

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

Page

General information **05.02**

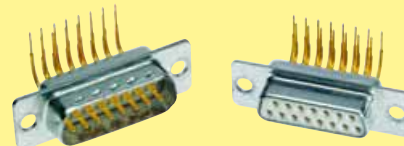
Technical characteristics **05.03**

Attenuation characteristics for standard capacitance values **05.04**

Connectors with turned solder pins, straight **05.06**



Connectors with turned solder pins, right angled (European footprint 2.54 mm) **05.12**



Connectors with solder buckets **05.24**

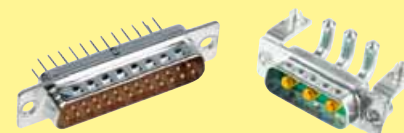


Panel cut outs / panel mountings **05.28**

Customized solutions

General information **05.29**

HARTING customer request form **05.32**



HARTING filter D connectors are distinguished by their high performance and offer optimal filtering. The filtering element incorporates a multi-layer printed circuit board and surface mount components, all within the standard D-Sub shell.

The HARTING filter D range consists of:

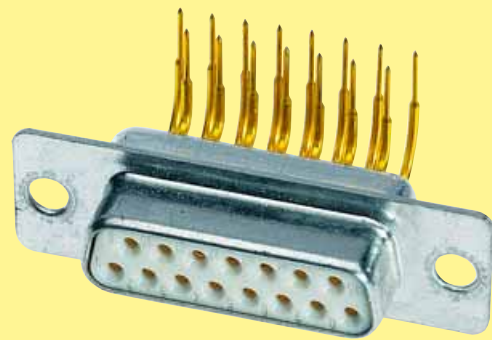
- A standard range of products (available from stock for pcb and cable applications):
 - male and female connectors
 - various terminations such as solder buckets, straight and right angled solder pins
 - 9, 15, 25 and 37 contact versions
 - a large range of accessories

- **Customized solutions:**

The innovative technical solution of filtering enables customers to select the optimum filter on a contact by contact approach. This flexible technology allows not only to segregate the filtering per contact but also to mix the type of filter in a single competitive product. Please contact your local HARTING representative. Customized possibilities are explained on pages 05.29 ff.

HARTING filtered D connectors are suitable for military, aerospace, industrial, medical, telecom and computers applications.

HARTING filter D connectors can also take advantage of **reflow soldering** and the cost savings it brings.



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

Working current 7.5 A max.

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

Contact resistance $\leq 10 \text{ m}\Omega$
Insulation resistance $\geq 1000 \text{ M}\Omega$

Temperature range $-55 \text{ }^\circ\text{C} \dots +125 \text{ }^\circ\text{C}$
Heat deflection temperature limit according to DIN 53 461 $+255 \text{ }^\circ\text{C}$

Terminations
a) Solder buckets max. 0.8 mm^2
b) Solder pins $\varnothing 0.6 \text{ mm}$ for P.C.B. holes $\varnothing 0.8/1 \text{ mm}$
c) Solder pins, angled 90° $\varnothing 0.6 \text{ mm}$ for P.C.B. holes $\varnothing 0.8/1 \text{ mm}$

Materials
Insulation PCT, glass-fibre filled, flame retardant acc. to UL 94-V0
Colour: natural

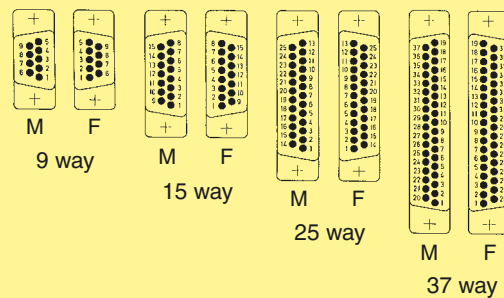
Contacts Copper alloy
Male and female contacts are turned

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

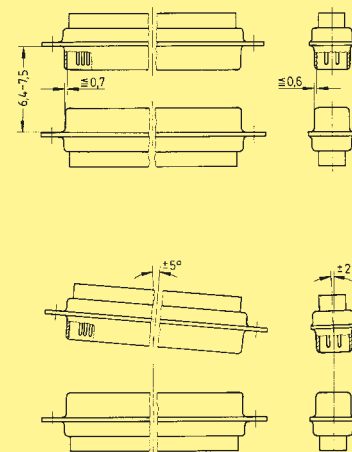
Metal shell Steel

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⁾	Frequency [MHz]	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

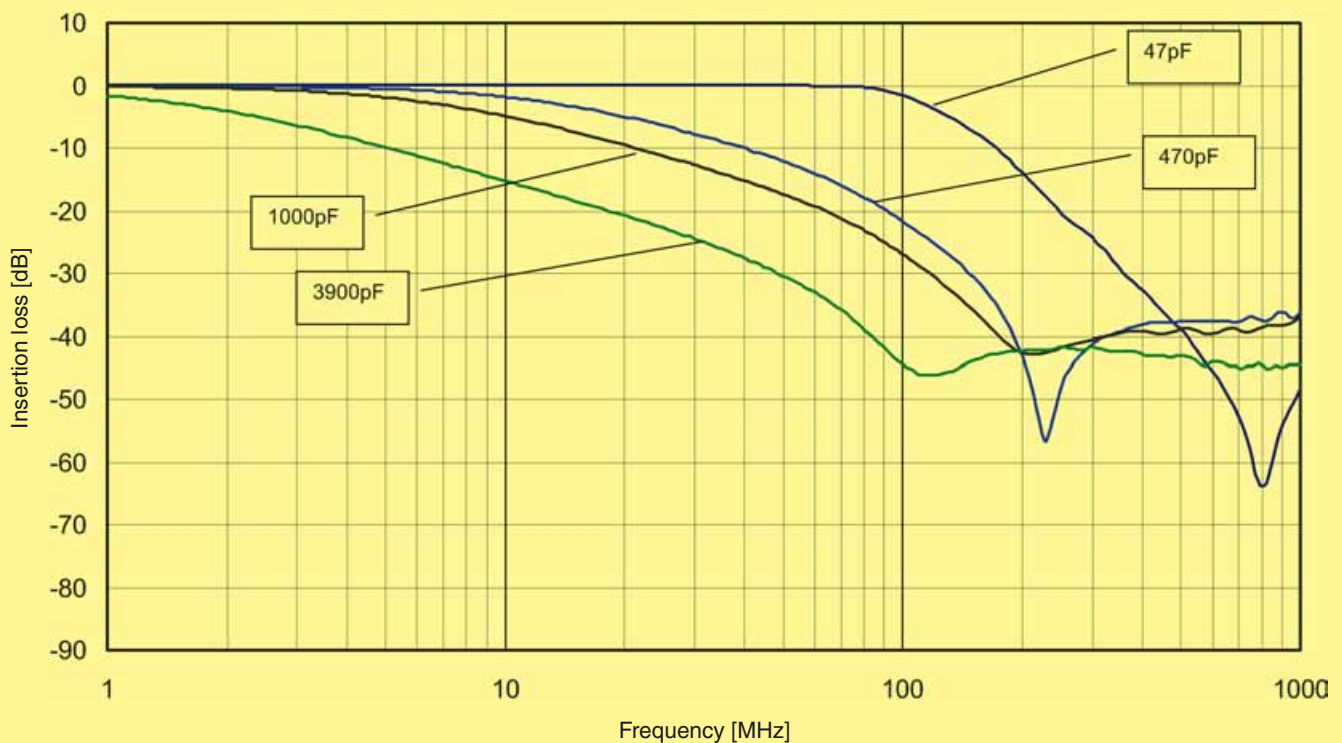
¹⁾ Capacitance tolerance = ± 20 % (For other capacitor values see pages 05.30 ff).

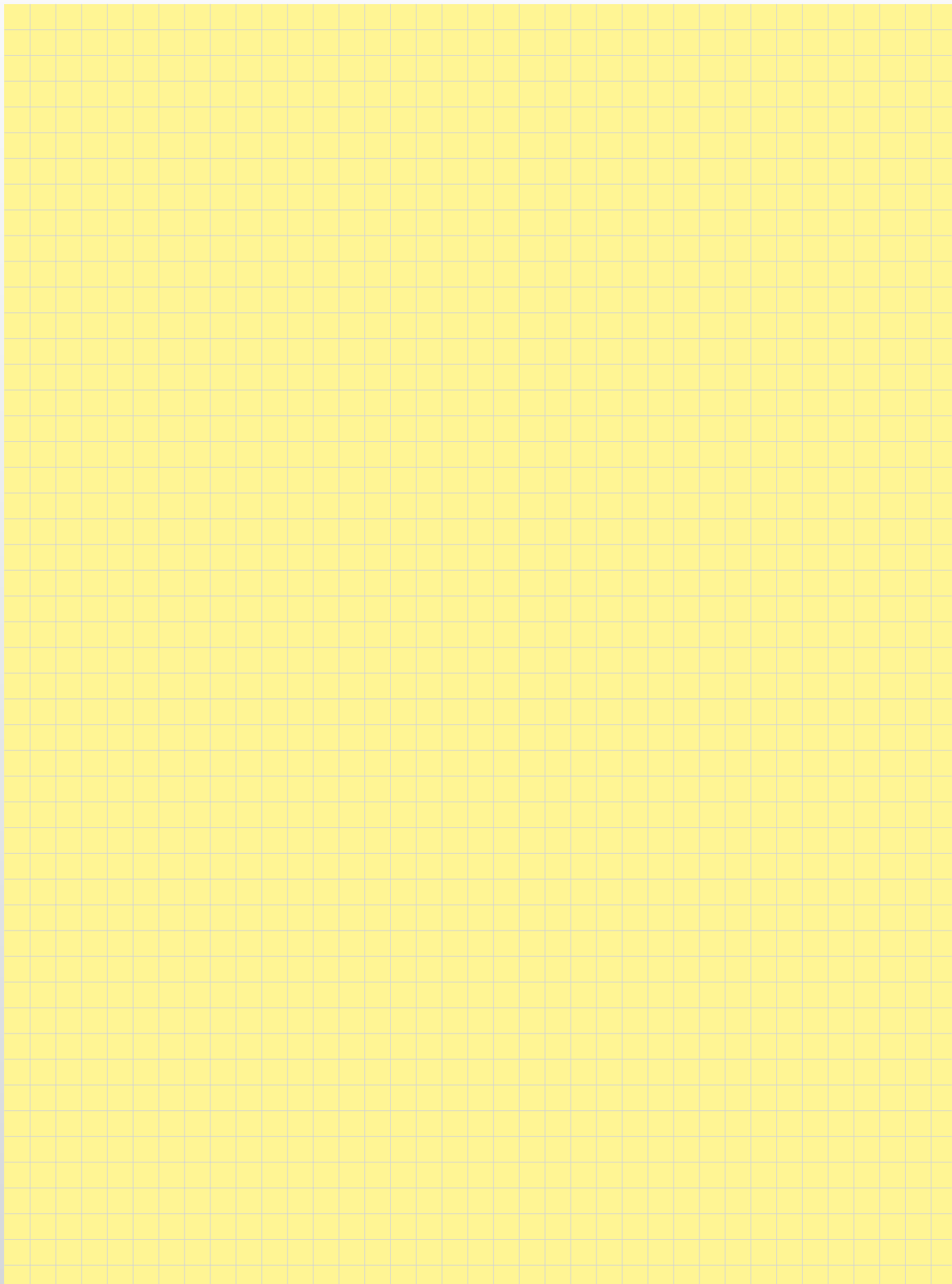
Measured in 50 Ω system according to MIL-STD-220, no load.

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 05.30)

Typical insertion loss for different filters (measured)





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 - F

Number of contacts

9-37



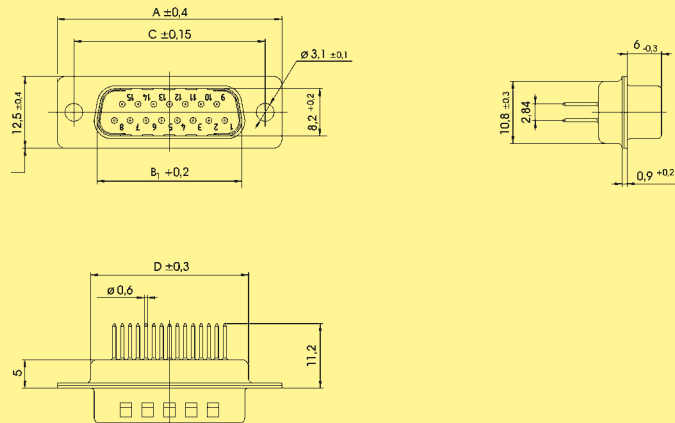
Turned solder pins, straight, through hole

Identification

Drawing

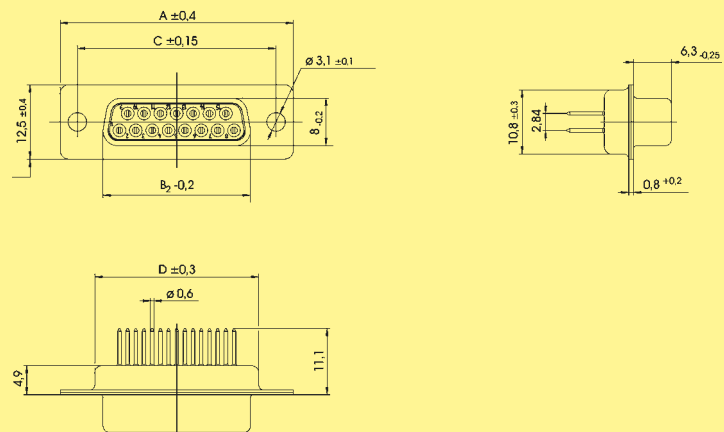
Dimensions in mm

Male connector

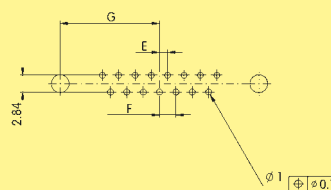


No. of contacts	A	B ₁	B ₂	C	D	E	F	G
9	30.8	16.9	16.4	25.00	19.3	1.37	2.74	12.50
15	39.1	25.2	24.7	33.30	27.5	1.37	2.74	16.65
25	53.0	38.9	38.5	47.04	41.3	1.40	2.77	23.52
37	69.3	55.3	54.9	63.50	57.7	1.40	2.77	31.75

Female connector



Board drillings



D-Sub



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 - F

Number of contacts

9-37



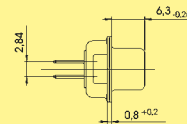
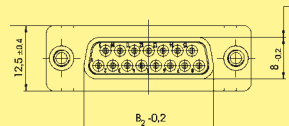
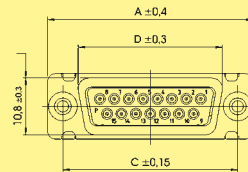
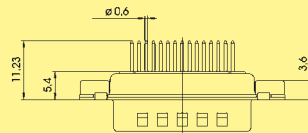
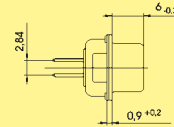
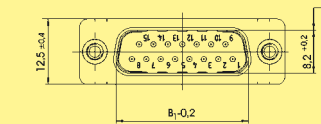
Turned solder pins, straight, clinch nut

Identification

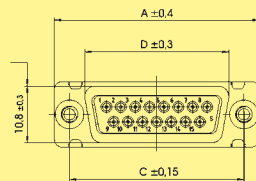
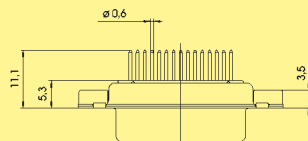
Drawing

Dimensions in mm

Male connector

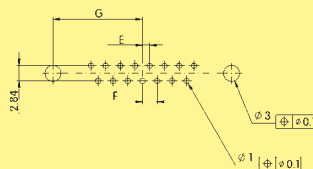


Female connector



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



D-Sub



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 - F

Number of contacts

9-37



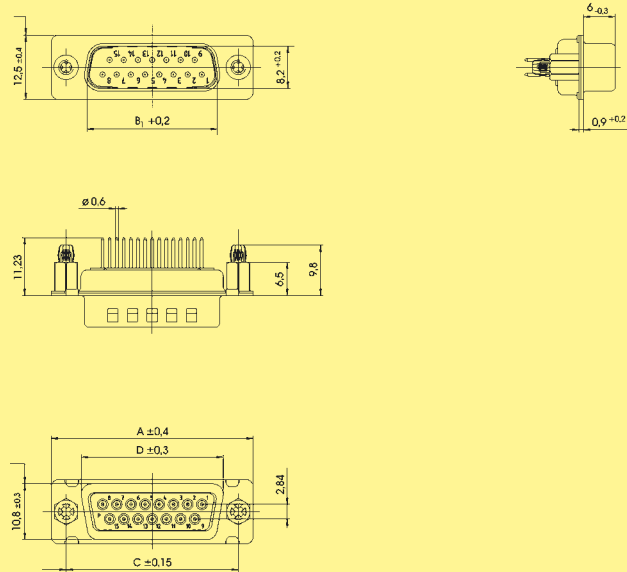
Turned solder pins, straight, straight board clips

Identification

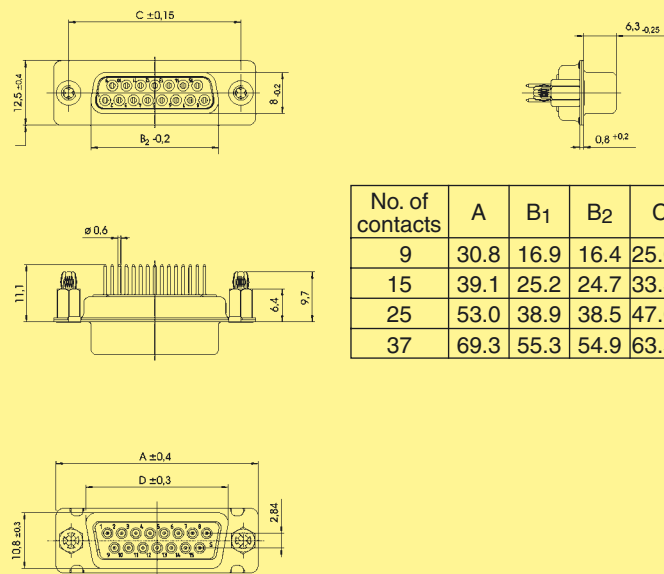
Drawing

Dimensions in mm

Male connector

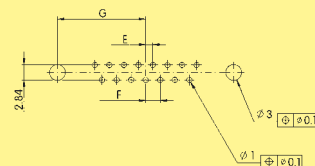


Female connector



No. of contacts	A	B1	B2	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 - F

Number of contacts

9-37



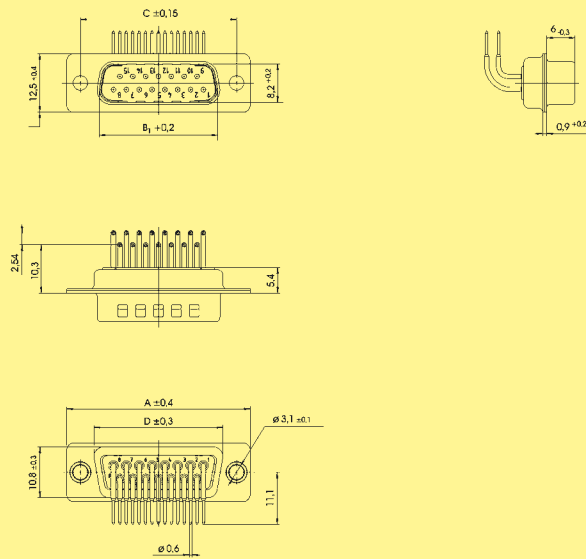
Turned solder pins, right angled, through hole

Identification

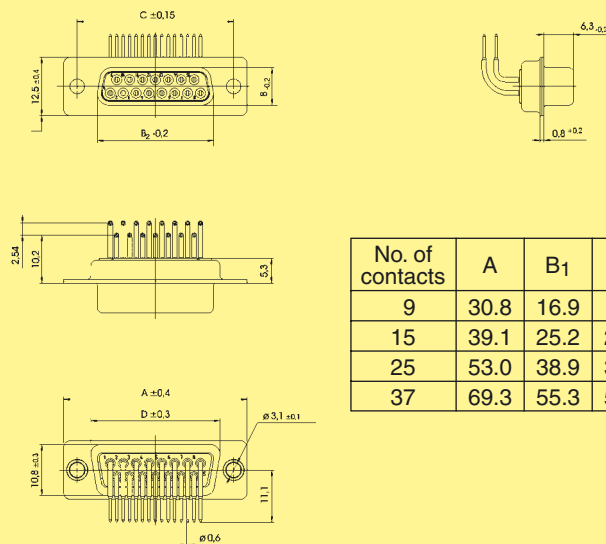
Drawing

Dimensions in mm

Male connector

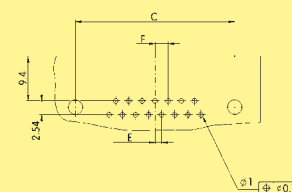


Female connector



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

D-Sub - F

Number of contacts

9-37



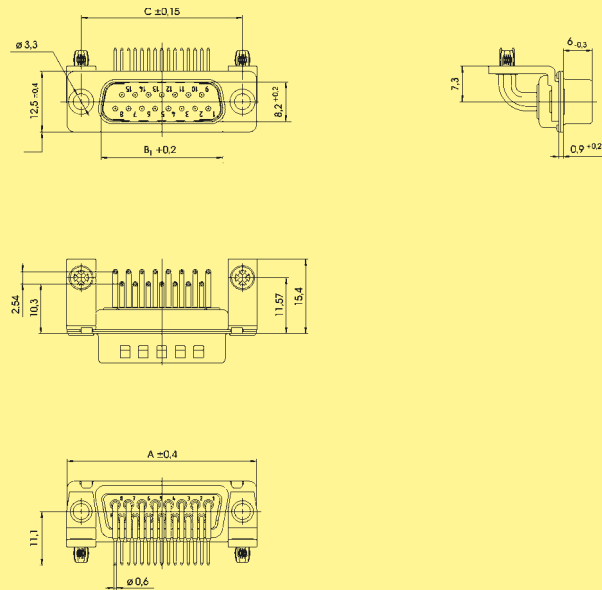
Turned solder pins, right angled, bracket, board lock and through hole

Identification

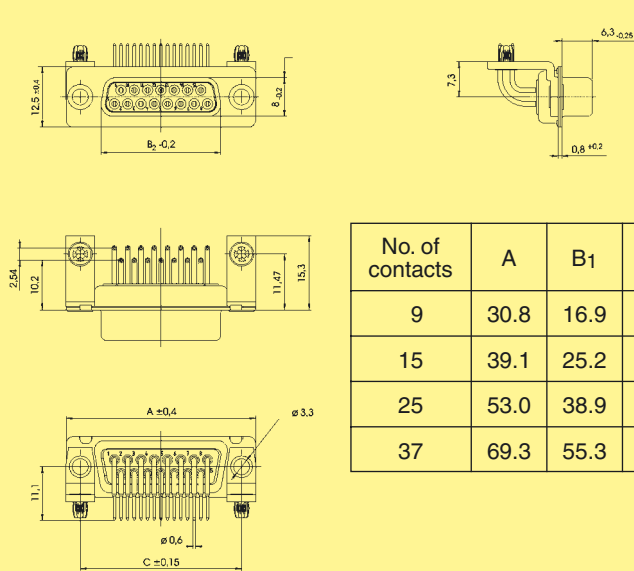
Drawing

Dimensions in mm

Male connector

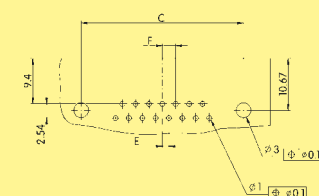


Female connector



No. of contacts	A	B1	B2	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



D-Sub



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 - F

Number of contacts

9-37



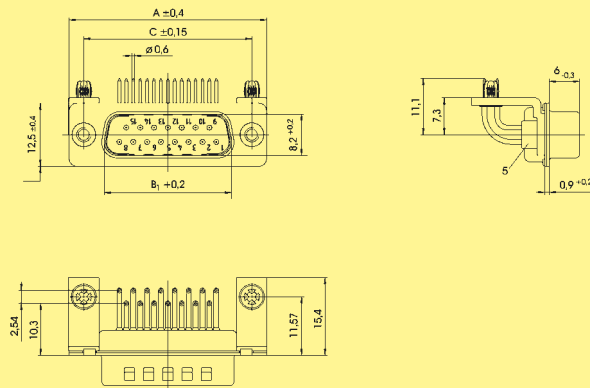
Turned solder pins, right angled, bracket, board lock and clinch nut

Identification

Drawing

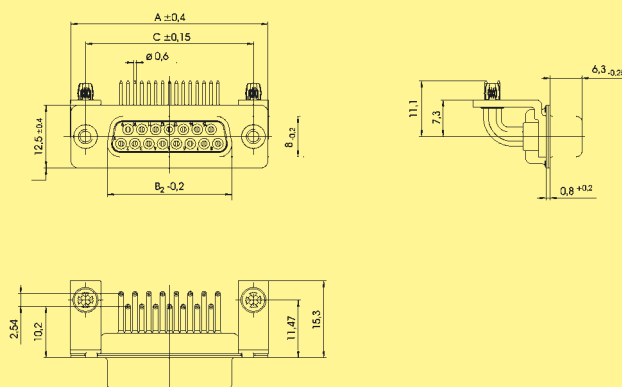
Dimensions in mm

Male connector

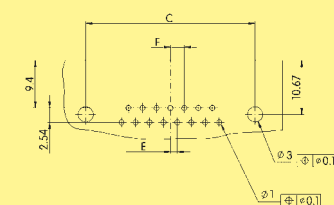


No. of contacts	A	B1	B2	C	E	F
9	30.8	16.9	16.4	25.00	1.37	2.74
15	39.1	25.2	24.7	33.30	1.37	2.74
25	53.0	38.9	38.5	47.04	1.40	2.77
37	69.3	55.3	54.9	63.50	1.40	2.77

Female connector



Board drillings



D-Sub



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 - F

Number of contacts

9-37



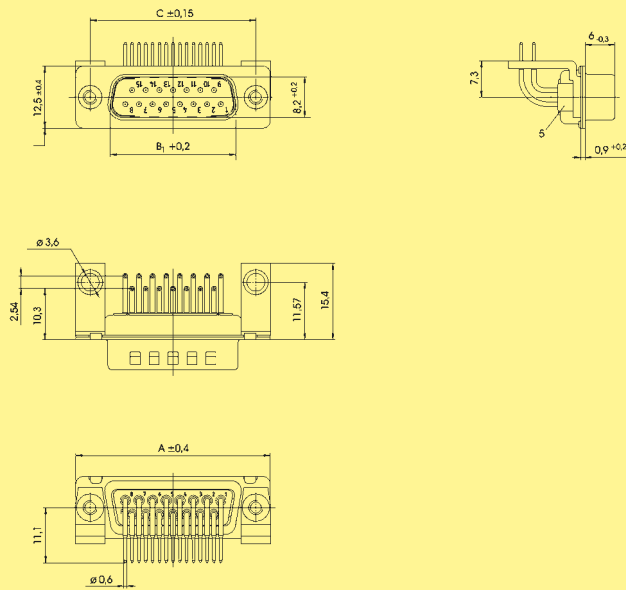
Turned solder pins, right angled, bracket and clinch nut

Identification

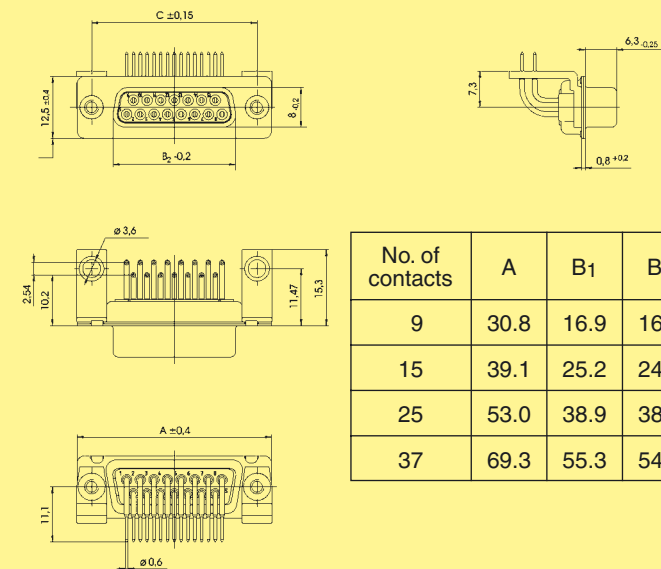
Drawing

Dimensions in mm

Male connector

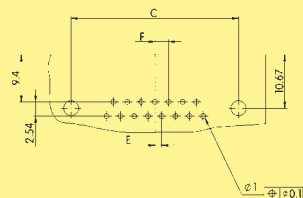


Female connector



No. of contacts	A	B1	B2	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 - F

Number of contacts

9-37



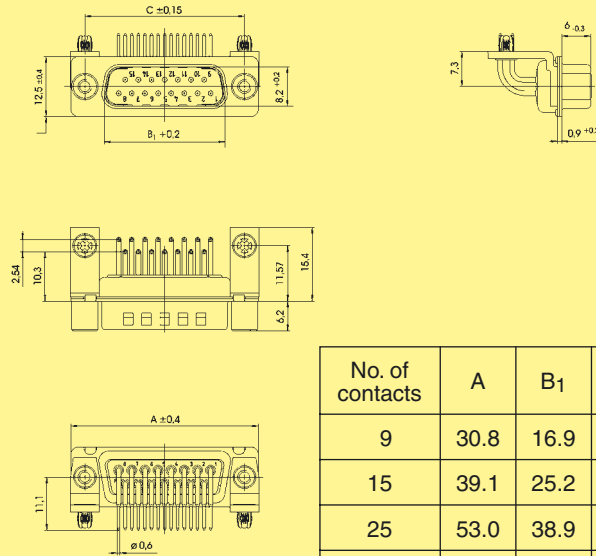
Turned solder pins, right angled, bracket, board lock and female screw

Identification

Drawing

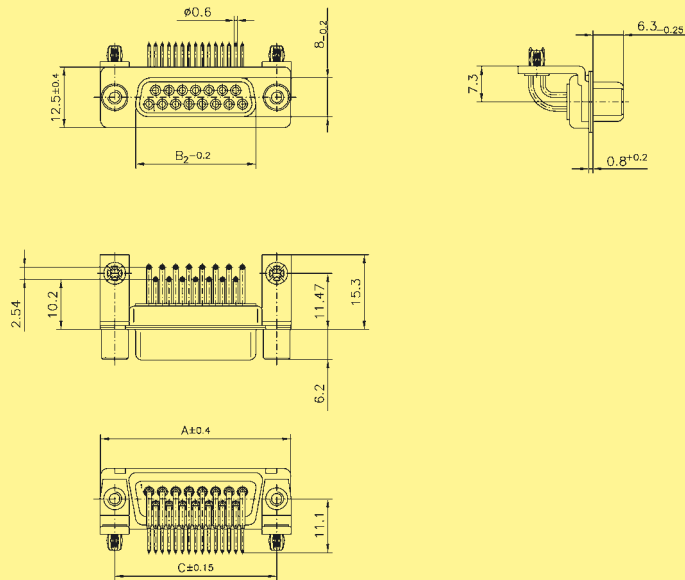
Dimensions in mm

Male connector

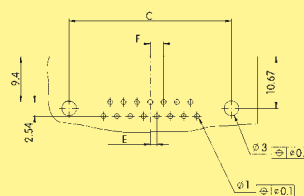


No. of contacts	A	B ₁	B ₂	C	E	F
9	30.8	16.9	16.4	25.00	1.37	2.74
15	39.1	25.2	24.7	33.30	1.37	2.74
25	53.0	38.9	38.5	47.04	1.40	2.77
37	69.3	55.3	54.9	63.50	1.40	2.77

Female connector



Board drillings



D-Sub



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 - F

Number of contacts

9-37



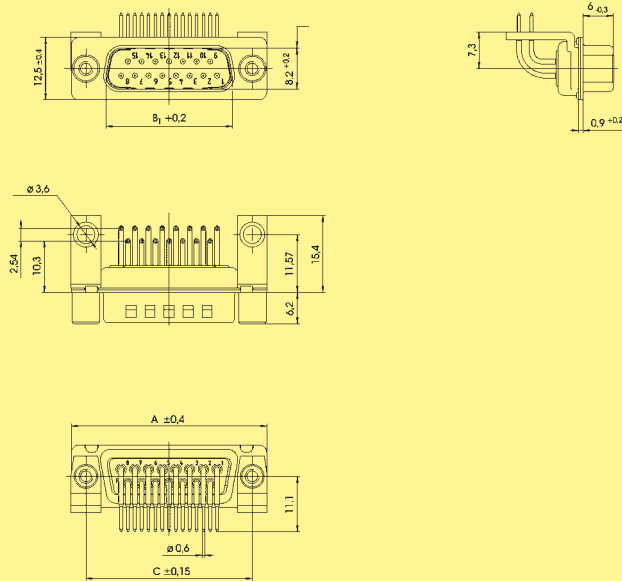
Turned solder pins, right angled, bracket and female screw

Identification

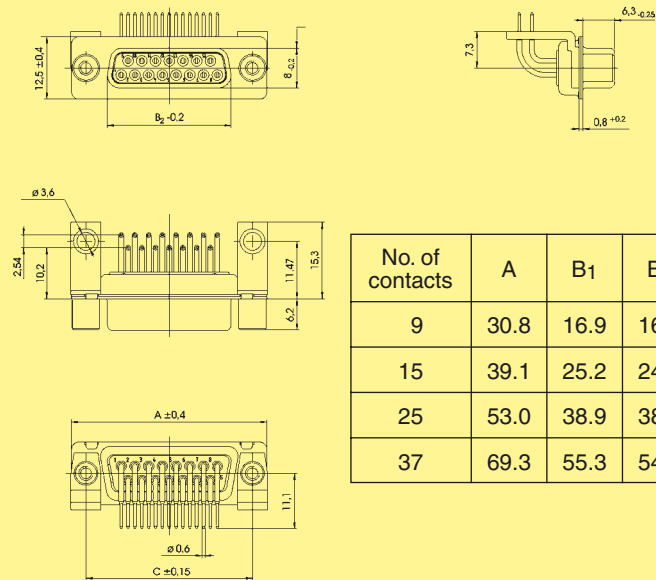
Drawing

Dimensions in mm

Male connector

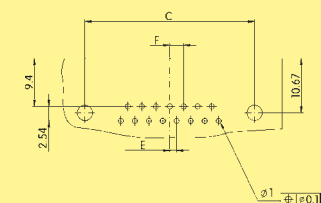


Female connector



No. of contacts	A	B1	B2	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

D-Sub - F

Number of contacts

9-37



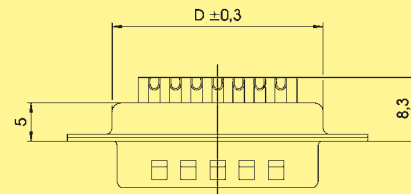
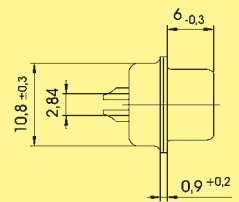
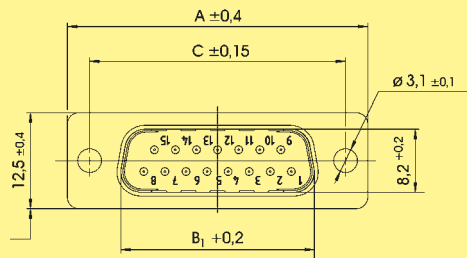
Solder buckets, through hole

Identification

Drawing

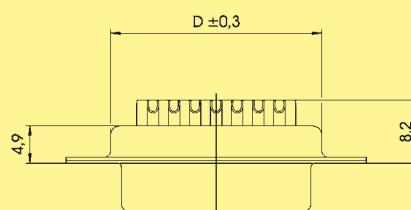
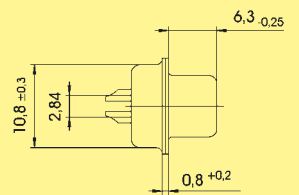
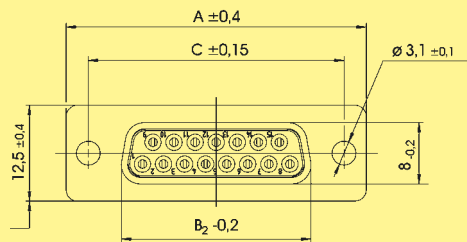
Dimensions in mm

Male connector



No. of contacts	A	B1	B2	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



D-Sub



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 - F

Number of contacts

9-37



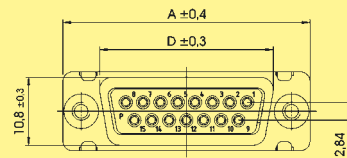
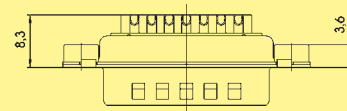
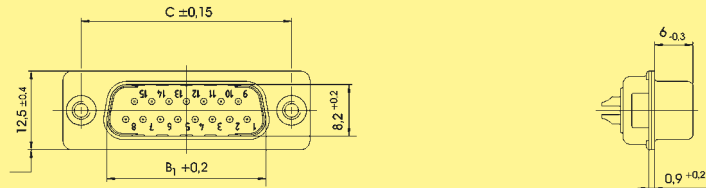
Solder buckets, clinch nut

Identification

Drawing

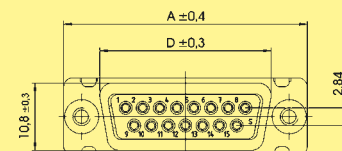
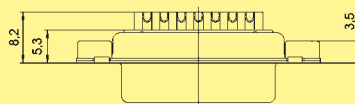
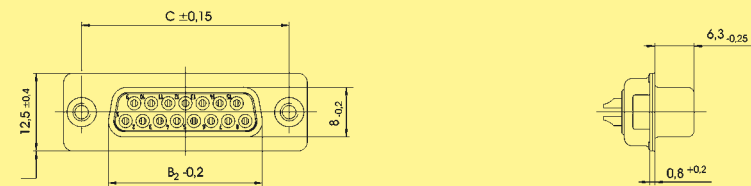
Dimensions in mm

Male connector



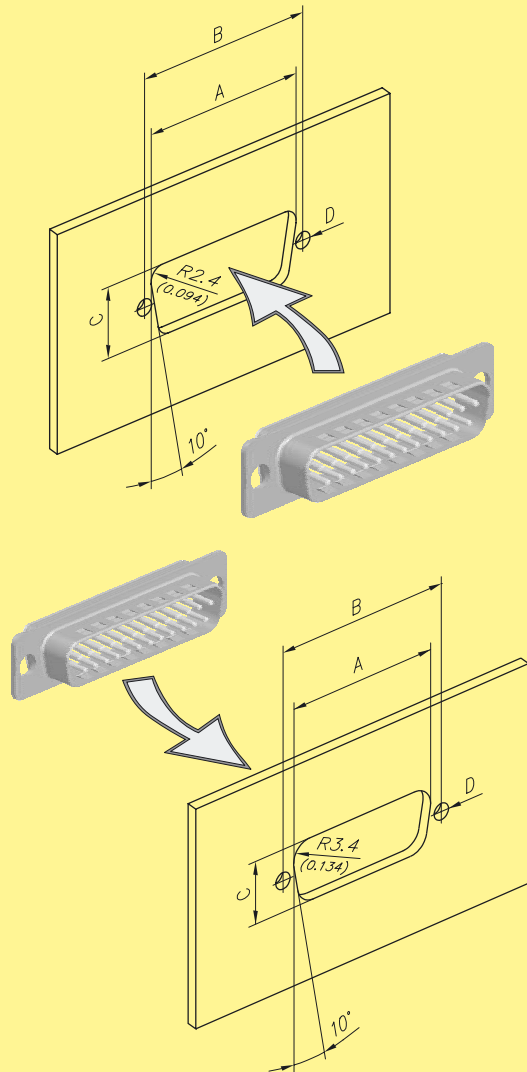
No. of contacts	A	B ₁	B ₂	C	D
9	30.8	16.9	16.4	25.00	19.3
15	39.1	25.2	24.7	33.30	27.5
25	53.0	38.9	38.5	47.04	41.3
37	69.3	55.3	54.9	63.50	57.7

Female connector

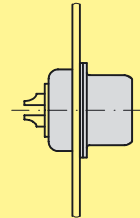


Panel cut outs / panel mountings

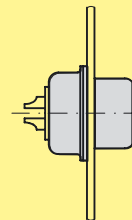
Panel cut outs



Front mounting

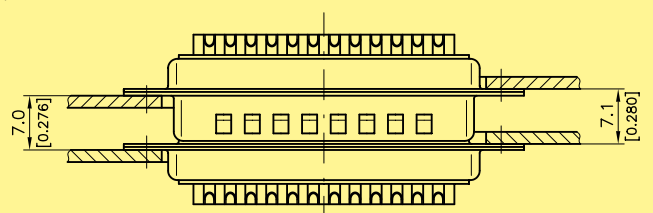
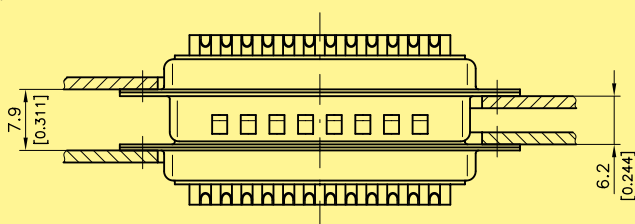


Rear mounting



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



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).

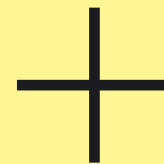
The biggest advantage of the HARTING technology is that multiple filter assemblies can be configured to create different filter designs: C, Pi, L and T types. Since any value of capacitor can be placed on any contact, a wide range of configurations can be built, it is even possible to have an individual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

Furthermore, ***Pi filters can be supplied in a standard connector size shell.*** In addition, protection against lightning 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
- Ferrite filter
- ESD protection
- Lightning 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 05.32 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		32	30	30	200 V DC	500 V DC
33000	1	9	19	29		34	39	32	100 V DC	150 V DC
47000	1	11	23	30		32	35	32	100 V DC	150 V DC
100000	2	18	32	40		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 05.32 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		60	52	48	100 V DC	250 V DC
94000	2	15	32	50		52	48	42	50 V DC	125 V DC
200000	7	21	48	65		52	48	42	16 V DC	25 V DC

Ferrite filter:

Inductance (μH) ¹⁾	Min. insertion loss						
	Attenuation vs. frequency [MHz]						
	1	5	10	50	100	500	1000
0.2	–	–	–	–	2 dB	2 dB	15 dB

¹⁾ Measured at 0.1 V_{rms} @ 1 KHz
Measured in 50 Ω system according to MIL-STD-220, no load.

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	<input type="checkbox"/> Male	<input type="checkbox"/> Female			
	No. of contacts	<input type="checkbox"/> 9	<input type="checkbox"/> 15	<input type="checkbox"/> 25	<input type="checkbox"/> 37	<input type="checkbox"/> 50
	Termination	<input type="checkbox"/> Solder bucket	<input type="checkbox"/> Straight pcb	<input type="checkbox"/> R/A Eur, 2.54 mm	<input type="checkbox"/> R/A US, 2.84 mm	

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

Flange thread and board locking options

Right angled version

<input type="checkbox"/> Through hole	
<input type="checkbox"/> Clinch nut 4-40 UNC	
<input type="checkbox"/> Clinch nut M3	
<input type="checkbox"/> Bracket	
<input type="checkbox"/> Board lock	
<input type="checkbox"/> Female screw lock 4-40 UNC	
<input type="checkbox"/> Female screw lock M3	

Straight version

<input type="checkbox"/> Through hole	
<input type="checkbox"/> Clinch nut 4-40 UNC	
<input type="checkbox"/> Clinch nut M3	
<input type="checkbox"/> Spacer 4-40 UNC	
<input type="checkbox"/> Spacer M3	
<input type="checkbox"/> Female screw lock 4-40 UNC	
<input type="checkbox"/> Spacer 4-40 UNC + board lock	
<input type="checkbox"/> Spacer M3 + board lock	
Spacer + board lock and female screw lock	
<input type="checkbox"/> M3	<input type="checkbox"/> 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: _____

