



Pushing Performance

HARTING Interface Connectors





Pushing Performance

Quality Connections Worldwide

HARTING was founded in 1945 by the family that still owns the company. Its headquarters are situated in Espelkamp, in Eastern Westphalia.

Today, HARTING employs more than 2,400 people worldwide, including 300 engineers and scientists. Over 500 technical specialists are available to implement customer requirements.

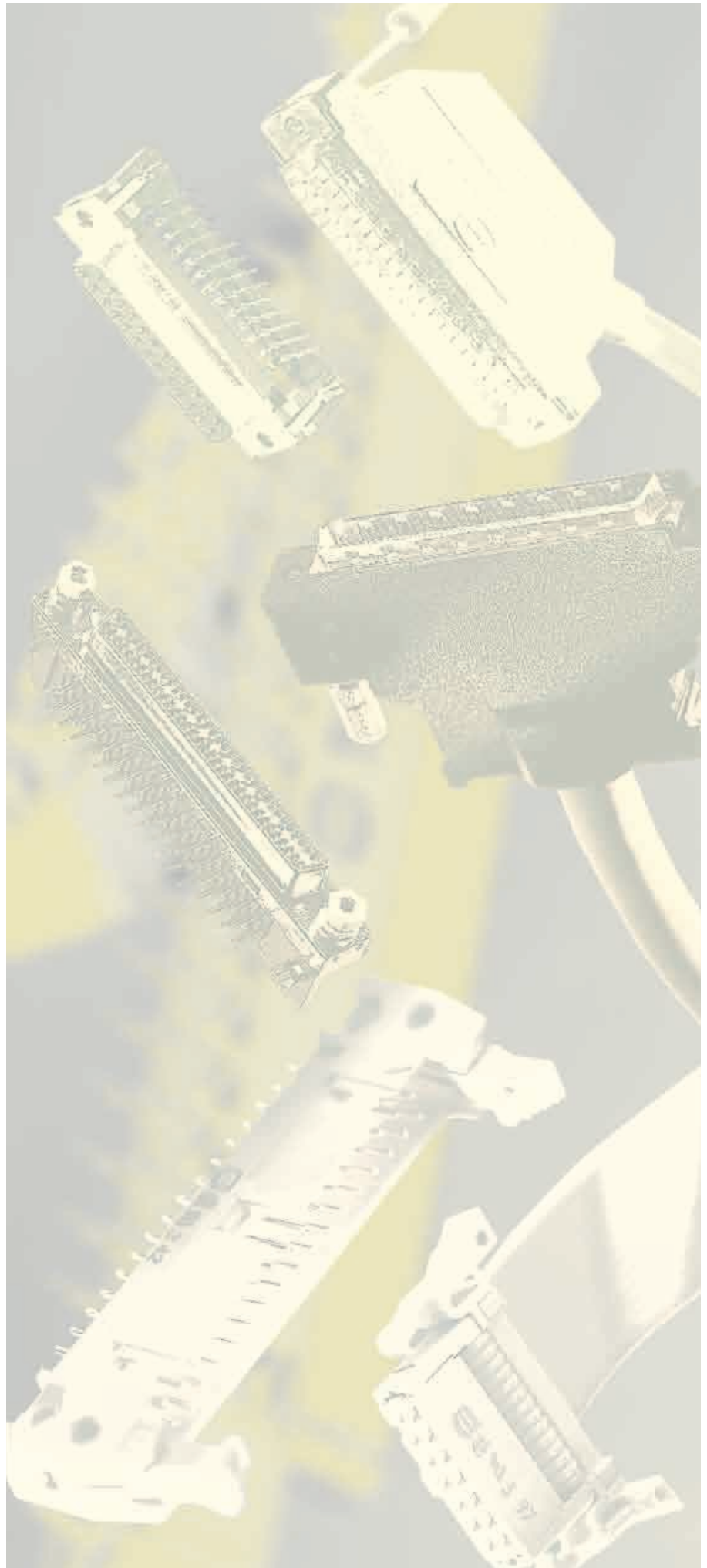
With subsidiaries in 25 countries and ten production plants, the company is one of the leading manufacturers of electrical and electronic connectors. The global HARTING network means that the company is always in close touch with the market and ideally placed to work together with its customers.

As the market leader HARTING offers the benefits of just-in-time service and maintains close business relations with all of its key customers in the global marketplace. In more than one of its product areas, HARTING leads the field.

HARTING products are manufactured using advanced, automated techniques, with CAD systems employed both in research and development and in tool-making.

In matters of quality, HARTING is convinced that zero-defect production can only be achieved through fully automated processes. Our quality assurance organization and procedures are documented in accordance with EN ISO 9001 in a quality assurance manual. In 2006 HARTING became the first company worldwide to receive the new IRIS quality certificate (the International Railway Industry Standard).

HARTING employs around 60 staff in quality assurance alone. The majority of these engineers and technicians are trained and qualified to standards laid down by the DGQ (German Association of Quality) or SAQ (Swiss Association of Quality).



Interface connectors			Chapter
harlink® Modular metric high speed connectors IEC 61 076-4-107, 2.0 mm [0.079"] pitch			00
harmik® Miniature D connectors, IEC 61 076-3-100, IEC 61 076-3-101, 1.27 mm [0.050"] pitch			01
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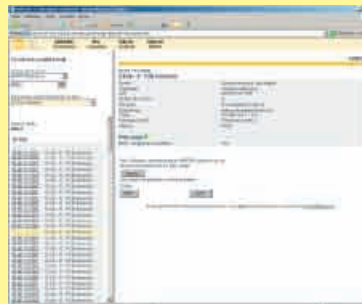
HARKIS® is the abbreviation for **HARTING-Katalog-Informationen-System** (HARTING catalogue information system).

HARKIS® is an electronic catalogue with part configuration and 3D components library. Here you can choose a connector according to your demands. Afterwards you are able to send your inquiry created with the listed parts. The drawings to every single part are available in PDF-format. The parts are downloadable in 2D-format (DXF) and 3D-format (IGES, STEP). The 3D-models can be viewed with a VRML-viewer.

You can find **HARKIS®** on our homepage www.HARTING.com. It is also available on CD-Rom and DVD.



Part configuration



CAD library

Identification

Part number

HARKIS® CD-Rom
Basic product catalogue

98 40 000 0401

HARKIS® DVD
Basic product catalogue
2D and 3D CAD files inclusive

98 40 000 0405



General approvals:



Interface connectors
are in conformity with the
Directive 2002/95/EC
EC Directive on the Restriction and Use
of Certain Hazardous Substances in
Electrical and Electronic Devices
RoHS

General information

It is the customer's responsibility to check whether the components illustrated in this catalogue comply with different regulations from those stated in special fields of application which we are unable to foresee.

We reserve the right to modify designs in order to improve quality, keep pace with technological advancement or meet particular requirements in production.

No part of this catalogue may be reproduced in any form (print, photocopy, microfilm or any other process) or processed, duplicated or distributed by means of electronic systems without the written permission of HARTING Electronics GmbH & Co. KG, Espelkamp. We are bound by the German version only.

har-link® Modular metric high speed connectors, 2.0 mm pitch

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har-link® connector system – general information

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The **har-link®** connector system of HARTING complies with the requirements of IEC 61076-4-107 and is a compact and robust pcb-to-cable interface with excellent data transmission properties for high-speed networking and telecommunications.

All dimensions of the **har-link®** connector are in accordance with IEC 917 and IEEE P 1301 requirements, which allows for easy implementation into both metric and inch-based systems. In addition, **har-link®** supports hot plugging as required by modern bus systems such as CompactPCI, S-bus and VME.

har-link® allows data transmission up to 2 Gbit/s per pair and is therefore perfectly suited for modern transmission protocols such as Low Voltage Differential Signals (see Fig. 1). The design of the **har-link®** connector allows differential pairs to be placed horizontally (parallel to the pcb), thus reducing the skew at high frequencies and considering high signal integrity.

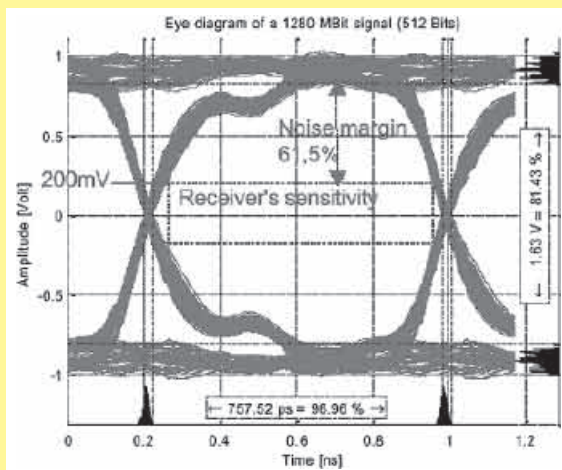


Fig. 1: Eye diagram of a 1280 MBit signal (512 Bits)

The metal shells of the **har-link®** connector are a guarantee for its superior performance in the EMI-polluted environment (see Fig. 2).



Fig. 2: 360° screened-can construction with locking levers

To reach a screening attenuation of more than 50 dB up to 1 GHz, HARTING offers brackets covering each connector in conjunction with a gasket, which is compressed between the bracket and the front panel (see Fig. 3).

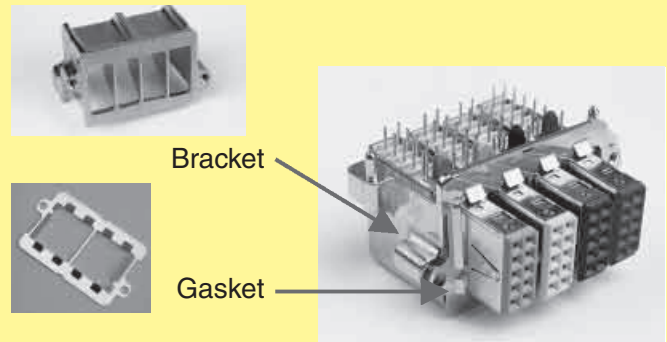


Fig. 3: 4 cavities bracket and gasket

Once plugged, the mated pair shows excellent mating safety. Due to the locking levers on both sides of the male connector, the connection withstands a pulling force of up to 80 N (see Fig. 2).

The high temperature resistant material of the **har-link®** female connector body supports the safe reflow soldering process. For easy identification of female modules, six different colours are available (see Fig. 4).

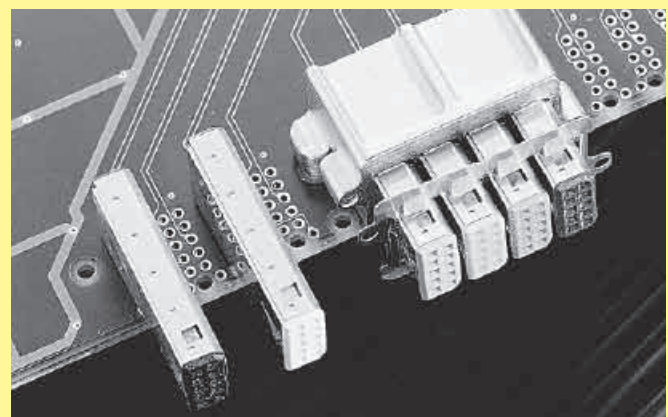
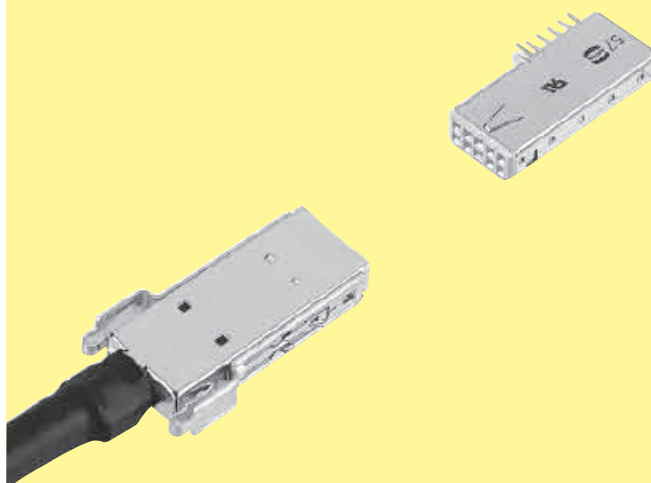


Fig. 4: Female modules

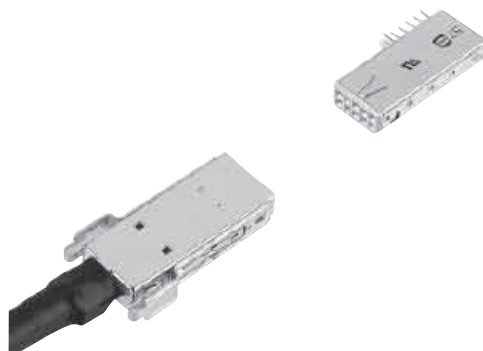
In addition to single connectors, HARTING provides cable assemblies with unshielded twisted pairs or with shielded twisted pairs for high speed applications such as IEEE 1355. A crimping tool range for terminating the male **har-link®** connectors is available.



Number of contacts	10
Approvals	IEC 61 076-4-107 UL recognized: E102079
Contact pitch Connector pitch	2 mm 6 mm
Working current	1.5 A at 70 °C
Test voltage U _{r.m.s.}	750 V
Contact resistance Insulation resistance	≤ 30 mΩ ≥ 10 ¹⁰ Ω
Temperature range during reflow soldering	-55 °C ... + 125 °C female: max. + 260 °C for 60 s
Mating cycles	250, performance level 2
Terminations	Insulation displacement (male), AWG 28/7 - 30/7, AWG 30 solid Solder pins for ø 0.6 mm min. (female)
Insertion force Withdrawal force	10 N max. / module 2 N min. / module (without locking levers)
Latching system	Locking levers
Materials Mouldings	Male connector: Polyester, UL 94-V0 Female connector: High temperature plastic material, UL 94-V0
Contacts Shells	Copper alloy Male connector: Stainless steel Female connector: Silver nickel
Contact surface Contact zone	Selectively gold-plated

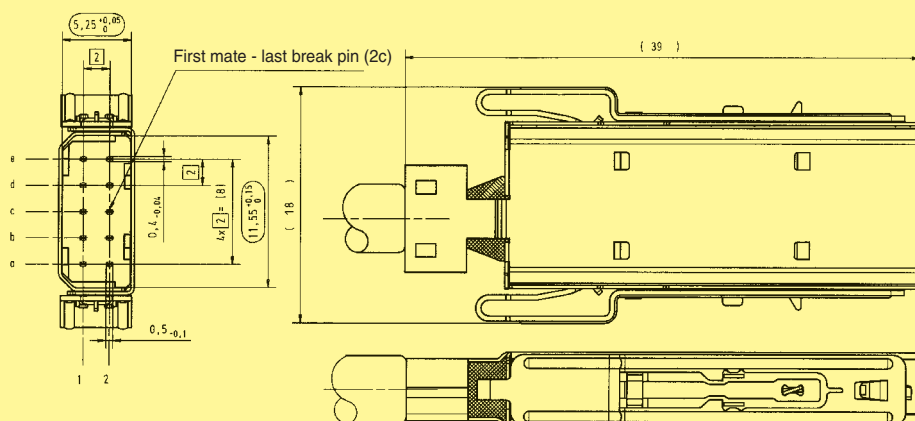


Male connectors, straight
Female connectors, angled

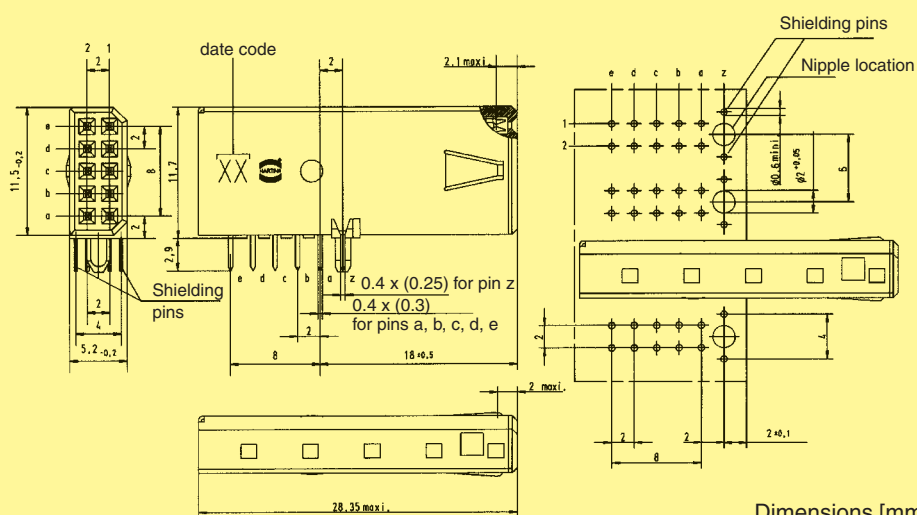


Identification	No. of contacts	Colour	Part No.
Male connector for insulation displacement	10	Black	27 11 161 8001
Female connector with solder pins	10	Beige (standard)	27 21 121 8000
	10	Red	27 21 121 8002
	10	Yellow	27 21 121 8004
	10	Green	27 21 121 8005
	10	Blue	27 21 121 8006
	10	Black	27 21 121 8010

Male connector



Female connector



Dimensions [mm]

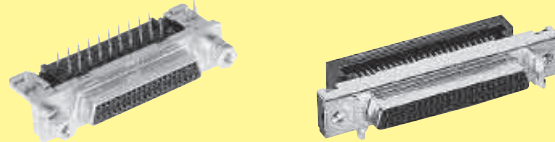
harmik® Miniature D connectors, 1.27 mm pitch

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I/O connectors

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Pin and socket



Technical characteristics

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Connectors with straight solder pins

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Bellows



Technical characteristics

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Connectors with straight solder pins

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Connectors with right angled solder pins

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Connectors with IDC discrete wire termination

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Hoods



Technical characteristics

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Hoods for pin and socket male connectors

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Hoods for bellows male connectors

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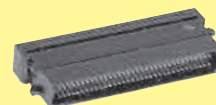
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Pin and socket



Technical characteristics

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Connectors with straight solder pins

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Connectors with IDC flat cable termination

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for economical and reliable connections

har-mik

A comprehensive range of high density interface connectors based on two mating design concepts:

- Blade and fork contact in the Pin/Socket range.
- Leaf contact in the Bellows range.

Available in a various number of contacts with options for secure locking of mated connectors in accordance with the following international standards:

- Small Computer System Interface
SCSI-2
SCSI-2 wide
SCSI-3
- Intelligent Peripheral Interface
IPI
- High Performance Peripheral Interface
HIPPI
- High Speed Serial Interface
HSSI
- Media Independent Interface
MII
- Bi-directional Parallel Interface
IEEE – 1284-C
- EIA – TIA
232-E
- IEC
61 076-3-100
for bellows connectors
- IEC
61 076-3-101
for pin and socket connectors

UL recognised

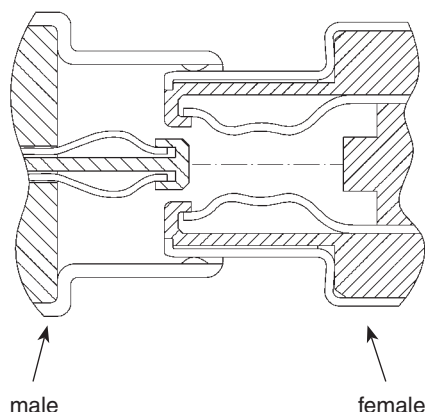
For customer specific applications we can design and manufacture solutions to match your requirement.

Sales department
HARTING components

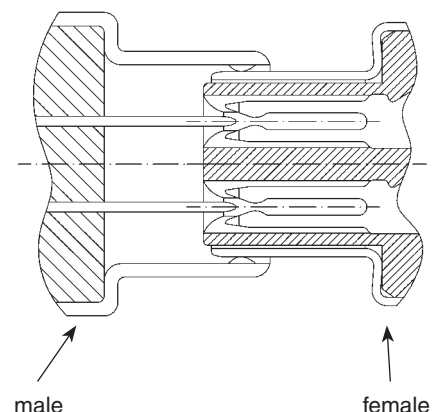


Certified according to EN ISO 9001
in design/development, production,
installation and servicing

Bellows
with leaf contact design



Pin and socket
with blade and fork contact design



Number of contacts 20, 26, 50, 68, 100

Pitch 1.27 mm

Working current 1 A

Working voltage 240 V ~

Test voltage $U_{r.m.s.}$ 750 V

Contact resistance $\leq 30 \text{ m}\Omega$

Insulation resistance $\geq 10^3 \text{ M}\Omega$

Temperature range -55 °C ... + 105 °C

Terminations

Solder pins Straight for pcb holes
min. $\varnothing$ 0.74 mm
Angled 90° for pcb holes
min. $\varnothing$ 0.74 mm

Insulation displacement Discrete wire
AWG 28 to AWG 30
max. section: 0.089 mm²
min. section: 0.050 mm²
Insulation $\varnothing$ min. 0.50 mm
 $\varnothing$ max. 0.88 mm
Flat cable
AWG 30 pitch 0.635 mm

Materials

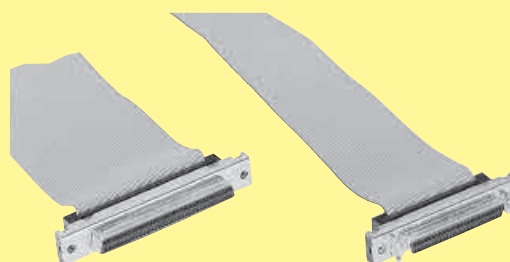
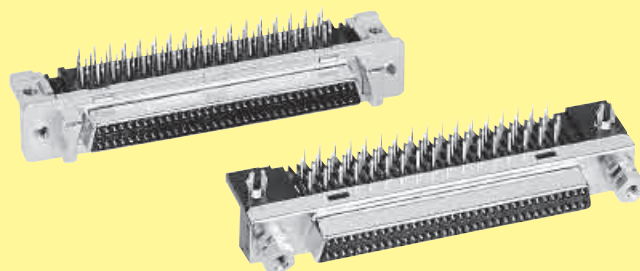
Moulding Thermoplastic resin
glass-fibre filled UL 94-V0

Contacts Copper alloy

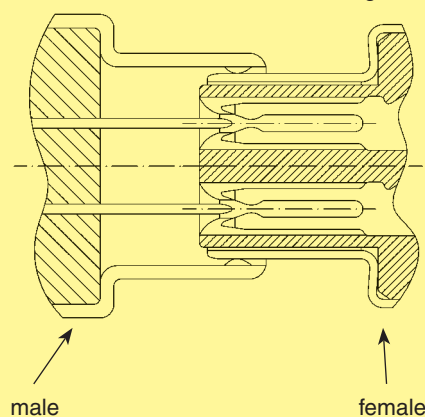
Contact surface

Contact zone Selectively gold plated
according to performance level

Metal shell Die cast zamac or stamped
steel, nickel-plated

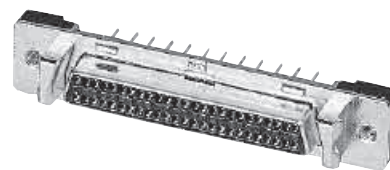


Pin and socket
with blade and fork contact design



Number of contacts

20–68

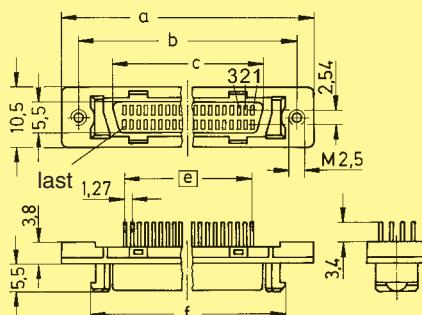


Female connectors, straight

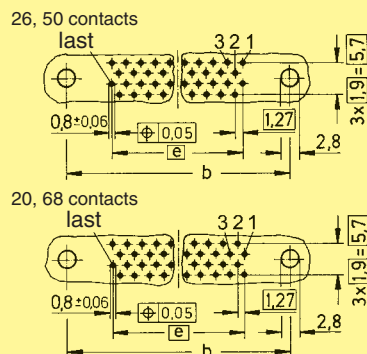
Identification	No. of contacts	Part No.
Female connectors with straight solder pins	20	60 01 020 5102
	26	60 01 026 5102
	50	60 01 050 5102
	68	60 01 068 5102

Dimensions

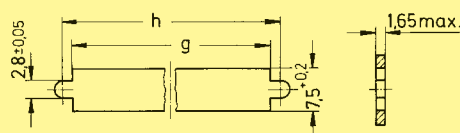
	a	b _{±0.1}	c	e	f	g	h
20	33.40	27.43	15.60	9 x 1.27 = 11.43	23.24	23.70	27.45
26	37.21	31.24	19.41	12 x 1.27 = 15.24	27.05	27.50	31.25
50	52.45	46.48	34.65	24 x 1.27 = 30.48	42.29	42.80	46.50
68	63.88	57.91	46.08	33 x 1.27 = 41.91	53.72	54.20	57.90



Board drillings



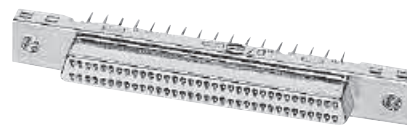
Panel cut out



Dimensions in mm

Number of contacts

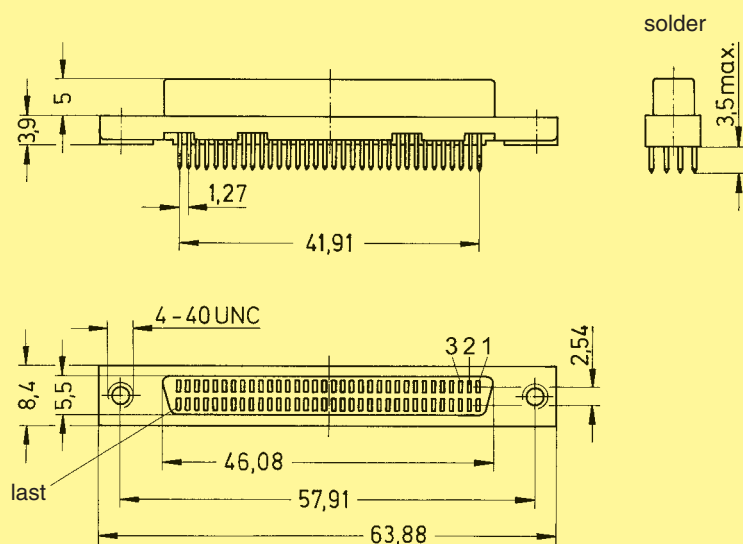
68



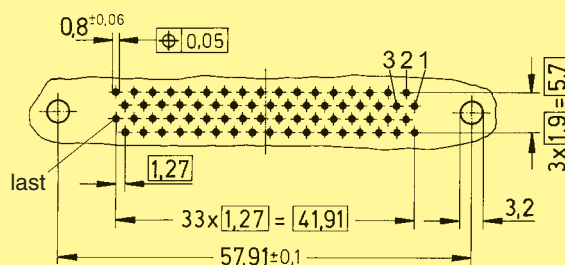
Female connectors, straight

Identification	No. of contacts	Part No.
Female connector with straight solder pins	68	60 02 068 5120

Dimensions



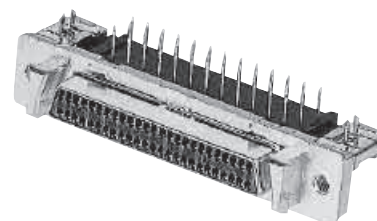
Board drillings (Components side)



Dimensions in mm

Number of contacts

20–68

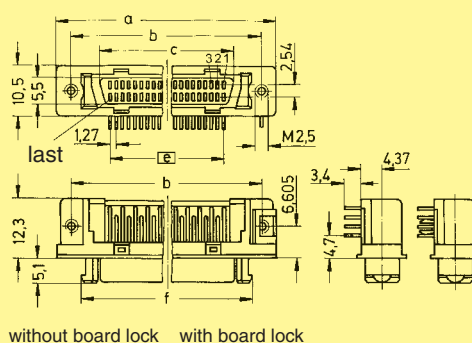


Female connectors, angled

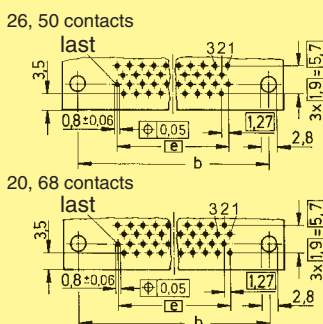
Identification	No. of contacts	Part No.
Female connectors with angled solder pins		
	20	60 01 020 51 ...
	26	60 01 026 51 ...
	50	60 01 050 51 ...
	68	60 01 068 51 ...
Panel fixing	Board fixing	
M 2.5	M 2.5	32
M 2.5	Board lock	40

Dimensions

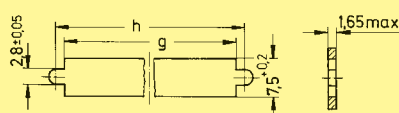
	a	b _{±0.1}	c	e	f	g	h
20	33.40	27.40	15.60	9 x 1.27 = 11.43	23.24	23.70	27.45
26	37.21	31.24	19.41	12 x 1.27 = 15.24	27.05	27.50	31.25
50	52.45	46.45	34.65	24 x 1.27 = 30.48	42.29	42.80	46.50
68	63.88	57.88	46.08	33 x 1.27 = 41.91	53.72	54.20	57.90



Board drillings



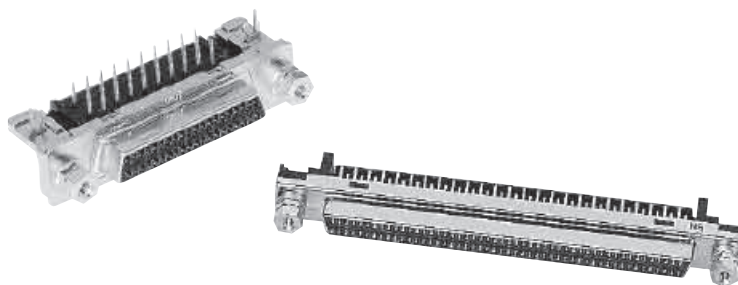
Panel cut out



Dimensions in mm

Number of contacts

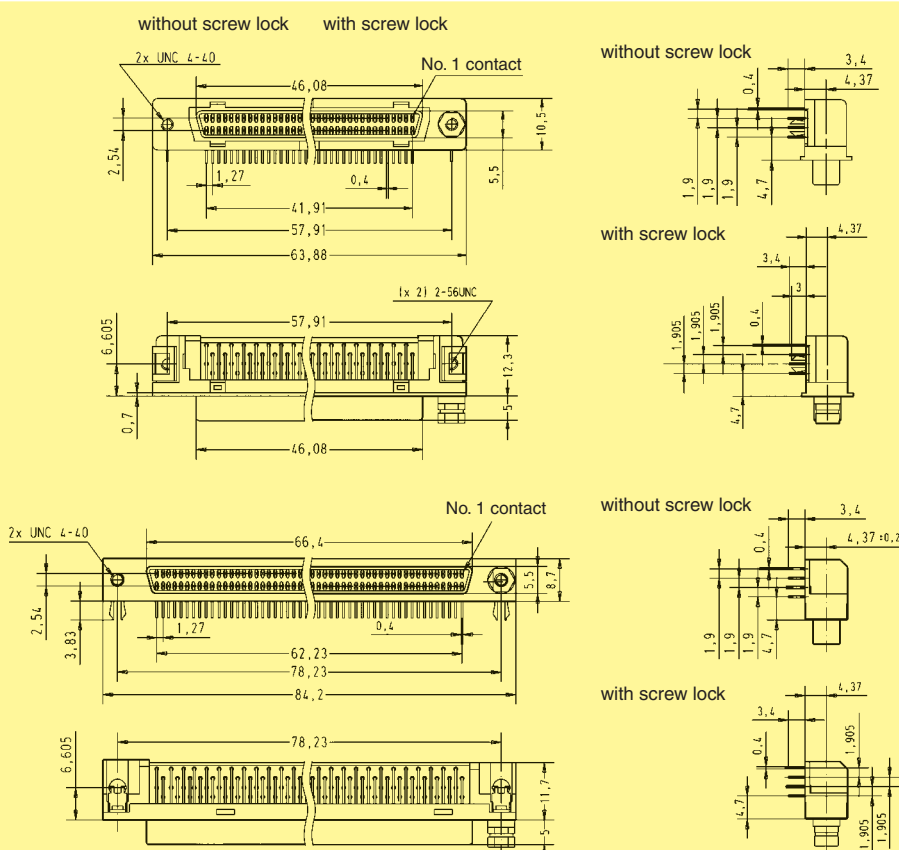
68–100



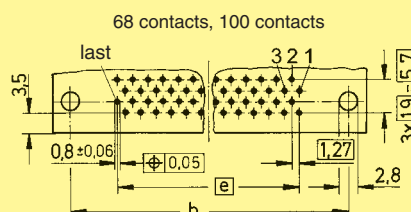
Female connectors, angled

Identification	No. of contacts	Part No.
Female connectors with angled solder pins	68	60 02 068 51 . .
	100	60 02 100 51 . .
With female screw lock	41	
Without female screw lock	50	

Dimensions

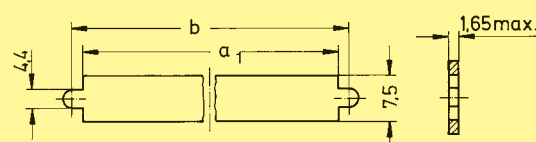


Board drillings
(Components side)



	a ₁	b	e
68	54.22	57.91	33 x 1.27 = 41.91
100	74.53	78.23	49 x 1.27 = 62.23

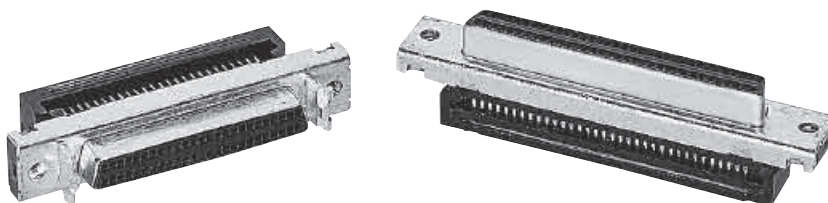
Panel cut out



Dimensions in mm

Number of contacts

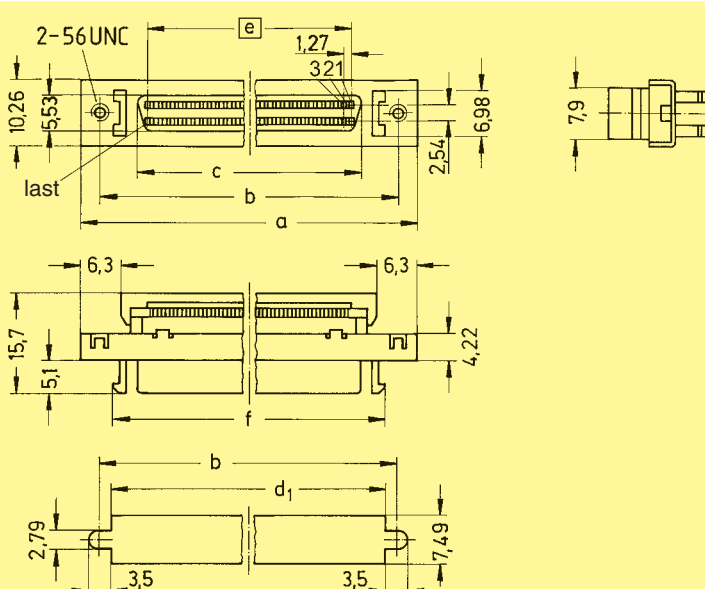
50–68



Female connectors for IDC flat cable, straight

Identification	No. of contacts	Part No.
Female panel connectors with insulation displacement termination for IDC flat cable pitch 0.635 mm AWG 30		with latch system
	50	60 04 050 5343
	68	60 04 068 5343
		with screw lock system
		60 04 050 5344
		60 04 068 5344

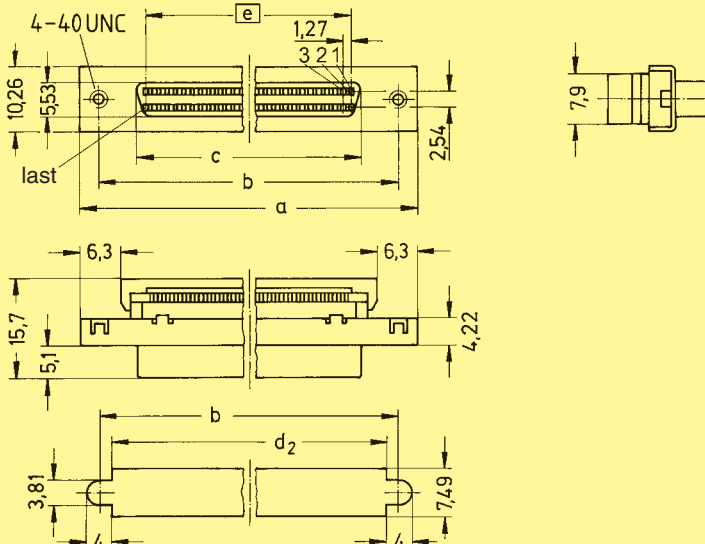
Dimensions for connectors with latch system



	a	b	c	d ₁	d ₂	e	f
50	52.45	46.48	34.70	42.80	42.30	30.48	42.30
68	63.88	57.91	46.13	54.23	53.72	41.91	53.72

Panel cut out

Dimensions for connectors with screw lock system



Panel cut out

Dimensions in mm

Number of contacts

20–100



Male connectors for IDC discrete wire, straight

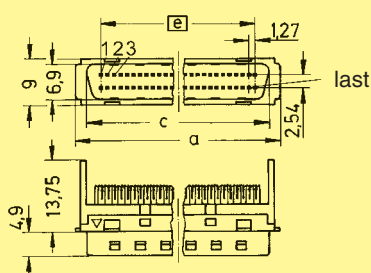
Identification	No. of contacts	Part No.
Male connectors with insulation displacement termination for discrete wire AWG 28/30		
	20	60 03 020 52 ..
	26	60 03 026 52 ..
	50	60 03 050 52 ..
	68	60 03 068 52 ..
	100	60 03 100 52 ..
Insulation diameter (mm)		
Ø = 0.50–0.65	00	
Ø = 0.65–0.80	10	
Ø = 0.80–0.88	20	

Available sizes

	Part No.	Ø	20	26	50	68	100
Male	60 03 ... 5200	0.50–0.65	●	●	●	●	
	60 03 ... 5210	0.65–0.80	●		●	●	●
	60 03 ... 5220	0.80–0.88	●	●	●		

● = Available sizes

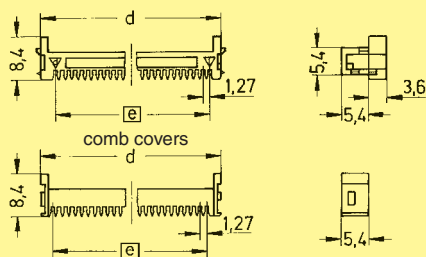
Dimensions



	a	c	d	e
20	21.25	17.00	16.75	11.43
26	25.06	20.81	20.56	15.24
50	40.30	36.05	35.80	30.48
68	51.73	47.48	47.23	41.91
100	72.05	67.80	67.55	62.23

Comb cover

(delivered with connectors)



Dimensions in mm



High quality contact surfaces require expertise and latest technological equipment.

Technology at HARTING preserves natural resources thus improving the environment

Number of contacts 20, 26, 28, 36, 50, 68

Pitch 1.27 mm

Working current 1 A

Working voltage 240 V ~

Test voltage $U_{r.m.s.}$ 750 V

Contact resistance $\leq 40 \text{ m}\Omega$

Insulation resistance $\geq 10^3 \text{ M}\Omega$

Temperature range -55 °C ... + 105 °C

Terminations

Solder pins Straight for pcb holes
min. $\varnothing 0.74 \text{ mm}$
Angled 90° for pcb holes
min. $\varnothing 0.74 \text{ mm}$

Insulation displacement AWG 28 to AWG 30
max. section: 0.089 mm^2
min. section: 0.050 mm^2
Insulation $\varnothing$ min. 0.50 mm
 $\varnothing$ max. 0.65 mm

Materials

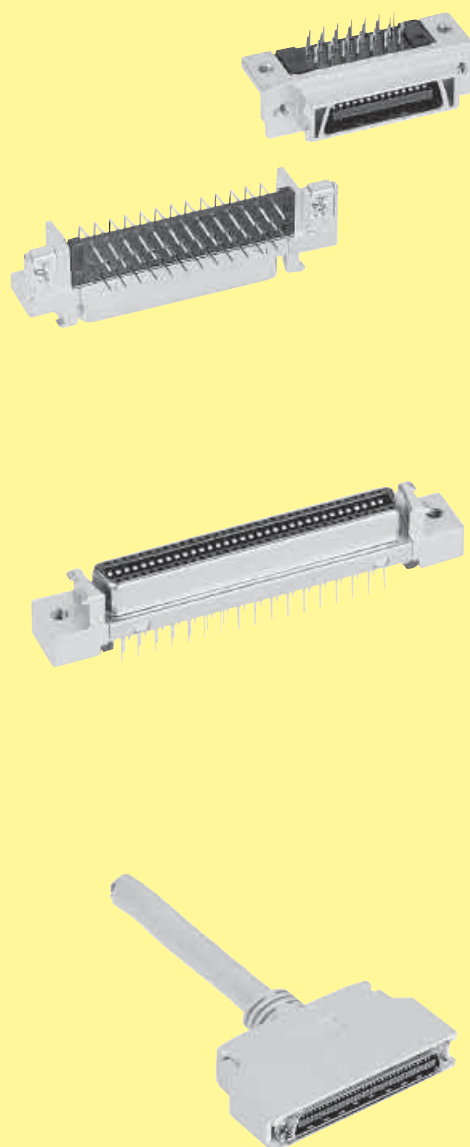
Moulding Thermoplastic resin
glass-fibre filled UL 94-V0

Contacts Copper alloy

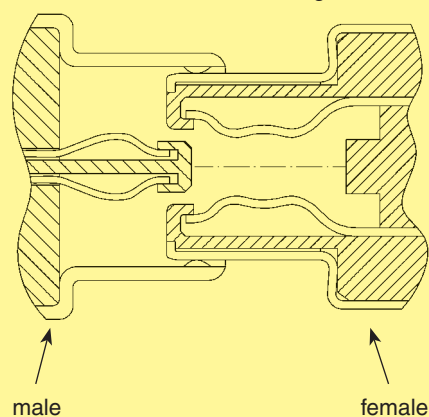
Contact surface

Contact zone Selectively gold plated
according to performance level

Metal shell Die cast zamac or stamped
steel, nickel-plated

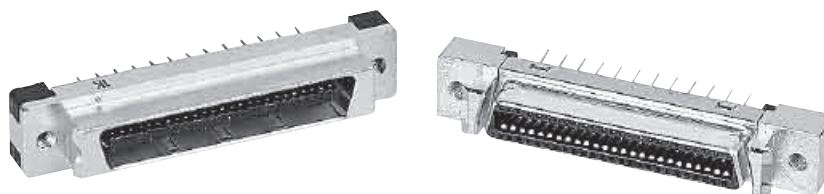


Bellows
with leaf contact design



Number of contacts

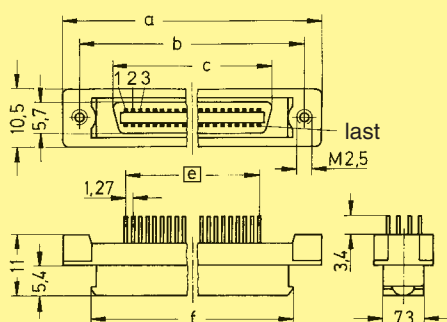
26–68



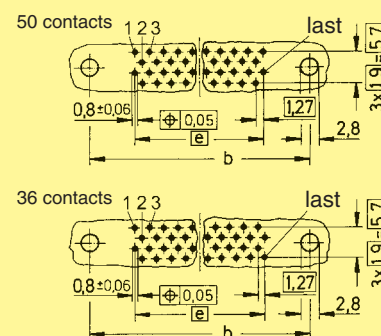
Male and female connectors, straight

Identification	No. of contacts	Part No.
Male and female connectors with straight solder pins		Male connector
		Female connector
	26	60 11 026 5102
	36	60 11 036 5102
	50	60 11 050 5102
	68	60 11 068 5102

Dimensions for male connectors

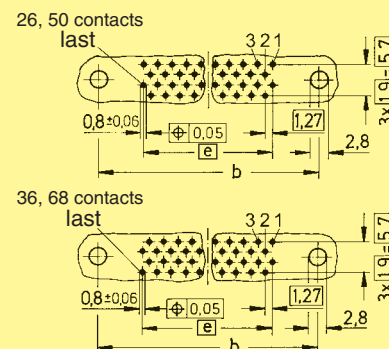
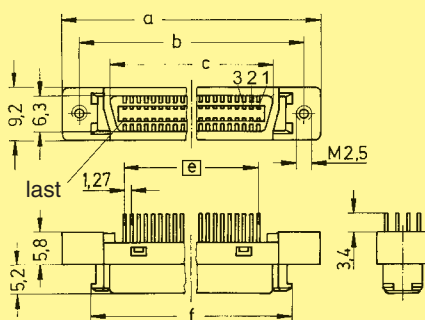


Board drillings

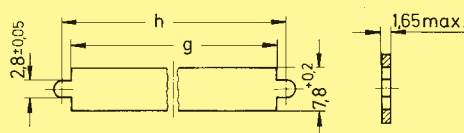


	a	b ± 0.1	c	e	f	g	h
26	37.16	31.26	20.26	12 x 1.27 = 15.24	27.11	27.50	31.25
36	43.51	37.61	26.61	17 x 1.27 = 21.59	33.46	33.90	37.60
50	52.40	46.50	35.50	24 x 1.27 = 30.48	42.35	42.80	46.50
68	63.83	57.93	46.93	33 x 1.27 = 41.91	53.78	54.20	57.90

Dimensions for female connectors



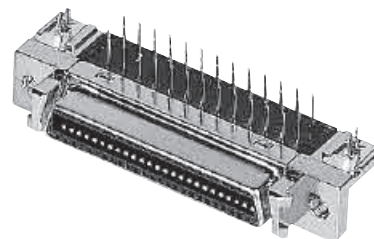
Panel cut out



Dimensions in mm

Number of contacts

20–68



Male and female connectors, angled

Identification

No. of contacts

Part No.

Male and female connectors with angled solder pins

Male connector

Female connector

20
26
28
36
50
68

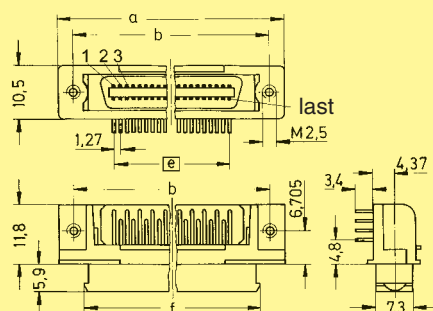
60 11 028 5232
60 11 036 5232
60 11 050 5232
60 11 068 5232

60 11 020 51 ...
60 11 026 51 ...
60 11 036 51 ...
60 11 050 51 ...
60 11 068 51 ...

Without board lock
With board lock

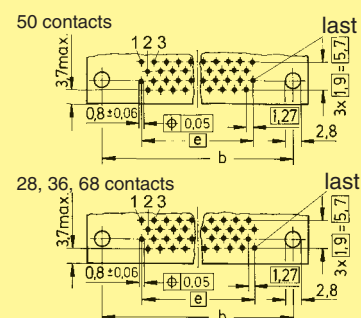
32
40

Dimensions for male connectors

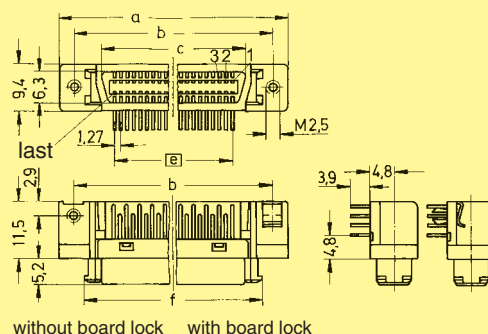


	a	b _{±0.1}	c	e	f	g	h
20	33.40	27.40	16.45	9 x 1.27 = 11.43	23.30	23.70	27.45
26	37.16	31.26	20.26	12 x 1.27 = 15.24	27.11	27.50	31.25
28	38.48	32.48	—	13 x 1.27 = 16.51	28.38	28.80	32.50
36	43.56	37.56	26.61	17 x 1.27 = 21.59	33.46	33.90	37.60
50	52.45	46.45	35.50	24 x 1.27 = 30.48	42.35	42.80	46.50
68	63.88	57.88	46.93	33 x 1.27 = 41.91	53.78	54.20	57.90

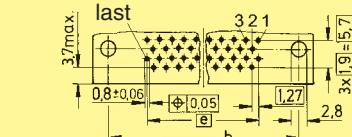
Board drillings



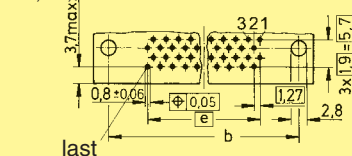
Dimensions for female connectors



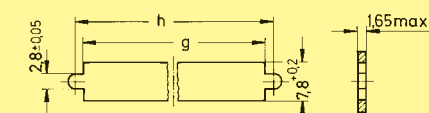
26, 50 contacts



20, 36, 68 contacts



Panel cut out



Dimensions in mm

Number of contacts

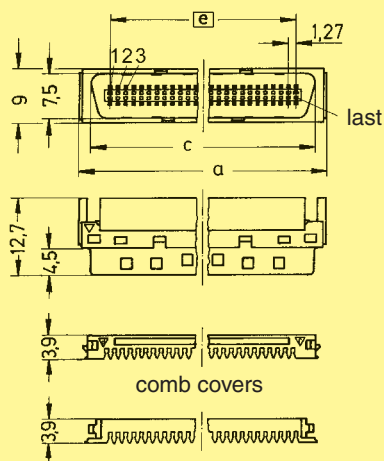
20–68



Male connectors for IDC discrete wire, straight

Identification	No. of contacts	Part No.
Male connectors with insulation displacement termination for discrete wire AWG 28/30 Insulation diameter (mm) $\varnothing = 0.50\text{--}0.65$		Male connector
	20	60 13 020 5200
	26	60 13 026 5200
	36	60 13 036 5200
	50	60 13 050 5200
	68	60 13 068 5200

Dimensions for male connectors

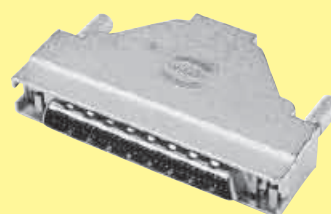
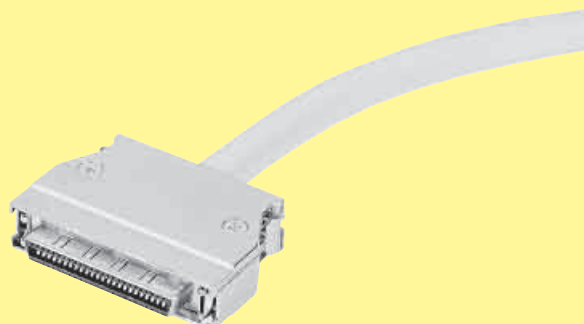


	a	c	e
20	21.24	17.55	11.43
26	25.05	21.36	15.24
36	31.40	27.71	21.59
50	40.29	36.60	30.48
68	51.72	48.03	41.91

Dimensions in mm

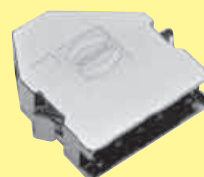
Hoods for pin and socket male connectors

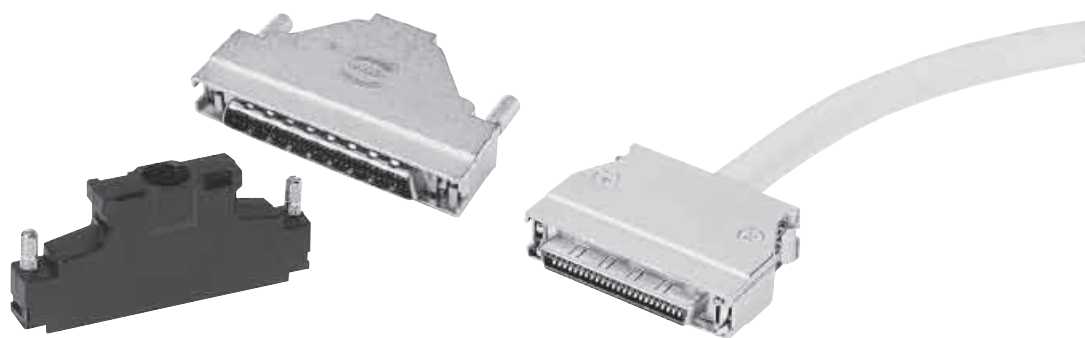
Number of contacts	20, 26, 36, 50, 68, 100
Surface	Die cast zamac, nickel-plated
	Thermoplastic resin, nickel-plated, steel insert



Hoods for bellows male connectors

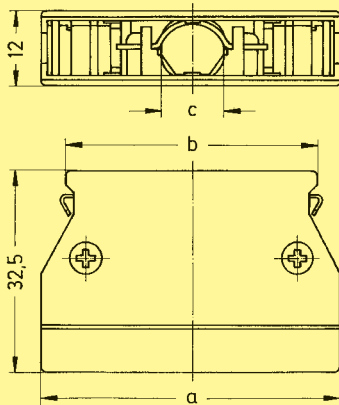
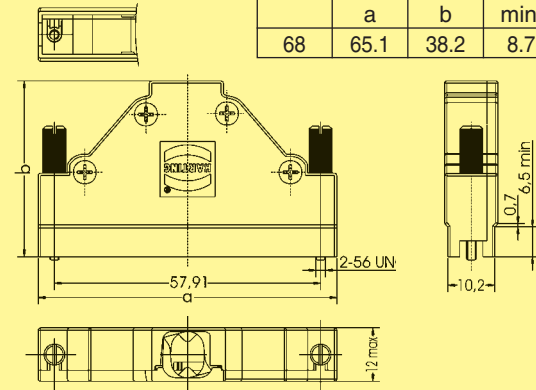
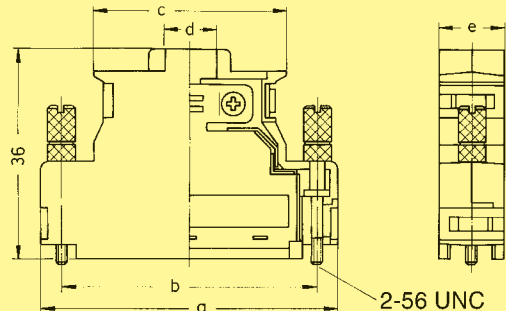
Number of contacts	20, 26, 36, 50, 68
Surface	Die cast zamac, nickel-plated
	Thermoplastic resin, nickel-plated, steel insert





Top entry hoods

har-mik

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm																								
Metal hood Large cable entry				<table><tr><td></td><td>a</td><td>b</td><td>c</td></tr><tr><td>20</td><td>28.95</td><td>21.15</td><td>8.00 x 8.50</td></tr><tr><td>26</td><td>32.76</td><td>24.96</td><td>8.00 x 6.75</td></tr><tr><td>36</td><td>39.11</td><td>31.31</td><td>9.00 x 10.00</td></tr><tr><td>50</td><td>48.00</td><td>40.20</td><td>9.00 x 10.00</td></tr><tr><td>68</td><td>59.43</td><td>51.63</td><td>9.00 x 10.00</td></tr></table>		a	b	c	20	28.95	21.15	8.00 x 8.50	26	32.76	24.96	8.00 x 6.75	36	39.11	31.31	9.00 x 10.00	50	48.00	40.20	9.00 x 10.00	68	59.43	51.63	9.00 x 10.00
	a	b	c																									
20	28.95	21.15	8.00 x 8.50																									
26	32.76	24.96	8.00 x 6.75																									
36	39.11	31.31	9.00 x 10.00																									
50	48.00	40.20	9.00 x 10.00																									
68	59.43	51.63	9.00 x 10.00																									
	20	60 03 020 0255																										
	26	60 03 026 0255																										
	36	60 03 036 0255																										
	50	60 03 050 0255																										
	68	60 03 068 0255																										
Metal hood Top cable entry				<table><tr><td></td><td colspan="2">Shell dimensions</td><td colspan="2">Cable dimensions</td></tr><tr><td></td><td>a</td><td>b</td><td>min.</td><td>max.</td></tr><tr><td>68</td><td>65.1</td><td>38.2</td><td>8.7</td><td>10.7</td></tr></table>		Shell dimensions		Cable dimensions			a	b	min.	max.	68	65.1	38.2	8.7	10.7									
	Shell dimensions		Cable dimensions																									
	a	b	min.	max.																								
68	65.1	38.2	8.7	10.7																								
	68	60 03 068 0145																										
Plastic hood with internal screen ¹⁾				<table><tr><td></td><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td></tr><tr><td>50</td><td>54.00</td><td>46.48</td><td>35.00</td><td>10.50</td><td>12.00</td></tr><tr><td>68</td><td>65.41</td><td>57.91</td><td>38.40</td><td>14.00</td><td>12.00</td></tr><tr><td>100</td><td>85.73</td><td>78.23</td><td>42.00</td><td>13.00</td><td>12.00</td></tr></table>		a	b	c	d	e	50	54.00	46.48	35.00	10.50	12.00	68	65.41	57.91	38.40	14.00	12.00	100	85.73	78.23	42.00	13.00	12.00
	a	b	c	d	e																							
50	54.00	46.48	35.00	10.50	12.00																							
68	65.41	57.91	38.40	14.00	12.00																							
100	85.73	78.23	42.00	13.00	12.00																							
	50	60 03 050 0143																										
	68	60 03 068 0143																										
	100	60 03 100 0143																										

For other size, please consult us.

¹⁾ Temperature range: - 55 °C ... + 60 °C



Side entry hoods

Identification

No. of
contacts

Part No.

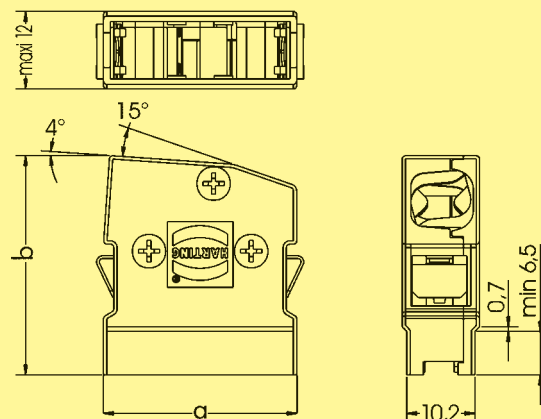
Drawing

Dimensions in mm

Metal hood

Cable side entry

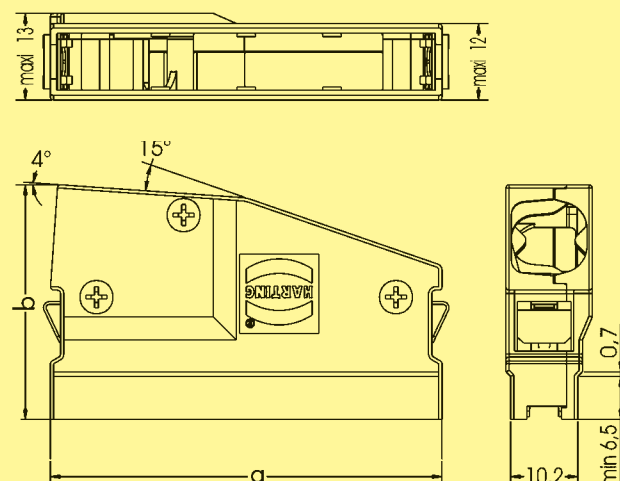
20	60 03 020 0555
26	60 03 026 0555
50	60 03 050 0555
68	60 03 068 0555



	Shell dimensions		Cable dimensions	
	a	b	min.	max.
20	29.0	32.9	6.2	8.0
26	32.8	32.9	6.5	8.5
50	48.0	35.6	8.3	10.3
68	59.4	35.6	8.7	10.7

Large cable side entry

68	60 03 068 0655
----	----------------



	Shell dimensions		Cable dimensions	
	a	b	min.	max.
68	59.4	35.6	10.0	12.0

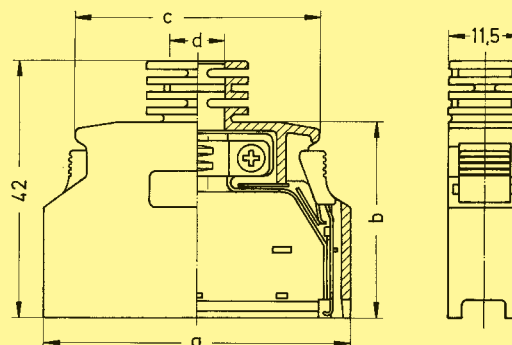


Top or side entry hoods

Identification No. of contacts Part No. Drawing Dimensions in mm

Plastic hood
with internal screen¹⁾

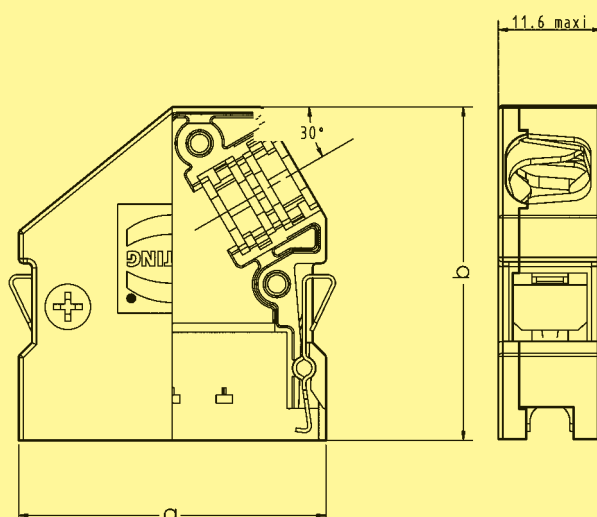
20	60 13 020 0153
26	60 13 026 0153
36	60 13 036 0153
50	60 13 050 0153
68	60 13 068 0153



	a	b	c	d
20	29.65	34.50	19.95	6.80
26	33.46	38.31	23.76	7.10
36	39.81	32.00	30.11	8.20
50	48.70	32.00	39.00	8.70
68	60.13	32.00	50.43	9.10

Metal hood
Cable side entry

26	60 13 026 0555
----	----------------



	Shell dimensions		Cable dimensions	
	a	b	min.	max.
26	33.8	36.8	6.5	8.5

¹⁾ Temperature range: - 55 °C ... + 60 °C



Female screw lock

Identification	Part No.	Drawing	Dimensions in mm
Screw lock Thread: M 2.5 / 2-56 UNC Height: 2.9 mm	60 01 000 9013		
Screw lock Thread: 4-40 UNC / 4-40 UNC Height: 3.99 mm	60 01 000 9018		
Screw lock Thread: 4-40 UNC / 2-56 UNC Height: 3.99 mm	60 01 000 9019		
Screw lock Thread: 4-40 UNC / 2-56 UNC Height: 5.5 mm	60 01 000 9020		
Screw lock Thread: 4-40 UNC / 4-40 UNC Height: 5.5 mm	60 01 000 9021		

for economical and reliable connections

A comprehensive range of high density intra cabinet connectors based on blade and fork contacts.

Available in a various number of contacts according to the following international standards and applications:

- Small Computer System Interface
SCSI-2
SCSI-2 wide
SCSI-3
- Internal Bus extension through
"Daisy chain" inter-linking via
0.635 mm pitch flat cable.
The 4-point design of the IDC
contact provides accurate and
reliable termination even with
teflon cable.

UL recognised

For customer specific applications we can design and manufacture solutions to match your requirement.

Sales department
HARTING components



Certified according to EN ISO 9001
in design/development, production,
installation and servicing

Pitch 1.27 mm

Working current

pcb connector 1 A
Flat cable connector 0.5 A

Working voltage

pcb connector 240 V ~
Flat cable connector 100 V ~

Test voltage $U_{r.m.s.}$

pcb connector 750 V
Flat cable connector 500 V

Contact resistance $\leq 25 \text{ m}\Omega$

Insulation resistance $\geq 10^3 \text{ M}\Omega$

Temperature range -55 °C ... + 105 °C

Terminations

Solder pins Straight for pcb holes
min. $\varnothing 0.74 \text{ mm}$

Insulation displacement Flat cable
AWG 30 pitch 0.635 mm

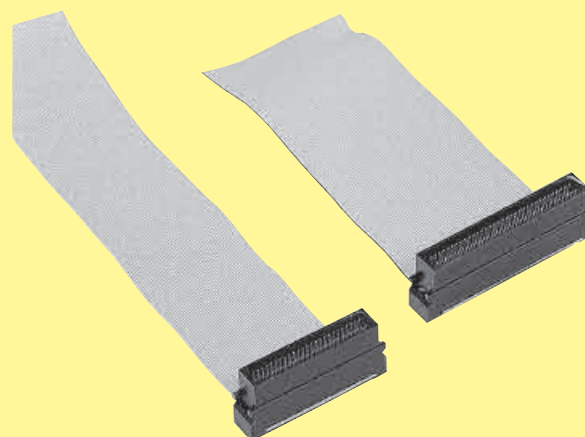
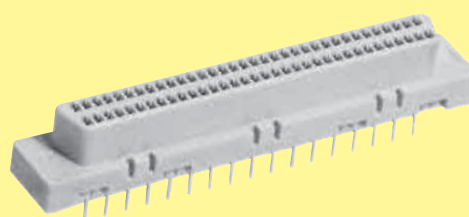
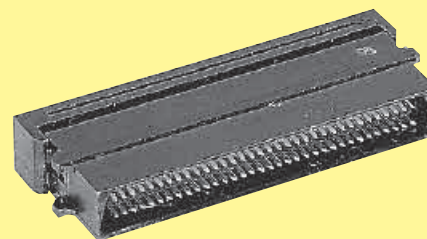
Materials

Moulding Thermoplastic resin
glass-fibre filled UL 94-V0

Contacts
pcb connector Copper alloy
Flat cable connector Nickel

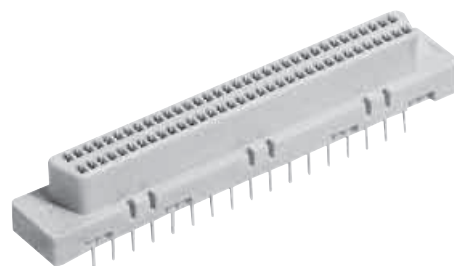
Contact surface

Contact zone Selectively gold plated
according to performance level



Number of contacts

68

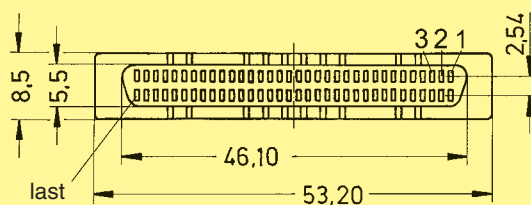
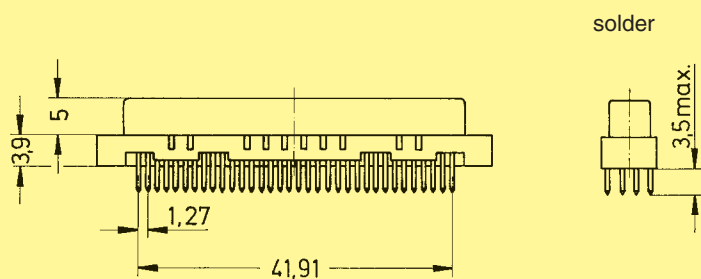


Female connectors, straight

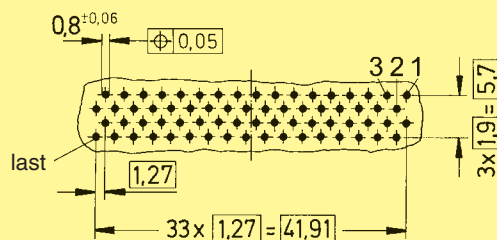
har-mik

Identification	No. of contacts	Part No.
Female connector with straight solder pins	68	60 05 068 5100

Dimensions

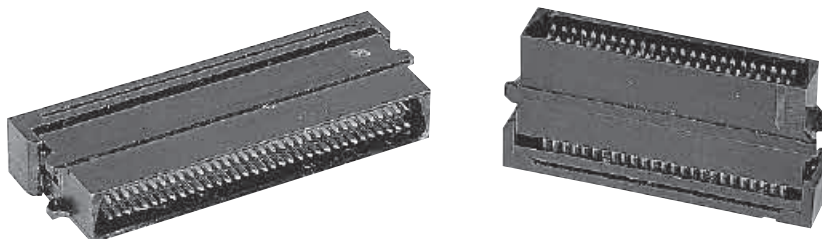


Board drillings
(Components side)



Number of contacts

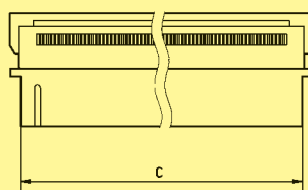
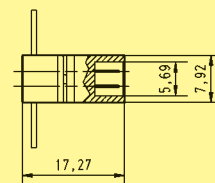
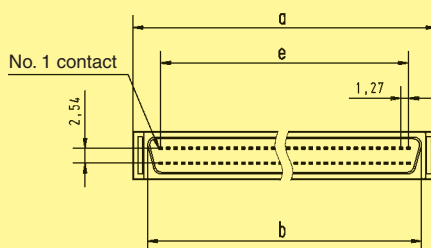
50–68



Male connectors for IDC flat cable, straight

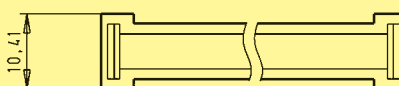
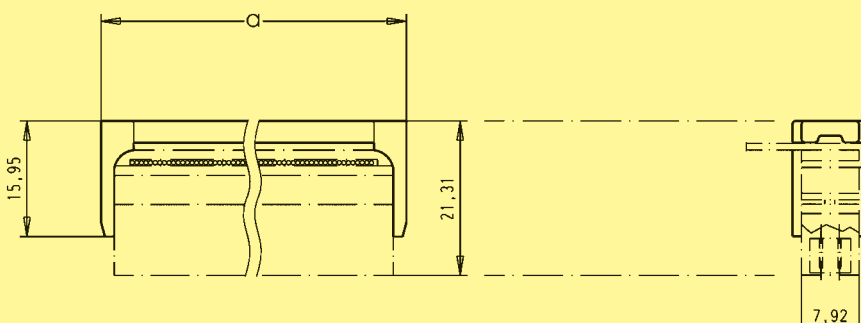
Identification	No. of contacts	Part No.	
Male connectors with insulation displacement termination for IDC flat cable pitch 0.635 mm AWG 30 Strain relief order separately		Male connector	Strain relief
	50	60 06 050 5440	60 06 050 9001
	68	60 06 068 5440	60 06 068 9001

Dimensions



	a	b	c	e
50	39.75	34.85	36.19	30.48
68	51.26	46.28	47.62	41.91

Strain relief

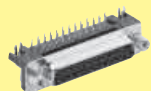
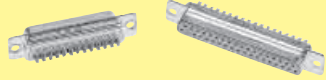


	a
50	42.16
68	53.44

Dimensions in mm

D-Sub – Standard subminiature D connectors

Page

Technical characteristics for solder connectors		02.02
Versions with straight solder pins		02.04
Mounting details for angled solder connectors		02.08
Original Versions		02.10
Mounting height 7.3 mm 9-37 way 8.7 mm 50 way		
Standard Versions		02.12
Mounting height 7.3 mm 9-37 way 8.7 mm 50 way		
Low-Profile Versions		02.18
Mounting height 3.6 mm 9-37 way 6.2 mm 50 way		
U.S. Footprint Versions		02.22
Mounting height 6.3 mm 9-37 way		
Mounting details		02.24
Technical characteristics for cable connectors		02.26
Versions with wrap posts		02.27
Versions with crimp terminal/crimp contacts		02.28
Versions with insulation displacement termination		02.34
Versions with solder buckets		02.36

Number of contacts 9, 15, 25, 37, 50
UL recognized

Working current

see current carrying capacity chart

Turned contacts 7.5 A max.

Stamped contacts 6.5 A max.

Test voltage $U_{r.m.s.}$ 1 kV

Clearance and creepage ≥ 1.0 mm

Contact resistance ≤ 10 m Ω

Insulation resistance $\geq 10^{10}$ Ω

Temperature range

-55 °C ... + 125 °C

The higher temperature limit includes the local ambient and heating effect of the contacts under load

Terminations

- a) Solder pins $\varnothing$ 0.6 mm for P.C.B. holes $\varnothing$ 0.8/1 mm
- b) Solder pins, angled 90° $\varnothing$ 0.6 mm for P.C.B. holes $\varnothing$ 1 mm

Materials

Mouldings and hoods Thermoplastic resin, glass-fibre filled (PBTP), UL 94-V0

Contacts Copper alloy

Contact surface

Contact zone selectively gold-plated according to performance level¹⁾

Metal shell Plated steel

Insertion and withdrawal force

Connector on P.C.B.

Solder, straight with clips

– insertion max. per connector: 60 N

– withdrawal min. per connector: 10 N

Mating force

9 way ≤ 30 N

15 way ≤ 50 N

25 way ≤ 83 N

37 way ≤ 123 N

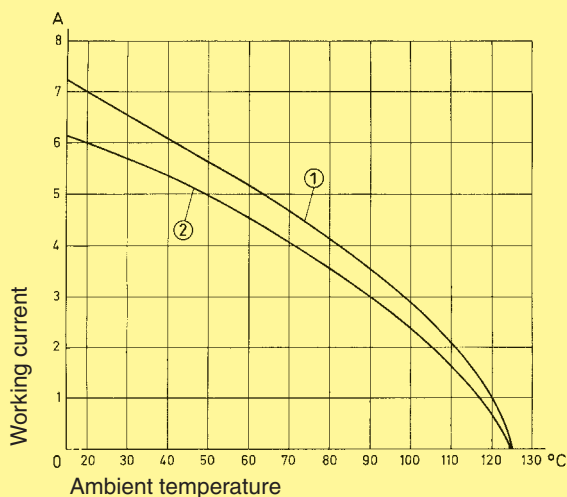
50 way ≤ 167 N

Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.

The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512.

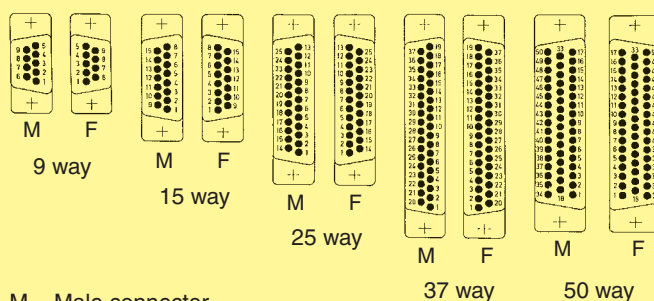


Example: 25 way connector

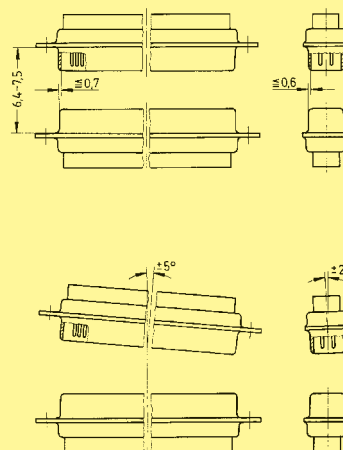
① Turned contacts

② Stamped contacts

Contact arrangement View from termination side



Mating conditions as per DIN 41 652



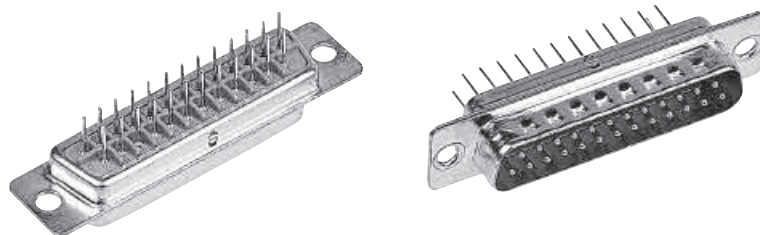
¹⁾ Performance level 3, 50 mating cycles, no gas test

Performance level 2 as per CECC 75 301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60 512

Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60 512

Number of contacts

9–50

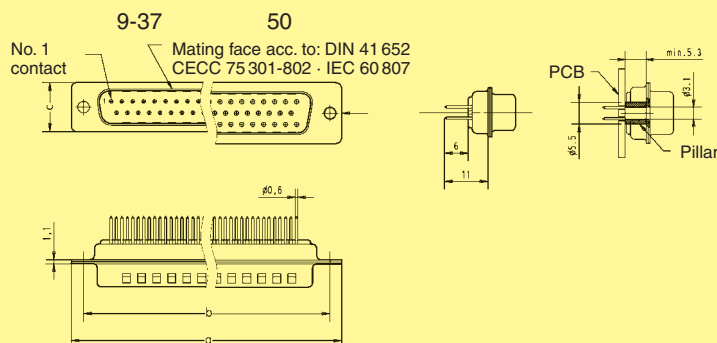


Turned solder pins, straight

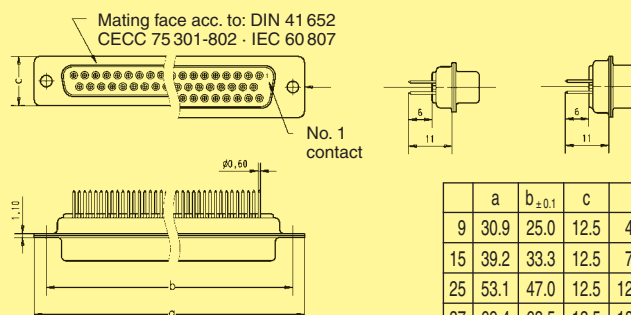
D-Sub - S

Identification	No. of contacts	Part No.
Performance levels Explanations see page 02.02 Other performance levels on request		Performance level 3 Performance level 2
Male connector metal shell with dimples	9 15 25 37 50	09 67 009 5654 09 67 015 5654 09 67 025 5654 09 67 037 5654 09 67 050 5654 ¹⁾
Female connector metal shell	9 15 25 37 50	09 67 009 4754 09 67 015 4754 09 67 025 4754 09 67 037 4754 09 67 050 4754 ¹⁾

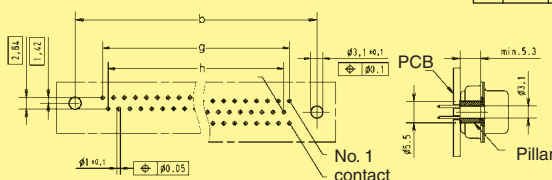
Male connector



Female connector



Board drillings



	a	b _{±0.1}	c	g	h
9	30.9	25.0	12.5	4 x [2.74] = [10.96]	3 x [2.74] = [8.22]
15	39.2	33.3	12.5	7 x [2.74] = [19.18]	6 x [2.74] = [16.44]
25	53.1	47.0	12.5	12 x [2.76] = [33.12]	11 x [2.76] = [30.36]
37	69.4	63.5	12.5	18 x [2.76] = [49.68]	17 x [2.76] = [46.92]
50	67.0	61.1	15.4	16 x [2.76] = [44.16]	15 x [2.76] = [41.40]

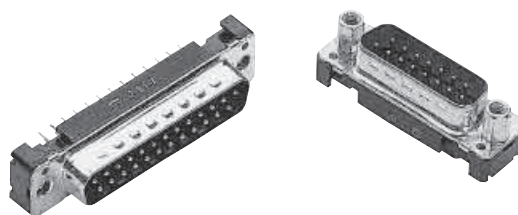
Dimensions in mm

¹⁾ Not normally kept in stock

Mating conditions see page 02.02

Number of contacts

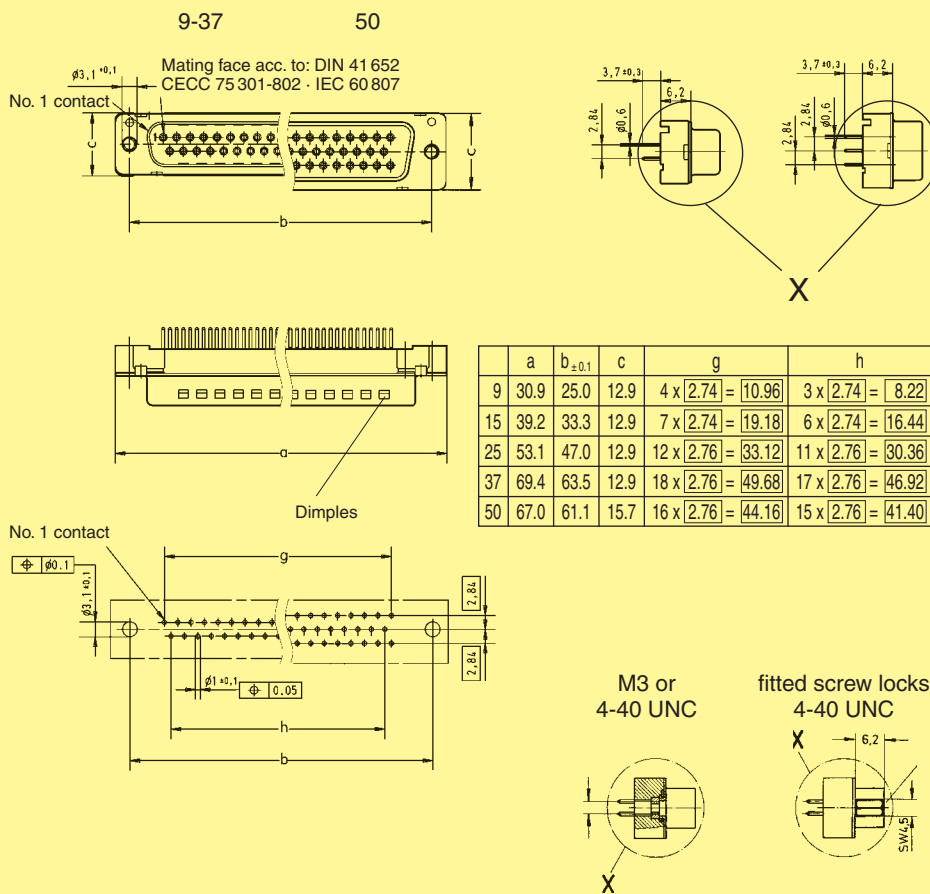
9–50



Turned solder pins, straight without grounding-pins

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 02.02 Other performance levels on request		Performance level 3	Performance level 2
Male connector metal shell with dimples 	9 15 25 37 50	09 66 121 770 09 66 221 770 09 66 321 770 09 66 421 770 09 66 521 770	09 66 121 670 09 66 221 670 09 66 321 670 09 66 421 670 09 66 521 670
Please insert digit for flange thread or fitted female screw locks	M3 ▶ 1 4-40 UNC ▶ 2 fitted screw locks 4-40 UNC ▶ 3		

Male connector



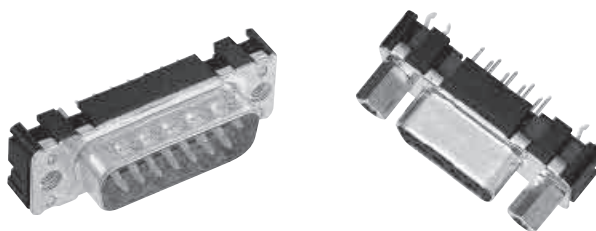
Board drillings

Dimensions in mm

Mating conditions see page 02.02

Number of contacts

9–37



Stamped solder pins, straight with/without grounding board locks

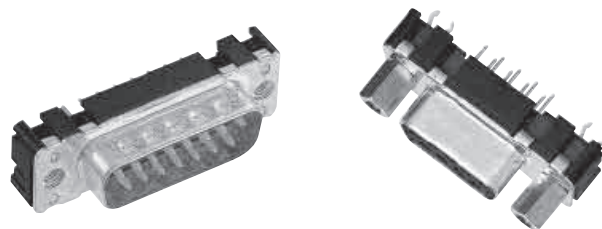
D-Sub - S

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 02.02 Other performance levels on request		Performance level 3	Performance level 2
Male connector metal shell with dimples			
Without grounding board locks	9	09 65 121 770 .	09 65 121 670 .
	15	09 65 221 770 .	09 65 221 670 .
	25	09 65 321 770 .	09 65 321 670 .
	37	09 65 421 770 .	09 65 421 670 .
With grounding board locks	9	09 65 161 771 .	09 65 161 671 .
	15	09 65 261 771 .	09 65 261 671 .
	25	09 65 361 771 .	09 65 361 671 .
	37	09 65 461 771 .	09 65 461 671 .
Female connector metal shell			
Without grounding board locks	9	09 66 111 750 .	09 66 111 650 .
	15	09 66 211 750 .	09 66 211 650 .
	25	09 66 311 750 .	09 66 311 650 .
	37	09 66 411 750 .	09 66 411 650 .
	50	09 66 511 750 .	09 66 511 650 .
With grounding board locks	9	09 66 151 751 .	09 66 151 651 .
	15	09 66 251 751 .	09 66 251 651 .
	25	09 66 351 751 .	09 66 351 651 .
	37	09 66 451 751 .	09 66 451 651 .
Please insert digit for flange thread or fitted female screw locks			
M3 ▶ 1			
4-40 UNC ▶ 2			
fitted screw locks 4-40 UNC ▶ 3 ¹⁾			

¹⁾ Fitted screw locks 4-40 UNC not normally kept in stock for performance level 3
 Connector dimensions see page 02.07. Mating conditions see page 02.02.

Number of contacts

9–37

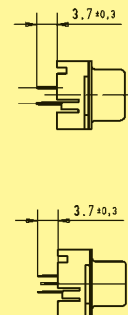
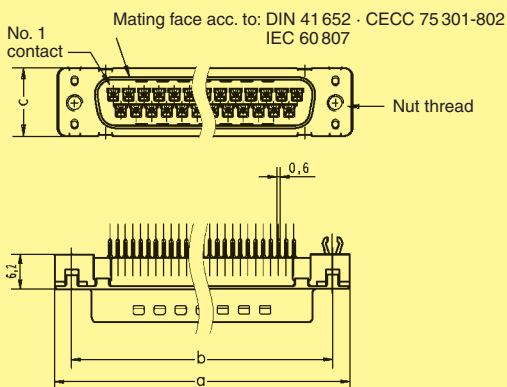
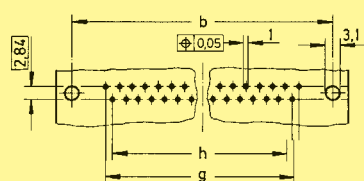
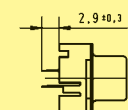
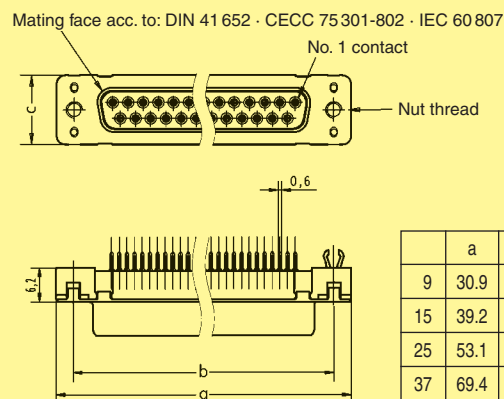


Stamped solder pins, straight with/without grounding board locks

Identification

Drawing

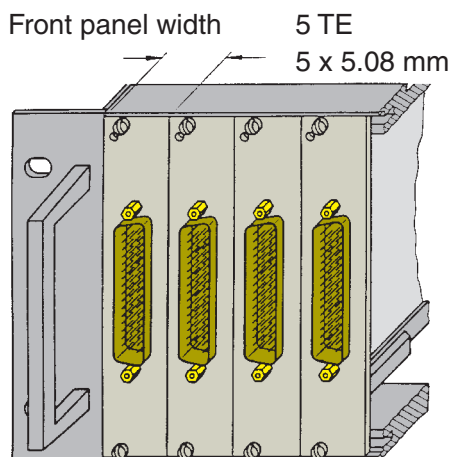
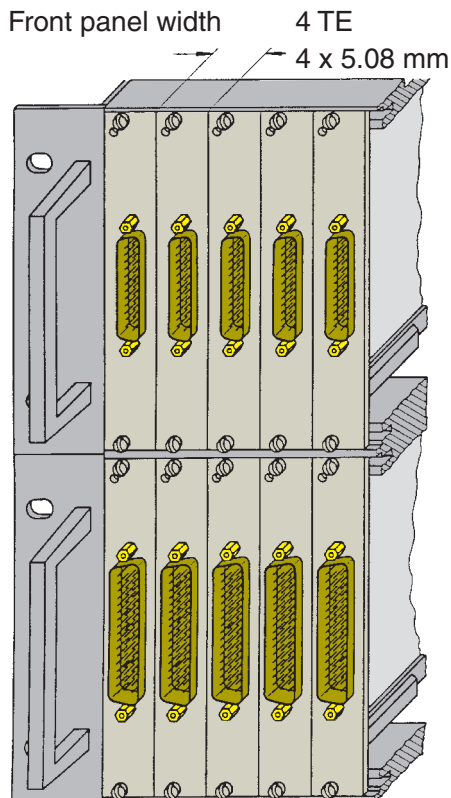
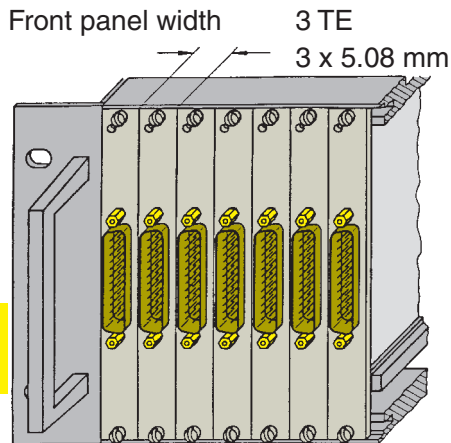
Dimensions in mm

Male connector
9 – 37 contacts

Female connector
9 – 37 contacts


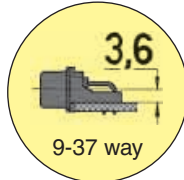
	a	b _{±0,1}	c	g	h
9	30.9	25.0	12.5	4 x 2.74 = 10.96	3 x 2.74 = 8.22
15	39.2	33.3	12.5	7 x 2.74 = 19.18	6 x 2.74 = 16.44
25	53.1	47.0	12.5	12 x 2.76 = 33.12	11 x 2.76 = 30.36
37	69.4	63.5	12.5	18 x 2.76 = 49.68	17 x 2.76 = 46.92

Board drillings
9 – 37 contacts

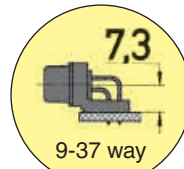
D-Sub - S



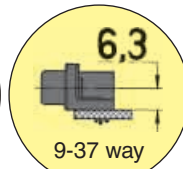
Low-Profile Versions
pages 02.18 – 02.21



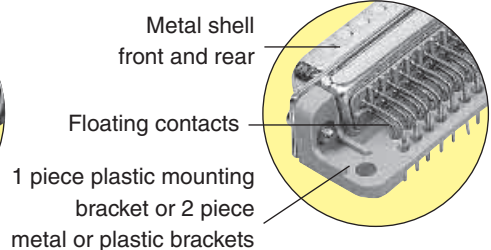
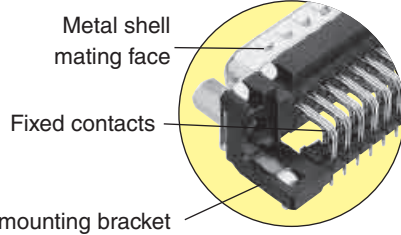
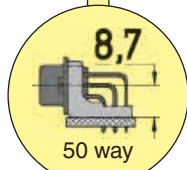
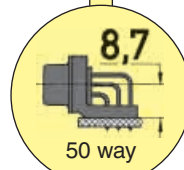
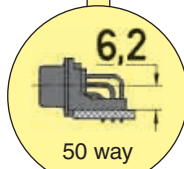
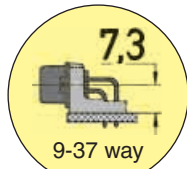
Standard Versions
pages 02.12 – 02.17



U.S. Footprint Versions
pages 02.22 – 02.23



Original Versions
pages 02.10 – 02.11



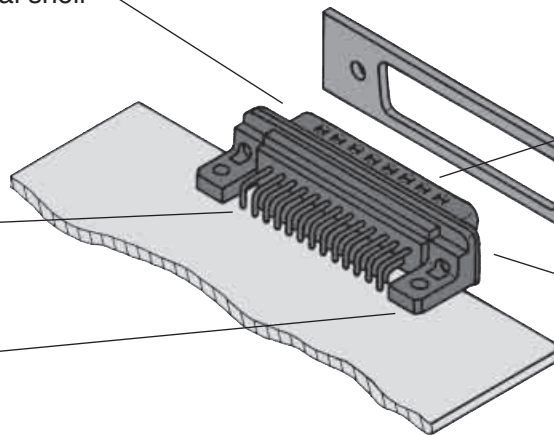
Advantages

All-round protective metal shell

- Polarisation
- Contact protection
- Plated shell
- Male connector with dimples

Plated terminations for increased solderability

Grounding contact riveted to metal shell



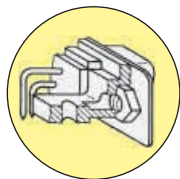
Contact surface finish to different performance levels

Panel

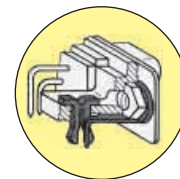
Different metal threads possible in flange area

- M3
- 4-40 UNC
- fitted female screw locks 4-40 UNC
- max. torque ≤ 0.8 Nm

Integrated plastic mounting bracket



Mounting bracket



Mounting bracket with snap-in-clips and grounding pin

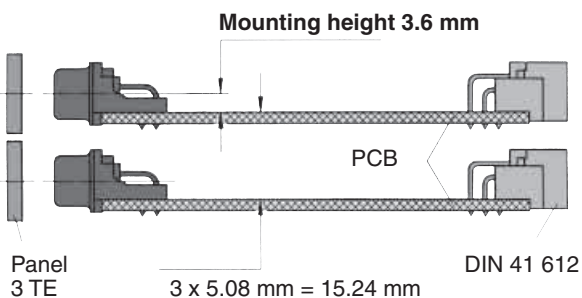
Mounting height

Low-Profile Versions

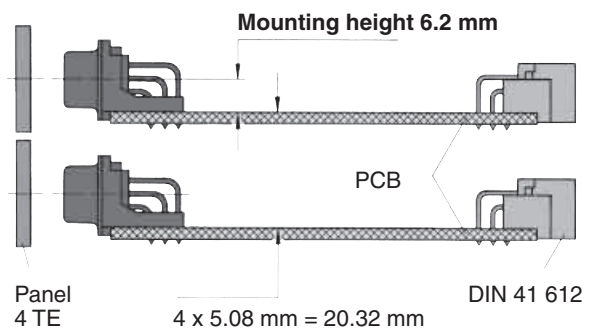
The reduced mounting height of these connectors allow them to be used on the same PCB as DIN 41 612

types with no loss of packaging density when card frames to DIN 41 494 are used.

9-37 way connectors with 3.6 mm mounting height can be fitted to front panels of 3 TE (15.24 mm) width.



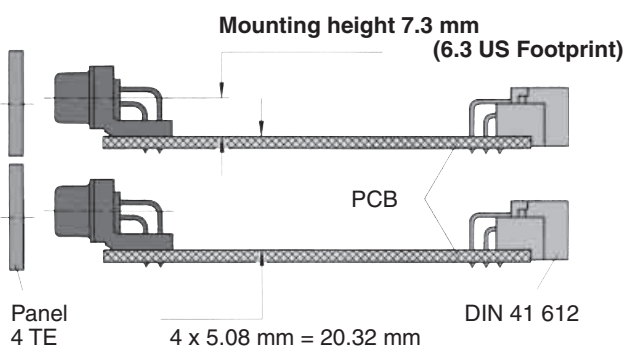
50 way connectors with 6.2 mm mounting height can be fitted to front panels of 4 TE (20.32 mm) width.



Standard Versions

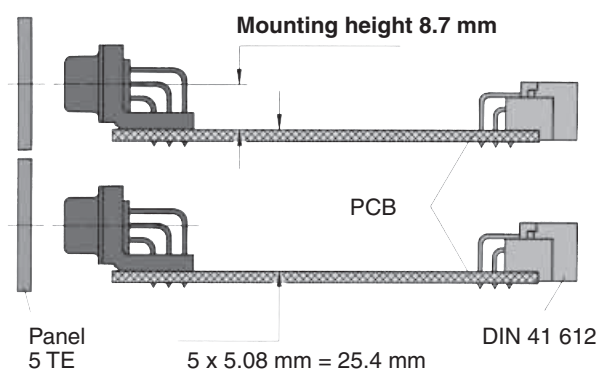
Original Versions

9-37 way connectors with 7.3 mm mounting height can be fitted to front panels of 4 TE (20.32 mm) width.



US Footprint

50 way connectors with 8.7 mm mounting height can be fitted to front panels of 5 TE (25.4 mm) width.





D-Sub - S

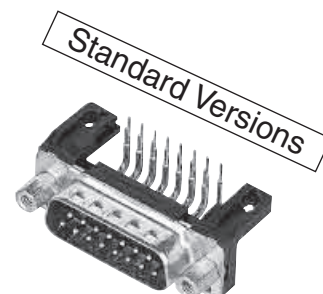
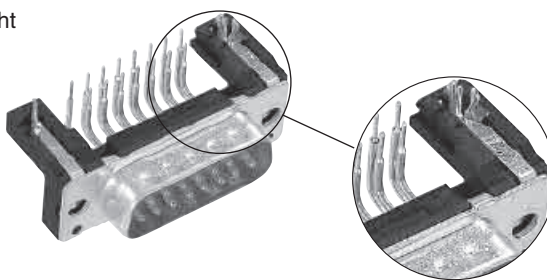
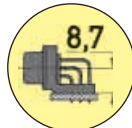
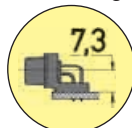
02
11

3) for 2.54/2.84 mm row separation
4) Not in conjunction with mounting bracket

Number of contacts

Mounting height

9–37
50



Standard Versions

Turned solder pins, angled with/without snap-in-clips and grounding board locks

D-Sub - S

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 02.02 Other performance levels on request		Performance level 3	Performance level 2
Male connector metal shell with dimples		2.84 mm pitch	2.84 mm pitch
With snap-in clips and grounding board locks	9	09 66 163 781 .	09 66 163 681 .
	15	09 66 263 781 .	09 66 263 681 .
	25	09 66 363 781 .	09 66 363 681 .
	37	09 66 463 781 .	09 66 463 681 .
	50	09 66 563 781 .	09 66 563 681 .
 available on request		2.54 mm pitch	2.54 mm pitch
	9	09 66 162 781 .	09 66 162 681 .
	15	09 66 262 781 .	09 66 262 681 .
	25	09 66 362 781 .	09 66 362 681 .
	37	09 66 462 781 .	09 66 462 681 .
Without snap-in clips and grounding board locks	50	09 66 562 781 .	09 66 562 681 .
		2.84 mm pitch	2.84 mm pitch
	9	09 66 123 780 .	09 66 123 680 .
	15	09 66 223 780 .	09 66 223 680 .
	25	09 66 323 780 .	09 66 323 680 .
 available on request	37	09 66 423 780 .	09 66 423 680 .
	50	09 66 523 780 .	09 66 523 680 .
		2.54 mm pitch	2.54 mm pitch
	9	09 66 122 780 .	09 66 122 680 .
	15	09 66 222 780 .	09 66 222 680 .
Please insert digit for flange thread or fitted female screw locks	25	09 66 322 780 .	09 66 322 680 .
	37	09 66 422 780 .	09 66 422 680 .
	50	09 66 522 780 .	09 66 522 680 .
M3 ▶ 1 4-40 UNC ▶ 2 fitted screw locks 4-40 UNC ▶ 3			

Mounting height



A photograph of a D-sub connector, specifically a 15-pin female version. A black label with the text "Standard Versions" is positioned above the connector, with a white line pointing from the text to the connector's pins.

D-Sub - S

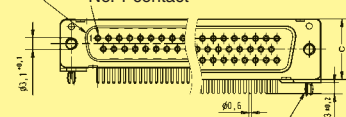
Dimensions in mm

With snap-in clips
and grounding board locks

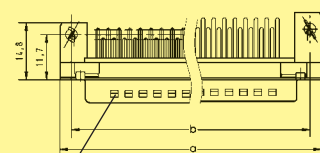
Without snap-in clips
and grounding board locks

Board drillings

Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807
No. 1 contact

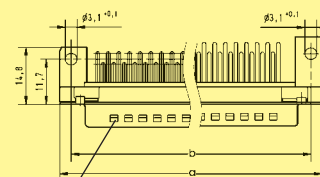
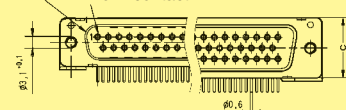


Grounding pins 0.2 x 0.6

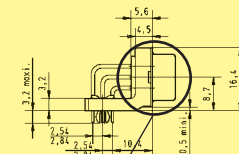
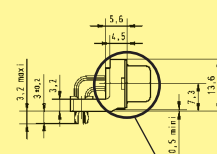


7
Dimples

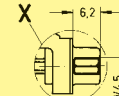
Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807
No. 1 contact



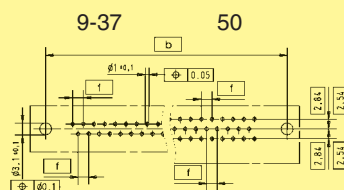
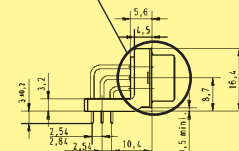
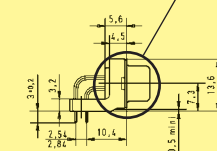
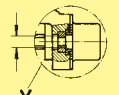
7
Dimples



fitted screw locks
4 - 40 UNC



M3 or
4 - 40 UNC

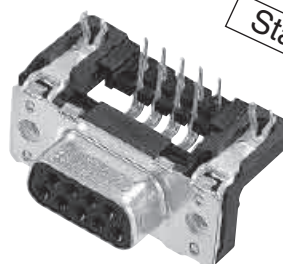
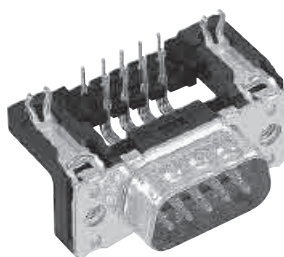
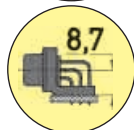
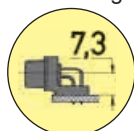


	a	b ± 0.1	c	f
9	30.90	25.00	12.90	2.74
15	39.20	33.30	12.90	2.74
25	53.10	47.00	12.90	2.76
37	69.40	63.50	12.90	2.76
50	67.00	61.10	15.70	2.76

Number of contacts

Mounting height

9–37
50



Standard Versions

Stamped solder pins, angled with grounding board locks

D-Sub - S

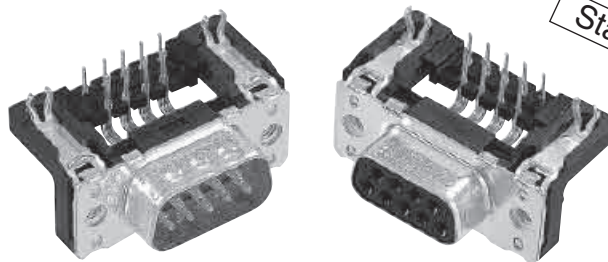
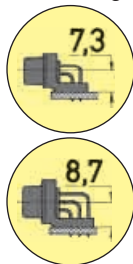
Identification	No. of contacts	Part No.	
Performance levels Explanations see page 02.02 Other performance levels on request		Performance level 3	Performance level 2
Male connector metal shell with dimples		2.84 mm pitch	2.84 mm pitch
	9	09 65 163 781 . 1)	09 65 163 681 . 1)
	15	09 65 263 781 . 1)	09 65 263 681 . 1)
	25	09 65 363 781 . 1)	09 65 363 681 . 1)
	37	09 65 463 781 . 1)	09 65 463 681 . 1)
		2.54 mm pitch	2.54 mm pitch
	9	09 65 162 781 .	09 65 162 681 .
	15	09 65 262 781 .	09 65 262 681 .
	25	09 65 362 781 .	09 65 362 681 .
	37	09 65 462 781 .	09 65 462 681 .
Female connector metal shell		2.84 mm pitch	2.84 mm pitch
	9	09 66 153 761 . 1)	09 66 153 661 . 1)
	15	09 66 253 761 . 1)	09 66 253 661 . 1)
	25	09 66 353 761 . 1)	09 66 353 661 . 1)
	37	09 66 453 761 . 1)	09 66 453 661 . 1)
	50	09 66 553 761 . 1)	09 66 553 661 . 1)
		2.54 mm pitch	2.54 mm pitch
	9	09 66 152 761 .	09 66 152 661 .
	15	09 66 252 761 .	09 66 252 661 .
	25	09 66 352 761 .	09 66 352 661 .
	37	09 66 452 761 .	09 66 452 661 .
	50	09 66 552 761 . 1)	09 66 552 661 . 1)
Please insert digit for flange thread or fitted female screw locks			
Ø 3.1 mm hole ▶ 0 ¹⁾			
M3 ▶ 1			
4-40 UNC ▶ 2			
fitted screw locks 4-40 UNC ▶ 3			

1) Not normally kept in stock

Number of contacts

Mounting height

9–37
50



Standard Versions

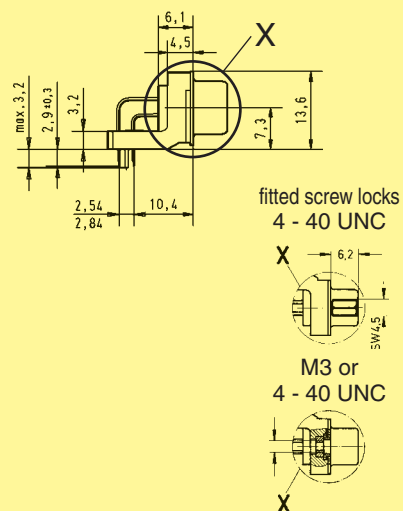
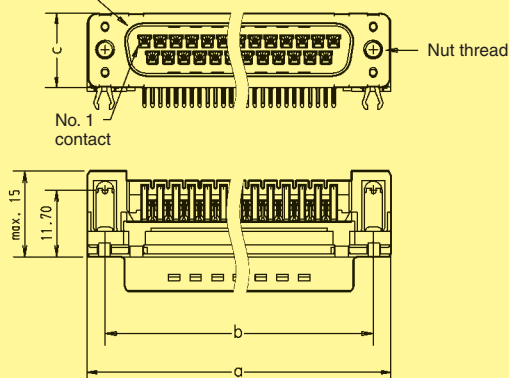
Stamped solder pins, angled with grounding board locks

Identification

Drawing

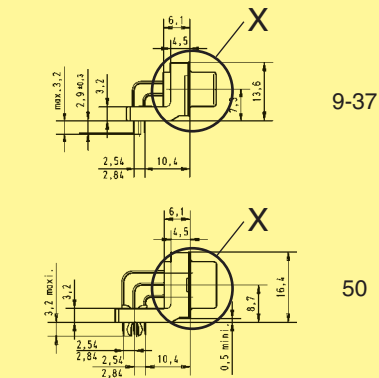
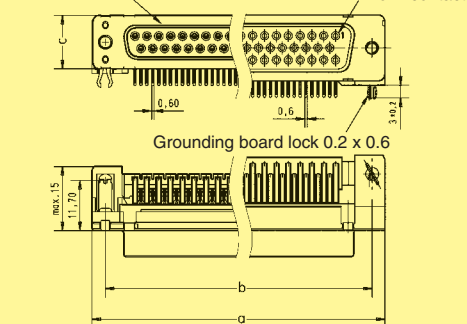
Dimensions in mm

Male connector

Mating face acc. to: DIN 41 652 · CECC 75 301-802
IEC 60 807


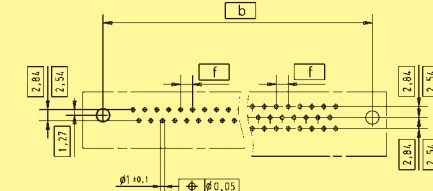
Female connector

9-37 50

Mating face acc. to: DIN 41 652 · CECC 75 301-802
IEC 60 807


Board drillings

9-37 50

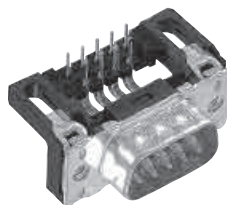
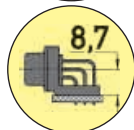
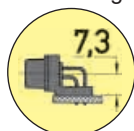


	a	b±0.1	c	f
9	30.90	25.00	12.50	2.74
15	39.20	33.30	12.50	2.74
25	53.10	47.00	12.50	2.76
37	69.40	63.50	12.50	2.76
50	67.00	61.10	15.40	2.76

Number of contacts

Mounting height

9–37
50



Standard Versions

Stamped solder pins, angled without grounding board locks

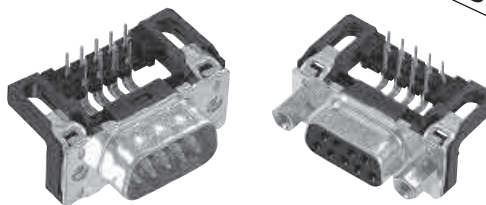
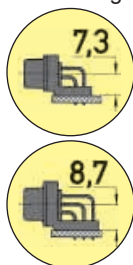
D-Sub - S

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 02.02 Other performance levels on request		Performance level 3	Performance level 2
Male connector metal shell with dimples		2.84 mm pitch	2.84 mm pitch
	9	09 65 123 780 .	09 65 123 680 .
	15	09 65 223 780 .	09 65 223 680 .
	25	09 65 323 780 .	09 65 323 680 .
	37	09 65 423 780 .	09 65 423 680 .
		2.54 mm pitch	2.54 mm pitch
	9	09 65 122 780 .	09 65 122 680 .
	15	09 65 222 780 .	09 65 222 680 .
	25	09 65 322 780 .	09 65 322 680 .
	37	09 65 422 780 .	09 65 422 680 .
Female connector metal shell		2.84 mm pitch	2.84 mm pitch
	9	09 66 113 760 . ¹⁾	09 66 113 660 . ¹⁾
	15	09 66 213 760 . ¹⁾	09 66 213 660 . ¹⁾
	25	09 66 313 760 . ¹⁾	09 66 313 660 . ¹⁾
	37	09 66 413 760 . ¹⁾	09 66 413 660 . ¹⁾
	50	09 66 513 760 . ¹⁾	09 66 513 660 . ¹⁾
		2.54 mm pitch	2.54 mm pitch
	9	09 66 112 760 .	09 66 112 660 .
	15	09 66 212 760 .	09 66 212 660 .
	25	09 66 312 760 .	09 66 312 660 .
	37	09 66 412 760 .	09 66 412 660 .
	50	09 66 512 760 . ¹⁾	09 66 512 660 . ¹⁾
Please insert digit for flange thread or fitted female screw locks Ø 3.1 mm hole ▶ 0 ¹⁾ M3 ▶ 1 4-40 UNC ▶ 2 fitted screw locks 4-40 UNC ▶ 3			

Number of contacts

Mounting height

9–37
50



Standard Versions

Stamped solder pins, angled without grounding board locks

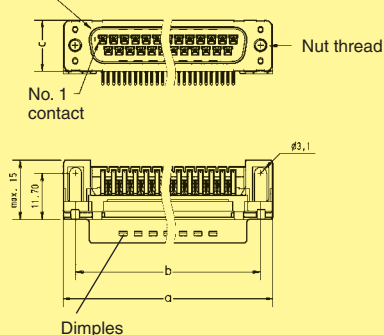
Identification

Drawing

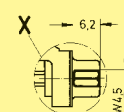
Dimensions in mm

Male connector

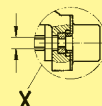
Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807



fitted screw locks
4 - 40 UNC

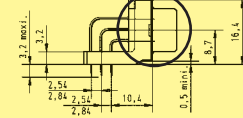
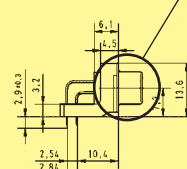
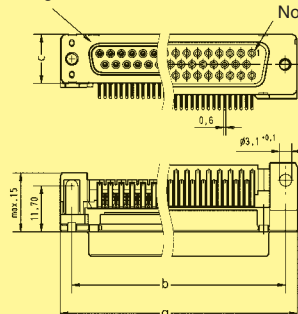


M3 or
4 - 40 UNC

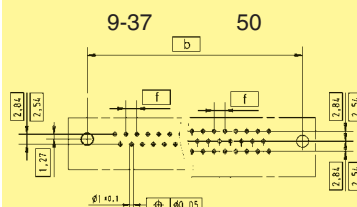


Female connector

9-37 50
Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807



Board drillings

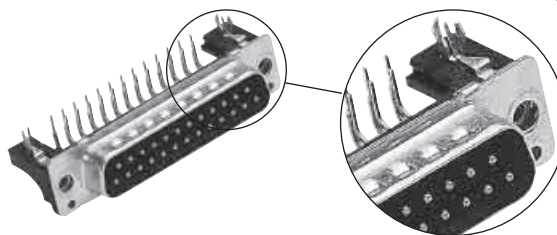
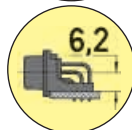
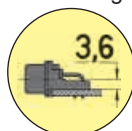


	a	b±0.1	c	f
9	30.90	25.00	12.50	2.74
15	39.20	33.30	12.50	2.74
25	53.10	47.00	12.50	2.76
37	69.40	63.50	12.50	2.76
50	67.00	61.10	15.40	2.76

Number of contacts

Mounting height

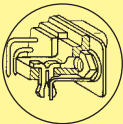
9–37
50



Low-Profile Versions

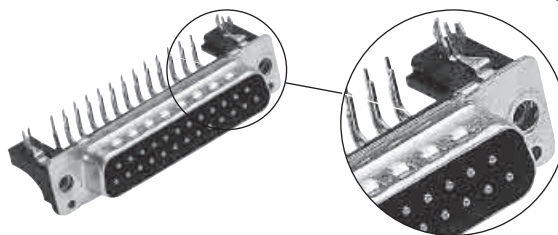
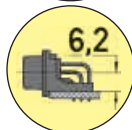
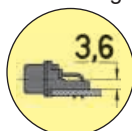
Turned solder pins, angled with snap-in-clips and grounding board locks

D-Sub - S

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 02.02 Other performance levels on request		Performance level 3	Performance level 2
Male connector metal shell with dimples 			
			
		2.54 mm pitch	2.54 mm pitch
	9	09 66 162 781 .	09 66 162 681 .
	15	09 66 262 781 .	09 66 262 681 .
	25	09 66 362 781 .	09 66 362 681 .
	37	09 66 462 781 .	09 66 462 681 .
	50	09 66 562 781 .	09 66 562 681 .
Please insert digit for flange thread or fitted female screw locks			
M3 ▶ 5 4-40 UNC ▶ 6 fitted screw locks 4-40 UNC ▶ 7			

Number of contacts

Mounting height

9-37
50


Low-Profile Versions

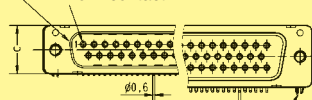
Turned solder pins, angled with snap-in-clips and grounding board locks

Identification

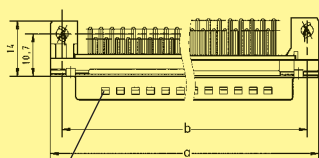
Drawing

Dimensions in mm

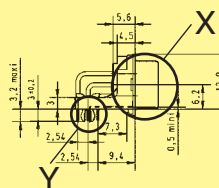
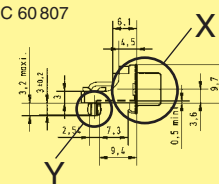
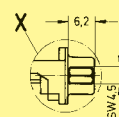
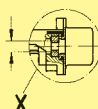
Male connector

9-37 50
Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807
No. 1 contact


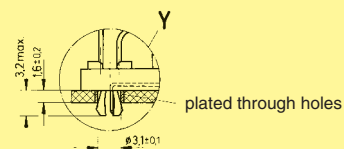
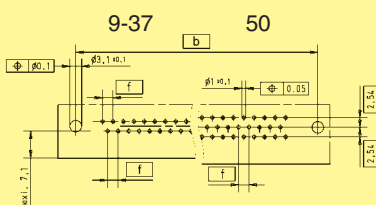
Grounding board lock 0.2 x 0.6



Dimples


fitted screw locks
4 - 40 UNC

M3 or
4 - 40 UNC


Board drillings

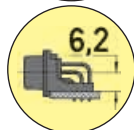
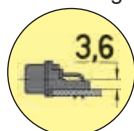


	a	b ± 0.1	c	f
9	30.90	25.00	12.50	2.74
15	39.20	33.30	12.50	2.74
25	53.10	47.00	12.50	2.76
37	69.40	63.50	12.50	2.76
50	67.00	61.10	15.70	2.76

Number of contacts

Mounting height

9–37
50



Low-Profile Versions

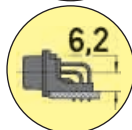
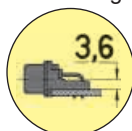
Stamped solder pins, angled with grounding board locks

D-Sub - S

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 02.02 Other contact surfaces on request		Performance level 3	Performance level 2
Male connector metal shell with dimples	9 15 25 37	09 65 162 781 . 09 65 262 781 . 09 65 362 781 . 09 65 462 781 .	09 65 162 681 . 09 65 262 681 . 09 65 362 681 . 09 65 462 681 .
Female connector metal shell	9 15 25 37 50	09 66 152 761 . 09 66 252 761 . 09 66 352 761 . 09 66 452 761 . 09 66 552 761 . ¹⁾	09 66 152 661 . 09 66 252 661 . 09 66 352 661 . 09 66 452 661 . 09 66 552 661 . ¹⁾
Please insert digit for flange thread or fitted female screw locks			
M3 ▶ 5 4-40 UNC ▶ 6 fitted screw locks 4-40 UNC ▶ 7			

Number of contacts

Mounting height

9-37
50


Low-Profile Versions

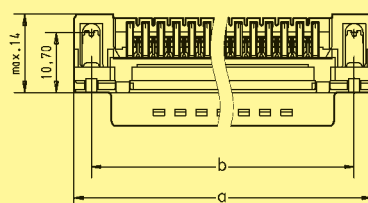
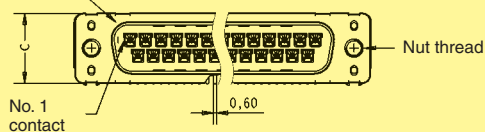
Stamped solder pins, angled with grounding board locks

Identification

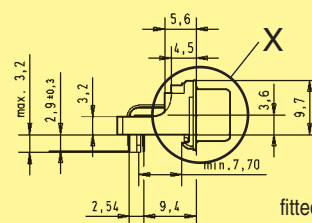
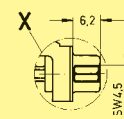
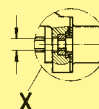
Drawing

Dimensions in mm

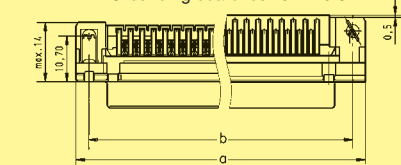
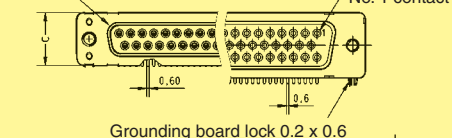
Male connector

Mating face acc. to: DIN 41 652 · CECC 75 301-802
IEC 60 807


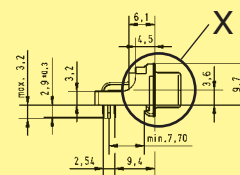
9-37 50


fitted screw locks
4 - 40 UNC

M3 or
4 - 40 UNC


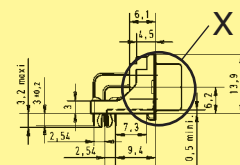
Female connector

Mating face acc. to: DIN 41 652 · CECC 75 301-802
IEC 60 807


9-37 50

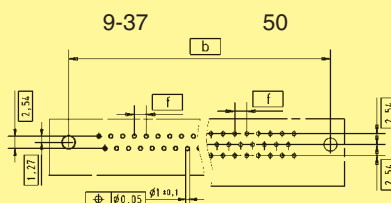


9-37



50

Board drillings

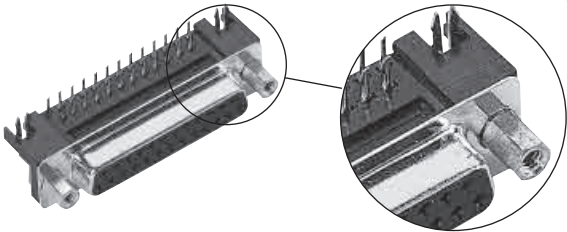
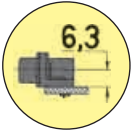


	a	b±0.1	c	f
9	30.90	25.00	12.50	2.74
15	39.20	33.30	12.50	2.74
25	53.10	47.00	12.50	2.76
37	69.40	63.50	12.50	2.76
50	67.00	61.10	15.40	2.76

Number of contacts

9–37

Mounting height



U.S. Footprint

Stamped solder pins, angled with snap-in-clips and grounding board locks

D-Sub - S

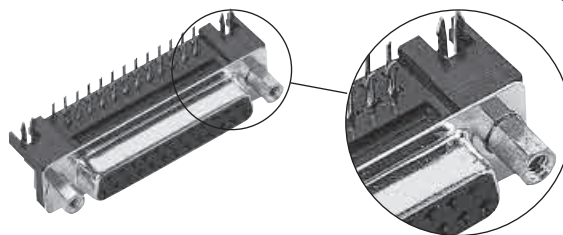
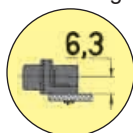
Identification	No. of contacts	Part No.	
Performance levels Explanations see page 02.02 Other performance levels on request		Performance level 3	S4 ¹⁾
Male connector metal shell with dimples			
		2.84 mm pitch	2.84 mm pitch
	9	09 68 163 781 .	09 68 163 581 .
	15	09 68 263 781 .	09 68 263 581 .
	25	09 68 363 781 .	09 68 363 581 .
	37	09 68 463 781 .	09 68 463 581 .
Female connector metal shell			
		2.84 mm pitch	2.84 mm pitch
	9	09 68 153 761 .	09 68 153 561 .
	15	09 68 253 761 .	09 68 253 561 .
	25	09 68 353 761 .	09 68 353 561 .
	37	09 68 453 761 .	09 68 453 561 .
Please insert digit for flange thread or fitted female screw locks			
M3 ▶ 1 ²⁾			
4-40 UNC ▶ 2			
fitted screw locks 4-40 UNC ▶ 3			

¹⁾ S4: ≥ 0.76 µm Au (30 µinch)
²⁾ Not normally kept in stock

Number of contacts

Mounting height

9–37



U.S. Footprint

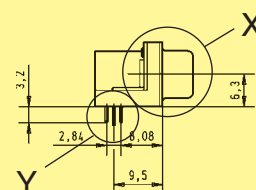
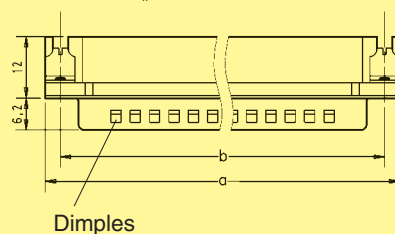
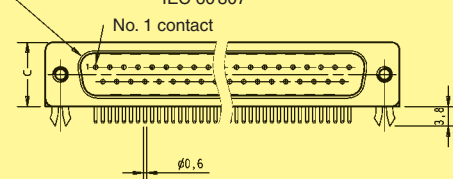
Stamped solder pins, angled with snap-in-clips and grounding board locks

Identification

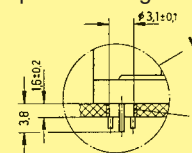
Drawing

Dimensions in mm

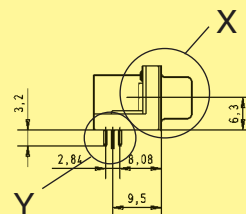
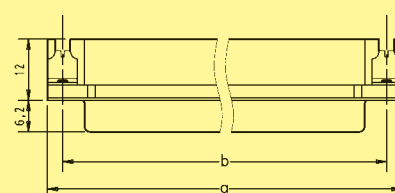
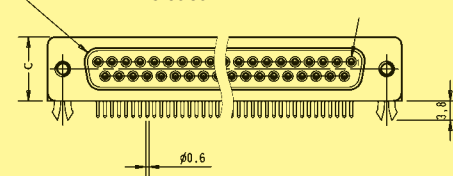
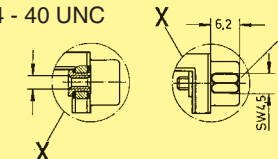
Male connector

Mating face acc. to: DIN 41 652 · CECC 75 301-802
IEC 60 807


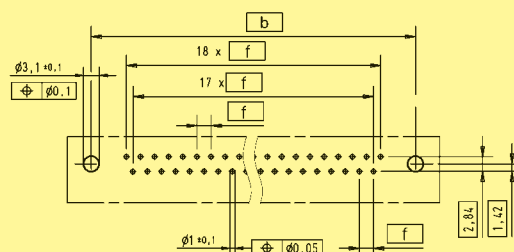
plated through holes



Female connector

Mating face acc. to: DIN 41 652 · CECC 75 301-802
IEC 60 807

M3 or
4 - 40 UNC


Board drillings



	a	b±0.1	c	f
9	30.90	25.00	12.55	2.77
15	39.20	33.30	12.55	2.77
25	53.10	47.00	12.55	2.77
37	69.40	63.50	12.55	2.77

Identification

Drawing

Dimensions in mm

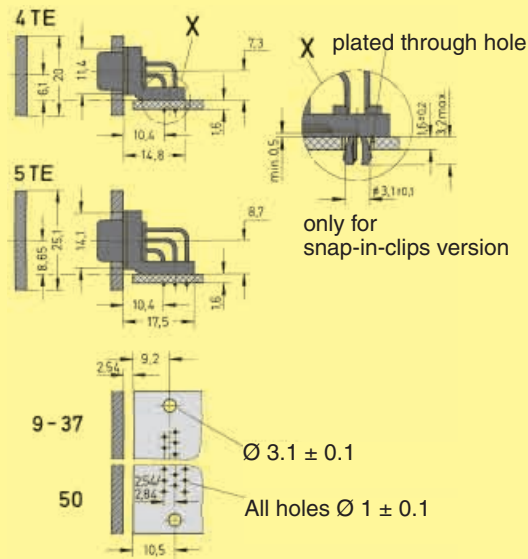
Standard Versions

Mounting height 7.3 mm

9-37 way
for front panel
4 units of width (TE)

Mounting height 8.7 mm

50 way
for front panel
5 units of width (TE)



for connectors see pages 02.12 – 02.17

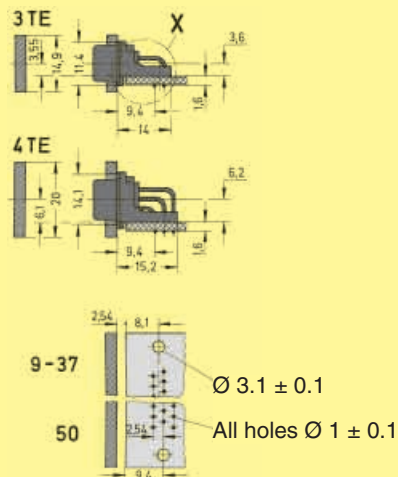
Low-Profile Versions

Mounting height 3.6 mm

9-37 way
for front panel
3 units of width (TE)

Mounting height 6.2 mm

50 way
for front panel
4 units of width (TE)



When used in a wave soldering process the mating face of the connector must be protected with adhesive tape.

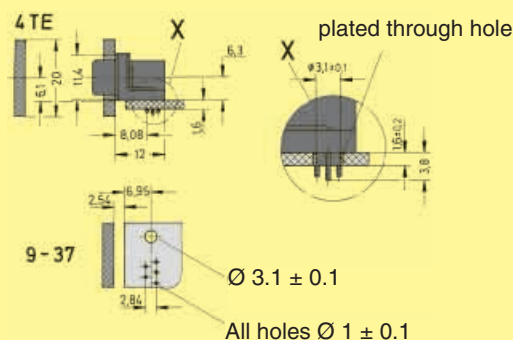


for connectors see pages 02.18 – 02.21

U.S. Footprint Versions

Mounting height 6.3 mm

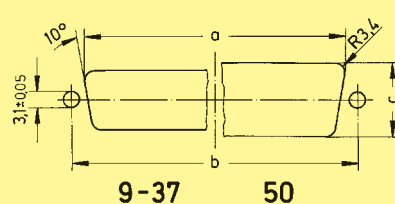
9-37 way
for front panel
4 units of width (TE)



for connectors see pages 02.22 – 02.23

Panel cut out
for front/rear mount

Values are taken from the
CECC 75301-802

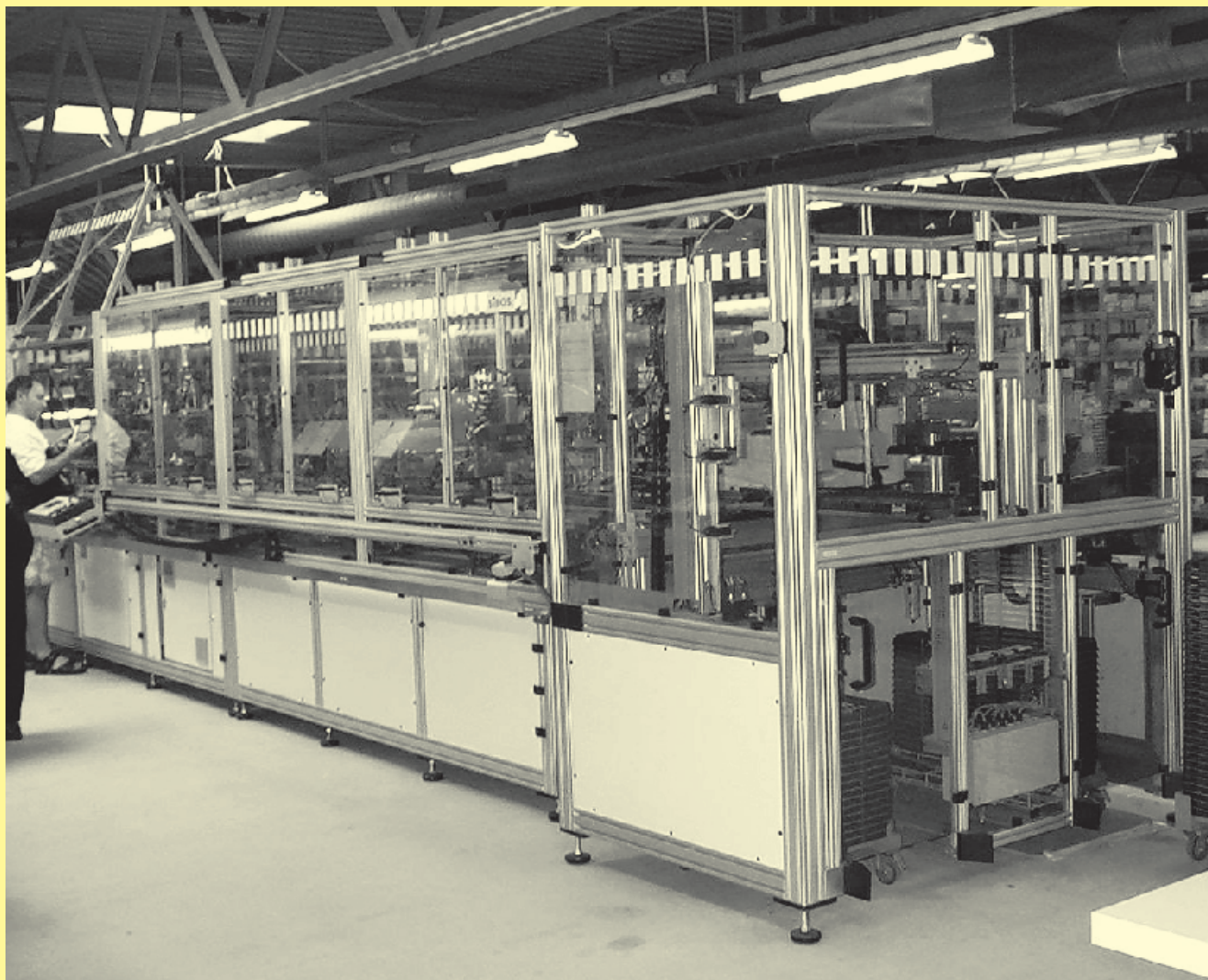


Front mount

	a±0.2	b±0.13	c±0.2
9	22.2	25.0	12.3
15	30.5	33.3	12.3
25	44.3	47.0	12.3
37	60.7	63.5	12.3
50	58.3	61.1	15.1

Rear mount

	a±0.2	b±0.13	c±0.2
9	20.5	25.0	11.4
15	28.8	33.3	11.4
25	42.5	47.0	11.4
37	59.1	63.5	11.4
50	56.3	61.1	14.1



Fully automated assembly line, split into two sublines for a high production flexibility.



SEK connector mounted in a tape ready for placement using an odd form assembly station.

Subline one for pre-assembly and subline two for customizing.

The assembly line features an integrated online camera inspection system and laser printing.

Our claim is quality.

Our challenge is to improve quality from day to day.

Number of contacts 9, 15, 25, 37, 50
UL recognized

Working current

see current carrying capacity chart

Turned contacts 7.5 A max.

Stamped contacts 6.5 A max.

Insulation displacement 2 A max.

Test voltage $U_{r.m.s.}$ 1 kV

Clearance and creepage ≥ 1.0 mm
 ≥ 0.7 mm (insulation displacement)

Contact resistance ≤ 10 m Ω
Insulation resistance $\geq 10^{10}$ Ω

Temperature range

turned version -55 °C ... + 125 °C

stamped solder

bucket version -25 °C ... + 85 °C

Terminations

- Solder buckets
AWG 20
- Crimp contacts
0.09-0.25 mm²
AWG 28-24
max. insulation $\varnothing$ 1.02 mm
0.25-0.56 mm²
AWG 24-20
max. insulation $\varnothing$ 1.52 mm
- Insulation displacement
AWG 28/7 and AWG 26/7
AWG 28/1 and AWG 30/1
- Wrap posts 0.6 x 0.6 mm
diagonal 0.8-0.86 mm
length 13 mm

Materials

Mouldings and hoods Thermoplastic resin, glass-fibre filled (PBTP),
UL 94-V0

Contacts Copper alloy

Contact surface

Contact zone selectively gold-plated
according to performance level¹⁾

Metal shell Plated steel

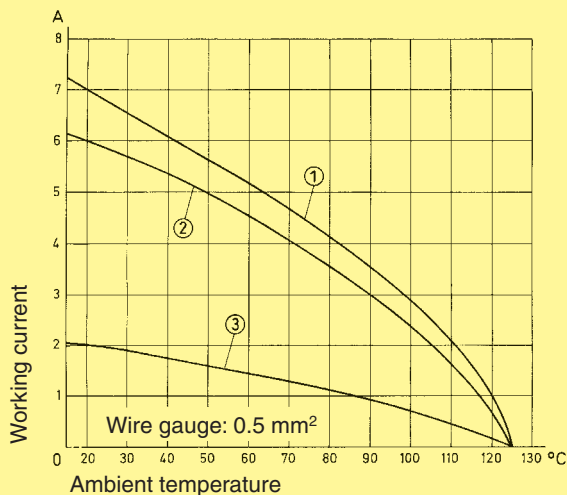
Mating force

9 way	≤ 30 N
15 way	≤ 50 N
25 way	≤ 83 N
37 way	≤ 123 N
50 way	≤ 167 N

Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60512.



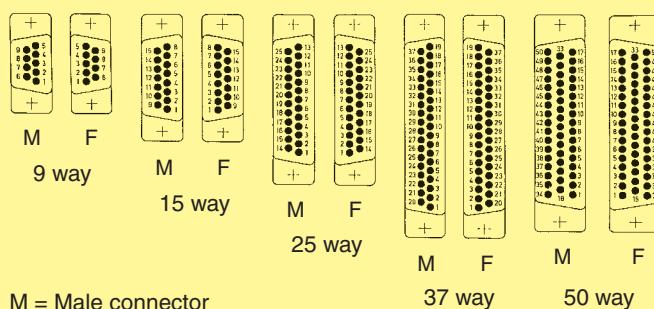
Example: 25 way connector

① Turned contacts

② Stamped contacts

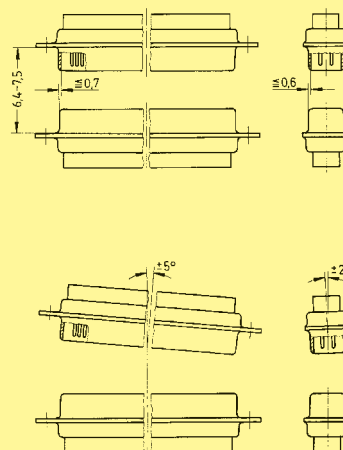
③ Insulation displacement contacts

Contact arrangement View from termination side



M = Male connector
F = Female connector

Mating conditions as per DIN 41 652



¹⁾ Performance level 3, 50 mating cycles, no gas test

Performance level 2 as per CECC 75301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60512

Performance level 1 as per CECC 75301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60512

9-50



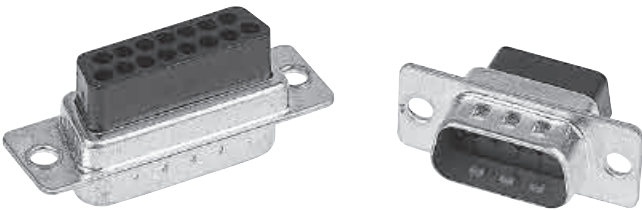
D-Sub - S

02
27

Mating conditions see page 02.26

Number of contacts

9–50

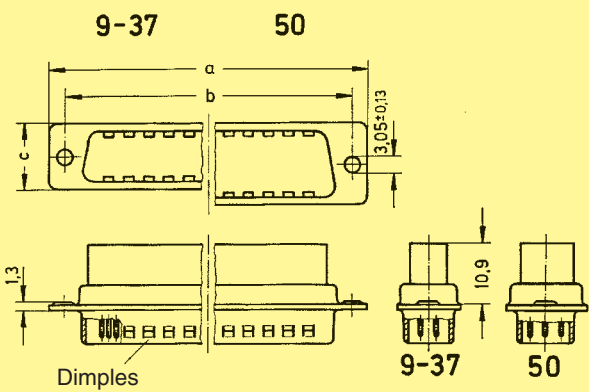


Crimp terminal

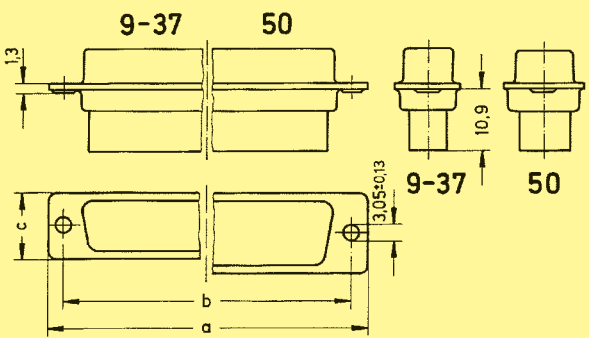
D-Sub - S

Identification	No. of contacts	Part No.
Male connector Order contacts separately metal shell with dimples	9	09 67 009 5601
	15	09 67 015 5601
	25	09 67 025 5601
	37	09 67 037 5601
	50	09 67 050 5601
Female connector Order contacts separately metal shell	9	09 67 009 4701
	15	09 67 015 4701
	25	09 67 025 4701
	37	09 67 037 4701
	50	09 67 050 4701

Male connector



Female connector



	a	b ±0.1	c
9	30.9	25.0	12.5
15	39.2	33.3	12.5
25	53.1	47.0	12.5
37	69.4	63.5	12.5
50	67.0	61.1	15.4

Panel cut out
for front/rear mount

Values are taken from the
CECC 75 301-802

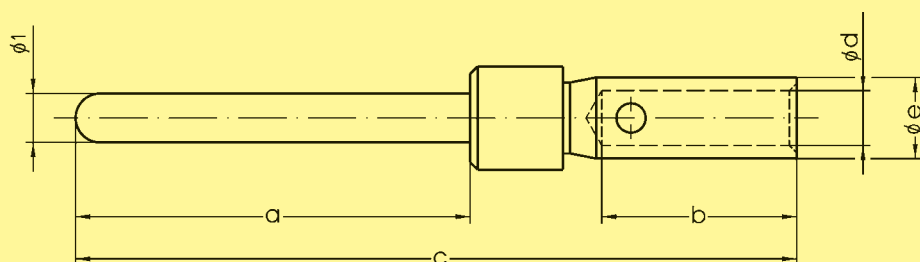
see page 02.24

Dimensions in mm

Crimp contacts

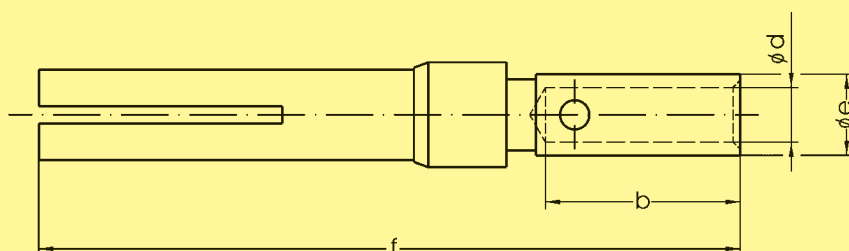
Identification	Wire gauge (mm ²)	Part No.	
		turned male contacts	turned female contacts
		Performance level 1*	Performance level 1*
Individual contacts	AWG 22-18 0.33-0.82	61 03 000 0112	61 03 000 0113
	AWG 22-20 0.33-0.52	61 03 000 0073	61 03 000 0074
	AWG 26-22 0.13-0.33	61 03 000 0094	61 03 000 0096
	AWG 28-24 0.09-0.25	61 03 000 0078	61 03 000 0080

Male contacts



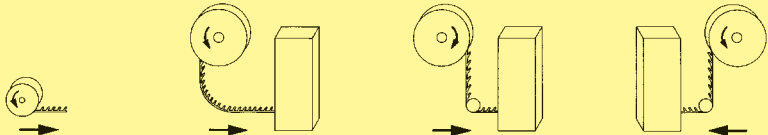
	a	b	c	d	e	f
AWG 22-18	8.23	4.2	14.0	1.35	1.75	13.6
AWG 22-20	8.10	4.0	14.8	1.12	1.66	14.4
AWG 26-22	8.10	4.0	14.8	0.90	1.66	14.4
AWG 28-24	8.10	4.0	14.8	0.64	1.66	14.4

Female contacts



* Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60512

Crimp contacts

Identification	Wire gauge (mm ²)	Part No.		
Performance levels Explanations see page 02.26 Other performance levels on request		stamped male contacts		
		Performance level 3	Performance level 2	Performance level 1
Individual contacts	0.09-0.25 AWG 28-24	09 67 000 7177 ¹⁾	09 67 000 7178 ¹⁾	09 67 000 7176 ¹⁾
500 pieces/reel Unrolling left	stranded	09 67 000 7167	09 67 000 7168	09 67 000 7166
10 000 pieces/reel Unrolling left Unrolling left reversed Unrolling right reversed		09 67 000 7157 09 67 000 7147 09 67 000 7137	09 67 000 7158 09 67 000 7148 09 67 000 7138	09 67 000 7156 09 67 000 7146 09 67 000 7136
Individual contacts	0.25-0.56 AWG 24-20	09 67 000 8177 ¹⁾	09 67 000 8178 ¹⁾	09 67 000 8176 ¹⁾
500 pieces/reel Unrolling left	stranded	09 67 000 8167	09 67 000 8168	09 67 000 8166
10 000 pieces/reel Unrolling left Unrolling left reversed Unrolling right reversed		09 67 000 8157 09 67 000 8147 09 67 000 8137	09 67 000 8158 09 67 000 8148 09 67 000 8138	09 67 000 8156 09 67 000 8146 09 67 000 8136
Unrolling direction				
		for HARTING tools		

¹⁾ Minimum order 500 pieces or multiples of 500
 Insertion and removal tool see chapter 31
 Contact dimensions see page 02.31

Crimp contacts

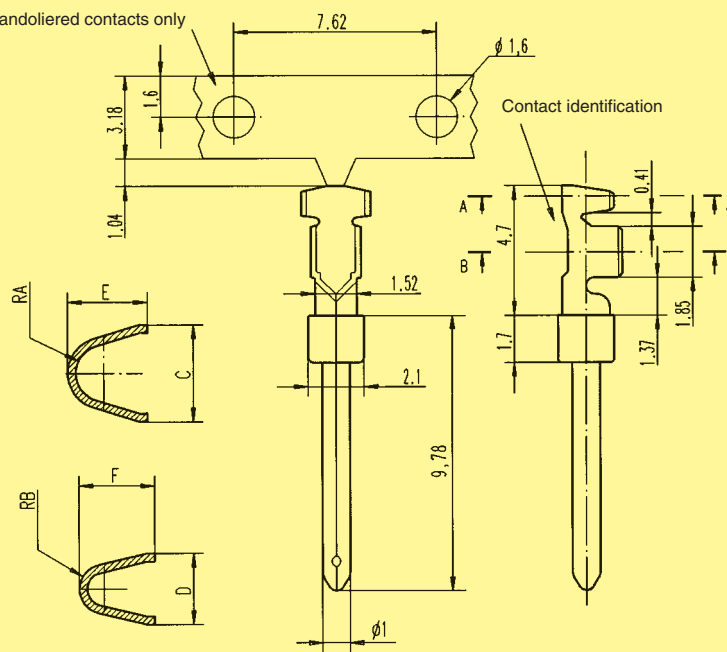
Identification

Drawing

Dimensions in mm

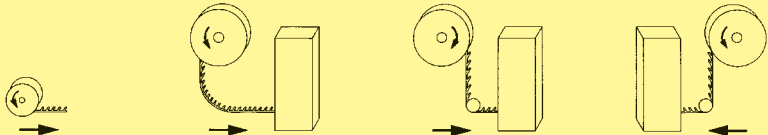
Male contacts

For bandoliered contacts only



AWG	C	D	E	F	RA	RB	Contact identification
20-24	2.46	1.78	1.98	1.90	0.71	0.43	—
24-28	1.65	1.47	1.52	1.52	0.50	0.33	==

Crimp contacts

Identification	Wire gauge (mm ²)	Part No.		
Performance levels Explanations see page 02.26 Other performance levels on request		stamped female contacts		
		Performance level 3	Performance level 2	Performance level 1
Individual contacts	0.09-0.25 AWG 28-24	09 67 000 7277 ¹⁾	09 67 000 7278 ¹⁾	09 67 000 7276 ¹⁾
500 pieces/reel Unrolling left	stranded	09 67 000 7267	09 67 000 7268	09 67 000 7266
10 000 pieces/reel Unrolling left Unrolling left reversed Unrolling right reversed		09 67 000 7257 09 67 000 7247 09 67 000 7237	09 67 000 7258 09 67 000 7248 09 67 000 7238	09 67 000 7256 09 67 000 7246 09 67 000 7236
Individual contacts	0.25-0.56 AWG 24-20	09 67 000 8277 ¹⁾	09 67 000 8278 ¹⁾	09 67 000 8276 ¹⁾
500 pieces/reel Unrolling left	stranded	09 67 000 8267	09 67 000 8268	09 67 000 8266
10 000 pieces/reel Unrolling left Unrolling left reversed Unrolling right reversed		09 67 000 8257 09 67 000 8247 09 67 000 8237	09 67 000 8258 09 67 000 8248 09 67 000 8238	09 67 000 8256 09 67 000 8246 09 67 000 8236
Unrolling direction				
		for HARTING tools		

¹⁾ Minimum order 500 pieces or multiples of 500
 Insertion and removal tool see chapter 31
 Contact dimensions see page 02.33



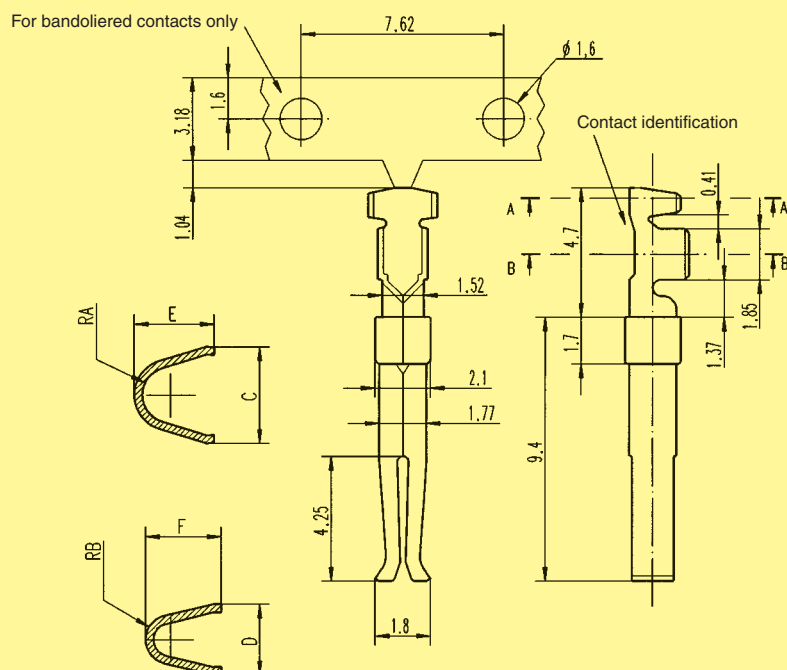
Crimp contacts

Identification

Drawing

Dimensions in mm

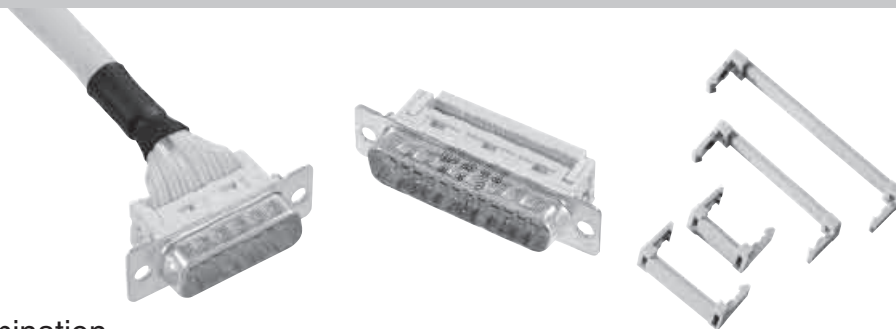
Female contacts



AWG	C	D	E	F	RA	RB	Contact identification
20-24	2.46	1.78	1.98	1.90	0.71	0.43	—
24-28	1.65	1.47	1.52	1.52	0.50	0.33	==

Number of contacts

9–37



Insulation displacement termination

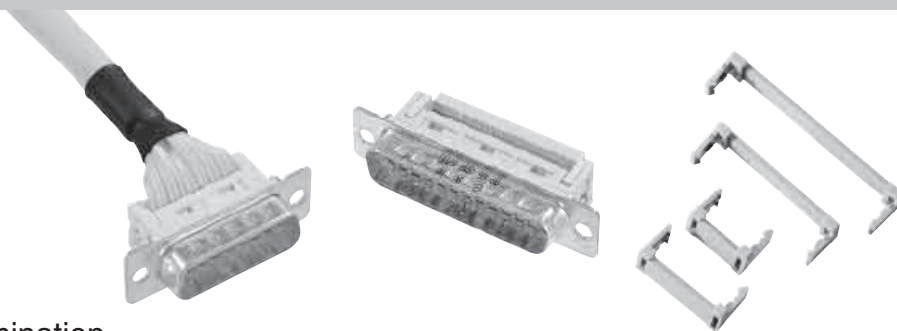
D-Sub - S

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 02.26 Other performance levels on request		Performance level 3	Performance level 2
Male connector pitch 1.27 mm metal shell with dimples	9 15 25 37	09 66 128 770 . 09 66 228 770 . 09 66 328 770 . 09 66 428 770 .	09 66 128 670 . 09 66 228 670 . 09 66 328 670 . 09 66 428 670 .
Female connector pitch 1.27 mm metal shell	9 15 25 37	09 66 118 750 . 09 66 218 750 . 09 66 318 750 . 09 66 418 750 .	09 66 118 650 . 09 66 218 650 . 09 66 318 650 . 09 66 418 650 .
Please insert digit for flange thread or fitted female screw locks ø 3.1 mm hole ▶ 0 M3 ▶ 1 ¹⁾ 4-40 UNC ▶ 2			
Strain relief clamp plastic for male and female connector	9 15 25 37	09 66 108 0001 09 66 208 0001 09 66 308 0001 09 66 408 0001	09 66 108 0001 09 66 208 0001 09 66 308 0001 09 66 408 0001

Number of contacts

9–37

Insulation displacement termination

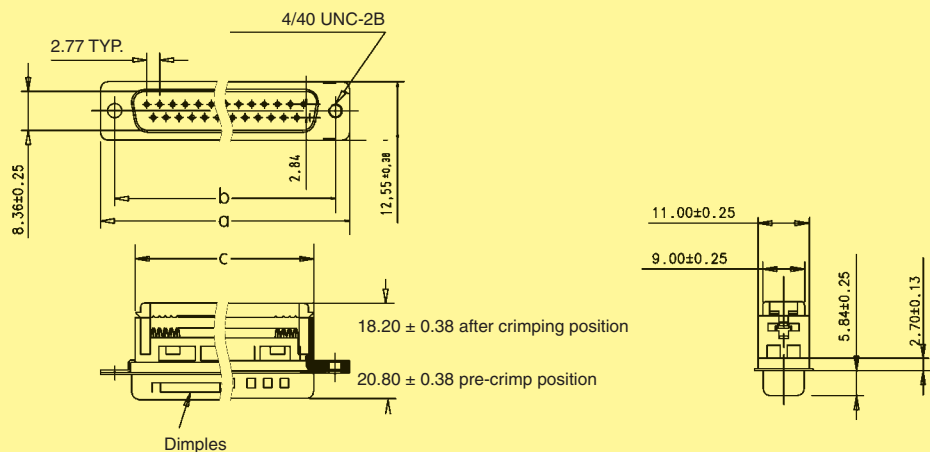


Identification

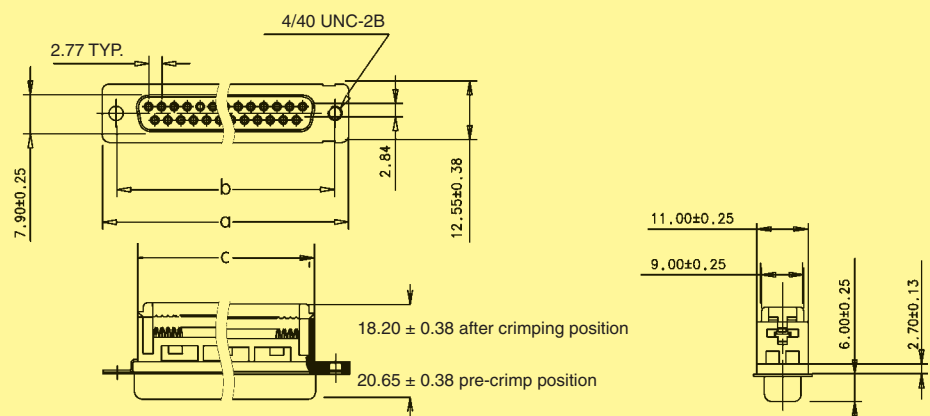
Drawing

Dimensions in mm

Male connector



Female connector

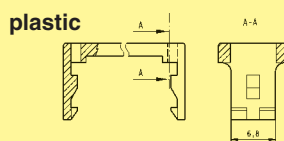


Male and female connectors

	a	b $\pm$ 0.1	c
9	30.80	24.99	16.10
15	39.10	33.32	24.00
25	53.09	47.04	38.14
37	69.40	63.50	54.60

Specified conductors
 stranded wires – AWG 28/7
 – AWG 26/7
 solid wires – AWG 30/1
 – AWG 28/1

Strain relief clamps


Panel cut out
for front/rear mount

Values are taken from the
 CECC 75 301-802

see page 02.24

Number of contacts

9–50



Solder buckets

D-Sub - S

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 02.26 Other performance levels on request		Performance level 3	Performance level 2
Male connector metal shell with dimples		turned contacts 9 09 67 009 5604 15 09 67 015 5604 25 09 67 025 5604 37 09 67 037 5604 50 09 67 050 5604 ¹⁾	turned contacts 09 67 009 5615 09 67 015 5615 09 67 025 5615 09 67 037 5615 09 67 050 5615
		stamped contacts 9 09 67 209 5604 15 09 67 215 5604 25 09 67 225 5604 37 09 67 237 5604 50 09 67 250 5604 ¹⁾	stamped contacts 09 67 209 5615 09 67 215 5615 09 67 225 5615 09 67 237 5615 09 67 250 5615 ¹⁾
Female connector metal shell		turned contacts 9 09 67 009 4704 15 09 67 015 4704 25 09 67 025 4704 37 09 67 037 4704 50 09 67 050 4704 ¹⁾	turned contacts 09 67 009 4715 09 67 015 4715 09 67 025 4715 09 67 037 4715 09 67 050 4715
		stamped contacts 9 09 67 209 4704 15 09 67 215 4704 25 09 67 225 4704 37 09 67 237 4704 50 09 67 250 4704 ¹⁾	stamped contacts 09 67 209 4715 09 67 215 4715 09 67 225 4715 09 67 237 4715 09 67 250 4715 ¹⁾

¹⁾ Not normally kept in stock

Number of contacts

9–50



Solder buckets

Identification

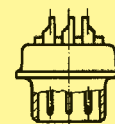
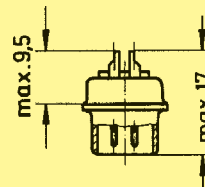
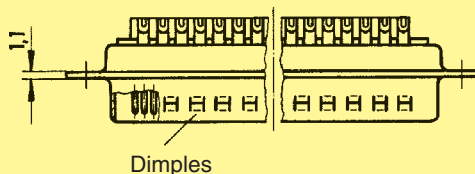
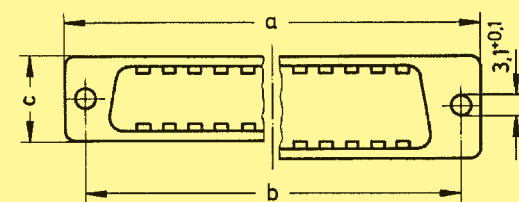
Drawing

Dimensions in mm

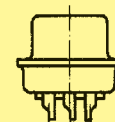
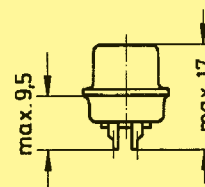
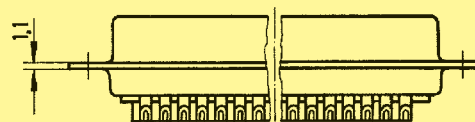
Male connector

9-37

50

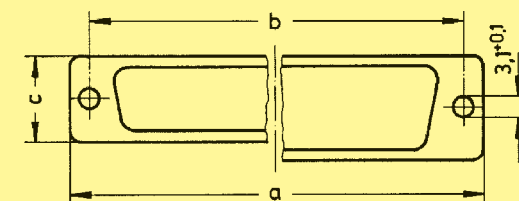


Female connector



9-37

50



	a	b _{±0.1}	c
9	30.9	25.0	12.5
15	39.2	33.3	12.5
25	53.1	47.0	12.5
37	69.4	63.5	12.5
50	67.0	61.1	15.4

Panel cut out
for front/rear mount

Values are taken from the
CECC 75 301-802

see page 02.24

Mating conditions see page 02.26

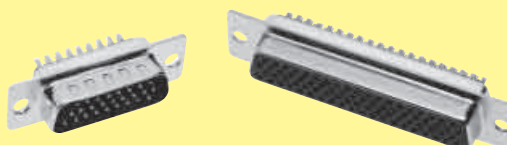
D-Sub - S

02
37

D-Sub – High Density subminiature D connectors

Page

Technical characteristics

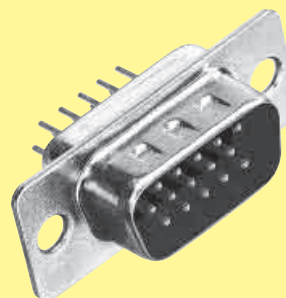
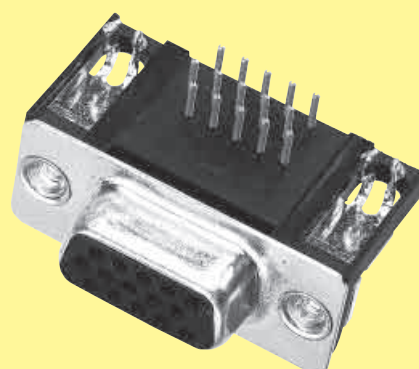
03.02Connectors
with crimp terminal / crimp contacts**03.03**Connectors
with straight solder cups**03.06**Connectors
with angled solder pins**03.08**Connectors
with straight solder pins**03.11**

Number of contacts	15, 26, 44, 62, 78 UL recognized
Working current Stamped contacts	2 A max.
Test voltage $U_{r.m.s.}$	1 kV
Clearance and creepage	≥ 1.0 mm
Contact resistance Insulation resistance	≤ 20 m Ω $\geq 5 \times 10^9$ Ω
Temperature range	-55 °C ... + 105 °C The higher temperature limit includes the local ambient and heating effect of the contacts under load

Terminations	a) Solder pins $\varnothing$ 0.65 mm for P.C.B. holes $\varnothing$ 1.02 mm b) Solder pins, angled 90° $\varnothing$ 0.7 mm for P.C.B. holes $\varnothing$ 1.02 mm c) Crimp contacts 0.14 - 0.22 mm ² AWG 26 - 24 max. insulation $\varnothing$ 1.38 mm d) Solder cups AWG 22
--------------	---

Materials	
Mouldings and hoods	Thermoplastic resin, glass-fibre filled (PBTP), UL 94-V0
Contacts	Copper alloy
Contact surface	
Contact zone	selectively gold-plated according to performance level ¹⁾
Metal shell	Plated steel

Mating force	
	15 way $\leq$ 46 N
	26 way $\leq$ 77 N
	44 way $\leq$ 127 N
	62 way $\leq$ 177 N
	78 way $\leq$ 222 N

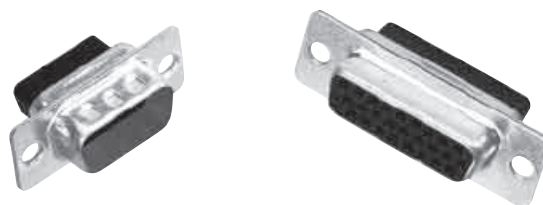


Number of contacts in the D-Sub standard/D-Sub high density range related to the shell size.

Shell size	D-Sub standard	D-Sub high density
1	9	15
2	15	26
3	25	44
4	37	62
5	50	78

Number of contacts

15-78

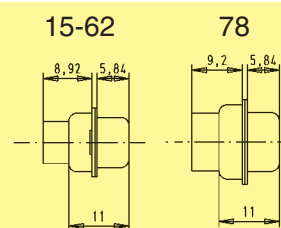
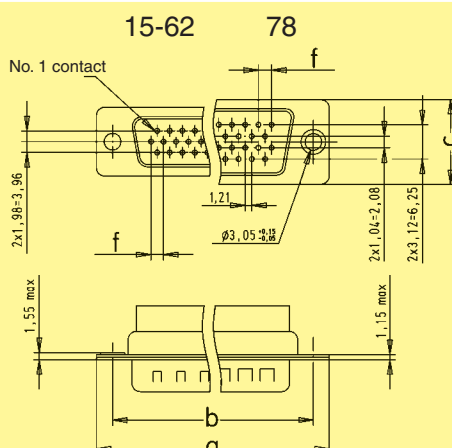


High density crimp terminal

Identification	No. of contacts	Part No.
Male connector Order contacts separately metal shell with dimples	15	09 56 100 5601
	26	09 56 200 5601
	44	09 56 300 5601
	62	09 56 400 5601
	78	09 56 500 5601
Female connector Order contacts separately metal shell	15	09 56 100 4701
	26	09 56 200 4701
	44	09 56 300 4701
	62	09 56 400 4701
	78	09 56 500 4701

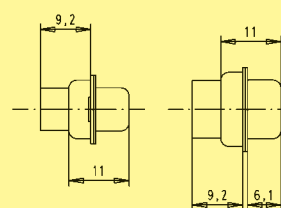
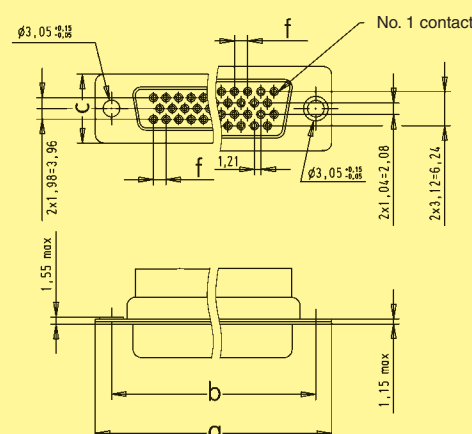
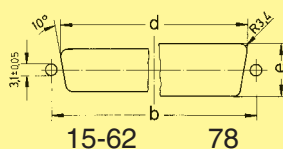
D-Sub - HD

Male connector



	a	b ± 0.13	c	f
15	30.9	25.0	12.5	2.29
26	39.2	33.3	12.5	2.29
44	53.1	47.0	12.5	2.29
62	69.4	63.5	12.5	2.41
78	67.0	61.1	15.4	2.41

Female connector

Panel cut out
for front/rear mountValues are taken from the
CECC 75301-802

Front mount

	b ± 0.13	d ± 0.2	e ± 0.2
15	25.0	22.2	12.3
26	33.3	30.5	12.3
44	47.0	44.3	12.3
62	63.5	60.7	12.3
78	61.1	58.3	15.1

Rear mount

	b ± 0.13	d ± 0.2	e ± 0.2
15	25.0	20.5	11.4
26	33.3	28.8	11.4
44	47.0	42.5	11.4
62	63.5	59.1	11.4
78	61.1	56.3	14.1

Dimensions in mm

Crimp contacts for high density connectors



Identification

Wire gauge
(mm²)

Part No.

Performance levels

Explanations see page 03.02

Other performance levels
on request

stamped male contacts

stamped female contacts

Performance level
3S4¹⁾Performance level
3S4¹⁾

500 pieces/box

0.14-0.22
AWG
26-24

stranded

09 56 000 8177

09 56 000 8175

09 56 000 8277

09 56 000 8275

500 pieces/reel
Unrolling left

09 56 000 8167

09 56 000 8165

09 56 000 8267

09 56 000 8265

10 000 pieces/reel
Unrolling left

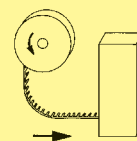
09 56 000 8157

09 56 000 8155

09 56 000 8257

09 56 000 8255

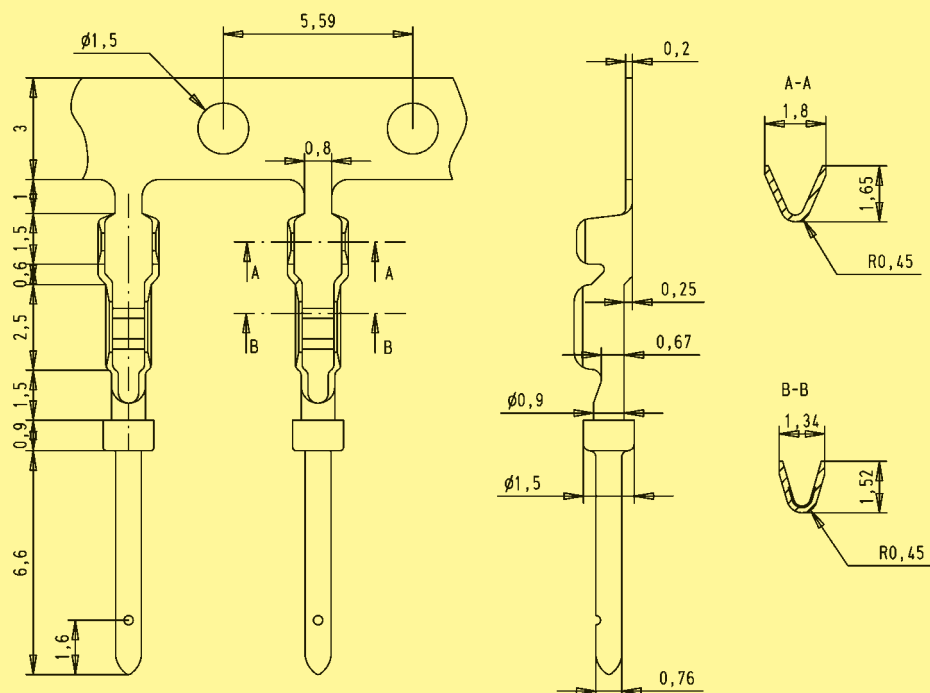
Unrolling direction

500 pieces/reel
Unrolling
left10 000 pieces/reel
Unrolling
left

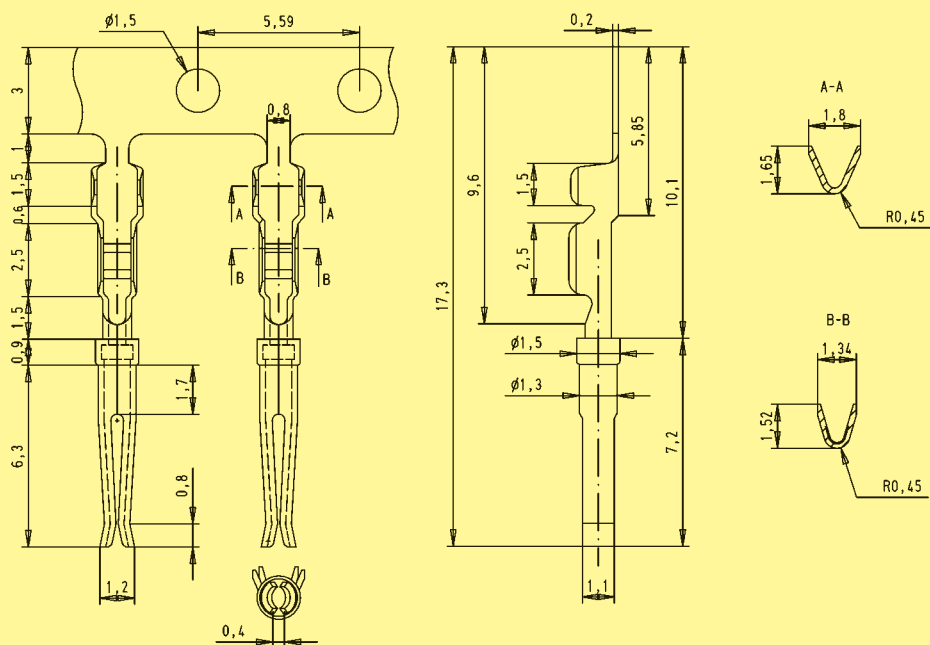
for HARTING tools

Dimensions in mm

wire gauge AWG 26-24



wire gauge AWG 26-24



Number of contacts

15–78



High density with stamped solder cups, straight

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 03.02 Other performance levels on request		Performance level 3	S4¹⁾
Male connector metal shell with dimples	15 26 44 62 78	09 56 100 5604 09 56 200 5604 09 56 300 5604 09 56 400 5604 09 56 500 5604	09 56 100 5615 050 09 56 200 5615 050 09 56 300 5615 050 09 56 400 5615 050 09 56 500 5615 050
Female connector metal shell	15 26 44 62 78	09 56 100 4704 09 56 200 4704 09 56 300 4704 09 56 400 4704 09 56 500 4704	09 56 100 4715 050 09 56 200 4715 050 09 56 300 4715 050 09 56 400 4715 050 09 56 500 4715 050

¹⁾ S4: $\geq 0.76 \mu\text{m Au}$ (30 μinch)

Number of contacts

15-78



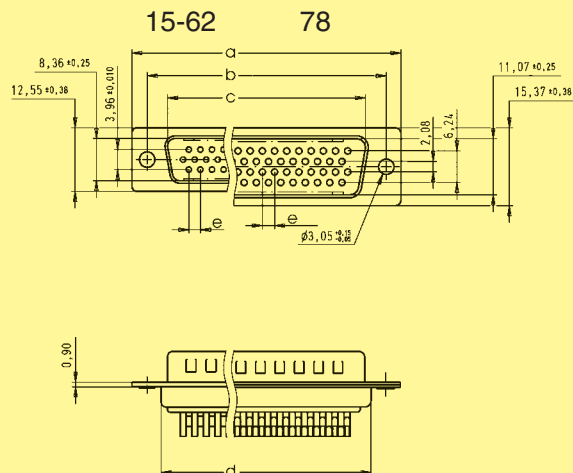
High density with stamped solder cups, straight

Identification

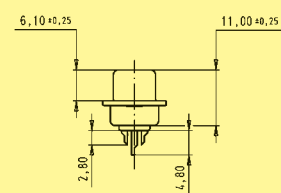
Drawing

Dimensions in mm

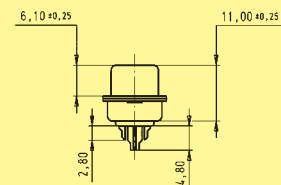
Male connector



15-62

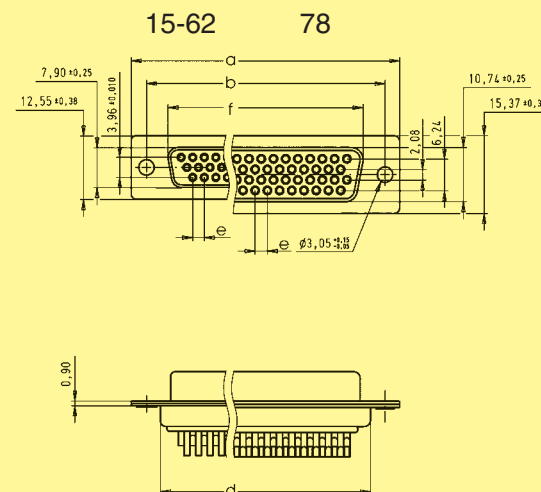


78

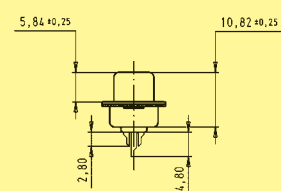


	a	b	c	d	e	f
15	30.89	24.99	16.92	19.28	2.29	16.33
26	39.10	33.32	25.25	27.51	2.29	24.66
44	53.09	47.04	38.96	41.30	2.29	38.38
62	69.40	63.50	55.25	57.71	2.42	54.84
78	66.93	61.11	52.81	55.32	2.42	52.43

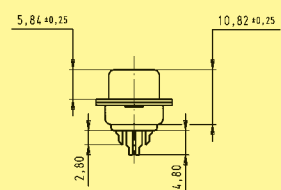
Female connector



15-62

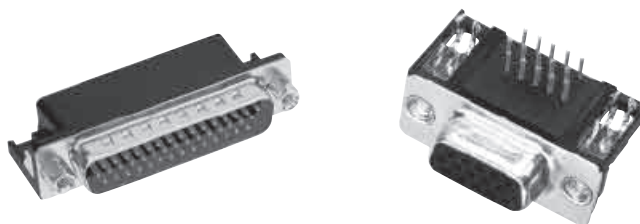


78



Number of contacts

15–78



High density with stamped solder pins, angled with grounding board locks

D-Sub - HD

Identification

No. of
contacts

Part No.

Performance levels

 Explanations see page 03.02
 Other performance levels on request
Performance level
3S4¹⁾

Male connector

metal shell with dimples

15
26
44
6209 56 162 781 .
09 56 262 781 .
09 56 362 781 .
09 56 462 781 .09 56 162 581 .
09 56 262 581 .
09 56 362 581 .
09 56 462 581 .

Female connector

metal shell

15
26
44
62
7809 56 152 761 .
09 56 252 761 .
09 56 352 761 .
09 56 452 761 .
09 56 552 761 .09 56 152 561 .
09 56 252 561 .
09 56 352 561 .
09 56 452 561 .
09 56 552 561 .Please insert digit for flange thread or
fitted female screw locks

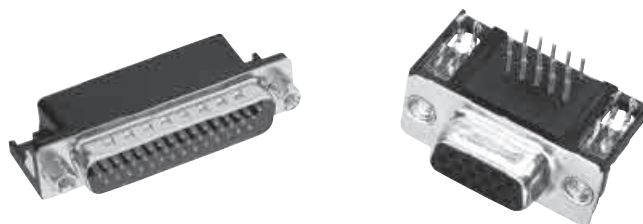
4-40 UNC ► 2

fitted screw locks 4-40 UNC ► 3

¹⁾ S4: ≥ 0.76 µm Au (30 µinch)

Number of contacts

15-78



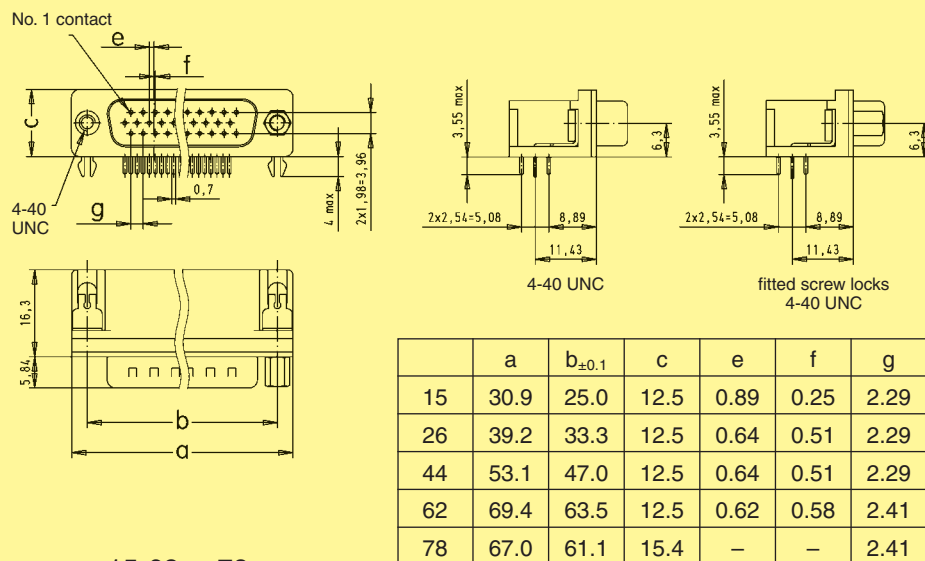
High density with stamped solder pins, angled with grounding board locks

Identification

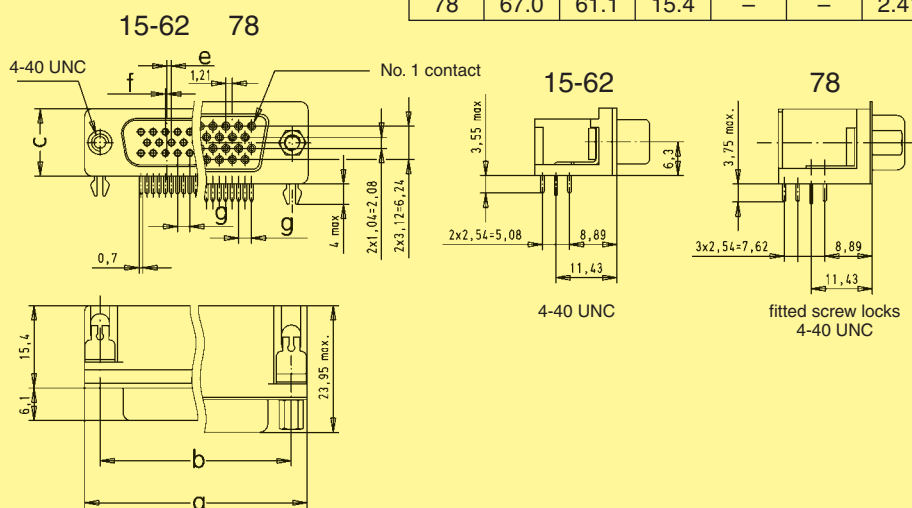
Drawing

Dimensions in mm

Male connector

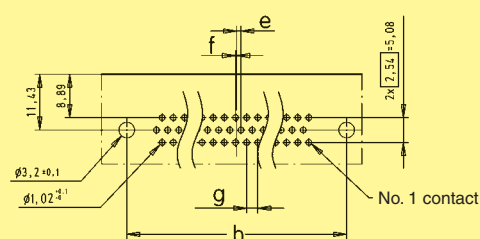


Female connector

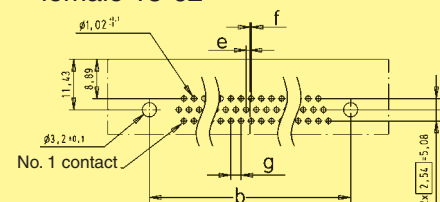


Board drillings

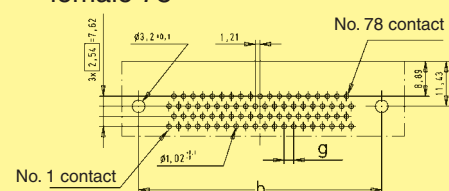
male



female 15-62



female 78



Number of contacts

15–78



High density with stamped solder pins, straight

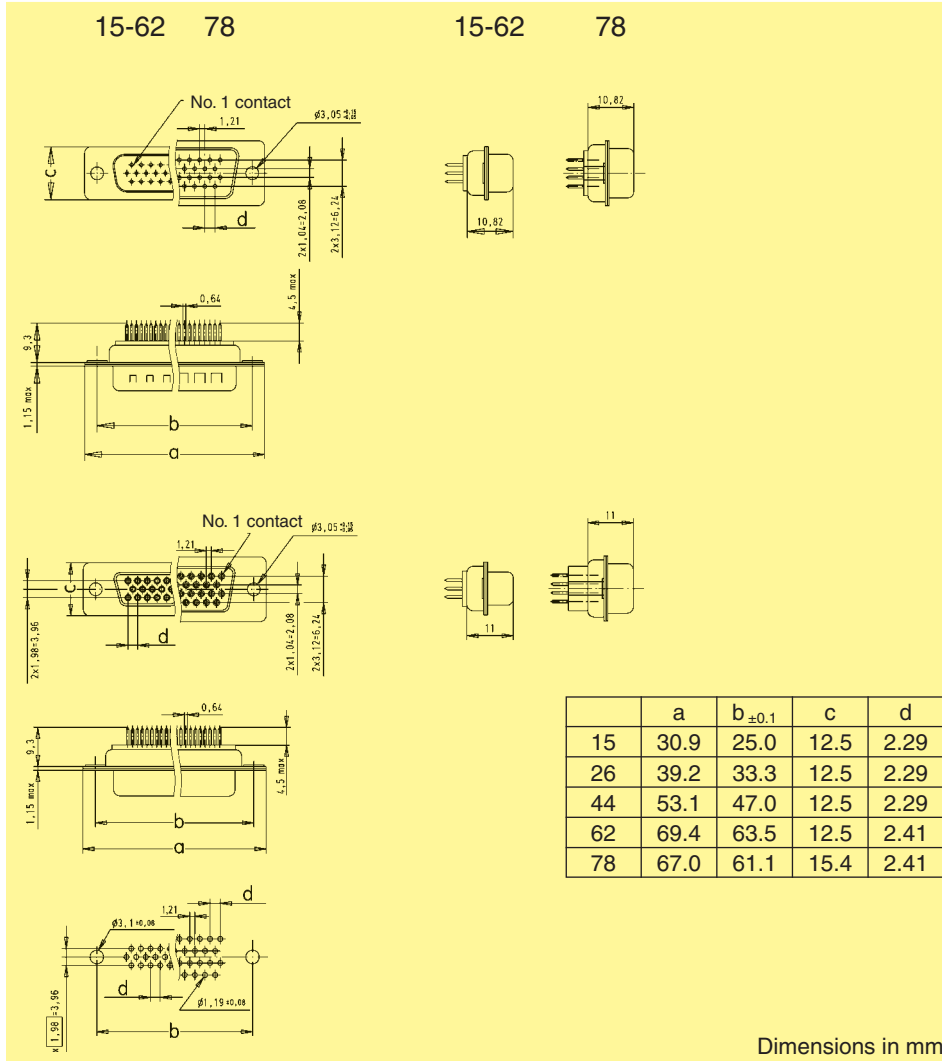
Identification	No. of contacts	Part No.
Performance levels Explanations see page 03.02 Other performance levels on request		Performance level 3 S4¹⁾
Male connector metal shell with dimples	15 26 44 62 78	09 56 161 7700 09 56 261 7700 09 56 361 7700 09 56 461 7700 09 56 561 7700
Female connector metal shell	15 26 44 62 78	09 56 151 5500 09 56 251 5500 09 56 351 5500 09 56 451 5500 09 56 551 5500

D-Sub - HD

Male connector

Female connector

Board drillings

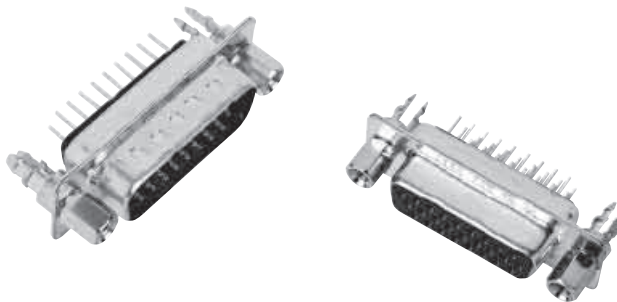


Dimensions in mm

¹⁾ S4: $\geq 0.76 \mu\text{m Au}$ (30 μinch)

Number of contacts

15–78



High density with stamped solder pins, straight with grounding board locks

D-Sub - HD

Identification

No. of
contacts

Part No.

Performance levels

 Explanations see page 03.02
 Other performance levels on request
Performance level
3S4¹⁾

Male connector

metal shell with dimples

15
26
44
62
7809 56 161 771 .
09 56 261 771 .
09 56 361 771 .
09 56 461 771 .
09 56 561 771 .09 56 161 571 .
09 56 261 571 .
09 56 361 571 .
09 56 461 571 .
09 56 561 571 .

Female connector

metal shell

15
26
44
62
7809 56 151 751 .
09 56 251 751 .
09 56 351 751 .
09 56 451 751 .
09 56 551 751 .09 56 151 551 .
09 56 251 551 .
09 56 351 551 .
09 56 451 551 .
09 56 551 551 .Please insert digit for flange thread or
fitted female screw locks

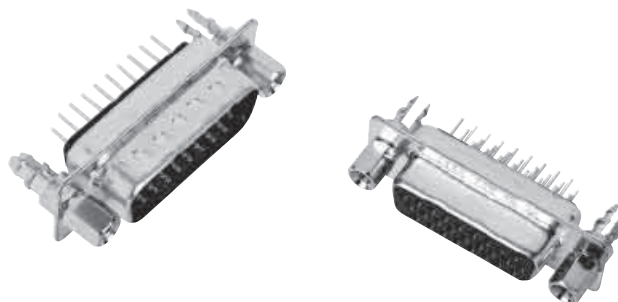
4-40 UNC ► 2

fitted screw locks 4-40 UNC ► 3

¹⁾ S4: $\geq 0.76 \mu\text{m Au}$ (30 μinch)

Number of contacts

15-78



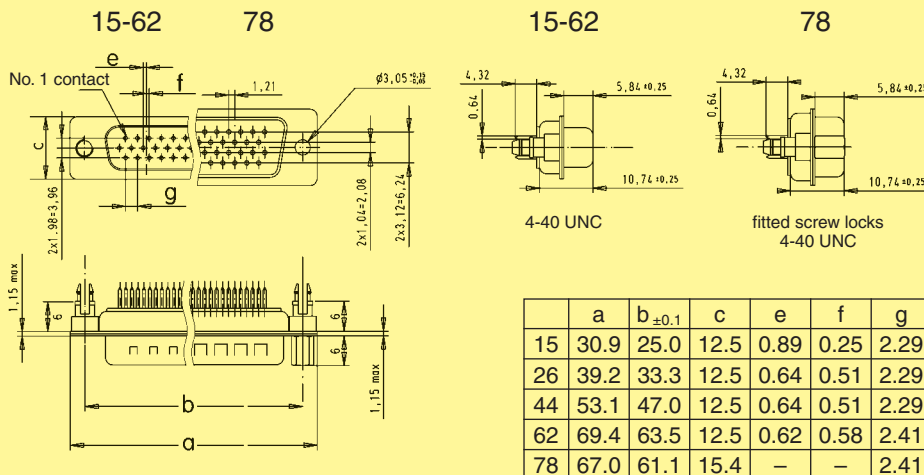
High density with stamped solder pins, straight with grounding board locks

Identification

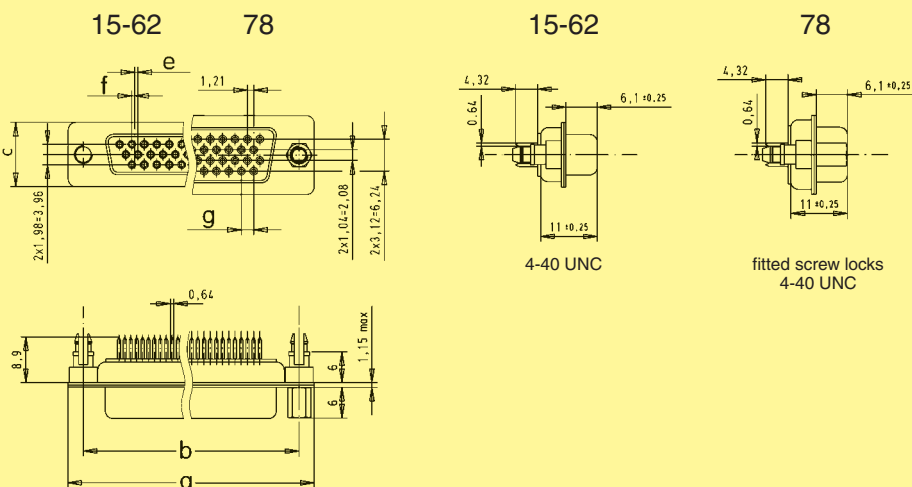
Drawing

Dimensions in mm

Male connector

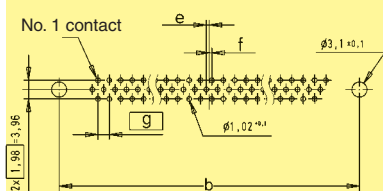


Female connector

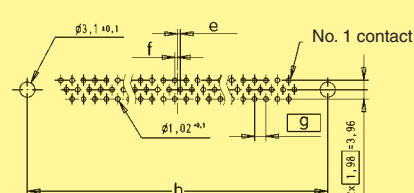


Board drillings

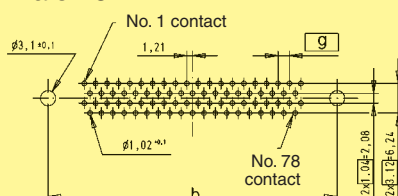
male 15-62



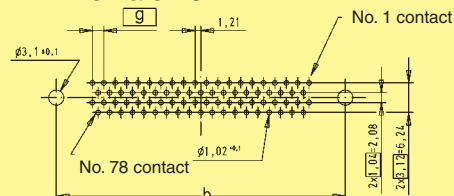
female 15-62



male 78



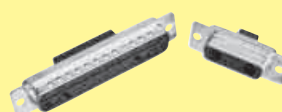
female 78



D-Sub – Mixed subminiature D connectors

Page

D-Sub mixed connector system – general information	04.02
Contact arrangements	04.03
Connectors for pcb applications – general information	04.04
Connectors for cable applications – general information	04.05
Technical characteristics for shells	04.06
Mixed shells with pre-mounted signal solder cup contacts	04.07
Shells without signal contacts for cable applications ..	04.14
Coded shells without signal contacts for cable applications	04.15
Mixed shells for signal crimp contacts	04.17
Technical characteristics for special contacts	04.21
Straight signal crimp contacts for cable applications	04.22
High voltage contacts for cable applications	04.23
Straight power contacts for cable applications	04.24
Coaxial contacts for cable applications	04.26
Pneumatic contacts for cable applications	04.29
Pcb hole patterns	04.30
Board drillings for connectors with straight pcb contacts	04.30
Board drillings for connectors with right angled pcb contacts	04.35
Customer request form for pcb connectors	04.40
Customer request form for cable connectors	04.42



HARTINGs' mixed D-Sub range brings the advantage of an industry standard I/O inter-connect product with the possibility to customise for any application.

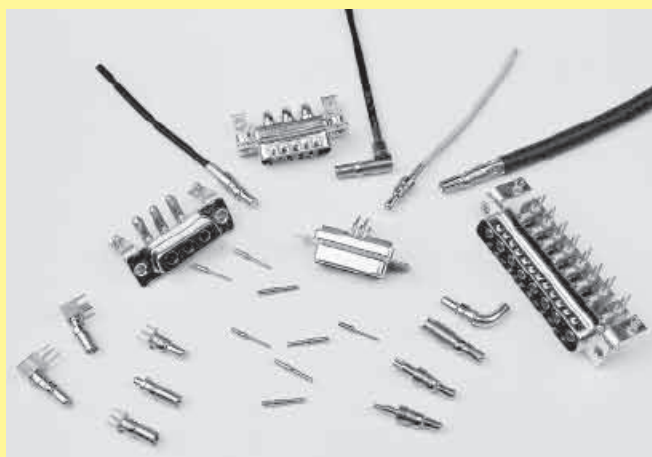
The range is designed around **the standard D-Sub shell sizes** with **the possibility to have a blend of contacts** such as signals with coaxial, power, high voltage or pneumatic contacts. Due to its construction, the product is **fully shielded** and helps reducing the EMI/RFI leakage.

All contacts are machined with two different platings.

When hot plug-in is required, **first mate last break** contacts can also be supplied.

For connectors to be fitted on a board with SMT components, they can be supplied in an **SMC (PiHIR) version** which is assembled in the reflow solder process, thus reducing assembly cost.

In addition, a complete range of accessories such as clinch nut, spacers, board locks, female screw lock, etc. ... meeting the requirements of virtually any application, including a blind mate feature, makes this product range very attractive thanks to its versatility, reliability and cost effectiveness.



Contact arrangements

The table shows the standard range supported by HARTING. Two versions are special since they allow to mix in the same shell male and female contacts: 2W2C and 3W3C. The purpose of these versions is to have a 100 % mating proof feature (the insulator shape prevents a 180° reversed mating).

The structure of the connectors' identification is so that the left side digits give the total number of contacts and the right side digits the number of special contacts which can be either power, coaxial or high voltage style.

Example: 13W3 stands for 13 contacts in total with 10 signal contacts and 3 special contacts.

	Shell size	
2W2C	1	
5W1	1	
3W3	2	
3W3C	2	
7W2	2	
11W1	2	
5W5	3	
9W4	3	
13W3	3	
17W2	3	
21W1	3	

	Shell size	
7W7	4	
8W8	4	
13W6	4	
21WA4	4	
25W3	4	
27W2	4	
24W7	5	
36W4	5	

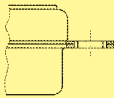
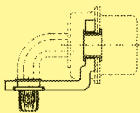
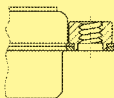
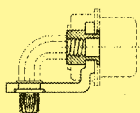
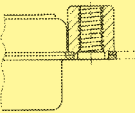
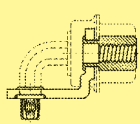
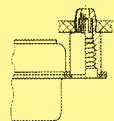
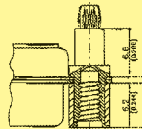
Note:
for any other layout please consult your HARTING representative.

Connectors for pcb applications – general information

The range of pcb connectors available at HARTING is summarised in the table under. For each of the basic connector versions, the available contact styles are documented with termination process, pitch, plating, rating for power contacts and impedance for coaxial contact etc..., as well as the accessory configuration.

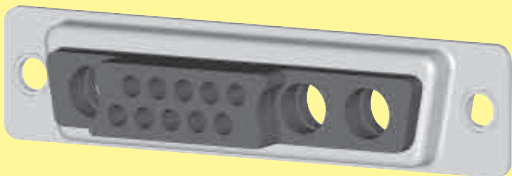
Pcb connectors are delivered fully loaded thus providing a very good positioning of the contacts in their cavities for an easy and safe insertion of the pins in the pcb holes particularly crucial in the right angled versions.

Due to the numerous possibilities offered with the pcb connectors, suggested method is to contact your local HARTING representative to determine the part number to order; see customer request form on pages 04.40 and 04.41.

	Straight		Right angled	
Insulator body	• Standard • SMC: Solder Reflow Compatible		• Standard • SMC: Solder Reflow Compatible	
Signal contacts	Solder termination • Pitch: 2.84 mm • Plating: 0.76 µm Au over Ni • Pcb thickness from 1.6 to 3.2 mm		Solder termination • Pitch: 2.54 mm • Plating: 0.76 µm Au over Ni • Pcb thickness from 1.6 to 3.2 mm	
Power contacts	Solder termination • Rating: 20, 30, 40 A • Plating: 0.76 µm Au over Ni Press-in termination • Rating: 30 A • Plating: 0.76 µm Au over Ni		Solder termination • Rating: 20, 30, 40 A • Plating: 0.76 µm Au over Ni	
Coaxial contacts	Solder termination • 50 or 75 Ω • Plating: 1.3 µm Au over Ni inner conductor 0.76 µm Au over Ni outer ring		Solder termination • 50 or 75 Ω • Plating: 1.3 µm Au over Ni inner conductor 0.76 µm Au over Ni outer ring	
Accessories	Through hole		Metal bracket with board lock and through hole	
	Nut: M3 or UNC 4-40		Metal bracket with board lock and clinch nut M3 or UNC 4-40	
	Spacer: M3 or UNC 4-40		Metal bracket with board lock and female screw lock UNC 4-40	
	Spacer (M3 or UNC 4-40) with board lock			
	Spacer + board lock + female screw lock M3 or UNC 4-40			

Connectors for cable applications – general information

Two termination processes are available: crimp or solder

Shell		
Signal contacts	Crimp termination - For wire gauge: AWG 20-24 or 26-28 - Plating: 0.76 µm or 0.2 µm Au over Ni	Pre-mounted solder cup contacts Plating: 0.76 µm or 0.1 µm Au over Ni
Power contacts	Crimp - Rating: 10, 20, 30, 40 A - Plating: 0.76 µm or 0.2 µm Au over Ni Solder cup - Rating: 10, 20, 30, 40 A - Plating: 0.76 µm or 0.2 µm Au over Ni	Crimp - Rating: 10, 20, 30, 40 A - Plating: 0.76 µm or 0.2 µm Au over Ni Solder cup - Rating: 10, 20, 30, 40 A - Plating: 0.76 µm or 0.2 µm Au over Ni
Coaxial contacts ¹⁾	Solder/crimp termination 50 or 75 Ω - Plating: 1.3 µm or 0.2 µm Au over Ni inner conductor 0.76 µm or 0.2 µm Au over Ni outer ring - Cables: RG 178, 179 ... Crimp/crimp termination 50 or 75 Ω - Plating: 1.3 µm or 0.2 µm Au over Ni inner conductor 0.76 µm or 0.2 µm Au over Ni outer ring - Cables: RG 178, 179 ...	Solder/crimp termination 50 or 75 Ω - Plating: 1.3 µm or 0.2 µm Au over Ni inner conductor 0.76 µm or 0.2 µm Au over Ni outer ring - Cables: RG 178, 179 ... Crimp/crimp termination 50 or 75 Ω - Plating: 1.3 µm or 0.2 µm Au over Ni inner conductor 0.76 µm or 0.2 µm Au over Ni outer ring - Cables: RG 178, 179 ...
High voltage contacts	Solder termination - Plating: 1.3 µm Au over Ni terminating and mating side	Solder termination - Plating: 1.3 µm Au over Ni terminating and mating side

¹⁾ Coaxial contacts are provided in two versions:

- Inner conductor soldered and outer part crimped (solder/crimp termination)
- Both inner and outer part crimped (crimp/crimp termination); this version is recommended for medium or large size volume since crimping is faster than soldering.

Number of contacts 2, 3, 5, 7, 8, 9, 11, 13, 17, 21, 24, 25, 27, 36

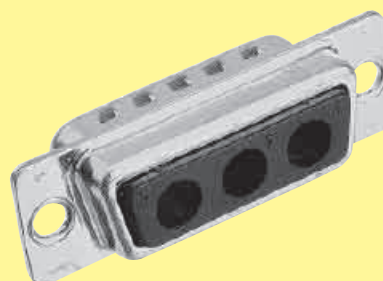
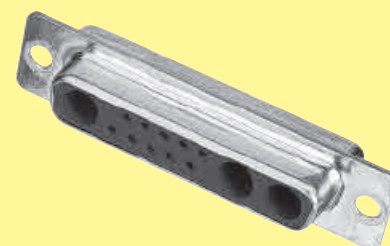
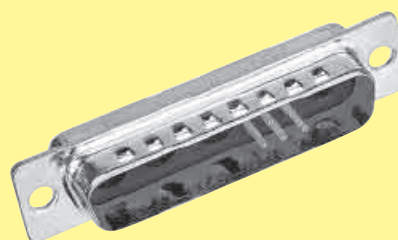
Approvals DIN 41 652, part 1
MIL-C 24 308

Working current 5 A for signal contacts

Temperature range -55 °C ... + 125 °C
The higher temperature limit includes the ambient and heating effect of the contacts under load

Materials
Mouldings Thermoplastic resin, glass-fibre filled (Polyester)
UL 94-V0
color: green for standard
black for crimp

Metal shell Plated steel



Number of contacts

7-27

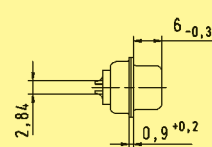
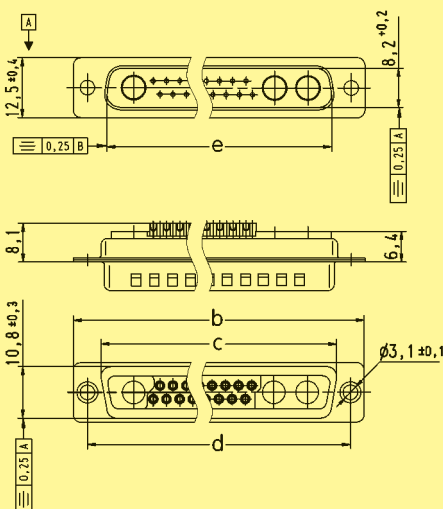


Mixed shells with pre-mounted signal solder cup contacts

Identification	No. of contacts ¹⁾	Part No.			
		male connectors		female connectors	
		Performance level 3	S4 ²⁾	Performance level 3	S4 ²⁾
	7W2	09 69 211 7072	09 69 211 5072	09 69 201 7072	09 69 201 5072
	17W2	09 69 311 7172	09 69 311 5172	09 69 301 7172	09 69 301 5172
	21WA4	09 69 411 7214	09 69 411 5214	09 69 401 7214	09 69 401 5214
	27W2	09 69 411 7272	09 69 411 5272	09 69 401 7272	09 69 401 5272

D-Sub - M

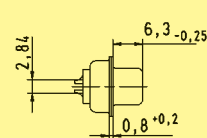
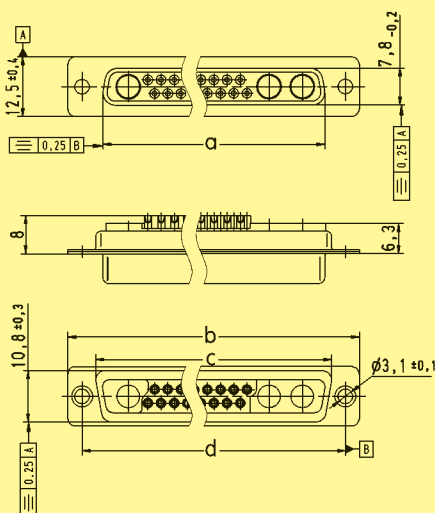
Male connectors



Solder cup termination for AWG 20 (0.5 mm²)

	a	b	c	d	e
7W2	24.6	39.1	27.5	33.30	25.2
17W2	38.3	53.0	41.3	47.04	38.9
21WA4	54.8	69.3	57.7	63.50	55.3
27W2	54.9	69.3	57.7	63.50	55.3

Female connectors



Solder cup termination for AWG 20 (0.5 mm²)

Dimensions in mm

¹⁾ Explanations see page 04.03²⁾ S4: $\geq 0.76 \mu\text{m Au}$

Board drillings see pages 04.30 ff

Order special contacts separately. See pages 04.21 ff

Number of contacts

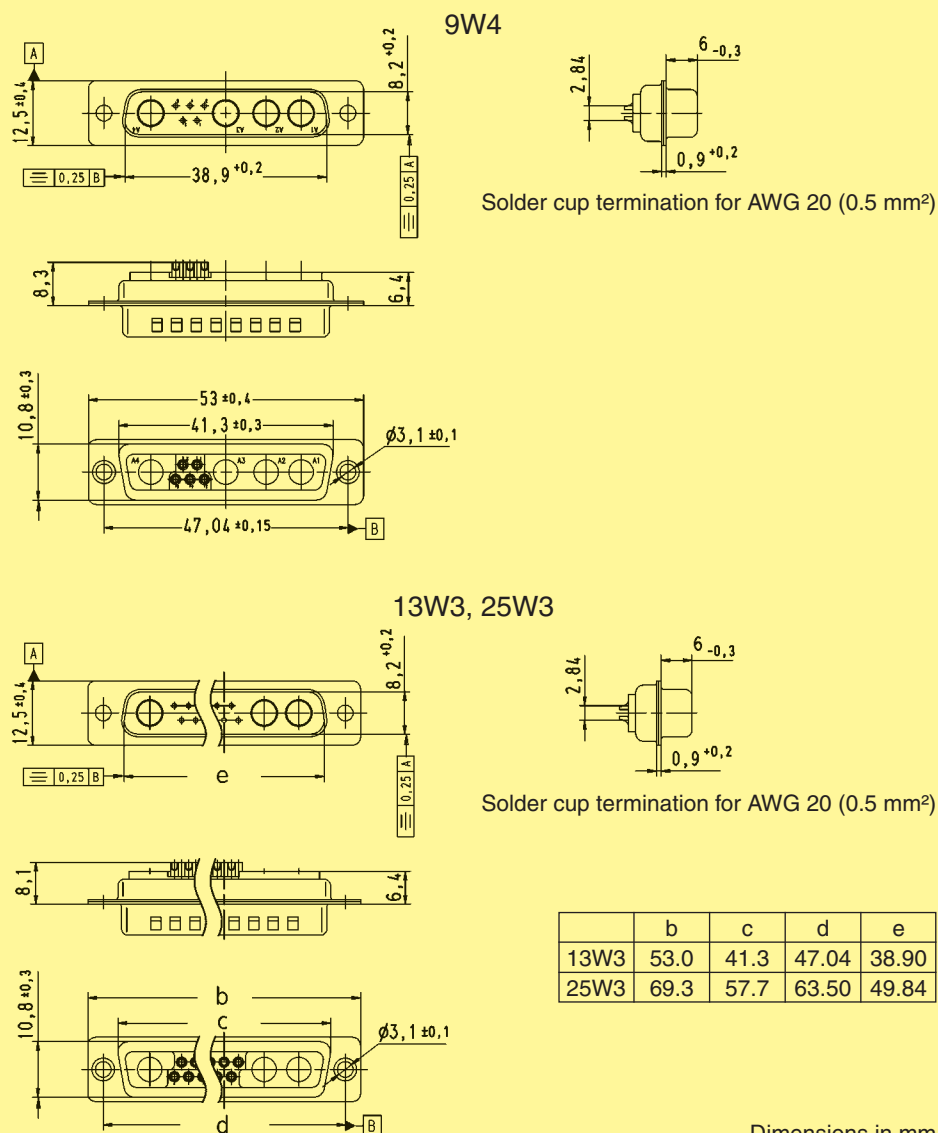
9–25



Mixed shells with pre-mounted signal solder cup contacts

Identification	No. of contacts ¹⁾	Part No.			
		male connectors		female connectors	
		Performance level 3	S4 ²⁾	Performance level 3	S4 ²⁾
	9W4	09 69 311 7094	09 69 311 5094	09 69 301 7094	09 69 301 5094
	13W3	09 69 311 7133	09 69 311 5133	09 69 301 7133	09 69 301 5133
	25W3	09 69 411 7253	09 69 411 5253	09 69 401 7253	09 69 401 5253

Male connectors

¹⁾ Explanations see page 04.03²⁾ S4: $\geq 0.76 \mu\text{m Au}$

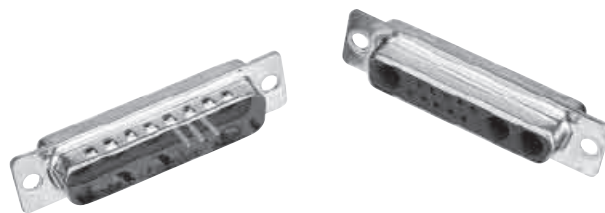
Board drillings see pages 04.30 ff

Drawings for female connectors see page 04.09

Order special contacts separately. See pages 04.21 ff

Number of contacts

9-25



Mixed shells with pre-mounted signal solder cup contacts

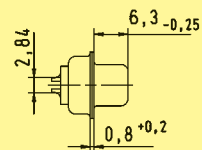
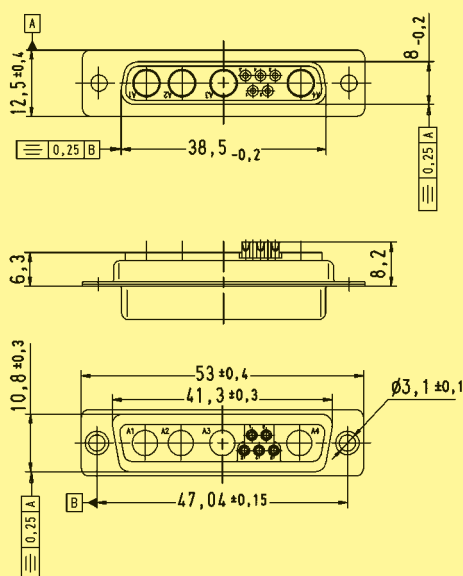
Identification

Drawing

Dimensions in mm

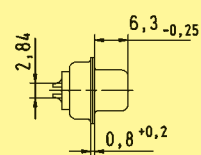
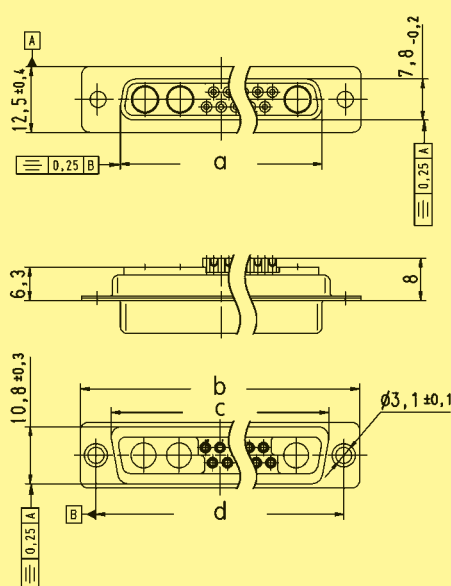
Female connectors

9W4



Solder cup termination for AWG 20 (0.5 mm²)

13W3, 25W3



Solder cup termination for AWG 20 (0.5 mm²)

	a	b	c	d
13W3	38.3	53.0	41.3	47.04
25W3	54.9	69.3	57.7	63.50

Number of contacts

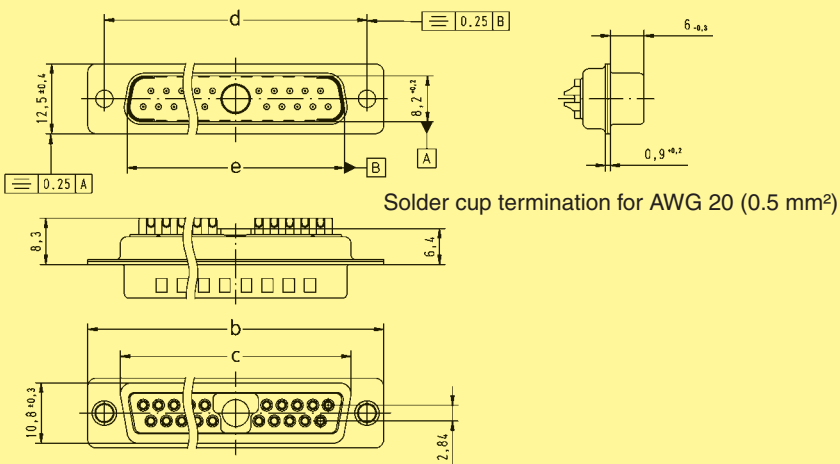
5–21



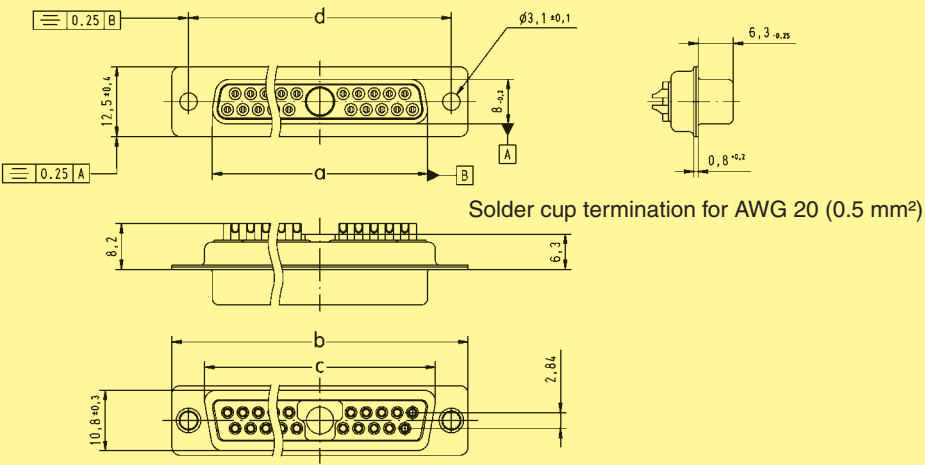
Mixed shells with pre-mounted signal solder cup contacts

Identification	No. of contacts ¹⁾	Part No.			
		male connectors		female connectors	
		Performance level 3	S4 ²⁾	Performance level 3	S4 ²⁾
	5W1	09 69 111 7051	09 69 111 5051	09 69 101 7051	09 69 101 5051
	11W1	09 69 211 7111	09 69 211 5111	09 69 201 7111	09 69 201 5111
	21W1	09 69 311 7211	09 69 311 5211	09 69 301 7211	09 69 301 5211

Male connectors



Female connectors



	a	b	c	d	e
5W1	16.4	30.8	19.3	25.00	16.9
11W1	24.7	39.1	27.5	33.30	25.2
21W1	38.5	53.0	41.3	47.04	38.9

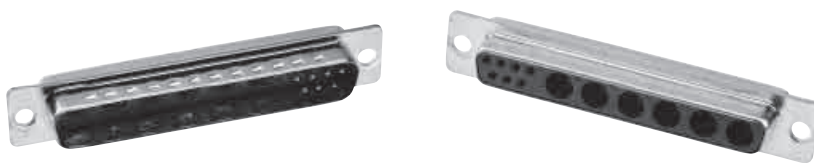
Dimensions in mm

¹⁾ Explanations see page 04.03
²⁾ S4: $\geq 0.76 \mu\text{m Au}$
Board drillings see pages 04.30 ff

Order special contacts separately. See pages 04.21 ff

Number of contacts

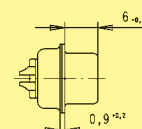
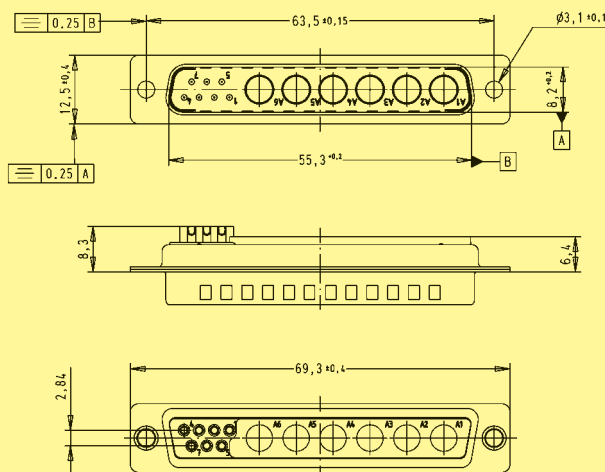
13



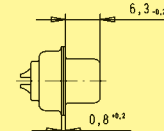
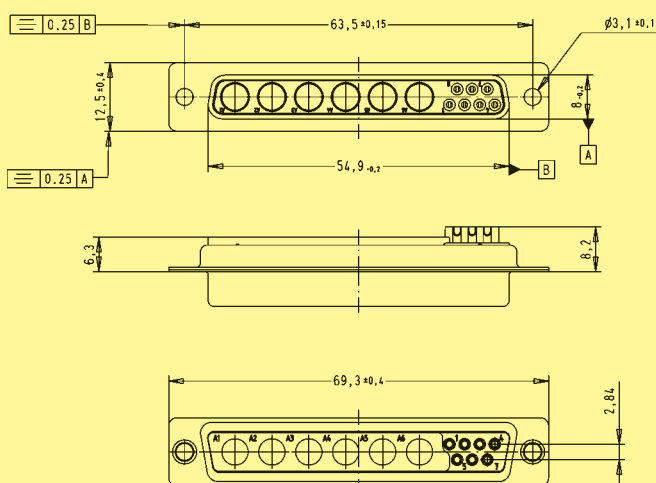
Mixed shells with pre-mounted signal solder cup contacts

Identification	No. of contacts ¹⁾	Part No.			
		male connectors		female connectors	
		Performance level 3	S4 ²⁾	Performance level 3	S4 ²⁾
	13W6	09 69 411 7136	09 69 411 5136	09 69 401 7136	09 69 401 5136

Male connectors

Solder cup termination
for AWG 20 (0.5 mm²)

Female connectors

Solder cup termination
for AWG 20 (0.5 mm²)

Dimensions in mm

¹⁾ Explanations see page 04.03
²⁾ S4: $\geq 0.76 \mu\text{m Au}$
 Board drillings see pages 04.30 ff

Order special contacts separately. See pages 04.21 ff

Number of contacts

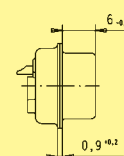
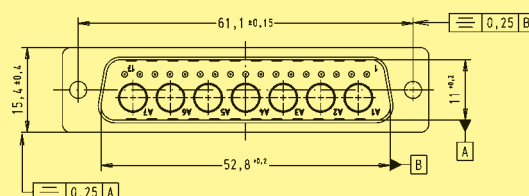
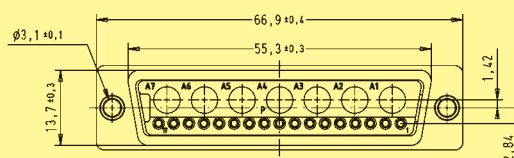
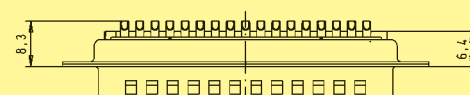
24



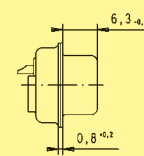
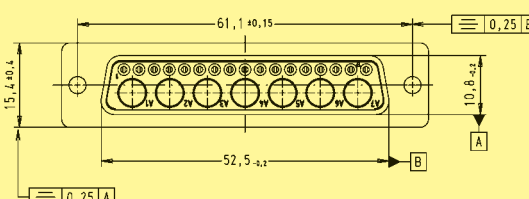
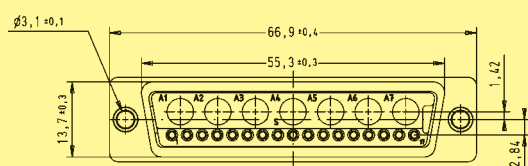
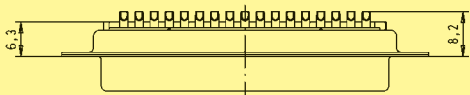
Mixed shells with pre-mounted signal solder cup contacts

Identification	No. of contacts ¹⁾	male connectors		female connectors	
		Performance level 3	S4 ²⁾	Performance level 3	S4 ²⁾
	24W7	09 69 511 7247	09 69 511 5247	09 69 501 7247	09 69 501 5247

Male connectors

Solder cup termination
for AWG 20 (0.5 mm²)

Female connectors

Solder cup termination
for AWG 20 (0.5 mm²)

Dimensions in mm

¹⁾ Explanations see page 04.03

²⁾ S4: $\geq 0.76 \mu\text{m Au}$

Board drillings see pages 04.30 ff

Order special contacts separately. See pages 04.21 ff

Number of contacts

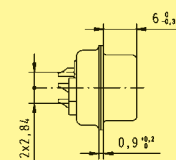
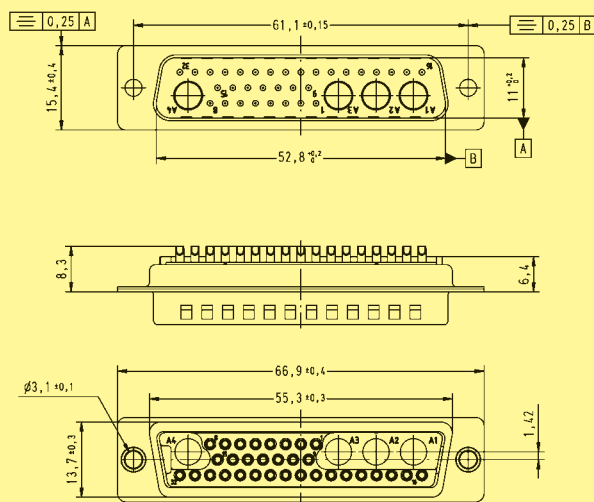
36



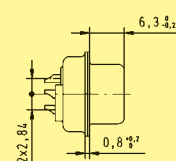
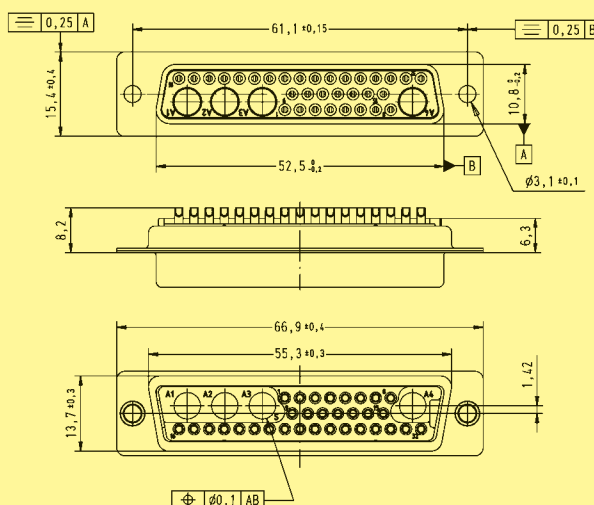
Mixed shells with pre-mounted signal solder cup contacts

Identification	No. of contacts ¹⁾	Part No.			
		male connectors		female connectors	
		Performance level 3	S4 ²⁾	Performance level 3	S4 ²⁾
	36W4	09 69 511 7364	09 69 511 5364	09 69 501 7364	09 69 501 5364

Male connectors

Solder cup termination
for AWG 20 (0.5 mm²)

Female connectors

Solder cup termination
for AWG 20 (0.5 mm²)

Dimensions in mm

¹⁾ Explanations see page 04.03
²⁾ S4: $\geq 0.76 \mu\text{m Au}$
 Board drillings see pages 04.30 ff

Order special contacts separately. See pages 04.21 ff

Number of contacts

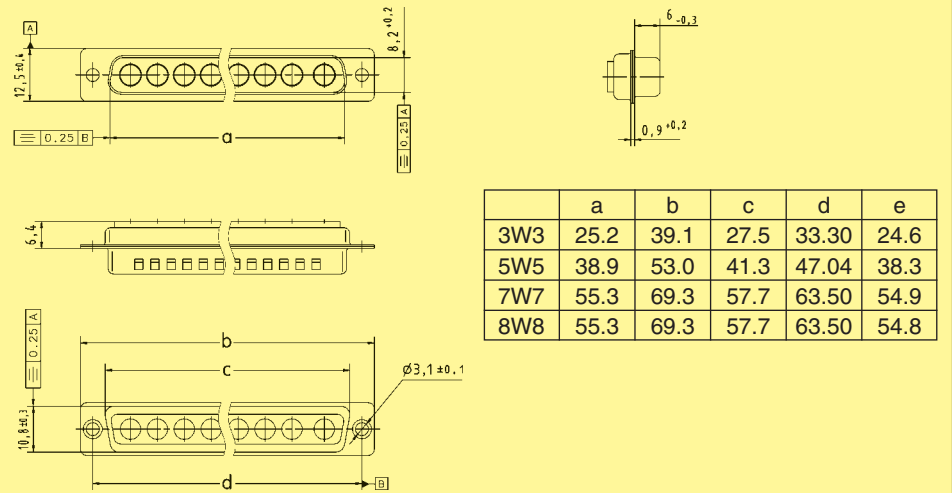
3–8



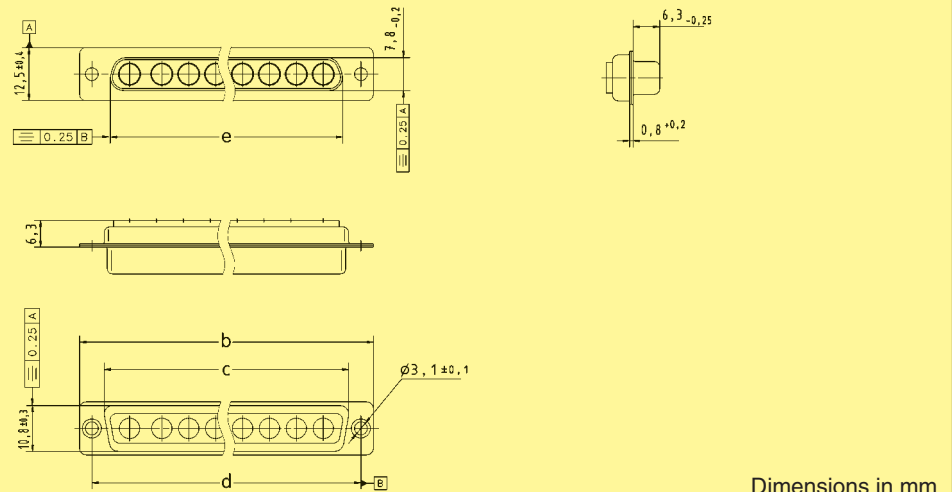
Shells without signal contacts for cable applications

Identification	No. of contacts ¹⁾	Part No.	
		male connectors	female connectors
	3W3	09 69 210 0033	09 69 200 0033
	5W5	09 69 310 0055	09 69 300 0055
	7W7	09 69 410 0077	09 69 400 0077
	8W8	09 69 410 0088	09 69 400 0088

Male connectors



Female connectors



Dimensions in mm

¹⁾ Explanations see page 04.03
Board drillings see pages 04.30 ff
Order special contacts separately. See pages 04.21 ff

Number of contacts

2

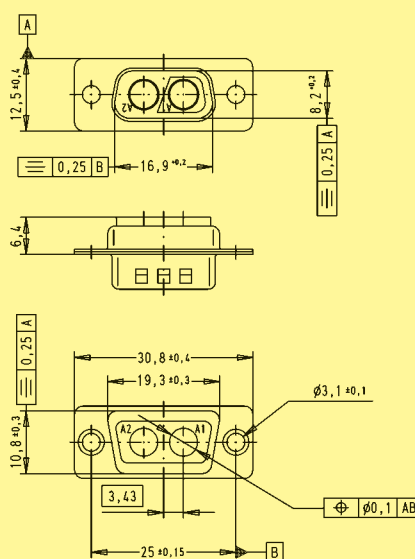


Coded shells without signal contacts for cable applications

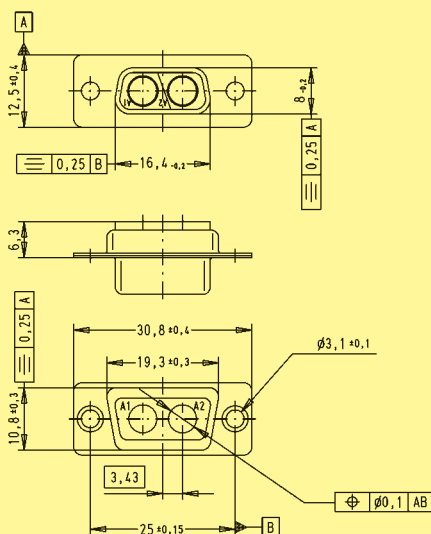
Identification	No. of contacts ¹⁾	Part No.
		male connector
	2W2C	09 69 110 0022
		female connector
		09 69 100 0022

D-Sub - M

Male connectors



Female connectors



Dimensions in mm

¹⁾ Explanations see page 04.03
 Board drillings see pages 04.30 ff
 Order special contacts separately. See pages 04.21 ff

Number of contacts

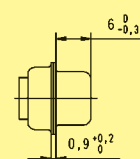
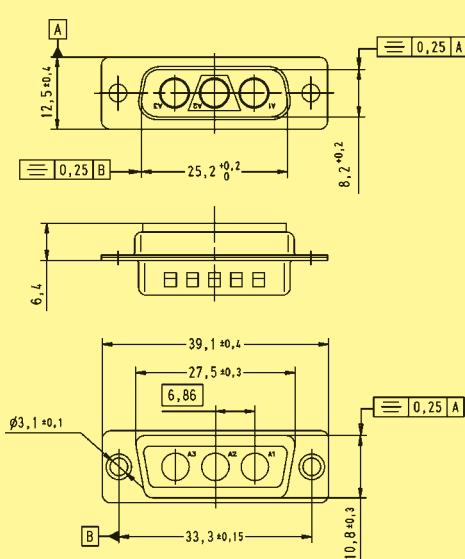
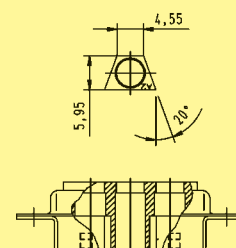
3



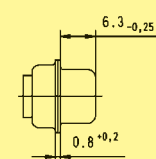
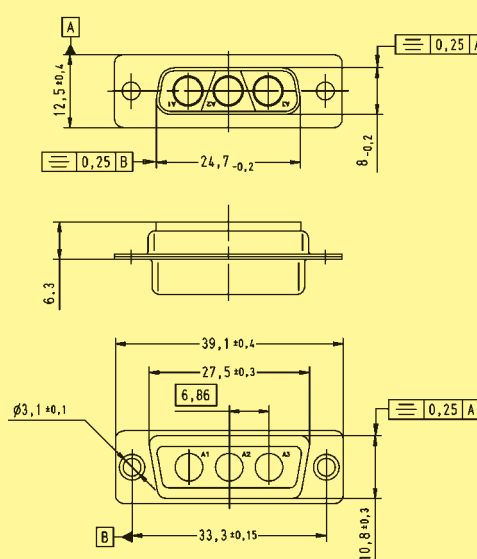
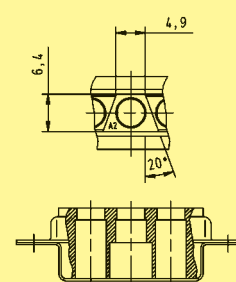
Coded shells without signal contacts for cable applications

Identification	No. of contacts ¹⁾	Part No.
		male connector
	3W3C	09 69 210 0633
		female connector
		09 69 200 0633

Male connectors

detail:
polarization feature

Female connectors

detail:
polarization feature

Dimensions in mm

¹⁾ Explanations see page 04.03
 Board drillings see pages 04.30 ff
 Order special contacts separately. See pages 04.21 ff

Number of contacts

7-21

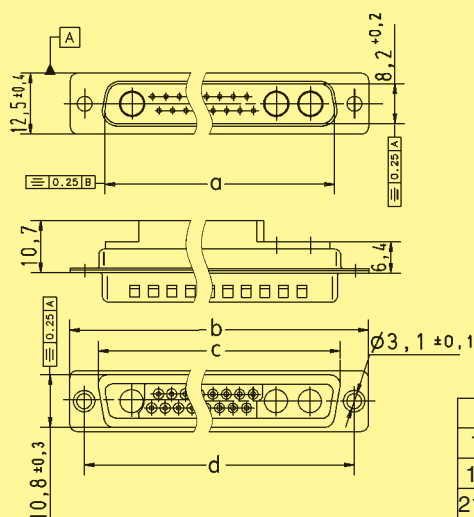


Mixed shells for signal crimp contacts

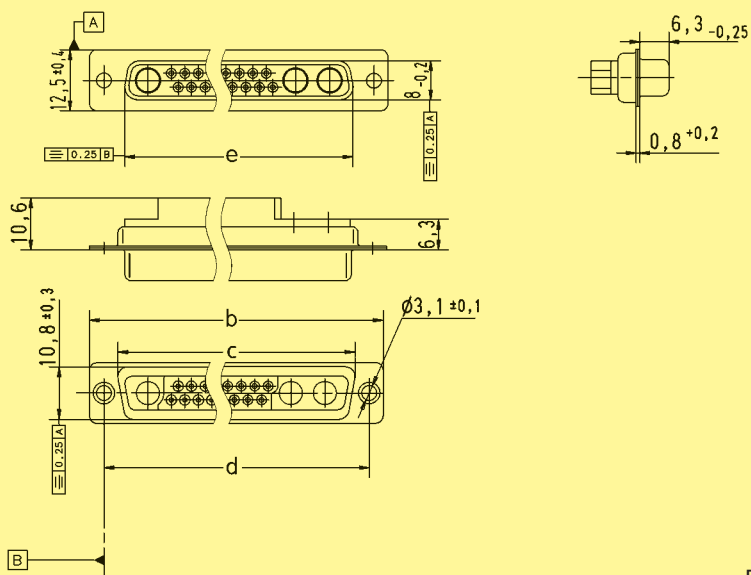
Identification	No. of contacts ¹⁾	Part No.
		male connectors
	7W2	09 69 212 0072
	17W2	09 69 312 0172
	21WA4	09 69 412 0214
		female connectors
		09 69 202 0072
		09 69 302 0172
		09 69 402 0214

D-Sub - M

Male connectors



Female connectors



Dimensions in mm

¹⁾ Explanations see page 04.03
 Board drillings see pages 04.30 ff
 Order special contacts separately. See pages 04.21 ff

Number of contacts

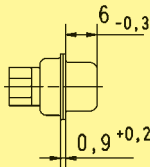
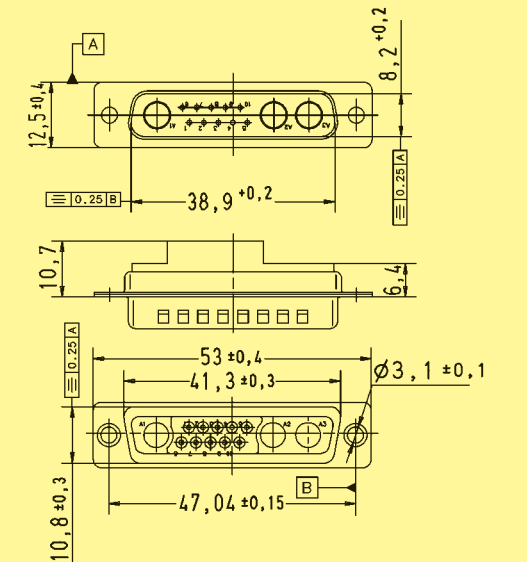
13



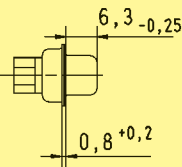
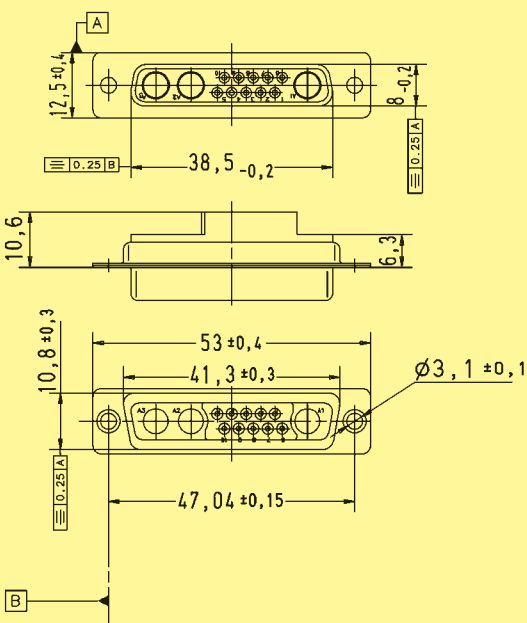
Mixed shells for signal crimp contacts

Identification	No. of contacts ¹⁾	Part No.	
		male connector	female connector
	13W3	09 69 312 0133	09 69 302 0133

Male connectors



Female connectors

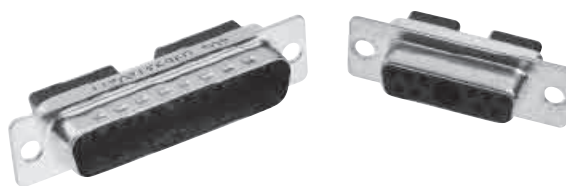


Dimensions in mm

¹⁾ Explanations see page 04.03
Board drillings see pages 04.30 ff
Order special contacts separately. See pages 04.21 ff

Number of contacts

11-21

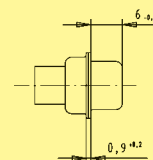
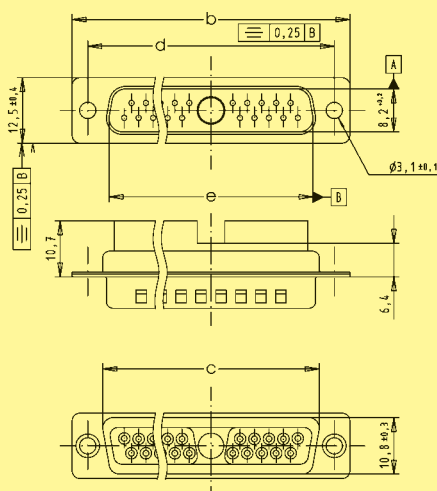


Mixed shells for signal crimp contacts

Identification	No. of contacts ¹⁾	Part No.
		male connectors
		female connectors
	11W1	09 69 212 0111
	21W1	09 69 312 0211
		09 69 202 0111
		09 69 302 0211

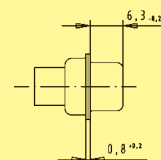
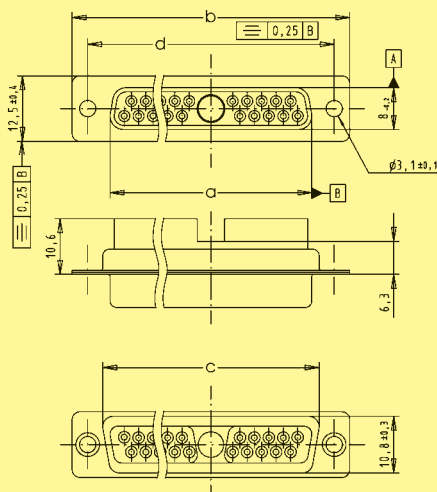
D-Sub - M

Male connectors



	a	b	c	d	e
11W1	24.7	39.1	27.5	33.30	25.2
21W1	38.5	53.0	41.3	47.04	38.9

Female connectors



Dimensions in mm

¹⁾ Explanations see page 04.03
 Order special contacts separately. See pages 04.21 ff
 Board drillings see pages 04.30 ff

Number of contacts

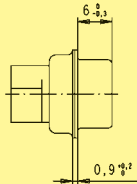
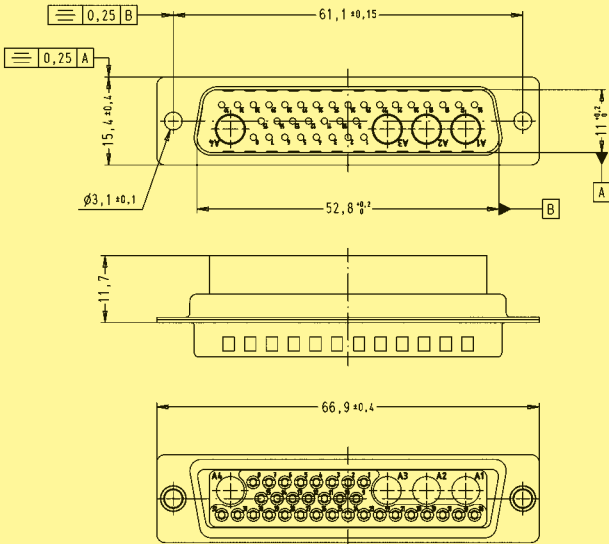
36



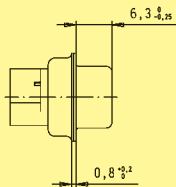
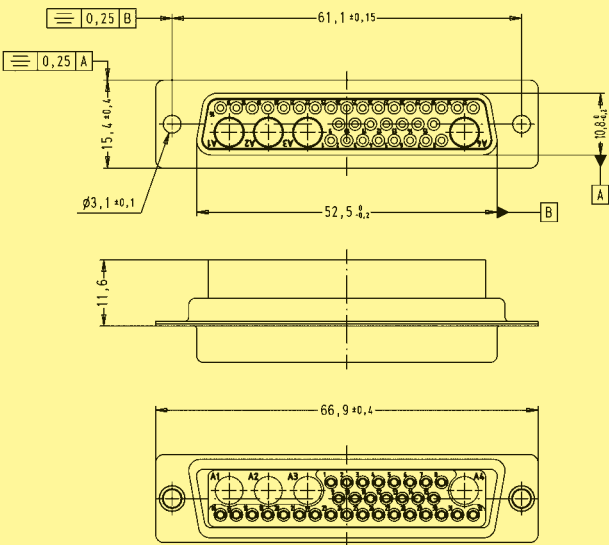
Mixed shells for signal crimp contacts

Identification	No. of contacts ¹⁾	Part No.	
	36W4	male connector	female connector
		09 69 512 0364	09 69 502 0364

Male connectors



Female connectors



Dimensions in mm

¹⁾ Explanations see page 04.03
Board drillings see pages 04.30 ff
Order special contacts separately. See pages 04.21 ff

	Signal contacts see page 04.22	Coaxial contacts see pages 04.26 – 04.28	Power contacts see pages 04.24 + 04.25	High voltage contacts see page 04.23	Pneumatic contacts see page 04.29
Working current	5 A	2 A	10 A, 20 A, 30 A or 40 A	2 A DC	–
Test voltage $U_{r.m.s.}$	–	750 V / 50 Hz	–	4 kV / 50 Hz	–
Operating voltage	–	–	–	≤ 3 kV	–
Contact resistance	–	≤ 2.7 mΩ (inner and outer conductor)	≤ 1 mΩ	≤ 3 mΩ (outer conductor)	–
Impedance	–	50 / 75 Ω	–	–	–
Frequency range	–	0 - 2 GHz	–	–	–
Temperature range	–	-55 °C ... + 135 °C	-55 °C ... + 155 °C	-55 °C ... + 125 °C	-10 °C ... + 60 °C
Mating cycles					
high performance level	≥ 500	≥ 500	≥ 500	–	–
standard performance level	≥ 200	≥ 200	≥ 200	≥ 500	–
Mating force	≤ 3.4 N	≤ 7 N/mated pair	≤ 7 N/mated pair	≤ 5 N	–
Unmating force	≥ 0.2 N	≤ 7 N/mated pair	appr. 5 N	appr. 2.5 N	–
Max. pressure	–	–	–	–	7 bars at 20 °C
Materials					
Contacts	Copper alloy	Copper alloy	Copper alloy	Copper alloy	German silver
Plating*					
Mating side / terminating side	0.76 μm Au / 0.76 μm Au or 0.2 μm Au / 0.2 μm Au		0.76 μm Au / 0.2 μm Au or 0.2 μm Au / 5 μm Sn	1.3 μm Au / 1.3 μm Au	–
Inner conductor mating side / terminating side	–	1.3 μm Au / 1.3 μm Au or 0.2 μm Au / 0.2 μm Au	–	–	–
Outer conductor mating side / terminating side	–	0.76 μm Au / 0.2 μm Au or 0.2 μm Au / 5 μm Sn	–	–	–
Retaining clip	–	Copper alloy	Copper alloy	PI	–
Insulator	–	PBFE/PBTP/PI	–	PTFE	–
O-ring	–	–	–	–	Vitton

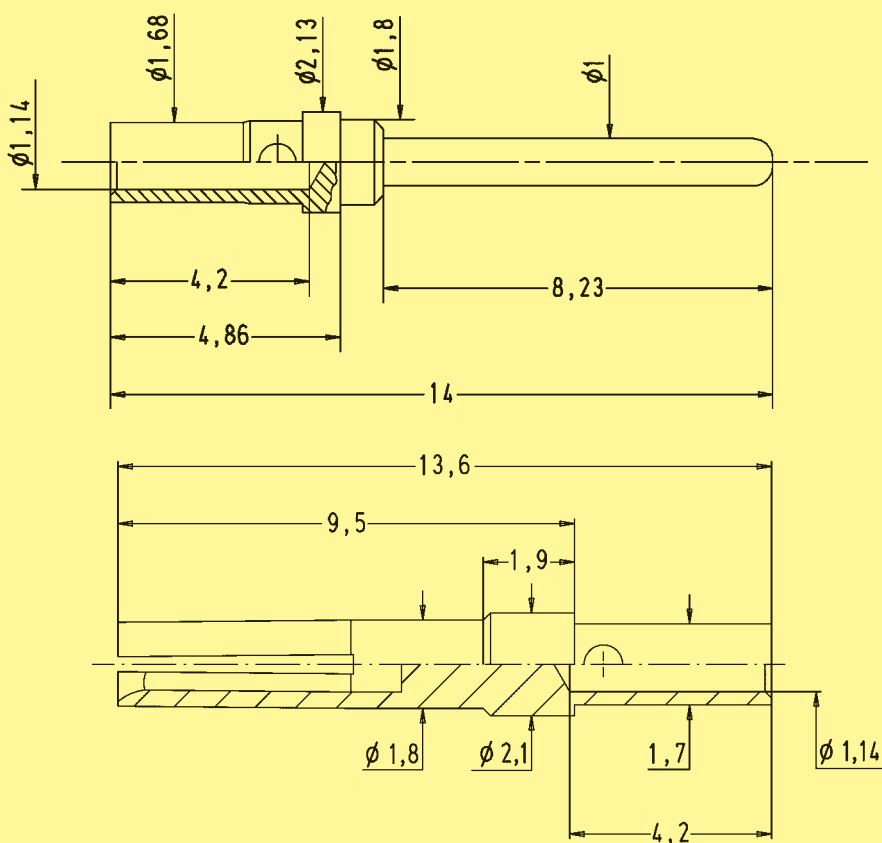


Straight signal crimp contacts for cable applications

Identification	Wire gauge (mm ²)	Part No.	
Male contact	0.09 - 0.14 AWG 28 - 26	Performance level 3	S4 ¹⁾
		09 69 282 7311	09 69 282 5311
	0.25 - 0.56 AWG 24 - 20	09 69 282 7310	09 69 282 5310
Female contact	0.09 - 0.14 AWG 28 - 26	09 69 182 7311	09 69 182 5311
	0.25 - 0.56 AWG 24 - 20	09 69 182 7310	09 69 182 5310

Male contact

Female contact

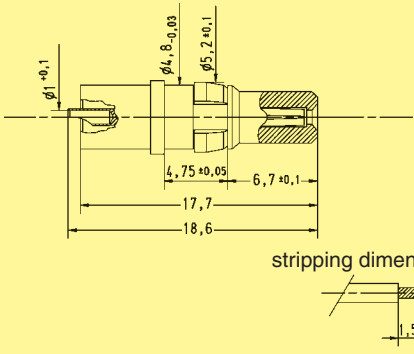
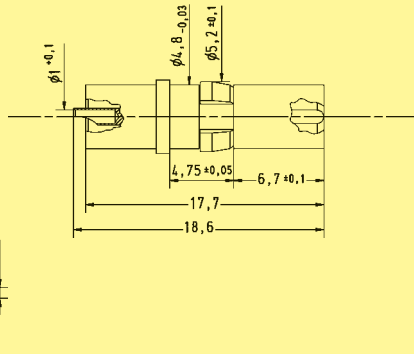
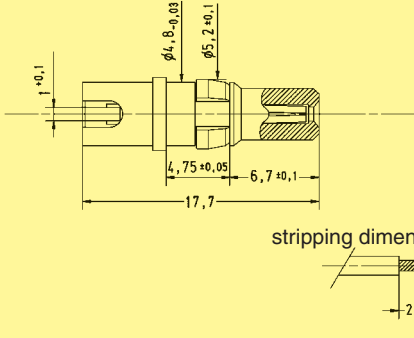
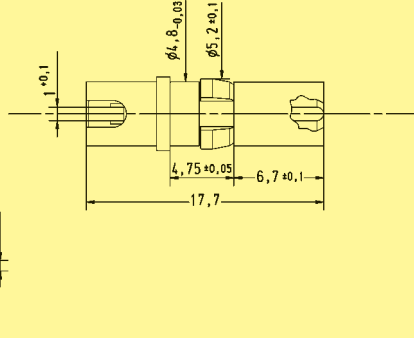


Dimensions in mm

¹⁾ S4: $\geq 0.76 \mu\text{m Au}$
Tooling see chapter 31



High voltage contacts for cable applications

Identification	Wire gauge (mm ²)	Part No.	
Straight versions	0.25 - 0.56 AWG 24 - 20	Male contacts Plating: 1.3 µm Au ¹⁾	Female contacts Plating: 1.3 µm Au ¹⁾
		09 69 281 2550	09 69 181 2550
Right angled versions	0.25 - 0.56 AWG 24 - 20	09 69 681 2550	09 69 581 2550
Straight versions	Male contacts		Female contacts
			
Right angled versions			

Dimensions in mm

¹⁾ for mating and terminating side



Straight power contacts for cable applications

Identification		Rating (A)	Part No.	
Performance levels			Performance level 3	S4 ¹⁾
Solder version				
Male contacts	10	09 69 281 7420	09 69 281 5420	
	20	09 69 281 7421	09 69 281 5421	
	30	09 69 281 7422	09 69 281 5422	
	40	09 69 281 7423	09 69 281 5423	
Female contacts	10	09 69 181 7420	09 69 181 5420	
	20	09 69 181 7421	09 69 181 5421	
	30	09 69 181 7422	09 69 181 5422	
	40	09 69 181 7423	09 69 181 5423	
Crimp version ²⁾				
Male contacts	10	09 69 282 7420	09 69 282 5420	
	20	09 69 282 7421	09 69 282 5421	
	30	09 69 282 7422	09 69 282 5422	
	40	09 69 282 7423	09 69 282 5423	
Female contacts	10	09 69 182 7420	09 69 182 5420	
	20	09 69 182 7421	09 69 182 5421	
	30	09 69 182 7422	09 69 182 5422	
	40	09 69 182 7423	09 69 182 5423	

¹⁾ S4: $\geq 0.76 \mu\text{m Au}$ ²⁾ Tooling see chapter 31

Dimensions see page 04.25



Straight power contacts for cable applications

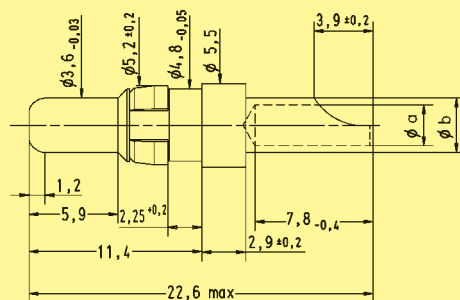
Identification

Drawing

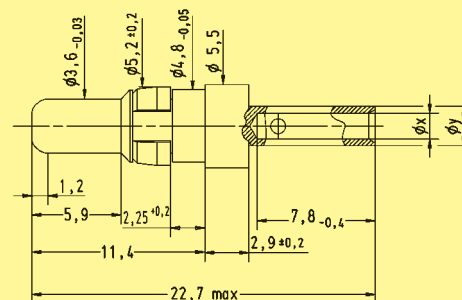
Dimensions in mm

Male contacts

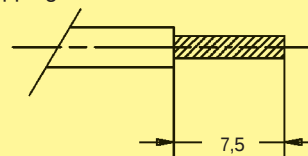
solder



crimp



stripping dimensions

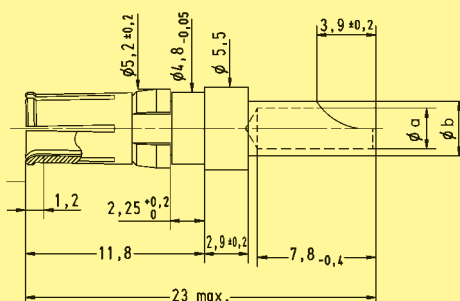


Rating (A)	$\varnothing a -0.1$	$\varnothing b \pm 0.05$
10	1.8	2.54
20	2.7	3.63
30	3.5	4.40
40	4.8	5.50

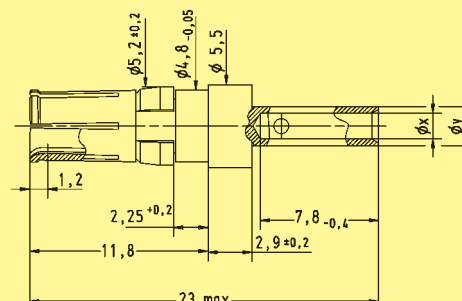
Rating (A)	$\varnothing x -0.1$	$\varnothing y \pm 0.05$	AWG
10	1.7	2.6	16 - 20
20	2.6	3.6	12 - 14
30	3.7	4.7	10 - 12
40	4.6	5.8	8 - 10

Female contacts

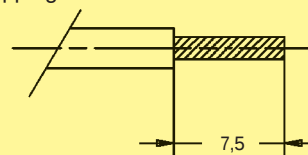
solder

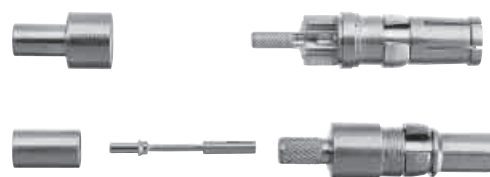


crimp



stripping dimensions





Coaxial contacts for cable applications

Identification		Impedance (Ω)	Part No.																																																																																					
		Straight male contacts		Straight female contacts																																																																																				
		Performance level 3	S4 ¹⁾	Performance level 3	S4 ¹⁾																																																																																			
Solder / crimp contact for cables RG 174 U, 188 AU, 316 U for cables RG 178 BU, 196 AU, 404 U for cables RG 58 CU, 141 AU for cables RG 179 BU, 187 AU for cables RGD 179	50	09 69 281 7140	09 69 281 5140	09 69 181 7140	09 69 181 5140																																																																																			
	50	09 69 281 7141	09 69 281 5141	09 69 181 7141	09 69 181 5141																																																																																			
	50	09 69 281 7143	09 69 281 5143	09 69 181 7143	09 69 181 5143																																																																																			
	75	09 69 281 7230	09 69 281 5230	09 69 181 7230	09 69 181 5230																																																																																			
	75	09 69 281 7233	09 69 281 5233	09 69 181 7233	09 69 181 5233																																																																																			
Crimp / crimp contact for cables RG 174 U, 188 AU, 316 U for cables RG 179 BU, 187 AU for cables RG 59 for cables RGD 179	50	09 69 282 7140	09 69 282 5140	09 69 182 7140	09 69 182 5140																																																																																			
	75	09 69 282 7230	09 69 282 5230	09 69 182 7230	09 69 182 5230																																																																																			
	75	09 69 282 7232	09 69 282 5232	09 69 182 7232	09 69 182 5232																																																																																			
	75	09 69 282 7233	09 69 282 5233	09 69 182 7233	09 69 182 5233																																																																																			
Harnessing dimensions (mm) 	<table><tr><th>Part No.</th><th>Ø A</th><th>Ø B</th><th>Ø C</th><th>Ø D</th><th>E</th><th>F</th><th>G</th></tr><tr><td>09 69 181 x140 09 69 281 x140</td><td>0.85</td><td>1.9</td><td>2.3</td><td>3.2</td><td>9.5</td><td>5.0</td><td>3.0</td></tr><tr><td>09 69 181 x141 09 69 281 x141</td><td>0.85</td><td>1.2</td><td>1.4</td><td>2.3</td><td>9.5</td><td>5.0</td><td>3.0</td></tr><tr><td>09 69 181 x143 09 69 281 x143</td><td>1.00</td><td>3.0</td><td>4.4</td><td>5.2</td><td>9.5</td><td>5.0</td><td>3.0</td></tr><tr><td>09 69 181 x230 09 69 281 x230</td><td>0.50</td><td>1.9</td><td>2.3</td><td>3.2</td><td>9.5</td><td>5.0</td><td>3.0</td></tr><tr><td>09 69 182 x140 09 69 282 x140</td><td>0.60</td><td>1.9</td><td>2.4</td><td>3.2</td><td>9.0</td><td>5.0</td><td>3.0</td></tr><tr><td>09 69 182 x230 09 69 282 x230</td><td>0.60</td><td>1.9</td><td>2.4</td><td>3.2</td><td>9.0</td><td>5.0</td><td>3.0</td></tr><tr><td>09 69 182 x232 09 69 282 x232</td><td>0.95</td><td>3.8</td><td>5.1</td><td>6.2</td><td>9.0</td><td>4.3</td><td>3.7</td></tr><tr><td>09 69 181 x233 09 69 281 x233</td><td>0.50</td><td>1.9</td><td>2.6</td><td>3.5</td><td>9.5</td><td>5.0</td><td>3.0</td></tr><tr><td>09 69 182 x233 09 69 282 x233</td><td>0.60</td><td>1.9</td><td>2.6</td><td>3.5</td><td>9.3</td><td>4.3</td><td>3.0</td></tr></table>								Part No.	Ø A	Ø B	Ø C	Ø D	E	F	G	09 69 181 x140 09 69 281 x140	0.85	1.9	2.3	3.2	9.5	5.0	3.0	09 69 181 x141 09 69 281 x141	0.85	1.2	1.4	2.3	9.5	5.0	3.0	09 69 181 x143 09 69 281 x143	1.00	3.0	4.4	5.2	9.5	5.0	3.0	09 69 181 x230 09 69 281 x230	0.50	1.9	2.3	3.2	9.5	5.0	3.0	09 69 182 x140 09 69 282 x140	0.60	1.9	2.4	3.2	9.0	5.0	3.0	09 69 182 x230 09 69 282 x230	0.60	1.9	2.4	3.2	9.0	5.0	3.0	09 69 182 x232 09 69 282 x232	0.95	3.8	5.1	6.2	9.0	4.3	3.7	09 69 181 x233 09 69 281 x233	0.50	1.9	2.6	3.5	9.5	5.0	3.0	09 69 182 x233 09 69 282 x233	0.60	1.9	2.6	3.5	9.3	4.3	3.0
	Part No.	Ø A	Ø B	Ø C	Ø D	E	F	G																																																																																
	09 69 181 x140 09 69 281 x140	0.85	1.9	2.3	3.2	9.5	5.0	3.0																																																																																
	09 69 181 x141 09 69 281 x141	0.85	1.2	1.4	2.3	9.5	5.0	3.0																																																																																
	09 69 181 x143 09 69 281 x143	1.00	3.0	4.4	5.2	9.5	5.0	3.0																																																																																
	09 69 181 x230 09 69 281 x230	0.50	1.9	2.3	3.2	9.5	5.0	3.0																																																																																
	09 69 182 x140 09 69 282 x140	0.60	1.9	2.4	3.2	9.0	5.0	3.0																																																																																
	09 69 182 x230 09 69 282 x230	0.60	1.9	2.4	3.2	9.0	5.0	3.0																																																																																
	09 69 182 x232 09 69 282 x232	0.95	3.8	5.1	6.2	9.0	4.3	3.7																																																																																
	09 69 181 x233 09 69 281 x233	0.50	1.9	2.6	3.5	9.5	5.0	3.0																																																																																
09 69 182 x233 09 69 282 x233	0.60	1.9	2.6	3.5	9.3	4.3	3.0																																																																																	

¹⁾ S4: $\geq 0.76 \mu\text{m Au}$
Dimensions see pages 04.27 and 04.28
Tooling see chapter 31



Coaxial contacts for cable applications

Identification

Drawing

Dimensions in mm

Male contacts

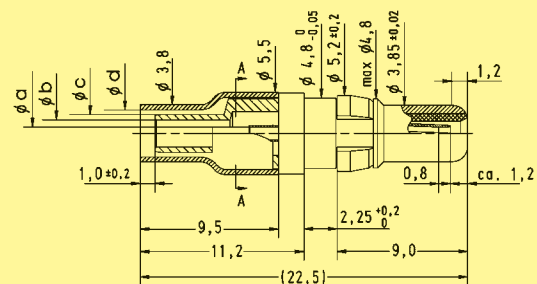
Part No.	ø a	ø b	ø c	ø d
09 69 281 x140	0.85	1.9	2.6	3.2
09 69 281 x141	0.85	1.2	1.7	2.3
09 69 281 x230	0.50	1.9	2.6	3.2

Part No.	ø a	ø b	ø c	ø d
09 69 281 x143	1.0	3.0	4.4	5.2

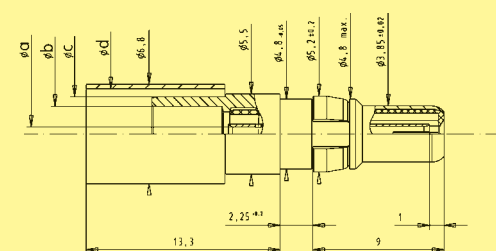
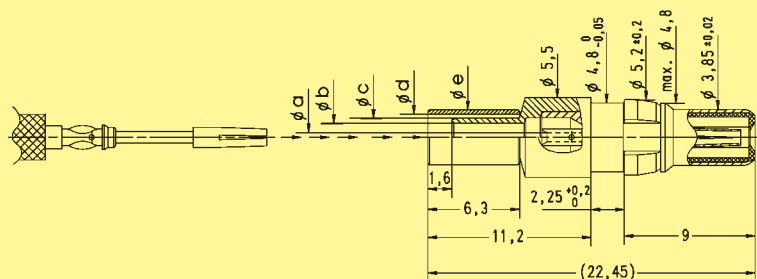
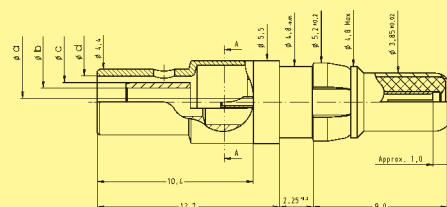
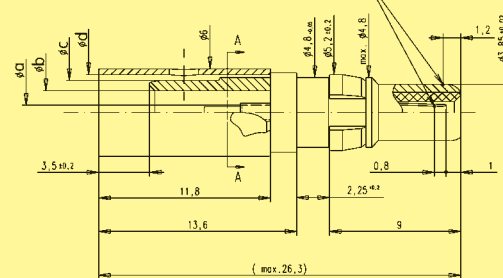
Part No.	ø a	ø b	ø c	ø d
09 69 281 x233	0.5	1.9	2.6	3.5

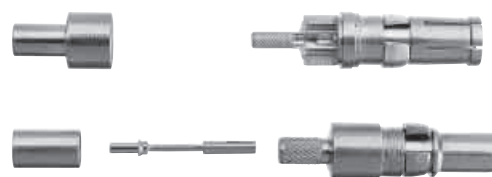
Part No.	ø a	ø b	ø c	ø d	ø e
09 69 282 x140	0.6	1.9	2.6	3.2	3.8
09 69 282 x230	0.6	1.9	2.6	3.2	3.8
09 69 282 x233	0.6	1.9	2.6	3.5	4.4

Part No.	ø a	ø b	ø c	ø d
09 69 282 x232	0.95	3.8	5.1	6.2



Points of plating thickness measurement





Coaxial contacts for cable applications

Identification

Drawing

Dimensions in mm

Female contacts

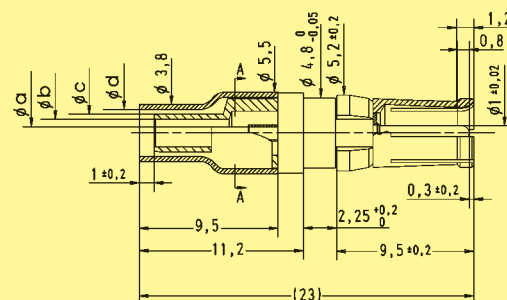
Part No.	$\varnothing a$	$\varnothing b$	$\varnothing c$	$\varnothing d$
09 69 181 x140	0.85	1.9	2.6	3.2
09 69 181 x141	0.85	1.2	1.7	2.3
09 69 181 x230	0.50	1.9	2.6	3.2

Part No.	$\varnothing a$	$\varnothing b$	$\varnothing c$	$\varnothing d$
09 69 181 x143	1.0	3.0	4.4	5.2

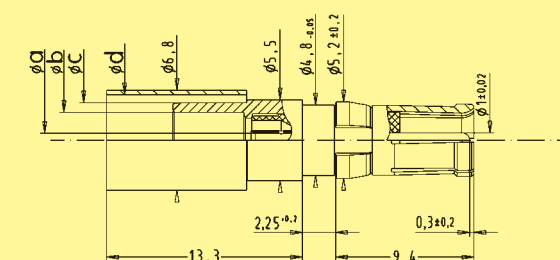
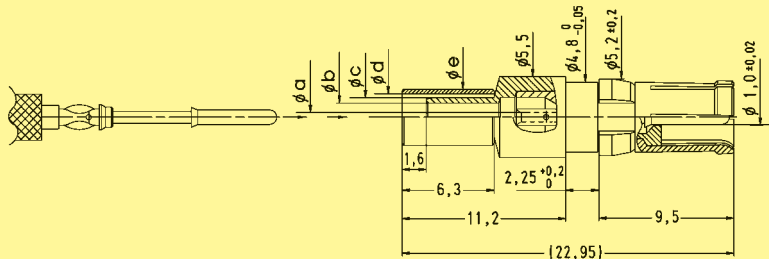
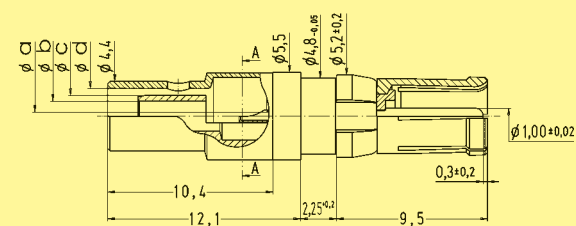
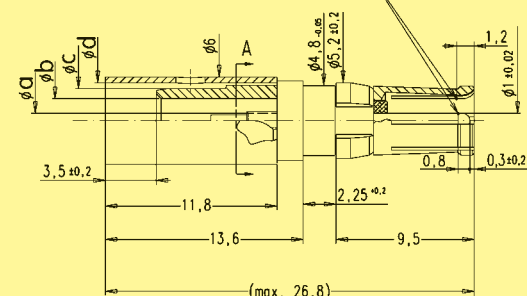
Part No.	$\varnothing a$	$\varnothing b$	$\varnothing c$	$\varnothing d$
09 69 181 x233	0.5	1.9	2.6	3.5

Part No.	$\varnothing a$	$\varnothing b$	$\varnothing c$	$\varnothing d$	$\varnothing e$
09 69 182 x140	0.6	1.9	2.6	3.2	3.8
09 69 182 x230	0.6	1.9	2.6	3.2	3.8
09 69 182 x233	0.6	1.9	2.6	3.5	4.4

Part No.	$\varnothing a$	$\varnothing b$	$\varnothing c$	$\varnothing d$
09 69 182 x232	0.95	3.8	5.1	6.2



Points of plating thickness measurement





Pneumatic contacts for cable applications

Identification	Inner diameter air tube (mm)	Part No.
Male contacts	2	09 69 287 0061
	2.6	09 69 287 0060
	3	09 69 287 0062
	4	09 69 287 0063
Female contacts	2	09 69 187 0061
	2.6	09 69 187 0060
	3	09 69 187 0062
	4	09 69 187 0063

Male contacts

Technical drawing of a male contact assembly. The drawing shows a cross-section of the assembly with various dimensions. The dimensions are: ø a, ø 3.6, ø 5.2 +0.2, ø 4.8, ø 5.5, ø b, ø c, ø d. The lengths are: 6.4, 9.7, 2.3 ±0.1, 10.5.

Part No.	ø a	ø b	ø c	ø d
09 69 x87 0061	1.45	2.6	1.5	0.95
09 69 x87 0060	1.65	3.1	2.0	1.65
09 69 x87 0062	1.65	3.4	2.3	1.85
09 69 x87 0063	1.65	4.8	3.7	2.95

Female contacts

Technical drawing of a female contact assembly. The drawing shows a cross-section of the assembly with various dimensions. The dimensions are: ø 4.8, ø 5.2 +0.2, ø 4.8, ø 5.5, ø b, ø c, ø d. The lengths are: 6.0, 9.69, 2.3 ±0.1, 10.5.

Dimensions in mm

Dimensions in mm

Board drillings for connectors with straight pcb contacts

Pcb hole patterns

In the next pages, the pcb hole pattern is given for the power and the coaxial contact per connector layout. In the case of the power contact, the drilling hole dimension is not mentioned; the table here under provides relevant information according to the current rating of the contact and its version.

Power contact diameter and pcb related drilling diameter

Rating	Straight connectors		Right angled connectors	
	Pin Ø (mm)	Pcb drilling Ø (mm)	Pin Ø (mm)	Pcb drilling Ø (mm)
20 A	2.60	2.9	2.85	3.15
30 A	—	—	3.20	3.50
40 A	3.75	4.0	3.75	4.05

Identification

Drawing

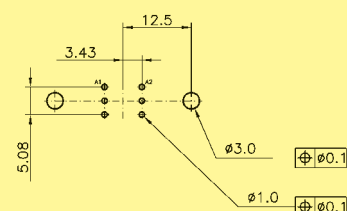
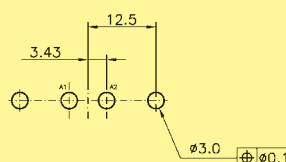
Dimensions in mm

Male connector*

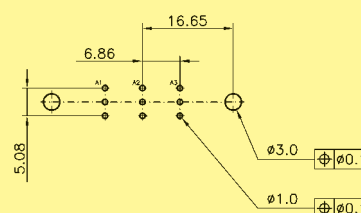
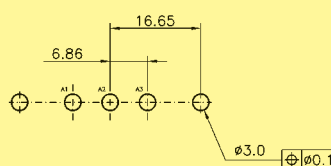
Power contact

Coaxial contact

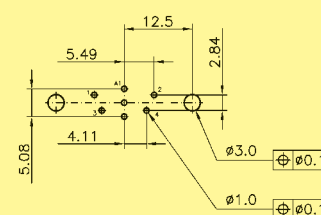
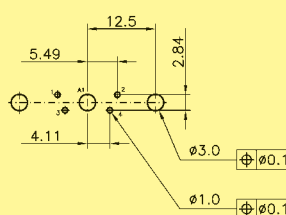
2W2C



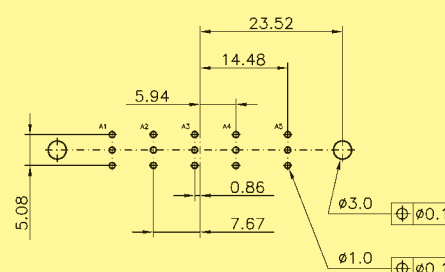
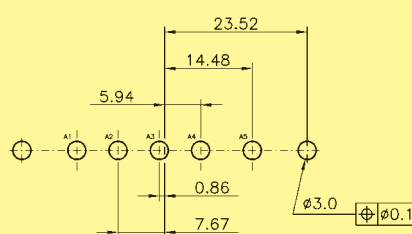
3W3 / 3W3C



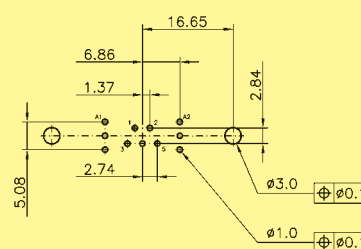
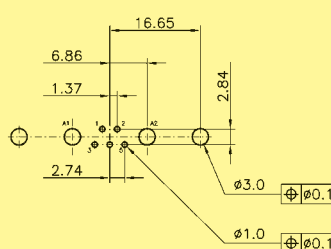
5W1



5W5



7W2



* When using a female connector with straight pcb contacts the board drilling pattern must be mirrored in the Y axis.



Board drillings for connectors with straight pcb contacts

Identification

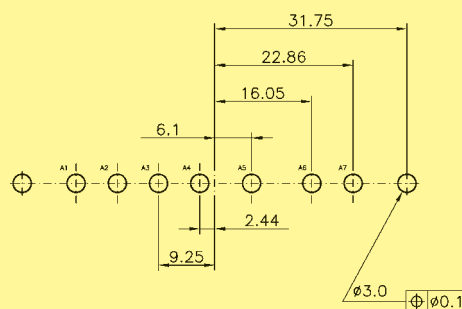
Drawing

Dimensions in mm

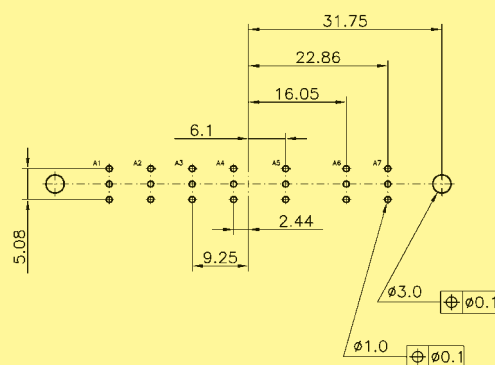
Male connector*

7W7

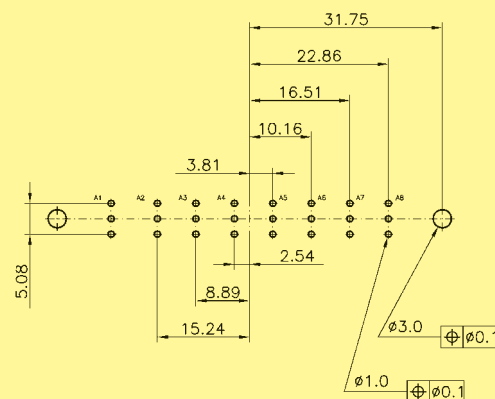
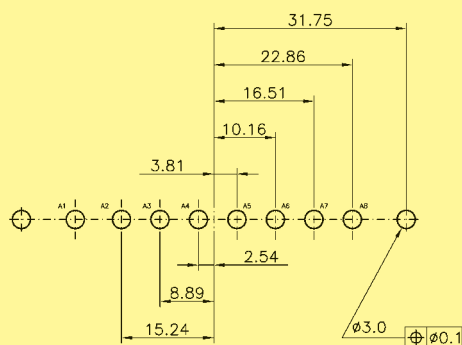
Power contact



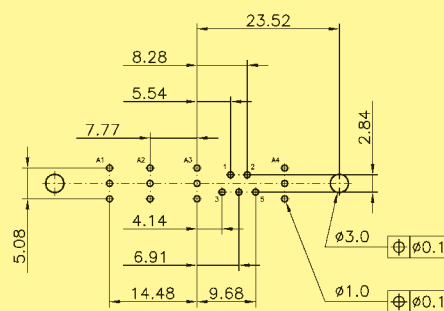
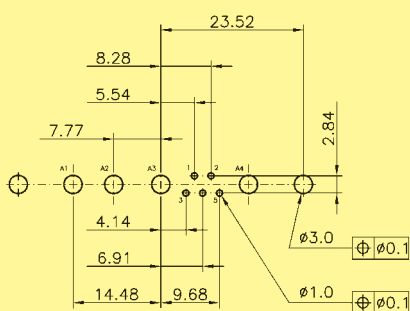
Coaxial contact



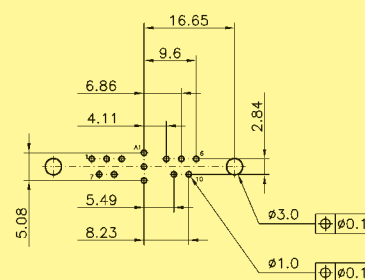
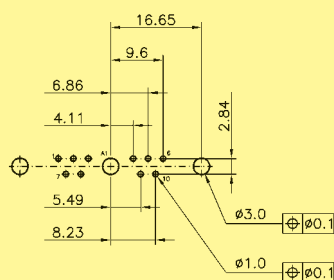
8W8



9W4



11W1



* When using a female connector with straight pcb contacts the board drilling pattern must be mirrored in the Y axis.



Board drillings for connectors with straight pcb contacts

Identification

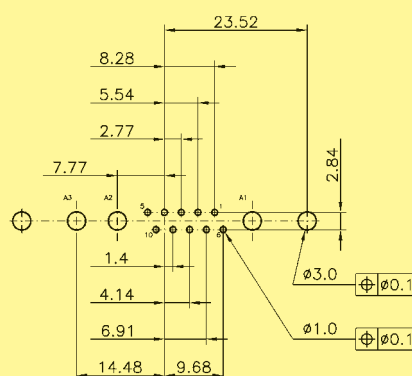
Drawing

Dimensions in mm

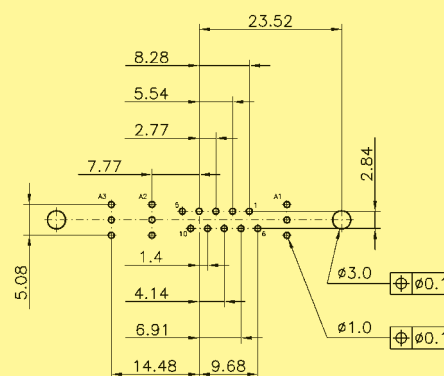
Male connector*

13W3

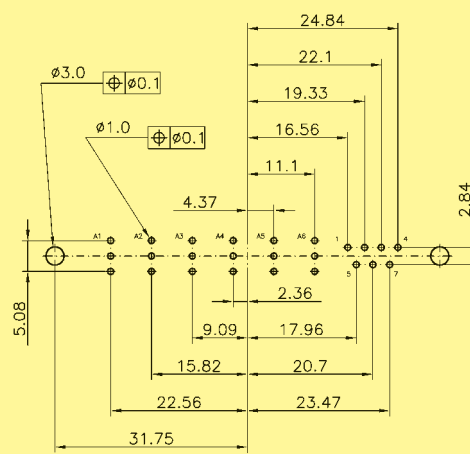
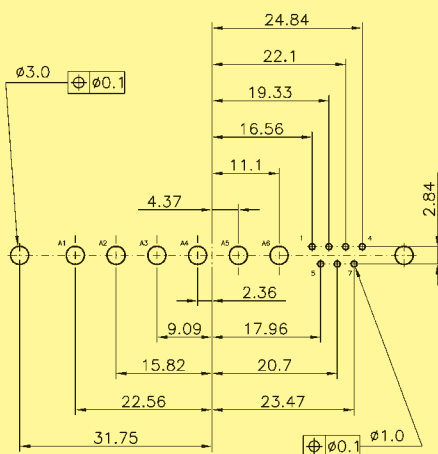
Power contact



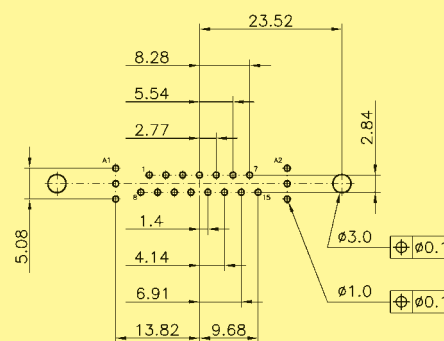
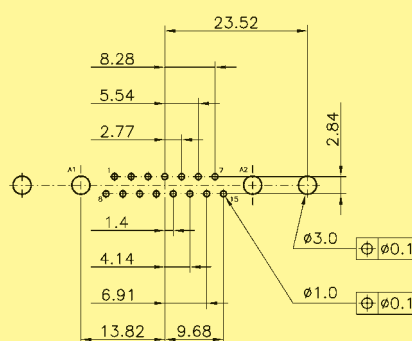
Coaxial contact



13W6



17W2



* When using a female connector with straight pcb contacts the board drilling pattern must be mirrored in the Y axis.



Board drillings for connectors with straight pcb contacts

Identification

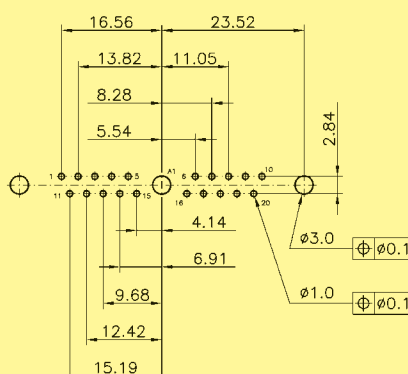
Drawing

Dimensions in mm

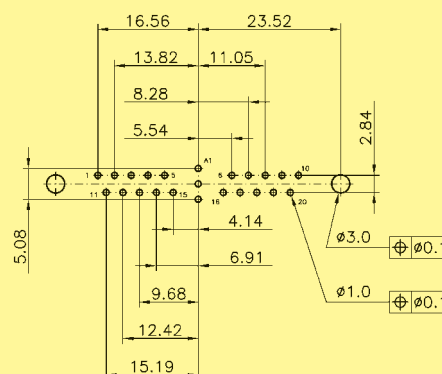
Male connector*

21W1

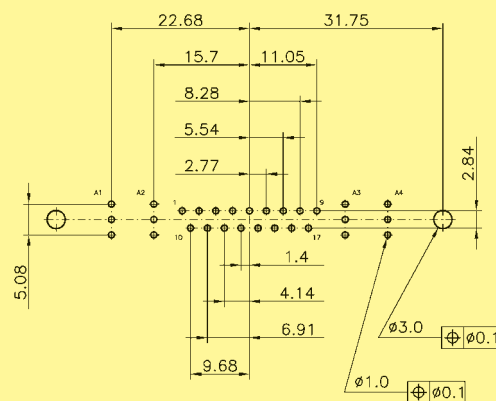
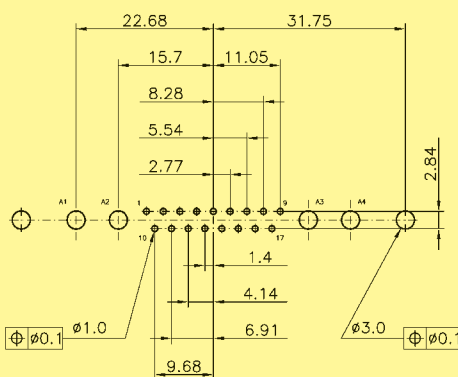
Power contact



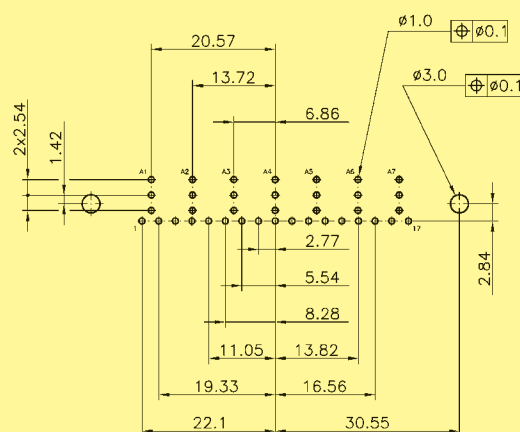
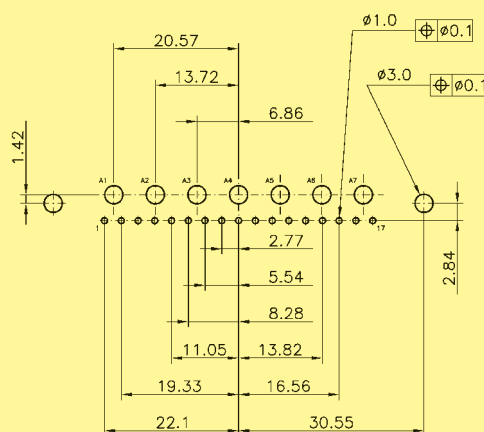
Coaxial contact



21WA4



24W7



* When using a female connector with straight pcb contacts the board drilling pattern must be mirrored in the Y axis.



Board drillings for connectors with straight pcb contacts

Identification

Drawing

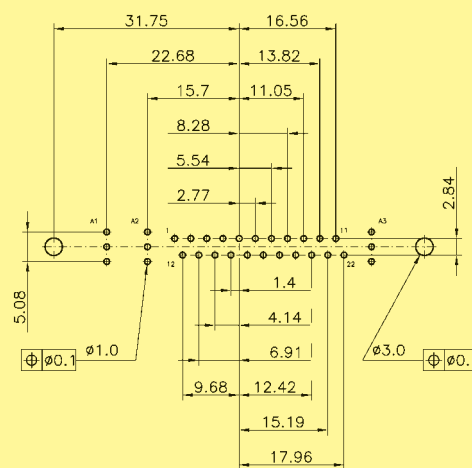
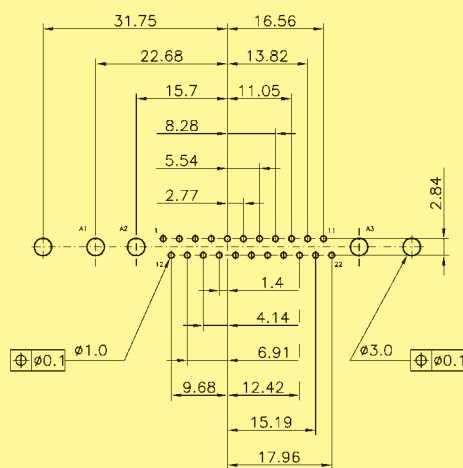
Dimensions in mm

Male connector*

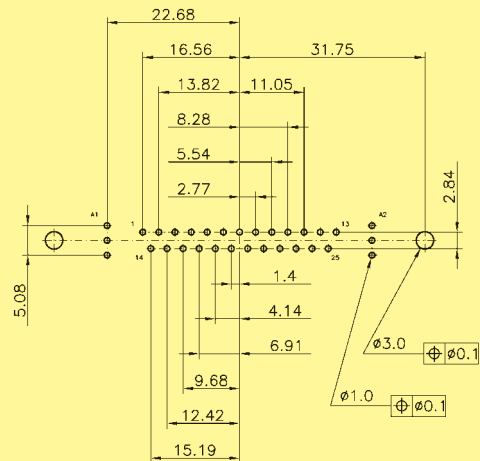
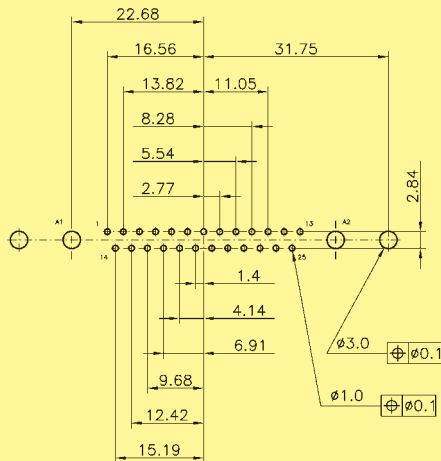
Power contact

Coaxial contact

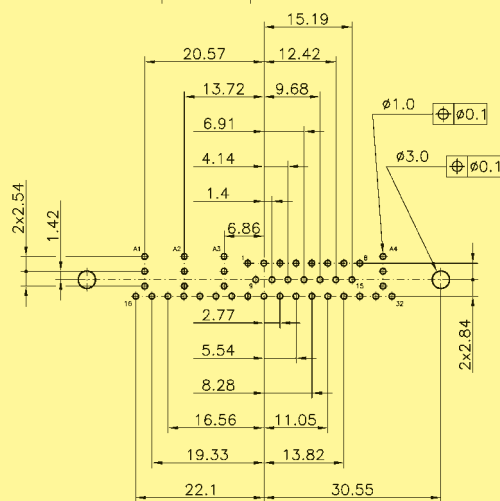
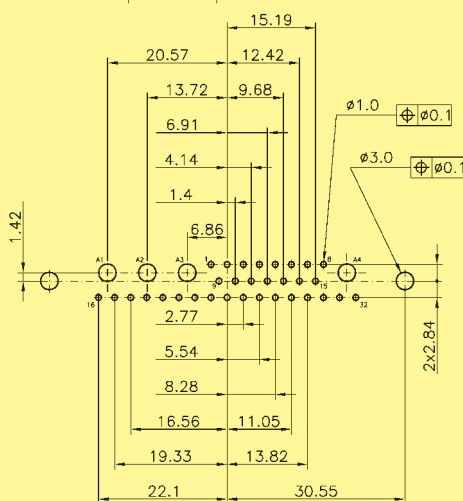
25W3



27W2



36W4



* When using a female connector with straight pcb contacts the board drilling pattern must be mirrored in the Y axis.



Board drillings for connectors with right angled pcb contacts

Identification

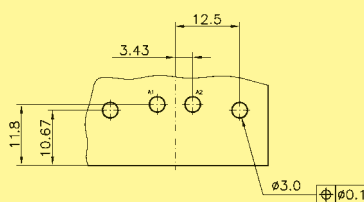
Drawing

Dimensions in mm

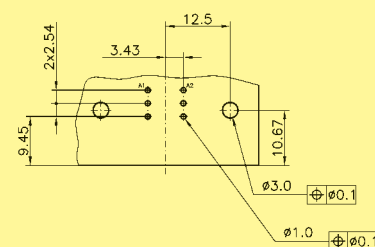
Male connector*

2W2C

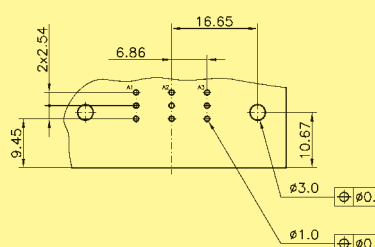
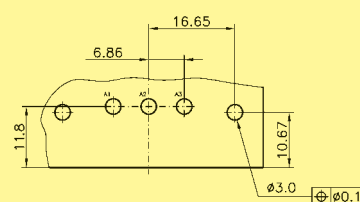
Power contact



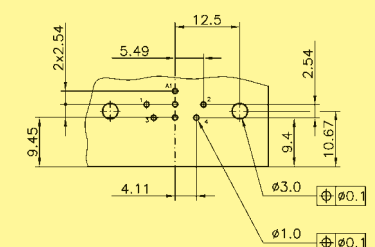
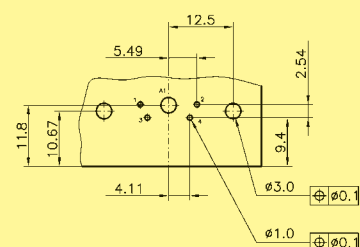
Coaxial contact



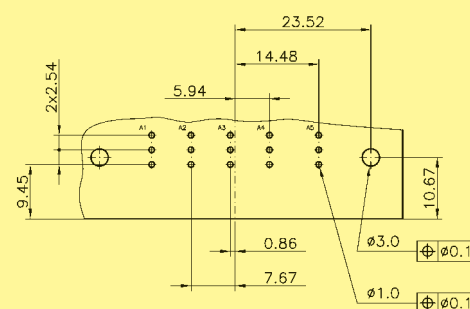
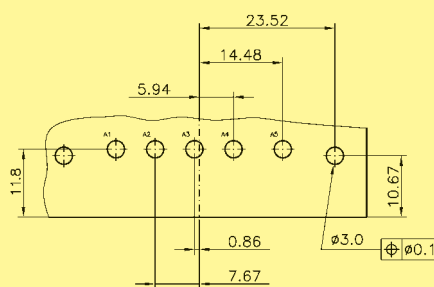
3W3 / 3W3C



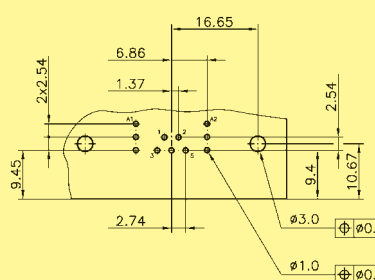
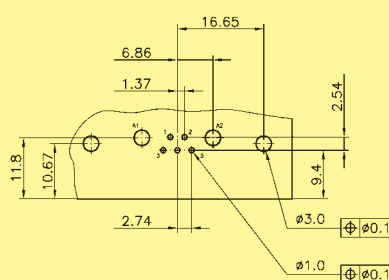
5W1



5W5



7W2



* When using a female connector with right angled pcb contacts the board drilling pattern must be mirrored in the Y axis.



Board drillings for connectors with right angled pcb contacts

Identification

Drawing

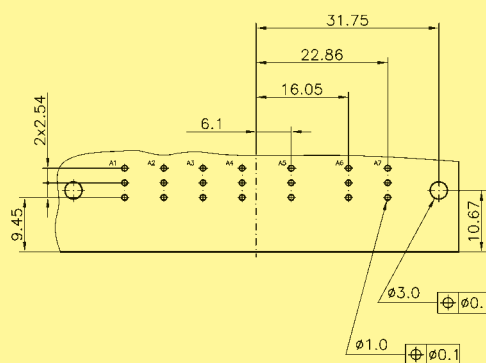
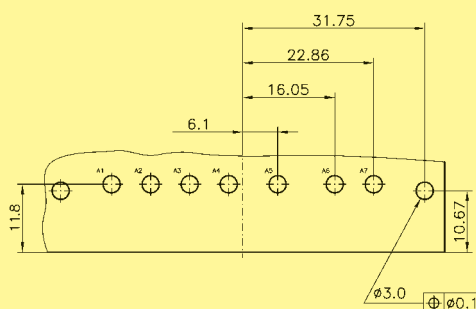
Dimensions in mm

Male connector*

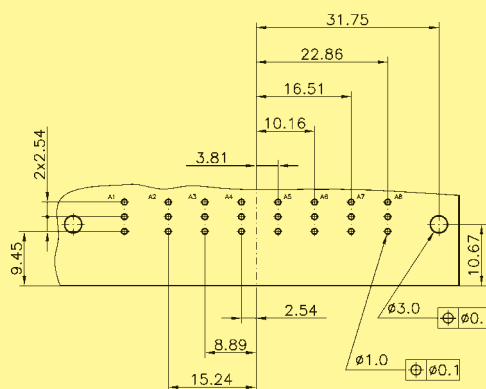
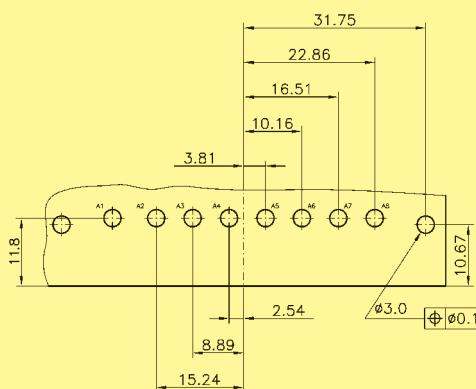
Power contact

Coaxial contact

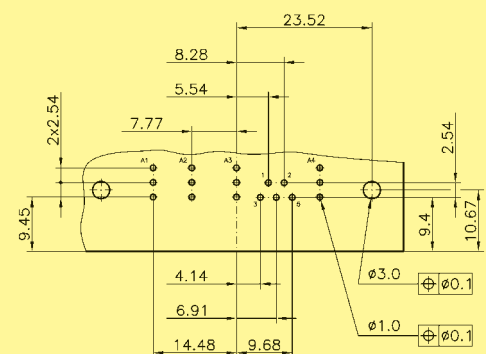
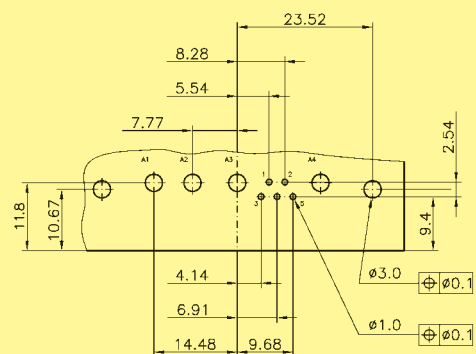
7W7



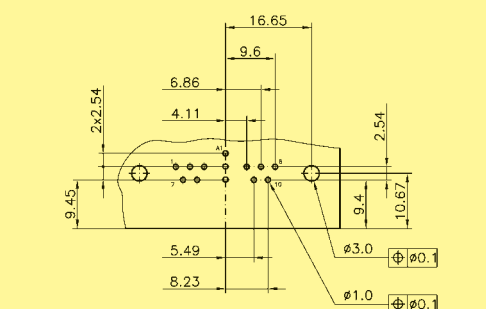
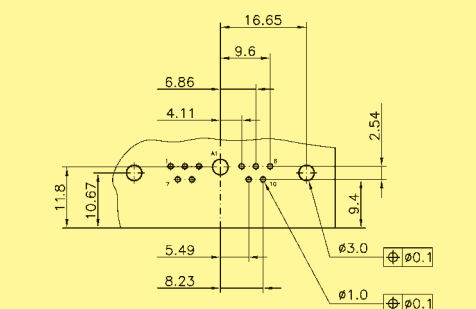
8W8



9W4



11W1



* When using a female connector with right angled pcb contacts the board drilling pattern must be mirrored in the Y axis.



Board drillings for connectors with right angled pcb contacts

Identification

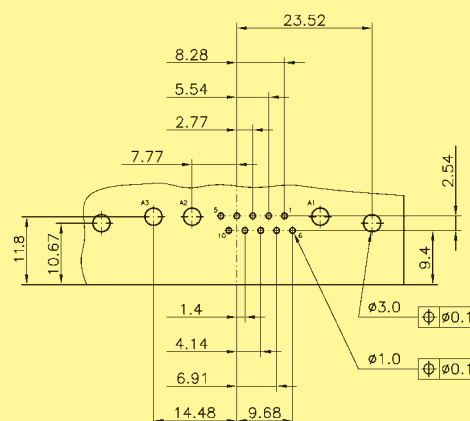
Drawing

Dimensions in mm

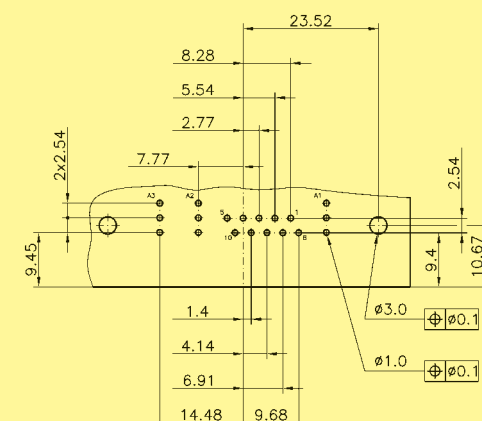
Male connector*

13W3

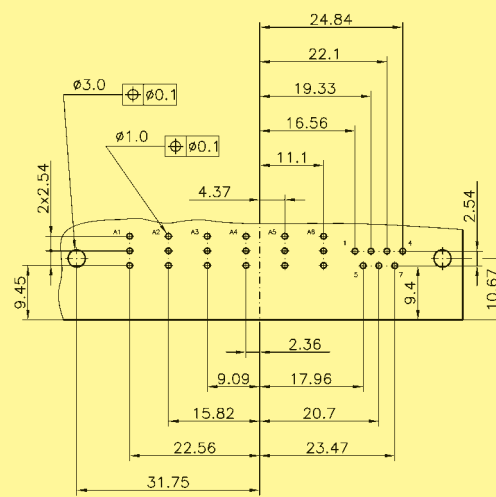
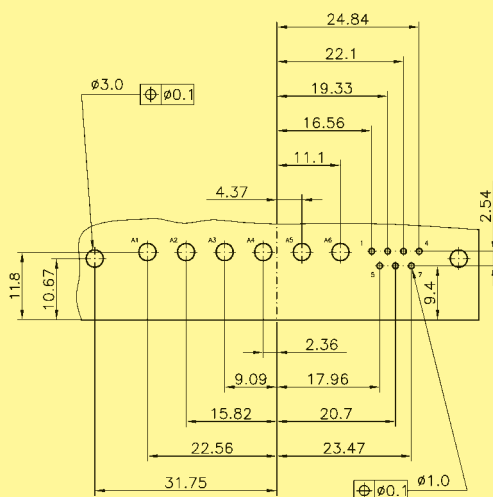
Power contact



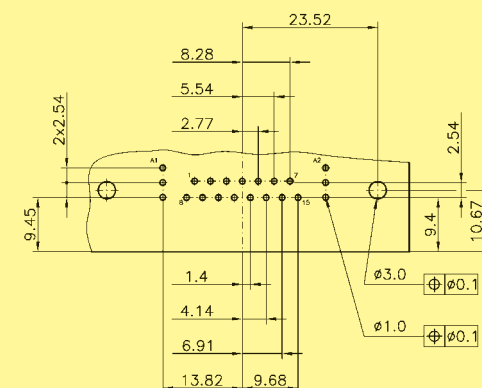
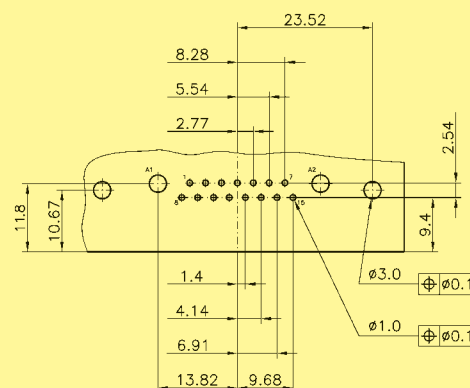
Coaxial contact



13W6



17W2



* When using a female connector with right angled pcb contacts the board drilling pattern must be mirrored in the Y axis.



Board drillings for connectors with right angled pcb contacts

Identification

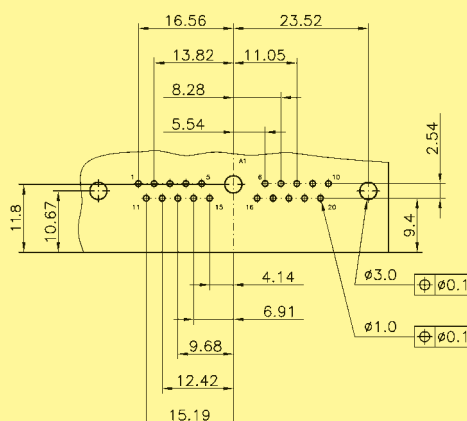
Drawing

Dimensions in mm

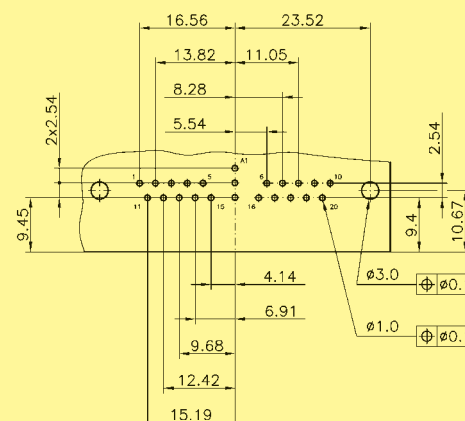
Male connector*

21W1

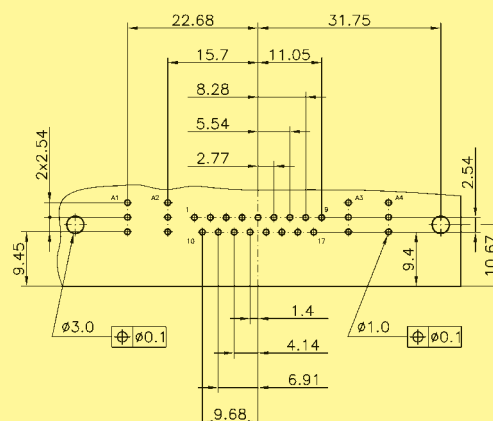
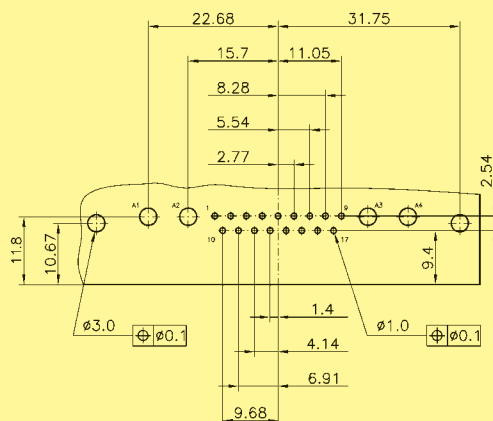
Power contact



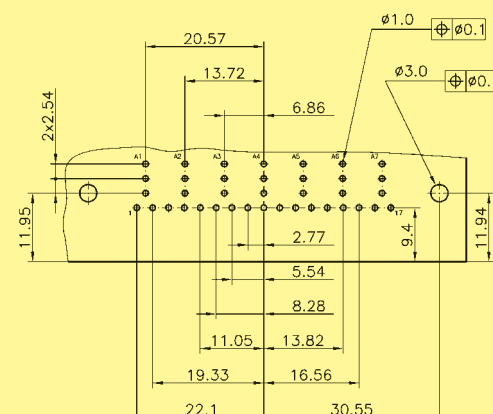
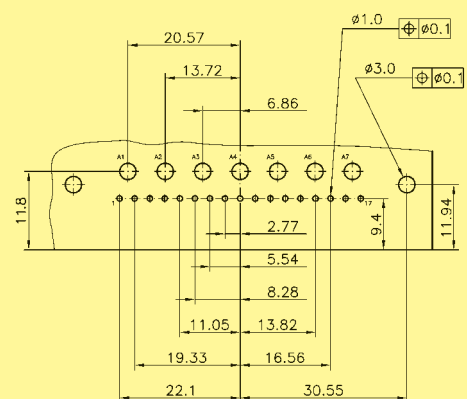
Coaxial contact



21WA4



24W7



* When using a female connector with right angled pcb contacts the board drilling pattern must be mirrored in the Y axis.



Board drillings for connectors with right angled pcb contacts

Identification

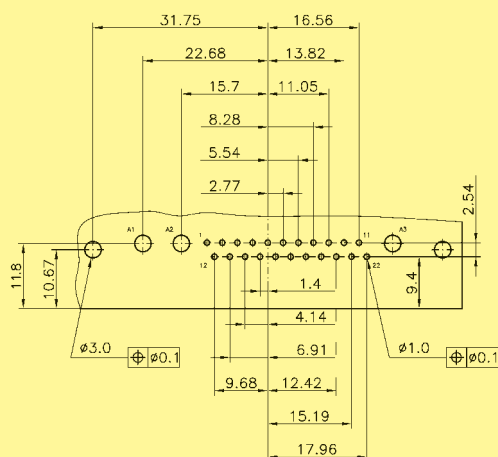
Drawing

Dimensions in mm

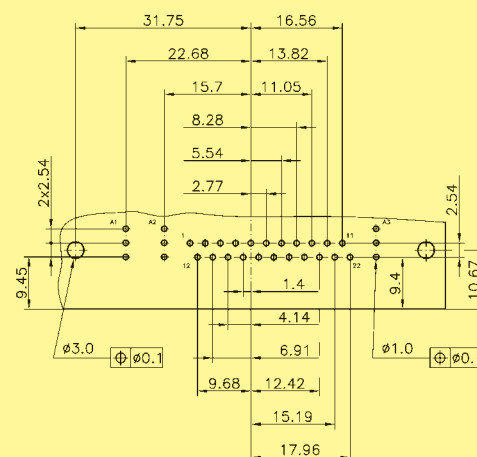
Male connector*

25W3

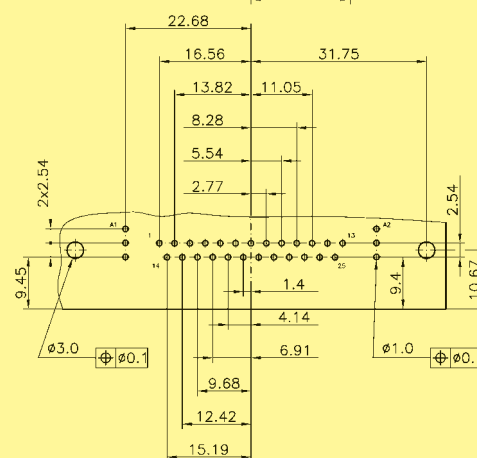
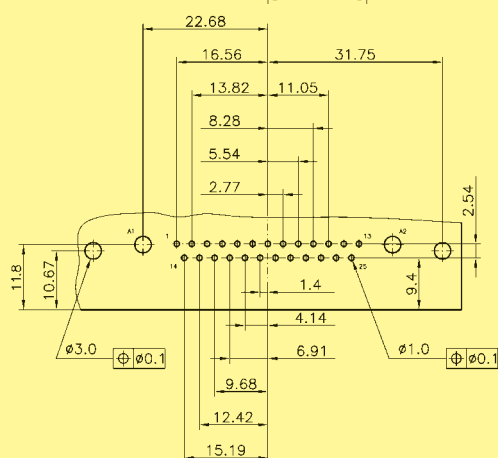
Power contact



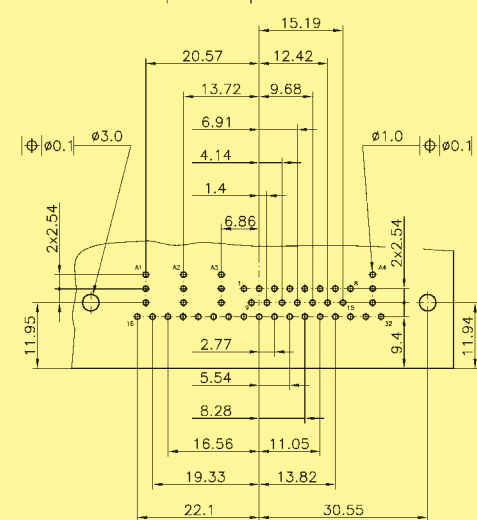
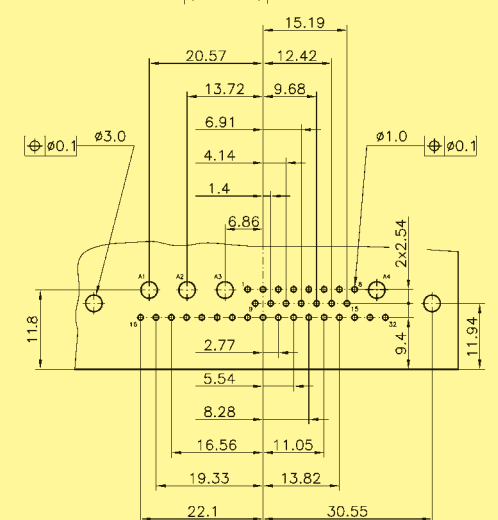
Coaxial contact



27W2



36W4

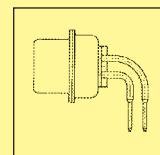
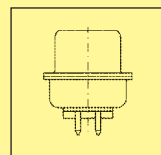


* When using a female connector with right angled pcb contacts the board drilling pattern must be mirrored in the Y axis.

HARTING customer request form for pcb connectors

1 Connector gender and type

- ☐ Plug (male contacts)
☐ Receptacle (female contacts)



- ☐ Straight ☐ Right angled

2 Contact arrangement

Standard

- | | | | |
|------------------------------|-------------------------------|--------------------------------|-------------------------------|
| ☐ 3W3 | ☐ 8W8 | ☐ 17W2 | |
| ☐ 5W1 | ☐ 9W4 | ☐ 21W1 | |
| ☐ 5W5 | ☐ 11W1 | ☐ 21WA4 | |
| ☐ 7W2 | ☐ 13W3 | ☐ 24W7 | ☐ 27W2 |
| ☐ 7W7 | ☐ 13W6 | ☐ 25W3 | ☐ 36W4 |

Special configurations
(mixed contact genders)

- ☐ 2W2C ☐ 3W3C

2.1 Any signal contacts?

- ☐ Yes (fill in questions below) ☐ No (go directly to item 2.2)
☐ Right angled 2.54 mm pitch
☐ Other pitch: _____

2.2 Any power contacts?

Current rating

- ☐ Yes (fill in questions below) ☐ No (go directly to item 2.3)
☐ 10 A ☐ 30 A
☐ 20 A ☐ 40 A

Termination type

- ☐ Solder pin for pcb
☐ Press-in for pcb (30A)

Performance level

[mating side / termination side]

- ☐ S4 [0.76 µm Au / 0.2 µm Au]
☐ PL 3 [0.2 µm Au / 5.0 µm Sn]

2.3 Any coaxial contacts?

Impedance

- ☐ Yes (fill in questions below) ☐ No (go directly to item 2.4)
☐ 50 Ω
☐ 75 Ω

Performance level

[mating side inner / outer conductor]

- ☐ S4 [1.3 µm Au / 0.76 µm Au]
☐ PL 3 [0.2 µm Au / 0.2 µm Au]

2.4 Any high voltage contacts?

- ☐ Yes ☐ No (go directly to item 2.5)

2.5 Any pneumatic contacts?

Tube inner diameter /

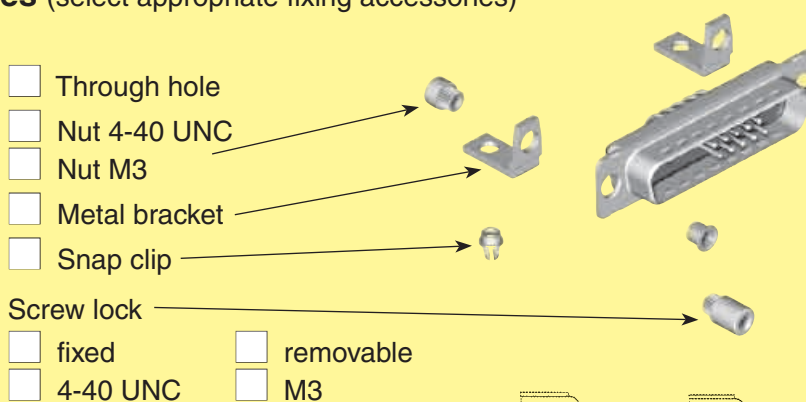
suitable compressed air tube

- ☐ Yes (fill in questions below) ☐ No (go directly to item 3)
☐ 2 mm / PU-2 ☐ 2.6 mm / PU-N4* 2.5
☐ 3 mm / PU-3 ☐ 4 mm / PU-4

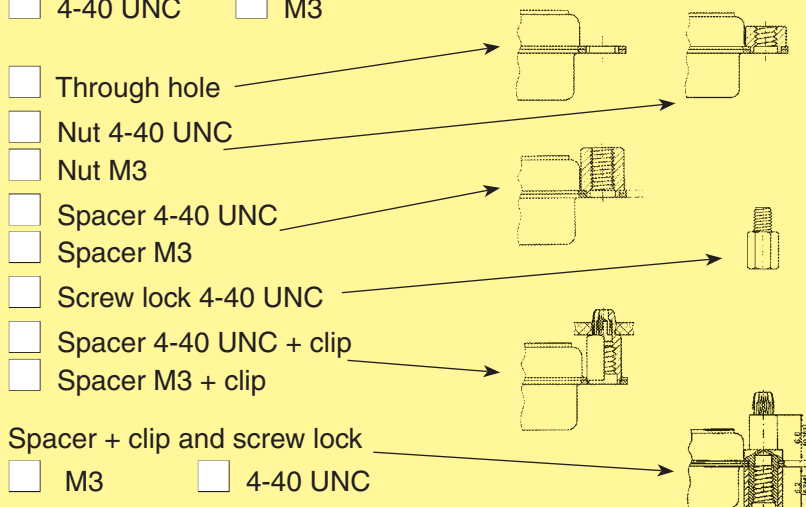
HARTING customer request form for pcb connectors

3 Pcb mounting accessories (select appropriate fixing accessories)

3.1 Right angled version

- ☐ Through hole
☐ Nut 4-40 UNC
☐ Nut M3
☐ Metal bracket
☐ Snap clip
 Screw lock
☐ fixed ☐ removable
☐ 4-40 UNC ☐ M3
- 

3.2 Straight version

- ☐ Through hole
☐ Nut 4-40 UNC
☐ Nut M3
☐ Spacer 4-40 UNC
☐ Spacer M3
☐ Screw lock 4-40 UNC
☐ Spacer 4-40 UNC + clip
☐ Spacer M3 + clip
 Spacer + clip and screw lock
☐ M3 ☐ 4-40 UNC
- 

4 Additional information

Pcb thickness:

Operating temperature:

Is hot plugging required

Is a vacuum pick and place process considered?

Is blind mating feature required?

(if possible provide pcb layout with plating specifications)

☐ standard

☐ No

☐ No

☐ No

☐ Yes

☐ Yes

☐ Yes (provide precise requirements)

☐ SMC compatible

Short description: _____

Name: _____

Company: _____

Address: _____

Phone: _____

Fax: _____

E-Mail: _____

Drawing: ☐ no ☐ yes

Samples: ☐ no ☐ yes, quantity

Volume (pcs./year): _____

Special requirements: _____

HARTING customer request form for cable connectors

1 Connector gender

- ☐ Plug (male contacts)
☐ Receptacle (female contacts)



21W4 mixed male for cable

2 Contact arrangement

Standard

- | | | | |
|------------------------------|-------------------------------|--------------------------------|-------------------------------|
| ☐ 3W3 | ☐ 8W8 | ☐ 17W2 | |
| ☐ 5W1 | ☐ 9W4 | ☐ 21W1 | |
| ☐ 5W5 | ☐ 11W1 | ☐ 21WA4 | |
| ☐ 7W2 | ☐ 13W3 | ☐ 24W7 | ☐ 27W2 |
| ☐ 7W7 | ☐ 13W6 | ☐ 25W3 | ☐ 36W4 |

Special configurations
(mixed contact genders)

- ☐ 2W2C ☐ 3W3C

2.1 Any signal contacts?

- ☐ Yes (fill in questions below) ☐ No (go directly to item 2.2)

Termination type

- ☐ Crimp ☐ Solder cup S4 [0.76 µm Au]

Signal cable size for crimp contact

- ☐ AWG 20-24 ☐ AWG 26-28

Crimp contact performance level

- ☐ S4 [0.76 µm Au / 0.2 µm Au]
☐ PL3 [0.2 µm Au / 5.0 µm Sn]

2.2 Any power contacts?

- ☐ Yes (fill in questions below) ☐ No (go directly to item 2.3)

Current rating

- ☐ 10 A ☐ 20 A ☐ 30 A ☐ 40 A

Termination type

- ☐ Crimp ☐ Solder cup

Performance level

[mating side / termination side]

- ☐ S4 [0.76 µm Au / 0.2 µm Au]
☐ PL3 [0.2 µm Au / 5.0 µm Sn]

2.3 Any coaxial contacts?

- ☐ Yes (fill in questions below) ☐ No (go directly to item 2.4)

Impedance

- ☐ 50 Ω ☐ 75 Ω

Termination type

- ☐ Crimp/crimp
☐ Crimp/solder [inner conductor is soldered, outer crimped]

Performance level

[mating side inner / outer conductor]

- ☐ S4 [1.3 µm Au / 0.76 µm Au]
☐ PL3 [0.2 µm Au / 0.2 µm Au]

Cable reference (e.g. RG 178): _____

HARTING customer request form for cable connectors

2.4 Any high voltage contacts? ☐ Yes ☐ No (go directly to item 2.5)

2.5 Any pneumatic contacts? ☐ Yes (fill in questions below) ☐ No (go directly to item 3)

Tube inner diameter /
suitable compressed air tube

☐ 2 mm / PU-2
☐ 3 mm / PU-3

☐ 2.6 mm / PU-N4* 2.5
☐ 4 mm / PU-4

3 Cable accessories

HARTING has a wide range of hoods including plastic, metallized plastic and full metal versions.

Name: _____	Drawing: ☐ no ☐ yes _____
Company: _____	Samples: ☐ no ☐ yes, quantity _____
Address: _____ _____	Volume (pcs./year): _____ _____
Phone: _____	Special requirements: _____
Fax: _____	_____
E-Mail: _____	_____

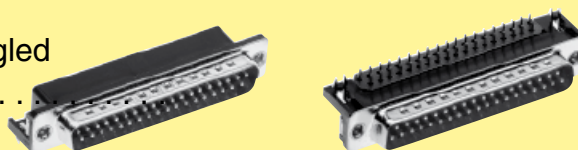
D-Sub – Filter subminiature D connectors, 2.54 mm pitch

Page

General information

**05.02****Ferrite-filter**

Technical characteristics

05.03Connectors with solder pins,
straight**05.04**Connectors with solder pins, right angled
(US footprint 2.84 mm)**05.05**

Connectors with solder buckets

**05.06****C-filter**

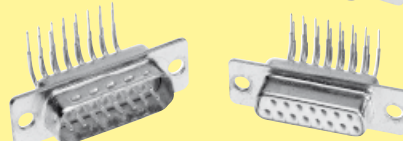
Technical characteristics

05.07

Attenuation characteristics for standard capacitance values

05.08

Filter adapters

**05.09**Connectors with turned solder pins,
straight**05.10**Connectors with turned solder pins, right angled
(European footprint 2.54 mm)**05.16**

Connectors with solder buckets

**05.28**

Panel cut outs / panel mountings

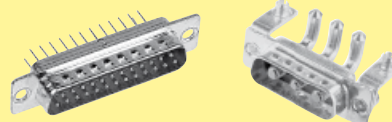
05.32

Customized solutions

General information

05.33

HARTING customer request form

05.36

Interference – Yesterdays problem!

In a fast developing technological environment the management of electromagnetic interference is becoming more challenging.

Therefore HARTING developed a range of filter solutions to help designers of electronic equipments to achieve the demanding goal of electromagnetic compatibility.

HARTING offers a wide range of solutions by the integration of a filter inside one of the most standard I/O ports on the market; the D-Sub.

From standard simple ferrite-filter solution to complex customized high performance filters, you will be able to find in the HARTING filter D-Sub range the adequate solution to protect your application from any introduction or radiation of noise through D-Sub port apertures.

Advantages

Wide range:

- 9, 15, 25 and 37 contact versions
- Various terminations such as solder buckets, straight and right angled solder pins
- A large range of accessories
- High performance (C-filter) as well as simple, quick and cost effective solutions (ferrite-filter)

Compatible with standard wave and lead-free reflow soldering (C-filter)

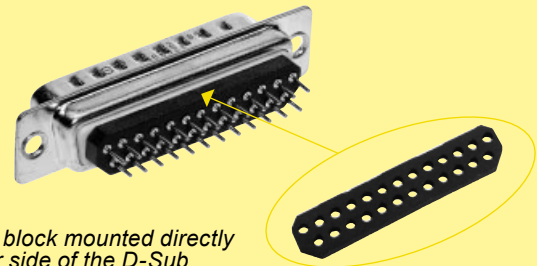
Same layout and shell dimensions as standard D-Sub connectors, no modification of PCB design necessary

Elimination of ringing, crosstalk phenomenon thanks to specific multilayer PCB used in C-filter design.

Flexible filter structure allowing a wide range of customization:

- Filter value (even pin by pin approach)
- Pi-filter
- Dielectric withstanding and working voltage
- Specific ESD / lightning protection

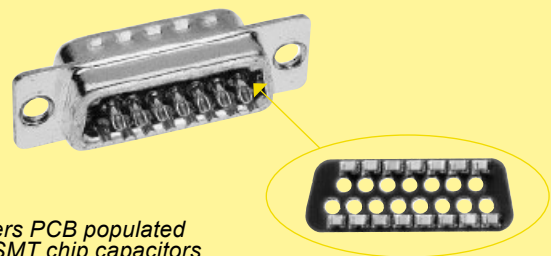
HARTINGs broad Filter range



Ferrite block mounted directly on rear side of the D-Sub

Ferrite-filter

Ferrite-filter D-Subs providing a low level of filtering thanks to simple blocks of inductive ferrite attached to the back end of the connectors. Providing a few dB attenuation only at high frequencies HARTING ferrite-filter D-Subs represent a cost effective solution in applications where the emission level is close to the limit.



4 layers PCB populated with SMT chip capacitors

C-filter

To address higher EMI disturbances HARTING propose a comprehensive range of C-filter D-Sub connectors. HARTING C-filter D-Sub integrates a patented 4 layer printed circuit board equipped with chip capacitors. This patented solution provides complete protection of the I/O port due to the filtering performance of the capacitors and the screening effect of the PCB. Further more the 4 layers PCB also limits the ability of interference to enter the equipment through the D-Sub aperture. Available in 4 standard filter values 47, 470, 1000 and 3900 pF HARTING C-filter D-Subs represent for all designers a smart filtering solution allowing replacement of a “defective” port by a filtered one without any change of the PCB design.

Filter adapter

To support engineers in the diagnosis of EMI disturbances HARTING has developed, in addition to its filter series a range of male/female filter D-Sub adapters.

These back-to-back adapters can be used as testing tools and replaced later on in production directly by a filtered D-Sub connector.

Number of contacts 9, 15, 25, 37

Working current 7.5 A max.

Working voltage 250 V AC max.

Dielectric withstanding voltage 500 V AC for 1 minute

Contact resistance $\leq 15 \text{ m}\Omega$
Insulation resistance $\geq 1000 \text{ M}\Omega$

Temperature range $-55^\circ\text{C} \dots +105^\circ\text{C}$

Terminations
 a) Solder buckets AWG 20
 b) Solder pins for P.C.B. holes
 $\varnothing 1 \pm 0.05 \text{ mm}$
 c) Solder pins, angled 90°
 for P.C.B. holes
 $\varnothing 1 \pm 0.05 \text{ mm}$

Materials
 Insulation PBT, flame retardant acc. to UL 94-V0

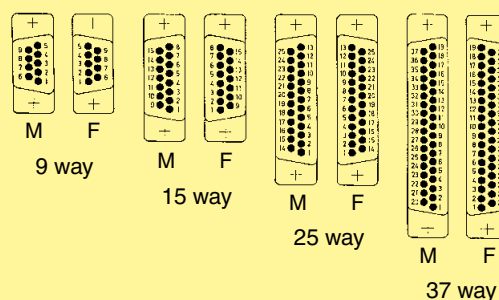
Contacts Copper alloy

Contact surface
 Performance level 3,
 as per IEC 60807-2,
 IEC 60512-25-2

Metal shell Steel (tin-plated)

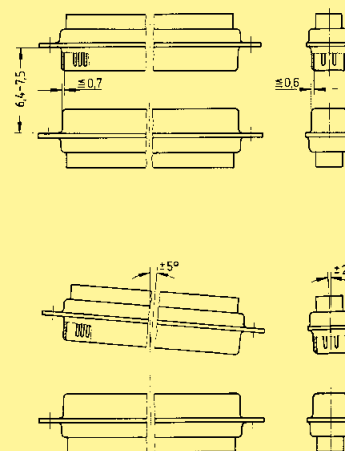
Contact arrangement

View from termination side



M = Male connector
 F = Female connector

Mating conditions as per CECC 75 301

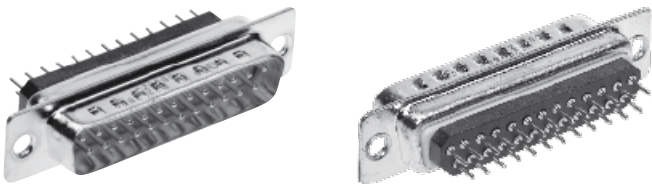


Minimum insertion loss

Frequency [MHz]	Attenuation [dB]
1	0.5
10	1.0
50	2.5
100	3.0
500	3.5
1000	4.0

Number of contacts

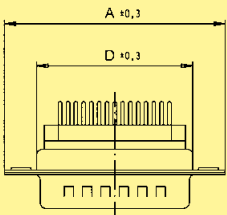
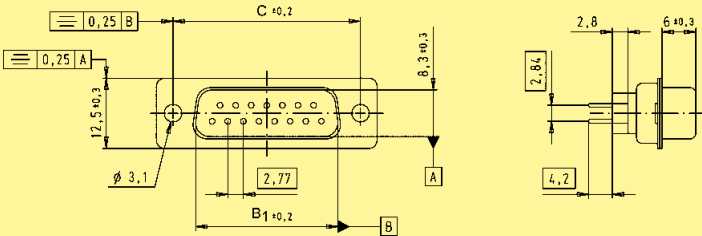
9–25



Solder pins, straight, through hole

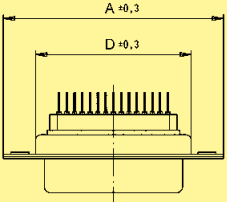
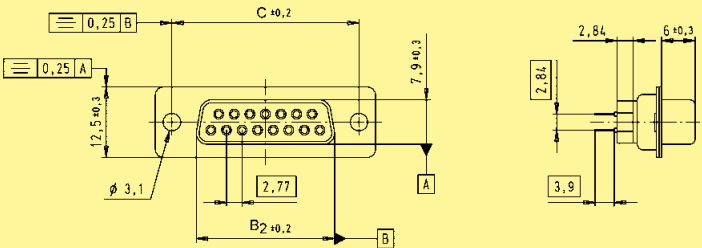
Identification	No. of contacts	Part No.	
Connectors with ferrite-filter		male connectors	female connectors
	9	09 64 122 7800	09 64 112 7800
	15	09 64 222 7800	09 64 212 7800
	25	09 64 322 7800	09 64 312 7800

Male connector

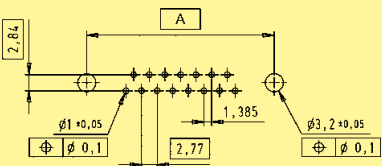


No. of contacts	A	B ₁	B ₂	C	D
9	30.8	16.92	16.3	25.0	19.2
15	39.2	25.25	24.6	33.3	27.7
25	53.1	38.96	38.3	47.1	41.1

Female connector



Board drillings



Dimensions in mm

Number of contacts

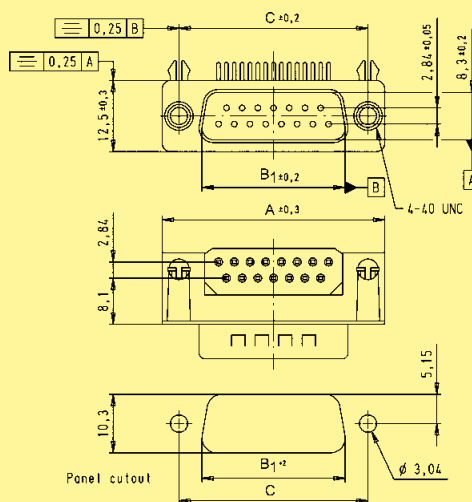
9–37



Solder pins, right angled, board lock and clinch nut

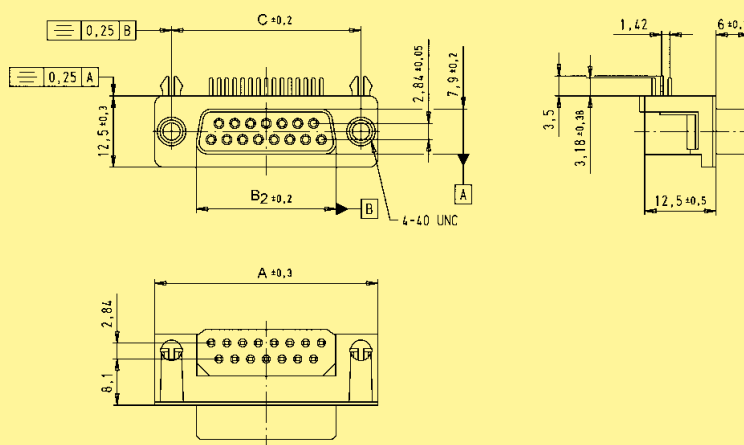
Identification	No. of contacts	Part No.
Connectors with ferrite-filter		male connectors
		female connectors
	9	09 64 123 7802
	15	09 64 223 7802
	25	09 64 323 7802
	37	09 64 423 7802

Male connector

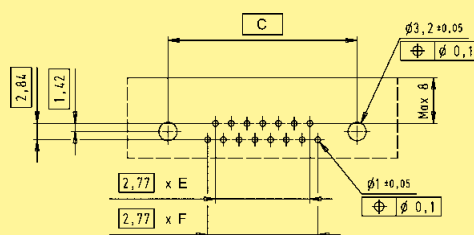


No. of contacts	A	B ₁	B ₂	C	E	F
9	30.8	16.92	16.3	25.0	3	4
15	39.2	25.25	24.6	33.3	6	7
25	53.1	38.96	38.3	47.1	11	12
37	69.4	55.42	54.8	63.5	17	18

Female connector



Board drillings



Dimensions in mm

Number of contacts

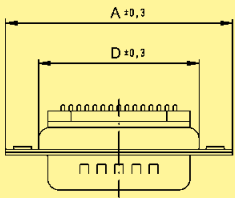
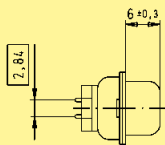
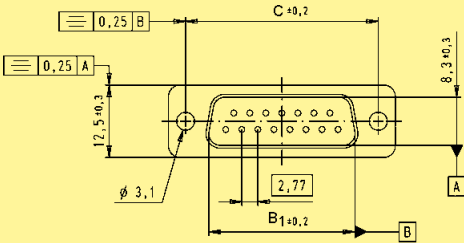
9-37



Solder buckets, through hole

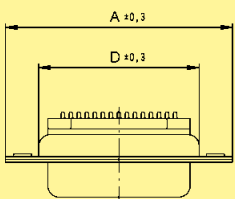
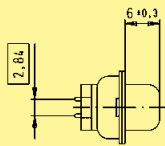
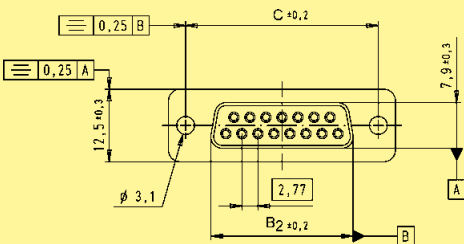
Identification	No. of contacts	Part No.	
Connectors with ferrite-filter		male connectors	female connectors
	9	09 64 121 7800	09 64 111 7800
	15	09 64 221 7800	09 64 211 7800
	25	09 64 321 7800	09 64 311 7800
	37	09 64 421 7800	09 64 411 7800

Male connector



No. of contacts	A	B ₁	B ₂	C	D
9	30.8	16.92	16.3	25.0	19.2
15	39.2	25.25	24.6	33.3	27.7
25	53.1	38.96	38.3	47.1	41.1
37	69.4	55.42	54.8	63.5	57.3

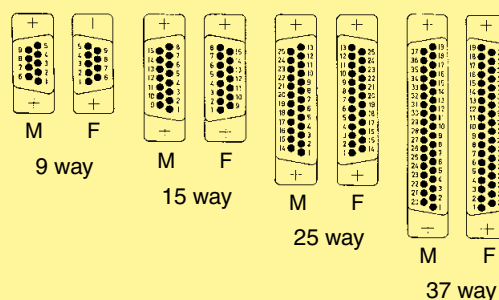
Female connector



Number of contacts	9, 15, 25, 37
Working current	7.5 A max. (connectors) 6.5 A max. (filter adapters)
Working voltage	100 V max. for standard capacitance values – higher working voltages are available as specific.
Dielectric withstanding voltage	250 V DC max. – higher dielectric withstanding voltages are available as specific (see page 05.34)
Contact resistance	$\leq 10 \text{ m}\Omega$
Insulation resistance	$\geq 1000 \text{ M}\Omega$
Temperature range	-55 °C ... + 125 °C (connectors) Heat deflection temperature limit according to DIN 53 461: + 255 °C -20 °C ... + 125 °C (filter adapters)
Terminations	a) Solder buckets max. 0.8 mm ² b) Solder pins Ø 0.6 mm for P.C.B. holes Ø 0.8/1 mm c) Solder pins, angled 90° Ø 0.6 mm for P.C.B. holes Ø 0.8/1 mm
Materials	
Insulation	PCT, glass-fibre filled, flame retardant acc. to UL 94-V0 Colour: natural
Contacts	Copper alloy Male and female contacts are turned
Contact surface	
Contact zone	Selectively plated according to performance level
Performance level	Performance level 2, as per CECC 75 301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60 512
Metal shell	Steel

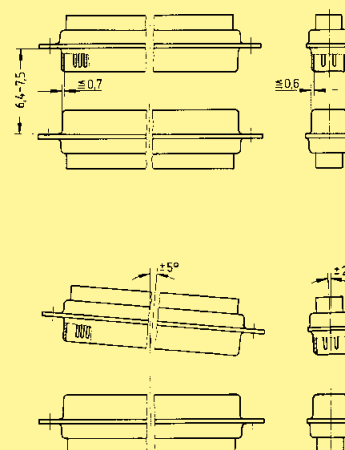
Contact arrangement

View from termination side



M = Male connector
F = Female connector

Mating conditions as per CECC 75 301



Attenuation characteristics for standard capacitance values

Min. insertion loss

Capacitance [pF] ¹⁾	Attenuation (in dB) vs. frequency [MHz]						
	1	5	10	50	100	500	1000
47						30	35
470			1	11	16	35	32
1000		1	3	12	24	38	30
3900	1	6	11	25	35	38	32

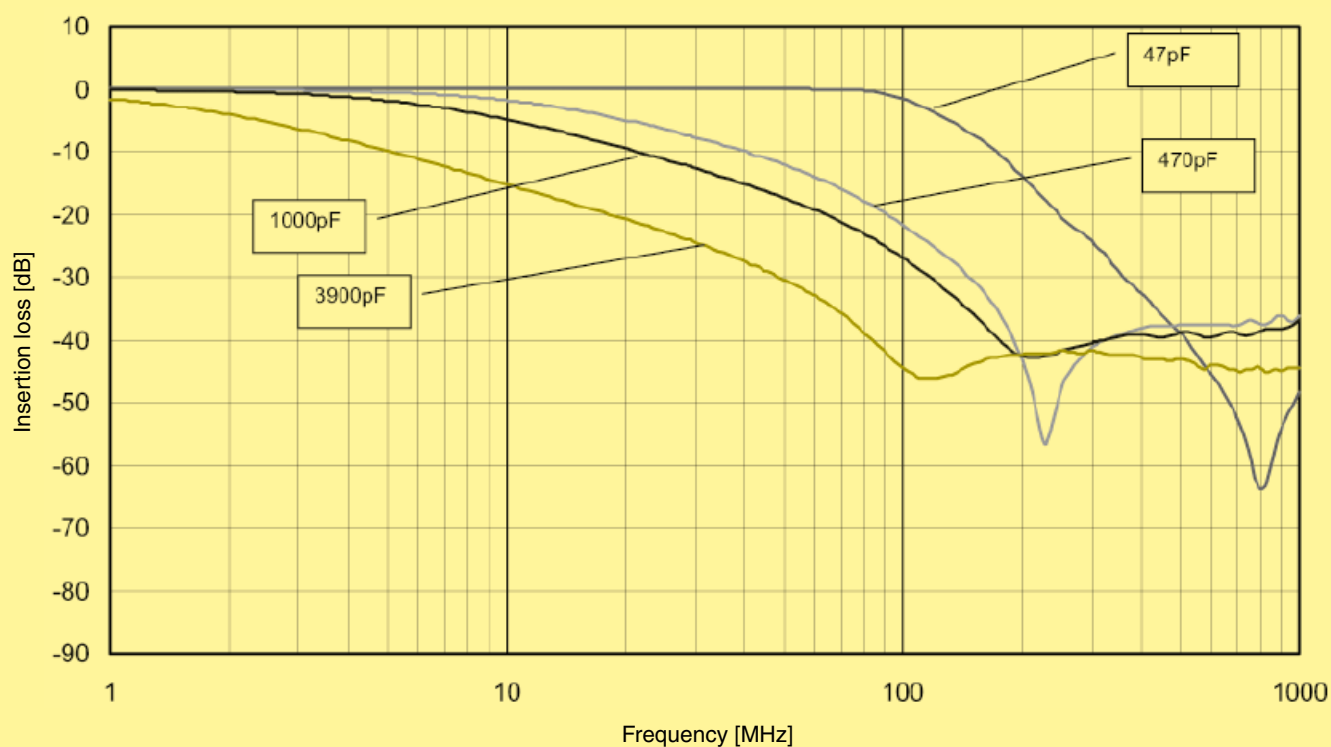
¹⁾ Capacitance tolerance = $\pm 20\%$ (For other capacitor values see pages 05.34 ff).

Measured in 50 Ω system according to MIL-STD-220, no load.

Working voltage: 100 V max. for standard capacitance values – higher working voltages are available as specific.

Dielectric withstanding voltage: 250 V DC max. – higher dielectric withstanding voltages are available as specific (see page 05.34)

Typical insertion loss for different filters (measured)



Number of contacts

9–37

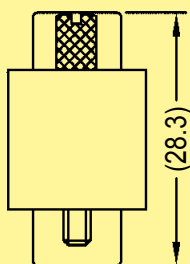
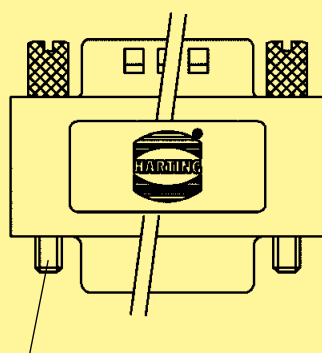
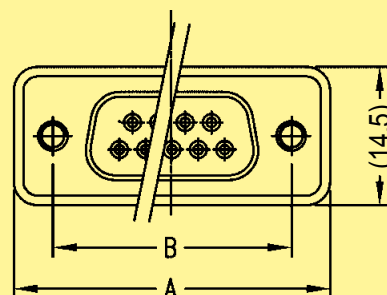


Filter adapters

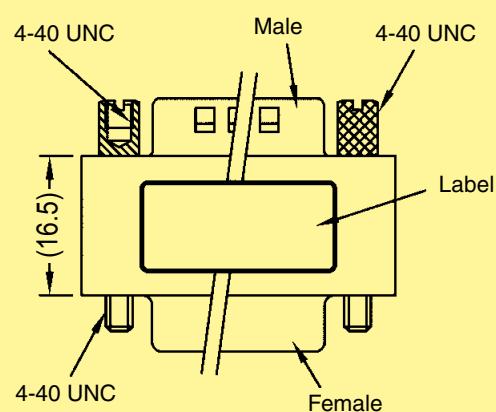
Identification	No. of contacts	Part No.
Male / female filter adapters with C-filter	9	09 64 100 72 ..
	15	09 64 200 72 ..
	25	09 64 300 72 ..
	37	09 64 400 72 ..
Please insert digit for capacitance	47 pF ▶ 10	
	470 pF ▶ 20	
	1000 pF ▶ 30	
	3900 pF ▶ 40	

Dimensions

	A	B
9	32.8	24.99
15	41.1	33.32
25	55.0	47.04
37	71.3	63.50

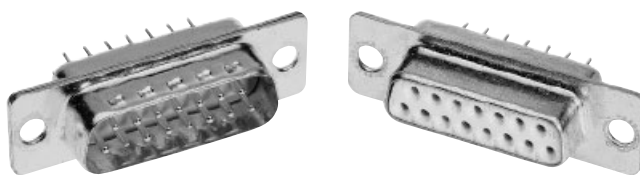


Screws are not pre-mounted to allow mounting from any ends



Number of contacts

9–37



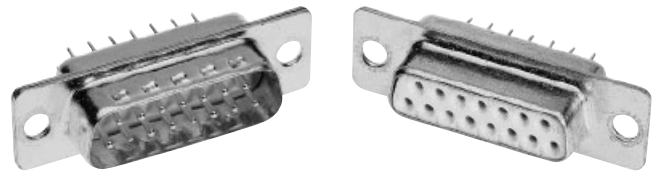
Turned solder pins, straight, through hole

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter			
	9	09 64 122 7210	09 64 112 7210
	15	09 64 222 7210	09 64 212 7210
	25	09 64 322 7210	09 64 312 7210
	37	09 64 422 7210	09 64 412 7210
Connectors with 470 pF C-filter			
	9	09 64 122 7220	09 64 112 7220
	15	09 64 222 7220	09 64 212 7220
	25	09 64 322 7220	09 64 312 7220
	37	09 64 422 7220	09 64 412 7220
Connectors with 1000 pF C-filter			
	9	09 64 122 7230	09 64 112 7230
	15	09 64 222 7230	09 64 212 7230
	25	09 64 322 7230	09 64 312 7230
	37	09 64 422 7230	09 64 412 7230
Connectors with 3900 pF C-filter			
	9	09 64 122 7240	09 64 112 7240
	15	09 64 222 7240	09 64 212 7240
	25	09 64 322 7240	09 64 312 7240
	37	09 64 422 7240	09 64 412 7240

D-Sub

Number of contacts

9-37



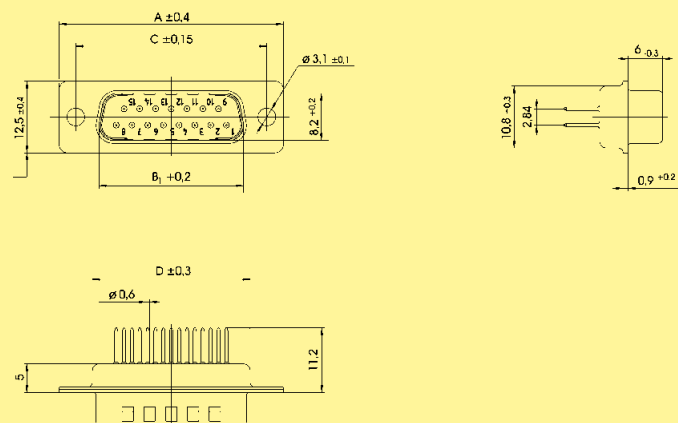
Turned solder pins, straight, through hole

Identification

Drawing

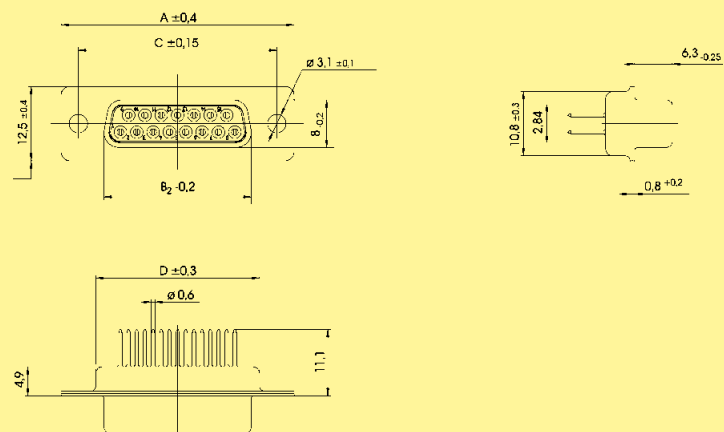
Dimensions in mm

Male connector

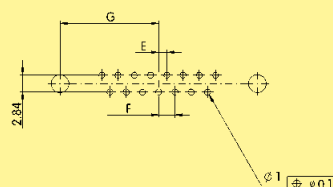


No. of contacts	A	B ₁	B ₂	C	D	E	F	G
9	30.8	16.9	16.4	25.00	19.3	1.37	2.74	12.50
15	39.1	25.2	24.7	33.30	27.5	1.37	2.74	16.65
25	53.0	38.9	38.5	47.04	41.3	1.40	2.77	23.52
37	69.3	55.3	54.9	63.50	57.7	1.40	2.77	31.75

Female connector



Board drillings



Number of contacts

9–37



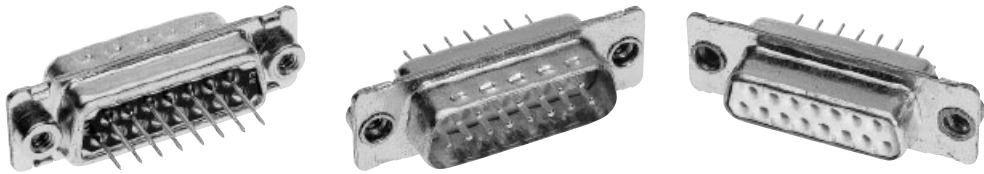
Turned solder pins, straight, clinch nut

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter			
	9	09 64 122 721 .	09 64 112 721 .
	15	09 64 222 721 .	09 64 212 721 .
	25	09 64 322 721 .	09 64 312 721 .
	37	09 64 422 721 .	09 64 412 721 .
Connectors with 470 pF C-filter			
	9	09 64 122 722 .	09 64 112 722 .
	15	09 64 222 722 .	09 64 212 722 .
	25	09 64 322 722 .	09 64 312 722 .
	37	09 64 422 722 .	09 64 412 722 .
Connectors with 1000 pF C-filter			
	9	09 64 122 723 .	09 64 112 723 .
	15	09 64 222 723 .	09 64 212 723 .
	25	09 64 322 723 .	09 64 312 723 .
	37	09 64 422 723 .	09 64 412 723 .
Connectors with 3900 pF C-filter			
	9	09 64 122 724 .	09 64 112 724 .
	15	09 64 222 724 .	09 64 212 724 .
	25	09 64 322 724 .	09 64 312 724 .
	37	09 64 422 724 .	09 64 412 724 .
Please insert digit for flange thread			
	4-40 UNC ▶ 7 M3 ▶ 8		

D-Sub

Number of contacts

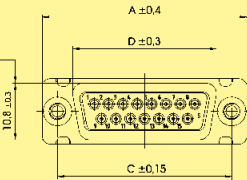
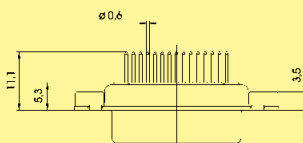
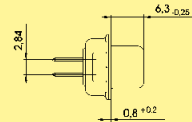
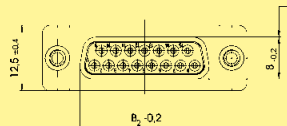
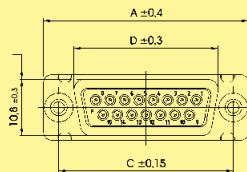
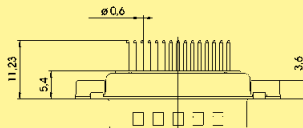
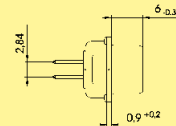
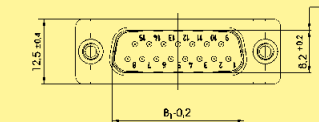
9-37



Turned solder pins, straight, clinch nut

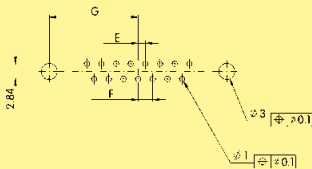
Identification Drawing Dimensions in mm

Male connector



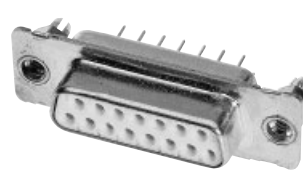
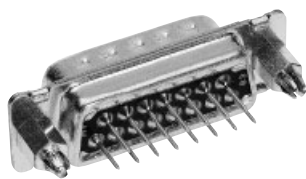
No. of contacts	A	B ₁	B ₂	C	D	E	F	G
9	30.8	16.9	16.4	25.00	19.3	1.37	2.74	12.50
15	39.1	25.2	24.7	33.30	27.5	1.37	2.74	16.65
25	53.0	38.9	38.5	47.04	41.3	1.40	2.77	23.52
37	69.3	55.3	54.9	63.50	57.7	1.40	2.77	31.75

Board drillings



Number of contacts

9–37



Turned solder pins, straight, straight board clips

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter	9	09 64 122 721 .	09 64 112 721 .
	15	09 64 222 721 .	09 64 212 721 .
	25	09 64 322 721 .	09 64 312 721 .
	37	09 64 422 721 .	09 64 412 721 .
Connectors with 470 pF C-filter	9	09 64 122 722 .	09 64 112 722 .
	15	09 64 222 722 .	09 64 212 722 .
	25	09 64 322 722 .	09 64 312 722 .
	37	09 64 422 722 .	09 64 412 722 .
Connectors with 1000 pF C-filter	9	09 64 122 723 .	09 64 112 723 .
	15	09 64 222 723 .	09 64 212 723 .
	25	09 64 322 723 .	09 64 312 723 .
	37	09 64 422 723 .	09 64 412 723 .
Connectors with 3900 pF C-filter	9	09 64 122 724 .	09 64 112 724 .
	15	09 64 222 724 .	09 64 212 724 .
	25	09 64 322 724 .	09 64 312 724 .
	37	09 64 422 724 .	09 64 412 724 .
Please insert digit for flange thread	4-40 UNC ▶ 5		
	M3 ▶ 6		

D-Sub

Number of contacts

9-37



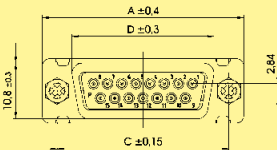
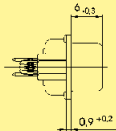
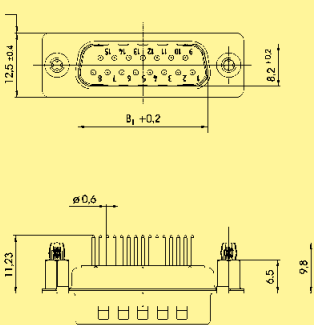
Turned solder pins, straight, straight board clips

Identification

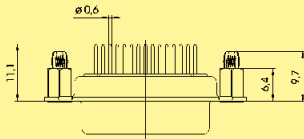
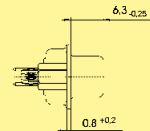
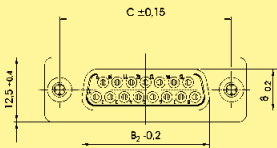
Drawing

Dimensions in mm

Male connector

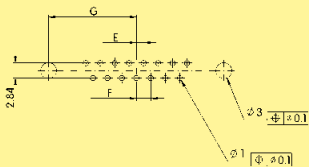


Female connector



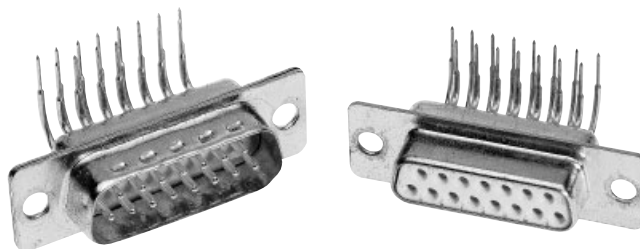
No. of contacts	A	B ₁	B ₂	C	D	E	F	G
9	30.8	16.9	16.4	25.00	19.3	1.37	2.74	12.50
15	39.1	25.2	24.7	33.30	27.5	1.37	2.74	16.65
25	53.0	38.9	38.5	47.04	41.3	1.40	2.77	23.52
37	69.3	55.3	54.9	63.50	57.7	1.40	2.77	31.75

Board drillings



Number of contacts

9–37



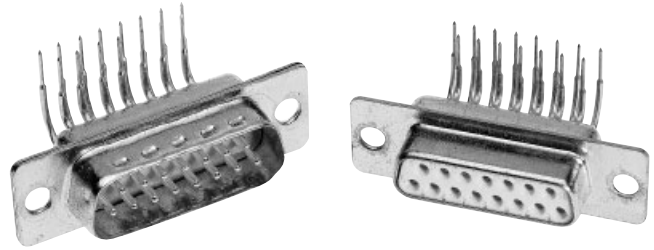
Turned solder pins, right angled, through hole

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter			
	9	09 64 124 7210	09 64 114 7210
	15	09 64 224 7210	09 64 214 7210
	25	09 64 324 7210	09 64 314 7210
	37	09 64 424 7210	09 64 414 7210
Connectors with 470 pF C-filter			
	9	09 64 124 7220	09 64 114 7220
	15	09 64 224 7220	09 64 214 7220
	25	09 64 324 7220	09 64 314 7220
	37	09 64 424 7220	09 64 414 7220
Connectors with 1000 pF C-filter			
	9	09 64 124 7230	09 64 114 7230
	15	09 64 224 7230	09 64 214 7230
	25	09 64 324 7230	09 64 314 7230
	37	09 64 424 7230	09 64 414 7230
Connectors with 3900 pF C-filter			
	9	09 64 124 7240	09 64 114 7240
	15	09 64 224 7240	09 64 214 7240
	25	09 64 324 7240	09 64 314 7240
	37	09 64 424 7240	09 64 414 7240

D-Sub

Number of contacts

9-37



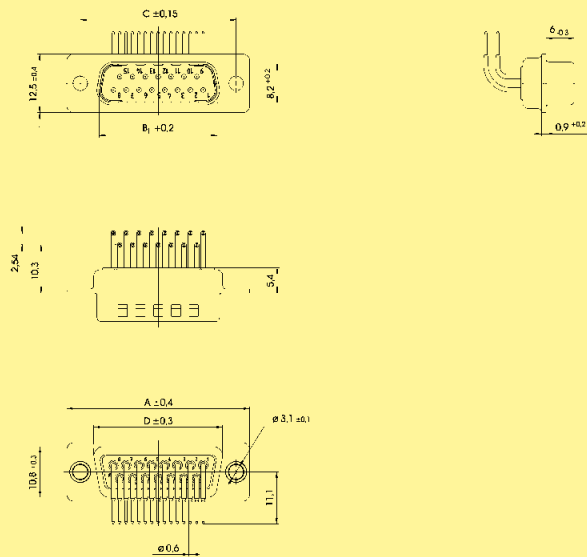
Turned solder pins, right angled, through hole

Identification

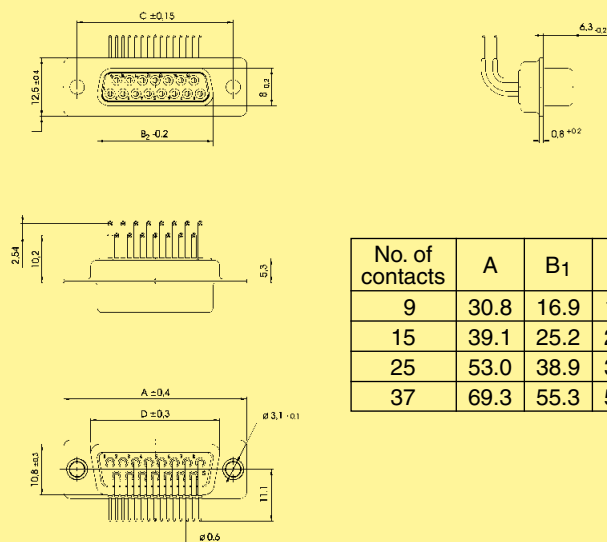
Drawing

Dimensions in mm

Male connector

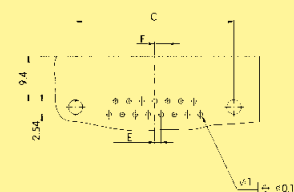


Female connector



No. of contacts	A	B ₁	B ₂	C	D	E	F
9	30.8	16.9	16.4	25.00	19.3	1.37	2.74
15	39.1	25.2	24.7	33.30	27.5	1.37	2.74
25	53.0	38.9	38.5	47.04	41.3	1.40	2.77
37	69.3	55.3	54.9	63.50	57.7	1.40	2.77

Board drillings



Number of contacts

9–37



Turned solder pins, right angled, bracket, board lock and through hole

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter	9	09 64 124 7211	09 64 114 7211
	15	09 64 224 7211	09 64 214 7211
	25	09 64 324 7211	09 64 314 7211
	37	09 64 424 7211	09 64 414 7211
Connectors with 470 pF C-filter	9	09 64 124 7221	09 64 114 7221
	15	09 64 224 7221	09 64 214 7221
	25	09 64 324 7221	09 64 314 7221
	37	09 64 424 7221	09 64 414 7221
Connectors with 1000 pF C-filter	9	09 64 124 7231	09 64 114 7231
	15	09 64 224 7231	09 64 214 7231
	25	09 64 324 7231	09 64 314 7231
	37	09 64 424 7231	09 64 414 7231
Connectors with 3900 pF C-filter	9	09 64 124 7241	09 64 114 7241
	15	09 64 224 7241	09 64 214 7241
	25	09 64 324 7241	09 64 314 7241
	37	09 64 424 7241	09 64 414 7241

Number of contacts

9-37



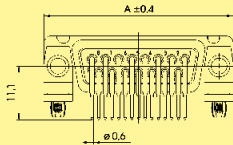
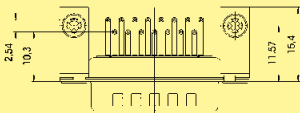
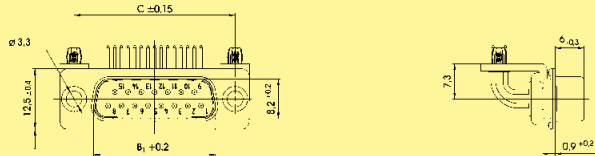
Turned solder pins, right angled, bracket, board lock and through hole

Identification

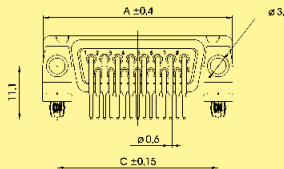
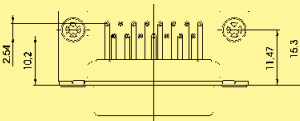
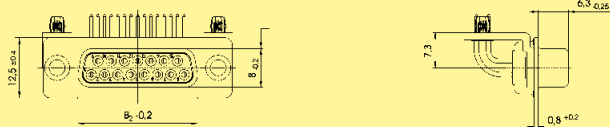
Drawing

Dimensions in mm

Male connector

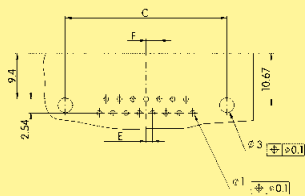


Female connector



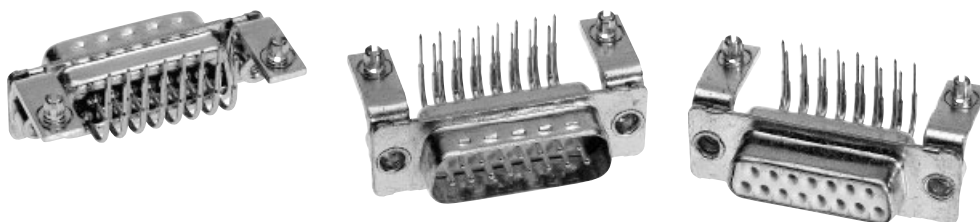
No. of contacts	A	B ₁	B ₂	C	E	F
9	30.8	16.9	16.4	25.00	1.37	2.74
15	39.1	25.2	24.7	33.30	1.37	2.74
25	53.0	38.9	38.5	47.04	1.40	2.77
37	69.3	55.3	54.9	63.50	1.40	2.77

Board drillings



Number of contacts

9–37



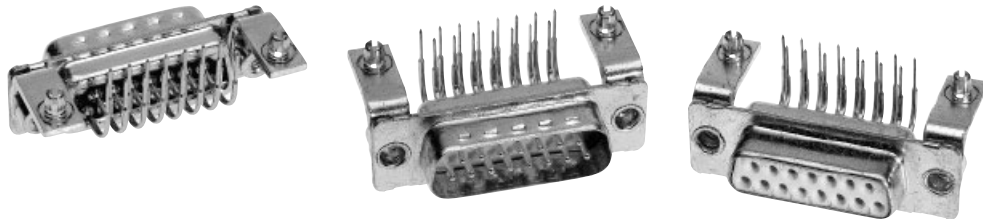
Turned solder pins, right angled, bracket, board lock and clinch nut

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter	9	09 64 124 721 .	09 64 114 721 .
	15	09 64 224 721 .	09 64 214 721 .
	25	09 64 324 721 .	09 64 314 721 .
	37	09 64 424 721 .	09 64 414 721 .
Connectors with 470 pF C-filter	9	09 64 124 722 .	09 64 114 722 .
	15	09 64 224 722 .	09 64 214 722 .
	25	09 64 324 722 .	09 64 314 722 .
	37	09 64 424 722 .	09 64 414 722 .
Connectors with 1000 pF C-filter	9	09 64 124 723 .	09 64 114 723 .
	15	09 64 224 723 .	09 64 214 723 .
	25	09 64 324 723 .	09 64 314 723 .
	37	09 64 424 723 .	09 64 414 723 .
Connectors with 3900 pF C-filter	9	09 64 124 724 .	09 64 114 724 .
	15	09 64 224 724 .	09 64 214 724 .
	25	09 64 324 724 .	09 64 314 724 .
	37	09 64 424 724 .	09 64 414 724 .
Please insert digit for flange thread	4-40 UNC ▶ 2		
	M3 ▶ 3		

D-Sub

Number of contacts

9-37



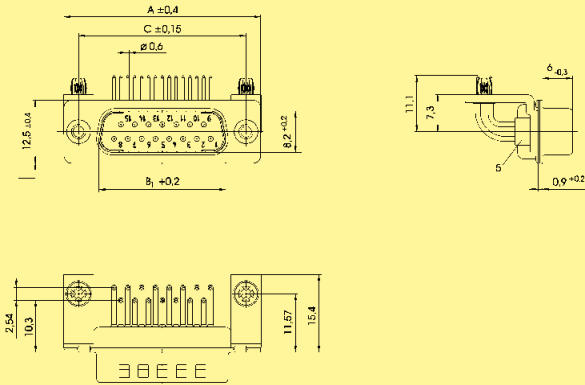
Turned solder pins, right angled, bracket, board lock and clinch nut

Identification

Drawing

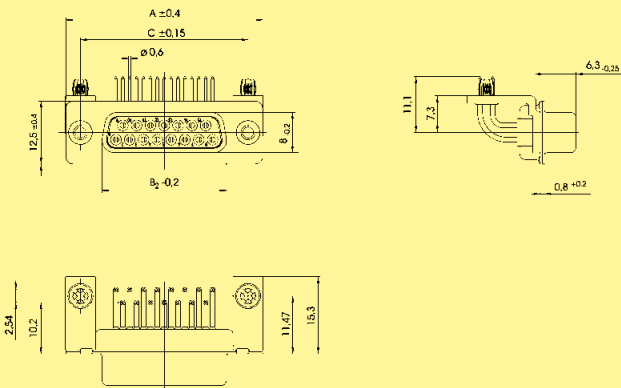
Dimensions in mm

Male connector

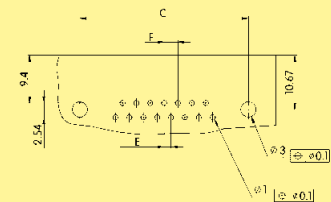


No. of contacts	A	B ₁	B ₂	C	E	F
9	30.8	16.9	16.4	25.00	1.37	2.74
15	39.1	25.2	24.7	33.30	1.37	2.74
25	53.0	38.9	38.5	47.04	1.40	2.77
37	69.3	55.3	54.9	63.50	1.40	2.77

Female connector

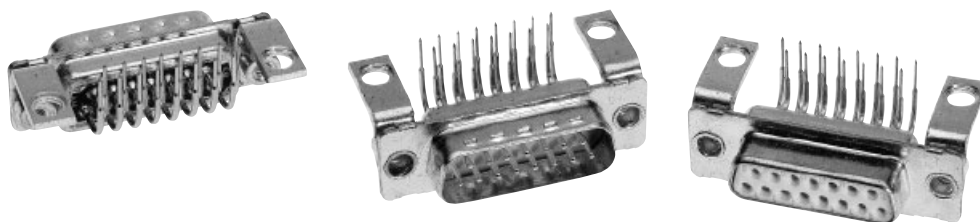


Board drillings



Number of contacts

9–37



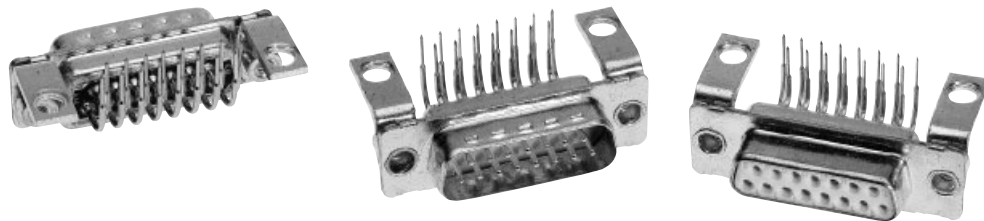
Turned solder pins, right angled, bracket and clinch nut

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter	9	09 64 124 721 .	09 64 114 721 .
	15	09 64 224 721 .	09 64 214 721 .
	25	09 64 324 721 .	09 64 314 721 .
	37	09 64 424 721 .	09 64 414 721 .
Connectors with 470 pF C-filter	9	09 64 124 722 .	09 64 114 722 .
	15	09 64 224 722 .	09 64 214 722 .
	25	09 64 324 722 .	09 64 314 722 .
	37	09 64 424 722 .	09 64 414 722 .
Connectors with 1000 pF C-filter	9	09 64 124 723 .	09 64 114 723 .
	15	09 64 224 723 .	09 64 214 723 .
	25	09 64 324 723 .	09 64 314 723 .
	37	09 64 424 723 .	09 64 414 723 .
Connectors with 3900 pF C-filter	9	09 64 124 724 .	09 64 114 724 .
	15	09 64 224 724 .	09 64 214 724 .
	25	09 64 324 724 .	09 64 314 724 .
	37	09 64 424 724 .	09 64 414 724 .
Please insert digit for flange thread	4-40 UNC ▶ 6		
	M3 ▶ 7		

D-Sub

Number of contacts

9-37



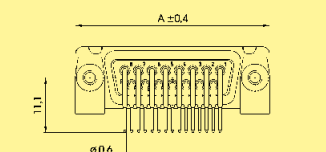
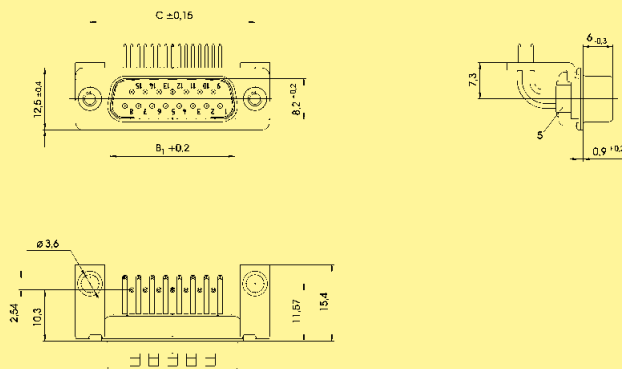
Turned solder pins, right angled, bracket and clinch nut

Identification

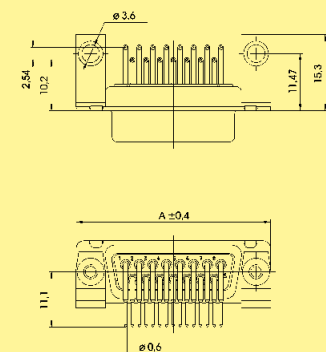
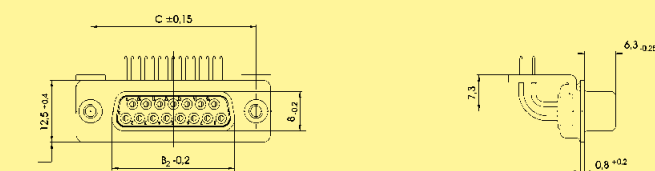
Drawing

Dimensions in mm

Male connector

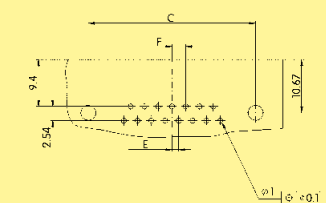


Female connector



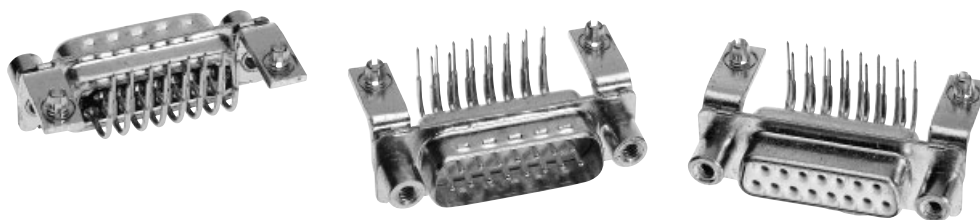
No. of contacts	A	B ₁	B ₂	C	E	F
9	30.8	16.9	16.4	25.00	1.37	2.74
15	39.1	25.2	24.7	33.30	1.37	2.74
25	53.0	38.9	38.5	47.04	1.40	2.77
37	69.3	55.3	54.9	63.50	1.40	2.77

Board drillings



Number of contacts

9–37



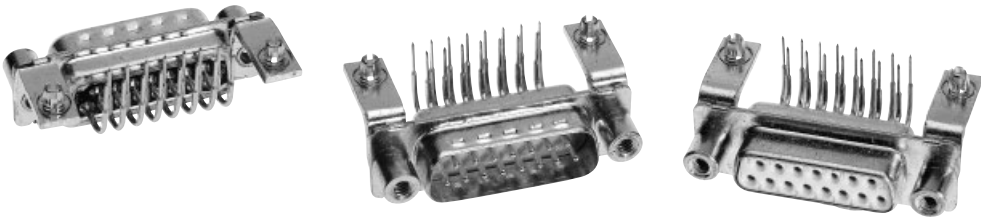
Turned solder pins, right angled, bracket, board lock and female screw

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter	9	09 64 124 721 .	09 64 114 721 .
	15	09 64 224 721 .	09 64 214 721 .
	25	09 64 324 721 .	09 64 314 721 .
	37	09 64 424 721 .	09 64 414 721 .
Connectors with 470 pF C-filter	9	09 64 124 722 .	09 64 114 722 .
	15	09 64 224 722 .	09 64 214 722 .
	25	09 64 324 722 .	09 64 314 722 .
	37	09 64 424 722 .	09 64 414 722 .
Connectors with 1000 pF C-filter	9	09 64 124 723 .	09 64 114 723 .
	15	09 64 224 723 .	09 64 214 723 .
	25	09 64 324 723 .	09 64 314 723 .
	37	09 64 424 723 .	09 64 414 723 .
Connectors with 3900 pF C-filter	9	09 64 124 724 .	09 64 114 724 .
	15	09 64 224 724 .	09 64 214 724 .
	25	09 64 324 724 .	09 64 314 724 .
	37	09 64 424 724 .	09 64 414 724 .
Please insert digit for flange thread	4-40 UNC ▶ 4		
	M3 ▶ 5		

D-Sub

Number of contacts

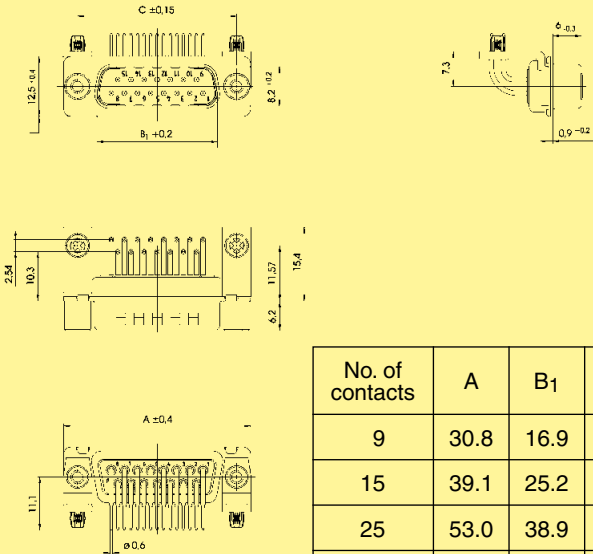
9-37



Turned solder pins, right angled, bracket, board lock and female screw

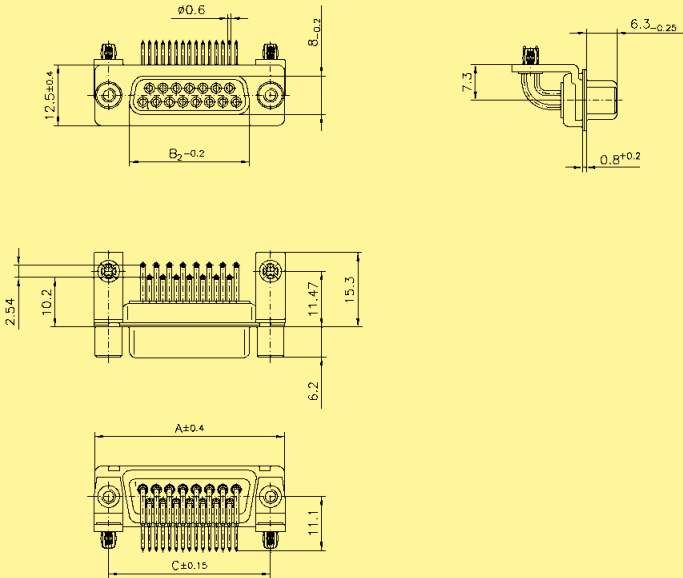
Identification Drawing Dimensions in mm

Male connector

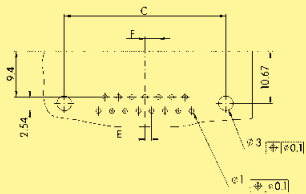


No. of contacts	A	B ₁	B ₂	C	E	F
9	30.8	16.9	16.4	25.00	1.37	2.74
15	39.1	25.2	24.7	33.30	1.37	2.74
25	53.0	38.9	38.5	47.04	1.40	2.77
37	69.3	55.3	54.9	63.50	1.40	2.77

Female connector

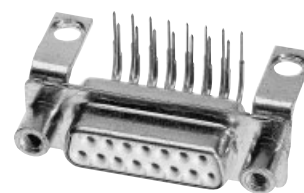
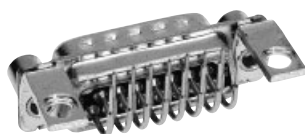


Board drillings



Number of contacts

9–37



Turned solder pins, right angled, bracket and female screw

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter			
	9	09 64 124 721 .	09 64 114 721 .
	15	09 64 224 721 .	09 64 214 721 .
	25	09 64 324 721 .	09 64 314 721 .
	37	09 64 424 721 .	09 64 414 721 .
Connectors with 470 pF C-filter			
	9	09 64 124 722 .	09 64 114 722 .
	15	09 64 224 722 .	09 64 214 722 .
	25	09 64 324 722 .	09 64 314 722 .
	37	09 64 424 722 .	09 64 414 722 .
Connectors with 1000 pF C-filter			
	9	09 64 124 723 .	09 64 114 723 .
	15	09 64 224 723 .	09 64 214 723 .
	25	09 64 324 723 .	09 64 314 723 .
	37	09 64 424 723 .	09 64 414 723 .
Connectors with 3900 pF C-filter			
	9	09 64 124 724 .	09 64 114 724 .
	15	09 64 224 724 .	09 64 214 724 .
	25	09 64 324 724 .	09 64 314 724 .
	37	09 64 424 724 .	09 64 414 724 .
Please insert digit for flange thread			
	4-40 UNC ▶ 8 M3 ▶ 9		

D-Sub

Number of contacts

9-37



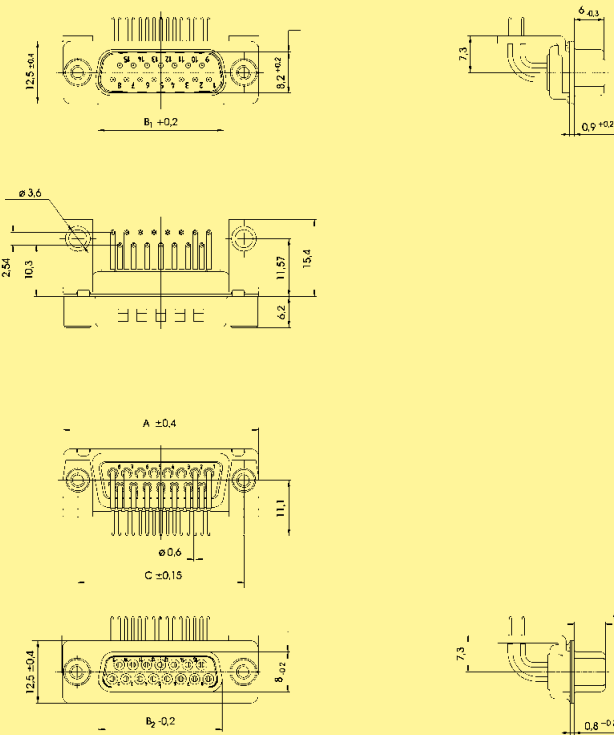
Turned solder pins, right angled, bracket and female screw

Identification

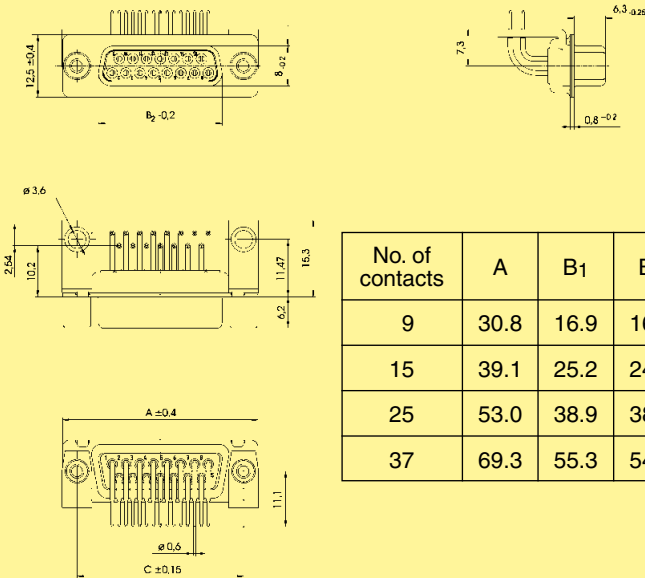
Drawing

Dimensions in mm

Male connector

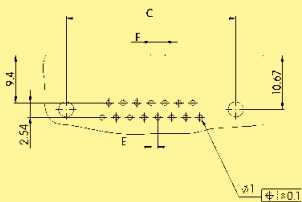


Female connector



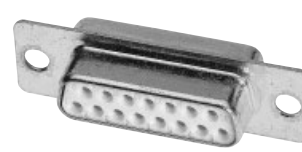
No. of contacts	A	B ₁	B ₂	C	E	F
9	30.8	16.9	16.4	25.00	1.37	2.74
15	39.1	25.2	24.7	33.30	1.37	2.74
25	53.0	38.9	38.5	47.04	1.40	2.77
37	69.3	55.3	54.9	63.50	1.40	2.77

Board drillings



Number of contacts

9–37



Solder buckets, through hole

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter	9	09 64 121 7210	09 64 111 7210
	15	09 64 221 7210	09 64 211 7210
	25	09 64 321 7210	09 64 311 7210
	37	09 64 421 7210	09 64 411 7210
Connectors with 470 pF C-filter	9	09 64 121 7220	09 64 111 7220
	15	09 64 221 7220	09 64 211 7220
	25	09 64 321 7220	09 64 311 7220
	37	09 64 421 7220	09 64 411 7220
Connectors with 1000 pF C-filter	9	09 64 121 7230	09 64 111 7230
	15	09 64 221 7230	09 64 211 7230
	25	09 64 321 7230	09 64 311 7230
	37	09 64 421 7230	09 64 411 7230
Connectors with 3900 pF C-filter	9	09 64 121 7240	09 64 111 7240
	15	09 64 221 7240	09 64 211 7240
	25	09 64 321 7240	09 64 311 7240
	37	09 64 421 7240	09 64 411 7240

Number of contacts

9–37



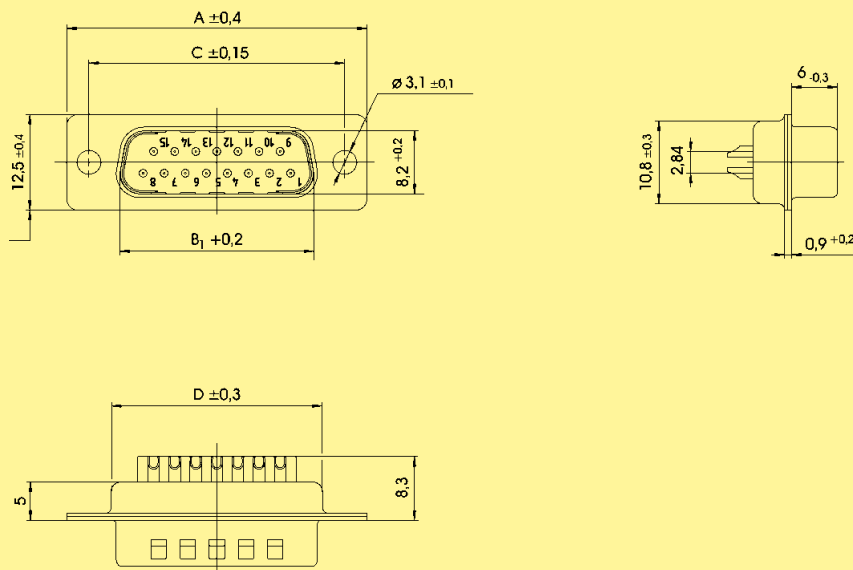
Solder buckets, through hole

Identification

Drawing

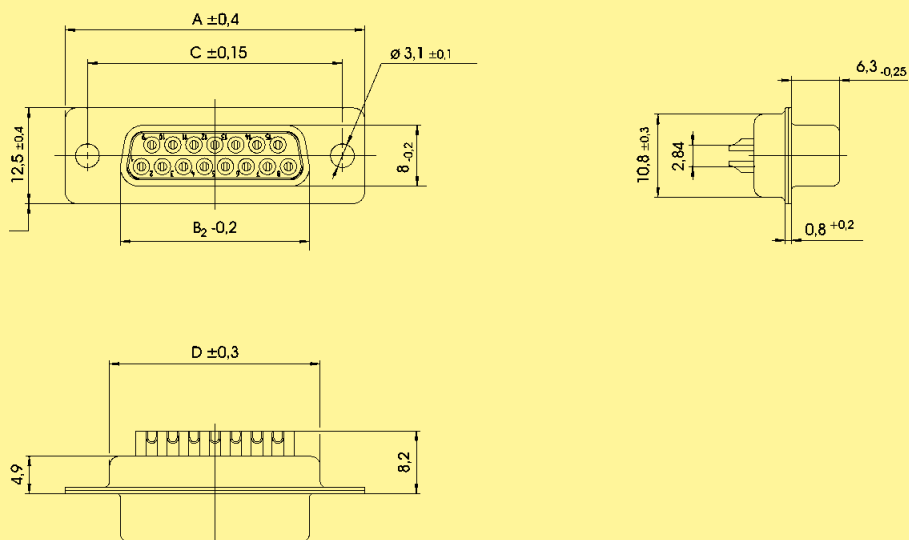
Dimensions in mm

Male connector



No. of contacts	A	B ₁	B ₂	C	D
9	30.8	16.9	16.4	25.00	19.3
15	39.1	25.2	24.7	33.30	27.5
25	53.0	38.9	38.5	47.04	41.3
37	69.3	55.3	54.9	63.50	57.7

Female connector



Number of contacts

9–37



Solder buckets, clinch nut

Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with 47 pF C-filter			
	9	09 64 121 721 .	09 64 111 721 .
	15	09 64 221 721 .	09 64 211 721 .
	25	09 64 321 721 .	09 64 311 721 .
	37	09 64 421 721 .	09 64 411 721 .
Connectors with 470 pF C-filter			
	9	09 64 121 722 .	09 64 111 722 .
	15	09 64 221 722 .	09 64 211 722 .
	25	09 64 321 722 .	09 64 311 722 .
	37	09 64 421 722 .	09 64 411 722 .
Connectors with 1000 pF C-filter			
	9	09 64 121 723 .	09 64 111 723 .
	15	09 64 221 723 .	09 64 211 723 .
	25	09 64 321 723 .	09 64 311 723 .
	37	09 64 421 723 .	09 64 411 723 .
Connectors with 3900 pF C-filter			
	9	09 64 121 724 .	09 64 111 724 .
	15	09 64 221 724 .	09 64 211 724 .
	25	09 64 321 724 .	09 64 311 724 .
	37	09 64 421 724 .	09 64 411 724 .
Please insert digit for flange thread			
	4-40 UNC ▶ 7 M3 ▶ 8		

D-Sub

Number of contacts

9-37



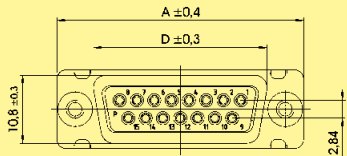
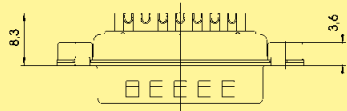
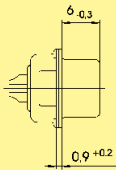
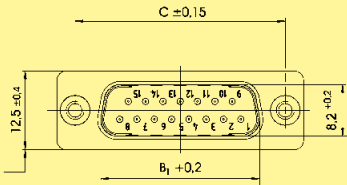
Solder buckets, clinch nut

Identification

Drawing

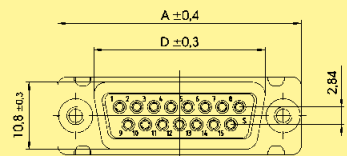
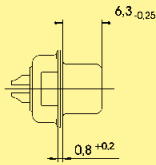
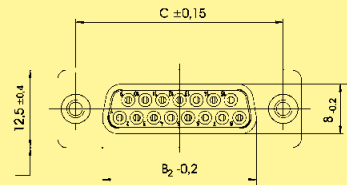
Dimensions in mm

Male connector



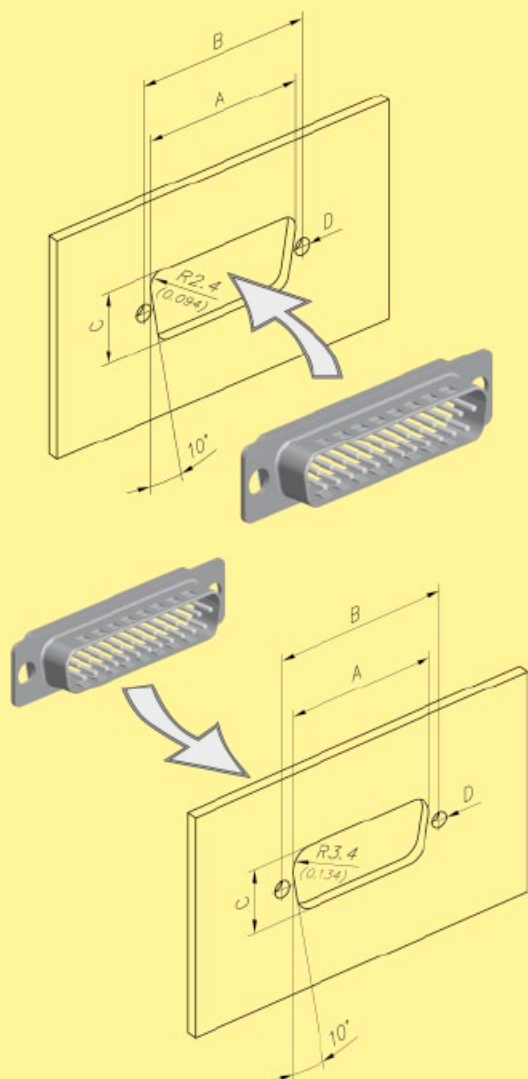
No. of contacts	A	B ₁	B ₂	C	D
9	30.8	16.9	16.4	25.00	19.3
15	39.1	25.2	24.7	33.30	27.5
25	53.0	38.9	38.5	47.04	41.3
37	69.3	55.3	54.9	63.50	57.7

Female connector

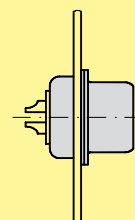


Panel cut outs / panel mountings

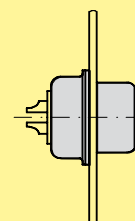
Panel cut outs



Front mounting

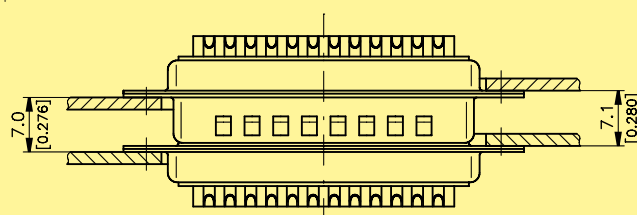
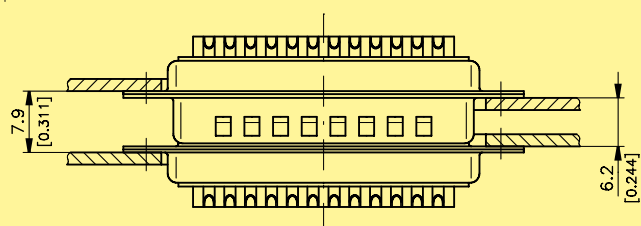


Rear mounting



No. of contacts	Mounting assembly	A ± 0.2	B ± 0.2	C ± 0.2
9	Front	22.2	25.0	12.3
	Rear	20.5	25.0	11.4
15	Front	30.5	33.3	12.3
	Rear	28.8	33.3	11.4
25	Front	44.3	47.0	12.3
	Rear	42.5	47.0	11.4
37	Front	60.7	63.5	12.3
	Rear	59.1	63.5	11.4

Panel mountings



For float mounting option please contact your local HARTING representative.

Dimensions in mm

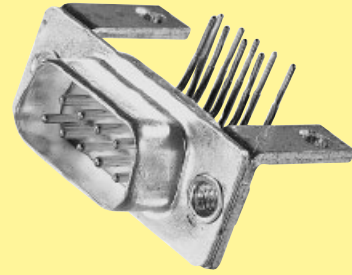
General information

With the innovative EMC platform approach, this enables customers to select their optimum filter requirements, contact per contact. Allowing not only to segregate the filtering per contact but also to mix the type of filter used. This is then cast in a single competitive product (in a standard D-Sub shell).

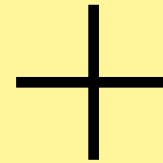
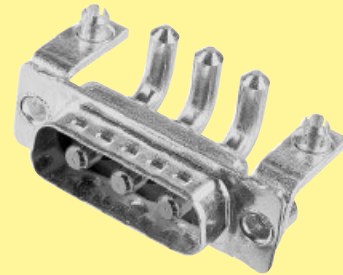
The biggest advantage of the HARTING technology is that multiple filter assemblies can be configured to create different filter designs: C, Pi, L and T types. Since any value of capacitor can be placed on any contact, a wide range of configurations can be built, it is even possible to have an individual pin unfiltered if necessary.

Furthermore, ***Pi-filters can be supplied in a standard connector size shell.*** In addition, protection against lightening and transient voltage can be included upon request.

In the next few pages, you will find all the necessary information plus a selection guide to help you to choose your appropriate solution.



or



- C-filter
- L-filter
- Pi-filter
- ESD protection
- Lightening protection
- Combination



With any capacitance on any pin in a **standard D-Sub shell.**

General information

Filter possibilities

C-filter:

Non exhaustive list of C-filter values that HARTING can supply (for specials see page 05.36 ff)

C-filter capacitance in pF	Minimum insertion loss								Max. working voltage	Max. dielectric withstanding
	Attenuation [dB] vs frequency [MHz]									
	0.1	1	5	10	50	100	500	1000		
47							30	35	500 V DC	750 V DC
100					1	3	40	35	500 V DC	750 V DC
150					1	6	45	35	500 V DC	750 V DC
180					1	10	40	32	500 V DC	750 V DC
270				1	3	12	35	32	500 V DC	750 V DC
330				1	7	13	35	32	500 V DC	750 V DC
470				1	10	15	35	32	500 V DC	750 V DC
820				2	10	18	30	30	500 V DC	750 V DC
1000			1	3	12	20	34	30	500 V DC	750 V DC
1800			2	6	17	30	35	32	500 V DC	750 V DC
3900		1	6	11	25	35	35	32	500 V DC	750 V DC
4700		1	9	13	30	38	35	32	500 V DC	750 V DC
5600		2	10	14	30	32	32	32	500 V DC	750 V DC
10000		1	10	15	30	32	30	30	200 V DC	500 V DC
33000	1	9	19	29	32	34	39	32	100 V DC	150 V DC
47000	1	11	23	30	32	32	35	32	100 V DC	150 V DC
100000	2	18	32	40	34	34	36	35	25 V DC	40 V DC

Pi filter:

Non exhaustive list of Pi filter values that HARTING can supply (for specials see page 05.36 ff)

Pi filter capacitance in pF	Minimum insertion loss								Max. working voltage	Max. dielectric withstanding
	Attenuation [dB] vs frequency [MHz]									
	0.1	1	5	10	50	100	500	1000		
94						2	35	50	200 V DC	500 V DC
200					1	8	50	40	200 V DC	500 V DC
440				1	8	16	50	40	200 V DC	500 V DC
940				2	12	24	50	40	200 V DC	500 V DC
2000			2	7	17	40	45	40	200 V DC	500 V DC
4400			5	10	28	60	45	40	200 V DC	500 V DC
9400		2	10	15	48	50	45	40	200 V DC	500 V DC
20000		5	14	20	50	60	52	48	100 V DC	250 V DC
94000	2	15	32	50	51	52	48	42	50 V DC	125 V DC
200000	7	21	48	65	55	52	48	42	16 V DC	25 V DC

General information

Other protection possibilities

ESD protection

(Electro Static Discharge protection)

For equipment to comply with:

- IEC-1000-4-2; levels 1 to 4 (Contact discharge test)
- RTCA-160 D; section 25

Typical parasitic capacitance (pF)	Max. clamp voltage (V)	Working voltage (V)
0.5 V _{rms} @ 1 KHz	@ I = 1 A @ 8/20 μS	@ I = 10 μA
1750	7.5	3
1250	13	5
650	22	12
430	33	18
220	48	26
200	51	30

EMP protection

(Electro Magnetic Pulse protection)

For equipment to comply with:

- MIL-STD-461 C: requirements CS 06, CS 10, CS 11, RS 05
- IEC-1000-4-4; EFT TESTS
- RTCA-160 D; section 17

Typical parasitic capacitance (pF)	Max. clamp voltage (V)	Working voltage (V)
0.5 V _{rms} @ 1 KHz	@ I = 10 A @ 8/20 μS	@ I = 10 μA
5675	9	3
3620	15	5
1500	26	14
820	34	18
275	50	26

Lightening protection

For equipment to comply with:

- IEC-1000-4-5; levels 1 and 2 (1.2 μ / 50 μS)
- RTCA-160 D; section 22 (pin injection, level 1)

Typical parasitic capacitance (pF)	Max. clamp voltage (V)	Working voltage (V)
0.5 V _{rms} @ 1 KHz	@ I = 30 A @ 8/20 μS	@ I = 10 μA
5500	12	3
3175	18	5
2000	21	9
1680	30	14
900	38	18
720	60	26
600	63	30

HARTING customer request form

Our innovative technology offers all the possibilities you may need.

For customer solutions, please contact your local HARTING representative.

Here is a summary of the information we need to develop a customer solution:

Connector

Standard D-Sub	Gender	☐ Male	☐ Female
	No. of contacts	☐ 9 ☐ 15 ☐ 25 ☐ 37 ☐ 50	
	Termination	☐ Solder bucket	☐ Straight pcb
		☐ R/A Eur, 2.54 mm	☐ R/A US, 2.84 mm

Mixed D-Sub	Gender	☐ Male	☐ Female
	Contact arrangement	☐ 3W3 ☐ 3W3C ☐ Other _____	
	Power contact rating	☐ 10 A ☐ 20 A ☐ 30 A ☐ 40 A	
	Termination	☐ Solder bucket	☐ Straight pcb
		☐ R/A pcb (please specify the board drillings)	

Flange thread and board locking options

Right angled version

☐ Through hole	
☐ Clinch nut 4-40 UNC	
☐ Clinch nut M3	
☐ Bracket	
☐ Board lock	
☐ Female screw lock 4-40 UNC	
☐ Female screw lock M3	

Straight version

☐ Through hole	
☐ Clinch nut 4-40 UNC	
☐ Clinch nut M3	
☐ Spacer 4-40 UNC	
☐ Spacer M3	
☐ Female screw lock 4-40 UNC	
☐ Spacer 4-40 UNC + board lock	
☐ Spacer M3 + board lock	
Spacer + board lock and female screw lock	
☐ M3	
☐ 4-40 UNC	

HARTING customer request from

Filter

What working voltage is used? _____

What is the maximum dielectric withstanding voltage needed? _____

Type of filter _____ (C-filter, Pi filter, L filter ...)

Capacitance _____

Are there other protections needed?

☐

No

☐

Yes

☐

ESD

☐

Transient

☐

EMP

☐

Lightening

If a pin-to-pin selection has to be done, please state the details

Pin 1: ?, Pin 2: ?, ...

Name: _____

Drawing: _____

☐

no

☐

yes

Company: _____

Samples: _____

☐

no

☐

yes, quantity

Address: _____

Volume (pcs./year): _____

Phone: _____

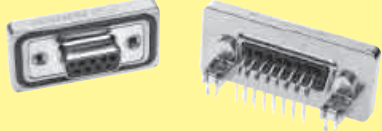
Special requirements: _____

Fax: _____

E-Mail: _____

D-Sub – Waterproof subminiature D IP 67 connectors

Page

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IP 67 versions with turned solder cups		06.04
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Accessories for IP 67 connectors		06.22
IP 67 plastic hoods		06.23
IP 67 metallized plastic hoods		06.24
Accessories for IP 67 hoods		06.25

Number of contacts 9, 15, 25, 37, 50
UL recognized

Working current 5 A

Test voltage 1200 V for 1 minute
between 2 contacts / contact and shell

Clearance and creepage ≥ 1.0 mm

Contact resistance
Straight contact ≤ 10 m Ω
Angled contact ≤ 25 m Ω
Angled contact 50 pole ≤ 35 m Ω

Insulation resistance
between contacts ≥ 5000 M Ω

Dielectric strength 50 kV/mm

Temperature range -25 °C ... +70 °C

Protection IP 67
(per DIN 40 050 / IEC 529)

Termination
Solder cup max. AWG 20
Solder pin straight 0.6 mm diameter
Solder pin angled 0.6 mm diameter

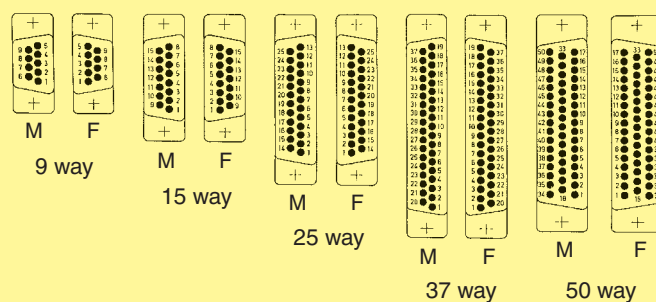
Material
Shell Brass, nickel plated
Insulator and plastic watertight frame Thermoplastic,
glass-fibre filled, UL 94-V0
Metal watertight frame Nickel plated zinc die cast
Contact material Machined copper alloy

Contact surface
Contact zone 0.76 μ m Au min. over Ni

Waterproofing element Silicone

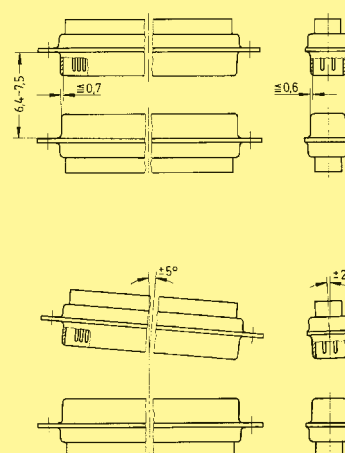
Mechanical
Mating cycles ≥ 500
Mating force per signal contact ≤ 3.4 N
Unmating force per signal contact ≥ 0.2 N

Contact arrangement View from termination side



M = Male connector
F = Female connector

Mating conditions as per DIN 41 652



Number of contacts

9–50



IP 67, turned solder cups

D-Sub - W

Identification	No. of contacts	Part No.
		S4 ¹⁾
Male connector metal shell with dimples	9 15 25 37 50	09 67 409 5615 09 67 415 5615 09 67 425 5615 09 67 437 5615 09 67 450 5615
Female connector metal shell	9 15 25 37 50	09 67 409 4715 09 67 415 4715 09 67 425 4715 09 67 437 4715 09 67 450 4715

¹⁾ S4: ≥ 0.76 µm Au (30 µinch)

Number of contacts

9–50



IP 67, turned solder cups

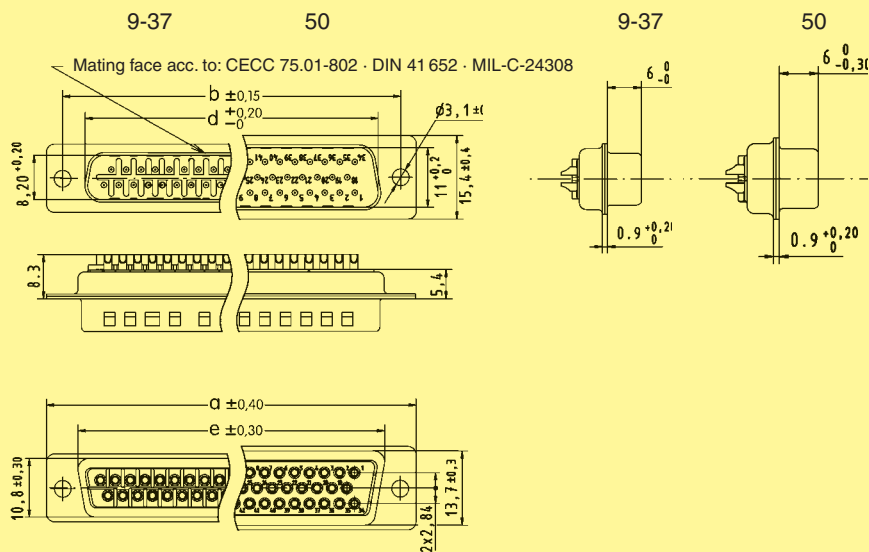
Identification

Drawing

Dimensions in mm

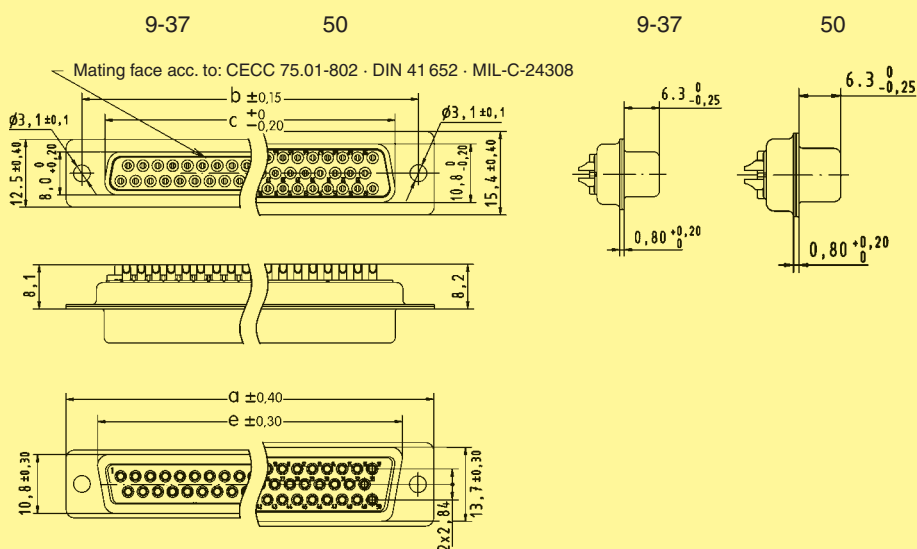
Male connector

9 – 50 contacts



Female connector

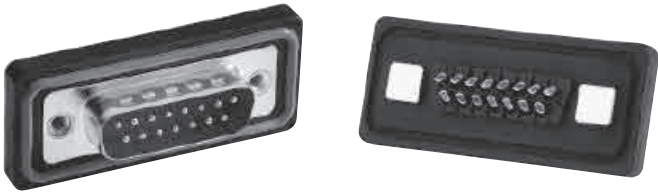
9 – 50 contacts



	a	b	c	d	e
9	30.8	25.00	16.4	16.9	19.3
15	39.1	33.30	24.7	25.2	27.5
25	53.0	47.04	38.5	38.9	41.3
37	69.3	63.50	54.9	55.3	57.7
50	66.9	61.10	52.5	52.8	55.3

Number of contacts

9–25



IP 67, turned solder cups, with rear plastic mounting plate

D-Sub - W

Identification	No. of contacts	Part No.	
		S4 ¹⁾	
Male connector metal shell with dimples	9 15 25	09 67 509 09 67 515 09 67 525	615 615 615
Please insert digit for flange thread	4-40 UNC ▶ 7 M3 ▶ 9		
Female connector metal shell	9 15 25	09 67 509 09 67 515 09 67 525	715 715 715
Please insert digit for flange thread	4-40 UNC ▶ 6 M3 ▶ 8		

¹⁾ S4: ≥ 0.76 µm Au (30 µinch)

Number of contacts

9–25



IP 67, turned solder cups, with rear plastic mounting plate

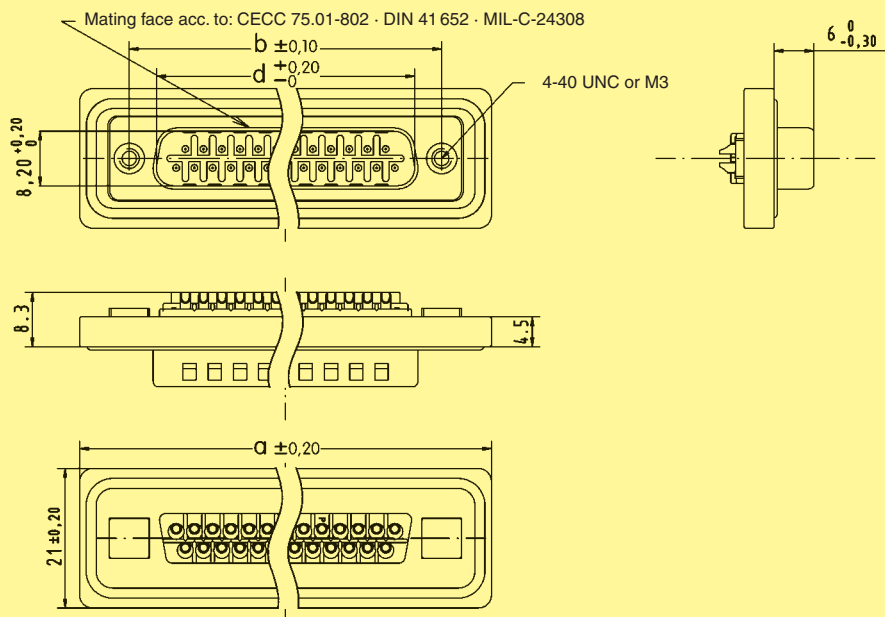
Identification

Drawing

Dimensions in mm

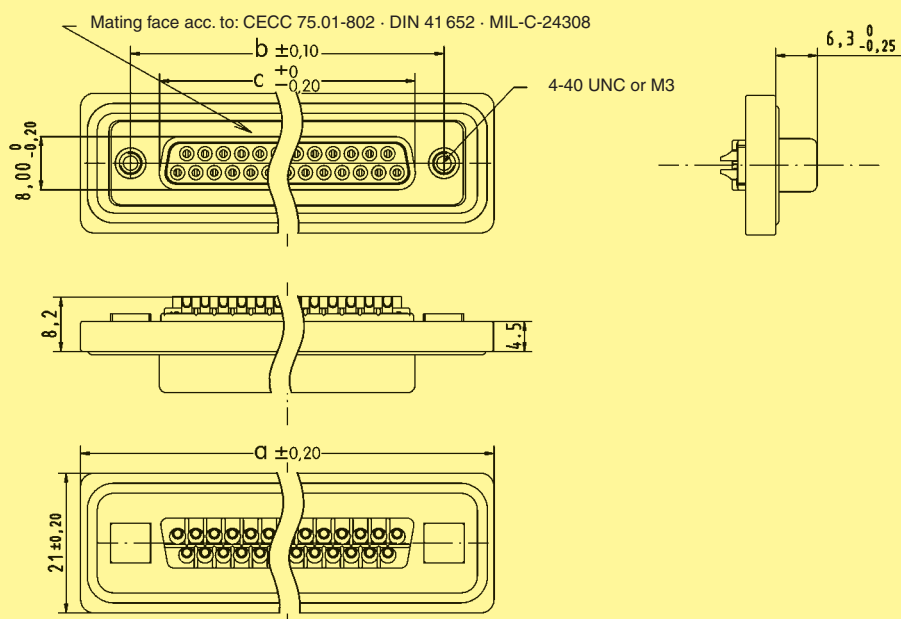
Male connector

9 – 25 contacts



Female connector

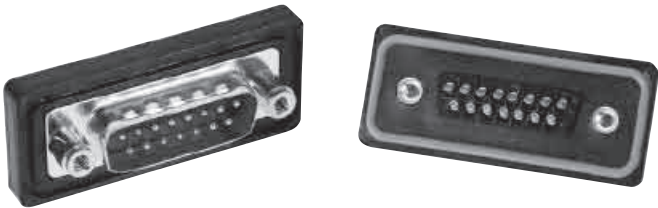
9 – 25 contacts



	a	b	c	d
9	40.0	25.00	16.4	16.9
15	48.3	33.30	24.7	25.2
25	62.0	47.04	38.5	38.9

Number of contacts

9–25



IP 67, turned solder cups, with front plastic mounting plate

D-Sub - W

Identification	No. of contacts	Part No.	
		S4 ¹⁾	
Male connector metal shell with dimples	9 15 25	09 67 709 09 67 715 09 67 725	615 615 615
Please insert digit for flange thread	4-40 UNC ▶ 7 M3 ▶ 9		
Female connector metal shell	9 15 25	09 67 709 09 67 715 09 67 725	715 715 715
Please insert digit for flange thread	4-40 UNC ▶ 6 M3 ▶ 8		

¹⁾ S4: ≥ 0.76 µm Au (30 µinch)

Number of contacts

9-25



IP 67, turned solder cups, with front plastic mounting plate

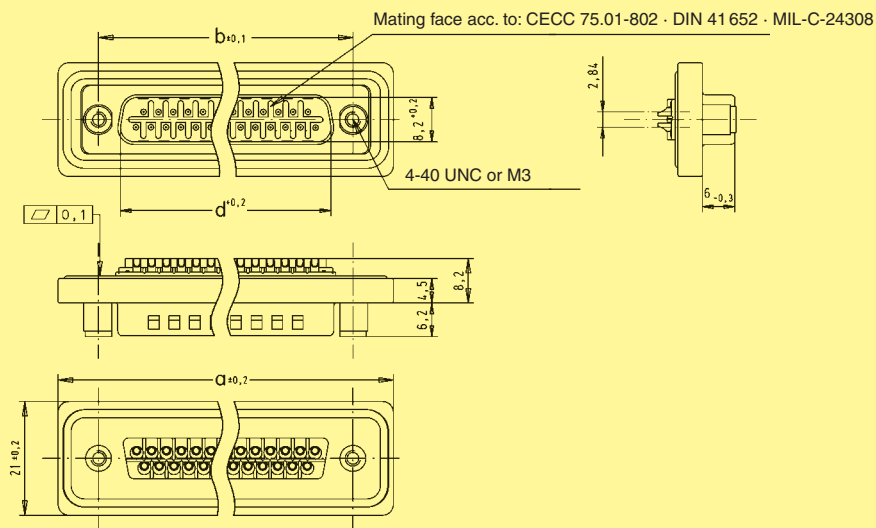
Identification

Drawing

Dimensions in mm

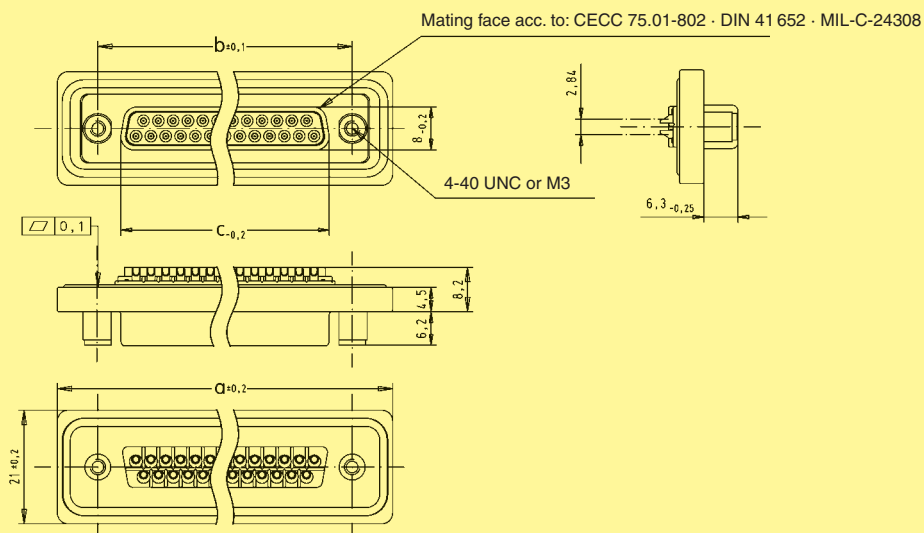
Male connector

9 – 25 contacts

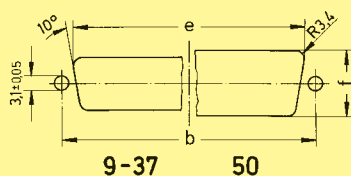


Female connector

9 – 25 contacts



	a	b	c	d
9	40.0	25.00	16.4	16.9
15	48.3	33.30	24.7	25.2
25	62.0	47.04	38.5	38.9

Panel cut out
for front/rear mountValues are taken from the
CECC 75 301-802

Front mount

	b ± 0.13	e ± 0.2	f ± 0.2
9	25.0	22.2	12.3
15	33.3	30.5	12.3
25	47.0	44.3	12.3

Rear mount

	b ± 0.13	e ± 0.2	f ± 0.2
9	25.0	20.5	11.4
15	33.3	28.8	11.4
25	47.0	42.5	11.4

Number of contacts

9–50



IP 67, turned solder cups, with rear metal mounting plate

D-Sub - W

Identification	No. of contacts	Part No.	
		S4 ¹⁾	
Male connector metal shell with dimples			
	9	09 67 609	615
	15	09 67 615	615
	25	09 67 625	615
	37	09 67 637	615
	50	09 67 650	615
Please insert digit for flange thread			
	4-40 UNC ▶ 7		
	M3 ▶ 9		
Female connector metal shell			
	9	09 67 609	715
	15	09 67 615	715
	25	09 67 625	715
	37	09 67 637	715
	50	09 67 650	715
Please insert digit for flange thread			
	4-40 UNC ▶ 6		
	M3 ▶ 8		

¹⁾ S4: ≥ 0.76 µm Au (30 µinch)

Number of contacts

9–50

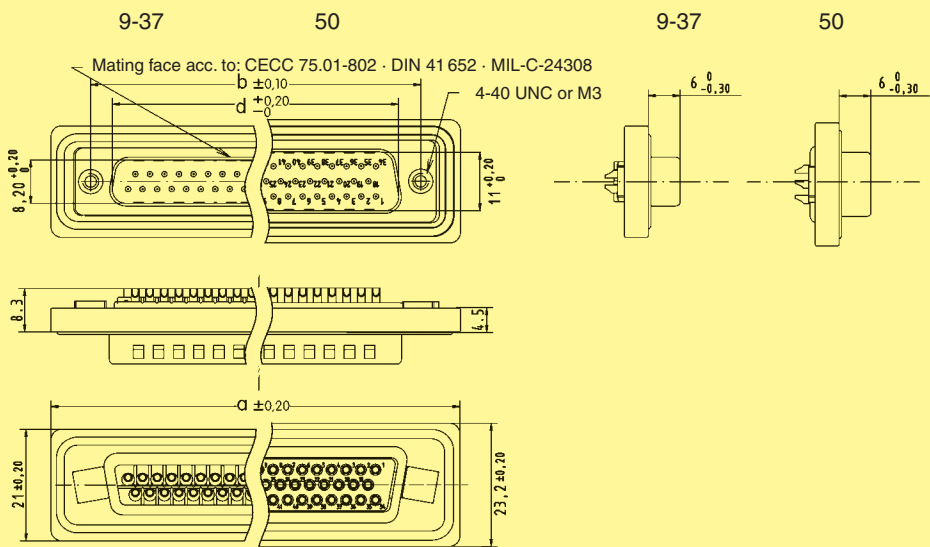
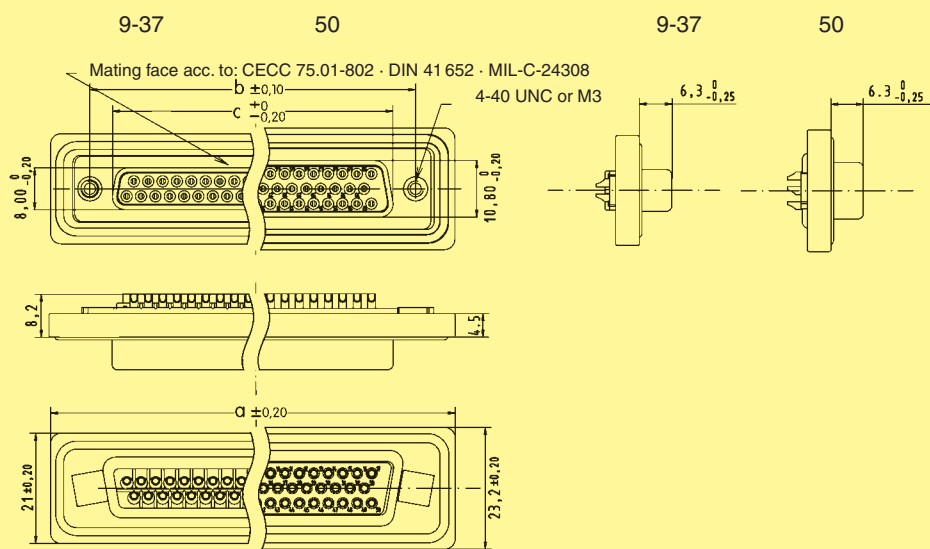


IP 67, turned solder cups, with rear metal mounting plate

Identification

Drawing

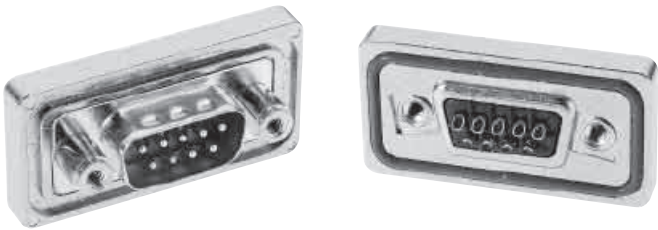
Dimensions in mm

Male connector
9 – 50 contactsFemale connector
9 – 50 contacts

	a	b	c	d
9	40,0	25,00	16,4	16,9
15	48,3	33,30	24,7	25,2
25	62,0	47,04	38,5	38,9
37	78,5	63,50	54,9	55,3
50	76,1	61,10	52,5	52,8

Number of contacts

9–50



IP 67, turned solder cups, with front metal mounting plate

D-Sub - W

Identification	No. of contacts	Part No.	
		S4 ¹⁾	
Male connector metal shell with dimples	9	09 67 809	615
	15	09 67 815	615
	25	09 67 825	615
	37	09 67 837	615
	50	09 67 850	615
Please insert digit for flange thread	4-40 UNC ▶ 7		
	M3 ▶ 9		
Female connector metal shell	9	09 67 809	715
	15	09 67 815	715
	25	09 67 825	715
	37	09 67 837	715
	50	09 67 850	715
Please insert digit for flange thread	4-40 UNC ▶ 6		
	M3 ▶ 8		

¹⁾ S4: ≥ 0.76 µm Au (30 µinch)

Number of contacts

9–50

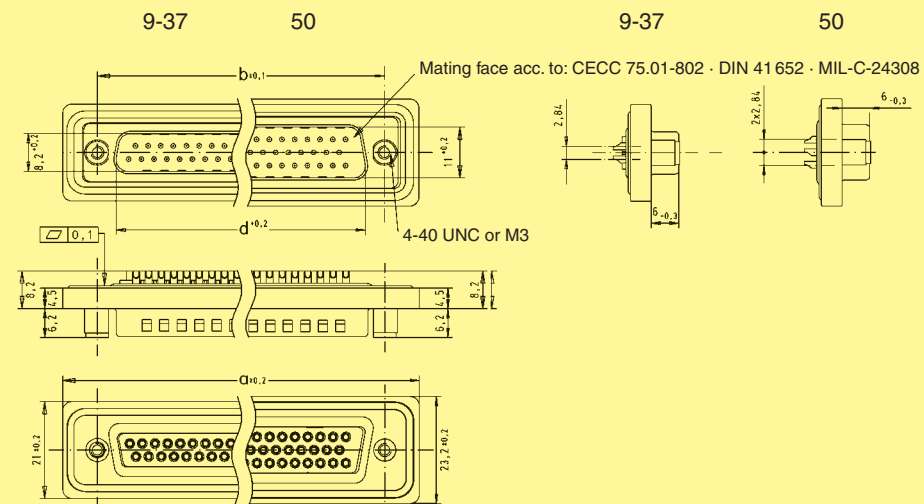
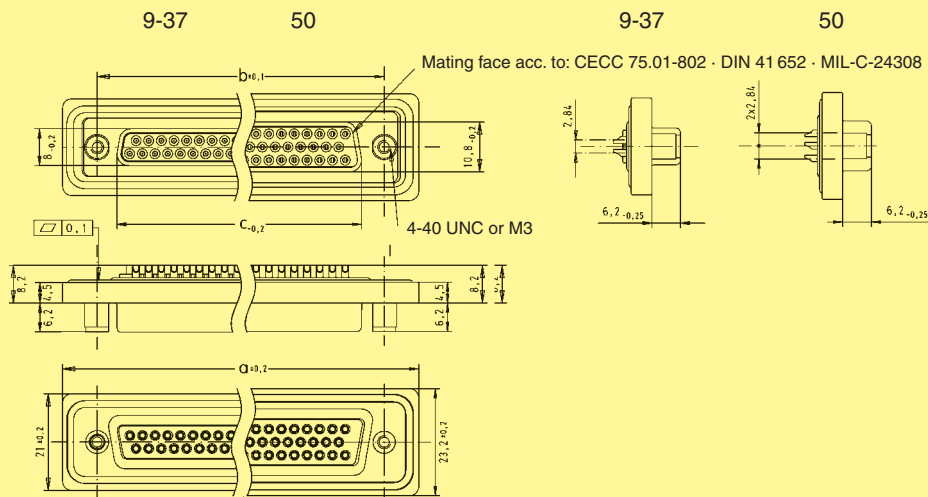


IP 67, turned solder cups, with front metal mounting plate

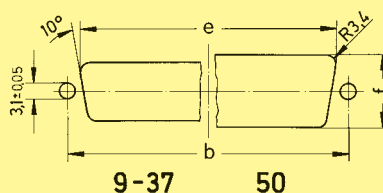
Identification

Drawing

Dimensions in mm

Male connector
9 – 50 contactsFemale connector
9 – 50 contacts

	a	b	c	d
9	40.0	25.00	16.4	16.9
15	48.3	33.30	24.7	25.2
25	62.0	47.04	38.5	38.9
37	78.5	63.50	54.9	55.3
50	76.1	61.10	51.3	52.8

Panel cut out
for front/rear mountValues are taken from the
CECC 75301-802

Front mount

	b _{±0.13}	e _{±0.2}	f _{±0.2}
9	25.0	22.2	12.3
15	33.3	30.5	12.3
25	47.0	44.3	12.3
37	63.5	60.7	12.3
50	61.1	58.3	15.1

Rear mount

	b _{±0.13}	e _{±0.2}	f _{±0.2}
9	25.0	20.5	11.4
15	33.3	28.8	11.4
25	47.0	42.5	11.4
37	63.5	59.1	11.4
50	61.1	56.3	14.1

Number of contacts

9–25



IP 67, straight turned solder pins,
with rear plastic mounting plate, spacer and board lock

D-Sub - W

Identification	No. of contacts	Part No.	
		S4 ¹⁾	
Male connector metal shell with dimples	9 15 25	09 67 509 09 67 515 09 67 525	675 675 675
Please insert digit for flange thread	4-40 UNC ▶ 7 M3 ▶ 9		
Female connector metal shell	9 15 25	09 67 509 09 67 515 09 67 525	775 775 775
Please insert digit for flange thread	4-40 UNC ▶ 6 M3 ▶ 8		

¹⁾ S4: ≥ 0.76 µm Au (30 µinch)

Number of contacts

9–25



IP 67, straight turned solder pins,
with rear plastic mounting plate, spacer and board lock

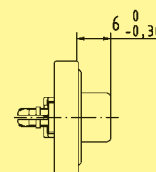
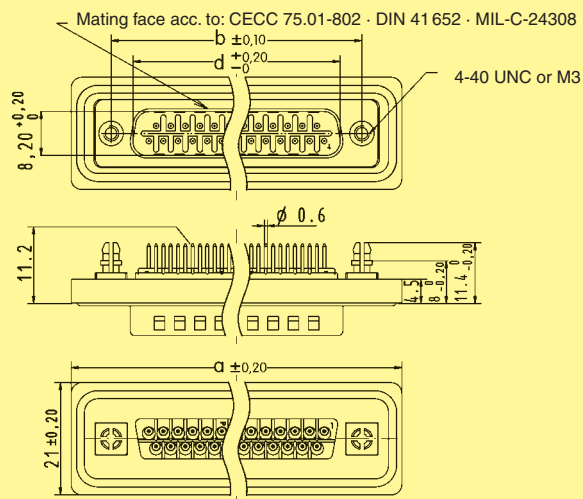
Identification

Drawing

Dimensions in mm

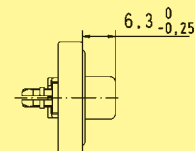
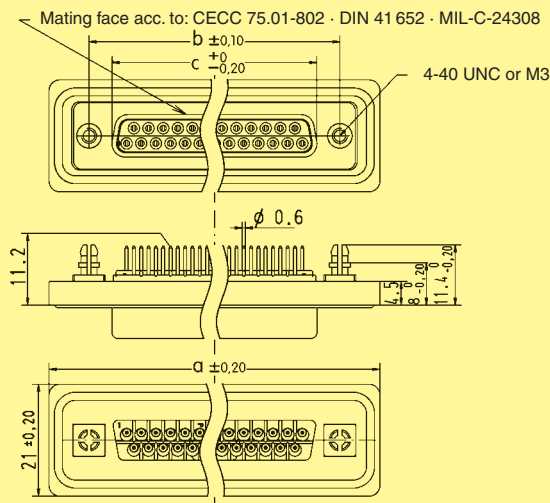
Male connector

9 – 25 contacts



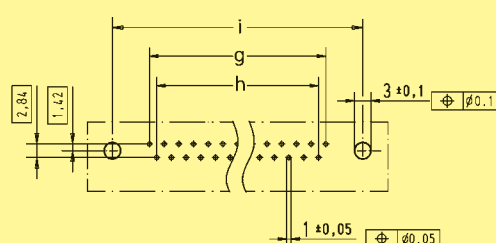
Female connector

9 – 25 contacts



	a	b	c	d	g	h	i
9	40.0	25.00	16.4	16.9	4 x $\boxed{2.74} = \boxed{10.96}$	3 x $\boxed{2.74} = \boxed{8.22}$	25.0
15	48.3	33.30	24.7	25.2	7 x $\boxed{2.74} = \boxed{19.18}$	6 x $\boxed{2.74} = \boxed{16.44}$	33.3
25	62.0	47.04	38.5	38.9	12 x $\boxed{2.76} = \boxed{33.12}$	11 x $\boxed{2.76} = \boxed{30.36}$	47.0

Board drillings



Number of contacts

9–50



IP 67, straight turned solder pins,
with rear metal mounting plate, spacer and board lock

D-Sub - W

Identification	No. of contacts	Part No.	
		S4 ¹⁾	
Male connector metal shell with dimples			
	9	09 67 609	675
	15	09 67 615	675
	25	09 67 625	675
	37	09 67 637	675
	50	09 67 650	675
Please insert digit for flange thread			
	4-40 UNC ▶ 7		
	M3 ▶ 9		
Female connector metal shell			
	9	09 67 609	775
	15	09 67 615	775
	25	09 67 625	775
	37	09 67 637	775
	50	09 67 650	775
Please insert digit for flange thread			
	4-40 UNC ▶ 6		
	M3 ▶ 8		

¹⁾ S4: ≥ 0.76 µm Au (30 µinch)

Number of contacts

9–50



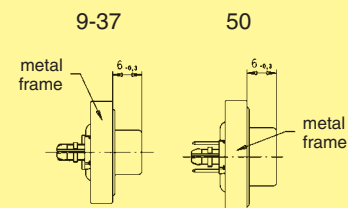
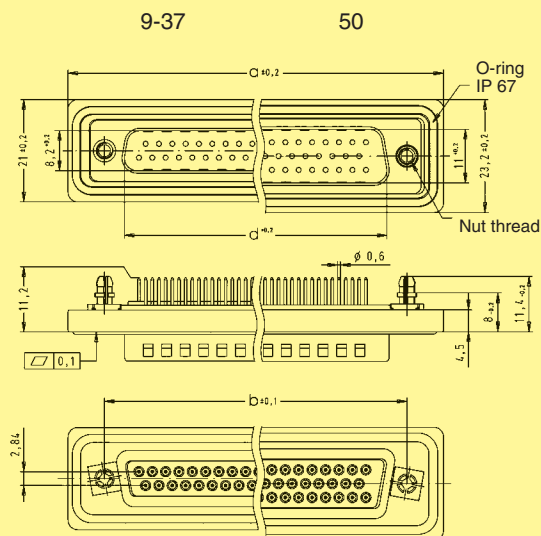
IP 67, straight turned solder pins,
with rear metal mounting plate, spacer and board lock

Identification

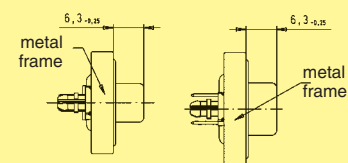
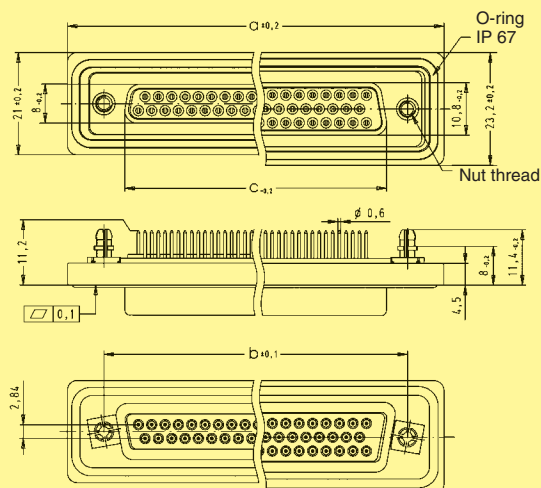
Drawing

Dimensions in mm

Male connector
9 – 50 contacts

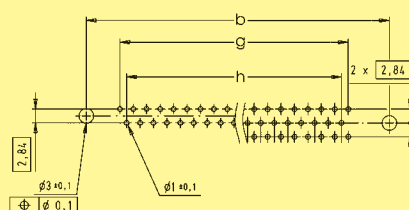


Female connector
9 – 50 contacts



	a	b	c	d	g	h
9	40.0	25.00	16.4	16.9	4 x $\frac{2.74}{10.96}$	3 x $\frac{2.74}{8.22}$
15	48.3	33.30	24.7	25.2	7 x $\frac{2.74}{19.18}$	6 x $\frac{2.74}{16.44}$
25	62.0	47.04	38.5	38.9	12 x $\frac{2.76}{33.12}$	11 x $\frac{2.76}{30.36}$
37	78.5	63.50	54.9	55.3	18 x $\frac{2.76}{49.68}$	17 x $\frac{2.76}{46.92}$
50	76.1	61.10	52.5	52.8	16 x $\frac{2.76}{44.16}$	15 x $\frac{2.76}{41.40}$

Board drillings



Number of contacts

9–25



IP 67, angled turned solder pins,
with rear plastic mounting plate, bracket and board lock

D-Sub - W

Identification	No. of contacts	Part No.	
		S4 ¹⁾	
Male connector metal shell with dimples			
	9	09 67 509	658
	15	09 67 515	658
	25	09 67 525	658
Please insert digit for flange thread			
	4-40 UNC ▶ 7		
	M3 ▶ 9		
Female connector metal shell			
	9	09 67 509	758
	15	09 67 515	758
	25	09 67 525	758
Please insert digit for flange thread			
	4-40 UNC ▶ 6		
	M3 ▶ 8		

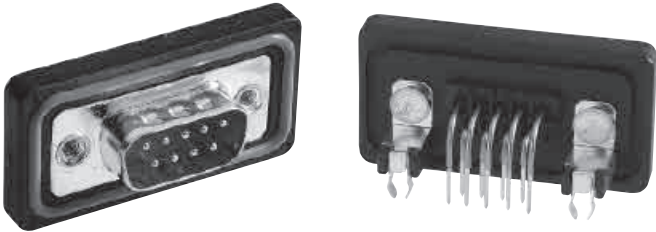
¹⁾ S4: ≥ 0.76 µm Au (30 µinch)

D-Sub

Number of contacts

9-25

IP 67, angled turned solder pins,
with rear plastic mounting plate, bracket and board lock

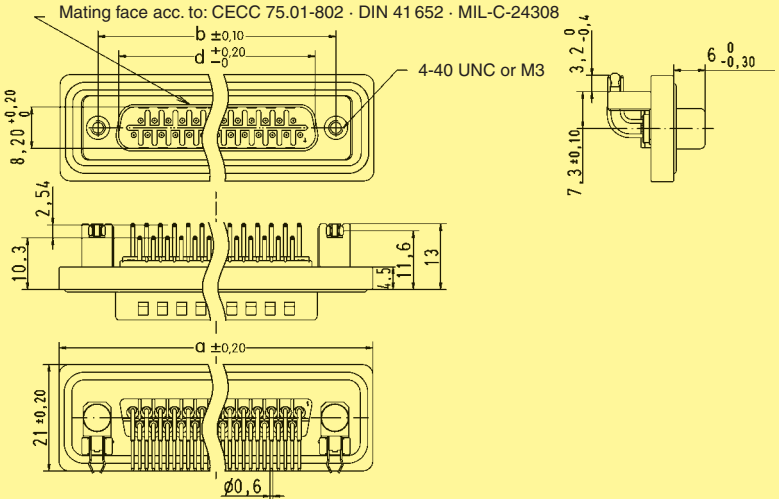


Identification

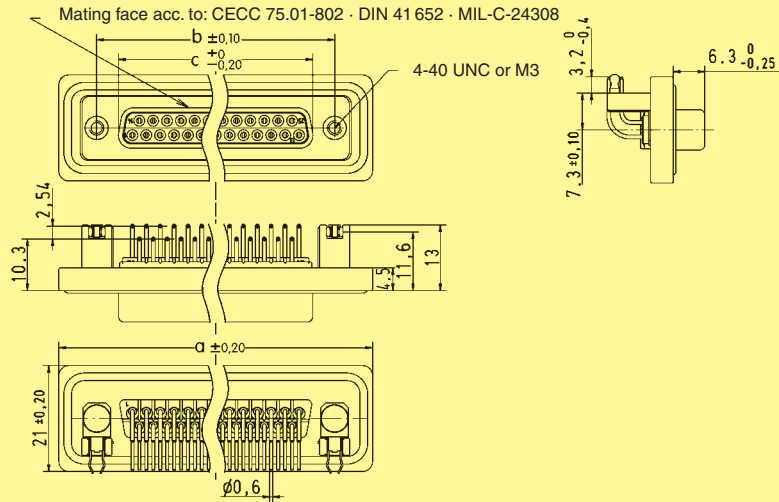
Drawing

Dimensions in mm

Male connector
9 – 25 contacts

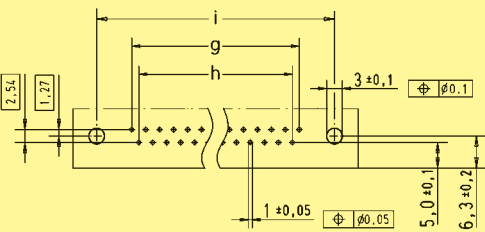


Female connector
9 – 25 contacts



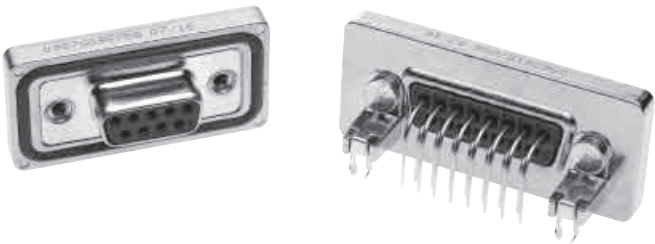
	a	b	c	d	g	h	i
9	40.0	25.00	16.4	16.9	4 x $2.74 = 10.96$	3 x $2.74 = 8.22$	25.0
15	48.3	33.30	24.7	25.2	7 x $2.74 = 19.18$	6 x $2.74 = 16.44$	33.3
25	62.0	47.04	38.5	38.9	12 x $2.76 = 33.12$	11 x $2.76 = 30.36$	47.0

Board drillings



Number of contacts

9–50



IP 67, angled turned solder pins,
with rear metal mounting plate, bracket and board lock

D-Sub - W

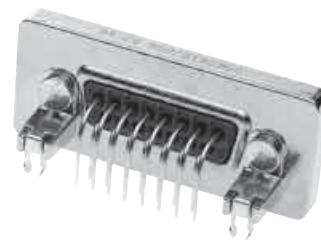
Identification	No. of contacts	Part No.	
		S4 ¹⁾	
Male connector metal shell with dimples			
	9	09 67 609	658
	15	09 67 615	658
	25	09 67 625	658
	37	09 67 637	658
	50	09 67 650	658
Please insert digit for flange thread			
	4-40 UNC ▶ 7		
	M3 ▶ 9		
Female connector metal shell			
	9	09 67 609	758
	15	09 67 615	758
	25	09 67 625	758
	37	09 67 637	758
	50	09 67 650	758
Please insert digit for flange thread			
	4-40 UNC ▶ 6		
	M3 ▶ 8		

¹⁾ S4: ≥ 0.76 µm Au (30 µinch)

Number of contacts

9–50

IP 67, angled turned solder pins,
with rear metal mounting plate, bracket and board lock

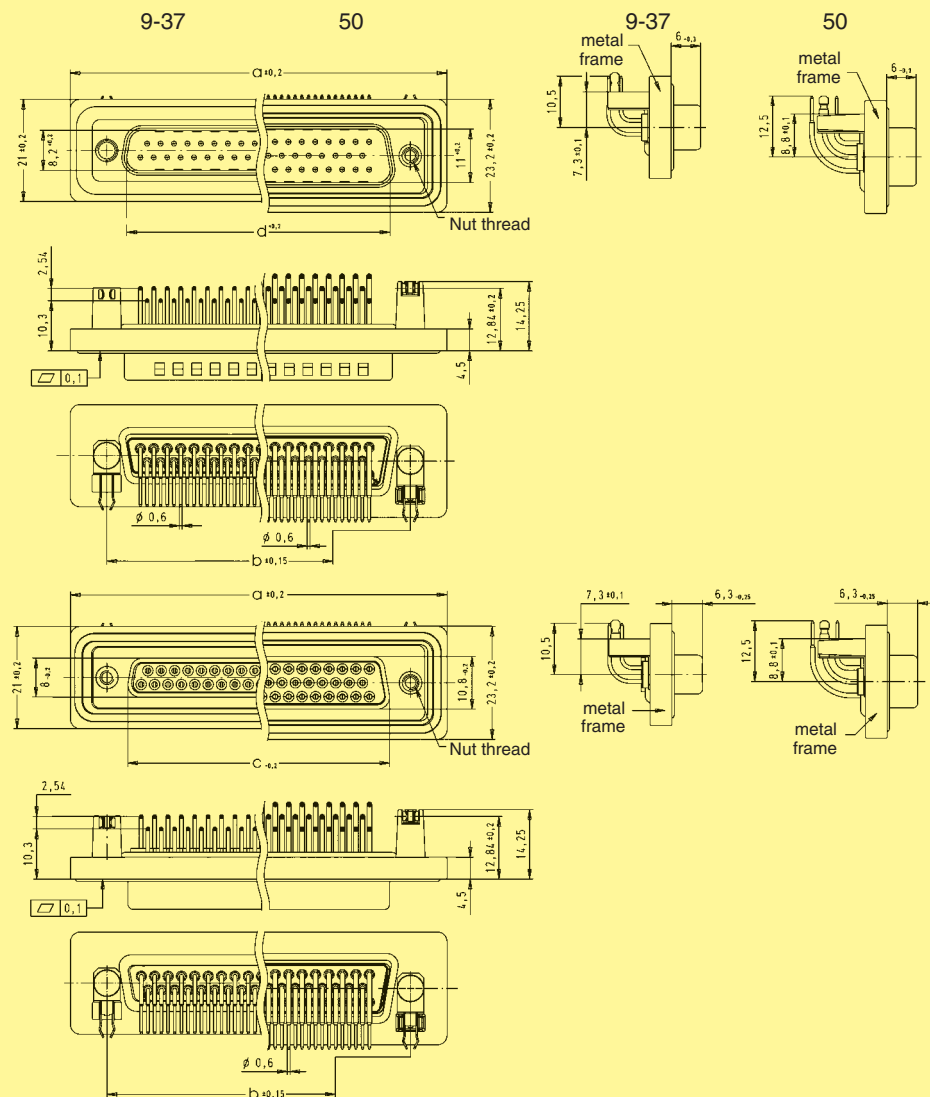


Identification

Drawing

Dimensions in mm

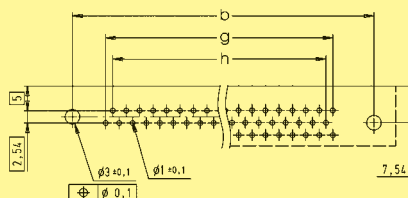
Male connector
9 – 50 contacts



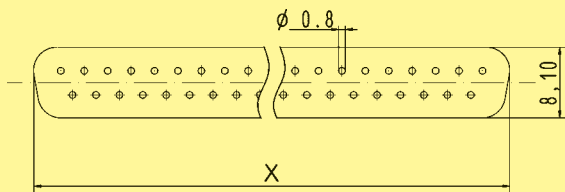
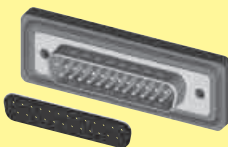
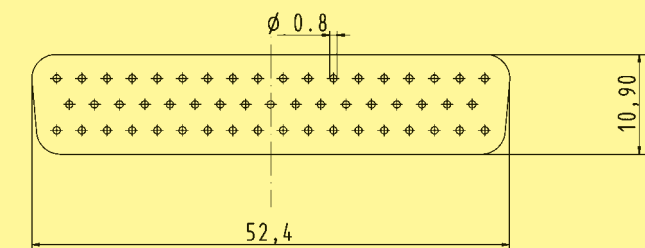
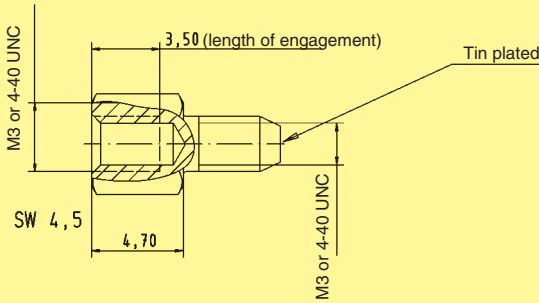
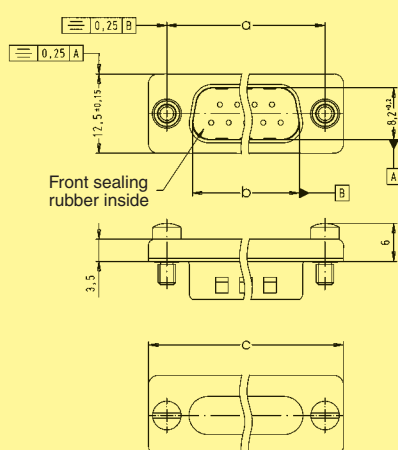
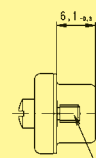
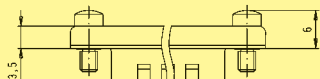
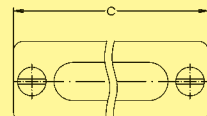
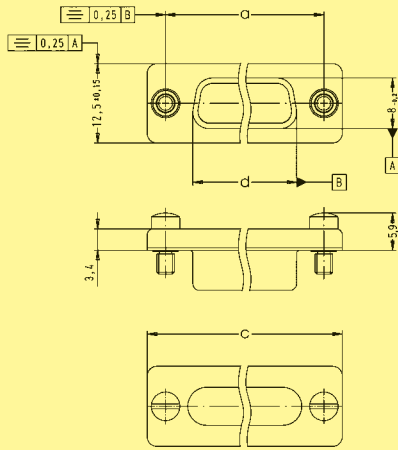
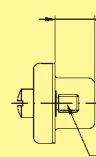
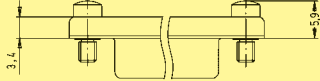
Female connector
9 – 50 contacts

	a	b	c	d	g	h
9	40.0	25.00	16.4	16.9	4 x $2.74 = 10.96$	3 x $2.74 = 8.22$
15	48.3	33.30	24.7	25.2	7 x $2.74 = 19.18$	6 x $2.74 = 16.44$
25	62.0	47.04	38.5	38.9	12 x $2.76 = 33.12$	11 x $2.76 = 30.36$
37	78.5	63.50	54.9	55.3	18 x $2.76 = 49.68$	17 x $2.76 = 46.92$
50	76.1	61.10	52.5	52.8	16 x $2.76 = 44.16$	15 x $2.76 = 41.40$

Board drillings



Accessories for IP 67 connectors

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm																				
Front sealing rubber¹⁾ IP 67 	9 15 25 37	09 67 002 9001 09 67 002 9002 09 67 002 9003 09 67 002 9004		<table><tr><th></th><th>x</th></tr><tr><td>9</td><td>16.7</td></tr><tr><td>15</td><td>24.8</td></tr><tr><td>25</td><td>38.8</td></tr><tr><td>37</td><td>54.7</td></tr></table>		x	9	16.7	15	24.8	25	38.8	37	54.7										
	x																							
9	16.7																							
15	24.8																							
25	38.8																							
37	54.7																							
Mounting example 	50	09 67 002 9005																						
Female screw lock and spacing washer M3  4-40 UNC		09 67 002 9006 09 67 002 9007																						
Dust cap for male connectors²⁾ M3  4-40 UNC	9 15 25 9 15 25	09 67 002 9055 09 67 002 9056 09 67 002 9057 09 67 002 9050 09 67 002 9051 09 67 002 9052	   	<table><tr><th></th><th>a</th><th>b</th><th>c</th><th>d</th></tr><tr><td>9</td><td>25.00</td><td>16.9</td><td>30.8</td><td>16.4</td></tr><tr><td>15</td><td>33.30</td><td>25.2</td><td>39.1</td><td>24.7</td></tr><tr><td>25</td><td>47.04</td><td>38.9</td><td>53.0</td><td>38.5</td></tr></table>		a	b	c	d	9	25.00	16.9	30.8	16.4	15	33.30	25.2	39.1	24.7	25	47.04	38.9	53.0	38.5
	a	b	c	d																				
9	25.00	16.9	30.8	16.4																				
15	33.30	25.2	39.1	24.7																				
25	47.04	38.9	53.0	38.5																				
Dust cap for female connectors³⁾ M3  4-40 UNC	9 15 25 9 15 25	09 67 002 9065 09 67 002 9066 09 67 002 9067 09 67 002 9060 09 67 002 9061 09 67 002 9062	   																					

²⁾ With inside glued front sealing rubber

³⁾ Order separately the front sealing rubber for an IP 67 performance

²⁾ With inside glued front sealing rubber

for female connectors³⁾

³⁾ Order separately the front sealing rubber for an IP 67 performance

¹⁾ The front sealing rubber is necessary when a mated system needs to have the IP 67 performance; in this case, the front sealing rubber is positioned in the IP 67 male connector prior to the mating operation with the facing IP 67 connector; it provides a full protection of the contacts at the mated area by preventing possible ingress of liquids or dust between the shells.



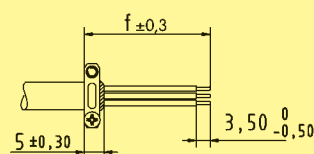
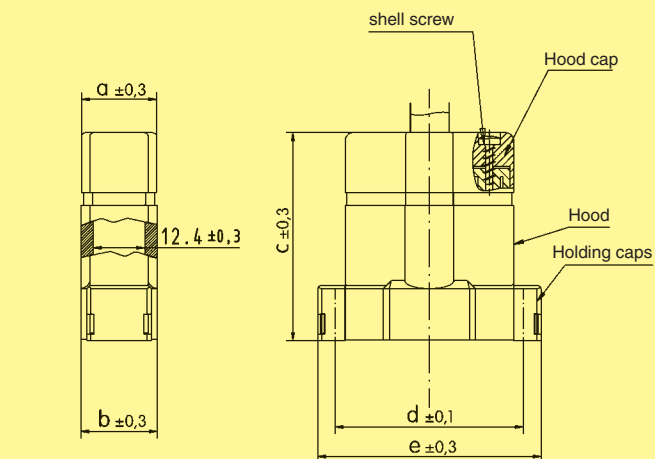
IP 67 plastic hoods

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
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Hood

Black thermoplastic

9	09 67 009 0436
15	09 67 015 0436
25	09 67 025 0436



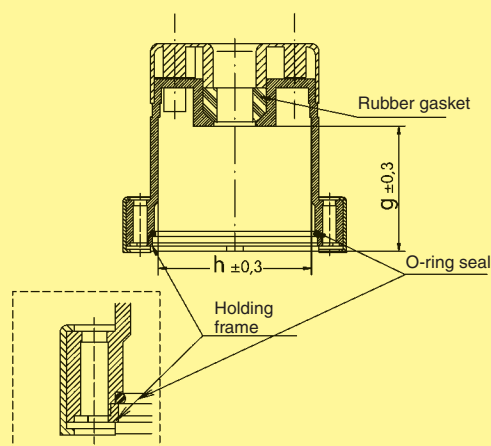
Mounting instructions

The stripped braid should not be fold back to avoid damaging the cable clamp and reducing its performance.

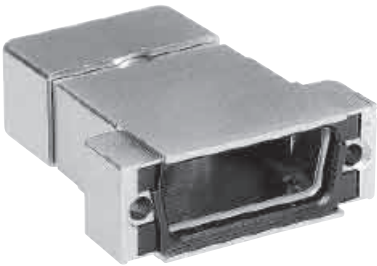
cable clamp



cable clamp screw



	a	b	c	d	e	f	g	h
9	15.6	15.6	41.0	25.00	33.6	23.0	25.0	17.0
15	15.6	15.6	46.8	33.30	42.0	27.5	30.8	25.1
25	18.8	19.1	52.0	47.04	55.7	31.5	33.8	38.8

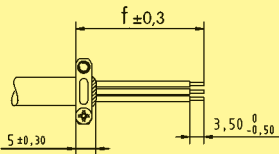
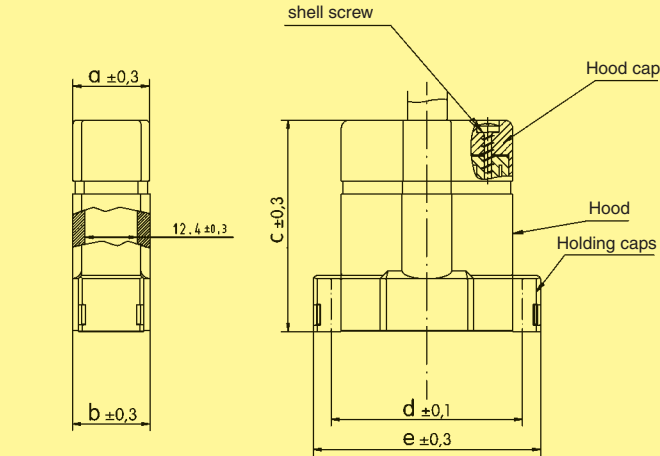


IP 67 metallized plastic hoods

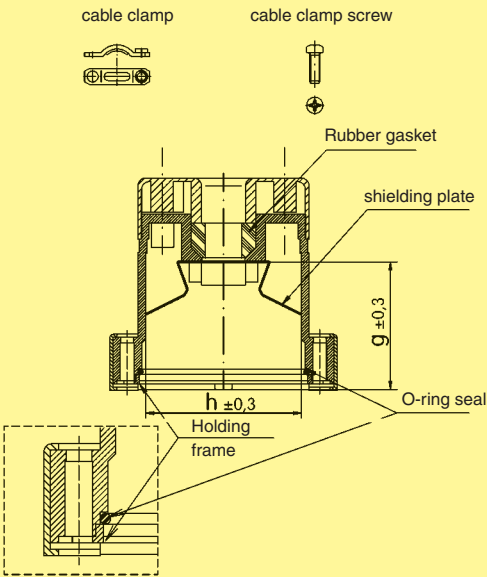
Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
----------------	-----------------	----------	---------	------------------

Hood
Metallized
thermoplastic

9	09 67 009 0437
15	09 67 015 0437
25	09 67 025 0437

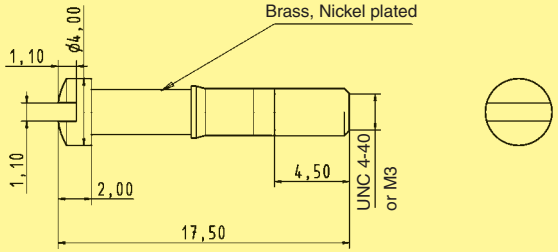
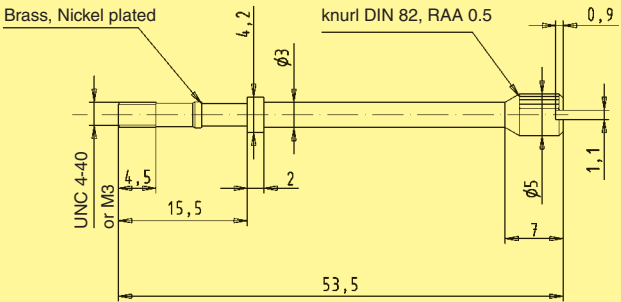
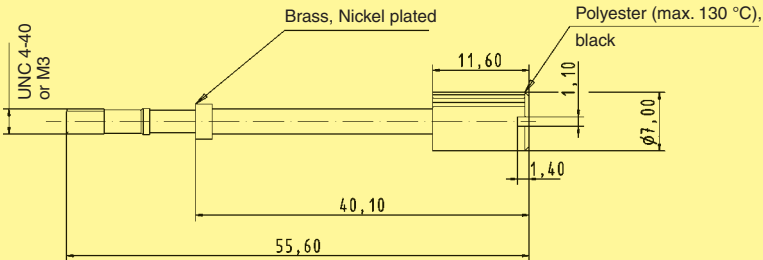


Mounting instructions
The stripped braid should not be fold back to avoid damaging the cable clamp and reducing its performance.



	a	b	c	d	e	f	g	h
9	15.6	15.6	41.0	25.00	33.6	23.0	25.0	17.0
15	15.6	15.6	46.8	33.30	42.0	27.5	30.8	25.1
25	18.8	19.1	52.0	47.04	55.7	31.5	33.8	38.8

Accessories for IP 67 hoods

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
Short locking screw 4-40 UNC 		09 67 002 9008		
Short locking screw M3 		09 67 002 9009		
Knurled locking screw 4-40 UNC 		09 67 002 9010		
Knurled locking screw M3 		09 67 002 9011		
Knurled locking screw 4-40 UNC with plastic cap 		09 67 002 9012		
Knurled locking screw M3 with plastic cap 		09 67 002 9013		

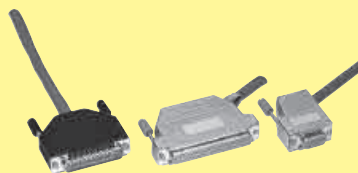
D-Sub – Housing range for subminiature D connectors

Page

General information – hoods for screw locking

07.02

Thermoplastic top and side entry hoods
with knurled screws



07.04

Thermoplastic side entry hoods
with knurled screws



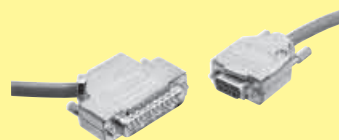
07.05

Thermoplastic top entry hoods
with knurled or locking screws



07.06

Full metal top and side entry hoods
with knurled screws



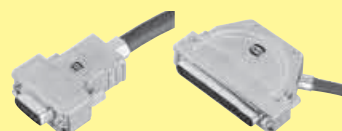
07.07

Full metal top and side entry hoods with short screws



07.08

Full metal top and side entry hoods
with different screw options



07.09

General information – hoods for spring or slide locking

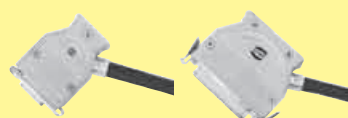
07.10

Thermoplastic top and side entry hoods
for spring or slide locking



07.11

Full metal top and side entry hoods
for spring or slide locking



07.12

HARTING – Guarantee a secure connection

Modern electronic applications demand a high degree of mechanical and electrical security.

To meet these requirements, continuous screening from the cable to the PCB via the connector is achieved by using state of the art components to DIN 41 652.

HARTING offer many solutions. These utilise various combinations of male and female connectors with hoods, featuring either screw locking or latching facilities.

Only 2 examples are shown:

- Continuous security screening and grounding with screw locking and metallized hood.
- Continuous grounding and vibration proof latching system with metallized hood.

Male connector with dimples

Screw lock

Cable with protective screen

Strain relief

Metallized hood

Female connector with protective metal shell

Grounding contact between protective metal shell and PCB

Female connector with protective metal shell

Spring latch

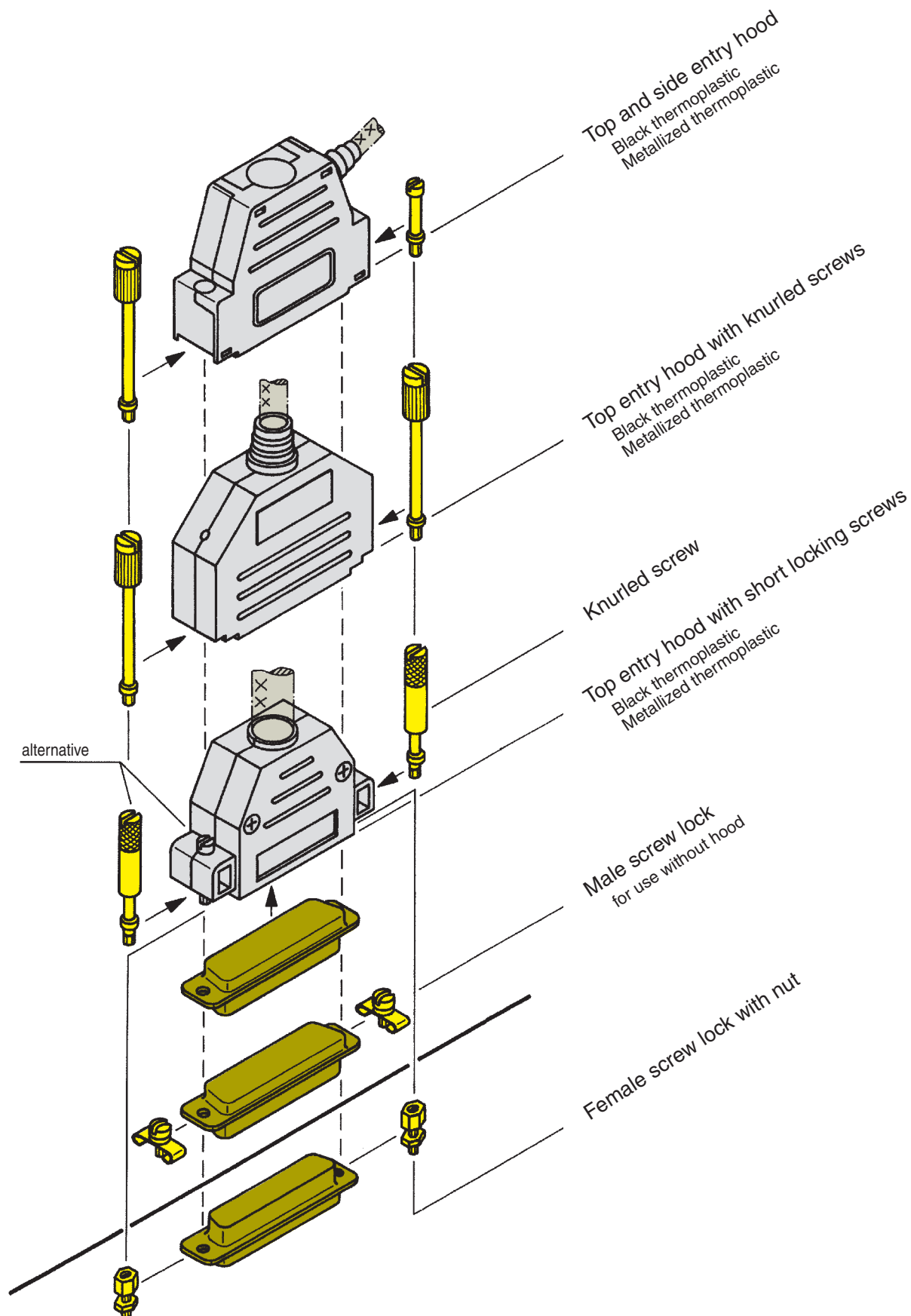
Strain relief

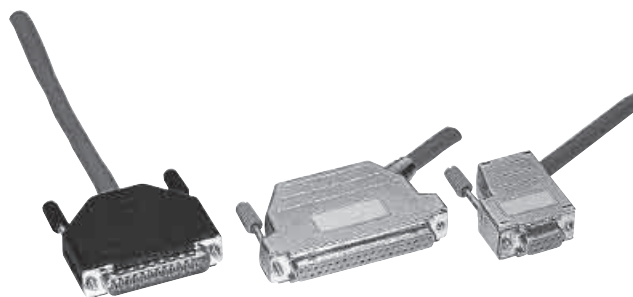
Cable with protective screen

Metallized hood

Male connector with dimples

Connector hoods for screw locking

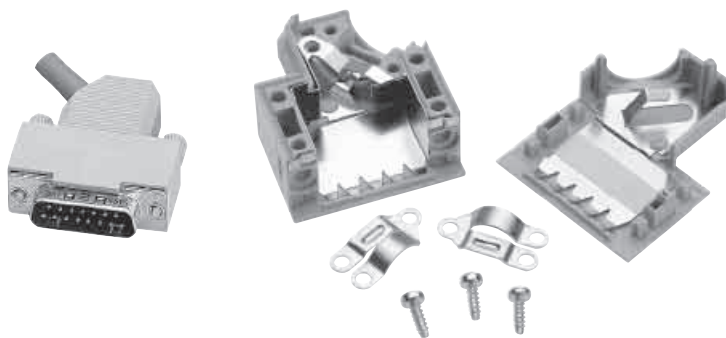




Top and side entry hoods with knurled screws

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm																																																
Top entry hood Black thermoplastic	9 15 25 37 50	09 67 009 0424 09 67 015 0424 09 67 025 0424 09 67 037 0424 09 67 050 0424	<table><tr><td></td><td>A1</td><td>A2</td><td>B</td><td>C1</td><td>C2</td><td>max. Ø 1</td><td>max. Ø 2</td></tr><tr><td>9</td><td>31.5</td><td>32.5</td><td>15</td><td>34</td><td>38</td><td>8.0</td><td>11.5</td></tr><tr><td>15</td><td>40.0</td><td>41.0</td><td>15</td><td>34</td><td>38</td><td>11.5</td><td>11.5</td></tr><tr><td>25</td><td>53.5</td><td>54.5</td><td>15</td><td>40</td><td>40</td><td>11.5</td><td>11.5</td></tr><tr><td>37</td><td>71.0</td><td>71.0</td><td>15</td><td>40</td><td>40</td><td>11.5</td><td>11.5</td></tr><tr><td>50</td><td>67.5</td><td></td><td>19</td><td>40</td><td></td><td>14.0</td><td></td></tr></table> C1: non-metallized C2: metallized		A1	A2	B	C1	C2	max. Ø 1	max. Ø 2	9	31.5	32.5	15	34	38	8.0	11.5	15	40.0	41.0	15	34	38	11.5	11.5	25	53.5	54.5	15	40	40	11.5	11.5	37	71.0	71.0	15	40	40	11.5	11.5	50	67.5		19	40		14.0		
	A1	A2	B	C1	C2	max. Ø 1	max. Ø 2																																													
9	31.5	32.5	15	34	38	8.0	11.5																																													
15	40.0	41.0	15	34	38	11.5	11.5																																													
25	53.5	54.5	15	40	40	11.5	11.5																																													
37	71.0	71.0	15	40	40	11.5	11.5																																													
50	67.5		19	40		14.0																																														
Top entry hood Metallized thermoplastic	9 15 25 37	09 67 009 0425 09 67 015 0425 09 67 025 0425 09 67 037 0425	Cut appropriate cable entry to fit actual cable diameter																																																	
Top and side entry hood Black thermoplastic	9 15 25 37	09 67 009 0434 09 67 015 0434 09 67 025 0434 09 67 037 0434 ¹⁾	<table><tr><td></td><td>A</td><td>B</td><td>C</td></tr><tr><td>9</td><td>31.5</td><td>15</td><td>40.0</td></tr><tr><td>15</td><td>40.0</td><td>15</td><td>40.0</td></tr><tr><td>25</td><td>53.5</td><td>15</td><td>43.0</td></tr><tr><td>37</td><td>71.3</td><td>15</td><td>42.5</td></tr></table>		A	B	C	9	31.5	15	40.0	15	40.0	15	40.0	25	53.5	15	43.0	37	71.3	15	42.5																													
	A	B	C																																																	
9	31.5	15	40.0																																																	
15	40.0	15	40.0																																																	
25	53.5	15	43.0																																																	
37	71.3	15	42.5																																																	
Top and side entry hood Metallized thermoplastic	9 15 25 37	09 67 009 0435 09 67 015 0435 ²⁾ 09 67 025 0435 ²⁾ 09 67 037 0435 ¹⁾	Cut appropriate cable entry to fit actual cable diameter																																																	
Grommet for top and side entry black thermoplastic hood		09 67 001 9968																																																		

¹⁾ 37 ways is only side entry²⁾ Cable clamp kit for two outputs is available with Part No. 09 67 001 9988 (it includes: screw, metal clamp, plastic insert and grommet)

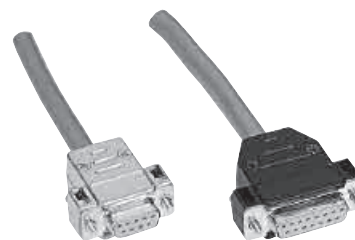


Side entry hoods with knurled screws

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm																									
Hood¹⁾ grey thermoplastic RAL 7032	9 15 25 37 50	09 67 009 0571 09 67 015 0571 09 67 025 0571 09 67 037 0571 09 67 050 0571																											
grey thermoplastic with internal tin-plate screening	9 15 25 37 50	09 67 009 0573 09 67 015 0573 09 67 025 0573 09 67 037 0573 09 67 050 0573																											
9-37 way for packaging density of 3 TE (15.24 mm)																													
			<table border="1"> <thead> <tr> <th></th><th>a max.</th><th>b</th><th>c</th><th>d max.</th></tr> </thead> <tbody> <tr> <td>15</td><td>39.62</td><td>33.3</td><td>15</td><td>Ø 9.1</td></tr> <tr> <td>25</td><td>53.52</td><td>47.0</td><td>15</td><td>Ø 11.5</td></tr> <tr> <td>37</td><td>69.80</td><td>63.5</td><td>15</td><td>Ø 12.8</td></tr> <tr> <td>50</td><td>67.41</td><td>61.1</td><td>19</td><td>Ø 14.5</td></tr> </tbody> </table>		a max.	b	c	d max.	15	39.62	33.3	15	Ø 9.1	25	53.52	47.0	15	Ø 11.5	37	69.80	63.5	15	Ø 12.8	50	67.41	61.1	19	Ø 14.5	
	a max.	b	c	d max.																									
15	39.62	33.3	15	Ø 9.1																									
25	53.52	47.0	15	Ø 11.5																									
37	69.80	63.5	15	Ø 12.8																									
50	67.41	61.1	19	Ø 14.5																									
Knurled screw Thread UNC Thread M3	9-50	09 67 000 9971 ⁴⁾ 09 67 001 9965*																											
Thread UNC Thread M3	9-50	09 67 001 9978 09 67 001 9977																											
Tooling⁶⁾ for assembly of hoods Top part Bottom part		09 99 000 0215* 09 99 000 0216*																											

* Not normally kept in stock

¹⁾ Order knurled screw separately²⁾ Before assembling the hood, the knurled screws must be inserted into the lower hood part.³⁾ For retained nut when using slide lock or female screw lock⁴⁾ 9 way 1 per hood – 15-50 way 2 per hood⁵⁾ Screw driver type ISO PH 1 for philips screw No 1 ISO norm 4757⁶⁾ Additional tooling (bench press) see chapter 32



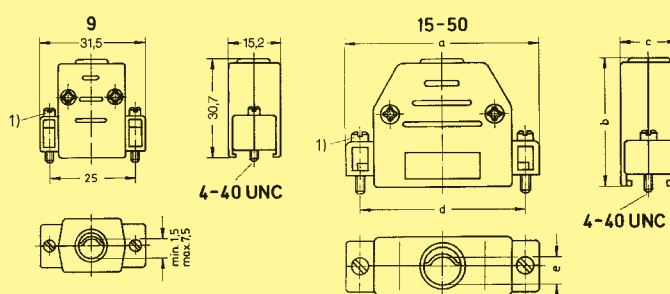
Top entry hoods with knurled or locking screws

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
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Hood

Black thermoplastic
with short locking
screws

9	09 67 009 0442
15	09 67 015 0442
25	09 67 025 0442
37	09 67 037 0442
50	09 67 050 0442

**Hood**

Metallized thermo-
plastic with short
locking screws

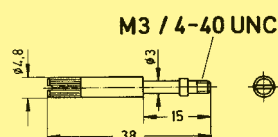
9	09 67 009 0443
15	09 67 015 0443
25	09 67 025 0443
37	09 67 037 0443
50	09 67 050 0443

	a	b	c	d	e	
					min.	max.
15	40.0	34.7	15.2	33.3	3.3	8.5
25	53.2	39.7	15.2	47.0	3.5	11.0
37	70.0	39.7	15.2	63.5	3.5	11.0
50	67.5	39.7	18.2	61.1	9.3	12.0

Knurled screw

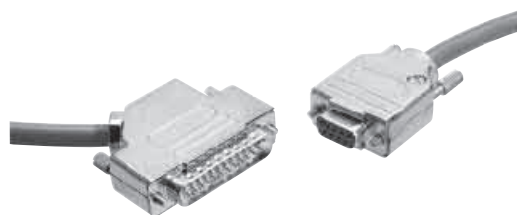
for metallized hood
Thread UNC
Thread M3

9-50	09 67 000 9925 ²⁾
9-50	09 67 000 9930 ²⁾



¹⁾ Use of knurled screws is possible. Please order separately

²⁾ Order 2 for each hood

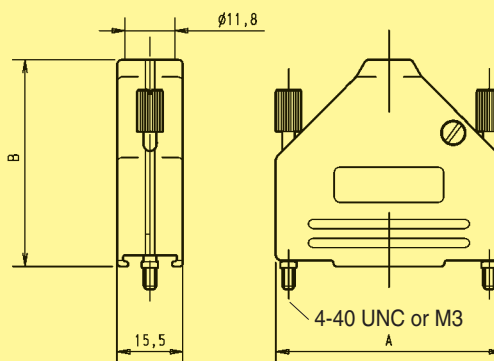


Full metal top and side entry hoods with knurled screws

Identification No. of contacts Part No. Drawing Dimensions in mm

Top entry hood

9 09 67 009 034 .
 15 09 67 015 034 .
 25 09 67 025 034 .
 37 09 67 037 034 .

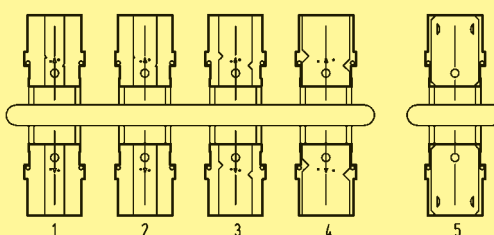


Poles	A	B
9	31.2	39.9
15	39.5	41.5
25	53.4	48.6
37	69.7	53.6

Please insert digit for screw option

Knurled screw, thread 4-40 UNC ▶ 3
 Knurled screw, thread M3 ▶ 8

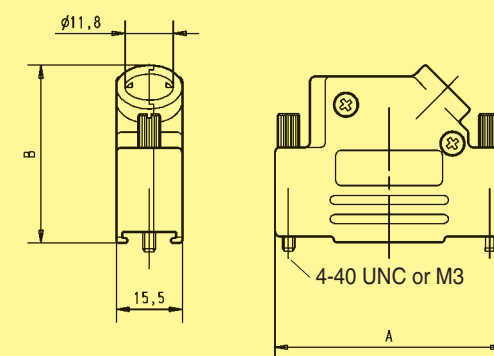
Grommet set halves



Grommet dimensions	
Number	Diameter
1	4.0
2	5.0
3	7.0
4	10.0
5	10.2

Side entry hood

9¹⁾ 09 67 009 033 .
 15 09 67 015 033 .
 25 09 67 025 033 .
 37 09 67 037 033 .

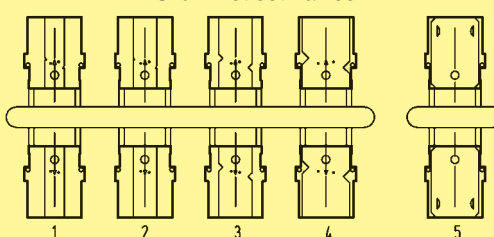


Poles	A	B
9	31.0	38.0
15	40.5	41.1
25	53.7	41.8
37	69.8	41.8

Please insert digit for screw option

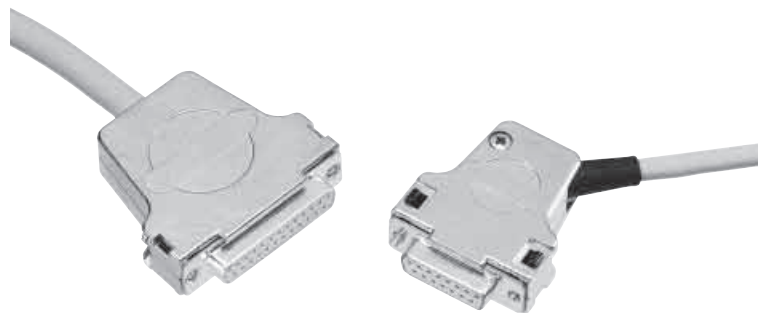
Knurled screw, thread 4-40 UNC ▶ 3
 Knurled screw, thread M3 ▶ 6

Grommet set halves



Grommet dimensions	
Number	Diameter
1	4.0
2	5.0
3	7.0
4	10.0
5	10.2

¹⁾ 9 pole hood provided with only one screw on the opposite side of the cable entry.



Full metal top and side entry hoods
with short screws

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm																																																								
Top entry hood Please insert digit for screw option Locking screw, thread 4-40 UNC ▶ 4 Locking screw, thread M3 ▶ 9	9 15 25 37 50	09 67 009 034 . 09 67 015 034 . 09 67 025 034 . 09 67 037 034 . 09 67 050 034 .	<table><tr><th rowspan="2">Poles</th><th rowspan="2">A</th><th rowspan="2">B</th><th rowspan="2">C</th><th rowspan="2">D</th><th colspan="2">Ø F1</th><th rowspan="2">Ø F2</th><th rowspan="2">Ø F3</th></tr><tr><th>Min.</th><th>Max.</th></tr><tr><td>9</td><td>31.8</td><td>42.4</td><td>20.8</td><td>15.4</td><td>3.0</td><td>9.5</td><td>6.5</td><td>—</td></tr><tr><td>15</td><td>40.3</td><td>43.5</td><td>23.3</td><td>15.4</td><td>3.0</td><td>8.5</td><td>6.5</td><td>12.5</td></tr><tr><td>25</td><td>54.0</td><td>47.7</td><td>31.7</td><td>15.4</td><td>3.0</td><td>8.5</td><td>8.0</td><td>12.5</td></tr><tr><td>37</td><td>70.2</td><td>50.4</td><td>48.2</td><td>15.4</td><td>3.0</td><td>12.0</td><td>9.0</td><td>15.0</td></tr><tr><td>50</td><td>67.8</td><td>50.5</td><td>45.8</td><td>18.2</td><td>3.0</td><td>12.0</td><td>9.7</td><td>15.0</td></tr></table> * Cable diameter without rubber bushing = Ø F1 Cable diameter with rubber bushing = Ø F2 Cable diameter without rubber bushing and without cable reduction plate = Ø F3	Poles	A	B	C	D	Ø F1		Ø F2	Ø F3	Min.	Max.	9	31.8	42.4	20.8	15.4	3.0	9.5	6.5	—	15	40.3	43.5	23.3	15.4	3.0	8.5	6.5	12.5	25	54.0	47.7	31.7	15.4	3.0	8.5	8.0	12.5	37	70.2	50.4	48.2	15.4	3.0	12.0	9.0	15.0	50	67.8	50.5	45.8	18.2	3.0	12.0	9.7	15.0	
Poles	A	B	C						D	Ø F1			Ø F2	Ø F3																																														
				Min.	Max.																																																							
9	31.8	42.4	20.8	15.4	3.0	9.5	6.5	—																																																				
15	40.3	43.5	23.3	15.4	3.0	8.5	6.5	12.5																																																				
25	54.0	47.7	31.7	15.4	3.0	8.5	8.0	12.5																																																				
37	70.2	50.4	48.2	15.4	3.0	12.0	9.0	15.0																																																				
50	67.8	50.5	45.8	18.2	3.0	12.0	9.7	15.0																																																				
Side entry hood Please insert digit for screw option Locking screw, thread 4-40 UNC ▶ 4 Locking screw, thread M3 ▶ 5	9 15 25 37 50	09 67 009 033 . 09 67 015 033 . 09 67 025 033 . 09 67 037 033 . 09 67 050 033 .																																																										
Locking hook Latch lock bolt Front mount thread 4-40 UNC thread M3 Rear mount thread 4-40 UNC thread M3 Cable to cable thread 4-40 UNC thread M3		09 67 002 9031 09 67 002 9041 09 67 002 9042 09 67 002 9032 09 67 002 9040 09 67 002 9044 09 67 002 9045	Front mount Rear mount Cable to cable																																																									

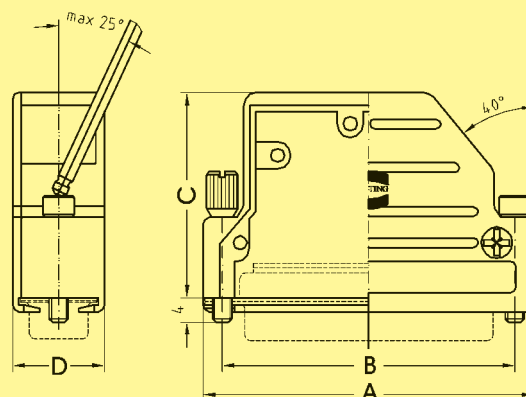


Full metal top and side entry hoods
with different screw options

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
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40° side entry hood

9	61 03 001 . 013
15	61 03 001 . 014
25	61 03 001 . 015



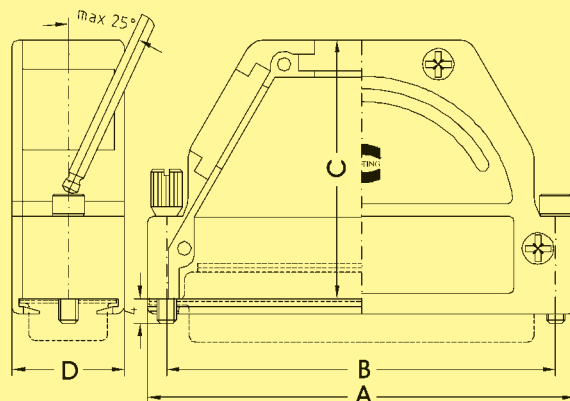
No. of contacts	A	B	C	D
9	31.0	25.0	35.0	15.0
15	39.3	33.3	35.0	15.0
25	53.0	47.0	35.0	15.0

Top/side entry hood

9	61 03 001 . 010
15	61 03 001 . 016
25	61 03 001 . 017 ¹⁾
37	61 03 001 . 018 ¹⁾
50	61 03 001 . 019 ¹⁾

Please insert digit for screw option

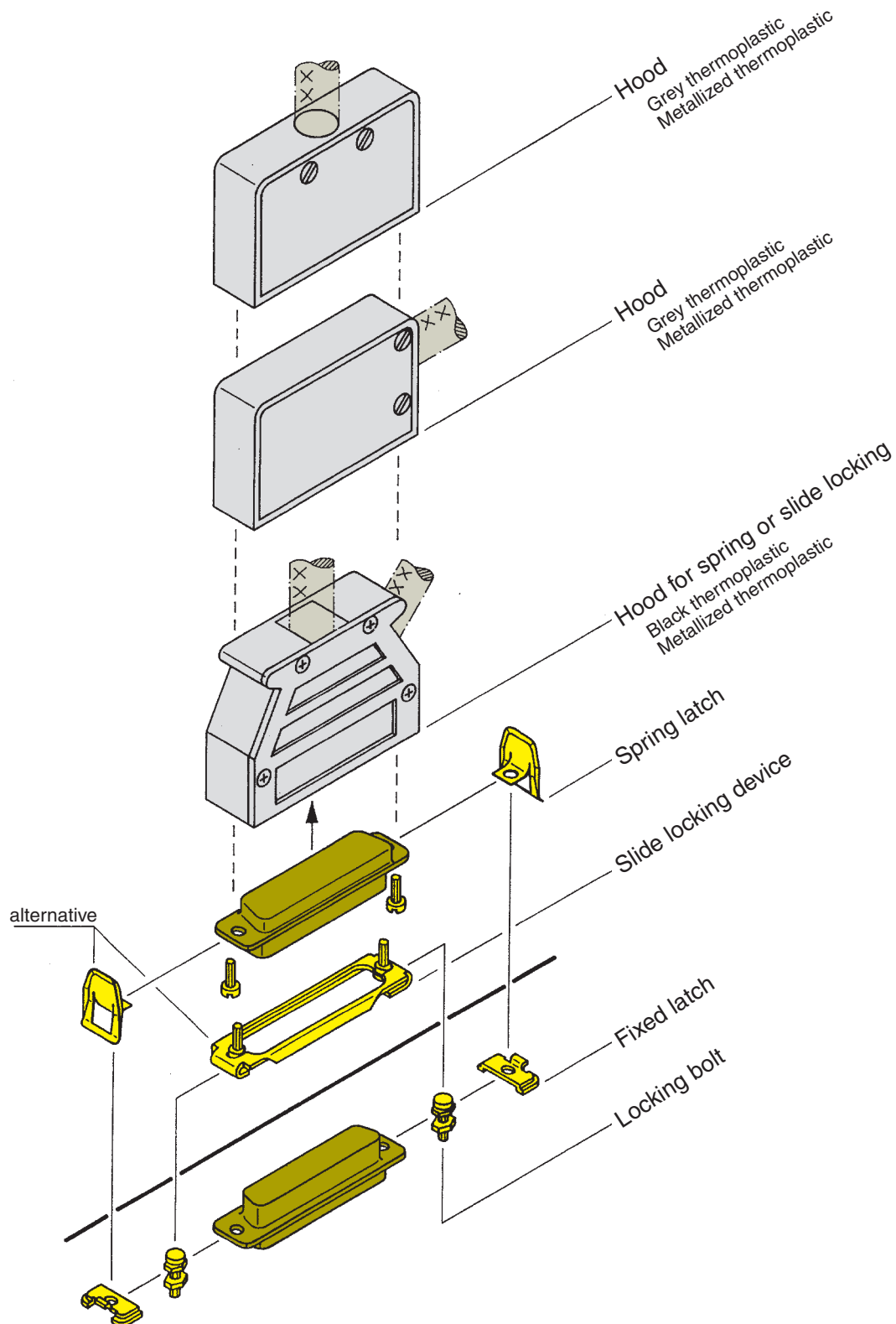
- Knurled screw, thread 4-40 UNC ► 0
- Hexagonal screw, thread M3 with captive washer ► 1
- Hexagonal screw, thread 4-40 UNC with captive washer ► 2
- Knurled screw, thread M3 ► 3



No. of contacts	No. of cable entries	A	B	C	D
9	1 (top)	31.0	25.0	38.0	15.0
15	1 (top)	39.5	33.3	35.0	15.0
25	3	53.0	47.0	43.0	15.0
37	3	69.5	63.5	43.0	15.0
50	3	67.2	61.6	43.0	17.8

¹⁾ Part No. contains two blanking pieces

Connector hoods for spring or slide locking



Thermoplastic top
and side entry hoods
for spring or slide locking



Identification

No. of
contacts

Part No.

Drawing

Dimensions in mm

Top entry hood

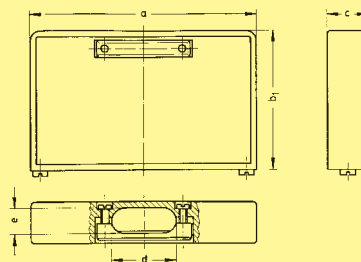
9
15
25
37
50

Thermoplastic
grey

09 67 009 0411
09 67 015 0411
09 67 025 0411
09 67 037 0411
09 67 050 0411

Thermoplastic
metallized

09 67 009 0413
09 67 015 0413
09 67 025 0413
09 67 037 0413
09 67 050 0413



9-37 way
for packaging density
of 3 TE (15.24 mm)

	a	b ₁	b ₂	c	d	e	
						min.	max.
9	31.0	23	28	12.8	10	5.75	9.0
15	39.4	28	28	12.8	10	5.75	9.0
25	53.3	34	34	12.8	14	5.75	9.0
37	69.7	43	43	12.8	20	5.75	9.0
50	67.1	41	41	15.8	20	5.75	11.6

Side entry hood

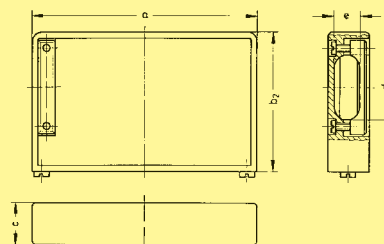
9
15
25
37
50

Thermoplastic
grey

09 67 009 0511
09 67 015 0511
09 67 025 0511
09 67 037 0511
09 67 050 0511

Thermoplastic
metallized

09 67 009 0513
09 67 015 0513
09 67 025 0513
09 67 037 0513
09 67 050 0513



9-37 way
for packaging density
of 3 TE (15.24 mm)

Top and side entry
hood ¹⁾

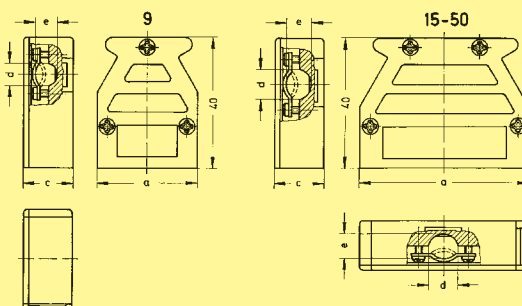
9
15
25
37
50

Thermoplastic
black

09 67 009 0452
09 67 015 0452
09 67 025 0452
09 67 037 0452
09 67 050 0452

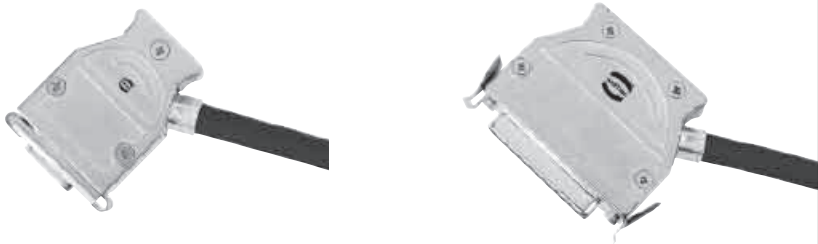
Thermoplastic
metallized

09 67 009 0453
09 67 015 0453
09 67 025 0453
09 67 037 0453
09 67 050 0453



	a	c	d	e	
				min.	max.
9	31.0	15.4	7	1.7	7.5
15	39.4	15.4	7	1.7	8.0
25	53.2	15.4	9	1.5	8.0
37	69.5	15.4	9	1.5	8.0
50	67.0	17.9	9	1.5	8.0

¹⁾ 9 poles is only side entry
Accessories see page 07.13

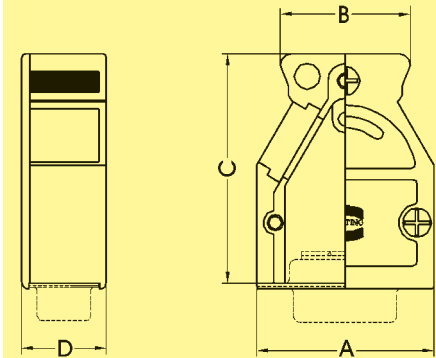


Full metal top and side entry hoods
for spring or slide locking

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
----------------	-----------------	----------	---------	------------------

Top/side entry hood with
spring/slide locking

	9	61 03 001 0022 ¹⁾
	15	61 03 001 0011 ²⁾
	25	61 03 001 0012 ²⁾
	37	61 03 001 0021 ²⁾
	50	61 03 001 0020 ²⁾



No. of contacts	No. of cable entries	A	B	C	D
9	2	31.0	22.6	40.0	14.8
15	3	39.0	30.6	40.0	14.8
25	3	53.0	42.6	40.0	14.8
37	3	69.5	59.2	40.0	14.8
50	3	67.0	55.0	40.0	17.6

D-Sub - H

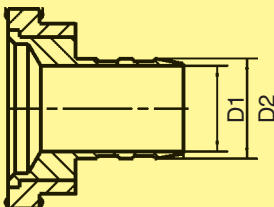
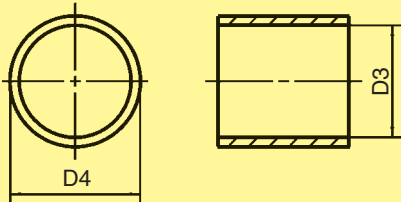
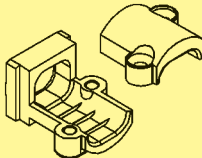
¹⁾ Part No. contains one blanking piece
²⁾ Part No. contains two blanking pieces

Accessories for spring or slide locking hoods

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm																														
Spring latch	9-50	corrosion resistant steel 09 67 000 9907 ¹⁾																																
Fixed latch	9-37 50	corrosion resistant steel 09 67 001 9971 ¹⁾ 09 67 001 9972 ¹⁾																																
Slide locking device	9 15 25 37 50	corrosion resistant steel 09 67 000 9914 09 67 000 9915 09 67 000 9916 09 67 000 9917 09 67 000 9918	<table border="1"> <thead> <tr> <th></th><th>a</th><th>b</th><th>c</th><th>d</th></tr> </thead> <tbody> <tr> <td>9</td><td>35.6</td><td>25.0</td><td>12.0</td><td>10.0</td></tr> <tr> <td>15</td><td>44.0</td><td>33.3</td><td>12.0</td><td>10.0</td></tr> <tr> <td>25</td><td>57.8</td><td>47.0</td><td>12.0</td><td>10.0</td></tr> <tr> <td>37</td><td>74.3</td><td>63.5</td><td>12.0</td><td>10.0</td></tr> <tr> <td>50</td><td>72.0</td><td>61.1</td><td>14.8</td><td>13.5</td></tr> </tbody> </table>		a	b	c	d	9	35.6	25.0	12.0	10.0	15	44.0	33.3	12.0	10.0	25	57.8	47.0	12.0	10.0	37	74.3	63.5	12.0	10.0	50	72.0	61.1	14.8	13.5	
	a	b	c	d																														
9	35.6	25.0	12.0	10.0																														
15	44.0	33.3	12.0	10.0																														
25	57.8	47.0	12.0	10.0																														
37	74.3	63.5	12.0	10.0																														
50	72.0	61.1	14.8	13.5																														
Locking bolt	9-50	tinned 09 67 001 9973 ¹⁾																																

¹⁾ Order 2 for each connector

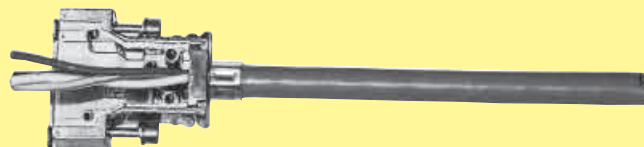
Accessories for full metal hoods

Identification	Part No.		Drawing	Dimensions in mm																																								
Crimp flange	Hoods for 9-37 pole D-Sub	Hoods for 50 pole D-Sub	<table><tr><th>D1</th><th>D2</th></tr><tr><td>3.0</td><td>4.0</td></tr><tr><td>3.5</td><td>4.5</td></tr><tr><td>4.0</td><td>5.0</td></tr><tr><td>4.5</td><td>5.5</td></tr><tr><td>5.0</td><td>6.0</td></tr><tr><td>5.5</td><td>6.5</td></tr><tr><td>6.0</td><td>7.0</td></tr><tr><td>6.5</td><td>7.5</td></tr><tr><td>7.0</td><td>8.0</td></tr><tr><td>7.5</td><td>8.5</td></tr><tr><td>8.0</td><td>9.0</td></tr><tr><td>8.5</td><td>9.5</td></tr><tr><td>9.0</td><td>10.0</td></tr></table> 	D1	D2	3.0	4.0	3.5	4.5	4.0	5.0	4.5	5.5	5.0	6.0	5.5	6.5	6.0	7.0	6.5	7.5	7.0	8.0	7.5	8.5	8.0	9.0	8.5	9.5	9.0	10.0													
	D1	D2																																										
	3.0	4.0																																										
	3.5	4.5																																										
	4.0	5.0																																										
	4.5	5.5																																										
	5.0	6.0																																										
	5.5	6.5																																										
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	7.0	8.0																																										
	7.5	8.5																																										
	8.0	9.0																																										
	8.5	9.5																																										
	9.0	10.0																																										
61 03 000 0062	61 03 000 5062																																											
61 03 000 0063	61 03 000 5063																																											
61 03 000 0064	61 03 000 5064																																											
61 03 000 0065	61 03 000 5065																																											
61 03 000 0066	61 03 000 5066																																											
61 03 000 0166	61 03 000 5166																																											
61 03 000 0067	61 03 000 5067																																											
61 03 000 0068	61 03 000 5068																																											
61 03 000 0069	61 03 000 5069																																											
61 03 000 0070	61 03 000 5070																																											
61 03 000 0071	61 03 000 5071																																											
61 03 000 0165	61 03 000 5165																																											
61 03 000 0072	61 03 000 5072																																											
Crimp ferrule	61 03 000 0045		<table><tr><th>D3</th><th>D4</th></tr><tr><td>5.0</td><td>6.0</td></tr><tr><td>5.5</td><td>6.5</td></tr><tr><td>6.0</td><td>7.0</td></tr><tr><td>6.5</td><td>7.5</td></tr><tr><td>7.0</td><td>8.0</td></tr><tr><td>7.5</td><td>8.5</td></tr><tr><td>8.0</td><td>9.0</td></tr><tr><td>8.5</td><td>9.5</td></tr><tr><td>9.0</td><td>10.0</td></tr><tr><td>9.5</td><td>10.5</td></tr><tr><td>10.0</td><td>11.0</td></tr><tr><td>10.5</td><td>11.5</td></tr><tr><td>11.0</td><td>12.0</td></tr><tr><td>11.5</td><td>12.5</td></tr><tr><td>12.0</td><td>13.0</td></tr><tr><td>12.5</td><td>13.5</td></tr><tr><td>13.0</td><td>14.0</td></tr><tr><td>13.7</td><td>15.0</td></tr><tr><td>14.0</td><td>15.0</td></tr></table> 	D3	D4	5.0	6.0	5.5	6.5	6.0	7.0	6.5	7.5	7.0	8.0	7.5	8.5	8.0	9.0	8.5	9.5	9.0	10.0	9.5	10.5	10.0	11.0	10.5	11.5	11.0	12.0	11.5	12.5	12.0	13.0	12.5	13.5	13.0	14.0	13.7	15.0	14.0	15.0	
	D3	D4																																										
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	13.0	14.0																																										
	13.7	15.0																																										
	14.0	15.0																																										
	61 03 000 0046																																											
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61 03 000 0058																																												
61 03 000 0142																																												
61 03 000 0059																																												
61 03 000 0127																																												
61 03 000 0060																																												
61 03 000 0061																																												
Cable clamp	cable-Ø appr. 5- 7 mm	61 03 000 0141																																										
	cable-Ø appr. 7-10 mm	61 03 000 0044																																										
	cable-Ø appr. 10-12 mm	61 03 000 0143																																										
	cable-Ø appr. 11-14 mm			61 03 000 0145																																								
Blanking piece for hoods	61 03 000 0042	61 03 000 0041																																										
Hexagonal screw thread 4-40 UNC x 17.5- 8.8 with captive washer	09 67 002 9020																																											
	09 67 002 9019																																											
Knurled screw thread 4-40 UNC	09 67 002 9018																																											
	09 67 002 9017																																											

Crimp flange termination instruction

1. Strip the cable sheath to the correct length (approx. 35 to 40 mm, depending on interface type).
2. Place the crimp ferrule over the cable sheath. Bend the outer screen backwards over the cable sheath. Cut screen approx. 2 mm from the end of the cable sheath.
3. Place the crimp flange over the wires covered by the remaining foil shield. Push and twist the crimp flange under the outer screen and cable sheath until the end of the cable sheath touches the crimp flange. HARTING has developed a special tool for optimised installation of the shielding over the crimp flange, part number 61 03 600 0017.
4. Move the crimp ferrule back onto the crimp flange and crimp the two parts together with the special service crimp tool part number 61 03 600 0020. For an optimised crimp process the tool should be positioned as close as possible to the crimp flange shoulder.
5. Cut off the internal screen foil and push the crimp flange inside the metal hood.

HARTING offers to test and define the best crimp flange and ferrule combination for customer specific cables.



D-Sub – Accessories for subminiature D connectors

Page

Accessories

08.02

Accessories

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
Female screw locks without nut Thread UNC/UNC Thread UNC/M3 Thread M3/UNC Thread M3/M3 Thread UNC/UNC Thread UNC/M3	9-50 9-50 9-50 9-50 9-50 9-50	09 67 000 9972 ¹⁾ 09 67 000 9974 ¹⁾ 09 67 001 9976 ¹⁾ 09 67 001 9974 ¹⁾ 09 67 001 9941 ¹⁾ 09 67 001 9954 ¹⁾	 	
for press-in connectors with grounding-pins or straight solder with grounding-clips. Thread UNC/UNC Thread UNC/M3	9-50 9-50	09 66 000 9972 ¹⁾ 09 66 000 9974 ¹⁾²⁾	 	
with captive washer Thread UNC/UNC	9-50	09 67 001 9957 ¹⁾		
with spring washer Thread UNC/UNC	9-50	09 67 001 9939 ¹⁾		

¹⁾ Order 2 for each connector

²⁾ M3 inner thread available on request

Accessories

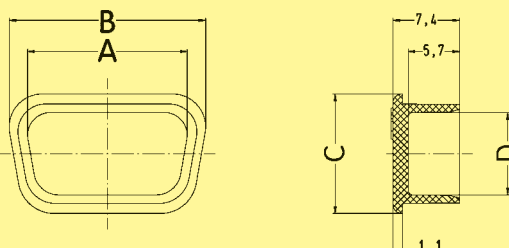
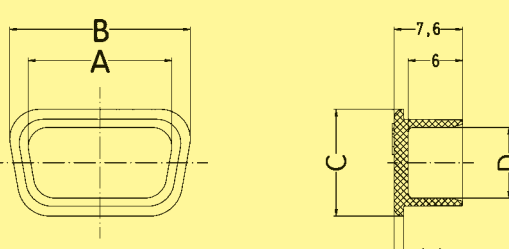
Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
Female screw locks with nut Thread UNC/UNC Thread UNC/M3 Thread UNC/UNC	9-50 9-50 9-50	09 67 000 9922 ¹⁾ 09 67 000 9924 ¹⁾ 09 67 000 9973 ¹⁾		
Male screw locks for use without hood	9-37 50	09 67 001 9969 ¹⁾ 09 67 001 9970 ¹⁾		
Hex extender	9-50	09 67 001 9985		
U-Clip with thread 4-40 UNC	9-50	09 67 001 9928 ¹⁾		
with thread 4-40 UNC and screw-lock	9-50	09 67 002 9030 ¹⁾		

¹⁾ Order 2 for each connector

Accessories

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm															
Dust cap black thermoplastic for male connector	9 15 25 37	09 67 009 0611 09 67 015 0611 09 67 025 0611 09 67 037 0611		<table><tr><th></th><th>A</th><th>B</th></tr><tr><td>9</td><td>17.0</td><td>22.40</td></tr><tr><td>15</td><td>25.3</td><td>30.80</td></tr><tr><td>25</td><td>38.9</td><td>44.40</td></tr><tr><td>37</td><td>55.4</td><td>60.75</td></tr></table>		A	B	9	17.0	22.40	15	25.3	30.80	25	38.9	44.40	37	55.4	60.75
	A	B																	
9	17.0	22.40																	
15	25.3	30.80																	
25	38.9	44.40																	
37	55.4	60.75																	
for female connector	9 15 25 37	09 67 009 0711 09 67 015 0711 09 67 025 0711 09 67 037 0711		<table><tr><th></th><th>A</th><th>B</th></tr><tr><td>9</td><td>16.0</td><td>22.5</td></tr><tr><td>15</td><td>24.4</td><td>31.0</td></tr><tr><td>25</td><td>37.8</td><td>44.3</td></tr><tr><td>37</td><td>54.3</td><td>60.8</td></tr></table>		A	B	9	16.0	22.5	15	24.4	31.0	25	37.8	44.3	37	54.3	60.8
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25	37.8	44.3																	
37	54.3	60.8																	
antistatic black thermoplastic for male connector	9 15 25 37	09 67 009 0612 09 67 015 0612 09 67 025 0612 09 67 037 0612		<table><tr><th></th><th>A</th><th>B</th></tr><tr><td>9</td><td>17.7</td><td>21.8</td></tr><tr><td>15</td><td>26.0</td><td>30.0</td></tr><tr><td>25</td><td>40.0</td><td>44.2</td></tr><tr><td>37</td><td>56.4</td><td>59.8</td></tr></table>		A	B	9	17.7	21.8	15	26.0	30.0	25	40.0	44.2	37	56.4	59.8
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25	40.0	44.2																	
37	56.4	59.8																	
for female connector	9 15 25 37	09 67 009 0712 09 67 015 0712 09 67 025 0712 09 67 037 0712		<table><tr><th></th><th>A</th><th>B</th></tr><tr><td>9</td><td>15.9</td><td>20.0</td></tr><tr><td>15</td><td>24.4</td><td>28.5</td></tr><tr><td>25</td><td>38.3</td><td>42.3</td></tr><tr><td>37</td><td>54.7</td><td>58.8</td></tr></table>		A	B	9	15.9	20.0	15	24.4	28.5	25	38.3	42.3	37	54.7	58.8
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15	24.4	28.5																	
25	38.3	42.3																	
37	54.7	58.8																	
UL 94 V0 grey thermoplastic for male connector	9 15 25 37	09 67 009 0613 09 67 015 0613 09 67 025 0613 09 67 037 0613		<table><tr><th></th><th>A</th><th>B</th></tr><tr><td>9</td><td>17.7</td><td>21.8</td></tr><tr><td>15</td><td>26.0</td><td>30.0</td></tr><tr><td>25</td><td>40.0</td><td>44.2</td></tr><tr><td>37</td><td>56.4</td><td>59.8</td></tr></table>		A	B	9	17.7	21.8	15	26.0	30.0	25	40.0	44.2	37	56.4	59.8
	A	B																	
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25	40.0	44.2																	
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for female connector	9 15 25 37	09 67 009 0713 09 67 015 0713 09 67 025 0713 09 67 037 0713		<table><tr><th></th><th>A</th><th>B</th></tr><tr><td>9</td><td>15.9</td><td>20.0</td></tr><tr><td>15</td><td>24.4</td><td>28.5</td></tr><tr><td>25</td><td>38.3</td><td>42.3</td></tr><tr><td>37</td><td>54.7</td><td>58.8</td></tr></table>		A	B	9	15.9	20.0	15	24.4	28.5	25	38.3	42.3	37	54.7	58.8
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37	54.7	58.8																	

Accessories

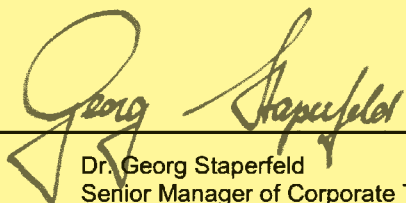
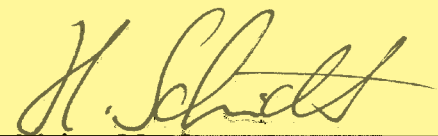
Identification	No. of contacts	Part No.	Drawing	Dimensions in mm																														
Dust cap metallized metallized thermoplastic																																		
for male connector	9 15 25 37 50	09 67 009 0614 09 67 015 0614 09 67 025 0614 09 67 037 0614 09 67 050 0614	 <table><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>9</td><td>17.7</td><td>21.8</td><td>13.2</td><td>9.1</td></tr><tr><td>15</td><td>26.0</td><td>30.0</td><td>13.2</td><td>9.1</td></tr><tr><td>25</td><td>40.0</td><td>44.2</td><td>13.2</td><td>9.1</td></tr><tr><td>37</td><td>56.4</td><td>59.8</td><td>13.2</td><td>9.1</td></tr><tr><td>50</td><td>53.9</td><td>57.8</td><td>15.9</td><td>11.7</td></tr></table>		A	B	C	D	9	17.7	21.8	13.2	9.1	15	26.0	30.0	13.2	9.1	25	40.0	44.2	13.2	9.1	37	56.4	59.8	13.2	9.1	50	53.9	57.8	15.9	11.7	
	A	B	C	D																														
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15	26.0	30.0	13.2	9.1																														
25	40.0	44.2	13.2	9.1																														
37	56.4	59.8	13.2	9.1																														
50	53.9	57.8	15.9	11.7																														
for female connector	9 15 25 37 50	09 67 009 0714 09 67 015 0714 09 67 025 0714 09 67 037 0714 09 67 050 0714	 <table><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>9</td><td>15.9</td><td>20.0</td><td>11.8</td><td>7.8</td></tr><tr><td>15</td><td>24.4</td><td>28.5</td><td>11.8</td><td>7.8</td></tr><tr><td>25</td><td>38.3</td><td>42.3</td><td>11.8</td><td>7.8</td></tr><tr><td>37</td><td>54.7</td><td>58.8</td><td>11.8</td><td>7.8</td></tr><tr><td>50</td><td>52.6</td><td>56.2</td><td>14.5</td><td>10.5</td></tr></table>		A	B	C	D	9	15.9	20.0	11.8	7.8	15	24.4	28.5	11.8	7.8	25	38.3	42.3	11.8	7.8	37	54.7	58.8	11.8	7.8	50	52.6	56.2	14.5	10.5	
	A	B	C	D																														
9	15.9	20.0	11.8	7.8																														
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37	54.7	58.8	11.8	7.8																														
50	52.6	56.2	14.5	10.5																														

SEK – Insulation Displacement Connector system (IDC), 2.54 mm pitch

Page

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Solder board connectors	
Technical characteristics	09.04
Male standard connectors	09.06
Male standard connectors, kinked	09.10
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Wrap post connectors	
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Male standard connectors	09.18
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Technical characteristics for pcb transition connectors, 2 rows	09.24
Pcb transition connectors, 2 rows	09.25
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Pcb transition connectors, 4 rows	09.29
Technical characteristics for DIP connectors	09.30
DIP connectors	09.31
Technical characteristics for DIN 41 612 connectors	09.32
DIN 41 612 connectors	09.33

Declaration of conformity

<i>This Declaration of Conformity is suitable to the European Standard EN 45 014, „General criteria for suppliers declaration of conformity“.</i> <i>The basis for the criteria has been found in international documentation, particularly in ISO/IEC Guide 22, 1996, „Information on manufacturers declaration of conformity with standards or other technical specifications“.</i>	We HARTING KGaA Marienwerder Str. 3 32339 Espelkamp HARTING Electronics GmbH & Co KG Marienwerder Str.3 32339 Espelkamp declare under our own responsibility that the Flat Cable Connector System is in conformity with the following standard IEC 60603-13 Connectors for frequencies below 3MHz for use with printed board-Part 13: Detail specification for two-part connectors with assessed quality, for printed boards, for basic grid of 2,54 mm (0,1in) with free connectors for non – accessible insulation displacement termination (ID) This declaration of conformity refers to the series: SEK
	Our testing laboratory is accredited and monitored by the German Accreditation Body Technology/ (DATEch). Reg.-Nr. DAT-P-041/94-02
QUALITY SYSTEM  certified by DQS acc. to ISO 9001 - Reg.-Nr. 2204	Our quality system is certified and monitored by DQS in conformity with the standard DIN EN ISO 9001 : 2000. Cert.-Nr. 002204 QM
<u>Espelkamp, 2004-11-18</u> Place and Date of publication	 Dr. Georg Staperfeld Senior Manager of Corporate Technology Services
<u>Espelkamp, 2004-11-18</u> Place and Date of publication	 Dipl.-Ing. Hartmuth Schmidt Director Global Product Management HARTING Electronics GmbH & Co KG

The HARTING Insulation Displacement Connector system

Economic and reliable connections

The flat cable and connector can be preassembled and used as a component with predetermined functional characteristics.

The HARTING insulation displacement contacts pierce the insulation on the flat cable to provide a durable gastight connection with the wire.

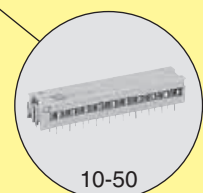
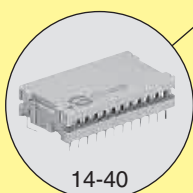
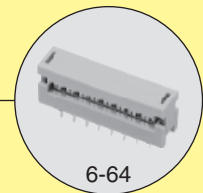
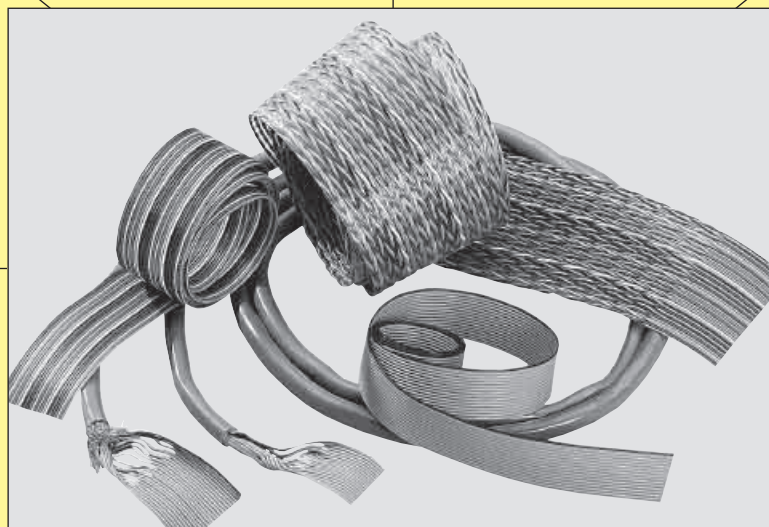
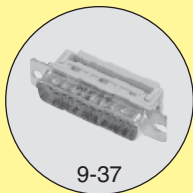
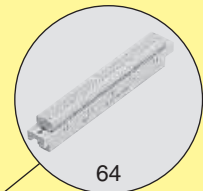
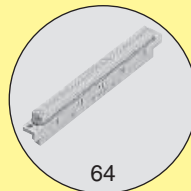
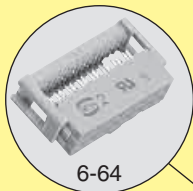
The HARTING¹⁾ insulation displacement technique constitutes the ideal solution to your wiring problems.

¹⁾ The HARTING insulation displacement system meets all the characteristics, specifications and test conditions of IEC 60352-4.

For "non standard applications" we can manufacture designs to match your requirements.

Please discuss requirements with us.

HARTING SEK connectors incorporate the latest design features and provide the assurance of high quality and reliability with economy.



Cable assemblies

- HARTING can supply cable assemblies to customer specifications.
- A wide range of connector types available with various contact arrangements constitute the ideal solution to your wiring problems.
- Cables of all types in economic reel lengths are available.

Quality

- Cables professionally assembled on HARTING work stations ensure reliable connections.
- Finished harnesses are subject to 100% quality checks on a HARTING test device.
- Insulation test.
- Contact resistance test.

Economy

- The tested assembly of connectors and flat cables from one manufacturer guarantees a high degree of economy and reliability.
- Investment for work stations and test devices are not required.
- Stocks of piece parts are reduced.

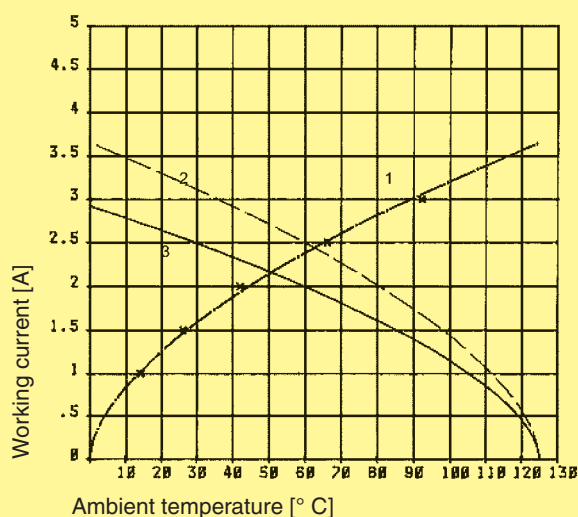
Number of contacts	6, 10, 14, 16, 20, 26, 30*, 34, 40, 50, 60, 64
Contact arrangement	straight, angled
Contact length	2.9 mm, 4.5 mm
Approvals	IEC 60 603-13 DIN EN 60 603-13 D 2632 BT 224 NFC 93-428 (HE 10) UL recognized: E102079 comply with MIL DTL 83 503
Pitch	2.54 mm [0.100"]
Working current	1 A
Working voltage	500 V for pollution degree 1
Test voltage $U_{r.m.s.}$	1 kV
Contact resistance	$\leq 20 \text{ m}\Omega$
Insulation resistance	$\geq 10^9 \Omega$
Temperature range	-55 °C ... + 125 °C The maximum temperature includes heating of contacts and ambient temperature
Terminations	For pcb hole $\varnothing 1 \pm 0.1 \text{ mm}$ DIN IEC 52 141 Diagonal: 0.79 mm
Materials	
Moulding	Thermoplastic resin (PBTP) UL 94-V0
Contact surface	
Contact zone	gold-plated according to performance level ¹⁾



Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512.



Example: 50 way connector

- ① Temperature rise
- ② Derating
- ③ Derating curve at $I_{max} \times 0.8$ (IEC 60 512-2)

Insertion and withdrawal forces

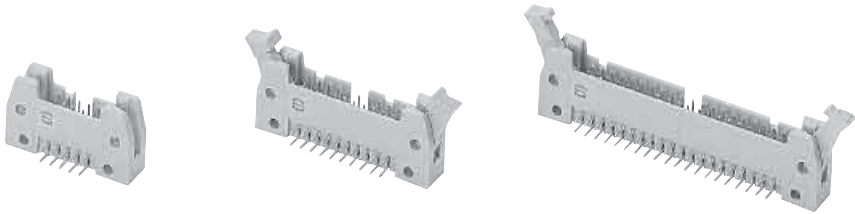
Number of contacts	Maximum force [N]	
	Performance level 1 and 2	Performance level 3
6	12	18
10	20	30
14	28	42
16	32	48
20	40	60
26	52	78
30	60	90
34	68	102
40	80	120
50	100	150
60	120	180
64	128	192

¹⁾ Performance level 3 as per IEC 60 603-13, ≥ 50 mating cycles, no gas test
Performance level 2 as per IEC 60 603-13, ≥ 250 mating cycles, 4 days gas test
as per MIL DTL 83 503, $> 0.76 \mu\text{m Au}$ ($30 \mu\text{inch}$), other performance levels on request

* on request

Number of contacts

6-64



Male header with angled solder pins

Identification	No. of contacts	Part No.					
		Without levers		With short levers		With long levers	
Male header with angled solder pins Length: 2.9 mm	6	09 18 506	└ 923	09 18 506	└ 913	09 18 506	└ 903
	10	09 18 510	└ 923	09 18 510	└ 913	09 18 510	└ 903
	14	09 18 514	└ 923	09 18 514	└ 913	09 18 514	└ 903
	16	09 18 516	└ 923	09 18 516	└ 913	09 18 516	└ 903
	20	09 18 520	└ 923	09 18 520	└ 913	09 18 520	└ 903
	26	09 18 526	└ 923	09 18 526	└ 913	09 18 526	└ 903
	34	09 18 534	└ 923	09 18 534	└ 913	09 18 534	└ 903
	40	09 18 540	└ 923	09 18 540	└ 913	09 18 540	└ 903
	50	09 18 550	└ 923	09 18 550	└ 913	09 18 550	└ 903
	60	09 18 560	└ 923	09 18 560	└ 913	09 18 560	└ 903
	64	09 18 564	└ 923	09 18 564	└ 913	09 18 564	└ 903
30 contacts and kinked version on request							
Male header with angled solder pins Length: 4.5 mm	6	09 18 506	└ 921*	09 18 506	└ 911*	09 18 506	└ 901*
	10	09 18 510	└ 921*	09 18 510	└ 911*	09 18 510	└ 901*
	14	09 18 514	└ 921*	09 18 514	└ 911*	09 18 514	└ 901*
	16	09 18 516	└ 921*	09 18 516	└ 911*	09 18 516	└ 901*
	20	09 18 520	└ 921*	09 18 520	└ 911*	09 18 520	└ 901*
	26	09 18 526	└ 921*	09 18 526	└ 911*	09 18 526	└ 901*
	34	09 18 534	└ 921*	09 18 534	└ 911*	09 18 534	└ 901*
	40	09 18 540	└ 921*	09 18 540	└ 911*	09 18 540	└ 901*
	50	09 18 550	└ 921*	09 18 550	└ 911*	09 18 550	└ 901*
	60	09 18 560	└ 921*	09 18 560	└ 911*	09 18 560	└ 901*
	64	09 18 564	└ 921*	09 18 564	└ 911*	09 18 564	└ 901*
30 contacts and kinked version on request							

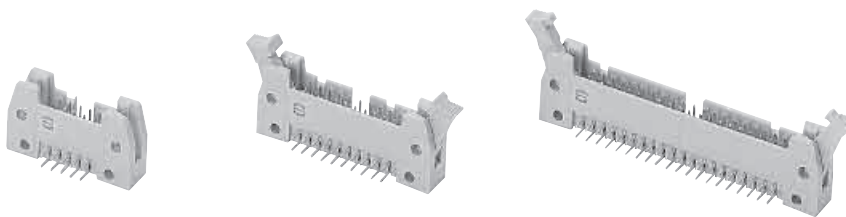
* Not normally kept in stock
For accessories see page 09.16
For dimensions see page 09.07

For performance level 3 please specify digit
For performance level 2 please specify digit
> 0.76 µm Au (30 µinch) on request



Number of contacts

6-64



Male header with angled solder pins

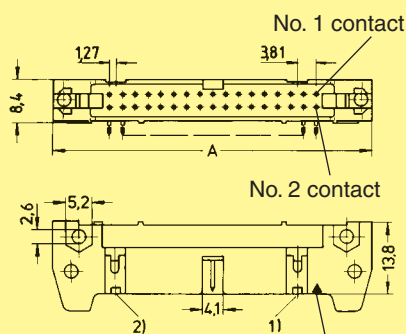
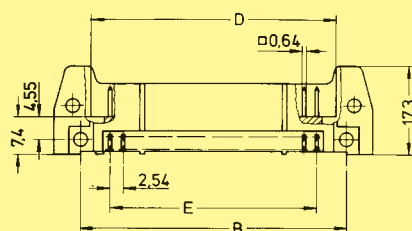
Identification

Drawing

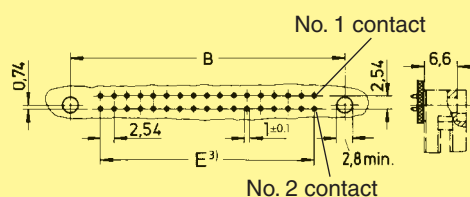
Dimensions in mm

Male header

No. of contacts	A	B	D	E	F	G
6	26.9	16.76	12.45	2.54 x 2 = 5.08	36.9	40.3
10	32.0	21.84	17.53	2.54 x 4 = 10.16	42.0	45.4
14	37.1	26.92	22.61	2.54 x 6 = 15.24	47.1	50.4
16	39.6	29.46	25.15	2.54 x 7 = 17.78	49.6	53.0
20	44.7	34.54	30.23	2.54 x 9 = 22.86	54.7	58.1
26	52.3	42.16	37.85	2.54 x 12 = 30.48	62.3	65.7
34	62.5	52.32	48.01	2.54 x 16 = 40.64	72.5	75.8
40	70.1	59.94	55.63	2.54 x 19 = 48.26	80.1	83.5
50	82.8	72.64	68.33	2.54 x 24 = 60.96	92.8	96.2
60	95.5	85.34	81.03	2.54 x 29 = 73.66	105.5	108.9
64	100.6	90.42	86.11	2.54 x 31 = 78.74	110.6	113.9

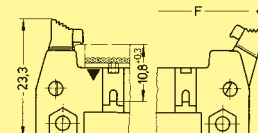


Marking No. 1 contact



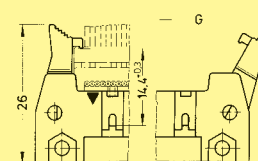
Short levers

for use with female connector without strain relief clamp



Long levers

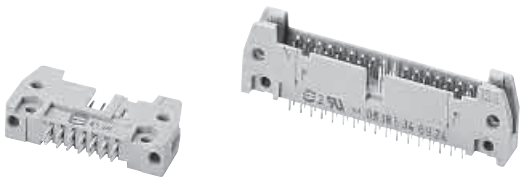
for use with female connector with strain relief clamp



Board drillings

Number of contacts

6-64



Male header with straight solder pins

Identification	No. of contacts	Part No.					
		Without levers		With short levers		With long levers	
Male header with straight solder pins Length: 2.9 mm	6	09 18 506	└ 924	09 18 506	└ 914	09 18 506	└ 904
	10	09 18 510	└ 924	09 18 510	└ 914	09 18 510	└ 904
	14	09 18 514	└ 924	09 18 514	└ 914	09 18 514	└ 904
	16	09 18 516	└ 924	09 18 516	└ 914	09 18 516	└ 904
	20	09 18 520	└ 924	09 18 520	└ 914	09 18 520	└ 904
	26	09 18 526	└ 924	09 18 526	└ 914	09 18 526	└ 904
	34	09 18 534	└ 924	09 18 534	└ 914	09 18 534	└ 904
	40	09 18 540	└ 924	09 18 540	└ 914	09 18 540	└ 904
	50	09 18 550	└ 924	09 18 550	└ 914	09 18 550	└ 904
	60	09 18 560	└ 924	09 18 560	└ 914	09 18 560	└ 904
	64	09 18 564	└ 924	09 18 564	└ 914	09 18 564	└ 904
	30 contacts on request						
Male header with straight solder pins Length: 4.5 mm	6	09 18 506	└ 922*	09 18 506	└ 912*	09 18 506	└ 902*
	10	09 18 510	└ 922*	09 18 510	└ 912*	09 18 510	└ 902*
	14	09 18 514	└ 922*	09 18 514	└ 912*	09 18 514	└ 902*
	16	09 18 516	└ 922*	09 18 516	└ 912*	09 18 516	└ 902*
	20	09 18 520	└ 922*	09 18 520	└ 912*	09 18 520	└ 902*
	26	09 18 526	└ 922*	09 18 526	└ 912*	09 18 526	└ 902*
	34	09 18 534	└ 922*	09 18 534	└ 912*	09 18 534	└ 902*
	40	09 18 540	└ 922*	09 18 540	└ 912*	09 18 540	└ 902*
	50	09 18 550	└ 922*	09 18 550	└ 912*	09 18 550	└ 902*
	60	09 18 560	└ 922*	09 18 560	└ 912*	09 18 560	└ 902*
	64	09 18 564	└ 922*	09 18 564	└ 912*	09 18 564	└ 902*
	30 contacts and kinked version on request						

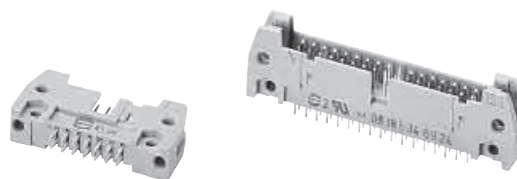
* Not normally kept in stock
For accessories see page 09.16
For dimensions see page 09.09

For performance level 3 please specify digit
For performance level 2 please specify digit
> 0.76 µm Au (30 µinch) on request



Number of contacts

6-64


Male header with straight solder pins

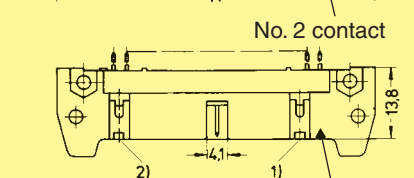
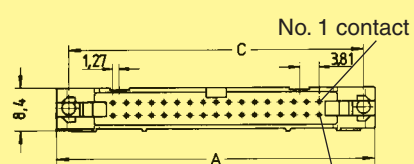
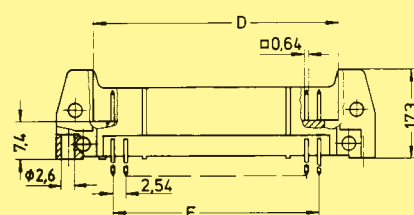
Identification

Drawing

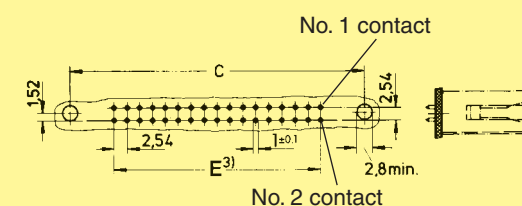
Dimensions in mm

Male header

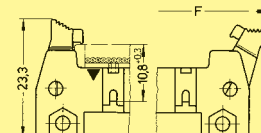
No. of contacts	A	C	D	E	F	G
6	26.9	22.86	12.45	2.54 x 2 = 5.08	36.9	40.3
10	32.0	27.94	17.53	2.54 x 4 = 10.16	42.0	45.4
14	37.1	33.02	22.61	2.54 x 6 = 15.24	47.1	50.4
16	39.6	35.56	25.15	2.54 x 7 = 17.78	49.6	53.0
20	44.7	40.64	30.23	2.54 x 9 = 22.86	54.7	58.1
26	52.3	48.26	37.85	2.54 x 12 = 30.48	62.3	65.7
34	62.5	58.42	48.01	2.54 x 16 = 40.64	72.5	75.8
40	70.1	66.04	55.63	2.54 x 19 = 48.26	80.1	83.5
50	82.8	78.74	68.33	2.54 x 24 = 60.96	92.8	96.2
60	95.5	91.44	81.03	2.54 x 29 = 73.66	105.5	108.9
64	100.6	96.52	86.11	2.54 x 31 = 78.74	110.6	113.9



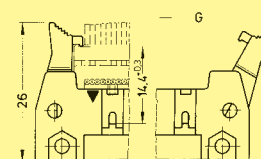
Marking No. 1 contact



Short levers

for use with female connector without strain relief clamp


Long levers

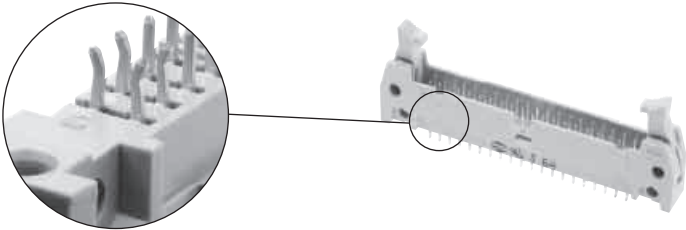
for use with female connector with strain relief clamp


a) Solder pins for 1 ± 0.1 mm dia. hole

Board drillings

Number of contacts

6-64



Male header with straight solder pins, kinked

Identification	No. of contacts	Part No.					
		Without levers		With short levers		With long levers	
Male header with straight solder pins, kinked Length: 2.9 mm	6	09 18 506	└ 024	09 18 506	└ 014	09 18 506	└ 004
	10	09 18 510	└ 024	09 18 510	└ 014	09 18 510	└ 004
	14	09 18 514	└ 024	09 18 514	└ 014	09 18 514	└ 004
	16	09 18 516	└ 024	09 18 516	└ 014	09 18 516	└ 004
	20	09 18 520	└ 024	09 18 520	└ 014	09 18 520	└ 004
	26	09 18 526	└ 024	09 18 526	└ 014	09 18 526	└ 004
	34	09 18 534	└ 024	09 18 534	└ 014	09 18 534	└ 004
	40	09 18 540	└ 024	09 18 540	└ 014	09 18 540	└ 004
	50	09 18 550	└ 024	09 18 550	└ 014	09 18 550	└ 004
	60	09 18 560	└ 024	09 18 560	└ 014	09 18 560	└ 004
	64	09 18 564	└ 024	09 18 564	└ 014	09 18 564	└ 004
30 contacts on request							

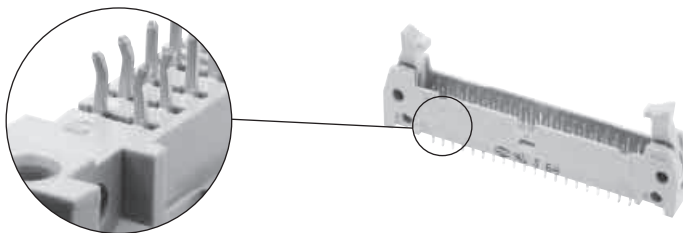
* Not normally kept in stock
For accessories see page 09.16
For dimensions see page 09.11

For performance level 3 please specify digit
For performance level 2 please specify digit
> 0.76 µm Au (30 µinch) on request



Number of contacts

6-64


Male header with straight solder pins, kinked

Identification

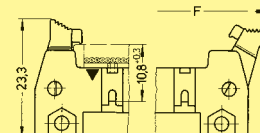
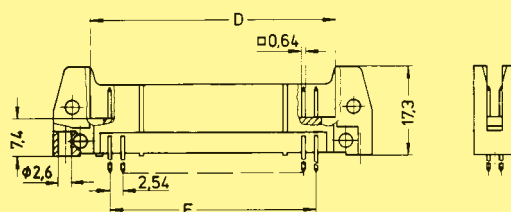
Drawing

Dimensions in mm

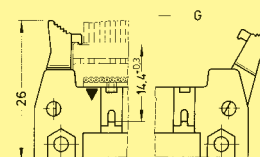
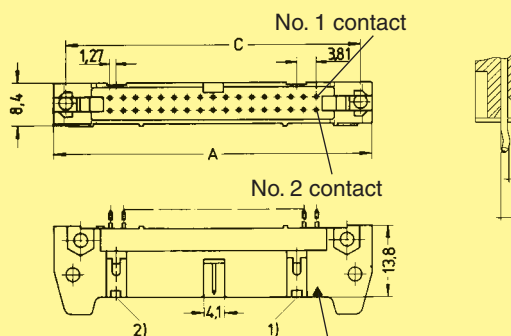
Male header

No. of contacts	A	C	D	E	F	G
6	26.9	22.86	12.45	2.54 x 2 = 5.08	36.9	40.3
10	32.0	27.94	17.53	2.54 x 4 = 10.16	42.0	45.4
14	37.1	33.02	22.61	2.54 x 6 = 15.24	47.1	50.4
16	39.6	35.56	25.15	2.54 x 7 = 17.78	49.6	53.0
20	44.7	40.64	30.23	2.54 x 9 = 22.86	54.7	58.1
26	52.3	48.26	37.85	2.54 x 12 = 30.48	62.3	65.7
34	62.5	58.42	48.01	2.54 x 16 = 40.64	72.5	75.8
40	70.1	66.04	55.63	2.54 x 19 = 48.26	80.1	83.5
50	82.8	78.74	68.33	2.54 x 24 = 60.96	92.8	96.2
60	95.5	91.44	81.03	2.54 x 29 = 73.66	105.5	108.9
64	100.6	96.52	86.11	2.54 x 31 = 78.74	110.6	113.9

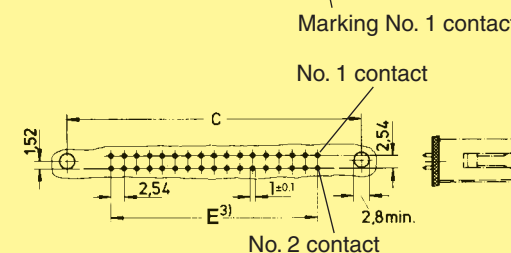
Short levers

for use with female connector without strain relief clamp


Long levers

for use with female connector with strain relief clamp


Board drillings

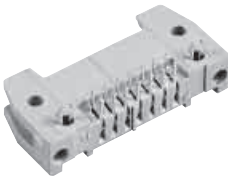


● Kinked contact: pcb thickness from 1.50 to 1.94 mm after Cu + Sn plating with non-remelted through holes $\varnothing$ 0.80 to $\varnothing$ 0.95 mm. Max. insertion force = 125 N. Min. retention force = 6 N.

○ Non-kinked contact: Solder pins for pcb connections $\varnothing$ 1 ± 0.1 mm as per IEC 60603-13.

Number of contacts

6-64



Male header with angled solder pins and board lock

Identification	No. of contacts	Part No.					
		Without levers		With short levers		With long levers	
Male header with angled solder pins and pcb board lock Length: 2.9 mm for 1.6 mm pcb thickness To hold the connector on the pcb before the soldering process, two board locks have been added on the male header with angled solder pins.	6	09 18 506	└ 973*	09 18 506	└ 963*	09 18 506	└ 953*
	10	09 18 510	└ 973*	09 18 510	└ 963*	09 18 510	└ 953*
	14	09 18 514	└ 973*	09 18 514	└ 963*	09 18 514	└ 953*
	16	09 18 516	└ 973*	09 18 516	└ 963*	09 18 516	└ 953*
	20	09 18 520	└ 973*	09 18 520	└ 963*	09 18 520	└ 953*
	26	09 18 526	└ 973*	09 18 526	└ 963*	09 18 526	└ 953*
	34	09 18 534	└ 973*	09 18 534	└ 963*	09 18 534	└ 953*
	40	09 18 540	└ 973*	09 18 540	└ 963*	09 18 540	└ 953*
	50	09 18 550	└ 973*	09 18 550	└ 963*	09 18 550	└ 953*
	60	09 18 560	└ 973*	09 18 560	└ 963*	09 18 560	└ 953*
	64	09 18 564	└ 973*	09 18 564	└ 963*	09 18 564	└ 953*

SEK

09
12

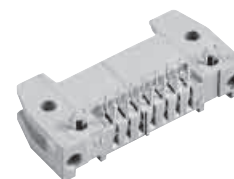
* Not normally kept in stock
30 contacts on request

For performance level 3 please specify digit
For performance level 2 please specify digit
> 0.76 µm Au (30 µinch) on request



Number of contacts

6-64



Male header with angled solder pins and board lock

Identification

Drawing

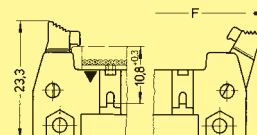
Dimensions in mm

Male header

No. of contacts	A	B	D	E	F	G
6	26.9	16.76	12.45	2.54 x 2 = 5.08	36.9	40.3
10	32.0	21.84	17.53	2.54 x 4 = 10.16	42.0	45.4
14	37.1	26.92	22.61	2.54 x 6 = 15.24	47.1	50.4
16	39.6	29.46	25.15	2.54 x 7 = 17.78	49.6	53.0
20	44.7	34.54	30.23	2.54 x 9 = 22.86	54.7	58.1
26	52.3	42.16	37.85	2.54 x 12 = 30.48	62.3	65.7
34	62.5	52.32	48.01	2.54 x 16 = 40.64	72.5	75.8
40	70.1	59.94	55.63	2.54 x 19 = 48.26	80.1	83.5
50	82.8	72.64	68.33	2.54 x 24 = 60.96	92.8	96.2
60	95.5	85.34	81.03	2.54 x 29 = 73.66	105.5	108.9
64	100.6	90.42	86.11	2.54 x 31 = 78.74	110.6	113.9

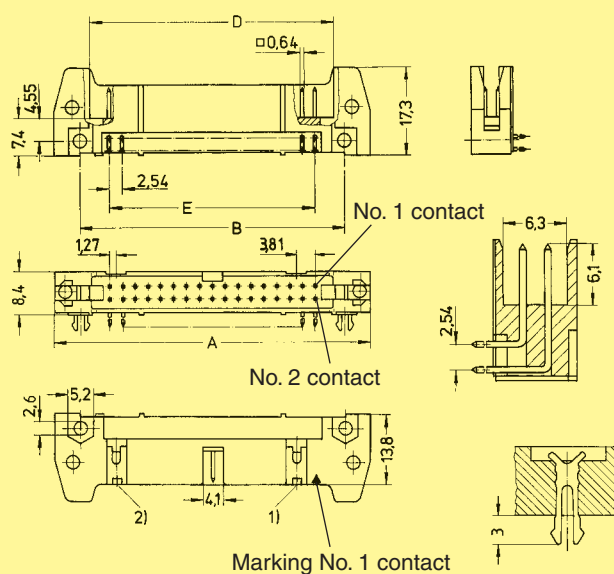
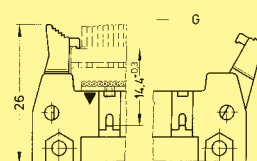
Short levers

for use with female connector without strain relief clamp

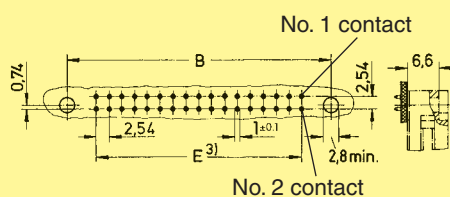


Long levers

for use with female connector with strain relief clamp

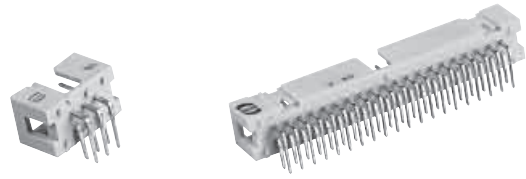


Board drillings



Number of contacts

6-64



Low-profile male header, angled solder pins

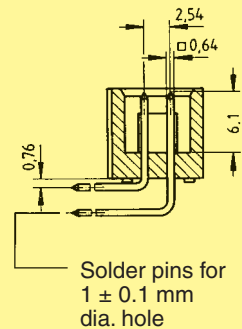
Identification No. of contacts Part No. Drawing Dimensions in mm

Male header with angled solder pins

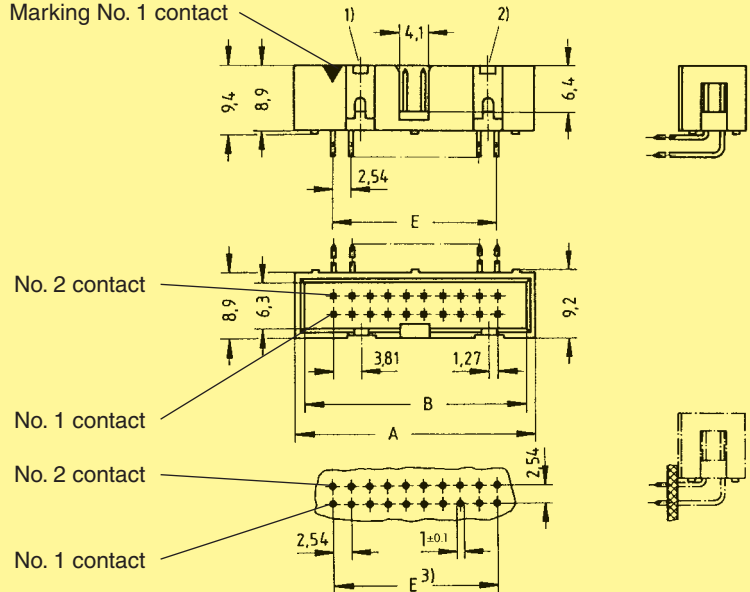
Length: 2.9 mm

6	09 18 506	323
10	09 18 510	323
14	09 18 514	323
16	09 18 516	323
20	09 18 520	323
26	09 18 526	323
34	09 18 534	323
40	09 18 540	323
50	09 18 550	323
60	09 18 560	323
64	09 18 564	323

No. of contacts	A	B	E
6	15.2	12.78	2.54 x 2 = 5.08
10	20.3	17.86	2.54 x 4 = 10.16
14	25.4	22.94	2.54 x 6 = 15.24
16	27.9	25.48	2.54 x 7 = 17.78
20	33.0	30.56	2.54 x 9 = 22.86
26	40.6	38.18	2.54 x 12 = 30.48
34	50.8	48.34	2.54 x 16 = 40.64
40	58.4	55.96	2.54 x 19 = 48.26
50	71.3	68.66	2.54 x 24 = 60.96
60	84.0	81.36	2.54 x 29 = 73.66
64	89.1	86.44	2.54 x 31 = 78.74



Marking No. 1 contact



For performance level 3 please specify digit 7
For performance level 2 please specify digit 6
> 0.76 µm Au (30 µinch) on request 5*

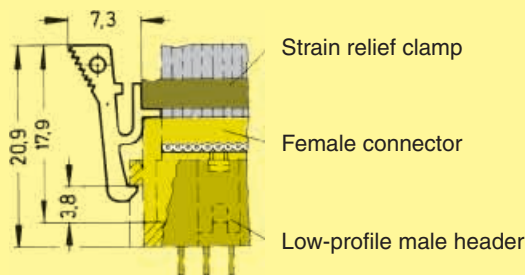


Identification No. of contacts Part No. Drawing Dimensions in mm

Locking lever for female connector with strain relief in conjunction with low-profile male header

When the security of latching is required and space is a premium, these locking levers can be fitted onto the strain relief of the HARTING female connector.

09 18 000 9905⁴⁾



Number of contacts

6-64



Low-profile male header, straight solder pins

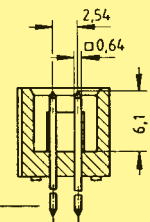
Identification No. of contacts Part No. Drawing Dimensions in mm

Male header with straight solder pins

Length: 2.9 mm

6	09 18 506	324
10	09 18 510	324
14	09 18 514	324
16	09 18 516	324
20	09 18 520	324
26	09 18 526	324
34	09 18 534	324
40	09 18 540	324
50	09 18 550	324
60	09 18 560	324
64	09 18 564	324

No. of contacts	A	B	E
6	15.2	12.78	$2.54 \times 2 = 5.08$
10	20.3	17.86	$2.54 \times 4 = 10.16$
14	25.4	22.94	$2.54 \times 6 = 15.24$
16	27.9	25.48	$2.54 \times 7 = 17.78$
20	33.0	30.56	$2.54 \times 9 = 22.86$
26	40.6	38.18	$2.54 \times 12 = 30.48$
34	50.8	48.34	$2.54 \times 16 = 40.64$
40	58.4	55.96	$2.54 \times 19 = 48.26$
50	71.3	68.66	$2.54 \times 24 = 60.96$
60	84.0	81.36	$2.54 \times 29 = 73.66$
64	89.1	86.44	$2.54 \times 31 = 78.74$



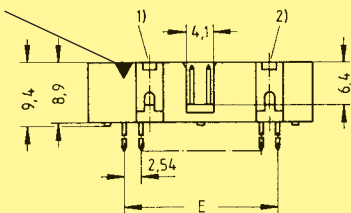
Solder pins for 1 ± 0.1 mm dia. hole

Male header with straight solder pins

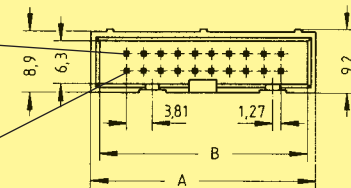
Length: 4.5 mm

6	09 18 506	322*
10	09 18 510	322*
14	09 18 514	322*
16	09 18 516	322*
20	09 18 520	322*
26	09 18 526	322*
34	09 18 534	322*
40	09 18 540	322*
50	09 18 550	322*
60	09 18 560	322*
64	09 18 564	322*

Marking No. 1 contact

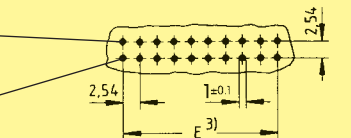


No. 2 contact



No. 1 contact

No. 2 contact



No. 1 contact

For performance level 3 please specify digit
For performance level 2 please specify digit
> 0.76 µm Au (30 µinch) on request

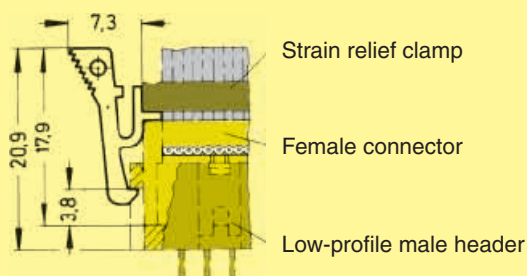


Identification No. of contacts Part No. Drawing Dimensions in mm

Locking lever for female connector with strain relief in conjunction with low-profile male header

When the security of latching is required and space is a premium, these locking levers can be fitted onto the strain relief of the HARTING female connector.

09 18 000 9905⁴⁾



* Not normally kept in stock

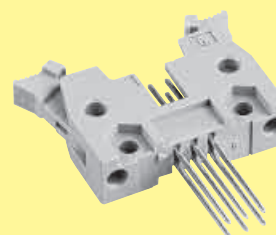
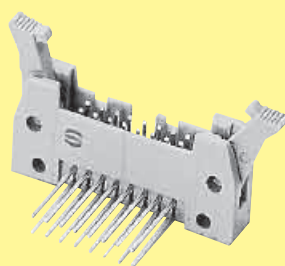
¹⁾ No polarization slot for 6, 10 or 14 way male header
²⁾ No polarization slot for 6 way male header

³⁾ Pitch tolerance: ± 0.1
⁴⁾ Order 2 per female connector

Accessories

Identification	Part No.	Drawing	Dimensions in mm
Polarization key 1) Part No. comprises 2 keys	09 18 500 9902 ¹⁾		
Locking lever (snaps into place, can be fitted whenever required) 2) Order 2 per male header	Long: 09 18 000 9903 ²⁾ Short: 09 18 000 9904 ²⁾	Long Short For use with female connector <u>with</u> strain relief clamp For use with female connector <u>without</u> strain relief clamp	
Fixing screws for 1.6 mm P.C. board 3) Part No. comprises 50 pieces	09 18 000 9906 ³⁾		
Coding system with loss of contact 4) Part No. comprises 6 code pins	Code pin 09 18 000 9901 ⁴⁾ Removal tool for male contacts 09 99 000 0133	To avoid cross-plugging adjacent connectors a coding system is required. A code pin is inserted into the appropriate cavity in the female connector. The corresponding male contact is removed by a special removal tool.	

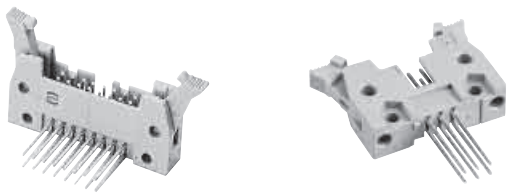
Number of contacts	6, 10, 14, 16, 20, 26, 34, 40, 50, 60, 64
Contact arrangement	straight, angled
Contact length	15 mm
Approvals	IEC 60603-13 DIN EN 60603-13 D 2632 BT 224 NFC 93-428 (HE 10) comply with MIL DTL 83503
Pitch	2.54 mm [0.100"]
Working current	1 A
Working voltage	500 V for pollution degree 1
Test voltage $U_{r.m.s.}$	1 kV
Contact resistance Insulation resistance	$\leq 20 \text{ m}\Omega$ $\geq 10^9 \Omega$
Temperature range	-55 °C ... + 125 °C The maximum temperature includes heating of contacts and ambient temperature
Terminations	0.6 mm x 0.6 mm Diagonal: 0.86 mm
Materials Moulding	Thermoplastic resin (PBTP) UL 94-V0
Contact surface Contact zone	gold-plated according to performance level ¹⁾



¹⁾ Performance level 3 as per IEC 60603-13, ≥ 50 mating cycles, no gas test
Performance level 2 as per IEC 60603-13, ≥ 250 mating cycles, 4 days gas test
as per MIL DTL 83503, $> 0.76 \mu\text{m Au}$ (30 μ inch), other performance levels on request

Number of contacts

6-64



Male header with wrap posts

Identification	No. of contacts	Part No.					
		Without levers		With short levers		With long levers	
Male header with angled wrap posts Length: 15 mm □ 0.6 mm	6	09 18 506	└ 926*	09 18 506	└ 916*	09 18 506	└ 906*
	10	09 18 510	└ 926*	09 18 510	└ 916*	09 18 510	└ 906*
	14	09 18 514	└ 926*	09 18 514	└ 916*	09 18 514	└ 906*
	16	09 18 516	└ 926*	09 18 516	└ 916*	09 18 516	└ 906*
	20	09 18 520	└ 926*	09 18 520	└ 916*	09 18 520	└ 906*
	26	09 18 526	└ 926*	09 18 526	└ 916*	09 18 526	└ 906*
	34	09 18 534	└ 926*	09 18 534	└ 916*	09 18 534	└ 906*
	40	09 18 540	└ 926*	09 18 540	└ 916*	09 18 540	└ 906*
	50	09 18 550	└ 926*	09 18 550	└ 916*	09 18 550	└ 906*
	60	09 18 560	└ 926*	09 18 560	└ 916*	09 18 560	└ 906*
	64	09 18 564	└ 926*	09 18 564	└ 916*	09 18 564	└ 906*
Male header with straight wrap posts Length: 15 mm □ 0.6 mm	6	09 18 506	└ 927*	09 18 506	└ 917*	09 18 506	└ 907*
	10	09 18 510	└ 927*	09 18 510	└ 917*	09 18 510	└ 907*
	14	09 18 514	└ 927*	09 18 514	└ 917*	09 18 514	└ 907*
	16	09 18 516	└ 927*	09 18 516	└ 917*	09 18 516	└ 907*
	20	09 18 520	└ 927*	09 18 520	└ 917*	09 18 520	└ 907*
	26	09 18 526	└ 927*	09 18 526	└ 917*	09 18 526	└ 907*
	34	09 18 534	└ 927*	09 18 534	└ 917*	09 18 534	└ 907*
	40	09 18 540	└ 927*	09 18 540	└ 917*	09 18 540	└ 907*
	50	09 18 550	└ 927*	09 18 550	└ 917*	09 18 550	└ 907*
	60	09 18 560	└ 927*	09 18 560	└ 917*	09 18 560	└ 907*
	64	09 18 564	└ 927*	09 18 564	└ 917*	09 18 564	└ 907*

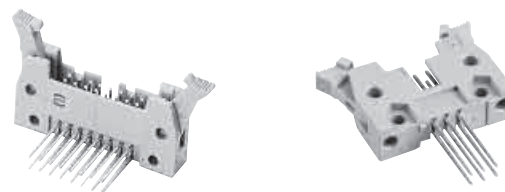
* Not normally kept in stock
For accessories see page 09.20
For dimensions see page 09.19

For performance level 3 please specify digit
For performance level 2 please specify digit
> 0.76 µm Au (30 µinch) on request



Number of contacts

6-64



Male header with wrap posts

Identification

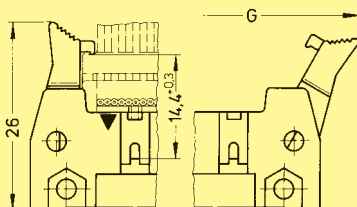
Drawing

Dimensions in mm

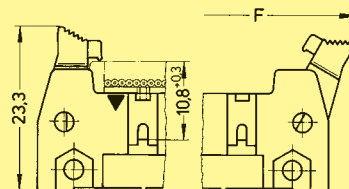
Male header

No. of contacts	A	B	C	D	E	F	G
6	26.9	16.76	22.86	12.45	2.54 x 2 = 5.08	36.9	40.3
10	32.0	21.84	27.94	17.53	2.54 x 4 = 10.16	42.0	45.4
14	37.1	26.92	33.02	22.61	2.54 x 6 = 15.24	47.1	50.4
16	39.6	29.46	35.56	25.15	2.54 x 7 = 17.78	49.6	53.0
20	44.7	34.54	40.64	30.23	2.54 x 9 = 22.86	54.7	58.1
26	52.3	42.16	48.26	37.85	2.54 x 12 = 30.48	62.3	65.7
34	62.5	52.32	58.42	48.01	2.54 x 16 = 40.64	72.5	75.8
40	70.1	59.94	66.04	55.63	2.54 x 19 = 48.26	80.1	83.5
50	82.8	72.64	78.74	68.33	2.54 x 24 = 60.96	92.8	96.2
60	95.5	85.34	91.44	81.03	2.54 x 29 = 73.66	105.5	108.9
64	100.6	90.42	96.52	86.11	2.54 x 31 = 78.74	110.6	113.9

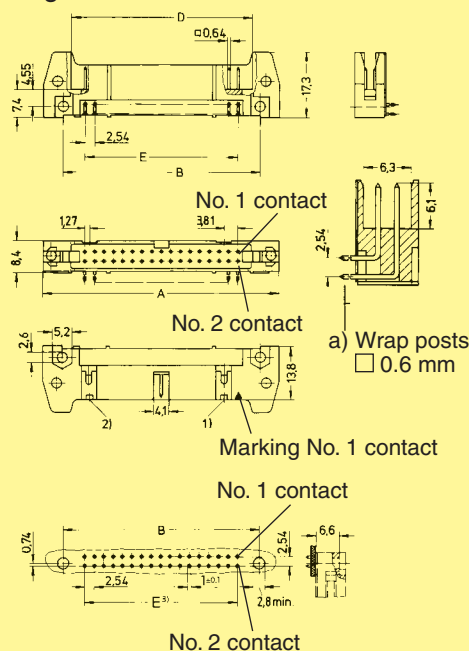
Long levers

for use with female connector
with strain relief clamp


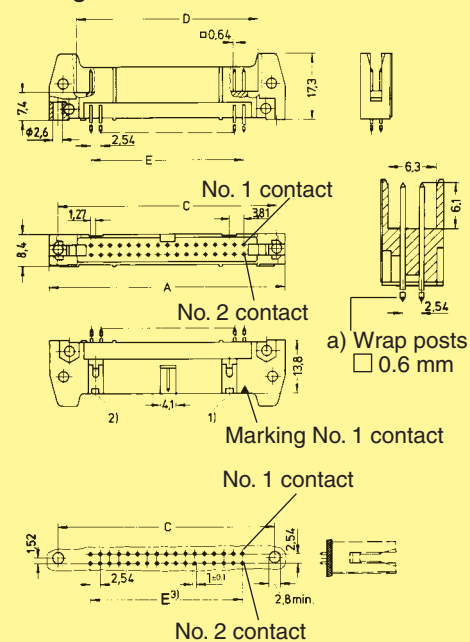
Short levers

for use with female connector
without strain relief clamp


Angled versions



Straight versions



Board drillings

For accessories see page 09.20

¹⁾ No polarization slot
for 6, 10 or 14 way male header

²⁾ No polarization slot for 6 way male header
³⁾ Pitch tolerance: ± 0.1

Accessories

Identification	Part No.	Drawing	Dimensions in mm
Polarization key 1) Part No. comprises 2 keys	09 18 500 9902 ¹⁾		
Locking lever (snaps into place, can be fitted whenever required)	Long: 09 18 000 9903 ²⁾ Short: 09 18 000 9904 ²⁾	Long Short For use with female connector <u>with</u> strain relief clamp For use with female connector <u>without</u> strain relief clamp	
Fixing screws for 1.6 mm P.C. board 3) Part No. comprises 50 pieces	09 18 000 9906 ³⁾		
Coding system with loss of contact 4) Part No. comprises 6 code pins	Code pin 09 18 000 9901 ⁴⁾ Removal tool for male contacts 09 99 000 0133	To avoid cross-plugging adjacent connectors a coding system is required. A code pin is inserted into the appropriate cavity in the female connector. The corresponding male contact is removed by a special removal tool.	

Number of contacts 6, 10, 14, 16, 20, 26, 30*, 34, 40, 50, 60, 64

Approvals

IEC 60 603-13
DIN EN 60 603-13
D 2632
BT 224
NFC 93-428 (HE 10)



UL recognized: E102079
comply with MIL DTL 83503

Pitch 2.54 mm [0.100"]

Working current 1 A

Working voltage 320 V
for pollution degree 1

Test voltage $U_{r.m.s.}$ 1 kV

Contact resistance $\leq 20 \text{ m}\Omega$
Insulation resistance $\geq 10^9 \Omega$

Temperature range -55 °C ... + 125 °C
The maximum temperature includes heating of contacts and ambient temperature

Terminations IDC flat cable
1.27 mm [0.050"] pitch:
AWG 26/7 – AWG 28/7

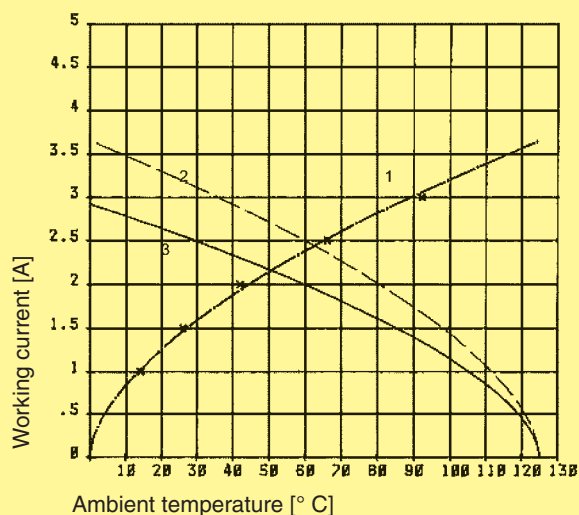
Materials Moulding Thermoplastic resin (PBTP)
UL 94-V0

Contact surface Contact zone gold-plated according to performance level¹⁾

Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512.



Example: 50 way connector

- ① Temperature rise
- ② Derating
- ③ Derating curve at $I_{max} \times 0.8$ (IEC 60512-2)

Insertion and withdrawal forces

Number of contacts	Maximum force [N]	
	Performance level 1 and 2	Performance level 3
6	12	18
10	20	30
14	28	42
16	32	48
20	40	60
26	52	78
30	60	90
34	68	102
40	80	120
50	100	150
60	120	180
64	128	192

¹⁾ Performance level 3 as per IEC 60 603-13, ≥ 50 mating cycles, no gas test
Performance level 2 as per IEC 60 603-13, ≥ 250 mating cycles, 4 days gas test
as per MIL DTL 83503, $> 0.76 \mu\text{m Au}$ (30 μ inch), other performance levels on request

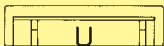
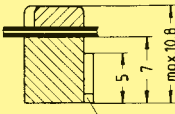
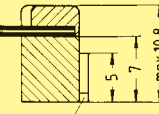
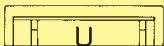
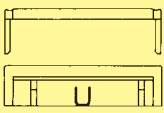
* on request

Number of contacts

6-64



Female connector

Identification	No. of contacts	Part No.		Drawing	Dimensions in mm
Female connector with central polarization <u>without</u> strain relief clamp 		open end cover	closed end cover	open end cover	closed end cover
					
<u>without</u> strain relief clamp with bulk packaging 	6	09 18 506	803	09 18 506	804
	10	09 18 510	803	09 18 510	804
	14	09 18 514	803	09 18 514	804
	16	09 18 516	803	09 18 516	804
	20	09 18 520	803	09 18 520	804
	26	09 18 526	803	09 18 526	804
	34	09 18 534	803	09 18 534	804
	40	09 18 540	803	09 18 540	804
	50	09 18 550	803	09 18 550	804
	60	09 18 560	803	09 18 560	804
	64	09 18 564	803	09 18 564	804
<u>without</u> strain relief clamp with bulk packaging 2) Packaging unit 5,000 pieces 3) Packaging unit 3,000 pieces	6	09 18 506	803 58U ²⁾		
	10	09 18 510	803 58U ²⁾		
	14	09 18 514	803 58U ²⁾		
	16	09 18 516	803 58U ²⁾		
	20	09 18 520	803 58U ²⁾		
	26	09 18 526	803 58U ²⁾		
	34	09 18 534	803 58U ³⁾		
	40	09 18 540	803 58U ³⁾		
<u>with</u> strain relief clamp 	6	09 18 506	813	09 18 506	814*
	10	09 18 510	813	09 18 510	814*
	14	09 18 514	813	09 18 514	814*
	16	09 18 516	813	09 18 516	814*
	20	09 18 520	813	09 18 520	814*
	26	09 18 526	813	09 18 526	814*
	34	09 18 534	813	09 18 534	814*
	40	09 18 540	813	09 18 540	814*
	50	09 18 550	813	09 18 550	814*
	60	09 18 560	813	09 18 560	814*
	64	09 18 564	813	09 18 564	814*
30 contacts on request					

No. of contacts	6	10	14	16	20	26
A	12.20	17.30	22.40	24.90	30.00	37.60
B	5.08	10.16	15.24	17.78	22.86	30.48

No. of contacts	34	40	50	60	64
A	47.80	55.40	68.10	80.80	85.90
B	40.64	48.26	60.96	73.66	78.74

For performance level 3 please specify digit
 For performance level 2 please specify digit
 > 0.76 µm Au (30 pinch) on request



¹⁾ Pitch tolerance: ± 0.1
 * Not normally kept in stock

Number of contacts

6-64



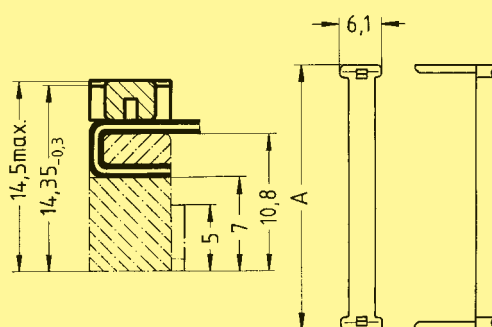
Strain relief clamp/Locking lever

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
----------------	-----------------	----------	---------	------------------

Strain relief clamp

6	09 18 506 9002
10	09 18 510 9002
14	09 18 514 9002
16	09 18 516 9002
20	09 18 520 9002
26	09 18 526 9002
34	09 18 534 9002
40	09 18 540 9002
50	09 18 550 9002
60	09 18 560 9002
64	09 18 564 9002

No. of contacts	A
6	12.2
10	17.3
14	22.4
16	24.9
20	30.0
26	37.6
34	47.8
40	55.4
50	68.1
60	80.8
64	85.9



with bulk packaging

6	09 18 506 9002 58U ²⁾
10	09 18 510 9002 58U ²⁾
14	09 18 514 9002 58U ²⁾
16	09 18 516 9002 58U ²⁾
20	09 18 520 9002 58U ²⁾
26	09 18 526 9002 58U ²⁾
34	09 18 534 9002 58U ³⁾
40	09 18 540 9002 58U ³⁾

6	12.2
10	17.3
14	22.4
16	24.9
20	30.0
26	37.6
34	47.8
40	55.4

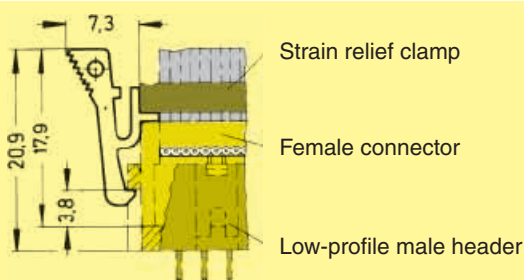
²⁾ Packaging unit
5,000 pieces

³⁾ Packaging unit
3,000 pieces

30 contacts on request

Locking lever for female connector

Only in conjunction
with low-profile male
header and
strain relief

09 18 000 9905¹⁾


When the security of latching is required and space is a premium, these locking levers can be fitted onto the strain relief of the HARTING female connector. This can then be used in conjunction with male low-profile headers (see pages 09.14 and 09.15).

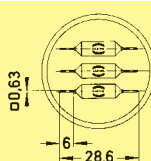
Coding system with loss of contact

Code pin

09 18 000 9901²⁾

Removal tool for
male contacts

09 99 000 0133



To avoid cross-plugging adjacent connectors a coding system is required. A code pin is inserted into the appropriate cavity in the female connector. The corresponding male contact is removed by a special removal tool.



¹⁾ Order 2 per female connector
²⁾ Part No. comprises 6 code pins

Number of contacts 6, 8, 10, 14, 16, 20, 24, 26, 30, 34, 40, 50, 60, 64

Pitch
On pcb side: 2.54 mm [0.100"]
On cable side: 1.27 mm [0.050"]

Working current 1 A

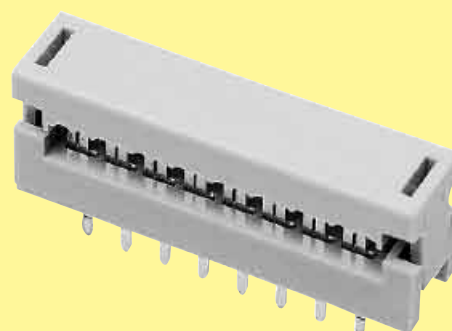
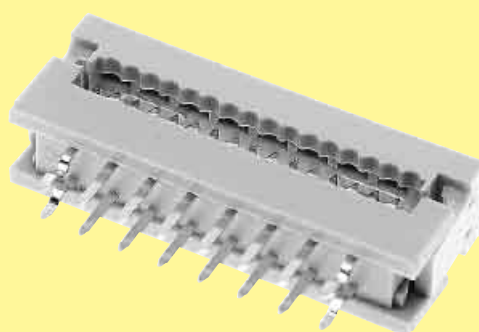
Test voltage $U_{r.m.s.}$ 1 kV AC – 1 minute

Contact resistance 35 m Ω max.
Insulation resistance $\geq 10^9 \Omega$

Temperature range -55 °C ... + 105 °C
The maximum temperature includes heating of contacts and ambient temperature

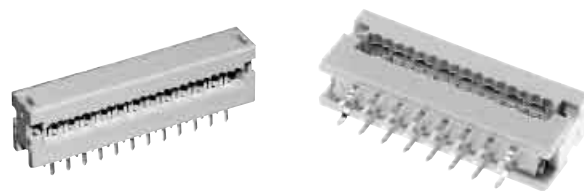
Terminations
Solder pins:
0.635 mm x 0.3 mm
Dimensions for pcb hole:
Standard version: $\varnothing 0.9 \pm 0.10$ mm
Kinked version: $\varnothing 1.0 \pm 0.05$ mm
Diagonal: 0.71 mm
IDC flat cable
1.27 mm [0.050"] pitch: AWG 28/7

Materials
Moulding Thermoplastic resin (PBT)
UL 94-V0



Number of contacts

6-40

Pcb transition connector, 2 rows, low-profile with 5.5 mm height

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm																																													
Pcb transition connector 2 rows Standard low-profile version	6	09 18 106 9622	<table><tr><th>No. of contacts</th><th>A± 0.38</th><th>B± 0.10</th></tr><tr><td>6</td><td>12.92</td><td>2.54 x 2 = 5.08</td></tr><tr><td>8</td><td>15.46</td><td>2.54 x 3 = 7.62</td></tr><tr><td>10</td><td>18.00</td><td>2.54 x 4 = 10.16</td></tr><tr><td>14</td><td>23.08</td><td>2.54 x 6 = 15.24</td></tr><tr><td>16</td><td>25.62</td><td>2.54 x 7 = 17.78</td></tr><tr><td>20</td><td>30.74</td><td>2.54 x 9 = 22.86</td></tr><tr><td>24</td><td>35.78</td><td>2.54 x 11 = 27.94</td></tr><tr><td>26</td><td>38.32</td><td>2.54 x 12 = 30.48</td></tr><tr><td>30</td><td>43.40</td><td>2.54 x 14 = 35.56</td></tr><tr><td>34</td><td>48.48</td><td>2.54 x 16 = 40.64</td></tr><tr><td>40</td><td>56.10</td><td>2.54 x 19 = 48.26</td></tr><tr><td>50</td><td>68.80</td><td>2.54 x 24 = 60.96</td></tr><tr><td>60</td><td>81.50</td><td>2.54 x 29 = 73.66</td></tr><tr><td>64</td><td>86.58</td><td>2.54 x 31 = 78.74</td></tr></table>	No. of contacts	A ± 0.38	B ± 0.10	6	12.92	2.54 x 2 = 5.08	8	15.46	2.54 x 3 = 7.62	10	18.00	2.54 x 4 = 10.16	14	23.08	2.54 x 6 = 15.24	16	25.62	2.54 x 7 = 17.78	20	30.74	2.54 x 9 = 22.86	24	35.78	2.54 x 11 = 27.94	26	38.32	2.54 x 12 = 30.48	30	43.40	2.54 x 14 = 35.56	34	48.48	2.54 x 16 = 40.64	40	56.10	2.54 x 19 = 48.26	50	68.80	2.54 x 24 = 60.96	60	81.50	2.54 x 29 = 73.66	64	86.58	2.54 x 31 = 78.74	
	No. of contacts	A ± 0.38		B ± 0.10																																													
	6	12.92		2.54 x 2 = 5.08																																													
	8	15.46		2.54 x 3 = 7.62																																													
	10	18.00		2.54 x 4 = 10.16																																													
	14	23.08		2.54 x 6 = 15.24																																													
	16	25.62		2.54 x 7 = 17.78																																													
	20	30.74		2.54 x 9 = 22.86																																													
	24	35.78		2.54 x 11 = 27.94																																													
	26	38.32		2.54 x 12 = 30.48																																													
	30	43.40		2.54 x 14 = 35.56																																													
	34	48.48		2.54 x 16 = 40.64																																													
	40	56.10		2.54 x 19 = 48.26																																													
	50	68.80		2.54 x 24 = 60.96																																													
	60	81.50		2.54 x 29 = 73.66																																													
	64	86.58		2.54 x 31 = 78.74																																													
8	09 18 108 9622																																																
10	09 18 110 9622																																																
14	09 18 114 9622																																																
16	09 18 116 9622																																																
20	09 18 120 9622																																																
24	09 18 124 9622																																																
26	09 18 126 9622																																																
30	09 18 130 9622																																																
34	09 18 134 9622																																																
40	09 18 140 9622																																																
50	09 18 150 9622																																																
60	09 18 160 9622																																																
64	09 18 164 9622																																																
Pcb transition connector 2 rows Kinked low-profile version 2 kinked pins at each extremity	6	09 18 106 9422	Lead No. 1 Lead No. 2 Kinked pins pre-assembled assembled pre-assembled assembled																																														
	8	09 18 108 9422																																															
	10	09 18 110 9422																																															
	14	09 18 114 9422																																															
	16	09 18 116 9422																																															
	20	09 18 120 9422																																															
	24	09 18 124 9422																																															
	26	09 18 126 9422																																															
	30	09 18 130 9422																																															
	34	09 18 134 9422																																															
	40	09 18 140 9422																																															
	50	09 18 150 9422																																															
	60	09 18 160 9422																																															
	64	09 18 164 9422																																															
	Board drillings				Lead No. 2 Lead No. 1 Ø 0.90± 0.10 standard version Ø 1.00± 0.05 kinked version																																												

1) Pitch tolerance: ± 0.05

Number of contacts* 10, 16, 20, 26, 34, 40, 50

Pitch
On pcb side: 2.54 mm [0.100"]
On cable side: 1.27 mm [0.050"]

Working current 1 A

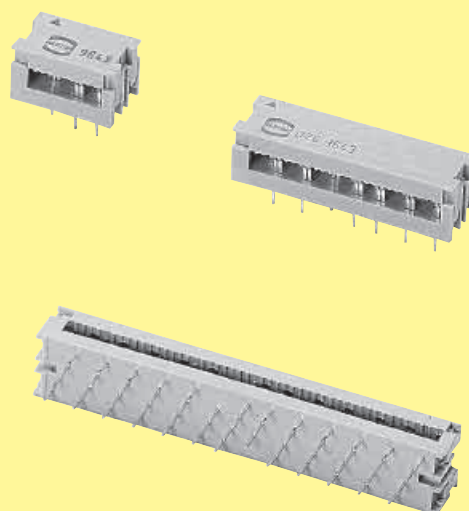
Test voltage $U_{r.m.s.}$ 500 V

Contact resistance $\leq 20 \text{ m}\Omega$
Insulation resistance $\geq 10^{12} \Omega$

Temperature range -40 °C ... + 125 °C
The maximum temperature includes heating of contacts and ambient temperature

Terminations
Solder pins
0.45 mm x 0.35 mm
for pcb hole $\varnothing$ 0.8 mm
Diagonal: 0.58 mm
IDC flat cable
1.27 mm [0.050"] pitch:
AWG 26/7 – AWG 28/7 – AWG 30/1

Materials
Moulding Thermoplastic resin (PC)
UL 94-V0



Number of contacts

10-50



Pcb transition connector, 4 rows

Identification

No. of
contacts

Part No.

Drawing

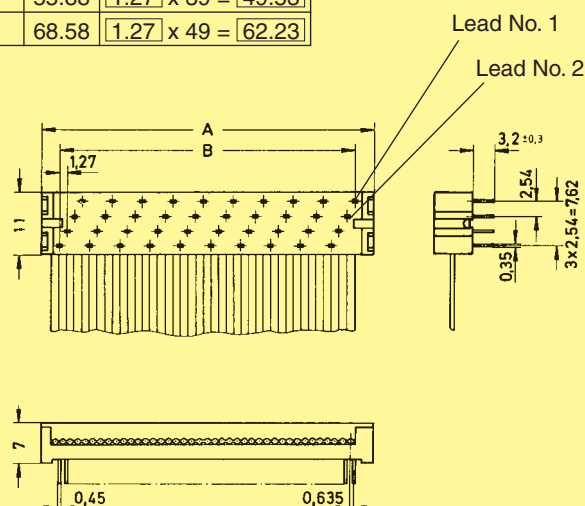
Dimensions in mm

Pcb transition
connector

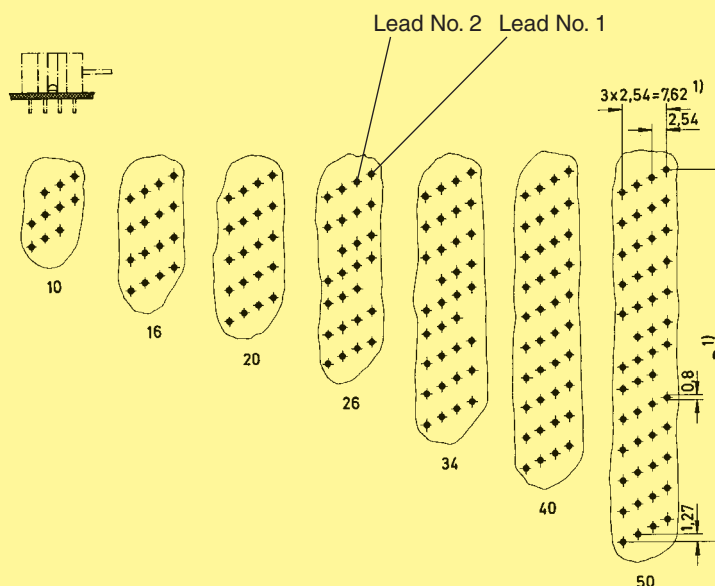
4 rows

10	09 19 010 9643*
16	09 19 016 9643*
20	09 19 020 9643*
26	09 19 026 9643*
34	09 19 034 9643*
40	09 19 040 9643*
50	09 19 050 9643*

No. of contacts	A	B
10	17.78	$1.27 \times 9 = 11.43$
16	25.40	$1.27 \times 15 = 19.05$
20	30.48	$1.27 \times 19 = 24.13$
26	38.10	$1.27 \times 25 = 31.75$
34	48.26	$1.27 \times 33 = 41.91$
40	55.88	$1.27 \times 39 = 49.53$
50	68.58	$1.27 \times 49 = 62.23$



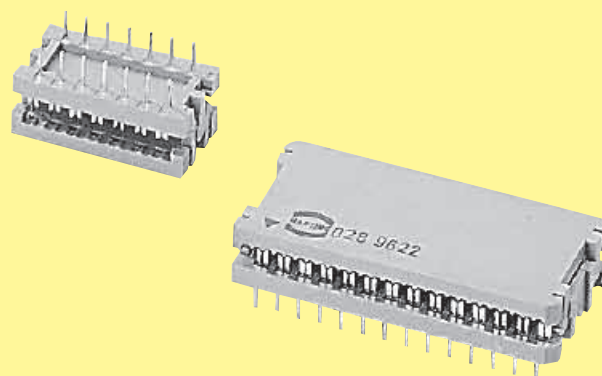
Board drillings



* Not normally kept in stock.

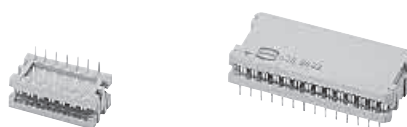
¹⁾ Pitch tolerance: ± 0.1

Number of contacts*	14, 16, 24, 28, 40
Pitch	On pcb side: 2.54 mm [0.100"] On cable side: 1.27 mm [0.050"]
Working current	1 A
Test voltage $U_{r.m.s.}$	500 V
Contact resistance Insulation resistance	$\leq 20 \text{ m}\Omega$ $\geq 10^{12} \Omega$
Temperature range	-40 °C ... + 125 °C The maximum temperature includes heating of contacts and ambient temperature
Terminations	Solder pins 0.45 mm x 0.35 mm for pcb hole $\varnothing$ 0.8 mm Diagonal: 0.58 mm IDC flat cable 1.27 mm [0.050"] pitch: AWG 26/7 – AWG 28/7
Materials Moulding	Thermoplastic resin (PC) UL 94-V0



Number of contacts

14-40



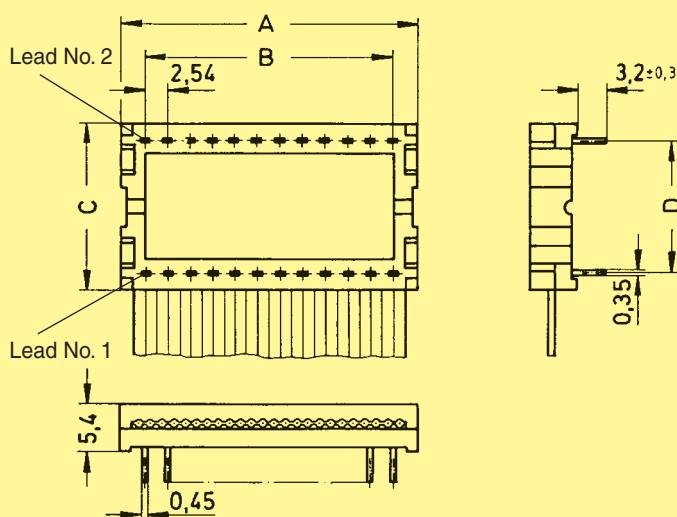
DIP connector for IC base or for soldering into pcb

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
----------------	-----------------	----------	---------	------------------

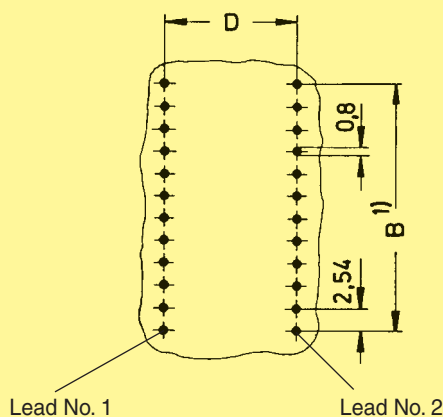
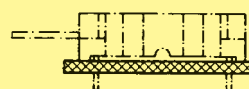
DIP connector

14	09 17 014 9622*
16	09 17 016 9622*
24	09 17 024 9622*
28	09 17 028 9622*
40	09 17 040 9622*

No. of contacts	A	B	C	D
14	20.5	2.54 x 6 = 15.24	11	7.62
16	23.0	2.54 x 7 = 17.78	11	7.62
24	33.0	2.54 x 11 = 27.94	18.7	15.24
28	38.1	2.54 x 13 = 33.02	18.7	15.24
40	53.3	2.54 x 19 = 48.26	18.7	15.24



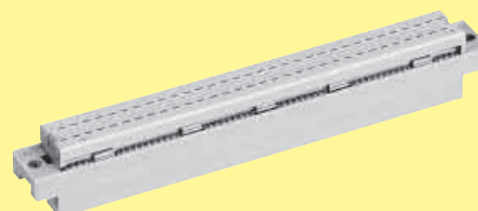
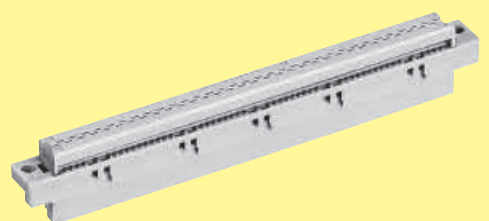
Board drillings



* Not normally kept in stock

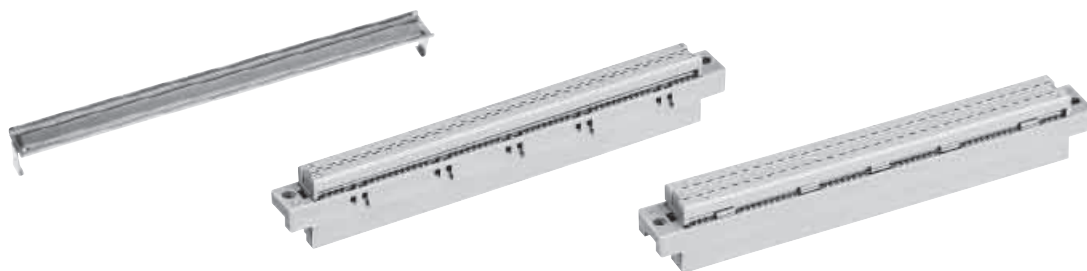
¹⁾ Pitch tolerance: ± 0.1

Number of contacts	64
Pitch	2.54 mm [0.100"]
Working current	1 A max.
Clearance Creepage	≥ 1.2 mm ≥ 1.2 mm
Working voltage The working voltage also depends on the clearance and creepage dimensions of the pcb itself, and the associated wiring	according to the safety regulations of the equipment
Test voltage $U_{r.m.s.}$	1 kV
Contact resistance	≤ 20 m Ω
Insulation resistance	$\geq 10^{12}$ Ω
Temperature range	-55 °C ... + 125 °C The maximum temperature includes heating of contacts and ambient temperature
Termination Female connector	Insulation displacement: AWG 28/7
Insertion and withdrawal force	≤ 60 N
Materials Moulding	Thermoplastic resin, glass-fibre filled, UL 94-V0
Contacts	Copper alloy
Contact surface Contact zone	selectively plated according to performance level



Number of contacts

64



Female connectors for insulation displacement

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
Female connector for insulation displacement	64	performance level 2 09 02 264 6828	Lead number 1 of flat cable on contact 1 b Contact arrangement View from termination side	
		performance level 3 09 02 264 7828		
Type C	64	performance level 2 09 03 264 6828 09 03 764 6828 ^{c)}	Lead number 1 of flat cable on contact 1 c Contact arrangement View from termination side Mateable with 3-row male connector Type C. No female contact in middle row. Panel cut out	
		performance level 3 09 03 264 7828		
Strain relief for types B and C		09 03 000 9940		

	a	b
Type B	8.3	10.16
Type C	10.8	12.7

Male connectors see DIN 41 612 catalogue

^{c)} Connectors with coding

Press-in – Technology and board connectors

Page

General information 20.02

harmik®

Technical characteristics 20.05

I/O connectors, straight 20.06



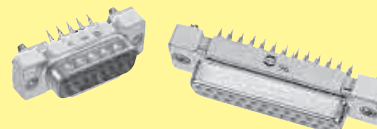
Intra cabinet connectors, straight 20.07



D-Sub – S

Technical characteristics 20.08

Press-in connectors, straight 20.10



SEK

Technical characteristics for standard connectors 20.14

Press-in connectors, straight 20.16



Technical characteristics for low-profile connectors 20.18

Low-profile press-in connectors, straight 20.19

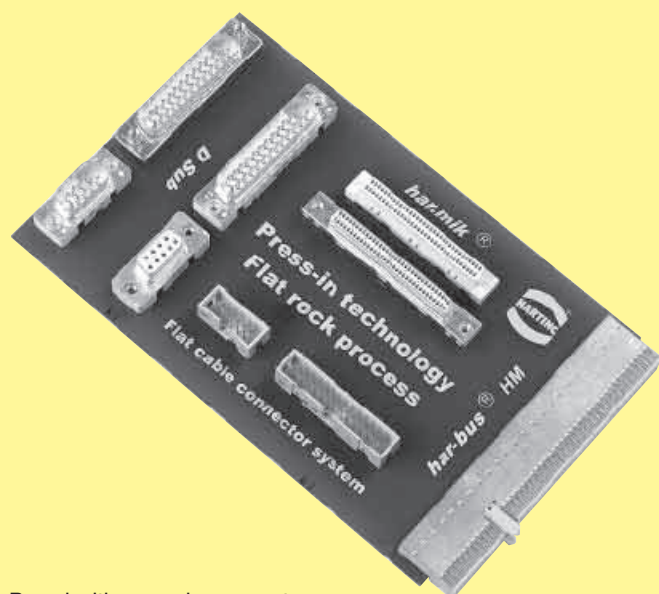


Solderless termination for connectors has proven to be reliable for decades. Today the use of press-in connectors encompasses all fields of electrical and electronical applications.

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

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

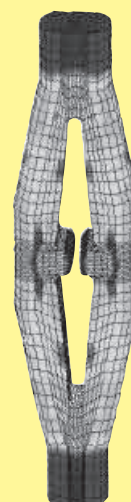
Due to variety of different connector contact designs, the press-in zone has been designed to fit perfectly to the contact metal thickness and the plated through hole dimensions and tolerances.



Board with press-in connectors

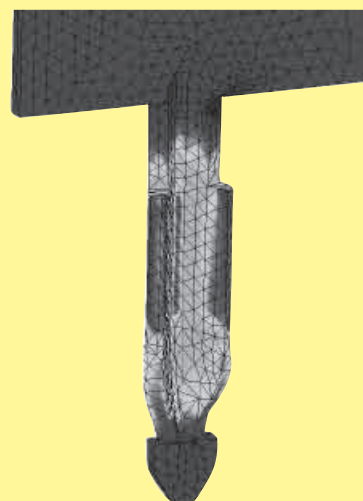
har-mik®

The patented contact design allows 20 % more tolerance on the plated through hole of 0.6 mm than the standard tolerance of $0.6^{+0.07}_{-0.05}$ mm.



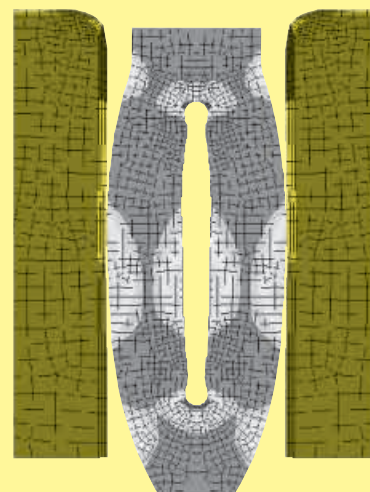
D-Sub

The terminating spoon shape of the contact provides a reliable vertical position of the connector for better alignment during insertion.



SEK

The renowned needle eye allows for compensation of tolerances of pcb surface properties. The excessive material is displaced within the plated through hole whereby a gastight connection is assured.



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

Today tinned surfaces are widely used as a standard, the pcb technology trends are moving to low tin or tin free surfaces. Cu, Pd, Au and Ag are the important alternatives. Specific parameters and particularly different friction factors of these surfaces make high demands on press-in zones.

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

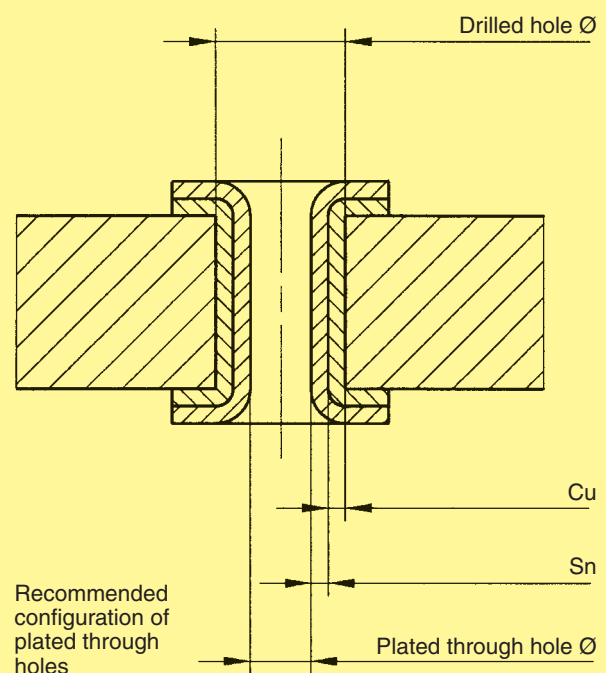
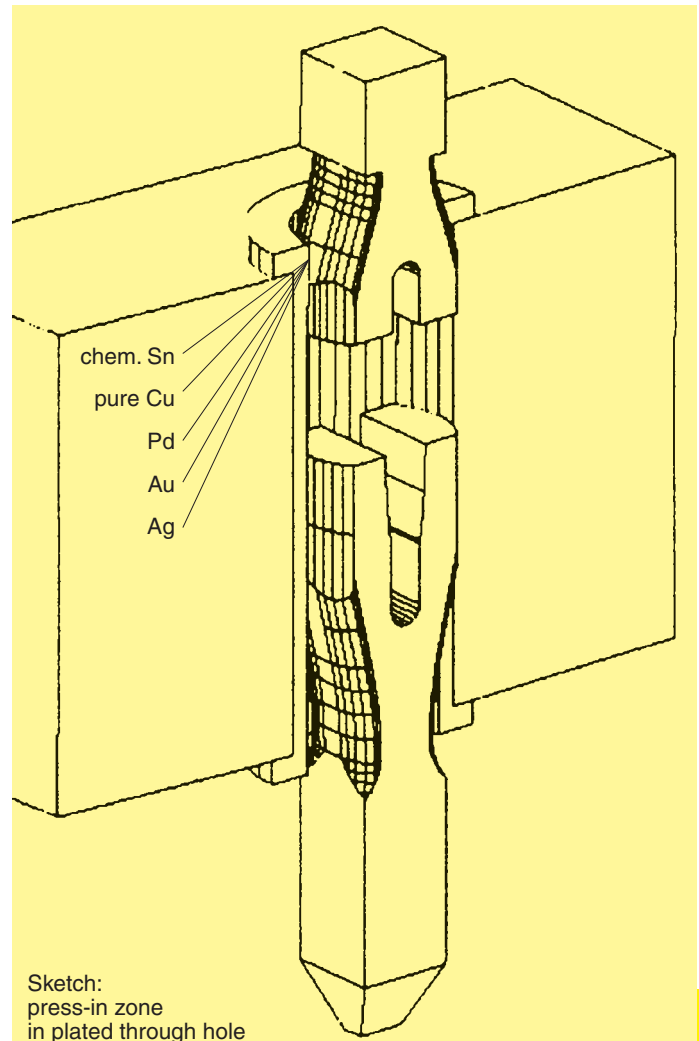
Please contact us for detailed test reports.

Benefits of the press-in technology

- Thermal shocks associated with the soldering process and the risk of the board malfunction are avoided.
- No need for the subsequent cleaning of the assembled pcb's

Recommended configuration chart for tinned plated through holes

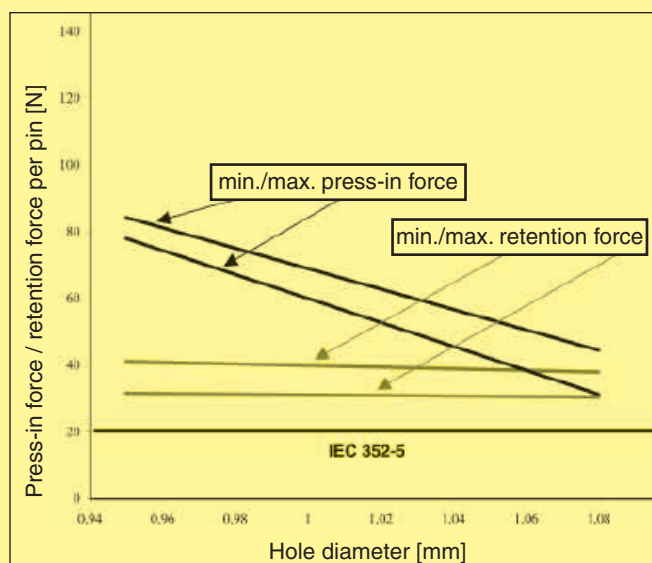
	Plated through hole	
	0.6 mm	1 mm
Drilled hole Ø [mm]	0.71 - 0.74	1.12 - 1.15
Cu thickness [µm]	30 - 60	25 - 75
Sn thickness [µm]	5 - 20	5 - 15
Plated hole Ø [mm]	0.55 - 0.67	0.94 - 1.09
Board thickness [mm]	1.6 - 3.2	1.6 - 3.2
Connector range	har-mik	SEK and D-Sub



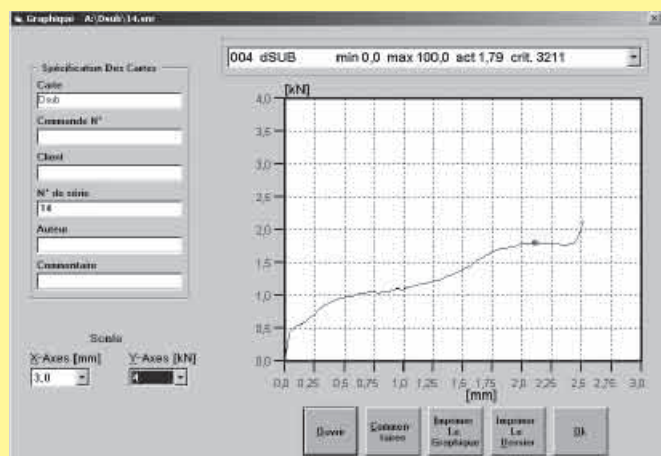
Quality control of the press-in termination

The press-in force correlates with the diameter of the plated through hole and with the friction coefficient of the surface; therefore it can be used for a continuous monitoring of the process.

The retention force, as an indirect measure of the normal force, serves to qualify the process or random tests



Typical press-in and retention forces for the D-Sub press-in zone



The automatic press-in machines of HARTING feature a graphical user interface for monitoring the process and the quality of the press-in termination (see chapter 30).



X-ray photo of a pressed-in connector

Number of contacts	68
Pitch	1.27 mm
Working current	1 A
Working voltage	240 V ~
Test voltage $U_{r.m.s.}$	750 V
Contact resistance	$\leq 30 \text{ m}\Omega$
Insulation resistance	$\geq 10^3 \text{ M}\Omega$
Temperature range	-55 °C ... + 105 °C

Materials

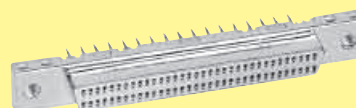
Moulding	Thermoplastic resin glass-fibre filled UL 94-V0
Contacts	Copper alloy

Contact surface

Contact zone	selectively gold-plated acc. to performance level
Metal shell	Die cast zamac or stamped steel, nickel-plated

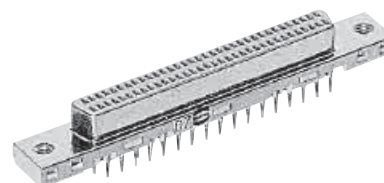
Press-in

Insertion process	Flat rock
Maximum press-in force per contact	100 N
Minimum push out force per contact	15 N
Number of repairs	2
Diameter of pcb plated through holes	$\varnothing 0.6^{+0.07}_{-0.05} \text{ mm}$
Recommended pcb holes for press-in process	Hole : $\varnothing 0.71 - 0.74 \text{ mm}$ Cu : 30 – 60 μm Sn : 5 – 20 μm
Pcb thickness	1.6 – 3.2 mm



Number of contacts

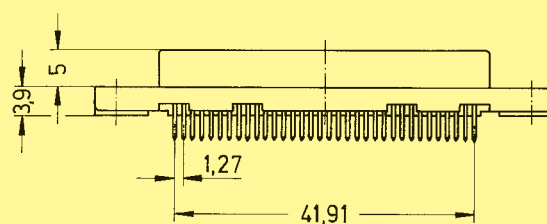
68



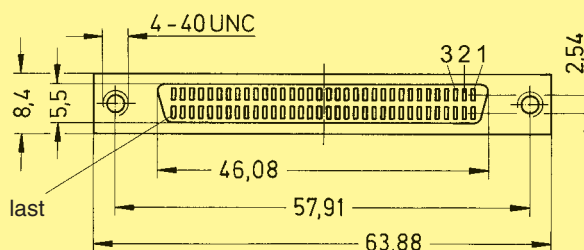
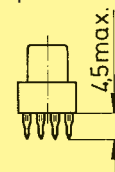
Female connectors, straight

Identification	No. of contacts	Part No.
Female connector with straight press-in pins	68	60 02 068 5322

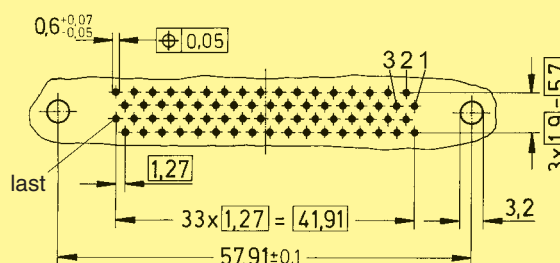
Dimensions



press-in



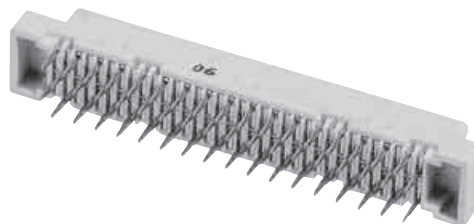
Board drillings
(Components side)



Dimensions in mm

Number of contacts

68



Female connectors, straight

Identification

No. of contacts

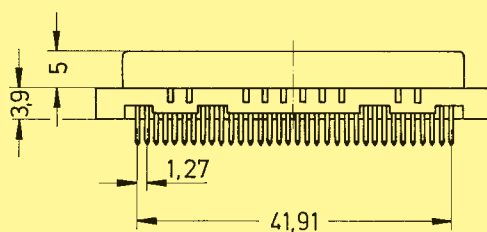
Part No.

Female connector with straight press-in pins

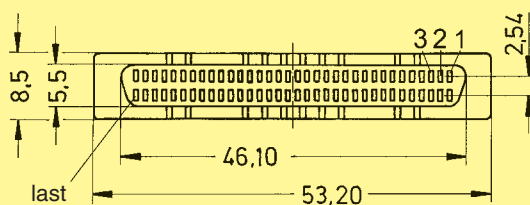
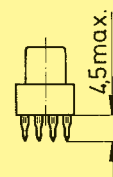
68

60 05 068 5322

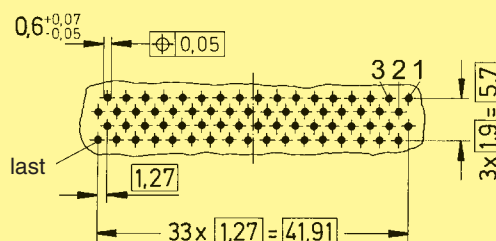
Dimensions



press-in



Board drillings
(Components side)



Dimensions in mm

Number of contacts	9, 15, 25, 37, 50 UL recognized
Working current see current carrying capacity chart Stamped contacts	6.5 A max.
Test voltage $U_{r.m.s.}$	1 kV
Clearance and creepage	≥ 1.0 mm
Contact resistance	≤ 10 m Ω
Insulation resistance	$\geq 10^{10}$ Ω
Temperature range	-55 °C ... + 125 °C The higher temperature limit includes the local ambient and heating effect of the contacts under load

Terminations	Recommended PCB through holes	
	Signal pin	Grounding pin
<i>Tin-lead plated PCB</i>	Hole	1.15-0.03
	Cu	25-75 μ m
	Sn	5-15 μ m
	Plated hole	0.94-1.09 mm
<i>Chemical tin-plated PCB</i>	Hole	1.05-0.03
	Cu	25-50 μ m
	Sn	0.8-1.0 μ m
	Plated hole	1.00-1.10 mm
<i>Au / Ni plated PCB</i>	Hole	1.15-0.03
	Cu	25-50 μ m
	Ni	3-7 μ m
	Au	0.05-0.12 μ m
	Plated hole	1.00-1.10 mm
<i>Silver plated PCB</i>	Hole	1.15-0.03
	Cu	25-50 μ m
	Ag	0.1-0.3 μ m
	Plated hole	1.00-1.10 mm
<i>OSP copper plated PCB</i>	Hole	1.15-0.03
	Cu	25-50 μ m
	Plated hole	1.00-1.10 mm

PCB board thickness: 1.6-3.2 mm

Materials	
Mouldings and hoods	Liquid Crystal Polymer (LCP) UL 94-V0
Contacts	Copper alloy
Contact surface	
Contact zone	selectively gold-plated acc. to performance level ¹⁾
Metal shell	Plated steel

Insertion and withdrawal force

Connector on P.C.B.

Press-in without grounding pins

– insertion max. per contact: 120 N

– withdrawal min. per contact: 20 N

Press-in with grounding pins

– insertion max. per grounding pin: 250 N

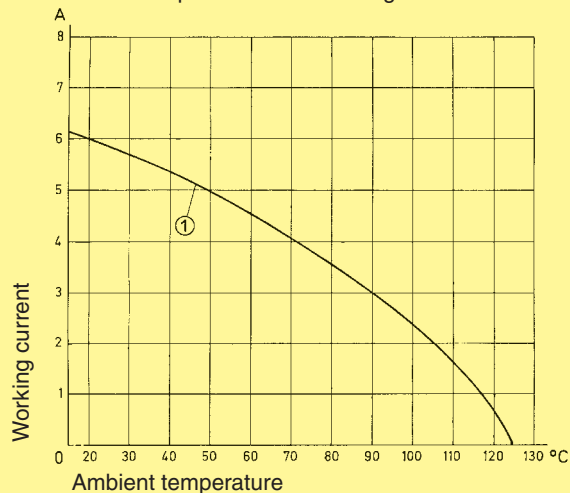
– withdrawal min. per grounding pin: 30 N

Mating force9 way ≤ 30 N15 way ≤ 50 N25 way ≤ 83 N37 way ≤ 123 N50 way ≤ 167 N**Current carrying capacity**

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.

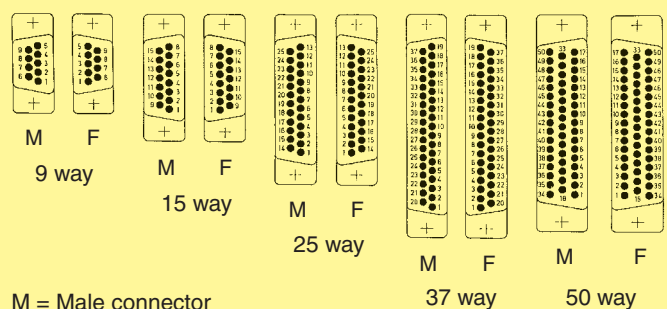
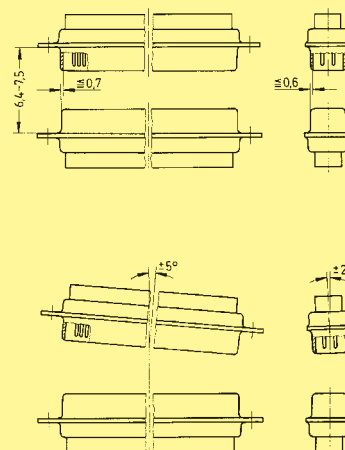
The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512.



Example: 25 way connector

① Stamped contacts

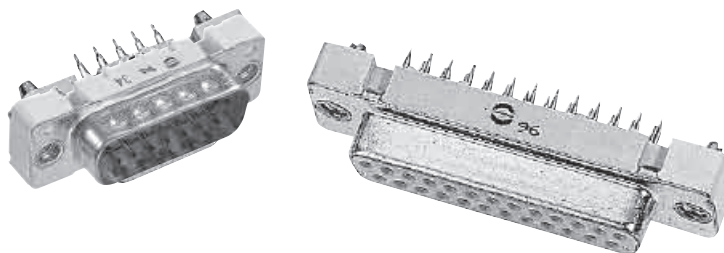
Contact arrangement View from termination sideM = Male connector
F = Female connector**Mating conditions as per DIN 41 652**¹⁾ Performance level 3, 50 mating cycles, no gas test

Performance level 2 as per CECC 75 301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60 512

Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60 512

Number of contacts

9–50

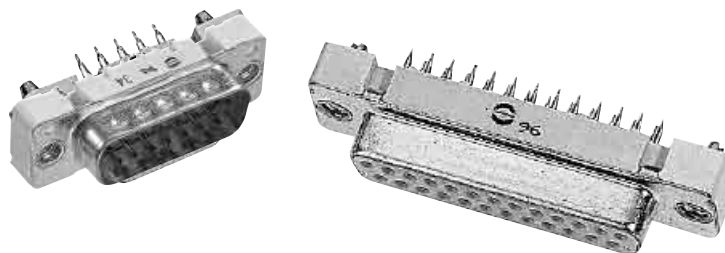


Press-in, straight with grounding press-in board locks

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 20.08 Other performance levels on request		Performance level 3	Performance level 2
Male connector Flange height x = 5.7 mm			
metal shell with dimples	9	09 66 164 771 .	09 66 164 671 .
	15	09 66 264 771 .	09 66 264 671 .
	25	09 66 364 771 .	09 66 364 671 .
Please insert digit for flange thread or fitted female screw locks			
M3 ▶	5		
4-40 UNC ▶	6		
fitted screw locks 4-40 UNC ▶	7 ¹⁾		
Female connector Flange height x = 5.7 mm			
metal shell	9	09 66 154 751 .	09 66 154 651 .
	15	09 66 254 751 .	09 66 254 651 .
	25	09 66 354 751 .	09 66 354 651 .
	37	09 66 454 751 .	09 66 454 651 .
Please insert digit for flange thread or fitted female screw locks			
M3 ▶	5		
4-40 UNC ▶	6		
fitted screw locks 4-40 UNC ▶	7 ¹⁾		
Female connector Flange height x = 6 mm			
metal shell	9	09 66 154 751 .	09 66 154 651 .
	15	09 66 254 751 .	09 66 254 651 .
	25	09 66 354 751 .	09 66 354 651 .
	37	09 66 454 751 .	09 66 454 651 .
	50	09 66 554 751 .	09 66 554 651 .
Please insert digit for flange thread or fitted female screw locks			
M3 ▶	1		
4-40 UNC ▶	2		
fitted screw locks 4-40 UNC ▶	3 ¹⁾		

Number of contacts

9–50

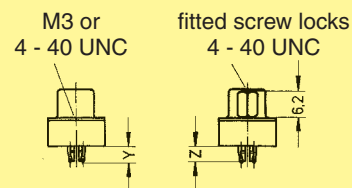
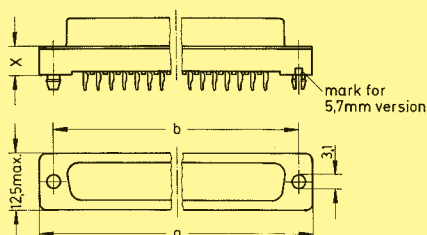


Press-in, straight with grounding press-in board locks

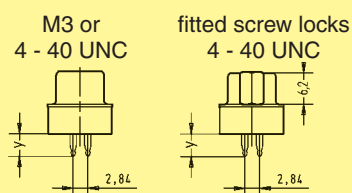
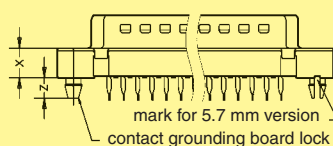
Identification

Drawing

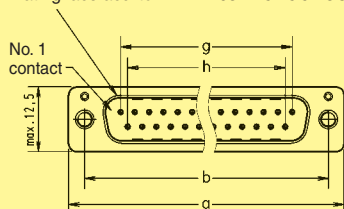
Dimensions in mm

Male connector
9 – 25 contacts


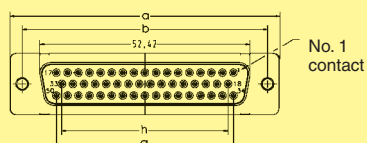
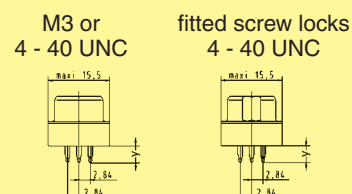
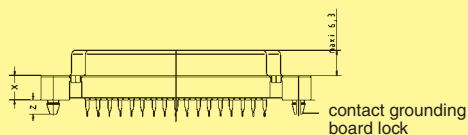
X	Y	Z
6.0 ± 0.2	4.20 ± 0.2	3.5 max.
5.7 ± 0.2	4.35 ± 0.2	3.9 max.

Female connector
9 – 37 contacts


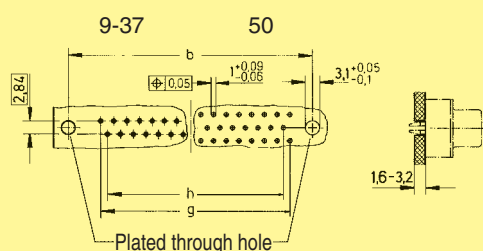
Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807



	a	b	g	h
9	31.00	24.90	4 x [2.74] = 10.96	3 x [2.74] = 8.22
15	39.30	33.20	7 x [2.74] = 19.18	6 x [2.74] = 16.44
25	53.10	47.00	12 x [2.76] = 33.12	11 x [2.76] = 30.36
37	69.65	63.55	18 x [2.76] = 49.68	17 x [2.76] = 46.92
50	67.00	61.10	16 x [2.76] = 44.16	15 x [2.76] = 41.40

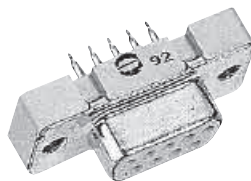
Female connector
50 contacts


Board drillings



Number of contacts

9–50



Press-in, straight without grounding press-in board locks

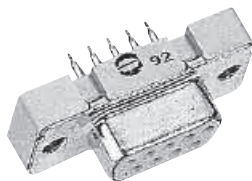
Identification	No. of contacts	Part No.	
Performance levels Explanations see page 20.08 Other performance levels on request		Performance level 3	Performance level 2
Male connector Flange height x = 5.7 mm			
metal shell with dimples	9	09 66 124 770 .	09 66 124 670 .
	15	09 66 224 770 .	09 66 224 670 .
	25	09 66 324 770 .	09 66 324 670 .
Please insert digit for flange thread or fitted female screw locks			
ø 3.1 mm hole ▶ 4 ¹⁾ M3 ▶ 5 4-40 UNC ▶ 6 fitted screw locks 4-40 UNC ▶ 7 ²⁾			
Female connector Flange height x = 5.7 mm			
metal shell	9	09 66 114 750 .	09 66 114 650 .
	15	09 66 214 750 .	09 66 214 650 .
	25	09 66 314 750 .	09 66 314 650 .
	37	09 66 414 750 .	09 66 414 650 .
Please insert digit for flange thread or fitted female screw locks			
ø 3.1 mm hole ▶ 4 ¹⁾ M3 ▶ 5 4-40 UNC ▶ 6 fitted screw locks 4-40 UNC ▶ 7 ²⁾			
Female connector Flange height x = 6 mm			
metal shell	9	09 66 114 750 .	09 66 114 650 .
	15	09 66 214 750 .	09 66 214 650 .
	25	09 66 314 750 .	09 66 314 650 .
	37	09 66 414 750 .	09 66 414 650 .
	50	09 66 514 750 .	09 66 514 650 .
Please insert digit for flange thread or fitted female screw locks			
ø 3.1 mm hole ▶ 0 ¹⁾ M3 ▶ 1 4-40 UNC ▶ 2 fitted screw locks 4-40 UNC ▶ 3 ²⁾			

¹⁾ Not normally kept in stock²⁾ Fitted screw locks 4-40 UNC not normally kept in stock for performance level 3

Connector dimensions see page 20.13. Mating conditions see page 20.08.

Number of contacts

9–50

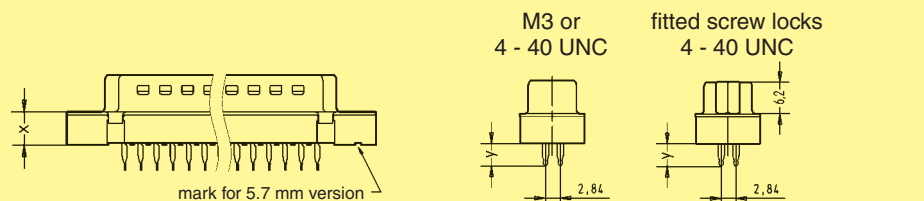


Press-in, straight without grounding press-in board locks

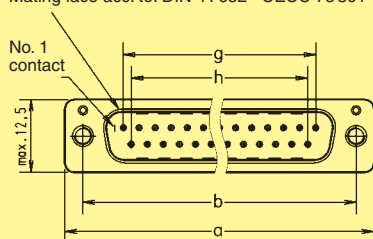
Identification

Drawing

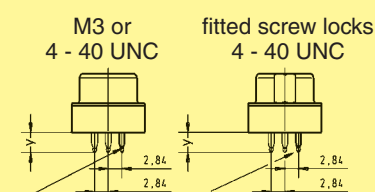
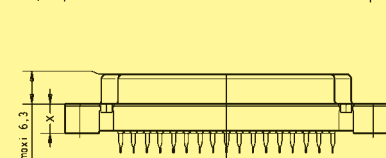
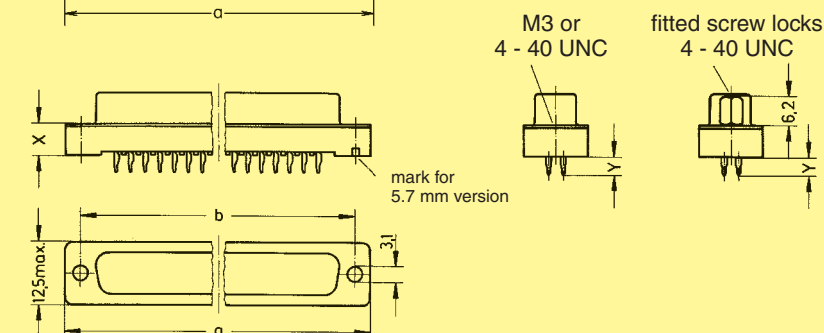
Dimensions in mm

Male connector
9 – 25 contacts


Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807



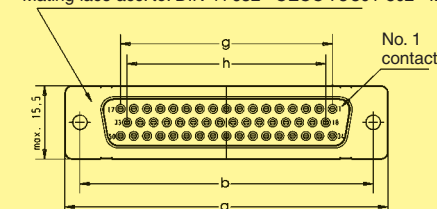
X	Y
6.0 ± 0.2	4.20 ± 0.2
5.7 ± 0.2	4.35 ± 0.2

Female connector
9 – 37 contacts


Press-in pins from position 34 to 50 are reversed 180 degrees

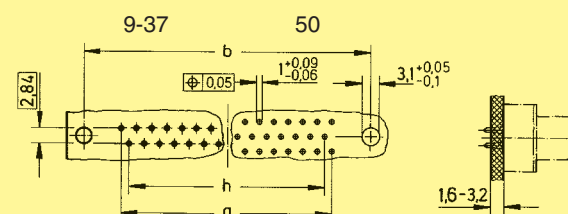
Female connector
50 contacts

Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807



	a	b	g	h
9	31.00	24.90	$4 \times [2.74] = 10.96$	$3 \times [2.74] = 8.22$
15	39.30	33.20	$7 \times [2.74] = 19.18$	$6 \times [2.74] = 16.44$
25	53.10	47.00	$12 \times [2.76] = 33.12$	$11 \times [2.76] = 30.36$
37	69.65	63.55	$18 \times [2.76] = 49.68$	$17 \times [2.76] = 46.92$
50	67.00	61.10	$16 \times [2.76] = 44.16$	$15 \times [2.76] = 41.40$

Board drillings



Number of contacts 10, 14, 16, 20, 26, 34, 40, 50, 60, 64

Contact arrangement straight

Contact length 4.5 mm

Approvals IEC 60603-13

Design acc. to D 2632
BT 224
BS 9525
NFC 93-428 (HE 10)
MIL DTL 83503

Pitch 2.54 mm [0.100"]

Working current 1 A

Working voltage 350 V DC or AC peak

Test voltage $U_{r.m.s.}$ 1 kV

Contact resistance $\leq 20 \text{ m}\Omega$
Insulation resistance $\geq 10^9 \Omega$

Temperature range -55 °C ... + 125 °C
The maximum temperature includes heating of contacts and ambient temperature

Materials
Moulding PBT
UL 94-V0
Contacts Phosphor bronze

Contact surface
Contact zone gold-plated according to performance level¹⁾

Terminations Recommended PCB through holes

<i>Tin-lead plated PCB</i>	Hole	1.15 $\pm$ 0.025
	Cu	min. 25 μm
	Sn	max. 15 μm
	Plated hole	0.94-1.09 mm

<i>Chemical tin-plated PCB</i>	Hole	1.15 $\pm$ 0.025
	Cu	min. 25 μm
	Sn	min. 0.8 μm
	Plated hole	1.00-1.10 mm

<i>Au / Ni plated PCB</i>	Hole	1.15 $\pm$ 0.025
	Cu	min. 25 μm
	Ni	3-7 μm
	Au	0.05-0.12 μm
	Plated hole	1.00-1.10 mm

<i>Silver plated PCB</i>	Hole	1.15 $\pm$ 0.025
	Cu	min. 25 μm
	Ag	0.1-0.3 μm
	Plated hole	1.00-1.10 mm

<i>OSP copper plated PCB</i>	Hole	1.15 $\pm$ 0.025
	Cu	min. 25 μm
	Plated hole	1.00-1.10 mm

PCB board thickness: $\geq 1.6 \text{ mm}$

Insertion and withdrawal forces

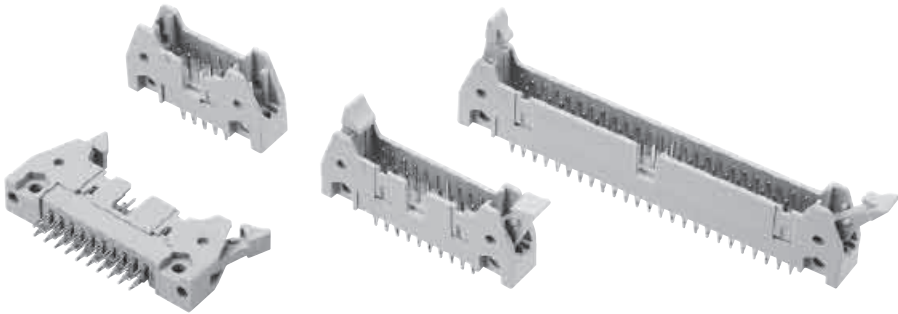
Number of contacts	Maximum force [N]
	Performance level 1
10	20
14	28
16	32
20	40
26	52
34	68
40	80
50	100
60	120
64	128

¹⁾ Performance level 1 as per IEC 60603-13, ≥ 500 mating cycles, 10 days gas test

Number of contacts

10-64

Male header,
straight press-in pins

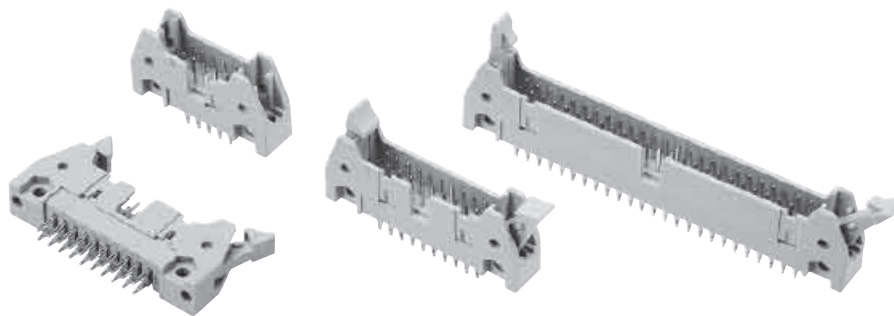


Identification	No. of contacts	Part No.		
		Without levers	With short levers	With long levers
Male header with straight press-in terminations Length: 4.5 mm				
	10	09 18 510 5929	09 18 510 5919	09 18 510 5909
	14	09 18 514 5929	09 18 514 5919	09 18 514 5909
	16	09 18 516 5929	09 18 516 5919	09 18 516 5909
	20	09 18 520 5929	09 18 520 5919	09 18 520 5909
	26	09 18 526 5929	09 18 526 5919	09 18 526 5909
	34	09 18 534 5929	09 18 534 5919	09 18 534 5909
	40	09 18 540 5929	09 18 540 5919	09 18 540 5909
	50	09 18 550 5929	09 18 550 5919	09 18 550 5909
	60	09 18 560 5929	09 18 560 5919	09 18 560 5909
	64	09 18 564 5929	09 18 564 5919	09 18 564 5909

Press-in
technology

Number of contacts

10-64

Male header,
straight press-in pins


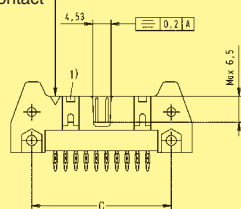
Identification

Drawing

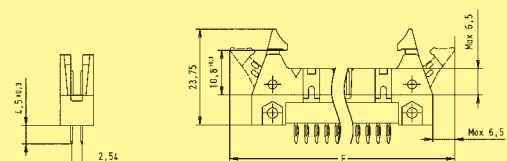
Dimensions in mm

Male header

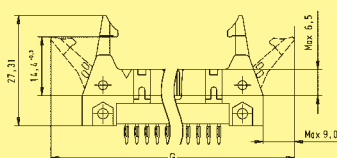
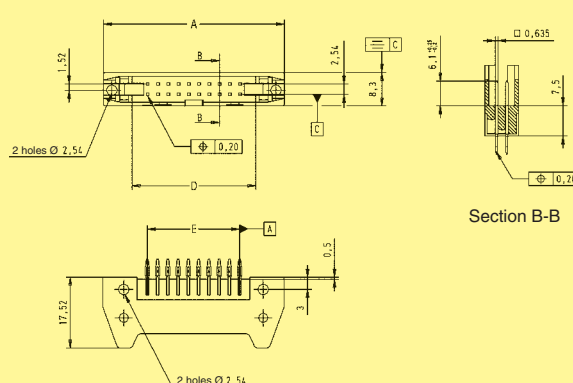
No. of contacts	A	C	D	E	F	G
10	32.11	21.84	17.91	2.54 x 4 = 10.16	45.11	50.11
14	37.19	26.92	22.99	2.54 x 6 = 15.24	50.19	55.19
16	39.73	29.46	25.53	2.54 x 7 = 17.78	52.73	57.73
20	44.81	34.54	30.61	2.54 x 9 = 22.86	57.81	62.81
26	52.43	42.16	38.23	2.54 x 12 = 30.48	65.43	70.43
34	62.59	52.32	48.39	2.54 x 16 = 40.64	75.59	80.59
40	70.21	59.94	56.01	2.54 x 19 = 48.26	83.21	88.21
50	82.91	72.64	68.71	2.54 x 24 = 60.96	95.91	100.91
60	95.61	85.34	81.41	2.54 x 29 = 73.66	108.61	113.61
64	100.69	90.42	86.49	2.54 x 31 = 78.74	113.69	118.69

Marking
No. 1 contact


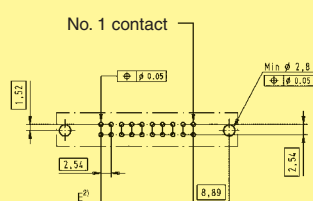
Short levers



Long levers



Board drillings


¹⁾ No polarization slot
for 10 or 14 way male header

²⁾ Pitch tolerance: ± 0.1

Number of contacts 6, 10, 14, 16, 20, 26, 34, 40, 50, 60, 64

Contact arrangement straight

Contact length 5.5 mm

Approvals IEC 60 603-13
DIN EN 60 603-13
D 2632
BT 224
NFC 93-428 (HE 10)

 US

UL recognized: E102079
comply with MIL DTL 83 503

Pitch 2.54 mm [0.100"]

Working current 1 A

Test voltage $U_{r.m.s.}$ 1 kV

Contact resistance $\leq 20 \text{ m}\Omega$
Insulation resistance $\geq 10^9 \Omega$

Temperature range -55 °C ... + 105 °C
The maximum temperature includes heating of contacts and ambient temperature

Press-in

Diameter of pcb plated through holes $\varnothing 1.0^{+0.09}_{-0.06} \text{ mm}$

Recommended pcb holes for press-in process
Hole: $\varnothing 1.12 - 1.15 \text{ mm}$
Cu : 25 – 75 μm
Sn : 5 – 15 μm

Pcb thickness 1.6 – 3.2 mm

Materials
Moulding Thermoplastic resin (PBT)
UL 94-V0

Contact surface
Contact zone gold-plated according to performance level¹⁾

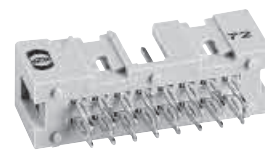
Insertion and withdrawal forces

Number of contacts	Maximum force [N]	
	Performance level 1 and 2	Performance level 3
6	12	18
10	20	30
14	28	42
16	32	48
20	40	60
26	52	78
34	68	102
40	80	120
50	100	150
60	120	180
64	128	192

¹⁾ Performance level 3 as per IEC 60 603-13, ≥ 50 mating cycles, no gas test
Performance level 2 as per IEC 60 603-13, ≥ 250 mating cycles, 4 days gas test
as per MIL DTL 83 503, $> 0.76 \mu\text{m Au}$ (30 μ inch), other performance levels on request

Number of contacts

6-64



Low-profile male header, straight press-in pins

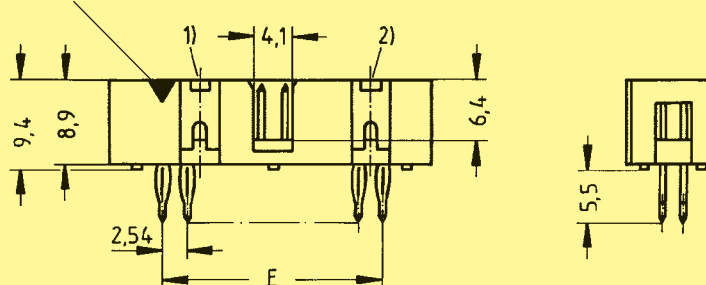
Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
----------------	-----------------	----------	---------	------------------

Low-profile male header with straight press-in terminations
Length: 5.5 mm

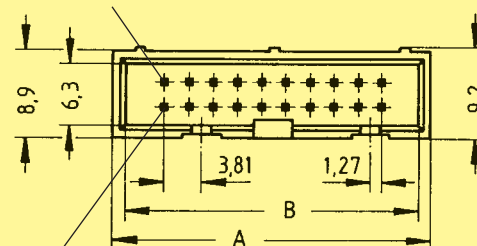
6	09 18 506	□ 329
10	09 18 510	□ 329
14	09 18 514	□ 329
16	09 18 516	□ 329
20	09 18 520	□ 329
26	09 18 526	□ 329
34	09 18 534	□ 329
40	09 18 540	□ 329
50	09 18 550	□ 329
60	09 18 560	□ 329
64	09 18 564	□ 329

No. of contacts	A	B	E
6	15.2	12.78	$2.54 \times 2 = 5.08$
10	20.3	17.86	$2.54 \times 4 = 10.16$
14	25.4	22.94	$2.54 \times 6 = 15.24$
16	27.9	25.48	$2.54 \times 7 = 17.78$
20	33.0	30.56	$2.54 \times 9 = 22.86$
26	40.6	38.18	$2.54 \times 12 = 30.48$
34	50.8	48.34	$2.54 \times 16 = 40.64$
40	58.4	55.96	$2.54 \times 19 = 48.26$
50	71.3	68.66	$2.54 \times 24 = 60.96$
60	84.0	81.36	$2.54 \times 29 = 73.66$
64	89.1	86.44	$2.54 \times 31 = 78.74$

Marking No. 1 contact

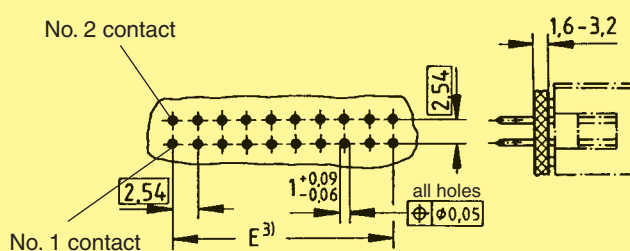


No. 2 contact



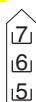
No. 1 contact

No. 2 contact



Board drillings

For Performance Level 3 please specify digit
For Performance Level 2 please specify digit
> 0.76 µm Au (30 µinch) on request



Not normally kept in stock

- 1) No polarization slot for 6, 10 or 14 way
2) No polarization slot for 6 way
3) Pitch tolerance: ± 0.1

Surface Mount Technology (SMT) board connectors

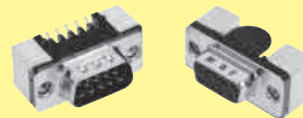
Page

D-Sub – SMT

Technical characteristics

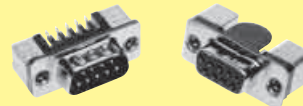
21.02

Standard versions



21.04

Low-profile versions



21.06

Number of contacts 9, 15*, 25*

Working current 5 A

Test voltage $U_{r.m.s.}$ 1 kV

Clearance and creepage ≥ 1.0 mm

Contact resistance < 25 m Ω
Insulation resistance < 5 G Ω

Temperature range as per profile JEDEC 020 D

Terminations Solder pins for P.C.B. pads

Materials

Mouldings LCP black
UL 94-V0

Contacts Phosphorus bronze

Grounding die Zamac

Shell Steel

Contact surface

Contact zone selectively gold-plated
according to performance
level¹⁾

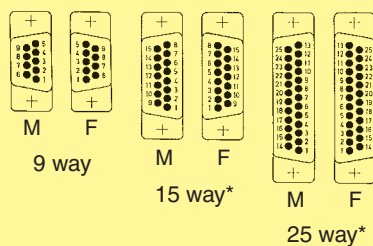
Grounding die Pure tin

Shell Nickel plated

Insertion and withdrawal force

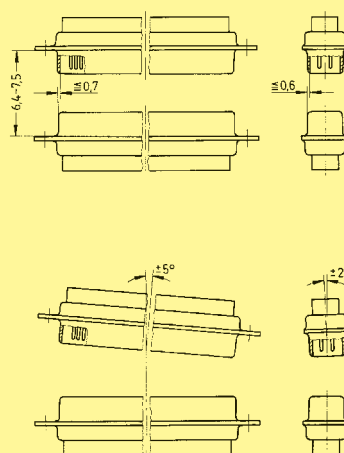
– insertion max. per connector: 30 N
– withdrawal min. per connector: 3.3 N

Contact arrangement View from termination side



M = Male connector
F = Female connector

Mating conditions as per DIN 41 652



¹⁾ Performance level 3, 50 mating cycles, no gas test

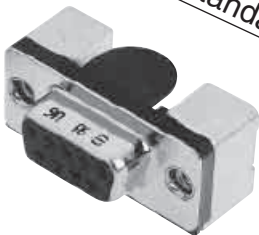
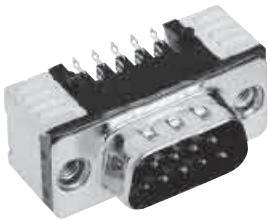
Performance level 2 as per CECC 75 301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60 512

Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60 512

* Available on request

Number of contacts

9*



Standard Versions

SMT stamped solder pins, angled with grounding board locks

SMT
technology

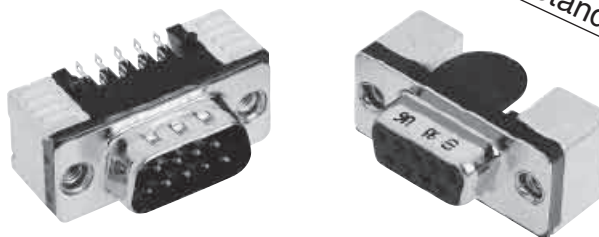
Identification	No. of contacts	Part No.					
Performance levels Explanations see page 21.02 Other performance levels on request		Performance level 3		Performance level 2		Performance level 1	
Male connector metal shell with dimples	9	09 55 166 78 .. 741		09 55 166 68 .. 741		09 55 166 38 .. 741	
Female connector metal shell	9	09 55 156 76 .. 741		09 55 156 66 .. 741		09 55 156 36 .. 741	
Please insert digit for flange thread or fitted female screw locks							
M3 ▶ 11							
4-40 UNC ▶ 12							
fitted screw locks M3 ▶ 33							
fitted screw locks 4-40 UNC ▶ 13							

* 15 and 25 way connectors are available on request
Connector dimensions see page 21.05. Mating conditions see page 21.02.

Number of contacts

9*

Standard Versions



SMT stamped solder pins, angled with grounding board locks

Identification

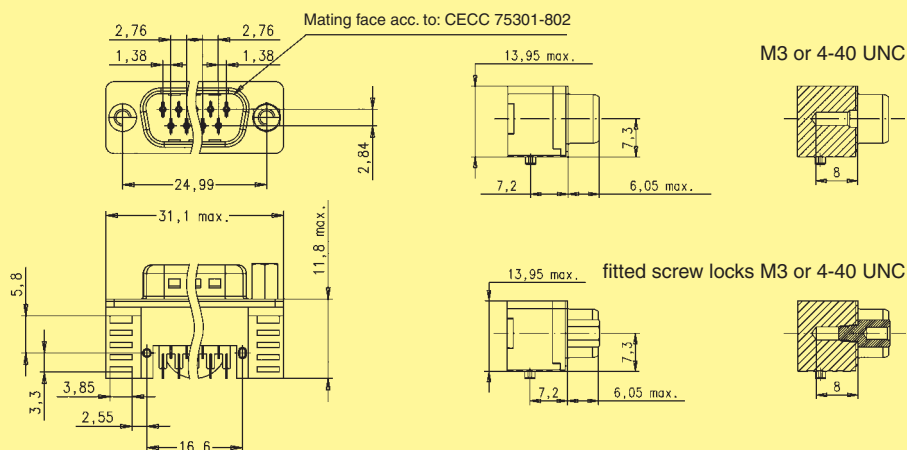
Drawing

Dimensions in mm

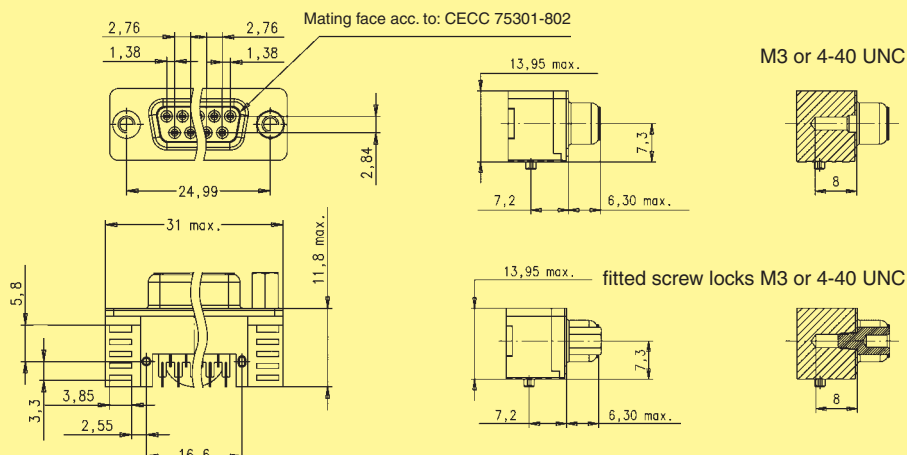
Male connector

M3 or 4-40 UNC

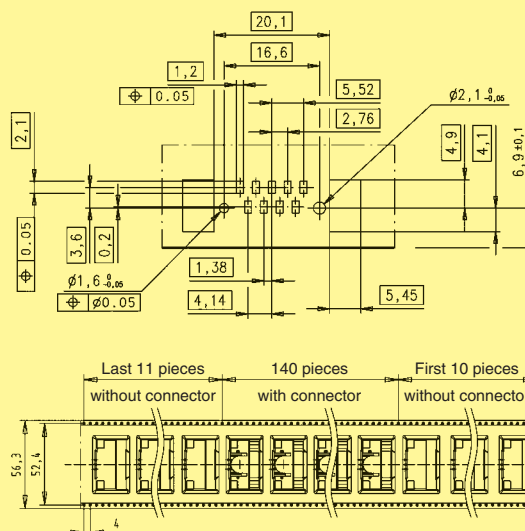
fitted screw locks M3 or 4-40 UNC



Female connector

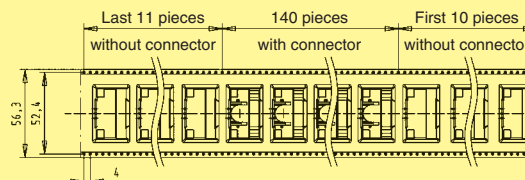


pcb layout



Packaging

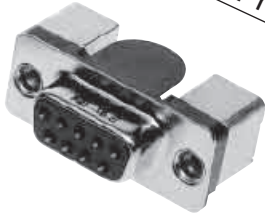
(1 reel = 140 pieces)
Reel diameter = 330 mm



SMT
technology

Number of contacts

9*



Low-Profile Versions

SMT stamped solder pins, angled with grounding board locks

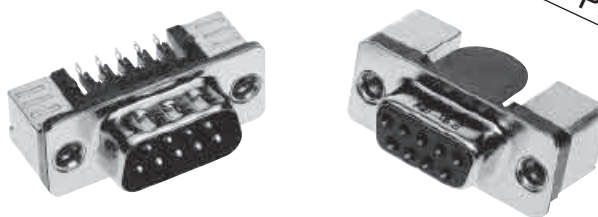
SMT
technology

Identification	No. of contacts	Part No.					
Performance levels Explanations see page 21.02 Other performance levels on request		Performance level 3		Performance level 2		Performance level 1	
Male connector metal shell with dimples	9	09 55 166 78 ... 741		09 55 166 68 ... 741		09 55 166 38 ... 741	
Female connector metal shell	9	09 55 156 76 ... 741		09 55 156 66 ... 741		09 55 156 36 ... 741	
Please insert digit for flange thread or fitted female screw locks M3 ▶ 15 4-40 UNC ▶ 16 fitted screw locks M3 ▶ 18 fitted screw locks 4-40 UNC ▶ 17							

* 15 and 25 way connectors are available on request
Connector dimensions see page 21.07. Mating conditions see page 21.02.

Number of contacts

9*



Low-Profile Versions

SMT stamped solder pins, angled with grounding board locks

Identification

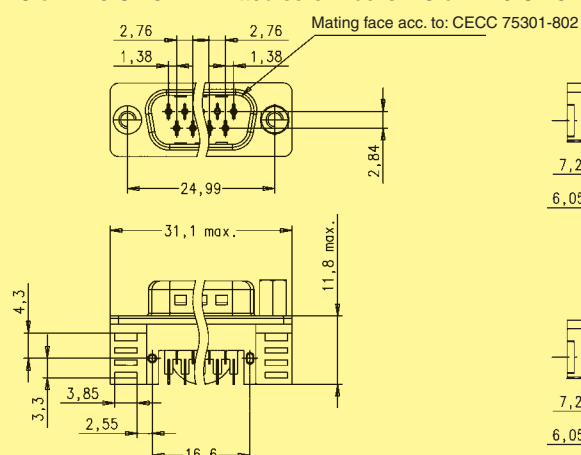
Drawing

Dimensions in mm

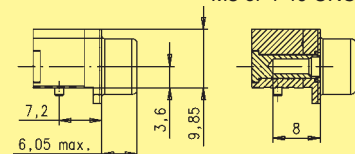
Male connector

M3 or 4-40 UNC

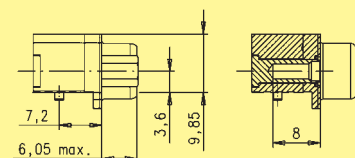
fitted screw locks M3 or 4-40 UNC



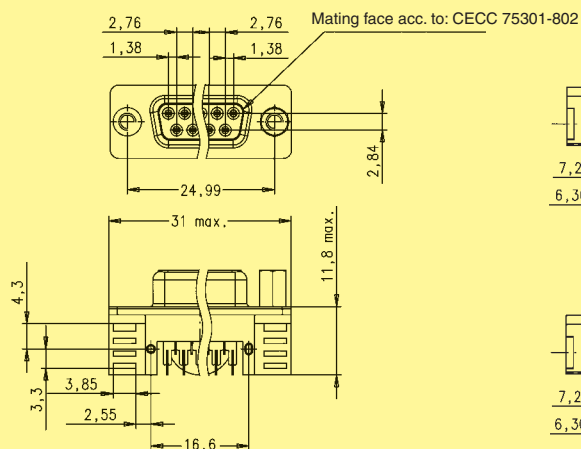
M3 or 4-40 UNC



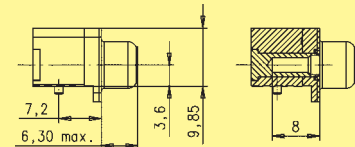
fitted screw locks M3 or 4-40 UNC



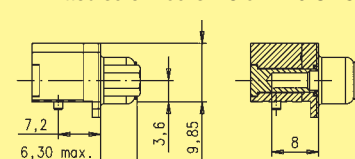
Female connector



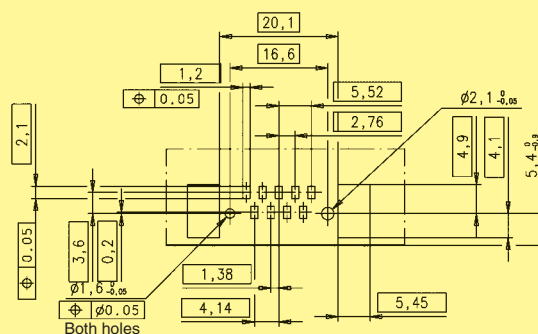
M3 or 4-40 UNC



fitted screw locks M3 or 4-40 UNC

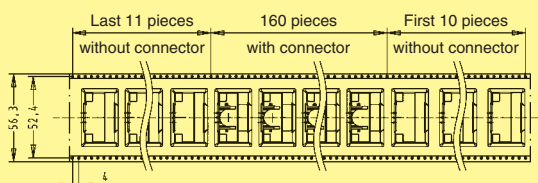


pcb layout



Packaging

(1 reel = 160 pieces)
Reel diameter = 330 mm



SMT
technology

SMC* – Technology and board connectors

Page

General information 22.02

harmik®

Technical characteristics 22.05

Pin and socket, female connectors 22.06



Technical characteristics 22.08

Bellows, female connectors 22.09



D-Sub – S

Technical characteristics 22.10

Mounting details 22.11

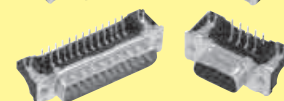
Straight versions 22.12



Standard versions 22.14



Low-profile versions 22.16



SEK

Technical characteristics 22.18

Male standard connectors 22.20



Male standard connectors with board lock 22.26



Male low-profile connectors 22.28

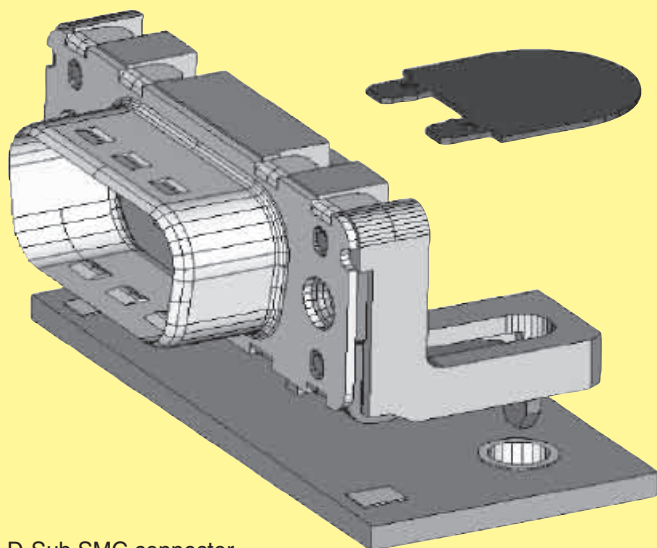


Accessories 22.30

* Also known as Pin-in-Paste or Through Hole Reflow (THR)

The continuing trend towards miniaturisation has revolutionised the assembly of electronic components. For the past 15 years, most components have been secured directly to the pcb surface by means of Surface Mount Technology (SMT). By dispensing with drilled holes on the pcb, a space saving of up to 70 percent is achieved.

Today, typical components such as ICs, resistors, capacitors, inductors, and connectors with straight terminal pins are almost exclusively fitted using SMD (Surface Mount Device) technology in mass production. In contrast, angled SMD connectors at the edge of the board have not been successful because of tolerance problems (co-planarity) and stresses during mating.



D-Sub SMC connector

“Pin in Hole Intrusive Reflow”*

In this process, the connector is inserted into plated through holes in a comparable way to conventional component mounting. All other components can be assembled on the pcb surface.

The components are positioned using pick-and-place machines. These automatic assembly machines differ according to whether the components are small, light-weight or bulky. Connectors, compared to ICs, are considered bulky (odd form). They are more difficult to grip, due to their comparatively heavy weight and larger size. But machines for odd form components, provide the higher insertion power, necessary to fit the components into pcb holes, which are filled with solder paste. Generally modern SMC production lines

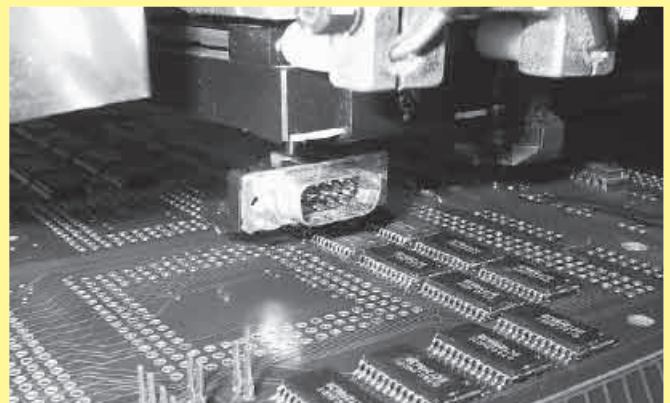
are equipped with both types of machine. Therefore the “Pin in Hole Intrusive Reflow” process entails no extra investment costs for the user.

Conventional assembly process:

1. Application of solder paste
2. Positioning the components
3. Positioning odd form components
4. Reflow soldering
5. Pressing in or partially dip soldering the connector at the board edge
6. Quality inspection

“Pin in Hole Intrusive Reflow” assembly:

1. Application of solder paste
2. Positioning the components
3. Positioning odd form components
4. Reflow soldering
5. Pressing in or partially dip soldering the connector at the board edge
6. Quality inspection



D-Sub in pick and place machine equipped with vacuum nozzle

Interface connectors were designed for Pin in Hole Intrusive Reflow with features like an inspection friendly black colour, tape and reel packaging for automated handling and it is self retaining on pcb via kinked pin. The open design – moulded from high temperature resistant material – ensures good heat distribution, so that current solder temperature profiles can be used. The special material of the insulation body withstands also the higher temperatures of lead free soldering.

Advantages for using interface connectors are:

- Partial dip soldering or press-in is no longer required
- High mechanical stability
- Complete compatibility with Surface Mount Technology
- Savings through integration into the automated assembly process
- Reduced floor space in the production plant

Application of solder paste

Before the components are assembled, solder paste is applied to all the solder pads and the plated through holes. Usually a screen printing process is used for this purpose. A squeegee moves across the pcb, which is masked with screens and presses the solder paste into all unmasked areas. A good solder joint is basically determined by the amount of the applied solder paste. Only a few parameters (illustrated on the right) will lead to the right quantity.

As an alternative to screen printing, the solder paste can be applied by means of a dispenser. A high-precision robot moves the dispenser to all required positions on the pcb. The dispensing method is particularly suitable for small pcb's or applications which demand high precision and flexibility in dispensing volumes.



Dispenser in operation

Solder paste volume

There are numerous scientific studies dealing with calculation of the required quantity of solder paste. These studies use various parameters, e.g. the shrinking factor of the paste during soldering or the thickness of the screens used for masking the pcb. Since such calculation methods are complicated to apply, the following rule of thumb has proved valuable in practice:

$$V_{\text{Paste}} = 2(V_H - V_P)$$

in which:

V_{Paste} = Required volume of solder paste

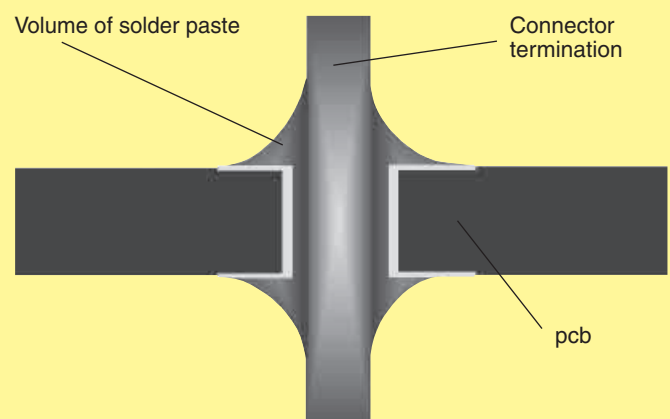
V_H = Volume of the plated through hole

V_P = Volume of the connector termination in the hole

Comment: the multiplier "2" compensates for solder paste shrinkage during soldering. For this purpose, it was assumed that 50 % of the paste consists of the actual solder, the other 50 % being soldering aids.

Requirements for the solder connection

At the beginning of a new production batch, the process parameters, such as quantity of solder paste and soldering temperature, can be set by interpreting simple cross-sections of the soldered connection. A reliable measure for achieving optimum parameters is the quantity of solder required to fill the hole. In soldered connections of high quality, the holes are filled to between 75 % and 100 %.



Plated through hole with connector termination

SMC connectors

SMC (Surface Mount Compatible) connectors have to withstand temperatures of up to 225°C in the reflow oven for 10 to 15 seconds. Therefore, the moulding must be made from a dimensionally stable plastic which expands at the same rate as the pcb material when subjected to heat.

The length of the connector contacts should be such that they protrude by no more than 1.5 millimetres after insertion to the pcb. Each contact collects solder on its tip as it penetrates the solder paste in the hole. So if the contact was too long, this solder would no longer be able to reflow back into the plated through hole by capillary action during the soldering process, therefore the quality of the soldered connection would suffer as a result.

Connector design must permit both automatic assembly with pick-and-place machines and manual positioning for test and pre-production batches. It is also important for the packaging of the connectors to be suitable for automated assembly. Experience shows that deep-drawn film and reel packaging fed into the pick-and-place machines with the aid of a conveyor system is particularly suitable.

HARTING SMC technology

HARTING offers its customers a complete system concept for integrating SMC technology into existing production lines. We manufacture a wide range of SMC connectors (3 and 5 row) in compliance with IEC 60 603-2, D-Sub connectors in compliance with CECC 75 301-802 and connectors from the har-mik® series with contact spacing of 1.27 millimetres. In addition, HARTING supports the market with packaging and processing concepts, which have been developed in collaboration with renowned manufacturers of SMC soldering and assembly plants.

You will find more detailed information in our SMC catalogue, as well as in our hard metric connectors catalogue.

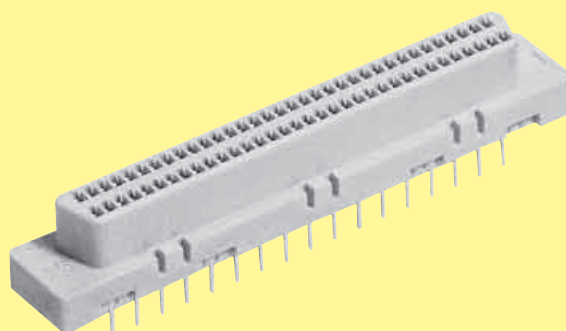
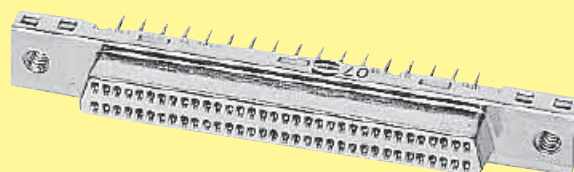
Advantages of the “Pin in Hole Intrusive Reflow” process:

- Partial dip soldering or press-in is no longer required
- Complete compatibility with Surface Mount Technology
- Complete integration into the automated assembly process
- Reduced floor space in the production plant
- As a rule, no additional investment costs



SEK connector mounted in a tape ready for placement using an odd form assembly station.

Number of contacts	68
Pitch	1.27 mm
Working current	1 A
Working voltage	240 V ~
Test voltage $U_{r.m.s.}$	750 V
Contact resistance	$\leq 30 \text{ m}\Omega$
Insulation resistance	$\geq 10^3 \text{ M}\Omega$
Temperature range during reflow soldering	-55 °C ... + 105 °C max. + 240 °C for 60 s
Terminations	
Solder pins	Straight for pcb holes min. $\varnothing 0.74 \text{ mm}$
Materials	
Moulding	Thermoplastic resin glass-fibre filled UL 94-V0 Liquid Chrystal Polymer (LCP)
Contacts	Copper alloy
Contact surface	
Contact zone	Selectively gold plated according to performance level
Metal shell	Die cast zamac or stamped steel, nickel-plated



Number of contacts

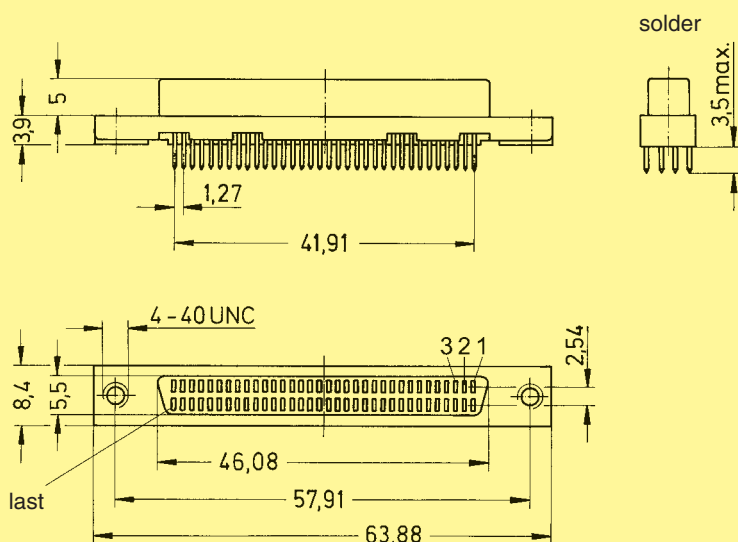
68



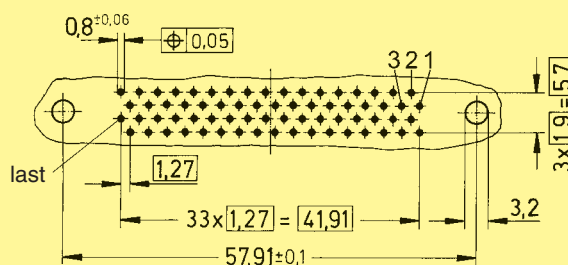
SMC female connectors, straight

Identification	No. of contacts	Part No.
SMC female connector with straight solder pins	68	60 02 068 5120

Dimensions



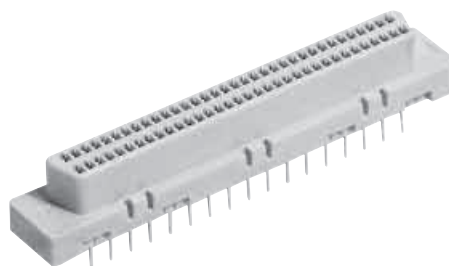
Board drillings
(Components side)



Dimensions in mm

Number of contacts

68



SMC female connectors, straight

Identification

No. of contacts

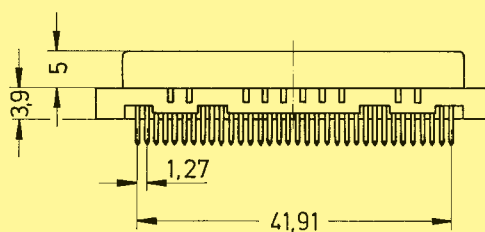
Part No.

SMC female connector with straight solder pins

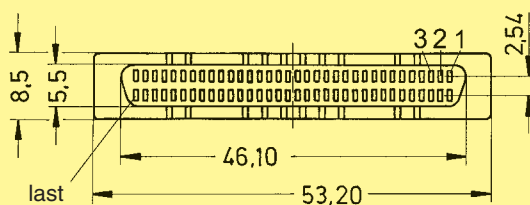
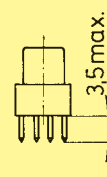
68

60 05 068 5100

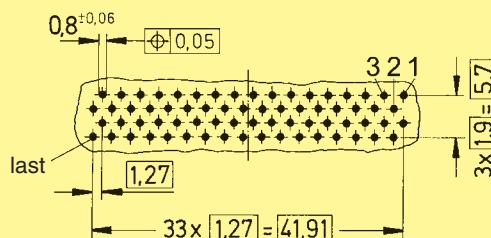
Dimensions



solder

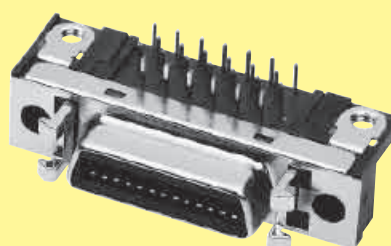
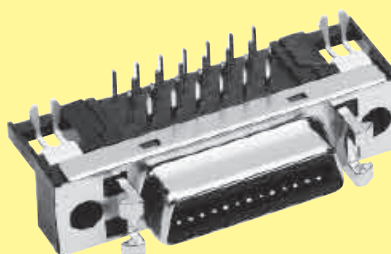
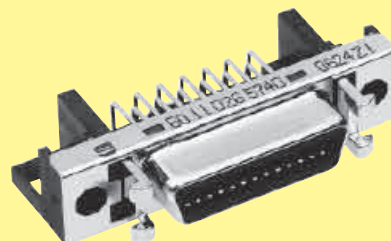


Board drillings
(Components side)



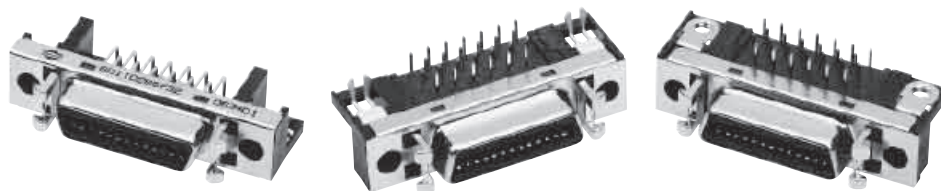
Dimensions in mm

Number of contacts	14, 26, 36
Pitch	1.27 mm
Working current	1 A
Working voltage	240 V ~
Test voltage $U_{r.m.s.}$	500 V
Contact resistance	$\leq 45 \text{ m}\Omega$
Insulation resistance	$\geq 10^3 \text{ M}\Omega$
Temperature range reflow soldering	-55 °C ... + 105 °C according to ICP/JEDEC J-STD-020 Revision D
Terminations	
Solder pins	Angled for pcb holes min. $\varnothing 0.62 \text{ mm}$
Materials	
Moulding	Thermoplastic resin glass-fibre filled UL 94-V0 Liquid Chrystal Polymer (LCP)
Contacts	Copper alloy
Contact surface	
Contact zone	Selectively gold plated according to performance level
Metal shell	Die cast zamac or stamped steel, nickel-plated



Number of contacts

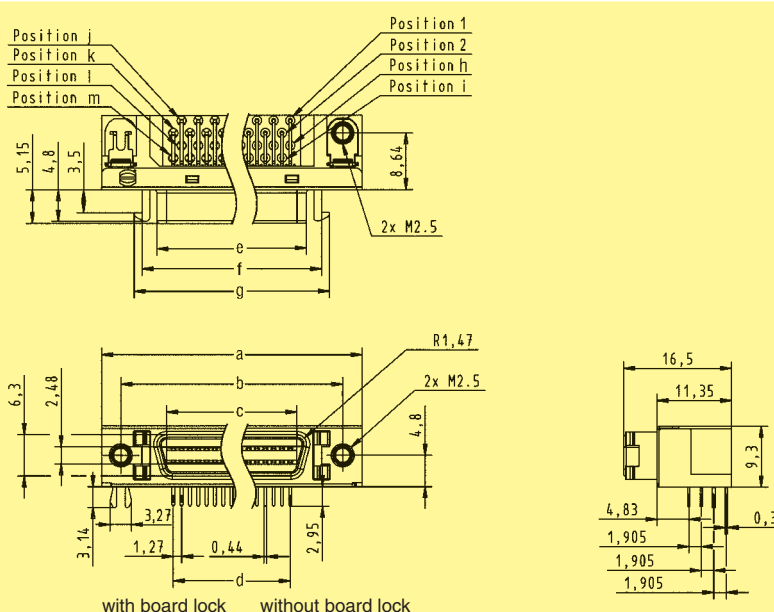
14–36



SMC female connectors, angled

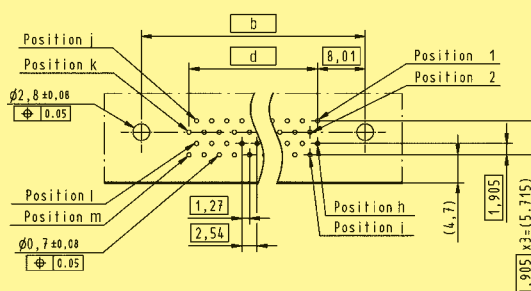
Identification	No. of contacts	Part No. for one reel
SMC female connectors with angled solder pins	14	60 11 014 57 .. 710
	26	60 11 026 57 .. 710
	36	60 11 036 57 .. 710
Without board lock	32	
With board lock	40	

Dimensions



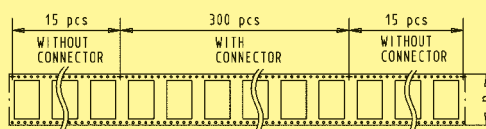
	a	b	c	d	e	f	g	h	i	j	k	l	m	n
14	29.54	23.64	9.62	7.62	12.62	17.14	19.54	8	9	7	6	14	13	44
26	37.16	31.26	17.24	15.24	20.24	24.76	27.16	14	15	13	12	26	25	56
36	43.51	37.61	23.59	21.59	26.59	31.11	33.51	19	20	17	18	35	36	56

Board drillings (Components side)



Packaging

(1 reel = 300 pieces)
Reel diameter = 380 mm



Dimensions in mm

Number of contacts 9, 15, 25, 37
UL recognized

Working current
see current carrying capacity chart
Stamped contacts 6.5 A max.

Test voltage $U_{r.m.s.}$ 1 kV

Clearance and creepage ≥ 1.0 mm

Contact resistance ≤ 10 m Ω
Insulation resistance $\geq 10^{10}$ Ω

Temperature range -55 °C ... + 125 °C
during reflow soldering max. + 240 °C for 15 s
The higher temperature limit includes the local ambient and heating effect of the contacts under load. All connectors are suitable for standard reflow processes.

Terminations
a) Solder pins $\varnothing$ 0.6 mm for P.C.B. holes $\varnothing$ 0.8/1 mm
b) Solder pins, angled 90° $\varnothing$ 0.6 mm for P.C.B. holes $\varnothing$ 1 mm

Materials
Mouldings Thermoplastic resin, glass-fibre filled (PCT), UL 94-V0

Contacts Copper alloy

Contact surface
Contact zone selectively gold-plated according to performance level¹⁾

Metal shell Plated steel

Insertion and withdrawal force
Connector on P.C.B.
Solder, straight with clips
– insertion max. per connector: 60 N
– withdrawal min. per connector: 10 N

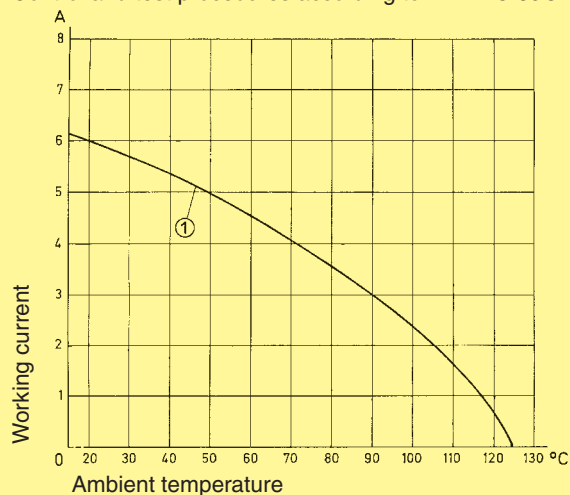
Mating force
9 way ≤ 30 N
15 way ≤ 50 N
25 way ≤ 83 N
37 way ≤ 123 N

Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.

The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

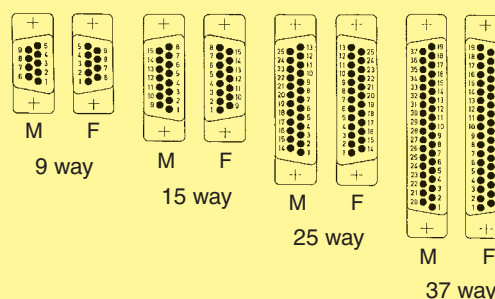
Control and test procedures according to DIN IEC 60 512.



Example: 25 way connector

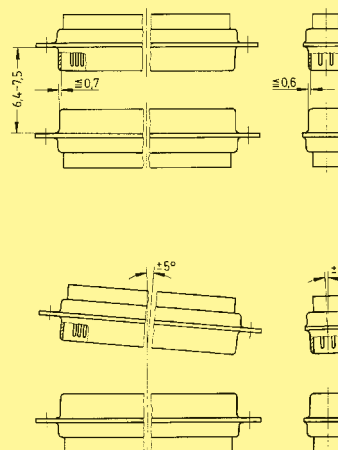
① Stamped contacts

Contact arrangement View from termination side



M = Male connector
F = Female connector

Mating conditions as per DIN 41 652



¹⁾ Performance level 3, 50 mating cycles, no gas test

Performance level 2 as per CECC 75 301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60 512

Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60 512

Identification

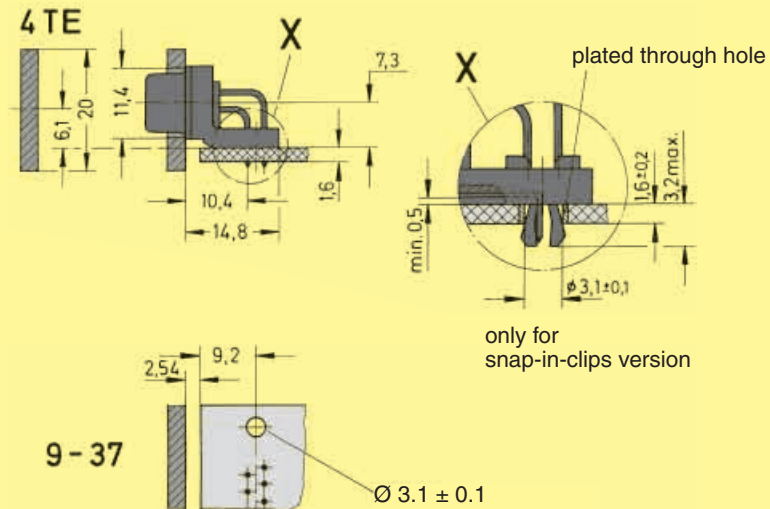
Drawing

Dimensions in mm

Standard Versions

Mounting height 7.3 mm

9-37 way
for front panel
4 units of width (TE)

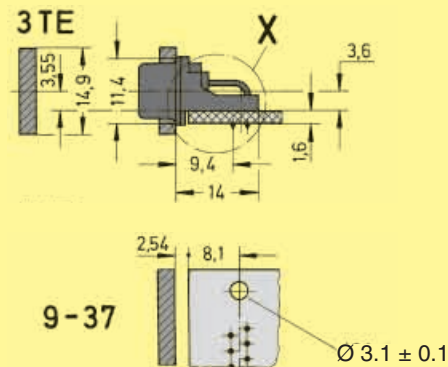


for connectors see pages 22.14 – 22.15

Low-Profile Versions

Mounting height 3.6 mm

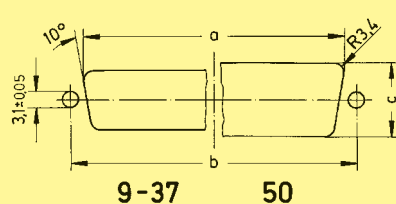
9-37 way
for front panel
3 units of width (TE)



for connectors see pages 22.16 – 22.17

**Panel cut out
for front/rear mount**

Values are taken from the
CECC 75301-802



Front mount

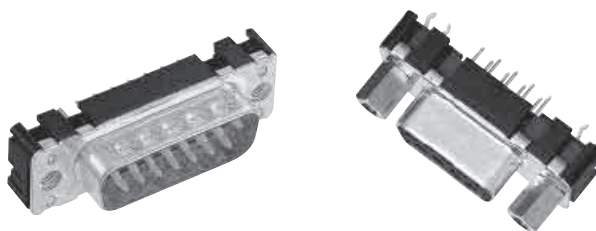
	$a_{\pm 0.2}$	$b_{\pm 0.13}$	$c_{\pm 0.2}$
9	22.2	25.0	12.3
15	30.5	33.3	12.3
25	44.3	47.0	12.3
37	60.7	63.5	12.3
50	58.3	61.1	15.1

Rear mount

	$a_{\pm 0.2}$	$b_{\pm 0.13}$	$c_{\pm 0.2}$
9	20.5	25.0	11.4
15	28.8	33.3	11.4
25	42.5	47.0	11.4
37	59.1	63.5	11.4
50	56.3	61.1	14.1

Number of contacts

9–37

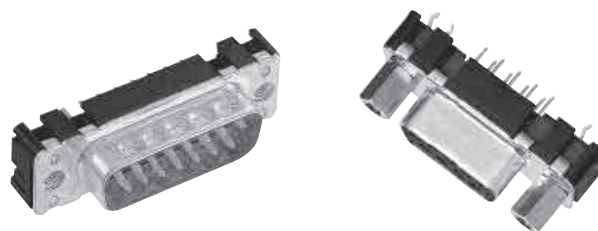


SMC stamped solder pins, straight with/without grounding board locks

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 22.10 Other performance levels on request		Performance level 3	Performance level 2
Male connector metal shell with dimples			
Without grounding board locks	9 15 25 37	09 65 129 770 09 65 229 770 09 65 329 770 09 65 429 770	09 65 129 670 09 65 229 670 09 65 329 670 09 65 429 670
With grounding board locks	9 15 25 37	09 65 169 771 09 65 269 771 09 65 369 771 09 65 469 771	09 65 169 671 09 65 269 671 09 65 369 671 09 65 469 671
Female connector metal shell			
Without grounding board locks	9 15 25 37	09 66 115 750 09 66 215 750 09 66 315 750 09 66 415 750	09 66 115 650 09 66 215 650 09 66 315 650 09 66 415 650
With grounding board locks	9 15 25 37	09 66 155 751 09 66 255 751 09 66 355 751 09 66 455 751	09 66 155 651 09 66 255 651 09 66 355 651 09 66 455 651
Please insert digit for flange thread or fitted female screw locks			
M3 ▶ 1 4-40 UNC ▶ 2 fitted screw locks 4-40 UNC ▶ 3 ¹⁾			

Number of contacts

9–37



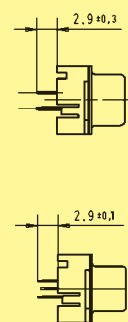
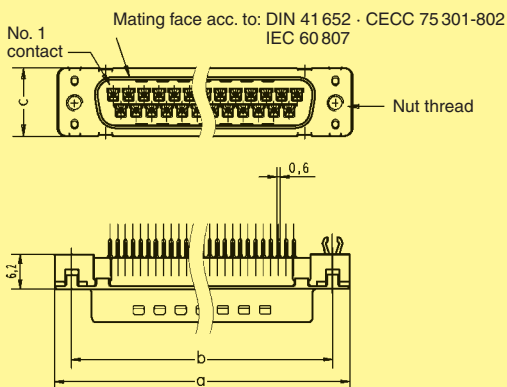
SMC stamped solder pins, straight with/without grounding board locks

Identification

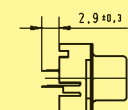
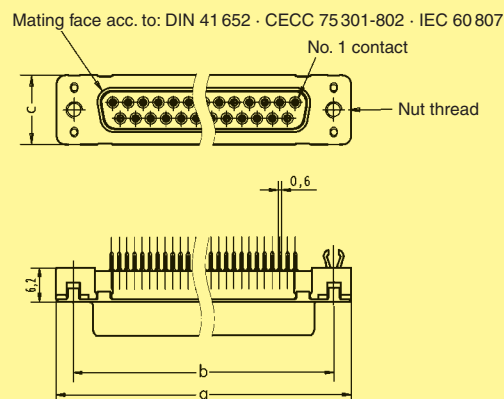
Drawing

Dimensions in mm

Male connector

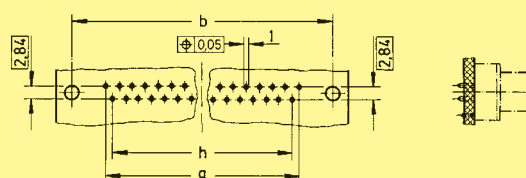


Female connector



	a	b _{±0,1}	c	g		h	
9	30.9	25.0	12.5	4 x	2.74 = 10.96	3 x	2.74 = 8.22
15	39.2	33.3	12.5	7 x	2.74 = 19.18	6 x	2.74 = 16.44
25	53.1	47.0	12.5	12 x	2.76 = 33.12	11 x	2.76 = 30.36
37	69.4	63.5	12.5	18 x	2.76 = 49.68	17 x	2.76 = 46.92

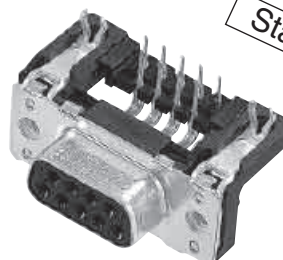
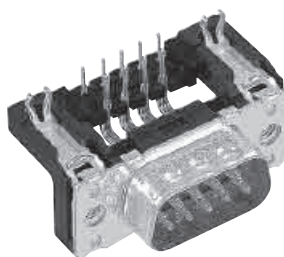
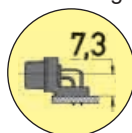
Board drillings



Number of contacts

9–37

Mounting height



Standard Versions

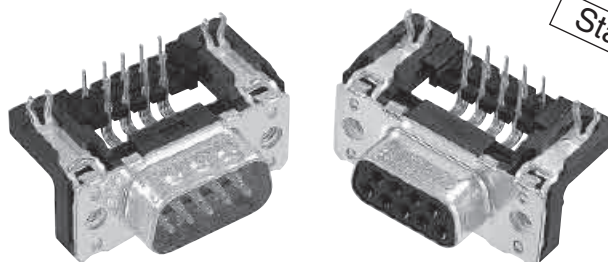
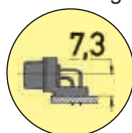
SMC stamped solder pins, angled with grounding board locks

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 22.10 Other performance levels on request		Performance level 3	Performance level 2
Male connector metal shell with dimples		2.84 mm pitch	2.84 mm pitch
	9	09 65 167 781 . 1)	09 65 167 681 . 1)
	15	09 65 267 781 . 1)	09 65 267 681 . 1)
	25	09 65 367 781 . 1)	09 65 367 681 . 1)
	37	09 65 467 781 . 1)	09 65 467 681 . 1)
		2.54 mm pitch	2.54 mm pitch
	9	09 65 166 781 .	09 65 166 681 .
	15	09 65 266 781 .	09 65 266 681 .
	25	09 65 366 781 .	09 65 366 681 .
	37	09 65 466 781 .	09 65 466 681 .
Female connector metal shell		2.84 mm pitch	2.84 mm pitch
	9	09 66 157 761 . 1)	09 66 157 661 . 1)
	15	09 66 257 761 . 1)	09 66 257 661 . 1)
	25	09 66 357 761 . 1)	09 66 357 661 . 1)
	37	09 66 457 761 . 1)	09 66 457 661 . 1)
		2.54 mm pitch	2.54 mm pitch
	9	09 66 156 761 .	09 66 156 661 .
	15	09 66 256 761 .	09 66 256 661 .
	25	09 66 356 761 .	09 66 356 661 .
	37	09 66 456 761 .	09 66 456 661 .
Please insert digit for flange thread or fitted female screw locks Ø 3.1 mm hole ▶ 0 ¹⁾ M3 ▶ 1 4-40 UNC ▶ 2 fitted screw locks 4-40 UNC ▶ 3			

Number of contacts

Mounting height

9–37



Standard Versions

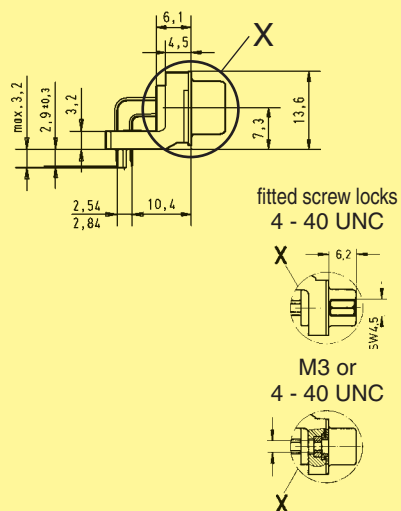
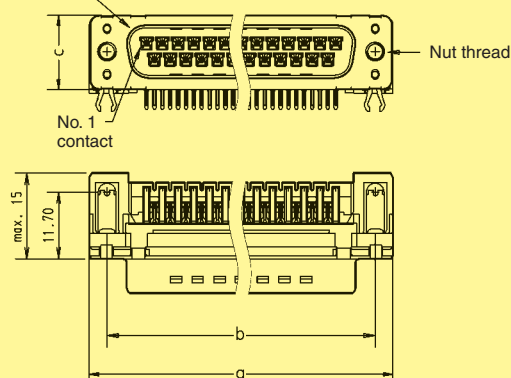
SMC stamped solder pins, angled with grounding board locks

Identification

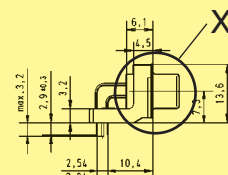
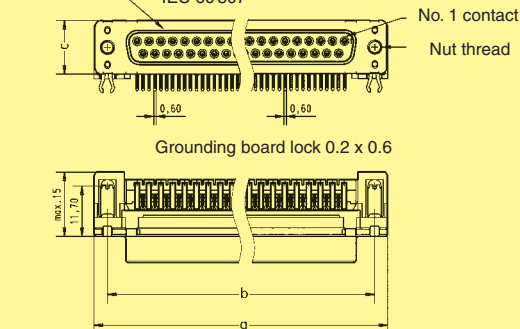
Drawing

Dimensions in mm

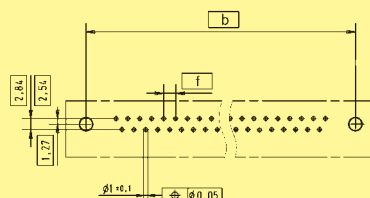
Male connector

Mating face acc. to: DIN 41 652 · CECC 75 301-802
IEC 60 807


Female connector

Mating face acc. to: DIN 41 652 · CECC 75 301-802
IEC 60 807


Board drillings

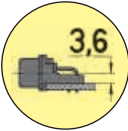


	a	b ± 0.1	c	f
9	30.90	25.00	12.50	2.74
15	39.20	33.30	12.50	2.74
25	53.10	47.00	12.50	2.76
37	69.40	63.50	12.50	2.76

Number of contacts

9–37

Mounting height



Low-Profile Versions

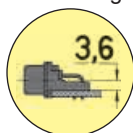
SMC stamped solder pins, angled with grounding board locks

Identification	No. of contacts	Part No.	
Performance levels Explanations see page 22.10 Other contact surfaces on request		Performance level 3	Performance level 2
Male connector metal shell with dimples	9 15 25 37	09 65 166 781 . 09 65 266 781 . 09 65 366 781 . 09 65 466 781 .	09 65 166 681 . 09 65 266 681 . 09 65 366 681 . 09 65 466 681 .
Female connector metal shell	9 15 25 37	09 66 156 761 . 09 66 256 761 . 09 66 356 761 . 09 66 456 761 .	09 66 156 661 . 09 66 256 661 . 09 66 356 661 . 09 66 456 661 .
Please insert digit for flange thread or fitted female screw locks			
M3 ▶	5		
4-40 UNC ▶	6		
fitted screw locks 4-40 UNC ▶	7		

Number of contacts

Mounting height

9–37



Low-Profile Versions

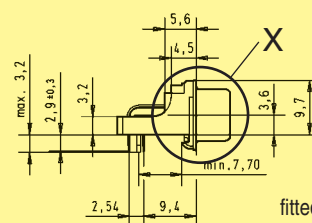
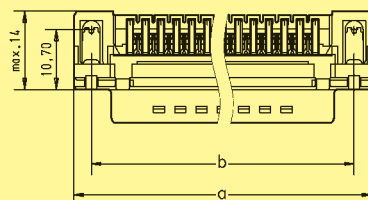
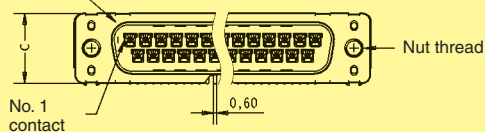
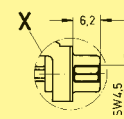
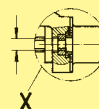
SMC stamped solder pins, angled with grounding board locks

Identification

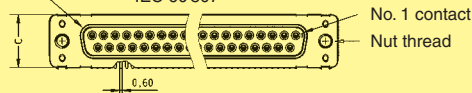
Drawing

Dimensions in mm

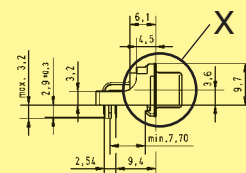
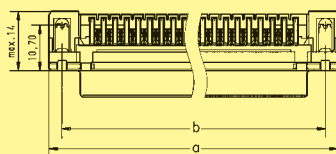
Male connector

Mating face acc. to: DIN 41 652 · CECC 75 301-802
IEC 60 807

fitted screw locks
4 - 40 UNC

M3 or
4 - 40 UNC


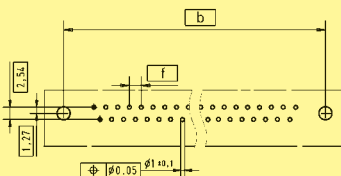
Female connector

Mating face acc. to: DIN 41 652 · CECC 75 301-802
IEC 60 807


Grounding board lock 0.2 x 0.6



Board drillings



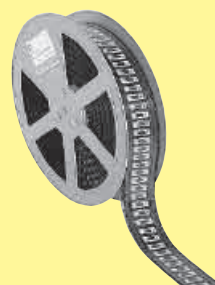
	a	b ± 0.1	c	f
9	30.90	25.00	12.50	2.74
15	39.20	33.30	12.50	2.74
25	53.10	47.00	12.50	2.76
37	69.40	63.50	12.50	2.76

Number of contacts	6, 10, 14, 16, 20, 26, 30*, 34, 40, 50, 60, 64
Contact arrangement	straight, angled
Contact length	2.9 mm
Approvals	IEC 60 603-13 DIN EN 60 603-13 D 2632 BT 224 NFC 93-428 (HE 10) comply with MIL DTL 83503
Pitch	2.54 mm [0.100"]
Working current	1 A
Working voltage	500 V for pollution degree 1
Test voltage $U_{r.m.s.}$	1 kV
Contact resistance	$\leq 20 \text{ m}\Omega$
Insulation resistance	$\geq 10^9 \Omega$
Temperature range	-55 °C ... + 125 °C during reflow soldering max. + 240 °C for 60 s The higher temperature limit includes the local ambient and heating effect of the contacts under load
Terminations	For pcb hole $\varnothing 1 \pm 0.1 \text{ mm}$ DIN IEC 52 141 Diagonal: 0.79 mm
Materials	
Moulding	Thermoplastic resin (PCT) UL 94-V0
Contact surface	
Contact zone	gold-plated according to performance level ¹⁾
Options on request	
Colour of connectors	black
For pick & place process	Tape & Reel packaging with/without vacuum cover Tube packaging with/without vacuum cover


New

Insertion and withdrawal forces

Number of contacts	Maximum force [N]	
	Performance level 1 and 2	Performance level 3
6	12	18
10	20	30
14	28	42
16	32	48
20	40	60
26	52	78
30	60	90
34	68	102
40	80	120
50	100	150
60	120	180
64	128	192



¹⁾ Performance level 3 as per IEC 60 603-13, ≥ 50 mating cycles, no gas test
Performance level 2 as per IEC 60 603-13, ≥ 250 mating cycles, 4 days gas test
as per MIL DTL 83 503, $> 0.76 \mu\text{m Au}$ (30 μ inch), other performance levels on request

* on request

Number of contacts

6-64



SMC male header with angled solder pins

Identification	No. of contacts	Part No.					
		Without levers		With short levers		With long levers	
SMC male header with angled solder pins Length: 2.9 mm	6	09 19 506	└ 923	09 19 506	└ 913	09 19 506	└ 903
	10	09 19 510	└ 923	09 19 510	└ 913	09 19 510	└ 903
	14	09 19 514	└ 923	09 19 514	└ 913	09 19 514	└ 903
	16	09 19 516	└ 923	09 19 516	└ 913	09 19 516	└ 903
	20	09 19 520	└ 923	09 19 520	└ 913	09 19 520	└ 903
	26	09 19 526	└ 923	09 19 526	└ 913	09 19 526	└ 903
	34	09 19 534	└ 923	09 19 534	└ 913	09 19 534	└ 903
	40	09 19 540	└ 923	09 19 540	└ 913	09 19 540	└ 903
	50	09 19 550	└ 923	09 19 550	└ 913	09 19 550	└ 903
	60	09 19 560	└ 923	09 19 560	└ 913	09 19 560	└ 903
	64	09 19 564	└ 923	09 19 564	└ 913	09 19 564	└ 903

30 contacts and kinked version on request

* Not normally kept in stock
For accessories see page 22.30
For dimensions see page 22.21

For performance level 3 please specify digit 
For performance level 2 please specify digit 
> 0.76 µm Au (30 µinch) on request 









Number of contacts

6-64



SMC male header with angled solder pins

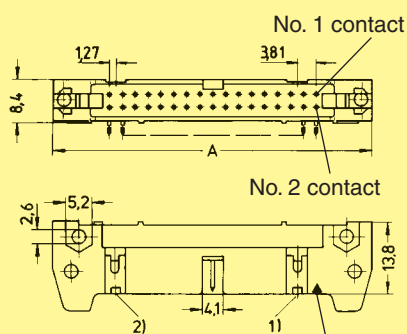
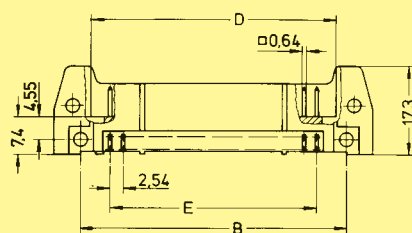
Identification

Drawing

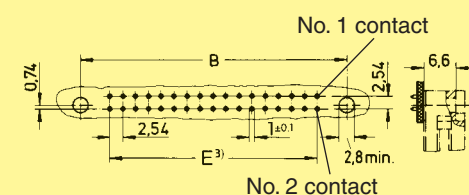
Dimensions in mm

SMC male header

No. of contacts	A	B	D	E	F	G
6	26.9	16.76	12.45	2.54 x 2 = 5.08	36.9	40.3
10	32.0	21.84	17.53	2.54 x 4 = 10.16	42.0	45.4
14	37.1	26.92	22.61	2.54 x 6 = 15.24	47.1	50.4
16	39.6	29.46	25.15	2.54 x 7 = 17.78	49.6	53.0
20	44.7	34.54	30.23	2.54 x 9 = 22.86	54.7	58.1
26	52.3	42.16	37.85	2.54 x 12 = 30.48	62.3	65.7
34	62.5	52.32	48.01	2.54 x 16 = 40.64	72.5	75.8
40	70.1	59.94	55.63	2.54 x 19 = 48.26	80.1	83.5
50	82.8	72.64	68.33	2.54 x 24 = 60.96	92.8	96.2
60	95.5	85.34	81.03	2.54 x 29 = 73.66	105.5	108.9
64	100.6	90.42	86.11	2.54 x 31 = 78.74	110.6	113.9

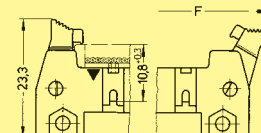


Marking No. 1 contact



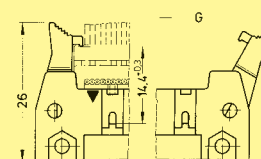
Short levers

for use with female connector without strain relief clamp



Long levers

for use with female connector with strain relief clamp



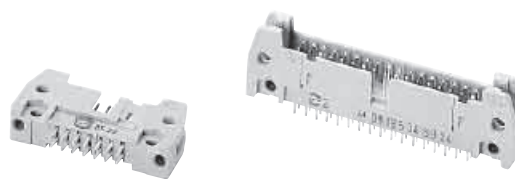
Board drillings

¹⁾ No polarization slot for 6, 10 or 14 way male header

²⁾ No polarization slot for 6 way male header

³⁾ Pitch tolerance: ± 0.1

6-64



Identification	No. of contacts	Part No.							
		Without levers		With short levers		With long levers			
SMC male header with straight solder pins Length: 2.9 mm	6	09 19 506	└ 924	09 19 506	└ 914	09 19 506	└ 904		
	10	09 19 510	└ 924	09 19 510	└ 914	09 19 510	└ 904		
	14	09 19 514	└ 924	09 19 514	└ 914	09 19 514	└ 904		
	16	09 19 516	└ 924	09 19 516	└ 914	09 19 516	└ 904		
	20	09 19 520	└ 924	09 19 520	└ 914	09 19 520	└ 904		
	26	09 19 526	└ 924	09 19 526	└ 914	09 19 526	└ 904		
	34	09 19 534	└ 924	09 19 534	└ 914	09 19 534	└ 904		
	40	09 19 540	└ 924	09 19 540	└ 914	09 19 540	└ 904		
	50	09 19 550	└ 924	09 19 550	└ 914	09 19 550	└ 904		
	60	09 19 560	└ 924	09 19 560	└ 914	09 19 560	└ 904		
	64	09 19 564	└ 924	09 19 564	└ 914	09 19 564	└ 904		
	30 contacts on request								

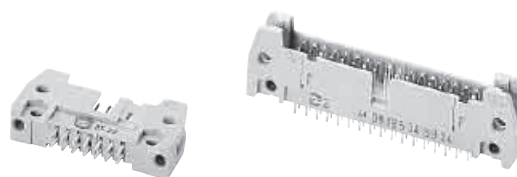
7
6
5

765

765

Number of contacts

6-64



SMC male header with straight solder pins

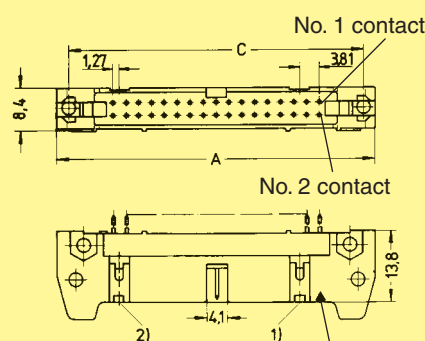
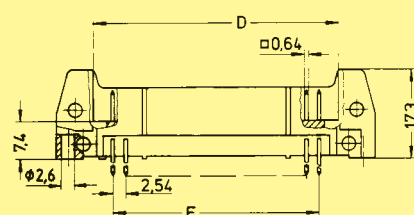
Identification

Drawing

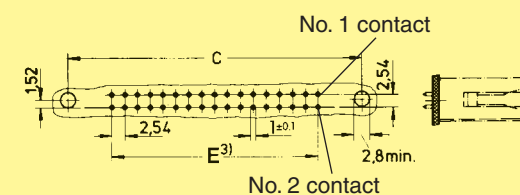
Dimensions in mm

SMC male header

No. of contacts	A	C	D	E	F	G
6	26.9	22.86	12.45	2.54 x 2 = 5.08	36.9	40.3
10	32.0	27.94	17.53	2.54 x 4 = 10.16	42.0	45.4
14	37.1	33.02	22.61	2.54 x 6 = 15.24	47.1	50.4
16	39.6	35.56	25.15	2.54 x 7 = 17.78	49.6	53.0
20	44.7	40.64	30.23	2.54 x 9 = 22.86	54.7	58.1
26	52.3	48.26	37.85	2.54 x 12 = 30.48	62.3	65.7
34	62.5	58.42	48.01	2.54 x 16 = 40.64	72.5	75.8
40	70.1	66.04	55.63	2.54 x 19 = 48.26	80.1	83.5
50	82.8	78.74	68.33	2.54 x 24 = 60.96	92.8	96.2
60	95.5	91.44	81.03	2.54 x 29 = 73.66	105.5	108.9
64	100.6	96.52	86.11	2.54 x 31 = 78.74	110.6	113.9

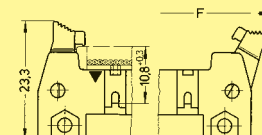


Marking No. 1 contact



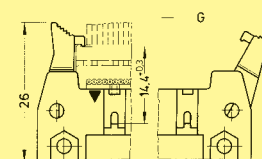
Short levers

for use with female connector without strain relief clamp



Long levers

for use with female connector with strain relief clamp



a) Solder pins for 1 ± 0.1 mm dia. hole

Board drillings

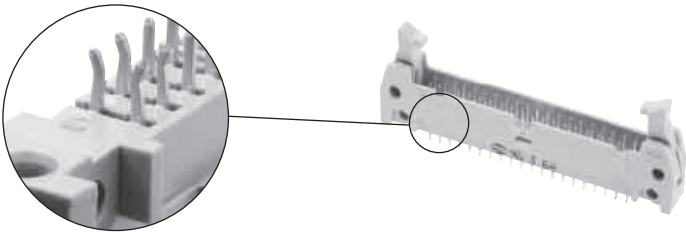
¹⁾ No polarization slot for 6, 10 or 14 way male header

²⁾ No polarization slot for 6 way male header

³⁾ Pitch tolerance: ± 0.1

Number of contacts

6-64



SMC male header with straight solder pins, kinked

Identification	No. of contacts	Part No.					
		Without levers		With short levers		With long levers	
SMC male header with straight solder pins, kinked Length: 2.9 mm	6	09 19 506	└ 024	09 19 506	└ 014	09 19 506	└ 004
	10	09 19 510	└ 024	09 19 510	└ 014	09 19 510	└ 004
	14	09 19 514	└ 024	09 19 514	└ 014	09 19 514	└ 004
	16	09 19 516	└ 024	09 19 516	└ 014	09 19 516	└ 004
	20	09 19 520	└ 024	09 19 520	└ 014	09 19 520	└ 004
	26	09 19 526	└ 024	09 19 526	└ 014	09 19 526	└ 004
	34	09 19 534	└ 024	09 19 534	└ 014	09 19 534	└ 004
	40	09 19 540	└ 024	09 19 540	└ 014	09 19 540	└ 004
	50	09 19 550	└ 024	09 19 550	└ 014	09 19 550	└ 004
	60	09 19 560	└ 024	09 19 560	└ 014	09 19 560	└ 004
	64	09 19 564	└ 024	09 19 564	└ 014	09 19 564	└ 004
30 contacts on request							

SMC technology

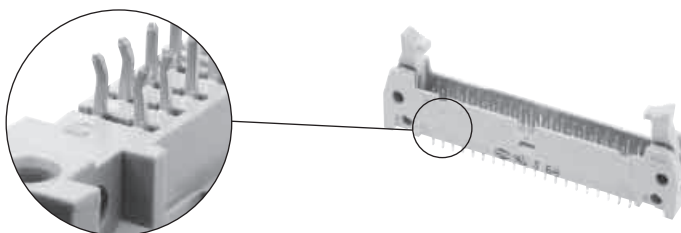
* Not normally kept in stock
For accessories see page 22.30
For dimensions see page 22.25

For performance level 3 please specify digit
For performance level 2 please specify digit
> 0.76 µm Au (30 µinch) on request



Number of contacts

6-64



SMC male header with straight solder pins, kinked

Identification

Drawing

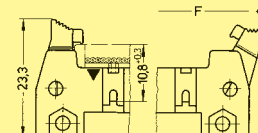
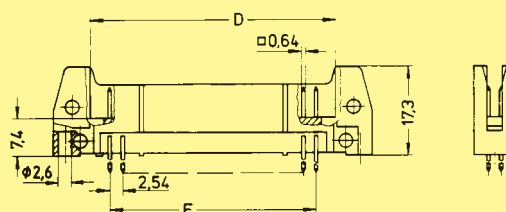
Dimensions in mm

SMC male header

No. of contacts	A	C	D	E	F	G
6	26.9	22.86	12.45	2.54 x 2 = 5.08	36.9	40.3
10	32.0	27.94	17.53	2.54 x 4 = 10.16	42.0	45.4
14	37.1	33.02	22.61	2.54 x 6 = 15.24	47.1	50.4
16	39.6	35.56	25.15	2.54 x 7 = 17.78	49.6	53.0
20	44.7	40.64	30.23	2.54 x 9 = 22.86	54.7	58.1
26	52.3	48.26	37.85	2.54 x 12 = 30.48	62.3	65.7
34	62.5	58.42	48.01	2.54 x 16 = 40.64	72.5	75.8
40	70.1	66.04	55.63	2.54 x 19 = 48.26	80.1	83.5
50	82.8	78.74	68.33	2.54 x 24 = 60.96	92.8	96.2
60	95.5	91.44	81.03	2.54 x 29 = 73.66	105.5	108.9
64	100.6	96.52	86.11	2.54 x 31 = 78.74	110.6	113.9

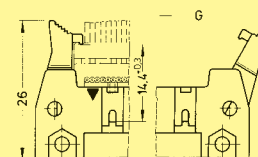
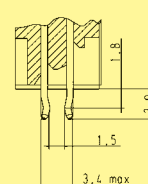
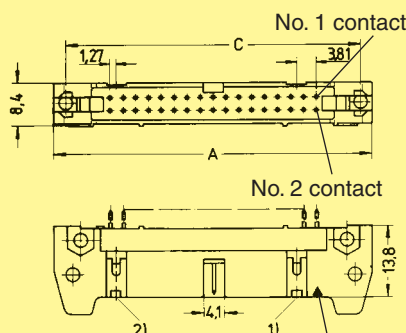
Short levers

for use with female connector without strain relief clamp



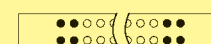
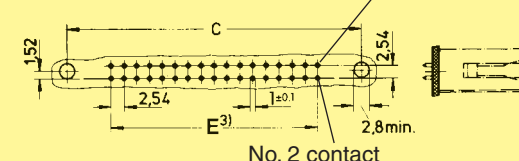
Long levers

for use with female connector with strain relief clamp



Marking No. 1 contact

No. 1 contact



Board drillings

● Kinked contact: pcb thickness from 1.50 to 1.94 mm after Cu + Sn plating with non-remelted through holes $\varnothing$ 0.80 to $\varnothing$ 0.95 mm. Max. insertion force = 125 N. Min. retention force = 6 N.

○ Non-kinked contact: Solder pins for pcb connections $\varnothing$ 1 ± 0.1 mm as per IEC 60603-13.

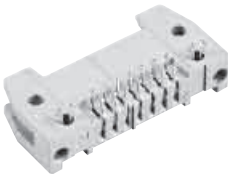
¹⁾ No polarization slot for 6, 10 or 14 way male header

²⁾ No polarization slot for 6 way male header

³⁾ Pitch tolerance: ± 0.1

Number of contacts

6-64



SMC male header with angled solder pins and board lock

Identification	No. of contacts	Part No.					
		Without levers		With short levers		With long levers	
SMC male header with angled solder pins and pcb board lock Length: 2.9 mm for 1.6 mm pcb thickness To hold the connector on the pcb before the soldering process, two board locks have been added on the male header with angled solder pins.	6	09 19 506	└ 973*	09 19 506	└ 963*	09 19 506	└ 953*
	10	09 19 510	└ 973*	09 19 510	└ 963*	09 19 510	└ 953*
	14	09 19 514	└ 973*	09 19 514	└ 963*	09 19 514	└ 953*
	16	09 19 516	└ 973*	09 19 516	└ 963*	09 19 516	└ 953*
	20	09 19 520	└ 973*	09 19 520	└ 963*	09 19 520	└ 953*
	26	09 19 526	└ 973*	09 19 526	└ 963*	09 19 526	└ 953*
	34	09 19 534	└ 973*	09 19 534	└ 963*	09 19 534	└ 953*
	40	09 19 540	└ 973*	09 19 540	└ 963*	09 19 540	└ 953*
	50	09 19 550	└ 973*	09 19 550	└ 963*	09 19 550	└ 953*
	60	09 19 560	└ 973*	09 19 560	└ 963*	09 19 560	└ 953*
	64	09 19 564	└ 973*	09 19 564	└ 963*	09 19 564	└ 953*

SMC technology

22-26

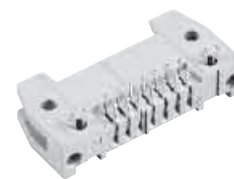
* Not normally kept in stock
30 contacts on request

For performance level 3 please specify digit
For performance level 2 please specify digit
> 0.76 µm Au (30 µinch) on request



Number of contacts

6-64



SMC male header with angled solder pins and board lock

Identification

Drawing

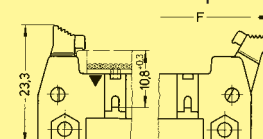
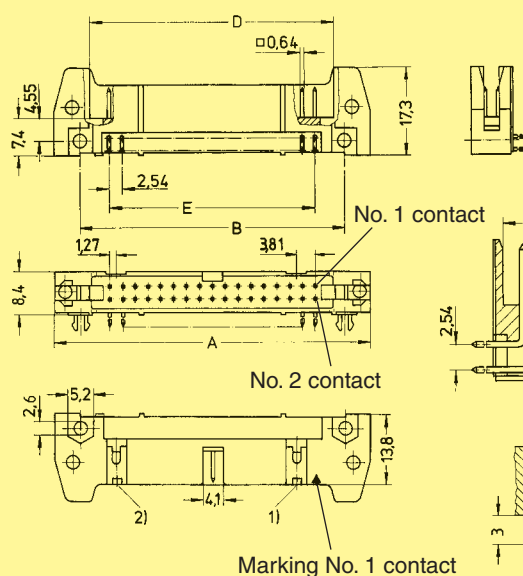
Dimensions in mm

SMC male header

No. of contacts	A	B	D	E	F	G
6	26.9	16.76	12.45	2.54 x 2 = 5.08	36.9	40.3
10	32.0	21.84	17.53	2.54 x 4 = 10.16	42.0	45.4
14	37.1	26.92	22.61	2.54 x 6 = 15.24	47.1	50.4
16	39.6	29.46	25.15	2.54 x 7 = 17.78	49.6	53.0
20	44.7	34.54	30.23	2.54 x 9 = 22.86	54.7	58.1
26	52.3	42.16	37.85	2.54 x 12 = 30.48	62.3	65.7
34	62.5	52.32	48.01	2.54 x 16 = 40.64	72.5	75.8
40	70.1	59.94	55.63	2.54 x 19 = 48.26	80.1	83.5
50	82.8	72.64	68.33	2.54 x 24 = 60.96	92.8	96.2
60	95.5	85.34	81.03	2.54 x 29 = 73.66	105.5	108.9
64	100.6	90.42	86.11	2.54 x 31 = 78.74	110.6	113.9

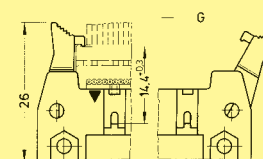
Short levers

for use with female connector without strain relief clamp

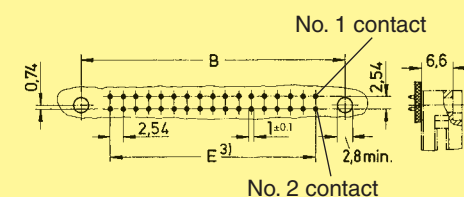


Long levers

for use with female connector with strain relief clamp



Board drillings



Number of contacts

6-64



Tape & Reel packaging
Available on request



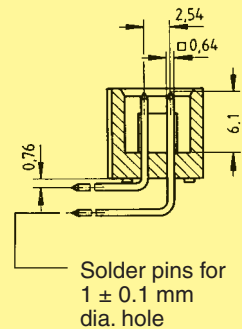
SMC low-profile male header, angled solder pins

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
----------------	-----------------	----------	---------	------------------

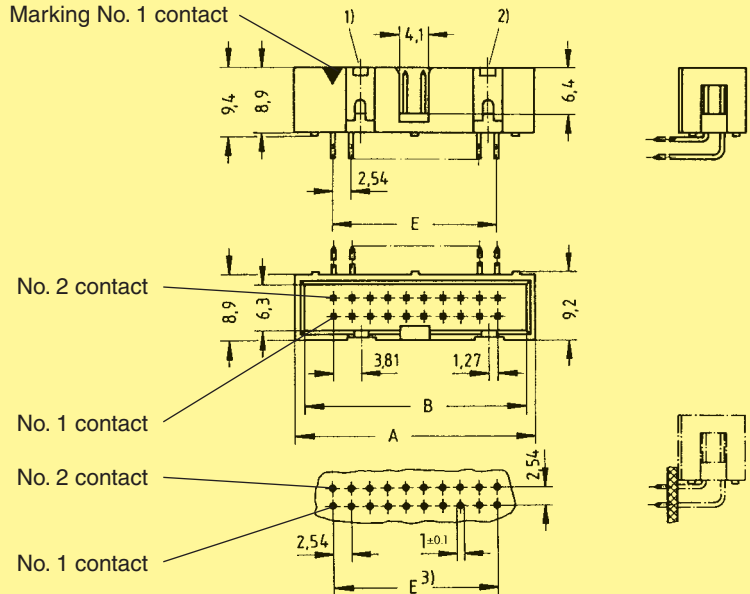
SMC male header with angled solder pins
Length: 2.9 mm

6	09 19 506	323
10	09 19 510	323
14	09 19 514	323
16	09 19 516	323
20	09 19 520	323
26	09 19 526	323
34	09 19 534	323
40	09 19 540	323
50	09 19 550	323
60	09 19 560	323
64	09 19 564	323

No. of contacts	A	B	E
6	15.2	12.78	2.54 x 2 = 5.08
10	20.3	17.86	2.54 x 4 = 10.16
14	25.4	22.94	2.54 x 6 = 15.24
16	27.9	25.48	2.54 x 7 = 17.78
20	33.0	30.56	2.54 x 9 = 22.86
26	40.6	38.18	2.54 x 12 = 30.48
34	50.8	48.34	2.54 x 16 = 40.64
40	58.4	55.96	2.54 x 19 = 48.26
50	71.3	68.66	2.54 x 24 = 60.96
60	84.0	81.36	2.54 x 29 = 73.66
64	89.1	86.44	2.54 x 31 = 78.74



Marking No. 1 contact



For performance level 3 please specify digit 7
For performance level 2 please specify digit 6
> 0.76 µm Au (30 µinch) on request

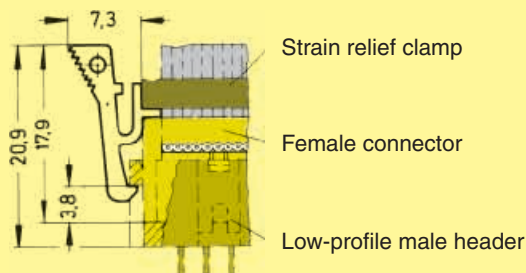


Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
----------------	-----------------	----------	---------	------------------

Locking lever for female connector with strain relief in conjunction with low-profile male header

When the security of latching is required and space is a premium, these locking levers can be fitted onto the strain relief of the HARTING female connector.

09 18 000 9905⁴⁾



* Not normally kept in stock

¹⁾ No polarization slot for 6, 10 or 14 way male header
²⁾ No polarization slot for 6 way male header

³⁾ Pitch tolerance: ± 0.1
⁴⁾ Order 2 per female connector

Number of contacts

6-64


Tape & Reel packaging
Available on request

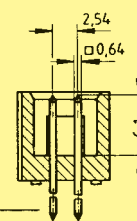
SMC low-profile male header, straight solder pins

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
----------------	-----------------	----------	---------	------------------

SMC male header with straight solder pins
Length: 2.9 mm

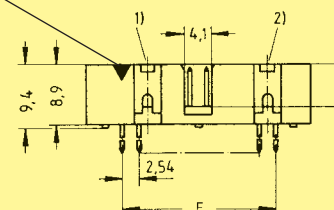
6	09 19 506	324
10	09 19 510	324
14	09 19 514	324
16	09 19 516	324
20	09 19 520	324
26	09 19 526	324
34	09 19 534	324
40	09 19 540	324
50	09 19 550	324
60	09 19 560	324
64	09 19 564	324

No. of contacts	A	B	E
6	15.2	12.78	2.54 x 2 = 5.08
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26	40.6	38.18	2.54 x 12 = 30.48
34	50.8	48.34	2.54 x 16 = 40.64
40	58.4	55.96	2.54 x 19 = 48.26
50	71.3	68.66	2.54 x 24 = 60.96
60	84.0	81.36	2.54 x 29 = 73.66
64	89.1	86.44	2.54 x 31 = 78.74

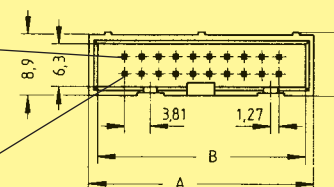


Solder pins for 1 ± 0.1 mm dia. hole

Marking No. 1 contact

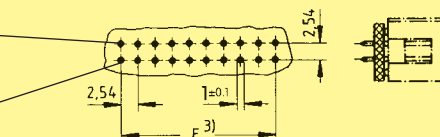


No. 2 contact



No. 1 contact

No. 2 contact



No. 1 contact

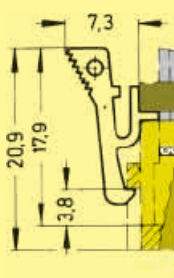
For performance level 3 please specify digit 7
For performance level 2 please specify digit 6
> 0.76 µm Au (30 µinch) on request



Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
----------------	-----------------	----------	---------	------------------

Locking lever for female connector with strain relief in conjunction with low-profile male header

When the security of latching is required and space is a premium, these locking levers can be fitted onto the strain relief of the HARTING female connector.

09 18 000 9905⁴⁾


Strain relief clamp

Female connector

Low-profile male header

* Not normally kept in stock

¹⁾ No polarization slot for 6, 10 or 14 way male header

²⁾ No polarization slot for 6 way male header

³⁾ Pitch tolerance: ± 0.1

⁴⁾ Order 2 per female connector

Accessories

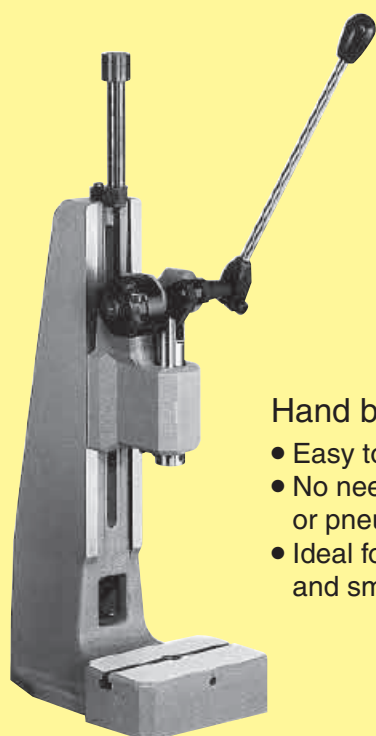
Identification	Part No.	Drawing	Dimensions in mm
Polarization key 1) Part No. comprises 2 keys	09 18 500 9902 ¹⁾		
Locking lever (snaps into place, can be fitted whenever required) 2) Order 2 per male header	Long: 09 19 000 9903 ²⁾ Short: 09 19 000 9904 ²⁾	Long Short For use with female connector <u>with</u> strain relief clamp For use with female connector <u>without</u> strain relief clamp	
Fixing screws for 1.6 mm P.C. board 3) Part No. comprises 50 pieces	09 18 000 9906 ³⁾		
Coding system with loss of contact 4) Part No. comprises 6 code pins	Code pin 09 18 000 9901 ⁴⁾ Removal tool for male contacts 09 99 000 0133	To avoid cross-plugging adjacent connectors a coding system is required. A code pin is inserted into the appropriate cavity in the female connector. The corresponding male contact is removed by a special removal tool.	

Tooling for press-in technology

Page

General information	30.02
Tooling compatible for complete interface connectors range	30.03
<i>Specific tooling</i>	
<i>harmik®</i>	30.10
<i>D-Sub – S</i>	30.10
<i>SEK</i>	30.11

HARTING modular tooling adapted to customer specific needs

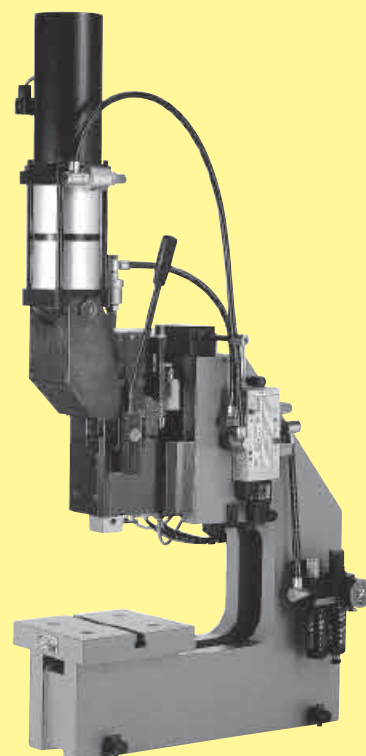


Hand bench press

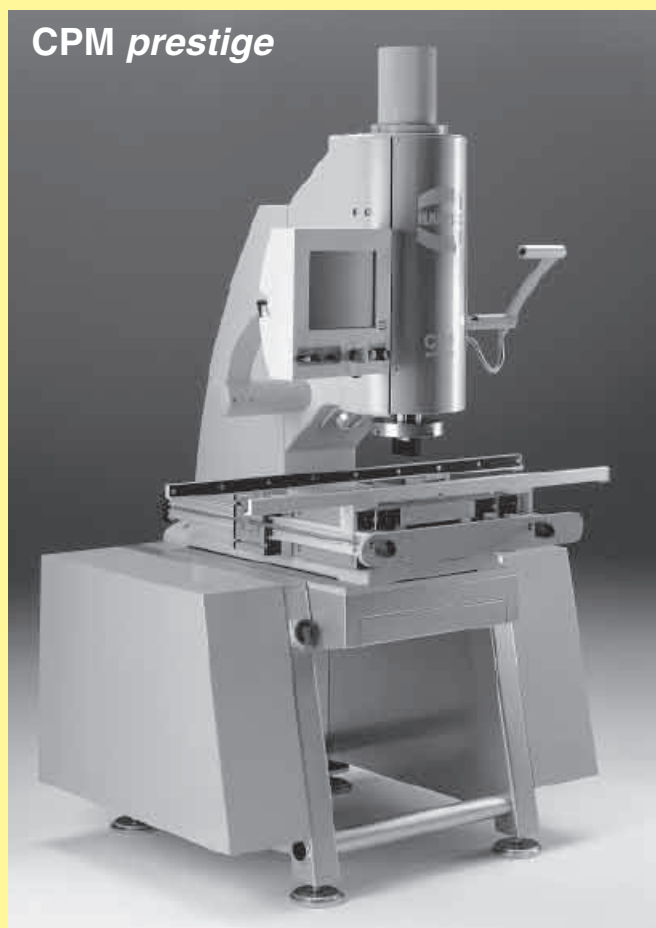
- Easy to install
- No need of electrical or pneumatic power
- Ideal for prototyping and small series

Pneumatic press

- Easy handling
- Limitation of press-in force adjustable
- Ideal for medium series

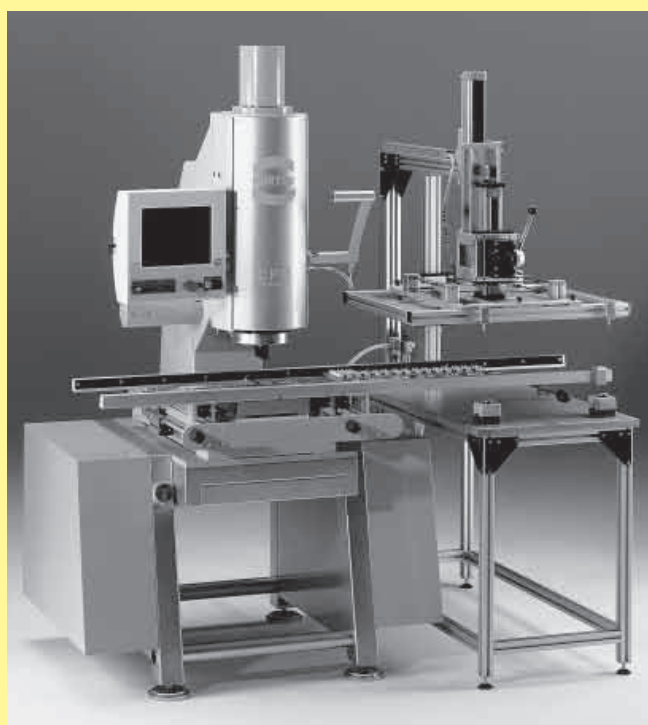


CPM *prestige*



The state of the art CPM press-in machine

- Fully programmable press-in machine
- Ideal for volume series



Bestseller **CPM *prestige*** with insertion removal station, adaptable to all HARTING press-in machines

Tooling compatible for complete interface connectors range

The **CPM prestige** press-in machine with a graphical user interface

The **CPM prestige** is a consequential development of the successful CPM 2001 press-in machines. The excellent design, supported by a wide range of tools presents a convenient, easy and comfortable way of processing backplanes and daughtercards. The machine is fully programmable and is supplied with a graphical user interface for control and visualisation of the complete process. The use of a microprocessor control allows the recognition and storage of different component heights, so that the pressing-in of different components is initiated simultaneously with only one button. The user-friendly touch-screen guides the user through the menu-orientated process controls.

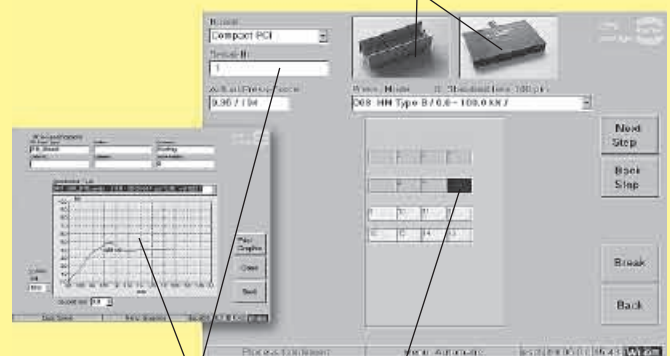
The visualisation of the entire press-in process (the position of the connector, press-in forces etc.) allows the rapid recognition and eradication of the possible error sources. With the addition of a barcode reader (1D and 2D)¹⁾ the parameters of every pcb layout can be stored, recalled and loaded into the automated press-in programme. The extensive operation monitor functions simplify the service and support of the machine.

The machine employs the automatic switch-off system "autosense", known worldwide for its reliability. The different connector types and the tolerances of the pcb are automatically recognised and taken into consideration at the press-in operation, thus maximising the process security.



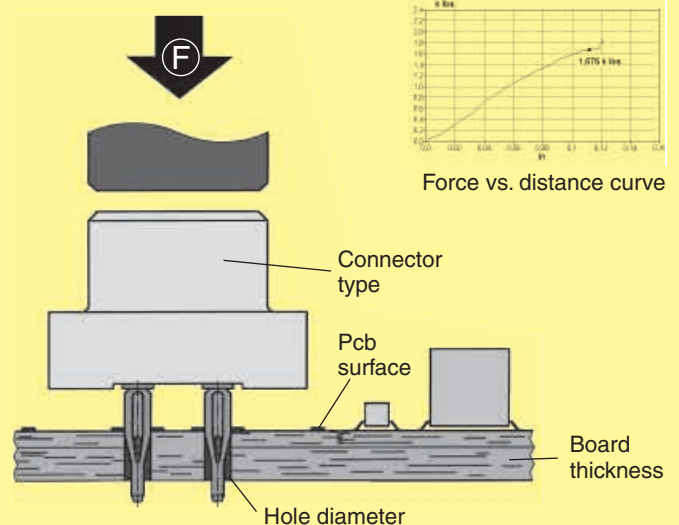
Visual guiding system via touch monitor

Real photos of connectors and tools



Process data

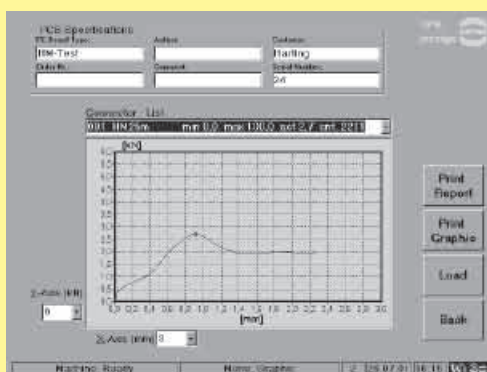
Layout with current position highlighted



Shown are the four most considerable influences of the press-in process.

¹⁾ optional

Tooling compatible for complete interface connectors range



Quality control of press-in termination

The press-in force correlates with the diameter of the plated through hole and with the friction coefficient of the surface; therefore it can be used for a continuous monitoring of the process.

The retention force, as an indirect measure of the normal force, serves to qualify the process or random tests.



Part No. 09 89 040 0000

Technical characteristics

Drive	electro-mechanical, servo
Press-in force	100 kN
max. pcb dimensions	600 x 1000 mm
Floor space	1200 x 1150 mm
Weight	980 kg
Power supply	208 / 380 / 400 / 415 V
Consumption	< 1 kW
Colour	on request

CPM prestige
(incl. PC, control software, barcode reader, keyboard, touch screen)

Built-in features:

- Guiding rails (carbon/spring-loaded) for the secure positioning of the pcb
- Touch-screen and Industrial PC with UPS (uninterruptable power supply)
- Barcode reader for management ease of press-in programs
- All dimensions allow an easy integration into production lines

Process monitoring and quality assurance:

- Touch screen interface with graphical and verbal menus for all machine functions
- Autosense: automated press-in interruption at incorrect press-in forces
- Storage and validation of all press-in parameters via quality assurance software (press-in force tolerances)
- Continuous high-precision measurement and recording of press-in forces and distances
- Remote determination of errors and maintenance
- High flexibility through a modular tool range

Options:

- Rotatable tool changer
- Insertion removal station

Tooling compatible for complete interface connectors range

Insertion removal station

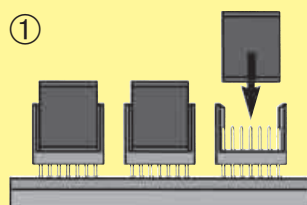


Power supply 220 V / 50 Hz
Air pressure 6 bar (15-16 l/min.)

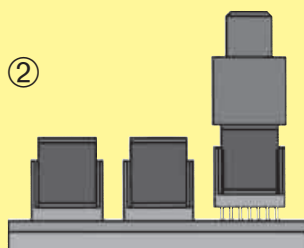
Part No. 09 89 040 3000
for pcb dimensions
of max.
710 mm x 540 mm

Bestseller **CPM prestige** with insertion removal station, adaptable to all HARTING press-in machines.

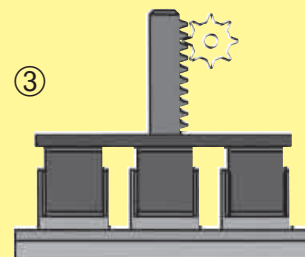
Principle:



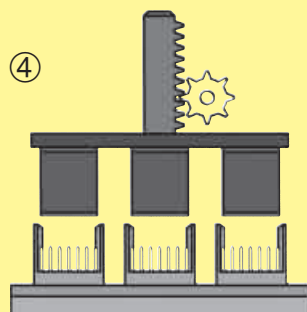
① Load all headers with inserts for **one press-in cycle**



② Press-in all connectors with a flat die



③ Position the magnetic plate

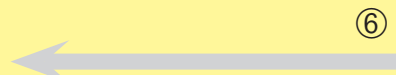


④ Remove all press-in inserts in one operation

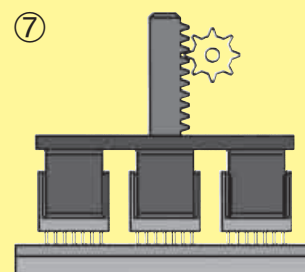
Remove the processed pcb from the machine



⑤



⑥ Move the next pre-assembled pcb to the press-in machine

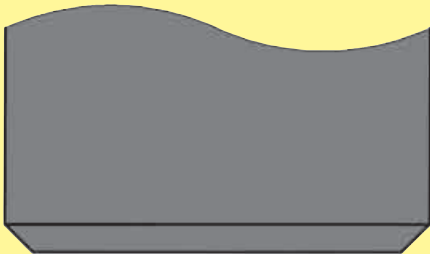


⑦ Load all headers in one operation

The insertion removal station has been developed both for the **CPM prestige** and the CPM 2001/s. It can additionally be used as stand alone equipment.

Tooling compatible for complete interface connectors range

Today nearly all female connectors are designed for flat rock tooling. For every type of male connector specific tooling and a high degree of X-Y-process accuracy is required. Therefore HARTING offers press-in insert blocks that transfer all well known assembling advantages from female connectors to male headers.

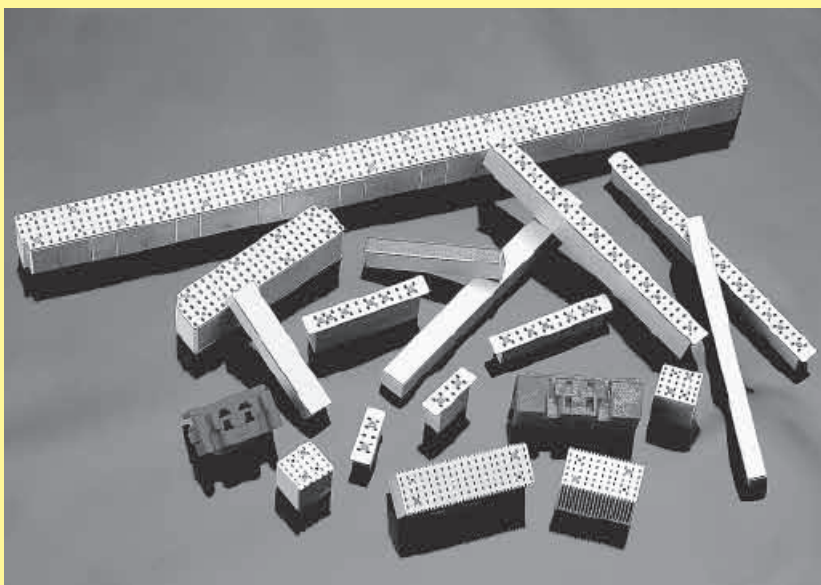
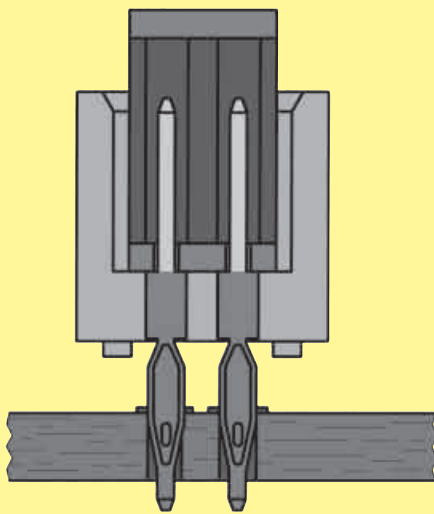


Advantages of press inserts

Robust tooling

No lateral force to pcb hole

No abrasion of the contact mating surface by the press tool



HARTING has already developed press-in inserts for all major male connector families on 2.54 mm, 2.5 mm and 2 mm pitches.

Inserts for any other special components can be developed on request.

The additional process for inserting and removing the press-in inserts can be efficiently done with the insertion removal station. This station removes all press-in inserts with a magnetic plate in one operation and inserts them into the next pre-assembled pcb with the necessary precision. (Principle see page 30.05).

The cycle time for loading all headers is between 4 and 6 seconds, independent from the amount of press-in inserts.

To load the inserts automatically means also that connectors assembled in a wrong way will be recognised and errors consequently prevented.

Tooling compatible for complete interface connectors range

Modular tooling system for starting connector press-in

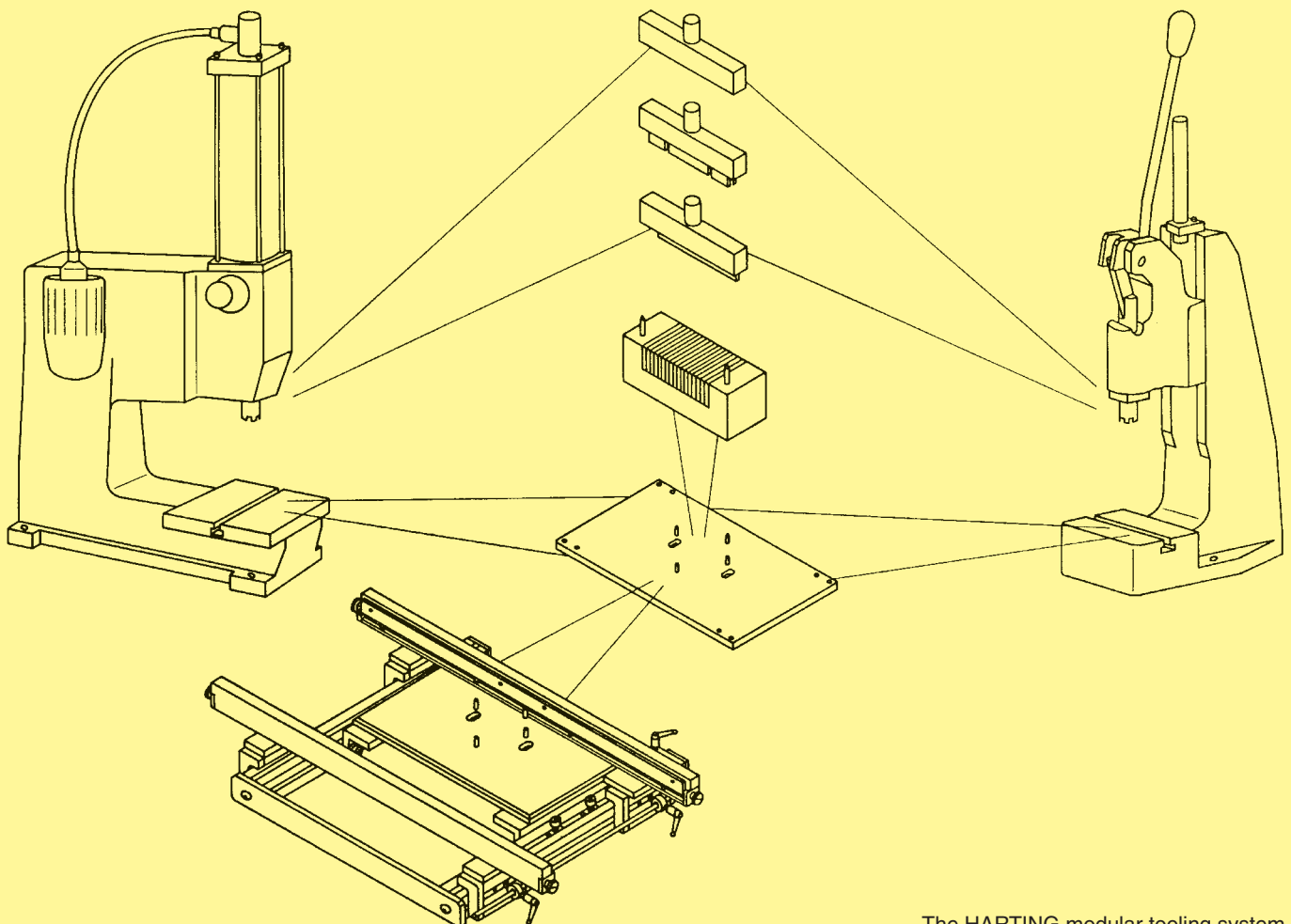
The diversity of connector types with press-in terminations and varying termination styles make it necessary to have a simple, flexible tooling system that can be continuously updated.

The HARTING modular tooling system has significant advantages in terms of economic assembly of the many connector types with press-in terminations. The basic modules of the tooling system which will always be required are:

- Press
- Top tool
- Bottom tool
- Base plate

To increase automation and productivity the following modules may be added to the basic assembly:

- Guide frame with base plate for accurate positioning of the pcb up to a length of 600 mm
- Guide frame "Standard" for hand bench press and pneumatic press and pcb height of 123.5 up to 309.5 mm
- Guide frame "Long" for pneumatic press and pcb height of 123.5 up to 668.5 mm



Tooling compatible for complete interface connectors range

Handling indications

When setting up an assembly machine it is not necessary to set the working height of the press and adjust the base plate more than once. There is no need for further adjustments. All the other adaptations for various applications are performed efficiently and are reliant by various combinations of individual modules.

Positioning the bottom tool in relation to the top tool

The ram of the HARTING press is generally provided with a cross-shaped groove which accurately positions the top tool in steps of 90°.

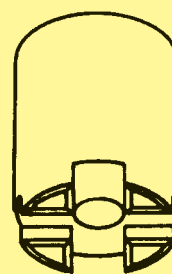
Two guide pins position the bottom tool in relation to the top tool simply and accurately.

These guide pins cannot be used for positioning the pcb or the connector!

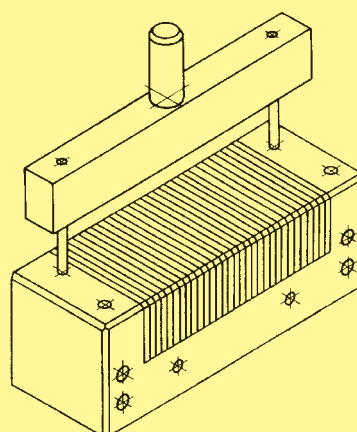
Two pairs of pins on the base plate locate the bottom tool in relation to the top tool in steps of 90°.

Bottom tool (narrow version)

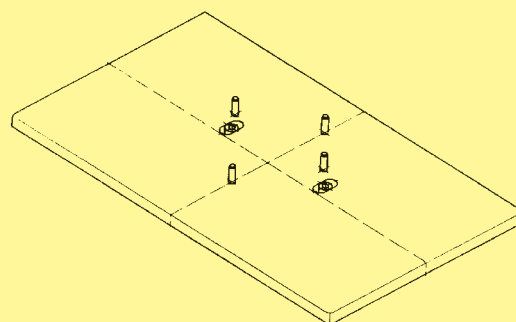
In addition to the square bottom tool with multi-functional properties, HARTING offers the alternative of a narrow bottom tool for assembling connectors with straight press-in terminations. This tool supports the pcb within the press-in connector zone and therefore makes it possible to assemble connectors where electronic components are to be placed in close proximity.



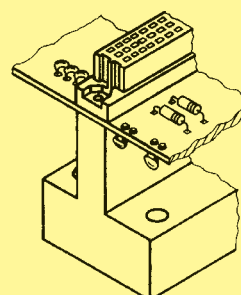
Ram with cross-shaped groove



Positioning the bottom tool in relation to top tool



Base plate with pairs of location pins at 90°



Narrow version of the bottom tool for special applications

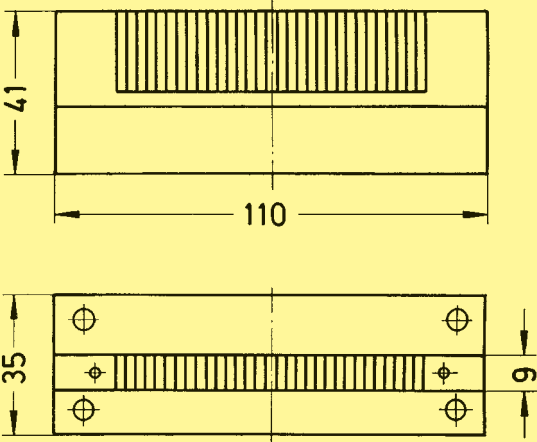
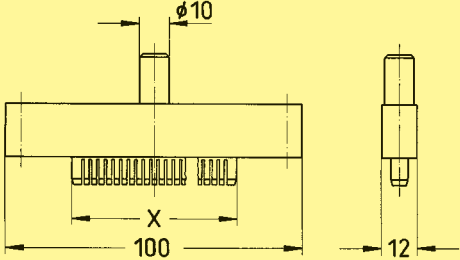
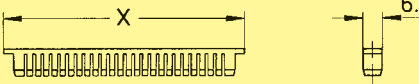
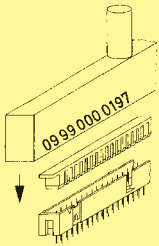
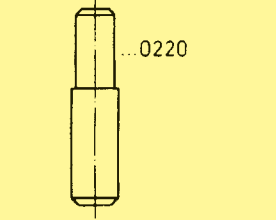
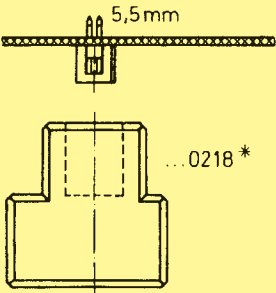
Specific tooling for har-mik and D-Sub

Identification	Part No.	
Bottom tool for har-mik	60 99 000 0031	
Press-out tool for har-mik	60 99 000 0032	
Bottom tool narrow for D-Sub Only one tool for all polarities, with or without grounding pins	9-37 way 09 99 000 0600 50 way 09 99 000 0523	 Bottom tool
Plastic with metal plate insert tool for D-Sub male	9 way 09 99 600 0709 15 way 09 99 600 0715 25 way 09 99 600 0725	
Other toolings on request		

Specific tooling for SEK male standard

Identification	Part No.	Drawing	Dimensions in mm
Top tool for SEK standard connectors			
10 way	09 99 000 0710		
14 way	09 99 000 0714		
16 way	09 99 000 0716		
20 way	09 99 000 0720		
26 way	09 99 000 0726		
34 way	09 99 000 0734		
40 way	09 99 000 0740		
50 way	09 99 000 0750		
60 way	09 99 000 0760		
64 way	09 99 000 0764		

Specific tooling for SEK male low-profile

Identification	Part No.	Drawing	Dimensions in mm
Bottom tool narrow for SEK	09 99 000 0256		
Top tool for SEK male low-profile connectors	6 way09 99 000 006 10 way09 99 000 010 14 way09 99 000 014 16 way09 99 000 016 20 way09 99 000 020 26 way09 99 000 026 34 way09 99 000 034 40 way09 99 000 040 50 way09 99 000 050 60 way09 99 000 060 64 way09 99 000 064	Top tool including insert  X Length depends on number of contacts Modular insert 	
Press-out tool for complete SEK male connectors with 5.5 mm terminations	09 99 000 0220		
Support block	09 99 000 0218		

* Further versions on request

Tooling for crimp technology

Page

General information **31.02**

Specific tooling

D-Sub – S **31.04**

D-Sub – HD **31.04**

D-Sub – M **31.08**

D-Sub – InduCom **31.11**

Crimp connection

A perfect crimp connection is gastight and therefore corrosion free. It is equivalent to a cold weld of the connected parts. For this reason, major features in achieving high quality crimp connections are the design of the crimping areas of the contact and of course the crimping tool itself. Wires to be connected must be carefully matched to the correct size of crimp contacts. If these basic requirements are met, users will be assured of highly reliable connections with a low contact resistance and a high resistance against corrosion.

The economical and technical advantages are:

- Constant contact resistance as a result of an unvariable crimp connection quality
- Corrosion free connections as a result of cold weld action
- Preparation of harnessing with crimp contacts already fitted
- More economic cable connection

Requirements for crimp connections are set out in DIN EN 60352-2.

Pull out force of stranded wire

An essential consideration for a good quality of crimp connection is the mechanical retention of the wire in the crimp contact. As set out in DIN EN 60352-2 the pull out force of the wire from the crimp must be at least 60 % (at 0.75 mm²) of the breaking force of the wire itself.

The adjacent diagram shows tensile strength plotted against wire cross sectional area. From this you can see the relationship between the breaking strength of wires and the force necessary to destroy HARTING crimp connections.

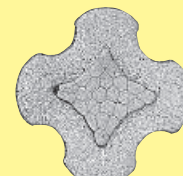
- ① Tensile strength of stranded wire
- ② Pull out force of wires from HARTING crimp contacts



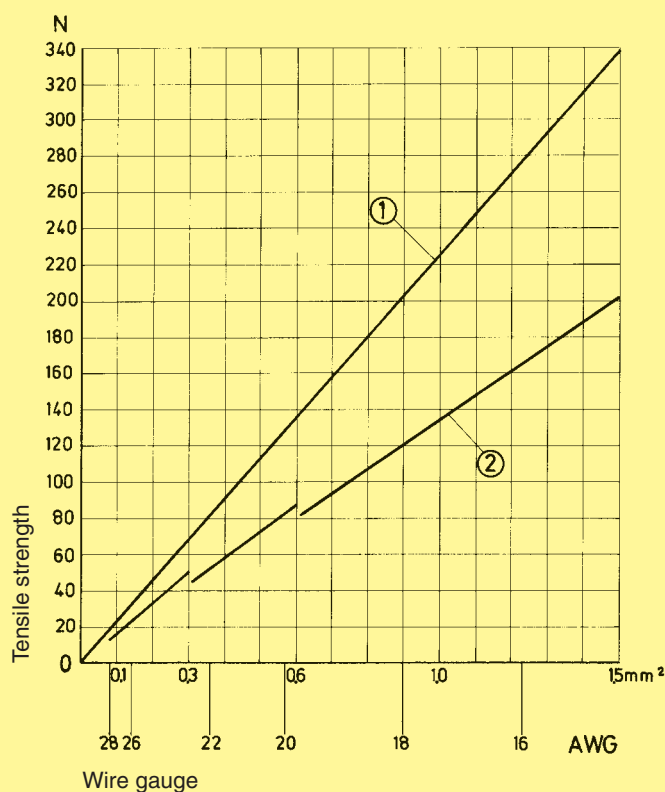
B shape cross section stamped contact



H shape cross section turned contact



4 points shape cross section turned contact



Crimping tools

Crimping tools (hand operated or automatic) are carefully designed to guarantee a symmetrical deformation of the crimping area of the contact and the wire through the high pressure forming parts of the tool. The locator automatically engages the crimp contact and the wire at the correct point in the tool. The wire insulation can also be included as a secondary feature of some crimp contacts to care for additional mechanical strength.

The ratchet in the tool performs 2 functions:

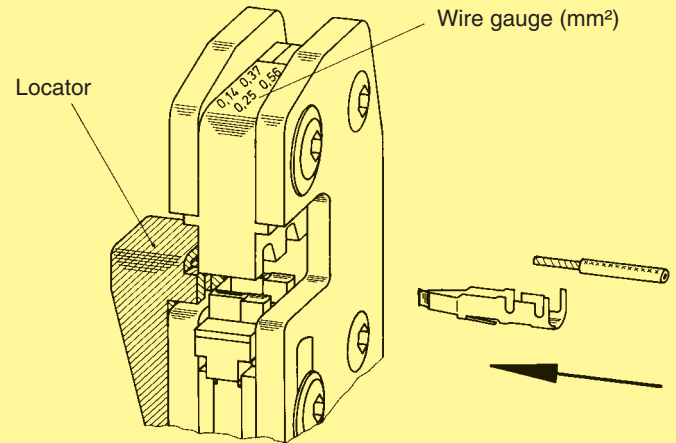
- ① It prevents insertion of the crimp into the tool for crimping before the jaws are fully open
- ② It prevents the tool from being opened before the crimping action is completed

A quality crimp connection can be achieved with this crimping system.

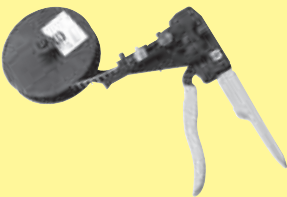
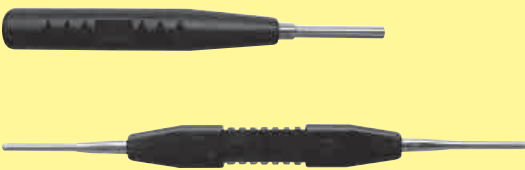
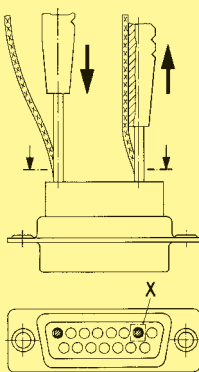
The adjacent sketches show important features of the HARTING hand crimping tool.

The HARTING automatic crimping tool uses bandoliered contacts.

The machine strips insulation from the wire and then crimps the contact. Both the crimping area and the insulation support are independently adjustable to facilitate the use of any wire type with dimensions within the stated crimp capacity.



Tools for crimp termination

Identification	Part No.	
Service crimp tool for single standard contacts for single high density contacts	09 99 000 0175 09 99 000 0596	
HARTING-Crimp tool for 500 bandoliered standard contacts for 500 bandoliered high density contacts	09 99 000 0169 09 99 000 0597	
HARTING-Semi-automatic crimping device Main drive foot-operated 220 V / 50 Hz Crimping head for bandoliered standard contacts Reel holder for 10 000 contacts	09 99 000 0246 09 99 000 0253 09 99 000 0158	 Wire gauge 0.09-0.56 mm ² (AWG 28-20) 
Insertion and removal tool for single standard contacts for single high density contacts	09 99 000 0171 09 99 000 0513	 

Assembly of crimp contacts

After crimping the stranded wire to the contact using a hand tool or automatic crimping device, insert the contact into the chamber with the tool, working from the wiring side. You will hear the contacts snap home and to check that they are securely in place, give the wire a gentle pull.

Removing crimp contacts

Position the tool from the wiring side as shown in the diagram below and insert into the contact chamber. The contact can then easily be removed from the wiring side together with the wire itself and reinserted in a different chamber. The tool is designed for a maximum insulation diameter of Ø 1.7 mm.



Stripping length: 2.5 + 0.5 mm

For all crimp tools: These tools are designed specifically for standard wires and not for solid wires.

Tools for crimp termination

Identification

Part No.

Drawing

Crimp tool

for turned male
and female contacts
AWG 28-18
8 indent crimp
in acc. to MIL 22 520/2-01

09 99 000 0501



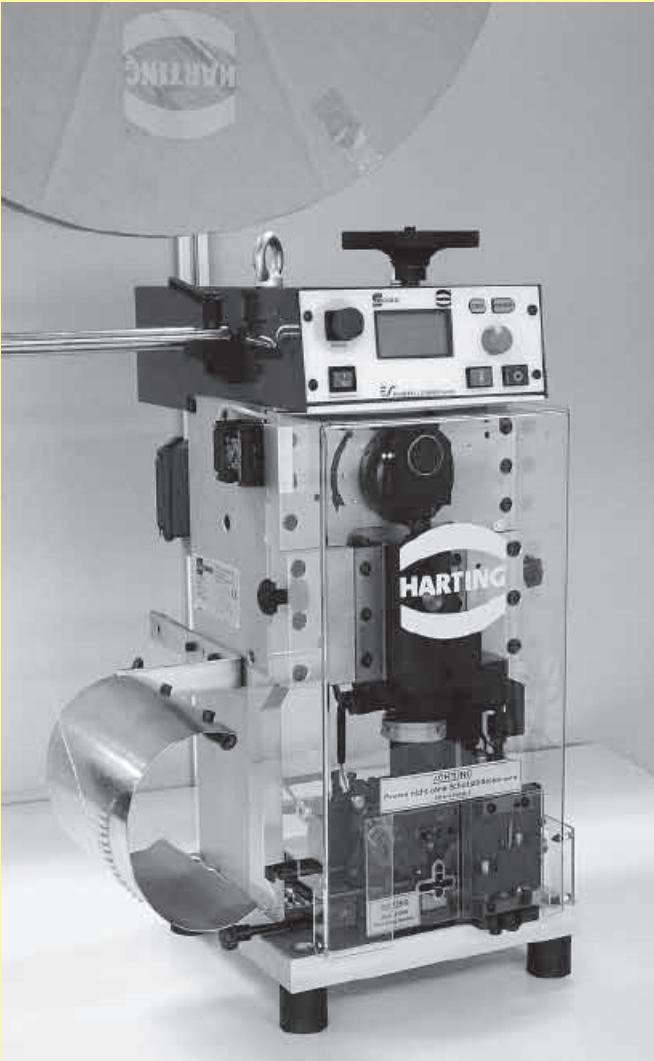
Part No. contact	Part No. locator	Crimp tool selection no.
61 03 000 0112	61 03 600 0024	7
61 03 000 0113	61 03 600 0024	7
61 03 000 0073	61 03 600 0023	7
61 03 000 0074	61 03 600 0023	7
61 03 000 0094	61 03 600 0023	7
61 03 000 0096	61 03 600 0023	7
61 03 000 0078	61 03 600 0023	7
61 03 000 0080	61 03 600 0023	7

Locator for crimp tool
Details see table

61 03 600 0023
61 03 600 0024



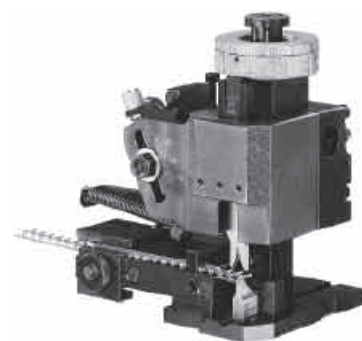
Automated crimping machine type BK



Main characteristics

- Smooth run through electronic brakes
- Hand wheel for manual adjustments
- Maintenance friendly through needle bearing rail
- Simple handling by quick change tool and stripper

Part No.	09 98 000 5000
Technical characteristics	
Dimensions	
Height	690 mm (1400 mm with a contact reel)
Width	350 mm
Depth	370 mm
Total weight	72 kg
Power supply	230 V, 50/60 Hz, 2.5 A
Consumption	0.75 kW
Motor speed	440 - 2000 rpm
Cable length	2 m incl. plug
Control	SPS
Work cycle trigger	Sensor
Work cycle	0.35 s for stripping and crimping
Illumination	Integrated tool light
Stroke counter	Daywise and fixed
Crimp force monitor	BB07i
Crimping tool	Quick change tool
Adjustable process parameters	Crimping height on wire Crimping height on insulation Depth of insulation stripping Length of insulation stripping Wire retainer position Wire position in the crimp contact Band thrust

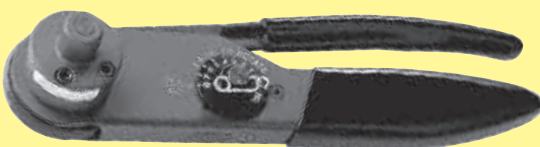


Identification	for use with	Part No.	Wire gauge [mm ²]	AWG	Insulation [Ø mm]
Crimping tool for DIN 41 612 connectors ¹⁾	contacts BC	09 98 000 3004	0.09 - 0.56	28 - 20	0.7 - 1.6
	contacts FC 1	09 98 000 3005	0.09 - 0.25	28 - 24	0.7 - 1.6
	FC 2	09 98 000 3006	0.14 - 0.56	26 - 20	0.8 - 2.3
	FC 3	09 98 000 3007	0.50 - 1.50	20 - 16	1.6 - 2.8
for D-Sub connectors ²⁾	standard contacts	09 98 000 3008 09 98 000 3009	0.09 - 0.25 0.25 - 0.56	28 - 24 24 - 20	0.7 - 1.4 0.9 - 1.7
	high density contacts	09 98 000 3012		26 - 24	0.8 - 1.4

¹⁾ 3.5 + 0.5 mm of insulation is stripped from the wire to be crimped

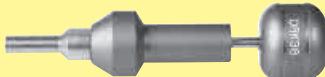
²⁾ 2.5 + 0.5 mm of insulation is stripped from the wire to be crimped

Tools for crimp termination

Identification	Part No.																												
Hand crimp tool for signal contacts	09 99 000 0501	 Wire gauge AWG 18 – 28																											
Die (To be ordered separately.)	09 99 000 0502																												
Hand crimp tool with fixed die for signal contacts	09 99 000 0505	 Wire gauge AWG 20 – 26																											
Hand crimp tool for power contacts	09 99 000 0509	 <table><tr><th>Contact Part No.</th><th>Gauge</th><th>Tool setting</th></tr><tr><td>09 69 182 5420</td><td>AWG 16, 18, 20</td><td>3 for AWG 16, 2 for AWG 18 and AWG 20</td></tr><tr><td>09 69 282 5420</td><td>AWG 16, 18, 20</td><td>3 for AWG 16, 2 for AWG 18 and AWG 20</td></tr><tr><td>09 69 182 5421</td><td>AWG 12, 14</td><td>5 for AWG 12 and 4 for AWG 14</td></tr><tr><td>09 69 282 5421</td><td>AWG 12, 14</td><td>5 for AWG 12 and 4 for AWG 14</td></tr><tr><td>09 69 182 5422</td><td>AWG 10, 12</td><td>7 for AWG 10 and 6 for AWG 12</td></tr><tr><td>09 69 282 5422</td><td>AWG 10, 12</td><td>7 for AWG 10 and 6 for AWG 12</td></tr><tr><td>09 69 182 5423</td><td>AWG 8, 10</td><td>7 for AWG 8 and 6 for AWG 10</td></tr><tr><td>09 69 282 5423</td><td>AWG 8, 10</td><td>7 for AWG 8 and 6 for AWG 10</td></tr></table>	Contact Part No.	Gauge	Tool setting	09 69 182 5420	AWG 16, 18, 20	3 for AWG 16, 2 for AWG 18 and AWG 20	09 69 282 5420	AWG 16, 18, 20	3 for AWG 16, 2 for AWG 18 and AWG 20	09 69 182 5421	AWG 12, 14	5 for AWG 12 and 4 for AWG 14	09 69 282 5421	AWG 12, 14	5 for AWG 12 and 4 for AWG 14	09 69 182 5422	AWG 10, 12	7 for AWG 10 and 6 for AWG 12	09 69 282 5422	AWG 10, 12	7 for AWG 10 and 6 for AWG 12	09 69 182 5423	AWG 8, 10	7 for AWG 8 and 6 for AWG 10	09 69 282 5423	AWG 8, 10	7 for AWG 8 and 6 for AWG 10
Contact Part No.	Gauge		Tool setting																										
09 69 182 5420	AWG 16, 18, 20	3 for AWG 16, 2 for AWG 18 and AWG 20																											
09 69 282 5420	AWG 16, 18, 20	3 for AWG 16, 2 for AWG 18 and AWG 20																											
09 69 182 5421	AWG 12, 14	5 for AWG 12 and 4 for AWG 14																											
09 69 282 5421	AWG 12, 14	5 for AWG 12 and 4 for AWG 14																											
09 69 182 5422	AWG 10, 12	7 for AWG 10 and 6 for AWG 12																											
09 69 282 5422	AWG 10, 12	7 for AWG 10 and 6 for AWG 12																											
09 69 182 5423	AWG 8, 10	7 for AWG 8 and 6 for AWG 10																											
09 69 282 5423	AWG 8, 10	7 for AWG 8 and 6 for AWG 10																											
Positioner for male and female contacts (To be ordered separately.)	09 99 000 0504																												
Hand crimp tool for coaxial contacts, solder/crimp version ¹⁾	09 99 000 0503	 <table><tr><th>Contact Part No.</th><th>Cavity</th></tr><tr><td>09 69 181 x230 09 69 281 x230</td><td>B</td></tr><tr><td>09 69 181 x141 09 69 281 x141</td><td>C</td></tr><tr><td>09 69 181 x140 09 69 281 x140</td><td>B</td></tr></table>	Contact Part No.	Cavity	09 69 181 x230 09 69 281 x230	B	09 69 181 x141 09 69 281 x141	C	09 69 181 x140 09 69 281 x140	B																			
Contact Part No.	Cavity																												
09 69 181 x230 09 69 281 x230	B																												
09 69 181 x141 09 69 281 x141	C																												
09 69 181 x140 09 69 281 x140	B																												
Die (To be ordered separately.)	09 99 000 0508	 <table><tr><th>Contact Part No.</th><th>Cavity</th></tr><tr><td>09 69 181 x143 09 69 281 x143</td><td>A</td></tr></table>	Contact Part No.	Cavity	09 69 181 x143 09 69 281 x143	A																							
Contact Part No.	Cavity																												
09 69 181 x143 09 69 281 x143	A																												
Die (To be ordered separately.)	09 99 000 0515	<table><tr><th>Contact Part No.</th><th>Cavity</th></tr><tr><td>09 69 181 x233 09 69 281 x233</td><td>B</td></tr></table>	Contact Part No.	Cavity	09 69 181 x233 09 69 281 x233	B																							
Contact Part No.	Cavity																												
09 69 181 x233 09 69 281 x233	B																												
Die (To be ordered separately.)	09 99 000 0519																												

¹⁾ Only the outer ferrule is crimped (inner conductor is soldered)

Tools for crimp termination

Identification	Part No.										
Hand crimp tool for coaxial contacts, crimp/crimp version¹⁾, suitable for inner contact	09 99 000 0501										
Inner contact die (To be ordered separately.)	09 99 000 0507	 <table><tr><th>Contact Part No.</th></tr><tr><td>09 69 182 x140</td></tr><tr><td>09 69 282 x140</td></tr><tr><td>09 69 182 x230</td></tr><tr><td>09 69 282 x230</td></tr><tr><td>09 69 182 x232</td></tr><tr><td>09 69 282 x232</td></tr><tr><td>09 69 182 x233</td></tr><tr><td>09 69 282 x233</td></tr></table>	Contact Part No.	09 69 182 x140	09 69 282 x140	09 69 182 x230	09 69 282 x230	09 69 182 x232	09 69 282 x232	09 69 182 x233	09 69 282 x233
Contact Part No.											
09 69 182 x140											
09 69 282 x140											
09 69 182 x230											
09 69 282 x230											
09 69 182 x232											
09 69 282 x232											
09 69 182 x233											
09 69 282 x233											
Hand crimp tool for coaxial contacts, crimp/crimp version¹⁾, suitable for outer ferrule	09 99 000 0503										
Outer contact die (To be ordered separately.)	09 99 000 0508	 <table><tr><th>Contact Part No.</th><th>Cavity</th></tr><tr><td>09 69 182 x140 09 69 282 x140</td><td>B</td></tr><tr><td>09 69 182 x230 09 69 282 x230</td><td>B</td></tr></table>	Contact Part No.	Cavity	09 69 182 x140 09 69 282 x140	B	09 69 182 x230 09 69 282 x230	B			
Contact Part No.	Cavity										
09 69 182 x140 09 69 282 x140	B										
09 69 182 x230 09 69 282 x230	B										
Outer contact die (To be ordered separately.)	09 99 000 0518	<table><tr><th>Contact Part No.</th><th>Cavity</th></tr><tr><td>09 69 182 x232 09 69 282 x232</td><td>A</td></tr></table>	Contact Part No.	Cavity	09 69 182 x232 09 69 282 x232	A					
Contact Part No.	Cavity										
09 69 182 x232 09 69 282 x232	A										
Outer contact die (To be ordered separately.)	09 99 000 0519	<table><tr><th>Contact Part No.</th><th>Cavity</th></tr><tr><td>09 69 182 x233 09 69 282 x233</td><td>B</td></tr></table>	Contact Part No.	Cavity	09 69 182 x233 09 69 282 x233	B					
Contact Part No.	Cavity										
09 69 182 x233 09 69 282 x233	B										
Insertion and extraction tool for signal contacts	09 99 000 0511										
Extraction tool for coaxial, power and high voltage contacts	09 99 000 0512										

¹⁾ Both inner and outer conductor are crimped

1. Strip the wire.

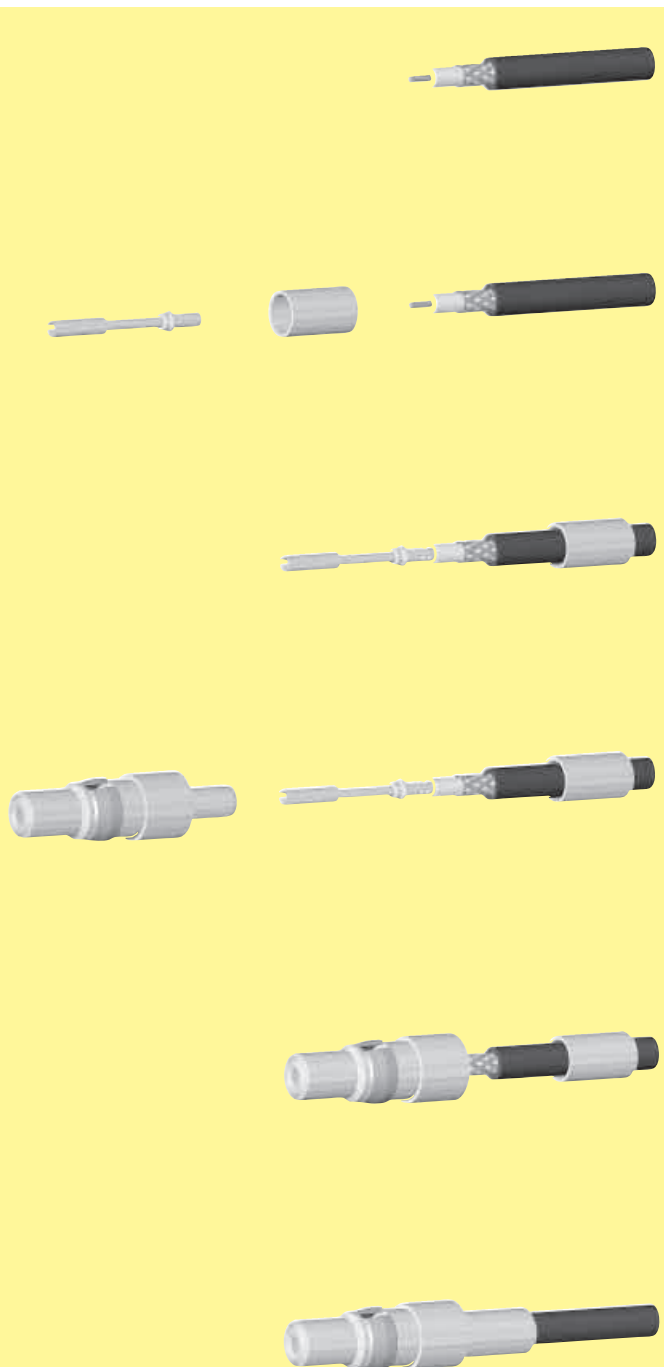
2. Attach the sleeve and inner conductor.

3. Crimp the inner conductor.

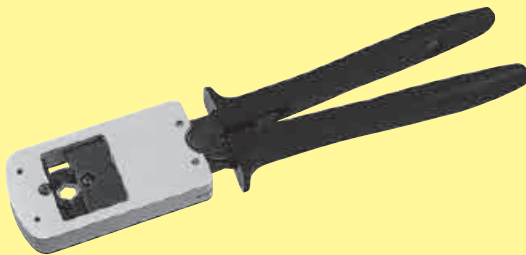
4. Snap the inner conductor into the contact.

5. Tap the shield on.

6. Slide the sleeve forwards and crimp.



Tools for crimp termination

Identification	Part No.	Drawing																				
Hexagonal head screwdriver for hoods with hexagonal screws	61 03 600 0021																					
Crimp tool for flange and ferrule	61 03 600 0020																					
Inserts for crimp tool	61 03 000 0179 61 03 000 0180 61 03 000 0098 61 03 000 0099 61 03 000 0100 61 03 000 0101 61 03 000 0102 61 03 000 0103 61 03 000 0104 61 03 000 0105 61 03 000 0174 61 03 000 0172 61 03 000 0168 61 03 000 0169 61 03 000 0175 61 03 000 0176 61 03 000 0177 61 03 000 0178 61 03 000 0173	<table><tr><th>Width of hexagonal nut [mm]</th></tr><tr><td>5.0</td></tr><tr><td>5.5</td></tr><tr><td>6.0</td></tr><tr><td>6.5</td></tr><tr><td>7.0</td></tr><tr><td>7.5</td></tr><tr><td>8.0</td></tr><tr><td>8.5</td></tr><tr><td>9.0</td></tr><tr><td>9.5</td></tr><tr><td>10.0</td></tr><tr><td>10.5</td></tr><tr><td>11.0</td></tr><tr><td>11.5</td></tr><tr><td>12.0</td></tr><tr><td>12.5</td></tr><tr><td>13.0</td></tr><tr><td>13.5</td></tr><tr><td>14.0</td></tr></table>	Width of hexagonal nut [mm]	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0
Width of hexagonal nut [mm]																						
5.0																						
5.5																						
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7.0																						
7.5																						
8.0																						
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9.0																						
9.5																						
10.0																						
10.5																						
11.0																						
11.5																						
12.0																						
12.5																						
13.0																						
13.5																						
14.0																						
Mounting tool for flange for D-Sub hoods (9-37 contacts) for D-Sub hoods (50 contacts)	61 03 600 0017 61 03 600 0018																					
Insertion and removal tool for contacts	09 99 000 0171																					

Tooling for IDC technology

Page

har-link®	32.02
har-mik®	32.02
D-Sub – S	32.07
SEK	32.08

Tools for insulation displacement termination

Identification	Part No.	Drawing	Dimensions [mm]
Cable aligner	27 79 000 0001		
Head and table	27 79 000 0002		
Crimping hand tool	27 99 000 0001		
Hand press	60 99 000 0007		

Tools for insulation displacement termination

Tools

- A comprehensive range of high density Input/Output and Intra-Cabinet connectors is only useful if supported by adequate and efficient termination tooling.
- HARTING has therefore designed a range of tools to offer the most efficient processing solution to satisfy a customer's manufacturing demand:
 - Small to medium size production volume.
Managed with hand tool or semi-automatic tool.
 - Medium to large size production volume managed with highly efficient automatic machines.



Semi-automatic machine CAT 60

Tools for insulation displacement termination for Pin and socket and Bellows range

Selection chart for semi-automatic assembly machine CAT 60

for connector	Semi automatic machine	Support plates	Adaptator	Head and table	Hand press
Male Pin and socket 60 03 ... 5200 60 03 ... 5210 60 03 ... 5220	60 99 000 0003	60 99 000 0004	60 99 ... 0005	60 99 000 0010	60 99 000 0007
Male Bellows 60 13 ... 5200		60 99 000 0012	60 99 ... 0013	60 99 000 0016	

Number of contacts

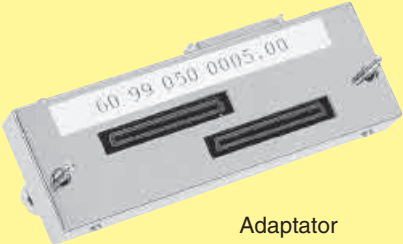
Tools for insulation displacement termination for Pin and socket and Bellows range

Selection chart for hand assembly

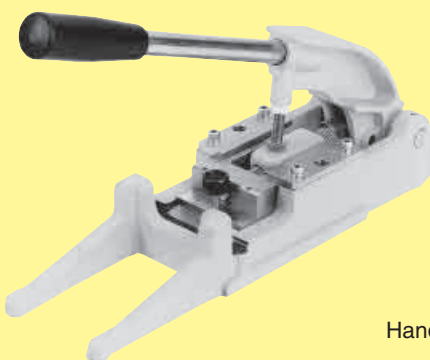
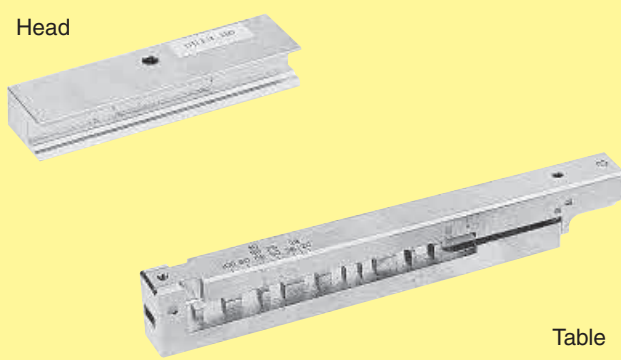
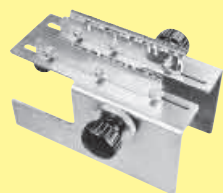
for connector	Hand cable aligner	Head and table	Hand press
Male Pin and socket 60 03 ... 5200 60 03 ... 5210 60 03 ... 5220	60 99 000 0011	60 99 000 0010	60 99 000 0007
Male Bellows 60 13 ... 5200	60 99 000 0017	60 99 000 0016	

Number of contacts

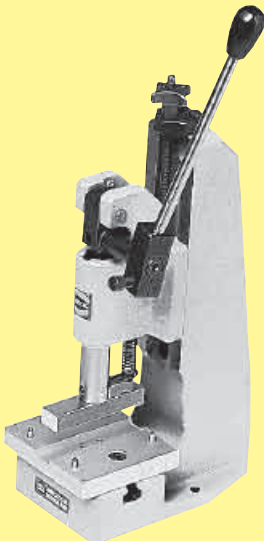
Tools for insulation displacement termination

Identification	Part No.	
Semi-automatic machine CAT 60	60 99 000 0003	 CAT 60
Support plates for Pin and socket and female Bellows connector	60 99 000 0004	 Support plates
Support plates for male Bellows connector	60 99 000 0012	
Adaptor for male Pin and socket connector	60 99 ... 0005	
Adaptor for male Bellows connector	60 99 ... 0013	 Adaptator
		Number of contacts

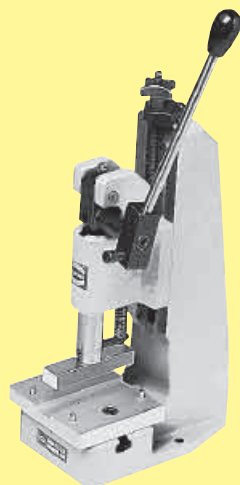
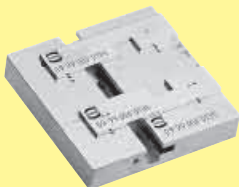
Tools for insulation displacement termination

Identification	Part No.	
Hand press	60 99 000 0007	 Hand press
Head and table for male Pin and socket connector	60 99 000 0010	 Head Table
Head and table for male Bellows connector	60 99 000 0016	
Hand cable aligner for Pin and socket and female Bellows connector	60 99 000 0011	
Hand cable aligner for male Bellows connector	60 99 000 0017	

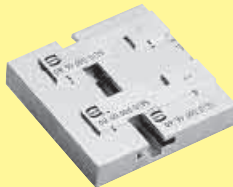
Tools for insulation displacement termination

Identification	Part No.	Drawing	Dimensions in mm
Bench press for termination of insulation displacement connectors	09 99 000 0114		
Base plate for termination of flat cables	60 99 000 0034		
Cable cutter for flat cables	09 99 000 0116		
Spare parts Blade Cutting plate	09 99 000 0179 09 99 000 0180		

Tools for insulation displacement termination

Identification	Part No.	Drawing	Dimensions in mm
Bench press for termination of insulation displacement connectors			
Base plate for termination of flat cables			
Insert for termination of 37 pole male connectors			
Hand tool with base plates (included in tool kit) for termination of insulation displacement connectors	09 99 000 0149	 	
Cable cutter for flat cables	09 99 000 0116		
Spare parts Blade Cutting plate	09 99 000 0179 09 99 000 0180		

Tools for insulation displacement termination

Identification	Part No.	Drawing	Dimensions in mm		
Bench press for termination of insulation displacement connectors	09 99 000 0114				
Base plate for termination of flat cables suitable for ...					
female	09 99 000 0115				
DIP	09 99 000 0134				
Pcb, 2 rows	09 99 000 0131				
Pcb, 4 rows	09 99 000 0130				
DIN 41 612	09 99 000 0150				
Hand tool with base plates (included in tool kit) for termination of insulation displacement connectors suitable for ...					
female	09 99 000 0149				
DIP					
Pcb, 2 rows					
DIN 41 612					
Cable cutter for flat cables	09 99 000 0116				
Spare parts					
Blade	09 99 000 0179				
Cutting plate	09 99 000 0180				



Cables

Page

har-link®	40.02
har-mik®	40.02
D-Sub – S and SEK	40.04

Cables for insulation displacement termination

Identification	No. of pairs	Part No.
Twisted pair cable with braid shield AWG 28 Length per reel: 100 m*	5	60 90 005 6003
	10	60 90 010 6003
	13	60 90 013 6003
	14	60 90 014 6003
	18	60 90 018 6003
	20	60 90 020 6003
	25	60 90 025 6003
	34	60 90 034 6003
	40	60 90 040 6003
	48	60 90 048 6003
	50	60 90 050 6003

Drawing	Dimensions in mm																																						
	<table border="1"> <thead> <tr> <th rowspan="2">No. of pairs</th><th colspan="2">Outside diameter</th></tr> <tr> <th>Nominal</th><th>Max</th></tr> </thead> <tbody> <tr><td>5</td><td>5.4</td><td>5.6</td></tr> <tr><td>10</td><td>6.2</td><td>6.5</td></tr> <tr><td>13</td><td>6.5</td><td>6.8</td></tr> <tr><td>14</td><td>6.5</td><td>6.8</td></tr> <tr><td>18</td><td>7.4</td><td>7.7</td></tr> <tr><td>20</td><td>7.7</td><td>8.2</td></tr> <tr><td>25</td><td>8.2</td><td>8.5</td></tr> <tr><td>34</td><td>8.7</td><td>9.0</td></tr> <tr><td>40</td><td>9.9</td><td>10.4</td></tr> <tr><td>48</td><td>10.1</td><td>10.6</td></tr> <tr><td>50</td><td>13.0</td><td>13.5</td></tr> </tbody> </table>		No. of pairs	Outside diameter		Nominal	Max	5	5.4	5.6	10	6.2	6.5	13	6.5	6.8	14	6.5	6.8	18	7.4	7.7	20	7.7	8.2	25	8.2	8.5	34	8.7	9.0	40	9.9	10.4	48	10.1	10.6	50	13.0
No. of pairs	Outside diameter																																						
	Nominal	Max																																					
5	5.4	5.6																																					
10	6.2	6.5																																					
13	6.5	6.8																																					
14	6.5	6.8																																					
18	7.4	7.7																																					
20	7.7	8.2																																					
25	8.2	8.5																																					
34	8.7	9.0																																					
40	9.9	10.4																																					
48	10.1	10.6																																					
50	13.0	13.5																																					
Twisted pair Separator Shield Jacket PVC																																							

Technical characteristics			
Number of pairs	5, 10, 13, 14, 18, 20, 25, 34, 40, 48, 50	Propagation velocity	60 %
Voltage rating	30 V (style UL 2789)	Temperature range	– 20 °C ... + 105 °C
Maximum conductor resistance (20 °C)	233 Ω/km	Cable materials Conductor 7 x 0.13 mm stranded tinned copper Insulation (except 50 pairs) PVC Ø 0.62 mm (for 50 pairs) PVC Ø 0.65 – 0.80 mm Shield Tinned copper braid, covering ≥ 80 % Jacket PVC Flammability rating IEC 332-1 Sheath marking AWM 2789 60°C 30V VW1 36963	
Minimum insulation resistance (20 °C)	1 MΩ/km		
Nominal differential impedance (TDR)	85 Ω		
Nominal differential capacitance (1 kHz)	110 pF/m		

* Except 60 90 050 6003: 150 m reel

Cables for insulation displacement termination

Identification	No. of wires	Part No.
Flat cable for IDC connector Pitch 0.635 mm AWG 30		
Length per reel: 100 ft 30.48 m	50 68	60 90 050 6008 60 90 068 6008

Drawing

Dimensions in mm

A technical drawing of a flat cable cross-section. It features four circular conductors arranged in a horizontal row. Each conductor is filled with a cross-hatch pattern. Dimension lines with arrows indicate the following: 'a' is the total width of the cable; 'b' is the width of a single conductor; 'c' is the distance between the centers of two adjacent conductors; and 'd' is the thickness of the cable's insulation layer.

	a ± 0.25	b ± 0.05	c ± 0.2	d ± 0.05
50	31.75	0.635	31.12	0.68
68	43.20	0.635	42.55	0.68

The tolerance b is not cumulative

Technical characteristics	
Number of wires	50, 68
Voltage rating	150 V
Impedance	75 Ω
Nominal differential capacitance (1 kHz)	90 pF/m
Pitch	0.635 mm
UL style	2 678
Temperature range	– 30 °C ... + 105 °C
Materials	
Conductor	7 x 0.102 mm regular tinning or Z-bonding AWG 30
Insulation	PVC

Cables for insulation displacement termination

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
Flat cable grey UL AWM-style 2651 CSA				
	6	09 18 006 700		
	9	09 18 009 700		
	10	09 18 010 700		
	14	09 18 014 700		
	15	09 18 015 700		
	16	09 18 016 700		
	18	09 18 018 700		
	20	09 18 020 700		
	24	09 18 024 700		
	25	09 18 025 700		
	26	09 18 026 700		
	28	09 18 028 700		
	34	09 18 034 700		
	37	09 18 037 700		
	40	09 18 040 700		
	50	09 18 050 700		
	60	09 18 060 700		
	64	09 18 064 700		
Length per reel 30.48 m (100 feet)	1		Conductor material _____ Copper tinned Gauge _____ AWG 28/7 0.089 mm ² Voltage rating _____ 300 V _{r.m.s.} Current rating _____ 1.3 A at 10 °C rise above ambient Capacity unbalanced _____ 45.9 pF/m Impedance unbalanced _____ 105 Ω Propagation delay _____ 4.9 ns/m nominal Insulation material _____ PVC Temperature rating (operating) _____ -20 °C ... + 105 °C Temperature rating (static) _____ -30 °C ... + 105 °C Flammability rating _____ Flame retardant VW-1 Insulation resistance _____ > 10 ⁴ MΩ/km	
100 m (328 feet)	4			
Flat cable colour coded				
Length per reel 30.48 m (100 feet)			Conductor material _____ Copper tinned Gauge _____ AWG 28/7 0.089 mm ² Voltage rating _____ 300 V _{r.m.s.} Conductor resistance _____ 221 mΩ/m Capacity unbalanced _____ 42.7 pF/m Impedance unbalanced _____ 105 Ω Inductance unbalanced _____ 0.68 μH/m Signal delay _____ 4.9 ns/m Insulation material _____ PVC Temperature rating _____ -20 °C ... + 105 °C Flammability rating _____ UL: VW 1 Insulation resistance _____ 10 ⁴ MΩ/km	Colour code sequence (in 10 steps) brown, red, orange, yellow, green, blue, violet, grey, white, black
UL AWM-style 20 130	9	09 18 009 7005		
	10	09 18 010 7005		
	14	09 18 014 7005		
	15	09 18 015 7005		
	16	09 18 016 7005		
	20	09 18 020 7005		
	24	09 18 024 7005		
	25	09 18 025 7005		
	26	09 18 026 7005		
	34	09 18 034 7005		
	37	09 18 037 7005		
	40	09 18 040 7005		
	50	09 18 050 7005		
	60	09 18 060 7005		
	64	09 18 064 7005		

Cables for insulation displacement termination

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm																																																
Flat cable twisted pair Length per reel 30.48 m (100 feet) UL AWM-style 20 130	10 14 16 20 26 34 40 50 60 64	09 18 010 7006 09 18 014 7006 09 18 016 7006 09 18 020 7006 09 18 026 7006 09 18 034 7006 09 18 040 7006 09 18 050 7006 09 18 060 7006 09 18 064 7006	colour coded AWG 28/7 1,27±0,13 1,02±0,13 1,07 (n-1) x 1,27 457,2 50,8 508																																																	
Round flat cable with screening (shielding) UL listed PLCC CL2 CSA certified AWM FT-1	9 10 14 15 16 20 25 26 34 37 40 50 60 64	09 18 009 70 09 18 010 70 09 18 014 70 09 18 015 70 09 18 016 70 09 18 020 70 09 18 025 70 09 18 026 70 09 18 034 70 09 18 037 70 09 18 040 70 09 18 050 70 09 18 060 70 09 18 064 70	Slit section 5 4 3 2 1 a b c	<table><tr><td></td><td>Flat cable twisted pair</td><td>Round flat cable with screening</td><td>Round flat cable without screening</td></tr><tr><td>Insulation material</td><td colspan="3">PVC</td></tr><tr><td>Conductor material</td><td colspan="3">Copper tinned</td></tr><tr><td>Gauge</td><td colspan="3">AWG 28/7 0.089 mm²</td></tr><tr><td>Voltage rating</td><td colspan="3">300 V_{r.m.s.}</td></tr><tr><td>Temperature rating</td><td colspan="3">-20 °C ... + 105 °C</td></tr><tr><td>Flammability rating</td><td colspan="3">UL: VW 1</td></tr><tr><td>Insulation resistance</td><td colspan="3">10⁴ MΩ/km</td></tr><tr><td>Conductor resistance</td><td>221 mΩ/m</td><td colspan="2">225 mΩ/m</td></tr><tr><td>Capacity unbalanced</td><td>49 pF/m</td><td colspan="2">78.7 pF/m</td></tr><tr><td>Impedance unbalanced</td><td>105 Ω</td><td colspan="2">75 Ω</td></tr><tr><td>Signal delay</td><td>5.2 ns/m</td><td colspan="2">5.25 ns/m nom.</td></tr></table> ① Flat cable, AWG 28/7 ② Aluminium / Polyester tape (spiral wrap) ③ 85 % minimum coverage tinned copper braid ④ Paper line ⑤ Outer jacket: black PVC		Flat cable twisted pair	Round flat cable with screening	Round flat cable without screening	Insulation material	PVC			Conductor material	Copper tinned			Gauge	AWG 28/7 0.089 mm²			Voltage rating	300 V _{r.m.s.}			Temperature rating	-20 °C ... + 105 °C			Flammability rating	UL: VW 1			Insulation resistance	10 ⁴ MΩ/km			Conductor resistance	221 mΩ/m	225 mΩ/m		Capacity unbalanced	49 pF/m	78.7 pF/m		Impedance unbalanced	105 Ω	75 Ω		Signal delay	5.2 ns/m	5.25 ns/m nom.	
	Flat cable twisted pair	Round flat cable with screening	Round flat cable without screening																																																	
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Length per reel 30.48 m (100 feet)	07																																																			
100 m (328 feet)	10*																																																			
without screening (shielding) UL listed PLCC CL2 CSA certified AWM FT-1	9 10 14 15 16 20 25 26 34 37 40 50 60 64	09 18 009 70 09 18 010 70 09 18 014 70 09 18 015 70 09 18 016 70 09 18 020 70 09 18 025 70 09 18 026 70 09 18 034 70 09 18 037 70 09 18 040 70 09 18 050 70 09 18 060 70 09 18 064 70	Edge mark on first conductor 0,64±0,18 1,27±0,08 AWG 28/7 grey 0,19±0,08 Slit section 4 3 2 1 a b c	<table><tr><td>No. of contacts</td><td>a</td><td>b</td><td>c</td></tr><tr><td>6 to 26</td><td>19.05</td><td>19.05</td><td>38.10</td></tr><tr><td>34 to 64</td><td>38.10</td><td>19.05</td><td>57.15</td></tr></table> ① Flat cable, AWG 28/7 ② Clear polyester ③ Paper line ④ Outer jacket: black PVC	No. of contacts	a	b	c	6 to 26	19.05	19.05	38.10	34 to 64	38.10	19.05	57.15																																				
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6 to 26	19.05	19.05	38.10																																																	
34 to 64	38.10	19.05	57.15																																																	
Length per reel 30.48 m (100 feet)	08																																																			
100 m (328 feet)	11*																																																			

* Not normally kept in stock
Important: always store reels vertically

List of part numbers



Part No.	Page	Part No.	Page	Part No.	Page	Part No.	Page	Part No.	Page	Part No.	Page
60 04 050 5343	01.09	60 13 068 0153	01.19	61 03 000 0052	07.14	61 03 001 0010	07.09				
60 04 050 5344	01.09	60 13 068 5200	01.15	61 03 000 0053	07.14	61 03 001 0011	07.12				
				61 03 000 0054	07.14	61 03 001 0012	07.12				
60 04 068 5343	01.09			61 03 000 0055	07.14	61 03 001 0013	07.09				
60 04 068 5344	01.09			61 03 000 0056	07.14	61 03 001 0014	07.09				
		60 90 005 6003	40.02	61 03 000 0057	07.14	61 03 001 0015	07.09				
				61 03 000 0058	07.14	61 03 001 0016	07.09				
		60 90 010 6003	40.02	61 03 000 0059	07.14	61 03 001 0017	07.09				
60 05 068 5100	01.23			61 03 000 0060	07.14	61 03 001 0018	07.09				
60 05 068 5100	22.07	60 90 013 6003	40.02	61 03 000 0061	07.14	61 03 001 0019	07.09				
60 05 068 5322	20.07			61 03 000 0062	07.14	61 03 001 0020	07.12				
		60 90 014 6003	40.02	61 03 000 0063	07.14	61 03 001 0021	07.12				
				61 03 000 0064	07.14	61 03 001 0022	07.12				
		60 90 018 6003	40.02	61 03 000 0065	07.14	61 03 001 1010	07.09				
60 06 050 5440	01.24			61 03 000 0066	07.14	61 03 001 1013	07.09				
60 06 050 9001	01.24	60 90 020 6003	40.02	61 03 000 0067	07.14	61 03 001 1014	07.09				
				61 03 000 0068	07.14	61 03 001 1015	07.09				
60 06 068 5440	01.24	60 90 025 6003	40.02	61 03 000 0069	07.14	61 03 001 1016	07.09				
60 06 068 9001	01.24			61 03 000 0070	07.14	61 03 001 1017	07.09				
		60 90 034 6003	40.02	61 03 000 0071	07.14	61 03 001 1018	07.09				
				61 03 000 0072	07.14	61 03 001 1019	07.09				
		60 90 040 6003	40.02	61 03 000 0073	02.29	61 03 001 2010	07.09				
60 11 014 5732 710	22.09			61 03 000 0074	02.29	61 03 001 2013	07.09				
60 11 014 5740 710	22.09	60 90 048 6003	40.02	61 03 000 0078	02.29	61 03 001 2014	07.09				
				61 03 000 0080	02.29	61 03 001 2015	07.09				
60 11 020 5132	01.14	60 90 050 6003	40.02	61 03 000 0094	02.29	61 03 001 2016	07.09				
60 11 020 5140	01.14	60 90 050 6008	40.03	61 03 000 0096	02.29	61 03 001 2017	07.09				
				61 03 000 0098	31.11	61 03 001 2018	07.09				
60 11 026 5102	01.13			61 03 000 0099	31.11	61 03 001 2019	07.09				
60 11 026 5132	01.14			61 03 000 0100	31.11	61 03 001 3010	07.09				
60 11 026 5140	01.14			61 03 000 0101	31.11	61 03 001 3013	07.09				
60 11 026 5732 710	22.09	60 99 ... 0005	32.03	61 03 000 0102	31.11	61 03 001 3014	07.09				
60 11 026 5740 710	22.09	60 99 ... 0005	32.04	61 03 000 0103	31.11	61 03 001 3015	07.09				
		60 99 ... 0013	32.03	61 03 000 0104	31.11	61 03 001 3016	07.09				
		60 99 ... 0013	32.04	61 03 000 0105	31.11	61 03 001 3017	07.09				
60 11 028 5232	01.14			61 03 000 0112	02.29	61 03 001 3018	07.09				
				61 03 000 0113	02.29	61 03 001 3019	07.09				
60 11 036 5102	01.13	60 99 000 0003	32.03	61 03 000 0127	07.14	61 03 600 0017	31.11				
60 11 036 5132	01.14	60 99 000 0003	32.04	61 03 000 0141	07.14	61 03 600 0018	31.11				
60 11 036 5140	01.14	60 99 000 0004	32.03	61 03 000 0142	07.14	61 03 600 0020	31.11				
60 11 036 5202	01.13	60 99 000 0004	32.04	61 03 000 0143	07.14	61 03 600 0021	31.11				
60 11 036 5232	01.14	60 99 000 0007	32.02	61 03 000 0145	07.14	61 03 600 0023	31.05				
60 11 036 5732 710	22.09	60 99 000 0007	32.03	61 03 000 0165	07.14	61 03 600 0024	31.05				
60 11 036 5740 710	22.09	60 99 000 0007	32.05	61 03 000 0166	07.14						
		60 99 000 0010	32.03	61 03 000 0168	31.11						
		60 99 000 0010	32.05	61 03 000 0169	31.11						
60 11 050 5102	01.13	60 99 000 0011	32.03	61 03 000 0172	31.11						
60 11 050 5132	01.14	60 99 000 0011	32.05	61 03 000 0173	31.11						
60 11 050 5140	01.14	60 99 000 0012	32.03	61 03 000 0174	31.11						
60 11 050 5202	01.13	60 99 000 0012	32.04	61 03 000 0175	31.11						
60 11 050 5232	01.14	60 99 000 0016	32.03	61 03 000 0176	31.11						
		60 99 000 0016	32.05	61 03 000 0177	31.11						
60 11 068 5102	01.13	60 99 000 0017	32.03	61 03 000 0178	31.11						
60 11 068 5132	01.14	60 99 000 0017	32.05	61 03 000 0179	31.11						
60 11 068 5140	01.14	60 99 000 0031	30.10	61 03 000 0180	31.11						
60 11 068 5232	01.14	60 99 000 0032	30.10	61 03 000 5062	07.14						
		60 99 000 0034	32.06	61 03 000 5063	07.14						
				61 03 000 5064	07.14						
60 13 ... 5200	32.03			61 03 000 5065	07.14						
				61 03 000 5066	07.14						
60 13 020 0153	01.19	61 03 000 0041	07.14	61 03 000 5067	07.14						
60 13 020 5200	01.15	61 03 000 0042	07.14	61 03 000 5068	07.14						
		61 03 000 0044	07.14	61 03 000 5069	07.14						
60 13 026 0153	01.19	61 03 000 0045	07.14	61 03 000 5070	07.14						
60 13 026 0555	01.19	61 03 000 0046	07.14	61 03 000 5071	07.14						
60 13 026 5200	01.15	61 03 000 0047	07.14	61 03 000 5072	07.14						
		61 03 000 0048	07.14	61 03 000 5165	07.14						
60 13 036 0153	01.19	61 03 000 0049	07.14	61 03 000 5166	07.14						
60 13 036 5200	01.15	61 03 000 0050	07.14								
		61 03 000 0051	07.14								
60 13 050 0153	01.19										
60 13 050 5200	01.15										