-000102       |
| 100                 | 49-000143       | 49-000142       |

# PC104 STACK-THROUGH VERSION

Female connector – straight – press fit contact – contact length 17 mm

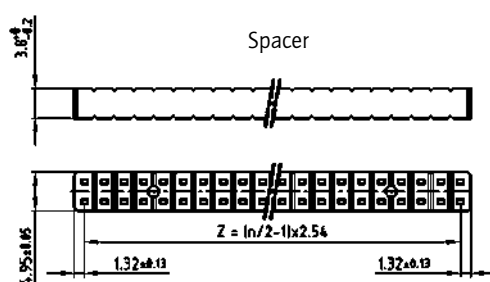
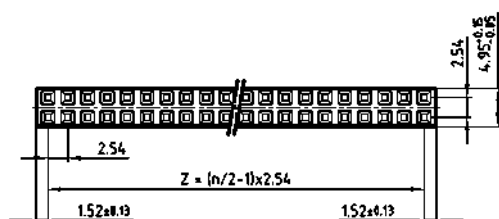
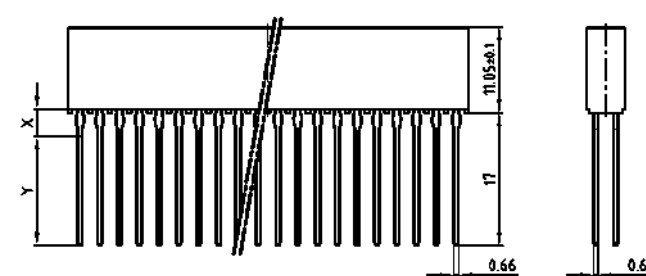


RoHS compliant

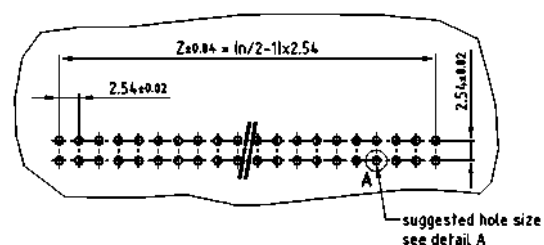
## DESCRIPTION

- Special contact length to achieve higher module stacks
- Flexible press fit design
- Double beam contacts
- 40/64/100 positions version (further versions on request)
- Quality class 3 and alternative quality class 2 available on request
- Delivered as a set with "spacer"

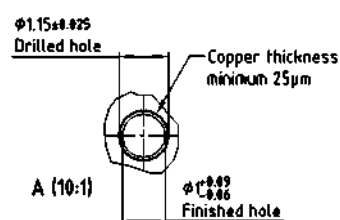
## PRODUCT DRAWING



## PCB-hole pattern



| Quality Class | Plating                   |                    |               |
|---------------|---------------------------|--------------------|---------------|
|               | Underplate min. 1.3 µm Ni |                    |               |
|               | Mating Area               | Post Area "X"      | Post Area "Y" |
| 3             | 0.25 µm Au                | 1.3 µm Sn 100 matt | 0.10 µm Au    |
| 2             | 0.40 µm Au                | 1.3 µm Sn 100 matt | 0.25 µm Au    |



## ORDER DATA

(Dim. = mm)

| Number of positions | Quality class 3 | Quality class 2 |
|---------------------|-----------------|-----------------|
| 40                  | 49-000033       | 49-000032       |
| 64                  | 49-000113       | 49-000112       |
| 100                 | 49-000153       | 49-000152       |

# PC104 Non-STACK-THROUGH VERSION

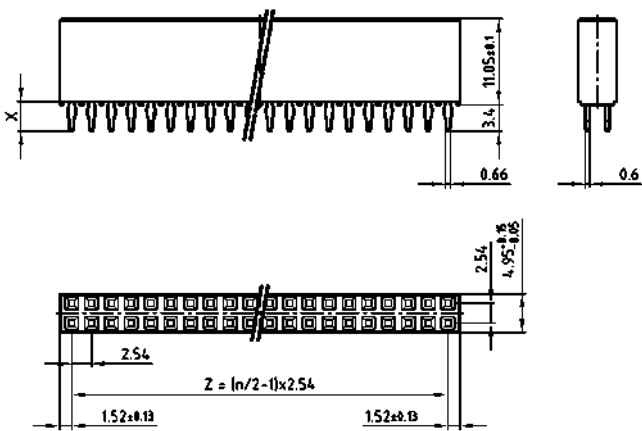
Female connector – straight – press fit contact – contact length 3.4 mm



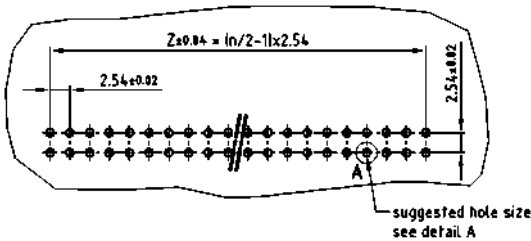
RoHS compliant

- DESCRIPTION
- Flexible press fit design
  - Double beam contacts
  - 40 / 64 / 100 positions version (further versions on request)
  - Quality class 3 and alternative quality class 2 available on request

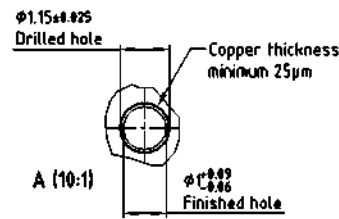
PRODUCT DRAWING



PCB-hole pattern



| Quality Class | Plating                   |                    |
|---------------|---------------------------|--------------------|
|               | Underplate min. 1.3 µm Ni |                    |
|               | Mating Area               | Post Area "X"      |
| 3             | 0.25 µm Au                | 1.3 µm Sn 100 matt |
| 2             | 0.40 µm Au                | 1.3 µm Sn 100 matt |



ORDER DATA

(Dim. = mm)

| Number of positions | Quality class 3 | Quality class 2 |
|---------------------|-----------------|-----------------|
| 40                  | 49-000013       | 49-000012       |
| 64                  | 49-000093       | 49-000092       |
| 100                 | 49-000133       | 49-000132       |

# PC104 Non-Stack-Through Version

Female connector – straight – solder pin – contact length 3.4 mm

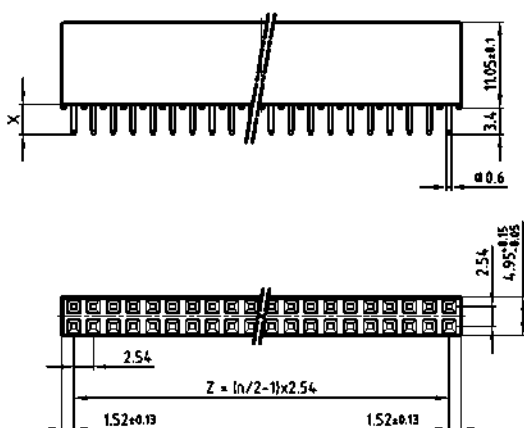


RoHS compliant

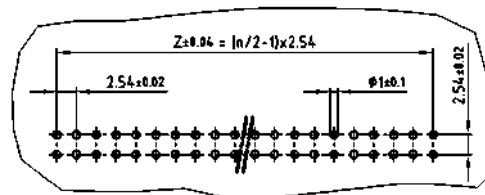
## DESCRIPTION

- Double beam contacts
- 40 / 64 / 100 positions version (further versions on request)
- Quality class 3 and alternative quality class 2 available on request

## PRODUCT DRAWING



## PCB-hole pattern



| Quality Class | Plating                   |                    |
|---------------|---------------------------|--------------------|
|               | Underplate min. 1.3 µm Ni |                    |
|               | Mating Area               | Post Area "X"      |
| 3             | 0.25 µm Au                | 1.3 µm Sn 100 matt |
| 2             | 0.40 µm Au                | 1.3 µm Sn 100 matt |

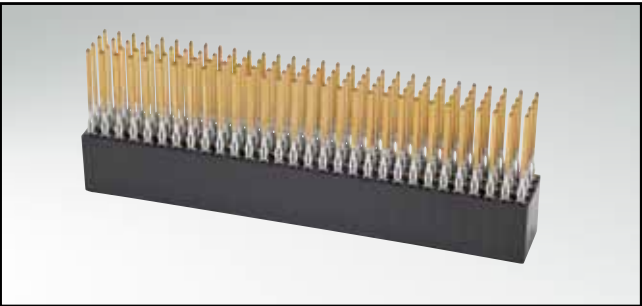
## ORDER DATA

(Dim. = mm)

| Number of positions | Quality class 3 | Quality class 2 |
|---------------------|-----------------|-----------------|
| 40                  | 49-000043       | 49-000042       |
| 64                  | 49-000123       | 49-000122       |
| 100                 | 49-000163       | 49-000162       |

# PC104PLUS STACK-THROUGH VERSION

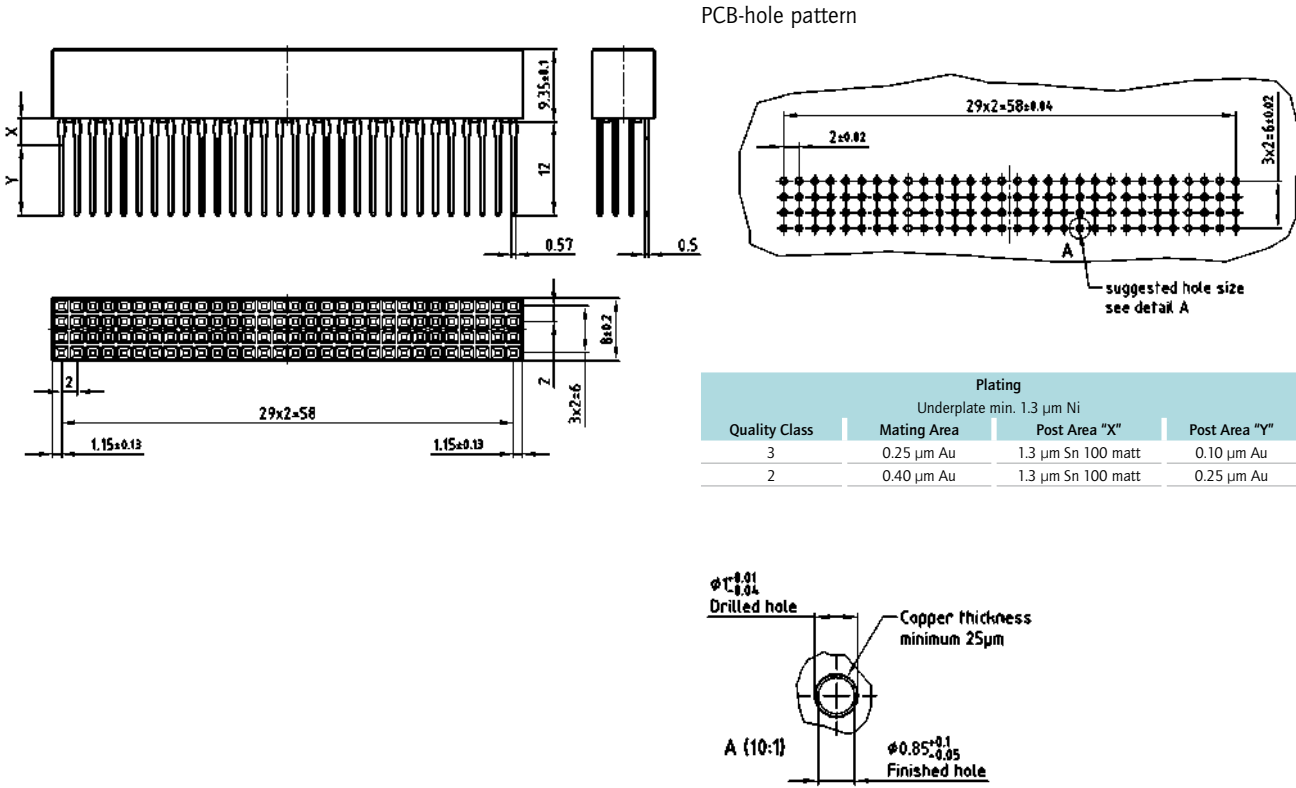
Female connector – straight – press fit contact – contact length 12.2 mm



RoHS compliant

- DESCRIPTION**
- Flexible press fit design
  - Double beam contacts
  - Standard version 120 positions
  - Quality class 3 and alternative quality class 2 available on request

**PRODUCT DRAWING**



**ORDER DATA** (Dim. = mm)

| Number of positions | Quality class 3 | Quality class 2 |
|---------------------|-----------------|-----------------|
| 120                 | 49-100023       | 49-100022       |

# PC104PLUS Non-STACK-THROUGH VERSION

Female connector – straight – press fit contact – contact length 3.0 mm



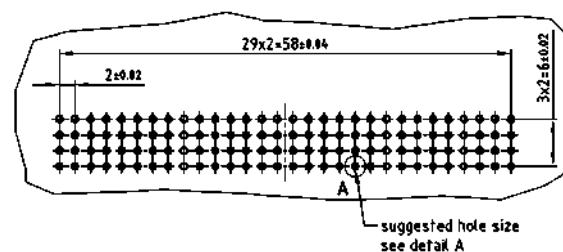
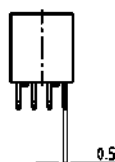
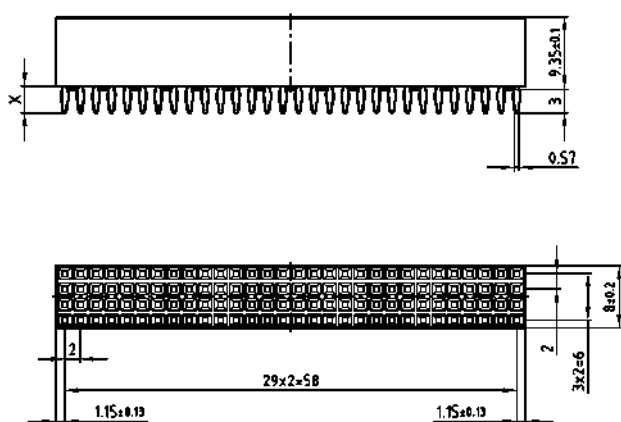
RoHS compliant

## DESCRIPTION

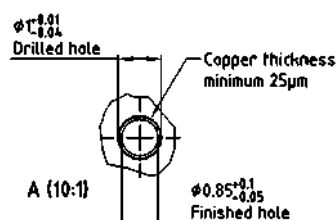
- Flexible press fit design
- Double beam contacts
- Standard version 120-position
- Quality class 3 and alternative quality class 2 available on request

## PRODUCT DRAWING

### PCB-hole pattern



| Quality Class | Plating                   |                                     |
|---------------|---------------------------|-------------------------------------|
|               | Underplate min. 1.3 µm Ni |                                     |
| 3             | Mating Area<br>0.25 µm Au | Post Area "X"<br>1.3 µm Sn 100 matt |
| 2             | Mating Area<br>0.40 µm Au | Post Area "X"<br>1.3 µm Sn 100 matt |



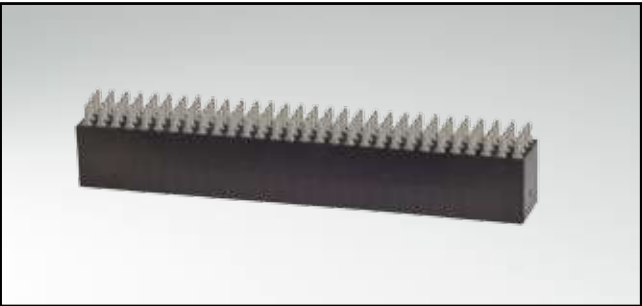
## ORDER DATA

(Dim. = mm)

| Number of positions | Quality class 3 | Quality class 2 |
|---------------------|-----------------|-----------------|
| 120                 | 49-100013       | 49-100012       |

# PC104PLUS Non-STACK-THROUGH VERSION

Female connector – straight – solder pin – contact length 3.0 mm

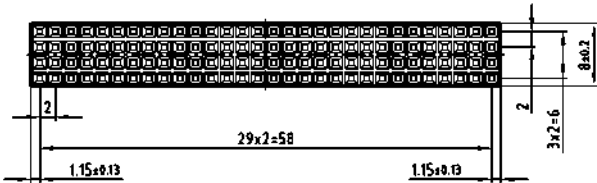
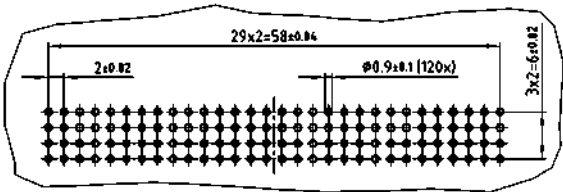
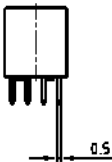
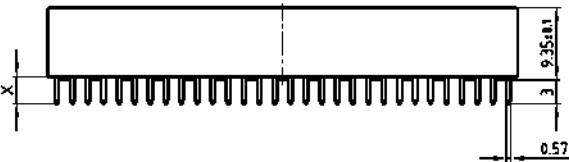


RoHS compliant

- DESCRIPTION**
- Double beam contacts
  - Standard version 120-position
  - Standard finishing quality class 2, alternative quality class 3

**PRODUCT DRAWING**

PCB-hole pattern



| Quality Class | Plating                   |                    |
|---------------|---------------------------|--------------------|
|               | Underplate min. 1.3 µm Ni |                    |
|               | Mating Area               | Post Area "X"      |
| 3             | 0.25 µm Au                | 1.3 µm Sn 100 matt |
| 2             | 0.40 µm Au                | 1.3 µm Sn 100 matt |

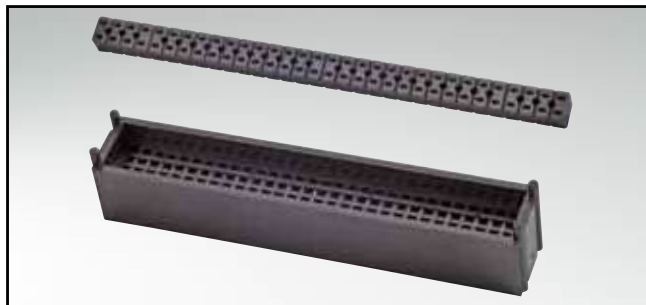
**ORDER DATA**

(Dim. = mm)

| Number of positions | Quality class 3 | Quality class 2 |
|---------------------|-----------------|-----------------|
| 120                 | 49-100003       | 49-100002       |

# PC104 UND PC104PLUS ACCESSORIES

## Spacer and interconnection housing "shroud"



RoHS compliant

### DESCRIPTION

#### Spacer

- Can be ordered separately
- 40/64/100 positions version (further positions on request)

#### Interconnection housing (shroud)

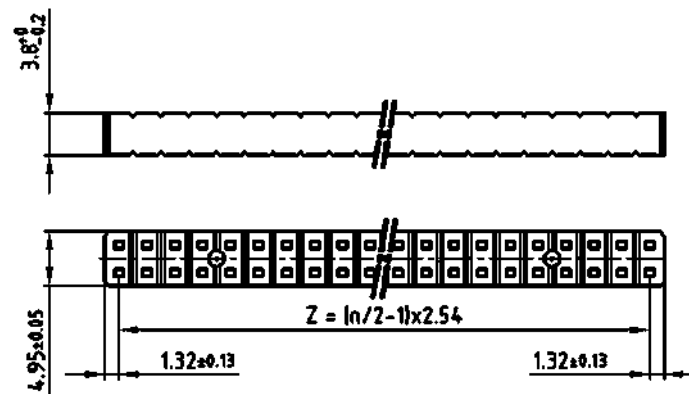
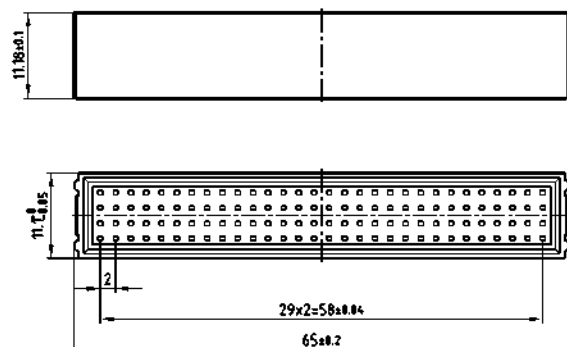
- Specific shroud to stabilize and guide stack-through contacts
- Available with and without positioning
- Color is black (further colors on request)

### PRODUCT DRAWING

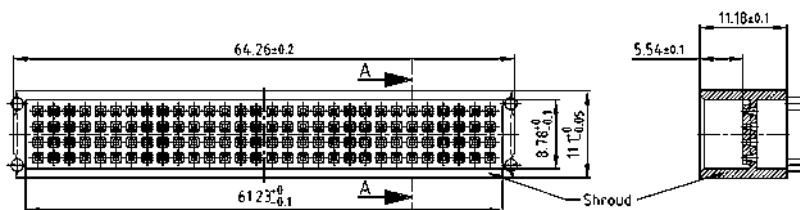
Interconnection housing for PC104plus

Spacer for PC104

Version without positioning



Version with positioning



(Dim. = mm)

### ORDER DATA

| INTERCONNECTION HOUSING PC104PLUS |                     |             |
|-----------------------------------|---------------------|-------------|
| No. of Pos.                       | Design              | Part number |
| 120                               | with positioning    | 49-100030   |
| 120                               | without positioning | 49-100040   |

| SPACER FOR PC104    |             |
|---------------------|-------------|
| Number of positions | Part number |
| 40                  | 49-100080   |
| 64                  | 49-100060   |
| 100                 | 49-100050   |

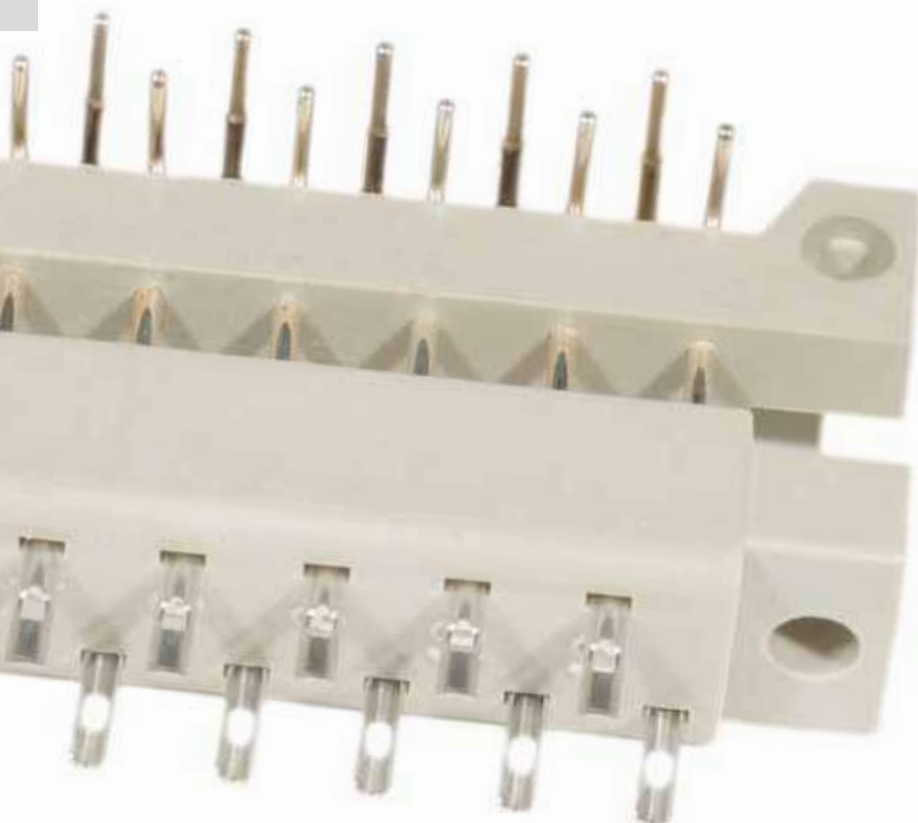
## SECTION 7

# CONNECTORS DIN 41617

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This traditional connector is still being used in many applications. New designs as well as redesigns of existing systems are manufactured with this series of connectors.

One reason is the proven solid design and the high current carrying capability.





The connector is available in three layouts:  
13, 21 and 31 positions in male and female  
version with gold or silver plated contacts.  
Available termination styles are: solder cup,  
straight and right angled PCB solder tails.

In addition a connector converter from  
DIN 41617 to DIN EN 60603-2 provides  
adaptability to the newer connector series.

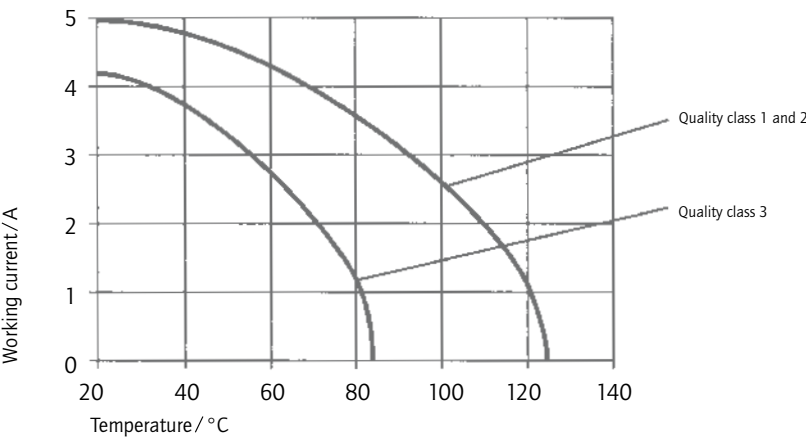


TECHNICAL DATA

| Material                               |                 | DIN 41617                                                                                          | DIN 41617 / DIN EN 60603 |
|----------------------------------------|-----------------|----------------------------------------------------------------------------------------------------|--------------------------|
| Insulator                              |                 | Polycarbonat GF                                                                                    |                          |
| Contacts                               |                 | Copper alloy                                                                                       |                          |
| Flammability                           |                 | UL 94 V-1                                                                                          |                          |
| Initial contact resistance             |                 | ≤ 15 mΩ                                                                                            | ≤ 10 mΩ                  |
| Initial insulation resistance          | Quality class 1 | ≥ 10 <sup>12</sup> Ω                                                                               | ≥ 10 <sup>11</sup> Ω     |
|                                        | Quality class 2 | ≥ 10 <sup>11</sup> Ω                                                                               |                          |
|                                        | Quality class 3 | ≥ 10 <sup>10</sup> Ω                                                                               |                          |
| Creepage distance                      | Contact–Ground  | ≥ 1 mm                                                                                             | ≥ 1.2 mm                 |
|                                        | Contact–Contact | ≥ 0.5 mm                                                                                           |                          |
| Clearance distance                     | Contact–Ground  | ≥ 1 mm                                                                                             | ≥ 1.2 mm                 |
|                                        | Contact–Contact | ≥ 1 mm                                                                                             |                          |
| Voltage Proof U eff.                   | Contact–Ground  | 900 V                                                                                              | 1000 V                   |
|                                        | Contact–Contact | 1150 V                                                                                             | 1550 V                   |
| Working voltage                        |                 | 250 V<br>depending on isolation coordination (refer to DIN VDE 0110/IEC 664-1)                     |                          |
| Working current                        | + 20 °C         | Quality class 1 + 2 = 4 A max.                                                                     | 4 A max.                 |
|                                        | + 70 °C         |                                                                                                    |                          |
|                                        | + 100 °C        | Quality class 3 = 2 A max.                                                                         |                          |
| Working temperature                    | Quality class 1 | -65 °C to +125 °C                                                                                  | -65 °C to +125 °C        |
|                                        | Quality class 2 | -55 °C to +125 °C                                                                                  |                          |
|                                        | Quality class 3 | -25 °C to + 85 °C                                                                                  |                          |
| Mating and unmating forces<br>(F max.) |                 | 13 pos. 32 N / AU    30 N / AG<br>21 pos. 33 N / AU    48 N / AG<br>31 pos. 48 N / AU    70 N / AG | 31 + 1 pos. 80 N         |
| Quality class 3                        |                 | 50 cycles                                                                                          | 50 cycles                |
| Quality class 2                        |                 | 400 cycles                                                                                         | 400 cycles               |
| Quality class 1                        |                 | 500 cycles                                                                                         | 500 cycles               |
| Silver plating                         |                 | 500 cycles                                                                                         |                          |

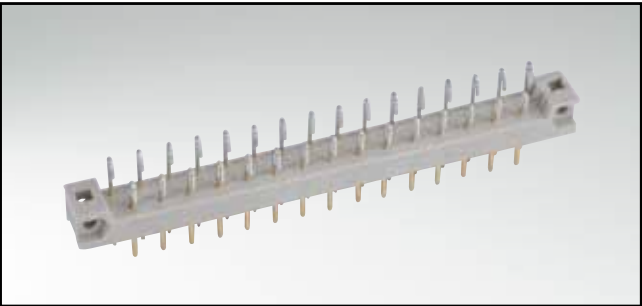
Technical alterations are subjects to change without notice.

Derating-Diagramm DIN 41617



# CONNECTOR ACCORDING TO DIN 41617

Male connector – solder lug – 13, 21 and 31 positions

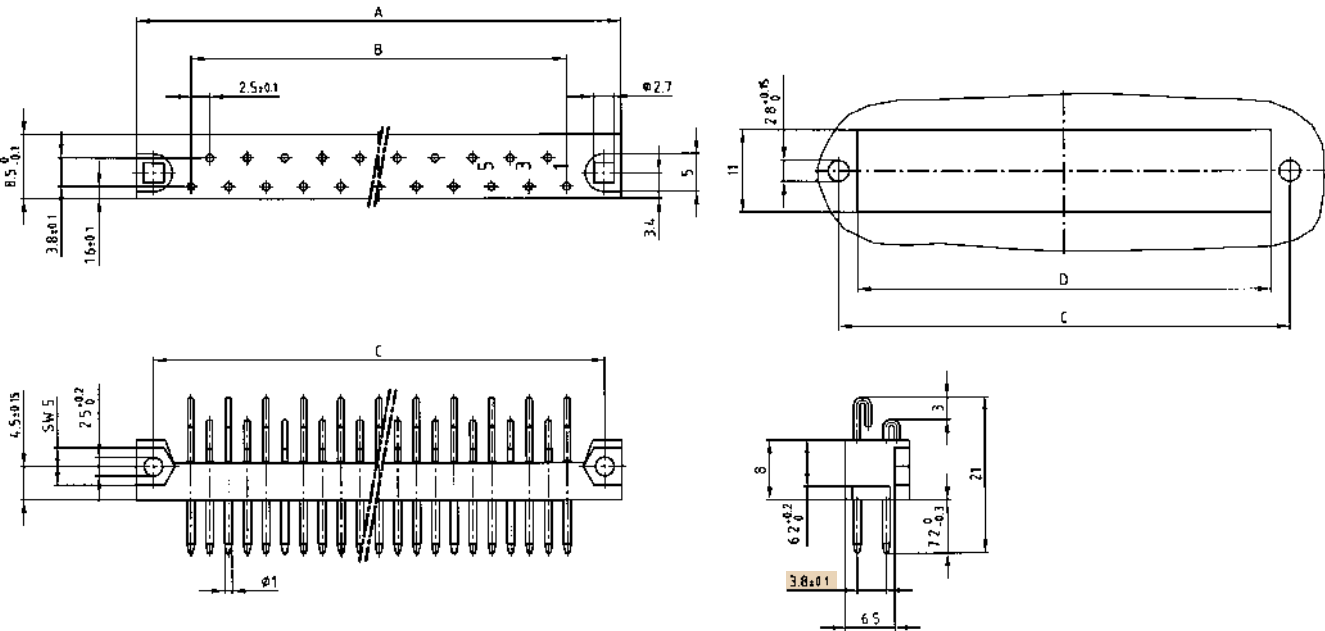


RoHS compliant

- DESCRIPTION**
- Solder lug
  - Contact plating
    - standard quality classes 3 and 2
    - quality class 1 on request (\*)
    - hard silver plated
  - Special insulator

**PRODUCT DRAWING**

Panel cutout



| No. of Pos. | A ± 0.2 | B ± 0.1       | C ± 0.1 | D  |
|-------------|---------|---------------|---------|----|
| 13          | 44.6    | 12 x 2.5 = 30 | 40      | 35 |
| 21          | 64.6    | 20 x 2.5 = 50 | 60      | 55 |
| 31          | 89.6    | 30 x 2.5 = 75 | 85      | 80 |

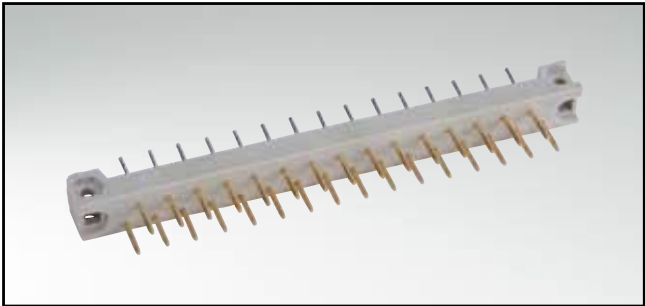
**ORDER DATA**

(Dim. = mm)

| No. of Pos. | hard silver plated | Quality class 3 | Quality class 2 | Quality class 1 * |
|-------------|--------------------|-----------------|-----------------|-------------------|
| 13          | 101 E 10139 X      | 101 A 10139 X   | 101 B 10139 X   | 101 C 10139 X     |
| 21          | 101 E 10149 X      | 101 A 10149 X   | 101 B 10149 X   | 101 C 10149 X     |
| 31          | 101 E 10159 X      | 101 A 10159 X   | 101 B 10159 X   | 101 C 10159 X     |

# CONNECTOR ACCORDING TO DIN 41617

Male connector – straight – 13, 21 and 31 positions



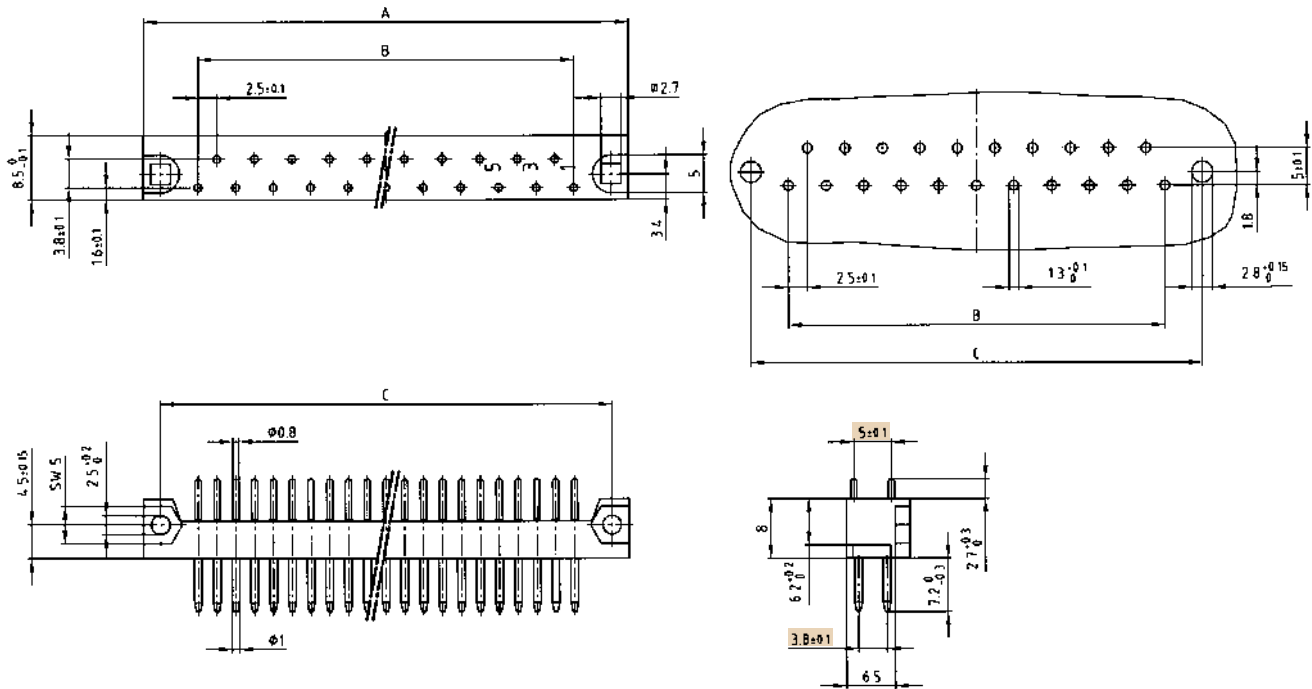
RoHS compliant

DESCRIPTION

- Solder pin
- Contact plating
  - standard quality classes 3 and 2
  - quality class 1 on request (\*)
  - hard silver plated
- Special insulator

PRODUCT DRAWING

PCB-hole pattern



| No. of Pos. | A ±0.2 | B ±0.1    | C ±0.1 |
|-------------|--------|-----------|--------|
| 13          | 44.6   | 12x2.5=30 | 40     |
| 21          | 64.6   | 20x2.5=50 | 60     |
| 31          | 89.6   | 30x2.5=75 | 85     |

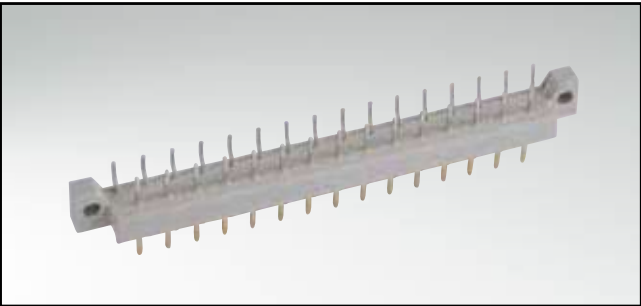
ORDER DATA

(Dim. = mm)

| No. of Pos. | hard silver plated | Quality class 3 | Quality class 2 | Quality class 1* |
|-------------|--------------------|-----------------|-----------------|------------------|
| 13          | 101 E 10019 X      | 101 A 10019 X   | 101 B 10019 X   | 101 C 10019 X    |
| 21          | 101 E 10029 X      | 101 A 10029 X   | 101 B 10029 X   | 101 C 10029 X    |
| 31          | 101 E 10039 X      | 101 A 10039 X   | 101 B 10039 X   | 101 C 10039 X    |

# CONNECTOR ACCORDING TO DIN 41617

Male connector – angled – 13, 21 and 31 positions

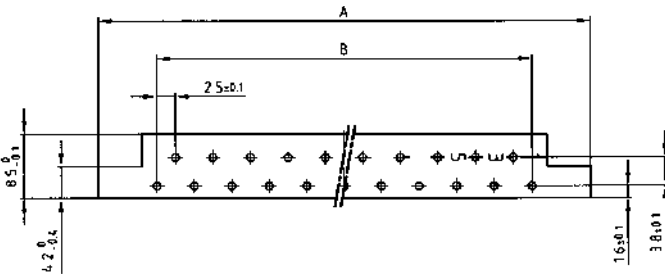


RoHS compliant

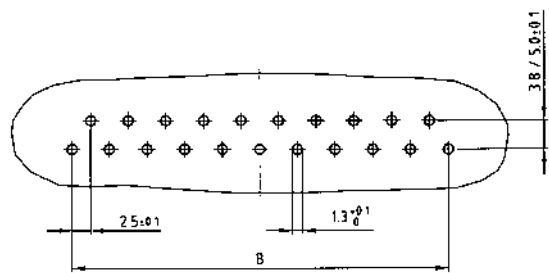
## DESCRIPTION

- Solder pin
- Contact plating
  - standard quality classes 3 and 2
  - quality class 1 on request (\*)
  - hard silver plated
- Standard insulator

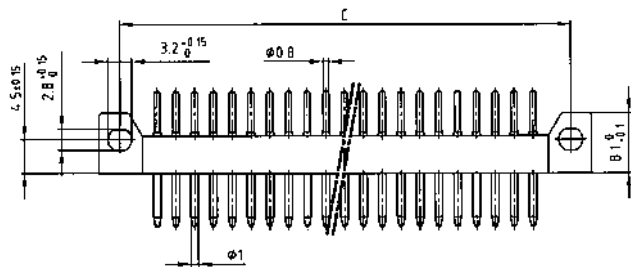
## PRODUCT DRAWING



PCB-hole pattern

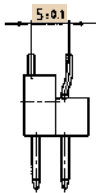
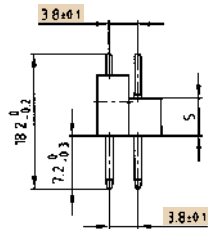


Contact spacing



3,8 mm

5,0 mm



| No. of Pos. | A ±0.2 | B ±0.1    | C ±0.1 |
|-------------|--------|-----------|--------|
| 13          | 45.6   | 12x2.5=30 | 40     |
| 21          | 65.6   | 20x2.5=50 | 60     |
| 31          | 89.6   | 30x2.5=75 | 85     |

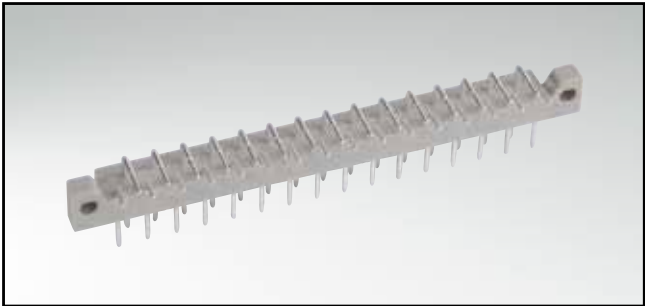
## ORDER DATA

(Dim. = mm)

| No. of Pos. | Contact spacing | hard silver plated | Quality class 3 | Quality class 2 | Quality class 1 * |
|-------------|-----------------|--------------------|-----------------|-----------------|-------------------|
| 13          | 3.8 mm          | 101 E 10049 X      | 101 A 10049 X   | 101 B 10049 X   | 101 C 10049 X     |
| 13          | 5.0 mm          | 101 E 10169 X      | 101 A 10169 X   | 101 B 10169 X   | 101 C 10169 X     |
| 21          | 3.8 mm          | 101 E 10059 X      | 101 A 10059 X   | 101 B 10059 X   | 101 C 10059 X     |
| 21          | 5.0 mm          | 101 E 10179 X      | 101 A 10179 X   | 101 B 10179 X   | 101 C 10179 X     |
| 31          | 3.8 mm          | 101 E 10069 X      | 101 A 10069 X   | 101 B 10069 X   | 101 C 10069 X     |
| 31          | 5.0 mm          | 101 E 10189 X      | 101 A 10189 X   | 101 B 10189 X   | 101 C 10189 X     |

# CONNECTOR ACCORDING TO DIN 41617

Male connector – angled – 13, 21 and 31 positions

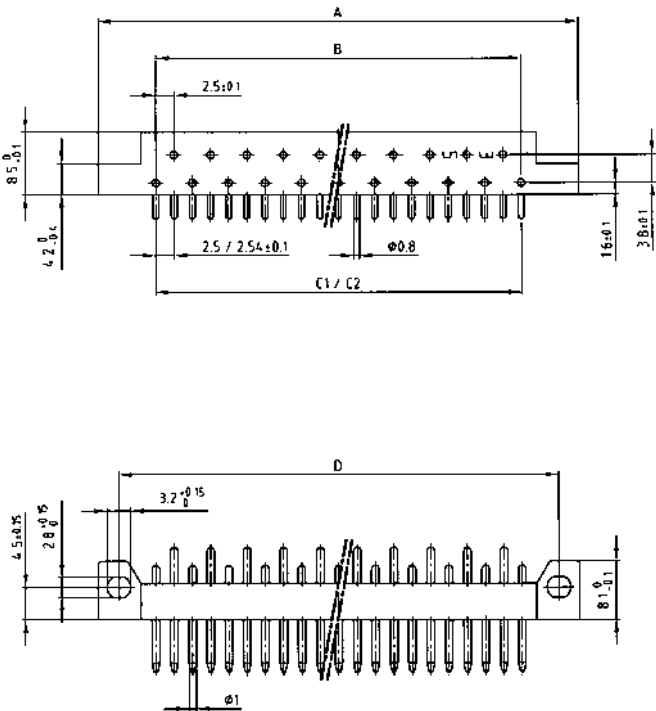


RoHS compliant

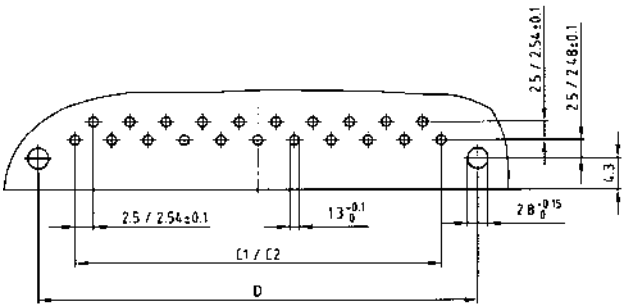
DESCRIPTION

- Solder pin
- Contact plating
  - standard quality classes 3 and 2
  - quality class 1 on request (\*)
  - hard silver plated
- Standard insulator

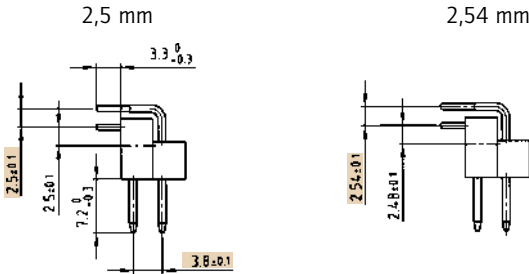
PRODUCT DRAWING



PCB-hole pattern



Contact spacing



| No. of Pos. | A ±0.2 | B ±0.1    | C <sub>1</sub> ±0.1 | C <sub>2</sub> ±0.1 | D ±0.1 |
|-------------|--------|-----------|---------------------|---------------------|--------|
| 13          | 45.6   | 12x2.5=30 | 12x2.5=30           | 12x2.54=30.48       | 40     |
| 21          | 65.6   | 20x2.5=50 | 20x2.5=50           | 20x2.54=50.80       | 60     |
| 31          | 90.6   | 30x2.5=75 | 30x2.5=75           | 30x2.54=75.20       | 85     |

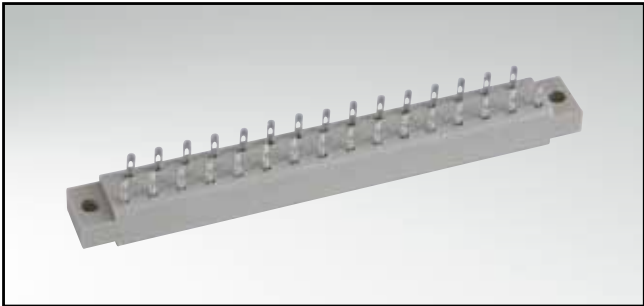
ORDER DATA

(Dim. = mm)

| No. of Pos. | Contact spacing | hard silver plated | Quality class 3 | Quality class 2 | Quality class 1 * |
|-------------|-----------------|--------------------|-----------------|-----------------|-------------------|
| 13          | 2.50 mm         | 101 E 10079 X      | 101 A 10079 X   | 101 B 10079 X   | 101 C 10079 X     |
| 13          | 2.54 mm         | 101 E 10089 X      | 101 A 10089 X   | 101 B 10089 X   | 101 C 10089 X     |
| 21          | 2.50 mm         | 101 E 10099 X      | 101 A 10099 X   | 101 B 10099 X   | 101 C 10099 X     |
| 21          | 2.54 mm         | 101 E 10109 X      | 101 A 10109 X   | 101 B 10109 X   | 101 C 10109 X     |
| 31          | 2.50 mm         | 101 E 10119 X      | 101 A 10119 X   | 101 B 10119 X   | 101 C 10119 X     |
| 31          | 2.54 mm         | 101 E 10129 X      | 101 A 10129 X   | 101 B 10129 X   | 101 C 10129 X     |

# CONNECTOR ACCORDING TO DIN 41617

Female connector – solder lug – 13, 21 and 31 positions

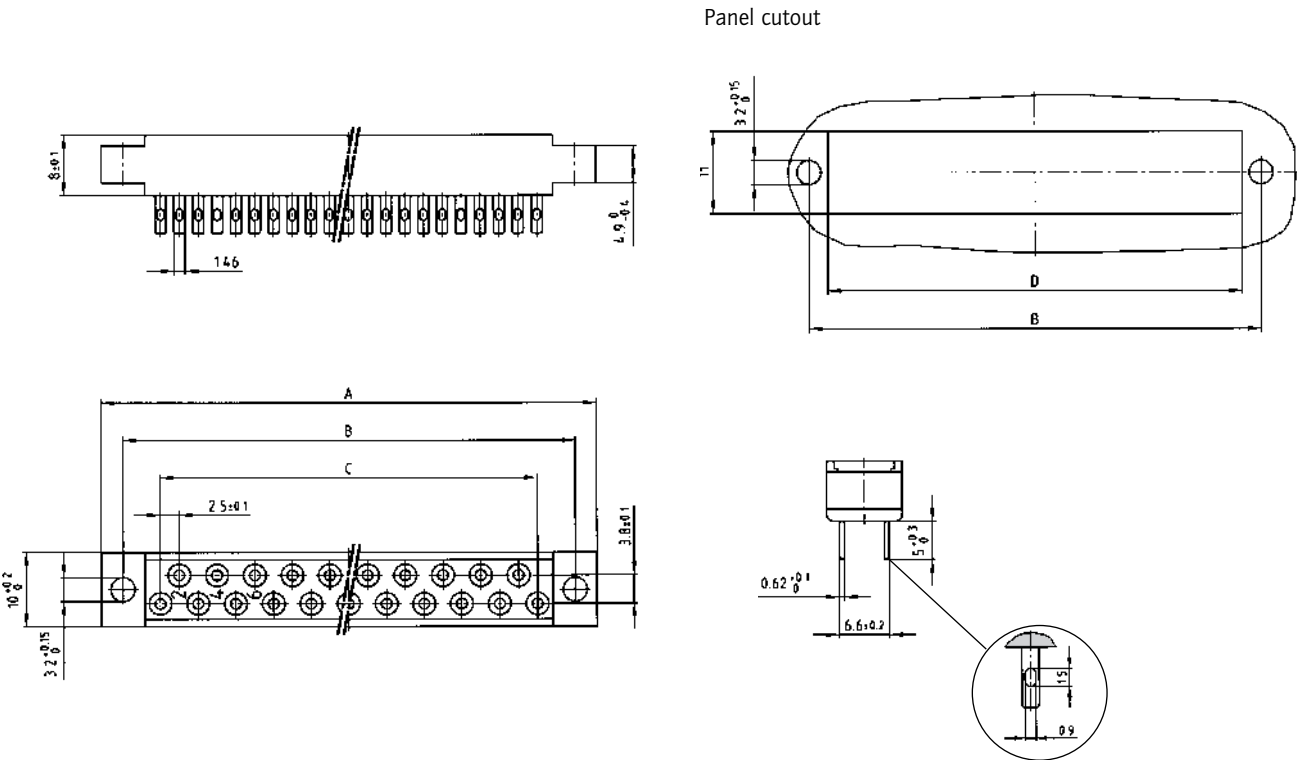


RoHS compliant

DESCRIPTION

- Solder lug
- Contact plating
  - standard quality classes 3 and 2
  - quality class 1 on request (\*)
  - hard silver plated

PRODUCT DRAWING



| No. of Pos. | A ±0.3 | B ±0.1 | C ±0.1    | D  |
|-------------|--------|--------|-----------|----|
| 13          | 45.8   | 40     | 12x2.5=30 | 35 |
| 21          | 65.8   | 60     | 20x2.5=50 | 55 |
| 31          | 90.8   | 85     | 30x2.5=75 | 80 |

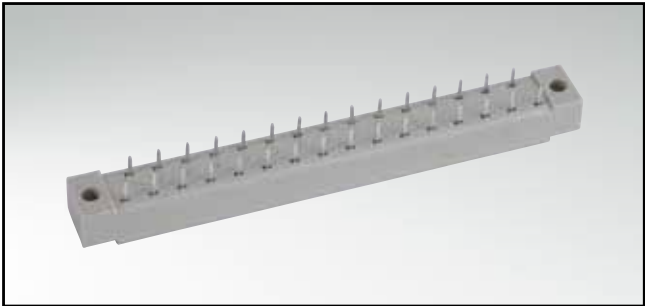
ORDER DATA

(Dim. = mm)

| No. of Pos. | hard silver plated | Quality class 3 | Quality class 2 | Quality class 1 * |
|-------------|--------------------|-----------------|-----------------|-------------------|
| 13          | 102 E 10019 X      | 102 A 10019 X   | 102 B 10019 X   | 102 C 10019 X     |
| 21          | 102 E 10029 X      | 102 A 10029 X   | 102 B 10029 X   | 102 C 10029 X     |
| 31          | 102 E 10039 X      | 102 A 10039 X   | 102 B 10039 X   | 102 C 10039 X     |

# CONNECTOR ACCORDING TO DIN 41617

Female connector – straight – 13, 21 and 31 positions

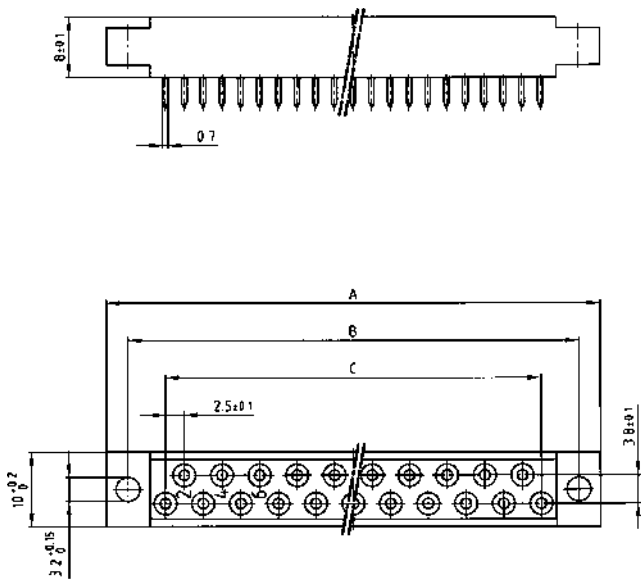


RoHS compliant

DESCRIPTION

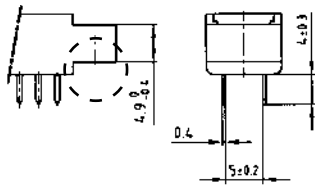
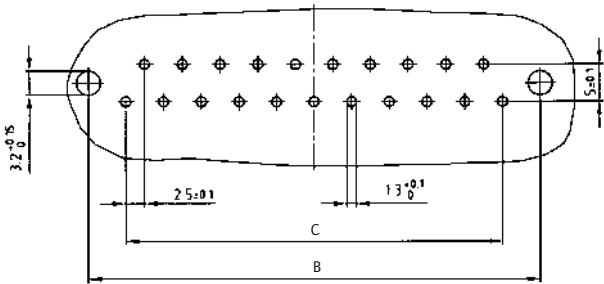
- Solder pin
- Insulator “set up” (A) or “connected” (D)
- Contact plating
  - standard quality classes 3 and 2
  - quality class 1 on request (\*)
  - hard silver plated

PRODUCT DRAWING

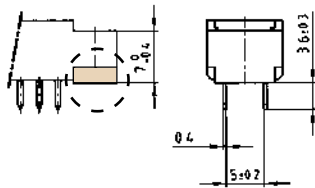


| No. of Pos. | A -0.3 | B ±0.1 | C ±0.1    |
|-------------|--------|--------|-----------|
| 13          | 45.8   | 40     | 12x2.5=30 |
| 21          | 65.8   | 60     | 20x2.5=50 |
| 31          | 90.8   | 85     | 30x2.5=75 |

PCB-hole pattern



Version A  
“set up”



Version D  
“connected”

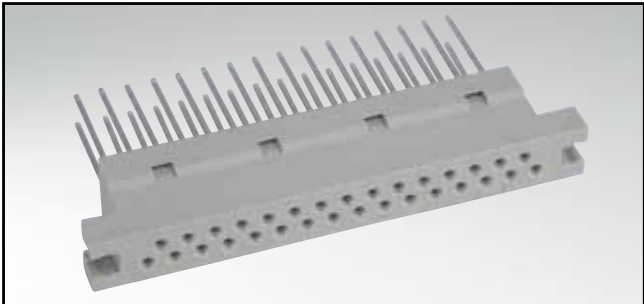
ORDER DATA

(Dim. = mm)

| No. of Pos. | Insulator | hard silver plated | Quality class 3 | Quality class 2 | Quality class 1 * |
|-------------|-----------|--------------------|-----------------|-----------------|-------------------|
| 13          | Version A | 102 E 10049 X      | 102 A 10049 X   | 102 B 10049 X   | 102 C 10049 X     |
| 13          | Version D | 102 E 10059 X      | 102 A 10059 X   | 102 B 10059 X   | 102 C 10059 X     |
| 21          | Version A | 102 E 10069 X      | 102 A 10069 X   | 102 B 10069 X   | 102 C 10069 X     |
| 21          | Version D | 102 E 10079 X      | 102 A 10079 X   | 102 B 10079 X   | 102 C 10079 X     |
| 31          | Version A | 102 E 10089 X      | 102 A 10089 X   | 102 B 10089 X   | 102 C 10089 X     |
| 31          | Version D | 102 E 10099 X      | 102 A 10099 X   | 102 B 10099 X   | 102 C 10099 X     |

# CONNECTOR ACCORDING TO DIN 41617 / DIN EN 60603-2

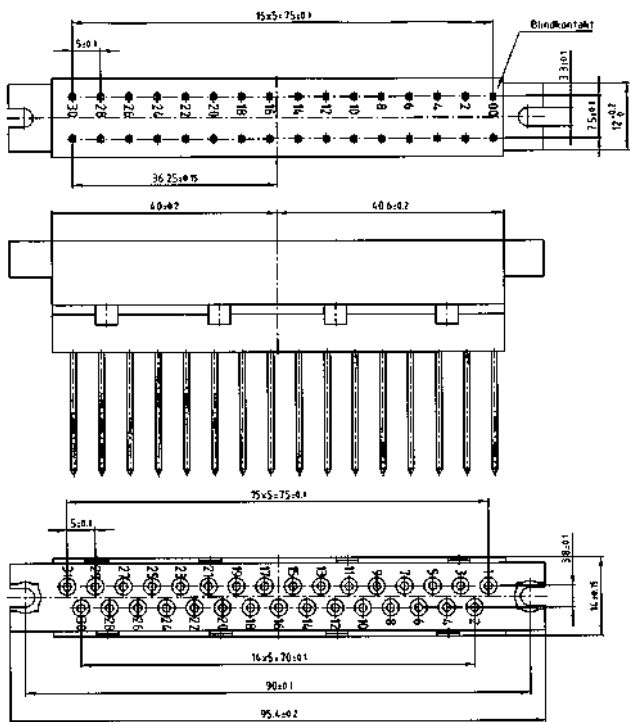
## Converter female connector – 31 / 32 positions



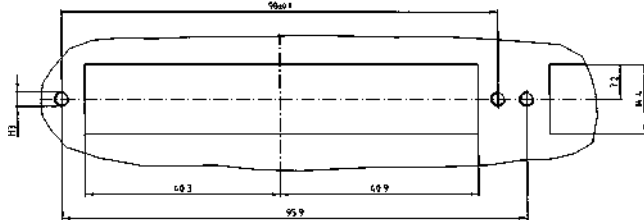
RoHS compliant

- DESCRIPTION**
- Wire Wrap and solder lug
  - Quality class 1 (Standard)
  - Mating side with 31 contacts
  - Connecting side with 32 contacts (one contact not contacted)

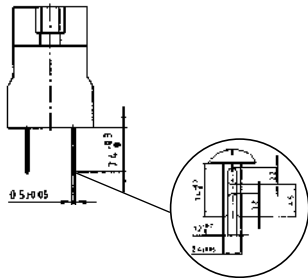
**PRODUCT DRAWING**



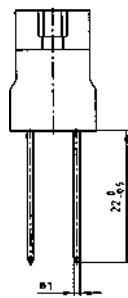
**Panel cutout**



**Solder lug**



**Wire Wrap**



**ORDER DATA**

| No. of Pos. | Quality class | Solder lug    | Wire Wrap     |
|-------------|---------------|---------------|---------------|
| 31/32       | 1             | 122 C 13019 X | 122 C 13069 X |

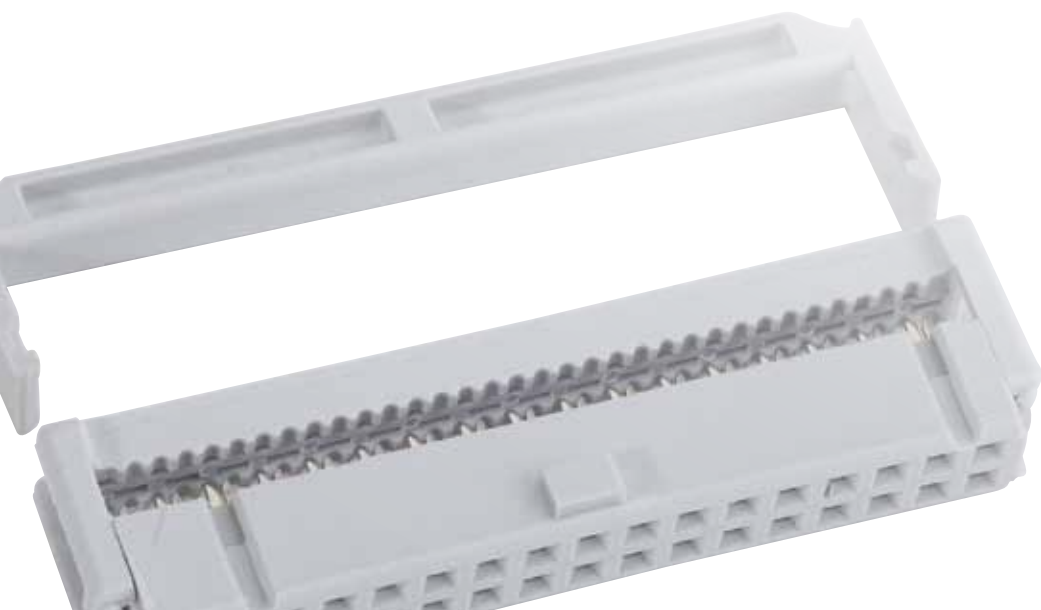
## SECTION 8

# FLATCABLE CONNECTORS DIN 41651

The CONEC flatcable connector system meets DIN 41651 requirement. It is a reliable and cost effective interconnect system.

The flat cables used with this connector family have 10 to 64 (AWG 28) conductors at 1.27 mm pitch.

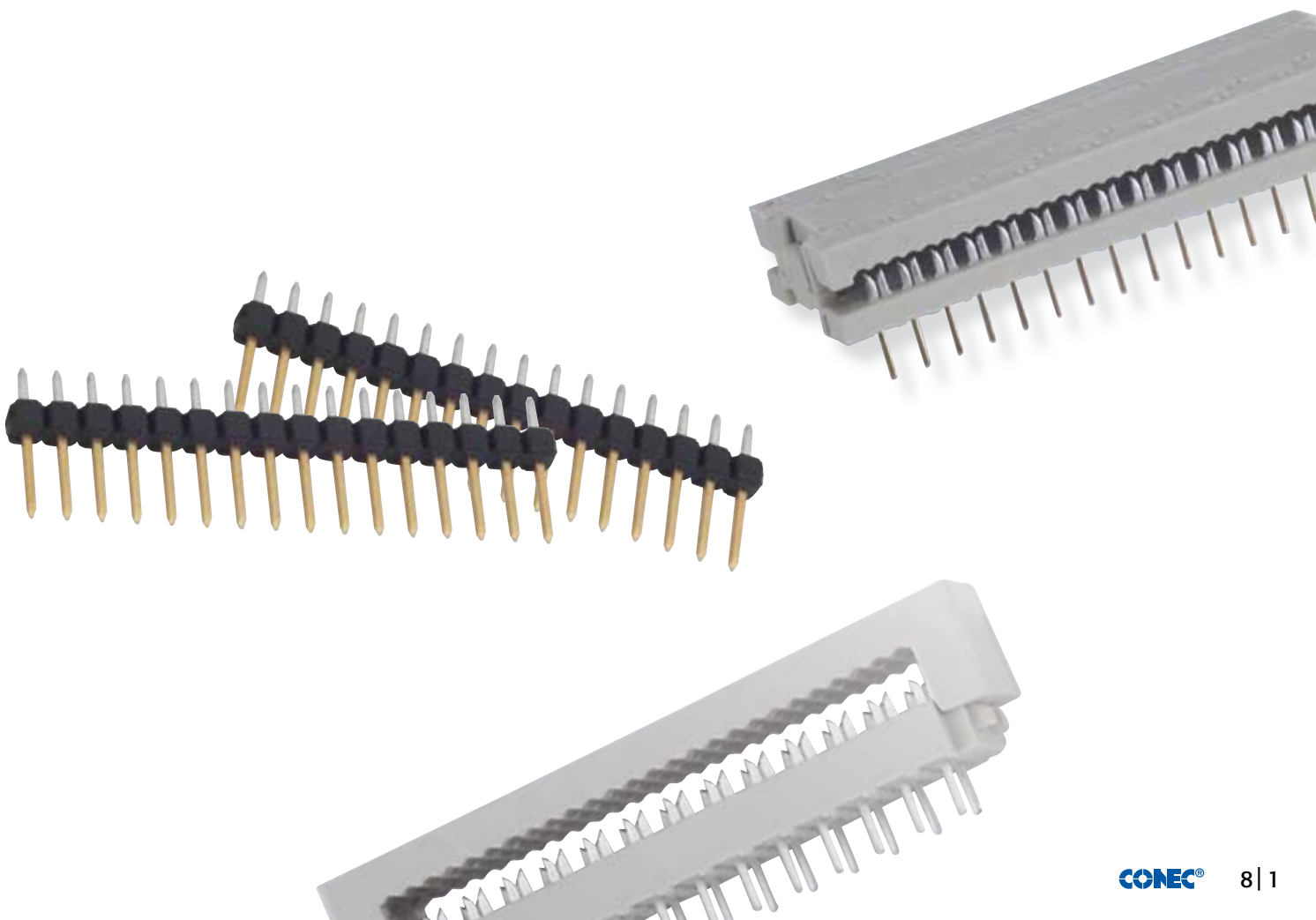
The shrouded headers provide convenient guide for the mating socket connectors. The shroud also provides polarization to prevent incorrect mating. The locking ears not only provide latching of the mated pair but also act as ejectors for unmating the mated pair.





CONEC has beside the DIN41651 Connector serie another flatcable connectors in the program. This are D-Subminiature, Type C (DIN 41612), DIP and PCB Connectors.

Plug and Socket Connectors with 2.54 mm contact spacing complete the program.



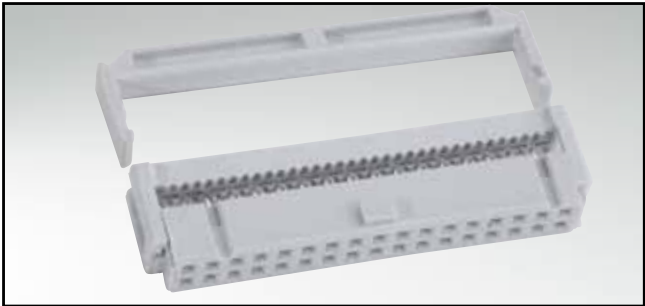
TECHNICAL DATA

| Materials                                             | DIN 41651                             | DIP + PCB                      | DIN 41612-IDC    | CBL                            | CSU                            |
|-------------------------------------------------------|---------------------------------------|--------------------------------|------------------|--------------------------------|--------------------------------|
| Insulator                                             | PBT GF                                |                                |                  | PA                             | PA                             |
| Flammability                                          | UL 94 V-O                             |                                |                  |                                |                                |
| Material contacts                                     | Copper alloy                          |                                |                  |                                |                                |
| Contact plating                                       | gold over nickel                      | gold over nickel or tin plated | gold over nickel | gold over nickel or tin plated | gold over nickel or tin plated |
| Working temperature                                   | -65° C to +150° C                     |                                |                  | -40°C to +135°C                | -45°C to +115°C                |
| Working current                                       | 1 A                                   |                                |                  | 5 A<br>+70° C                  |                                |
| Insulation resistance                                 |                                       | ≥ 10 <sup>12</sup> Ω           |                  | ≥ 10 <sup>12</sup> Ω           | ≥ 10 <sup>12</sup> Ω           |
| Contact resistance                                    |                                       |                                |                  | ≤ 10 mΩ                        | 4 mΩ                           |
| Voltage proof                                         | 1000 V eff.                           | 550 V eff.                     |                  |                                |                                |
| Working voltage                                       |                                       | 250 V                          |                  |                                | 250 V                          |
| Quality class 3<br>Quality class 2<br>Quality class 1 | 50 cycles<br>400 cycles<br>500 cycles |                                |                  |                                |                                |

Technical alterations are subjects to change without notice.

# FLATCABLE CONNECTORS

## Socket connector – insulation displacement termination (IDC)

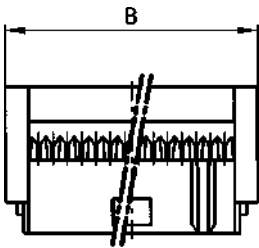
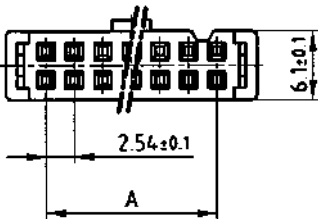


RoHS compliant

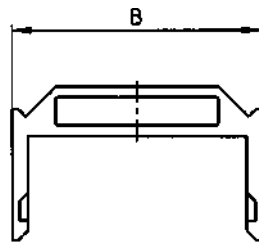
DESCRIPTION

- Contact spacing 2.54 mm
- 6 to 64 positions
- Strain relief needs to be ordered separately
- With polarization key
- Standard quality class 3
- Other quality classes on request

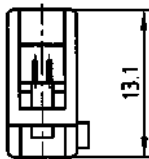
PRODUCT DRAWING



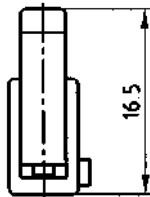
strain relief



without strain relief



with strain relief (installed)



| No. of Pos. | A ± 0.1          | B ± 0.2 | No. of Pos. | A ± 0.1           | B ± 0.2 |
|-------------|------------------|---------|-------------|-------------------|---------|
| 06          | 2 x 2.54 = 5.08  | 12.30   | 26          | 12 x 2.54 = 30.48 | 37.60   |
| 08          | 3 x 2.54 = 7.62  | 14.80   | 34          | 16 x 2.54 = 40.64 | 47.80   |
| 10          | 4 x 2.54 = 10.16 | 17.30   | 40          | 19 x 2.54 = 48.26 | 55.40   |
| 14          | 6 x 2.54 = 15.24 | 22.40   | 50          | 24 x 2.54 = 60.96 | 68.10   |
| 16          | 7 x 2.54 = 17.78 | 24.90   | 60          | 29 x 2.54 = 73.66 | 80.80   |
| 20          | 9 x 2.54 = 22.86 | 30.00   | 64          | 31 x 2.54 = 78.74 | 85.85   |

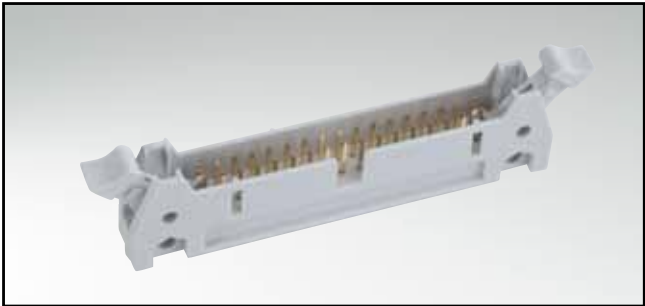
ORDER DATA

(Dim. = mm)

| No. of Pos. | Socket connector | Strain relief | No. of Pos. | Socket connector | Strain relief |
|-------------|------------------|---------------|-------------|------------------|---------------|
| 6           | 142 A 10199 X    |               | 26          | 142 A 10259 X    | 140 X 10099 X |
| 8           | 142 A 10209 X    |               | 34          | 142 A 10269 X    | 140 X 10109 X |
| 10          | 142 A 10219 X    | 140 X 10059 X | 40          | 142 A 10279 X    | 140 X 10119 X |
| 14          | 142 A 10229 X    | 140 X 10069 X | 50          | 142 A 10289 X    | 140 X 10129 X |
| 16          | 142 A 10239 X    | 140 X 10079 X | 60          | 142 A 10299 X    | 140 X 10139 X |
| 20          | 142 A 10249 X    | 140 X 10089 X | 64          | 142 A 10419 X    | 140 X 10159 X |

FLATCABLE CONNECTORS

Plug connector – straight



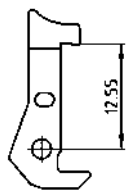
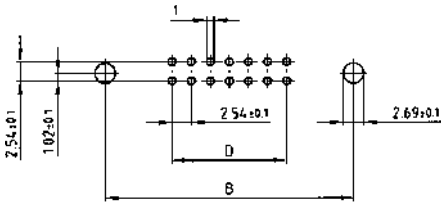
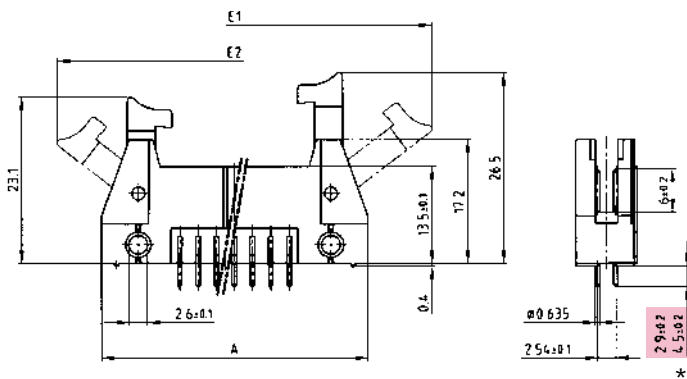
RoHS compliant

DESCRIPTION

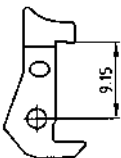
- Solder pin
- Pin length 2.9 mm alternative 4.5 mm (\*) on request
- 10 to 64 positions
- Center polarization
- Available with long, short and without latches
- Long latches for socket connector with strain relief

PRODUCT DRAWING

PCB-hole pattern



Long latches  
Part no. 140 X 10019 X



Short latches  
Part no. 140 X 10029 X

| No. of Pos. | A ±0.2 | B ±0.1 | C ±0.2 | D ±0.1         | E1     | E2     |
|-------------|--------|--------|--------|----------------|--------|--------|
| 10          | 32.00  | 27.94  | 17.82  | 4x2.54= 10.16  | 50.00  | 44.50  |
| 14          | 37.08  | 33.02  | 22.90  | 6x2.54= 15.24  | 55.00  | 49.50  |
| 16          | 39.62  | 35.56  | 25.44  | 7x2.54= 17.78  | 57.60  | 52.10  |
| 20          | 44.70  | 40.64  | 30.52  | 9x2.54= 22.86  | 62.50  | 57.00  |
| 26          | 52.32  | 48.26  | 38.14  | 12x2.54= 30.48 | 70.10  | 64.60  |
| 34          | 62.48  | 58.42  | 48.30  | 16x2.54= 40.64 | 80.30  | 74.80  |
| 40          | 70.10  | 66.04  | 55.92  | 19x2.54= 48.26 | 87.90  | 82.40  |
| 50          | 82.80  | 78.74  | 68.62  | 24x2.54= 60.96 | 100.70 | 95.20  |
| 60          | 95.50  | 91.44  | 81.32  | 29x2.54= 73.66 | 113.40 | 107.90 |
| 64          | 100.58 | 96.52  | 86.40  | 31x2.54= 78.74 | 118.52 | 113.02 |

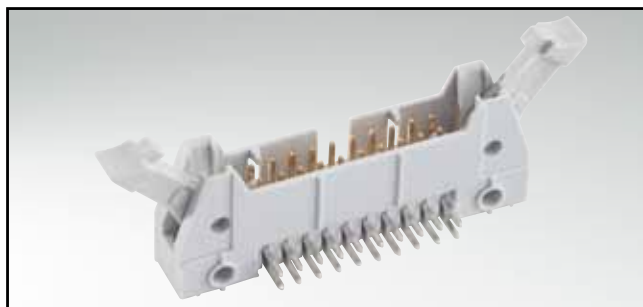
ORDER DATA

(Dim. = mm)

| No. of Pos. | WITHOUT LATCHES   |                    | WITH SHORT LATCHES |                    | WITH LONG LATCHES |                    |
|-------------|-------------------|--------------------|--------------------|--------------------|-------------------|--------------------|
|             | Pin length 2.9 mm | Pin length 4.5 mm* | Pin length 2.9 mm  | Pin length 4.5 mm* | Pin length 2.9 mm | Pin length 4.5 mm* |
| 10          | 141 A 10019 X     | 141 A 10109 X      | 141 A 10199 X      | 141 A 10289 X      | 141 A 10379 X     | 141 A 10469 X      |
| 14          | 141 A 10029 X     | 141 A 10119 X      | 141 A 10209 X      | 141 A 10299 X      | 141 A 10389 X     | 141 A 10479 X      |
| 16          | 141 A 10039 X     | 141 A 10129 X      | 141 A 10219 X      | 141 A 10309 X      | 141 A 10399 X     | 141 A 10489 X      |
| 20          | 141 A 10049 X     | 141 A 10139 X      | 141 A 10229 X      | 141 A 10319 X      | 141 A 10409 X     | 141 A 10499 X      |
| 26          | 141 A 10059 X     | 141 A 10149 X      | 141 A 10239 X      | 141 A 10329 X      | 141 A 10419 X     | 141 A 10509 X      |
| 34          | 141 A 10069 X     | 141 A 10159 X      | 141 A 10249 X      | 141 A 10239 X      | 141 A 10429 X     | 141 A 10519 X      |
| 40          | 141 A 10079 X     | 141 A 10169 X      | 141 A 10259 X      | 141 A 10349 X      | 141 A 10439 X     | 141 A 10529 X      |
| 50          | 141 A 10089 X     | 141 A 10179 X      | 141 A 10269 X      | 141 A 10359 X      | 141 A 10449 X     | 141 A 10539 X      |
| 60          | 141 A 10099 X     | 141 A 10189 X      | 141 A 10279 X      | 141 A 10369 X      | 141 A 10459 X     | 141 A 10549 X      |
| 64          | 141 A 12289 X     | 141 A 12429 X      | 141 A 12319 X      | 141 A 12329 X      | 141 A 12339 X     | 141 A 12349 X      |

# FLATCABLE CONNECTORS

## Plug connector – angled



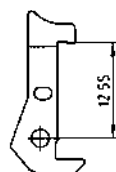
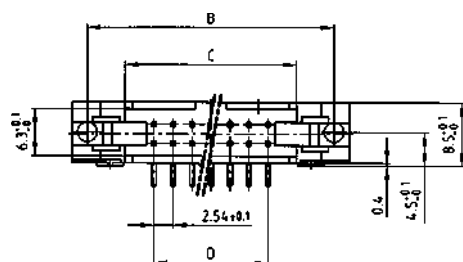
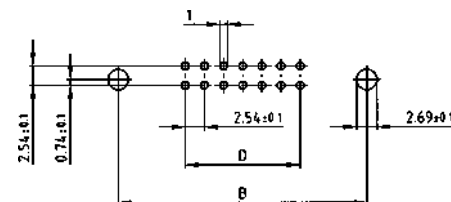
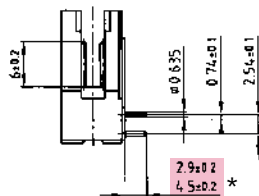
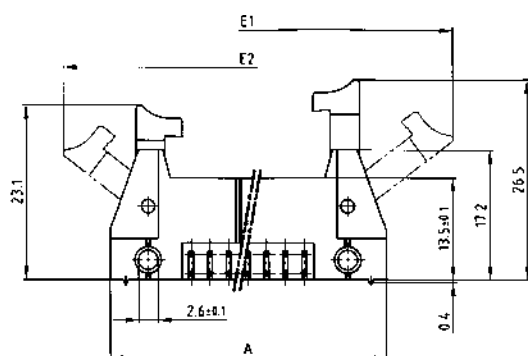
RoHS compliant

### DESCRIPTION

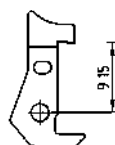
- Solder pin
- Pin length 2.9 mm alternative 4.5 mm (\*) on request
- 10 to 64 positions
- Center polarization
- Available with long, short and without latches
- Long latches for socket connector with strain relief

### PRODUCT DRAWING

### PCB-hole pattern



Long latches  
Part no. 140 X 10019 X



Short latches  
Part no. 140 X 10029 X

| No. of Pos. | A ±0.2 | B ±0.1 | C ±0.2 | D ±0.1        | E1     | E2     |
|-------------|--------|--------|--------|---------------|--------|--------|
| 10          | 32.00  | 27.94  | 17.82  | 4x2.54=10.16  | 50.00  | 44.50  |
| 14          | 37.08  | 33.02  | 22.90  | 6x2.54=15.24  | 55.00  | 49.50  |
| 16          | 39.62  | 35.56  | 25.44  | 7x2.54=17.78  | 57.60  | 52.10  |
| 20          | 44.70  | 40.64  | 30.52  | 9x2.54=22.86  | 62.50  | 57.00  |
| 26          | 52.32  | 48.26  | 38.14  | 12x2.54=30.48 | 70.10  | 64.60  |
| 34          | 62.48  | 58.42  | 48.30  | 16x2.54=40.64 | 80.30  | 74.80  |
| 40          | 70.10  | 66.04  | 55.92  | 19x2.54=48.26 | 87.90  | 82.40  |
| 50          | 82.80  | 78.74  | 68.62  | 24x2.54=60.96 | 100.70 | 95.20  |
| 60          | 95.50  | 91.44  | 81.32  | 29x2.54=73.66 | 113.40 | 107.90 |
| 64          | 100.58 | 96.52  | 86.40  | 31x2.54=78.74 | 118.52 | 113.02 |

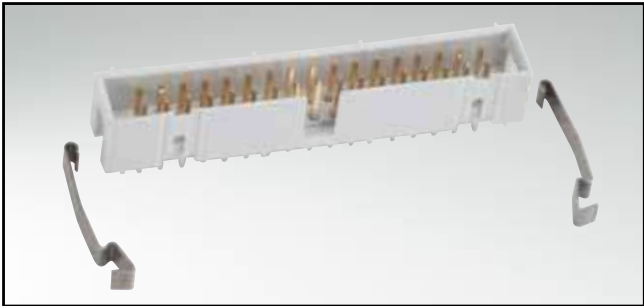
### ORDER DATA

(Dim. = mm)

| No. of Pos. | WITHOUT LATCHES   |                    | WITH SHORT LATCHES |                    | WITH LONG LATCHES |                    |
|-------------|-------------------|--------------------|--------------------|--------------------|-------------------|--------------------|
|             | Pin length 2.9 mm | Pin length 4.5 mm* | Pin length 2.9 mm  | Pin length 4.5 mm* | Pin length 2.9 mm | Pin length 4.5 mm* |
| 10          | 141 A 10559 X     | 141 A 10649 X      | 141 A 10739 X      | 141 A 10829 X      | 141 A 10919 X     | 141 A 11009 X      |
| 14          | 141 A 10569 X     | 141 A 10659 X      | 141 A 10749 X      | 141 A 10839 X      | 141 A 10929 X     | 141 A 11019 X      |
| 16          | 141 A 10579 X     | 141 A 10669 X      | 141 A 10759 X      | 141 A 10849 X      | 141 A 10939 X     | 141 A 11029 X      |
| 20          | 141 A 10589 X     | 141 A 10679 X      | 141 A 10769 X      | 141 A 10859 X      | 141 A 10949 X     | 141 A 11039 X      |
| 26          | 141 A 10599 X     | 141 A 10689 X      | 141 A 10779 X      | 141 A 10869 X      | 141 A 10959 X     | 141 A 11049 X      |
| 34          | 141 A 10609 X     | 141 A 10699 X      | 141 A 10789 X      | 141 A 10879 X      | 141 A 10969 X     | 141 A 11059 X      |
| 40          | 141 A 10619 X     | 141 A 10709 X      | 141 A 10799 X      | 141 A 10889 X      | 141 A 10979 X     | 141 A 11069 X      |
| 50          | 141 A 10629 X     | 141 A 10719 X      | 141 A 10809 X      | 141 A 10899 X      | 141 A 10989 X     | 141 A 11079 X      |
| 60          | 141 A 10639 X     | 141 A 10729 X      | 141 A 10819 X      | 141 A 10909 X      | 141 A 10999 X     | 141 A 11089 X      |
| 64          | 141 A 12279 X     | 141 A 12439 X      | 141 A 12359 X      | 141 A 12369 X      | 141 A 12379 X     | 141 A 12389 X      |

# FLATCABLE CONNECTORS

## Low profile header – straight



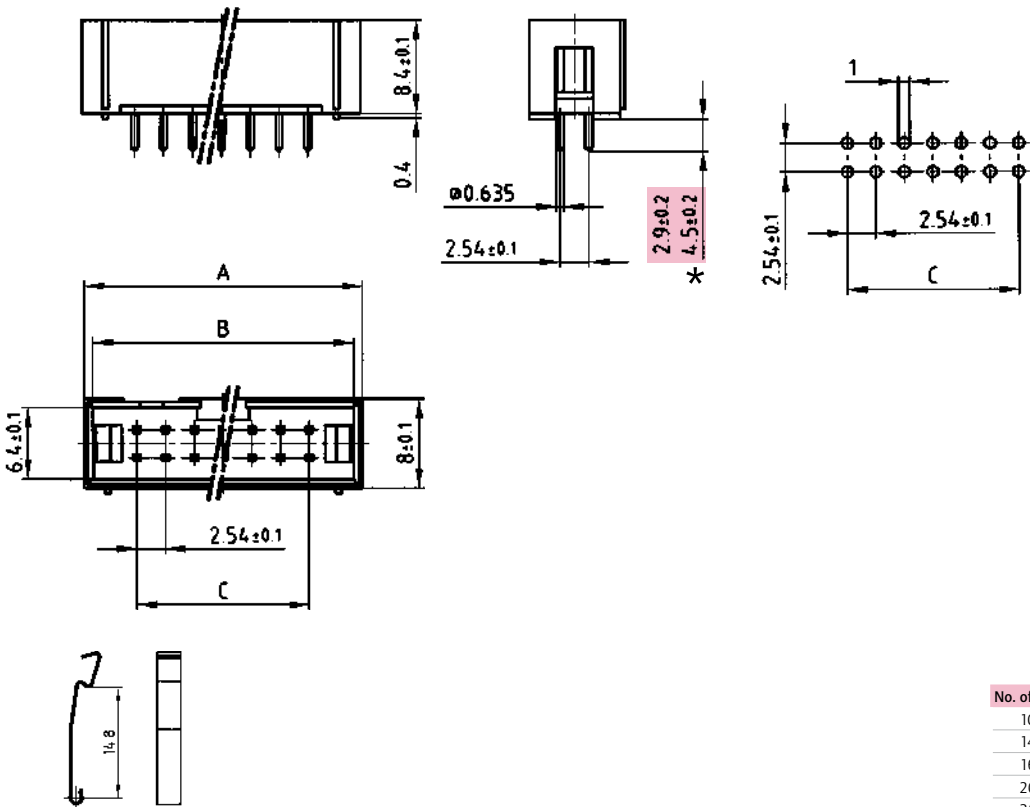
RoHS compliant

DESCRIPTION

- Solder pin
- Pin length 2.9 mm alternative 4.5 mm (\*) on request
- 10 to 64 positions
- Center polarization
- Space saving version
- Clip latches need to be ordered separately

PRODUCT DRAWING

PCB-hole pattern



Clip latches  
Part no. 140 X 10039 X

| No. of Pos. | A ± 0.2 | B ± 0.1 | C ± 0.1        |
|-------------|---------|---------|----------------|
| 10          | 19,50   | 17,90   | 4x2.54= 10.16  |
| 14          | 24,60   | 23,00   | 6x2.54= 15.24  |
| 16          | 27,20   | 25,60   | 7x2.54= 17.78  |
| 20          | 32,30   | 30,70   | 9x2.54= 22.86  |
| 26          | 39,90   | 38,30   | 12x2.54= 30.48 |
| 34          | 50,10   | 48,50   | 16x2.54= 40.64 |
| 40          | 57,80   | 56,20   | 19x2.54= 48.26 |
| 50          | 70,50   | 68,90   | 24x2.54= 60.96 |
| 64          | 89,10   | 86,40   | 31x2.54= 78.74 |

ORDER DATA

(Dim. = mm)

| No. of Pos. | Pin length 2.9 mm | Pin length 4.5 mm* | No. of Pos. | Pin length 2.9 mm | Pin length 4.5 mm* |
|-------------|-------------------|--------------------|-------------|-------------------|--------------------|
| 10          | 141 A 11639 X     | 141 A 11729 X      | 34          | 141 A 11689 X     | 141 A 11779 X      |
| 14          | 141 A 11649 X     | 141 A 11739 X      | 40          | 141 A 11699 X     | 141 A 11789 X      |
| 16          | 141 A 11659 X     | 141 A 11749 X      | 50          | 141 A 11709 X     | 141 A 11799 X      |
| 20          | 141 A 11669 X     | 141 A 11759 X      | 60          | 141 A 12269 X     | 141 A 12449 X      |
| 26          | 141 A 11679 X     | 141 A 11769 X      |             |                   |                    |

# FLATCABLE CONNECTORS

## Low profile header – angled

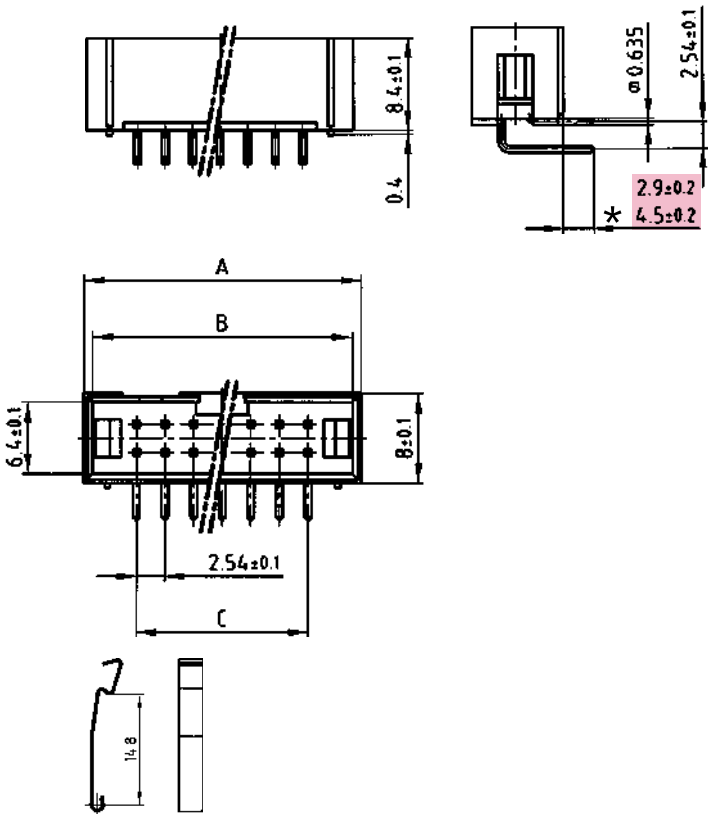


RoHS compliant

### DESCRIPTION

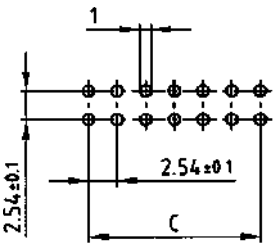
- Solder pin
- Pin length 2.9 mm alternative 4.5 mm (\*) on request
- 10 to 64 positions
- Center polarization
- Space saving version
- Clip latches need to be ordered separately

### PRODUCT DRAWING



Clip latches  
Part no. 140 X 10039 X

### PCB-hole pattern



| No. of Pos. | A ± 0.2 | B ± 0.1 | C ± 0.1           |
|-------------|---------|---------|-------------------|
| 10          | 19.50   | 17.90   | 4 x 2.54 = 10.16  |
| 14          | 24.60   | 23.00   | 6 x 2.54 = 15.24  |
| 16          | 27.20   | 25.60   | 7 x 2.54 = 17.78  |
| 20          | 32.30   | 30.70   | 9 x 2.54 = 22.86  |
| 26          | 39.90   | 38.30   | 12 x 2.54 = 30.48 |
| 34          | 50.10   | 48.50   | 16 x 2.54 = 40.64 |
| 40          | 57.80   | 56.20   | 19 x 2.54 = 48.26 |
| 50          | 70.50   | 68.90   | 24 x 2.54 = 60.96 |
| 64          | 89.10   | 86.40   | 31 x 2.54 = 78.74 |

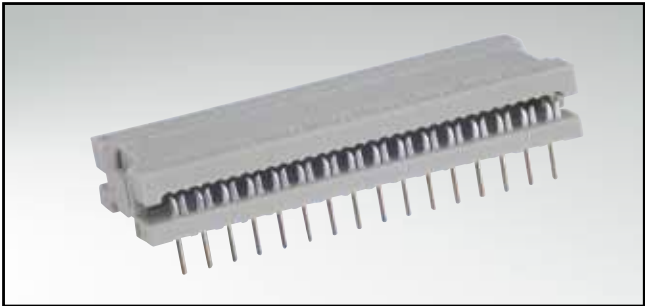
### ORDER DATA

(Dim. = mm)

| No. of Pos. | Pin length 2.9 mm | Pin length 4.5 mm* | No. of Pos. | Pin length 2.9 mm | Pin length 4.5 mm* |
|-------------|-------------------|--------------------|-------------|-------------------|--------------------|
| 10          | 141 A 11909 X     | 141 A 11999 X      | 34          | 141 A 11959 X     | 141 A 12049 X      |
| 14          | 141 A 11919 X     | 141 A 12009 X      | 40          | 141 A 11969 X     | 141 A 12059 X      |
| 16          | 141 A 11929 X     | 141 A 12019 X      | 50          | 141 A 11979 X     | 141 A 12069 X      |
| 20          | 141 A 11939 X     | 141 A 12029 X      | 60          | 141 A 12399 X     | 141 A 12459 X      |
| 26          | 141 A 11949 X     | 141 A 12039 X      |             |                   |                    |

# FLATCABLE CONNECTORS

Dip connector – 4 to 40 positions

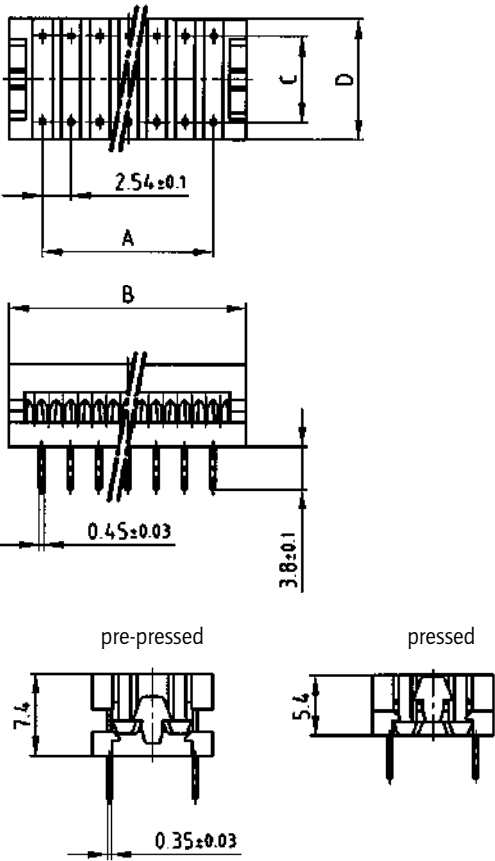


RoHS compliant

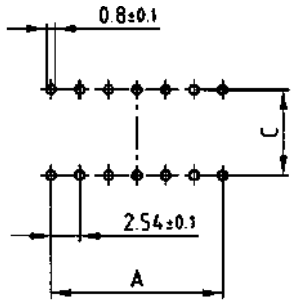
DESCRIPTION

- Insulation displacement termination (IDC)
- Contact spacing 2.54 mm
- Contact plating: gold or tin plated

PRODUCT DRAWING



PCB-hole pattern



| No. of Pos. | A ± 0.1       | B ± 0.2 | C ± 0.1 | D ± 0.1 |
|-------------|---------------|---------|---------|---------|
| 4           | 2.54          | 8.41    | 7.62    | 10.7    |
| 6           | 2x2.54=5.08   | 10.95   | 7.62    | 10.7    |
| 8           | 3x2.54=7.62   | 13.49   | 7.62    | 10.7    |
| 10          | 4x2.54=10.16  | 16.03   | 7.62    | 10.7    |
| 12          | 5x2.54=12.70  | 18.57   | 7.62    | 10.7    |
| 14          | 6x2.54=15.24  | 21.11   | 7.62    | 10.7    |
| 16          | 7x2.54=17.78  | 23.56   | 7.62    | 10.7    |
| 18          | 8x2.54=20.32  | 26.19   | 7.62    | 10.7    |
| 20          | 9x2.54=22.86  | 28.73   | 7.62    | 10.7    |
| 22          | 10x2.54=25.40 | 31.35   | 10.16   | 13.2    |
| 24          | 11x2.54=27.94 | 33.60   | 15.24   | 18.3    |
| 28          | 13x2.54=33.02 | 38.97   | 15.24   | 18.3    |
| 32          | 15x2.54=38.10 | 44.05   | 15.24   | 18.3    |
| 36          | 17x2.54=43.18 | 49.13   | 15.24   | 18.3    |
| 40          | 19x2.54=48.26 | 53.90   | 15.24   | 18.3    |

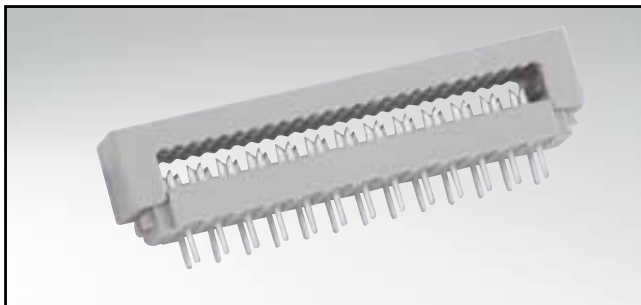
ORDER DATA

(Dim. = mm)

| No. of Pos. | gold plated   | tin plated    | No. of Pos. | gold plated   | tin plated    |
|-------------|---------------|---------------|-------------|---------------|---------------|
| 4           | 220 A 10019 X | 220 F 10019 X | 20          | 220 A 10099 X | 220 F 10099 X |
| 6           | 220 A 10029 X | 220 F 10029 X | 22          | 220 A 10109 X | 220 F 10109 X |
| 8           | 220 A 10039 X | 220 F 10039 X | 24          | 220 A 10119 X | 220 F 10119 X |
| 10          | 220 A 10049 X | 220 F 10049 X | 28          | 220 A 10129 X | 220 F 10129 X |
| 12          | 220 A 10059 X | 220 F 10059 X | 32          | 220 A 10139 X | 220 F 10139 X |
| 14          | 220 A 10069 X | 220 F 10069 X | 36          | 220 A 10149 X | 220 F 10149 X |
| 16          | 220 A 10079 X | 220 F 10079 X | 40          | 220 A 10159 X | 220 F 10159 X |
| 18          | 220 A 10089 X | 220 F 10089 X |             |               |               |

# FLATCABLE CONNECTORS

PCB connector – 10 to 64 positions

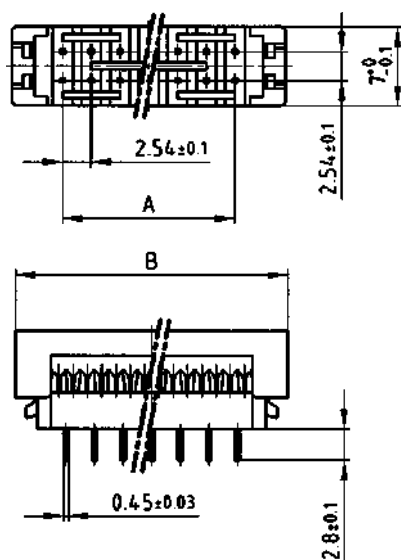


RoHS compliant

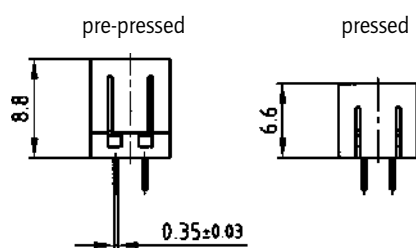
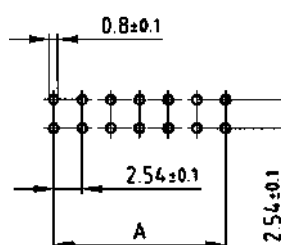
## DESCRIPTION

- Insulation displacement termination (IDC)
- Contact spacing 2.54 mm
- Contact plating: gold or tin plated

## PRODUCT DRAWING



## PCB-hole pattern



| No. of Pos. | A ±0.1        | B ±0.2 |
|-------------|---------------|--------|
| 10          | 4x2.54=10.16  | 19.15  |
| 14          | 6x2.54=15.24  | 24.25  |
| 16          | 7x2.54=17.78  | 26.82  |
| 20          | 9x2.54=22.86  | 31.90  |
| 26          | 12x2.54=30.48 | 39.50  |
| 34          | 16x2.54=40.64 | 49.68  |
| 40          | 19x2.54=48.26 | 57.30  |
| 50          | 24x2.54=60.96 | 70.00  |
| 60          | 29x2.54=73.66 | 82.75  |
| 64          | 31x2.54=78.74 | 87.78  |

## ORDER DATA

(Dim. = mm)

| No. of Pos. | tin plated    |
|-------------|---------------|
| 10          | 220 F 10169 X |
| 14          | 220 F 10179 X |
| 16          | 220 F 10189 X |
| 20          | 220 F 10199 X |
| 26          | 220 F 10209 X |

| No. of Pos. | tin plated    |
|-------------|---------------|
| 34          | 220 F 10219 X |
| 40          | 220 F 10229 X |
| 50          | 220 F 10239 X |
| 60          | 220 F 10249 X |
| 64          | 220 F 10259 X |

FLATCABLE CONNECTORS

D-SUB IDC – stamped contacts – 9 to 37 positions



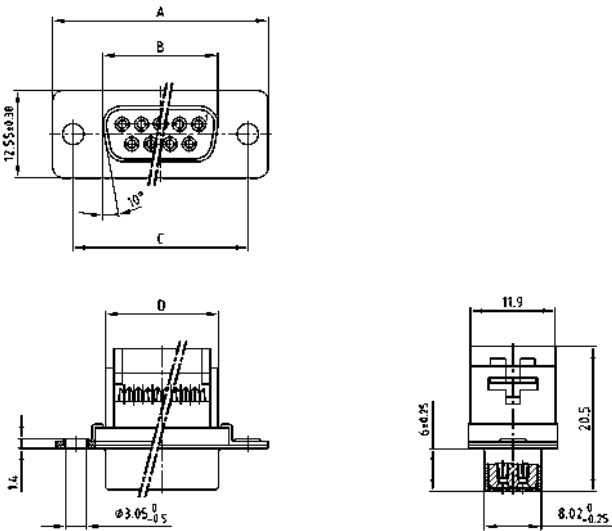
RoHS compliant – CSA listed, File No.: LR 115000-1 – UL listed, File No.: E202784

DESCRIPTION

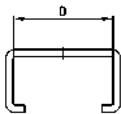
- For wire size AWG 26 to 28 flatcable
- Mounting style: with through-hole, Ø 3 mm
- Connector includes strain relief
- Quality class 3 (other quality classes on request)
- Shell: steel tin plated

PRODUCT DRAWING

Socket connector

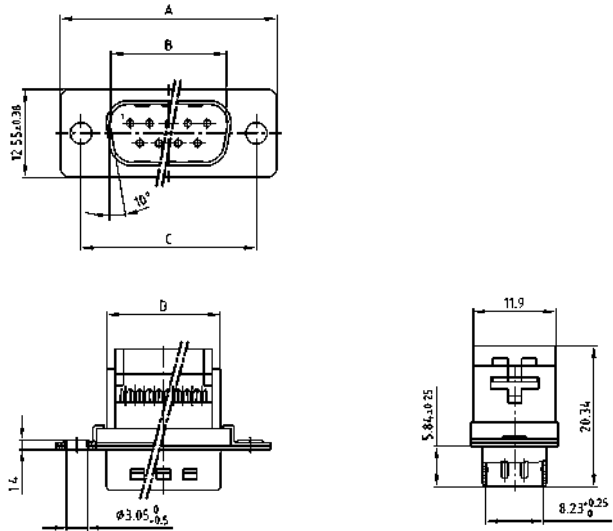


Strain relief

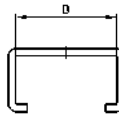


| No. of Pos. | A ± 0.25 | B ± 0.25 | C ± 0.25 | D ± 0.25 |
|-------------|----------|----------|----------|----------|
| 09          | 30.80    | 16.46    | 25.00    | 16.10    |
| 15          | 39.10    | 24.79    | 33.30    | 24.00    |
| 25          | 53.09    | 38.50    | 47.04    | 38.14    |
| 37          | 69.40    | 54.96    | 63.50    | 54.60    |

Plug connector



Strain relief



| No. of Pos. | A ± 0.25 | B ± 0.25 | C ± 0.25 | D ± 0.25 |
|-------------|----------|----------|----------|----------|
| 09          | 30.80    | 16.79    | 25.00    | 16.10    |
| 15          | 39.10    | 25.12    | 33.30    | 24.00    |
| 25          | 53.09    | 83.84    | 47.04    | 38.14    |
| 37          | 69.40    | 55.30    | 63.50    | 54.60    |

ORDER DATA

(Dim. = mm)

| SOCKET CONNECTOR    |                |               |
|---------------------|----------------|---------------|
| Number of positions | Mounting style | Part number   |
| 09                  | Through-hole   | 302 A 10089 X |
| 15                  | Through-hole   | 302 A 10099 X |
| 25                  | Through-hole   | 302 A 10109 X |
| 37                  | Through-hole   | 302 A 10119 X |

| PLUG CONNECTOR      |                |               |
|---------------------|----------------|---------------|
| Number of positions | Mounting style | Part number   |
| 09                  | Through-hole   | 301 A 10089 X |
| 15                  | Through-hole   | 301 A 10099 X |
| 25                  | Through-hole   | 301 A 10109 X |
| 37                  | Through-hole   | 301 A 10119 X |

# FLATCABLE CONNECTORS

## D-SUB IDC – stamped contacts – 9 to 37 positions



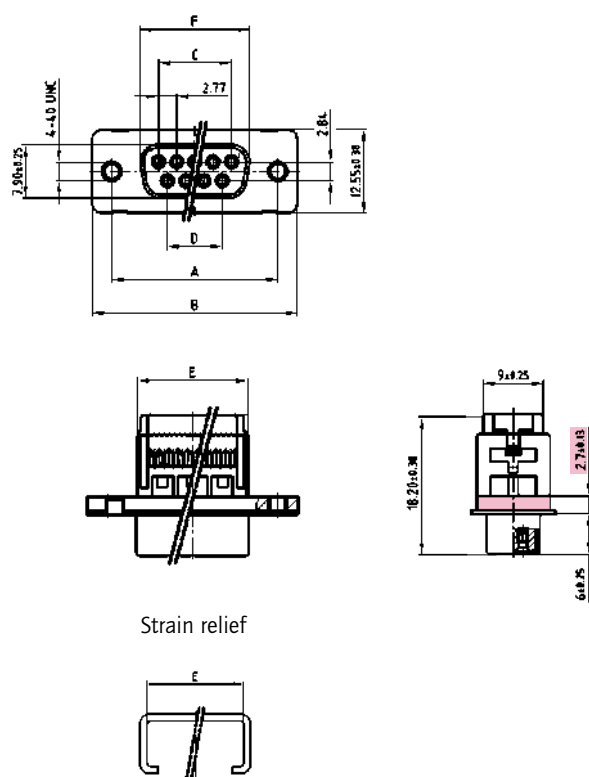
RoHS compliant – CSA listed, File No.: LR 115000-1 – UL listed, File No.: E202784

### DESCRIPTION

- For wire size AWG 26 to 28 flatcable
- Mounting style: with 4-40 UNC threaded insert
- Connector includes strain relief
- Quality class 3 (other quality classes on request)
- Shell: steel tin plated
- Not suitable for hood assembly

### PRODUCT DRAWING

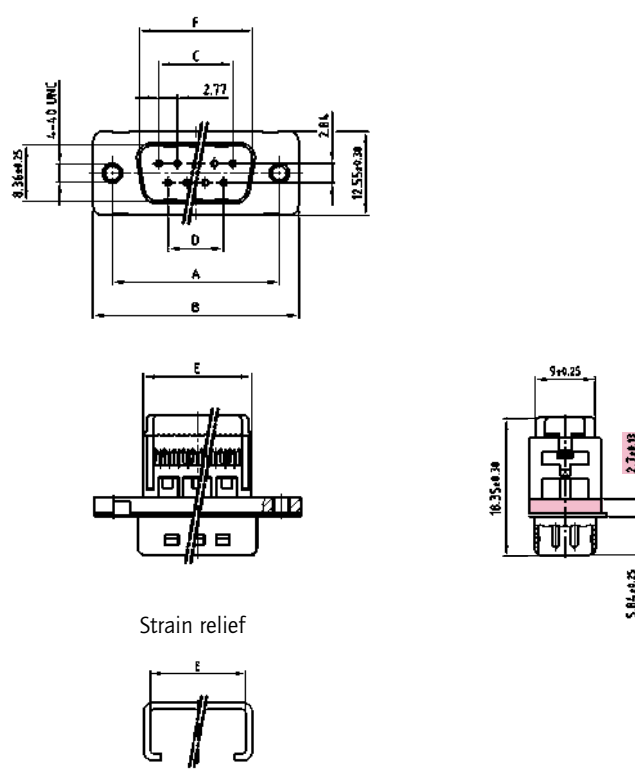
Socket connector



Strain relief

| No. of Pos. | A ± 0.13 | B ± 0.25 | C ± 0.13 | D ± 0.13 | E ± 0.25 | F ± 0.25 |
|-------------|----------|----------|----------|----------|----------|----------|
| 09          | 24.99    | 30.80    | 11.08    | 8.31     | 16.10    | 16.33    |
| 15          | 33.32    | 39.10    | 19.39    | 16.62    | 24.00    | 24.66    |
| 25          | 47.04    | 53.09    | 33.24    | 30.47    | 38.14    | 38.38    |
| 37          | 63.50    | 69.40    | 49.86    | 47.09    | 54.60    | 54.84    |

Plug connector



Strain relief

| No. of Pos. | A ± 0.13 | B ± 0.25 | C ± 0.13 | D ± 0.13 | E ± 0.25 | F ± 0.25 |
|-------------|----------|----------|----------|----------|----------|----------|
| 09          | 24.99    | 30.80    | 11.08    | 8.31     | 16.10    | 16.92    |
| 15          | 33.32    | 39.10    | 19.39    | 16.62    | 24.00    | 25.25    |
| 25          | 47.04    | 53.09    | 33.24    | 30.47    | 38.14    | 38.96    |
| 37          | 63.50    | 69.40    | 49.86    | 47.09    | 54.60    | 55.45    |

### ORDER DATA

(Dim. = mm)

| SOCKET CONNECTOR    |                          |                |
|---------------------|--------------------------|----------------|
| Number of positions | Mounting style           | Part number    |
| 09                  | Threaded insert 4-40 UNC | DLS 1XSSAG04 X |
| 15                  | Threaded insert 4-40 UNC | DLS 2XSSAG04 X |
| 25                  | Threaded insert 4-40 UNC | DLS 3XSSAG04 X |
| 37                  | Threaded insert 4-40 UNC | DLS 4XSSAG04 X |

| PLUG CONNECTOR      |                          |                |
|---------------------|--------------------------|----------------|
| Number of positions | Mounting style           | Part number    |
| 09                  | Threaded insert 4-40 UNC | DLS 1XPSAG04 X |
| 15                  | Threaded insert 4-40 UNC | DLS 2XPSAG04 X |
| 25                  | Threaded insert 4-40 UNC | DLS 3XPSAG04 X |
| 37                  | Threaded insert 4-40 UNC | DLS 4XPSAG04 X |

FLATCABLE CONNECTORS

D-SUB IDC – stamped contacts – 9 to 37 positions



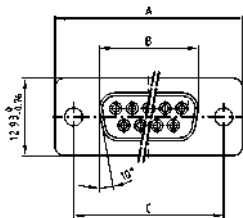
RoHS compliant – CSA listed, File No.: LR 115000-1 – UL listed, File No.: E202784

DESCRIPTION

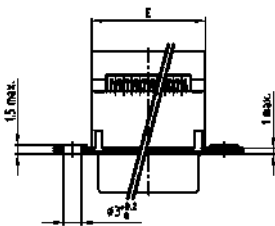
- For wire size AWG 26 to 28 flatcable
- Mounting style: with through-hole, Ø 3 mm
- Strain relief need to be ordered separately
- Quality class 3 (also available in quality class 1)
- Shell: Steel tin plated

PRODUCT DRAWING

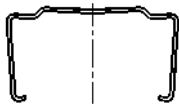
Socket connector



Mounting style: Through-hole

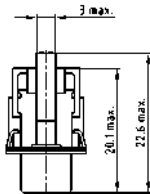


Strain relief

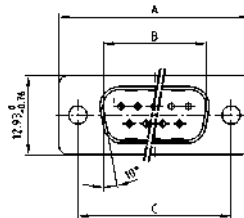


| No. of Pos. | A $-0.76$ | B $+0.25$ | C                        | E $+0.10$ |
|-------------|-----------|-----------|--------------------------|-----------|
| 09          | 30.80     | 16.30     | 25.00 $+0.12$            | 18.73     |
| 15          | 39.20     | 24.60     | 33.30 $+0.15$<br>$-0.10$ | 26.86     |
| 25          | 53.10     | 38.30     | 47.04 $\pm 0.13$         | 40.78     |
| 37          | 69.40     | 54.80     | 63.50 $\pm 0.13$         | 57.04     |

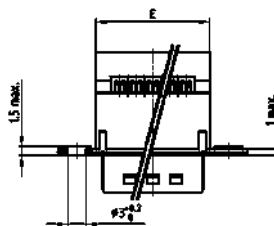
with strain relief



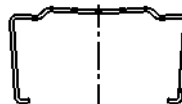
Plug connector



Mounting style: Through-hole

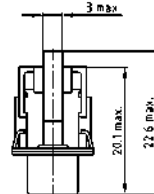


Strain relief



| No. of Pos. | A $-0.76$ | B $+0.25$ | C                        | E $+0.10$ |
|-------------|-----------|-----------|--------------------------|-----------|
| 09          | 30.80     | 16.79     | 25.00 $+0.12$            | 18.73     |
| 15          | 39.20     | 25.12     | 33.30 $+0.15$<br>$-0.10$ | 26.86     |
| 25          | 53.10     | 38.84     | 47.04 $\pm 0.13$         | 40.78     |
| 37          | 69.40     | 55.30     | 63.50 $\pm 0.13$         | 57.04     |

with strain relief



ORDER DATA

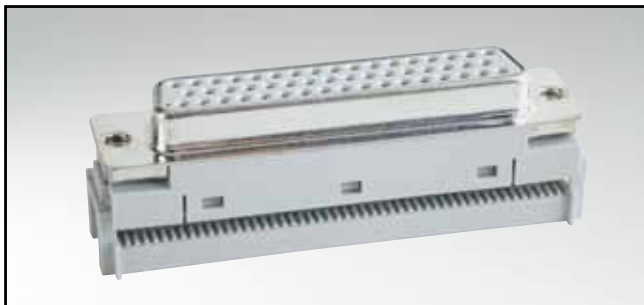
(Dim. = mm)

| SOCKET CONNECTOR    |                |               |
|---------------------|----------------|---------------|
| Number of positions | Mounting style | Part number   |
| 09                  | Through-hole   | 162 A 11899 X |
| 15                  | Through-hole   | 162 A 11909 X |
| 25                  | Through-hole   | 162 A 11919 X |
| 37                  | Through-hole   | 162 A 11929 X |
| 09                  | Strain relief  | 160 X 10019 X |
| 15                  | Strain relief  | 160 X 10029 X |
| 25                  | Strain relief  | 160 X 10039 X |
| 37                  | Strain relief  | 160 X 10049 X |

| PLUG CONNECTOR      |                |               |
|---------------------|----------------|---------------|
| Number of positions | Mounting style | Part number   |
| 09                  | Through-hole   | 161 A 13499 X |
| 15                  | Through-hole   | 161 A 13509 X |
| 25                  | Through-hole   | 161 A 13519 X |
| 37                  | Through-hole   | 161 A 13529 X |
| 09                  | Strain relief  | 160 X 10019 X |
| 15                  | Strain relief  | 160 X 10029 X |
| 25                  | Strain relief  | 160 X 10039 X |
| 37                  | Strain relief  | 160 X 10049 X |

# FLATCABLE CONNECTORS

## D-SUB IDC – stamped contacts – 50 positions



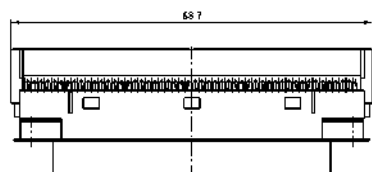
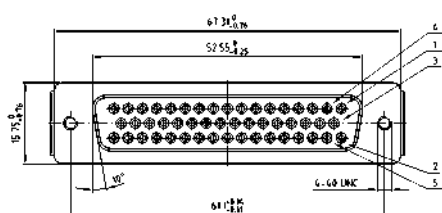
RoHS compliant – CSA listed, File No.: LR 115000-1 – UL listed, File No.: E202784

### DESCRIPTION

- For wire size AWG 26 to 28 flatcable
- Mounting style: with 4-40 UNC threaded insert
- Strain relief need to be ordered separately
- Quality class 3 (also available in quality class 1)
- Shell: Steel tin plated

### PRODUCT DRAWING

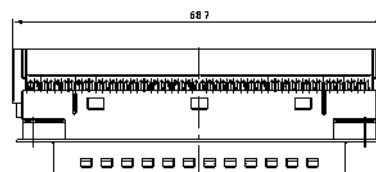
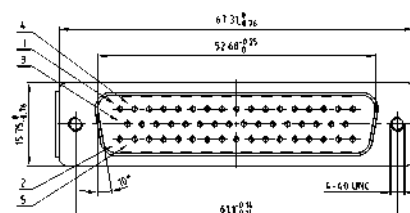
Socket connector



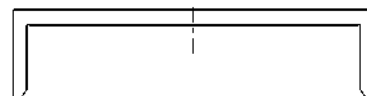
Strain relief



Plug connector



Strain relief



### ORDER DATA

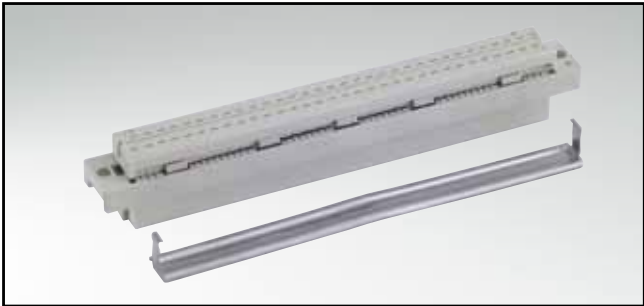
(Dim. = mm)

| SOCKET CONNECTOR    |                          |               |
|---------------------|--------------------------|---------------|
| Number of positions | Mounting style           | Part number   |
| 50                  | Threaded insert 4-40 UNC | 162 A 11939 X |
| 50                  | Strain relief            | 160 X 10059 X |

| PLUG CONNECTOR      |                          |               |
|---------------------|--------------------------|---------------|
| Number of positions | Mounting style           | Part number   |
| 50                  | Threaded insert 4-40 UNC | 161 A 13539 X |
| 50                  | Strain relief            | 160 X 10059 X |

FLATCABLE CONNECTORS

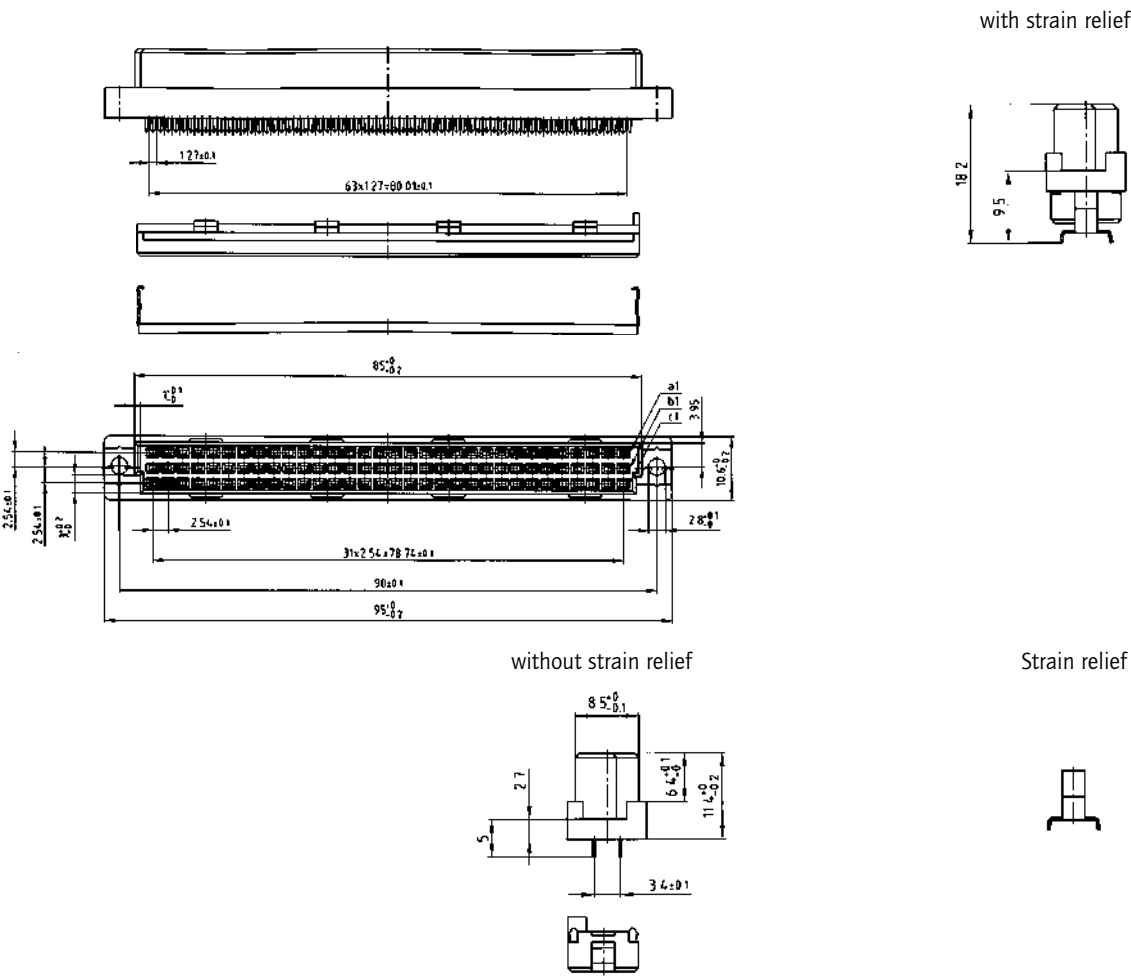
Type C – female connector – Insulation displacement termination (IDC) – 64 positions



RoHS compliant

- DESCRIPTION
- Flat cable termination
  - Strain relief need to be ordered separately
  - Quality class 3 (also available in quality class 2 or 1)

PRODUCT DRAWING

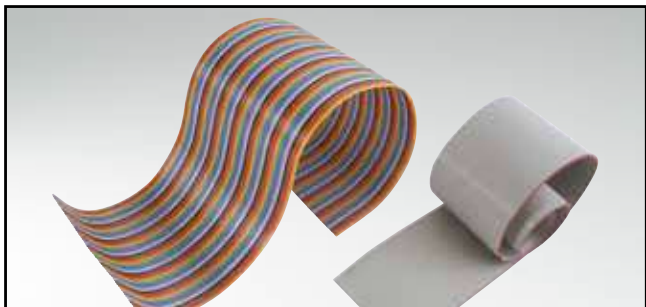


ORDER DATA (Dim. = mm)

| No. of Pos. | • = contact, + = no contact |   |   |   |   |   | Female connector without strain relief | Strain relief |
|-------------|-----------------------------|---|---|---|---|---|----------------------------------------|---------------|
|             | Pos                         | 1 | 2 | 3 | 4 | 5 |                                        |               |
| 64          | a                           | • | • | • | • | • | 122 A 11699 X                          | 120 X 10169 X |
|             | b                           | + | + | + | + | + |                                        |               |
|             | c                           | • | • | • | • | • |                                        |               |

# FLATCABLE

Grey or color-coded



RoHS compliant

## DESCRIPTION

Flat cable **colored grey**

■ Flame-retardant ref. class UL-VW-1

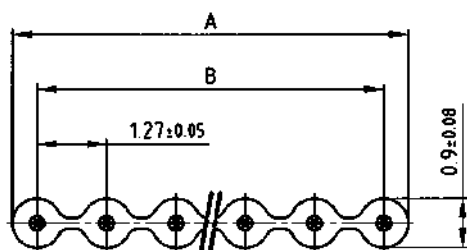
■ UL-Style No. 2651

Flat cable **color-coded**

■ Flame-retardant ref. class UL-VW-1

■ UL-Style No. 2651

## PRODUCT DRAWING



| Technical Data       |                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------|
| Conductor:           | Cu tin plated                                                                                        |
| Dielectric strength: | > 2 kV<br>at 50 Hz, at acc. over one minute                                                          |
| Insulation:          | min. 100 Ω x km at 20 °C                                                                             |
| Conductor resistant: | max. 216 Ω / km at 20 °C                                                                             |
| Capacitance:         | max. 60 pF / m at 1 kHz                                                                              |
| Impedance (GSG):     | ca. 100 Ω at 1 MHz                                                                                   |
| Current rating:      | max. 2,1 A at 25 °C                                                                                  |
| Working voltage:     | max. 300 V                                                                                           |
| Temperature range:   | at rest: -30 °C to +105 °C (-40 °C per ISO6722)<br>in motion: -20 °C to +105 °C (-40 °C per ISO6722) |

Flame-retardant ref. class UL-VW-1 / CSA FT-1

| No. of Pos. | A            | B            |
|-------------|--------------|--------------|
| 10          | 12.70 ± 0.25 | 11.43 ± 0.18 |
| 14          | 17.78 ± 0.25 | 16.51 ± 0.18 |
| 16          | 20.32 ± 0.38 | 19.05 ± 0.28 |
| 20          | 25.40 ± 0.38 | 24.13 ± 0.28 |
| 25          | 31.75 ± 0.38 | 30.48 ± 0.28 |
| 34          | 43.18 ± 0.51 | 41.91 ± 0.38 |
| 40          | 50.80 ± 0.51 | 49.53 ± 0.38 |
| 50          | 63.50 ± 0.51 | 62.23 ± 0.38 |
| 64          | 81.28 ± 0.51 | 80.01 ± 0.38 |

(Dim. = mm)

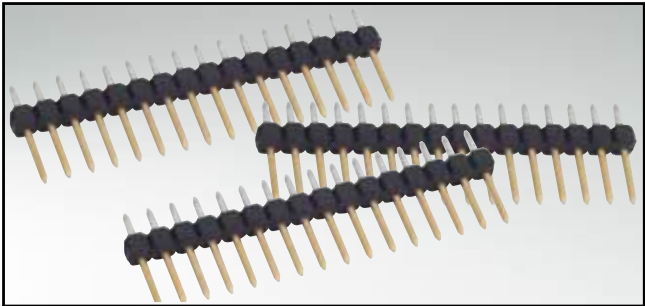
## ORDER DATA

| No. of Pos. | Flat cable grey |
|-------------|-----------------|
| 10          | 145 X 10029 X   |
| 14          | 145 X 10039 X   |
| 16          | 145 X 10059 X   |
| 20          | 145 X 10069 X   |
| 25          | 145 X 10089 X   |
| 34          | 145 X 10109 X   |
| 40          | 145 X 10129 X   |
| 50          | 145 X 10139 X   |
| 64          | 145 X 10159 X   |

| No. of Pos. | Flat cable color-coded |
|-------------|------------------------|
| 10          | 145 X 10179 X          |
| 14          | 145 X 10189 X          |
| 16          | 145 X 10209 X          |
| 20          | 145 X 10219 X          |
| 25          | 145 X 10239 X          |
| 34          | 145 X 10259 X          |
| 40          | 145 X 10279 X          |
| 50          | 145 X 10289 X          |
| 64          | 145 X 10309 X          |

# CSU - PIN HEADER

Straight version – one and two rows



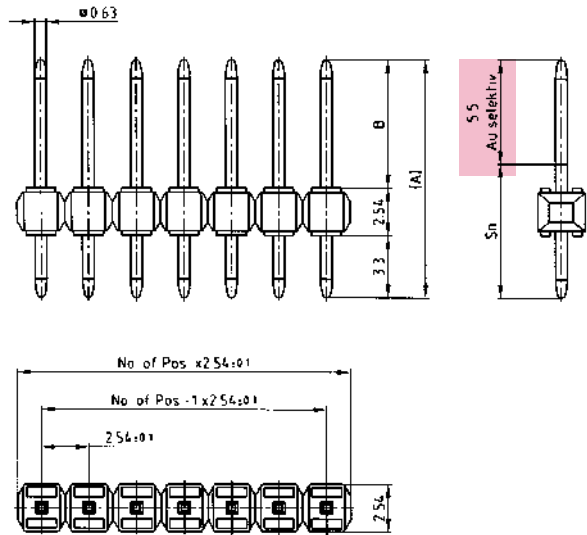
RoHS compliant

DESCRIPTION

- Solder pin
- Contact spacing 2.54 mm
- One row: 5, 10, 20, 30, 40 and 50 positions
- Two row: 10, 20, 40, 60, 80 and 100 positions
- Further positions on request
- Contact plating:
  - gold plated in mating area and tin in solder area
  - completely tin plated
- Other platings on request

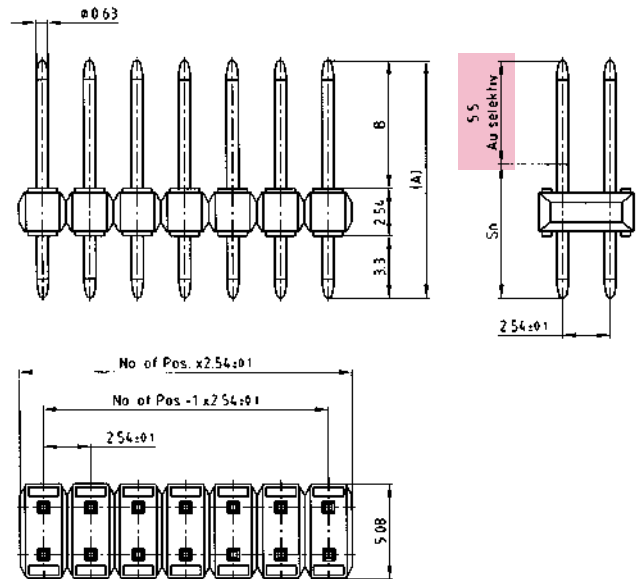
PRODUCT DRAWING

One row straight



| Pin lenght A | B $\pm 0.1$ |
|--------------|-------------|
| 11,3         | 5,46        |
| 12,6         | 6,76        |
| 14,7         | 8,66        |
| 17,7         | 11,86       |
| 19,8         | 13,96       |
| 21,6         | 15,76       |
| 24,9         | 19,06       |

Two row straight



ORDER DATA

(Dim. = mm)

| ONE ROW – STRAIGHT – PIN LENGTH 11.3 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 5                                       | 201 A 12059 X | 201 F 12059 X |
| 10                                      | 201 A 12109 X | 201 F 12109 X |
| 20                                      | 201 A 12209 X | 201 F 12209 X |
| 30                                      | 201 A 12309 X | 201 F 12309 X |
| 40                                      | 201 A 22159 X | 201 F 22159 X |
| 50                                      | 201 A 22259 X | 201 F 22259 X |

| ONE ROW – STRAIGHT – PIN LENGTH 12.6 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 5                                       | 201 A 10059 X | 201 F 10059 X |
| 10                                      | 201 A 10109 X | 201 F 10109 X |
| 20                                      | 201 A 10209 X | 201 F 10209 X |
| 30                                      | 201 A 10309 X | 201 F 10309 X |
| 40                                      | 201 A 22439 X | 201 F 22439 X |
| 50                                      | 201 A 22539 X | 201 F 22539 X |

| TWO ROW – STRAIGHT – PIN LENGTH 11.3 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 10                                      | 201 A 12419 X | 201 F 12419 X |
| 20                                      | 201 A 12469 X | 201 F 12469 X |
| 40                                      | 201 A 12569 X | 201 F 12569 X |
| 60                                      | 201 A 12669 X | 201 F 12669 X |
| 80                                      | 201 A 22299 X | 201 F 22299 X |
| 100                                     | 201 A 22399 X | 201 F 22399 X |

| TWO ROW – STRAIGHT – PIN LENGTH 12.6 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 10                                      | 201 A 10419 X | 201 F 10419 X |
| 20                                      | 201 A 10469 X | 201 F 10469 X |
| 40                                      | 201 A 10569 X | 201 F 10569 X |
| 60                                      | 201 A 10669 X | 201 F 10669 X |
| 80                                      | 201 A 22579 X | 201 F 22579 X |
| 100                                     | 201 A 22679 X | 201 F 22679 X |

# CSU - PIN HEADER

## Straight version – one and two rows

### ORDER DATA

| ONE ROW – STRAIGHT – PIN LENGTH 14.7 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 5                                       | 201 A 12779 X | 201 F 12779 X |
| 10                                      | 201 A 12829 X | 201 F 12829 X |
| 20                                      | 201 A 12929 X | 201 F 12929 X |
| 30                                      | 201 A 13029 X | 201 F 13029 X |
| 40                                      | 201 A 22719 X | 201 F 22719 X |
| 50                                      | 201 A 22819 X | 201 F 22819 X |

| ONE ROW – STRAIGHT – PIN LENGTH 17.7 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 5                                       | 201 A 13499 X | 201 F 13499 X |
| 10                                      | 201 A 13549 X | 201 F 13549 X |
| 20                                      | 201 A 13649 X | 201 F 13649 X |
| 30                                      | 201 A 13749 X | 201 F 13749 X |
| 40                                      | 201 A 22999 X | 201 F 22999 X |
| 50                                      | 201 A 23099 X | 201 F 23099 X |

| ONE ROW – STRAIGHT – PIN LENGTH 19.8 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 5                                       | 201 A 14219 X | 201 F 14219 X |
| 10                                      | 201 A 14269 X | 201 F 14269 X |
| 20                                      | 201 A 14369 X | 201 F 14369 X |
| 30                                      | 201 A 14469 X | 201 F 14469 X |
| 40                                      | 201 A 23279 X | 201 F 23279 X |
| 50                                      | 201 A 23379 X | 201 F 23379 X |

| ONE ROW – STRAIGHT – PIN LENGTH 21.6 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 5                                       | 201 A 14939 X | 201 F 14939 X |
| 10                                      | 201 A 14989 X | 201 F 14989 X |
| 20                                      | 201 A 15089 X | 201 F 15089 X |
| 30                                      | 201 A 15189 X | 201 F 15189 X |
| 40                                      | 201 A 23559 X | 201 F 23559 X |
| 50                                      | 201 A 23659 X | 201 F 23659 X |

| ONE ROW – STRAIGHT – PIN LENGTH 24.9 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 5                                       | 201 A 15659 X | 201 F 15659 X |
| 10                                      | 201 A 15709 X | 201 F 15709 X |
| 20                                      | 201 A 15809 X | 201 F 15809 X |
| 30                                      | 201 A 15909 X | 201 F 15909 X |
| 40                                      | 201 A 23839 X | 201 F 23839 X |
| 50                                      | 201 A 23939 X | 201 F 23939 X |

| TWO ROW – STRAIGHT – PIN LENGTH 14.7 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 10                                      | 201 A 13139 X | 201 F 13139 X |
| 20                                      | 201 A 13189 X | 201 F 13189 X |
| 40                                      | 201 A 13289 X | 201 F 13289 X |
| 60                                      | 201 A 13389 X | 201 F 13389 X |
| 80                                      | 201 A 22859 X | 201 F 22859 X |
| 100                                     | 201 A 22959 X | 201 F 22959 X |

| TWO ROW – STRAIGHT – PIN LENGTH 17.7 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 10                                      | 201 A 13859 X | 201 F 13859 X |
| 20                                      | 201 A 13909 X | 201 F 13909 X |
| 40                                      | 201 A 14009 X | 201 F 14009 X |
| 60                                      | 201 A 14109 X | 201 F 14109 X |
| 80                                      | 201 A 23139 X | 201 F 23139 X |
| 100                                     | 201 A 23239 X | 201 F 23239 X |

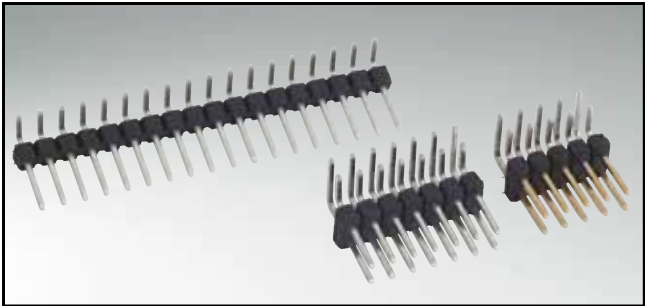
| TWO ROW – STRAIGHT – PIN LENGTH 19.8 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 10                                      | 201 A 14579 X | 201 F 14579 X |
| 20                                      | 201 A 14629 X | 201 F 14629 X |
| 40                                      | 201 A 14729 X | 201 F 14729 X |
| 60                                      | 201 A 14829 X | 201 F 14829 X |
| 80                                      | 201 A 23419 X | 201 F 23419 X |
| 100                                     | 201 A 23519 X | 201 F 23519 X |

| TWO ROW – STRAIGHT – PIN LENGTH 21.6 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 10                                      | 201 A 15299 X | 201 F 15299 X |
| 20                                      | 201 A 15349 X | 201 F 15349 X |
| 40                                      | 201 A 15449 X | 201 F 15449 X |
| 60                                      | 201 A 15549 X | 201 F 15549 X |
| 80                                      | 201 A 23699 X | 201 F 23699 X |
| 100                                     | 201 A 23799 X | 201 F 23799 X |

| TWO ROW – STRAIGHT – PIN LENGTH 24.9 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 10                                      | 201 A 16019 X | 201 F 16019 X |
| 20                                      | 201 A 16069 X | 201 F 16069 X |
| 40                                      | 201 A 16169 X | 201 F 16169 X |
| 60                                      | 201 A 16269 X | 201 F 16269 X |
| 80                                      | 201 A 23979 X | 201 F 23979 X |
| 100                                     | 201 A 24079 X | 201 F 24079 X |

# CSU - PIN HEADER

Angled version – one and two row



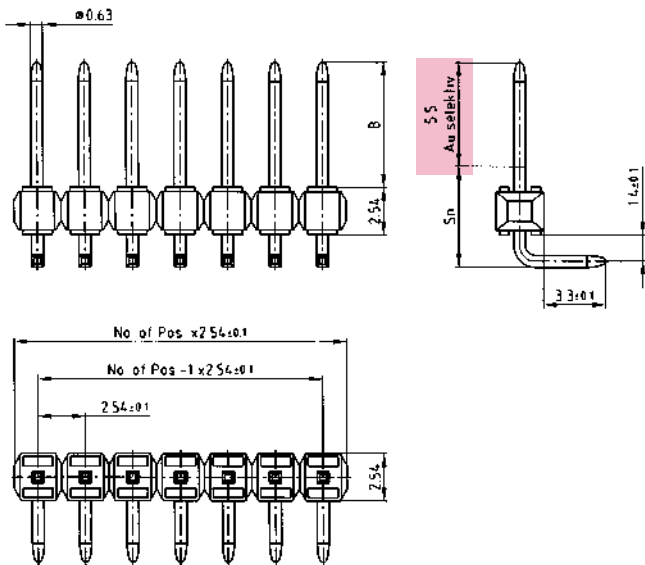
RoHS compliant

DESCRIPTION

- Solder pin
- Contact spacing 2.54 mm
- One row: 5, 10, 20, 30, 40 and 50 positions
- Two row: 10, 20, 40, 60, 80 and 100 positions
- Further positions on request
- Contact plating:
  - gold plated in mating area and tin in solder area
  - completely tin plated
- Other platings on request

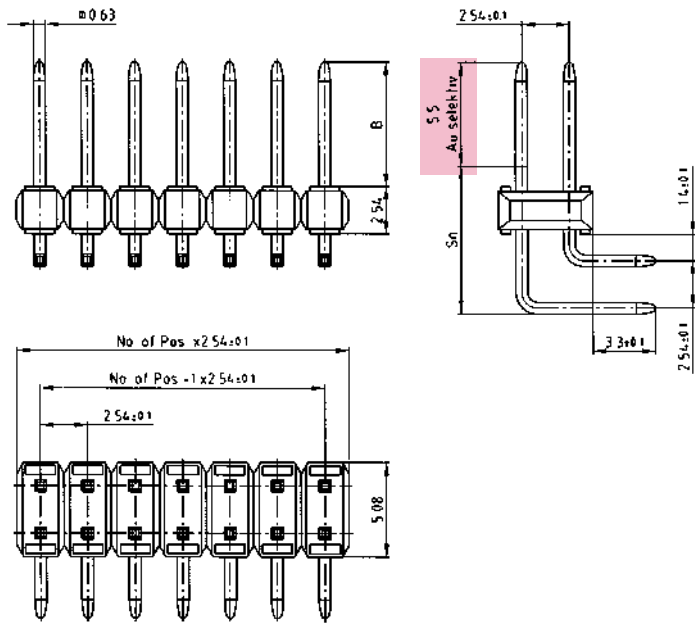
PRODUCT DRAWING

One row angled



| One row angled |             |
|----------------|-------------|
| Pin length     | $B \pm 0.1$ |
| 12.6 mm        | 04.5        |
| 14.7 mm        | 06.6        |
| 17.7 mm        | 09.6        |
| 19.8 mm        | 11.7        |
| 21.6 mm        | 13.5        |
| 24.9 mm        | 16.8        |

Two row angled



| Two row angled       |                      |             |
|----------------------|----------------------|-------------|
| Pin length inner row | Pin length outer row | $B \pm 0.1$ |
| 12.6 mm              | 17.7 mm              | 4.5         |
| 14.7 mm              | 19.8 mm              | 6.6         |

(Dim. = mm)

# CSU - PIN HEADER

## Angled version – one and two row

### ORDER DATA

| ONE ROW – ANGLED – PIN LENGTH 12.6 MM |               |               |
|---------------------------------------|---------------|---------------|
| Number of positions                   | gold plated   | tin plated    |
| 5                                     | 201 A 16379 X | 201 F 16379 X |
| 10                                    | 201 A 16429 X | 201 F 16429 X |
| 20                                    | 201 A 16529 X | 201 F 16529 X |
| 30                                    | 201 A 16629 X | 201 F 16629 X |
| 40                                    | 201 A 24119 X | 201 F 24119 X |
| 50                                    | 201 A 24219 X | 201 F 24219 X |

| ONE ROW – ANGLED – PIN LENGTH 14.7 MM |               |               |
|---------------------------------------|---------------|---------------|
| Number of positions                   | gold plated   | tin plated    |
| 5                                     | 201 A 10779 X | 201 F 10779 X |
| 10                                    | 201 A 10829 X | 201 F 10829 X |
| 20                                    | 201 A 10929 X | 201 F 10929 X |
| 30                                    | 201 A 11029 X | 201 F 11029 X |
| 40                                    | 201 A 24399 X | 201 F 24399 X |
| 50                                    | 201 A 24499 X | 201 F 24499 X |

| ONE ROW – ANGLED – PIN LENGTH 17.7 MM |               |               |
|---------------------------------------|---------------|---------------|
| Number of positions                   | gold plated   | tin plated    |
| 5                                     | 201 A 17099 X | 201 F 17099 X |
| 10                                    | 201 A 17149 X | 201 F 17149 X |
| 20                                    | 201 A 17249 X | 201 F 17249 X |
| 30                                    | 201 A 17349 X | 201 F 17349 X |
| 40                                    | 201 A 24679 X | 201 F 24679 X |
| 50                                    | 201 A 24779 X | 201 F 24779 X |

| ONE ROW – ANGLED – PIN LENGTH 19.8 MM |               |               |
|---------------------------------------|---------------|---------------|
| Number of positions                   | gold plated   | tin plated    |
| 5                                     | 201 A 17459 X | 201 F 17459 X |
| 10                                    | 201 A 17509 X | 201 F 17509 X |
| 20                                    | 201 A 17609 X | 201 F 17609 X |
| 30                                    | 201 A 17709 X | 201 F 17709 X |
| 40                                    | 201 A 24819 X | 201 F 24819 X |
| 50                                    | 201 A 24919 X | 201 F 24919 X |

| ONE ROW – ANGLED – PIN LENGTH 21.6 MM |               |               |
|---------------------------------------|---------------|---------------|
| Number of positions                   | gold plated   | tin plated    |
| 5                                     | 201 A 17819 X | 201 F 17819 X |
| 10                                    | 201 A 17869 X | 201 F 17869 X |
| 20                                    | 201 A 17969 X | 201 F 17969 X |
| 30                                    | 201 A 18069 X | 201 F 18069 X |
| 40                                    | 201 A 24959 X | 201 F 24959 X |
| 50                                    | 201 A 25059 X | 201 F 25059 X |

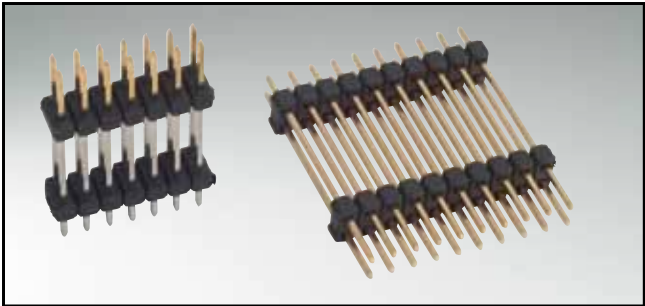
| ONE ROW – ANGLED – PIN LENGTH 24.9 MM |               |               |
|---------------------------------------|---------------|---------------|
| Number of positions                   | gold plated   | tin plated    |
| 5                                     | 201 A 18179 X | 201 F 18179 X |
| 10                                    | 201 A 18229 X | 201 F 18229 X |
| 20                                    | 201 A 18329 X | 201 F 18329 X |
| 30                                    | 201 A 18429 X | 201 F 18429 X |
| 40                                    | 201 A 25099 X | 201 F 25099 X |
| 50                                    | 201 A 25199 X | 201 F 25199 X |

| TWO ROW – ANGLED – PIN LENGTH 12.6 / 17.7 MM |               |               |
|----------------------------------------------|---------------|---------------|
| Number of positions                          | gold plated   | tin plated    |
| 10                                           | 201 A 16739 X | 201 F 16739 X |
| 20                                           | 201 A 16789 X | 201 F 16789 X |
| 40                                           | 201 A 16889 X | 201 F 16889 X |
| 60                                           | 201 A 16989 X | 201 F 16989 X |
| 80                                           | 201 A 24259 X | 201 F 24259 X |
| 100                                          | 201 A 24359 X | 201 F 24359 X |

| TWO ROW – ANGLED – PIN LENGTH 14.7 / 19.8 MM |               |               |
|----------------------------------------------|---------------|---------------|
| Number of positions                          | gold plated   | tin plated    |
| 10                                           | 201 A 11139 X | 201 F 11139 X |
| 20                                           | 201 A 11189 X | 201 F 11189 X |
| 40                                           | 201 A 11289 X | 201 F 11289 X |
| 60                                           | 201 A 11389 X | 201 F 11389 X |
| 80                                           | 201 A 24539 X | 201 F 24539 X |
| 100                                          | 201 A 24639 X | 201 F 24639 X |

# CSU - PIN HEADER

Double hood – straight – one and two row



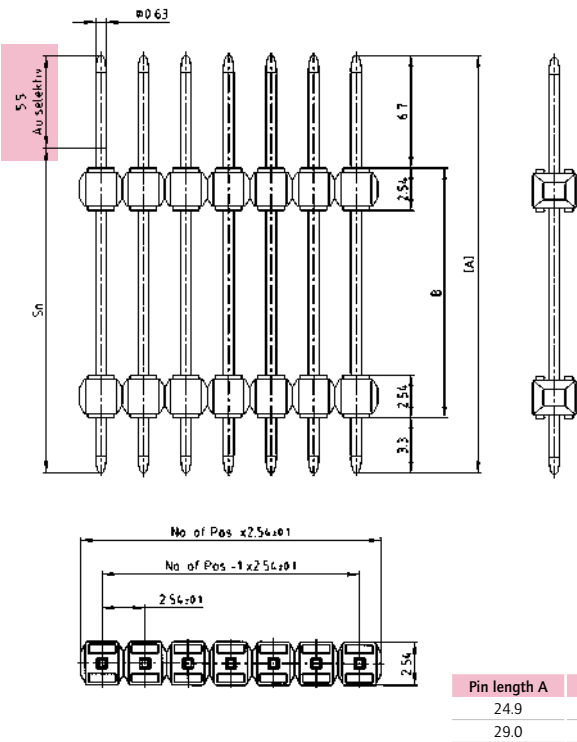
RoHS compliant

DESCRIPTION

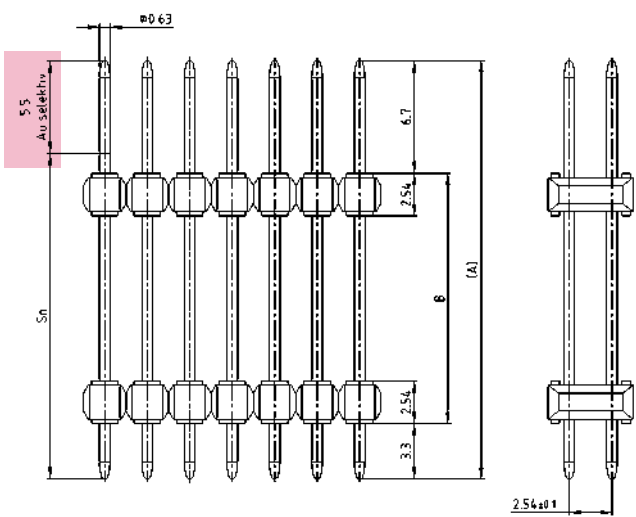
- Solder pin
- Contact spacing 2.54 mm
- One row: 5, 10, 20, 30, 40 and 50 positions
- Two row: 10, 20, 40, 60, 80 and 100 positions
- Further positions on request
- Contact plating
  - gold plated in mating area and tin in solder area
  - completely tin plated
- Other platings on request

PRODUCT DRAWING

One row straight



Two row straight



| Pin length A | B $\pm 0.1$ |
|--------------|-------------|
| 24.9         | 14.9        |
| 29.0         | 19.0        |

ORDER DATA

(Dim. = mm)

| ONE ROW – STRAIGHT – PIN LENGTH 24.9 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 5                                       | 201 A 18539 X | 201 F 18539 X |
| 10                                      | 201 A 18589 X | 201 F 18589 X |
| 20                                      | 201 A 18689 X | 201 F 18689 X |
| 30                                      | 201 A 18789 X | 201 F 18789 X |
| 40                                      | 201 A 25239 X | 201 F 25239 X |
| 50                                      | 201 A 25339 X | 201 F 25339 X |

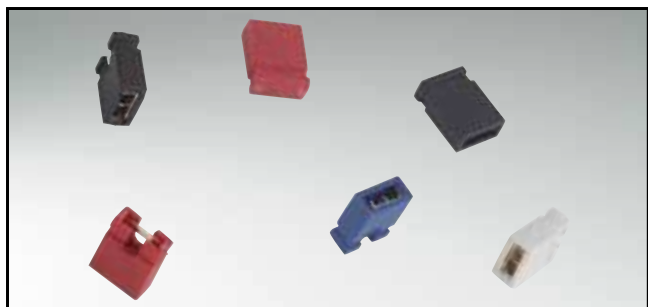
| ONE ROW – STRAIGHT – PIN LENGTH 29.0 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 5                                       | 201 A 19259 X | 201 F 19259 X |
| 10                                      | 201 A 19309 X | 201 F 19309 X |
| 20                                      | 201 A 19409 X | 201 F 19409 X |
| 30                                      | 201 A 19509 X | 201 F 19509 X |
| 40                                      | 201 A 25519 X | 201 F 25519 X |
| 50                                      | 201 A 25619 X | 201 F 25619 X |

| TWO ROW – STRAIGHT – PIN LENGTH 24.9 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 10                                      | 201 A 18899 X | 201 F 18899 X |
| 20                                      | 201 A 18949 X | 201 F 18949 X |
| 40                                      | 201 A 19049 X | 201 F 19049 X |
| 60                                      | 201 A 19149 X | 201 F 19149 X |
| 80                                      | 201 A 25379 X | 201 F 25379 X |
| 100                                     | 201 A 25479 X | 201 F 25479 X |

| TWO ROW – STRAIGHT – PIN LENGTH 29.0 MM |               |               |
|-----------------------------------------|---------------|---------------|
| Number of positions                     | gold plated   | tin plated    |
| 10                                      | 201 A 19619 X | 201 F 19619 X |
| 20                                      | 201 A 19669 X | 201 F 19669 X |
| 40                                      | 201 A 19769 X | 201 F 19769 X |
| 60                                      | 201 A 19869 X | 201 F 19869 X |
| 80                                      | 201 A 25659 X | 201 F 25659 X |
| 100                                     | 201 A 25759 X | 201 F 25759 X |

# SHORT CIRCUIT PLUG

Open and closed version



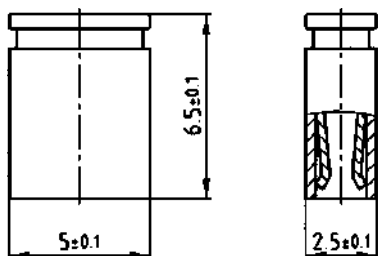
RoHS compliant

## DESCRIPTION

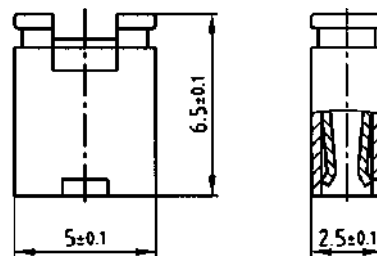
- Gold plated contacts
- Contact spacing 2.54 mm
- Several colors

## PRODUCT DRAWING

Closed version



Open version



### Technical Data

|                        |                    |
|------------------------|--------------------|
| Contacts:              | Phosphorbronze     |
| Insulator:             | PA 6,6 UL 94 V-0   |
| Contact resistance:    | ≤ 7 mΩ             |
| Current rating:        | 2.5 A              |
| Insulation resistance: | 10 <sup>12</sup> Ω |
| Withdrawal force:      | ≤ 3 N              |
| Insertion force:       | ≤ 6 N              |
| Temperature range:     | -65°C to + 150°C   |
| Contact surface:       | Gold over nickel   |
| Contact spacing:       | 2.54 mm            |

## ORDER DATA

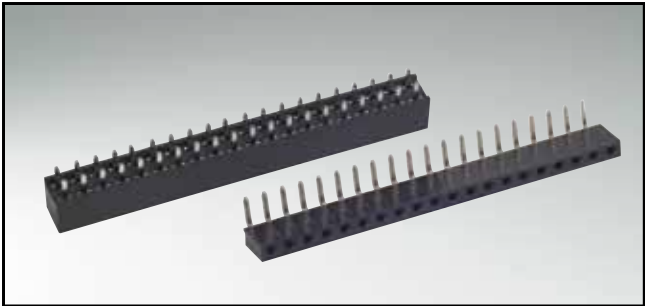
(Dim. = mm)

| Color | closed version |
|-------|----------------|
| grey  | 200 A 10069 X  |
| black | 200 A 10079 X  |
| blue  | 200 A 10089 X  |
| red   | 200 A 10099 X  |
| green | 200 A 10109 X  |

| Color | open version  |
|-------|---------------|
| grey  | 200 A 10019 X |
| black | 200 A 10029 X |
| blue  | 200 A 10039 X |
| red   | 200 A 10049 X |
| green | 200 A 10059 X |

CBL - SOCKET CONNECTOR

Straight and angled – one and two row – installation height 5.7 mm



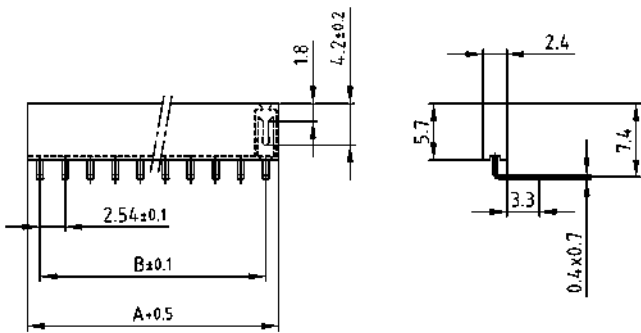
RoHS compliant

DESCRIPTION

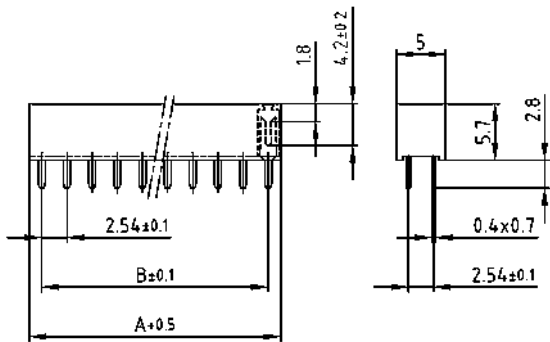
- Solder pin
- Contact spacing 2.54 mm
- One row: 5, 10 and 20 positions
- Two row: 10, 20 and 40 positions
- Further positions on request
- Contact plating: gold or tin plated
- Suitable for CSU pin headers

PRODUCT DRAWING

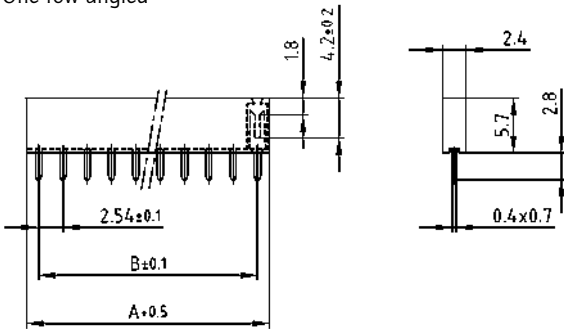
One row straight



Two row straight



One row angled



| No. of Pos. |         | A + 0.5 | B ± 0.1           |
|-------------|---------|---------|-------------------|
| One row     | Two row |         |                   |
| 5           | 10      | 12.7    | 4 x 2.54 = 10.16  |
| 10          | 20      | 25.4    | 9 x 2.54 = 22.86  |
| 20          | 40      | 50.8    | 19 x 2.54 = 48.26 |

ORDER DATA

(Dim. = mm)

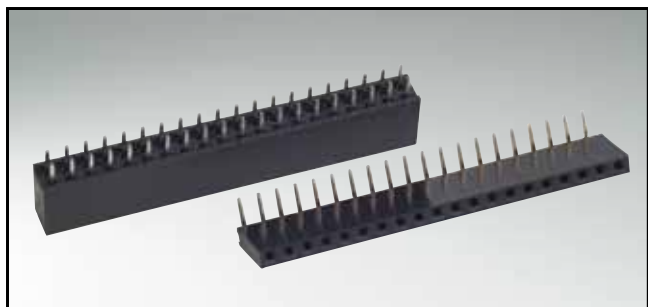
| ONE ROW – STRAIGHT |               |               |
|--------------------|---------------|---------------|
| No. of Pos.        | gold plated   | tin plated    |
| 5                  | 202 A 10019 X | 202 F 10019 X |
| 10                 | 202 A 10029 X | 202 F 10029 X |
| 20                 | 202 A 10039 X | 202 F 10039 X |

| TWO ROW – STRAIGHT |               |               |
|--------------------|---------------|---------------|
| No. of Pos.        | gold plated   | tin plated    |
| 10                 | 202 A 10079 X | 202 F 10079 X |
| 20                 | 202 A 10089 X | 202 F 10089 X |
| 40                 | 202 A 10099 X | 202 F 10099 X |

| ONE ROW – ANGLED |               |               |
|------------------|---------------|---------------|
| No. of Pos.      | gold plated   | tin plated    |
| 5                | 202 A 10049 X | 202 F 10049 X |
| 10               | 202 A 10059 X | 202 F 10059 X |
| 20               | 202 A 10069 X | 202 F 10069 X |

# CBL SOCKET CONNECTOR

Straight – one and two row – installation height 8.5 mm



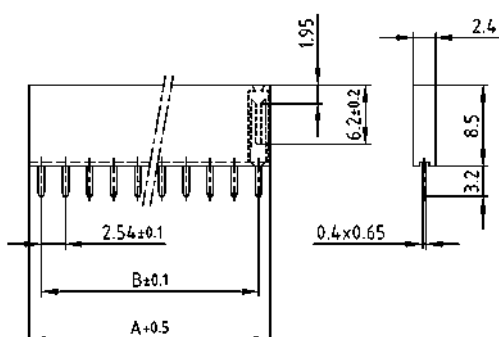
RoHS compliant

## DESCRIPTION

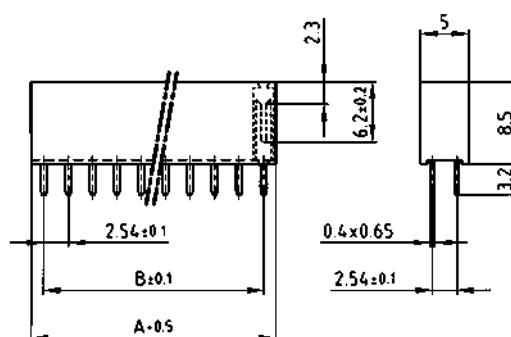
- Solder pin
- Contact spacing 2.54 mm
- One row: 5, 10 and 20 positions
- Two row: 10, 20 and 40 positions
- Further positions on request
- Contact plating: gold plated or tin plated
- Suitable for CSU pin headers

## PRODUCT DRAWING

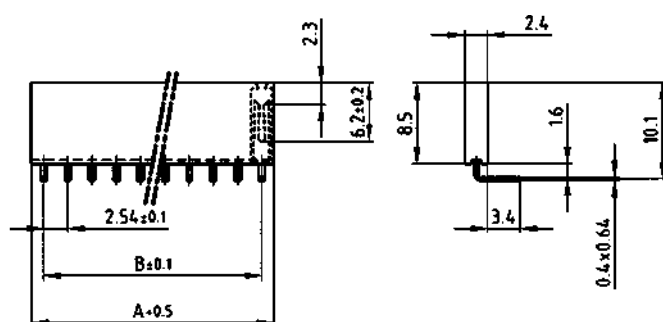
One row straight



Two row straight



One row angled



| No. of Pos. |         | A + 0.5 | B ± 0.1           |
|-------------|---------|---------|-------------------|
| one row     | two row |         |                   |
| 5           | 10      | 12.7    | 4 x 2.54 = 10.16  |
| 10          | 20      | 25.4    | 9 x 2.54 = 22.86  |
| 20          | 40      | 50.8    | 19 x 2.54 = 48.26 |

## ORDER DATA

(Dim. = mm)

| ONE ROW – STRAIGHT |               |               |
|--------------------|---------------|---------------|
| No. of Pos.        | gold plated   | tin plated    |
| 5                  | 202 A 10109 X | 202 F 10109 X |
| 10                 | 202 A 10119 X | 202 F 10119 X |
| 20                 | 202 A 10129 X | 202 F 10129 X |

| TWO ROW – STRAIGHT |               |               |
|--------------------|---------------|---------------|
| No. of Pos.        | gold plated   | tin plated    |
| 10                 | 202 A 10169 X | 202 F 10169 X |
| 20                 | 202 A 10179 X | 202 F 10179 X |
| 40                 | 202 A 10189 X | 202 F 10189 X |

| ONE ROW – ANGLED |               |               |
|------------------|---------------|---------------|
| No. of Pos.      | gold plated   | tin plated    |
| 5                | 202 A 10139 X | 202 F 10139 X |
| 10               | 202 A 10149 X | 202 F 10149 X |
| 20               | 202 A 10159 X | 202 F 10159 X |

## SECTION 9

# INSTALLATION AND ASSEMBLY TOOLS



CONEC offers a variety of special tools to facilitate the reliable, rational assembly of contacts and connectors in its line of flatcable connectors. These tools are practice-proven and ensure the optimal handling of our products.



For technical support and handling technic  
please contact the factory.





DESCRIPTION \_\_\_\_\_

**Press in tool**  
for straight CompactPCI male connector, 38 positions

**Part number**            360X15129X

**Press in tool**  
for straight CompactPCI male connector, 47 positions

**Part number**            360X15139X



DESCRIPTION \_\_\_\_\_

**Press in tool**  
for straight CompactPCI female connector,  
38 and 47 positions

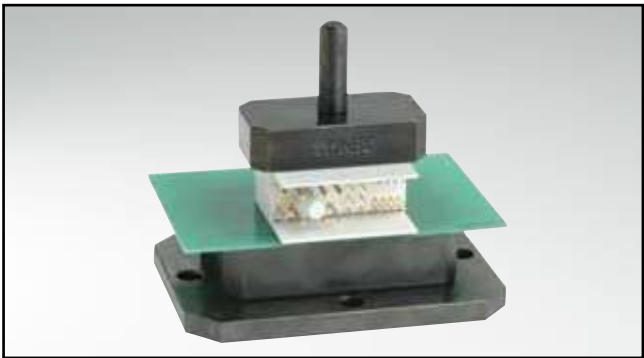
**Part number**            360X15119X



DESCRIPTION \_\_\_\_\_

**Press in tool**  
for straight AdvancedTCA female connectors

**Part number**            360X15149X



DESCRIPTION \_\_\_\_\_

**Press in tool**  
for angled AdvancedTCA male connectors

**Part number**            360X15159X



**DESCRIPTION** \_\_\_\_\_

**Hand crimp tool**  
for CompactPCI crimp contacts  
(Inserts need to be ordered separately)

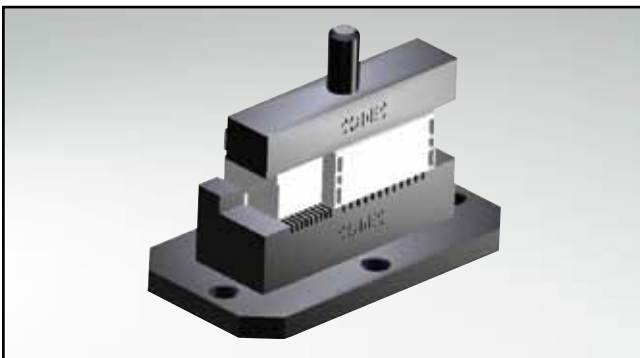
**Part number**      360X21079X



**DESCRIPTION** \_\_\_\_\_

**Inserts**  
for above hand crimp tool

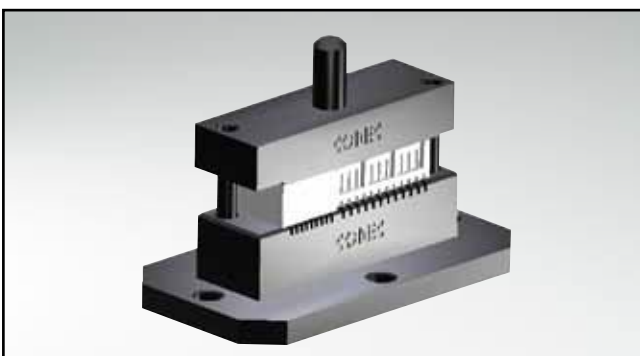
**Part number**      360X21089X



**DESCRIPTION** \_\_\_\_\_

**Press in tool**  
for MicroTCA Power Module output connector, angled

**Part number**      36-000080



**DESCRIPTION** \_\_\_\_\_

**Press in tool**  
for MicroTCA Power Backplane output connector, straight

**Part number**      36-000070



DESCRIPTION \_\_\_\_\_

**Hand Crimp tool**  
for high power contacts DIN EN 60603-2

**Part number**                360 X 10409 X



DESCRIPTION \_\_\_\_\_

**Inserts**  
for above hand crimp tool

**Part number**                360 X 20029 X



DESCRIPTION \_\_\_\_\_

**Hand Crimp tool**  
for coaxial contacts (inner conductor) and  
D-SUB for Signal Crimp contacts standard and High Density  
(Inserts must be ordered separately)

**Part number**                360 X 10329 X



DESCRIPTION \_\_\_\_\_

**Inserts**  
for above hand crimp tool

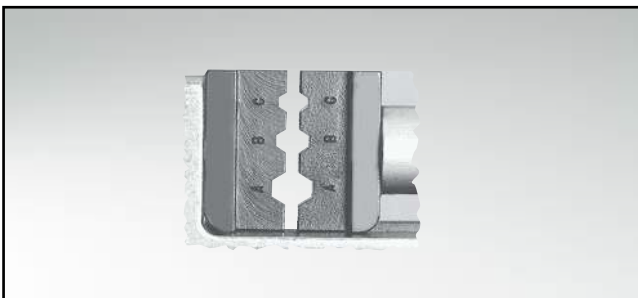
Inserts for hand crimp tool  
for use with hand crimp tool 360X10329X

| Plug Connector | Socket connector | Tool Inserts  | Inserts cavity                      |        |
|----------------|------------------|---------------|-------------------------------------|--------|
| 123 C 21049 X  | 124 C 21049 X    | 360 X 11049 X | depends on<br>wire<br>select cavity |        |
| 123 C 21059 X  | 124 C 21059 X    | 360 X 11049 X |                                     |        |
| 123 C 21069 X  | 124 C 21069 X    | 360 X 11049 X |                                     |        |
| 123 C 23049 X  | 124 C 23049 X    | 360 X 11059 X | AWG                                 | Cavity |
| 123 C 23059 X  | 124 C 23059 X    | 360 X 11059 X |                                     |        |
| 123 C 23069 X  | 124 C 23069 X    | 360 X 11059 X |                                     |        |
| 123 C 33039 X  | 124 C 33039 X    | 360 X 11059 X |                                     |        |
| 123 C 33049 X  | 124 C 33049 X    | 360 X 11059 X |                                     |        |


**DESCRIPTION**
**Hand Crimp tool**

for coaxial contacts (outer conductor),  
(Inserts must be ordered separately)

**Part number** 360 X 10519 X


**DESCRIPTION**
**Inserts**

for above hand crimp tool

**Inserts for hand crimp tool coaxial contacts (outer conductor)  
for use with hand crimp tool 360X10519X**

| Plug Connector | Socket connector | Tool Inserts  | Inserts cavity |
|----------------|------------------|---------------|----------------|
| 123 C 20059 X  | 124 C 20059 X    | 360 X 11019 X | C              |
| 123 C 20069 X  | 124 C 20069 X    | 360 X 11019 X | B              |
| 123 C 20079 X  | 124 C 20079 X    | 360 X 11039 X | B              |
| 123 C 20089 X  | 124 C 20089 X    | 360 X 11029 X | A              |
| 123 C 21049 X  | 124 C 21049 X    | 360 X 11019 X | B              |
| 123 C 21059 X  | 124 C 21059 X    | 360 X 11029 X | A              |
| 123 C 21069 X  | 124 C 21069 X    | 360 X 11039 X | B              |
| 123 C 22069 X  | 124 C 22069 X    | 360 X 11019 X | C              |
| 123 C 22079 X  | 124 C 22079 X    | 360 X 11019 X | B              |
| 123 C 22089 X  | 124 C 22089 X    | 360 X 11039 X | B              |
| 123 C 22099 X  | 124 C 22099 X    | 360 X 11019 X | A              |
| 123 C 22109 X  | 124 C 22109 X    | 360 X 11029 X | A              |
| 123 C 32049 X  | 124 C 32049 X    | 360 X 11019 X | C              |
| 123 C 32059 X  | 124 C 32059 X    | 360 X 11019 X | B              |
| 123 C 32069 X  | 124 C 32069 X    | 360 X 11019 X | A              |
| 123 C 23049 X  | 124 C 23049 X    | 360 X 11019 X | B              |
| 123 C 23059 X  | 124 C 23059 X    | 360 X 11039 X | B              |
| 123 C 23069 X  | 124 C 23069 X    | 360 X 11029 X | A              |
| 123 C 33039 X  | 124 C 33039 X    | 360 X 11019 X | B              |
| 123 C 33049 X  | 124 C 33049 X    | 360 X 11019 X | A              |



### DESCRIPTION \_\_\_\_\_

#### Extraction tool

for D-SUB coaxial, high power and high voltage contacts  
for DIN EN 60603-2 high power and coaxial contacts

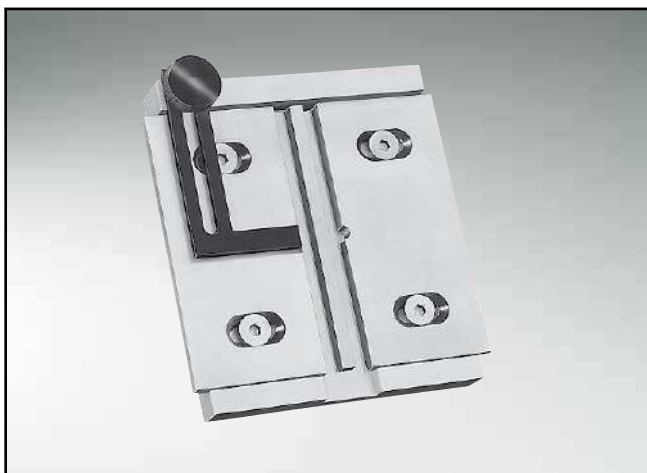
Part number 360 X 10219 X



### DESCRIPTION \_\_\_\_\_

#### Hand cutting scissors

Part number 360 X 10059 X



### DESCRIPTION \_\_\_\_\_

#### Tooling set

for hand lever press (see page 9 | 7)

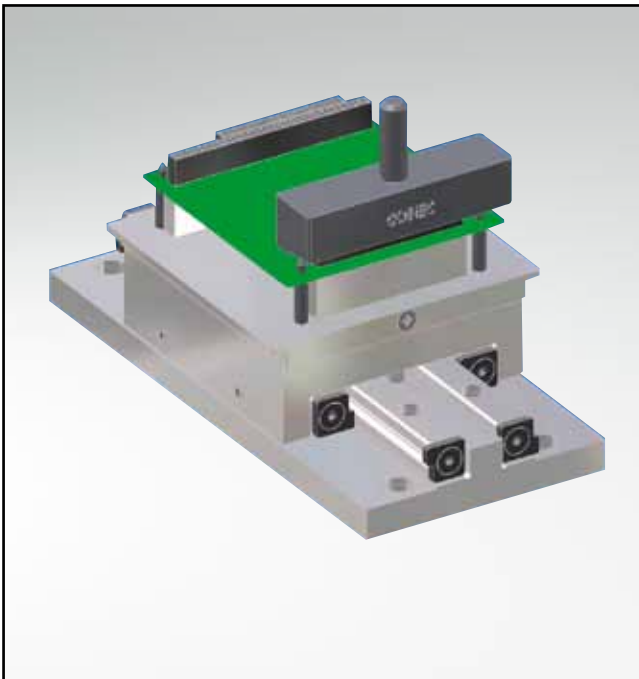
Part number 360 X 10029 X



DESCRIPTION \_\_\_\_\_

Manually operated lever press

Part number 360 X 12369 X



DESCRIPTION \_\_\_\_\_

Press in tool  
for PC104 and PC104plus connectors

Part number 36-000130

SECTION 10  
**PART NUMBERS**

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6658  
6  
66589



**66589B 74**

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9B 75

6 589B 76

B 77

PART NUMBERS

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| 101 A 10029 X | 7   4          | 101 E 10019 X | 7   4          | 102 E 10099 X | 7   8          |
| 101 A 10039 X | 7   4          | 101 E 10029 X | 7   4          | 120 X 10019 X | 4   29         |
| 101 A 10049 X | 7   5          | 101 E 10039 X | 7   4          | 120 X 10019 X | 4   31         |
| 101 A 10059 X | 7   5          | 101 E 10049 X | 7   5          | 120 X 10039 X | 4   36         |
| 101 A 10069 X | 7   5          | 101 E 10059 X | 7   5          | 120 X 10049 X | 4   36         |
| 101 A 10079 X | 7   6          | 101 E 10069 X | 7   5          | 120 X 10059 X | 4   36         |
| 101 A 10089 X | 7   6          | 101 E 10079 X | 7   6          | 120 X 10089 X | 4   35         |
| 101 A 10099 X | 7   6          | 101 E 10089 X | 7   6          | 120 X 10099 X | 4   35         |
| 101 A 10109 X | 7   6          | 101 E 10099 X | 7   6          | 120 X 10109 X | 4   35         |
| 101 A 10119 X | 7   6          | 101 E 10109 X | 7   6          | 120 X 10119 X | 4   35         |
| 101 A 10129 X | 7   6          | 101 E 10119 X | 7   6          | 120 X 10129 X | 4   35         |
| 101 A 10139 X | 7   3          | 101 E 10129 X | 7   6          | 120 X 10129 X | 4   35         |
| 101 A 10149 X | 7   3          | 101 E 10139 X | 7   3          | 120 X 10129 X | 4   35         |
| 101 A 10159 X | 7   3          | 101 E 10149 X | 7   3          | 120 X 10129 X | 4   35         |
| 101 A 10169 X | 7   5          | 101 E 10159 X | 7   3          | 120 X 10149 X | 4   35         |
| 101 A 10179 X | 7   5          | 101 E 10169 X | 7   5          | 120 X 10149 X | 4   35         |
| 101 A 10189 X | 7   5          | 101 E 10179 X | 7   5          | 120 X 10149 X | 4   35         |
| 101 B 10019 X | 7   4          | 101 E 10189 X | 7   5          | 120 X 10149 X | 4   35         |
| 101 B 10029 X | 7   4          | 102 A 10019 X | 7   7          | 120 X 10169 X | 4   34         |
| 101 B 10039 X | 7   4          | 102 A 10029 X | 7   7          | 120 X 10169 X | 8   14         |
| 101 B 10049 X | 7   5          | 102 A 10039 X | 7   7          | 120 X 10319 X | 4   37         |
| 101 B 10059 X | 7   5          | 102 A 10049 X | 7   8          | 120 X 10359 X | 4   37         |
| 101 B 10069 X | 7   5          | 102 A 10059 X | 7   8          | 120 X 10369 X | 4   37         |
| 101 B 10079 X | 7   6          | 102 A 10069 X | 7   8          | 120 X 10379 X | 4   37         |
| 101 B 10089 X | 7   6          | 102 A 10079 X | 7   8          | 121 A 10019 X | 4   6          |
| 101 B 10099 X | 7   6          | 102 A 10089 X | 7   8          | 121 A 10029 X | 4   6          |
| 101 B 10109 X | 7   6          | 102 A 10099 X | 7   8          | 121 A 10039 X | 4   6          |
| 101 B 10119 X | 7   6          | 102 B 10019 X | 7   7          | 121 A 10049 X | 4   6          |
| 101 B 10129 X | 7   6          | 102 B 10029 X | 7   7          | 121 A 10059 X | 4   6          |
| 101 B 10139 X | 7   3          | 102 B 10039 X | 7   7          | 121 A 10069 X | 4   6          |
| 101 B 10149 X | 7   3          | 102 B 10049 X | 7   8          | 121 A 10109 X | 4   10         |
| 101 B 10159 X | 7   3          | 102 B 10059 X | 7   8          | 121 A 10119 X | 4   10         |
| 101 B 10169 X | 7   5          | 102 B 10069 X | 7   8          | 121 A 10139 X | 4   10         |
| 101 B 10179 X | 7   5          | 102 B 10079 X | 7   8          | 121 A 10149 X | 4   10         |
| 101 B 10189 X | 7   5          | 102 B 10089 X | 7   8          | 121 A 10159 X | 4   10         |
| 101 C 10019 X | 7   4          | 102 B 10099 X | 7   8          | 121 A 10169 X | 4   10         |
| 101 C 10029 X | 7   4          | 102 C 10019 X | 7   7          | 121 A 10189 X | 4   10         |
| 101 C 10039 X | 7   4          | 102 C 10029 X | 7   7          | 121 A 10199 X | 4   10         |
| 101 C 10049 X | 7   5          | 102 C 10039 X | 7   7          | 121 A 10259 X | 4   8          |
| 101 C 10059 X | 7   5          | 102 C 10049 X | 7   8          | 121 A 10269 X | 4   8          |
| 101 C 10069 X | 7   5          | 102 C 10059 X | 7   8          | 121 A 10279 X | 4   8          |
| 101 C 10079 X | 7   6          | 102 C 10069 X | 7   8          | 121 A 10289 X | 4   8          |
| 101 C 10089 X | 7   6          | 102 C 10079 X | 7   8          | 121 A 10299 X | 4   8          |
| 101 C 10099 X | 7   6          | 102 C 10089 X | 7   8          | 121 A 10309 X | 4   8          |
| 101 C 10109 X | 7   6          | 102 C 10099 X | 7   8          | 121 A 10349 X | 4   12         |
| 101 C 10119 X | 7   6          | 102 E 10019 X | 7   7          | 121 A 10359 X | 4   12         |
| 101 C 10129 X | 7   6          | 102 E 10029 X | 7   7          | 121 A 10379 X | 4   12         |
| 101 C 10139 X | 7   3          | 102 E 10039 X | 7   7          | 121 A 10389 X | 4   12         |
| 101 C 10149 X | 7   3          | 102 E 10049 X | 7   8          | 121 A 10399 X | 4   12         |
| 101 C 10159 X | 7   3          | 102 E 10059 X | 7   8          | 121 A 10409 X | 4   12         |
| 101 C 10169 X | 7   5          | 102 E 10069 X | 7   8          | 121 A 10429 X | 4   12         |
| 101 C 10179 X | 7   5          | 102 E 10079 X | 7   8          | 121 A 10439 X | 4   12         |

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| 121 A 10509 X | 4   14         | 122 A 10089 X | 4   7          | 122 A 10719 X | 4   13         |
| 121 A 10519 X | 4   14         | 122 A 10099 X | 4   7          | 122 A 10729 X | 4   13         |
| 121 A 10529 X | 4   14         | 122 A 10109 X | 4   7          | 122 A 10739 X | 4   13         |
| 121 A 10549 X | 4   14         | 122 A 10119 X | 4   7          | 122 A 10759 X | 4   13         |
| 121 A 10559 X | 4   14         | 122 A 10129 X | 4   7          | 122 A 10769 X | 4   13         |
| 121 A 10569 X | 4   14         | 122 A 10139 X | 4   7          | 122 A 10779 X | 4   13         |
| 121 A 10589 X | 4   16         | 122 A 10149 X | 4   7          | 122 A 10789 X | 4   13         |
| 121 A 10599 X | 4   16         | 122 A 10159 X | 4   7          | 122 A 10809 X | 4   13         |
| 121 A 10619 X | 4   16         | 122 A 10169 X | 4   11         | 122 A 10819 X | 4   13         |
| 121 A 10629 X | 4   16         | 122 A 10179 X | 4   11         | 122 A 10839 X | 4   15         |
| 121 A 10639 X | 4   18         | 122 A 10199 X | 4   11         | 122 A 10849 X | 4   15         |
| 121 A 10649 X | 4   18         | 122 A 10209 X | 4   11         | 122 A 10859 X | 4   15         |
| 121 A 10659 X | 4   18         | 122 A 10219 X | 4   11         | 122 A 10879 X | 4   17         |
| 121 A 10669 X | 4   18         | 122 A 10229 X | 4   11         | 122 A 10889 X | 4   17         |
| 121 A 10699 X | 4   23         | 122 A 10249 X | 4   11         | 122 A 10919 X | 4   19         |
| 121 A 10709 X | 4   23         | 122 A 10259 X | 4   11         | 122 A 10929 X | 4   19         |
| 121 A 10719 X | 4   23         | 122 A 10269 X | 4   11         | 122 A 10939 X | 4   19         |
| 121 A 10789 X | 4   26         | 122 A 10279 X | 4   11         | 122 A 10949 X | 4   19         |
| 121 A 10849 X | 4   21         | 122 A 10299 X | 4   11         | 122 A 10959 X | 4   19         |
| 121 A 10859 X | 4   21         | 122 A 10309 X | 4   11         | 122 A 10969 X | 4   19         |
| 121 A 20779 X | 4   21         | 122 A 10319 X | 4   11         | 122 A 10979 X | 4   24         |
| 121 A 20789 X | 4   21         | 122 A 10329 X | 4   11         | 122 A 10989 X | 4   24         |
| 121 A 20799 X | 4   21         | 122 A 10349 X | 4   11         | 122 A 10999 X | 4   24         |
| 121 A 20809 X | 4   21         | 122 A 10359 X | 4   11         | 122 A 11039 X | 4   24         |
| 121 A 20819 X | 4   6          | 122 A 10369 X | 4   11         | 122 A 11049 X | 4   24         |
| 121 A 20829 X | 4   6          | 122 A 10379 X | 4   11         | 122 A 11059 X | 4   24         |
| 121 A 20839 X | 4   6          | 122 A 10399 X | 4   11         | 122 A 11069 X | 4   24         |
| 121 A 20849 X | 4   8          | 122 A 10409 X | 4   11         | 122 A 11079 X | 4   24         |
| 121 A 20859 X | 4   8          | 122 A 10419 X | 4   9          | 122 A 11089 X | 4   24         |
| 121 A 20869 X | 4   8          | 122 A 10429 X | 4   9          | 122 A 11099 X | 4   24         |
| 121 A 20879 X | 4   10         | 122 A 10439 X | 4   9          | 122 A 11109 X | 4   24         |
| 121 A 20889 X | 4   10         | 122 A 10449 X | 4   9          | 122 A 11119 X | 4   24         |
| 121 A 20909 X | 4   10         | 122 A 10459 X | 4   9          | 122 A 11129 X | 4   27         |
| 121 A 20919 X | 4   10         | 122 A 10469 X | 4   9          | 122 A 11139 X | 4   27         |
| 121 A 20929 X | 4   12         | 122 A 10479 X | 4   9          | 122 A 11609 X | 4   22         |
| 121 A 20939 X | 4   12         | 122 A 10489 X | 4   9          | 122 A 11619 X | 4   22         |
| 121 A 20959 X | 4   12         | 122 A 10499 X | 4   9          | 122 A 11629 X | 4   22         |
| 121 A 20969 X | 4   12         | 122 A 10509 X | 4   9          | 122 A 11699 X | 4   34         |
| 121 A 20979 X | 4   18         | 122 A 10519 X | 4   9          | 122 A 11699 X | 8   14         |
| 121 A 20989 X | 4   18         | 122 A 10529 X | 4   9          | 122 A 13079 X | 4   19         |
| 121 B 10799 X | 4   32         | 122 A 10539 X | 4   9          | 122 A 13089 X | 4   19         |
| 121 E 10949 X | 4   30         | 122 A 10559 X | 4   9          | 122 A 13099 X | 4   22         |
| 121 E 10959 X | 4   30         | 122 A 10579 X | 4   13         | 122 A 13109 X | 4   22         |
| 121 E 21109 X | 4   28         | 122 A 10589 X | 4   13         | 122 A 13119 X | 4   22         |
| 121 E 21119 X | 4   28         | 122 A 10609 X | 4   13         | 122 A 13129 X | 4   22         |
| 121 E 21129 X | 4   28         | 122 A 10619 X | 4   13         | 122 A 13139 X | 4   22         |
| 122 A 10019 X | 4   7          | 122 A 10629 X | 4   13         | 122 A 13149 X | 4   22         |
| 122 A 10029 X | 4   7          | 122 A 10639 X | 4   13         | 122 A 13159 X | 4   22         |
| 122 A 10039 X | 4   7          | 122 A 10659 X | 4   13         | 122 A 13169 X | 4   22         |
| 122 A 10049 X | 4   7          | 122 A 10669 X | 4   13         | 122 A 13179 X | 4   22         |
| 122 A 10059 X | 4   7          | 122 A 10679 X | 4   13         | 122 A 13189 X | 4   7          |
| 122 A 10069 X | 4   7          | 122 A 10689 X | 4   13         | 122 A 13199 X | 4   7          |
| 122 A 10079 X | 4   7          | 122 A 10709 X | 4   13         | 122 A 13209 X | 4   7          |

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| 122 A 13229 X | 4   9          | 123 C 11139 X | 5   11         | 123 C 32049 X | 5   18         |
| 122 A 13239 X | 4   9          | 123 C 11149 X | 5   11         | 123 C 32049 X | 9   5          |
| 122 A 13249 X | 4   11         | 123 C 12019 X | 5   13         | 123 C 32059 X | 5   18         |
| 122 A 13259 X | 4   11         | 123 C 12119 X | 5   13         | 123 C 32059 X | 9   5          |
| 122 A 13279 X | 4   11         | 123 C 13019 X | 5   14         | 123 C 32069 X | 5   18         |
| 122 A 13289 X | 4   11         | 123 C 13039 X | 5   14         | 123 C 32069 X | 9   5          |
| 122 A 13299 X | 4   13         | 123 C 13119 X | 5   14         | 123 C 33039 X | 5   19         |
| 122 A 13309 X | 4   13         | 123 C 13139 X | 5   14         | 123 C 33039 X | 9   4          |
| 122 A 13329 X | 4   13         | 123 C 14029 X | 5   12         | 123 C 33039 X | 9   5          |
| 122 A 13339 X | 4   13         | 123 C 14049 X | 5   12         | 123 C 33049 X | 5   19         |
| 122 A 13349 X | 4   19         | 123 C 14129 X | 5   12         | 123 C 33049 X | 9   4          |
| 122 A 13359 X | 4   19         | 123 C 14149 X | 5   12         | 123 C 33049 X | 9   5          |
| 122 B 11159 X | 4   33         | 123 C 20059 X | 5   16         | 123 C 34029 X | 5   20         |
| 122 B 11739 X | 4   25         | 123 C 20059 X | 9   5          | 123 C 35029 X | 5   21         |
| 122 B 11749 X | 4   25         | 123 C 20069 X | 5   16         | 124 A 10019 X | 5   15         |
| 122 B 11759 X | 4   25         | 123 C 20069 X | 9   5          | 124 A 10039 X | 5   10         |
| 122 C 13019 X | 7   9          | 123 C 20079 X | 5   16         | 124 A 10049 X | 5   10         |
| 122 C 13069 X | 7   9          | 123 C 20079 X | 9   5          | 124 A 10069 X | 5   10         |
| 122 E 11609 X | 4   29         | 123 C 20089 X | 5   16         | 124 A 11019 X | 5   11         |
| 122 E 11619 X | 4   29         | 123 C 20089 X | 9   5          | 124 A 11029 X | 5   11         |
| 122 E 11629 X | 4   29         | 123 C 21049 X | 5   17         | 124 A 11039 X | 5   11         |
| 122 E 11639 X | 4   29         | 123 C 21049 X | 9   4          | 124 A 11049 X | 5   11         |
| 122 E 11649 X | 4   29         | 123 C 21049 X | 9   5          | 124 A 12019 X | 5   13         |
| 122 E 11659 X | 4   29         | 123 C 21059 X | 5   17         | 124 A 13019 X | 5   14         |
| 122 E 11709 X | 4   31         | 123 C 21059 X | 9   5          | 124 A 13039 X | 5   14         |
| 122 E 11719 X | 4   31         | 123 C 21059 X | 9   4          | 124 A 14029 X | 5   12         |
| 123 A 10019 X | 5   15         | 123 C 21069 X | 5   17         | 124 A 14049 X | 5   12         |
| 123 A 10039 X | 5   10         | 123 C 21069 X | 9   4          | 124 C 10019 X | 5   15         |
| 123 A 10049 X | 5   10         | 123 C 21069 X | 9   5          | 124 C 10039 X | 5   10         |
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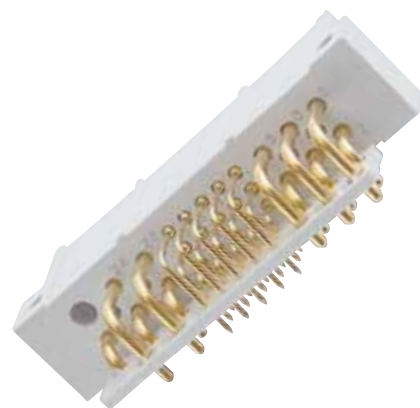
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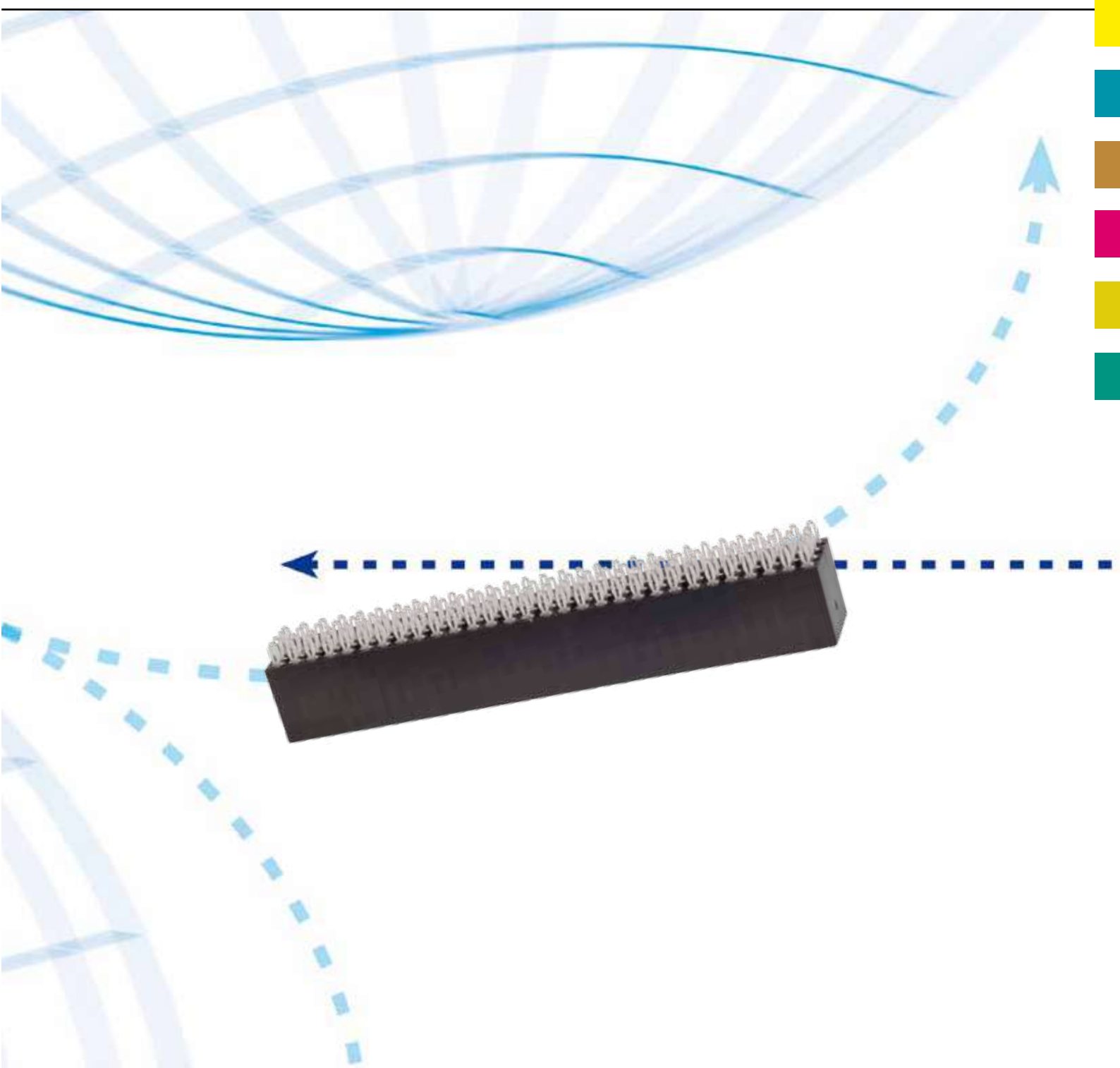


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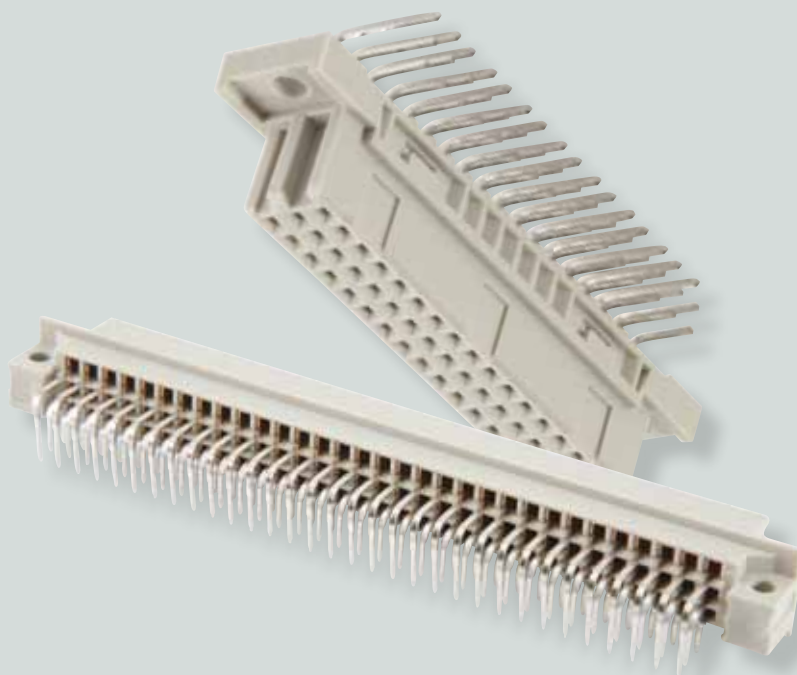




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