

PHILIPS

Data handbook



Electronic
components
and materials

Components and materials

Part 10 November 1982

Connectors

COMPONENTS AND MATERIALS

PART 10 - NOVEMBER 1982

CONNECTORS

DATA HANDBOOK SYSTEM

Our Data Handbook System is a comprehensive source of information on electronic components, sub-assemblies and materials; it is made up of four series of handbooks each comprising several parts.

ELECTRON TUBES	BLUE
SEMICONDUCTORS	RED
INTEGRATED CIRCUITS	PURPLE
COMPONENTS AND MATERIALS	GREEN

The several parts contain all pertinent data available at the time of publication, and each is revised and reissued periodically.

Where ratings or specifications differ from those published in the preceding edition they are pointed out by arrows. Where application information is given it is advisory and does not form part of the product specification.

If you need confirmation that the published data about any of our products are the latest available, please contact our representative. He is at your service and will be glad to answer your inquiries.

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May 1980

ELECTRON TUBES (BLUE SERIES)

The blue series of data handbooks is comprised of the following parts:

- T1** Tubes for r.f. heating
- T2** Transmitting tubes for communications
- T3** Klystrons, travelling-wave tubes, microwave diodes
- ET3** Special Quality tubes, miscellaneous devices (will not be reprinted)
- T4** Magnetrons
- T5** Cathode-ray tubes
Instrument tubes, monitor and display tubes, C.R. tubes for special applications
- T6** Geiger-Müller tubes
- T7** Gas-filled tubes
Segment indicator tubes, indicator tubes, dry reed contact units, thyratrons, industrial rectifying tubes, ignitrons, high-voltage rectifying tubes, associated accessories
- T8** Picture tubes and components
Colour TV picture tubes, black and white TV picture tubes, colour monitor tubes for data graphic display, monochrome monitor tubes for data graphic display, components for colour television, components for black and white television and monochrome data graphic display
- T9** Photo and electron multipliers
Photomultiplier tubes, phototubes, single channel electron multipliers, channel electron multiplier plates
- T10** Camera tubes and accessories, image intensifiers
- T11*** Microwave components and assemblies

* Will become available in the course of 1982.

SEMICONDUCTORS (RED SERIES)

The red series of data handbooks is comprised of the following parts:

- S1 Diodes**
Small-signal germanium diodes, small-signal silicon diodes, voltage regulator diodes (< 1,5 W), voltage reference diodes, tuner diodes, rectifier diodes
- S2 Power diodes, thyristors, triacs**
Rectifier diodes, voltage regulator diodes (> 1,5 W), rectifier stacks, thyristors, triacs
- S3 Small-signal transistors**
- S4 Low-frequency power transistors and hybrid IC modules**
- S5 Field-effect transistors**
- S6 R.F. power transistors and modules**
- S7 Microminiature semiconductors for hybrid circuits**
- S8 Devices for optoelectronics**
Photosensitive diodes and transistors, light-emitting diodes, displays, photocouplers, infrared sensitive devices, photoconductive devices.
- S9** Taken into handbook T11 of the blue series
- S10 Wideband transistors and wideband hybrid IC modules**

INTEGRATED CIRCUITS (PURPLE SERIES)

The purple series of data handbooks is comprised of the following parts:

- IC1** Bipolar ICs for radio and audio equipment
- IC2** Bipolar ICs for video equipment
- IC3** ICs for digital systems in radio, audio and video equipment
- IC4** Digital integrated circuits
LOC MOS HE4000B family
- IC5** Digital integrated circuits – ECL
ECL10 000 (GX family), ECL100 000 (HX family), dedicated designs
- IC6*** Professional analogue integrated circuits
- IC7** Signetics bipolar memories
- IC8** Signetics analogue circuits
- IC9** Signetics TTL logic

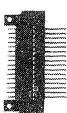
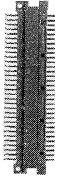

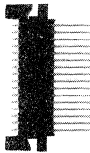
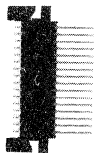
* This handbook will be available by the end of 1982.

COMPONENTS AND MATERIALS (GREEN SERIES)

The green series of data handbooks is comprised of the following parts:



- C1 Assemblies for industrial use**
PLC modules, PC20 modules, HN1L FZ/30 series, NORbits 60-, 61-, 90-series, input devices, hybrid ICs, peripheral devices
- C2 Television tuners, video modulators, surface acoustic wave filters**
- C3 Loudspeakers**
- C4 Ferroxcube potcores, square cores and cross cores**
- C5 Ferroxcube for power, audio/video and accelerators**
- C6 Electric motors and accessories**
Permanent magnet synchronous motors, stepping motors, direct current motors
- C7 Variable capacitors**
- C8 Variable mains transformers**
- C9 Piezoelectric quartz devices**
Quartz crystal units, temperature compensated crystal oscillators, compact integrated oscillators, quartz crystal cuts for temperature measurements
- C10 Connectors**
- C11 Non-linear resistors**
Voltage dependent resistors (VDR), light dependent resistors (LDR), negative temperature coefficient thermistors (NTC), positive temperature coefficient thermistors (PTC)
- C12 Variable resistors and test switches**
- C13 Fixed resistors**
- C14 Electrolytic and solid capacitors**
- C15 Film capacitors, ceramic capacitors**
- C16 Piezoelectric ceramics, permanent magnet materials**

CONNECTORS

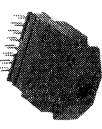




type	type number	pitch mm (in)			number of contacts	IDC	terminations				current at 20°C A	mechanical endurance (insertions)
		2,54 (0,1)	3,81 (0,15)	3,96 (0,156)			5,08 (0,2)	solder tags	dip-solder pins	pins for wire wrapping		
TWO-PART PRINTED-WIRING CONNECTORS												
	F054*	•			32, 48, 64 (double row)		•	•	•		3,5	300
	F068-I	•			32, 64 (style B) 32 (style C) 64, 96 (style C)	•	•	•	•		2	50 (perf. class 3) 400 (perf. class 2) 500 (perf. classes 1 and 1a)
	F068-II				32, 48 (style F) 64 (style G)		•		•		5,5	400
	F080		•		32, 42 (double row)				•		2,5	500
	F081	•			48, 64 (double row)				•		2	500

* Maintenance type.

CONNECTORS

type	type number	pitch mm (in)			number of contacts	terminations			current at 20 °C A	mechanical endurance (insertions)
		2,54 (0,1)	3,81 (0,15)	3,96 (0,156)		5,08 (0,2)	solder tags	dip-solder pins		
TWO-PART JUMPER CONNECTOR										
	F088*				2				3	150
MODULAR CONNECTOR SYSTEM										
	F095				board edge socket: 2 to 32 (single row) 4 to 130 (double row) panel socket: 2 to 32 (single row) 4 to 100 (double row) bottom-entry socket: 2 to 32 (single row) 4 to 20 (double row) mounting block for contact pins: 8, 16, 20 (double row) male header, straight pins: 2 to 32 (single row) 4 to 64 (double row) male header, 90° angled pins: 2 to 32 (single row) 4 to 64 (double row) male header, 90° angled pins: 4 to 60 (double row) jumper: 2 (inter-connected)			3	300	
									3	300
									3	300
									2	200
									2	50

* Maintenance type.

type	type number	pitch mm (in)	number of contacts	terminations				current at 20 °C A	mechanical endurance (insertions)
				IDC solder tags or pins	dip-solder pins	wire wrapping	crimp-contacts		
TEST CONNECTOR ASSEMBLY									
	F120	3,175 (0,125)	8, 16 (double row)	•	•		2,2	500	
RACK AND PANEL CONNECTORS									
	F121	3	16, 32, 48 (double row)	•	•	•	2,5	500	
SUBMINIATURE RACK AND PANEL CONNECTORS									
	F161		9, 15, 25, 37, 50	•	•	•	7,5	500	
RIBBON CABLE CONNECTOR SYSTEM									
	F303	2,54 (0,1)	10, 14, 16, 20, 26, 34, 40, 50, 60, 64 (double row)	•	•	•	1	200	
CABLE ASSEMBLY									
	F501		25				1,5	500	

CONVERSION LIST

The table below gives the 12-digit catalogue numbers of the connectors and their accessories, mentioned in this Handbook, and the corresponding type numbers where the data can be found.

catalogue number	type number	catalogue number	type number
0712 150 0	F303; cable with stranded wires	2422 049	F081
0712 236 0	F303; cable with solid wires	2422 050	F080
2422 020 5	F045	2422 062 0	F095; panel sockets
2442 024 88003	F088; female plug	2422 062 1	F095; board edge sockets
2422 025 8801 .	} F121	2422 062 4	} F095; male headers with straight pins
2422 025 8802 .		2422 062 5	
2422 025 88031		2422 062 6	F095; male headers with 90° angled pins
2422 025 88032 up to		} F068-II	2422 062 7
2422 025 88059	2422 062 8		F095; male headers with 90° angled pins
2422 025 8809 .	2422 062 9		F095, jumpers
2422 025 881 . .	F054	2422 062 97 . . .	F501; cable assembly
2422 025 891 . .	} F068-I	2422 606 0000 .	F501; fixing screw
2422 025 89283 up to		2422 606 00051	2422 606 0
2422 025 89405	F088; mounting strip	2422 606 1	F161; connectors with IDC
2422 025 89303	F121	2422 606 29 . . .	} F161; connectors with solder cups
2422 025 89458	} F068-1	2422 606 2	
2422 025 89542 up to		2422 606 3	2422 606 4
2422 025 89546	} F068-I; accessories	2422 606 5	} F161; connectors with 90° angled dip-solder pins
2422 025 89574		2422 606 6	
2422 025 89575	} F068-I	2422 606 7	} F303; male headers
2422 025 89578 up to		2422 606 8	
2422 025 89735	F046	2422 606 9	F303; accessories
2422 036 6	F050	2422 606 96 . . .	F303; cable connectors
2422 037 8	F047	2432 022 100 . .	F303; strain reliefs
2422 037 7	connectors with	2432 022 101 . .	F303; PB transition connectors
2422 039 0	F053; pins for wire wrapping	2432 022 1900 .	
2422 044 0	F053; connectors with dip solder pins	2432 022 200 . .	
		2432 022 290 . .	
		2432 022 411 . .	

CONNECTORS

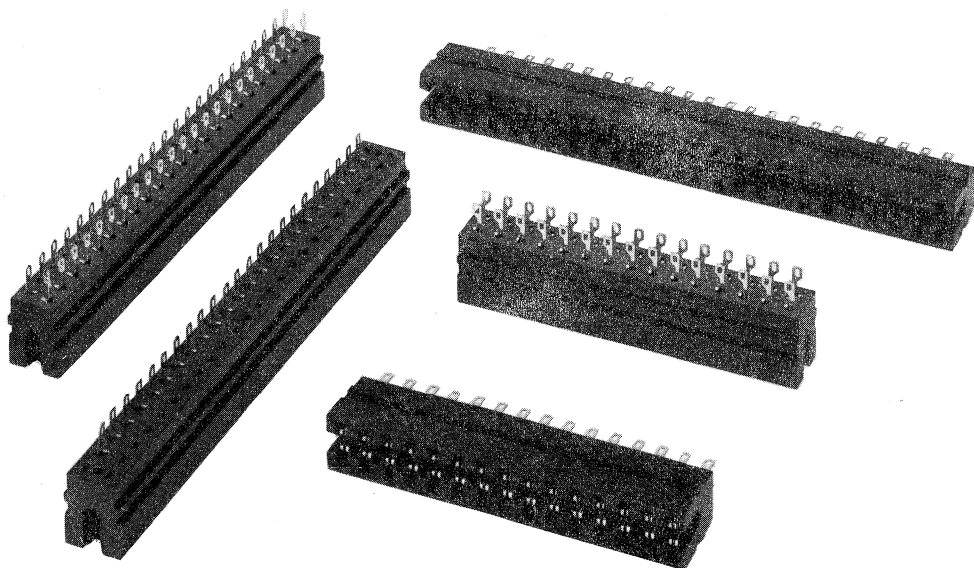
catalogue number	type number	catalogue number	type number
2432 022 421 ..	F303; DIS mini connectors	4332 026 224 ..	F161; connectors for crimp-on snap-in connections
2432 022 431 ..	F303; DIS connectors	4332 026 225 ..	F161; tools
2432 022 441 ..	F303; DIP connectors	4332 026 23 ...	} F161; accessories
2432 022 900 ..	} Insulation displacement tools	4332 026 24 ...	
2622 540 09 ...		} F161; tools	4332 026 25 ...
2622 540 10 ...			
3522 201 65250	} F121; cable clamps	4332 026 260 ..	
3522 201 65260			
3522 201 66440	} F120; mounting brackets	4332 026 269 ..	F161; tools
3522 201 70460			
3522 202 08940	} F080; F081; accessories	4332 026 28030	} F095; mounting block for pins
3522 202 15230		4332 026 28040	
3522 202 15240			
4322 027 58 ...	} F120	4332 026 288 ..	} F068-I; accessories
4322 027 59 ...			
4322 027 7 ...	F121; cable hoods	4332 026 29 ...	
4322 027 73750	F095; mounting block for pins	4332 026 30 ...	
4332 026 04630	} F045; accessories		
4332 026 04740			
4332 026 04750			
4332 026 04760			
4332 026 04770			
4332 026 06540	F046; accessories		
4332 026 06550	F046; F047; F050, F053; accessories		
4332 026 06560	F046; accessories		
4332 026 11110	F045; accessories		
4332 026 16770	F088; contact pin		
4332 026 19 ...	F161; crimp contacts		

PRINTED-WIRING CONNECTORS

- 5,08 mm (0,2 in) pitch

QUICK REFERENCE DATA

Contact pitch	5,08 mm (0,2 in)
Number of contacts	1 to 54
single row	2 to 108
double row	
Board thickness	1,42 to 1,78 mm
Terminations	solder tags
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	4,5 A
Mechanical endurance	300 insertions
Climatic category (IEC 68)	25/085/21



APPLICATION

For use in telecommunication, data processing and industrial equipment.

DESCRIPTION

The connectors have a moulded body of black, tropic-proof thermosetting phenolic resin. The contact springs are of phosphor bronze; they are bifurcated to provide a double contact and are removable. The contact surfaces are gold plate on nickel plate.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	4,5 A
Derated current curve	according to IEC 512, test 5b, see Fig. 1
<p>Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz. Measured outside the body:</p> <ul style="list-style-type: none"> initially $\leq 12\text{ m}\Omega$ after mechanical endurance $\leq 12\text{ m}\Omega$ after damp heat test $\leq 14\text{ m}\Omega$ 	
<p>Insulation resistance</p> <ul style="list-style-type: none"> initially $> 10^4\text{ M}\Omega$ after damp heat test $> 10^2\text{ M}\Omega$ 	
Creepage distance between contacts	$\geq 2,6\text{ mm}$
Clearance between contacts	$\geq 0,5\text{ mm}$
<p>Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$</p> <ul style="list-style-type: none"> between adjacent or opposite contacts 1000 V (r.m.s.), 50 Hz between a contact and earth 1000 V (r.m.s.), 50 Hz 	
Capacitance between contacts at 1 kHz	$\leq 1\text{ pF}$

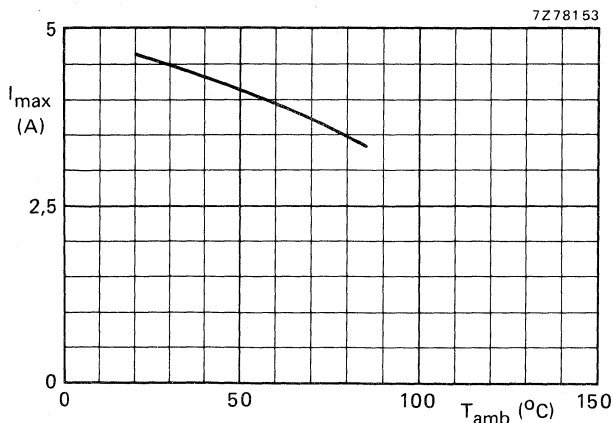


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	5,08 mm (0,2 in)
Number of contacts	
single row	1 to 54
double row	2 to 108
Board thickness	1,42 to 1,78 mm
Polarization	by means of a polarizing key
Mechanical endurance	300 insertions
Connector body material	tropic-proof phenolic resin
Contact springs	
material	phosphor bronze
shape	bifurcated
finish of contact surfaces	gold plate on nickel plate
contact force	≥ 1 N
type of terminations	solder tag
finish of terminations	gold flash
Solderability	235 °C, 2 s, according to IEC 512, test 12a
Resistance to soldering heat	350 °C, 10 s, according to IEC 512, test 12d
Shock	according to IEC 512, test 6c, 50g, 11 ms
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 0,75 mm (p-p) or 10 g, 3 directions, 6 h per direction

ENVIRONMENTAL DATA

Climatic category (IEC 68)	25/085/21
Ambient temperature range	-25 to + 85 °C
Damp heat, steady state	according to IEC 512, test 11c, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V-0

DIMENSIONAL DATA

Dimensions in mm

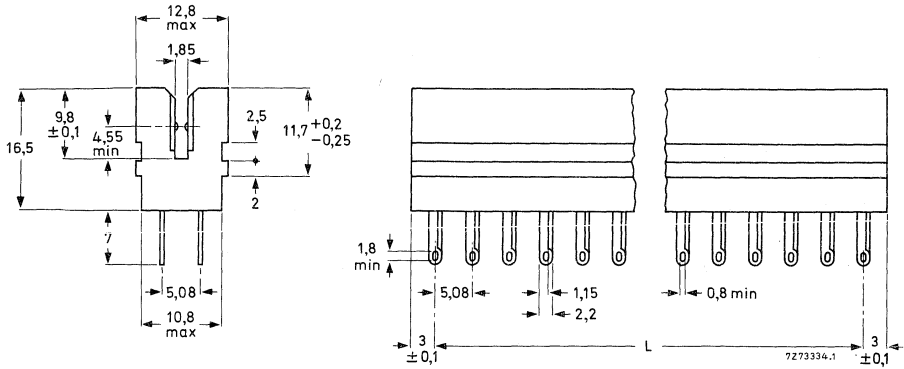


Fig. 2 Double row connector. See Table 1 for dimension L. For the single row version, one row of contact springs is omitted.

Table 1

number of contacts		L		catalogue number	
single row	double row	L _{nom}	tol.	single row	double row
3	6	10,16	± 0,20	2422 020 50302	2422 020 50312
4	8	15,24		50402	50412
5	10	20,32		50502	50512
6	12	25,40		50602	50612
7	14	30,48		50702	50712
8	16	35,56		50802	50812
9	18	40,64		50902	50912
10	20	45,72		51002	51012
11	22	50,80		51102	51112
12	24	55,88		51202	51212
13	26	60,96	± 0,30	51302	51312
14	28	66,04		51402	51412
15	30	71,12		51502	51512
16	32	76,20		51602	51612
17	34	81,28		51702	51712
18	36	86,36		51802	51812
19	38	91,44		51902	51912
20	40	96,52		52002	52012
21	42	101,60		52102	52112
22	44	106,68		52202	52212
23	46	111,76	± 0,40	52302	52312
24	48	116,84		52402	52412
25	50	121,92		52502	52512

Table 1 (continued)

number of contacts		L		catalogue number	
single row	double row	L _{nom}	tol.	single row	double row
26	52	127,00	± 0,40	2422 020 52602	2422 020 52612
27	54	132,08		52702	52712
28	56	137,16		52802	52812
29	58	142,24		52902	52912
30	60	147,32		53002	53012
31	62	152,40		53102	53112
32	64	157,48		53202	53212
33	66	162,56		53302	53312
34	68	167,64		53402	53412
35	70	172,72		53502	53512
36	72	177,80		53602	53612
37	74	182,88		53702	53712
38	76	187,96		53802	53812
39	78	193,04		53902	53912
40	80	198,12		54002	54012
41	82	203,20		54102	54112
42	84	208,28	54202	54212	
43	86	213,36	54302	54312	
44	88	218,44	54402	54412	
45	90	223,52	54502	54512	
46	92	228,60	54602	54612	
47	94	233,68	54702	54712	
48	96	238,76	54802	54812	
49	98	243,84	54902	54912	
50	100	248,92	55002	55012	
51	102	254,00	55102	55112	
52	104	259,08	55202	55212	
53	106	264,16	55302	55312	
54	108	269,24	55402	55412	

For ordering see page 9. ←

Note

In view of the use of mounting brackets, all connectors given in Table 1 can also be supplied without contacts at the ends. For ordering these versions, replace last digit of the catalogue number by 4.

MOUNTING

Mounting brackets

For mounting brackets to be used with connector F045, see Table 2.

Table 2

mounting application	mounting bracket		catalogue number
	according to Fig.	material	
rail or panel	3	thermoplastic	4332 026 11110
rail or panel	5	metal	4332 026 04760
panel	7	metal	4332 026 04750*
panel	9 and 10	metal	4332 026 04630* (bracket) and 4332 026 04770* (end piece)

➔ For ordering see page 9.

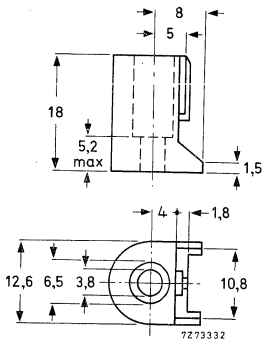


Fig. 3 Thermoplastic mounting bracket 4332 026 11110.

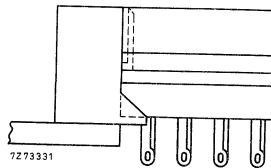


Fig. 4 Part-view, showing mounting bracket in position.

* Only to be used with connectors without end contacts.

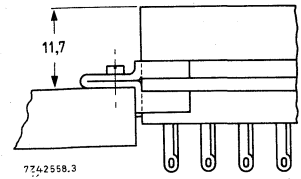
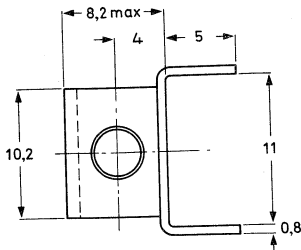


Fig. 6 Part view, showing mounting bracket in position.

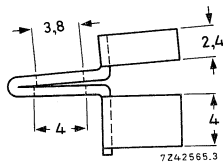


Fig. 5 Metal mounting bracket 4332 026 04760.

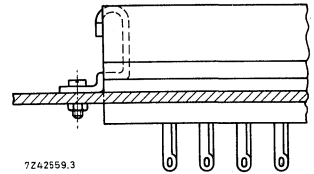
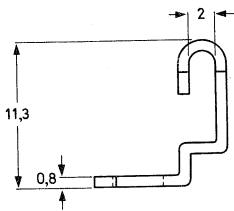


Fig. 8 Part view, showing mounting bracket in position.

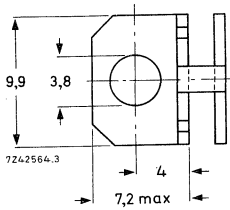


Fig. 7 Metal mounting bracket 4332 026 04750.

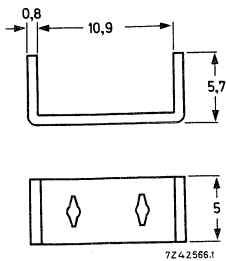


Fig. 9 Metal mounting bracket 4332 026 04630.

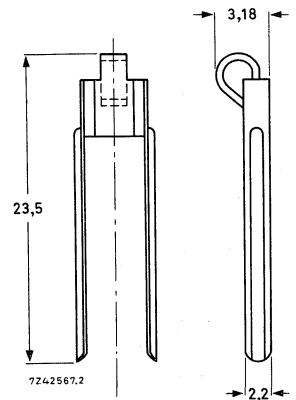


Fig. 10 End piece 4332 026 04770.



Fig. 11 Part views, showing mounting bracket and end piece in position.

Piercing diagrams

In Figs 12 and 13, piercing diagrams are given for connectors with mounting brackets as shown in Figs 3 to 11.

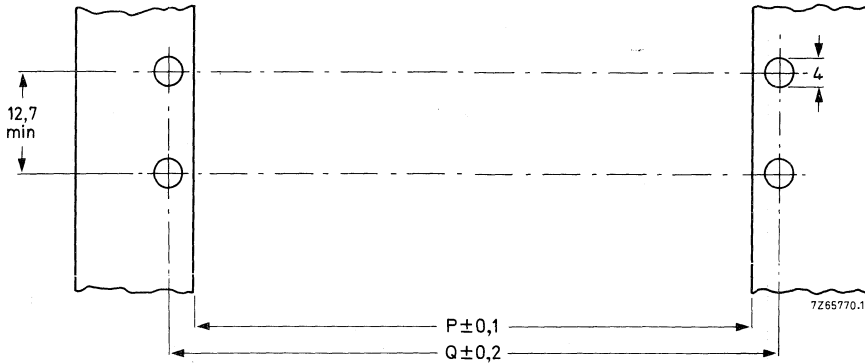


Fig. 12 Piercing diagram for rail mounting; see Table 3 for dimensions P and Q.

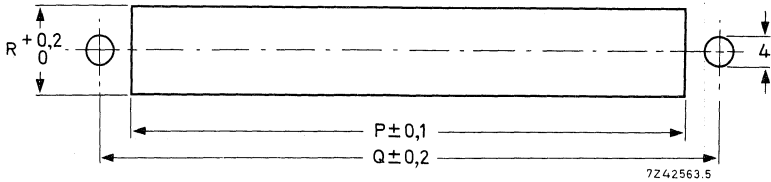


Fig. 13 Piercing diagram for panel mounting; see Table 3 for dimensions P, Q and R. If bracket 4332 026 04630 and end piece 4332 026 04770 are used the circular holes are superfluous.

Table 3

bracket used	dimensions (mm)		
	P	Q	R
4332 026 11110	$L_{max} + 6,2$	$L_{nom} + 14$	11,0
04760	$L_{max} + 7,8$	$L_{nom} + 14$	12,8
04750	$L_{max} + 6,2$	$L_{nom} + 14$	11,0
04630	$L_{max} + 6,2$	$L_{nom} + 14$	11,0
04770			

See Table 1 for L_{nom} and L_{max} .

Printed-wiring board recommendations

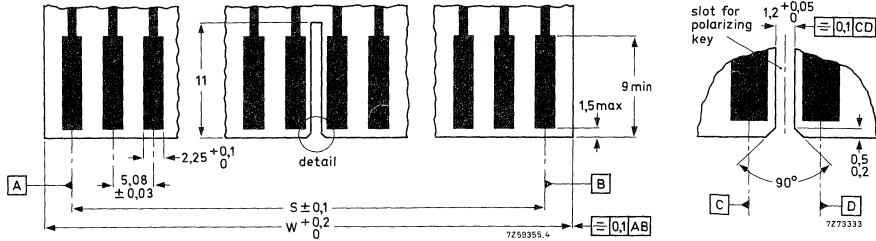


Fig. 14 Recommended dimensions of the printed-wiring board; see Table 4 for dimensions S and W.

Table 4

bracket used	dimensions (mm)	
	S	W
4332 026 11110	L_{nom}	$L_{min} + 1,9$
04760	L_{nom}	$L_{min} + 5,5$
04750	$L_{nom} - 10,16$	$L_{min} - 0,1$
04630	$L_{nom} - 10,16$	$L_{min} - 0,15$
04770		

See Table 1 for L_{nom} and L_{min} .

POLARIZATION AND POSITIONING

A thermoplastic key (Fig. 15) inserted in a slot between any two adjacent contacts ensures that a printed-wiring board is correctly polarized in its connector. This method involves no loss of contacts. A slot must be made in the printed-wiring board to receive the key (Fig. 14).

The same key is also recommended for positioning of the board when using connectors with more than 35 contacts (single row) or 70 contacts (double row). In this case the slot in the printed-wiring board should be near the centre.

Catalogue number of polarizing key: 4332 026 04740.

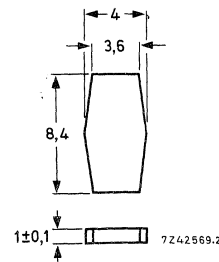


Fig. 15 Polarizing key.

MARKING

The package is marked with:
 12-digit catalogue number;
 reference number of manufacturer;
 number of pieces.

ORDERING

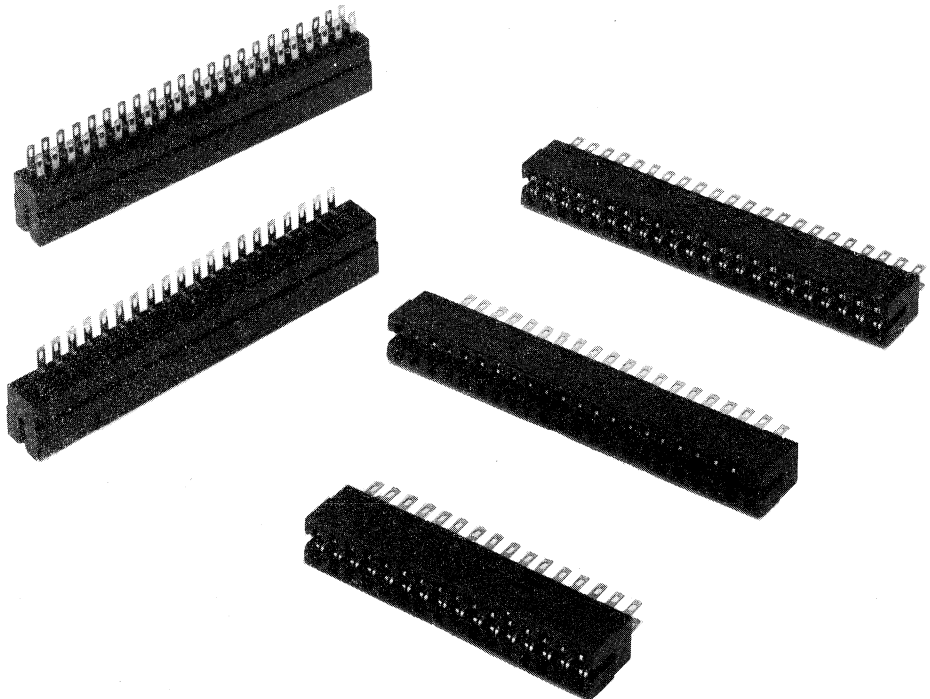
Order the connectors and accessories by quoting the 12-digit catalogue number as shown in Tables 1 and 2. Note that the catalogue number applies to one piece, and take into account the minimum order quantity of 100.

PRINTED-WIRING CONNECTORS

• 3,81 mm (0,15 in) pitch

QUICK REFERENCE DATA

Contact pitch	3,81 mm (0,15 in)
Number of contacts	4 to 45
single row	8 to 90
double row	1,42 to 1,78 mm
Board thickness	solder tags
Terminations	4,5 A
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	300 insertions
Mechanical endurance	25/085/21
Climatic category (IEC 68)	



APPLICATION

For use in telecommunication, data processing and industrial equipment.

DESCRIPTION

The connectors have a moulded body of black, tropic-proof thermosetting phenolic resin. The contact springs are of phosphor bronze; they are bifurcated to provide a double contact and are removable. The contact surfaces are gold plate on nickel plate.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$

4,5 A

Derated current curve

according to IEC 512,
test 5b, see Fig. 1

Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz.

Measured outside the body:

initially

$\leq 10\text{ m}\Omega$

after mechanical endurance

$\leq 10\text{ m}\Omega$

after damp heat test

$\leq 12\text{ m}\Omega$

Insulation resistance

initially

$> 10^4\text{ M}\Omega$

after damp heat test

$> 10^2\text{ M}\Omega$

Creepage distance between contacts

$\geq 1,8\text{ mm}$

Clearance between contacts

$\geq 0,4\text{ mm}$

Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$

between contacts

1000 V (r.m.s.), 50 Hz

between a contact and earth

1000 V (r.m.s.), 50 Hz

Capacitance between contacts at 1 kHz

$\leq 2\text{ pF}$

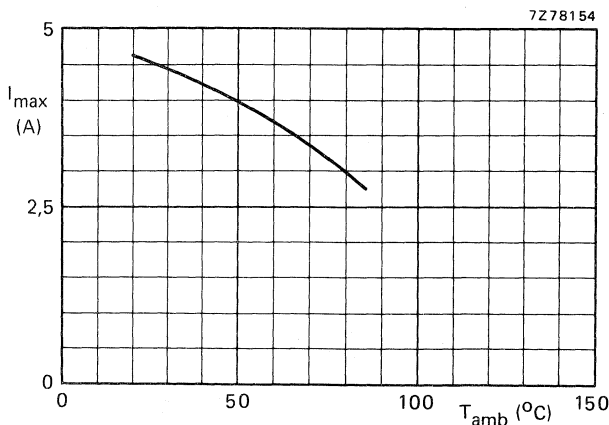


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	3,81 mm (0,15 in)
Number of contacts	
single row	4 to 45
double row	8 to 90
Board thickness	1,42 to 1,78 mm
Polarization	by means of a polarizing key (Fig. 10)
Mechanical endurance	300 insertions
Connector body material	tropic-proof phenolic resin
Contact springs	
material	phosphor bronze
shape	bifurcated
finish of contact surfaces	gold plate-on nickel plate
contact force	≥ 0,8 N
type of termination	solder tag
finish of termination	gold flash
Solderability	235 °C, 2 s, according to IEC 512, test 12a
Resistance to soldering heat	350 °C, 10 s, according to IEC 512, test 12d
Shock	according to IEC 512, test 6c, 50g, 11 ms
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 0,75 mm (p-p) or 10g, 3 directions, 6 h per direction

ENVIRONMENTAL DATA

Climatic category (IEC 68)	25/085/21
Ambient temperature range	-25 to + 85 °C
Damp heat, steady state	according to IEC 512, test 11c, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V-0

DIMENSIONAL DATA

Dimensions in mm

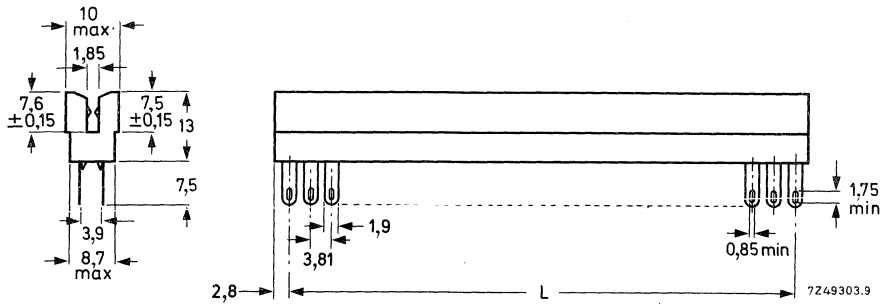


Fig. 2 Double row connector. See Table 1 for dimension L. For the single row version, one row of contact springs is omitted.

Table 1

number of contacts		L		catalogue number	
single row	double row	L _{nom}	tolerance	single row	double row
6	12	19,05	± 0,15	2422 036 60602	2422 036 60612
7	14	22,86		60702	60712
8	16	26,67		60802	60812
9	18	30,48		60902	60912
10	20	34,29		61002	61012
11	22	38,10		61102	61112
12	24	41,91		61202	61212
13	26	45,72		61302	61312
14	28	49,53		61402	61412
15	30	53,34		61502	61512
16	32	57,15	61602	61612	
17	34	60,96	61702	61712	
18	36	64,77	61802	61812	
19	38	68,58	61902	61912	
20	40	72,39	62002	62012	
21	42	76,20	62102	62112	
22	44	80,01	62202	62212	
23	46	83,82	62302	62312	
24	48	87,63	62402	62412	
25	50	91,44	62502	62512	
26	52	95,25	62602	62612	
27	54	99,06	62702	62712	
28	56	102,87	62802	62812	
29	58	106,68	62902	62912	
30	60	110,49	63002	63012	
31	62	114,30	63102	63112	
32	64	118,11	63202	63212	
33	66	121,92	63302	63312	
34	68	125,73	63402	63412	
35	70	129,54	63502	63512	
36	72	133,35	63602	63612	
37	74	137,16	63702	63712	
38	76	140,97	63802	63812	
39	78	144,78	63902	63912	
40	80	148,59	64002	64012	
41	82	152,40	64102	64112	
42	84	156,21	64202	64212	
43	86	160,02	64302	64312	
44	88	163,83	64402	64412	
45	90	167,64	64502	64512	

For ordering, see page 8.

Note

In view of the use of mounting brackets, all connectors given in the table can also be supplied without contacts at the ends. For ordering these versions, replace last digit of the catalogue number by 4.

MOUNTING

Mounting brackets

Two types of brackets for rail or panel mounting are available:

- thermoplastic bracket, catalogue number 4332 026 06560 (Figs 3 and 4);
- metal bracket, catalogue number 4332 026 06540 (Figs 5 and 6).

→ For ordering, see page 8.

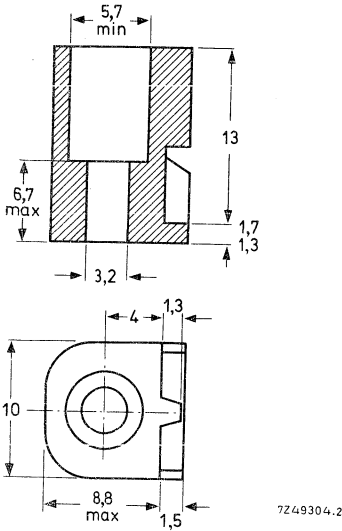


Fig. 3 Thermoplastic mounting bracket
4332 026 06560.

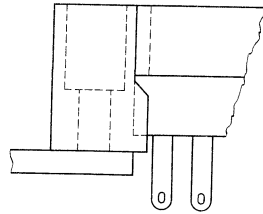


Fig. 4 Part view, showing mounting
bracket in position.

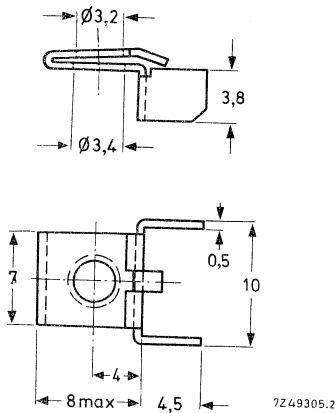


Fig. 5 Metal mounting bracket
4332 026 06540.

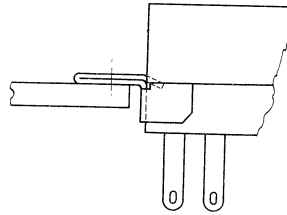


Fig. 6 Part view, showing mounting
bracket in position.

Piercing diagrams

In Figs 7 and 8, piercing diagrams are given for connectors with mounting brackets as shown in Figs 3 and 5.

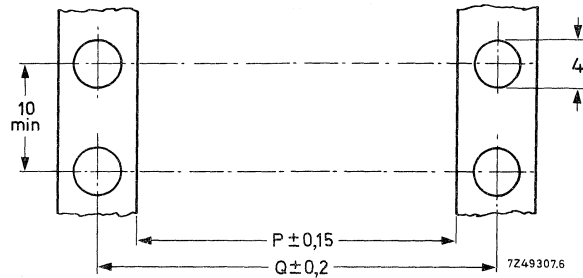


Fig. 7 Piercing diagram for rail mounting; $P = L_{\max} + 7$ mm, $Q = L_{\text{nom}} + 13,4$ mm. For L_{nom} and L_{\max} see Table 1.

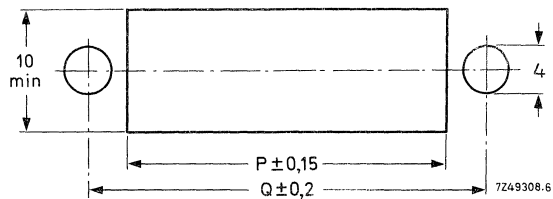


Fig. 8 Piercing diagram for panel mounting; $P = L_{\max} + 7$ mm, $Q = L_{\text{nom}} + 13,4$ mm. For L_{nom} and L_{\max} see Table 1.

Printed-wiring board recommendations

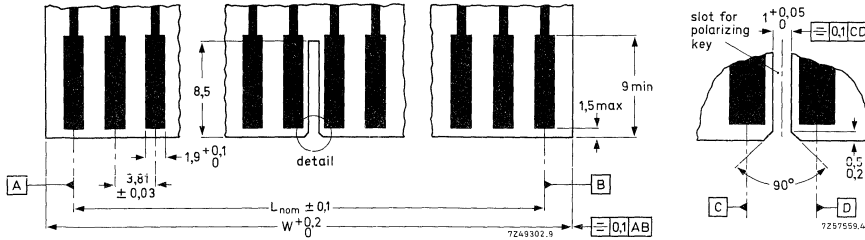


Fig. 9 Recommended dimensions of the printed-wiring board; $W = L_{nom} + 2,6$ mm. For L_{nom} see Table 1.

POLARIZATION AND POSITIONING

A thermoplastic key (Fig. 10) inserted in a slot between any two adjacent contacts ensures that a printed-wiring board is correctly polarized in its connector. This method involves no loss of contacts. A slot must be made in the printed-wiring board to receive the key (Fig. 9).

The same key is also recommended for positioning to avoid misalignment arising from cumulative tolerances in the case of long connectors (with more than 35 contacts, single row), and open-end mounting. For long connectors the slot in the printed-wiring board should be near the centre.

Positioning is not required if a connector with no more than 35 contacts (single row) is used together with thermoplastic brackets.

Catalogue number of polarizing key: 4332 026 06550.

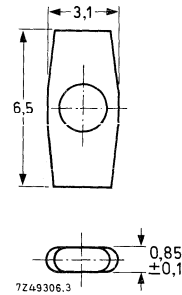


Fig. 10 Polarizing key.

MARKING

The package is marked with:
 12-digit catalogue number;
 reference number of manufacturer;
 number of pieces.

→ ORDERING

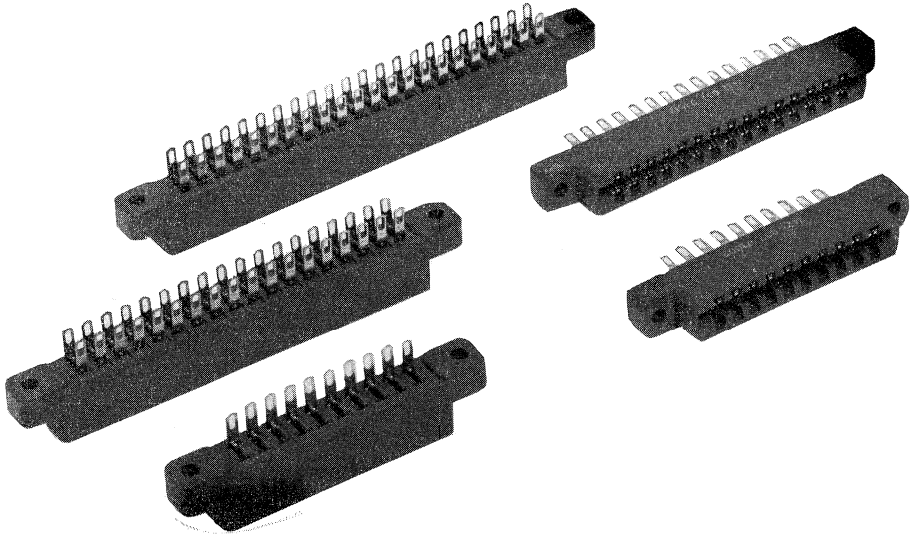
Order the connectors and accessories by quoting the 12-digit catalogue number as shown on pages 5 and 6. Note that the catalogue number applies to one piece, and take into account the minimum order quantity of 100.

PRINTED-WIRING CONNECTORS

- For basic grid of 3,96 mm (0,156 in)

QUICK REFERENCE DATA

Contact pitch	3,96 mm (0,156 in)
Number of contacts	6, 10, 15, 18 and 22
single row	12, 20, 30, 36 and 44
double row	1, 42 to 1,78 mm
Board thickness	solder tags
Terminations	5,5 A
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	250 insertions
Mechanical endurance	65/125/21
Climatic category (IEC 68)	MIL-C-21097
Basic specification	



APPLICATION

For use in professional and industrial equipment.

DESCRIPTION

The connectors have a moulded body of a blue tropic-proof glass-fibre-filled thermosetting material. The contact springs are of phosphor bronze, they are bifurcated to provide a double contact. The contact surfaces are gold plate on nickel plate on copper plate.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	5,5 A
Derated current curve	according to IEC 512, test 5b, see Fig. 1
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz.	
Measured outside the body:	
initially	$\leq 7\text{ m}\Omega$
after mechanical endurance	$\leq 7\text{ m}\Omega$
after damp heat test	$\leq 7\text{ m}\Omega$
Insulation resistance	
initially	$> 10^5\text{ M}\Omega$
after damp heat test	$> 10^3\text{ M}\Omega$
Creepage distance between contacts	$\geq 1,9\text{ mm}$
Clearance between contacts	$\geq 0,4\text{ mm}$
Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$	
between adjacent contacts	1000 V (r.m.s.), 50 Hz
between a contact and earth	1000 V (r.m.s.), 50 Hz
Capacitance between contacts at 1 kHz	$\leq 2\text{ pF}$

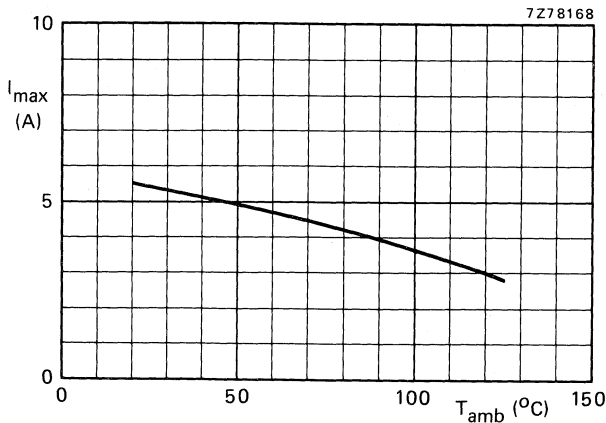


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	3,96 mm (0,156 in)
Number of contacts	
single row	6, 10, 15, 18, 22
double row	12, 20, 30, 36, 44
Board thickness	1,42 to 1,78 mm
Polarization	by means of a polarizing key (see Fig. 5)
Insertion force*	see Table 1
Withdrawal force per contact*	> 0,2 N
Mechanical endurance	250 insertions
Connector body material	glass-fibre-filled thermosetting
Contacts	
material	phosphor bronze
shape	bifurcated
finish of contact surfaces	gold plate on nickel plate on copper plate
contact force	> 0,8 N
type of termination	solder tag with eyelet
finish of termination	gold flash
Mass	see Table 1
Solderability	235 °C, 2 s, according to IEC 512, test 12a
Resistance to soldering heat	350 °C, 10 s, according to IEC 512, test 12d
Shock	according to IEC 512, test 6c, 50g, 11 ms
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 0,75 mm (p-p) or 10g, 3 directions, 6 h per direction

Table 1

number of contacts	insertion force (N)	approx. mass (g)
12	≤ 27	7
20	≤ 45	10
30	≤ 60	14
36	≤ 70	17
44	≤ 80	20

ENVIRONMENTAL DATA

Climatic category (IEC 68)	65/125/21
Ambient temperature range	-65 to + 125 °C
Damp heat, steady state	according to IEC 512, test 11c, 21 days, 40 °C, R.H. 90 to 95%
Salt mist	according to IEC 512, test 11f, 24 h
Flammability	according to UL94, category V-0

* Measured with mechanical gauge according to MIL-C-21097.

DIMENSIONAL DATA

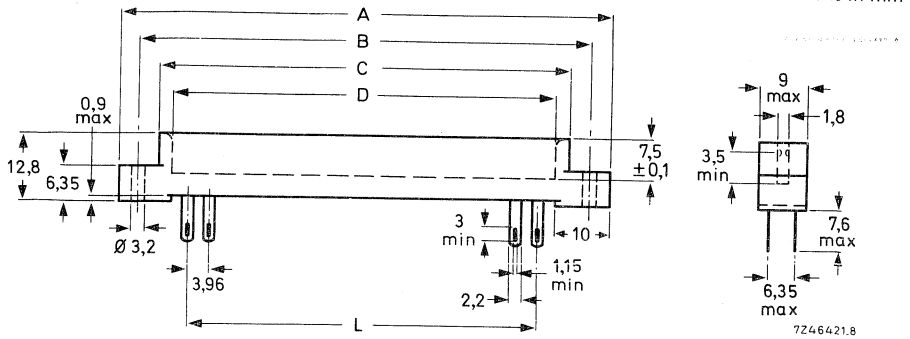


Fig. 2a Double row connector; see Table 2 for dimensions A, B, C, D and L. For the single-row version, one row of contacts is omitted.

Fig. 2b Double-row connector with bridged opposite contacts. Dimensions are identical with those in Fig. 2a except for the tag length; see also Table 2.

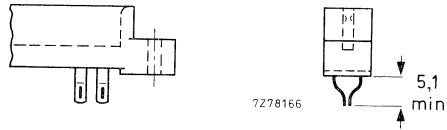


Table 2

number of contacts		dimensions					catalogue number 2422 037				
single row	double row	A _{max}	B	C _{max}	D	L	single row	double row	double-row bridged		
6	12	47,34	38,91	± 0,2	32,56	27,94 ± 0,15	+ 0,2 - 0,1	70602	70612	70616	
10	20	63,19	54,76		48,43	43,79 ± 0,15		35,64	71002	71012	71016
15	30	83,00	74,62		68,27	63,60 ± 0,15		55,44	71502	71512	71516
18	36	94,89	86,51		80,18	75,49 ± 0,15		67,32	71802	71812	71816
22	44	110,74	102,41		96,06	91,34 ± 0,20		83,16	72202	72212	72216

→ For ordering, see page 6.

MOUNTING

Dimensions in mm

Panel cut-out

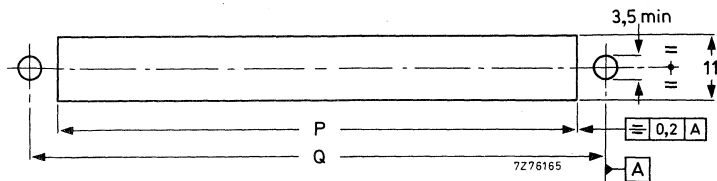


Fig. 3 Panel cut-out; see Table 3 for dimensions P and Q.

Table 3

number of contacts		dimensions	
single row	double row	P	Q
6	12	28,85	38,91
10	20	44,70	54,76
15	30	64,50	74,62
18	36	76,40	86,51
22	44	92,20	102,41
		} ± 0,2	

Printed-wiring board recommendations

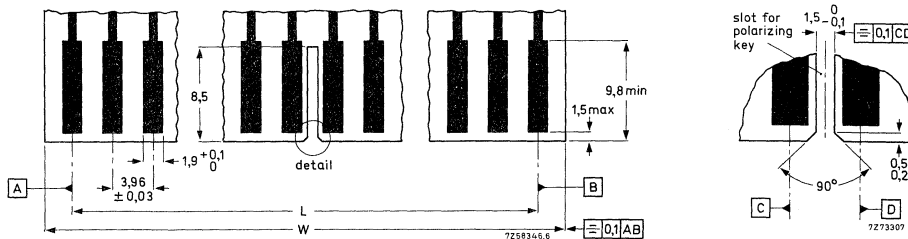


Fig. 4 Recommended dimensions of the printed-wiring board; see Table 4 for dimensions L and W.

Table 4

number of contacts		dimensions	
single row	double row	L	W
6	12	19,80	27,78
10	20	35,64	43,63
15	30	55,44	63,44
18	36	67,32	75,33
22	44	83,16	91,13
		} -0,2	

POLARIZATION

A thermoplastic key (Fig. 5), inserted in a slot between any two adjacent contacts ensures that a printed-wiring board is correctly polarized in its connector.

This method involves no loss of contacts. A slot must be made in the printed-wiring board to receive the key (Fig. 4).

Catalogue number of polarizing key: 4332 026 06550.

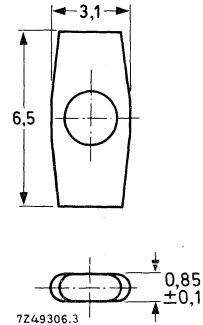


Fig. 5 Polarizing key.

MARKING

Package

The package is marked with:

- 12-digit catalogue number;
- reference number of manufacturer;
- number of pieces.

Connector

The body is marked with the 12-digit catalogue number.

The terminations are marked with figures and letters according to MIL-STD-C-21097-1 (Figs 6a and 6b).

Fig. 6a Marking of single row connector with 22 contacts.

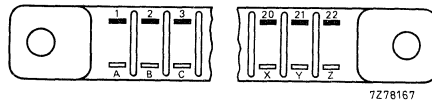
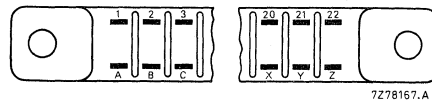


Fig. 6b Marking of double row connector with 44 contacts.



→ **ORDERING**

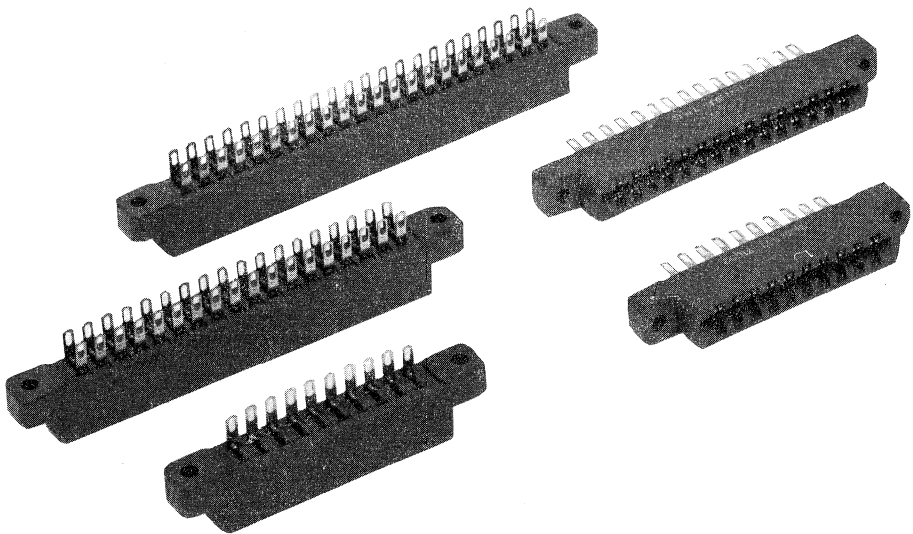
Order the connector by quoting the 12-digit catalogue number as shown in Table 2. Note that the catalogue number applies to one piece, and take into account the minimum order quantity of 100.

PRINTED-WIRING CONNECTORS

- For basic grid of 3,96 mm (0,156 in)

QUICK REFERENCE DATA

Contact pitch	3,96 mm (0,156 in)
Number of contacts	6, 10, 15, 18 and 22
single row	12, 20, 30, 36 and 44
double row	1,42 to 1,78 mm
Board thickness	solder tags
Terminations	5,5 A
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	100 insertions
Mechanical endurance	65/125/21
Climatic category (IEC 68)	



APPLICATION

For use in professional and industrial equipment.

DESCRIPTION

→ The connectors have a moulded body of a blue tropic-proof glass-fibre-filled thermosetting material. The contact springs are phosphor bronze, they are bifurcated to provide a double contact. The contact surfaces are gold plate on nickel plate.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	5,5 A
Derated current curve	according to IEC 512, test 5b; see Fig. 1
<p>Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz.</p> <p>Measured outside the body:</p> <ul style="list-style-type: none"> initially $\leq 10\text{ m}\Omega$ after mechanical endurance $\leq 10\text{ m}\Omega$ after damp heat test $\leq 12\text{ m}\Omega$ 	
<p>Insulation resistance</p> <ul style="list-style-type: none"> initially $> 10^5\text{ M}\Omega$ after damp heat test $> 10^3\text{ M}\Omega$ 	
Creepage distance between contacts	$\geq 1,9\text{ mm}$
Clearance between contacts	$\geq 0,4\text{ mm}$
<p>Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$</p> <ul style="list-style-type: none"> between adjacent contacts 1000 V (r.m.s.), 50 Hz between a contact and earth 1000 V (r.m.s.), 50 Hz 	
Capacitance between contacts at 1 kHz	$\leq 2\text{ pF}$

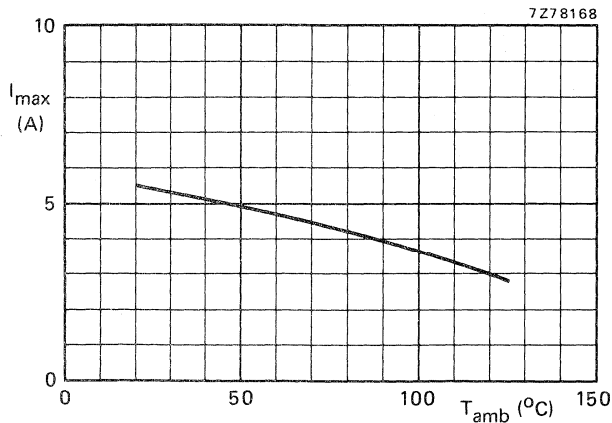


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	3,96 mm (0,156 in)
Number of contacts	6, 10, 15, 18, 22
single row	12, 20, 30, 36, 44
double row	
Board thickness	1,42 to 1,78 mm
Polarization	by means of a polarizing key (see Fig. 5)
Insertion force, measured with mechanical gauge, 1,57 mm	see Table 1
Withdrawal force per contact, measured with mechanical gauge, 1,37 mm	> 0,2 N
Mechanical endurance	100 insertions
Connector body material	glass-fibre-filled thermosetting
Contacts	
material	phosphor bronze
shape	bifurcated
finish of contact surfaces	gold plate on nickel plate
contact force	> 0,8 N
type of termination	solder tag with eyelet
finish of termination	gold flash
Mass	see Table 1
Solderability	235 °C, 2 s, according to IEC 512, test 12a
Resistance to soldering heat	350 °C, 10 s, according to IEC 512, test 12d
Shock	according to IEC 512, test 6c, 50g, 11 ms
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 0,75 mm (p-p) or 10g, 3 directions, 6 h per direction

Table 1

number of contacts	insertion force (N)	approx. mass (g)
12	≤ 27	7
20	≤ 45	10
30	≤ 60	14
36	≤ 70	17
44	≤ 80	20

ENVIRONMENTAL DATA

Climatic category (IEC 68)	65/125/21
Ambient temperature range	-65 to + 125 °C
Damp heat, steady state	according to IEC 512, test 11c, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V-0

DIMENSIONAL DATA

Dimensions in mm

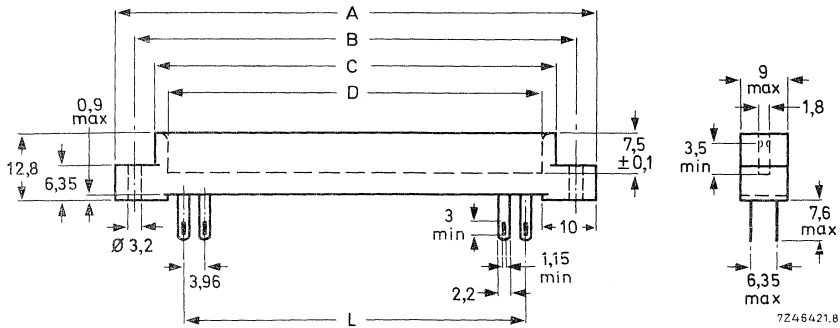


Fig. 2 Double row connector; see Table 2 for dimensions A, B, C, D and L. For the single-row version, one row of contacts is omitted.

Table 2

number of contacts		dimensions					catalogue number 2422 037			
single row	double row	A _{max}	B	C _{max}	D	L	single row	double row		
6	12	47,34	38,91	± 0,2	32,56	27,94 ± 0,15	+0,2 -0,1	80602	80612	
10	20	63,19	54,76		48,43	43,79 ± 0,15		35,64	81002	81012
15	30	83,00	74,62		68,27	63,60 ± 0,15		55,44	81502	81512
18	36	94,89	86,51		80,18	75,49 ± 0,15		67,32	81802	81812
22	44	110,74	102,41		96,06	91,34 ± 0,20		83,16	82202	82212

For ordering, see page 6.

MOUNTING

Dimensions in mm

Panel cut-out

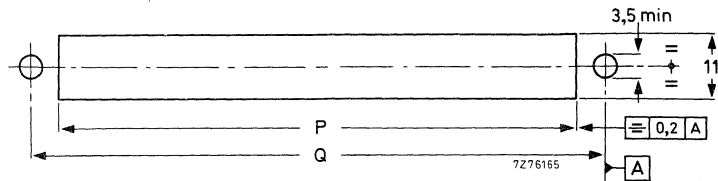


Fig. 3 Panel cut-out; see Table 3 for dimensions P and Q.

Table 3

number of contacts		dimensions	
single row	double row	P	Q
6	12	28,85	38,91
10	20	44,70	54,76
15	30	64,50	74,62
18	36	76,40	86,51
22	44	92,20	102,41

} ± 0,2

Printed-wiring board recommendations

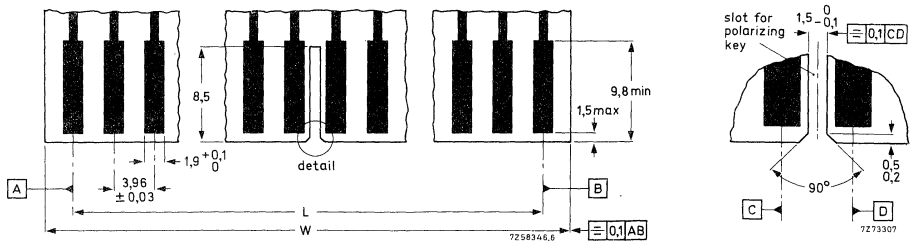


Fig. 4 Recommended dimensions of the printed-wiring board; see Table 4 for dimensions L and W.

Table 4

number of contacts		dimensions	
single row	double row	L	W
6	12	19,80	27,78
10	20	35,64	43,63
15	30	55,44	63,44
18	36	67,32	75,33
22	44	83,16	91,13

} ± 0,1

POLARIZATION

A thermoplastic key (Fig. 5), inserted in a slot between any two adjacent contacts ensures that a printed-wiring board is correctly polarized in its connector.

This method involves no loss of contacts. A slot must be made in the printed-wiring board to receive the key (Fig. 4).

Catalogue number of polarizing key: 4332 026 06550.

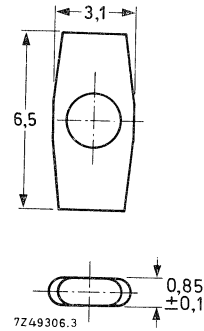


Fig. 5 Polarizing key.

MARKING

Package

The package is marked with:

- 12-digit catalogue number;
- reference number of manufacturer;
- number of pieces.

Connector

The body is marked with the 12-digit catalogue number.

The terminations are marked with figures and letters (Figs 6a and 6b).

Fig. 6a Marking of single row connector with 22 contacts.

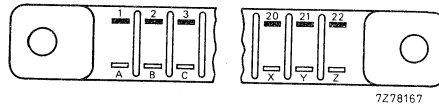
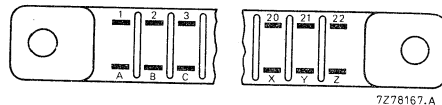


Fig. 6b Marking of double row connector with 44 contacts.



→ **ORDERING**

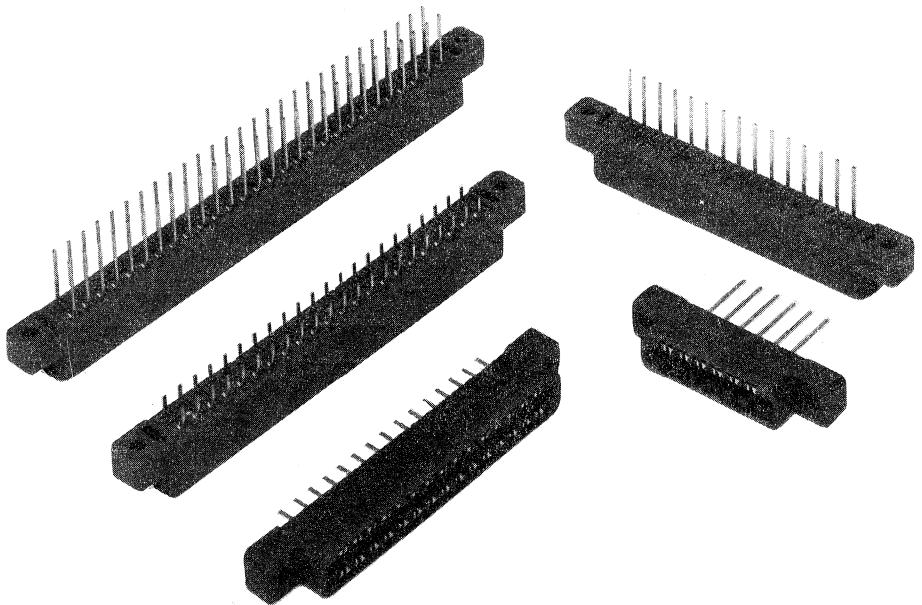
Order the connector by quoting the 12-digit catalogue number as shown in Table 2. Note that the catalogue number applies to one piece, and take into account the minimum order quantity of 100.

PRINTED-WIRING CONNECTORS

- For basic grid of 3,96 mm (0,156 in)

QUICK REFERENCE DATA

Contact pitch	3,96 mm (0,156 in)
Number of contacts	6, 10, 15, 18, 22, 28, 36 and 43
single row	12, 20, 30, 36, 44, 56, 72 and 86
double row	
Board thickness	1,42 to 1,78 mm
Terminations	dip-solder pins pins for wire wrapping
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	4 A
Mechanical endurance	250 insertions
Climatic category (IEC 68)	40/125/21



APPLICATION

For use in professional and industrial equipment.

DESCRIPTION

The connectors have a moulded body of a red tropic-proof glass-fibre-filled thermoplastic material. The contact springs are of phosphor bronze, they are bifurcated to provide a double contact. The contact surfaces are gold plate on nickel plate.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	4 A
Derated current curve	according to IEC 512, test 5b; see Fig. 1
<p>Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz.</p> <p>Measured outside the body:</p> <p>initially $\leq 18\text{ m}\Omega$</p> <p>after mechanical endurance $\leq 18\text{ m}\Omega$</p> <p>after damp heat test $\leq 20\text{ m}\Omega$</p>	
<p>Insulation resistance</p> <p>initially $> 10^5\text{ M}\Omega$</p> <p>after damp heat test $> 10^3\text{ M}\Omega$</p>	
Creepage distance between contacts	$\geq 2,1\text{ mm}$
Clearance between contacts	$\geq 0,4\text{ mm}$
<p>Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$</p> <p>between adjacent contacts 1000 V (r.m.s.), 50 Hz</p> <p>between a contact and earth 1000 V (r.m.s.), 50 Hz</p>	
Capacitance between contacts at 1 kHz	$\leq 2\text{ pF}$

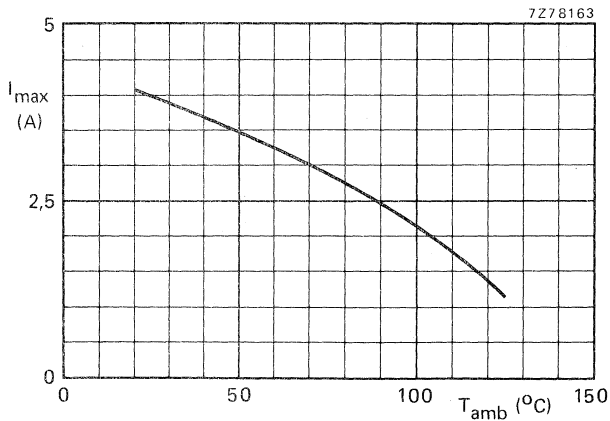


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	3,96 mm (0,156 in)
Number of contacts	6, 10, 15, 18, 22, 28, 36, 43
single row	12, 20, 30, 36, 44, 56, 72, 86
double row	
Board thickness	1,42 to 1,78 mm
Polarization	by means of a polarizing key (see Fig. 6)
Insertion force, measured with mechanical gauge, 1,57 mm	see Table 1
Withdrawal force per contact, measured with mechanical gauge, 1,37 mm	> 0,2 N
Mechanical endurance	250 insertions
Connector body material	glass-fibre-filled thermoplastic
Contacts	
material	phosphor bronze
shape	bifurcated
finish of contact surfaces	gold plate or nickel plate
contact force	> 0,8 N
type of termination	dip-solder pin; pin for wire wrapping
finish of termination	gold flash
Wire diameter	AWG30 to AWG26 (ϕ 0,25 to 0,40 mm)
Mass	see Table 1
Solderability	235 °C, 2 s, according to IEC 512, test 12a
Resistance to soldering heat	260 °C, 5 s, according to IEC 512, test 12d
Shock	according to IEC 512, test 6c, 50g, 11 ms
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 0,75 mm (p-p) or 10g, 3 directions, 6 h per direction

Table 1

number of contacts	insertion force N	approx. mass g
12	≤ 27	7
20	≤ 45	10
30	≤ 60	14
36	≤ 70	17
44	≤ 80	20
56	≤ 100	25
72	≤ 120	31
86	≤ 140	37

ENVIRONMENTAL DATA

Climatic category (IEC 68)	40/125/21
Ambient temperature range	-40 to + 125 °C
Damp heat, steady state	according to IEC 512, test 11c, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V-1

DIMENSIONAL DATA

Dimensions in mm

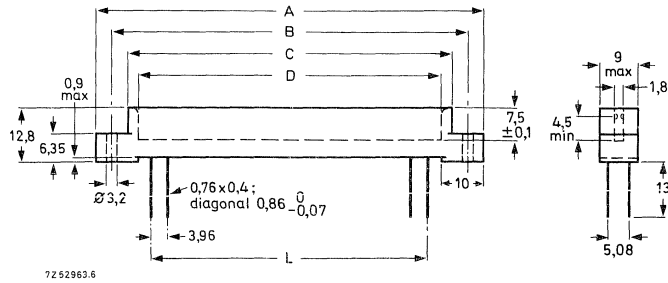


Fig. 2a Double row connector with pins for wire wrapping; see Table 2 for dimensions A, B, C, D and L. For the single-row version, one row of contacts is omitted.

Fig. 2b Double row connector with dip-solder pins. Dimensions are identical with those in Fig. 2a, except for the pin length; see also Table 3. For the single-row version, one row of contacts is omitted.

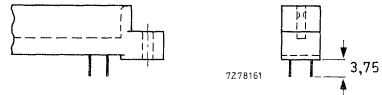


Table 2 Connectors with pins for wire wrapping

number of contacts		dimensions					catalogue number 2422 039		
single row	double row	A _{max}	B	C _{max}	D	L	single row	double row	
6	12	47,34	38,91 ± 0,2	32,56	27,94 ± 0,15	19,80	+0,2 -0,1	00602	00612
10	20	63,19	54,76 ± 0,2	48,43	43,79 ± 0,15	35,64		01002	01012
15	30	83,00	74,62 ± 0,2	68,27	63,60 ± 0,15	55,44		01502	01512
18	36	94,89	86,51 ± 0,2	80,18	75,49 ± 0,15	67,32		01802	01812
22	44	110,74	102,41 ± 0,2	96,06	91,34 ± 0,20	83,16		02202	02212
28	56	134,21	126,09 ± 0,4	118,97	115,11 ± 0,25	106,92		02802	02812
36	72	166,19	157,99 ± 0,4	150,67	146,76 ± 0,25	138,60		03602	03612
43	86	193,82	185,47 ± 0,4	178,61	174,55 ± 0,25	166,32		04302	04312

Table 3 Connectors with dip-solder pins

number of contacts		dimensions					catalogue number 2422 044		
single row	double row	A _{max}	B	C _{max}	D	L	single row	double row	
6	12	47,34	38,91 ± 0,2	32,56	27,94 ± 0,15	19,80	} + 0,2 - 0,1	00602	00612
10	20	63,19	54,76 ± 0,2	48,43	43,79 ± 0,15	35,64		01002	01012
15	30	83,00	74,62 ± 0,2	68,27	63,60 ± 0,15	55,44		01502	01512
18	36	94,89	86,51 ± 0,2	80,18	75,49 ± 0,15	67,32		01802	01812
22	44	110,74	102,41 ± 0,2	96,06	91,34 ± 0,20	83,16		02202	02212
28	56	134,21	126,09 ± 0,4	118,97	115,11 ± 0,25	106,92		02802	02812
36	72	166,19	157,99 ± 0,4	150,67	146,76 ± 0,25	138,60		03602	03612
43	86	193,82	185,47 ± 0,4	178,61	174,55 ± 0,25	166,32		04302	04312

For ordering, see page 7.

MOUNTING

Dimensions in mm

Panel cut-out

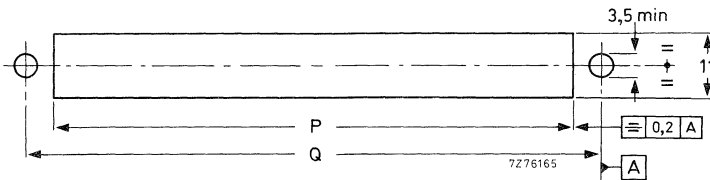


Fig. 3 Panel cut-out; see Table 4 for dimensions P and Q.

Table 4

number of contacts		dimensions	
single row	double row	P	Q
6	12	28,85	38,91
10	20	44,70	54,76
15	30	64,50	74,62
18	36	76,40	86,51
22	44	92,20	102,41
28	56	115,70	126,09
36	72	147,70	157,99
43	86	175,30	185,47

Table 6

number of contacts		dimensions	
single row	double row	L	W
6	12	19,80	27,78
10	20	35,64	43,63
15	30	55,44	63,44
18	36	67,32	75,33
22	44	83,16	91,13
28	56	106,92	114,85
36	72	138,60	146,50
43	86	166,32	174,29

POLARIZATION

A thermoplastic key (Fig. 6), inserted in a slot between any two adjacent contacts ensures that a printed-wiring board is correctly polarized in its connector. This method involves no loss of contacts. A slot must be made in the printed-wiring board to receive the key (Fig. 5).

Catalogue number of polarizing key: 4332 026 06550.

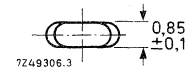
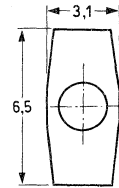


Fig. 6 Polarizing key.

MARKING

Package

The package is marked with:
 12-digit catalogue number;
 reference number of manufacturer;
 number of pieces.

Connector

The terminations are marked with figures and letters (Figs 7a and 7b).

Fig. 7a Marking of single row connector with 22 contacts.

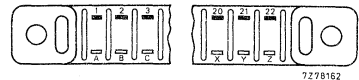
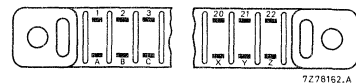


Fig. 7b Marking of double-row connector with 44 contacts.



ORDERING

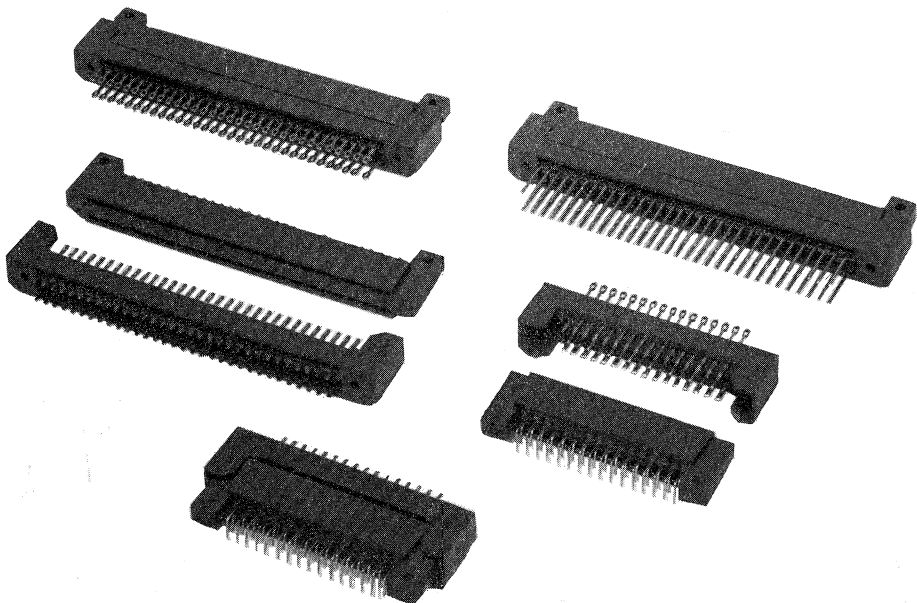
Order the connector by quoting the 12-digit catalogue number as shown in Tables 2 and 3. Note that the catalogue number applies to one piece, and take into account the minimum order quantity of 100.

TWO-PART PRINTED-WIRING CONNECTORS

- For basic grid of 2,54 mm (0,1 in).

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts	32, 48, 64
Board thickness	1,42 to 1,78 mn.
Terminations	solder tags
male part	straight dip-solder pins
	pins for wire wrapping
female part	90° angled dip-solder pins
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	3,5 A
Mechanical endurance	300 insertions
Climatic category (IEC 68)	65/125/21



APPLICATION

These connectors are designed for use in applications where high quality and high density packaging of electronic circuits are required.

DESCRIPTION

The connectors consist of a female part to be fitted to a printed-wiring board and a male part to be mounted on a chassis or a back panel. Both parts have a blue body of glass-fibre-filled thermosetting material. The contact springs of the female part and the contact pins of the male part are of phosphor bronze; the contact surfaces are rolled gold on nickel plating. The contact terminations of both parts are gold flashed. No special provisions are required for polarization.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	3,5 A
Derated current curve	according to IEC 512, test 5b, see Fig. 1
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz	
initially	$\leq 17\text{ m}\Omega$
after mechanical endurance	$\leq 20\text{ m}\Omega$
after damp heat test (IEC 68, test Ca)	$\leq 20\text{ m}\Omega$
Insulation resistance	
initially	$> 10^5\text{ M}\Omega$
after damp heat test (IEC 68, test Ca)	$> 10^3\text{ M}\Omega$
Creepage distance between contacts	$\geq 0,8\text{ mm}$
Clearance between contacts	$\geq 0,8\text{ mm}$
Proof voltage for 1 min , at $20\text{ }^{\circ}\text{C}$	
between adjacent contacts	1000 V (r.m.s.), 50 Hz
between a contact and earth	2000 V (r.m.s.), 50 Hz
Capacitance between contacts at 1 kHz	$\leq 2\text{ pF}$

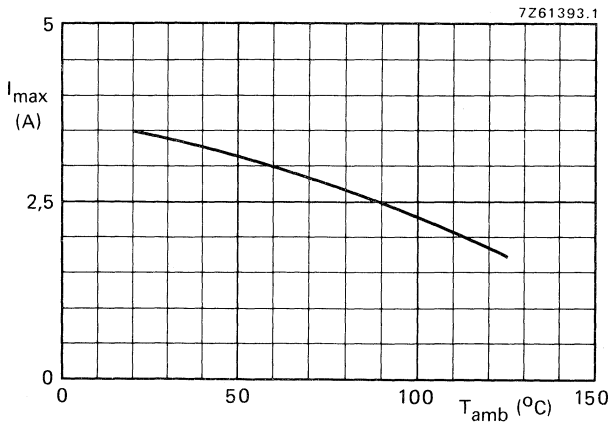


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)	
Number of contacts	32, 48, 64	
Board thickness	1,42 to 1,78 mm	
Polarization	achieved by asymmetrical housing	
Insertion force and withdrawal force	see Table 1	
Mechanical endurance	300 insertions	
Connector body material	glass-fibre-filled thermosetting	
Contacts	male part	female part
material	phosphor bronze	phosphor bronze
shape	rectangular pin	single face
finish of contact surfaces	rolled-on gold on nickel plate	rolled-on gold on nickel plate
type of termination	solder tag straight dip-solder pin pin for wire wrapping	90° angled dip-solder pin
finish of termination	gold flash	gold flash
Wire diameter	AWG30 to AWG26 (ϕ 0,25 to ϕ 0,40 mm)	
Mass	see Table 1	
Solderability	235 °C, 2 s, according to IEC 512, test 12a	
Resistance to soldering heat	350 °C, 10 s, according to IEC 512, test 12d	
Shock	according to IEC 512, test 6c, 50g, 11 ms	
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 0,75 mm (p-p) or 10g, 3 directions, 6 h per direction	

Table 1

number of contacts	insertion force N	withdrawal force N	approx. mass (g)	
			male part	female part
32	≤ 45	≥ 5	10	6
48	≤ 65	≥ 7,5	12	9
64	≤ 85	≥ 10	15	12

ENVIRONMENTAL DATA

Climatic category (IEC 68)	65/125/21
Ambient temperature range	-65 to + 125 °C
Damp heat, steady state	according to IEC 512, test 11c, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V-0

DIMENSIONAL DATA

Dimensions in mm

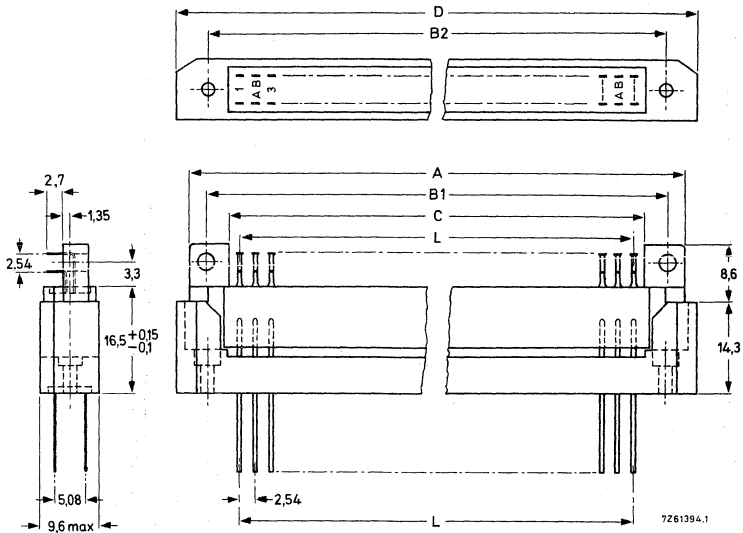


Fig. 2 Connector combination showing female part with 90° angled dip-solder pins and male part with pins for wire wrapping; see Table 2 for dimensions A, B1, B2, C, D and L. See Figs 3, 4 and 5 for different terminations of the male part.

Table 2

number of contacts	dimensions					
	A _{max}	B1	B2	C _{min}	D _{max}	L
32	54,3	48,26	48,26	41,4	58,3	38,10
48	74,7	68,58	68,58	61,7	78,6	58,42
64	95,1	88,90	88,90	82,0	98,9	78,74

Male parts

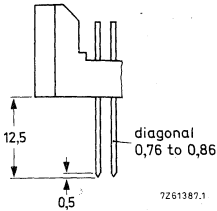


Fig. 3 Pins for wire wrapping.

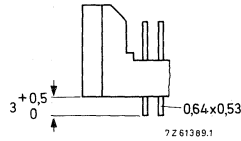


Fig. 4 Straight dip-solder pins.

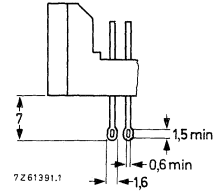


Fig. 5 Solder tags.

Table 3 Catalogue numbers for ordering

number of contacts	catalogue number			
	male part			female part
	pins for wire wrapping (Fig. 3)	dip-solder pins (Fig. 4)	solder tags (Fig. 5)	
32	2422 025 89117	2422 025 89119	2422 025 89121	2422 025 89114
48	89123	89125	89126	89115
64	89128	89131	89132	89116

For ordering, see page 7.

MOUNTING

Hole patterns for mounting of male parts

Dimensions in mm

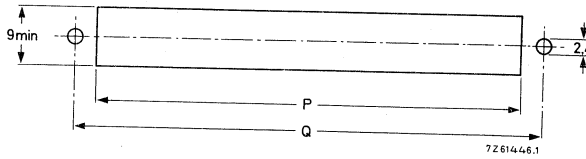


Fig. 6 Hole pattern for panel mounting of male parts; see Table 4 for dimensions P and Q.

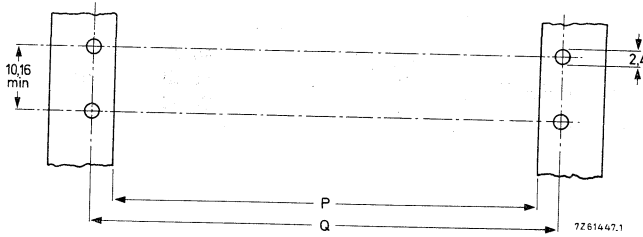


Fig. 7 Hole pattern for rail mounting of male parts; see Table 4 for dimensions P and Q.

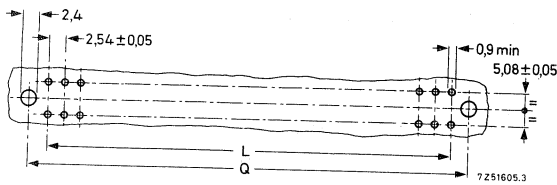


Fig. 8 Hole pattern for board mounting of male parts; see Table 4 for dimensions L and Q.

Hole pattern for mounting of female parts

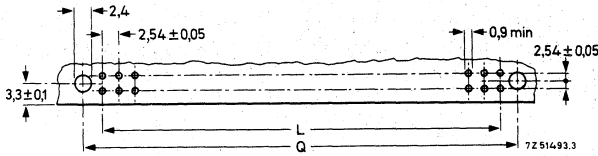


Fig. 9 Hole pattern for board mounting of female parts; see Table 4 for dimensions L and Q.

Table 4

number of contacts	dimensions		
	L	P	Q
32	38,10	43,2	48,26
48	58,42	63,5	68,58
64	78,74	83,8	88,90

$\left. \begin{matrix} 32 \\ 48 \\ 64 \end{matrix} \right\} \pm 0,05$
 $\left. \begin{matrix} 43,2 \\ 63,5 \\ 83,8 \end{matrix} \right\} \pm 0,1$
 $\left. \begin{matrix} 48,26 \\ 68,58 \\ 88,90 \end{matrix} \right\} \pm 0,1$

MARKING

Package

The package is marked with:

- 12-digit catalogue number;
- reference number of manufacturer;
- number of pieces.

Connector

The terminations of the male part are marked as shown in Fig. 11.

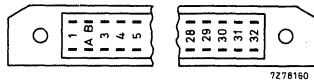


Fig. 11 Marking of male part with 64 contacts.

ORDERING

Order the connector by quoting the 12-digit catalogue number as shown in Table 3. Note that the catalogue number applies to one piece, and take into account the minimum order quantity of 100.

TWO-PART PRINTED-WIRING CONNECTORS

- For basic grid of 2,54 mm (0,1 in)

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)	5,08 mm (0,2 in)				
Number of contacts						
style B (2 rows)	32,64					
style C (3 rows)	64,96	32				
Board thickness	1,6 mm					
Terminations						
male part	90° angled dip-solder pins straight dip-solder pins solder tags	} with or without protruding earth contacts				
	90° angled pins for wire wrapping straight pins for wire wrapping					
female part	pins for wire wrapping straight dip-solder pins solder tags 90° angled dip-solder pins					
Current at $T_{amb} = 20\text{ °C}$	2 A					
Performance class		3	2	1	1a	←
Mechanical endurance (insertions)	50	400	500	500		
Climatic category	55/125/00	55/125/56	55/125/56	65/125/56		
Detail specification		DIN41612/IEC 603-2			VG95324	

Performance classes

- 2 Versions according to DIN41612 (1976) and IEC 603-2 (1980).
- 1 and 3 Versions according to DIN41612 (draft 1981).
- 1a Versions according to military standard VG95324 (1977).

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APPLICATION

These connectors are designed for use in applications where high quality and high density packaging of electronic circuits are required. They can be used on single Eurocards (100 mm x 160 mm), double Eurocards (233,3 mm x 160 mm) and 19-in racks according to DIN 41494.

DESCRIPTION

→ The connectors consist of a male part to be fitted to a printed-wiring board and a female part to be mounted on a chassis or back panel. The male parts and the female parts have a mono-block body construction of grey glass-fibre-filled thermoplastic material and tinned terminations, except for the female parts with solder tags or 90° angled dip-solder pins, and the female parts of performance class 1a, which have a contact insert of glass-fibre-filled diallylphthalate. The terminations of male and female parts of performance class 1a are gold-flashed.

The contact springs of the female part are of phosphor bronze; the contact pins of the male part are of brass. The contact surfaces are gold on nickel plating.

The male parts with dip-solder pins can be supplied with protruding earth contacts, approximately 1 mm longer than the other contacts. No special provisions are required for polarization. Cable hoods, locking clips and brackets are available for various applications. External keying systems can be employed to ensure correct positioning of the board in a rack.

→ Note: For rear-mating applications female parts with gold on nickel plated pins for wire wrapping are available on request.

SURVEY

		style B			style C	
		number of contacts		number of contacts	number of contacts	
terminations		2 x 32	1 x 32	3 x 32	2 x 32	2 x 16
		2,54 mm pitch		2,54 mm pitch	2,54 mm pitch	5,08 mm pitch
male parts	90° angled dip-solder pins, with or without protruding earth contacts					
	straight dip-solder pins, with or without protruding earth contacts					
	solder tags					
	90° angled pins for wire wrapping					
	straight pins for wire wrapping					
female parts	pins for wire wrapping					
	straight dip-solder pins					
	solder tags					
	Maintenance types					
	90° angled dip-solder pins					

DATA FOR ALL PERFORMANCE CLASSES

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2 A	
Derated current curve	according to IEC 512, test 5b and VG 95324, part 1	
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz		
initially	$\leq 20\text{ m}\Omega$	
after tests	$\leq 20\text{ m}\Omega$	
Insulation resistance		
initially	$> 10^6\text{ M}\Omega$	
after tests	$> 10^4\text{ M}\Omega$	
Creepage distance	2,54 mm pitch	5,08 mm pitch
between contacts	$\geq 1,2\text{ mm}$ } *	$\geq 3,0\text{ mm}$ } *
between a contact and earth	$\geq 1,8\text{ mm}$ } *	$\geq 1,8\text{ mm}$ } *
Clearance		
between contacts	$\geq 1,2\text{ mm}$ } *	$\geq 3,0\text{ mm}$ } *
between a contact and earth	$\geq 1,6\text{ mm}$ } *	$\geq 1,6\text{ mm}$ } *
Proof voltage for 1 min, at 20 °C		
between contacts	1000 V (r.m.s.), 50 Hz	
between a contact and earth	1550 V (r.m.s.), 50 Hz	
Capacitance between contacts at 1 kHz	$\leq 1,5\text{ pF}$	

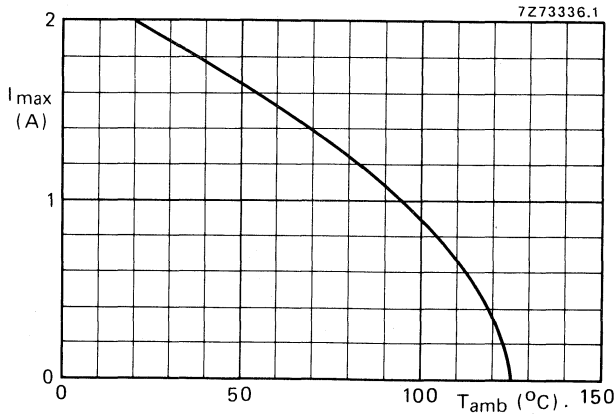


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

* This value may be reduced by the wiring and/or the printed-wiring boards.

MECHANICAL DATA

Contact pitch	2,54 or 5,08 mm
Number of contacts	
style B	max. 64
style C	max. 96
Board thickness	1,6 mm
Polarization	achieved by asymmetrical housing
Retention force per contact, measured with mechanical gauge according to IEC 603-2	$\geq 0,15$ N
Connector body	
material	glass-fibre-filled thermoplastic
colour	grey (RAL 7032)
Contacts of male part	
material	brass
finish of contact surfaces	gold on nickel plate
Contacts of female part	
material	phosphor bronze
finish of contact surfaces	gold on nickel plate
Insertion and withdrawal force	see Table 1

Table 1

number of contacts	insertion force and withdrawal force N	approx. mass (g)	
		male part	female part
32	≤ 30	9,5	12
64	≤ 60	12	14,5
96	≤ 90	14,5	17,5

→ DATA PER PERFORMANCE CLASS

Performance class	3	2	1	1a
Electrical data				
Endurance	—	1000 h at 1,0 A and 70 °C	1000 h at 0,9 A and 85 °C	1000 h at 0,9 A and 85 °C
Mechanical data				
Endurance (insertions)	50	400	500	500
Female insert material				
straight dip-solder and wire-wrap terminations	—	—	—	thermosetting
other terminations	thermosetting	thermosetting	thermosetting	thermosetting
Solderability	according to IEC 512, test 12a, 235 °C, 2s			according to VG 95210, part 23, 230 °C, 5s
Resistance to soldering heat	according to IEC 512, test 12d, 260 °C, 10s			according to DIN 40046, part 18, 350 °C, 3,5s
Shock	—	—	according to IEC 512, test 6c, 50g, 11 ms	according to VG 95210, part 28, half sine pulse, 50g, 11 ms, 3 directions, 10 shocks per direction
Vibration	—	according to IEC 512, test 6d, 10 to 500 Hz, 0,35 mm (p-p) or 5g, 3 directions, 2 h per direction	according to IEC 512, test 6d, 10 to 2000 Hz, 1,5 mm (p-p) or 20g, 3 directions, 2 h per direction	according to VG 95210, part 19, 10 to 2000 Hz, 1,52 mm (p-p) or 20g, 3 directions, 4 h per direction
Acceleration	—	—	according to IEC 512, test 6a, 100g, 3 directions, 5 min per direction	according to VG 95210, part 27, 100g, 6 directions, 5 min per direction

Performance class	3	2	1	1a
Environmental data				
Climatic category (IEC 68)	55/125/00	55/125/56	55/125/56	65/125/56
Ambient temperature range	-55 to + 125 °C	-55 to + 125 °C	-55 to + 125 °C	-65 to + 125 °C
Storage temperature range	-55 to + 125 °C	-55 to + 125 °C	-55 to + 125 °C	-65 to + 125 °C
Damp heat, steady state	—	according to IEC 512, test 11c, 40 °C, R.H. 90 to 95%, 56 days		according to VG 95210, part 4, 56 days, 40 °C, R.H. 90 to 95%
Dry heat		according to IEC 512, test 11i, 16 h, 125 °C		according to VG 95324, 16 h, 125 °C
Salt mist	—	—	—	according to VG 95210, part 2, 5%, 48 h
Low air pressure	—		according to IEC 68, test M, 5 min, 25 °C, 300 mbar	according to VG 95210, part 6, 5 min, 25 °C, 8 mm Hg
Corrosion		climatic se- quence: after 200 operations according to IEC 512, test 11 m, damp heat cyclic, 2 cycles, and according to IEC 512, test 11 i, dry heat, 125 °C, 16 h	industrial atmosphere: according to IEC 512, test 11g; after 250 opera- tions: 10 ppm SO ₂ , 10 days, 1 ppm H ₂ S, 10 days	industrial atmosphere: according to VG 95319, part 2, after 500 opera- tions: SO ₂ , 1%, 24 h, followed by H ₂ S, 1%, 24 h
Flammability		according to UL94, category V-1		according to VG 95210, part 12 time of flame application: 15 ± 1 s burning time max. 10 s

DATA FOR ALL PERFORMANCE CLASSES

DIMENSIONAL DATA

Dimensions in mm

Two-part connector, style B (2-row housing)

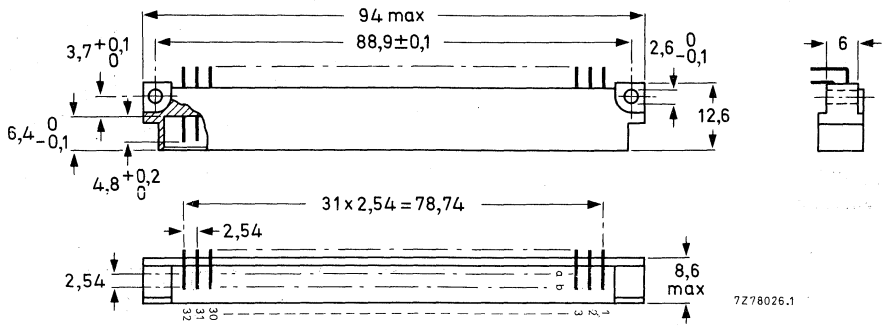


Fig. 2 Male part with 90° angled dip-solder pins.

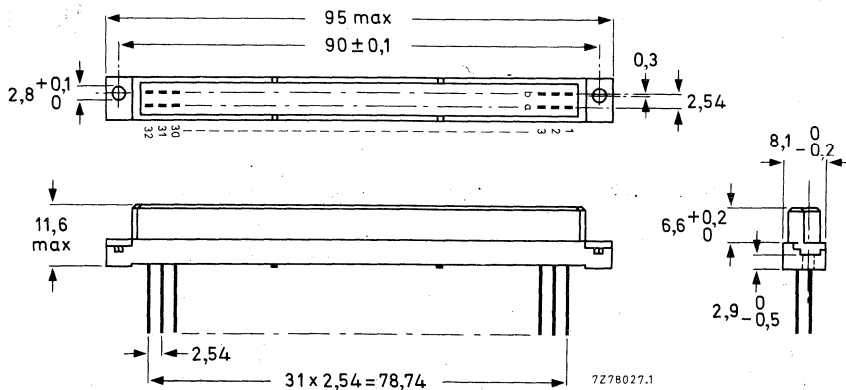


Fig. 3 Female part with pins for wire wrapping.

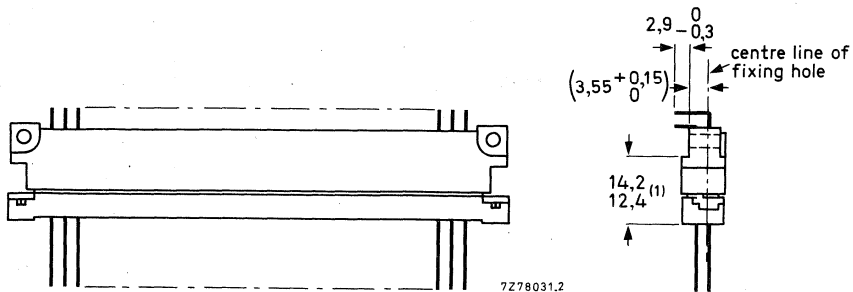


Fig. 4 Combination of connector parts shown in Figs 2 and 3.

(1) Reliable contact range.

Male parts

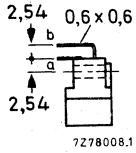


Fig. 5 90° angled dip-solder pins.

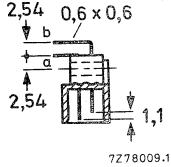


Fig. 6 90° angled dip-solder pins, with protruding earth contacts.

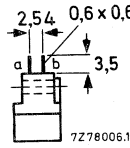


Fig. 7 Straight dip-solder pins.

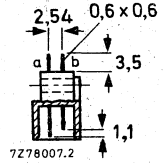


Fig. 8 Straight dip-solder pins, with protruding earth contacts.

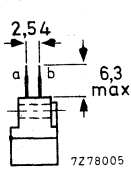


Fig. 9 Solder tags.

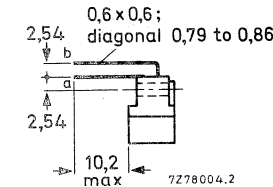
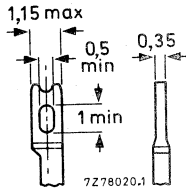


Fig. 10 90° angled pins for wire wrapping.

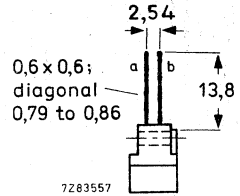


Fig. 11 Straight pins for wire wrapping.

Female parts

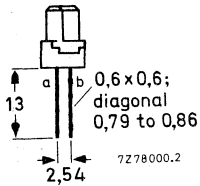


Fig. 12 Pins for wire wrapping.

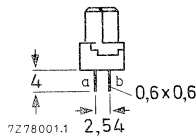


Fig. 13 Straight dip-solder pins.

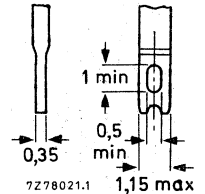
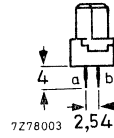


Fig. 14 Solder tags.

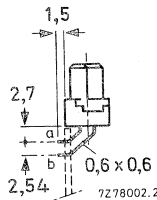


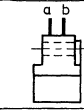

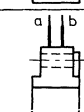
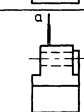
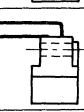

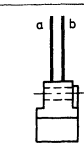
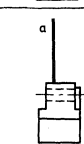


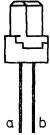
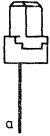
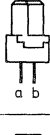
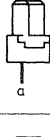
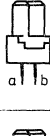
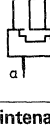
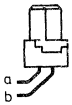

Fig. 15 90° angled dip-solder pins.

→ **Table 2a** Catalogue numbers for ordering male parts, style B; preferred versions are indicated thus: ▲

terminations	contacts		catalogue number of male part 2422 025			
	positions occupied	no.	performance class			
			3	2	1	1a
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89578 ▲	89285 ▲ 89366*	89715 89716*	89385
	a1,a2,a3 to a32;	32	89579 ▲	89292 ▲ 89367*	89717 89718*	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64		89368 89369*	89719 89721*	
	a1,a2,a3 to a32;	32		89404 89371*	89722 89723*	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64		89372	89724	
	a1,a2,a3 to a32	32		89373	89725	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64		89314	89726	
	a1,a2,a3 to a32	32		89315	89727	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64		89542		
	a1,a2,a3 to a32	32		89543		

* With protruding earth contacts a1 and a32.

Table 2b Catalogue numbers for ordering female parts, style B; preferred versions are indicated thus: ▲ ←

terminations	contacts		catalogue number of female part 2422 025 performance class			
	positions occupied	no.	3	2	1	1a
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89581 ▲	89286 ▲	89728	89387
	a1,a2,a3 to a32	32	89582	89293	89729	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89583 ▲	89297 ▲	89731	
	a1,a2,a3 to a32	32	89584 ▲	89302 ▲	89732	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64		89329 ▲	89733	
	a1,a2,a3 to a32	32		89331 ▲	89734	
Maintenance type 	a1,a2,a3 to a32; b1,b2,b3 to b32	64		89378		
Maintenance type 	a1,a2,a3 to a32	32		89377		

Two-part connector style C (3-row housing)

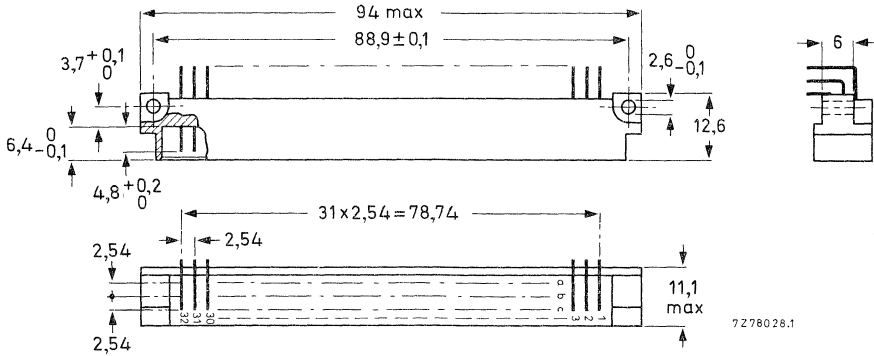


Fig. 16 Male part with 90° angled dip-solder pins.

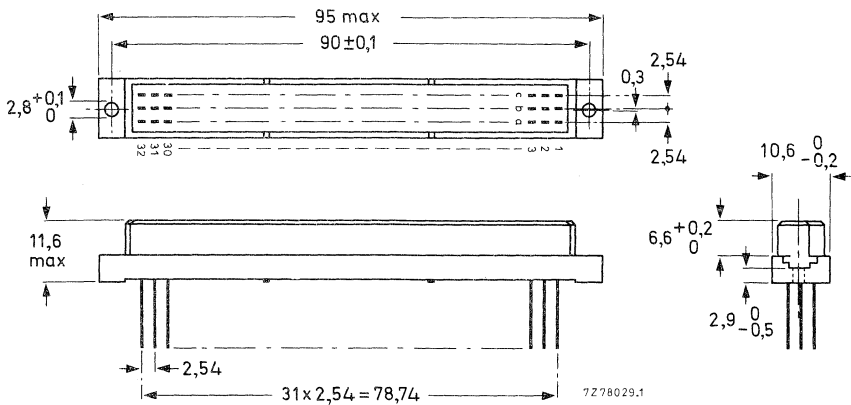


Fig. 17 Female part with pins for wire wrapping.

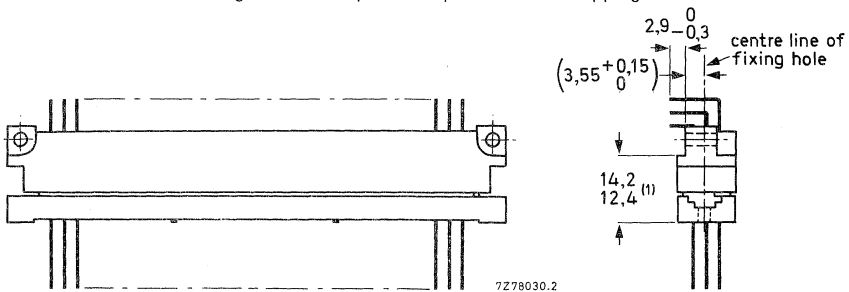


Fig. 18 Combination of connector parts shown in Figs 16 and 17.

(1) Reliable contact range.

Male parts

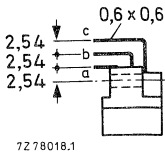


Fig. 19 90° angled dip-solder pins.

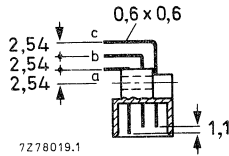


Fig. 20 90° angled dip-solder pins, with protruding earth contacts.

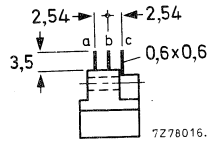


Fig. 21 Straight dip-solder pins.

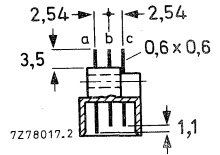


Fig. 22 Straight dip-solder pins, with protruding earth contacts.

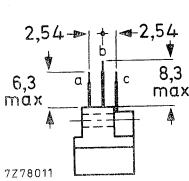


Fig. 23 Solder tags.

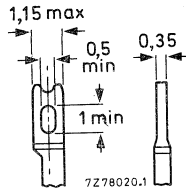


Fig. 24 90° angled pins for wire wrapping.

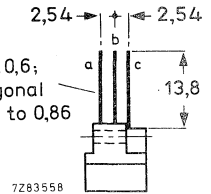
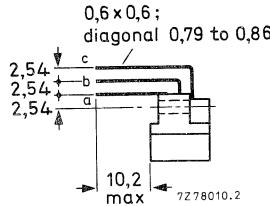


Fig. 25 Straight pins for wire wrapping.

Female parts

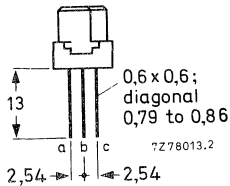


Fig. 26 Pins for wire wrapping.

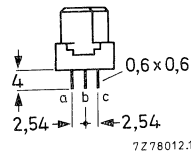


Fig. 27 Straight dip-solder pins.

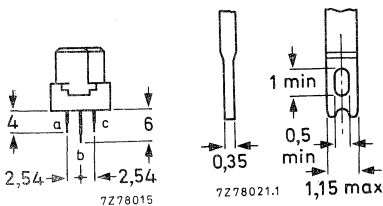


Fig. 28 Solder tags.

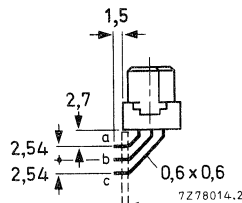












Fig. 29 90° angled dip-solder pins.

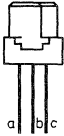
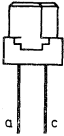
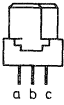
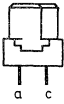
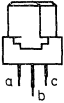
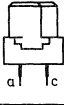
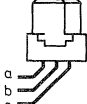
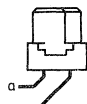
Table 3a Catalogue numbers for ordering male parts, style C; preferred versions are indicated thus: ▲

terminations	contacts		catalogue number of male part 2422 025			
	positions occupied	no.	performance class			
			3	2	1	1a
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89585 ▲	89283 ▲ 89354*	89675 89678*	89386
	a1,a2,a3 to a32; c1,c2,c3 to c32	64	89586 ▲	89287 ▲ 89355*	89679 89681*	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89587 ▲	89289 ▲ 89356**	89682 89683**	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96		89357 89358*	89684 89685*	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64		89359 89403*	89686 89687*	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32		89361 89362**	89688 89689**	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96		89363	89691	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64		89364	89692	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32		89365	89693	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96		89313	89694	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64		89324	89695	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32		89319	89696	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96		89544		
	a1,a2,a3 to a32; c1,c2,c3 to c32	64		89545		
	a2,a4,a6 to a32; c2,c4,c6 to c32	32		89546		

* With protruding earth contacts a1 and a32.

** With protruding earth contacts a2 and a32.

Table 3b Catalogue numbers for ordering female parts, style C; preferred versions indicated thus: ▲ ←

terminations	contacts	catalogue number of female part 2422 025				
		performance class				
		no.	3	2	1	1a
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89588 ▲	89284 ▲	89697	89388
	a1,a2,a3 to a32; c1,c2,c3 to c32	64	89589 ▲	89288 ▲	89698	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89591 ▲	89291 ▲	89735	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89592 ▲	89296 ▲	89701	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64	89593 ▲	89298 ▲	89702	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89594 ▲	89299 ▲	89703	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96		89325 ▲	89712	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64		89326 ▲	89713	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32		89327 ▲	89714	
Maintenance type 	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96		89382		
Maintenance type 	a1,a2,a3 to a32; c1,c2,c3 to c32	64		89405		
	a2,a4,a6 to a32; c2,c4,c6 to c32	32		89379		

MOUNTING

Dimensions in mm

Panel cut-out for female parts

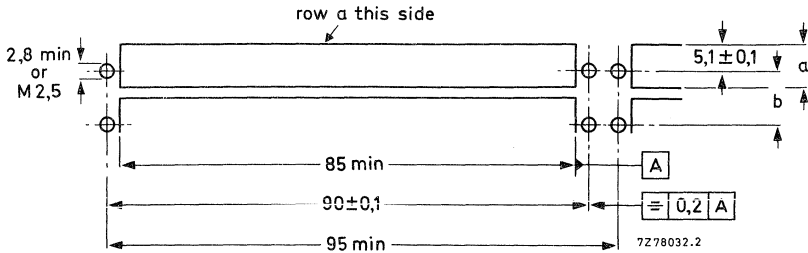


Fig. 30 Panel cut-out; see Table 4 for dimensions a and b.

Table 4

connector style	a _{min}	b _{min}
B	8,3	10,16
C	10,8	12,7

Hole pattern on printed boards for female parts

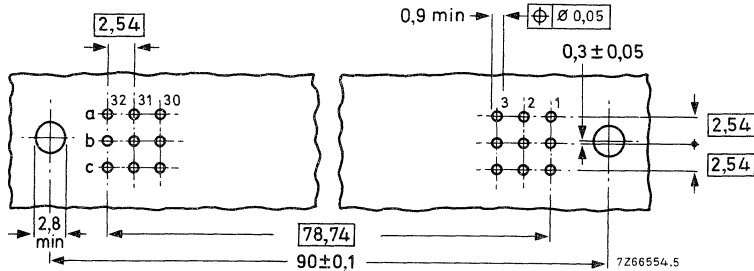


Fig. 31 For 3 x 32 contacts (style C).

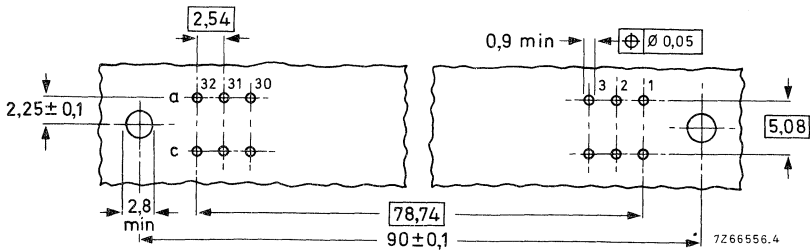


Fig. 32 For 2 x 32 contacts (style C).

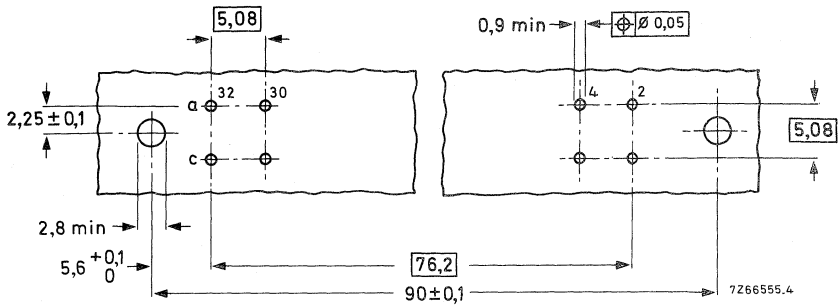


Fig. 33 For 2 x 16 contacts (style C).

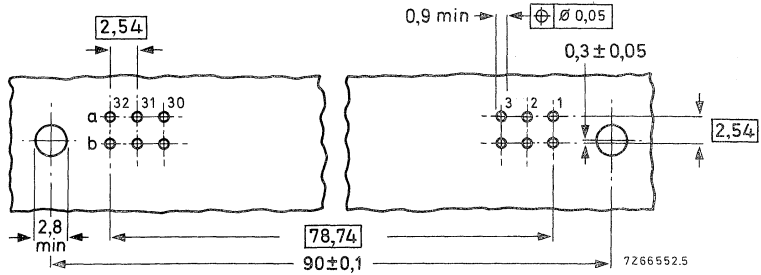


Fig. 34 For 2 x 32 contacts (style B).

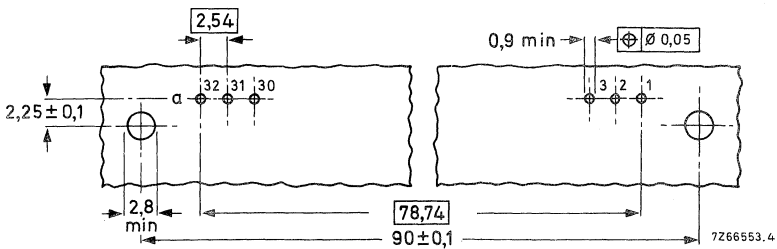


Fig. 35 For 1 x 32 contacts (style B).

Note: For mounting of female parts with 90° angled dip-solder pins, see page 29.

Hole pattern on printed boards for male parts

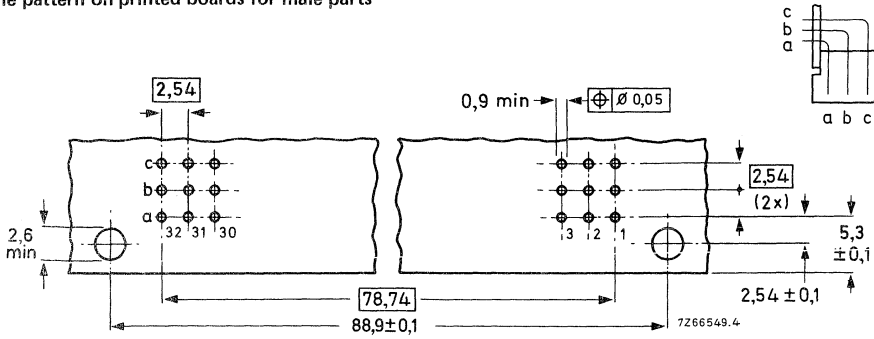


Fig. 36 For 3 x 32 contacts (style C).

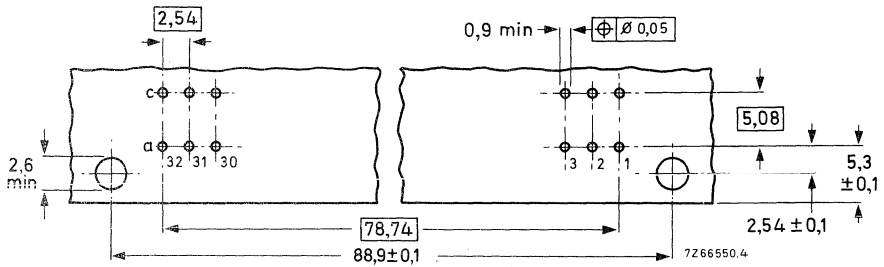


Fig. 37 For 2 x 32 contacts (style C).

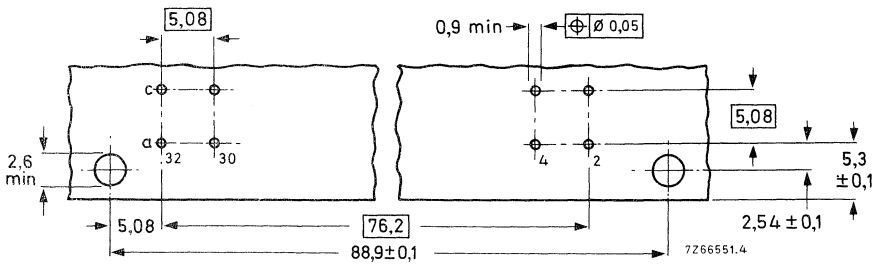


Fig. 38 For 2 x 16 contacts (style C).

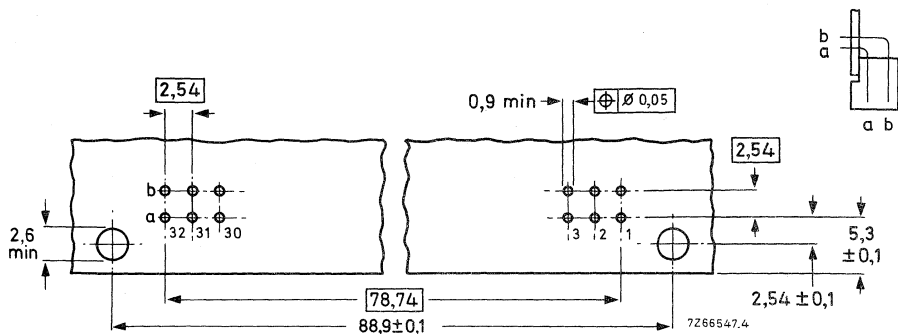


Fig. 39 For 2 x 32 contacts (style B).

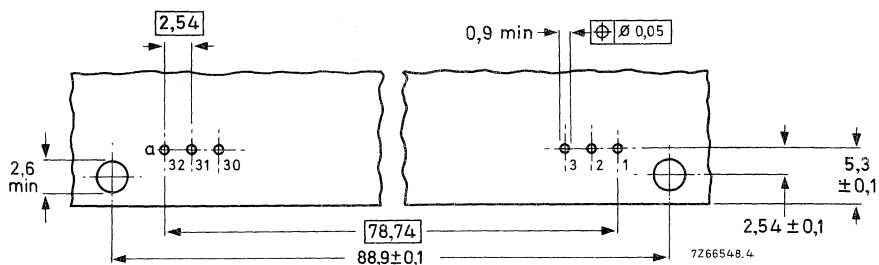


Fig. 40 For 1 x 32 contacts (style B).

MARKING**Package**

The package is marked with:

- 12-digit catalogue number;
- type number;
- reference number of manufacturer and country of origin;
- number of pieces;
- date of manufacture.

Connector

The bodies of the male and female parts are marked with:

- date of manufacture;
- name of manufacturer;
- 12-digit catalogue number;
- performance class (facultative);
- type number (facultative).

The terminations are marked as shown in Table 5a on the next page.

Table 5a

style	male part	female part
B		
C		

HOW TO ORDER MALE AND FEMALE PARTS

Order male and female parts by quoting the 12-digit catalogue numbers as shown in Tables 2 and 3. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity, see Table 5b. Please order in multiples of this quantity.

Example

The minimum quantity of male parts with 90° angled dip-solder pins and protruding earth contacts, and female parts with pins for wire wrapping, style C, 96 contacts, performance class 1, should be ordered as:
 100 x 2422 025 89678;
 100 x 2422 025 89697.

Table 5b

version	performance class	smallest packing quantity
male/female parts	1a	20
female parts	1,2,3	100
male parts, except those with 90° angled pins for wire wrapping		100
male parts with 90° angled pins for wire wrapping		50

ACCESSORIES

Cable hood

A hood of grey thermoplastic material for cable mounting can be supplied. The hood consists of two identical parts; it is suitable for use with both male and female parts. It is provided with three cable inlets, covered with snap-in plugs. The component parts of the hood are supplied unassembled in a plastic bag. A cable clamp with two screws is supplied with each hood. Separate cable clamps can be supplied under catalogue number 4332 026 30280; please order in multiples of 5. Use of the cable hood with a connector of style B requires the use of a packing piece (4332 026 26070). Locking clips and brackets are available for different applications (see Figs 43, 44 and 45).

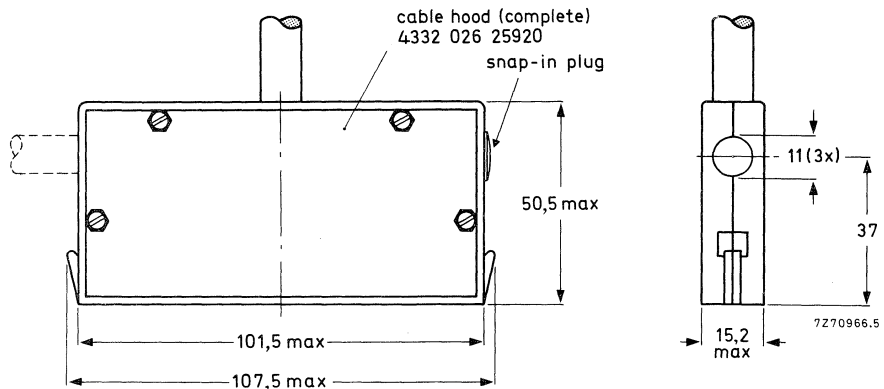


Fig. 41 Assembled cable hood.

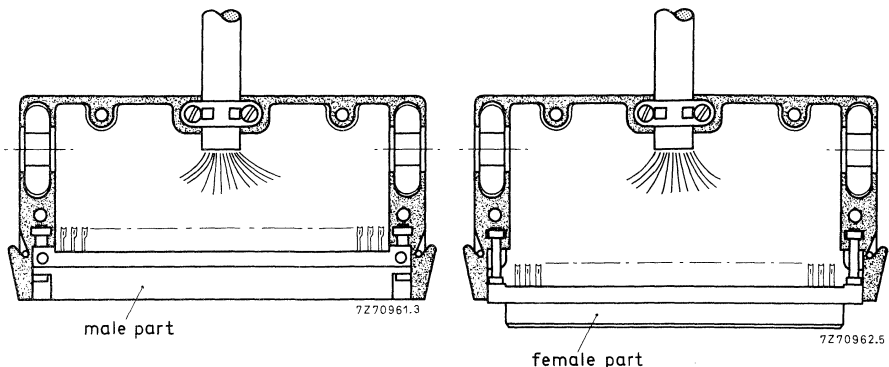


Fig. 42 Fixing of cable to the hood and mounting of the hood to the connector part. Maximum permissible cable diameter is 11 mm (e.g. 96 insulated wires AWG30).

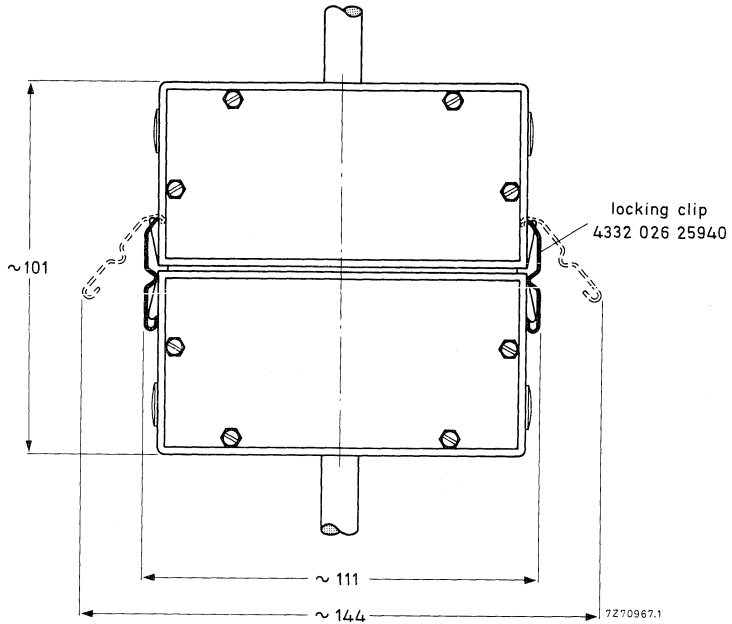


Fig. 43 Cable to cable application.

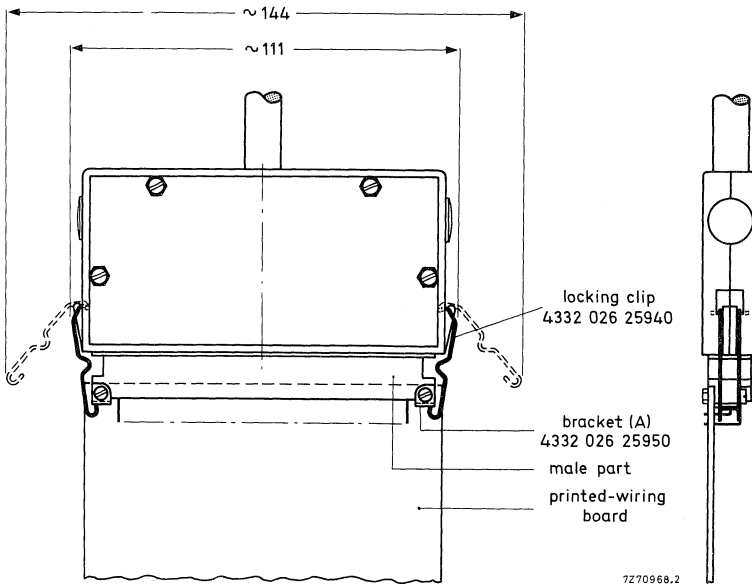


Fig. 44 Cable to printed-wiring board application.

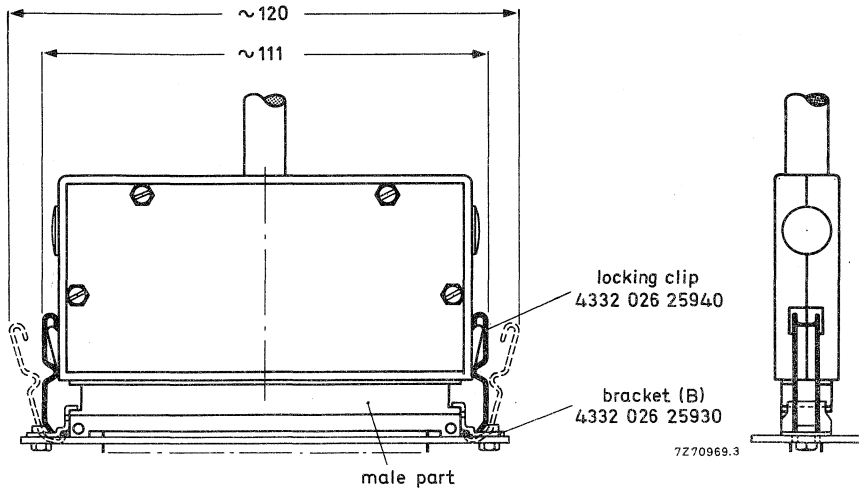


Fig. 45 Cable to panel application.

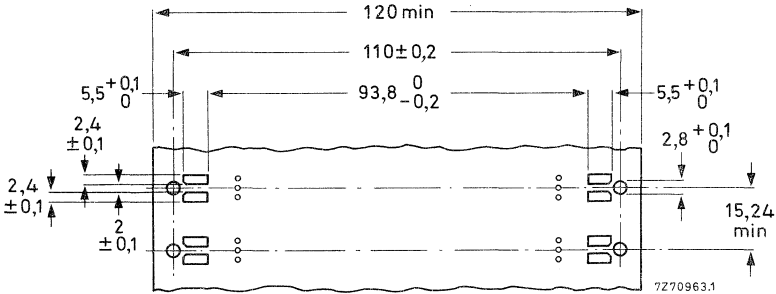


Fig. 46 Hole pattern on printed board for cable to panel application.

Table 6 Catalogue numbers for ordering accessories

accessory	catalogue number	smallest packing quantity
cable hood (complete)	4332 026 25920	10
locking clip	25940	10
bracket (B), see Fig. 45	25930	10
bracket (A), see Fig. 44	25950	10
packing piece, for use with connector style B	26070	10

For ordering these accessories see page 32.

Coding parts

A set of coding parts can be supplied. They prevent insertion of the male part into the wrong female part. A set consists of a stainless steel key strip for the male part, a stainless steel keyway strip for the female part, and polycarbonate keys. The strips are fixed to their relevant connector part by means of the connector mounting screws.

The key is pushed over the selected position of the key strip and the corresponding tooth of the keyway strip (Fig. 47a) broken off by means of a pair of pliers. Both strips are marked 1 to 16 inclusive, to facilitate location of the key. Maximum number of key locations with one key is 16; with two keys 120.

For use with male parts with 90° angled pins, the coding parts can be applied in two ways, as shown in Figs 47a and 47b; mounting according to Fig. 47b requires the use of a spacer.

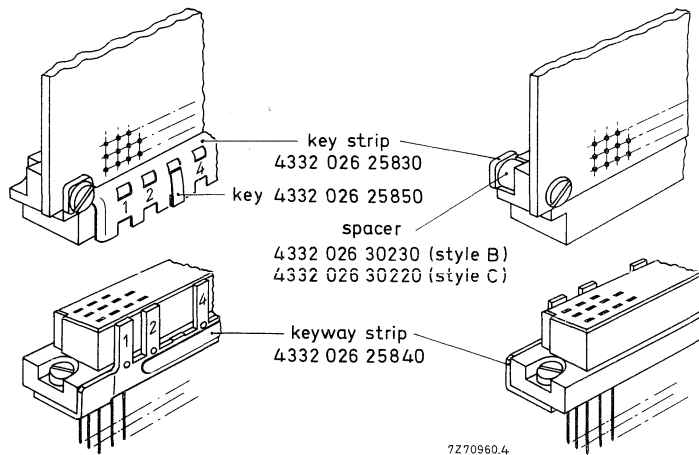


Fig. 47a Coding parts; key strip mounted to solder side of printed board.

Fig. 47b Coding parts; key strip mounted to male part on component side of printed board.

Mass of key strip: approx. 6 g
 of keyway strip: approx. 8 g
 of key: approx. 0,07 g

Notes

Minimum centre-to-centre distance between two adjacent connectors of style B is 12,7 mm and of style C, 15,24 mm.

The female part is raised 1 mm above the panel (thickness of the keyway strip).

The coding system cannot be applied to a connector with cable hood.

The use of coding parts with male parts with straight dip-solder pins is shown in Figs 48a and 48b.

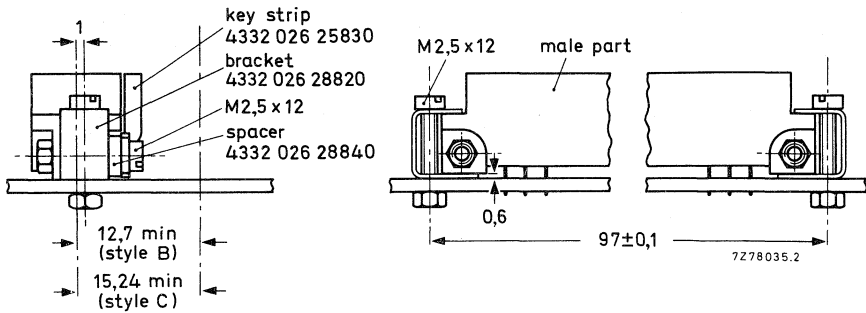


Fig. 48a Key strip mounted to a male part with straight dip-solder pins.

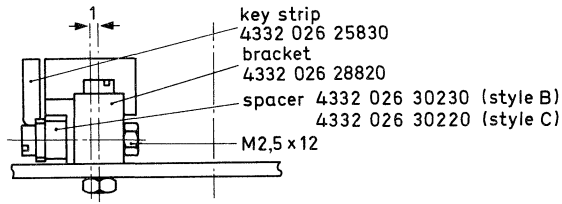


Fig. 48b Key strip mounted to a male part with straight dip-solder pins.

Table 7 Catalogue numbers for ordering accessories

accessory	catalogue number	smallest packing quantity
key strip (Fig. 49)	4322 026 25830	10
keyway strip (Fig. 50)	25840	10
key	25850	100
spacer for style B	30230	10
spacer for style C	30220	10
spacer for mounting according to Fig. 48a	28840	10
bracket for mounting according to Figs 48a and 48b	28820	10

For ordering these accessories, see page 32.

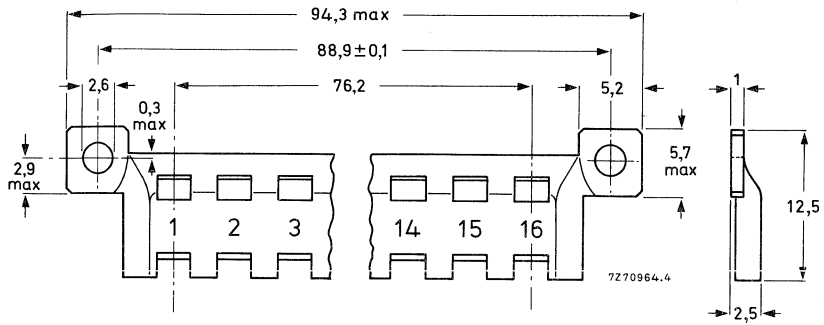


Fig. 49 Key strip.

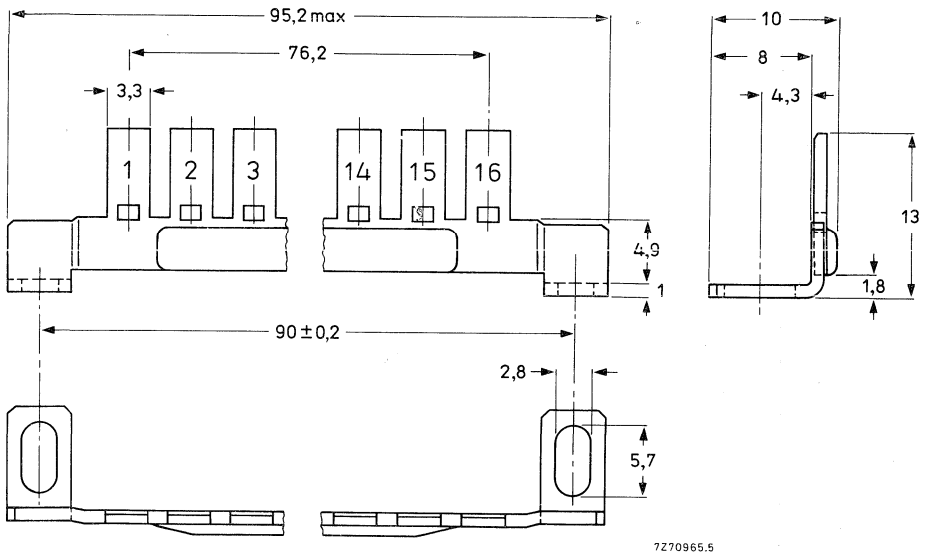


Fig. 50 Keyway strip.

Another set of coding parts for the reverse coding system is:

- a stainless steel key strip for the female part,
- a stainless steel keyway strip for the male part,
- a polycarbonate key.

The strips are fixed in position with the connector mounting screws.

Coding is similar to the coding system specified on pages 24 to 26, but with the roles of the key strip and the keyway strip reversed. The key strip, which is fitted to the female part, can be coded after the panel has been assembled. The coding can be changed or corrected by repositioning the key only, without removing the female part from the panel.

Key strip and keyway strip are marked 1 to 16, to facilitate location of the key. Maximum number of codes with one key is 16, with two keys 120.

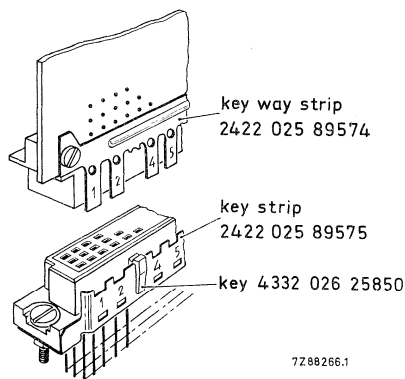


Fig. 51 Reverse coding system.

Table 8

coding part	mass g	catalogue number	smallest packing quantity
keyway strip	8	2422 025 89574	100
key strip	6	2422 025 89575	100
key	0,07	4332 026 25850	100

For ordering the coding parts, see page 32.

Notes

Minimum centre-to-centre spacing between adjacent connectors is 12,7 mm for style B and 15,24 mm for style C.

The coding system raises the female part 1 mm above the panel (thickness of the key strip).

The coding system cannot be used if the connector has a cable hood.

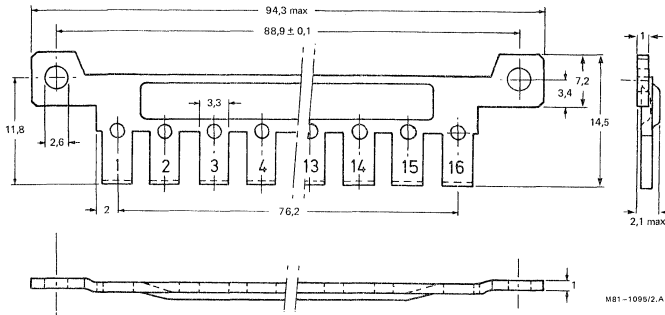


Fig. 52 Keyway strip.

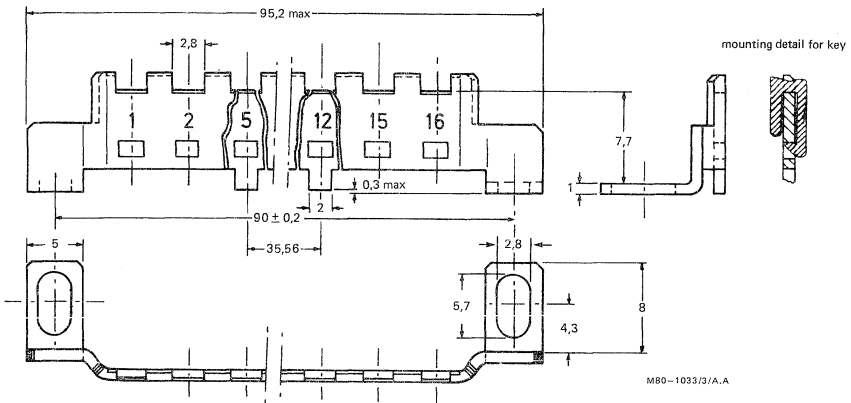


Fig. 53 Key strip.

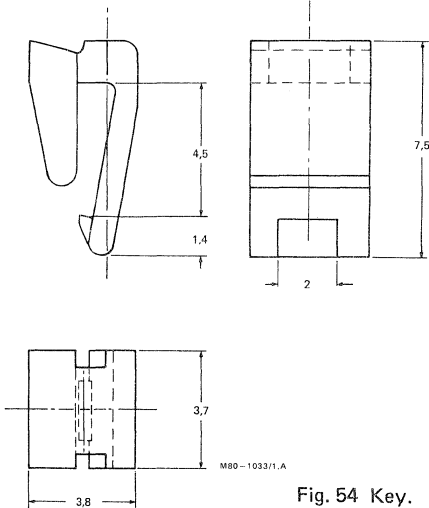


Fig. 54 Key.

Accessories for female parts with pins for wire wrapping

For connection of a cable to the wire wrapping pins of a female part, e.g. at the rear of a back panel, a set of accessories is available: receptacle, distance pieces, locking clips and screws M2,5 x 5 (Fig. 55). The receptacle permits the wrapping of one wrap per pin up to AWG30. Use of female parts of style B requires the use of a packing piece in the receptacle.

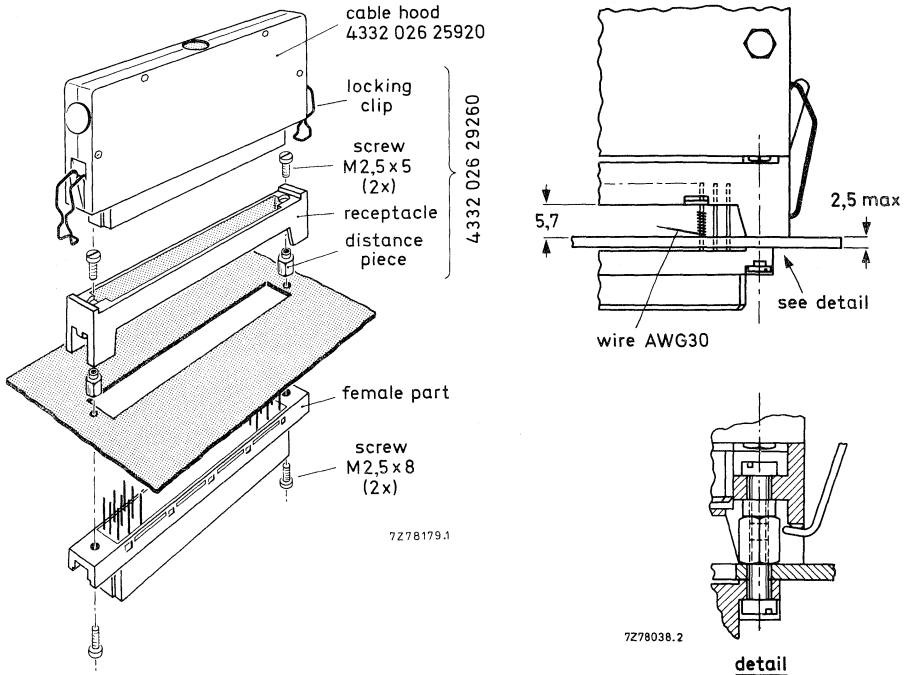


Fig. 55 Accessories for female parts with pins for wire wrapping.

Table 9 Catalogue number for ordering accessories

accessory	catalogue number	smallest packing quantity
set of accessories, consisting of 1 receptacle, 2 distance pieces, 2 locking clips, 2 screws M2,5 x 5	4322 026 29260	10
packing piece for use with female parts of style B	29090	10

For ordering these accessories see page 32.

Mounting brackets for female parts with 90° angled dip-solder pins

A mounting bracket with locking facility is available for fitting female parts with 90° angled pins to printed boards (Fig. 56) or to extension boards (Fig. 57). Two types of clips can be supplied for locking to the cable hood and to the male part respectively.

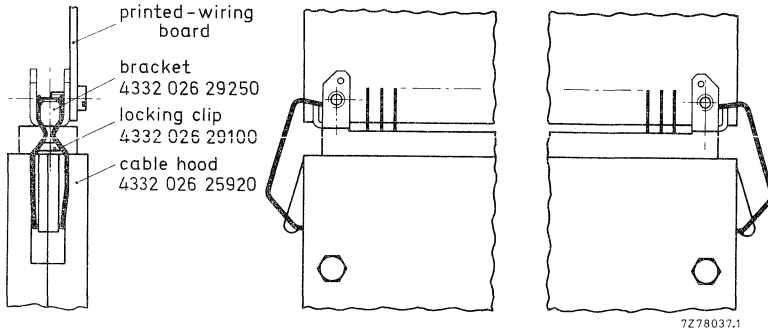


Fig. 56 Mounting of a female part to a board with bracket having locking facility.

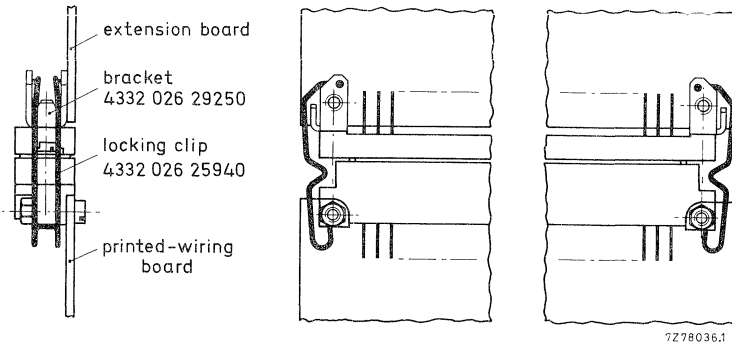


Fig. 57 Mounting of a female part to an extension board with bracket having locking facility.

Another mounting bracket for fitting female parts with 90° angled pins to printed boards is shown in Fig. 58. The bracket is provided with two M2,5 holes. The hole pattern of the board is shown in Fig. 59.

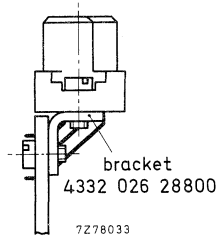


Fig. 58 Mounting of a female part to a board.

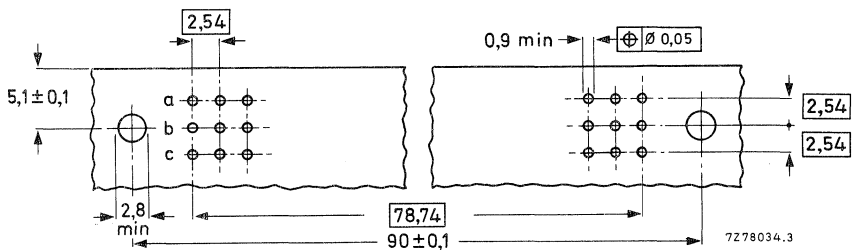


Fig. 59 Hole pattern of the board for a female part with 3 x 32 contacts (style C): for 2 x 32 contacts (style B) the holes of row c are omitted.

Table 10 Catalogue numbers for ordering accessories

accessory	catalogue number	smallest packing quantity
mounting bracket (Fig. 58)	4332 026 28800	10
mounting bracket (Figs 56 and 57)	29250	10
clip for locking to a cable hood (Fig. 56)	29100	10
clip for locking to a male part (Fig. 57)	25940	10

For ordering these accessories see page 32.

How to order accessories

Order accessories by quoting the 12-digit catalogue numbers as shown in Tables 6 to 10. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity. Please order in multiples of this quantity, with a minimum of 100 pieces.

Example

The minimum quantity of parts for the reverse coding system should be ordered as:

100 x 2422 025 89574;

100 x 2422 025 89575;

100 x 4332 026 25850.

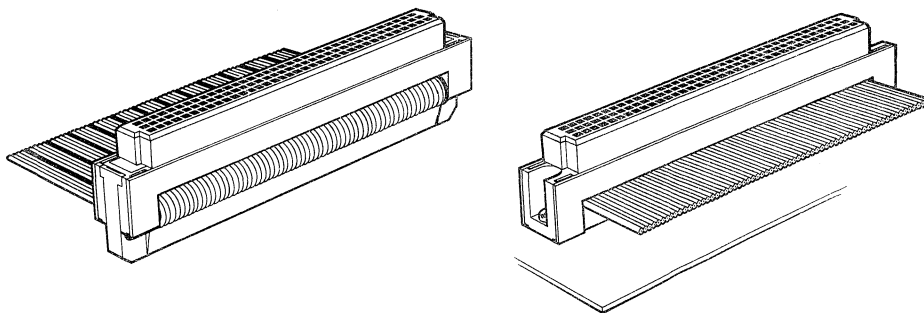
TWO-PART PRINTED-WIRING CONNECTORS

female part with IDC terminations

- For ribbon cables with solid AWG30/1 or stranded wires AWG28/7
- Mate with IEC/DIN connector range, style C
- Versions for cable with strain relief or for fixed mounting

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts style C (3 rows)	64
Board thickness	1,6 mm
Terminations	insulation displacement
Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Mechanical endurance	400 insertions
Climatic category (IEC 68)	55/105/56



APPLICATION

For connection of flat ribbon cables in electronic circuits where high density packaging is required.

DESCRIPTION

These female connectors have a one-piece construction of a contact block with insulation displacement contacts, and a pre-mounted pressure block, in which the cable has to be inserted. The connectors have a grey, flame-retardant, glass-fibre-filled polyester body. The contacts are of phosphor bronze and have a gold on nickel finish.

During insulation displacement the pressure block is firmly pressed and locked to the contact block. For appropriate assembling tools, see data sheet "Insulation Displacement Tools". Ribbon cables with stranded AWG28/7 or solid wires, AWG30/1 can be used; see data sheet "Ribbon Cables F303".

Two versions of female connectors are available: for use as a free cable connector with strain relief, or for fixed mounting without strain relief. The female connectors mate all male parts, type C, of the F068-I series.

ELECTRICAL DATA

Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz	
initially	$\leq 15\text{ m}\Omega$
after tests	$\leq 20\text{ m}\Omega$
Insulation resistance	
initially	$> 10^6\text{ M}\Omega$
after tests	$> 10^4\text{ M}\Omega$
Proof voltage for 1 min, at 20 °C	
between contacts	1000 V (r.m.s.), 50 Hz
between a contact and earth	1550 V (r.m.s.), 50 Hz

MECHANICAL DATA

Contact pitch	2,54 mm
Number of contacts, style C	64 (rows a and c)
Board thickness	1,6 mm
Polarization	achieved by asymmetrical housing
Connector body	
material	glass-fibre-filled polyester
colour	grey (RAL 7032)
Contacts	
material	phosphor bronze
finish of contact surfaces	gold on nickel plate
type of termination	insulation displacement
Insertion and withdrawal force	$\leq 60\text{ N}$
Mechanical endurance	400 insertions, according to IEC 512, test 9a
Vibration	according to IEC 512, test 6 d, 10-500 Hz, 0,75 mm (p-p) or 5 g, 3 x 2 h
Wire size	AWG28/7 (0,08 mm ²) or AWG30/1 (0,05 mm ²)

ENVIRONMENTAL DATA

Climatic category (IEC 68)

55/105/56

Ambient temperature range

-55 to + 105 °C

Damp heat, steady state

according to IEC 512, test 11c, 56 days,
40 °C, R.H. 90 to 95%.

Dry heat

according to IEC 512, test 11i, 16 h,
105 °C

Flammability

according to UL94, category V-0

DIMENSIONAL DATA

Dimensions in mm

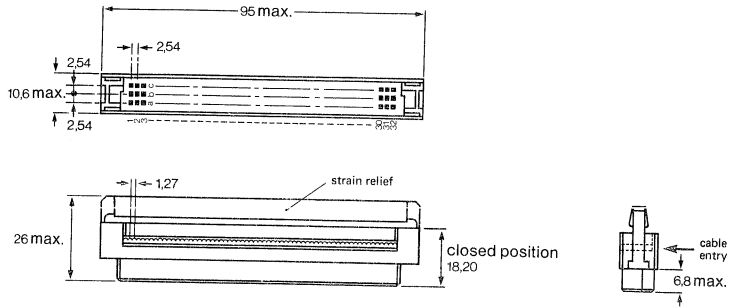


Fig. 1 Female connector, free cable version.
Strain relief (Fig. 3) to be ordered separately.

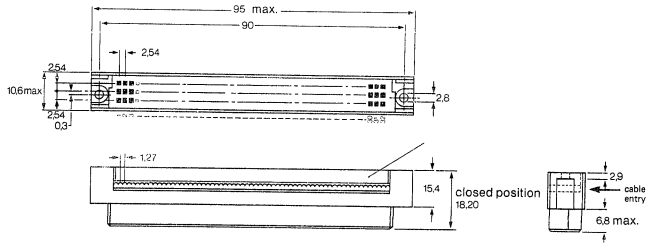


Fig. 2 Female connector, fixed mounting version.

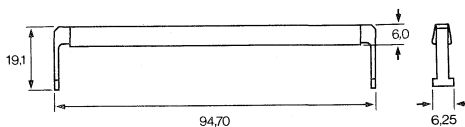


Fig. 3 Strain relief, to be used with the free cable version shown in Fig. 1.

For ribbon cables, see data sheet "Ribbon Cables F303".

For assembling tools, see data sheet "Insulation Displacement Tools".

How to order

Order the component by quoting the 12-digit catalogue number as shown in the tabel below. Note that the catalogue number applies to one piece, and takes into account the smallest packing quantity. Please order in multiples of this quantity.

component	catalogue number	smallest packing quantity
free cable version	2422 025 89651 ▲	50
strain relief	2422 025 89659 ▲	50
fixed mounting version	2422 025 89652	50

Example: The minimum quantity of the free cable version with strain relief should be ordered as:

50 x 2422 025 89651;

50 x 2422 025 89659.

▲ Preferred.

MOUNTING

Cable/connector assembling

The unstripped ribbon cable has to be inserted into the corrugated slot in the pressure block of the connector (Fig. 4).

The pressure block is then pushed to the contact block by the assembling tool.

After pressing, the two parts of the connector remain firmly locked together.

For the free cable version only:

The ribbon cable is then folded over the connector (Fig. 5).

To complete the assembly procedure the strain relief is snapped over the ends of the connector (Fig. 6).

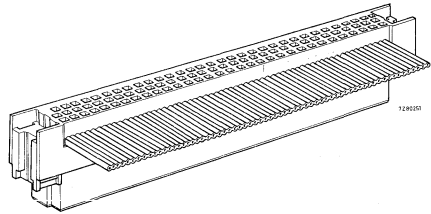


Fig. 4.

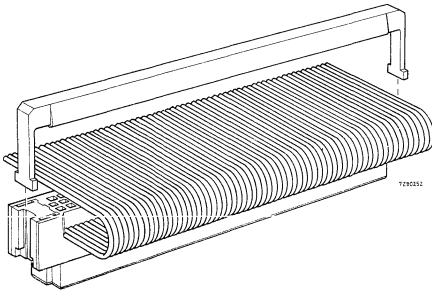


Fig. 5.

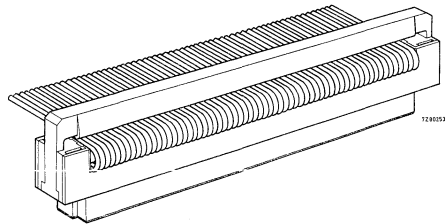


Fig. 6.

MARKING

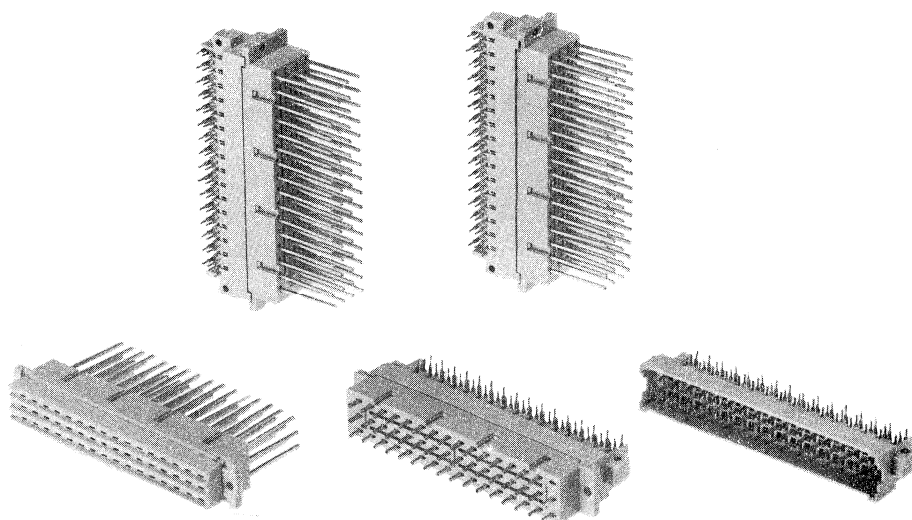
The contacts are marked at the termination side of the connectors.

TWO-PART PRINTED-WIRING CONNECTORS

- For basic grid of 5,08 mm (0,2 in)

QUICK REFERENCE DATA

Contact pitch	5,08 mm (0,2 in)
Number of contacts	
style F	32, 48
style G	64
Board thickness	1,42 to 1,78 mm
Terminations	
male part	90° angled dip-solder pins* straight dip-solder pins solder tags*
female part	straight dip-solder pins pins for wire wrapping solder tags
Current at $T_{amb} = 20\text{ °C}$	5,5 A
Mechanical endurance	400 insertions
Climatic category (IEC 68)	55/125/56
Detail specifications	IEC 603-2 and DIN 41612



* With or without protruding earth contacts.

APPLICATION

For use in applications where high current and/or high voltage operation is required. For signal connections the complementary F068-I series of connectors can be employed. The combination of F068-I and F068-II connectors is ideal for a wide range of professional applications, including those having severe industrial environments.

DESCRIPTION

The connectors consist of a male part to be fitted to a printed-wiring board and a female part to be mounted on a chassis or a back panel. Both parts have a grey body of glass-fibre-filled thermoplastic material.

The contact springs of the female part are of phosphor bronze, the contact pins of the male part are of brass; the contact surfaces are gold on nickel plating. The contact terminations of both parts are tinned. The contact springs of the female part are reinforced with a steel spring, which gives an extra guarantee for reliable functioning under severe conditions of continuous load, vibration, etc. The male parts with 90° angled dip-solder pins or solder tags can be supplied with protruding earth contacts, which are approx. 1,5 mm longer than the other contacts.

No special provisions are required for polarization.



ELECTRICAL DATACurrent at $T_{amb} = 20\text{ }^{\circ}\text{C}$

5,5 A

Derated current curve

according to IEC 512,
test 5b, see Fig. 1

Contact resistance (including material resistance)

at 10 mA, max 20 mV(peak) open circuit voltage, 1 kHz

initially

 $\leq 15\text{ m}\Omega$

after mechanical endurance

 $\leq 15\text{ m}\Omega$

after damp heat test (IEC 68, test Ca)

 $\leq 15\text{ m}\Omega$

Insulation resistance

initially

 $> 10^6\text{ M}\Omega$

after damp heat test (IEC 68, test Ca)

 $> 10^4\text{ M}\Omega$

Creepage distance

between contacts

 $\geq 3\text{ mm}$ (Notes 1 and 2)

between a contact and earth

 $\geq 6\text{ mm}$ (Note 1)

Clearance

between contacts

 $\geq 1,6\text{ mm}$

between a contact and earth

 $\geq 3,5\text{ mm}$

} Note 1

Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$

between contacts

1550 V(r.m.s.), 50 Hz

between a contact and earth

2500 V(r.m.s.), 50 Hz

Capacitance between contacts at 1 kHz

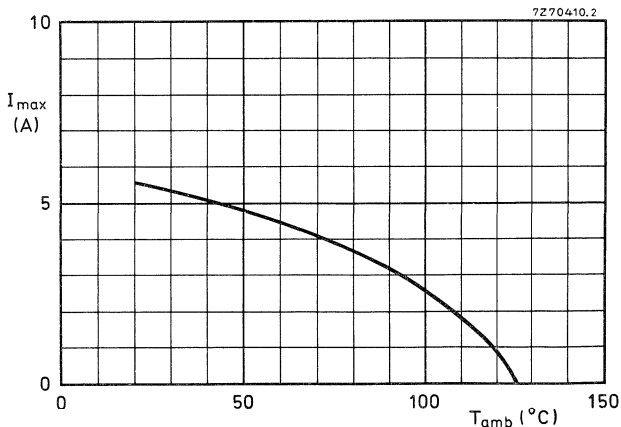
 $\leq 2\text{ pF}$ 

Fig.1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

Notes

1. This value may be reduced by the wiring and/or the printed-wiring boards.
2. Between rows z and f (style G): $\geq 1,9\text{ mm}$.

MECHANICAL DATA

Contact pitch	5,08 mm(0,2 in)
Number of contacts	32, 48
style F	64
style G	
Board thickness	1,6 mm
Polarization	by means of asymmetrical position of the contacts
Insertion force and withdrawal force	see Table 1
Withdrawal force per contact, measured with mechanical gauge according to DIN 41612	$\geq 0,2$ N
Mechanical endurance	400 insertions, according to IEC 512, test 9a
Connector body material	glass-fibre-filled thermoplastic
Contacts	male part
material	brass
shape	rectangular pin
→ finish of contact surfaces	gold-plate on nickel plate
type of termination	<ul style="list-style-type: none"> ● 90° angled dip-solder pin ● straight dip-solder pin ● solder tag
finish of termination	$\geq 6 \mu\text{m}$ tinned
Wire diameter	AWG22 to AWG28 ($\phi 0,64$ to $\phi 0,32$ mm)
Mass	see Table 1
Solderability	235 °C, 2 s according to IEC 512, test 12a
Resistance to soldering heat	260 °C, 10 s according to IEC 512, test 12d
Vibration	according to IEC512, test 6d, 10 to 500 Hz, 0,35 mm(p-p) or 5g, 3 directions, 2 h per direction

Table 1

number of contacts	insertion force and withdrawal force N	approx. mass (g)	
		male part	female part
32	≤ 50	18	34
48	≤ 75	22	40
64	≤ 100	33	57

ENVIRONMENTAL DATA

Climatic category (IEC 68)	55/125/56
Ambient temperature range	-55 to +125 °C
Storage temperature range	-55 to +125 °C
Damp heat, steady state	according to IEC512, test 11c, 56 days, 40 °C, R.H. 90 to 95%
Dry heat	according to IEC512, test 11i, 16 h, 125 °C
Low air pressure	according to IEC512, test 11k, 5 min, 20 °C, 30 kPa
Flammability	according to UL94, category V-1

DIMENSIONAL DATA

Two-part connector, style F (3-row housing)

Dimensions in mm

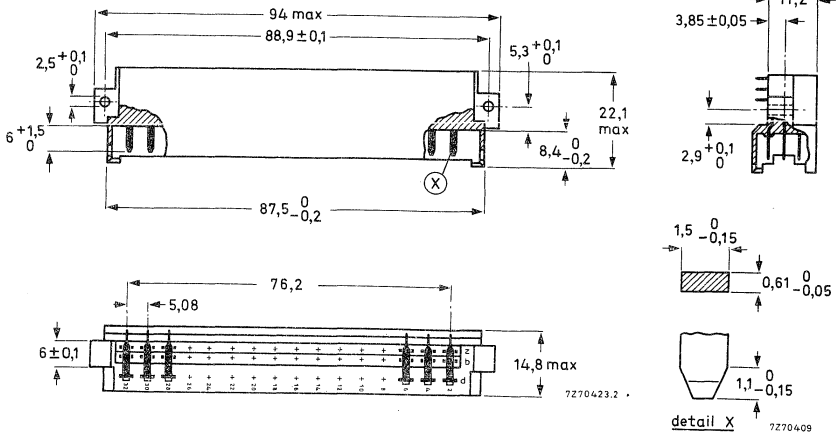


Fig. 2 Male part with 90° angled dip-solder pins.

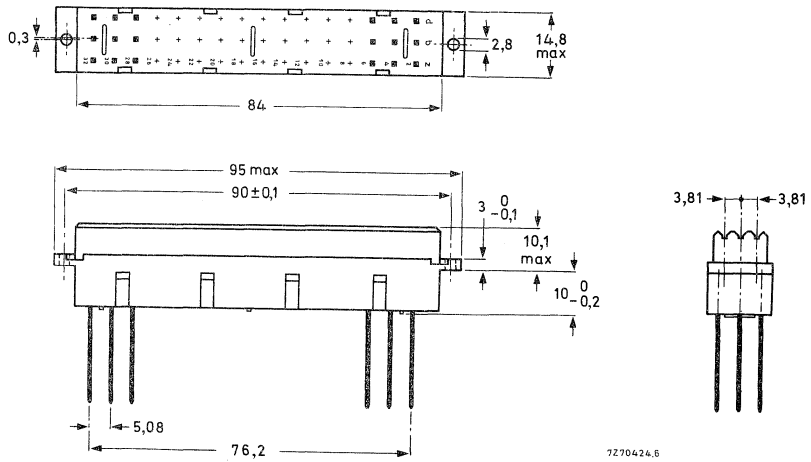


Fig. 3 Female part with pins for wire wrapping.

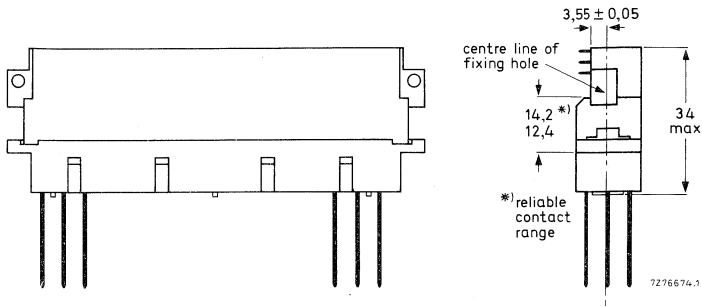


Fig. 4 Combination of connector parts shown in Figs 2 and 3.

Male parts

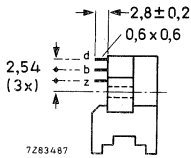


Fig. 5 90° angled dip-solder pins.*

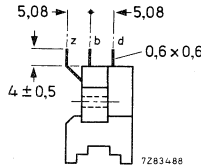


Fig. 6 Straight dip-solder pins.

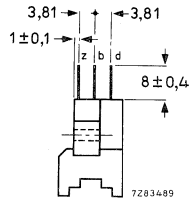
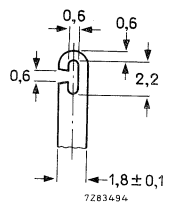


Fig. 7 Solder tags.*



Female parts

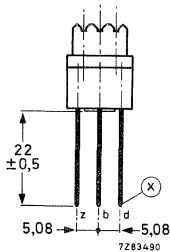


Fig. 8 Pins for wire wrapping.

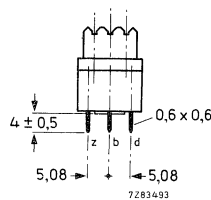
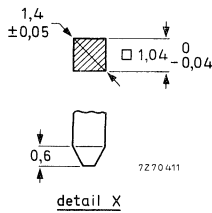


Fig. 9 Straight dip-solder pins.

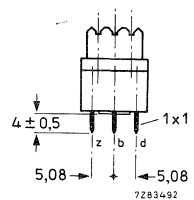


Fig. 10 Straight dip-solder pins.

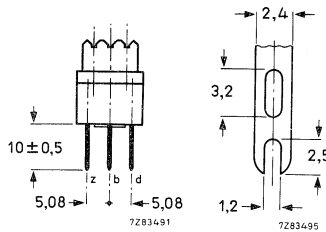
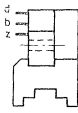
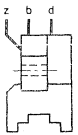
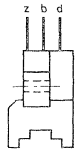


Fig. 11 Solder tags.

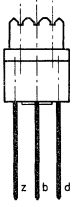
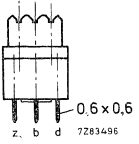
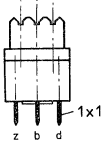
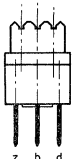
* Available with or without protruding earth contacts, which are approx. 1,5 mm longer than the other contacts.

Table 2a Catalogue numbers for ordering male parts, style F

terminations	contacts			catalogue number of male part
	number	positions occupied	protruding earth contacts	
 <p>90° angled dip-solder pins</p>	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	— b2,b32 d2,d32 z32 b2,b32,z2 d2,d32,z2	2422 025 88143
				88033
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	— b2,b32 z32 b2,b32,z2	2422 025 88142
88032				
32	d2,d4,d6 to d32 z2,z4,z6 to z32	— d2,d32 z32 d2,d32,z2	2422 025 88115	
			88138	
 <p>straight dip-solder pins</p>	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	—	2422 025 88043
				32
	32	d2,d4,d6 to d32; z2,z4,z6 to z32	—	
 <p>solder tags</p>	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	— b2,b32 d2,d32	2422 025 88059
				88045
	32	b2,b4,b6 to b32 z2,z4,z6 to z32	— b2,b32	2422 025 88058
88044				
32	d2,d4,d6 to d32; z2,z4,z6 to z32	— d2,d32	2422 025 88153	
				88139

→ The smallest packing quantity is 30.

Table 2b Catalogue numbers for ordering female parts, style F

terminations	contacts		catalogue number of female part
	number	positions occupied	
 <p>pins for wire wrapping</p>	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88047
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	2422 025 88046
		d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88155
 <p>straight dip-solder pins (0,6 x 0,6)</p>	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88127
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	2422 025 88125
		d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88157
 <p>straight dip-solder pins (1 x 1)</p>	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88051
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	2422 025 88049
		d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88116
 <p>solder tags</p>	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88053
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	2422 025 88052
		d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88133

The smallest packing quantity is 30.

How to order

Order the connector parts by quoting the 12-digit catalogue number as shown in Tables 2a and 2b. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

Two-part connector, style G (4-row housing)

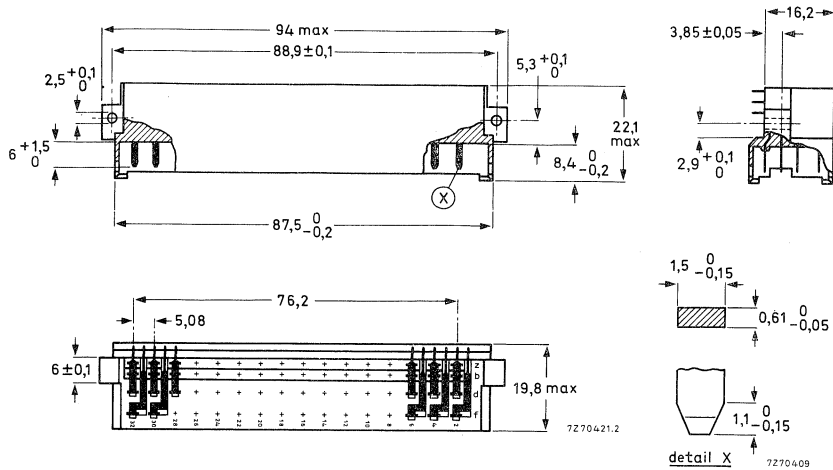


Fig. 12 Male part with 90° angled dip-solder pins. The pitch between the pins of rows z and f is 2,54 mm instead of 5,08 mm.

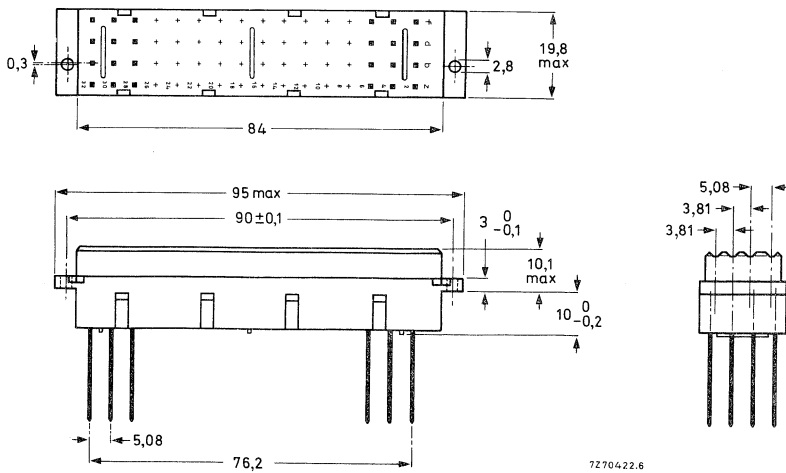


Fig. 13 Female part with pins for wire wrapping.

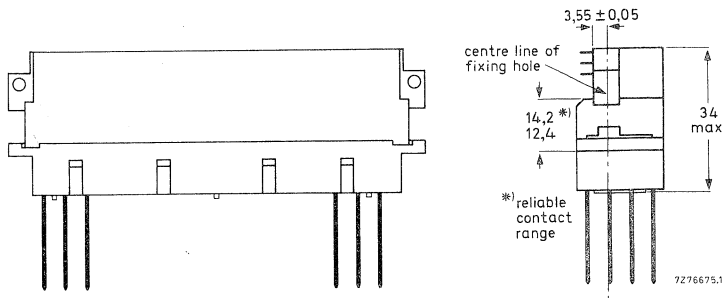


Fig. 14 Combination of connector parts shown in Figs 12 and 13.

Male parts

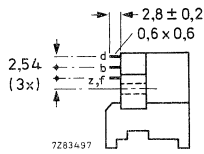


Fig. 15 90° angled dip-solder pins.*

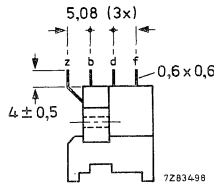


Fig. 16 Straight dip-solder pins.

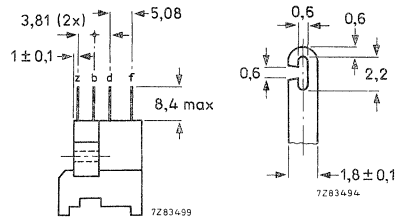


Fig. 17 Solder tags.*

Female parts

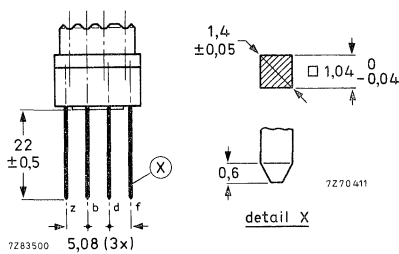


Fig. 18 Pins for wire wrapping.

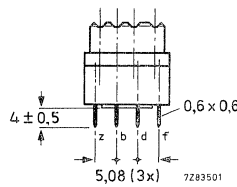


Fig. 19 Straight dip-solder pins.

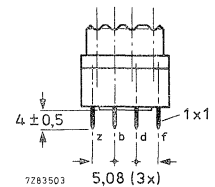


Fig. 20 Straight dip-solder pins.

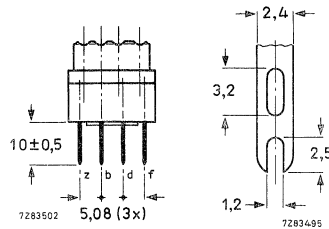
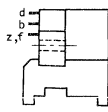
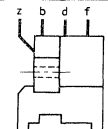
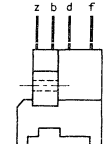


Fig. 21 Solder tags.

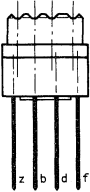
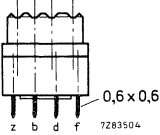
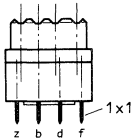
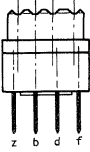
* Available with or without protruding earth contacts, which are approx. 1.5 mm longer than the other contacts.

Table 3a Catalogue numbers for ordering male parts, style G

terminations	contacts			catalogue number of male part
	number	positions occupied	protruding earth contacts	
 <p>90° angled dip-solder pins</p>	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	— b2,b32 z32 b2,b32,z2 d2,d32 d2,d32,z2	2422 025 88144 88034 88037 88041 88147 88152
 <p>straight dip-solder pins</p>	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	—	2422 025 88091
 <p>solder tags</p>	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	— b2,b32 d2,d32	2422 025 88092 88093 88149

→ The smallest packing quantity is 24.

Table 3b Catalogue numbers for ordering female parts, style G

terminations	contacts		catalogue number of female part
	number	positions occupied	
 <p>pins for wire wrapping</p>	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	2422 025 88048
 <p>straight dip-solder pins (0,6x0,6)</p>	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	2422 025 88129
 <p>straight dip-solder pins (1 x 1)</p>	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	2422 025 88094
 <p>solder tags</p>	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	2422 025 88096

The smallest packing quantity is 24.

How to order

Order the connector parts by quoting the 12-digit catalogue number as shown in Tables 3a and 3b. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

MOUNTING

Dimensions in mm

Panel cut-out for female parts

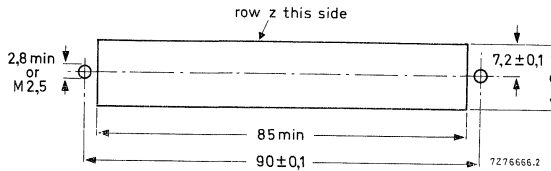


Fig. 22 Panel cut-out; see Table 4 for dimension a.

Table 4

connector style	a _{min}
F	15
G	20

Hole patterns on printed boards for female parts

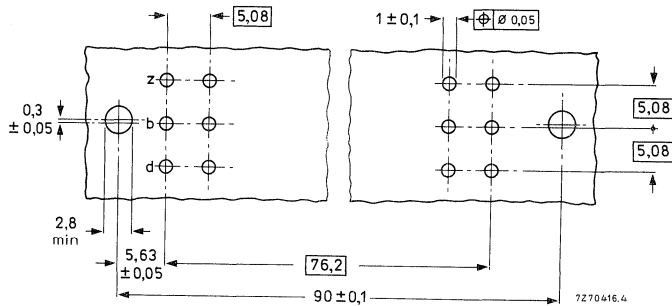


Fig. 23 For 3 x 16 contacts; style F.

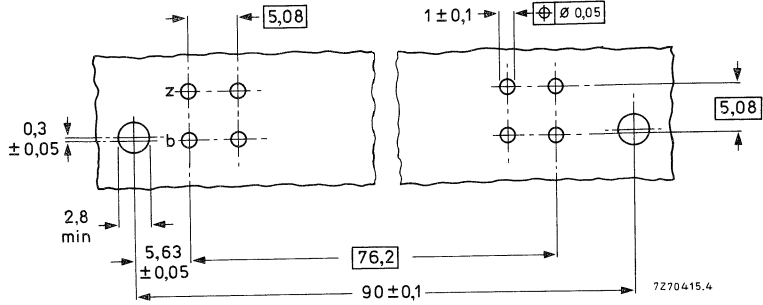


Fig. 24 For 2 x 16 contacts (rows b and z); style F.

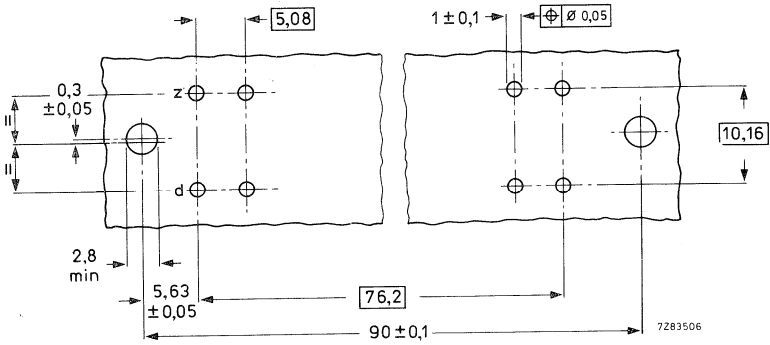


Fig. 25 For 2 x 16 contacts (rows d and z); style F.

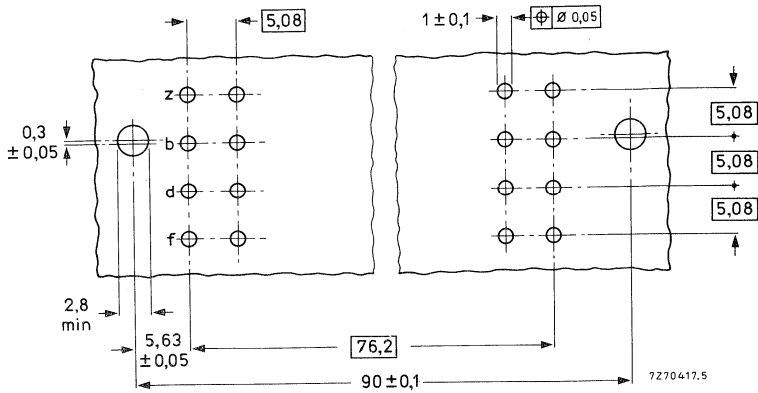


Fig. 26 For 4 x 16 contacts; style G.

Hole patterns on printed boards for male parts

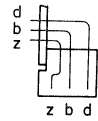
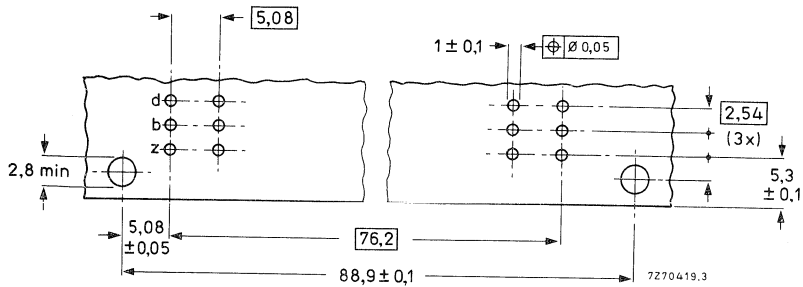


Fig. 27 For 3 x 16 contacts; style F.

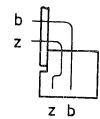
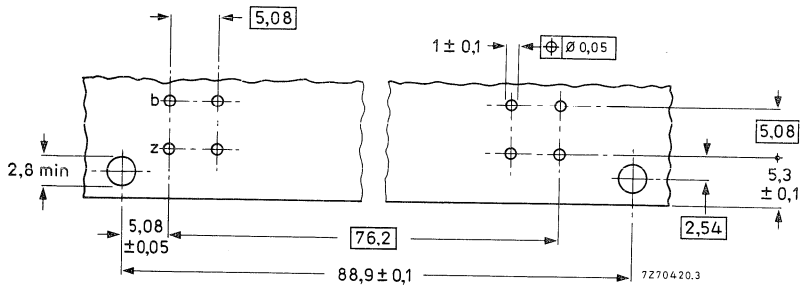


Fig. 28 For 2 x 16 contacts (rows b and z); style F.

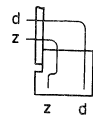
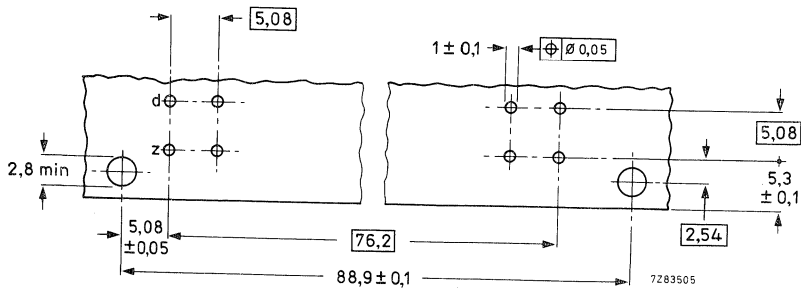


Fig. 29 For 2 x 16 contacts (rows d and z); style F.

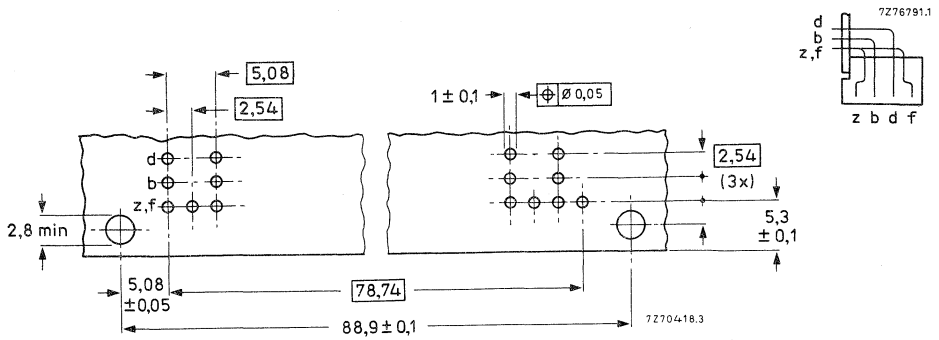


Fig. 30 For 4 x 16 contacts; style G.

MARKING

Package

The package is marked with:
 12-digit catalogue number;
 reference number of manufacturer;
 number of pieces.

Connector

The bodies of the male and female parts are marked with:
 12-digit catalogue number;
 type number;
 date of manufacture
 name of manufacturer.

The terminations are marked as shown in the table below.

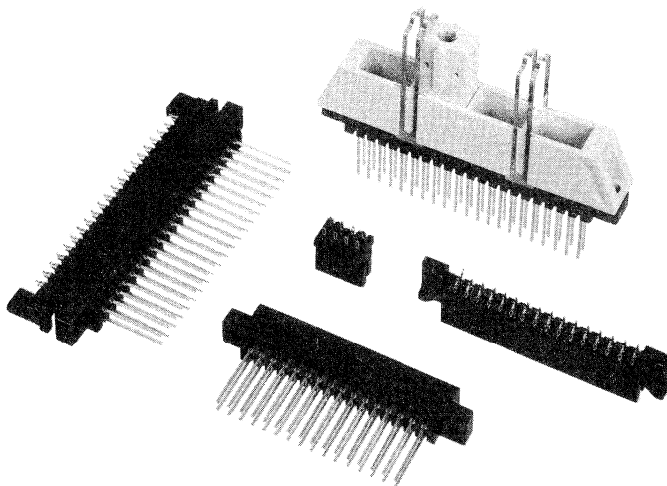
Table 6

connector style	male part	female part
F	<p>7276667</p>	<p>7276670</p>
G	<p>7276668</p>	<p>7276669</p>

3,81 mm (0,15 in) PITCH TWO-PART PRINTED-WIRING CONNECTORS

QUICK REFERENCE DATA

Contact pitch	3,81 mm (0,15 in)
Number of connections, double row	32, 42
test plug, double row	8
Board thickness	1,42 to 1,78 mm
Terminations	
male part	pins for wire wrap
female part	solder tags
test plug	solder tags with eyelet
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2,5 A
Mechanical endurance	500 insertions
Climatic category (IEC68)	10/100/21



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APPLICATION

For use in telecommunication equipment.

DESCRIPTION

The connectors consist of a female part to be fitted to a printed-wiring board and a male part to be mounted on a chassis or a back panel. Both parts have a dark green glass-fibre-filled phenolformaldehyde body. The contact springs and contact pins are of phosphor bronze; the contact surfaces are rolled-on gold on nickel plating. The contact mating length is 3,5 mm min. The contacts are specially treated to prevent the influence of sparks on contact surfaces when printed-wiring boards are plugged into or pulled out of equipment in operation.

A test plug with 8 contacts is available for use as a cable connector for monitoring circuit parameters (see Accessories).

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2,5 A
Derated current curve	according to IEC 512, test 5b, see Fig.1
Contact resistance (including material resistance) at 10 mA, max 20 mV (peak) open circuit voltage, 1 kHz.	
Measured outside the body:	
initially	$\leq 13\text{ m}\Omega$
after mechanical endurance	$\leq 13\text{ m}\Omega$
after damp heat test	$\leq 13\text{ m}\Omega$
Insulation resistance	
initially	$> 10^4\text{ M}\Omega$
after damp heat test	$> 10^3\text{ M}\Omega$
at maximum ambient temperature	$> 10^4\text{ M}\Omega$
Creepage distance	
between adjacent contacts	$\geq 0,7\text{ mm}$
between opposite contacts	$\geq 2,2\text{ mm}$
Clearance	
between adjacent contacts	$\geq 0,6\text{ mm}$
between opposite contacts	$\geq 1,4\text{ mm}$
Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$	
between adjacent contacts	1200 V (r.m.s.), 50 Hz
between opposite contacts	2000 V (r.m.s.), 50 Hz
Capacitance between contacts at 1 kHz	$\leq 4\text{ pF}$

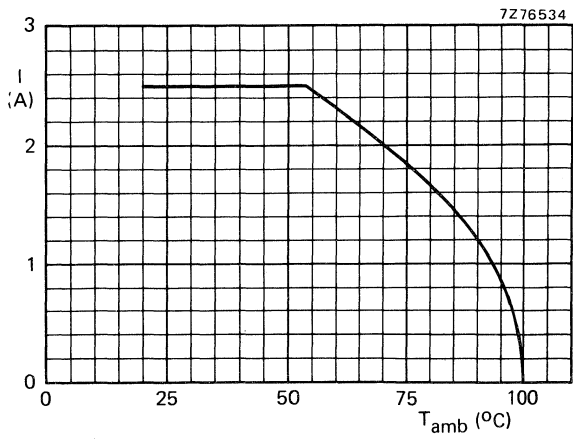


Fig.1 Maximum current per contact, equally on all contacts, as a function of ambient temperature.

MECHANICAL DATA

Contact pitch 3,81 mm (0,15 in)
 Number of connections, double row 32, 42
 Board thickness 1,42 to 1,78 mm
 Polarization and positioning by means of polarizing key pins
 Insertion force see Table 1
 Withdrawal force see Table 1
 Mechanical endurance 500 insertions; according to IEC 512, test 9a
 Connector body material glass-fibre-filled phenolformaldehyde

Contacts

material
 shape

→ finish of contact surfaces

contact force
 type of termination
 → finish of termination

Contact retention in insert
 push
 pull

Wire cross-section

Mass

Solderability

Resistance to heat

Bumping

Vibration

male part	female part
phosphor bronze solid cantilever goldflash on rolled-on gold on nickel plate	phosphor bronze bifurcated goldflash on rolled-on gold on nickel plate
	≥ 0,5 N
pin for wire wrap tin plated	solder tag tin plated
≥ 20 N	≥ 8 N
≥ 40 N	≥ 20 N
AWG24 to AWG26 (φ 0,5 to φ 0,4 mm)	
see Table 1	
235 °C, 2 s, according to IEC 512, test 12a	
260 °C, 10 s, according to IEC 512, test 12d	
according to IEC 512, test 6b, 10g, 16 ms, 6 directions, 1000 bumps	
according to IEC 512, test 6d, 10 to 55 Hz, 0,7 mm (p-p), 3 directions, 2 h per direction	

Table 1

number of connections	insertion force (N)	withdrawal force (N)	approx. mass (g)	
			male part	female part
32	≤ 35	≥ 3	14,8	10,4
42	≤ 45	≥ 4	18,8	13,3

ENVIRONMENTAL DATA

Climatic category (IEC68)

10/100/21

Ambient temperature range

-10 to +100 °C

Storage temperature range

-40 to +100 °C

Damp heat, steady state

according to IEC 512, test 11c, 21 days,
40 °C, R.H. 90 to 95%

Industrial atmosphere

after 250 operations, according to IEC 68,
test Kc, 25 ppm SO₂, 10 days; ←
test Kd, 12,5 ppm H₂S, 10 days

DIMENSIONAL DATA

Dimensions in mm

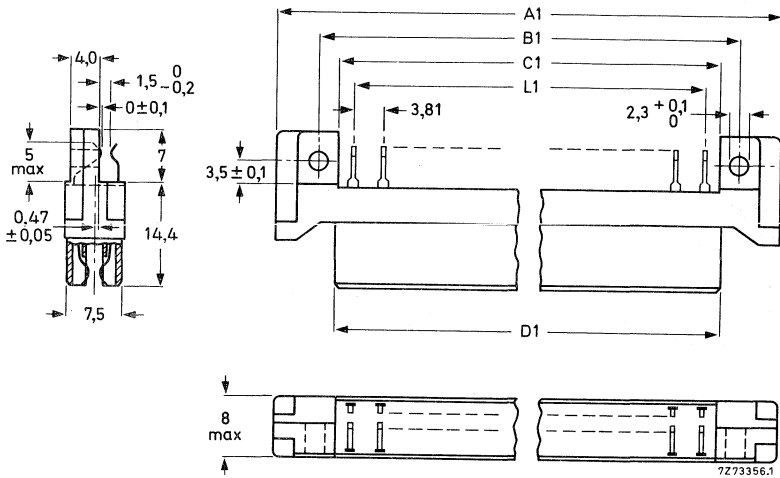


Fig.2 Female part; see Table 2 for dimensions A1, B1, C1, D1 and L1.

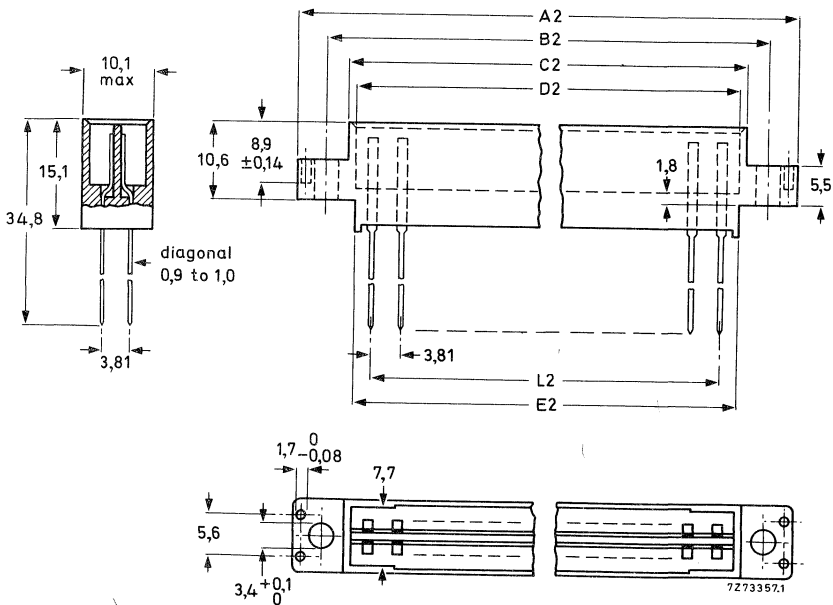


Fig.3 Male part; see Table 3 for dimensions A2, B2, C2, D2, E2 and L2.

Table 2

number of connections	dimensions (mm)					catalogue number
	A1 _{max}	B1	C1 _{min}	D1	L1	
32	79,83	68,58 ± 0,1	62,9	63,98	57,15	2422 050 16028
42	100,15	88,90 ± 0,1	83,2	84,30	76,20	2422 050 21028

Table 3

number of connections	dimensions (mm)						catalogue number
	A2 _{max}	B2	C2 _{max}	D2	E2 _{max}	L2	
32	80,38	72,18 ± 0,1	66,43	64,38	63,68	57,15	2422 050 16027
42	100,70	92,50 ± 0,1	86,75	84,70	84,00	76,20	2422 050 21027

MOUNTING

Panel cut-out for male parts

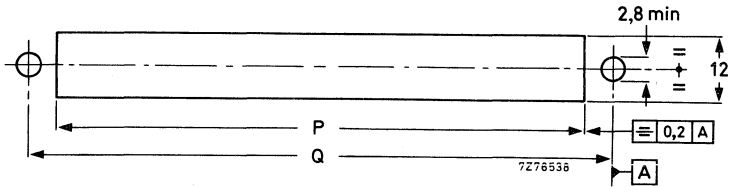


Fig.4 Panel cut-out for the male part; see Table 4 for dimensions P and Q.

Table 4

number of connections	dimensions (mm)	
	P	Q
32	65,20 ± 0,2	72,18 ± 0,2
42	85,50 ± 0,2	92,50 ± 0,2

Printed-wiring board recommendations

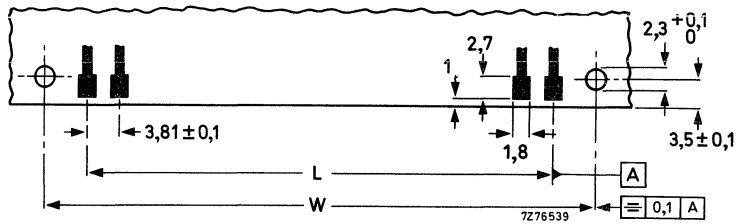


Fig.5 Recommended dimensions of the printed-wiring board to be fitted to the female part; see Table 5 for dimensions L and W.

Table 5

number of connections	dimensions (mm)	
	L	W
32	57,15	68,58 ± 0,1
42	76,20	88,90 ± 0,1

POLARIZATION AND POSITIONING

To ensure that a female part is inserted into the correct male part, key pins can be used, which have to be glued into the appropriate holes of the male part (Fig.6). The corresponding corners of the body of the matching female part have to be cut away (Fig.7).

It is recommended that two or more key pins be used and to distribute them over the two ears of the male part.

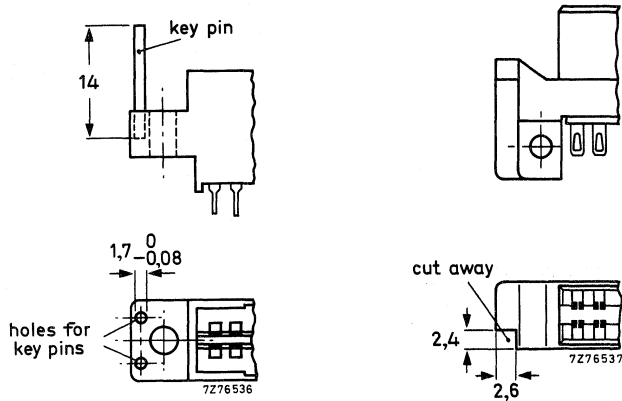


Fig.6

Fig.7

MARKING

The package is marked with:
12-digit catalogue number;
reference number of manufacturer;
number of pieces.

ACCESSORIES

A female test plug with 8 connections in double row can be supplied for use as a cable connector. In combination with the auxiliary parts shown in Fig.9, four test plugs mate with the male part with 42 connections.

The mass is 2,5 g.

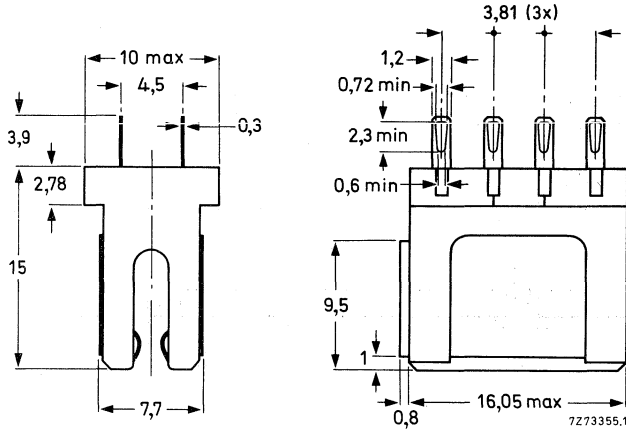


Fig. 8 Test plug; dimensions in mm.

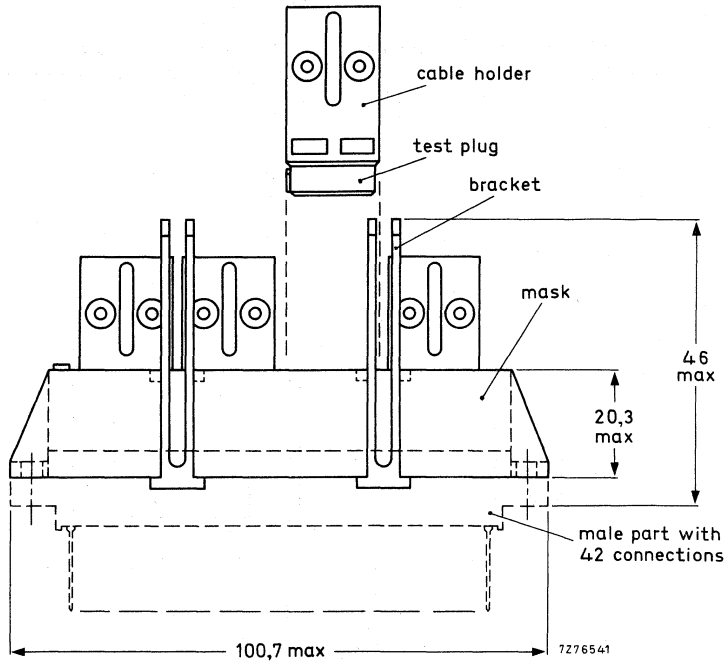


Fig.9 Four test plugs with auxiliary parts; dimensions in mm.

Catalogue numbers for ordering

Table 6

description	catalogue number
test plug	2422 050 90005
plastic cable holder	3522 202 15240
plastic mask	3522 202 15230
metal bracket	3522 202 08940

PACKING

The connectors and the test plug are packed in boxes. The number per box is given in Table 7.

Table 7

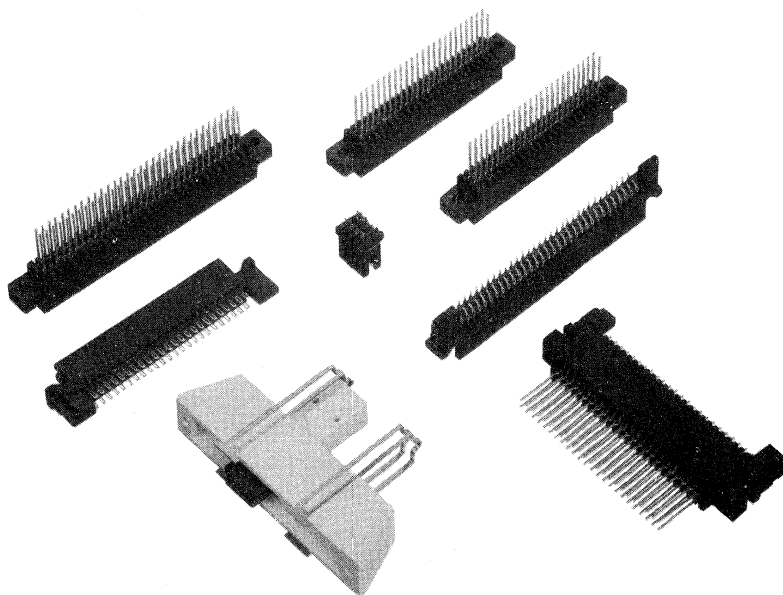
connector	number per box
male part, 32 connections	60
female part, 32 connections	60
male part, 42 connections	50
female part, 42 connections	50
test plug	88

Please order in multiples of these quantities.

2,54 mm (0,1 in) PITCH TWO-PART PRINTED-WIRING CONNECTORS

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of connections, double row test plug, double row	48, 64 8
Board thickness	1,42 to 1,78 mm
Terminations male part female part	pins for wire wrap solder tags or solder tags with eyelet (only for 48 connections) solder tags with eyelet
test plug	2 A
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	500 insertions
Mechanical endurance	10/100/21
Climatic category (IEC68)	



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APPLICATION

For use in telecommunication equipment.

DESCRIPTION

The connectors consist of a female part to be fitted to a printed-wiring board and a male part to be mounted on a chassis or a back panel. Both parts have a dark green glass-fibre-filled phenolformaldehyde body. The contact springs and contact pins are of phosphor bronze; the contact surfaces are rolled-on gold on nickel plating. The contact mating length is 3,5 mm min. The contacts are specially treated to prevent the influence of sparks on contact surfaces when printed-wiring boards are plugged into or pulled out of equipment in operation.

A test plug with 8 contacts is available for use as a cable connector for monitoring circuit parameters (see Accessories).

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2 A
Derated current curve	according to IEC 512, test 5b, see Fig.1
Contact resistance (including material resistance) at 10 mA, max 20 mV (peak) open circuit voltage, 1 kHz.	
Measured outside the body:	
initially	$\leq 13\text{ m}\Omega$
after mechanical endurance	$\leq 13\text{ m}\Omega$
after damp heat test	$\leq 13\text{ m}\Omega$
Insulation resistance	
initially	$> 10^4\text{ M}\Omega$
after damp heat test	$> 10^3\text{ M}\Omega$
at maximum ambient temperature	$> 10^4\text{ M}\Omega$
Creepage distance	
between adjacent contacts	$\geq 0,5\text{ mm}$
between opposite contacts	$\geq 2,2\text{ mm}$
Clearance	
between adjacent contacts	$\geq 0,4\text{ mm}$
between opposite contacts	$\geq 1,4\text{ mm}$
Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$	
between adjacent contacts	1000 V (r.m.s.), 50 Hz
between opposite contacts	2000 V (r.m.s.), 50 Hz
Capacitance between contacts at 1 kHz	$\leq 4\text{ pF}$

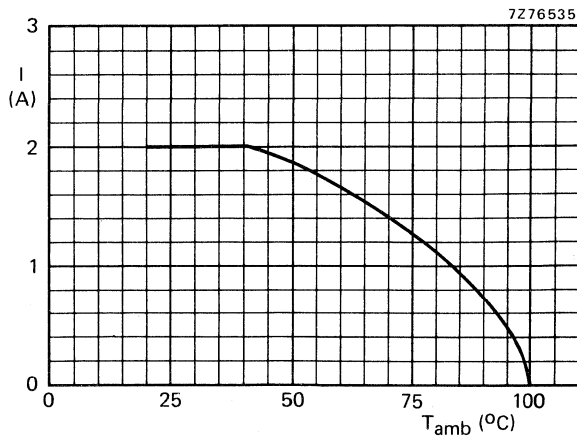


Fig.1 Maximum current per contact, equally on all contacts, as a function of ambient temperature.

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)
Number of connections, double row	48, 64
Board thickness	1,42 to 1,78 mm
Polarization and positioning	by means of polarizing key pins
Insertion force	see Table 1
Withdrawal force	see Table 1
Mechanical endurance	500 insertions; according to IEC 512, test 9a
Connector body material	glass-fibre-filled phenolformaldehyde
Contacts	male part female part
material	phosphor bronze phosphor bronze
shape	solid cantilever bifurcated
→ finish of contact surfaces	goldflash on goldflash on
	rolled-on gold rolled-on gold
	on nickel plate on nickel plate
	≥ 0,5 N
contact force	
type of termination	pin for wire wrap solder tag, solder tag
48 connections	
	with eyelet
64 connections	pin for wire wrap solder tag
→ finish of termination	tin plated tin plated
Contact retention in insert	
push	≥ 20 N ≥ 8 N
pull	≥ 40 N ≥ 20 N
Wire cross-section	AWG24 to AWG26 (φ 0,5 to φ 0,4 mm)
Mass	see Table 1
Solderability	235 °C, 2 s, according to IEC 512, test 12a
Resistance to heat	260 °C, 10 s, according to IEC 512, test 12d
Bumping	according to IEC 512, test 6b, 10g, 16 ms, 6 directions, 1000 bumps
Vibration	according to IEC 512, test 6d, 10 to 55 Hz, 0,7 mm (p-p), 3 directions, 2 h per direction

Table 1

number of connections	insertion force (N)	withdrawal force (N)	approx. mass (g)	
			male part	female part
48	≤ 50	≥ 5	15,9	10,5
64	≤ 65	≥ 7	20,4	13,2

ENVIRONMENTAL DATA

Climatic category (IEC 68)

10/100/21

Ambient temperature range

-10 to +100 °C

Storage temperature range

-40 to +100 °C

Damp heat, steady state

according to IEC 512, test 11c, 21 days,
40 °C, R.H. 90 to 95%

Industrial atmosphere

after 250 operations, according to IEC 68,
test Kc, 25 ppm SO₂, 10 days,
test Kd, 12,5 ppm H₂S, 10 days



DIMENSIONAL DATA

Dimensions in mm

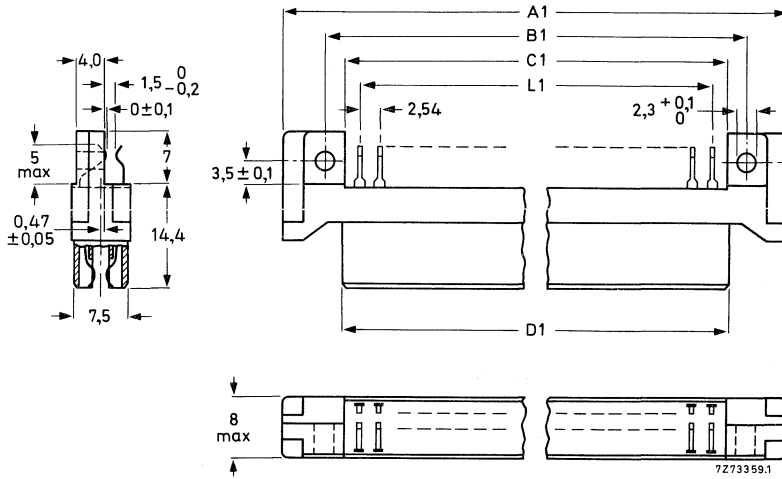


Fig.2 Female part with solder tags; see Table 2 for dimensions A1, B1, C1, D1 and L1.

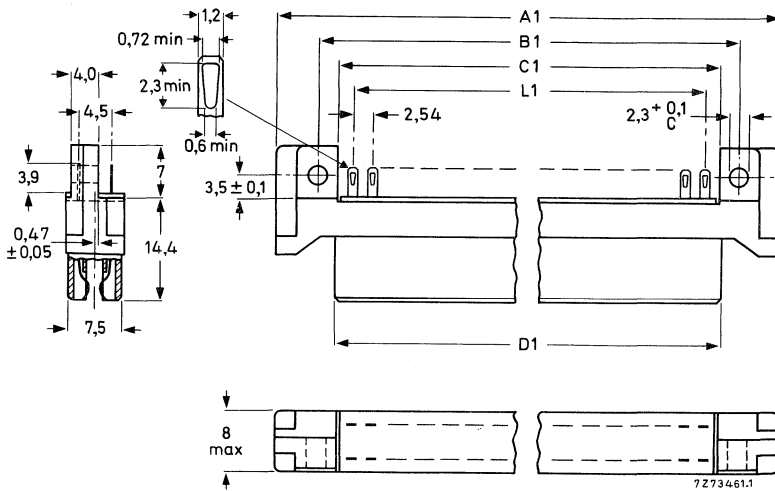


Fig.3 Female part with solder tags with eyelet; see Table 2 for dimensions A1, B1, C1, D1 and L1.

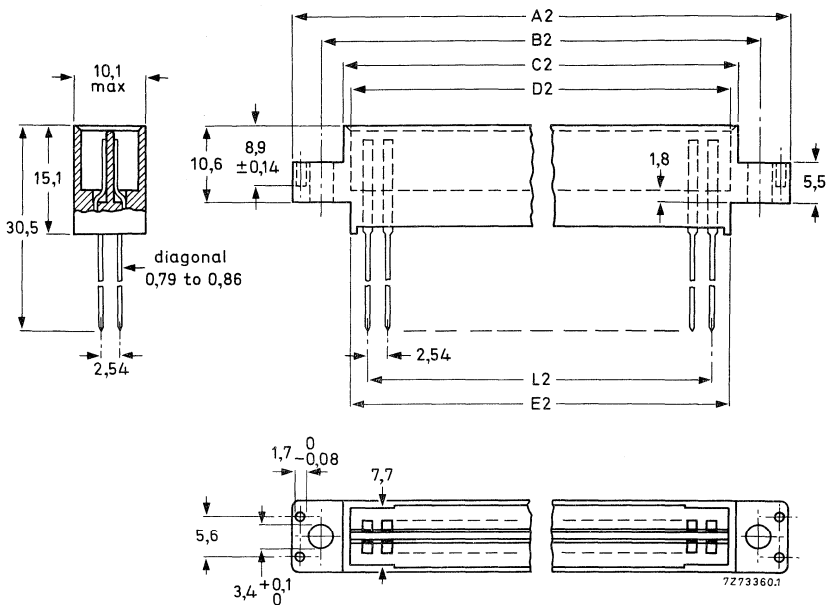


Fig.4 Male part; see Table 3 for dimensions A2, B2, C2, D2, E2 and L2.

Table 2

number of connections	dimensions (mm)					catalogue number
	A1 _{max}	B1	C1 _{min}	D1	L1	
48 (Fig.2)	79,83	68,58 ± 0,1	62,9	63,98	58,42	2422 049 24028
48 (Fig.3)	79,83	68,58 ± 0,1	62,9	63,98	58,42	2422 049 24038
64 (Fig.2)	100,15	88,90 ± 0,1	83,2	84,30	78,74	2422 049 32028

Table 3

number of connections	dimensions (mm)						catalogue number
	A2 _{max}	B2	C2 _{max}	D2	E2 _{max}	L2	
48	80,38	72,18 ± 0,1	66,43	64,38	63,68	58,42	2422 049 24027
64	100,70	92,50 ± 0,1	86,75	84,70	84,00	78,74	2422 049 32027

MOUNTING

Panel cut-out for male parts

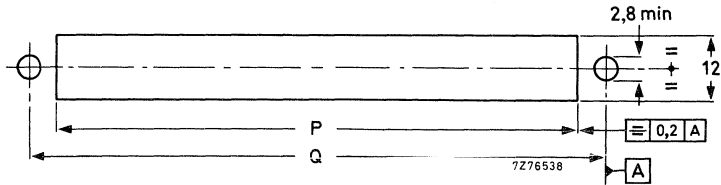


Fig.5 Panel cut-out for the male part; see Table 4 for dimensions P and Q.

Table 4

number of connections	dimensions (mm)	
	P	Q
48	$65,20 \pm 0,2$	$72,18 \pm 0,2$
64	$85,50 \pm 0,2$	$92,50 \pm 0,2$

Printed-wiring board recommendations

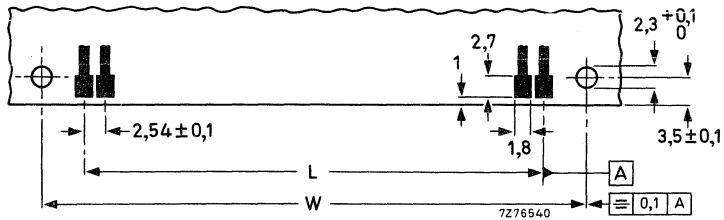


Fig.6 Recommended dimensions of the printed-wiring board to be fitted to the female part; see Table 5 for dimensions L and W.

Table 5

number of connections	dimensions (mm)	
	L	W
48	58,42	$68,58 \pm 0,1$
64	78,74	$88,90 \pm 0,1$

POLARIZATION AND POSITIONING

To ensure that a female part is inserted into the correct male part, key pins can be used, which have to be glued into the appropriate holes of the male part (Fig.7). The corresponding corners of the body of the matching female part have to be cut away (Fig.8).

It is recommended that two or more key pins be used and to distribute them over the two ears of the male part.

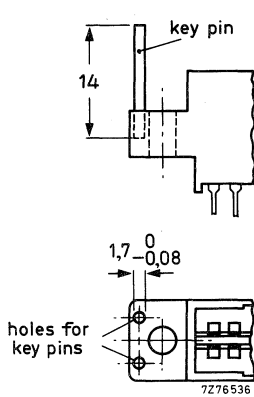


Fig.7

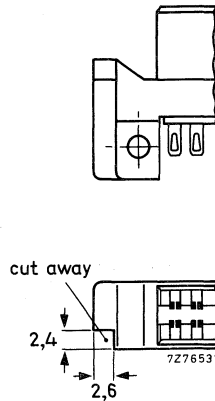


Fig.8

MARKING

The package is marked with:
12-digit catalogue number;
reference number of manufacturer;
number of pieces.

ACCESSORIES

A female test plug with 8 connections in double row can be supplied for use as a cable connector. In combination with the auxiliary parts shown in Fig.10, four test plugs mate with the male part with 48 connections.

The mass is 1,9 g.

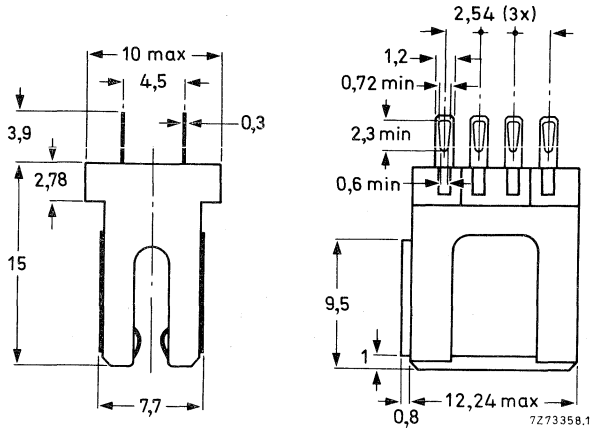


Fig. 9 Test plug; dimensions in mm.

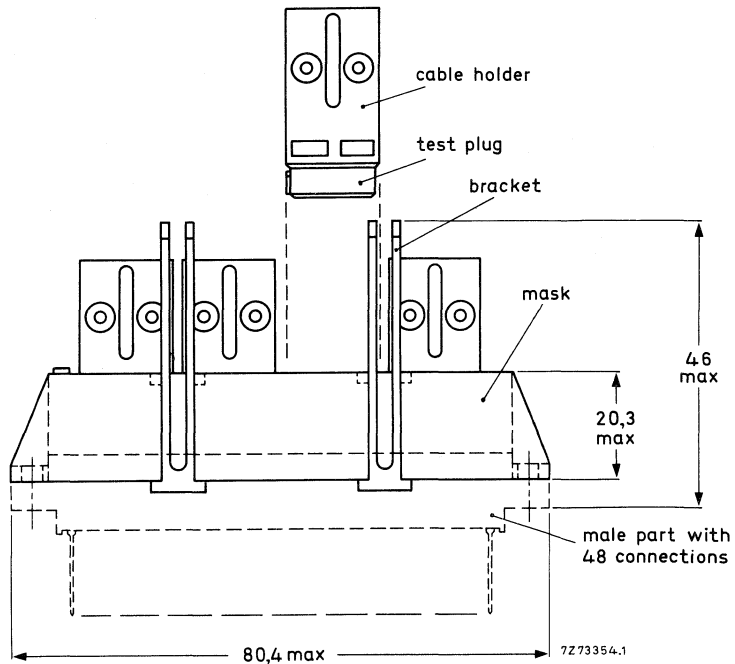


Fig.10 Four test plugs with auxiliary parts; dimensions in mm.

Catalogue numbers for ordering

Table 6

description	catalogue number
test plug	2422 049 90005
plastic cable holder	3522 202 15240
plastic mask	3522 202 15230
metal bracket	3522 202 08940

PACKING

The connectors and the test plug are packed in boxes. The number per box is given in Table 7.

Table 7

connector	number per box
male part, 48 connections	60
female part, 48 connections	60
male part, 64 connections	50
female part, 64 connections	50
test plug	110

Please order in multiples of these quantities.

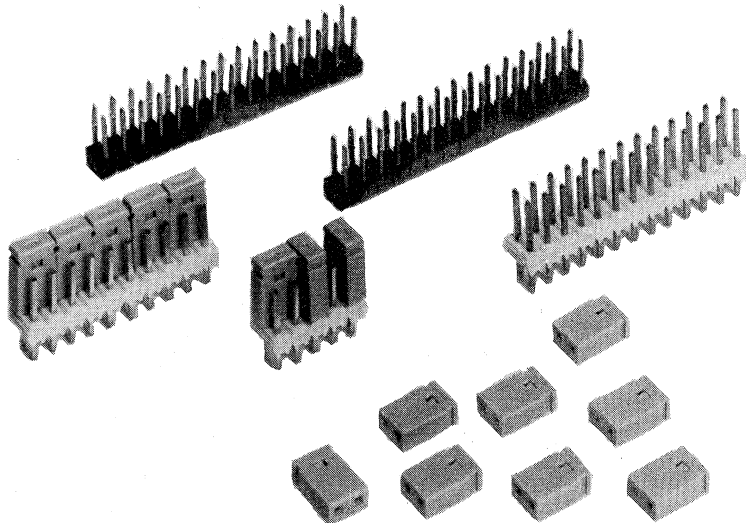
TWO-PART JUMPER CONNECTOR

- 2,54 mm (0,1 in) pitch

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts	2
Board thickness	1,42 to 1,78 mm
Terminations of contact pins	suitable for dip-soldering
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	3 A
Mechanical endurance	150 insertions
Climatic category (IEC 68)	55/125/21

800109-13-02



APPLICATION

This connector is intended for use as a link between two adjacent points on a printed-wiring board with a grid of 2,54 mm (0,1 in) thus enabling various circuit configurations to be built up or parts of the circuit to be shorted out.

DESCRIPTION

The connector consists of two contact pins for dip-solder mounting and a female plug. The plug is moulded in grey glass-fibre-filled thermoplastic. The contact springs in the plug and the pins are of phosphor bronze; the springs are shaped to provide two contact surfaces.

The contact faces are hard gold plated. The pins can be supplied either loose or in a mounting strip with 2 x 16 pins which can be removed after dip-soldering.

If the contact pins are to be permanently interconnected, a modified wire wrapping can be used instead of the female plug.

Note: The female plug also mates with the male headers (11 mm pin length) of the F095 modular connector system; see data sheet on F095.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	3 A
Derated current curve	according to IEC 512, test 5b, see Fig. 1
<p>Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz.</p> <p>Measured at point A, see Fig. 2</p> <ul style="list-style-type: none"> initially $\leq 25\text{ m}\Omega$ after mechanical endurance $\leq 25\text{ m}\Omega$ after damp heat test $\leq 35\text{ m}\Omega$ 	
<p>Insulation resistance</p> <ul style="list-style-type: none"> initially $> 5 \cdot 10^3\text{ M}\Omega$ after damp heat test $> 10^3\text{ M}\Omega$ 	
<p>Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$</p> <ul style="list-style-type: none"> between contact and a metal mounting plate 750 V (r.m.s.), 50 Hz 	

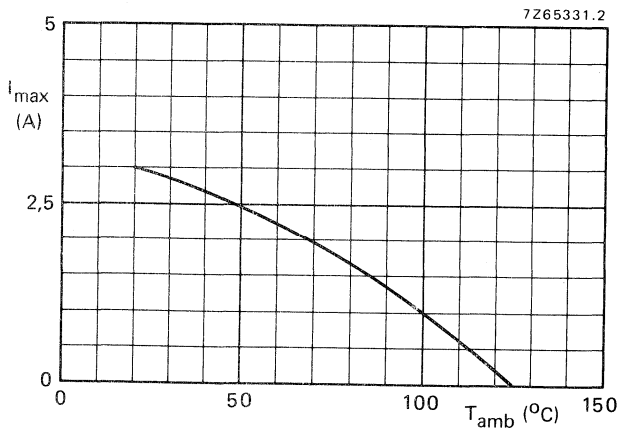


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts	2
Board thickness	1,42 to 1,78 mm
Insertion force	$\leq 2\text{N}$
Withdrawal force	$\geq 0,12\text{N}$
Mechanical endurance	150 insertions; according to IEC 512, test 9a
Connector body material	glass-fibre-filled thermoplastic
Contact pins and springs	
material	phosphor bronze
shape	see Fig. 2
finish of contact surfaces	hard gold
contact force	$\geq 2 \times 0,5\text{N}$
type of pin termination	dip-solder
finish of termination	hard gold
Mass	
female plug	0,16g
contact pin	0,021g
Solderability	according to IEC 512, test 12a, 235 °C, 2 s
Shock	according to IEC 512, test 6c, 50g, 11 ms (plug in fixed position)
Vibration	according to IEC 512, test 6d, 10 to 1500 Hz, 1,5 mm (p-p) or 10g, 3 directions, 2 h per direction (plug in fixed position)

ENVIRONMENTAL DATA

Climatic category (IEC 68)	55/125/21
Ambient temperature range	-55 to + 125 °C
Damp heat, steady state	according to IEC 512, test 11c, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V-1

DIMENSIONAL DATA

Dimensions in mm

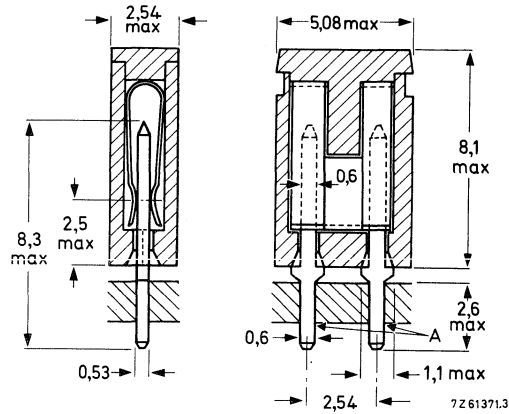


Fig. 2 Two-part jumper connector in mounted position.

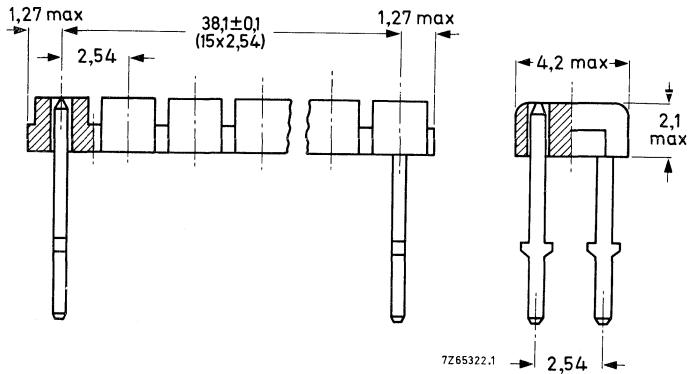


Fig. 3 Removable mounting strip with 2 x 16 contact pins. For pin dimensions see Fig. 2.

Table 1

connector part	catalogue number	smallest packing quantity
female plug	2422 024 88003	500
loose pin	4332 026 16770	1000
removable mounting strip with 2 x 16 pins	2422 025 89303	30

For ordering, see next page.

MOUNTING

The best result of pin positioning is achieved by using pins supplied on a removable mounting strip. After dip or wave soldering of the pins, the strip can be removed by hand or a pair of tweezers. For piercing diagram of the printed-wiring board see Fig. 4.

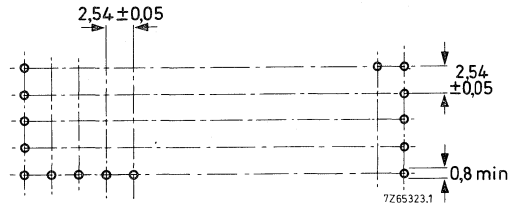


Fig. 4 Piercing diagram.

MARKING

The package is marked with:
12-digit catalogue number;
reference number of manufacturer;
number of pieces.

HOW TO ORDER

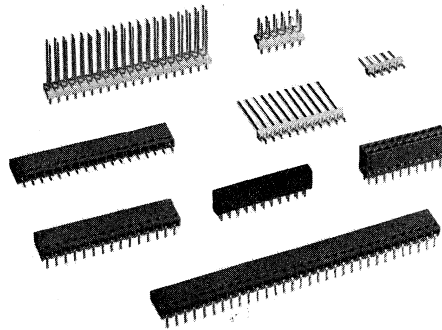
Order the parts by quoting the 12-digit catalogue numbers as shown in Table 1. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

MODULAR CONNECTOR SYSTEM

- For basic grid of 2,54 mm (0,1 in)

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts	
<i>Female connectors</i>	
board edge socket, single row	2 to 32
board edge socket, double row	4 to 130
panel socket, single row	2 to 32
panel socket, double row	4 to 100
bottom-entry socket, single row*	2 to 32
bottom-entry socket, double row*	4 to 20
jumper*	2 (interconnected)
<i>Male connectors</i>	
male header, straight pins, single row	2 to 32
male header, straight pins, double row	4 to 64
male header, 90° angled pins, single row	2 to 32
male header, 90° angled pins, double row	4 to 64
mounting block for pins, double row	8, 12, 20
Board thickness	1,6 mm
Terminations	dip-solder pins pins for wire wrapping
Current at $T_{amb} = 20\text{ °C}$	3 A
Mechanical endurance	300 insertions
Climatic category (IEC 68)	55/125/21



* Types with slightly different properties; for data see the relevant separate data sheet F095.

APPLICATION

This modular connector system has been developed to provide a simple, flexible yet reliable means of interconnecting electronic circuit boards and modules in applications where maximum packing density is of major importance.

DESCRIPTION

The system consists of the following parts (see also Fig. 1).

Female connectors:

- board edge sockets for connecting daughter boards at right-angles to mother boards in vertically stacked card systems;
- panel sockets for horizontally stacking printed-wiring boards;
- bottom-entry sockets* for horizontal or vertical interconnection of printed-wiring boards.

Male connectors:

- male headers with straight or 90° angled pins for accommodating mini wire wrapping joints or mating panel sockets and board edge sockets;
- mounting blocks for pins.

The board edge sockets and panel sockets have a body of flame retardent, glass-fibre-filled thermo-setting material. The sockets are provided with pins for dip or wave soldering.

The male headers, mounting blocks and bottom-entry sockets have a body of flame retardent, glass-fibre-filled thermoplastic polyester material. They are provided with dip-solder pins or pins for wire wrapping.

The contact springs and pins are gold finished phosphor bronze; the electrical contact surfaces are gold-on-nickel plated.

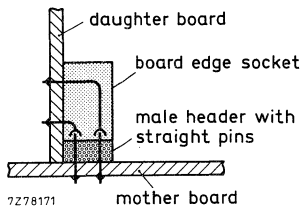


Fig. 1a.

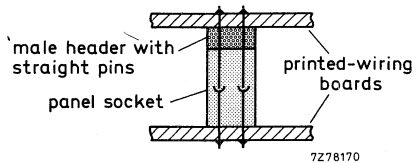


Fig. 1b.

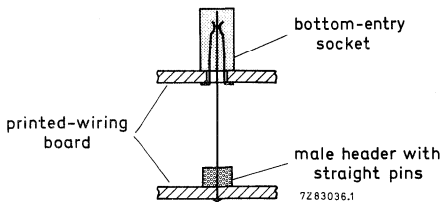


Fig. 1c.

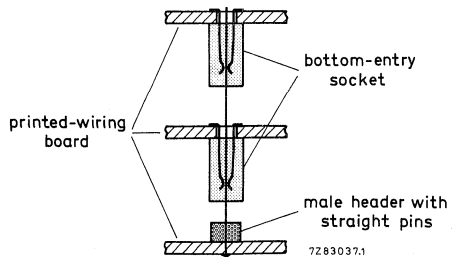
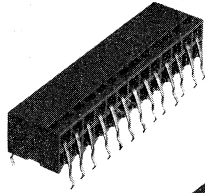


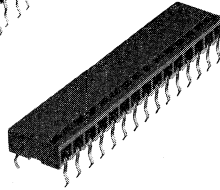
Fig. 1d.

SURVEY

Board-edge
sockets

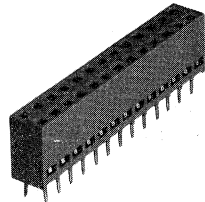


4 to 130 contacts; double row

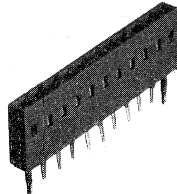


2 to 32 contacts; single row

Panel sockets

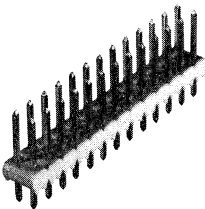


4 to 100 contacts; double row

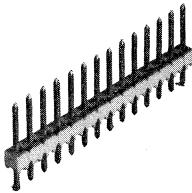


2 to 32 contacts; single row

Male headers with
straight pins

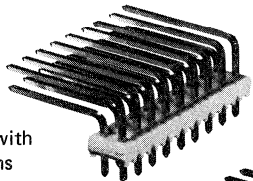


4 to 64 contacts; double row

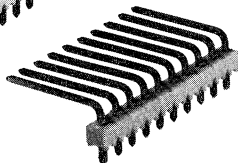


2 to 32 contacts; single row

Male headers with
90° angled pins



4 to 20 contacts; double row



2 to 32 contacts; single row

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$

3 A

Derated current curve

according to IEC 512,
test 5b, see Fig. 2

Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz.

Measured on contact pin at 2 mm from connector body:

initially

$\leq 15\text{ m}\Omega$

after tests

$\leq 20\text{ m}\Omega$

Insulation resistance

initially

$> 10^5\text{ M}\Omega$

after tests

$> 10^3\text{ M}\Omega$

Creepage distance

between adjacent or opposite contacts

$\geq 0,5\text{ mm}$

Clearance

between adjacent or opposite contacts

$\geq 0,4\text{ mm}$

Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$

between adjacent or opposite contacts

750 V (r.m.s.), 50 Hz

Capacitance between contacts at 1 MHz

$\leq 1,5\text{ pF}$

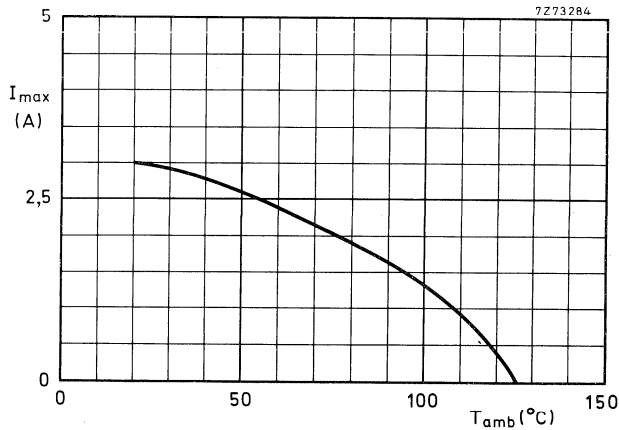


Fig. 2 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)		
Number of contacts			
<i>Female connectors</i>			
board edge socket, single row	2 to 32		
board edge socket, double row	4 to 130		
panel socket, single row	2 to 32		
panel socket, double row	4 to 100		
<i>Male connectors</i>			
male header, straight pins, single row	2 to 32		
male header, straight pins, double row	4 to 64		
male header, 90° angled pins, single row	2 to 32		
male header, 90° angled pins, double row	4 to 64		
Board thickness (for dip-solder application)	1,6 mm		
Insertion force per contact	≤ 1,5 N		
Withdrawal force per contact	≥ 0,1 N		
Mechanical endurance	300 insertions: according to IEC 512, test 9a		
Connector body material	glass-fibre-filled thermosetting glass-fibre-filled thermoplastic		
board edge socket and panel socket	springs		pins
male header	solid cantilever	square wire, chamfered at both ends	
		rolled-on gold	gold plate
finish of contact surfaces	on nickel plate	on nickel plate	
	dip-solder pin	dip-solder pin	
type of termination	dip-solder pin	pin for wire wrapping	
		gold flash	gold plate on nickel plate
finish of termination	gold flash		
Wire diameter for wire wrapping	AWG30 to AWG26 (ϕ 0,25 to 0,40 mm)		
Solderability	235 °C, 2 s, according to IEC 512, test 12a		
Resistance to soldering heat	260 °C, 10 s, according to IEC 512, test 12d		
Shock	according to IEC 512, test 6c, 50g, 11 ms		
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 1,5 mm (p-p) or 10g, 3 directions, 2 h per direction		

ENVIRONMENTAL DATA

Climatic category (IEC 68)

Ambient temperature range

Storage temperature range

Damp heat, steady state

Dry heat

Salt mist

Flammability

55/125/21

-55 to + 125 °C

-55 to + 125 °C

according to IEC 512, test 11c,
21 days, 40 °C, R.H. 90 to 95%

according to IEC 512, test 11i,
16 h, 125 °C

according to IEC 512, test 11f,
96 h

according to UL94, category V-0

DIMENSIONAL DATA: BOARD EDGE SOCKETS

Dimensions in mm

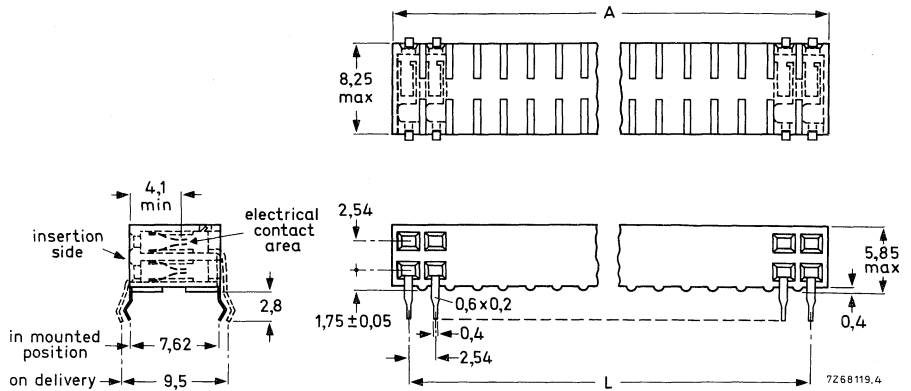


Fig. 3 Board edge socket, double row. See Table 1 for dimensions A and L.

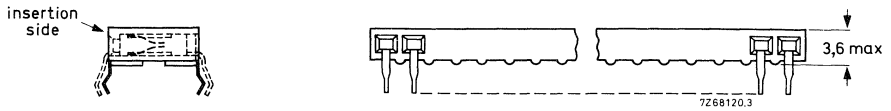


Fig. 4 Board edge socket, single row. Dimensions are identical with those in Fig. 3, except as shown.

Table 1 Board edge sockets

number of contacts		L	A	catalogue number 2422 062		smallest packing quantity
single row	double row			single row	double row	
2	4	2,54	5,44	10202	10212	432
3	6	5,08	7,98	10302	10312	297
4	8	7,62	10,52	10402	10412	225
5	10	10,16	13,06	10502	10512	180
6	12	12,70	15,60	10602	10612	153
7	14	15,24	18,14	10702	10712	135
8	16	17,78	20,68	10802	10812	117
9	18	20,32	23,22	10902	10912	99
10	20	22,86	25,76	11002	11012	90
11	22	25,40	28,30	11102	11112	81
12	24	27,94	30,84	11202	11212	72
13	26	30,48	33,38	11302	11312	72
14	28	33,02	35,92	11402	11412	63
15	30	35,56	38,46	11502	11512	63
16	32	38,10	41,00	11602	11612	54
17	34	40,64	43,54	11702	11712	54
18	36	43,18	46,08	11802	11812	45
19	38	45,72	48,62	11902	11912	45
20	40	48,26	51,16	12002	12012	45
21	42	50,80	53,70	12102	12112	45
22	44	53,34	56,24	12202	12212	36
23	46	55,88	58,78	12302	12312	36
24	48	58,42	61,32	12402	12412	36
25	50	60,96	63,86	12502	12512	36
26	52	63,50	66,40	12602	12612	36
27	54	66,04	68,94	12702	12712	36
28	56	68,58	71,48	12802	12812	27
29	58	71,12	74,02	12902	12912	27
30	60	73,66	76,56	13002	13012	27
31	62	76,20	79,10	13102	13112	27
32	64	78,74	81,64	13202	13212	27

Table 1: Board edge sockets (continued)

number of contacts		L	A	catalogue number 2422 062		smallest packing quantity
single row	double row			single row	double row	
	66	81,28	84,18		13312	27
	68	83,82	86,72		13412	27
	70	86,36	89,26		13512	27
	72	88,90	91,80		13612	27
	74	91,44	94,34		13712	18
	76	93,98	96,88		13812	18
	78	96,52	99,42		13912	18
	80	99,06	101,96		14012	18
	82	101,60	104,50		14112	18
	84	104,14	107,04		14212	18
	86	106,68	109,58		14312	18
	88	109,22	112,12		14412	18
	90	111,76	114,66		14512	18
	92	114,30	117,20		14612	18
	94	116,84	119,74		14712	18
	96	119,38	122,28		14812	18
	98	121,92	124,82	$\pm 0,30$	14912	18
	100	124,46	127,36	$\pm 0,15$	15012	18
	102	127,00	129,90		15112	18
	104	129,54	132,44		15212	18
	106	132,08	134,98		15312	9
	108	134,62	137,52		15412	9
	110	137,16	140,06		15512	9
	112	139,70	142,60		15612	9
	114	142,24	145,14		15712	9
	116	144,78	147,68		15812	9
	118	147,32	150,22		15912	9
	120	149,86	152,76		16012	9
	122	152,40	155,30		16112	9
	124	154,94	157,84		16212	9
	126	157,48	160,38		16312	9
	128	160,02	162,92		16412	9
	130	162,56	165,46		16512	9

For ordering, see "How to order", page 19.

DIMENSIONAL DATA: PANEL SOCKETS

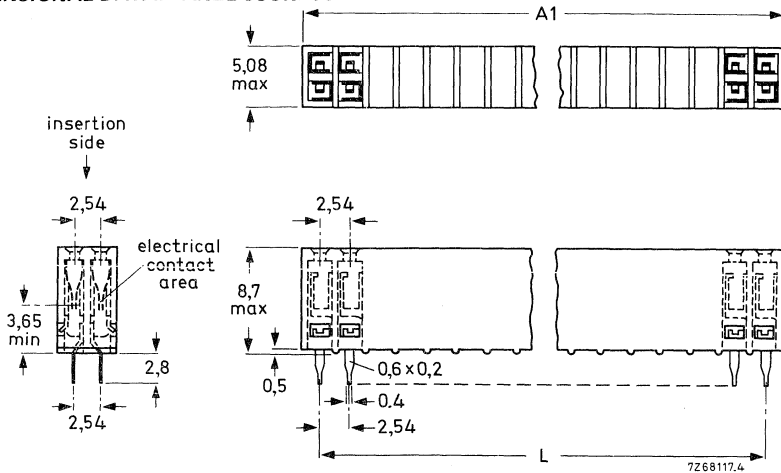


Fig. 5 Panel socket, double row. See Table 2 for dimensions A1 and L.

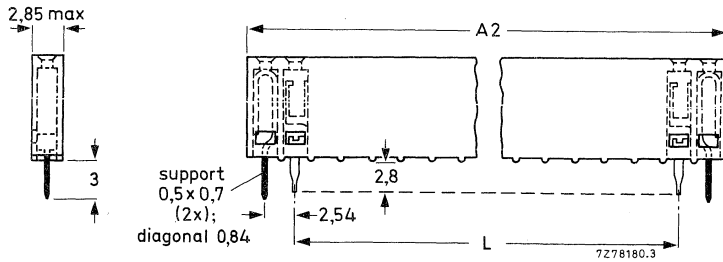


Fig. 6 Panel socket, single row. Dimensions are identical with those in Fig. 5 except as shown. See Table 2 for dimensions A2 and L.

Table 2: Panel sockets

number of contacts		L	A1	A2	catalogue number 2422 062		smallest packing quantity
single row	double row				single row (with supports)	double row (without supports)	
2	4	2,54	5,44	10,52	00272	00212	392
3	6	5,08	7,98	13,06	00372	00312	264
4	8	7,62	10,52	15,60	00472	00412	200
5	10	10,16	13,06	18,14	00572	00512	160
6	12	12,70	15,60	20,68	00672	00612	126
7	14	15,24	18,14	23,22	00772	00712	120
8	16	17,78	20,68	25,76	00872	00812	104
9	18	20,32	23,22	28,30	00972	00912	88
10	20	22,86	25,76	30,84	01072	01012	80

Table 2: Panel sockets (continued)

number of contacts		L	A1	A2	catalogue number 2422 062		smallest packing quantity
single row	double row				single row (with supports)	double row (without supports)	
11	22	25,40	28,30	33,38	01172	01112	72
12	24	27,94	30,84	35,92	01272	01212	64
13	26	30,48	33,38	38,46	01372	01312	64
14	28	33,02	35,92	41,00	01472	01412	56
15	30	35,56	38,46	43,54	01572	01512	56
16	32	38,10	41,00	46,08	01672	01612	48
17	34	40,64	43,54	48,62	01772	01712	48
18	36	43,18	46,08	51,16	01872	01812	48
19	38	45,72	48,62	53,70	01972	01912	40
20	40	48,26	51,16	56,24	02072	02012	40
21	42	50,80	53,70	58,78	± 0,30 02172	02112	40
22	44	53,34	56,24	61,32	02272	02212	32
23	46	55,88	58,78	63,86	02372	02312	32
24	48	58,42	61,32	66,40	02472	02412	32
25	50	60,96	63,86	68,94	02572	02512	32
26	52	63,50	66,40	71,48	02672	02612	32
27	54	66,04	68,94	74,02	02772	02712	32
28	56	68,58	71,48	76,56	02872	02812	24
29	58	71,12	74,02	79,10	02972	02912	24
30	60	73,66	76,56	81,64	03072	03012	24
31	62	76,20	± 0,15 79,10	± 0,30 84,18	03172	03112	24
32	64	78,74	81,64	86,72	03272	03212	24
	66	81,28	84,18			03312	24
	68	83,82	86,72			03412	24
	70	86,36	89,26			03512	24
	72	88,90	91,80			03612	24
	74	91,44	94,34			03712	16
	76	93,98	96,88			03812	16
	78	96,52	99,42			03912	16
	80	99,06	101,96			04012	16
	82	101,60	104,50			04112	16
	84	104,14	107,04			04212	16
	86	106,68	109,58			04312	16
	88	109,22	112,12			04412	16
	90	111,76	114,66			04512	16
	92	114,30	117,20			04612	16
	94	116,84	119,74			04712	16
	96	119,38	122,28			04812	16
	98	121,92	124,82			04912	16
	100	124,46	127,36			05012	16

For ordering, see "How to order", page 19.

→ DIMENSIONAL DATA: MOUNTING BLOCKS FOR CONTACT PINS

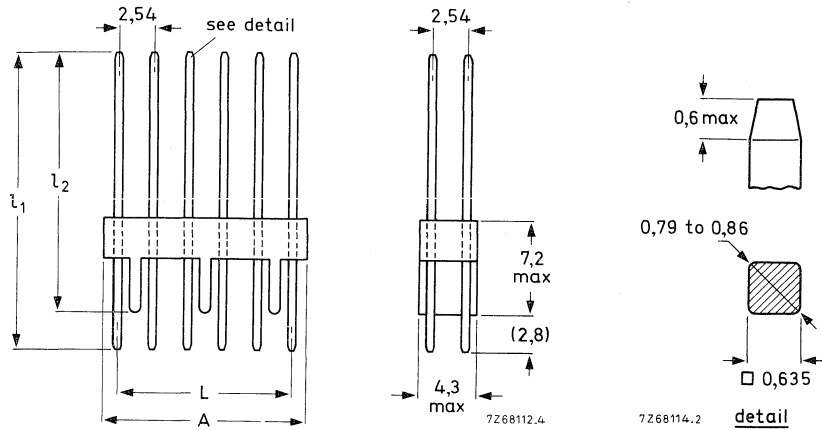


Fig. 7 Mounting block for pins, double row. See Table 3 for dimensions l_1 , l_2 , A and L.

Table 3 Mounting blocks for pins

number of contacts	l_1	l_2	L	A_{max}	catalogue number	smallest packing quantity
2 x 10	$22 \pm 0,1$	$19,2 \pm 0,2$	$22,86 \pm 0,1$	25,4	4322 027 73750	50
2 x 6	$22 \pm 0,1$	$19,2 \pm 0,2$	$12,70 \pm 0,1$	15,2	4332 026 28030	90
2 x 4	$22 \pm 0,1$	$19,2 \pm 0,2$	$7,62 \pm 0,1$	10,1	4332 026 28040	135

For ordering, see "How to order", page 19.

DIMENSIONAL DATA: MALE HEADERS WITH STRAIGHT PINS

These male headers are available with the following pin lengths:

- 11 mm, especially for use with jumpers F095 and female cable connectors F303 (double-row versions);
- 12 mm, especially for use with board edge sockets and panel sockets;
- 22 mm, especially for use with panel sockets and bottom-entry sockets.

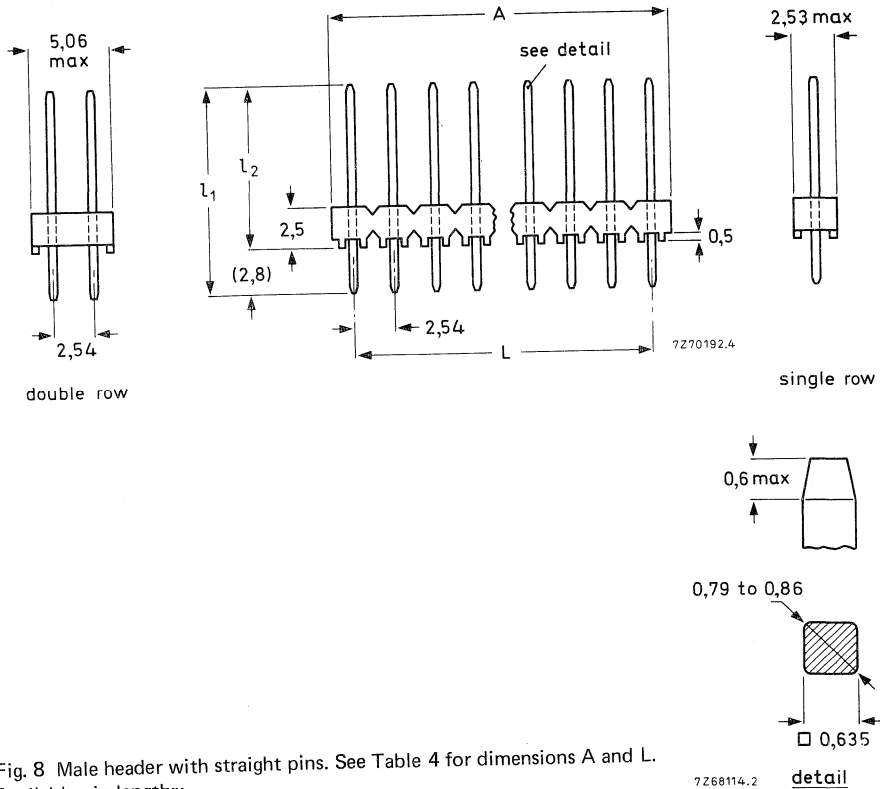


Fig. 8 Male header with straight pins. See Table 4 for dimensions A and L.

Available pin lengths:

$l_1 = 11 \pm 0,1 \text{ mm}$, $l_2 = 8,2 \pm 0,2 \text{ mm}$;

$l_1 = 12 \pm 0,1 \text{ mm}$, $l_2 = 9,2 \pm 0,2 \text{ mm}$;

$l_1 = 22 \pm 0,1 \text{ mm}$, $l_2 = 19,2 \pm 0,2 \text{ mm}$.

Other pin lengths are available on request.

Table 4: Male headers with straight pins

number of contacts		L	A	catalogue number 2422 062				smallest packing quantity
				pin length $l_1 = 11$ mm		pin length $l_1 = 12$ mm		
single row	double row			single row	double row	single row	double row	
2	4	2,54	5,08	60241	60251	40241	40251	500*
3	6	5,08	7,62	60341	60351	40341	40351	300**
4	8	7,62	10,16	60441	60451	40441	40451	200▲
5	10	10,16	12,70	60541	60551	40541	40551	168
6	12	12,70	15,24	60641	60651	40641	40651	136
7	14	15,24	17,78	60741	60751	40741	40751	120
8	16	17,78	20,32	60841	60851	40841	40851	104
9	18	20,32	22,86	60941	60951	40941	40951	88
10	20	22,86	25,40	61041	61051	41041	41051	80
11	22	25,40	27,94	61141	61151	41141	41151	72
12	24	27,94	30,48	61241	61251	41241	41251	72
13	26	30,48	33,02	61341	61351	41341	41351	64
14	28	33,02	35,56	61441	61451	41441	41451	56
15	30	35,56	38,10	61541	61551	41541	41551	56
16	32	38,10	40,64	61641	61651	41641	41651	48
17	34	40,64	43,18	61741	61751	41741	41751	48
18	36	43,18	45,72	61841	61851	41841	41851	48
19	38	45,72	48,26	61941	61951	41941	41951	40
20	40	48,26	50,80	62041	62051	42041	42051	40
21	42	50,80	53,34	62141	62151	42141	42151	40
22	44	53,34	55,88	62241	62251	42241	42251	32
23	46	55,88	58,42	62341	62351	42341	42351	32
24	48	58,42	60,96	62441	62451	42441	42451	32
25	50	60,96	63,50	62541	62551	42541	42551	32
26	52	63,50	66,04	62641	62651	42641	42651	32
27	54	66,04	68,58	62741	62751	42741	42751	32
28	56	68,58	71,12	62841	62851	42841	42851	24
29	58	71,12	73,66	62941	62951	42941	42951	24
30	60	73,66	76,20	63041	63051	43041	43051	24
31	62	76,20	78,74	63141	63151	43141	43151	24
32	64	78,74	81,28	63241	63251	43241	43251	24

* 1040 for single row.

** 700 for single row.

▲ 500 for single row.

Table 4 Male headers with straight pins (continued)

number of contacts		L	A	catalogue number 2422 062		smallest packing quantity
single row	double row			pin length $l_1 = 22$ mm		
				single row	double row	
2	4	2,54	5,08	50241	50251	250
3	6	5,08	7,62	50341	50351	170
4	8	7,62	10,16	50441	50451	130
5	10	10,16	12,70	50541	50551	105
6	12	12,70	15,24	50641	50651	85
7	14	15,24	17,78	50741	50751	75
8	16	17,78	20,32	50841	50851	65
9	18	20,32	22,86	50941	50951	55
10	20	22,86	25,40	51041	51051	50
11	22	25,40	27,94	51141	51151	45
12	24	27,94	30,48	51241	51251	40
13	26	30,48	33,02	51341	51351	40
14	28	33,02	35,56	51441	51451	35
15	30	35,56	38,10	51541	51551	35
16	32	38,10	40,64	51641	51651	30
17	34	40,64	43,18	51741	51751	30
18	36	43,18	45,72	51841	51851	25
19	38	45,72	48,26	51941	51951	25
20	40	48,26	50,80	52041	52051	25
21	42	50,80	53,34	52141	52151	25
22	44	53,34	55,88	52241	52251	20
23	46	55,88	58,42	52341	52351	20
24	48	58,42	60,96	52441	52451	20
25	50	60,96	63,50	52541	52551	20
26	52	63,50	66,04	52641	52651	20
27	54	66,04	68,58	52741	52751	20
28	56	68,58	71,12	52841	52851	15
29	58	71,12	73,66	52941	52951	15
30	60	73,66	76,20	53041	53051	15
31	62	76,20	78,74	53141	53151	15
32	64	78,74	81,28	53241	53251	15

For ordering, see "How to order", page 19.

DIMENSIONAL DATA: MALE HEADERS WITH 90° ANGLED PINS

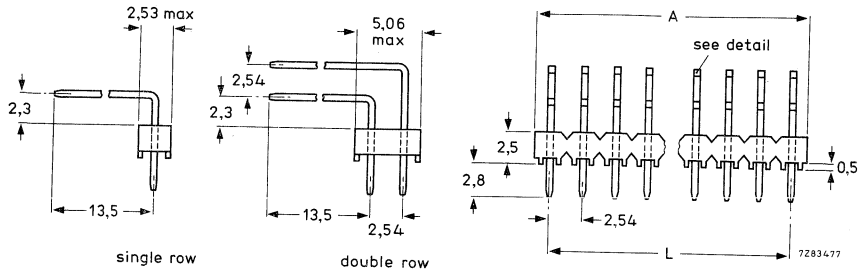


Fig. 9 Male header with 90° angled pins; see Table 5 for dimensions A and L.

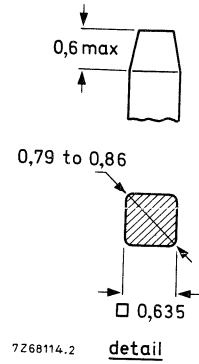


Table 5: Male headers with 90° angled pins

number of contacts		L	A	catalogue number 2422 062		smallest packing quantity	
single row	double row			single row	double row	single row	double row
2	4	2,54	5,08	70201	70211	400	276
3	6	5,08	7,62	70301	70311	272	192
4	8	7,62	10,16	70401	70411	208	144
5	10	10,16	12,70	70501	70511	168	114
6	12	12,70	15,24	70601	70611	136	96
7	14	15,24	17,78	70701	70711	120	84
8	16	17,78	20,32	70801	70811	104	72
9	18	20,32	22,86	70901	70911	88	66
10	20	22,86	25,40	71001	71011	80	60
11	22	25,40	27,94	71101	71111	72	54
12	24	27,94	30,48	71201	71211	64	48
13	26	30,48	33,02	71301	71311	64	42
14	28	33,02	35,56	71401	71411	56	42
15	30	35,56	38,10	71501	71511	56	36
16	32	38,10	40,64	71601	71611	48	36
17	34	40,64	43,18	71701	71711	48	30
18	36	43,18	45,72	71801	71811	40	30
19	38	45,72	48,26	71901	71911	40	30
20	40	48,26	50,80	72001	72011	40	30
21	42	50,80	53,34	72101	72111	40	24
22	44	53,34	55,88	72201	72211	32	24
23	46	55,88	58,42	72301	72311	32	24
24	48	58,42	60,96	72401	72411	32	24
25	50	60,96	63,50	72501	72511	32	24
26	52	63,50	66,04	72601	72611	32	18
27	54	66,04	68,58	72701	72711	32	18
28	56	68,58	71,12	72801	72811	24	18
29	58	71,12	73,66	72901	72911	24	18
30	60	73,66	76,20	73001	73011	24	18
31	62	76,20	78,74	73101	73111	24	18
32	64	78,74	81,28	73201	73211	24	18

For ordering, see "How to order", page 19.

MOUNTING

Dimensions in mm

Hole pattern on printed boards

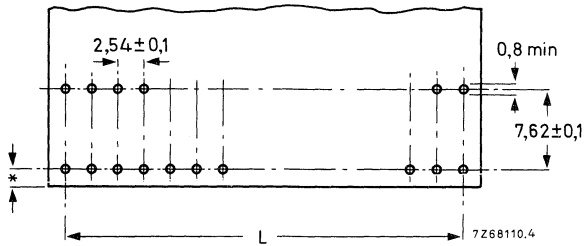


Fig. 10 Hole pattern for board edge sockets. See Table 1, pages 8 and 9 for dimension L. The dimension marked * is determined by customer application (min. 2 mm).

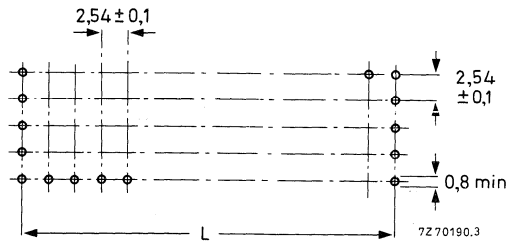
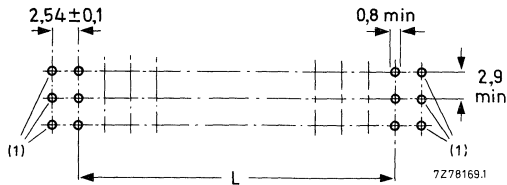


Fig. 11 Hole pattern for double-row panel sockets. See Table 2, pages 10 and 11 for dimension L.



(1) These holes are intended for the supports of the panel socket (diagonal $0,84 \pm 0,02$ mm).

Fig. 12 Hole pattern for single-row panel sockets. See Table 2, pages 10 and 11 for dimension L.

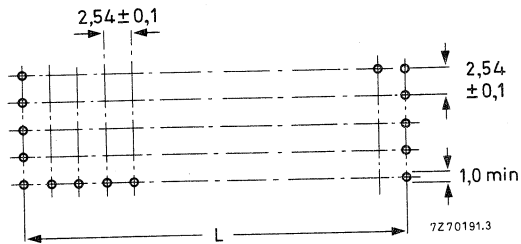


Fig. 13 Hole pattern for male headers. See Table 4 or 5, pages 14, 15 or 17, for dimension L.

HOW TO ORDER

Order the connectors by quoting the 12-digit catalogue number as shown in Tables 1 to 5. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

Example

100 panel sockets with 16 contacts, double row, should be ordered as:

104 x 2422 062 00812.

MODULAR CONNECTOR SYSTEM

bottom-entry sockets

- For basic grid of 2,54 mm (0,1 in)

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts	
single row	2 to 32
double row	4 to 20
Board thickness	1,6 mm
Terminations	dip-solder pins
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2 A
Mechanical endurance	25 insertions
Climatic category, IEC 68	55/125/21

APPLICATION

For use with male headers of the F095 modular connector system, for parallel or perpendicular inter-connection of printed-wiring boards.

DESCRIPTION

The bottom-entry socket is a female connector of the F095 modular connector system. It has a body of flame retardent, glass-fibre-filled thermoplastic polyester material. The socket is provided with tinned dip-solder terminations, which have to be bent after insertion in the printed-wiring board.

A silicone rubber solder stop is available to prevent entry of solder into the springs during the soldering process.

The contact springs are phosphor bronze; the electrical contact surfaces are gold-on-nickel plated.

ELECTRICAL, MECHANICAL AND ENVIRONMENTAL DATA

All data given in the F095 data sheet are valid, except those mentioned below.

→ Current at $T_{amb} = 20\text{ °C}$	2 A
Number of contacts	
single row	2 to 32
double row	4 to 20
Mechanical endurance	25 insertions, according to IEC 512, test 9a
Connector body material	glass-fibre-filled thermoplastic
Contact springs	
material	phosphor bronze
shape	solid cantilever
finish of contact surfaces	rolled-on gold on nickel plate
type of termination	dip-solder
finish of termination	tinned

DIMENSIONAL DATA

Dimensions in mm

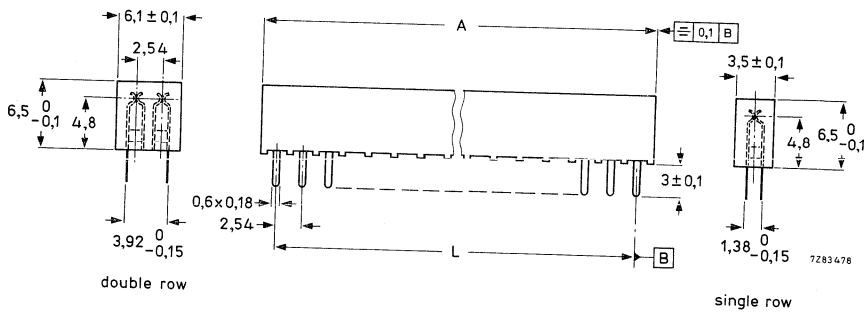


Fig. 1 Bottom-entry socket. See Table 1 for dimensions A and L.

Table 1

number of contacts		L	A	catalogue number 2422 062		smallest packing quantity
single row	double row			single row	double row	
2	4	2,54	6,14	80201	80211	378
3	6	5,08	8,68	80301	80311	270
4	8	7,62	11,22	80401	80411	207
5	10	10,16	13,76	80501	80511	171
6	12	12,70	16,30	80601	80611	144
7	14	15,24	18,84	80701	80711	126
8	16	17,78	21,38	80801	80811	108
9	18	20,32	23,92	80901	80911	99
10	20	22,86	26,46	81001	81011	90
11		25,40	29,00	81101		81
12		27,94	31,54	81201		72
13		30,48	34,08	81301		72
14		33,02	36,62	81401		63
15		35,56	39,16	81501		63
16		38,10	41,70	81601		54
17		40,64	44,24	81701		54
18		43,18	46,78	81801		45
19		45,72	49,32	81901		45
20		48,26	51,86	82001		45
21		50,80	54,40	82101		36
22		53,34	56,94	82201		36
23		55,88	59,48	82301		36
24		58,42	62,02	82401		36
25		60,96	64,56	82501		36
26		63,50	67,10	82601		36
27		66,04	69,64	82701		27
28		68,58	72,18	82801		27
29		71,12	74,72	82901		27
30		73,66	77,26	83001		27
31		76,20	79,80	83101		27
32		78,74	82,34	83201		27

HOW TO ORDER

Order the bottom-entry sockets by quoting the 12-digit catalogue number as shown in the table above. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

Example

80 bottom-entry sockets with 30 contacts, single row, should be ordered as:

81 × 2422 062 83001.

MOUNTING

Dimensions in mm

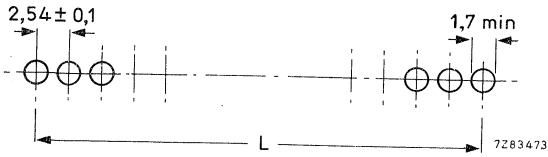


Fig. 2 Hole pattern for single-row bottom-entry sockets; see Table 1 for dimension L.

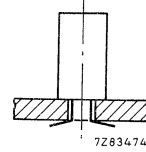


Fig. 3 Single-row bottom-entry socket in mounted position.

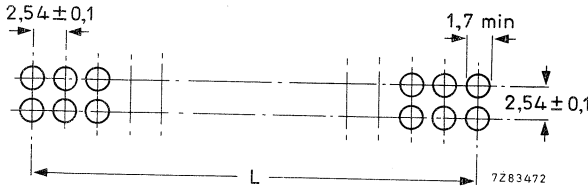


Fig. 4 Hole pattern for double-row bottom-entry sockets; see Table 1 for dimension L.

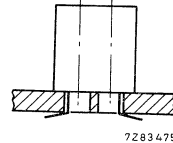


Fig. 5 Double-row bottom-entry socket in mounted position.

ACCESSORIES

A silicone rubber solder stop, inserted in the holes of the printed-wiring board before dip-soldering, prevents entry of solder into the bottom-entry socket.

Catalogue number of strip with solder stops,

single row: 2422 062 89001

double row: 2422 062 89011.

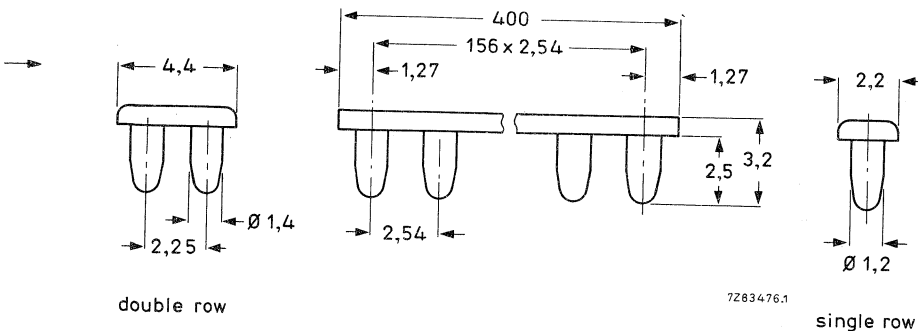


Fig. 6 Strip with solder stops for bottom-entry socket.

MODULAR CONNECTOR SYSTEM

male header with 90° angled pins

- For basic grid of 2,54 mm (0,1 in)

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts, double row	4 to 60
Board thickness	1,6 mm
Terminations	dip-solder pins
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2 A
Mechanical endurance	200 insertions
Climatic category, IEC 68	55/125/21

APPLICATION

These male headers are used with female cable connectors, e.g. type F303, for connecting the in- and outgoing wiring to electronic circuits. They are specially used in applications where mounting space is limited.

DESCRIPTION

These double-row male headers are parts of the F095 modular connector system. They have a body of flame retardant, glass-fibre-filled thermoplastic polyester material. They are provided with gold-on-nickel plated brass contacts.

For keying reasons male headers with an odd number of contacts are supplied.

ELECTRICAL, MECHANICAL AND ENVIRONMENTAL DATA

All data given in the F095 data sheet are valid, except those mentioned below.

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2 A
Number of contacts, double row	4 to 60
Mechanical endurance	200 insertions
Connector body	
material	glass-fibre-filled thermoplastic
colour	grey (RAL7032)
Contact pins	
material	brass
shape	square pin, chamfered at both ends
finish of contact surface	gold plate on nickel plate
type of termination	dip-solder pin
finish of termination	gold flash on nickel plate

DIMENSIONAL DATA

Dimensions in mm

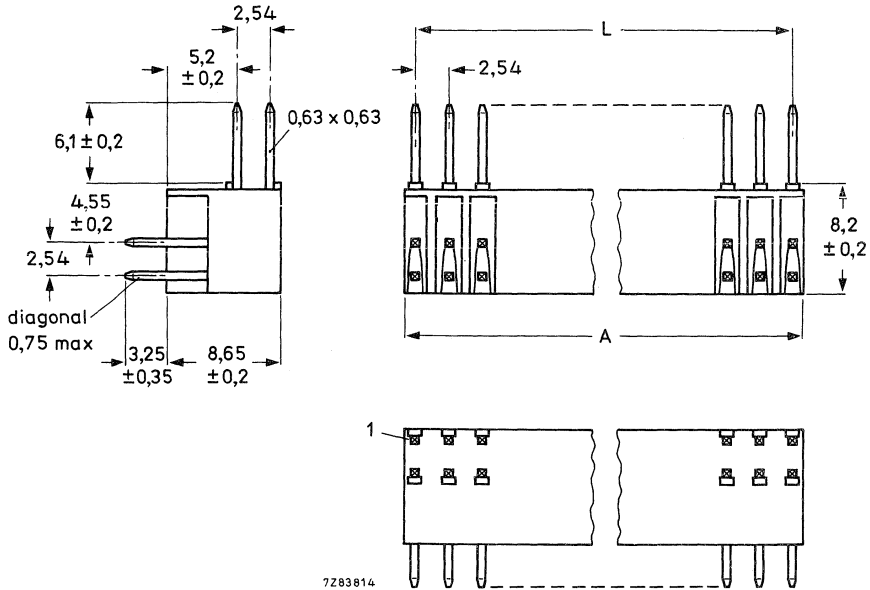


Fig. 1 Male header with 90° angled pins; see Table 1 for dimensions A and L.
For male headers with an odd number of contacts, contact pin 1 is omitted.

Table 1

number of contacts, double row	L tol. $\pm 0,1$	A tol. $+0,3$ $-0,5$	catalogue number 2422 062	smallest packing quantity	number of contacts, double row	L tol. $\pm 0,1$	A tol. $+0,3$ $-0,5$	catalogue number 2422 062	smallest packing quantity
4	2,54	5,08	90411	343					
5	5,08	7,62	90511	238					
6	5,08	7,62	90611	238	36	43,18	45,72	93611	35
7	7,62	10,16	90711	175	37	45,72	48,26	93711	35
8	7,62	10,16	90811	175	38	45,72	48,26	93811	35
9	10,16	12,70	90911	140	39	48,26	50,80	93911	35
10	10,16	12,70	91011	140	40	48,26	50,80	94011	35
11	12,70	15,24	91111	119	41	50,80	53,34	94111	35
12	12,70	15,24	91211	119	42	50,80	53,34	94211	35
13	15,24	17,78	91311	105	43	53,34	55,88	94311	28
14	15,24	17,78	91411	105	44	53,34	55,88	94411	28
15	17,78	20,32	91511	91	45	55,88	58,42	94511	28
16	17,78	20,32	91611	91	46	55,88	58,42	94611	28
17	20,32	22,86	91711	77	47	58,42	60,96	94711	28
18	20,32	22,86	91811	77	48	58,42	60,96	94811	28
19	22,86	25,40	91911	70	49	60,96	63,50	94911	28
20	22,86	25,40	92011	70	50	60,96	63,50	95011	28
21	25,40	27,94	92111	63	51	63,50	66,04	95111	28
22	25,40	27,94	92211	63	52	63,50	66,04	95211	28
23	27,94	30,48	92311	56	53	66,04	68,58	95311	28
24	27,94	30,48	92411	56	54	66,04	68,58	95411	28
25	30,48	33,02	92511	56	55	68,58	71,12	95511	21
26	30,48	33,02	92611	56	56	68,58	71,12	95611	21
27	33,02	35,56	92711	49	57	71,12	73,66	95711	21
28	33,02	35,56	92811	49	58	71,12	73,66	95811	21
29	35,56	38,10	92911	49	59	73,66	76,20	95911	21
30	35,56	38,10	93011	49	60	73,66	76,20	96011	21
31	38,10	40,64	93111	42					
32	38,10	40,64	93211	42					
33	40,64	43,18	93311	42					
34	40,64	43,18	93411	42					
35	43,18	45,72	93511	35					

HOW TO ORDER

Order the male headers by quoting the 12-digit catalogue number as shown in the table above. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

Example

40 male headers with 55 contacts, double row, should be ordered as:

42 x 2422 062 95511.

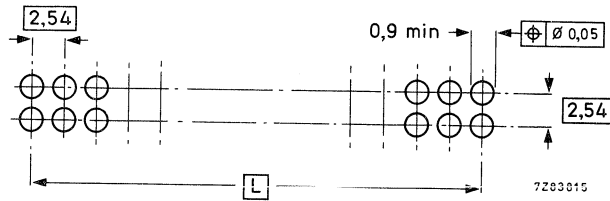


Fig. 2 Hole pattern for male headers with 90° angled pins; see Table 1 for dimension L.

MODULAR CONNECTOR SYSTEM

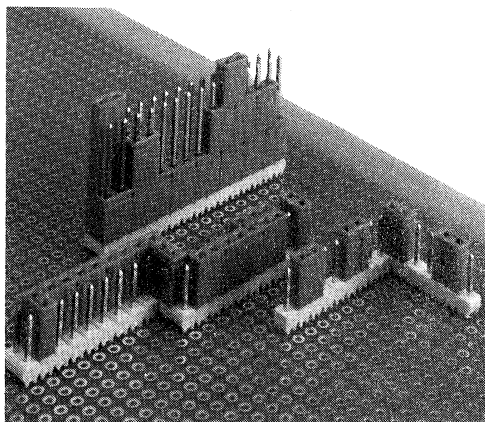
jumper

- For basic grid of 2,54 mm (0,1 in)

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts	2 (interconnected)
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2 A
Mechanical endurance	50 insertions
Climatic category, IEC 68	55/125/21

820818-10-10



APPLICATION

This jumper is for interconnection of two adjacent pins in electronic circuits, thus providing flexibility in circuit programming. It is very suitable for circuits with high-density packaging.

The jumper is intended for use with the F095 male headers with straight 11 mm pins, giving 9 mm profile height to this combination.

DESCRIPTION

This jumper is a female connector with a body of glass-fibre-filled thermoplastic. The contact springs are of phosphor bronze; the contact surfaces are gold on nickel plate.

The jumper mates with 0,635 mm square pins of min. 5,7 mm length. The pins can pass all the way through the jumper, enabling stacking of two or more jumpers on the same pin. The openings, at the top of the jumper allow inspection of the contacts with a test probe.

The jumper is available in four colours.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$

2 A

Derated current curve

according to IEC 512,
test 5b, see Fig. 2

Contact resistance (including material
resistance) at 10 mA, max. 20 mV (peak)
open circuit voltage, 1 kHz

initially $\leq 20\text{ m}\Omega$
after tests $\leq 25\text{ m}\Omega$

Insulation resistance

initially $> 5 \cdot 10^3\text{ M}\Omega$
after tests $> 10^3\text{ M}\Omega$

Creepage distances and clearances (see Fig. 1)

between jumpers A and B $\geq 1,5\text{ mm}$
between jumpers B and C $\geq 0,7\text{ mm}$
between jumpers C and D $\geq 1,2\text{ mm}$
between jumpers D and E $\geq 1,7\text{ mm}$
between jumpers E and F $\geq 1,0\text{ mm}$

Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$

between contact and body surface 750 V (r.m.s.), 50 Hz

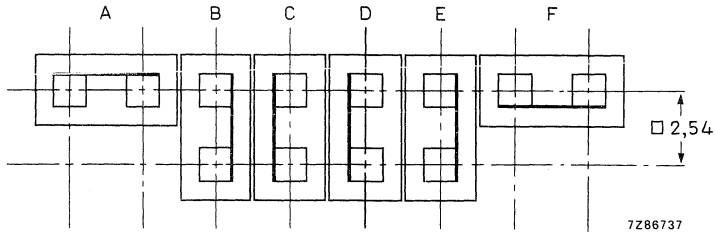


Fig. 1 Arrangement of jumpers on 2,54 mm grid.

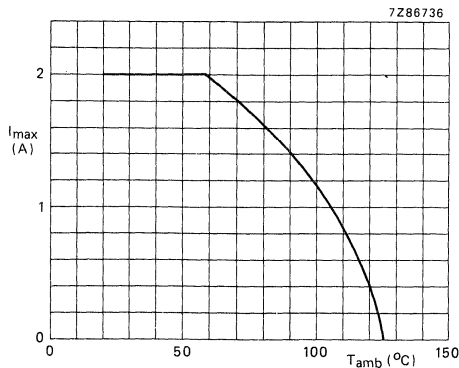


Fig. 2 Maximum current as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts	2 (interconnected)
Insertion/withdrawal force, per contact	≤ 3 N
Mechanical endurance	50 insertions; according to IEC 512, test 9a
Connector body material	glass-fibre-filled thermoplastic
Contact springs	
material	phosphor bronze
shape	see Fig. 3
finish of contact surface	gold on nickel plate
Mass	0,1 g
Shock	according to IEC 512, test 6c, 50 g, 11 ms (jumper in free position on male header)
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 1,5 mm (p-p) or 10g, 3 directions, 2 h per direction (jumper in free position on male header)

ENVIRONMENTAL DATA

Climatic category (IEC 68)	55/125/21
Ambient temperature range	-55 to + 125 °C
Damp heat, steady state	according to IEC 512, test 11c, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V-1

DIMENSIONAL DATA

Dimensions in mm

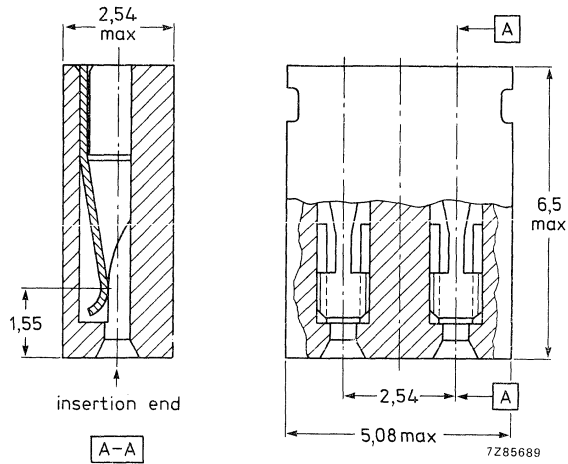


Fig. 3.

HOW TO ORDER

Order the jumper by quoting the 12-digit catalogue number as shown in the Table below. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity,

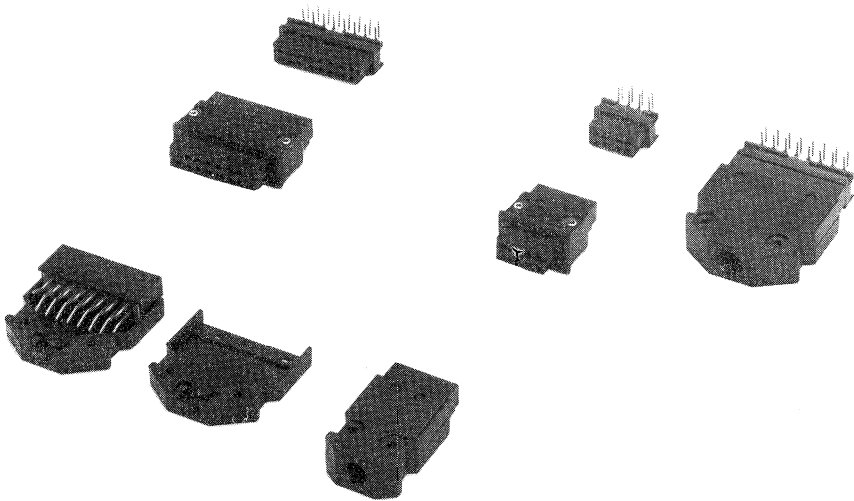
colour of jumper	catalogue number	smallest packing quantity
yellow	2422 062 97014	500
grey	97024	500
red	97034	500
blue	97044	500

TEST CONNECTOR ASSEMBLY

- 3,175 mm (0,125 in) pitch

QUICK REFERENCE DATA

Contact pitch	3,175 mm (0,125 in)
Number of contacts	8, 16
Board thickness	1,42 to 1,78 mm
Terminations	dip-solder pins
spring contact box	solder pins
test cord plug	
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2,2 A
Mechanical endurance	500 insertions
Climatic category, IEC 68	10/100/21



APPLICATION

For testing purposes in telephone and telegraph transmission equipment.

DESCRIPTION

This test connector assembly consists of three parts:

- a spring contact box, to be fitted to a printed-wiring board, for use as a contact socket of test points;
- a U-link, for interconnecting each pair of opposite contact springs of the spring contact box;
- a test cord plug.

The test cord plug can be directly inserted into the spring contact box, or via the U-link for testing purposes.

All parts have a black, flame retardent, glass-fibre-filled, polyphenylene body. They are provided with a snap-lock system, which is such that when removing the test cord plug from the U-link, the latter will remain in position in the spring contact box.

The contact springs are of phosphor bronze. The contact surfaces are gold on nickel plating.

No special provisions are required for polarization.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2,2 A
Derated current curve	according to IEC 512-3, test 5b, see Fig. 1
Contact resistance (including material resistance)	
at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz*	
initially	$\leq 10\text{ m}\Omega$ per contact
after damp heat test	$\leq 10\text{ m}\Omega$ per contact
Insulation resistance	
initially	$> 10^6\text{ M}\Omega$
after damp heat test	$> 10^4\text{ M}\Omega$
Creepage distance	
between adjacent contacts	$\geq 0,9\text{ mm}$
between opposite contacts	$\geq 0,5\text{ mm}$
Clearance	
between adjacent contacts	$\geq 0,9\text{ mm}$
between opposite contacts	$\geq 0,5\text{ mm}$
Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$	
between adjacent contacts	1000 V (r.m.s.), 50 Hz
between opposite contacts	1000 V (r.m.s.), 50 Hz

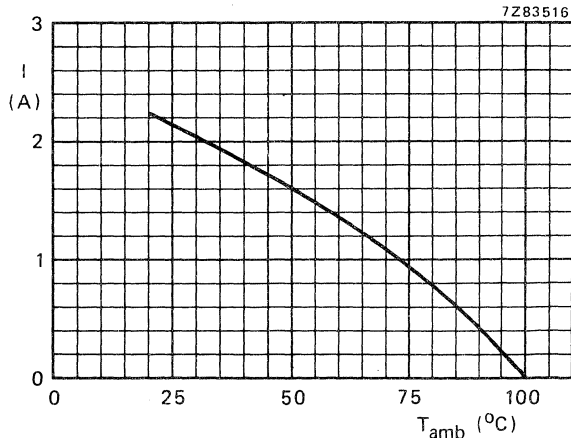


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature.

* Measured between two opposite pins of the spring contact box at a distance of 2 mm from the body; U-link inserted in the spring contact box.

MECHANICAL DATA

Contact pitch	3,175 mm (0,125 in)												
Number of contacts	8, 16												
Board thickness	1,42 to 1,78 mm												
Polarization	achieved by asymmetrical housing												
Insertion force													
U-link into spring contact box	≤ 30 N												
test cord plug into U-link	≤ 11 N												
Withdrawal force													
U-link from spring contact box	12 to 22 N												
test cord plug from U-link	5 to 11 N												
Mechanical endurance	500 insertions; according to IEC 512-5, test 9a												
Connector body material	glass-fibre-filled polyphenylene												
Contacts													
material	<table border="1" style="display: inline-table; vertical-align: top;"> <tr> <th style="border: none;">springs</th> <th style="border: none;">pins</th> </tr> <tr> <td style="border: none;">phosphor bronze</td> <td style="border: none;">phosphor bronze</td> </tr> <tr> <td style="border: none;">solid cantilever</td> <td style="border: none;">square wire</td> </tr> <tr> <td style="border: none;">≥ 2,5 μm rolled-on gold on ≥ 1 μm nickel</td> <td style="border: none;">≥ 2,5 μm gold plate on ≥ 1 μm nickel plate</td> </tr> <tr> <td style="border: none;">dip-solder pin</td> <td style="border: none;">solder pin</td> </tr> <tr> <td style="border: none;">tinned</td> <td style="border: none;">≥ 2,5 μm gold plate on ≥ 1 μm nickel plate</td> </tr> </table>	springs	pins	phosphor bronze	phosphor bronze	solid cantilever	square wire	≥ 2,5 μm rolled-on gold on ≥ 1 μm nickel	≥ 2,5 μm gold plate on ≥ 1 μm nickel plate	dip-solder pin	solder pin	tinned	≥ 2,5 μm gold plate on ≥ 1 μm nickel plate
springs	pins												
phosphor bronze	phosphor bronze												
solid cantilever	square wire												
≥ 2,5 μm rolled-on gold on ≥ 1 μm nickel	≥ 2,5 μm gold plate on ≥ 1 μm nickel plate												
dip-solder pin	solder pin												
tinned	≥ 2,5 μm gold plate on ≥ 1 μm nickel plate												
shape													
finish of contact surfaces													
type of termination													
finish of termination													
contact force	≥ 0,75 N												
contact mating length	≥ 1,2 mm												
Mass	see Table 1												
Solderability	235 °C, 2 s												
Resistance to heat	260 °C, 10 s												
Bumping	according to IEC 68, test T } according to IEC 68, test T according to IEC 68, test Eb, 10g, 16 ms, 6 directions, 1000 bumps												
Vibration	according to IEC 68, test Fc, 10 to 55 Hz, 0,7 mm (p-p), 3 directions, 0,5 h per direction												

Table 1

number of contacts	approx. mass (g)		
	spring contact box	U-link	test cord plug (without cable hood)
8	1,5	4	1,3
16	3	8	2,5

ENVIRONMENTAL DATA

Climatic category (IEC 68)

10/100/21

Ambient temperature range

-10 to +70 °C

Storage temperature range

-40 to +100 °C

Damp heat, steady state

according to IEC 68, test Ca, 21 days,
40 °C, R.H. 90 to 95%

Dry heat

according to IEC 68, test Ba,
16 h, 100 °C

Salt mist

according to IEC 68, test Ka, 96 h

Industrial atmosphere

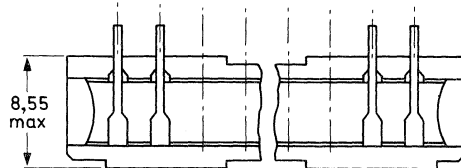
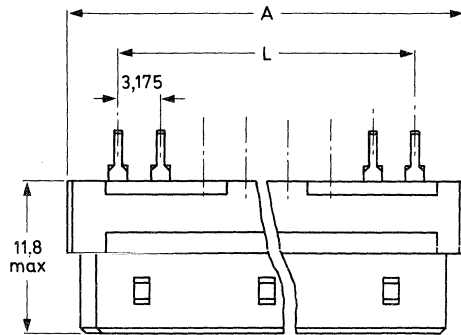
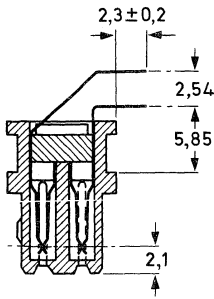
1% H₂S, 24 h; 1% SO₂, 24 h

Flammability

according to UL94, category V1

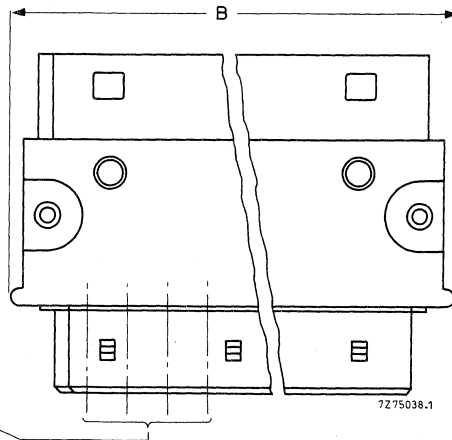
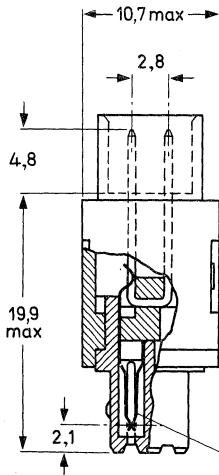
DIMENSIONAL DATA

Dimensions in mm



7275037.1

Fig. 2 Spring contact box; see Table 2 for dimensions A and L.



7275038.1

Fig. 3 U-link; see Table 3 for dimension B.

The U-link with 8 contacts and the U-link with 16 contacts have 4 springs (S).

The U-link with 8 contacts has a hold rim on the four sides (max. thickness = 12,2 mm) that with 16 contacts has a hold rim on the shorter sides only.

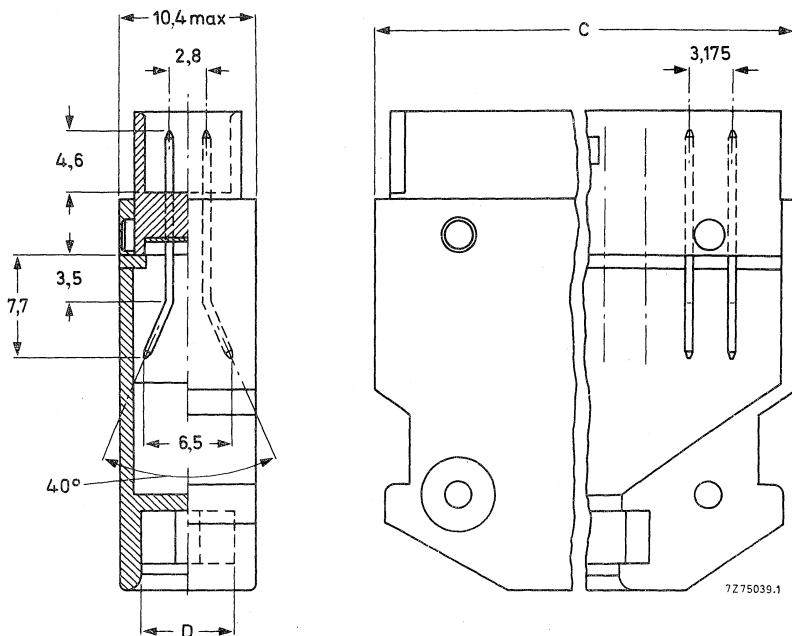


Fig. 4 Test cord plug with cable hood. See Table 4 for dimensions C and D.

Table 2 Spring contact box

number of contacts	A	L	catalogue number
8	16,95	9,525	4322 027 58360
16	29,65	22,225	4322 027 59870

Table 3 U-link

number of contacts	B	catalogue number
8	20,6	4322 027 58370
16	33,3	4322 027 59880

Table 4 Test cord plug and cable hood

number of contacts	C	D	catalogue number	
			test cord plug	cable hood (half)
8	18,9	5,0	4322 027 58380	4322 027 58390
16	31,6	5,5	4322 027 59890	4322 027 59900

MOUNTING

A test connector assembly, of which the spring contact box is mounted on a printed-wiring board, is shown in Fig. 5. The spring contact box can be fitted by means of a mounting bracket (Fig. 6). This bracket may not be connected to earth or any other electronic circuit. For the catalogue number of the mounting bracket, see Table 5.

Table 5 Mounting bracket

number of contacts	catalogue number
8	3522 201 70460
16	3522 201 66440

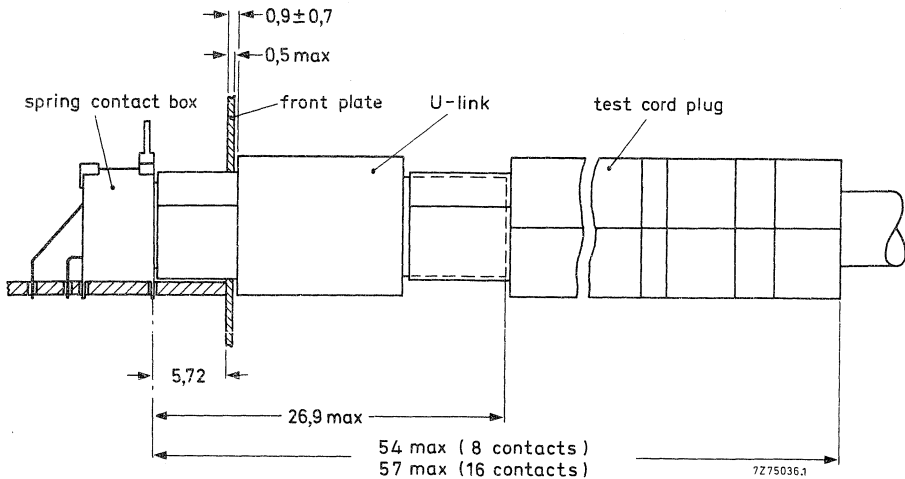


Fig. 5 Mounting of test connector assembly.

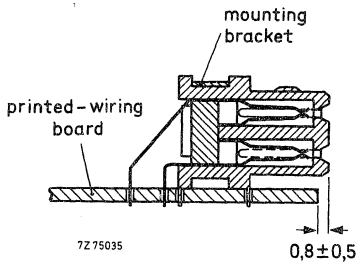


Fig. 6 Fitting of spring contact box by means of a bracket.

The piercing diagram for the spring contact box is shown in Fig. 7, which is based on a front plate thickness of $0,5$ mm. If the front plate is thicker ($0,5 + y$ mm), the dimension $5,72$ mm in Figs 7a and 7b must be reduced by y mm, otherwise the connector assembly will fail to engage.

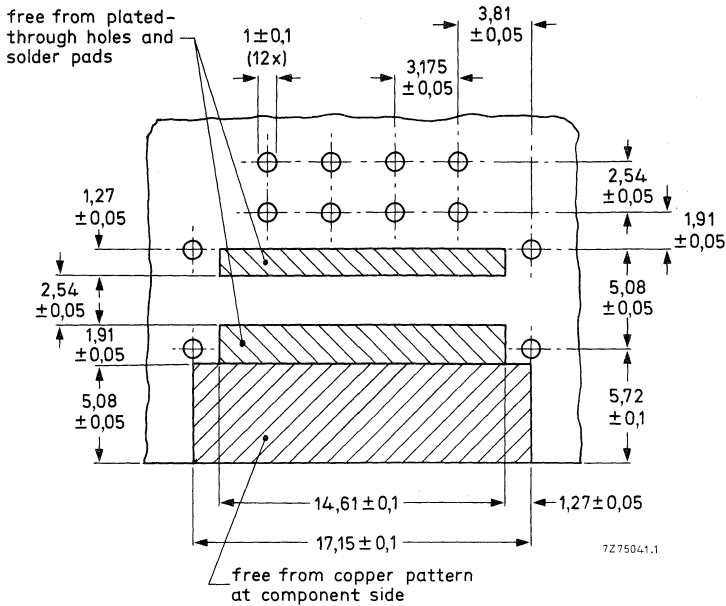


Fig. 7a Hole pattern for the spring contact box with 8 pins.

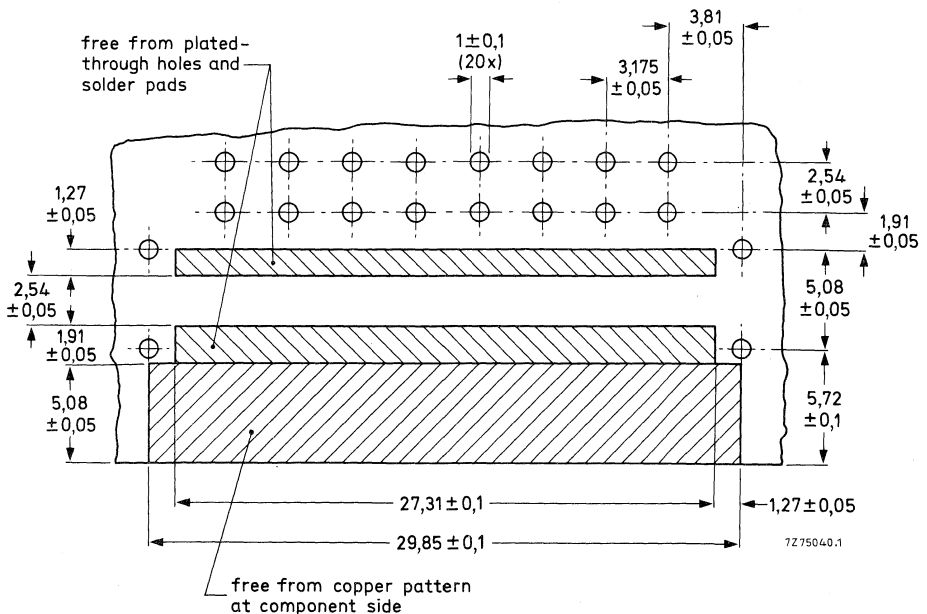


Fig. 7b Hole pattern for the spring contact box with 16 pins.

MARKING

The package is marked with:
12-digit catalogue number;
reference number of manufacturer;
number of pieces.

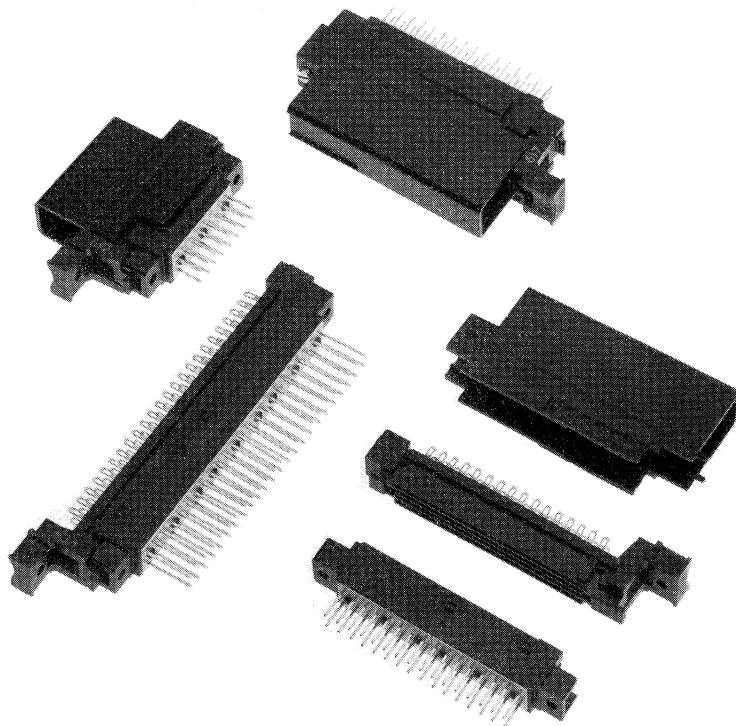
PACKING

The connectors and the test plug are packed in boxes.

RACK AND PANEL CONNECTORS

QUICK REFERENCE DATA

Contact pitch	3 mm
Number of connections	16, 32, 48
Terminations	straight or 90° angled dip-
male part	solder pins, or pins for
female part	wire wrapping
female part	solder tags
Current at $T_{amb} = 20\text{ °C}$	2,5 A
Mechanical endurance	500 insertions
Climatic category (IEC 68)	10/100/21



APPLICATION

For use in data processing, telecommunication and general industrial equipment, as a rack and panel connector.

DESCRIPTION

These connectors consist of three parts:

- a male part to be fitted to a rack or a panel;
- a female part to be used as a cable part;
- a cable hood.

All parts have a black, flame retardent, glass-fibre-filled, polyphenylene body.

The contact springs are of phosphor bronze. The contact surfaces are gold on nickei plating.

The connectors are provided with a locking device.

No special provisions are required for polarization.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	2,5 A
Derated current curve	according to IEC 512-3, test 5b, see Fig. 1
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz.	
Measured on the pins of the male part, 2 mm from the body	
initially	$\leq 10\text{ m}\Omega$
after damp heat test	$\leq 10\text{ m}\Omega$
Insulation resistance	
initially	$> 10^6\text{ M}\Omega$
after damp heat test	$> 10^4\text{ M}\Omega$
Creepage distance	
between adjacent contacts	$\geq 0,7\text{ mm}$
between opposite contacts	$\geq 2,2\text{ mm}$
Clearance	
between adjacent contacts	$\geq 0,7\text{ mm}$
between opposite contacts	$\geq 1,4\text{ mm}$
Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$	
between adjacent contacts	1200 V (r.m.s.), 50 Hz
between opposite contacts or	
between a contact and earth	2000 V (r.m.s.), 50 Hz

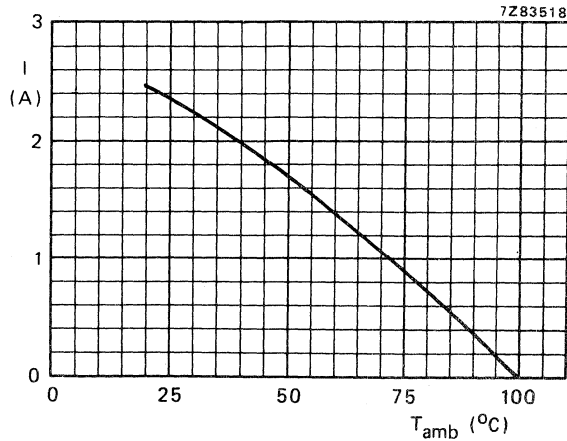


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	3 mm
Number of contacts	16, 32, 48
Polarization	achieved by asymmetrical housing
Insertion force	see Table 1
Withdrawal force	see Table 1
Mechanical endurance	500 insertions; according to IEC 512-5, test 9a
Connector body material	glass-fibre-filled polyphenylene
Contacts	male part female part
material	phosphor bronze phosphor bronze
shape	square pin solid cantilever
finish of contact surfaces	$\geq 2,5 \mu\text{m}$ gold plate on $\geq 1 \mu\text{m}$ nickel $\geq 2,5 \mu\text{m}$ rolled-on gold on $\geq 1 \mu\text{m}$ nickel plate
contact force	$\geq 0,70 \text{ N}$
type of termination	straight or 90° angled dip-solder pin solder tag
finish of termination	pin for wire wrapping $\geq 2,5 \mu\text{m}$ gold plate on $\geq 1 \mu\text{m}$ nickel tinned
Contact mating length	$\geq 0,8 \text{ mm}$
Mass	see Table 1
Solderability	235 °C, 2 s
Resistance to heat	350 °C, 3,5 s } according to IEC 68, test T
Bumping	according to IEC 68, test Eb, 10g, 16 ms, 6 directions, 1000 bumps
Vibration	according to IEC 68, test Fc, 10 to 55 Hz, 0,70 mm (p-p), 3 directions, 0,5 h per direction

Table 1

number of contacts	insertion force (N)	withdrawal force (N)	approx. mass (g)	
			male part	female part
16	≤ 19	≤ 17	4	5
32	≤ 37	≤ 34	7	7
48	≤ 55	≤ 50	10	10

ENVIRONMENTAL DATA

Climatic category (IEC 68)

10/100/21

Ambient temperature range

-10 to + 70 °C

Storage temperature range

-40 to + 100 °C

Damp heat, steady state

according to IEC 68, test Ca, 21 days,
40 °C, R.H. 90 to 95%

Dry heat

according to IEC 68, test Ba, 16 h, 100 °C

Salt mist

according to IEC 68, test Ka, 96 h

Industrial atmosphere

1% H₂S, 24 h; 1% SO₂, 24 h

Flammability

according to UL94, category V1

DIMENSIONAL DATA

Dimensions in mm

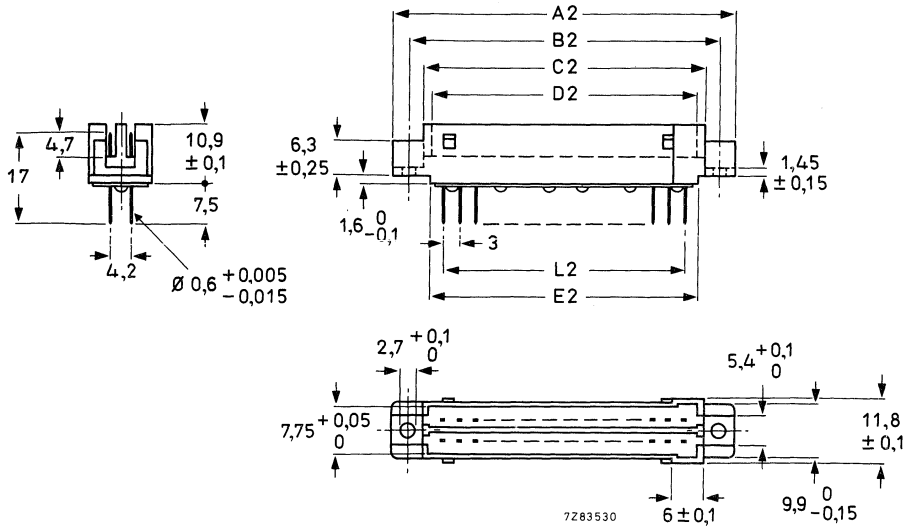


Fig. 2 Male part with straight dip-solder pins; see Table 2 for dimensions A2, B2, C2, D2, E2 and L2.

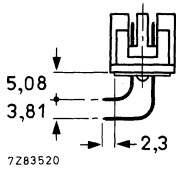


Fig. 3 Male part with 90° angled dip-solder pins; dimensions are identical with those in Fig. 2, except as shown.

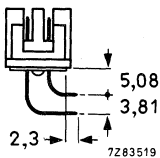


Fig. 4 Male part with 90° angled dip-solder pins; dimensions are identical with those in Fig. 2, except as shown.

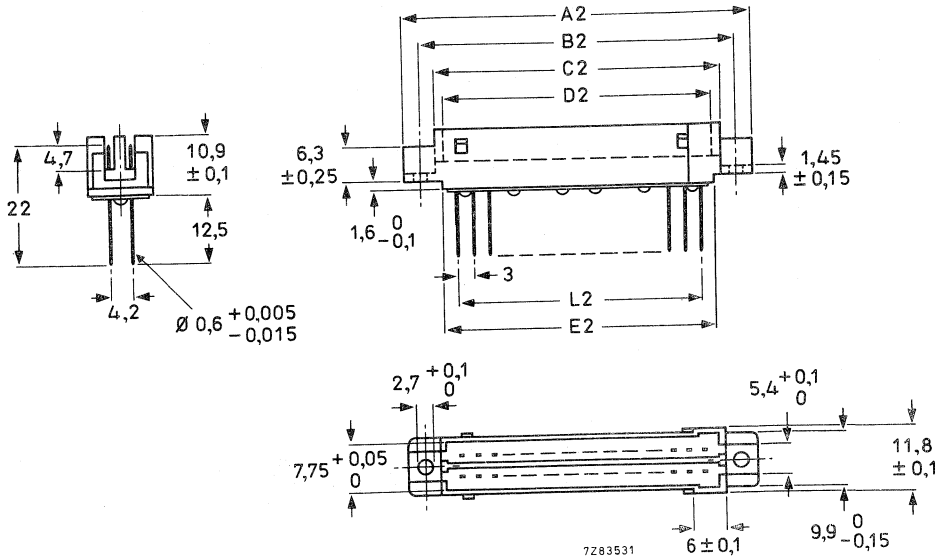


Fig. 5 Male part with pins for wire wrapping; see Table 2 for dimensions A2, B2, C2, D2, E2 and L2.

Table 2

number of contacts	Fig.	dimensions (mm)						catalogue number		
		A2 _{max}	B2	C2 _{max}	D2	E2 _{max}	L2			
16	2	40	34	± 0,1	28,6	25,6	25,8	21	2422 025 88028	
32	2	64	58		52,6	49,6	49,8	45		88018
48	2	88	82		76,6	73,6	73,8	69		88021
16	3	40	34		28,6	25,6	25,8	21	88029	
32	3	64	58		52,6	49,6	49,8	45	88031	
16	4	40	34		28,6	25,6	25,8	21	88016	
32	4	64	58		52,6	49,6	49,8	45	88024	
32	5	64	58		52,6	49,6	49,8	45	89458	
48	5	88	82		76,6	73,6	73,8	69	88022	

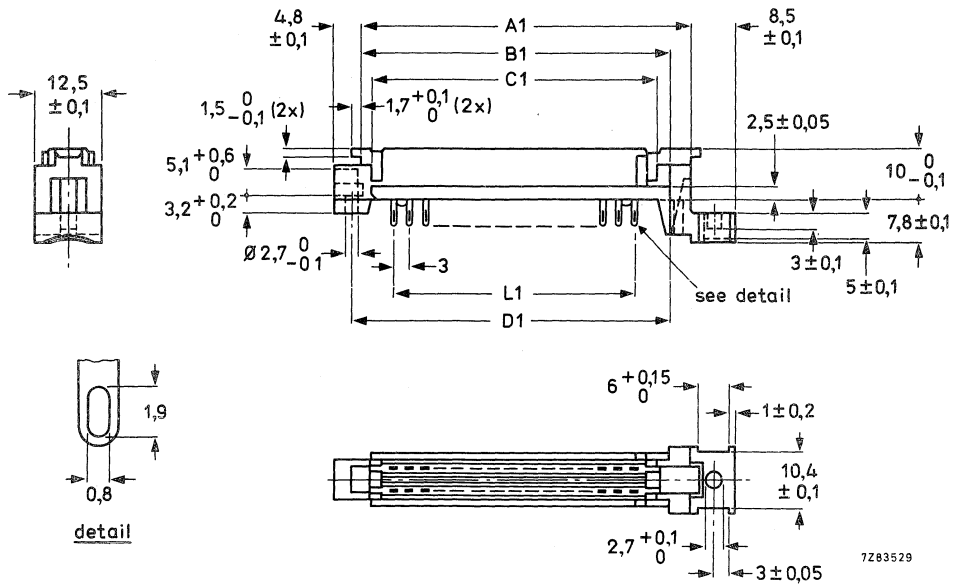


Fig. 6 Female part with solder tags; see Table 3 for dimensions A1, B1, C1, D1 and L1.

Fig. 7 Female part with 24 solder tags; dimensions are identical with those in Fig. 6, except as shown.

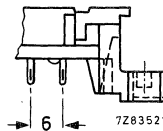


Table 3

number of contacts	Fig.	dimensions (mm)					catalogue number
		A1	B1	C1	D1	L1	
16	6	38	34	28,8	35,6	21	2422 025 88015 88017 88019 88025
32	6	62	58	52,8	59,6	45	
48	6	86	82	76,8	83,6	69	
24	7	86	82	76,8	83,6	66	

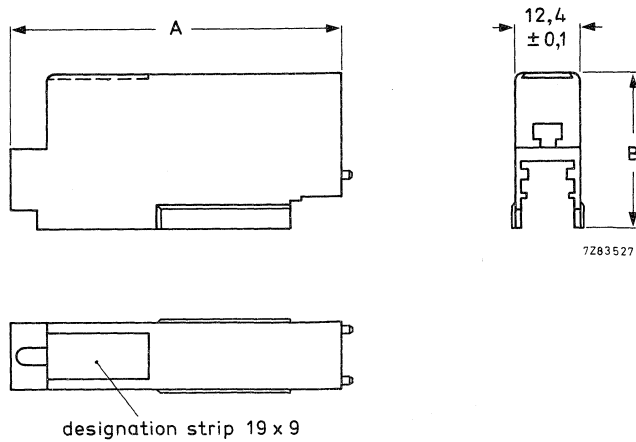


Fig. 8 Cable hood; see Table 4 for dimensions A and B.

Table 4

number of contacts of female part	dimensions (mm)				catalogue number
	A		B		
16	38	} +0,2	28,8	} +0,1	4322 027 75950
32	62		28,8		75960
48*	86	} -0,1	28,8	} -0,2	75970
48*	86		35,8		78470

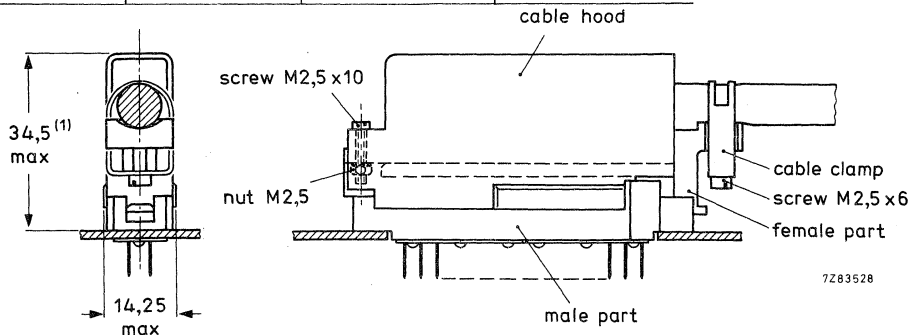


Fig. 9 Rack and panel connector assembly; see also Accessories.

(1) 41,5 mm for cable hood 4322 027 78470.

* Also to be used for 24 contacts.

MOUNTING

Panel cut-out for female parts

Dimensions in mm

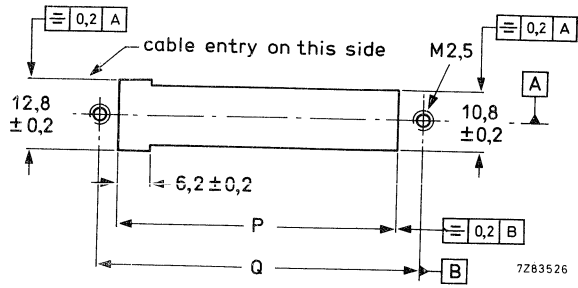


Fig. 10 Panel cut-out for the female part; see Table 5 for dimensions P and Q.

Table 5

number of contacts	dimensions (mm)	
	P	Q
16	$27 \pm 0,2$	$34 \pm 0,1$
32	$51 \pm 0,2$	$58 \pm 0,1$
48	$75 \pm 0,2$	$82 \pm 0,1$

Hole patterns on printed boards for male parts

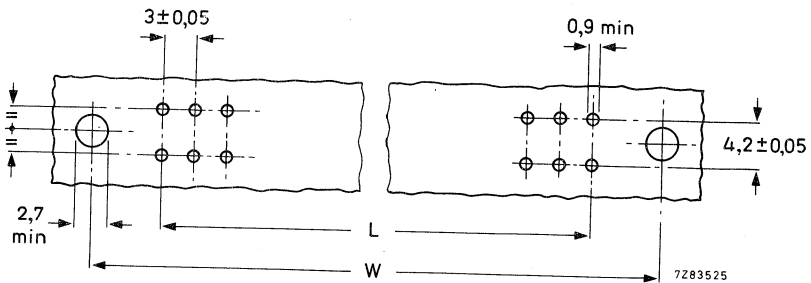


Fig. 11 Hole pattern for a male part with straight dip-solder pins. See Table 6 for dimensions L and W.

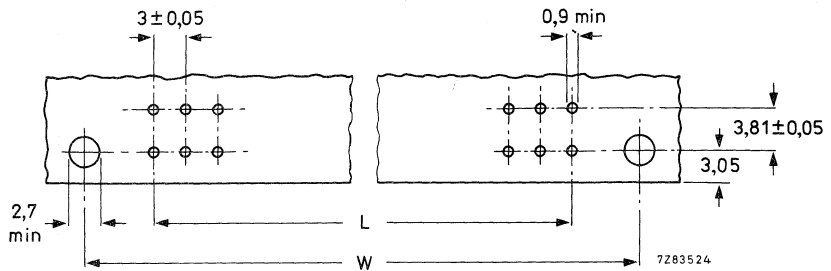


Fig. 12 Hole pattern for a male part with 90° angled dip-solder pins.
See Table 6 for dimensions L and W.

Table 6

number of contacts	dimensions (mm)	
	L	W
16	21 ± 0,05	34 ± 0,1
32	45 ± 0,05	58 ± 0,1
48	69 ± 0,05	82 ± 0,1

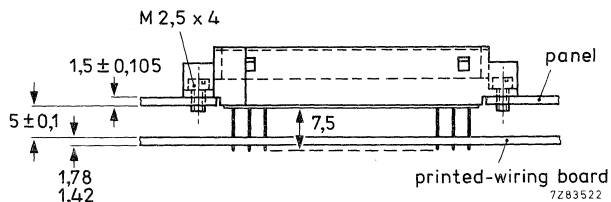


Fig. 13 Mounting example of a male part with dip-solder pins (7,5 mm).

MARKING

The package is marked with:
 12-digit catalogue number;
 reference number of manufacturer;
 number of pieces.

ACCESSORIES

Stainless steel cable clamps (Fig. 9) are available to suit the diameter of the cable; see Table 7. Certain cables are given a wrapping of PVC tape to prevent the conductors from being damaged by the clamp. The tape also can be used for adapting the cable diameter to the diameter given in Table 7. Cables whose diameters are not stated in this Table must be laced up or secured in some other way to the fixing lug of the connector.

Table 7

cable diameter (mm)	catalogue number of cable clamp	required screw
9	3522 201 65260	M2,5 x 8
10,5		M2,5 x 6
11	3522 201 65250	M2,5 x 8
12,5		M2,5 x 6

PACKING

The connectors are packed in boxes.

ADDITIONAL INFORMATION**Removing of the female part from the male part**

1. Slacken screw A (Fig. 14) by about one turn.
2. Push the cable hood in the direction of the arrow as far as it will go.
3. Pull the female part from the male part.

Removing of the cable hood from the female part

1. Retract screw A (Fig. 14) so much that the screw head can pass through the elongated hole in the cable hood.
2. Slide the cable hood from the female part.

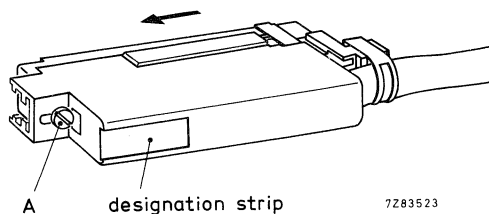
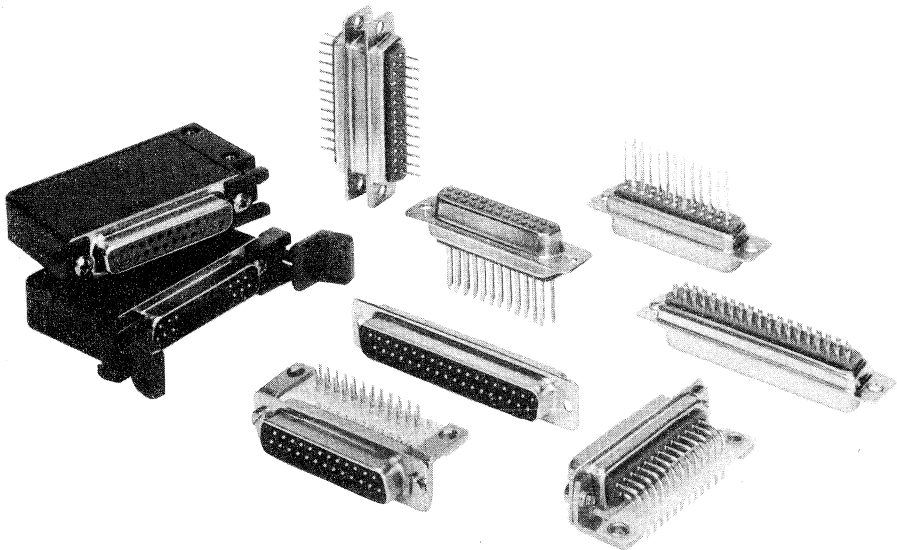


Fig. 14.

SUBMINIATURE RACK AND PANEL CONNECTORS

QUICK REFERENCE DATA

Number of contacts	9, 15, 25, 37 and 50
Terminations	solder cups dip-solder pins, straight or 90° angled pins for wire wrapping crimp-on snap-in
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	7,5 A
Mechanical endurance	500 insertions
Climatic category (IEC 68)	55/125/21
Dimensions	according to MIL-C-24308.



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APPLICATION

For rack and panel connection in industrial, telecommunication and data processing equipment.

DESCRIPTION

→ The connectors consist of a red glass-fibre-filled thermoplastic insulating block, mounted in a shell of passivated, zinc-plated steel. The insulating block contains a number of contact pins or sockets, which are made of a copper alloy and are gold-plated on a nickel layer.

Different types of pin and socket terminations are available: for hand or dip-solder, wire wrapping or crimp applications. For the later application the contact pins and sockets are supplied as loose parts, while the insulating block of the connector contains only a number of holes allowing the crimpable pins and sockets to be loaded into the block. The contacts can be crimped with MIL-standardized tools.

The connectors meet the dimensional requirements of MIL-C-24308.

If a connector is to be used as a cable plug or socket, it can be fitted with a cable hood and locking device.

ELECTRICAL DATACurrent at $T_{amb} = 20\text{ }^{\circ}\text{C}$

7,5 A

Derated current curve

according to IEC 512,
test 5b, see Fig. 1Contact resistance (including material resistance)
at 10 mA, max. 20 mV (peak) open circuit voltage,
1 kHz, measured outside the body

initially

 $\leq 3\text{ m}\Omega$

after tests

 $\leq 5\text{ m}\Omega$

Insulation resistance

initially

 $> 10^5\text{ M}\Omega$

after tests

 $> 10^3\text{ M}\Omega$

Creepage distance

between contacts

 $\geq 1\text{ mm}$

between a contact and earth

 $\geq 1\text{ mm}$

Clearance distance

between contacts

 $\geq 1\text{ mm}$

between a contact and earth

 $\geq 1\text{ mm}$ Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$

between contacts

1000 V (r.m.s.), 50 Hz

between a contact and earth

1000 V (r.m.s.), 50 Hz

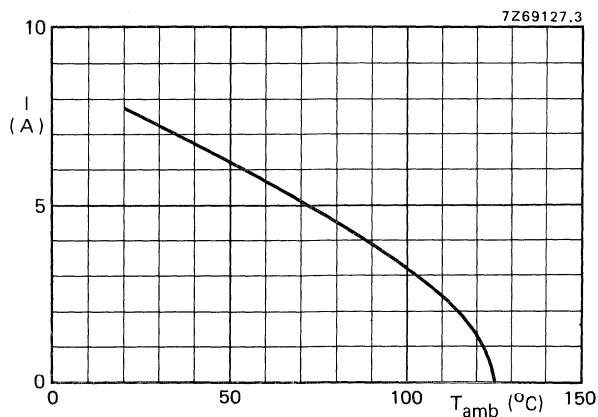


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	see piercing diagrams, Figs 36-40
Number of contacts	9, 15, 25, 37, 50
Positioning	trapezoidal shaped shell prevents incorrect insertion
Insertion force	see Table 1
Withdrawal force	see Table 1
Mechanical endurance	500 insertions; according to IEC 512, test 9a
Connector body material	glass-fibre-filled thermoplastic
Contacts	
material	copper alloy
shape	round pins and cylindrical sockets with a two-fold spring facility
finish	hard gold on nickel plate
type of termination	solder cup, dip-solder pin (straight or 90° angled), wire wrapping pin, crimp-on snap-in
Contact retention in insert	≥ 40 N
Mass	see Table 1
Solderability	according to IEC 512, test 12a, 235 °C, 2 s*
Shock	according to IEC 512, test 6c, 50g, 11 ms, 6 directions, 3 shocks per direction
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 0,75 mm (p-p) or 10g, 3 directions, 4 h per direction

Table 1

shell size	number of contacts	insertion force (N)	withdrawal force (N)	approx. mass (g) of complete	
				pin connector	socket connector
1	9	≤ 46	≤ 27	6	7
2	15	≤ 78	≤ 46	8	9
3	25	≤ 129	≤ 78	12	14
4	37	≤ 180	≤ 111	16	20
5	50	≤ 226	≤ 138	20	25

* Minimum distance between body and solder point: 2,5 mm.

ENVIRONMENTAL DATA

Climatic category (IEC 68)

55/125/21

Ambient temperature range

−55 to + 125 °C

Damp heat, steady state

according to IEC 512, test 11c, 21 days,
40 °C, R.H. 90 to 95%

Flammability

according to UL94, category V-1

DIMENSIONAL DATA

Dimensions in mm

Connectors with solder cups (accommodate up to AWG20 stranded wire)

Connectors with 9, 15, 25 and 37 contacts

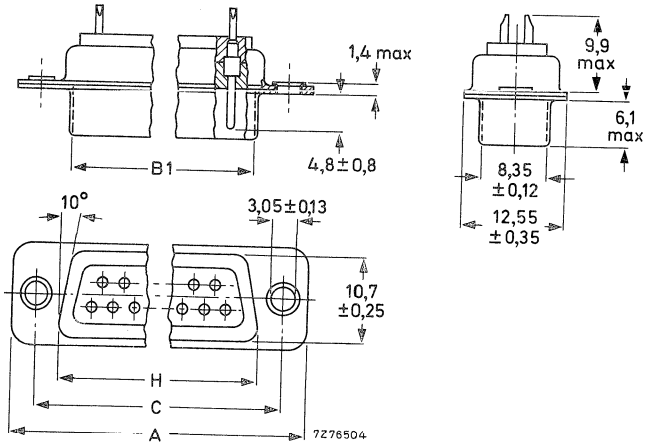


Fig. 2 Pin connector; see also Table 2.

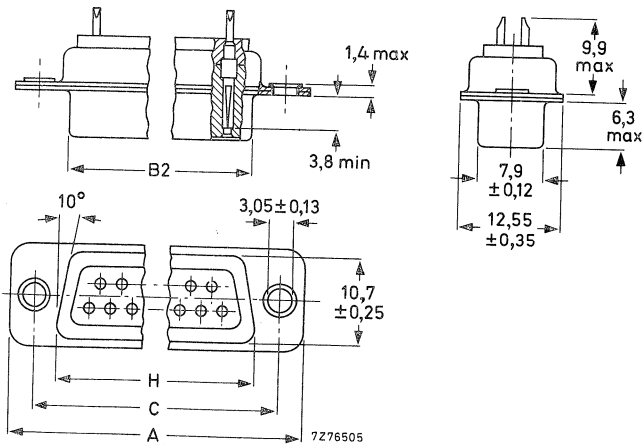


Fig. 3 Socket connector; see also Table 2.

Connectors with 50 contacts

The connectors with 50 contacts have the same dimensions as shown in the figures on the opposite page, except those shown in the figures below.

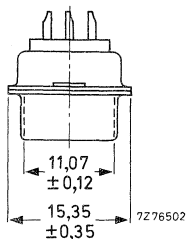


Fig. 4 Side view of pin connector.

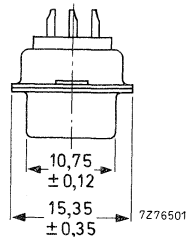


Fig. 5 Side view of socket connector.

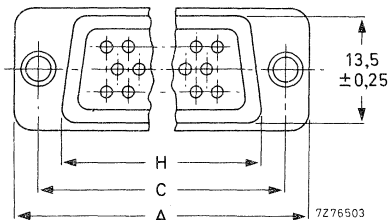


Fig. 6 Terminal side of pin (or socket) connector; see also Table 2.

Table 2

	shell size	number of contacts	dimensions (mm)					catalogue number
			A (± 0,35)	C (± 0,12)	H (± 0,25)	B1 (± 0,15)	B2 (± 0,15)	
pin connector	1	9	30,80	25,0	19,3	16,93		2422 606 20901
	2	15	39,15	33,3	27,5	25,25		21501
	3	25	53,00	47,05	41,3	39,00		22501
	4	37	69,30	63,5	57,7	55,45		23701
	5	50	66,90	61,1	55,3	52,83		25001
socket connector	1	9	30,80	25,0	19,3		16,30	2422 606 30901
	2	15	39,15	33,3	27,5		24,65	31501
	3	25	53,00	47,05	41,3		38,35	32501
	4	37	69,30	63,5	57,7		54,80	33701
	5	50	66,90	61,1	55,3		52,40	35001

For ordering, see "How to order", page 25.

Note: see *Mechanical Data* for solder conditions.

Connectors with straight dip-solder pins (see also piercing diagrams, Figs 31 to 35)

Connectors with 9, 15, 25 and 37 contacts

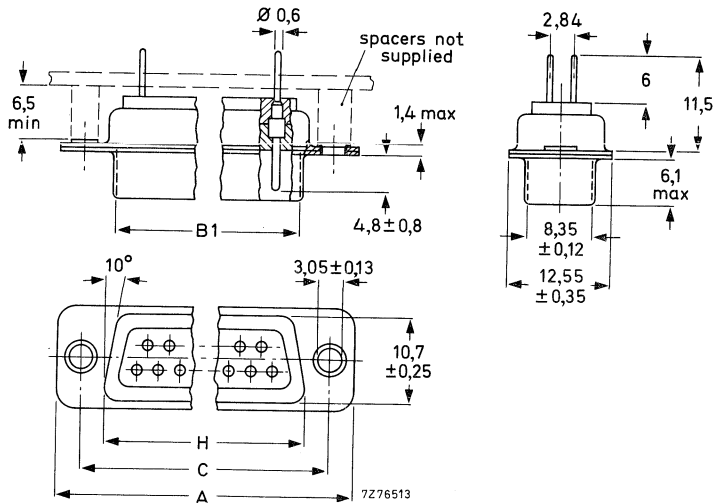


Fig. 7 Pin connector; see also Table 3.

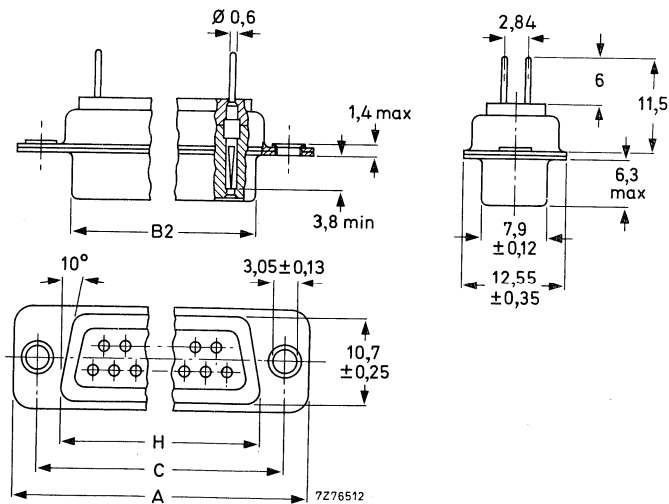


Fig. 8 Socket connector; see also Table 3.

Connectors with 50 contacts

The connectors with 50 contacts have the same dimensions as shown in the figures on the opposite page, except those shown in the figures below.

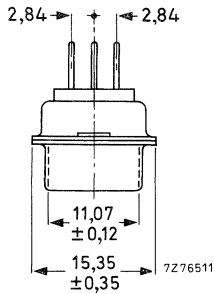


Fig. 9 Side view of pin connector.

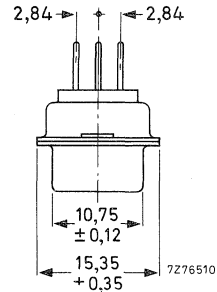


Fig. 10 Side view of socket connector.

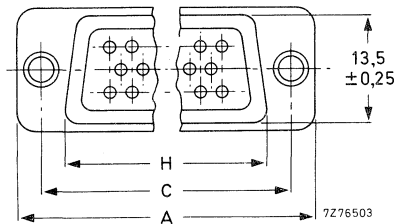


Fig. 11 Terminal side of pin (or socket) connector; see also Table 3.

Table 3

	shell size	number of contacts	dimensions in (mm)					catalogue number
			A (± 0,35)	C (± 0,12)	H (± 0,25)	B1 (± 0,15)	B2 (± 0,15)	
pin connector	1	9	30,80	25,0	19,3	16,93		2422 606 60901
	2	15	39,15	33,3	27,5	25,25		61501
	3	25	53,00	47,05	41,3	39,00		62501
	4	37	69,30	63,5	57,7	55,45		63701
	5	50	66,90	61,1	55,3	52,83		65001
socket connector	1	9	30,80	25,0	19,3		16,30	2422 606 70901
	2	15	39,15	33,3	27,5		24,65	71501
	3	25	53,00	47,05	41,3		38,35	72501
	4	37	69,30	63,5	57,7		54,80	73701
	5	50	66,90	61,1	55,3		52,40	75001

For ordering, see "How to order", page 25.

Note: See *Mechanical Data* for solder conditions.

Connectors with 90° angled dip-solder pins (see also piercing diagrams, Figs 31 to 35)

Connectors with 9, 15, 25 and 37 contacts

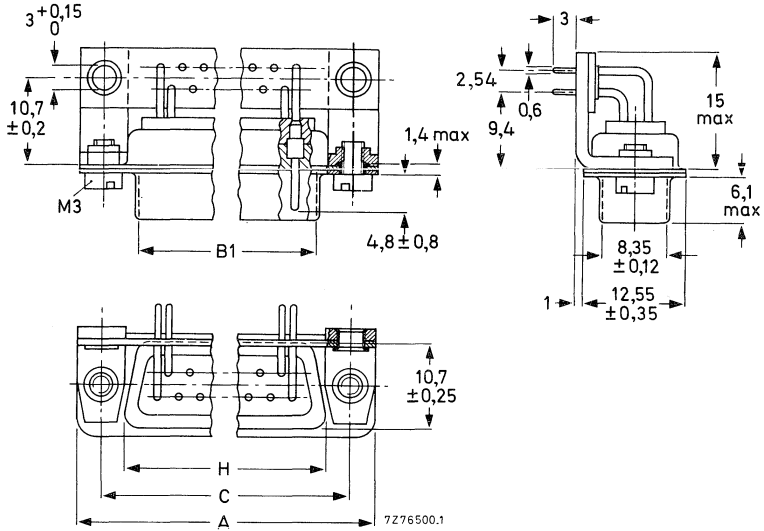


Fig. 12 Pin connector; see also Table 4.

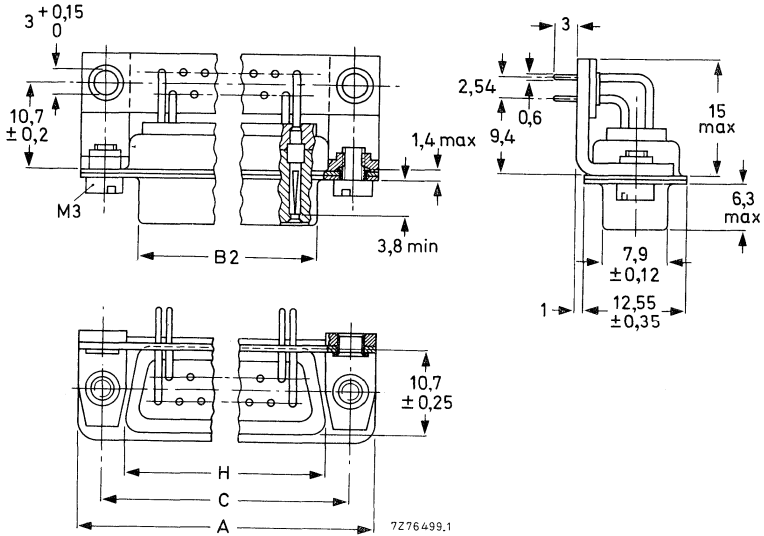


Fig. 13 Socket connector; see also Table 4.

Connectors with 50 contacts

The connectors with 50 contacts have the same dimensions as shown in the figure on the opposite page, except those shown in the figure below.

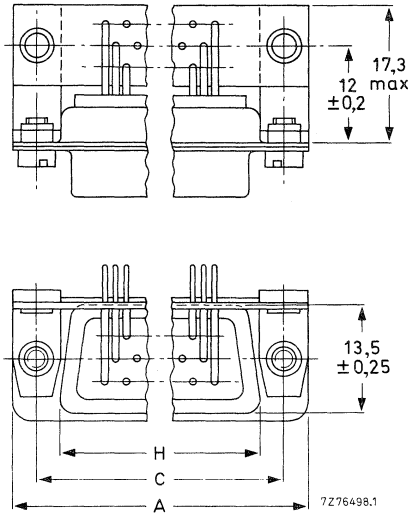


Fig. 14 Pin connector; see also Table 4.

Fig. 16 Side view of socket connector.

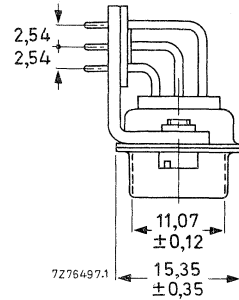


Fig. 15 Side view of pin connector.

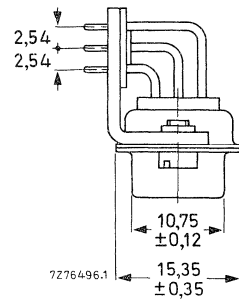


Table 4

	shell size	number of contacts	dimensions (mm)					catalogue number
			A (± 0,35)	C (± 0,12)	H (± 0,25)	B1 (± 0,15)	B2 (± 0,15)	
pin connector	1	9	30,80	25,0	19,3	16,93		2422 606 80901
	2	15	39,15	33,3	27,5	25,25		81501
	3	25	53,00	47,05	41,3	39,00		82501
	4	37	69,30	63,5	57,7	55,45		83701
	5	50	66,90	61,1	55,3	52,83		85001
socket connector	1	9	30,80	25,0	19,3		16,30	2422 606 90901
	2	15	39,15	33,3	27,5		24,65	91501
	3	25	53,00	47,05	41,3		38,35	92501
	4	37	69,30	63,5	57,7		54,80	93701
	5	50	66,90	61,1	55,3		52,40	95001

For ordering, see "How to order", page 25.

Note: These connectors are also available without mounting bracket and pin-alignment plate; catalogue numbers are identical to those in Table 4, except for the 11th digit, which is 1 instead of 0.

Connectors with 90° angled dip-solder pins, with plastic mounting bracket

These connectors are available with loose or riveted bracket. Versions with rivets are for general use and for IEC Standard-Interface Systems, e.g. with cable assemblies F501. Versions without rivets are for applications which require M3 or 4-40NC fixing screws, e.g. slide locking.

Connectors with 9, 15, 25 and 37 contacts

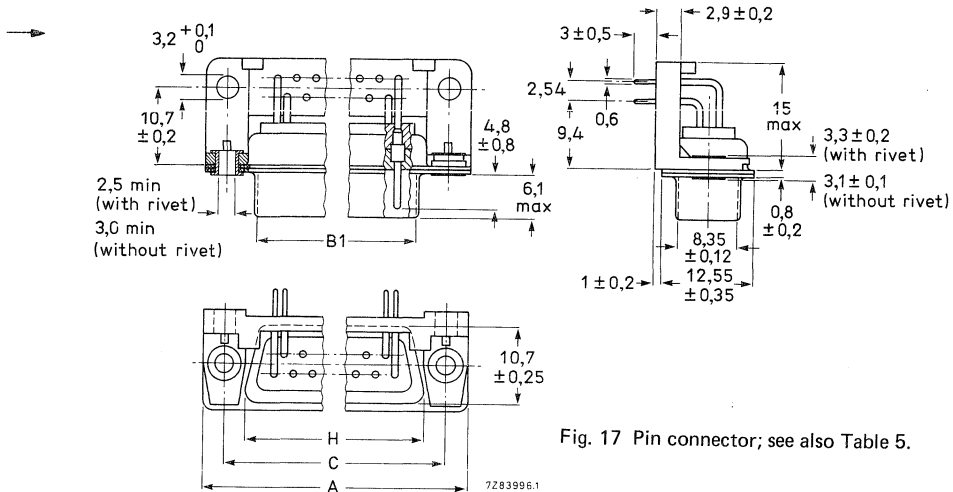


Fig. 17 Pin connector; see also Table 5.

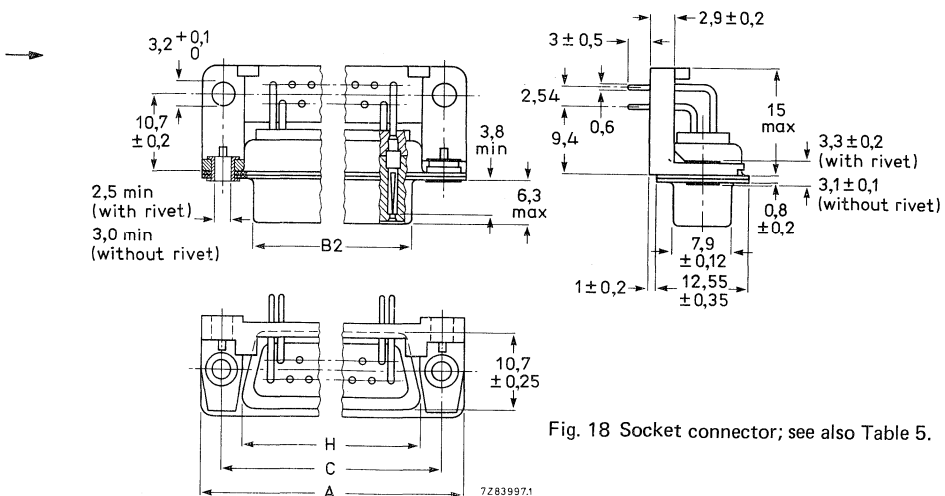


Fig. 18 Socket connector; see also Table 5.

Connectors with 50 contacts

The connectors with 50 contacts have the same dimensions as shown in the figures on the opposite page, except those shown in the figures below.

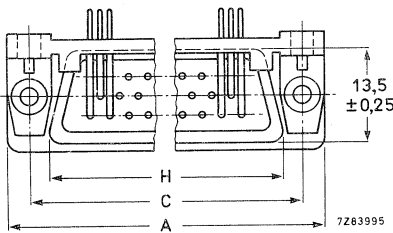
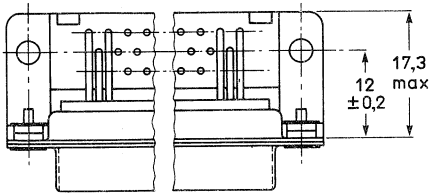


Fig. 19 Pin connector; see also Table 5.

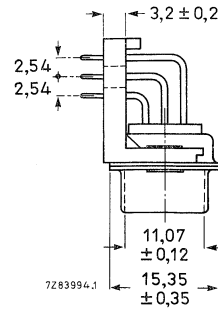


Fig. 20 Side view of pin connector.

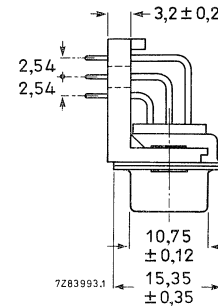


Fig. 21 Side view of socket connector.

Table 5

	shell size	number of contacts	dimensions (mm)					catalogue number 2422 606	
			A	C	H	B1	B2	with riveted bracket	with loose bracket
			(±0,35)	(±0,12)	(±0,25)	(±0,15)	(±0,15)		
pin connector	1	9	30,80	25,0	19,3	16,93		80931	80951
	2	15	39,15	33,3	27,5	25,25		81531	81551
	3	25	53,00	47,05	41,3	39,00		82531	82551
	4	37	69,30	63,5	57,7	55,45		83731	83751
	5	50	66,90	61,1	55,3	52,83		85031	85051
socket connector	1	9	30,80	25,0	19,3		16,30	90931	90951
	2	15	39,15	33,3	27,5		24,65	91531	91551
	3	25	53,00	47,05	41,3		38,35	92531	92551
	4	37	69,30	63,5	57,7		54,80	93731	93751
	5	50	66,90	61,1	55,3		52,40	95031	95051

For ordering, see "How to order", page 25.

Connectors with wire wrapping pins (accommodate AWG28 and AWG30 wire; 0,32 and 0,25 mm dia.)
 Connectors with 9, 15, 25 and 37 contacts

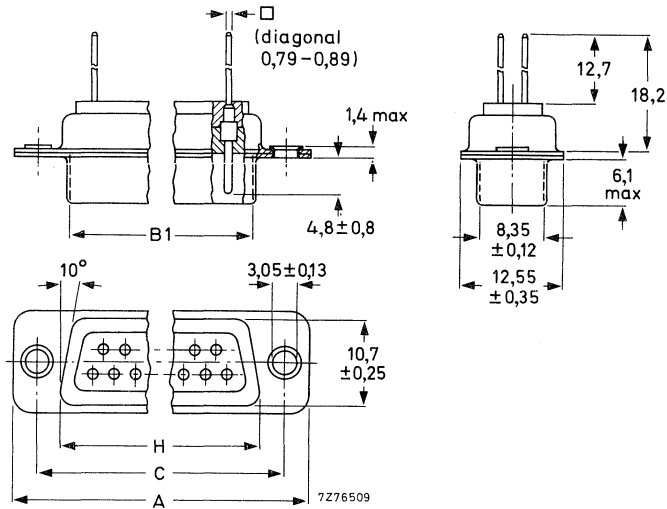


Fig. 22 Pin connector; see also Table 6.

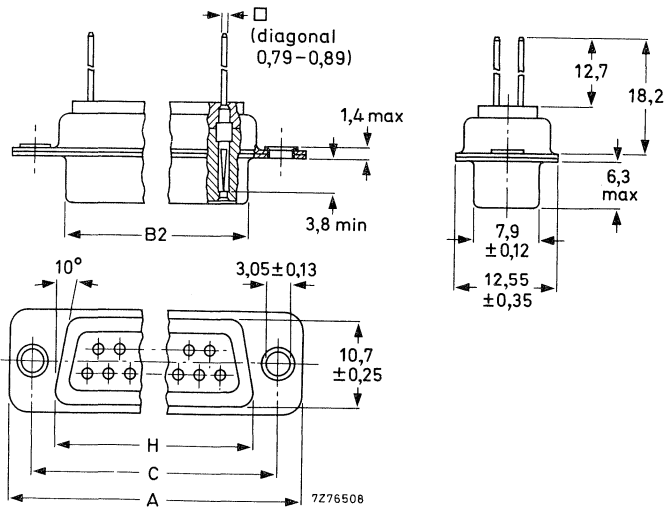


Fig. 23 Socket connector; see also Table 6.

Connectors with 50 contacts

The connectors with 50 contacts have the same dimensions as shown in the figures on the opposite page, except those shown in the figures below.

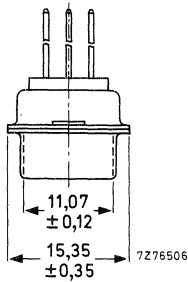


Fig. 24 Side view of pin connector.

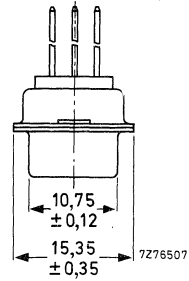


Fig. 25 Side view of socket connector.

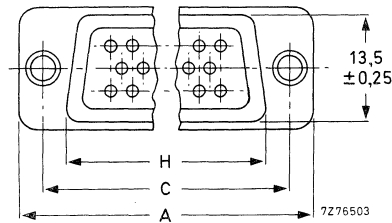


Fig. 26 Terminal side of pin (or socket) connector; see also Table 6.

Table 6

	shell size	number of contacts	dimensions (mm)					catalogue number
			A (± 0,35)	C (± 0,12)	H (± 0,25)	B1 (± 0,15)	B2 (± 0,15)	
pin connector	1	9	30,80	25,0	19,3	16,93		2422 606 40901
	2	15	39,15	33,3	27,5	25,25		41501
	3	25	53,00	47,05	41,3	39,00		42501
	4	37	69,30	63,5	57,7	55,45		43701
	5	50	66,90	61,1	55,3	52,83		45001
socket connector	1	9	30,80	25,0	19,3		16,30	2422 606 50901
	2	15	39,15	33,3	27,5		24,65	51501
	3	25	53,00	47,05	41,3		38,35	52501
	4	37	69,30	63,5	57,7		54,80	53701
	5	50	66,90	61,1	55,3		52,40	55001

For ordering, see "How to order", page 25.

Connectors for crimp-on snap-in connections (accommodate AWG20 to AWG24 wire; 0,6 to 0,23 mm²). These connectors are supplied without contacts; loose crimp contact pins and sockets are available.

Connectors for 9, 15, 25 and 37 contacts

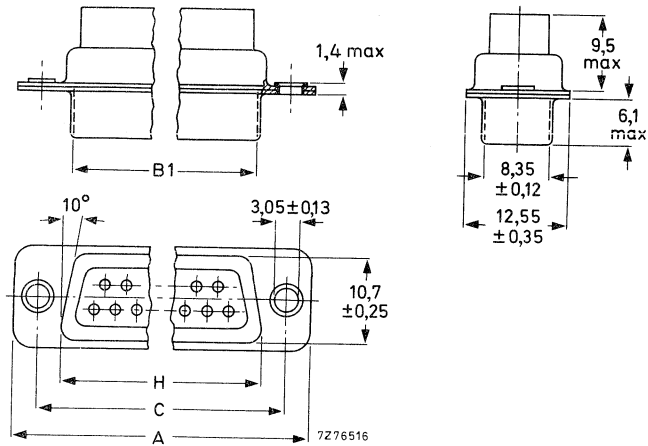


Fig. 27 Pin connector; see also Table 7.

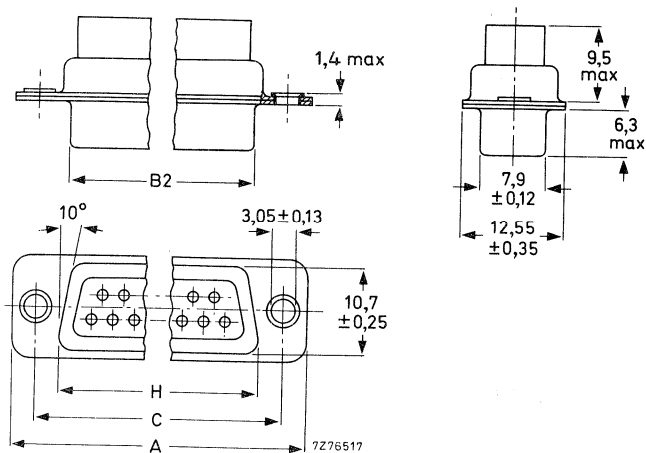


Fig. 28 Socket connector; see also Table 7.

Connectors for 50 contacts

The connectors for 50 contacts have the same dimensions as shown in the figures on the opposite page, except those shown in the figures below.

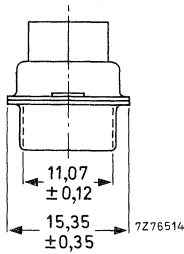


Fig. 29 Side view of pin connector

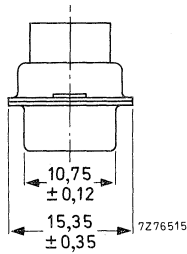


Fig. 30 Side view of socket connector.

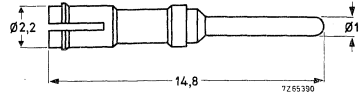


Fig. 32 Crimp contact pin.

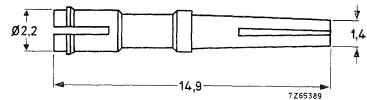


Fig. 33 Crimp contact socket.

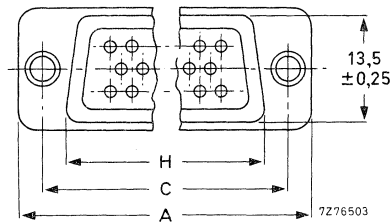


Fig. 31 Terminal side of pin (or socket) connector; see also Table 7.

Table 7

	shell size	number of contacts	dimensions (mm)					catalogue number
			A (± 0,35)	C (± 0,12)	H (± 0,25)	B1 (± 0,15)	B2 (± 0,15)	
pin connector	1	9	30,80	25,0	19,3	16,93		4332 026 22400
	2	15	39,15	33,3	27,5	25,25		22420
	3	25	53,00	47,05	41,3	39,00		22440
	4	37	69,30	63,5	57,7	55,45		22460
	5	50	66,90	61,1	55,3	52,83		22480
socket connector	1	9	30,80	25,0	19,3		16,30	4332 026 22410
	2	15	39,15	33,3	27,5		24,65	22430
	3	25	53,00	47,05	41,3		38,35	22450
	4	37	69,30	63,5	57,7		54,80	22470
	5	50	66,90	61,1	55,3		52,40	22490

Catalogue number of crimp contact pin 4332 026 19690.

Catalogue number of crimp contact socket 4332 026 19700.

For ordering, see "How to order", page 25.

MOUNTING

Panel cut-outs for all versions

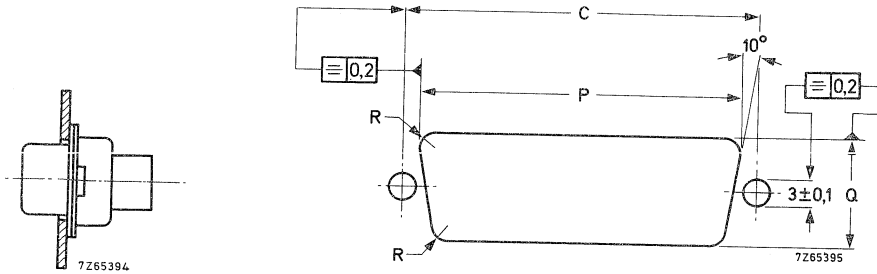


Fig. 34 Rear flange mounting.

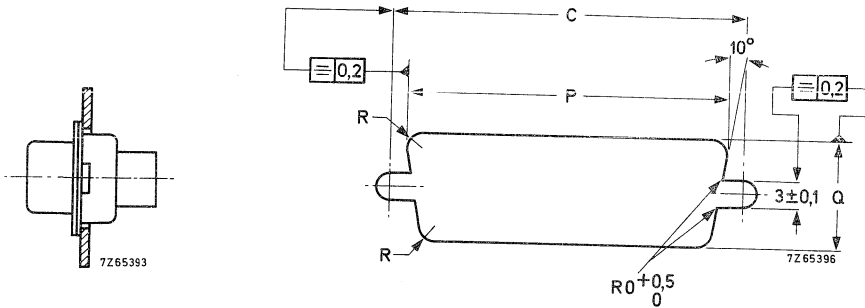


Fig. 35 Front flange mounting.

Table 8

mounting method	shell size	number of contacts	C ± 0,2	P ± 0,2	Q ± 0,2	R ± 0,2
rear flange mounting	1	9	25,0	20,5	11,4	3,4
	2	15	33,3	28,8	11,4	3,4
	3	25	47,0	42,5	11,4	3,4
	4	37	63,5	59,1	11,4	3,4
	5	50	61,1	56,3	14,1	3,4
front flange mounting	1	9	25,0	22,2	12,3	2,1
	2	15	33,3	30,5	12,3	2,1
	3	25	47,0	44,3	12,3	2,1
	4	37	63,5	60,7	12,3	2,1
	5	50	61,1	58,3	15,3	2,1

Crimping and mounting of contacts for crimp connections

Mounting tools

Contact insertion tool (white), see Fig. 41: catalogue number 4332 026 22500.

Contact extraction tool (red), see Fig. 42: catalogue number 4332 026 22510.

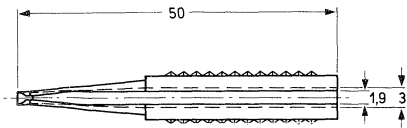


Fig. 41 Insertion tool (white).

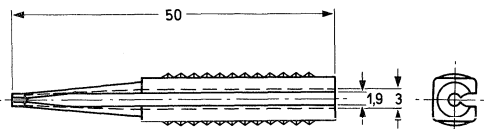


Fig. 42 Extraction tool (red).

Wire stripping

Cut the wires to the required length and strip a part of the insulation from the end to be crimped, as shown in Figs 43 and 44, depending on the diameter of the wire.

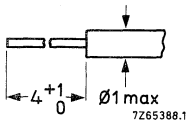


Fig. 43 Wire diameter max. 1 mm.

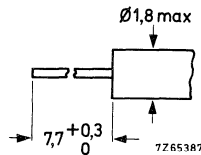


Fig. 44 Wire diameter greater than 1 mm (max. 1,8 mm).

Contact crimping

Fit the positioner into the crimping tool and insert the contact pin or the contact socket. Push the stripped end of the wire as far as possible into the back of the pin or socket and crimp the contact to the wire. (For cables with a diameter greater than 1 mm, the insulation remains outside the contact end.)

Contact insertion

Push the pin or socket by hand from the rear into the requisite hole in the insulating block until it fits. For wires with AWG24 (0,23 mm²) use the white insertion tool shown in Fig. 41: place the pin or socket in the groove of the tool and insert the pin or socket into the hole of the insulating block until it fits.

Contact extraction (rear release system)

Place the wire into the groove of the red extraction tool (Fig. 42). Push the tool from the rear into the hole of the insulating block until it touches the ledge (contact is unlocked). Release the tool and pull on the wire (contact is free).

Contact crimping tools

Crimping of contacts can be effected with the hand crimping tool MS 3198-1, and associated parts, as listed below.

Hand crimping tool, MS 3198-1

catalogue number 2622 540 10004

Positioner to hand crimping tool, MS 3198-5P

catalogue number 2622 540 10907

Hand crimping tool MS 3198-1,
including positioner MS 3198-5P

catalogue number 2622 540 09151

Gauge pins for adjustment and control of
crimp depth

for AWG20 (0,6 mm²)

catalogue number 4332 026 26930

for AWG22 (0,36 mm²)

catalogue number 4332 026 26940

for AWG24 (0,23 mm²)

catalogue number 4332 026 26950

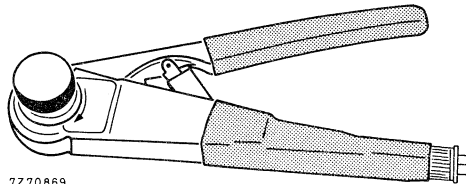


Fig. 45 Hand crimping tool.

7270869

MARKING

Package

The package is marked with: 12-digit catalogue number;
reference number of manufacturer;
number of pieces.

Connector

The terminations of the connectors are marked as shown in Table 9.

Table 9

shell size	number of contacts	pin connector	socket connector
1	9		
2	15		
3	25		
4	37		
5	50		

7275243

ACCESSORIES

Cable hoods

Hoods of thermoplastic material for cable mounting can be supplied in two versions: straight and 90° angled. A cable clamp and two screws are supplied with each hood. Also supplied are two screws to secure the hood to the connector.

Table 10

version	shell size	number of contacts	dimensions (mm)					catalogue number
			1	w	d	p	q	
straight (Fig. 46)	1	9	28	31	12,7	7,5	8	4332 026 23690
	2	15	29	39,2	12,7	8,6	9	23740
	3	25	34	53	12,7	14	9	23790
	4	37	40	69,5	12,7	20	9	23840
	5	50	40	67	15,5	20	12	23890
90° angled (Fig. 47)	1	9	28	39	12,7	7,5	8	4332 026 23710
	2	15	29	47,2	12,7	8,6	9	23760
	3	25	34	61	12,7	14	9	23810
	4	37	40	77,5	12,7	20	9	23860
	5	50	40	75	15,5	20	12	23910

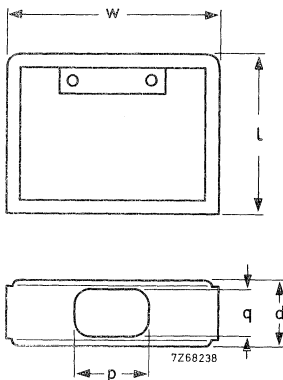


Fig. 46 Straight cable hood.

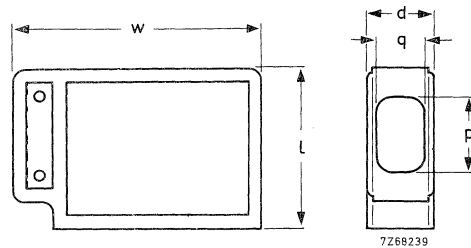


Fig. 47 90° angled cable hood.

Locking devices

Locking clips and handles of thermoplastic material are available for locking pin connectors to socket connectors (see Fig. 48).

Use must be made of:

- 2 x handle 4332 026 24350 and
- 2 x clip 4332 026 24070.

For locking a 90° angled cable hood use must be made of:

- 1 x handle 4332 026 24350
- 1 x handle (90° angled) 4332 026 24360 and
- 2 x clip 4332 026 24070.

The locking devices are secured with the fixing screws of the hoods.

If locking devices are used without the cable hoods shown in Figs 46 and 47, they can be secured with ordinary screws and nuts.

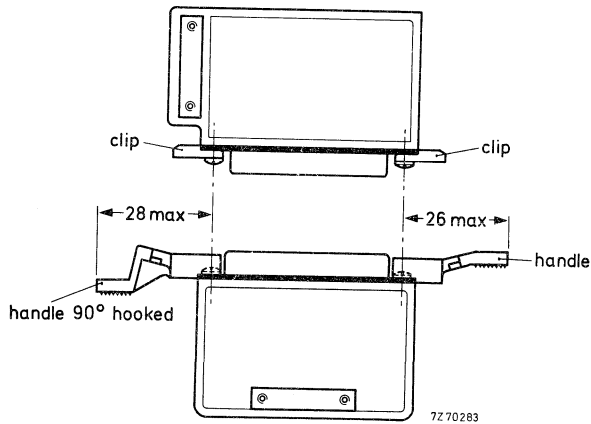


Fig. 48.

PACKING**Connectors**

The connectors are packed in boxes. The smallest packing quantity is given in Table 11.

Table 11

shell size	smallest packing quantity	
	type with 90° angled pins	other types
1	170	170
2	130	140
3	90	100
4	70	70
5	35	80

Cable hoods

The cable hoods are packed in plastic bags. The smallest packing quantity is 5 hoods and associated clamps and screws.

Locking devices

The locking devices are packed in plastic bags. The smallest packing quantity is 50 for handles, and 100 for clips.

HOW TO ORDER

Order the connectors and accessories by quoting the 12-digit catalogue numbers as shown in the tables. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity (see above); please order in multiples of this quantity.

Example

200 pin and socket connectors with solder cups, 25 contacts, with straight cable hoods, and locking clips and handles, should be ordered as:

200 x 2422 606 22501,
 200 x 2422 606 32501,
 400 x 4332 026 23790,
 400 x 4332 026 24350,
 400 x 4332 026 24070.

SUBMINIATURE RACK AND PANEL CONNECTORS

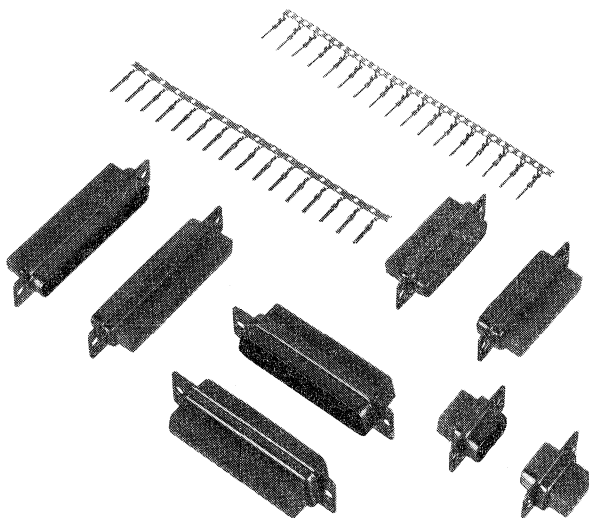
for stamped crimp-on snap-in contacts

- Accommodate AWG20 to AWG30 wire
- Contact pins and sockets supplied on reels

QUICK REFERENCE DATA

Number of contacts	9, 15, 25, 37 and 50
Terminations	crimp-on snap-in
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	7,5 A
Mechanical endurance	500 insertions
Climatic category (IEC 68)	55/125/10
Dimensions	according to MIL-C-24308

800502-02-01



APPLICATION

For rack and panel connection in industrial, telecommunication and data processing equipment.

DESCRIPTION

→ The connectors consist of a glass-fibre-filled thermoplastic insulating block, mounted in a shell of passivated, zinc-plated steel. The insulating block contains a number of holes allowing crimpable pins and sockets to be loaded into the block.

The contact pins and sockets are made of copper alloy and are gold plated on a nickel layer. They are supplied on band on reels. The contacts are crimped with insulation support by means of special tools.

The connectors meet the dimensional requirements of MIL-C-24308.

ELECTRICAL DATA

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	7,5 A
Contact resistance (including material resistance) at 10 mA, max. 20 mV(peak) open circuit voltage, 1 kHz, measured outside the body	
initially	$\leq 10\text{ m}\Omega$
after tests	$\leq 15\text{ m}\Omega$
Insulation resistance	
initially	$> 10^5\text{ M}\Omega$
after tests	$> 10^2\text{ M}\Omega$
Creepage distance	
between contacts	$\geq 0,6\text{ mm}$
between a contact and earth	$\geq 1\text{ mm}$
Clearance distance	
between contacts	$\geq 0,6\text{ mm}$
between a contact and earth	$\geq 1\text{ mm}$
Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$	
between contacts	1000 V (r.m.s.), 50 Hz
between a contact and earth	1000 V (r.m.s.), 50 Hz

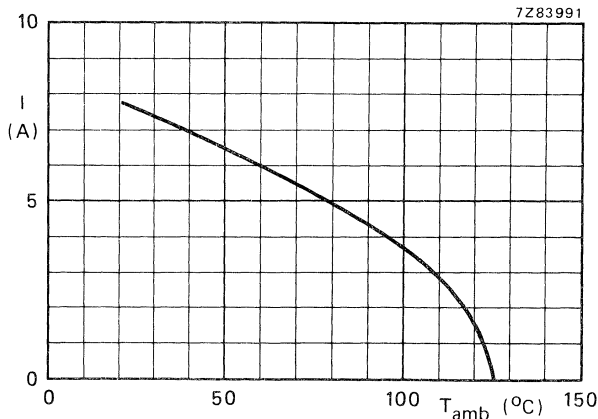


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Number of contacts	9, 15, 25, 37, 50
Positioning	trapezoidal shaped shell prevents incorrect insertion
Insertion force	see Table 1
Withdrawal force	see Table 1
Mechanical endurance	500 insertions; according to IEC 512, test 9a
Connector body material	glass-fibre-filled thermoplastic
Contacts	stamped
material	copper alloy
shape	formed pins and sockets with a two-fold spring facility
finish	gold plate on nickel plate
type of termination	crimp-on snap-in
finish of termination	gold flash on nickel plate
Contact retention in insert	≥ 20 N
Mass	see Table 1
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 1,50 mm (p-p) or 20g, 3 directions, 2 h per direction

Table 1

shell size	number of contacts	insertion force (N)	withdrawal force (N)	approx. mass (without contacts)	
				pin connector	socket connector
1	9	≤ 30	≤ 20	3,5	3,4
2	15	≤ 50	≤ 33	5,5	5,7
3	25	≤ 83	≤ 56	9,1	9,5
4	37	≤ 123	≤ 82	13,5	14,2
5	50	≤ 167	≤ 111	18,0	19,0

ENVIRONMENTAL DATA

Climatic category (IEC 68)	55/125/10
Ambient temperature	-55 to + 125 °C
Damp heat, steady state	according to IEC 512, test 11c, 10 days, 40 °C, R.H. 90 to 95%

DIMENSIONAL DATA

Dimensions in mm

The connectors are suited for crimp-on snap-in connections, accomodating AWG20 to AWG30 wire (0,05 to 0,5 mm²).

The connectors are supplied without contacts; crimp contact pins and sockets on band on reels are available.

Connectors for 9, 15, 25 and 37 contacts

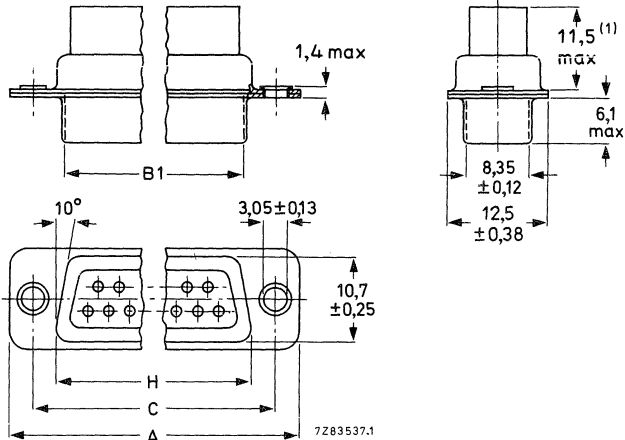


Fig. 2 Pin connector; see also Table 2.

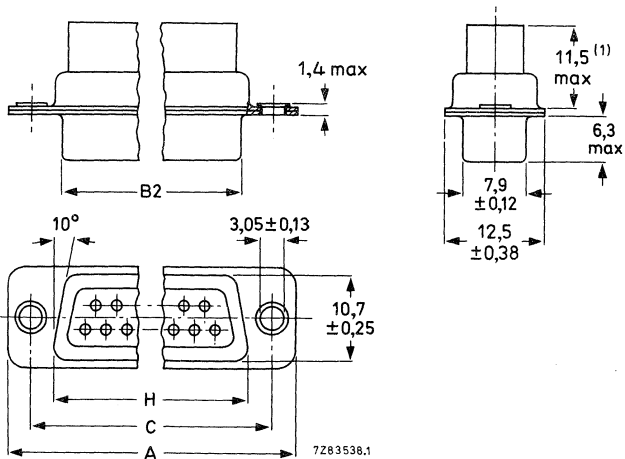


Fig. 3 Socket connector; see also Table 2.

(1) Different from MIL-C-24308.

Subminiature rack and panel connectors

Connectors for 50 contacts

The connectors for 50 contacts have the same dimensions as shown in the figures on the preceding page, except those shown in the figures below.

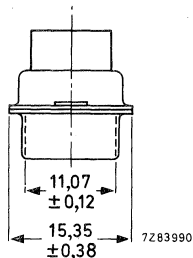


Fig. 4 Side view of pin connector.

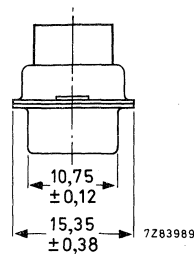


Fig. 5 Side view of socket connector.

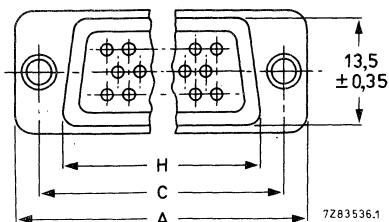


Fig. 6 Terminal side of pin (or socket) connector; see also Table 2.

Table 2

	shell size	number of contacts	dimensions (mm)					catalogue number
			A (± 0,38)	C (± 0,12)	H (± 0,25)	B1 +0,25 -0,15	B2 +0,15 -0,25	
pin connector	1	9	30,80	25,0	19,3	16,93		2422 606 00901
	2	15	39,15	33,3	27,5	25,25		01501
	3	25	53,00	47,05	41,3	39,00		02501
	4	37	69,30	63,5	57,7	55,45		03701
	5	50	66,90	61,1	55,3	52,83		05001
socket connector	1	9	30,80	25,0	19,3		16,30	2422 606 10901
	2	15	39,15	33,3	27,5		24,65	11501
	3	25	53,00	47,05	41,3		38,35	12501
	4	37	69,30	63,5	57,7		54,80	13701
	5	50	66,90	61,1	55,3		52,40	15001

The smallest packing quantity is 50.

For ordering, see "How to order", page 35.

Crimp contact pins and sockets

→ The contact pins and sockets are supplied on reels of 10 000 ± 25 pieces; reels with 300 pieces (smallest packing quantity) are also available, see Table 3.

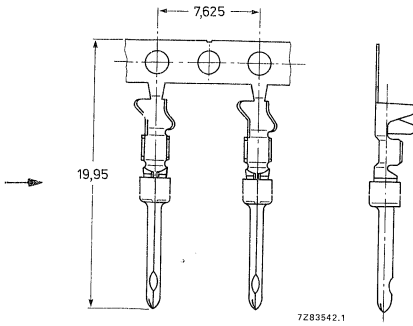


Fig. 7 Crimp contact pins for AWG20 to AWG26 wires, on band.

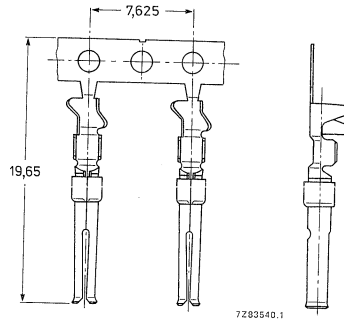


Fig. 8 Crimp contact sockets for AWG20 to AWG26 wires, on band.

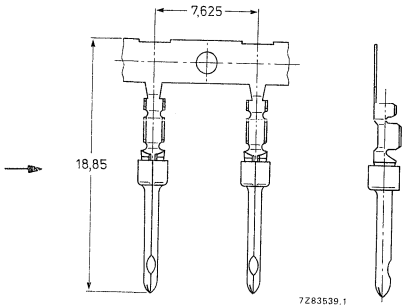


Fig. 9 Crimp contact pins for AWG28 to AWG30 wires, on band.

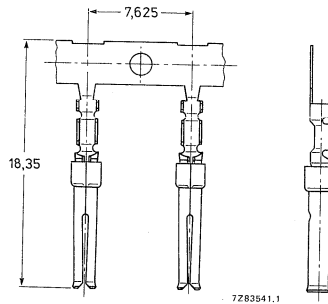


Fig. 10 Crimp contact sockets for AWG28 to AWG30 wires, on band.

Table 3

	catalogue number	
	reel with 10 000 pieces	reel with 300 pieces
pins for AWG20 to AWG26 wires	2422 606 00111	2422 606 00211
socket for AWG20 to AWG26 wires	2422 606 10111	2422 606 10211
pins for AWG28 to AWG30 wires	2422 606 00101	2422 606 00201
sockets for AWG28 to AWG30 wires	2422 606 10101	2422 606 10201

→ For ordering, see "How to order", page 35.

MOUNTING

Panel cut-outs

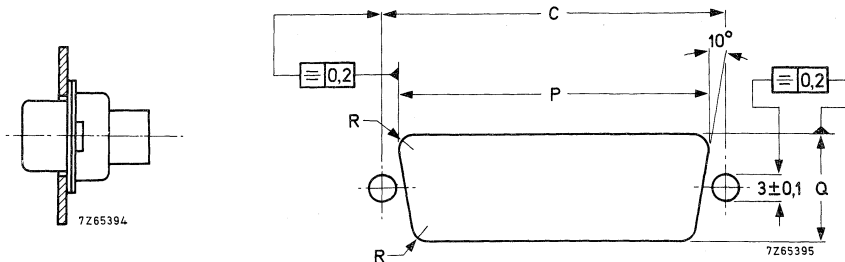


Fig. 11 Rear flange mounting.

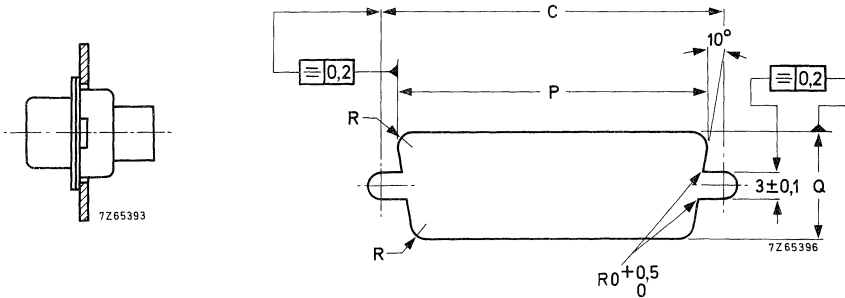


Fig. 12 Front flange mounting.

Table 4

mounting method	shell size	number of contacts	C ± 0,2	P ± 0,2	Q ± 0,2	R ± 0,2
rear flange mounting	1	9	25,0	20,5	11,4	3,4
	2	15	33,3	28,8	11,4	3,4
	3	25	47,0	42,5	11,4	3,4
	4	37	63,5	59,1	11,4	3,4
	5	50	61,1	56,3	14,1	3,4
front flange mounting	1	9	25,0	22,2	12,3	2,1
	2	15	33,3	30,5	12,3	2,1
	3	25	47,0	44,3	12,3	2,1
	4	37	63,5	60,7	12,3	2,1
	5	50	61,1	58,3	15,3	2,1

Crimping and mounting of contacts

For semi-automatic crimping an electric stripping/crimping machine can be supplied (Fig. 13). This machine strips the insulation over the required length, crimps the contacts and cuts the crimped contacts from the band; contact feed is automatic.

The main characteristics of the machine are:

supply voltage	220 to 240 V
power consumption	370 W
wire to be crimped	see Table 5
crimping speed	approx. 2000 crimps/h
mass	approx. 60 kg
catalogue number	2422 606 96101

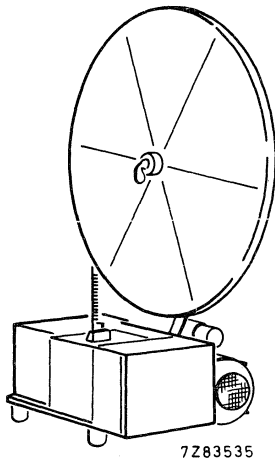


Fig. 13.

Table 5

wire to be crimped	wire gauge	conductor cross-section mm ²	wire diameter (including insulation) mm
stranded or solid wire	AWG20	0,50	0,5 to 1,6
	AWG22	0,35	
	AWG24	0,22	
	AWG26	0,14	
	AWG28	0,08	
	AWG30	0,05	

The tool shown in Fig. 14 is available for hand crimping.

800502-02-08

Catalogue number of case with hand crimping tool:

2422 606 96131, for AWG20 to AWG26 wires,

2422 606 96132, for AWG28 to AWG30 wires.

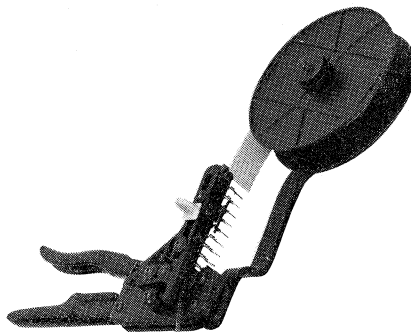


Fig. 14.

For hand crimping cut the wires to the required length and strip 2 + 1 mm of the insulation from the end to be crimped. Use stranded or solid wire as given in Table 5. Crimp the contact pins and sockets to the wires with the aid of the crimping tool. Snap the contacts with the crimped wire into the holes of the insulation block.

Use can be made of insertion and extraction tools (Fig. 15).

Catalogue number of insertion tool: 2422 606 96141, for AWG20 to AWG30 wires.

Catalogue number of extraction tool: 2422 606 96142, for AWG28 to AWG30 wires;

2422 606 96143, for AWG24 to AWG26 wires;

2422 606 96144, for AWG20 to AWG22 wires;

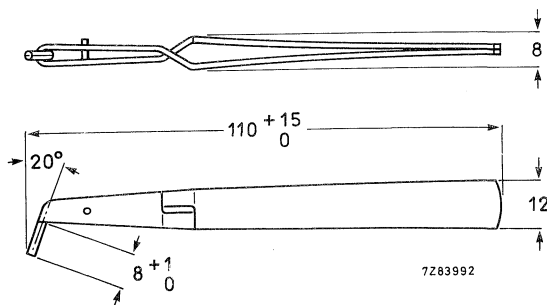


Fig. 15.

HOW TO ORDER

Order the connectors and crimp contact pins and sockets by quoting the 12-digit catalogue number as shown in Tables 2 and 3. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

Example: 200 pin and socket connectors, with 50 contacts, and contact pins and sockets for AWG28 to AWG30 wires, should be ordered as:

200 x 2422 606 05001,

200 x 2422 606 15001,

10 000 x 2422 606 00101,

10 000 x 2422 606 10101.

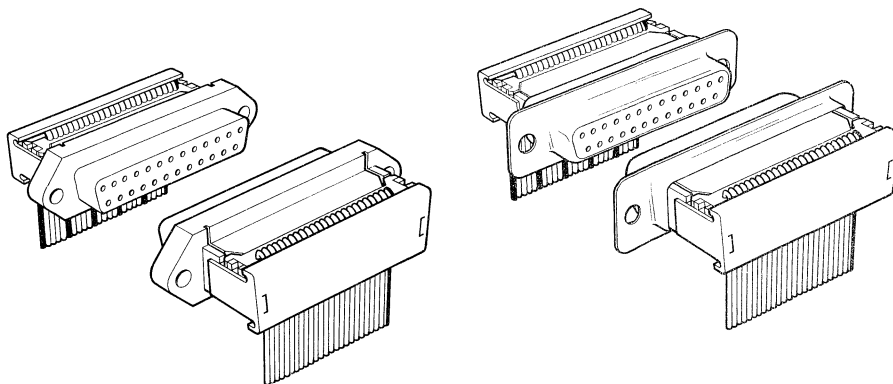
SUBMINIATURE RACK AND PANEL CONNECTORS

IDC type

- Connectors with insulation displacement terminations
- For ribbon cables with solid AWG30/1 or stranded wires AWG28/7
- Mate with standard D connector range

QUICK REFERENCE DATA

Number of contacts	9, 15, 25, 37
Terminations	insulation displacement
Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Mechanical endurance	100 insertions
Climatic category (IEC 68)	55/105/04
Dimensions	according to MIL-C-24308



APPLICATION

For rack and panel connection in industrial, telecommunication and data processing equipment.

DESCRIPTION

These IDC rack and panel connectors are available in two versions: an all plastic version (grey glass-fibre-filled polyester), and a version which consists of a grey glass-fibre-filled polyester insulating block, mounted in a shell of yellow chromate, zinc-plated steel. The connectors contain a number of pins and sockets, which are made of beryllium copper and are gold plated on a nickel layer. The pin and socket terminations are for insulation displacement. The connectors have a pre-mounted pressure block in which the ribbon cable has to be inserted. During the insulation displacement the pressure block is firmly pressed and locked to the connector. For appropriate assembling tools, see data sheet "Insulation Displacement Tools". Ribbon cables with solid AWG30/1 or stranded wires AWG28/7, can be used, see data sheet "Ribbon Cables F303".

The connectors meet the dimensional requirements of MIL-C-24306. They mate with standard D connectors.

Strain reliefs are available for relieving stress on the terminations of the connector.

ELECTRICAL DATA

Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz	
initially	$\leq 10\text{ m}\Omega$
after tests	$\leq 15\text{ m}\Omega$
Insulation resistance	
initially	$> 2 \times 10^6\text{ M}\Omega$
after tests	$> 2 \times 10^6\text{ M}\Omega$
Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$	
between contacts	1000 V (r.m.s.) 50 Hz
between a contact and earth	1000 V (r.m.s.) 50 Hz

MECHANICAL DATA

Number of contacts	9, 15, 25, 37
Positioning	trapezoidal shape prevents incorrect insertion
Insertion and withdrawal forces	see Table 1
Mechanical endurance	100 insertions; according to IEC 512, test 9a
Connector body material	glass-fibre-filled thermoplastic polyester
Contacts	
material	beryllium copper
shape	round pins and cylindrical sockets with a two-fold spring facility
finish	gold on nickel plate
type of termination	insulation displacement
Wire size	AWG28/7 (0,08 mm ²) or AWG30/1 (0,05 mm ²)
Shock	according to IEC 512, test 6c, 50g, 6 ms
Vibration	according to IEC 512, test 6d, 10-2000 Hz, 1,5 mm (p-p) or 10g, 3 directions, 2h per direction

Table 1

shell size	number of contacts	insertion and withdrawal forces (N)
1	9	≤ 45
2	15	≤ 75
3	25	≤ 125
4	37	≤ 175

ENVIRONMENTAL DATA

Climatic category (IEC 68)	55/105/04
Ambient temperature range	-55 to + 105 °C
Damp heat, steady state	according to IEC 512, test 11c, 4 days, 40 °C, R.H. 90 to 95%
Dry heat	according to IEC 512, test 11i, 250h, 85 °C
Salt mist	according to IEC 512, test 11f, 48h
Flammability	according to UL94, category V-0

DIMENSIONAL DATA

Dimensions in mm

Metal shell version

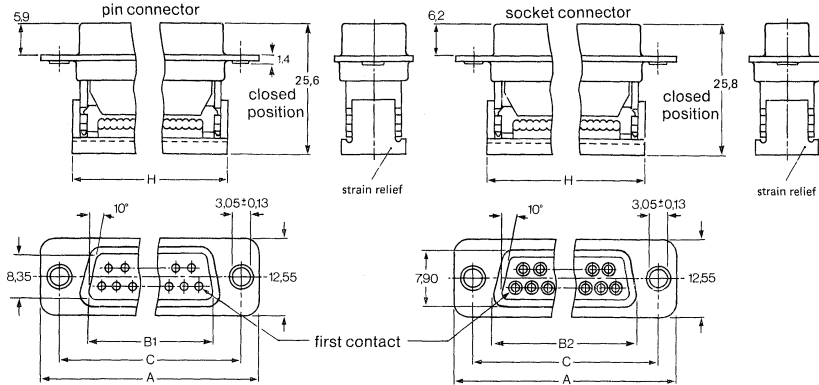


Fig. 1 Pin and socket connector, version with metal shell. See Table 2 for dimensions A, B1, B2, C and H.

Table 2

	number of contacts	dimensions (mm)					catalogue number
		A	C	H	B1	B2	
pin connector	9	30,80	25,00	19,70	16,93		2422 606 29601
	15	39,15	33,30	28,00	25,25		29602
	25	53,00	47,05	41,70	39,00		29603 ▲
	37	69,30	63,50	58,20	55,45		29604
socket connector	9	30,80	25,00	19,70		16,30	2422 606 29611
	15	39,15	33,30	28,00		24,65	29612
	25	53,00	47,05	41,70		38,35	29613 ▲
	37	69,30	63,50	58,20		54,80	29614

The smallest packing quantity is 100.

Notes: Strain reliefs are supplied separately; see paragraph "ACCESSORIES".

For ribbon cables, see data sheet "Ribbon Cables F303".

For assembling tools, see data sheet "Insulation Displacement Tools".

For ordering, see "How to order", page 6.

▲ Preferred.

All-plastic version

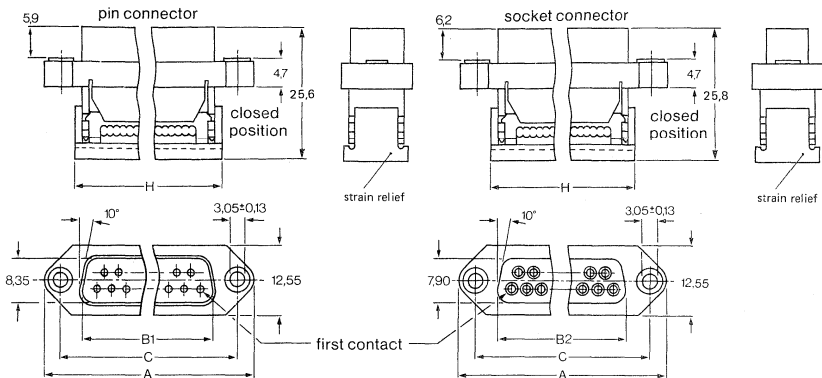


Fig. 2 Pin and socket connector, all plastic version. See Table 3 for dimensions A, B1, B2, C and H.

Table 3

	number of contacts	dimensions (mm)					catalogue number
		A	C	H	B1	B2	
pin connector	9	30,80	25,00	19,70	16,93		2422 606 29501
	15	39,15	33,30	28,00	25,25		29502
	25	53,00	47,05	41,70	39,00		29503 ▲
	37	69,30	63,50	58,20	55,45		29504 ▲
socket connector	9	30,80	25,00	19,70		16,30	2422 606 29511
	15	39,15	33,30	28,00		24,65	29512
	25	53,00	47,05	41,70		38,35	29513 ▲
	37	69,30	63,50	58,20		54,80	29514 ▲

The smallest packing quantity is 100.

Notes: Strain reliefs are supplied separately; see paragraph "ACCESSORIES".

For ribbon cables, see data sheet "Ribbon Cables F303".

For assembling tools, see data sheet "Insulation Displacement Tools".

For ordering, see "How to order", page 6.

▲ Preferred.

ACCESSORIES

Strain reliefs

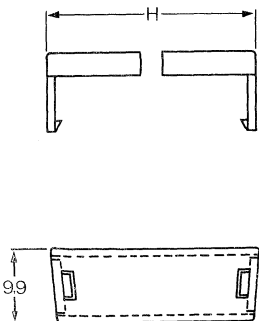


Fig. 3 Strain relief; see Table 4 for dimension H.

Table 4

number of connector contacts	H mm	catalogue number	smallest packing quantity
9	19,70	2422 606 29701	50
15	28,00	29702	50
25	41,70	29703 ▲	50
37	58,20	29704 ▲	50

HOW TO ORDER

Order the connectors and strain reliefs by quoting the 12-digit catalogue number as shown in Tables 2, 3 and 4. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

Example: The minimum quantity of pin and socket connectors, metal shell version, with 25 contacts, with strain relief, should be ordered as:

100 x 2422 606 29603,

100 x 2422 606 29613,

100 x 2422 606 29703.

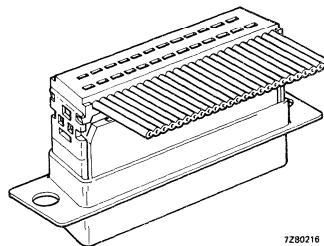
MOUNTING

Cable/connector assembling

The unstripped ribbon cable has to be inserted into the corrugated slot in the pre-mounted pressure block (Fig. 4).

The pressure block is then pushed downwards to the connector by the assembling tool.

After pressing, the two parts of the connector remain firmly locked together.



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Fig. 4.

▲ Preferred.

The ribbon cable is then folded over the connector (Fig. 5).

To complete the assembling procedure the strain relief is snapped over the ends of the connector (Fig. 6).

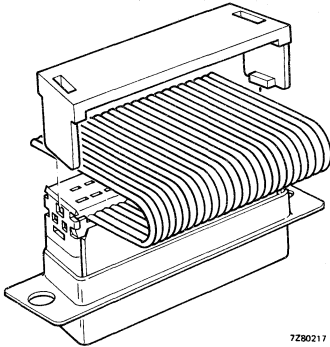


Fig. 5.

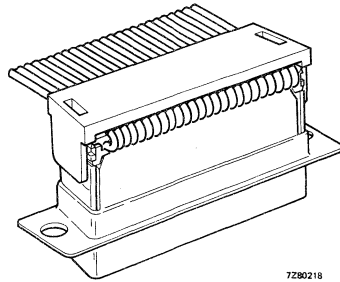


Fig. 6.

Panel cut-outs for both versions

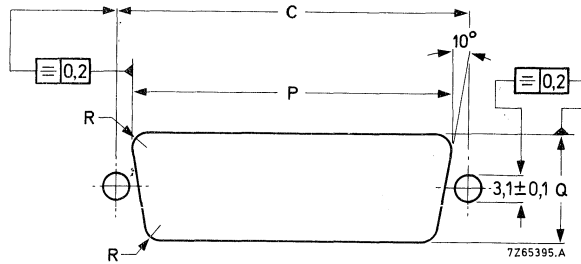


Fig. 7 Rear mounting; see Table 5 for dimensions C, P, Q and R.

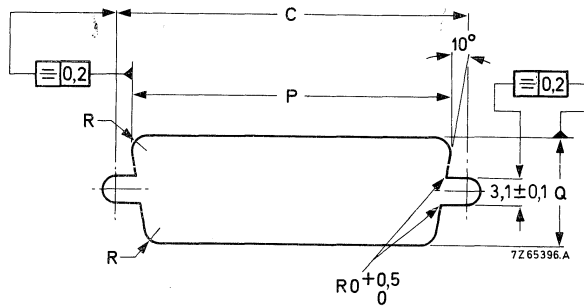


Fig. 8 Front mounting; see Table 5 for dimensions C, P, Q and R.

Table 5

mounting method	number of contacts	C ± 0,2	P ± 0,2	Q ± 0,2	R ± 0,2
rear flange mounting	9	25,0	20,5	11,4	3,4
	15	33,3	28,8	11,4	3,4
	25	47,0	42,5	11,4	3,4
	37	63,5	59,1	11,4	3,4
front flange mounting	9	25,0	22,2	13,1	2,1
	15	33,3	30,5	13,1	2,1
	25	47,0	44,3	13,1	2,1
	37	63,5	60,7	13,1	2,1

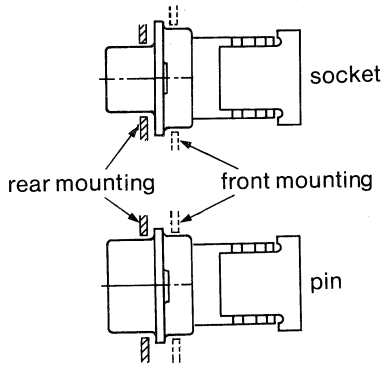


Fig. 9 Mounting of metal-shell version.

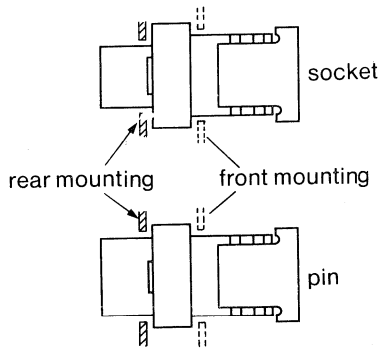


Fig. 10 Mounting of all-plastic version.

MARKING

Package

The package is marked with: 12-digit catalogue number;
reference number of manufacturer;
number of pieces.

Connector

The mating side of the connectors are marked as shown in Table 6.
Contact 1 is marked ▲ at the cable side.

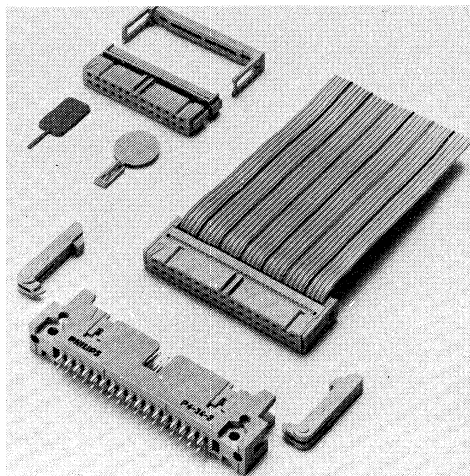
Table 6

shell size	number of contacts	pin connector	socket connector
1	9		
2	15		
3	25		
4	37		

7Z75243.A

RIBBON CABLE CONNECTOR SYSTEM

- For flat ribbon cables, AWG28/1, AWG28/7, AWG30/1
- Cable connectors with insulation displacement contacts; pre-mounted pressure block provides short assembling time



820902-01-02

The F303 ribbon cable connector system provides an efficient and reliable means of electronic circuit interconnection, where high quality and high packing density are important criteria.

The F303 system consist of:

- a series of female cable connectors with insulation displacement contacts, to be fitted to flat ribbon cables;
- a series of mating male headers with straight or 90°-angled dip-solder pins or pins for wire-wrapping, for board or chassis mounting;
- a series of accessories to be used with cable connectors and male headers, i.e. strain reliefs, clamp/ejectors, coding pegs and polarizing clips;
- a series of connectors (DIP, DIS, DIS mini, PB transition) with insulation displacement contacts. The pin configurations provide facilities for printed-board applications and IC sockets;
- a series of ribbon cables in stranded or solid-wire form, supplied on reels;
- a series of assembling tools for terminating the connectors to ribbon cables.

See the survey on the next page.

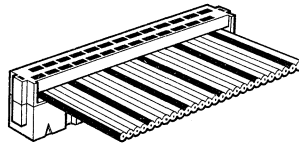
Detailed information is given in the separate F303 data sheets on:

- cable connectors and male headers;
- DIP (dual in-line pluggable) connectors;
- DIS (dual in-line solderable) connectors;
- DIS (dual in-line solderable) mini connectors;
- PB (printed board) transition connectors;
- ribbon cables;
- insulation displacement tools.

SURVEY

page

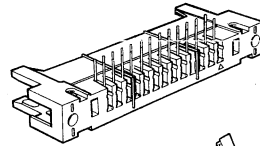
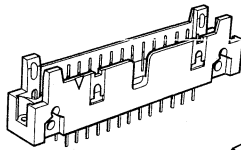
Cable connectors



10

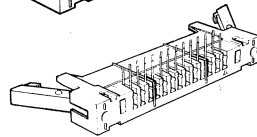
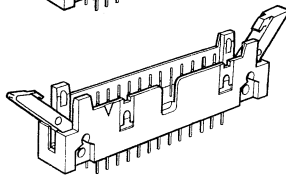
Male headers

with dip-solder pins



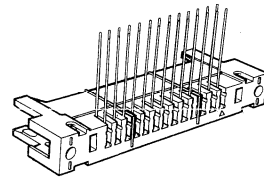
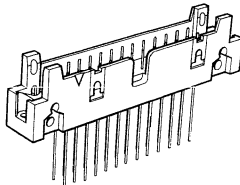
12

with dip-solder pins,
with clamp/ejectors



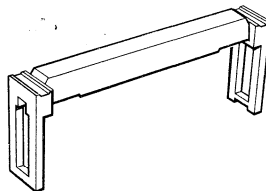
14,15

with pins for wire wrapping

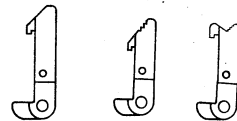


13

Accessories



strain relief



clamp/ejectors

11,16



coding peg

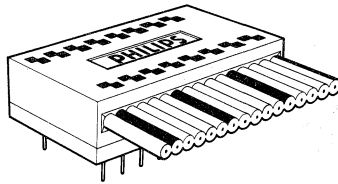


polarizing clip

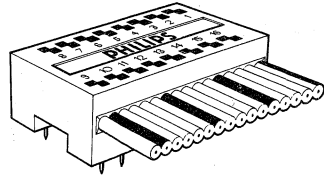
17

Connectors for
printed-board applications

page

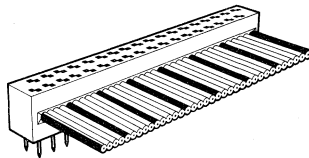


DIP (dual in-line pluggable)

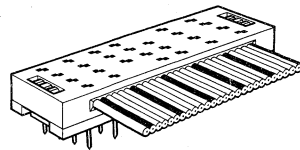


DIS (dual in-line solderable)

21,27



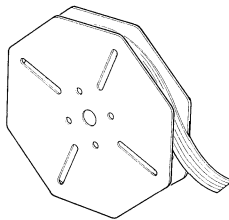
DIS mini (dual in-line solderable);
2,54 mm row distance



PB (printed board) transition

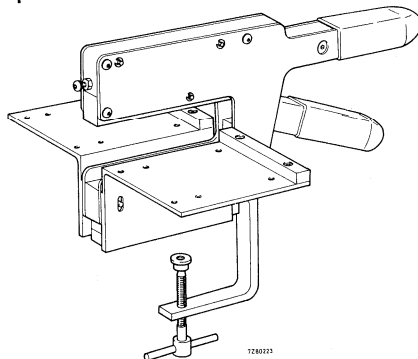
33,39

Flat ribbon cables

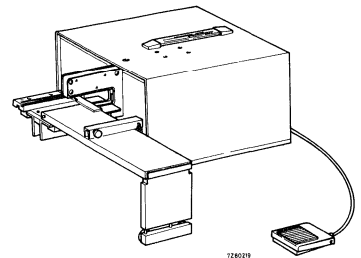


45

Insulation displacement tools



hand assembling tool



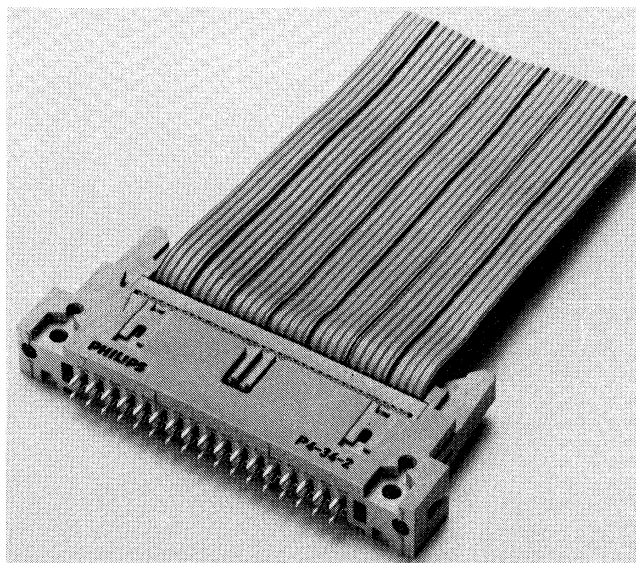
electrical assembling tool

CABLE CONNECTORS AND MALE HEADERS

- Cable connectors with insulation displacement contacts
- Mating male headers with dip-solder pins or pins for wire wrapping
- For ribbon cables with solid or stranded wires, AWG28
- Basic specifications: DIN 41651, BS9525 F0023, MIL-C-83503 and NF/UTE C93-428

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts, double row	10, 14, 16, 20, 26, 34, 40, 50, 60, 64
Terminations	
cable connector	insulation displacement termination
male header	straight dip-solder pins 90°-angled dip-solder pins straight pins for wire wrapping 90°-angled pins for wire wrapping
Current at $T_{amb} = 70\text{ °C}$	1 A
Mechanical endurance	200 insertions
Climatic category, IEC 68	55/105/21



820902-01-01

APPLICATION

This range of ribbon cable connectors and mating male headers is designed to provide a simple, yet reliable means of interconnecting electronic circuits in applications where high quality and high packing density are required.

DESCRIPTION

This connector range consists of a series of female cable connectors to be fitted to flat ribbon cable and a series of mating male headers. Cable connectors and male headers have a grey body of flame retardent, glass-fibre-filled thermoplastic polyester. The male headers are provided with straight or 90°-angled dip-solder pins or pins for wire wrapping; the cable connectors have contact springs with terminations for insulation displacement.

The cable connectors consist of a block containing the contact springs, and a pre-mounted pressure block with corrugated slot for error-free alignment of the cable. During the insulation displacing both blocks are firmly pressed together and locked by two retaining bars.

The contact springs are of beryllium copper, the contact pins are of brass; the contact surfaces are gold on nickel plating, the terminations are tin plated.

Ribbon cables with stranded or solid wires are supplied on reels.

A range of accessories is available:

- clamp/ejectors, which clamp the cable connector automatically when it is inserted into the male header, and also serve as ejectors for easy separation;
- strain relief, for relieving stress on the terminations of the cable connector;
- internal coding system, to ensure correct positioning;
- polarizing clips, to ensure correct insertion of cable connector into male header;
- appropriate tools for terminating the cable connectors to ribbon cables.

Note: The cable connectors also mate with male headers (pin length 11 mm) of the F095 modular connector system.

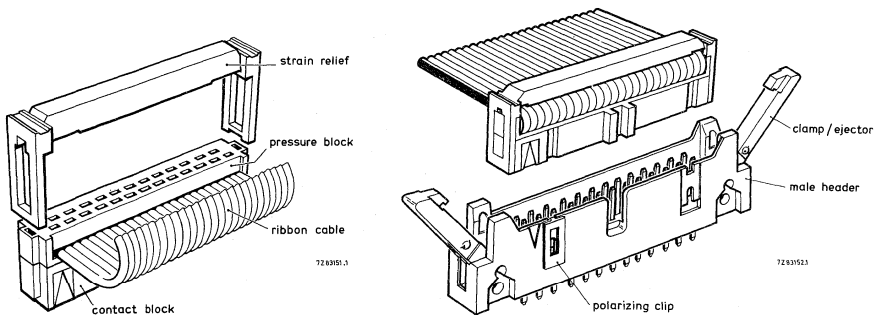


Fig. 1 Cable connector, male header, and accessories.

ELECTRICAL DATACurrent at $T_{amb} = 70\text{ }^{\circ}\text{C}$

1 A

Derated current curve

according to IEC 512-3,
test 5b, see Fig. 2Contact resistance (including material
resistance) at 10 mA, max. 20 mV (peak)
open circuit voltage, 1 kHz

initially

 $\leq 15\text{ m}\Omega$

after tests

 $\leq 20\text{ m}\Omega$

Insulation resistance

initially

 $> 10^3\text{ M}\Omega$

after damp heat test

 $> 10^2\text{ M}\Omega$

Creepage distance

between adjacent or opposite contacts

 $\geq 0,8\text{ mm}$

Clearance

between adjacent or opposite contacts

 $\geq 0,8\text{ mm}$ Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$

1000 V (r.m.s.), 50 Hz

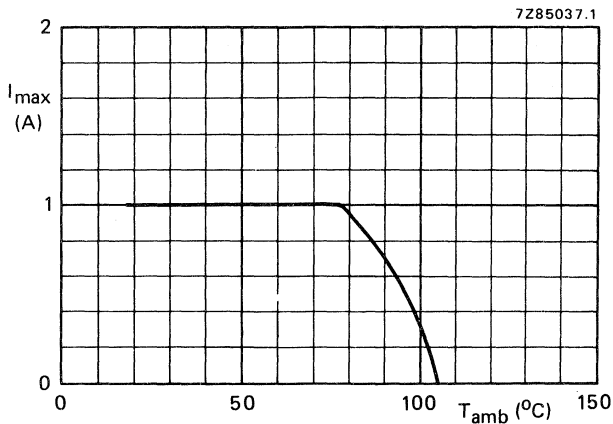


Fig. 2 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).*

* The current restriction of 1 A in the temperature range 20 to $75\text{ }^{\circ}\text{C}$ is caused by the cable specification.

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)	
Number of contacts, double row	10, 14, 16, 20, 26, 34, 40, 50, 60, 64	
Board thickness (for male headers)	1,6 mm	
Polarization	achieved by polarizing key on cable connector and keyway in male header	
Insertion force per contact	≤ 1,5 N	
Withdrawal force per contact	≥ 0,15 N; ≤ 1,5 N	
Mechanical endurance	200 insertions, according to IEC 512-5, test 9a	
Body	glass-fibre-filled thermoplastic polyester	
material	grey (RAL 7032)	
colour		
Contacts	cable connector	male header
material	beryllium copper	brass
shape	solid cantilever	square pin, chamfered at both ends
finish of contact surfaces	gold plate on nickel plate	gold plate on nickel plate
type of termination	● insulation displacement *	● straight dip-solder pin
		● 90°-angled dip-solder pin
		pin
		● straight pin for wire wrapping **
		● 90°-angled pin for wire wrapping**
finish of termination	tin plate	tin plate
contact mating length		≥ 2 mm
Solderability	235 °C, 2 s	according to IEC 512, test 12a
Resistance to soldering heat	260 °C, 10 s	according to IEC 512, test 12d
Shock ▲	according to IEC 512, test 6c, 50g, 11 ms	
Vibration ▲	according to IEC 512, test 6d, 10 to 2000 Hz, 1,5 mm (p-p), or 10g, 3 directions, 2 h per direction	

* Accommodate ribbon cable with solid or stranded wires AWG28.

** Accommodate AWG26 to AWG30 wire; 0,40 to 0,25 mm diameter.

▲ Also valid for cable connectors when used with F095 male headers; max. free cable length 150 mm.

ENVIRONMENTAL DATA

Climatic category (IEC 68)

55/105/21

Ambient temperature range

-55 to + 105 °C

Damp heat, steady state

according to IEC 512, test 11c, 21 days,
40 °C, R.H. 90 to 95%

Dry heat

according to IEC 512, test 11i, 16 h,
105 °C

Industrial atmosphere

1 ppm H₂S, 4 days; 1 ppm SO₂, 4 days

Flammability

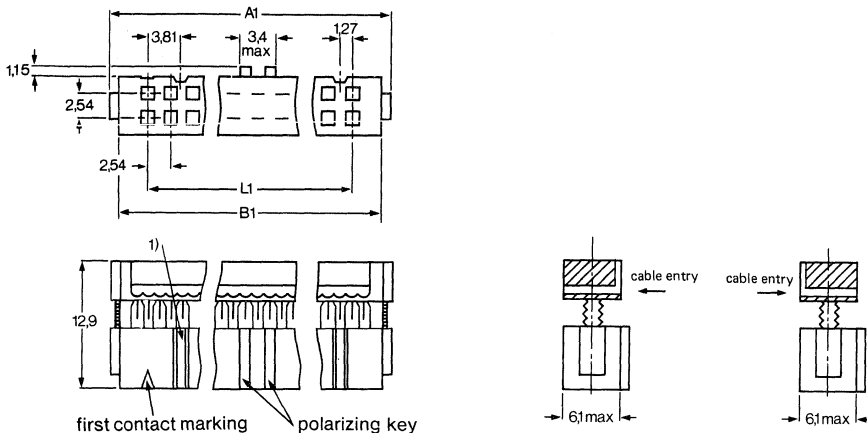
according to UL94, category V-0

DIMENSIONAL DATA

Dimensions in mm

Cable connectors

The cable connectors are available with the cable entry at the groove side, or opposite the groove side. They are supplied with pre-mounted pressure block. The cable connectors can be used with ribbon cables AWG28/1 and AWG28/7.



1) non-existent at 10 and 14 contacts

Fig. 3 Cable connector; see Table 1 for dimensions A1, B1 and L1. The height after pressing both blocks together is max. 10,8 mm, as shown in Fig. 4.

Table 1

number of contacts	A1 max. mm	B1 max. mm	L1 mm	catalogue number		smallest packing quantity
				Cable entry at ▲ groove side	Cable entry opposite groove side	
10	17,30	15,3	10,16	2432 022 20001	2432 022 20021	140
14	22,40	20,4	15,24	2432 022 20002	2432 022 20022	110
16	24,90	22,95	17,78	2432 022 20003	2432 022 20023	100
20	30,0	27,90	22,86	2432 022 20004	2432 022 20024	80
26	37,6	35,60	30,48	2432 022 20005	2432 022 20025	60
34	47,8	45,80	40,64	2432 022 20006	2432 022 20026	50
40	55,4	53,40	48,26	2432 022 20007	2432 022 20027	40
50	68,1	66,10	60,96	2432 022 20008	2432 022 20028	30
60	80,8	78,80	73,66	2432 022 20009	2432 022 20029	30
64	85,9	83,90	78,74	2432 022 20011	2432 022 20031	30

▲ Preferred.

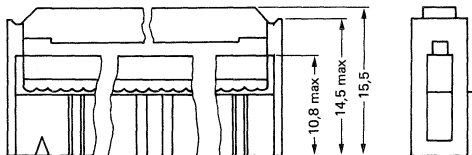


Fig. 4 Cable connector with strain relief.

For ribbon cables, see data sheet "Ribbon Cables F303".

For assembling tools, see data sheet "Insulation Displacement Tools".

Strain reliefs

Strain reliefs are supplied separately. The smallest packing quantity is 100.

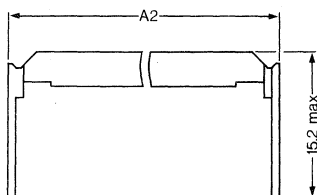


Fig. 5 Strain relief; see Table 2 for dimension A2.

Table 2

number of contacts	A2 mm	catalogue number
10	17,30	2432 022 29001
14	22,40	2432 022 29002
16	24,90	2432 022 29003
20	30,0	2432 022 29004
26	37,6	2432 022 29005
34	47,8	2432 022 29006
40	55,4	2432 022 29007
50	68,1	2432 022 29008
60	80,8	2432 022 29009
64	85,9	2432 022 29011

How to order

Order cable connectors and strain reliefs by quoting the 12-digit catalogue number as shown in Tables 1 and 2. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

Example: The minimum quantity of the cable connector with 16 contacts, and cable entry at groove side, with strain relief, should be ordered as:

100 x 2432 022 29003;

100 x 2432 022 29003.

Male headers with dip-solder pins; without clamp/ejectors

The male headers are available with straight or 90°-angled dip-solder pins.

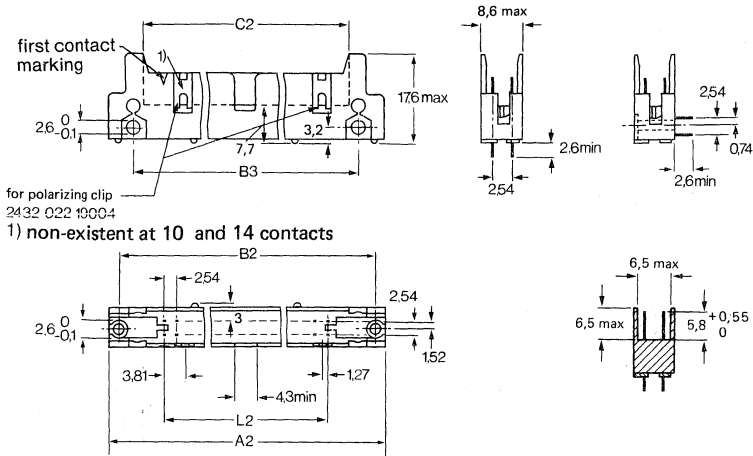


Fig. 6 Male header with dip-solder pins; see Table 3 for dimensions A2, B2, B3, C2, and L2.

Table 3

number of contacts	A2 max. mm	B2 mm	B3 mm	C2 min. mm	L2 mm	catalogue number ▲ 2432 022		smallest packing quantity
						straight pins	90°-angled pins	
10	32,25	27,94	21,84	17,95	10,16	10001	10021	150
14	37,33	33,02	26,92	23,05	15,24	10002	10022	130
16	39,87	35,56	29,46	25,55	17,78	10003	10023	130
20	44,95	40,64	34,54	30,65	22,86	10004	10024	110
26	52,57	48,26	42,16	38,25	30,48	10005	10025	100
34	62,73	58,42	52,32	48,45	40,64	10006	10026	80
40	70,35	66,04	59,94	56,10	48,26	10007	10027	70
50	83,05	78,74	72,64	68,80	60,96	10008	10028	60
60	95,75	91,44	85,34	81,50	73,66	10009	10029	50
64	100,83	96,52	90,42	86,50	78,74	10011	10031	50

Polarizing clips and clamp/ejectors are supplied separately; see "Accessories".

For mounting of male headers, see "Mounting", page 18.

For ordering, see "How to order male headers", page 16.

▲ Preferred.

Male headers with pins for wire wrapping; without clamp/ejectors

The male headers are available with straight or 90°-angled pins for wire wrapping.

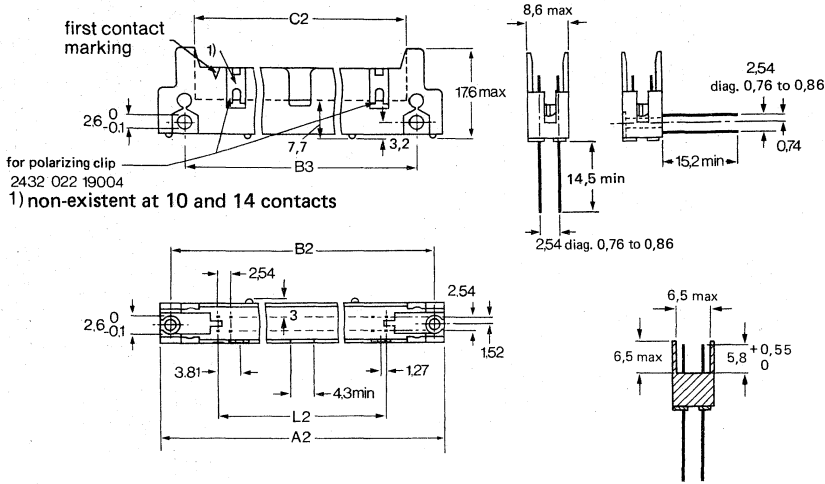


Fig. 7 Male header with pins for wire wrapping; see Table 4 for dimensions A2, B2, B3, C2 and L2.

Table 4

number of contacts	A2 max. mm	B2 mm	B3 mm	C2 min. mm	L2 mm	catalogue number 2432 022		smallest packing quantity	
						straight pins	90°-angled pins	straight pins	90°-angled pins
10	32,25	27,94	21,84	17,95	10,16	10041	10061	150	75
14	37,33	33,02	26,92	23,05	15,24	10042	10062	130	65
16	39,87	35,56	29,46	25,55	17,78	10043	10063	130	65
20	44,95	40,64	34,54	30,65	22,86	10044	10064	110	55
26	52,57	48,26	42,16	38,25	30,48	10045	10065	100	50
34	62,73	58,42	52,32	48,45	40,64	10046	10066	80	40
40	70,35	66,04	59,94	56,10	48,26	10047	10067	70	35
50	83,05	78,74	72,64	68,80	60,96	10048	10068	60	30
60	95,75	91,44	85,34	81,50	73,66	10049	10069	50	25
64	100,83	96,52	90,42	86,50	78,74	10051	10071	50	25

Polarizing clips and clamp/ejectors are supplied separately; see "Accessories".

For mounting of male headers, see "Mounting", page 18.

For ordering, see "How to order male headers", page 16.

Male headers with dip-solder pins; with clamp/ejectors suitable for use with cable connectors with strain relief

The male headers are available with straight or 90°-angled dip-solder pins.

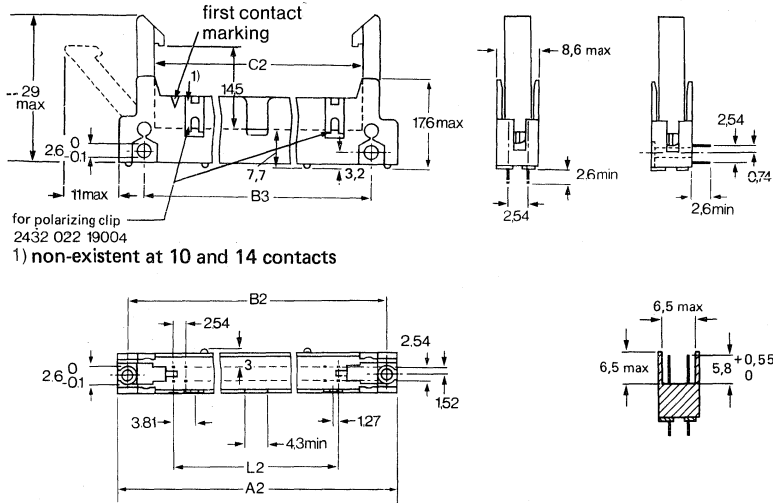


Fig. 8 Male header with dip-solder pins, and clamp/ejectors (2432 022 19002) for cable connectors with strain relief; see Table 5 for dimensions A2, B2, B3, C2 and L2.

Table 5

number of contacts	A2 max. mm	B2 mm	B3 mm	C2 min. mm	L2 mm	catalogue number 2432 022		smallest packing quantity
						straight pins	90°-angled pins	
10	32,25	27,94	21,84	17,95	10,16	10121	10141	150
14	37,33	33,02	26,92	23,05	15,24	10122	10142	130
16	39,87	35,56	29,46	25,55	17,78	10123	10143	130
20	44,95	40,64	34,54	30,65	22,86	10124	10144	110
26	52,57	48,26	42,16	38,25	30,48	10125	10145	100
34	62,73	58,42	52,32	48,45	40,64	10126	10146	80
40	70,35	66,04	59,94	56,10	48,26	10127	10147	70
50	83,05	78,74	72,64	68,80	60,96	10128	10148	60
60	95,75	91,44	85,34	81,50	73,66	10129	10149	50
64	100,83	96,52	90,42	86,50	78,74	10131	10151	50

For mounting of male headers, see "Mounting", page 18.

For ordering, see "How to order male headers", page 16.

Male headers with dip-solder pins; with clamp/ejectors suitable for use with cable connectors without strain relief

The male headers are available with straight or 90°-angled dip-solder pins.

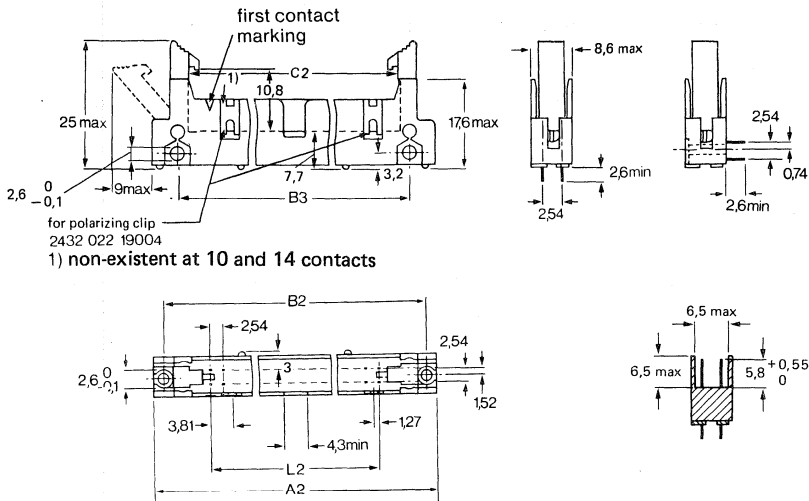


Fig. 9 Male header with dip-solder pins, and clamp/ejectors (2432 022 19001) for cable connectors without strain relief; see Table 6 for dimensions A2, B2, B3, C2 and L2.

Table 6

number of contacts	A2 max. mm	B2 mm	B3 mm	C2 min. mm	L2 mm	catalogue number 2432 022		smallest packing quantity
						straight pins	90°-angled pins	
10	32,25	27,94	21,84	17,95	10,16	10081	10101	150
14	37,33	33,02	26,92	23,05	15,24	10082	10102	130
16	39,87	35,56	29,46	25,55	17,78	10083	10103	130
20	44,95	40,64	34,54	30,65	22,86	10084	10104	110
26	52,57	48,26	42,16	38,25	30,48	10085	10105	100
34	62,73	58,42	52,32	48,45	40,64	10086	10106	80
40	70,35	66,04	59,94	56,10	48,26	10087	10107	70
50	83,05	78,74	72,64	68,80	60,96	10088	10108	60
60	95,75	91,44	85,34	81,50	73,66	10089	10109	50
64	100,83	96,52	90,42	86,50	78,74	10091	10111	50

For mounting of male headers, see "Mounting", page 18.

For ordering, see "How to order male headers", page 16.

How to order male headers

Order male headers by quoting the 12-digit catalogue number as shown in Tables 3 to 6. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

Additional clamp/ejectors should be ordered separately; see "Accessories" for catalogue numbers.

Example: The minimum quantity of the male header (without clamp/ejectors) with 90°-angled dip-solder pins 34 contacts, and additional clamp/ejectors for use with cable connectors with strain relief, should be ordered as:

- 80 x 2432 022 10026;
- 200 x 2432 022 19002.

ACCESSORIES

Clamp/ejectors

These clamp/ejectors are for use with male headers, shown on pages 12 and 13. They must be inserted vertically into the male header, and clicked into holes. The smallest packing quantity is 100.

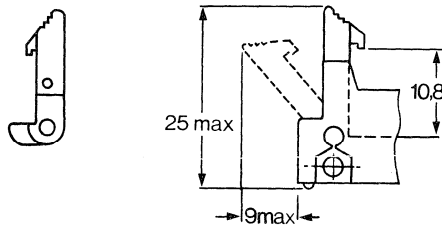


Fig. 10 Clamp/ejector, suitable for use with cable connectors without strain relief. Catalogue number: 2432 022 19001.▲

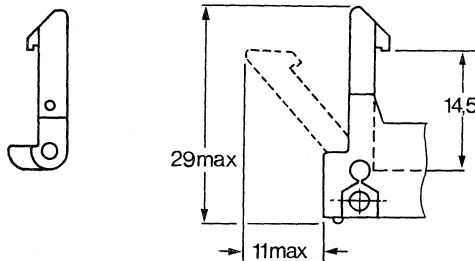


Fig. 11 Clamp/ejector, suitable for use with cable connectors with strain relief. Catalogue number: 2432 022 19002.▲

▲ Preferred.

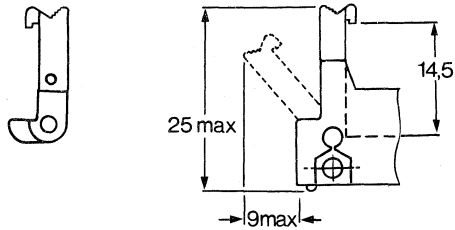


Fig. 12 Clamp/ejector, suitable for use with cable connectors with strain relief. Catalogue number: 2432 022 19003.

Coding pegs

Coding of cable connectors is achieved by inserting a plastic peg into one or more of the receptacles. The corresponding pin(s) of the associated male headers must be removed by cutting. The smallest packing quantity is 120.

Catalogue number: 2432 022 19005.

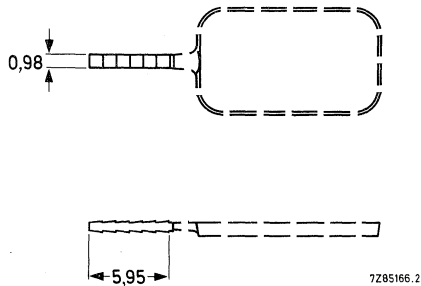


Fig. 13 Coding peg.

Polarizing clips

Polarizing clips are for inserting into the grooves of the male headers. The smallest packing quantity is 100.

Catalogue number: 2432 022 19004.

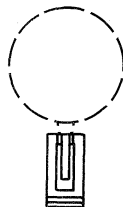


Fig. 14 Polarizing clip.

MOUNTING

Dimensions in mm

Hole pattern on printed boards for male headers viewed from components side

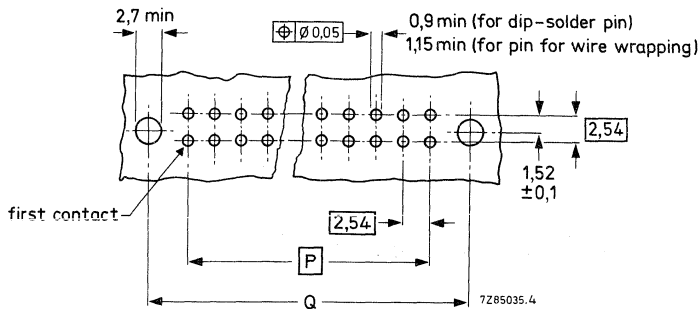


Fig. 15 Hole pattern for male headers with straight dip-solder pins or straight pins for wire wrapping; for dimensions P and Q, see Table 7. Fixing of the male headers can be done by means of M2 screws and nuts. Mounting is only possible when the clamp/ejectors are not inserted.

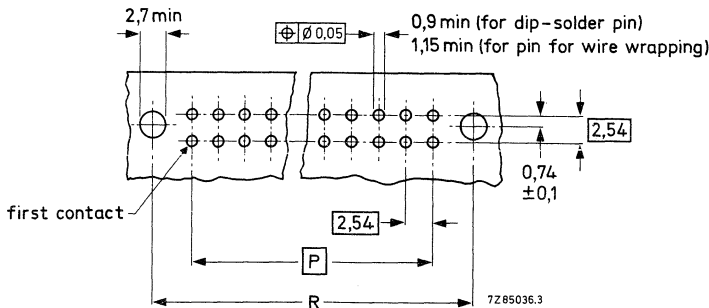


Fig. 16 Hole pattern for male headers with 90°-angled dip-solder pins or 90°-angled pins for wire wrapping; for dimensions P and R see Table 7. Fixing of the male headers can be done by means of M2,5 screws and nuts.

Table 7

number of contacts	P	Q	R
10	10,16	27,94	21,84
14	15,24	33,02	26,92
16	17,78	35,56	29,46
20	22,86	40,64	34,54
26	30,48	48,26	42,16
34	40,64	58,42	52,32
40	48,26	66,04	59,94
50	60,96	78,74	72,64
60	73,66	91,44	85,34
64	78,74	96,52	90,42

} ± 0,1

Cable/connector assembling

The unstripped ribbon cable has to be inserted into the corrugated slot in the pressure block of the cable connector (Fig. 17).

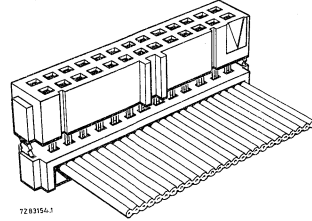


Fig. 17.

The contact block is then pushed downwards to the pressure block by the assembling tool.

After pressing, the two parts of the cable connector remain firmly locked together by two retaining bars, which enter lugs at the ends of the pressure block during the pressing operation (Fig. 18).

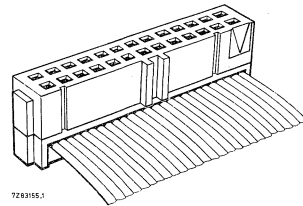


Fig. 18.

The ribbon cable is then folded over the cable connector (Fig. 19).

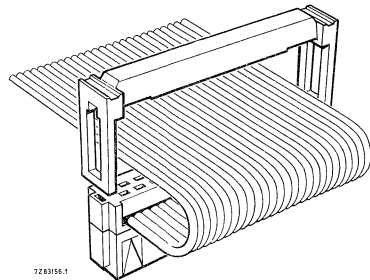


Fig. 19.

To complete the assembling procedure the strain relief is snapped over the end lugs of the connector (Fig. 20).

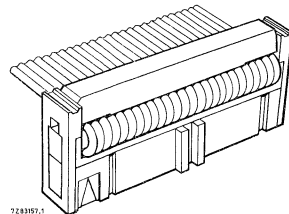


Fig. 20.

MARKING

Package

The package is marked with:

- 12-digit catalogue number;
- reference number of manufacturer;
- number of pieces.

Cable connectors and male headers

The bodies are marked with:

- name of manufacturer;
- date code;
- number of connections;
- performance class.

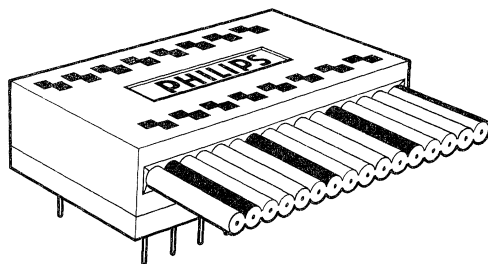
The first contact of the cable connectors, and that of the male headers, are identified by a Δ sign.

DIP CONNECTORS

- Dual in-line pluggable
- With insulation displacement terminations (IDC)
- For ribbon cables with solid AWG30/1 or stranded wires AWG28/7

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts, double row	14, 16
Board thickness	1,6 mm
Terminations to cable to socket or board	insulation displacement pin
Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Mechanical endurance	50 insertions
Climatic category, IEC 68	55/105/04



APPLICATION

For connection of ribbon cables to IC sockets (dual in-line configuration) or directly to printed boards.

DESCRIPTION

This dual in-line pluggable connector consists of two parts: a block in which the insulation displacement contact pins are arranged, and a pressure block in which the ribbon cable has to be inserted. Both parts have a grey body of flame retardent glass-fibre-filled polyester. The contact pins are of phosphor bronze, and have a gold or tin finish. The gold-finished pins are suitable for insertion into dual in-line sockets, the tinned versions are for dip-soldering in printed boards. A bevelled corner of the contact block marks the first contact pin. During the insulation displacement both blocks are firmly pressed and locked together.

For appropriate assembling tools, see data sheet "Insulation Displacement Tools". Ribbon cables with stranded AWG28/7 or solid wires AWG30/1, can be used; see data sheet "Ribbon Cables F303".

ELECTRICAL DATA

Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak)	
initially	$\leq 20\text{ m}\Omega$
after tests	$\leq 50\text{ m}\Omega$
Insulation resistance	
initially	$> 10^5\text{ M}\Omega$
after tests	$> 2 \times 10^4\text{ M}\Omega$
Proof voltage for 1 min, at sea level	1000 V (r.m.s.), 50 Hz

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts, double row	14, 16
Board thickness	1,6 mm
Mechanical endurance	50 insertions
Body	
material	glass-fibre-filled thermoplastic polyester
colour	grey (RAL 7032)
Contacts	
material	for insulation displacement
finish of contact surfaces	phosphor bronze
type of termination	gold on nickel plate, or tinned
to cable	insulation displacement
to socket or board	pin
Wire size	AWG28/7 (0,08 mm ²) or AWG30/1 (0,05 mm ²)
Solderability	230 °C, 5 s according to IEC 512, test 12a
Resistance to soldering heat	260 °C, 10 s according to IEC 512, test 12d
Shock	according to IEC 512, test 6c, 50g, 6 ms
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 1,5 mm (p-p), or 10g, 3 directions, 2 h per direction

ENVIRONMENTAL DATA

Climatic category (IEC 68)	55/105/04
Ambient temperature range	-55 to +105 °C
Damp heat, steady state	according to IEC 512, test 11c, 4 days, 40 °C, R.H. 90 to 95%
Dry heat	according to IEC 512, test 11i, 250 h, 85 °C
Salt mist	according to IEC 512, test 11f, 48 h
Flammability	according to UL94, category V-0

DIMENSIONAL DATA

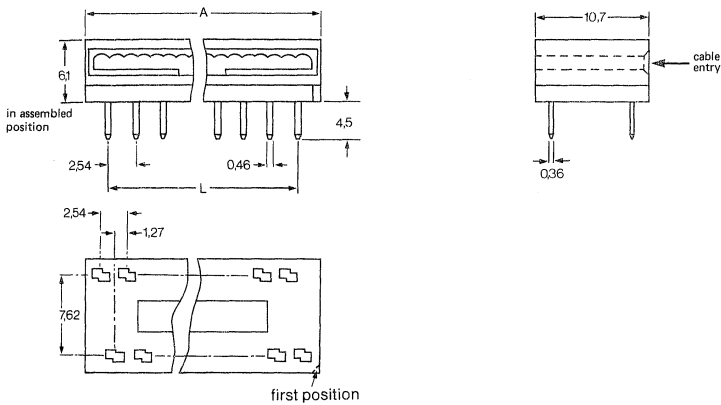


Fig. 1 DIP connector; both parts pressed together.
See Table 1 for dimensions A and L.

Table 1

number of contacts	A	L	catalogue number		smallest packing quantity
			gold finish	tin finish	
14	19,05	16,51	2432 022 44101 ▲	2432 022 44121 ▲	100
16	21,59	19,05	2432 022 44102 ▲	2432 022 44122 ▲	100

For ribbon cables, see data sheet "Ribbon Cables F303".

For assembling tools, see data sheet "Insulation Displacement Tools".

How to order

Order the connector by quoting the 12-digit catalogue number as shown in Table 1. Note that the catalogue number applies to one connector (contact block + pressure block), and take into account the smallest packing quantity; please order in multiples of this quantity.

Example: The minimum quantity of the connector with 16 gold-finished contacts should be ordered as: 100 x 2432 022 44102.

▲ Preferred

MOUNTING

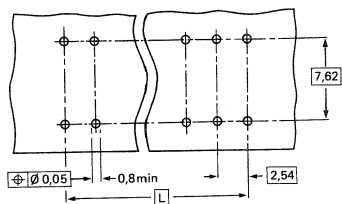


Fig. 2 Hole pattern; see Table 1 for dimension L.

MARKING

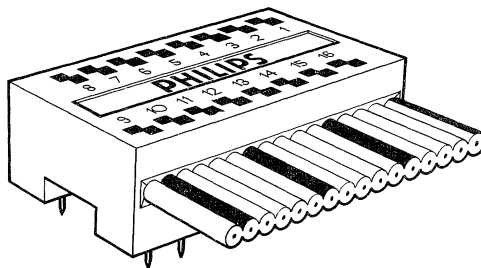
The pressure block is marked with the manufacturer's name.

DIS CONNECTORS

- Dual in-line solderable
- With insulation displacement terminations (IDC)
- For ribbon cables with solid AWG30/1 or stranded wires AWG28/7

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts, double row	14, 16, 24
Board thickness	1,6 mm
Terminations to cable	insulation displacement
to board	dip-solder pin
Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Climatic category, IEC 68	55/105/04



APPLICATION

The DIS connector is for connection of ribbon cables to printed boards.

DESCRIPTION

This dual in-line solderable connector has a grey body of flame retardent glass-fibre-filled polyester. The insulation displacement contact pins are of phosphor bronze, and have a gold or tin finish. Connectors with open or closed cable slot are available.*

During the insulation displacing the IDC terminations are firmly pressed into the ribbon cable. For appropriate assembling tools, see data sheet "Insulation Displacement Tools". Ribbon cables with stranded AWG28/7 or solid wires AWG30/1, can be used; see data sheet "Ribbon Cables F303".

ELECTRICAL DATA

Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak)	
initially	$\leq 10\text{ m}\Omega$
after tests	$\leq 15\text{ m}\Omega$
Insulation resistance	
initially	$> 10^5\text{ M}\Omega$
after tests	$> 2 \times 10^4\text{ M}\Omega$
Proof voltage for 1 min, at sea level	1000 V (r.m.s.), 50 Hz

* Connectors with 24 contacts are only available with closed cable slot.

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts, double row	14, 16, 24
Board thickness	1,6 mm
Body	
material	glass-fibre-filled thermoplastic polyester
colour	grey (RAL 7032)
Contacts	
material	phosphor bronze
finish of contact surfaces	gold on nickel plate, or tinned
type of termination	
to cable	insulation displacement
to board	dip-solder pin
Wire size	AWG28/7 (0,08 mm ²) or AWG30/1 (0,05 mm ²)
Solderability	230 °C, 5 s according to IEC 512, test 12a
Resistance to soldering heat	260 °C, 10 s according to IEC 512, test 12d
Shock	according to IEC 512, test 6c, 50g, 6 ms
Vibration	according to IEC 512, test 6d, 10-2000 Hz, 1,5 mm (p-p) or 10 g, 3 directions, 2 h per direction

ENVIRONMENTAL DATA

Climatic category (IEC 68)	55/105/04
Ambient temperature range	-55 to +105 °C
Damp heat, steady state	according to IEC 512, test 11c, 4 days, 40 °C, R.H. 90 to 95%
Dry heat	according to IEC 512, test 11i, 250 h, 85 °C
Salt mist	according to IEC 512, test 11f, 48 h
Flammability	according to UL94, category V-0

DIMENSIONAL DATA

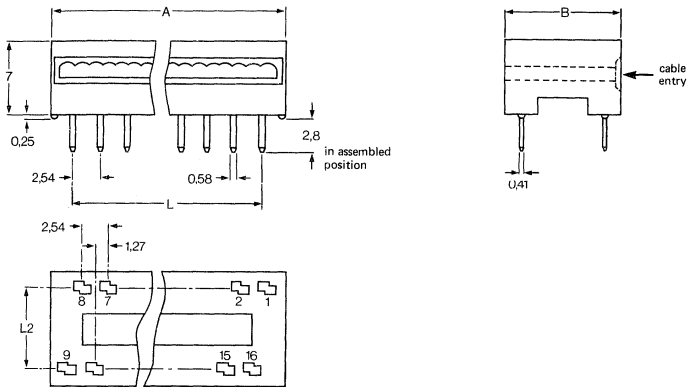


Fig. 1 DIS connector, after assembling.
See Table 1 for dimensions A, B, L and L2.

Table 1

number of contacts	A	B	L	L2	catalogue number 2432 022				smallest packing quantity
					gold finish		tin finish		
					open cable slot	closed cable slot	open cable slot	closed cable slot	
14	19,81	10,67	15,24	7,62	43121 ▲	43101	43131 ▲	43111 ▲	100
16	22,35	10,67	17,78	7,62	43122 ▲	43102	43132 ▲	43112 ▲	100
24	32,51	18,29	27,94	15,24		43103		43113 ▲	100

For ribbon cables, see data sheet "Ribbon Cables F303".

For assembling tools, see data sheet "Insulation Displacement Tools".

How to order

Order the connector by quoting the 12-digit catalogue number as shown in Table 1. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

Example: The minimum quantity of the connector with 16 gold-finished contacts, and open cable slot should be ordered as: 100 x 2432 022 43122.

▲Preferred.

MOUNTING

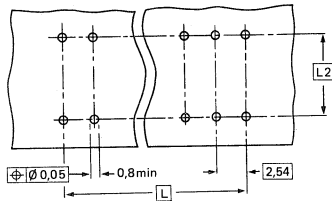


Fig. 2 Hole pattern; see Table 1 for dimensions L and L2.

MARKING

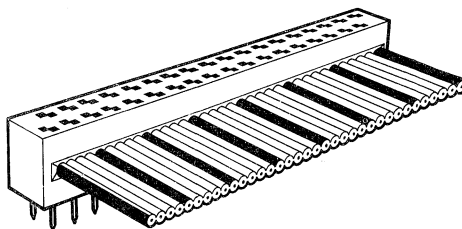
The manufacturer's name and the contact positions are marked at the top face of the connector.

DIS MINI CONNECTORS

- Dual in-line solderable
- With insulation displacement terminations (IDC)
- For ribbon cables with solid AWG30/1 or stranded wires AWG28/7

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts, double row	20, 26, 34
Board thickness	1,6 mm
Terminations	
to cable	insulation displacement
to board	dip-solder pin
Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Climatic category, IEC 68	55/105/04



APPLICATION

The DIS mini connector is for connection of ribbon cables to printed boards.

DESCRIPTION

This mini dual in-line solderable connector has a grey body of flame retardent glass-fibre-filled polyester. The insulation displacement contact pins are of phosphor bronze, and have a tin finish. The pins are suitable for dip-soldering in printed boards. The connector has an open cable slot.

During the insulation displacement the IDC terminations are firmly pressed into the ribbon cable. For appropriate assembling tools, see data sheet: "Insulation Displacement Tools". Ribbon cables with stranded AWG28/7 or solid wires AWG30/1, can be used; see data sheet "Ribbon Cables F303".

ELECTRICAL DATA

Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak)	
initially	$\leq 10\text{ m}\Omega$
after tests	$\leq 15\text{ m}\Omega$
Insulation resistance	
initially	$> 10^5\text{ M}\Omega$
after tests	$> 2 \times 10^4\text{ M}\Omega$
Proof voltage for 1 min, at sea level	1000 V (r.m.s.), 50 Hz

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts, double row	20, 26, 34
Board thickness	1,6 mm
Body	
material	glass-fibre-filled thermoplastic polyester
colour	grey (RAL 7032)
Contacts	
material	phosphor bronze
finish of contact surfaces	tinned
type of termination	
to cable	insulation displacement
to board	dip-solder pin
Wire size	AWG28/7 (0,08 mm ²) or AWG30/1 (0,05 mm ²)
Solderability	230 °C, 5 s according to IEC 512, test 12a
Resistance to soldering heat	260 °C, 10 s according to IEC 512, test 12d
Shock	according to IEC 512, test 6c, 50 g, 6 ms
Vibration	according to IEC 512, test 6d, 10-2000 Hz, 1,5 mm (p-p) or 10 g, 3 directions, 2 h per direction

ENVIRONMENTAL DATA

Climatic category (IEC 68)	55/105/04
Ambient temperature range	-55 to +105 °C
Damp heat, steady state	according to IEC 512, test 11c, 4 days, 40 °C, R.H. 90 to 95%
Dry heat	according to IEC 512, test 11i, 250 h, 85 °C
Salt mist	according to IEC 512, test 11f, 48 h
Flammability	according to UL94, category V-0

DIMENSIONAL DATA

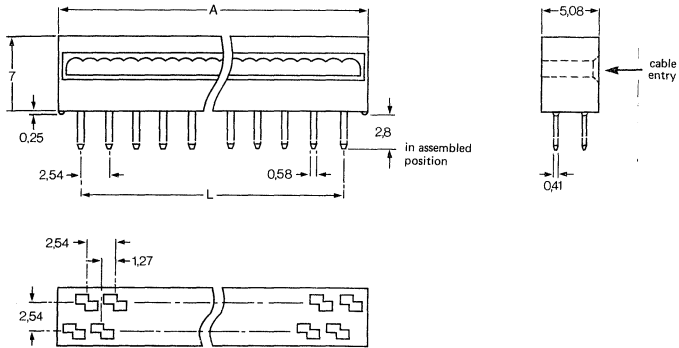


Fig. 1 DIS mini connector, after assembling.
See Table 1 for dimensions A and L.

Table 1

number of contacts	A	L	catalogue number	smallest packing quantity
20	27,43	22,86	2432 022 42111 ▲	100
26	35,05	30,48	2432 022 42112 ▲	100
34	45,21	40,64	2432 022 42113 ▲	100

For ribbon cables, see data sheet "Ribbon Cables F303".

For assembling tools, see data sheet "Insulation Displacement Tools".

How to order

Order the connector by quoting the 12-digit catalogue number as shown in Table 1. Note that the catalogue number applies to one piece, and take into account the smallest packing quantity; please order in multiples of this quantity.

Example: The minimum quantity of the connector with 26 contacts, should be ordered as:
100 x 2432 022 42112.

▲ Preferred.

MOUNTING

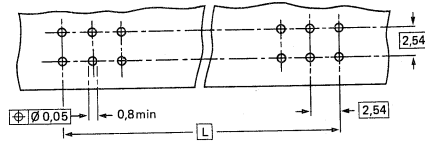


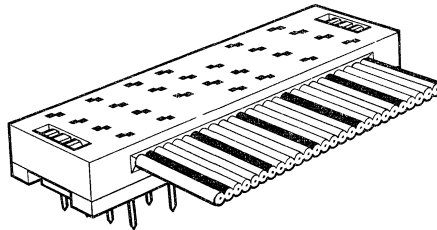
Fig. 2 Hole pattern; see Table 1 for dimension L.

PB TRANSITION CONNECTORS

- Low profile termination to printed boards
- With insulation displacement terminations (IDC)
- For ribbon cables with solid AWG30/1 or stranded wires AWG28/7

QUICK REFERENCE DATA

Contact pitch	1,27 mm (0,05 in)
Number of contacts, double row	10, 20, 26, 34, 40, 50
Board thickness	1,6 mm
Terminations to cable to board	insulation displacement dip-solder pin
Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Climatic category (IEC 68)	55/105/04



APPLICATION

For connection of ribbon cables to printed boards.

DESCRIPTION

This printed board transition connector consists of two parts: a block in which the insulation displacement contact pins are arranged, and a pressure block in which the ribbon cable has to be inserted. Both parts have a grey body of flame retardent glass-fibre-filled polyester. The contact pins are of phosphor bronze, and have a tin finish; the pins are suitable for dip-soldering in printed boards. A bevelled corner of the contact block marks the first contact pin.

During the insulation displacement both blocks are firmly pressed together and locked by two retaining barbs, which enter lugs at the ends of the pressure block. Insulation displacement can take place before or after soldering into the printed board.

For appropriate assembling tools, see data sheet "Insulation Displacement Tools". Ribbon cables with stranded AWG28/7 or solid wires AWG30/1, can be used, see data sheet "Ribbon Cables F303".

ELECTRICAL DATA

Current at $T_{amb} = 70\text{ }^{\circ}\text{C}$	1 A
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak)	
initially	$\leq 10\text{ m}\Omega$
after tests	$\leq 15\text{ m}\Omega$
Insulation resistance	
initially	$> 10^5\text{ M}\Omega$
after tests	$> 2 \times 10^4\text{ M}\Omega$
Proof voltage for 1 min, at sea level	1000 V (r.m.s.), 50 Hz

MECHANICAL DATA

Contact pitch	1,27 mm (0,05 in)
Number of contacts	10, 20, 26, 34, 40, 50
Board thickness	1,6 mm
Body	
material	glass-fibre-filled thermoplastic polyester
colour	grey (RAL 7032)
Contacts	
material	phosphor bronze
finish of terminations	tinned
type of termination	
to cable	insulation displacement
to board	dip-solder pin
Wire size	AWG28/7 (0,08 mm ²) or AWG30/1 (0,05 mm ²)
Solderability	230 °C, 5 s according to IEC 512, test 12a
Resistance to soldering heat	260 °C, 10 s, according to IEC 512, test 12d
Shock	according to IEC 512, test 6c, 50g, 6 ms
Vibration	according to IEC 512, test 6d, 10 to 2000 Hz, 1,5 mm (p-p), or 10g, 3 directions, 2 h per direction

ENVIRONMENTAL DATA

Climatic category (IEC 68)	55/105/04
Ambient temperature range	-55 to + 105 °C
Damp heat, steady state	according to IEC 512, test 11c, 4 days, 40 °C, R.H. 90 to 95%
Dry heat	according to IEC 512, test 11i, 250 h, 85 °C
Salt mist	according to IEC 512, test 11f, 48 h
Flammability	according to UL94, category V-0

DIMENSIONAL DATA

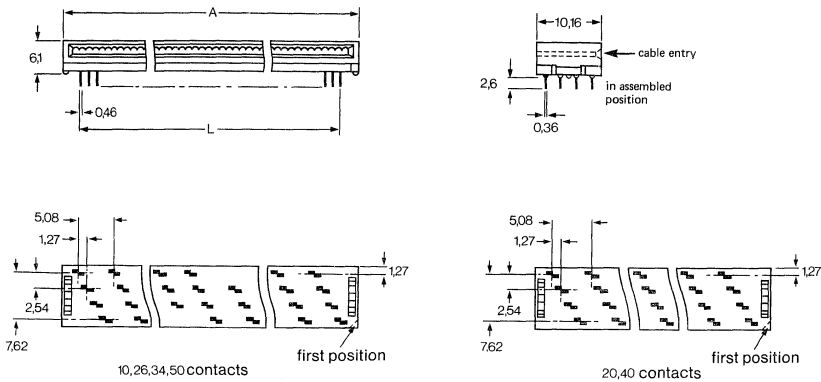


Fig. 1 PB transition connector; both parts pressed together.
See Table 1 for dimensions A and L.

Table 1

number of contacts	A	L	catalogue number	smallest packing quantity
10	17,78	11,43	2432 022 41111 ▲	100
20	30,48	24,13	2432 022 41112 ▲	100
26	38,10	31,75	2432 022 41113 ▲	100
34	48,26	41,91	2432 022 41114 ▲	100
40	55,88	49,53	2432 022 41115 ▲	100
50	68,58	62,23	2432 022 41116 ▲	100

For ribbon cables, see data sheet "Ribbon Cables F303".

For assembling tools, see data sheet "Insulation Displacement Tools".

How to order

Order the connector by quoting the 12-digit catalogue number as shown in Table 1. Note that the catalogue number applies to one connector (contact block + pressure block), and take into account the smallest packing quantity; please order in multiples of this quantity.

Example: The minimum quantity of the connector with 26 contacts should be ordered as:
100 x 2432 022 41113.

▲ Preferred.

MOUNTING

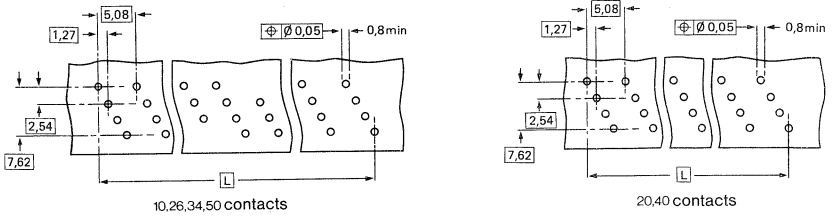
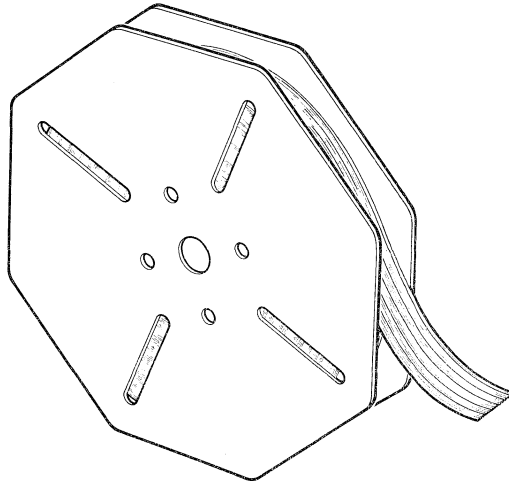


Fig. 2 Hole patterns; see Table 1 for dimension L.

RIBBON CABLES



Type	AWG 28/1 (solid)	AWG 28/7 (stranded)	AWG 30/1 (solid)
Listed style	2651	2651	2651
Length	50 ± 0,5 m	50 ± 0,5 m	50 ± 0,5 m
Colour	grey (RAL 7032)	grey (RAL 7032)	grey (RAL 7032)
Insulation material	PVC	PVC	PVC
Conductor material	tinned copper	tinned copper	tinned copper
Number of strands	—	7	—
Thickness of strands	—	AWG 36 (0,012 mm ²)	—
Maximum current at T _{amb} = 70 °C	1 A	1 A	1 A
Insulation resistance	> 10 ⁴ MΩ/km	> 10 ⁴ MΩ/km	> 10 ⁴ MΩ/km
Conductor resistance	230 mΩ/m	215 mΩ/m	330 mΩ/m
Impedance at 100 kHz	110 Ω ± 10%	100 Ω ± 10%	130 Ω ± 10%
Capacitance	42 pF/m	60 pF/m	42 pF/m
Propagation delay time	4,5 ns/m	4,5 ns/m	4,5 ns/m
Ambient temperature range	−55 to + 105 °C	−55 to + 105 °C	−55 to + 105 °C

Colour coding

1st wire marked red (visible at both sides), every 5th wire marked black

Flammability

according to UL94, category V-0

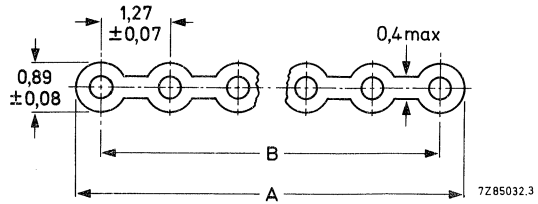


Fig. 1 Ribbon cable; see Table 1 for dimensions A and B.

Table 1 Ribbon cables

number of wires	A mm	B mm	catalogue number [▲]		
			AWG 28/1	AWG 28/7	AWG 30/1
9	11,43	10,16		0712 150 05007	0712 236 00032
10	12,70	11,43	0712 236 00022	02007	00033
14	17,78	16,51	00023	02008	00034
15	19,05	17,78		02015	00035
16	20,32	19,05	00024	02009	00036
20	25,40	24,13	00025	04005	00037
24	30,48	29,21		04008	00038
25	31,75	30,48		04009	00039
26	33,02	31,75	00026	04006	00041
34	43,18	41,91	00027	06003	00042
37	46,99	45,72		06012	00043
40	50,80	49,53	00028	06004	00044
50	63,50	62,23	00029	06005	00045
60	76,20	74,93	00031	06006	00051
64	81,28	80,01	00047	06013	00046

The ribbon cables (50 m) are supplied on reels (Fig. 2).

How to order

Order the ribbon cable by quoting the 12-digit catalogue number as shown in Table 1. Take into account the smallest packing quantity of 50 m; please order in multiples of this quantity.

Example: 400 m ribbon cable AWG 28/1, with 16 wires, should be ordered as: 400 metre 0712 236 00024

[▲] Preferred.

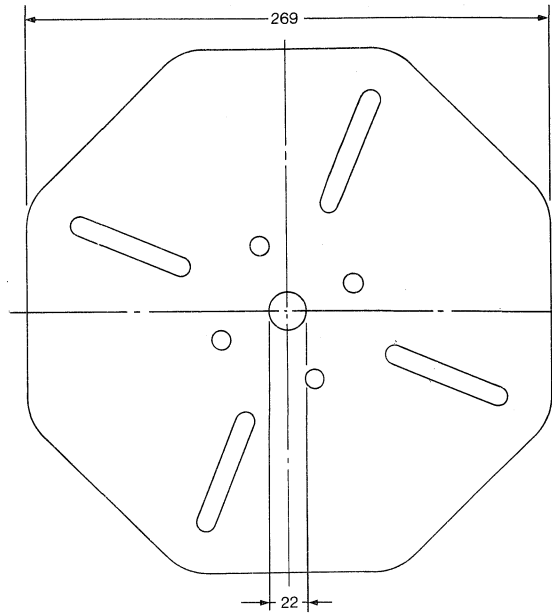


Fig. 2 Reel.

Note: To prevent deformation of the ribbon cable, the reels must always be positioned vertically (storage and assembling).

INSULATION DISPLACEMENT TOOLS

The assembling tools shown in Figs 1, 2 and 3 are available for assembling the IDC-type connectors F068-I, F161 and F303. Appropriate cable cutting jigs and assembling jigs, to be used with the tools, are supplied separately.

When used with the cable cutting jig, the tool cuts the cable cleanly, squarely and accurately to length; when used with the assembly jig, the tool applies the correct pressure to both parts of the connector, ensuring proper assembly.

Hand assembly tool (Fig. 1); see also pages 2 and 3

For small series, prototypes and repairs.
It can be bench-mounted for easy operation.

Overall dimensions: 240 mm x 300 mm x 240 mm.

To be used for assembling:

- all F303 connector types;
- F068-I female parts with IDC terminations;
- F161 subminiature rack and panel connectors with IDC terminations.

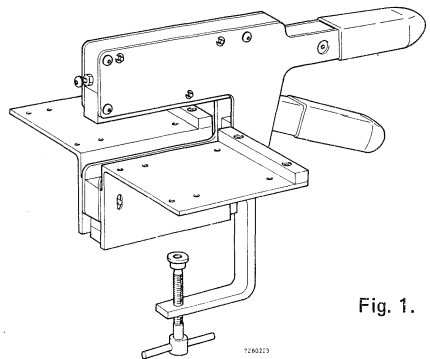


Fig. 1.

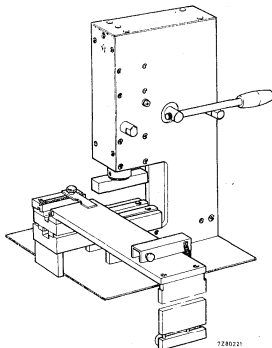


Fig. 2.

Manual bench press (Fig. 2); see also pages 4 and 5

Performs the same functions as the hand assembly tool, but with more facilities and higher pressing force (15 kN).

Overall dimensions: 430 mm x 430 mm x 600 mm.

Mass: approx. 25 kg.

To be used for assembling:

- F068-I female parts with IDC terminations;
- F161 subminiature rack and panel connectors with IDC terminations.

Electrical assembly unit (Fig. 3); see also pages 6 and 7

For large series.

Overall dimensions: 420 mm x 550 mm x 210 mm.

Required mains voltage: 220 V, 50/60 Hz.

Power consumption: 150 W

Length of mains cable: 1,5 m

Mass: approx. 16 kg

To be used for assembling:

- all F303 connector types.

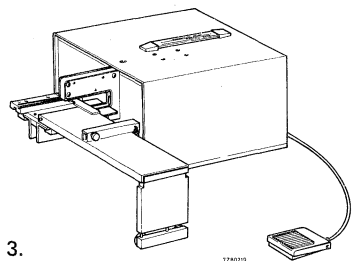
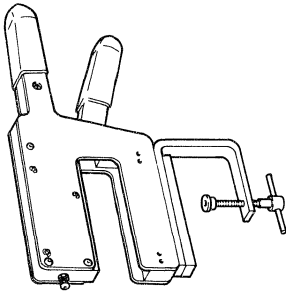
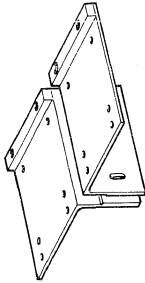


Fig. 3.

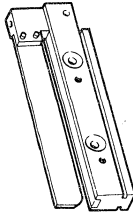
Survey of parts: hand assembly tool



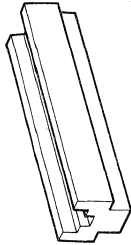
Basic tool



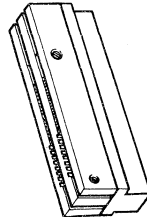
Plates with cable guides



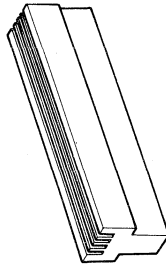
Cutter



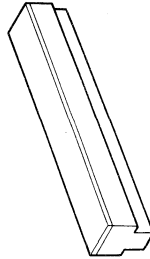
Jig for F068-1 and F161 connectors



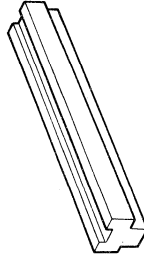
Jig and jig under part for F303 DIS and DIS mini connectors



Jig for F303 DIP and PB transition connectors



Jig for F303 PB transition connector, for assembling after soldering.



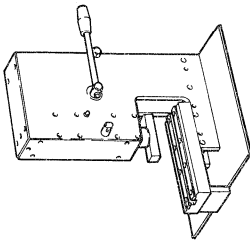
Jig for F303 cable connector

How to order: Order the assembling tool, its associated parts and appropriate jigs by quoting the 12-digit catalogue numbers as shown in the table on the opposite page. Note that the catalogue number applies to one piece.

part	catalogue number of part 2432 022 for use with IDC connector				
	F303 cable connector	F303 DIS connector	F303 DIS mini connector	F303 DIP/PB transition connector	F068-I F-161
For assembling					
basic tool	90064	90064	90064	90064	90064
plates with left	90091	90091	90091	90091	90091
plates with right	90092	90092	90092	90092	90092
cable guides	90034 (without cable stop)	90021 (14 contacts)	90024 (20 contacts)	90087	90016 (female)
jig	90035 (with cable stop)	90022 (16 contacts)	90025 (26 contacts)	90088*	90028 (male)
jig		90023 (24 contacts)	90026 (34 contacts)		
jig under part		90017	90017		
For cable cutting					
cutter	90018	90018	90018	90018	90018
spare knife	90059	90059	90059	90059	90059
spare plastic parts	90058	90058	90058	90058	90058

* For assembling PB transition connector after print mounting.

Survey of parts: Manual bench press



Basic tool

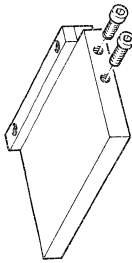
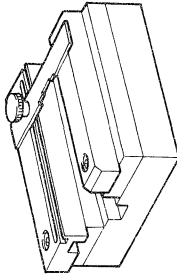
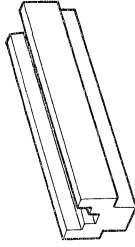


Plate with cable guide



Jig holder with connector/
cable guide



Jig

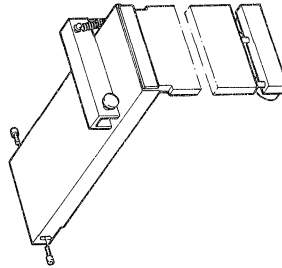
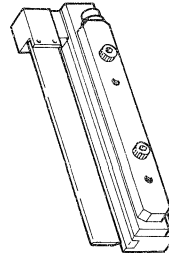
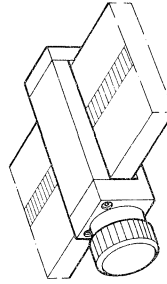


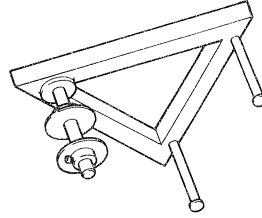
Table with support and cable clamp



Cutter with connection part



Length guide (for table, 750 mm)

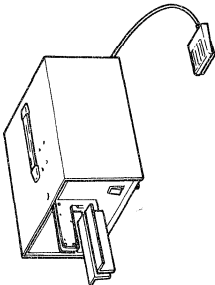


Reel holder

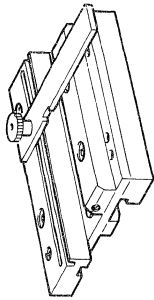
How to order: Order the assembling tool, its associated parts and appropriate jigs by quoting the 12-digit catalogue numbers as shown in the table on the opposite page. Note that the catalogue number applies to one piece.

part	catalogue number of part for use with IDC connector	
	F068-I	F161
For assembling		
basic tool	2432 022 90041	2432 022 90041
jig holder	90044	90044
jig	90046	90016 (female)
jig		90028 (male)
connector/cable guide	90012	90013
cable clamp	90007	90007
table, 250 mm	90003	90003
table, 750 mm	90011	90011
support	90004	90004
reel holder	90019	90019
For cable cutting		
plate with cable guide	90094	90094
cutter	90018	90018
spare knife	90059	90059
spare plastic parts	90058	90058
length guide	90015	90015
connection part for cutter	90093	90093

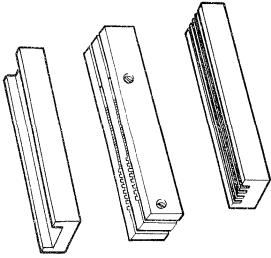
Survey of parts: Electrical assembly unit



Basic tool with pair of slices



Jig holder with connector/
cable guide



Jigs

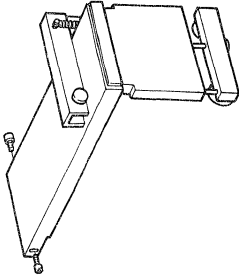


Table with support
and cable clamp

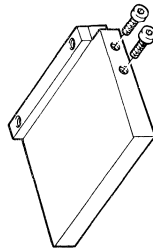
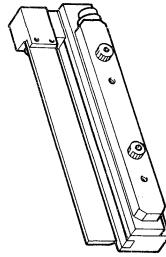
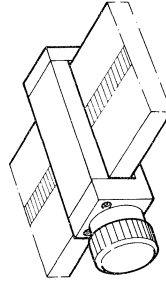


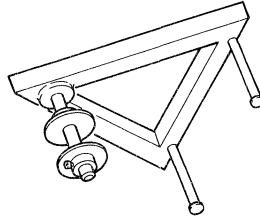
Plate with cable guide



Cutter with connection part



Length guide (for table, 750 mm)



Reel holder

How to order: Order the assembling tool, its associated parts and appropriate jigs by quoting the 12-digit catalogue numbers as shown in the table on the opposite page. Note that the catalogue number applies to one piece.

catalogue number of part 2432 022				
for use with IDC connector				
part	F303 cable connector	F303 DIS connector	F303 DIS mini connector	F303 DIP/PB transition connector
For assembling				
basic tool	90052	90052	90052	90052
pair of slides	90001	90001	90001	90001
jig holder	90002	90002	90002	90002
jig	90037 (with cable stop)	90021 (14 contacts)	90024 (20 contacts)	90031
jig	90038 (without cable stop)	90022 (16 contacts)	90025 (26 contacts)	90032*
jig		90023 (24 contacts)	90026 (34 contacts)	
connector/cable guide	90095	90097 (24 contacts)	90096	90089 (DIP)
connector/cable guide		90098 (14/16 contacts)		90099 (PB transition)
cable clamp	90007	90007	90007	90007
table, 250 mm	90003	90003	90003	90003
table, 750 mm	90011	90011	90011	90011
support	90004	90004	90004	90004
reel holder	90019	90019	90019	90019
For cable cutting				
plate with cable guide	90094	90094	90094	90094
cutter	90018	90018	90018	90018
spare knife	90059	90059	90059	90059
spare plastic parts	90058	90058	90058	90058
length guide	90015	90015	90015	90015
connection part for cutter	90093	90093	90093	90093

* For assembling PB transition connector after print mounting.

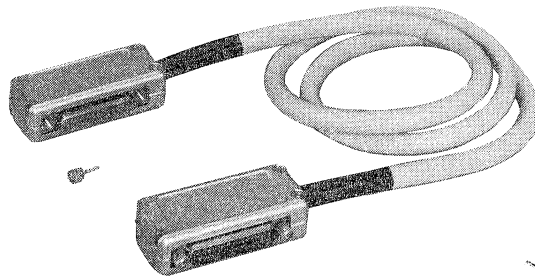
CABLE ASSEMBLY

- For IEC Standard-Interface Systems according to IEC 625-1.

QUICK REFERENCE DATA

Number of connections	25
Cable length	600, 750, 1000, 1200, 2000, 4000, 10 000 mm
Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	1,5 A
Climatic category, IEC 68	25/070/21
Basic specification	IEC 625-1*

790514-06-01



* Supersedes document IEC 66(CO) 22.

APPLICATION

This cable assembly is used for interconnecting programmable test and measuring instruments according to the IEC Standard-Interface System.

DESCRIPTION

The cable assembly consists of a multicore cable, which is terminated at both ends with a combination plug and socket.

The cable contains 24 wires, twisted in pairs, of which 16 are used as signal paths and 8 as logic ground returns. It is provided with an outer screen.

The combination plug and socket consists of an F161 25-pole male connector and a 25-pole female connector mounted back-to-back and connected in parallel. Each pair of connectors is assembled in a metal housing, consisting of two identical parts, fitted with two screws and nuts. Two knurled screws at the male side facilitate the fitting of the connector combination to other cable assemblies or to the male output connector of the instrument to be interconnected.

The cable and the connectors are designed according to the requirements laid down in IEC 625-1.*

Screws are available for mounting the output connectors of instruments, facilitating the locking of IEC Standard-Interface cables.

* Supersedes document IEC 66 (CO) 22.

ELECTRICAL DATA**Cable assembly**

Current at $T_{amb} = 20\text{ }^{\circ}\text{C}$	1,5 A
Proof voltage for 1 min, at $20\text{ }^{\circ}\text{C}$	
between contacts	500 V (r.m.s.), 50 Hz
between a contact and earth	500 V (r.m.s.), 50 Hz

Connectors

Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz	$\leq 5\text{ m}\Omega$
Insulation resistance	
initially	$> 10^5\text{ M}\Omega$
after damp heat test	$> 10^3\text{ M}\Omega$
Creepage distance	
between contacts	$\geq 1\text{ mm}$
between a contact and earth	$\geq 1\text{ mm}$
Clearance distance	
between contacts	$\geq 1\text{ mm}$
between a contact and earth	$\geq 1\text{ mm}$
Cable	
Capacitance between any signal line and all other lines at 1 kHz	$\leq 150\text{ pF/m}$
Resistance of	
each signal line	$\leq 0,14\text{ }\Omega/\text{m}$
signal line ground return	$\leq 0,14\text{ }\Omega/\text{m}$
common logic ground return	$\leq 0,085\text{ }\Omega/\text{m}$
overall shield	$\leq 0,0085\text{ }\Omega/\text{m}$

MECHANICAL DATA**Connectors**

Number of contacts	25
Positioning	trapezoidal shaped shell prevents incorrect insertion
Insertion force	≤ 129 N
Withdrawal force	≤ 78 N
Mechanical endurance	500 insertions; according to IEC 512-5, test 9a
Contacts	
material	copper alloy
shape	round pins and cylindrical sockets with a two-fold spring facility
finish	$\geq 0,5 \mu\text{m}$ hard gold on $\geq 2 \mu\text{m}$ nickel plating

Cable

Length	600, 750, 1000, 1200, 2000, 4000, 10 000 mm
Diameter	10,5 mm
Number of wires	24, twisted in pairs*
Wire type	stranded, high flex
Wire cross-section	AWG24 (0,23 mm ²)
Insulation	PVC
Overall shield	contains a braid of at least 85% coverage

ENVIRONMENTAL DATA

Climatic category (IEC 68)	25/070/21
Ambient temperature range	-25 to + 70 °C
Storage temperature range	-25 to + 70 °C

* Wire terminated at contacts 1 is twisted with wire terminated at contacts 14; wire terminated at contacts 2 is twisted with wire terminated at contacts 15; etc. Wire terminated at contacts 12 is twisted with wire terminated at contacts 25; the overall shield is connected to contacts 13.

DIMENSIONAL DATA

Dimensions in mm

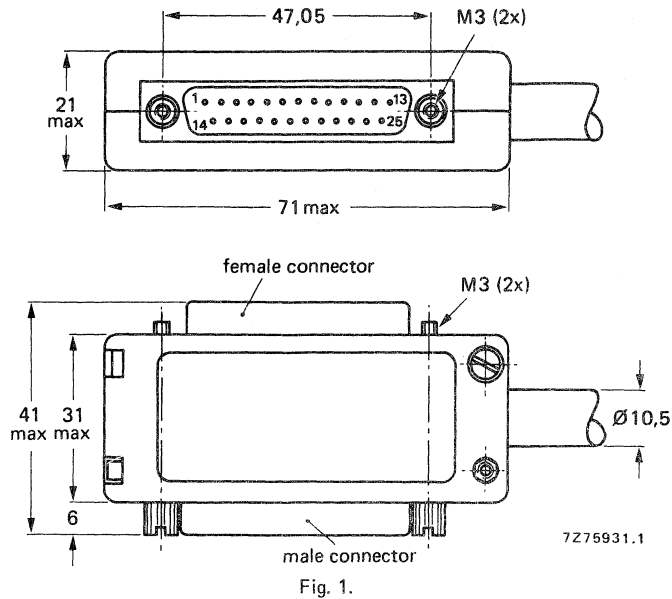


Table 1 Catalogue numbers for ordering

cable length mm	catalogue number of cable assembly
600	2422 606 00001
750	00002
1000	00003
1200	00004
2000	00005
4000	00006
10 000	00007

MARKING

Both cable ends are marked with 12-digit catalogue number and name of manufacturer.

ACCESSORIES

To suit the output connector* of an instrument to the IEC Standard-Interface System knurled fixing screws (Fig. 2) can be supplied, which accept the locking screws of a cable assembly.

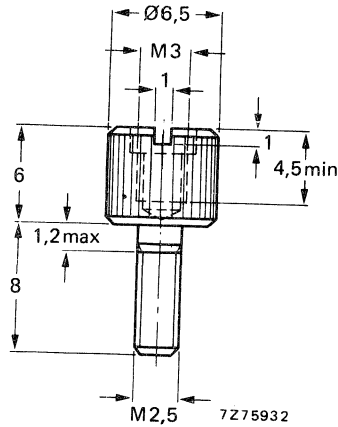


Fig. 2.

The material of the fixing screws is steel with nickel plating.
Catalogue number for ordering : 2422 606 00051.

PACKING

Each cable assembly is packed in a plastic bag.
The fixing screws are packed in plastic bags, containing 100 screws;
please order in multiples of this quantity.

* The output connector of an instrument to be connected to the IEC Standard-Interface cable is a male connector.

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