PHILIPS

Data handbook

Electronic components and materials

Components and materials

Part 10 October 1980

Connectors

COMPONENTS AND MATERIALS

PART 10 - OCTOBER 1980

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.

May 1980

ELECTRON TUBES (BLUE SERIES)

Starting in 1980, new part numbers and corresponding codes are being introduced. The former code of the preceding issue is given in brackets under the new code.

Part 1	**February 1980**	**T1 02-80** **(ET1a 12-75)**	**Tubes for r.f. heating**
Part 2	**April 1980**	**T2 04-80** **(ET1b 08-77)**	**Transmitting tubes for communications**
Part 2b	**May 1978**	**ET2b 05-78**	**Microwave semiconductors and components** Gunn, Impatt and noise diodes, mixer and detector diodes, backward diodes, varactor diodes, Gunn oscillators, sub-assemblies, circulators and isolators.
Part 3	**June 1980**	**T3 06-80** **(ET2a 11-77)**	**Klystrons, travelling-wave tubes, microwave diodes**
Part 3	**January 1975**	**ET3 01-75**	**Special Quality tubes, miscellaneous devices**
Part 4	**September 1980**	**T4 09-80** **(ET2a 11-77)**	**Magnetrons**
Part 5a	**October 1979**	**ET5a 10-79**	**Cathode-ray tubes** Instrument tubes, monitor and display tubes, C.R. tubes for special applications.
Part 5b	**December 1978**	**ET5b 12-78**	**Camera tubes and accessories, image intensifiers**
Part 6	**July 1980**	**T6 07-80** **(ET6 01-77)**	**Geiger-Müller tubes**
Part 7a	**March 1977**	**ET7a 03-77**	**Gas-filled tubes** Thyratrons, industrial rectifying tubes, ignitrons, high-voltage rectifying tubes.
Part 7b	**May 1979**	**ET7b 05-79**	**Gas-filled tubes** Segment indicator tubes, indicator tubes, switching diodes, dry reed contact units.
Part 8	**July 1979**	**ET8 07-79**	**Picture tubes and components** Colour TV picture tubes, black and white TV picture tubes, monitor tubes, components for colour television, components for black and white television.
Part 9	**June 1980**	**T9 06-80** **(ET9 03-78)**	**Photo and electron multipliers** Photomultiplier tubes, phototubes, single channel electron multipliers, channel electron multiplier plates.

SEMICONDUCTORS (RED SERIES)

Starting in 1980, new part numbers and corresponding codes are being introduced. The former code of the preceding issue is given in brackets under the new code.

Part 1	**March 1980**	**S1 03-80** **(SC1b 05-77)**	**Diodes** Small-signal germanium diodes, small-signal silicon diodes, special diodes, voltage regulator diodes (< 1,5 W), voltage reference diodes, tuner diodes, rectifier diodes
Part 2	**May 1980**	**S2 05-80** **(SC1a 08-78)**	**Power diodes, thyristors, triacs** Rectifier diodes, voltage regulator diodes (> 1,5 W), rectifier stacks, thyristors, triacs
Part 2	**June 1979**	**SC2 06-79**	**Low-frequency power transistors**
Part 3	**January 1978**	**SC3 01-78**	**High-frequency, switching and field-effect transistors***
Part 3	**April 1980**	**S3 04-80** **(SC2 11-77, partly)** **(SC3 01-78, partly)**	**Small-signal transistors**
Part 4a	**December 1978**	**SC4a 12-78**	**Transmitting transistors and modules**
Part 4b	**September 1978**	**SC4b 09-78**	**Devices for optoelectronics** Photosensitive diodes and transistors, light-emitting diodes, photocouplers, infrared sensitive devices, photoconductive devices
Part 4c	**July 1978**	**SC4c 07-78**	**Discrete semiconductors for hybrid thick and thin-film circuits**
Part 5	**October 1980**	**S5 10-80** **(SC3 01-78)**	**Field-effect transistors**

* Wideband transistors will be transferred to SC3c. The old book SC3 01-78 should be kept until then.

INTEGRATED CIRCUITS (PURPLE SERIES)

Starting in 1980, new part numbers and corresponding codes are being introduced. The former code of the preceding issue is given in brackets under the new code. Books with the purple cover will replace existing red covered editions as each is revised.

Part 1	**May 1980**	**IC1 04-80 (SC5b 03-77)**	**Bipolar ICs for radio and audio equipment**
Part 2	**May 1980**	**IC2 04-80 (SC5b 03-77)**	**Bipolar ICs for video equipment**
Part 5a	**November 1976**	**SC5a 11-76**	**Professional analogue integrated circuits**
Part 4	**October 1980**	**IC4 10-80 (SC6 10-77)**	**Digital integrated circuits** LOCMOS HE4000B family
Part 6b	**August 1979**	**SC6b 08-79**	**ICs for digital systems in radio and television receivers**

Signetics integrated circuits

Bipolar and MOS memories 1979
Bipolar and MOS microprocessors 1978
Analogue circuits 1979
Logic - TTL 1978

COMPONENTS AND MATERIALS (GREEN SERIES)

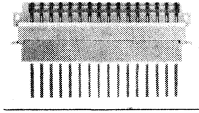
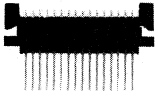
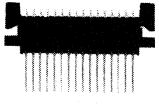
Starting in 1980, new part numbers and corresponding codes are being introduced. The former code of the preceding issue is given in brackets under the new code.

Part 1	July 1979	CM1 07-79	**Assemblies for industrial use** PLC modules, high noise immunity logic FZ/30 series, NORbits 60-series, 61-series, 90-series, input devices, hybrid integrated circuits, peripheral devices
Part 3a	September 1978	CM3a 09-78	**FM tuners, television tuners, surface acoustic wave filters**
Part 3b	October 1978	CM3b 10-78	**Loudspeakers**
Part 4a	November 1978	CM4a 11-78	**Soft Ferrites** Ferrites for radio, audio and television, beads and chokes, Ferroxcube potcores and square cores, Ferroxcube transformer cores
Part 4b	February 1979	CM4b 02-79	**Piezoelectric ceramics, permanent magnet materials**
Part 6	April 1977	CM6 04-77	**Electric motors and accessories** Small synchronous motors, stepper motors, miniature direct current motors
Part 7	September 1971	CM7 09-71	**Circuit blocks** Circuit blocks 100 kHz-series, circuit blocks 1-series, circuit blocks 10-series, circuit blocks for ferrite core memory drive
Part 7a	January 1979	CM7a 01-79	**Assemblies** Circuit blocks 40-series and CSA70 (L), counter modules 50-series, input/output devices
Part 8	June 1979	CM8 06-79	**Variable mains transformers**
Part 9	August 1979	CM9 08-79	**Piezoelectric quartz devices** Quartz crystal units, temperature compensated crystal oscillators
Part 10	October 1980	C10 10-80	**Connectors**
Part 11	December 1979	CM11 12-79	**Non-linear resistors** Voltage dependent resistors (VDR), light dependent resistors (LDR), negative temperature coefficient thermistors (NTC), positive temperature coefficient thermistors (PTC)
Part 12	November 1979	CM12 11-79	**Variable resistors and test switches**
Part 13	December 1979	CM13 12-79	**Fixed resistors**
Part 14	April 1980	C14 04-80 (CM2b 02-78)	**Electrolytic and solid capacitors**
Part 15	May 1980	C15 05-80 (CM2b 02-78)	**Film capacitors, ceramic capacitors, variable capacitors**

CONNECTORS

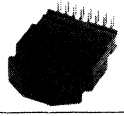
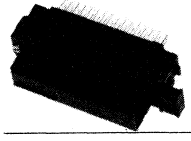
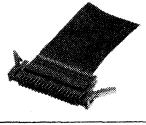
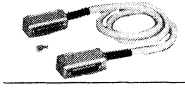
SURVEY

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	pins for wire wrapping	crimp contacts		
PRINTED-WIRING CONNECTORS												
	F045*				•	1 to 54 (single row) 2 to 108 (double row)	•				4,5	300
	F046*		•			4 to 45 (single row) 8 to 90 (double row)	•				4,5	300
	F047*			•		6, 10, 15, 18, 22 (single row) 12, 20, 30, 36, 44 (double row) 6, 10, 15, 18, 22 (bridged)	•				5,5	250
	F050*			•		6, 10, 15, 18, 22 (single row) 12, 20, 30, 36, 44 (double row) 6, 10, 15, 18, 22 (bridged)	•				5,5	100
	F053*			•		6, 10, 15, 18, 22, 28, 36, 43 (single row) 12, 20, 30, 36, 44, 56, 72, 86 (double row)		•	•		4	250
PRINTED-WIRING INTERCONNECTORS												
	F051*			•		6, 10, 15, 18, 22 (single row) 12, 20, 30, 36, 44 (double row)	•				5,5	300

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	pins for wire wrapping	crimp contacts		
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	400 (IEC/DIN) 500 (VG)
	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.

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	pins for wire wrapping	crimp contacts		
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) 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 20 (double row)		• • • • • • •	 • • •		 3 	 300 300 25 300 300

type	type number	pitch mm (in)	number of contacts	terminations				current at 20 °C A	mechanical endurance (insertions)
				solder tags or pins	dip-solder pins	pins for wire wrap-ping	crimp-con-tacts		
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 (double row)	cable connector has insulation displacement terminations		•	•	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
0712 150 0	F303; cable with stranded wires
0712 236 0	F303; cable with solid wires
2422 020 5	F045
2422 024 88003	F088; female plug
2422 025 8801 .	F121
2422 025 8802 .	F121
2422 025 88031	F121
2422 025 88032 up to 2422 025 88067	F068-II
2422 025 8809 .	F068-II
2422 025 881 . .	F068-II
2422 025 890 . .	F051
2422 025 891 . .	F054
2422 025 89283 up to 2422 025 89302	F068-I
2422 025 89303	F088; mounting strip
2422 025 89313 up to 2422 025 89448	F068-I
2422 025 89458	F121
2422 025 89483 up to 2422 025 89537	F068-I
2422 036 6	F046
2422 037 0	F050
2422 037 7	F047
2422 039 0	F053; connectors with pins for wire wrapping
2422 044 0	F053; connectors with dip solder pins

catalogue number	type number
2422 049	F081
2422 050	F080
2422 062 0	F095; panel sockets
2422 062 1	F095; board edge sockets
2422 062 4	F095; male headers with straight pins
2422 062 5	F095; male headers with straight pins
2422 062 6	F095; male headers with straight pins
2422 062 7	F095; male headers with 90° angled pins
2422 062 8	F095; bottom-entry sockets
2422 606 0000 .	F501; cable assembly
2422 606 00051	F501; fixing screw
2422 606 2	F161; connectors with solder cups
2422 606 3	F161; connectors with solder cups
2422 606 4	F161; connectors with pins for wire wrapping
2422 606 5	F161; connectors with pins for wire wrapping
2422 606 6	F161; connectors with straight dip-solder pins
2422 606 7	F161; connectors with straight dip-solder pins
2422 606 8	F161; connectors with 90° angled dip-solder pins
2422 606 9	F161; connectors with 90° angled dip-solder pins
2432 023 0	F303; male headers
2432 023 1	F303; male headers
2432 023 2	F303; male headers
2432 023 3	F303; male headers
2432 023 4	F303; cable connectors
2432 023 5	F303; cable connectors
2432 023 9	F303; accessories and tools
2622 540 10 . . .	F161; tools
3522 201 65250	F121; cable clamps
3522 201 65260	F121; cable clamps
3522 201 66440	F120; mounting brackets
3522 201 70460	F120; mounting brackets
3522 202 08940	F080, F081; accessories
3522 202 15230	F080, F081; accessories
3522 202 15240	F080, F081; accessories

catalogue number	type number
4322 027 58 . . .	F120
4322 027 59 . . .	
4322 027 7	F121; cable hoods
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 10840	F054; accessories
4332 026 11110	F045; accessories
4332 026 16770	F088; contact pin

catalogue number	type number
4332 026 224 . .	F161; connectors for crimp-on snap-in connections
4332 026 225 . .	F161; tools
4332 026 23 . . .	F161; accessories
4332 026 24 . . .	
4332 026 25 . . .	F068-I; accessories
4332 026 260 . .	
4332 026 269 . .	F161; tools
4332 026 28 . . .	F068-I; accessories
4332 026 29 . . .	
4332 026 30 . . .	

GLOSSARY OF TERMS

This glossary covers most of the terms used in this data handbook. For comprehensive explanation of terms reference is made to IEV 581, from which the greater part of this glossary is derived.

Bifurcated contact – Flat contact with a lengthwise slot, the two arms of which apply contact force in the same direction.

Clearance – Path through the air between two contacts.

Coding parts – Parts to be used with two-part connectors to code, and guide mating connector parts during mating, preventing incorrect insertion.

Connector body – Connector less its contacts.

Connector insert – Insulating element designed to support and position the contacts in the connector.

Contact – Conductive element in the connector which mates with a corresponding element to provide an electrical path.

Contact force – Normal force (90^{o}) which exists between engaged contact surfaces.

Contact pitch – Distance between contact centres.

Contact resistance – Electrical resistance of a mated set of contacts under specified conditions.

Contact retention force – Axial force withstanding extraction of a removable contact from a connector.

Contact spring – Contact having elastic properties to provide a force to its mating part.

Contact surface – Area in contact between two mated contacts or a contact and a conductor, which provides an electrical path.

Creepage distance – Path across the surface of the connector body between two contacts.

Crimp contact – Contact having a conductor barrel designed to be crimped.

Derated current curve – Maximum current curve, which is 20% derated from the basic current carrying capacity, taking into account errors in temperature measurements in the equipment, and external factors e.g. wire sizes and unequal distribution of loaded circuits.

Dip-solder pin – Contact with a termination intended to be bath-soldered.

Female contact – Contact intended to make electrical engagement on its inner surface, and which will accept entry of a male contact.

Female part – Part of a two-part connector provided with female contacts for mating the contacts of the male part.

Grid – Orthogonal network of two sets of parallel equidistant lines for positioning connections on a printed board.

Insertion force – Force to insert fully a set of mating components without the effect of a coupling, locking or similar device.

Male contact – Contact intended to make electrical engagement on its outer surface, and which will enter a female contact.

Male part – Part of a two-part connector provided with male contacts for mating the contacts of the female part.

Panel cut-out – Hole or group of holes cut in a panel or chassis for mounting a connector.

Pin for wire wrapping – Contact with a termination designed to accept a wrapped connection.

Polarization – Features on mating components to prevent incorrect mating.

Polarization key – Device providing mating of two components in the correct way.

Printed-wiring connector – Connector provided with female contacts for mating with contacts on the edge of a printed-wiring board.

Printed-wiring interconnector – Connector provided on one side with female contacts for mating with contacts on the edge of a printed-wiring board, and on the other side with male contacts for mating with contacts of a receptacle.

Protruding earth contact – Contact pin of a male part which is longer than the other pins, preventing damage of sensitive components, when inserting the male part into the female part.

Rack and panel connector – Two-part connector intended to provide a connection between a unit and its mounting rack; normally the connector parts are engaged by the movement between the unit and the rack.

Solder cup – Contact termination having a cup or hollow cylinder to accept a wire and retain the applied solder.

Solder tag – Contact termination provided with an eyelet designed for attachment of the conductor by soldering.

Termination – Part of the contact to which a conductor is normally connected.

Tuning fork contact – Resilient contact having a shape similar to that of a tuning fork, the two arms of which apply contact force in opposite directions.

Two-part connector – Connector which consists of a mating pair of parts; one part is mechanically and electrically connected to a printed board, and the other part is mounted as required by equipment practice.

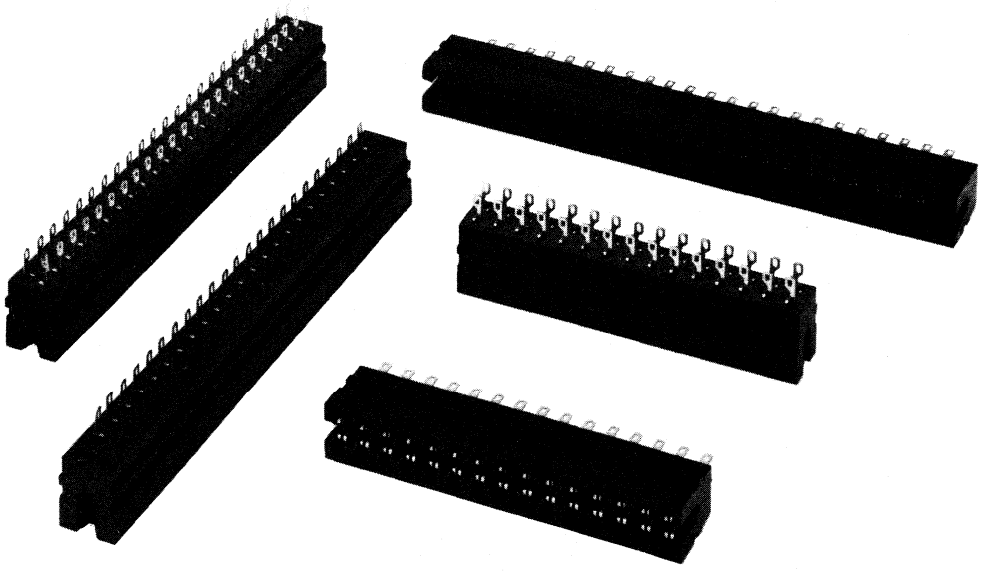
Withdrawal force – Force to withdraw fully a set of mating components without the effect of a coupling, locking or similar device.

PRINTED-WIRING CONNECTORS

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

QUICK REFERENCE 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
Terminations	solder tags
Current at T_{amb} = 20 °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 °C	4,5 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 outside the body:	
initially	$\leqslant$ 12 mΩ
after mechanical endurance	$\leqslant$ 12 mΩ
after damp heat test	$\leqslant$ 14 mΩ
Insulation resistance	
initially	$> 10^4$ MΩ
after damp heat test	$> 10^2$ MΩ
Creepage distance between contacts	$\geqslant$ 2,6 mm
Clearance between contacts	$\geqslant$ 0,5 mm
Proof voltage for 1 min, at 20 °C	
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	$\leqslant$ 1 pF

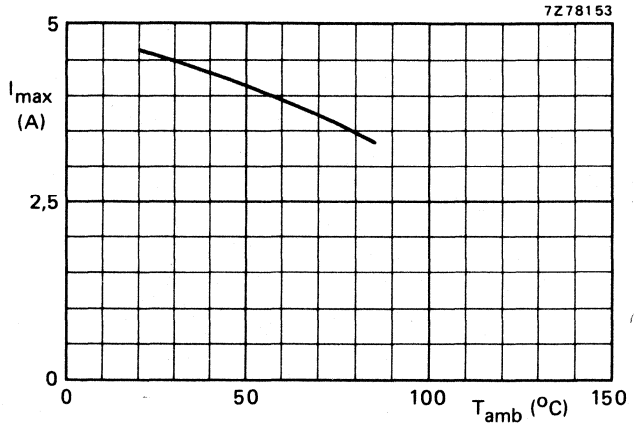


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

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	⩾ 0,75 μm gold plate on ⩾ 5 μm nickel plate
contact force	⩾ 1 N
type of terminations	solder tag
finish of terminations	gold flash
Solderability	235 °C, 2 s } according to IEC 68, test T
Resistance to soldering heat	350 °C, 10 s } according to IEC 68, test T
Shock	according to IEC 68, test Ea, 50g, 11 ms
Vibration	according to IEC 68, test Fc, 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 68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V0

DIMENSIONAL DATA

Dimensions in mm

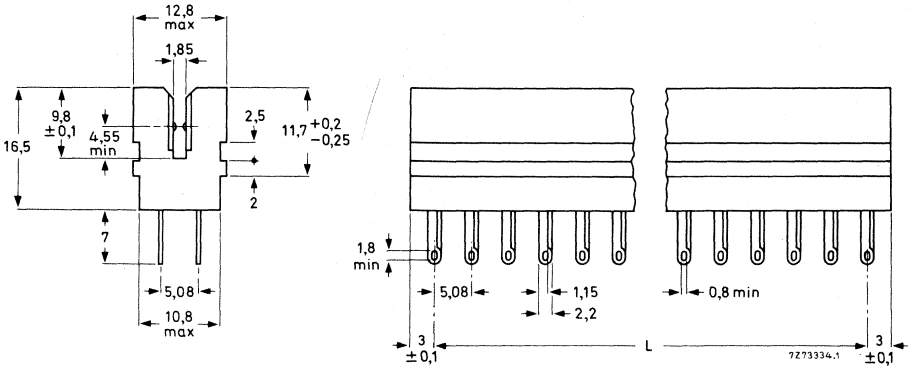


Fig. 2 Double row connector. See Table 1 for dimension L. For the single row version, one row of contact springs is omitted.

Table 1

number of contacts		L		catalogue number	
single row	double row	L_{nom}	tol.	single row	double row
3	6	10,16		2422 020 50302	2422 020 50312
4	8	15,24		50402	50412
5	10	20,32		50502	50512
6	12	25,40	± 0,20	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		51302	51312
14	28	66,04		51402	51412
15	30	71,12		51502	51512
16	32	76,20		51602	51612
17	34	81,28	± 0,30	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		52302	52312
24	48	116,84	± 0,40	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		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	± 0,40	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	± 0,50	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

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)

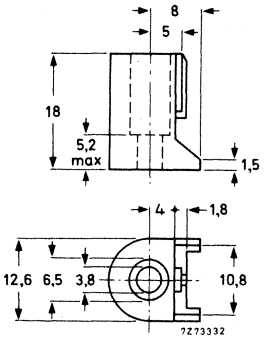


Fig. 3 Thermoplastic mounting bracket 4332 026 11110.

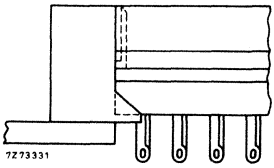
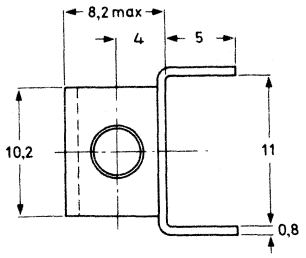


Fig. 4 Part view, showing mounting bracket in position.

* Only to be used with connectors without end contacts.



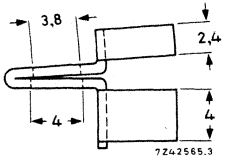


Fig. 5 Metal mounting bracket 4332 026 04760.

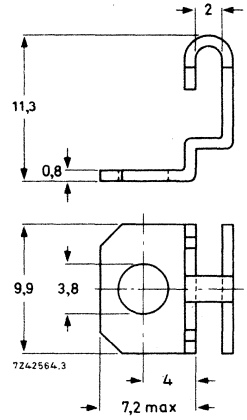


Fig. 7 Metal mounting bracket 4332 026 04750.

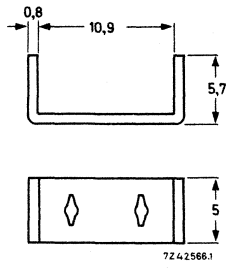


Fig. 9 Metal mounting bracket 4332 026 04630.

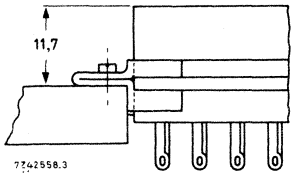


Fig. 6 Part view, showing mounting bracket in position.

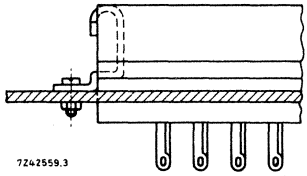


Fig. 8 Part view, showing mounting bracket in position.

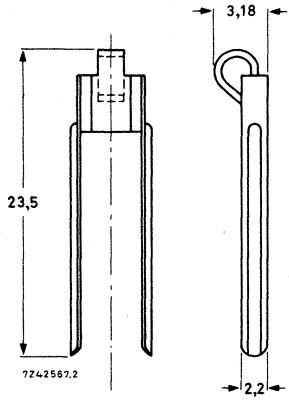


Fig. 10 End piece 4332 026 04770.

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.

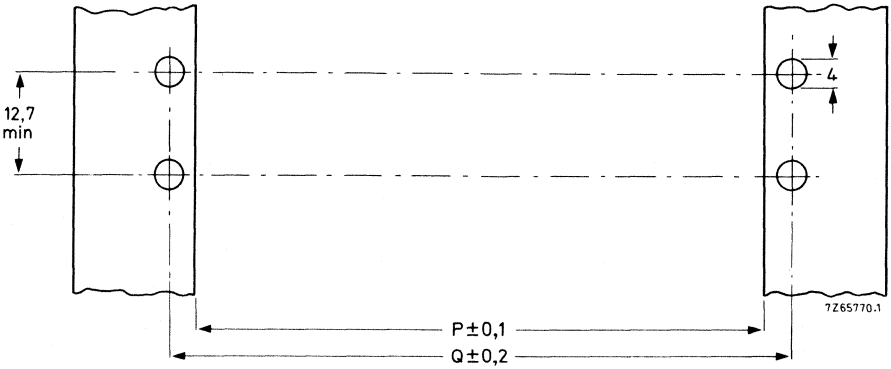


Fig. 12 Piercing diagram for rail mounting; see Table 3 for dimensions P and Q.

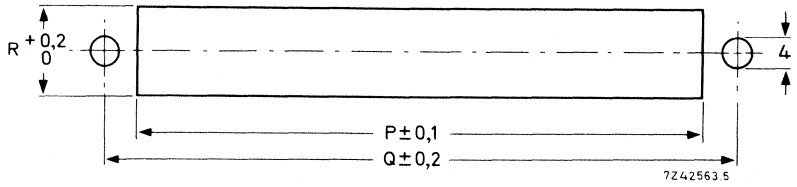


Fig. 13 Piercing diagram for panel mounting; see Table 3 for dimensions P, Q and R. If bracket 4332 026 04630 and end piece 4332 026 04770 are used the circular holes are superfluous.

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 / 04770	L_{max} + 6,2	L_{nom} + 14	11,0

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

Printed-wiring board recommendations

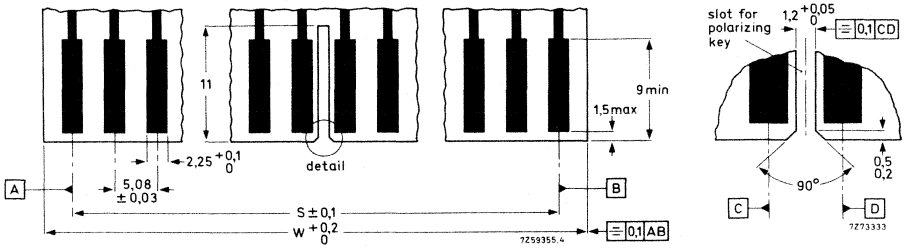


Fig. 14 Recommended dimensions of the printed-wiring board; see Table 4 for dimensions S and W.

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 | 04770	$L_{nom} - 10,16$	$L_{min} - 0,15$

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.

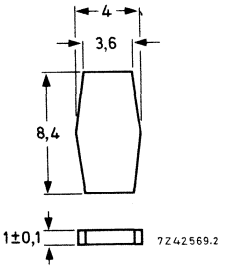


Fig. 15 Polarizing key.

MARKING

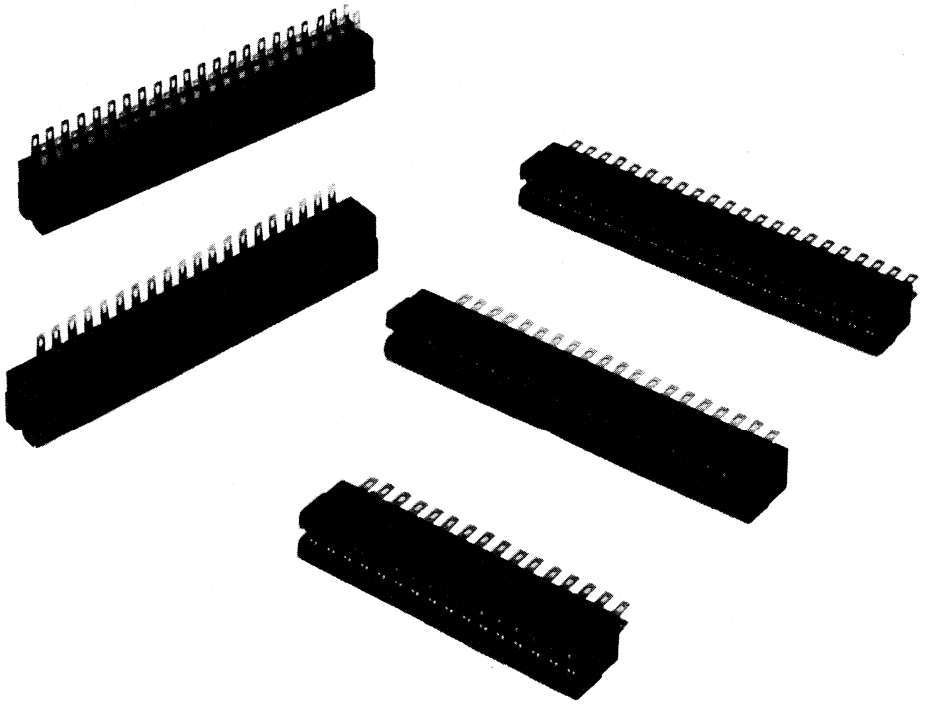
The package is marked with:
12-digit catalogue number;
reference number of manufacturer;
number of pieces.

PRINTED-WIRING CONNECTORS

- **3,81 mm (0,15 in) pitch**

QUICK REFERENCE 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
Terminations	solder tags
Current at T_{amb} = 20 °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 °C	4,5 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 outside the body:	
initially	$\leqslant$ 10 mΩ
after mechanical endurance	$\leqslant$ 10 mΩ
after damp heat test	$\leqslant$ 12 mΩ
Insulation resistance	
initially	$> 10^4$ MΩ
after damp heat test	$> 10^2$ MΩ
Creepage distance between contacts	$\geqslant$ 1,8 mm
Clearance between contacts	$\geqslant$ 0,4 mm
Proof voltage for 1 min , at 20 °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	$\leqslant$ 2 pF

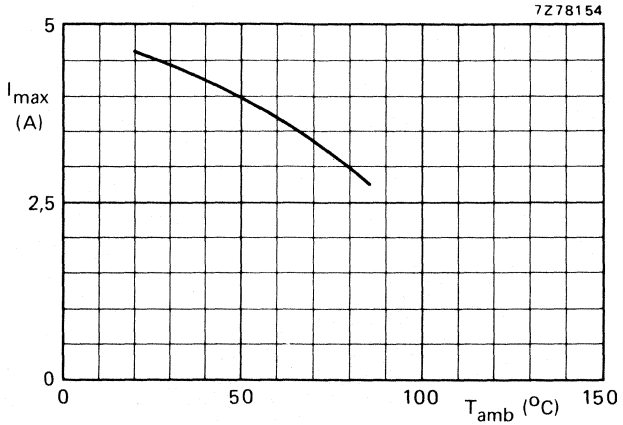


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

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	$\geqslant$ 0,8 μm gold plate on $\geqslant$ 5 μm nickel plate
contact force	$\geqslant$ 0,8 N
type of termination	solder tag
finish of termination	gold flash
Solderability	235 °C, 2 s } according to IEC 68, test T
Resistance to soldering heat	350 °C, 10 s } according to IEC 68, test T
Shock	according to IEC 68, test Ea, 50g, 11 ms
Vibration	according to IEC 68, test Fc, 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 68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V0

DIMENSIONAL DATA

Dimensions in mm

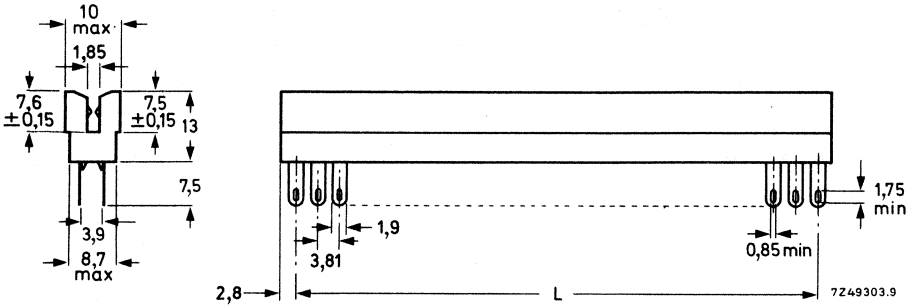


Fig. 2 Double row connector. See Table 1 for dimension L. For the single row version, one row of contact springs is omitted.

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	± 0,20	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	± 0,30	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

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);
- cadmium plated steel bracket, catalogue number 4332 026 06540 (Figs 5 and 6).

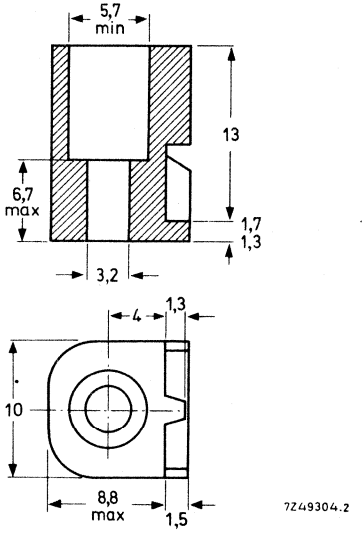


Fig. 3 Thermoplastic mounting bracket 4332 026 06560.

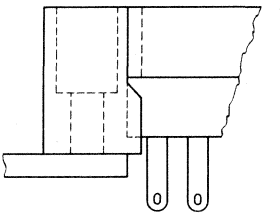


Fig. 4 Part view, showing mounting bracket in position.

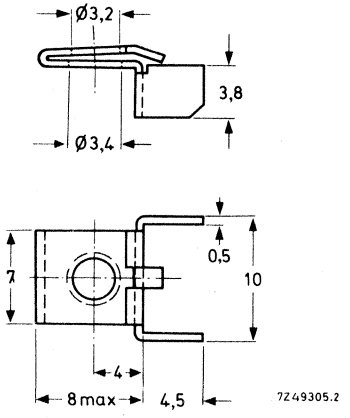


Fig. 5 Cadmium plated steel mounting bracket 4332 026 06540.

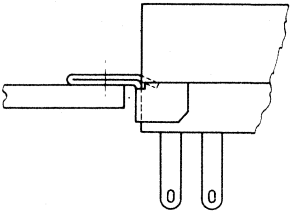


Fig. 6 Part view, showing mounting bracket in position.

Piercing diagrams

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

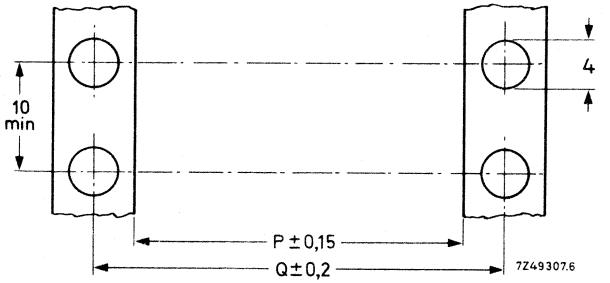


Fig. 7 Piercing diagram for rail mounting; P = L_{max} + 7 mm, Q = L_{nom} + 13,4 mm. For L_{nom} and L_{max} see Table 1.

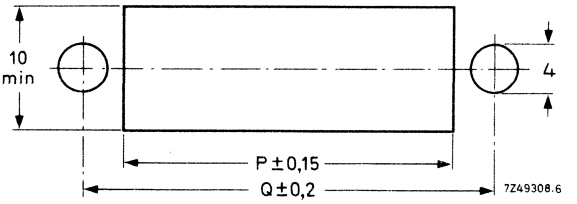


Fig. 8 Piercing diagram for panel mounting; P = L_{max} + 7 mm, Q = L_{nom} + 13,4 mm. For L_{nom} and L_{max} see Table 1.

Printed-wiring board recommendations

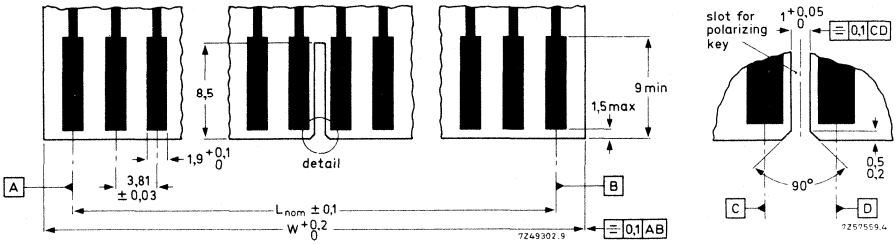


Fig. 9 Recommended dimensions of the printed-wiring board; $W = L_{nom} + 2{,}6$ mm. For L_{nom} see Table 1.

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.

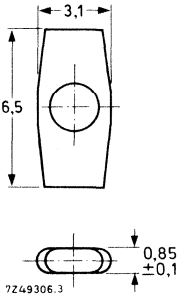


Fig. 10 Polarizing key.

MARKING

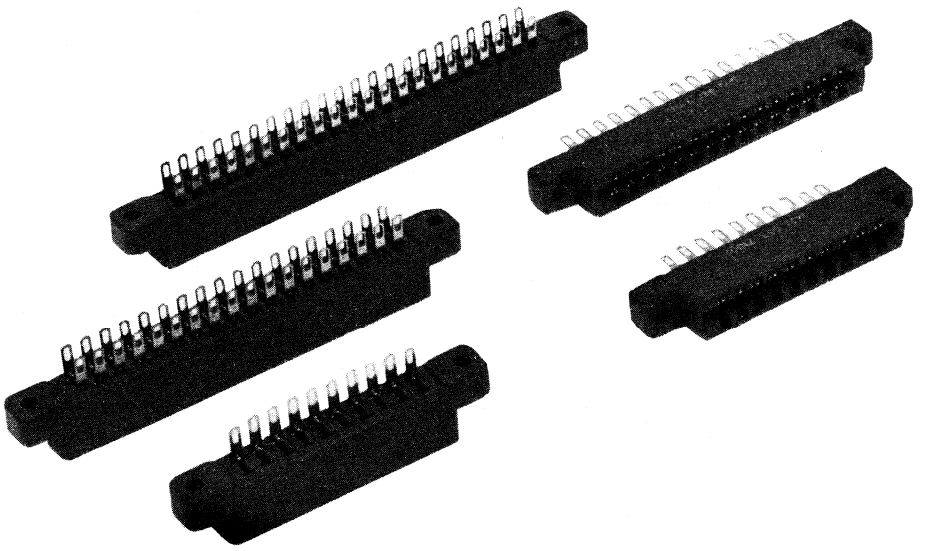
The package is marked with:
- 12-digit catalogue number;
- reference number of manufacturer;
- number of pieces.

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	
single row	6, 10, 15, 18 and 22
double row	12, 20, 30, 36 and 44
Board thickness	1, 42 to 1,78 mm
Terminations	solder tags
Current at T_{amb} = 20 °C	5,5 A
Mechanical endurance	250 insertions
Climatic category (IEC 68)	65/125/21
Basic specification	MIL-STD-C-21097-1



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 °C	5,5 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 outside the body:	
initially	$\leqslant$ 7 mΩ
after mechanical endurance	$\leqslant$ 7 mΩ
after damp heat test	$\leqslant$ 7 mΩ
Insulation resistance	
initially	$> 10^5$ MΩ
after damp heat test	$> 10^3$ MΩ
Creepage distance between contacts	$\geqslant$ 1,9 mm
Clearance between contacts	$\geqslant$ 0,4 mm
Proof voltage for 1 min, at 20 °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	$\leqslant$ 2 pF

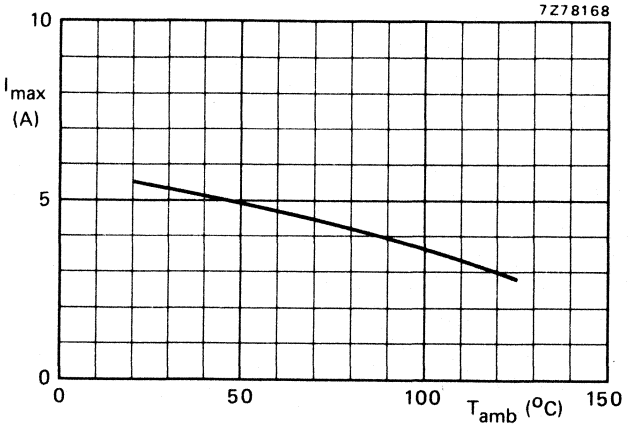


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

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	$\geqslant 1{,}3$ μm gold plate on $\geqslant 5$ μm nickel plate on $\geqslant 3$ μm 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 68, test T
Resistance to soldering heat	350 °C, 10 s } according to IEC 68, test T
Shock	according to IEC 68, test Ea, 50g, 11 ms
Vibration	according to IEC 68, test Fc, 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	$\leqslant 27$	7
20	$\leqslant 45$	10
30	$\leqslant 60$	14
36	$\leqslant 70$	17
44	$\leqslant 80$	20

ENVIRONMENTAL DATA

Climatic category (IEC 68)	65/125/21
Ambient temperature range	−65 to + 125 °C
Damp heat, steady state	according to IEC 68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Salt mist	according to IEC 68, test Ka, 24 h
Flammability	according to UL94, category V0

* Measured with mechanical gauge according to MIL-STD-C-21097-1.

DIMENSIONAL DATA

Dimensions in mm

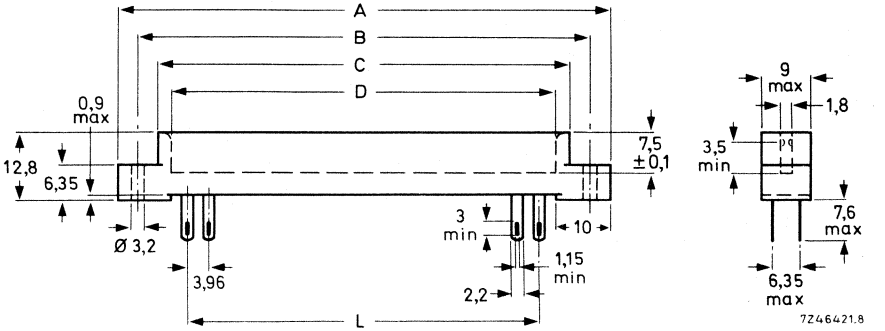


Fig. 2a Double row connector; see Table 2 for dimensions A, B, C, D and L. For the single-row version, one row of contacts is omitted.

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.

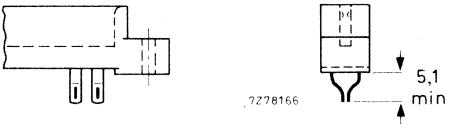


Table 2

number of contacts		dimensions						cataloque 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	19,80	+ 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

MOUNTING

Dimensions in mm

Panel cut-out

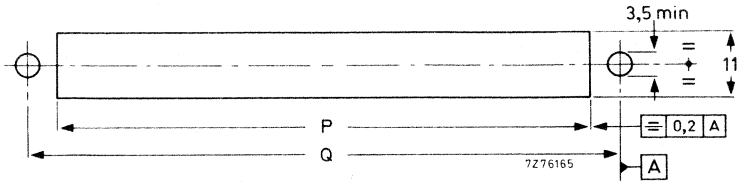
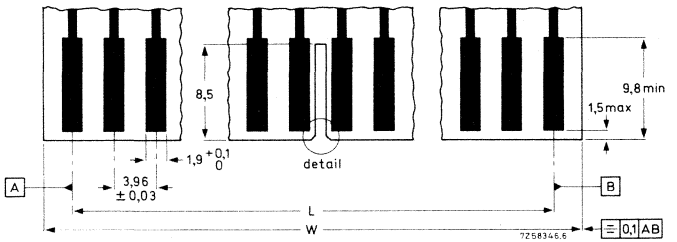


Fig. 3 Panel cut-out; see Table 3 for dimensions P and Q.

Table 3

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

Printed-wiring board recommendations



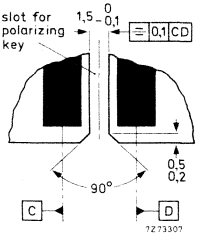


Fig. 4 Recommended dimensions of the printed-wiring board; see Table 4 for dimensions L and W.

Table 4

number of contacts		dimensions			
single row	double row	L		W	
6	12	19,80	± 0,1	27,78	−0,2
10	20	35,64		43,63	
15	30	55,44		63,44	
18	36	67,32		75,33	
22	44	83,16		91,13	

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.

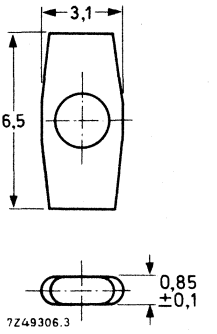


Fig. 5 Polarizing key.

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).

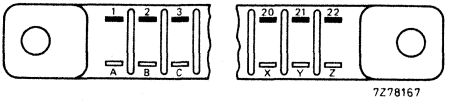


Fig. 6a Marking of single row connector with 22 contacts.

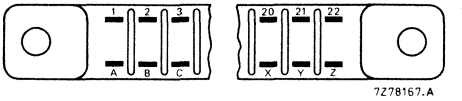


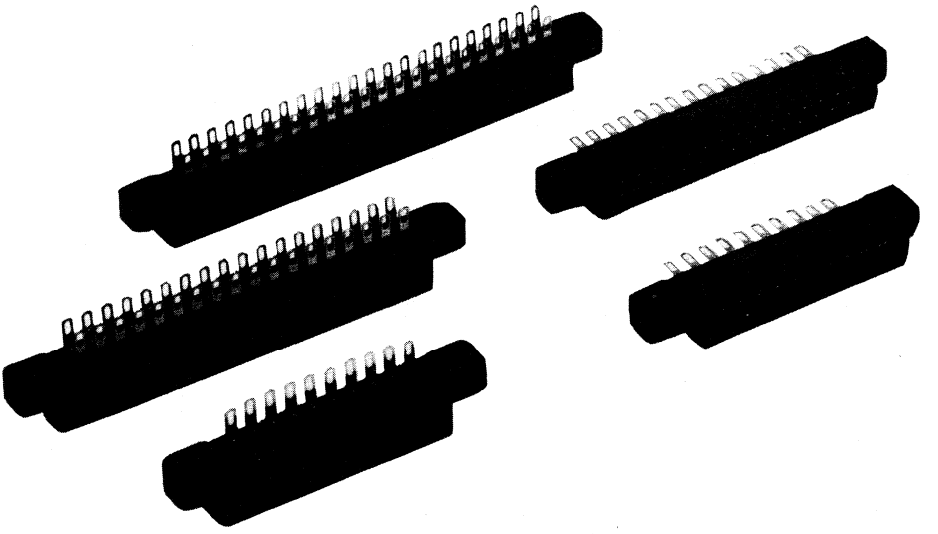
Fig. 6b Marking of double row connector with 44 contacts.

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	
single row	6, 10, 15, 18 and 22
double row	12, 20, 30, 36 and 44
Board thickness	1,42 to 1,78 mm
Terminations	solder tags
Current at T_{amb} = 20 °C	5,5 A
Mechanical endurance	100 insertions
Climatic category (IEC 68)	65/125/21



APPLICATION

For use in professional and industrial equipment.

DESCRIPTION

The connectors have a moulded body of a green 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 °C	5,5 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 outside the body:	
initially	$\leqslant$ 10 mΩ
after mechanical endurance	$\leqslant$ 10 mΩ
after damp heat test	$\leqslant$ 12 mΩ
Insulation resistance	
initially	$> 10^5$ MΩ
after damp heat test	$> 10^3$ MΩ
Creepage distance between contacts	$\geqslant$ 1,9 mm
Clearance between contacts	$\geqslant$ 0,4 mm
Proof voltage for 1 min, at 20 °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	$\leqslant$ 2 pF

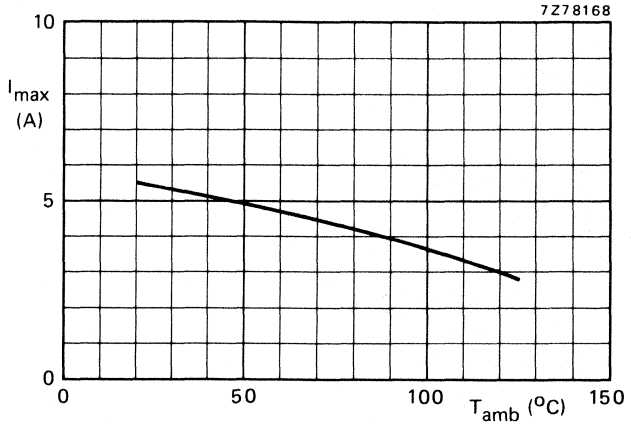


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

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, 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	$\geqslant 0{,}2$ μm gold plate on $\geqslant 3$ μm 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 68, test T
Resistance to soldering heat	350 °C, 10 s } according to IEC 68, test T
Shock	according to IEC 68, test Ea, 50g, 11 ms
Vibration	according to IEC 68, test Fc, 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	$\leqslant 27$	7
20	$\leqslant 45$	10
30	$\leqslant 60$	14
36	$\leqslant 70$	17
44	$\leqslant 80$	20

ENVIRONMENTAL DATA

Climatic category (IEC 68)	65/125/21
Ambient temperature range	−65 to + 125 °C
Damp heat, steady state	according to IEC 68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V0

DIMENSIONAL DATA

Dimensions in mm

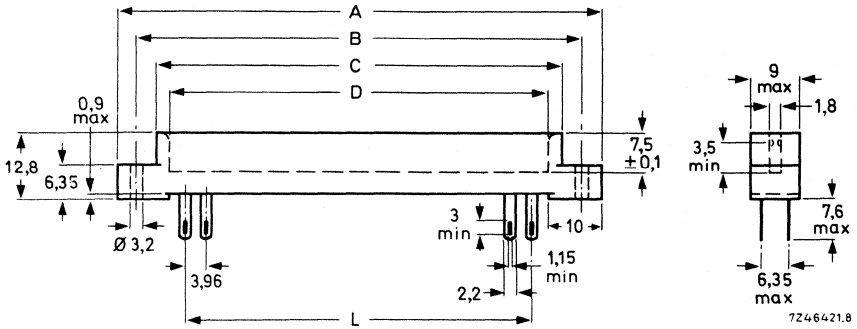


Fig. 2a Double row connector; see Table 2 for dimensions A, B, C, D and L. For the single-row version, one row of contacts is omitted.

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.

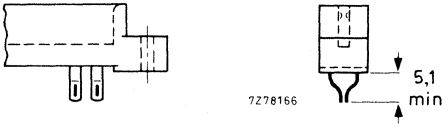


Table 2

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	19,80 +0,2 −0,1	00602	00612	00616
10	20	63,19	54,76	48,43	43,79 ± 0,15	35,64	01002	01012	01016
15	30	83,00	74,62	68,27	63,60 ± 0,15	55,44	01502	01512	01516
18	36	94,89	86,51	80,18	75,49 ± 0,15	67,32	01802	01812	01816
22	44	110,74	102,41	96,06	91,34 ± 0,20	83,16	02202	02212	02216

MOUNTING

Dimensions in mm

Panel cut-out

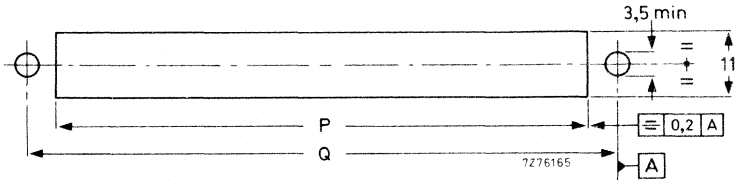


Fig. 3 Panel cut-out; see Table 3 for dimensions P and Q.

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	± 0,2	74,62	± 0,2
18	36	76,40		86,51	
22	44	92,20		102,41	

Printed-wiring board recommendations

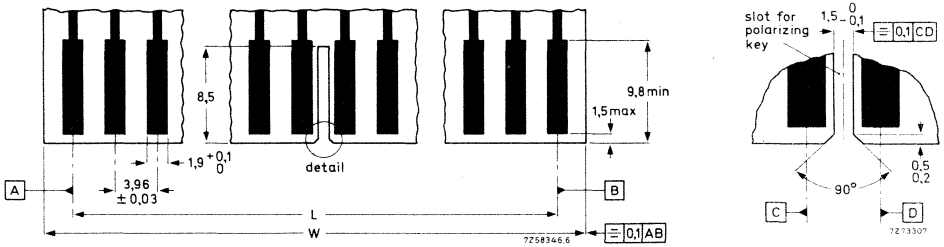


Fig. 4 Recommended dimensions of the printed-wiring board; see Table 4 for dimensions L and W.

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	± 0,1	63,44	−0,2
18	36	67,32		75,33	
22	44	83,16		91,13	

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.

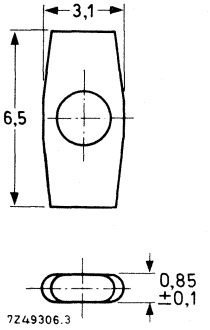


Fig. 5 Polarizing key.

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).

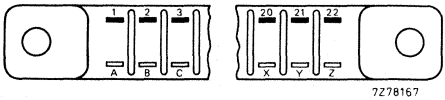


Fig. 6a Marking of single row connector with 22 contacts.

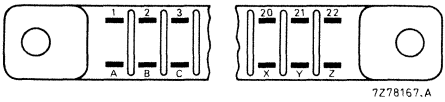


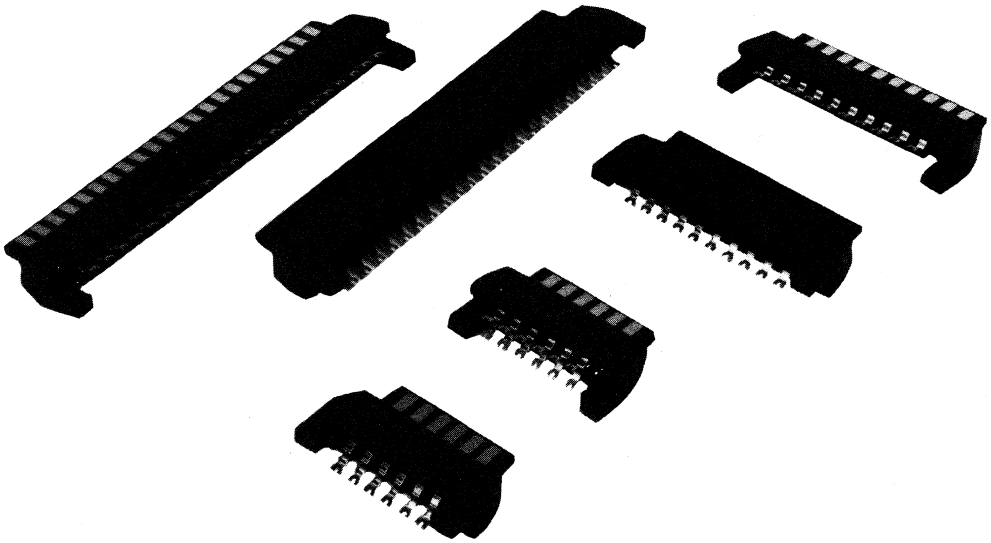
Fig. 6b Marking of double row connector with 44 contacts.

PRINTED-WIRING INTERCONNECTORS

- **3,96 mm (0,156 in) pitch**

QUICK REFERENCE DATA

Contact pitch	3,96 mm (0,156 in)
Number of contacts	
single row	6, 10 15, 18 and 22
double row	12, 20, 30, 36 and 44
Board thickness	1,42 to 1,78 mm
Terminations	solder tags
Current at T_{amb} = 20 °C	5,5 A
Mechanical endurance	300 insertions
Climatic category (IEC 68)	65/125/21



APPLICATION

For use in professional and industrial equipment.

DESCRIPTION

The interconnectors have a body of green glass-fibre-filled thermosetting material. The contact springs are of phosphor bronze. The contact surfaces are rolled gold on nickel plate.

The interconnectors mate with the printed-wiring connectors F050 and F053.

ELECTRICAL DATA

Current at T_{amb} = 20 °C	5,5 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 outside the body:	
initially	⩽ 8 mΩ
after mechanical endurance	⩽ 8 mΩ
after damp heat test	⩽ 10 mΩ
Insulation resistance	
initially	$> 10^5$ MΩ
after damp heat test	$> 10^3$ MΩ
Creepage distance between contacts	⩾ 1,25 mm
Clearance between contacts	⩾ 1,25 mm
Proof voltage for 1 min at 20 °C	
between adjacent contacts	1000 V (r.m.s.), 50 Hz
Capacitance	
between adjacent contacts	⩽ 1,5 pF
between opposite contacts	⩽ 2 pF

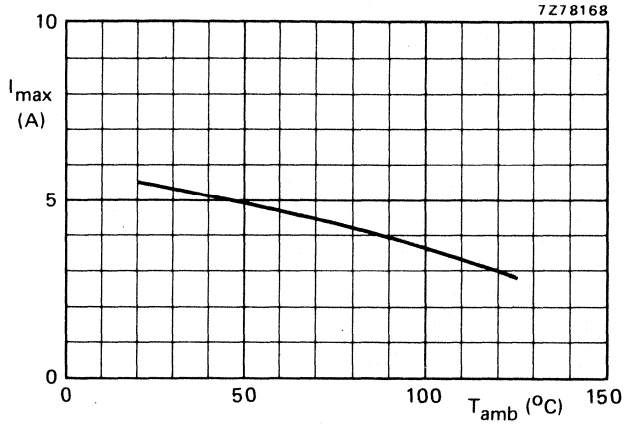


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

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
Mechanical endurance	300 insertions
Connector body material	glass-fibre-filled thermosetting
Contacts	
material	phosphor bronze
shape	single face
finish of contact surfaces	$\geqslant 3\ \mu m$ rolled gold
type of termination	solder tag with open eyelet
finish of termination	gold flash
Mass	see Table 1
Solderability	235 °C, 2 s } according to
Resistance to soldering heat	350 °C, 10 s } IEC 68, test T
Shock	according to IEC 68, test Ea, 50g, 11 ms
Vibration	according to IEC 68, test Fc, 10 to 2000 Hz, 0,75 mm (p-p) or 10g, 3 directions, 6 h per direction

Table 1

number of contacts	approx. mass (g)
12	6
20	8
30	11
36	12
44	15

ENVIRONMENTAL DATA

Climatic category (IEC 68)	65/125/21
Ambient temperature range	−65 to +125 °C
Damp heat, steady state	according to IEC 68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL 94, category V0

DIMENSIONAL DATA

Dimensions in mm

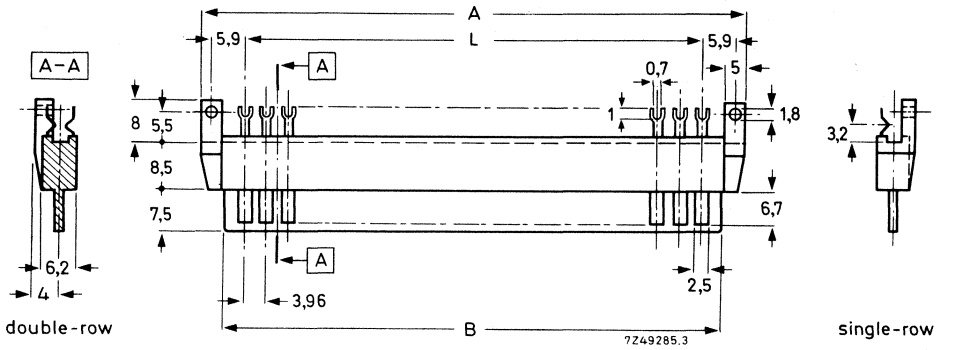


Fig. 2 Printed-wiring interconnector; see Table 2 for dimensions A, B and L.

Table 2

number of contacts		dimensions (mm)			catalogue number	
single row	double row	A max.	B	L	single row	double row
6	12	37,45	27,74	19,80 $^{+0,15}_{-0,1}$	2422 025 89071	2422 025 89076
10	20	53,34	43,58	35,64	89072	89077
15	30	73,14	63,40 ±0,3	55,44 ±0,2	89073	89078
18	36	85,02	75,30	67,32	89074	89079
22	44	100,86	91,10	83,16	89075	89081

MOUNTING

Printed-wiring board recommendations

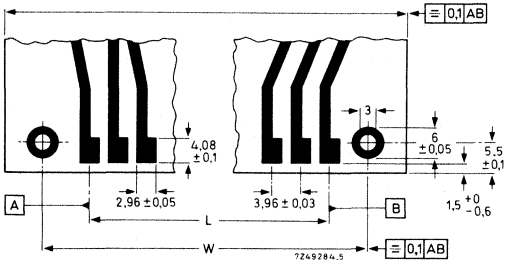


Fig. 3 Recommended dimensions of the printed-wiring board; see Table 3 for dimensions L and W.

Table 3

number of contacts		dimensions (mm)			
single row	double row	L		W	
6	12	19,80	±0,1	31,68	+0,2
10	20	35,64		47,52	
15	30	55,44		67,32	
18	36	67,32		79,20	
22	44	83,16		95,04	

The interconnector should be fixed to the printed-wiring board by means of screws or tubular rivets (max. ϕ1,7 mm), after positioning the board in such a way that the solder tags are opposite the corresponding contact pads of the board. To improve the rigidity of the fixing a washer with a diameter of 4,5 mm and a hole of 1,8 ± 0,1 mm should be placed under the screw or rivet and soldered to the copper isle of the mounting hole. See also Fig. 4. The solder tags should then be soldered to the contact pads.

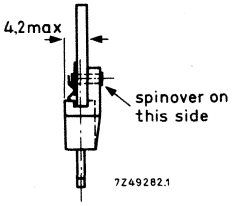


Fig. 4 Fixing of the interconnector to the printed-wiring board.

MARKING

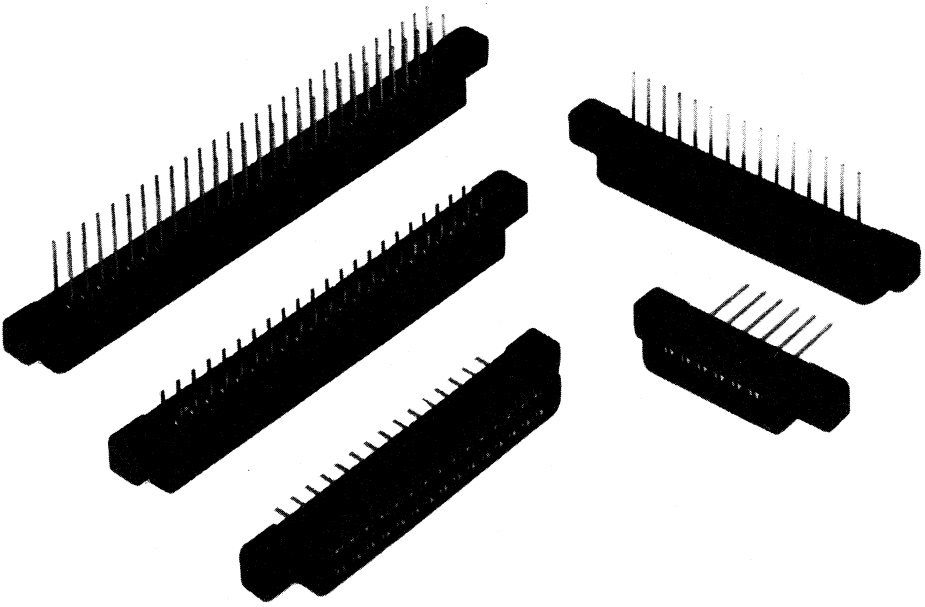
The package is marked with:
12-digit catalogue number;
reference number of manufacturer;
number of pieces.

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	
single row	6, 10, 15, 18, 22, 28, 36 and 43
double row	12, 20, 30, 36, 44, 56, 72 and 86
Board thickness	1,42 to 1,78 mm
Terminations	dip-solder pins pins for wire wrapping
Current at T_{amb} = 20 °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 °C	4 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 outside the body:	
initially	$\leqslant$ 18 mΩ
after mechanical endurance	$\leqslant$ 18 mΩ
after damp heat test	$\leqslant$ 20 mΩ
Insulation resistance	
initially	$> 10^5$ MΩ
after damp heat test	$> 10^3$ MΩ
Creepage distance between contacts	$\geqslant$ 2,1 mm
Clearance between contacts	$\geqslant$ 0,4 mm
Proof voltage for 1 min, at 20 °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	$\leqslant$ 2 pF

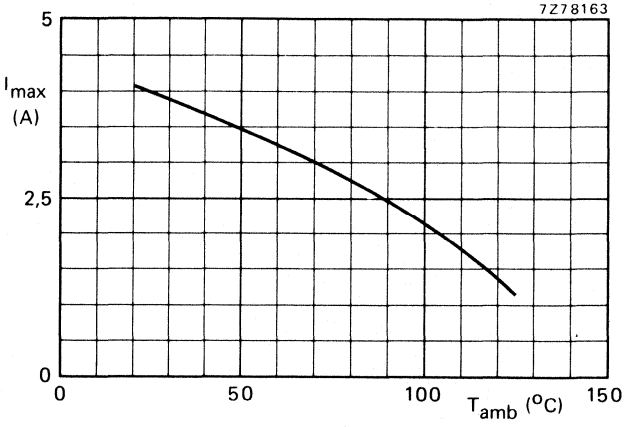


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	3,96 mm (0,156 in)
Number of contacts	
single row	6, 10, 15, 18, 22, 28, 36, 43
double row	12, 20, 30, 36, 44, 56, 72, 86
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	$\geqslant 1{,}3$ μm gold plate on $\geqslant 5$ μm 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 68, test T
Resistance to soldering heat	260 °C, 5 s }
Shock	according to IEC 68, test Ea, 50g, 11 ms
Vibration	according to IEC 68, test Fc, 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	$\leqslant 27$	7
20	$\leqslant 45$	10
30	$\leqslant 60$	14
36	$\leqslant 70$	17
44	$\leqslant 80$	20
56	$\leqslant 100$	25
72	$\leqslant 120$	31
86	$\leqslant 140$	37

ENVIRONMENTAL DATA

Climatic category (IEC 68)	40/125/21
Ambient temperature range	−40 to + 125 °C
Damp heat, steady state	according to IEC 68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V1

DIMENSIONAL DATA

Dimensions in mm

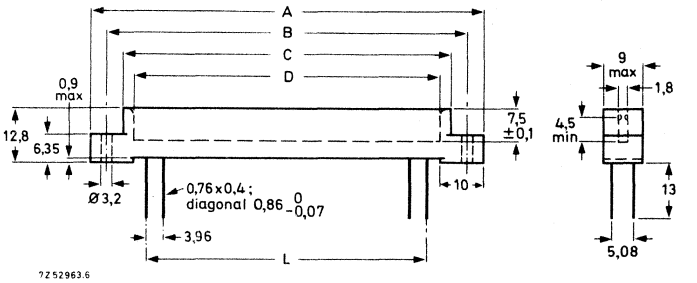


Fig. 2a Double row connector with pins for wire wrapping; see Table 2 for dimensions A, B, C, D and L. For the single-row version, one row of contacts is omitted.

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.

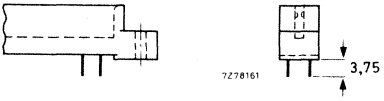


Table 2 Connectors with pins for wire wrapping

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	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

L: $^{+0,2}_{-0,1}$

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	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

L: $^{+0,2}_{-0,1}$

MOUNTING

Dimensions in mm

Panel cut-out

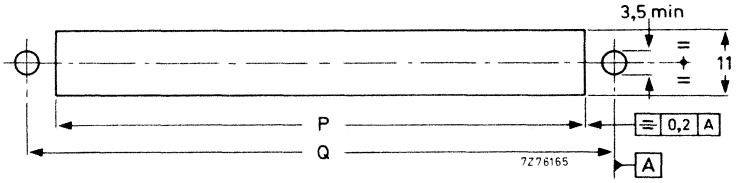


Fig. 3 Panel cut-out; see Table 4 for dimensions P and Q.

Table 4

number of contacts		dimensions			
single row	double row	P		Q	
6	12	28,85	± 0,2	38,91	± 0,2
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	

Piercing diagram for connectors with dip-solder pins

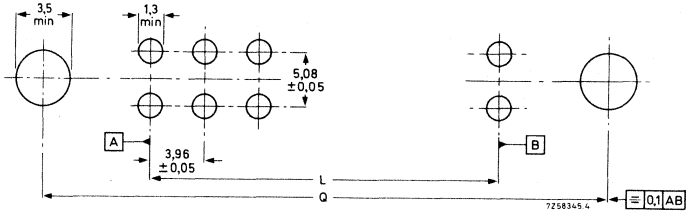


Fig. 4 Piercing diagram for double-row connectors; see Table 5 for dimensions L and Q.

Table 5

number of contacts		dimensions			
single row	double row	L		Q	
6	12	19,80	± 0,05	38,91	± 0,2
10	20	35,64		54,76	
15	30	55,44		74,62	
18	36	67,32		86,51	
22	44	83,16		102,41	
28	56	106,92		126,09	
36	72	138,60		157,99	
43	86	166,32		185,47	

Printed-wiring board recommendations

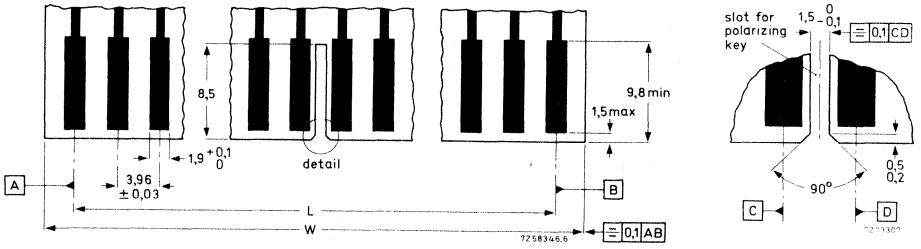


Fig. 5 Recommended dimensions of the printed-wiring board; see Table 6 for dimensions L and W.

Table 6

number of contacts		dimensions			
single row	double row	L		W	
6	12	19,80	± 0,1	27,78	−0,2
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.

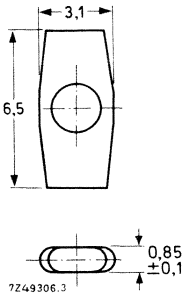


Fig. 6 Polarizing key.

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).

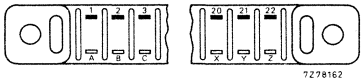


Fig. 7a Marking of single-row connector with 22 contacts.

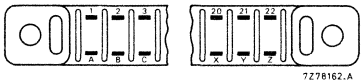


Fig. 7b Marking of double-row connector with 44 contacts.

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 mm
Terminations	
male part	solder tags straight dip-solder pins pins for wire wrapping
female part	90° angled dip-solder pins
Current at T_{amb} = 20 °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 °C	3,5 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	
initially	$\leqslant$ 17 mΩ
after mechanical endurance	$\leqslant$ 20 mΩ
after damp heat test (IEC 68, test Ca)	$\leqslant$ 20 mΩ
Insulation resistance	
initially	$> 10^5$ MΩ
after damp heat test (IEC 68, test Ca)	$> 10^3$ MΩ
Creepage distance between contacts	$\geqslant$ 0,8 mm
Clearance between contacts	$\geqslant$ 0,8 mm
Proof voltage for 1 min , at 20 °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	$\leqslant$ 2 pF

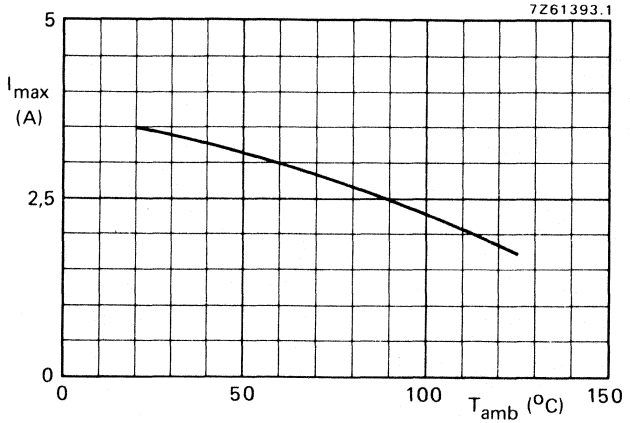


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

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	$\geqslant$ 2,5 μm rolled-on gold on $\geqslant$ 1 μm nickel plate	$\geqslant$ 2,5 μm rolled-on gold on $\geqslant$ 1 μm 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 (ϕ0,25 to ϕ0,40 mm)	
Mass	see Table 1	
Solderability	235 °C, 2 s	according to IEC 68, test Ta,
Resistance to soldering heat	350 °C, 10 s	according to IEC 68, test Ta,
Shock	according to IEC 68, test Ea, 50g, 11 ms	
Vibration	according to IEC 68, test Fc, 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	$\leqslant$ 45	$\geqslant$ 5	10	6
48	$\leqslant$ 65	$\geqslant$ 7,5	12	9
64	$\leqslant$ 85	$\geqslant$ 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 68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V0

DIMENSIONAL DATA

Dimensions in mm

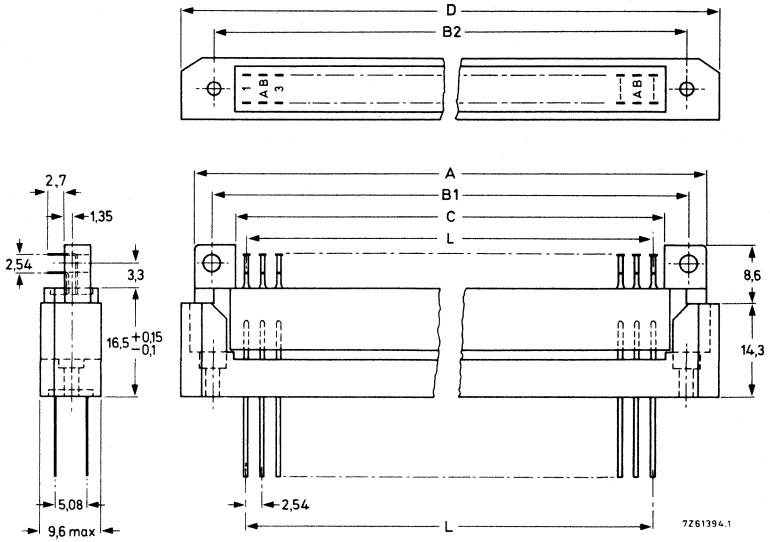


Fig. 2 Connector combination showing female part with 90° angled dip-solder pins and male part with pins for wire wrapping; see Table 2 for dimensions A, B1, B2, C, D and L.
See Figs 3, 4 and 5 for different terminations of the male part.

Table 2

number of contacts	dimensions						
	A_{max}	B1		B2		C_{min}	D_{max}	L
32	54,3	48,26	± 0,2	48,26	± 0,1	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

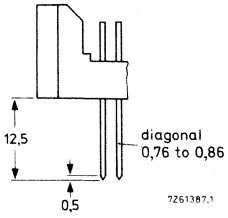


Fig. 3 Pins for wire wrapping.

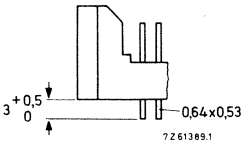


Fig. 4 Straight dip-solder pins.

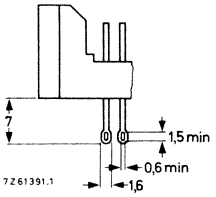


Fig. 5 Solder tags.

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

MOUNTING

Dimensions in mm

Hole patterns for mounting of male parts

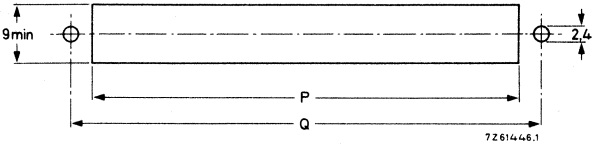


Fig. 6 Hole pattern for panel mounting of male parts; see Table 4 for dimensions P and Q.

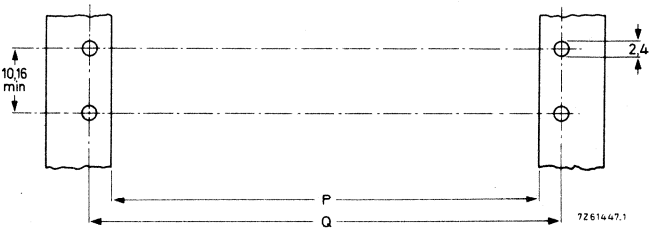


Fig. 7 Hole pattern for rail mounting of male parts; see Table 4 for dimensions P and Q.

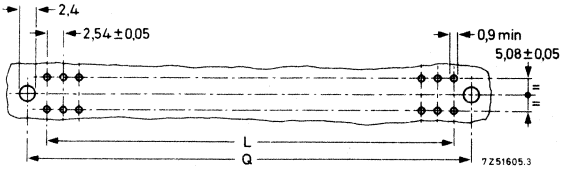


Fig. 8 Hole pattern for board mounting of male parts; see Table 4 for dimensions L and Q.

Hole pattern for mounting of female parts

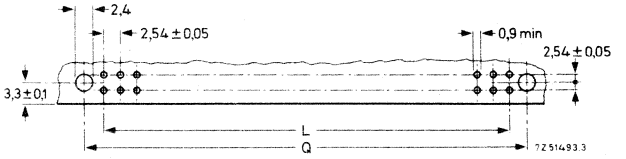


Fig. 9 Hole pattern for board mounting of female parts; see Table 4 for dimensions L and Q.

Table 4

number of contacts	dimensions					
	L		P		Q	
32	38,10	± 0,05	43,2	± 0,1	48,26	± 0,1
48	58,42		63,5		68,58	
64	78,74		83,8		88,90	

POLARIZATION

To ensure that the female part is inserted into the correct male part, it is recommended to use a polarizing key (Fig. 10). This key is inserted into a contact position of the female part. The corresponding contact pin of the male part must be broken off.
Catalogue number of polarizing key: 4332 026 10840.

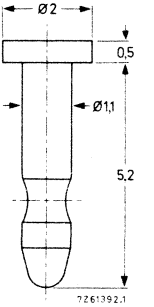


Fig. 10 Polarizing key.

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.

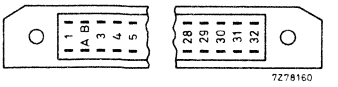


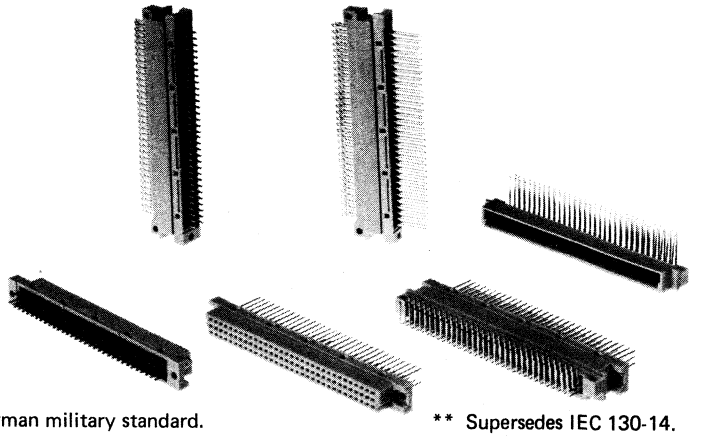
Fig. 11 Marking of male part with 64 contacts.

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	1,42 to 1,78 mm	
Terminations		
male part	90° angled dip-solder pins, straight dip-solder pins (with or without protruding earth contacts)	
	solder tags	
	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 °C	2 A	
Mechanical endurance		
according to IEC and DIN	400 insertions	
according to VG*	500 insertions	
Climatic category		
according to IEC and DIN	55/125/56	
according to VG*	65/125/56 ←	
Detail specifications	IEC 603-2**, DIN 41612 and VG 95324* ←	



* German military standard.

** Supersedes IEC 130-14.

Contents

	page
Application	2
Description	2
Survey	3
Electrical data	4
Mechanical data	5
Environmental data	7
Dimensional data	
style B	8
style C	12
Mounting	16
Marking	20
Accessories	
cable hood	21
coding parts	24
accessories for female parts with pins for wire wrapping	27
mounting brackets for female parts with 90° angled dip-solder pins	28
Packing	30

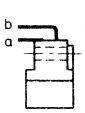
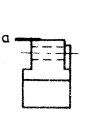
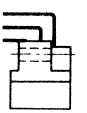
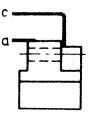
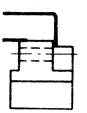
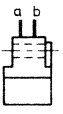
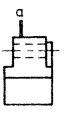
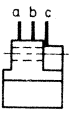
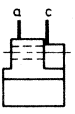
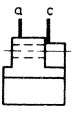
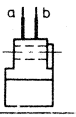
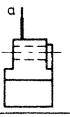
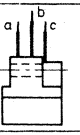
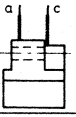
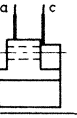
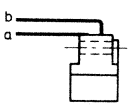
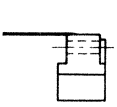
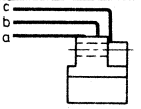
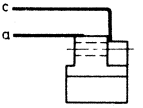
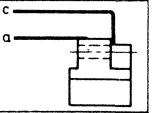
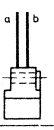
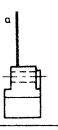
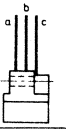
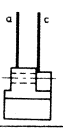
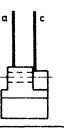
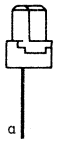
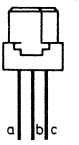
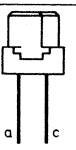
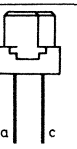
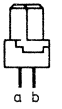
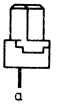
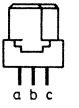
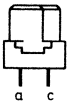
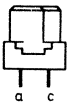
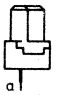
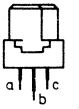
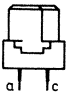
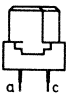
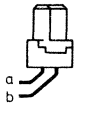
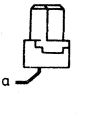
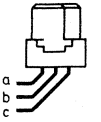
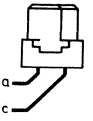
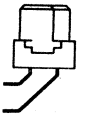
APPLICATION

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 a back panel. Both parts have a grey body of glass-fibre-filled thermoplastic material; the contact insert of the female part is of glass-fibre-filled diallylphthalate. 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 gold flashed. The male parts with dip-solder pins can be supplied with protruding earth contacts, which are 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. An external keying system can be employed to ensure correct positioning of the board in a rack.

SURVEY

		style B number of contacts		style C number of contacts		
	terminations	2 x 32 2,54 mm pitch	1 x 32 2,54 mm pitch	3 x 32 2,54 mm pitch	2 x 32 2,54 mm pitch	2 x 16 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					
	90° angled dip-solder pins					

ELECTRICAL DATA

Current at T_{amb} = 20 °C	2 A
Derated current curve	according to IEC 512-3, 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	⩽ 20 mΩ
after mechanical endurance	⩽ 20 mΩ
after damp heat test (IEC 68, test Ca)	⩽ 20 mΩ
Insulation resistance	
initially	> 10^6 MΩ
after damp heat test (IEC 68, test Ca)	> 10^4 MΩ
at maximum ambient temperature	> 10^5 MΩ

	2,54 mm pitch	5,08 mm pitch
Creepage distance		
between contacts	⩾ 1,2 mm *	⩾ 3,0 mm *
between a contact and earth	⩾ 1,8 mm *	⩾ 1,8 mm *
Clearance		
between contacts	⩾ 1,2 mm *	⩾ 3,0 mm *
between a contact and earth	⩾ 1,6 mm *	⩾ 1,6 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	⩽ 1,5 pF

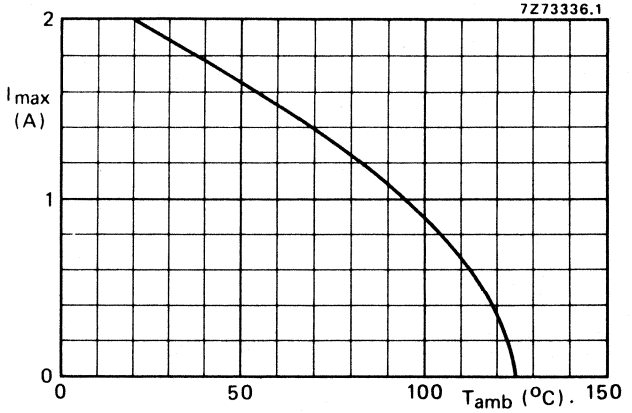


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

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

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)	5,08 mm (0,2 in)
Number of contacts		
style B	32, 64	
style C	64, 96	32
Board thickness	1,42 to 1,78 mm	
Polarization	achieved by asymmetrical housing	
Insertion force and withdrawal force	see Table 1	
Retention force per contact, measured with mechanical gauge according to IEC 603-2	⩾ 0,15 N	
Mechanical endurance	400 insertions, according to IEC 512-5, test 9a 500 insertions, according to VG 95324	
Connector body		←
material	glass-fibre-filled thermoplastic; insert of female part: glass fibre-filled diallylphthalate	
colour	grey (RAL 7032)	

	according to IEC 603-2/DIN 41612		according to VG 95324 ←
	class I	class II	
Contacts of male part			
material	brass		brass ←
finish of contact surfaces	⩾ 0,9 μm gold plate on ⩾ 2 μm nickel plate	⩾ 2 μm gold plate on ⩾ 2 μm nickel plate	⩾ 3 μm gold plate on ⩾ 2 μm nickel plate
type of termination	• 90° angled dip-solder pin • straight dip-solder pin • solder tag • 90° angled pin for wire wrapping • straight pin for wire wrapping	• 90° angled dip-solder pin • straight dip-solder pin • solder tag • 90° angled pin for wire wrapping	• 90° angled dip-solder pin • straight dip-solder pin • solder tag • 90° angled pin for wire wrapping
finish of termination	gold flash on 1 μm nickel plate		gold flash on 1 μm nickel plate
Contacts of female part			←
material	phosphor bronze		phosphor bronze
finish of contact surfaces	⩾ 1,1 μm gold plate on ⩾ 2 μm nickel plate	⩾ 2 μm gold plate on ⩾ 2 μm nickel plate	⩾ 4 μm gold plate on ⩾ 2 μm nickel plate
type of termination	• pin for wire wrapping • straight dip-solder pin • solder tag • 90° angled dip-solder pin		• pin for wire wrapping • straight dip-solder pin • solder tag • 90° angled dip-solder pin
finish of termination	gold flash on 1 μm nickel plate		gold flash on 1 μm nickel plate

Wire diameter	AWG30 to AWG26 (ϕ 0,25 to ϕ 0,40 mm)
Mass	see Table 1

	according to IEC 603-2/DIN 41612	according to VG 95324
Solderability	according to IEC 68, test T, 235 °C, 2 s	according to VG 95210, part 23, 230 °C, 5 s
Resistance to soldering heat	according to IEC 68, test T, 260 °C, 10 s	according to DIN 40046, part 18, 350 °C, 3,5 s
Shock		according to VG 95210, part 28, half sine pulse, 50g, 11 ms, 3 directions, 10 shocks per direction
Vibration	according to IEC 68, test Fc, 10 to 500 Hz, 0,35 mm (p-p) or 5 g, 3 directions, 2 h per direction	according to VG 95210, part 19, 10 to 2000 Hz, 1,52 mm (p-p) or 20 g, 3 directions, 4 h per direction
Acceleration		according to VG 95210, part 27, 100g, 6 directions, 5 min per direction

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

ENVIRONMENTAL DATA

	according to IEC 603-2/DIN 41612	according to VG 95324	
Climatic category (IEC 68)	55/125/56	65/125/56	←
Ambient temperature range	–55 to + 125 °C	–65 to + 125 °C	←
Storage temperature range	–55 to + 125 °C	–65 to + 125 °C	←
Damp heat, steady state	according to IEC 68, test Ca, 56 days, 40 °C, R.H. 90 to 95%	according to VG 95210, part 4, 56 days, 40 °C, R.H. 90 to 95%	
Dry heat	according to IEC 68, test Ba, 2 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	
Industrial atmosphere	according to DIN 41612; after 200 operations: 2 cycles damp heat, cyclic, according to IEC 68, test Db, upper temperature + 55 °C, followed by dry heat, according to IEC 68, test Ba, 16 h, 125 °C	according to VG 95319, part 2, after 500 operations: SO_2, 1%, 24 h, followed by H_2S, 1%, 24 h	←
Flammability	according to UL94, category V1	according to VG 95210, part 12; time of flame application: 15 ± 1 s, burning time max. 10 s	

DIMENSIONAL DATA

Dimensions in mm

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

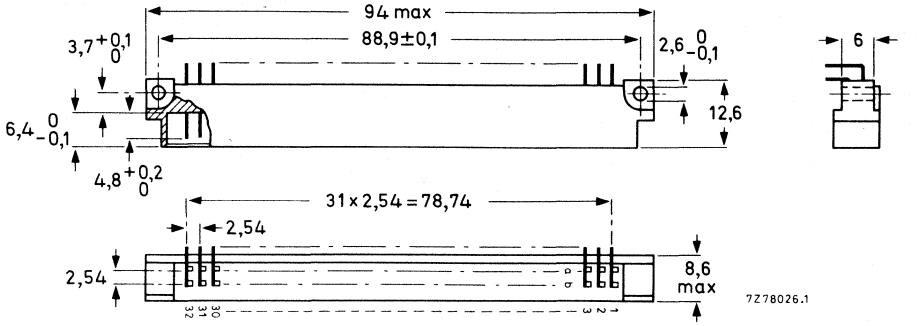


Fig. 2 Male part with 90° angled dip-solder pins.

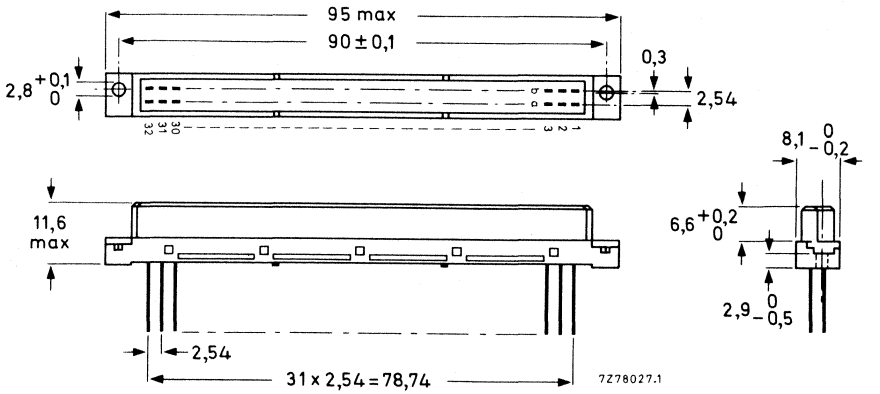


Fig. 3 Female part with pins for wire wrapping.

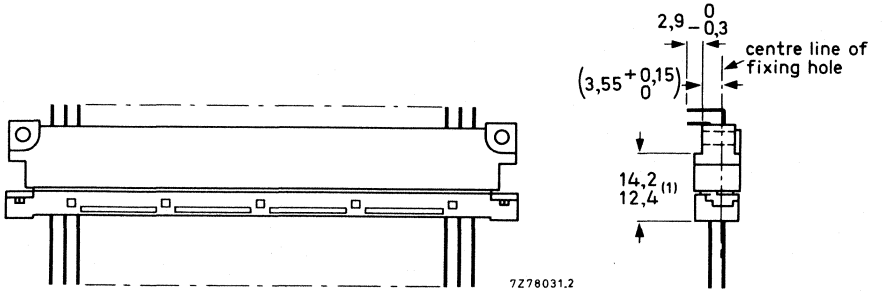


Fig. 4 Combination of connector parts shown in Figs 2 and 3.

(1) Reliable contact range.

Male parts

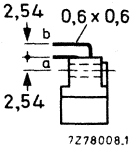


Fig. 5 90° angled dip-solder pins.

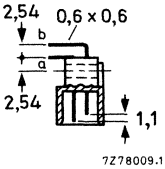


Fig. 6 90° angled dip-solder pins, with protruding earth contacts.

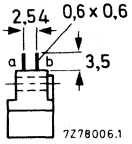


Fig. 7 Straight dip-solder pins.

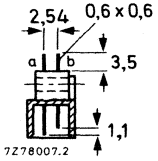


Fig. 8 Straight dip-solder pins, with protruding earth contacts.

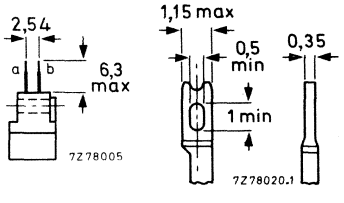


Fig. 9 Solder tags.

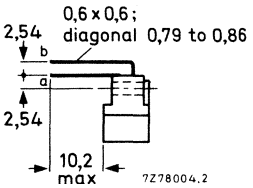


Fig. 10 90° angled pins for wire wrapping.

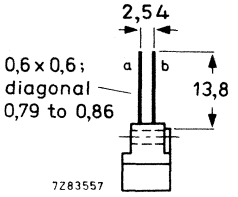


Fig. 11 Straight pins for wire wrapping.

Female parts

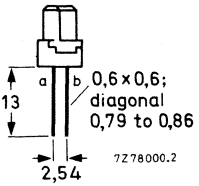


Fig. 12 Pins for wire wrapping.

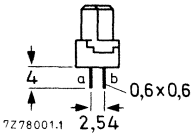
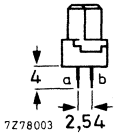


Fig. 13 Straight dip-solder pins.



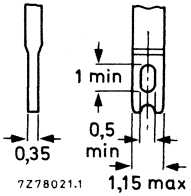


Fig. 14 Solder tags.

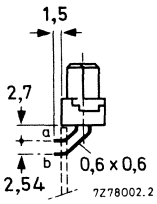
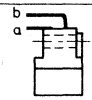
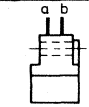
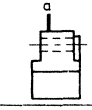
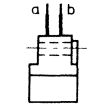
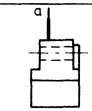
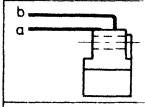
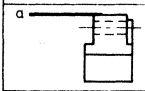
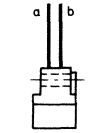
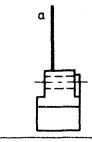


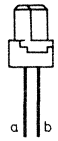
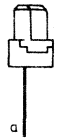
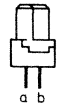
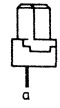
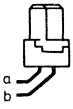
Fig. 15 90° angled dip-solder pins.

→ **Table 2a** Catalogue numbers for ordering male parts, style B

terminations	contacts		catalogue number of male part 2422 025			
			according to IEC 603-2/ DIN 41612		according to VG 95324	
	positions occupied	number	class I	class II	without certificate	with certificate
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89285 89366*	89486 89505*	89335 89416*	89385
	a1,a2,a3 to a32;	32	89292 89367*	89487 89506*	89336 89417*	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89368 89369*	89507 89508*	89418 89419*	
	a1,a2,a3 to a32;	32	89404 89371*	89509 89511*	89421 89422*	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89372	89512	89423	
	a1,a2,a3 to a32	32	89373	89513	89424	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89314	89514	89425	
	a1,a2,a3 to a32	32	89315	89515	89426	
	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

terminations	contacts		catalogue number of female part 2422 025			
			according to IEC 603-2/ DIN 41612		according to VG 95324	
	positions occupied	number	class I	class II	without certificate	with certificate
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89286	89492	89341	89387
	a1,a2,a3 to a32	32	89293	89493	89342	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89297	89503	89352	
	a1,a2,a3 to a32	32	89302	89504	89353	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89329	89497	89346	
	a1,a2,a3 to a32	32	89331	89498	89347	
	a1,a2,a3 to a32; b1,b2,b3 to b32	64	89378	89516	89427	
	a1,a2,a3 to a32	32	89377	89517	89428	

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

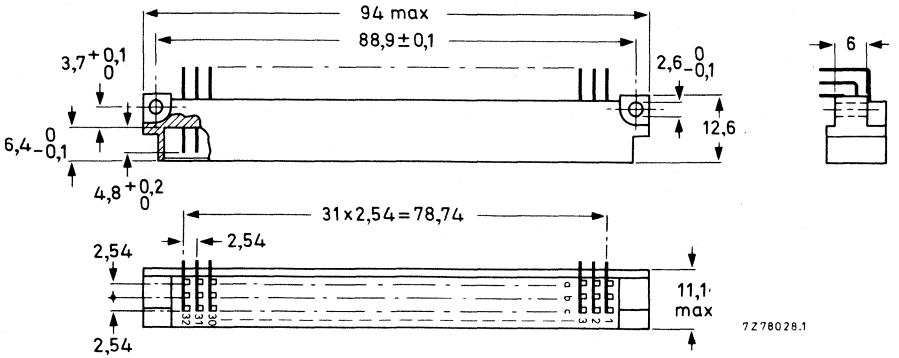


Fig. 16 Male part with 90° angled dip-solder pins.

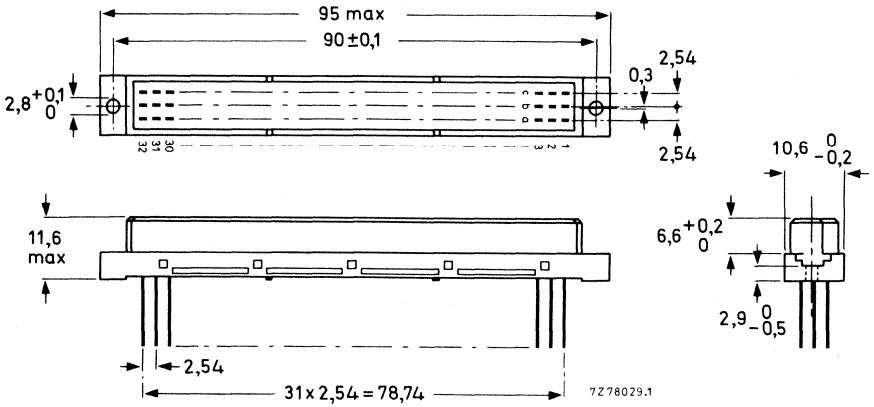


Fig. 17 Female part with pins for wire wrapping.

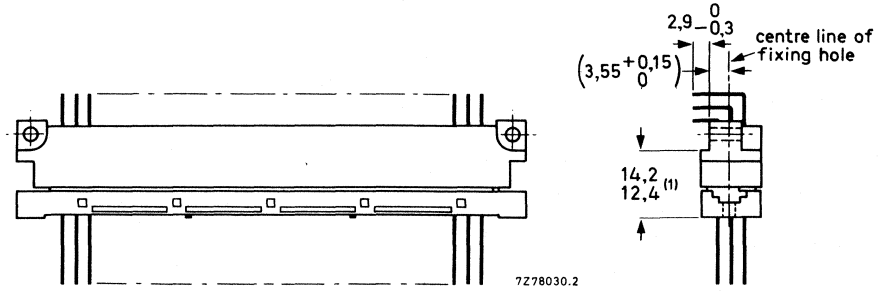


Fig. 18 Combination of connector parts shown in Figs 16 and 17.

(1) Reliable contact range.

Male parts

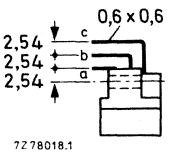


Fig. 19 90° angled dip-solder pins.

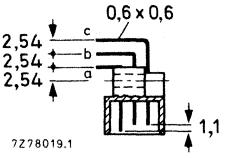


Fig. 20 90° angled dip-solder pins, with protruding earth contacts.

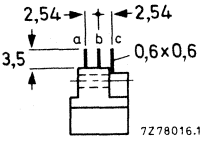


Fig. 21 Straight dip-solder pins.

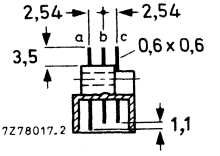


Fig. 22 Straight dip-solder pins, with protruding earth contacts.

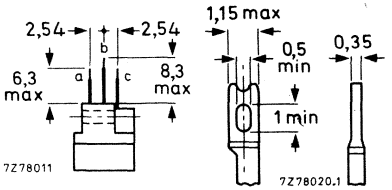


Fig. 23 Solder tags.

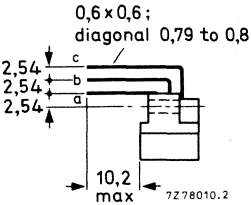


Fig. 24 90° angled pins for wire wrapping.

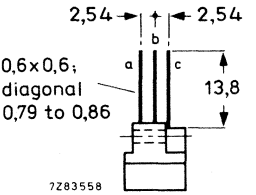


Fig. 25 Straight pins for wire wrapping.

Female parts

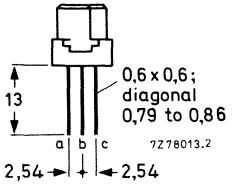


Fig. 26 Pins for wire wrapping.

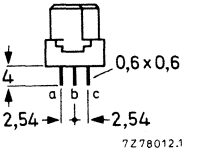


Fig. 27 Straight dip-solder pins.

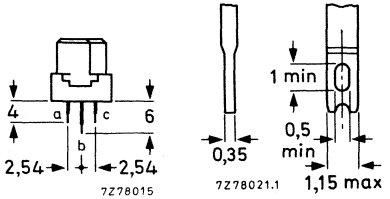


Fig. 28 Solder tags.

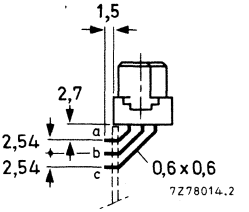


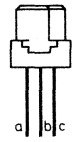
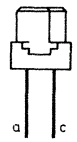
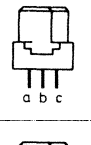
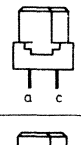
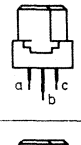
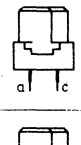
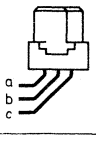
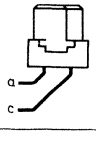
Fig. 29 90° angled dip-solder pins.

→ **Table 3a** Catalogue numbers for ordering male parts, style C

terminations	contacts		catalogue number of male part 2422 025			
			according to IEC 603-2/ DIN 41612		according to VG 95324	
	positions occupied	number	class I	class II	without certificate	with certificate
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89283 89354*	89483 89518*	89332 89429*	89386
	a1,a2,a3 to a32; c1,c2,c3 to c32;	64	89287 89355*	89484 89519*	89333 89431*	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89289 89356**	89485 89521**	89334 89432**	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89357 89358*	89522 89523*	89433 89434*	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64	89359 89403*	89524 89525*	89435 89436*	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89361 89362**	89526 89527**	89437 89438**	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89363	89528	89439	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64	89364	89529	89441	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89365	89531	89442	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89313	89532	89443	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64	89324	89533	89444	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89319	89534	89445	
	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

terminations	contacts		catalogue number of female part 2422 025			
			according to IEC 603-2/ DIN 41612		according to VG 95324	
	positions occupied	number	class I	class II	without certificate	with certificate
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89284	89488	89337	89388
	a1,a2,a3 to a32; c1,c2,c3 to c32	64	89288	89489	89338	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89291	89491	89339	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89296	89499	89348	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64	89298	89501	89349	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89299	89502	89351	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89325	89494	89343	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64	89326	89495	89344	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89327	89496	89345	
	a1,a2,a3 to a32; b1,b2,b3 to b32; c1,c2,c3 to c32	96	89382	89535	89446	
	a1,a2,a3 to a32; c1,c2,c3 to c32	64	89405	89536	89447	
	a2,a4,a6 to a32; c2,c4,c6 to c32	32	89379	89537	89448	

MOUNTING

Dimensions in mm

Panel cut-out for female parts

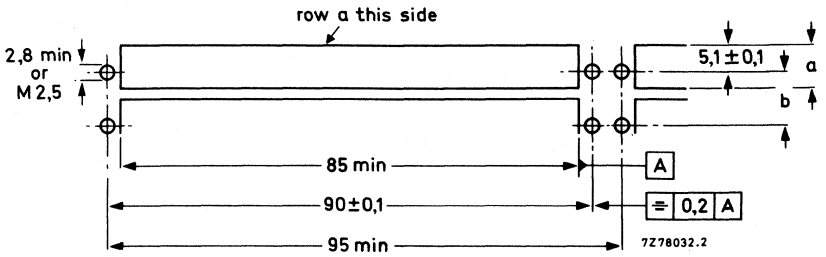


Fig. 30 Panel cut-out; see Table 4 for dimensions a and b.

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

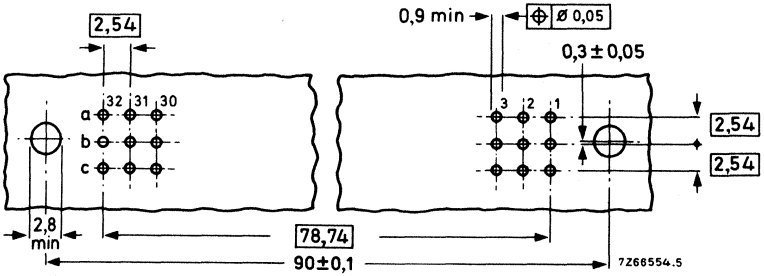


Fig. 31 For 3 x 32 contacts (style C).

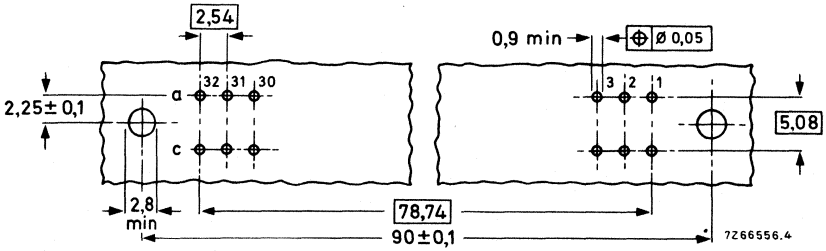


Fig. 32 For 2 x 32 contacts (style C).

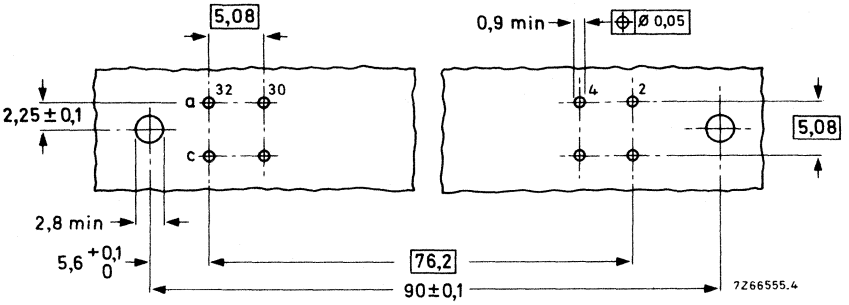


Fig. 33 For 2 x 16 contacts (style C).

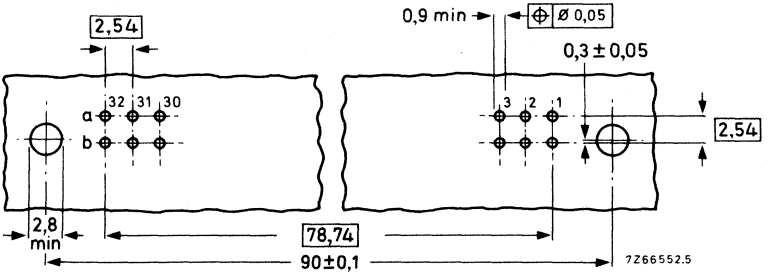


Fig. 34 For 2 x 32 contacts (style B).

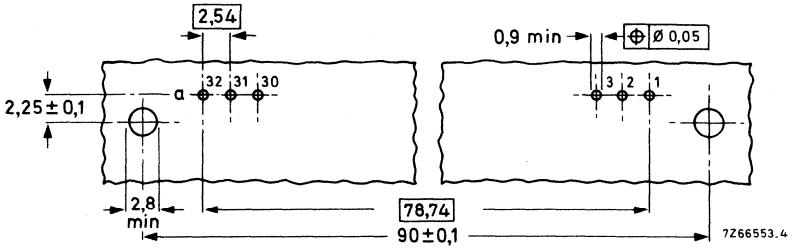


Fig. 35 For 1 x 32 contacts (style B).

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

→ **Hole pattern on printed boards for male parts**

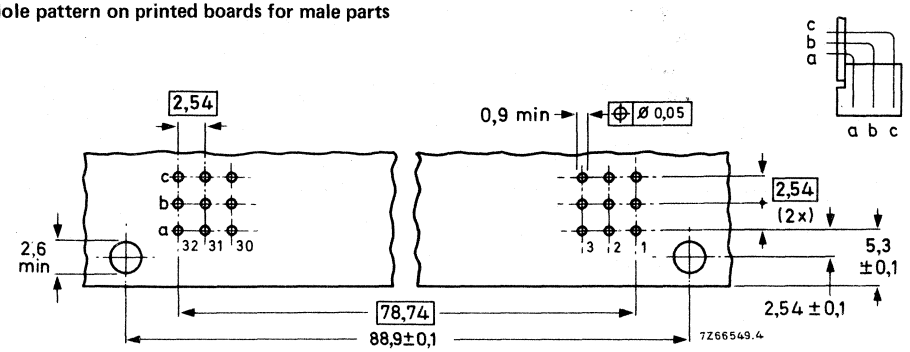


Fig. 36 For 3 x 32 contacts (style C).

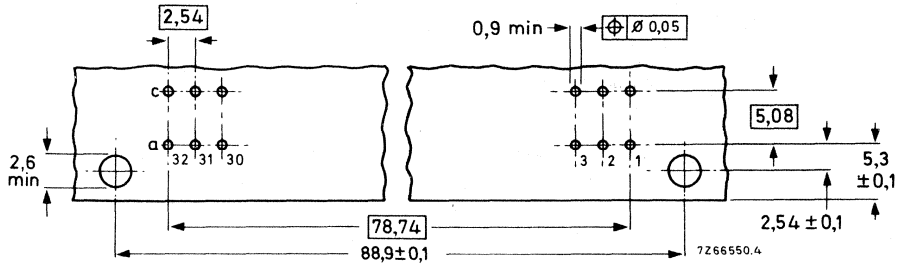


Fig. 37 For 2 x 32 contacts (style C).

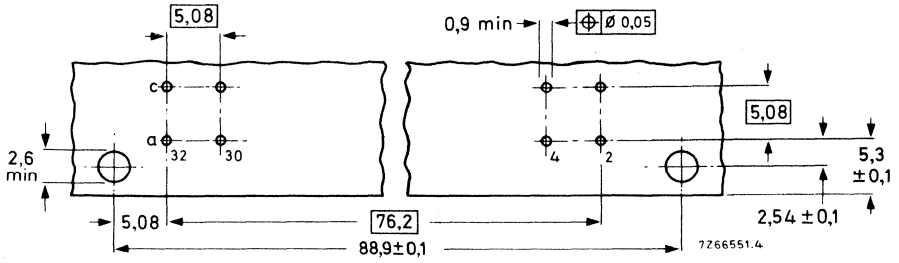


Fig. 38 For 2 x 16 contacts (style C).

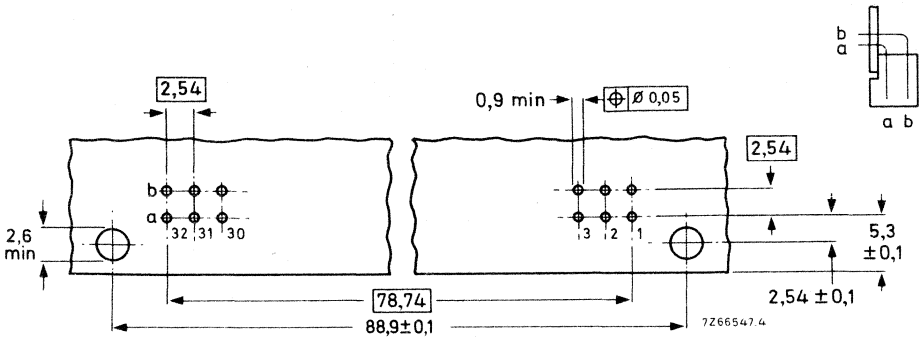


Fig. 39 For 2 x 32 contacts (style B).

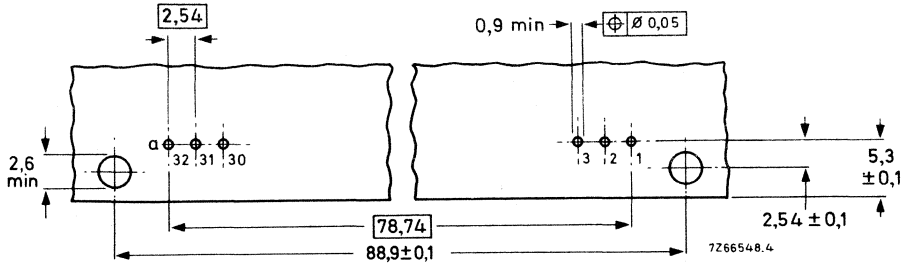


Fig. 40 For 1 x 32 contacts (style B).

MARKING

Package

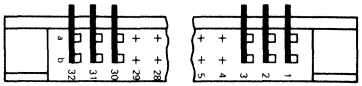
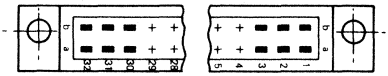
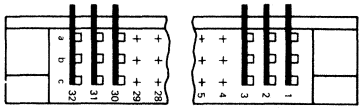
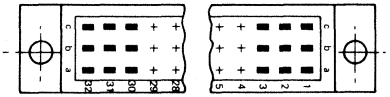
The package is marked with:
12-digit catalogue number;
reference number of manufacturer;
number of pieces.

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 5

style	male part	female part
B	 7Z78022.1	 7Z78024
C	 7Z78023	 7Z78025

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).

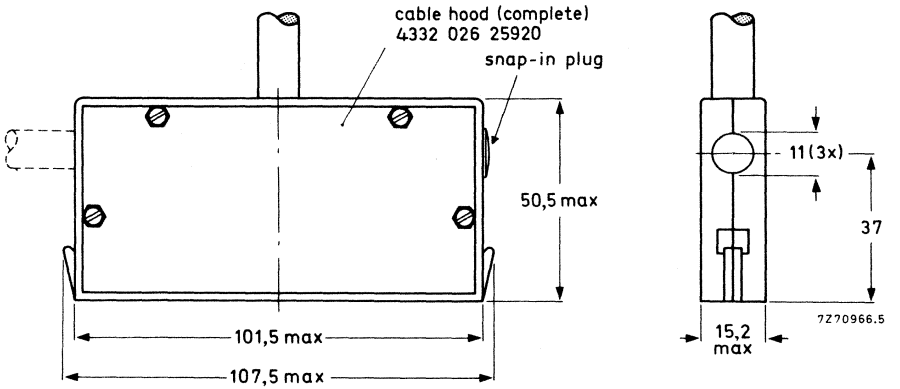


Fig. 41 Assembled cable hood.

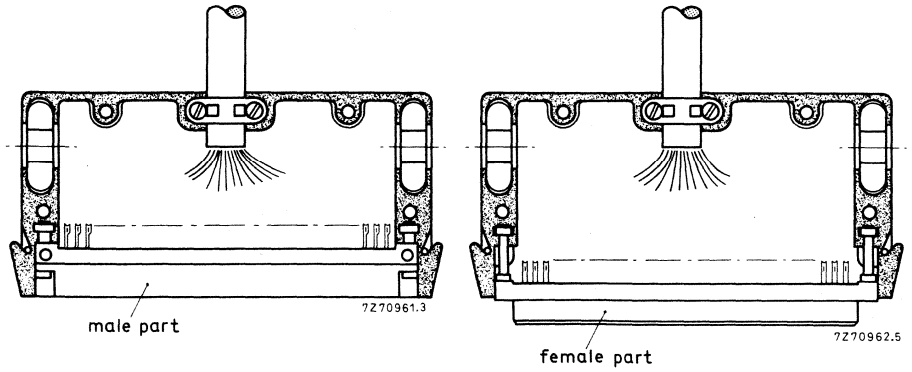


Fig. 42 Fixing of cable to the hood and mounting of the hood to the connector part. Maximum permissible cable diameter is 11 mm (e.g. 96 insulated wires AWG30).

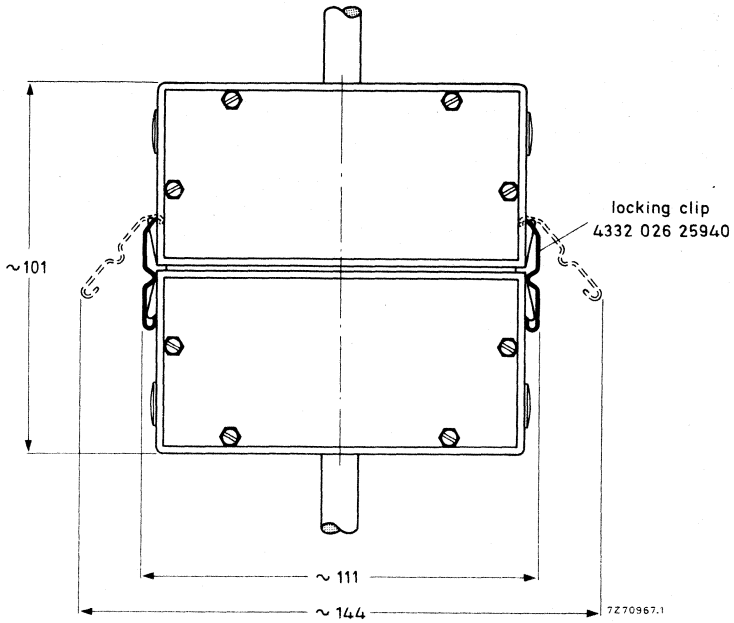


Fig. 43 Cable to cable application.

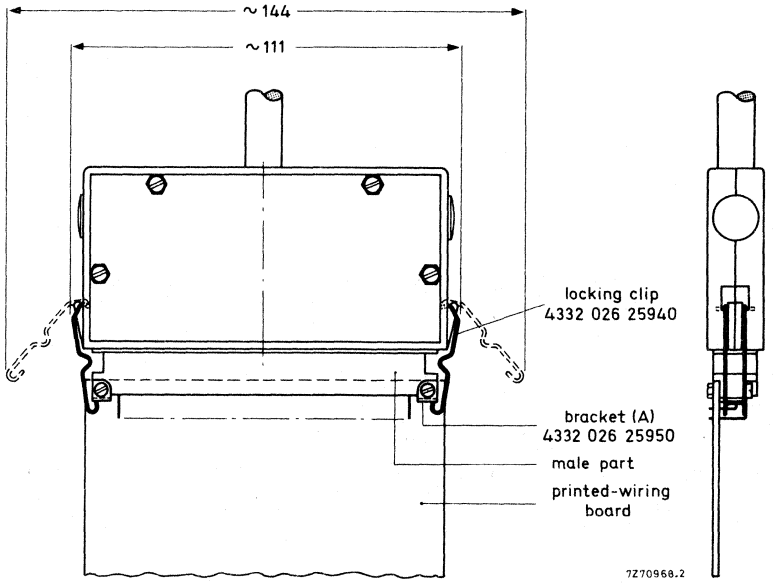


Fig. 44 Cable to printed-wiring board application.

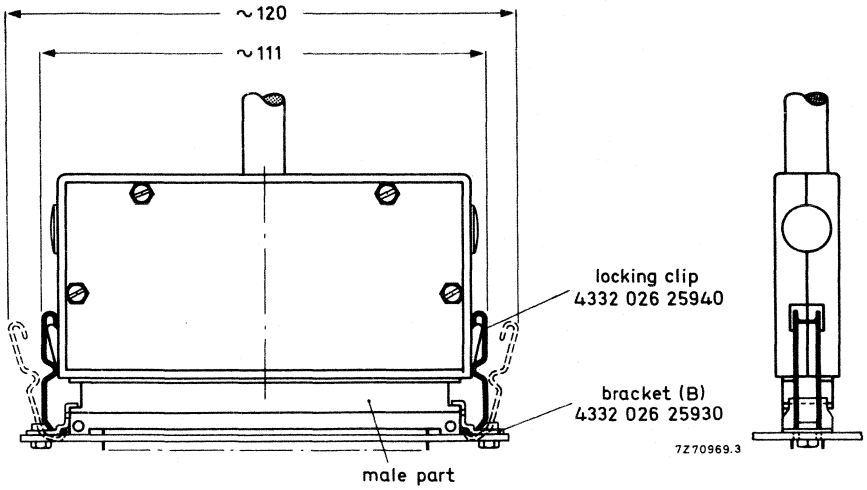


Fig. 45 Cable to panel application.

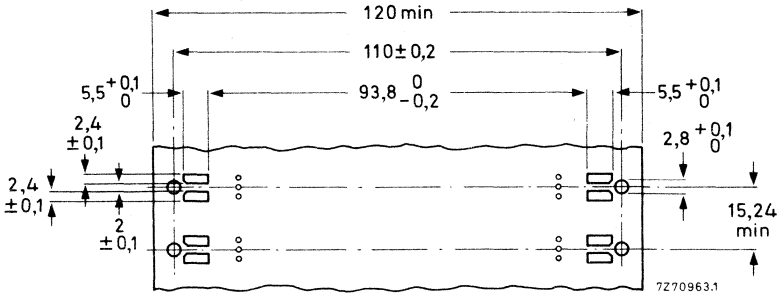


Fig. 46 Hole pattern on printed board for cable to panel application.

Table 6 Catalogue numbers for ordering accessories

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

For packing of these accessories see page 30.

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.

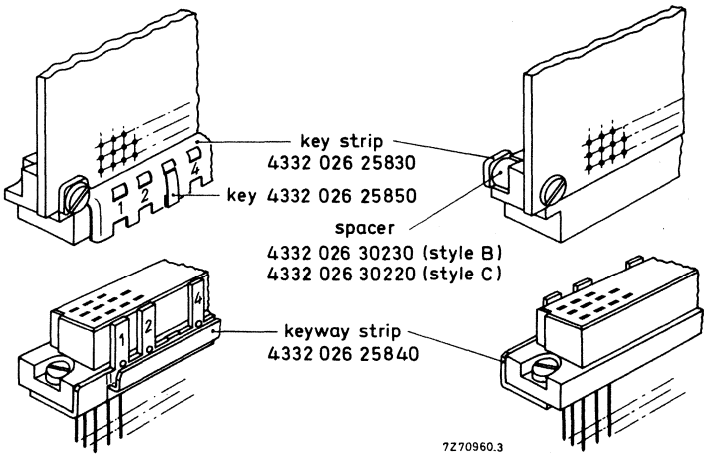


Fig. 47a Coding parts; key strip mounted to solder side of printed board.

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.

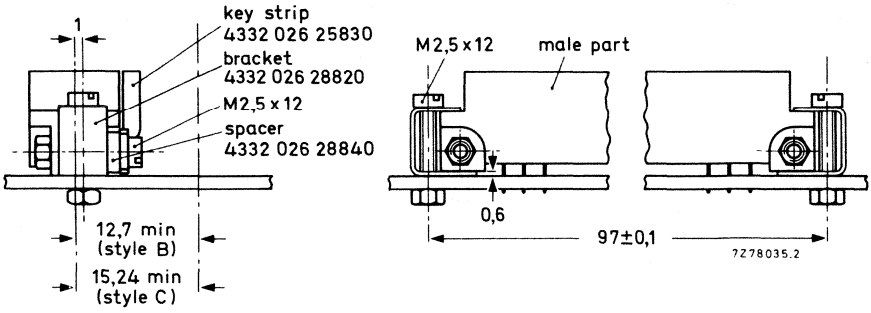


Fig. 48a Key strip mounted to a male part with straight dip-solder pins.

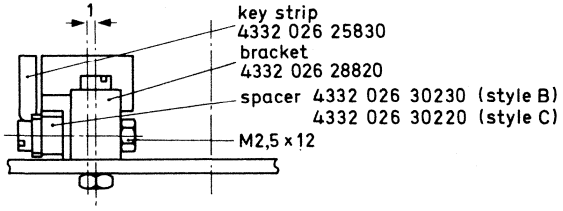


Fig. 48b Key strip mounted to a male part with straight dip-solder pins.

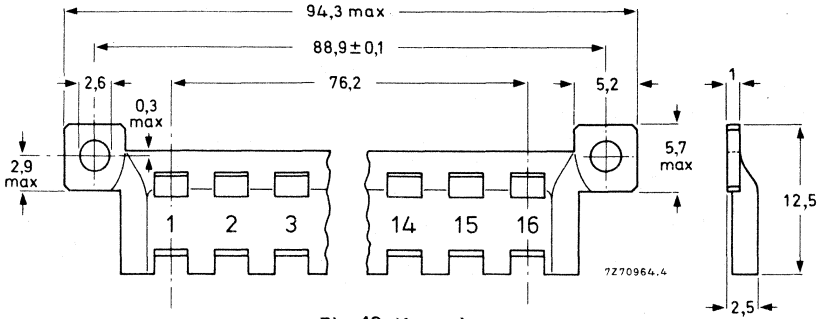


Fig. 49 Key strip.

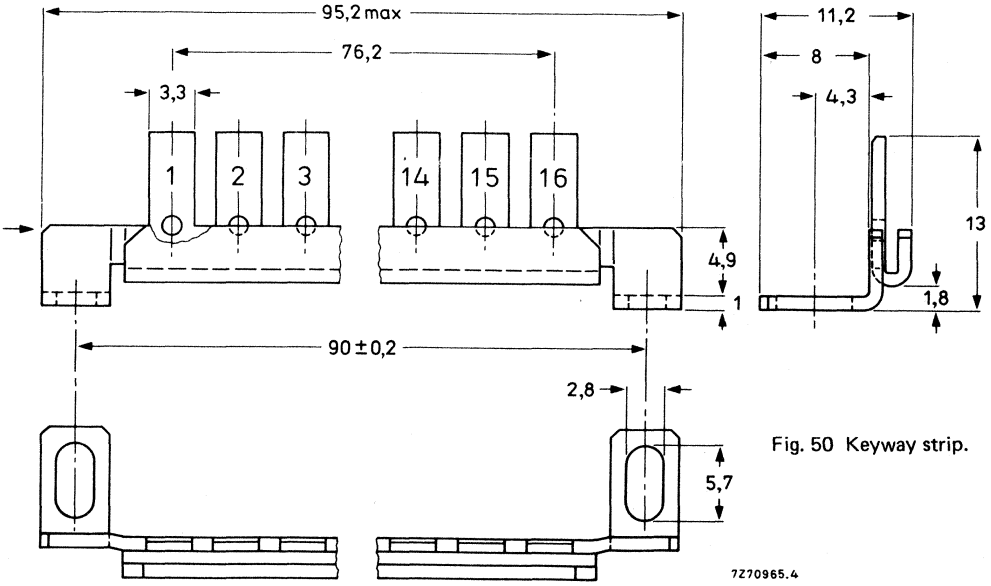


Fig. 50 Keyway strip.

Table 7 Catalogue numbers for ordering accessories

accessory	catalogue number
key strip	4332 026 25830
keyway strip	25840
key	25850
spacer for style B	30230
spacer for style C	30220
spacer for mounting according to Fig. 48a	28840
bracket for mounting according to Figs 48a and 48b	28820

For packing of these accessories see page 30.

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. 51). 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.

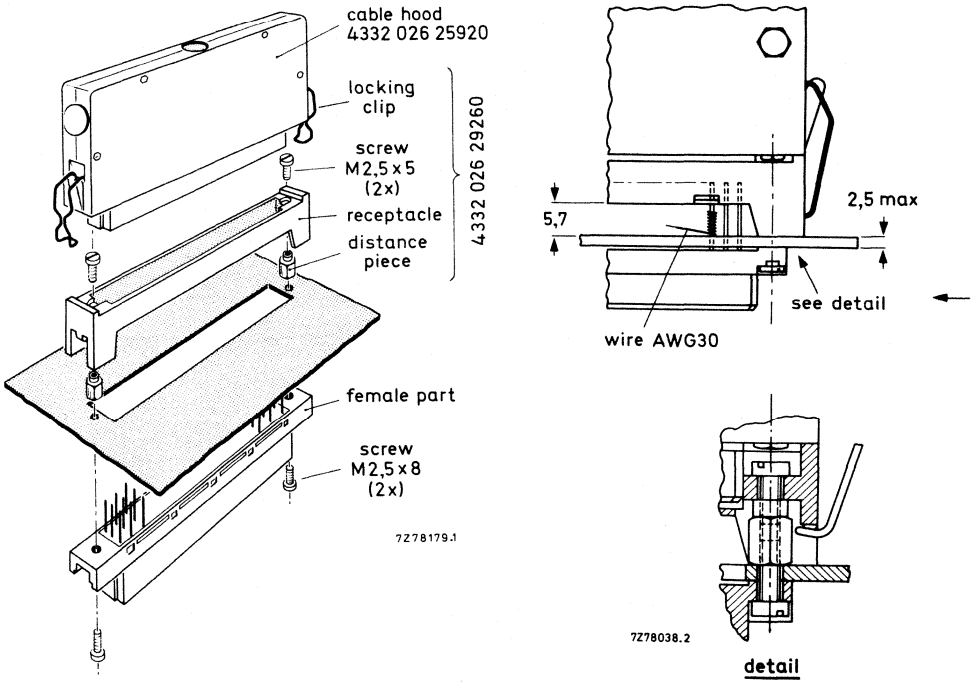


Fig. 51 Accessories for female parts with pins for wire wrapping.

Table 8 Catalogue numbers for ordering accessories

accessory	catalogue number
set of accessories, consisting of 1 receptacle, 2 distance pieces, 2 locking clips, 2 screws M2,5 x 5	4332 026 29260
packing piece	29090

For packing of these accessories see page 30.

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. 52) or to extension boards (Fig. 53). Two types of clips can be supplied for locking to the cable hood and to the male part respectively.

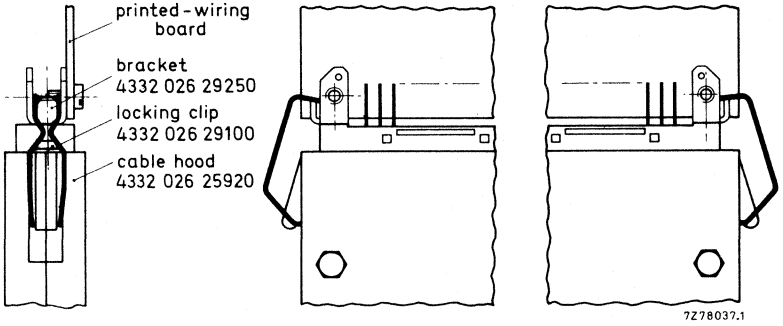


Fig. 52 Mounting of a female part to a board with bracket having locking facility.

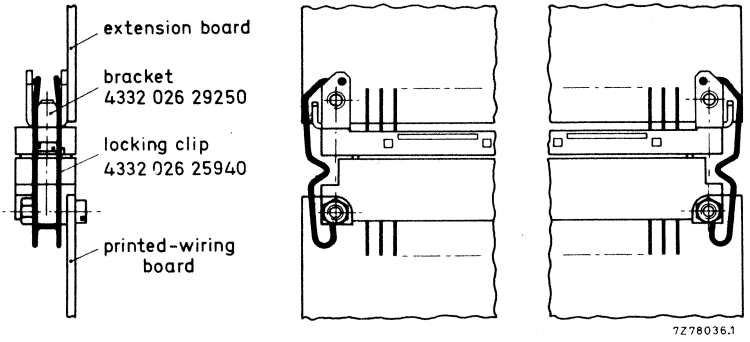


Fig. 53 Mounting of a female part to an extension board with bracket having locking facility.

Another mounting bracket for fitting female parts with 90° angled pins to printed boards is shown in Fig. 54. The bracket is provided with two M2,5 holes. The hole pattern of the board is shown in Fig. 55.

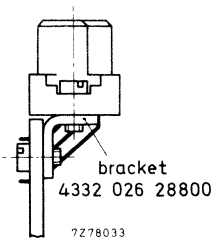


Fig. 54 Mounting of a female part to a board.

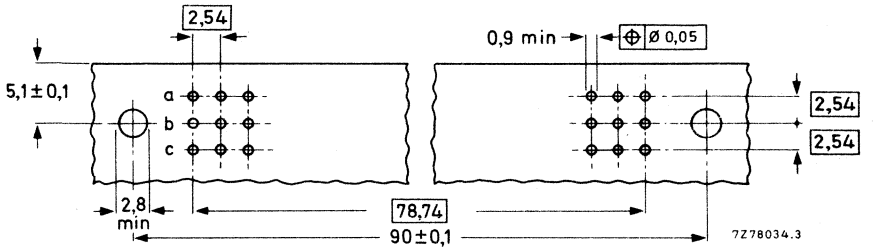


Fig. 55 Hole pattern of the board for a female part with 3 x 32 contacts (style C): for 2 x 32 contacts (style B) the holes of row c are omitted.

Table 9 Catalogue numbers for ordering accessories

accessory	catalogue number
mounting bracket (Fig. 54)	4332 026 28800
mounting bracket (Figs 52 and 53)	29250
clip for locking to a cable hood (Fig. 52)	29100
clip for locking to a male part (Fig. 53)	25940

For packing of these accessories see page 30.

PACKING

Connectors

The connectors are packed in boxes: style B 25 per box, style C 20 per box. Please order in multiples of these quantities.

Accessories

The accessories are packed in plastic bags; the number of pieces or sets per bag is given in Table 10. Please order in multiples of the stated quantities.

Table 10

accessory	catalogue number	number per bag
cable hood (unassembled) with associated parts (Fig. 41)	4332 026 25920	1
packing piece for use with cable hood	26070	5
locking clip (Figs 43, 44, 45, 53)	25940	10
locking clip (Fig. 52)	29100	10
key strip (Figs 47, 48)	25830	5
keyway strip (Figs 47a, 47b)	25840	5
key (Fig. 47a)	25850	100
spacer for style B (Figs 47b, 48b)	30230	10
spacer for style C (Figs 47b, 48b)	30220	10
spacer (Fig. 48a)	28840	50
mounting bracket for male part (Fig. 45)	25930	10
mounting bracket for male part (Fig. 44)	25950	10
mounting bracket for male part (Figs 48a, 48b)	28820	10
mounting bracket for female part (Fig. 54)	28800	10
mounting bracket for female part (Figs 52, 53)	29250	10
accessory set for female part (Fig. 51)	29260	5 *
packing piece for use with receptacle	29090	5

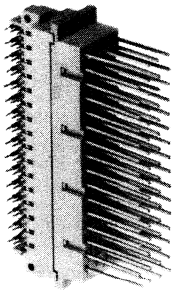
* Each set consists of: 1 receptacle, 2 distance pieces, 2 locking clips, 2 screws M2,5 x 5.

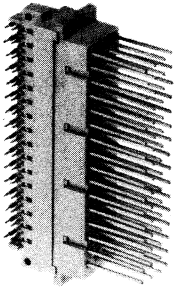
TWO-PART PRINTED-WIRING CONNECTORS

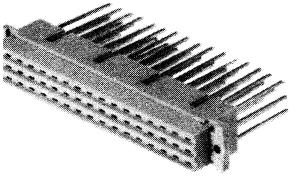
- **For basic grid of 5,08 mm (0,2 in)**

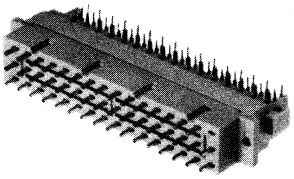
QUICK REFERENCE DATA

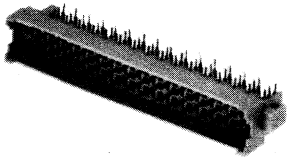
Contact pitch	5,08 mm (0,2 in)
Number of contacts	
style F	32, 48
style G	64
Board thickness	1,42 to 1,78 mm
Terminations	
male part	90° angled dip-solder pins* ←
	straight dip-solder pins
	solder tags*
female part	straight dip-solder pins
	pins for wire wrapping
	solder tags
Current at T_{amb} = 20 °C	5,5 A
Mechanical endurance	400 insertions
Climatic category (IEC 68)	55/125/56
Detail specifications	IEC 130-17 and DIN41612 ←











* 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. Female parts with non-reinforced springs are also available. 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 DATA

Current at T_{amb} = 20 °C	5,5 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	
initially	⩽ 15 mΩ
after mechanical endurance	⩽ 15 mΩ
after damp heat test (IEC 68, test Ca)	⩽ 15 mΩ
Insulation resistance	
initially	$> 10^6$ MΩ
after damp heat test (IEC 68, test Ca)	$> 10^4$ MΩ
Creepage distance	
between contacts	⩾ 3 mm (Notes 1 and 2)
between a contact and earth	⩾ 6 mm (Note 1)
Clearance	
between contacts	⩾ 1,6 mm } Note 1
between a contact and earth	⩾ 3,5 mm } Note 1
Proof voltage for 1 min, at 20 °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	⩽ 2 pF

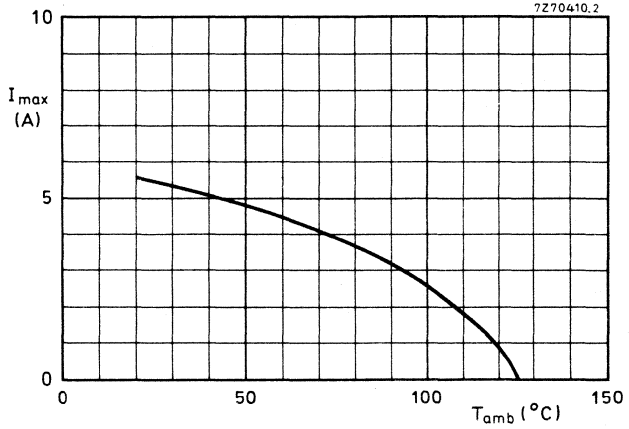


Fig.1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

Notes

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

MECHANICAL DATA

		male part	female part
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	
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		⩾ 0,2 N	
Mechanical endurance		400 insertions, according to IEC 512–5, test 9a	
Connector body material		glass-fibre-filled thermoplastic	
Contacts			
	material	brass	phosphor bronze
	shape	rectangular pin	solid cantilever
	finish of contact surfaces	⩾ 1 μm gold plate on ⩾ 3 μm nickel plate	⩾ 2 μm rolled-on gold on ⩾ 2 μm nickel plate
→	type of termination	• 90° angled dip-solder pin • straight dip-solder pin • solder tag	• pin for wire wrapping • straight dip-solder pin • solder tag
	finish of termination	⩾ 6 μm tinned	⩾ 6 μm tinned
Wire diameter		AWG22 to AWG28 (ϕ0,64 to ϕ0,32 mm)	
Mass		see Table 1	
Solderability		235 °C, 2 s	according to IEC68, test T
→ Resistance to soldering heat		260 °C, 10 s	according to IEC68, test T
→ Vibration		according to IEC68, test Fc, 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	approx. mass (g) 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 IEC68, test Ca, 56 days, 40 °C, R.H. 90 to 95% ←
Dry heat	according to IEC68, test Ba, 16 h, 125 °C ←
Low air pressure	according to IEC68, test M, 5 min, 22 °C, 30 kPa ←
Flammability	according to UL94, category V1

DIMENSIONAL DATA

Dimensions in mm

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

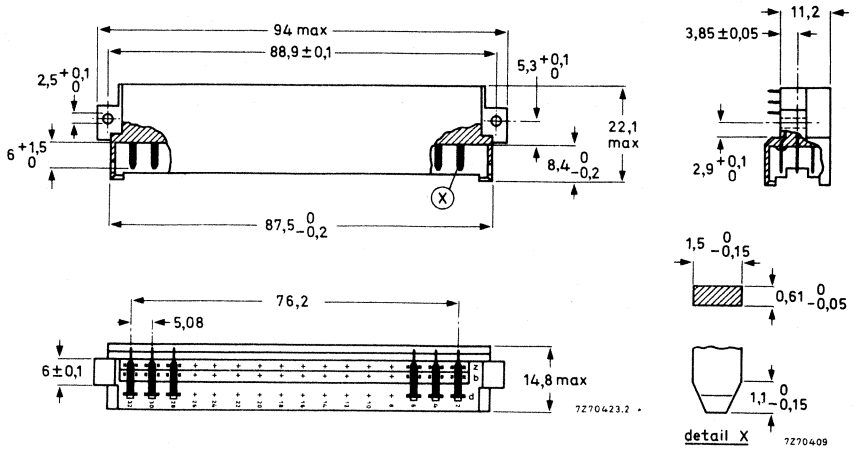


Fig. 2 Male part with 90° angled dip-solder pins.

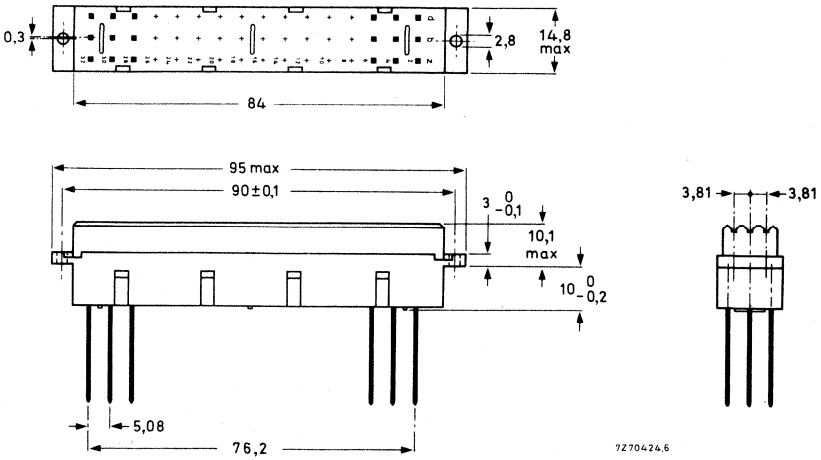


Fig. 3 Female part with pins for wire wrapping.

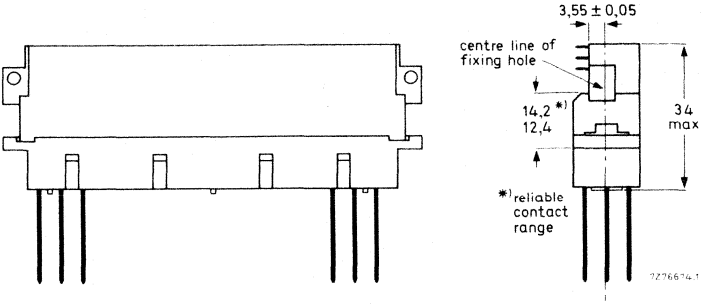


Fig. 4 Combination of connector parts shown in Figs 2 and 3.

Male parts

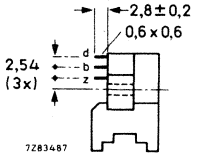


Fig. 5 90° angled dip-solder pins.*

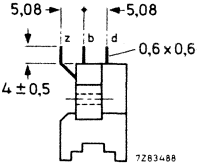


Fig. 6 Straight dip-solder pins.

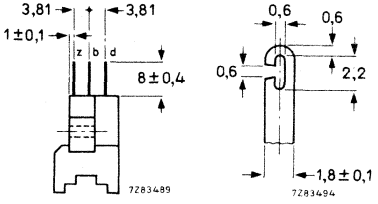


Fig. 7 Solder tags.*

Female parts

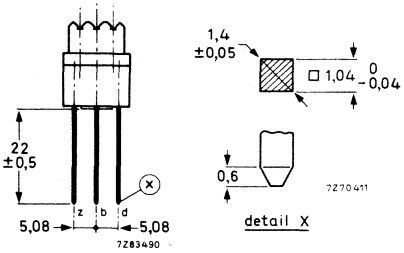


Fig. 8 Pins for wrapping.

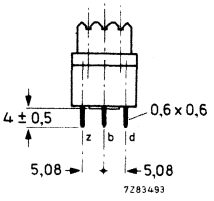


Fig. 9 Straight dip-solder pins.

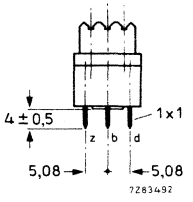


Fig. 10 Straight dip-solder pins.

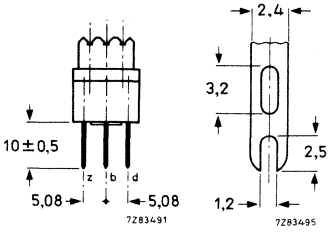


Fig. 11 Solder tags.

* 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

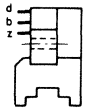
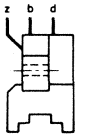
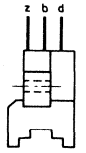
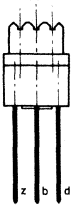
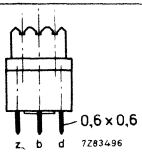
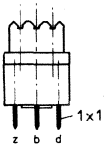
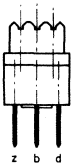
terminations	contacts			catalogue number of male part
	number	positions occupied	protruding earth contacts	
 90° angled dip-solder pins	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	–	2422 025 88143
			b2,b32	88033
			d2,d32	88146
			z32	88036
			b2,b32,z2	88039
			d2,d32,z2	88151
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	–	2422 025 88142
			b2,b32	88032
			z32	88035
			b2,b32,z2	88038
		d2,d4,d6 to d32 z2,z4,z6 to z32	–	2422 025 88115
			d2,d32	88138
			z32	88148
			d2,d32,z2	88145
 straight dip-solder pins	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	–	2422 025 88043
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	–	2422 025 88042
		d2,d4,d6 to d32; z2,z4,z6 to z32	–	2422 025 88161
 solder tags	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	–	2422 025 88059
			b2,b32	88045
			d2,d32	88154
	32	b2,b4,b6 to b32 z2,z4,z6 to z32	–	2422 025 88058
			b2,b32	88044
		d2,d4,d6 to d32; z2,z4,z6 to z32	–	2422 025 88153
			d2,d32	88139

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

terminations	contacts		catalogue number of female part
	number	positions occupied	
 pins for wire wrapping	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88047* 2422 025 88062
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	2422 025 88046* 2422 025 88061
		d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88155* 2422 025 88124
 straight dip-solder pins (0,6 x 0,6)	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88127* 2422 025 88128
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	2422 025 88125* 2422 025 88126
		d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88157* 2422 025 88158
 straight dip-solder pins (1 x 1)	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88051* 2422 025 88065
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	2422 025 88049* 2422 025 88064
		d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88116* 2422 025 88156
 solder tags	48	b2,b4,b6 to b32; d2,d4,d6 to d32; z2,z4,z6 to z32	2422 025 88053* 2422 025 88067
	32	b2,b4,b6 to b32; z2,z4,z6 to z32	2422 025 88052* 2422 025 88066
		d2,d4,d6 to d32 z2,z4,z6 to z32	2422 025 88133* 2422 025 88121

* Type with reinforced springs; preferred.

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

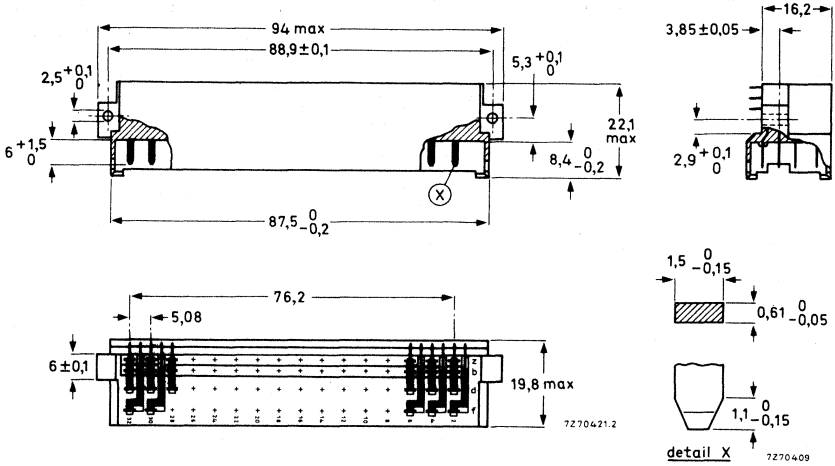


Fig. 12 Male part with 90° angled dip-solder pins. The pitch between the pins of rows z and f is 2,54 mm instead of 5,08 mm.

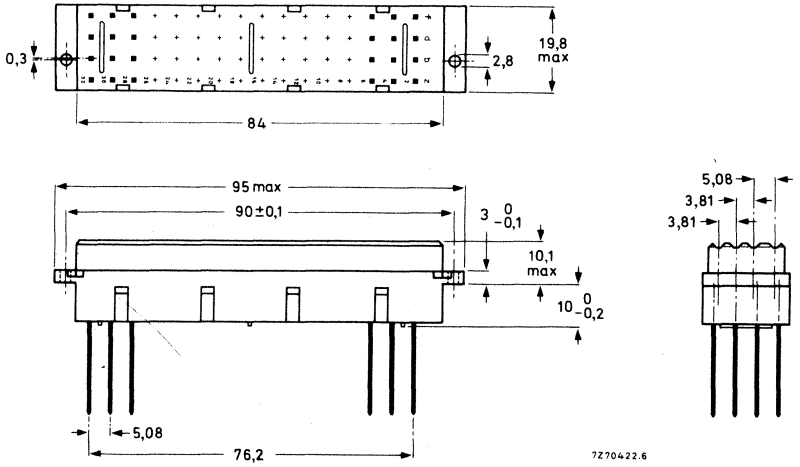


Fig. 13 Female part with pins for wire wrapping.

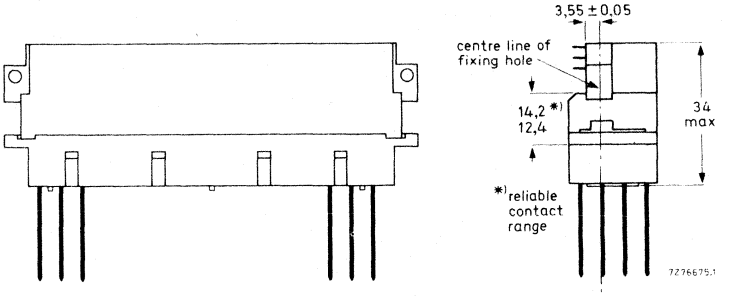


Fig. 14 Combination of connector parts shown in Figs 12 and 13.

Male parts

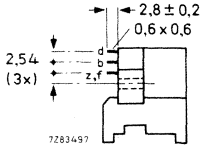


Fig. 15 90° angled dip-solder pins.*

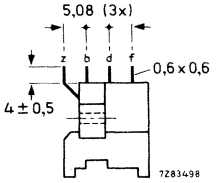


Fig. 16 Straight dip-solder pins.

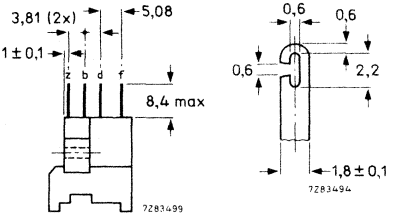


Fig. 17 Solder tags.*

Female parts

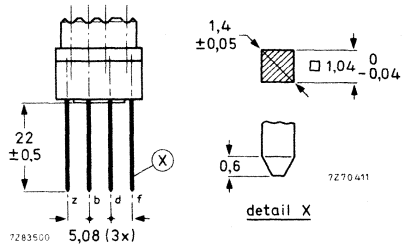


Fig. 18 Pins for wrapping.

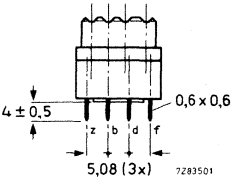


Fig. 19 Straight dip-solder pins.

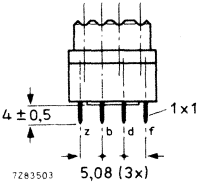


Fig. 20 Straight dip-solder pins.

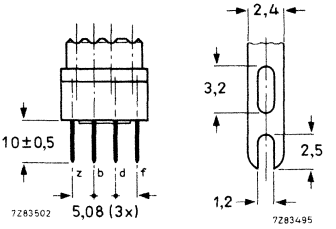


Fig. 21 Solder tags.

* 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

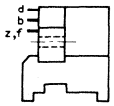
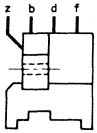
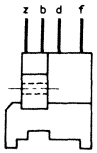
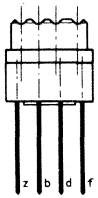
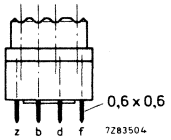
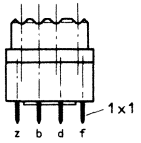
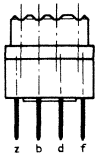
terminations	contacts			catalogue number of male part
	number	positions occupied	protruding earth contacts	
 90° angled dip-solder pins	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	– b2,b32 z32 b2,b32,z2 d2,d32 d2,d32,z2	2422 025 88144 88034 88037 88041 88147 88152
 straight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

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

terminations	contacts		catalogue number of female part
	number	positions occupied	
 pins for wire wrapping	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	2422 025 88048* 2422 025 88063
 straight dip-solder pins (0,6x0,6)	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	2422 025 88129* 2422 025 88131
 straight dip-solder pins (1x1)	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	2422 025 88094* 2422 025 88095
 solder tags	64	b2,b4,b6 to b32; d2,d4,d6 to d32; f2,f4,f6 to f32; z2,z4,z6 to z32	2422 025 88096* 2422 025 88097

* Type with reinforced springs; preferred.

MOUNTING

Dimensions in mm

Panel cut-out for female parts

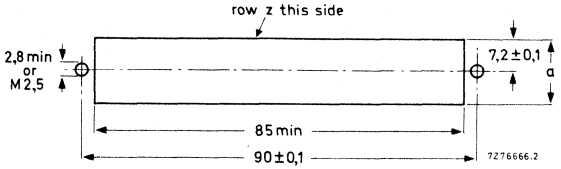


Fig. 22 Panel cut-out; see Table 4 for dimension a.

Table 4

connector style	a_{min}
F	15
G	20

→ **Hole patterns on printed boards for female parts**

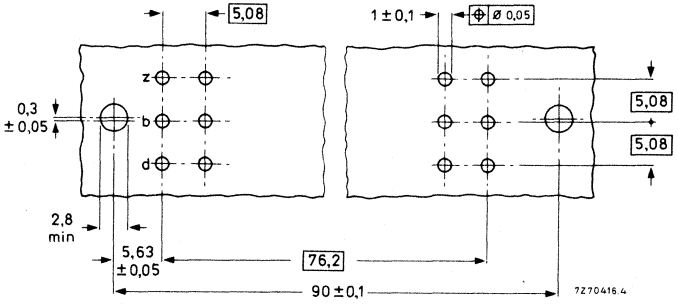


Fig. 23 For 3 x 16 contacts; style F.

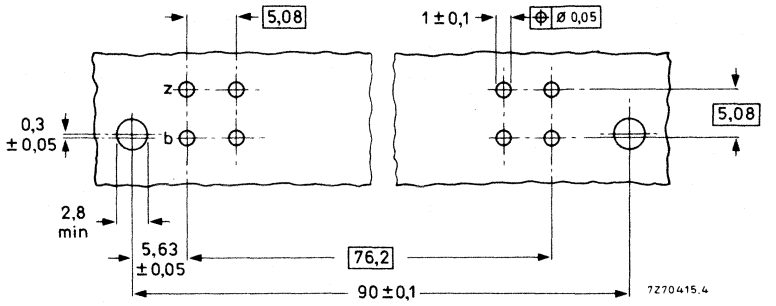


Fig. 24 For 2 x 16 contacts (rows b and z); style F.

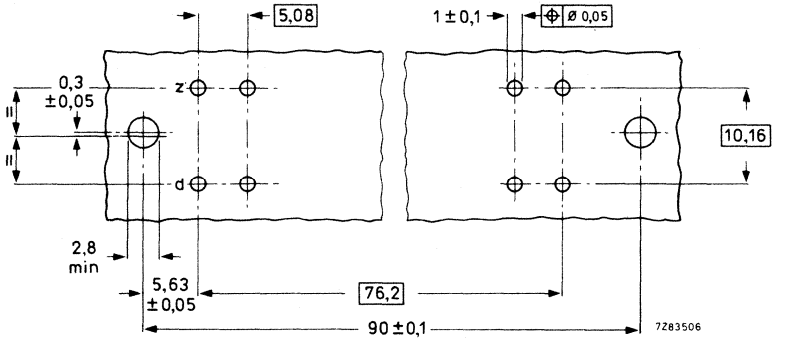


Fig. 25 For 2 x 16 contacts (rows d and z); style F.

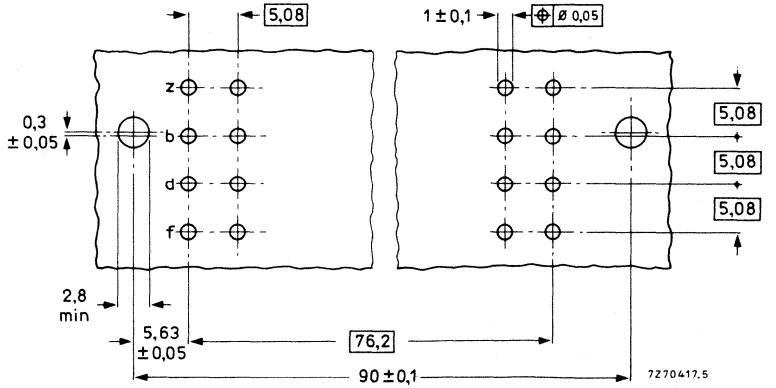


Fig. 26 For 4 x 16 contacts; style G.

→ **Hole patterns on printed boards for male parts**

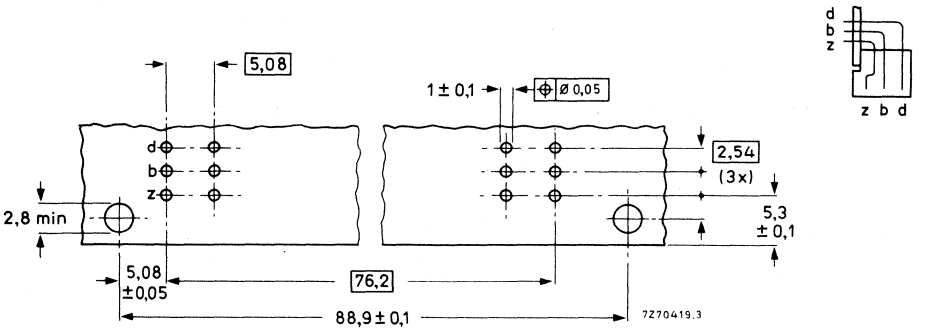


Fig. 27 For 3 x 16 contacts; style F.

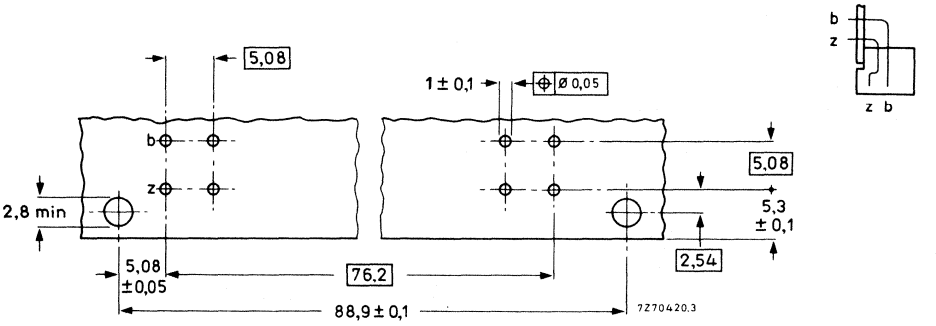


Fig. 28 For 2 x 16 contacts (rows b and z); style F.

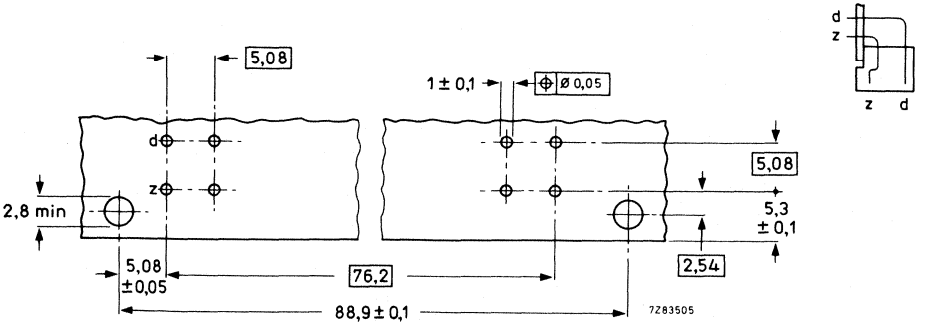


Fig. 29 For 2 x 16 contacts (rows d and z); style F.

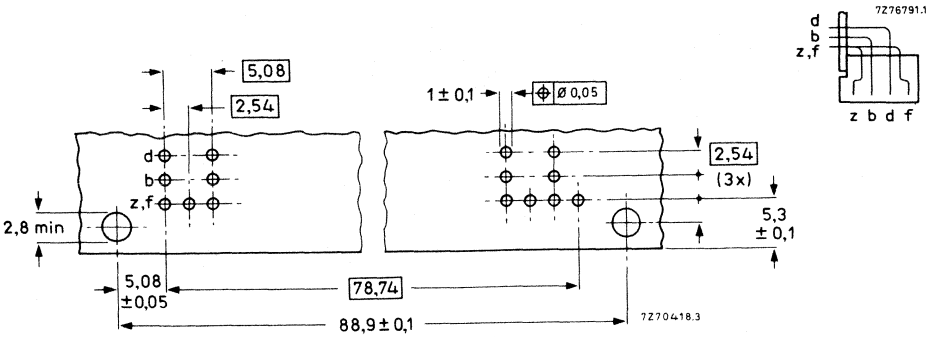


Fig. 30 For 4 x 16 contacts; style G.

MARKING

Package

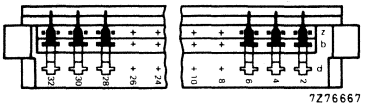
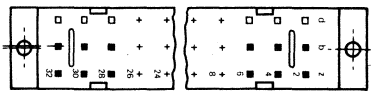
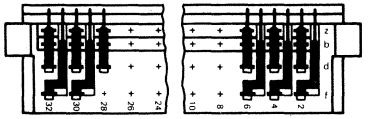
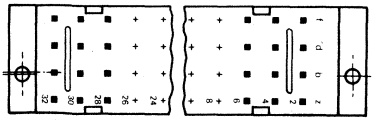
The package is marked with:
- 12-digit catalogue number;
- reference number of manufacturer;
- number of pieces.

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.

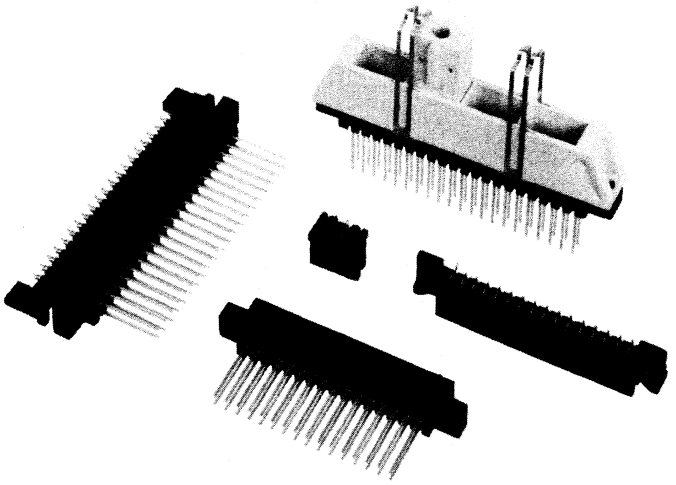
Table 6

connector style	male part	female part
F	 7Z76667	 7Z76670
G	 7Z76668	 7Z76669

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 °C	2,5 A
Mechanical endurance	500 insertions
Climatic category (IEC68)	10/100/21



Contents

Application	2
Description	2
Electrical data	3
Mechanical data	4
Environmental data	5
Dimensional data	6
Mounting	8
Polarization and positioning	9
Marking	9
Accessories	10
Packing	12

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 °C	2,5 A
Derated current curve	according to IEC512–3, 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	⩽ 13 mΩ
after mechanical endurance	⩽ 13 mΩ
after damp heat test	⩽ 13 mΩ
Insulation resistance	
initially	$> 10^4$ MΩ
after damp heat test	$> 10^3$ MΩ
at maximum ambient temperature	$> 10^4$ MΩ
Creepage distance	
between adjacent contacts	⩾ 0,7 mm
between opposite contacts	⩾ 2,2 mm
Clearance	
between adjacent contacts	⩾ 0,6 mm
between opposite contacts	⩾ 1,4 mm
Proof voltage for 1 min, at 20 °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	⩽ 4 pF

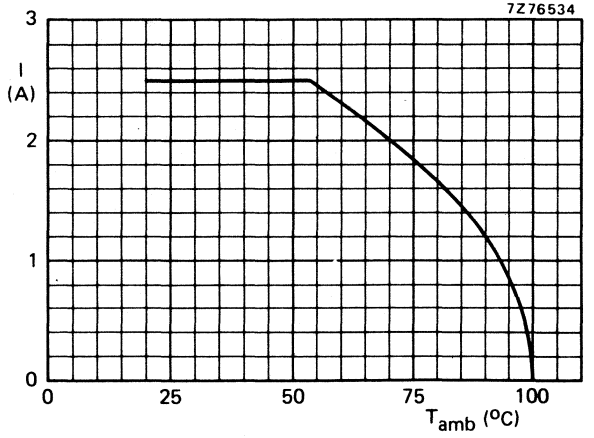


Fig.1 Maximum current per contact, equally on all contacts, as a function of ambient temperature.

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 IEC512–5, 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	⩾ 2,5 μm rolled-on gold on ⩾ 1 μm nickel plate	⩾ 2,5 μm rolled-on gold on ⩾ 1 μm nickel plate
contact force	⩾ 0,5 N	
type of termination	pin for wire wrap	solder tag
finish of termination	⩾ 0,2 μm gold plate	⩾ 0,2 μm gold plate
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 IEC68, test T	
Resistance to heat	260 °C, 10 s }	
Bumping	according to IEC68, test Eb, 10g, 16 ms, 6 directions, 1000 bumps	
Vibration	according to IEC68, test Fc, 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	approx. mass (g) 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 IEC68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Industrial atmosphere	0,05% H_2S, 24 h; 0,05% SO_2, 24 h

DIMENSIONAL DATA Dimensions in mm

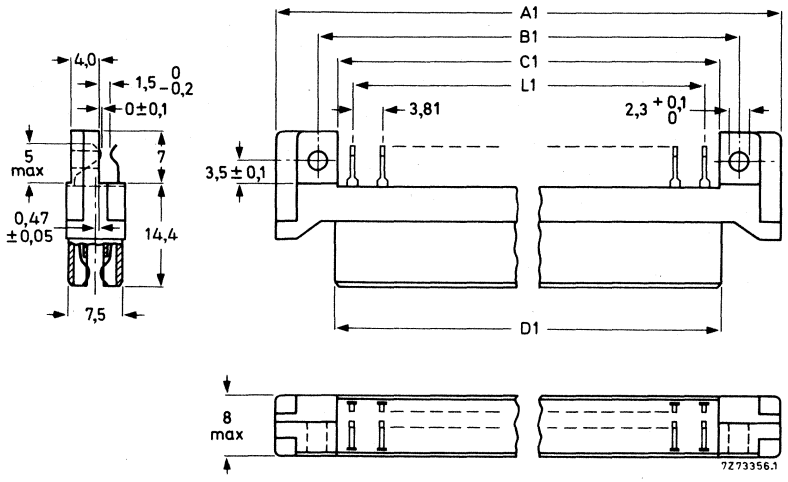


Fig.2 Female part; see Table 2 for dimensions A1, B1, C1, D1 and L1.

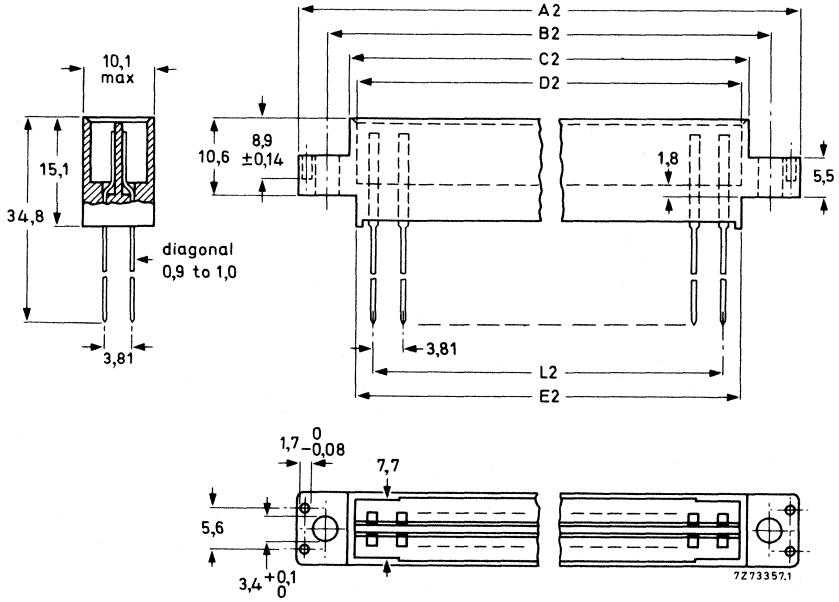


Fig.3 Male part; see Table 3 for dimensions A2, B2, C2, D2, E2 and L2.

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 16008
42	100,15	88,90 ± 0,1	83,2	84,30	76,20	2422 050 21008

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 16007
42	100,70	92,50 ± 0,1	86,75	84,70	84,00	76,20	2422 050 21007

MOUNTING

Panel cut-out for male parts

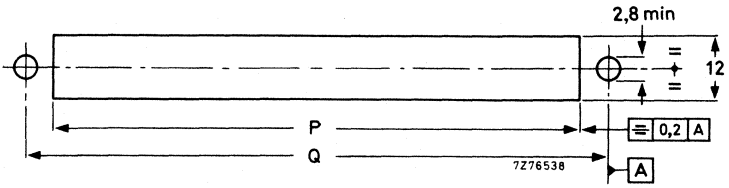


Fig.4 Panel cut-out for the male part; see Table 4 for dimensions P and Q.

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

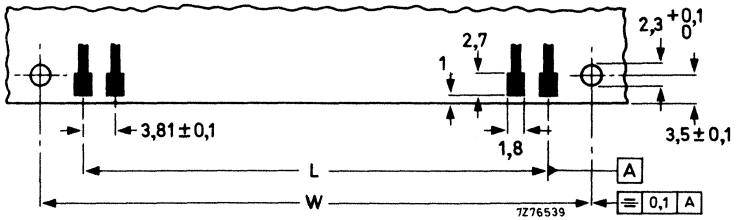


Fig.5 Recommended dimensions of the printed-wiring board to be fitted to the female part; see Table 5 for dimensions L and W.

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.

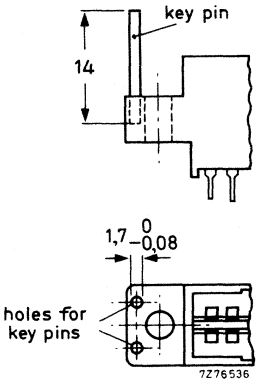


Fig.6

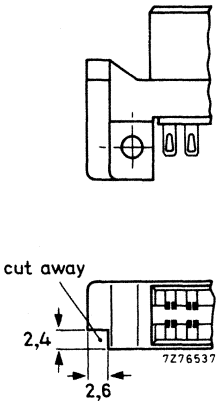


Fig.7

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 test plug has a dark green glass-fibre-filled phenolformaldehyde body. The bifurcated contact springs are of phosphor bronze; the contact surfaces are 2,5 μm min rolled-on gold on 1 μm min nickel plating. The contact terminations are solder tags with eyelet.

The mass is 2,5 g.

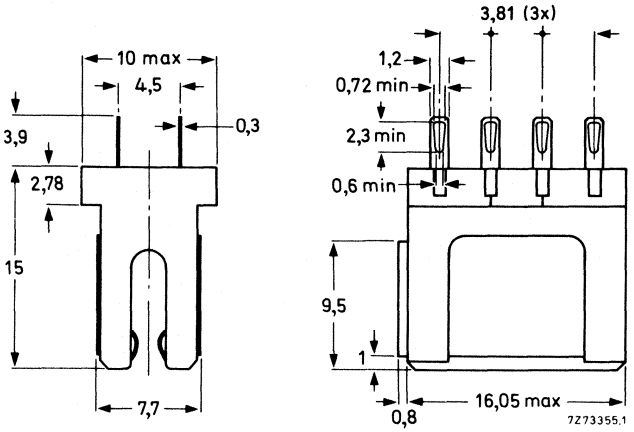


Fig.8 Test plug; dimensions in mm.

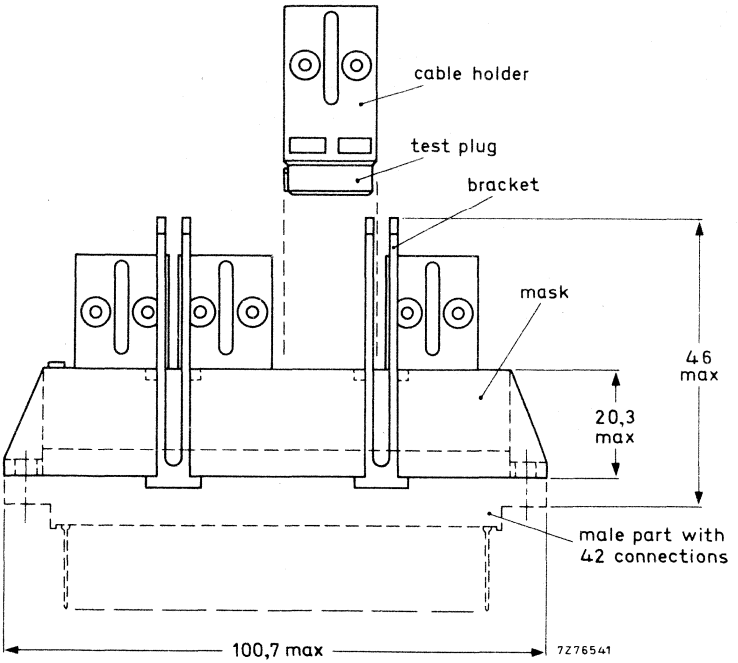


Fig.9 Four test plugs with auxiliary parts; dimensions in mm.

Catalogue numbers for ordering

Table 6

description	catalogue number
test plug	2422 050 90004
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

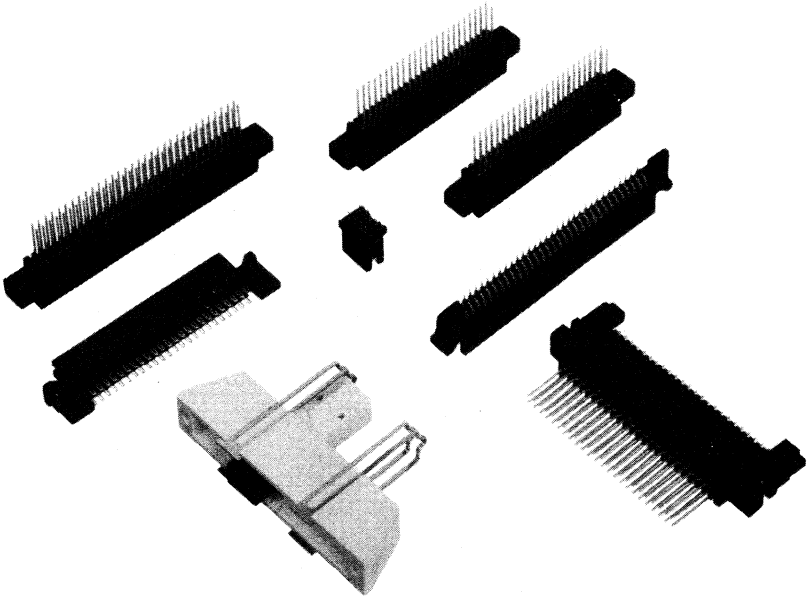
connector	number per box
male part, 32 connections	60
female part, 32 connections	60
male part. 42 connections	50
female part, 42 connections	50
test plug	88

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



Contents

Application	2
Dsecription	2
Electrical data	3
Mechanical data	4
Environmental data	5
Dimensional data	6
Mounting	8
Polarization and positioning	9
Marking	9
Accessories	10
Packing	12

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 °C	2 A
Derated current curve	according to IEC512–3, 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	⩽ 13 mΩ
after mechanical endurance	⩽ 13 mΩ
after damp heat test	⩽ 13 mΩ
Insulation resistance	
initially	$>10^4$ MΩ
after damp heat test	$>10^3$ MΩ
at maximum ambient temperature	$>10^4$ MΩ
Creepage distance	
between adjacent contacts	⩾ 0,5 mm
between opposite contacts	⩾ 2,2 mm
Clearance	
between adjacent contacts	⩾ 0,4 mm
between opposite contacts	⩾ 1,4 mm
Proof voltage for 1 min, at 20 °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	⩽ 4 pF

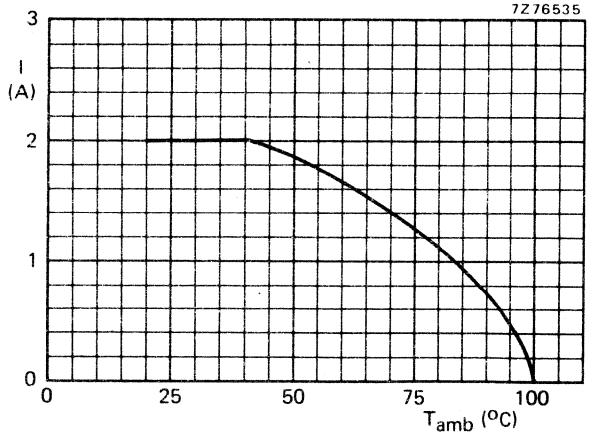


Fig.1 Maximum current per contact, equally on all contacts, as a function of ambient temperature.

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 IEC512–5, 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	⩾ 2,5 μm rolled-on gold on ⩾ 1 μm nickel plate	⩾ 2,5 μm rolled-on gold on ⩾ 1 μm nickel plate
contact force	⩾ 0,5 N	
type of termination		
48 connections	pin for wire wrap	solder tag, solder tag with eyelet
64 connections	pin for wire wrap	solder tag
finish of termination	⩾ 0,2 μm gold plate	⩾ 0,2 μm gold plate
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 68, test T	
Resistance to heat	260 °C, 10 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, 0,7 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	approx. mass (g) 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 68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Industrial atmosphere	0,05% H_2S, 24 h; 0,05% SO_2, 24 h

DIMENSIONAL DATA

Dimensions in mm

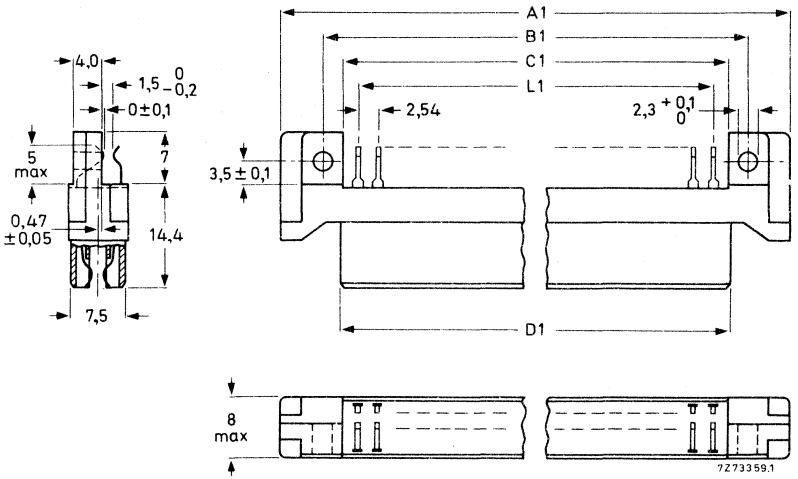


Fig.2 Female part with solder tags; see Table 2 for dimensions A1, B1, C1, D1 and L1.

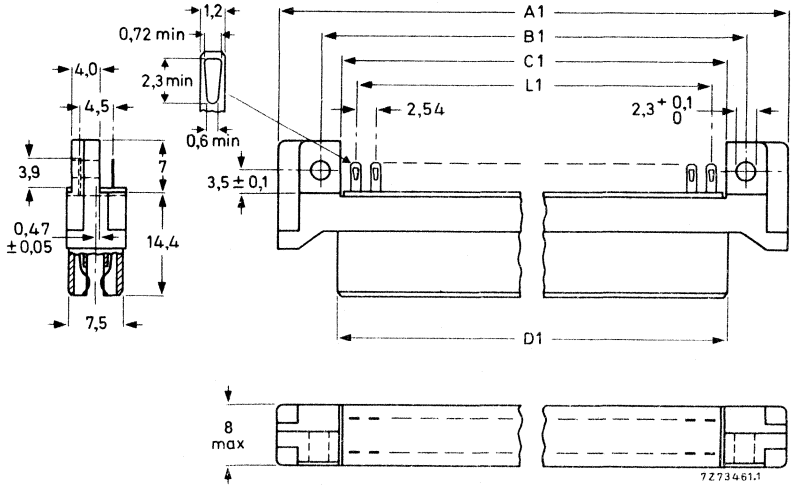


Fig.3 Female part with solder tags with eyelet; see Table 2 for dimensions A1, B1, C1, D1 and L1.

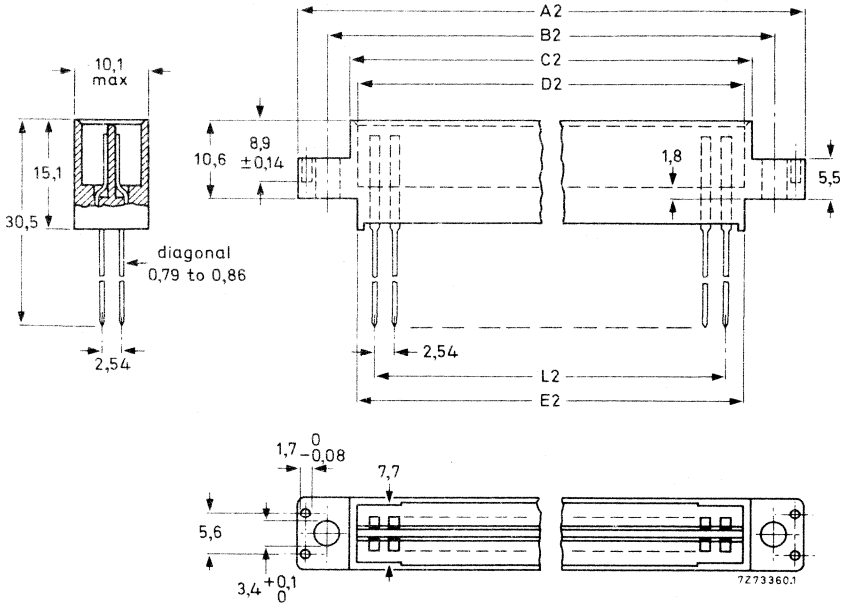


Fig.4 Male part; see Table 3 for dimensions A2, B2, C2, D2, E2 and L2.

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 24008
48 (Fig.3)	79,83	68,58 ± 0,1	62,9	63,98	58,42	2422 049 24018
64 (Fig.2)	100,15	88,90 ± 0,1	83,2	84,30	78,74	2422 049 32008

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 24007
64	100,70	92,50 ± 0,1	86,75	84,70	84,00	78,74	2422 049 32007

MOUNTING

Panel cut-out for male parts

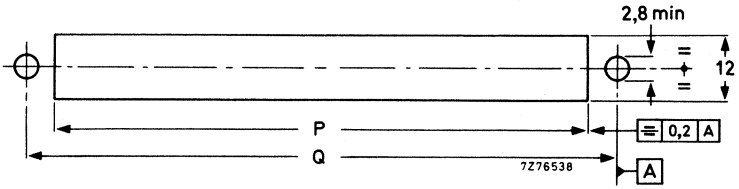


Fig.5 Panel cut-out for the male part; see Table 4 for dimensions P and Q.

Table 4

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

Printed-wiring board recommendations

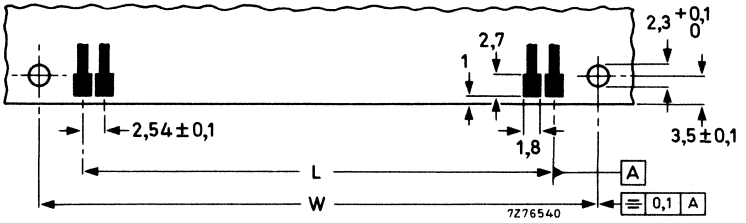


Fig.6 Recommended dimensions of the printed-wiring board to be fitted to the female part; see Table 5 for dimensions L and W.

Table 5

number of connections	dimensions (mm)	
	L	W
48	58,42	68,58 ± 0,1
64	78,74	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.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.

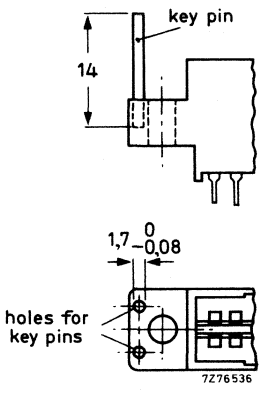


Fig.7

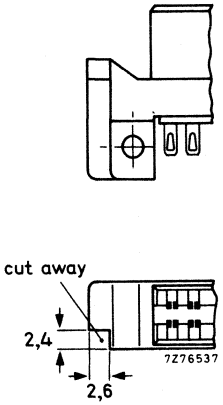


Fig.8

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 test plug has a dark green glass-fibre-filled phenolformaldehyde body. The bifurcated contact springs are of phosphor bronze; the contact surfaces are 2,5 μm min rolled-on gold on 1 μm min nickel plating. The contact terminations are solder tags with eyelet.

The mass is 1,9 g.

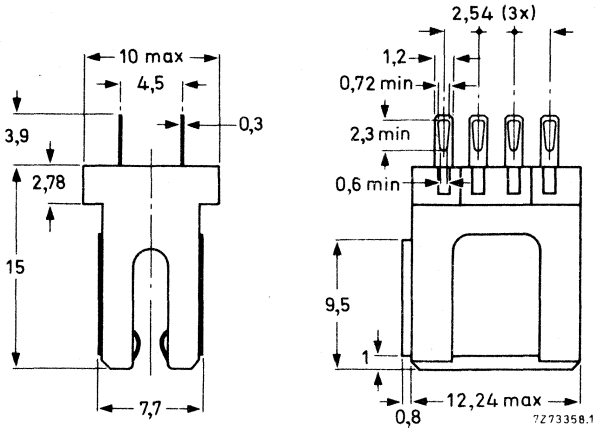


Fig.9 Test plug; dimensions in mm.

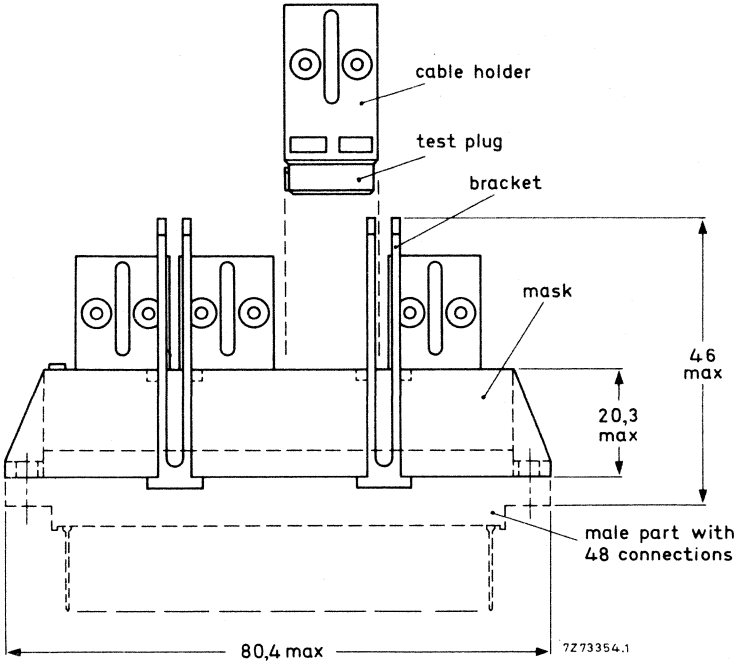


Fig.10 Four test plugs with auxiliary parts; dimensions in mm.

Catalogue numbers for ordering

Table 6

description	catalogue number
test plug	2422 049 90004
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

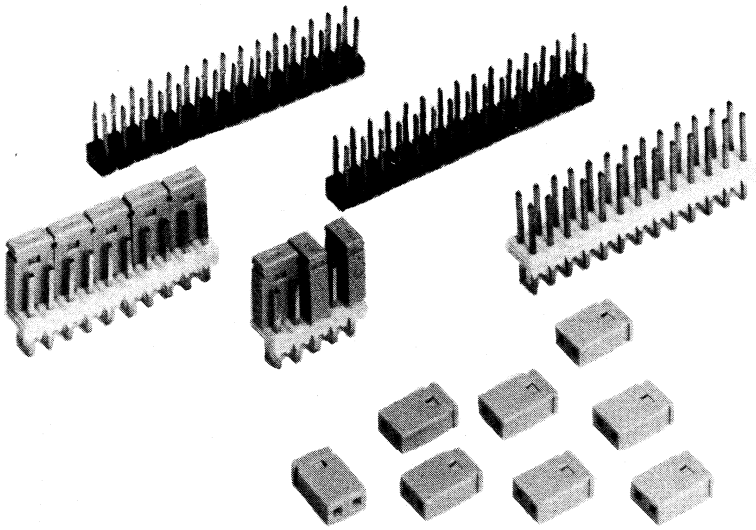
Please order in multiples of these quantities.

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 °C	3 A
Mechanical endurance	150 insertions
Climatic category (IEC 68)	55/125/21



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 besupplied 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 °C	3 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 at point A, see Fig. 2	
initially	⩽ 25 mΩ
after mechanical endurance	⩽ 25 mΩ
after damp heat test	⩽ 35 mΩ
Insulation resistance	
initially	$> 5.10^3$ MΩ
after damp heat test	$> 10^3$ MΩ
Proof voltage for 1 min, at 20 °C	
→ between contact and a metal mounting plate	750 V (r.m.s.), 50 Hz

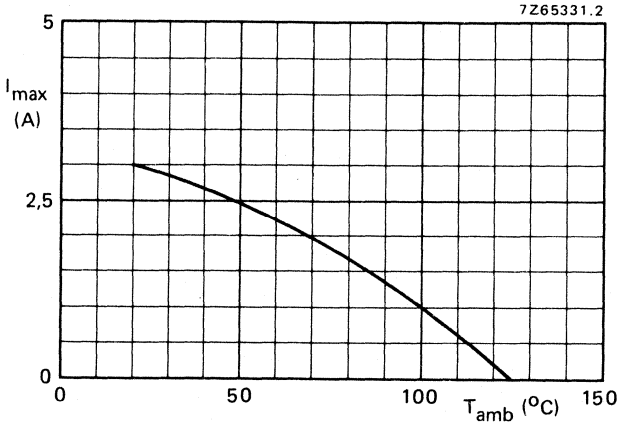


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts	2
Board thickness	1,42 to 1,78 mm
Insertion force	$\leqslant$ 2N
Withdrawal force	$\geqslant$ 0,12N
Mechanical endurance	150 insertions; according to IEC 512–5, test 9a
Connector body material	glass-fibre-filled thermoplastic
Contact pins and springs	
material	phosphor bronze
shape	see Fig. 2
finish of contact surfaces	$\geqslant$ 1 μm hard gold
contact force	$\geqslant$ 2 x 0,5N
type of pin termination	dip-solder
finish of termination	$\geqslant$ 1 μm hard gold
Mass	
female plug	0,16g
contact pin	0,021g
Solderability	according to IEC 68, test T, 350 °C, 2 s
Shock	according to IEC 68, test Ea, 50g, 11 ms (plug in fixed position)
Vibration	according to IEC 68, test Fc. 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 68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V1

DIMENSIONAL DATA

Dimensions in mm

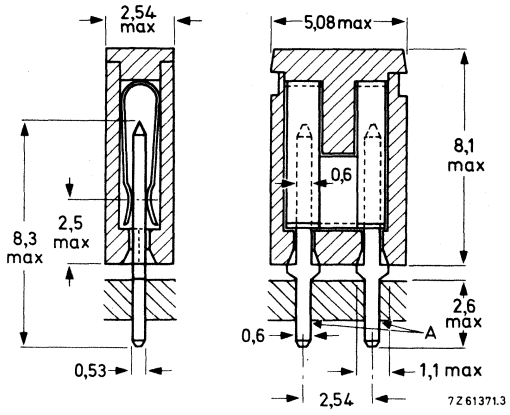


Fig. 2 Two-part jumper connector in mounted position.

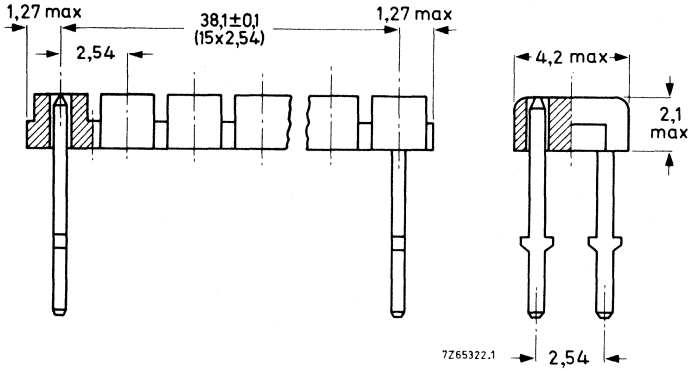


Fig. 3 Removable mounting strip with 2 x 16 contact pins. For pin dimensions see Fig. 2.

Table 1—Catalogue numbers for ordering.

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

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.

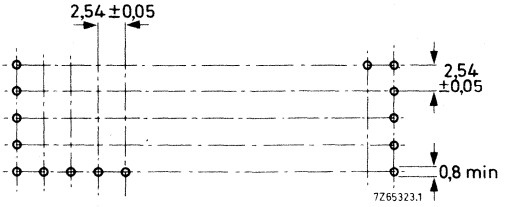


Fig. 4 Piercing diagram.

MARKING

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

PACKING

The female plugs and the loose pins are packed in plastic bags: plugs 500 per bag, pins 1000 per bag.

Mounting strips with 2 x 16 contact pins are packed in boxes of 30.

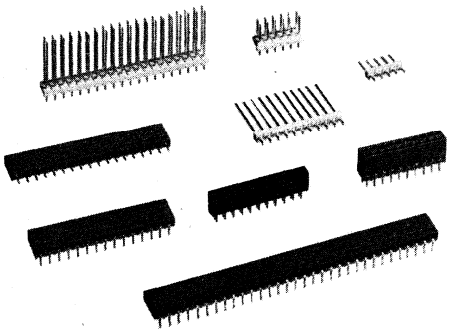
Please order in multiples of these quantities.

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		
Female connectors		
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	←
Male connectors		
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 20	←
Board thickness	1,42 to 1,78 mm	
Terminations	dip-solder pins pins for wire wrapping	←
Current at T_{amb} = 20 °C	3 A	
Mechanical endurance	300 insertions	
Climatic category (IEC 68)	55/125/21	



* Types with slightly different properties; not included in this data sheet. For data see data sheet on F095 additional version.

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.

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 and the bottom-entry sockets* have a body of flame retardent, glass-fibre-filled thermo-plastic 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.

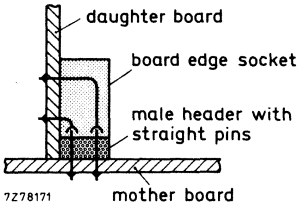


Fig. 1a.

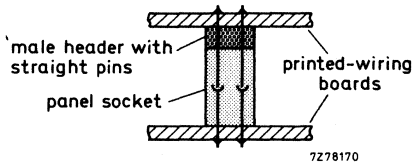


Fig. 1b.

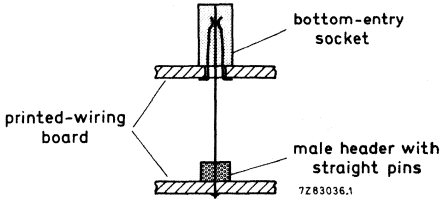


Fig. 1c.

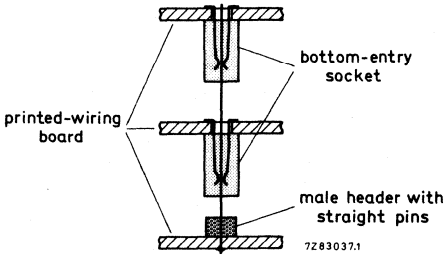
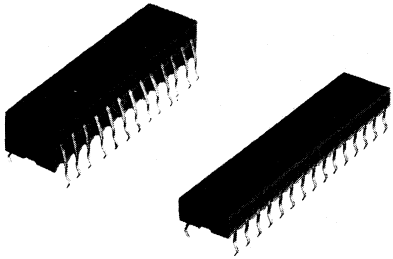


Fig. 1d.

* See data sheet on F095 additional version.

SURVEY

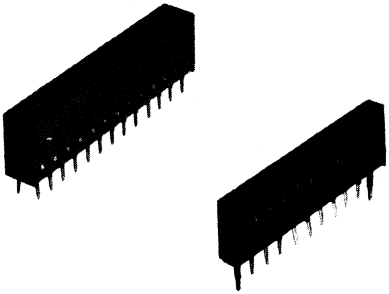
Board-edge sockets



4 to 130 contacts; double row

2 to 32 contacts; single row

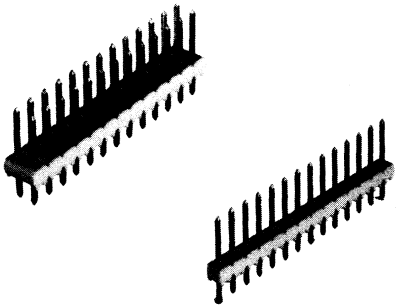
Panel sockets



4 to 100 contacts; double row

2 to 32 contacts; single row

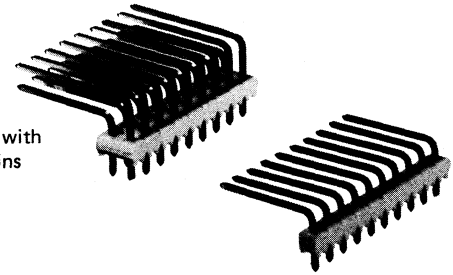
Male headers with straight pins



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 °C	3 A
Derated current curve	according to IEC 512–3, 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	$\leqslant$ 15 mΩ
after mechanical endurance	$\leqslant$ 20 mΩ
after damp heat test	$\leqslant$ 20 mΩ
Insulation resistance	
initially	$> 10^5$ MΩ
after damp heat test	$> 10^3$ MΩ
at maximum ambient temperature	$> 10^3$ MΩ
Creepage distance	
between adjacent or opposite contacts	$\geqslant$ 0,5 mm
Clearance	
between adjacent or opposite contacts	$\geqslant$ 0,4 mm
Proof voltage for 1 min, at 20 °C	
between adjacent or opposite contacts	750 V (r.m.s.), 50 Hz
Capacitance between contacts at 1 MHz	$\leqslant$ 1,5 pF

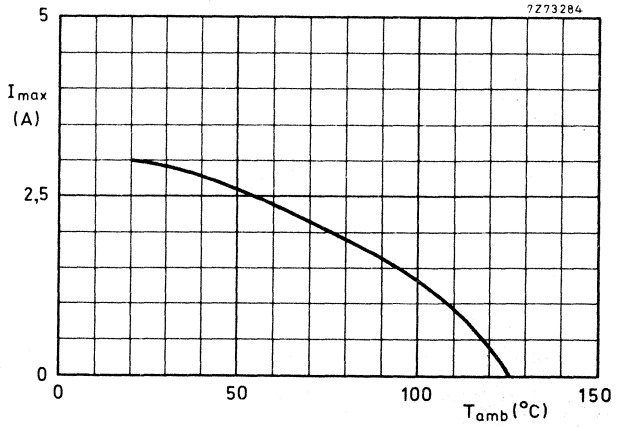


Fig. 2 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts	
Female connectors	←
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
Male connectors	
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 20
Board thickness (for dip-solder application)	1,42 to 1,78 mm
Insertion force per contact	⩽ 1,5 N
Withdrawal force per contact	⩾ 0,1 N
Mechanical endurance	300 insertions: according to IEC 512–5, test 9a
Connector body material	
board edge socket and panel socket	glass-fibre-filled thermosetting
male header	glass-fibre-filled thermoplastic

Contacts	springs	pins
material	phosphor bronze	phosphor bronze
shape	solid cantilever	square wire, chamfered at both ends
finish of contact surfaces	⩾ 2,4 μm rolled-on gold on ⩾ 1 μm nickel plate	⩾ 1 μm gold plate* on ⩾ 1 μm nickel plate ←
type of termination	dip-solder pin	dip-solder pin pin for wire wrapping
finish of termination	⩾ 0,15 μm gold flash	⩾ 1 μm gold plate on ⩾ 1 μm nickel plate

Wire diameter for wrapping	AWG30 to AWG28 (ϕ 0,25 to 0,32 mm)
Solderability	235 °C, 2 s } according to IEC 68, test T ←
Resistance to soldering heat	350 °C, 3,5 s }
Shock	according to IEC 68, test Ea, 50g, 11 ms
Vibration	according to IEC 68, test Fc, 10 to 2000 Hz, 1,5 mm (p-p) or 10g, 3 directions, 2 h per direction

* ⩾ 0,8 μm gold plate for male headers with 90° angled pins.

ENVIRONMENTAL DATA

Climatic category (IEC 68)	55/125/21
Ambient temperature range	−55 to + 125 °C
Storage temperature range	−55 to + 125 °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, 125 °C
Salt mist	according to IEC 68, test Ka, 96 h
Flammability	according to UL94, category V0

DIMENSIONAL DATA: BOARD EDGE SOCKETS

Dimensions in mm

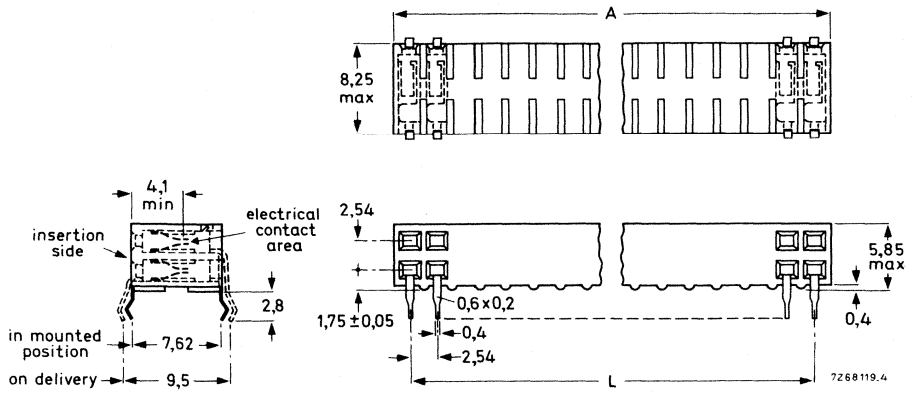


Fig. 3 Board edge socket, double row. See Table 1 for dimensions A and L.

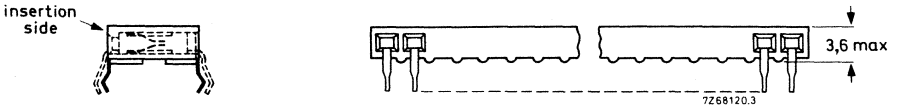


Fig. 4 Board edge socket, single row. Dimensions are identical with those in Fig. 3, except as shown.

Table 1: Board edge sockets

number of contacts		L		A		catalogue number	
single row	double row					single row	double row
2	4	2,54		5,44		2422 062 10202	2422 062 10212
3	6	5,08		7,98		10302	10312
4	8	7,62		10,52		10402	10412
5	10	10,16		13,06		10502	10512
6	12	12,70		15,60		10602	10612
7	14	15,24		18,14		10702	10712
8	16	17,78		20,68		10802	10812
9	18	20,32		23,22		10902	10912
10	20	22,86		25,76		11002	11012
11	22	25,40		28,30		11102	11112
12	24	27,94		30,84		11202	11212
13	26	30,48		33,38		11302	11312
14	28	33,02		35,92		11402	11412
15	30	35,56		38,46		11502	11512
16	32	38,10	± 0,15	41,00	± 0,30	11602	11612
17	34	40,64		43,54		11702	11712
18	36	43,18		46,08		11802	11812
19	38	45,72		48,62		11902	11912
20	40	48,26		51,16		12002	12012
21	42	50,80		53,70		12102	12112
22	44	53,34		56,24		12202	12212
23	46	55,88		58,78		12302	12312
24	48	58,42		61,32		12402	12412
25	50	60,96		63,86		12502	12512
26	52	63,50		66,40		12602	12612
27	54	66,04		68,94		12702	12712
28	56	68,58		71,48		12802	12812
29	58	71,12		74,02		12902	12912
30	60	73,66		76,56		13002	13012
31	62	76,20		79,10		13102	13112
32	64	78,74		81,64		13202	13212

Table 1: Board edge sockets (continued)

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

DIMENSIONAL DATA: PANEL SOCKETS

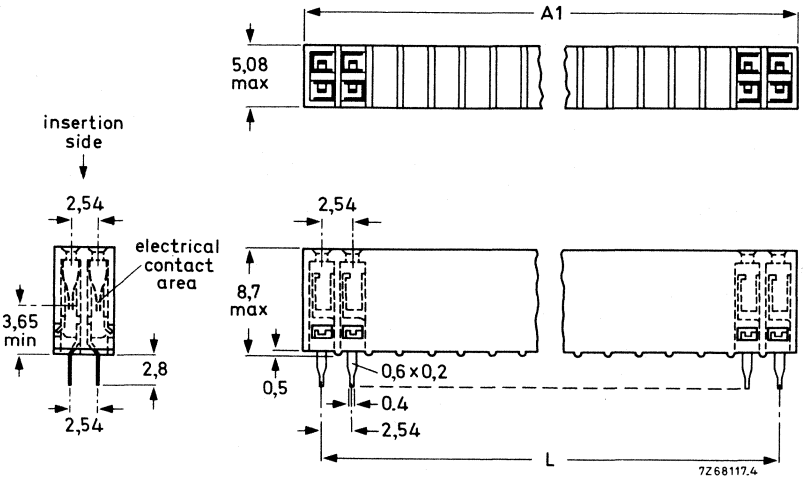


Fig. 5 Panel socket, double row. See Table 2 for dimensions A1 and L.

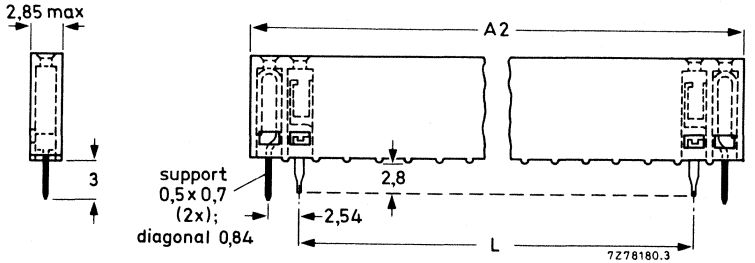


Fig. 6 Panel socket, single row. Dimensions are identical with those in Fig. 5 except as shown. See Table 2 for dimensions A2 and L.

Table 2: Panel sockets

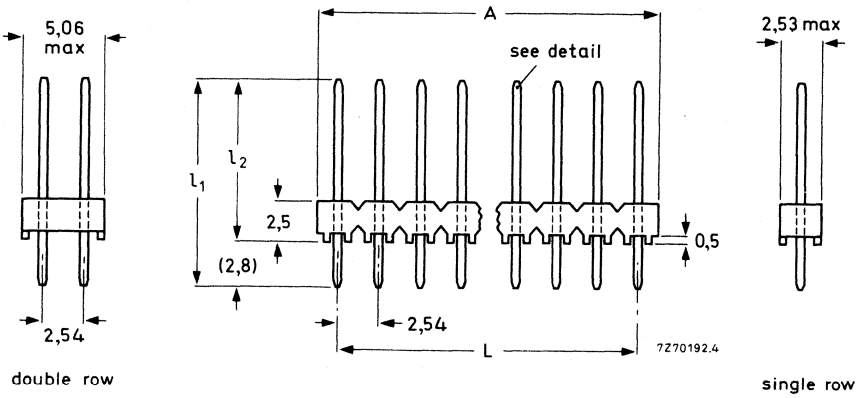
number of contacts		L	A1	A2	catalogue number	
single row	double row				single row (with supports)	double row (without supports)
2	4	2,54	5,44	10,52	2422 062 00272	2422 062 00212
3	6	5,08	7,98	13,06	00372	00312
4	8	7,62	10,52	15,60	00472	00412
5	10	10.16	13,06	18,14	00572	00512
6	12	12,70	15,60	20,68	00672	00612
7	14	15,24	18,14	23,22	00772	00712
8	16	17,78	20,68	25,76	00872	00812
9	18	20,32	23,22	28,30	00972	00912
10	20	22,86	25,76	30,84	01072	01012
		± 0,15	± 0,30	± 0,30		

Table 2: Panel sockets (continued)

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

DIMENSIONAL DATA: MALE HEADERS WITH STRAIGHT PINS

These male headers are available with the following pin lengths:
- 11 mm, especially for use with female plugs F088 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.



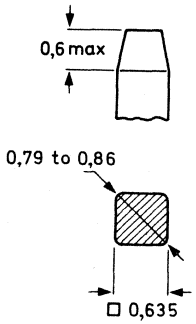


Fig. 7 Male header with straight pins. See Table 3 for dimensions A and L.
Available pin lengths:
l_1 = 11 ± 0,1 mm, l_2 = 8,2 ± 0,2 mm;
l_1 = 12 ± 0,1 mm, l_2 = 9,2 ± 0,2 mm;
l_1 = 22 ± 0,1 mm, l_2 = 19,2 ± 0,2 mm.
Other pin lengths are available on request.

Table 3: Male headers with straight pins

number of contacts		L	A	catalogue number 2422 062					
				pin length l_1 = 11 mm		pin length l_1 = 12 mm		pin length l_1 = 22 mm	
single row	double row			single row	double row	single row	double row	single row	double row
2	4	2,54	5,08	60241	60251	40241	40251	50241	50251
3	6	5,08	7,62	60341	60351	40341	40351	50341	50351
4	8	7,62	10,16	60441	60451	40441	40451	50441	50451
5	10	10,16	12,70	60541	60551	40541	40551	50541	50551
6	12	12,70	15,24	60641	60651	40641	40651	50641	50651
7	14	15,24	17,78	60741	60751	40741	40751	50741	50751
8	16	17,78	20,32	60841	60851	40841	40851	50841	50851
9	18	20,32	22,86	60941	60951	40941	40951	50941	50951
10	20	22,86	25,40	61041	61051	41041	41051	51041	51051
11	22	25,40	27,94	61141	61151	41141	41151	51141	51151
12	24	27,94	30,48	61241	61251	41241	41251	51241	51251
13	26	30,48	33,02	61341	61351	41341	41351	51341	51351
14	28	33,02	35,56	61441	61451	41441	41451	51441	51451
15	30	35,56	38,10	61541	61551	41541	41551	51541	51551
16	32	38,10	40,64	61641	61651	41641	41651	51641	51651
17	34	40,64 ± 0,15	43,18 ± 0,45	61741	61751	41741	41751	51741	51751
18	36	43,18	45,72	61841	61851	41841	41851	51841	51851
19	38	45,72	48,26	61941	61951	41941	41951	51941	51951
20	40	48,26	50,80	62041	62051	42041	42051	52041	52051
21	42	50,80	53,34	62141	62151	42141	42151	52141	52151
22	44	53,34	55,88	62241	62251	42241	42251	52241	52251
23	46	55,88	58,42	62341	62351	42341	42351	52341	52351
24	48	58,42	60,96	62441	62451	42441	42451	52441	52451
25	50	60,96	63,50	62541	62551	42541	42551	52541	52551
26	52	63,50	66,04	62641	62651	42641	42651	52641	52651
27	54	66,04	68,58	62741	62751	42741	42751	52741	52751
28	56	68,58	71,12	62841	62851	42841	42851	52841	52851
29	58	71,12	73,66	62941	62951	42941	42951	52941	52951
30	60	73,66	76,20	63041	63051	43041	43051	53041	53051
31	62	76,20	78,74	63141	63151	43141	43151	53141	53151
32	64	78,74	81,28	63241	63251	43241	43251	53241	53251

DIMENSIONAL DATA: MALE HEADERS WITH 90° ANGLED PINS

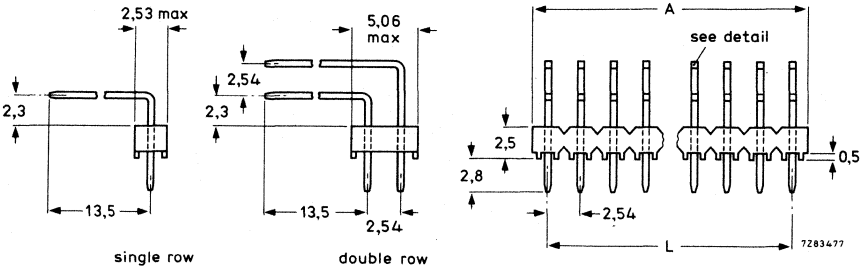


Fig. 8 Male header with 90° angled pins; see Table 4 for dimensions A and L.

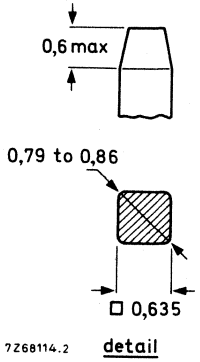


Table 4: Male headers with 90° angled pins

number of contacts		L		A		catalogue number	
single row	double row					single row	double row
2	4	2,54		5,08		2422 062 70201	2422 062 70211
3	6	5,08		7,62		70301	70311
4	8	7,62		10,16		70401	70411
5	10	10,16		12,70		70501	70511
6	12	12,70		15,24		70601	70611
7	14	15,24		17,78		70701	70711
8	16	17,78		20,32		70801	70811
9	18	20,32		22,86		70901	70911
10	20	22,86		25,40		71001	71011
11		25,40		27,94		71101	
12		27,94		30,48		71201	
13		30,48		33,02		71301	
14		33,02		35,56		71401	
15		35,56		38,10		71501	
16		38,10		40,64		71601	
17		40,64	± 0,15	43,18	± 0,45	71701	
18		43,18		45,72		71801	
19		45,72		48,26		71901	
20		48,26		50,80		72001	
21		50,80		53,34		72101	
22		53,34		55,88		72201	
23		55,88		58,42		72301	
24		58,42		60,96		72401	
25		60,96		63,50		72501	
26		63,50		66,04		72601	
27		66,04		68,58		72701	
28		68,58		71,12		72801	
29		71,12		73,66		72901	
30		73,66		76,20		73001	
31		76,20		78,74		73101	
32		78,74		81,28		73201	

MOUNTING

Dimensions in mm

Hole pattern on printed boards

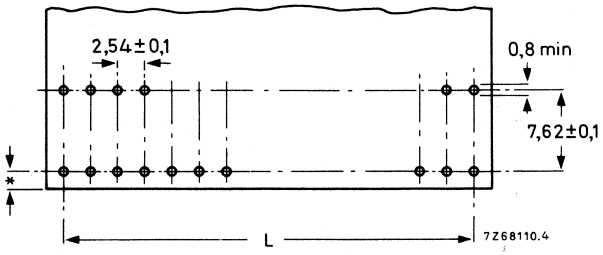


Fig. 9 Hole pattern for board edge sockets. See Table 1, pages 8 and 9 for dimension L. The dimension marked * is determined by customer application (min. 2 mm).

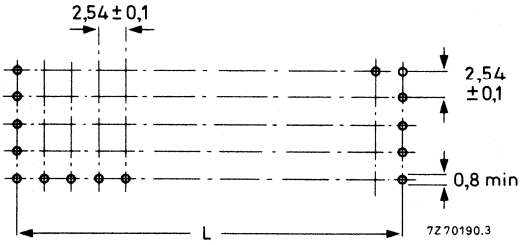
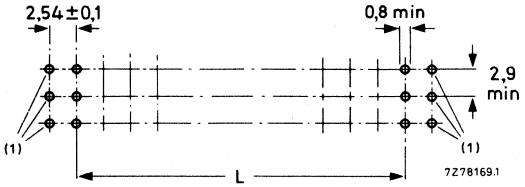


Fig. 10 Hole pattern for double-row panel sockets. See Table 2, pages 10 and 11 for dimension L.



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

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

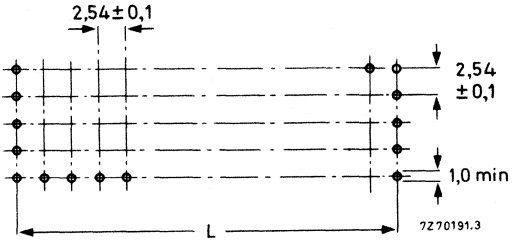


Fig. 12 Hole pattern for male headers. See Table 3 or 4, page 13 or 15 respectively, for dimension L.

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	1,42 to 1,78 mm
Terminations	dip-solder
Current at T_{amb} = 20 °C	3 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 interconnection 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.

Number of contacts	
single row	2 to 32
double row	4 to 20
Mechanical endurance	25 insertions, according to IEC 512–5, test 9a
Connector body material	glass-fibre-filled thermoplastic
Contact springs	
material	phosphor bronze
shape	solid cantilever
finish of contact surfaces	⩾ 0,8 μm rolled-on gold on ⩾ 1 μm nickel plate
type of termination	dip-solder
finish of termination	tinned

DIMENSIONAL DATA

Dimensions in mm

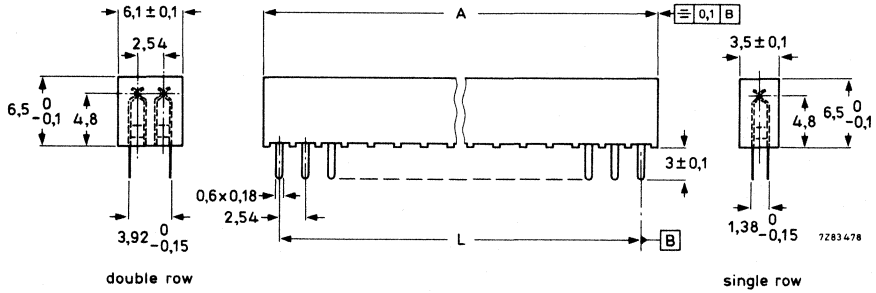


Fig. 1 Bottom-entry socket. See Table 1 for dimensions A and L.

Table 1

number of contacts		L		A		catalogue number	
single row	double row					single row	double row
2	4	2,54		6,14		2422 062 80201	2422 062 80211
3	6	5,08		8,68		80301	80311
4	8	7,62		11,22		80401	80411
5	10	10,16		13,76		80501	80511
6	12	12,70		16,30		80601	80611
7	14	15,24		18,84		80701	80711
8	16	17,78		21,38		80801	80811
9	18	20,32		23,92		80901	80911
10	20	22,86		26,46		81001	81011
11		25,40		29,00		81101	
12		27,94		31,54		81201	
13		30,48		34,08		81301	
14		33,02		36,62		81401	
15		35,56		39,16		81501	
16		38,10	± 0,1	41,70	± 0,3	81601	
17		40,64		44,24		81701	
18		43,18		46,78		81801	
19		45,72		49,32		81901	
20		48,26		51,86		82001	
21		50,80		54,40		82101	
22		53,34		56,94		82201	
23		55,88		59,48		82301	
24		58,42		62,02		82401	
25		60,96		64,56		82501	
26		63,50		67,10		82601	
27		66,04		69,64		82701	
28		68,58		72,18		82801	
29		71,12		74,72		82901	
30		73,66		77,26		83001	
31		76,20		79,80		83101	
32		78,74		82,34		83201	

MOUNTING

Dimensions in mm

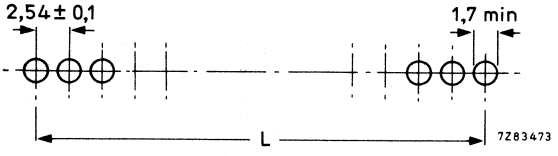


Fig. 2 Hole pattern for single-row bottom-entry sockets; see Table 1 for dimension L.

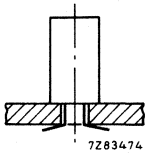


Fig. 3 Single-row bottom-entry socket in mounted position.

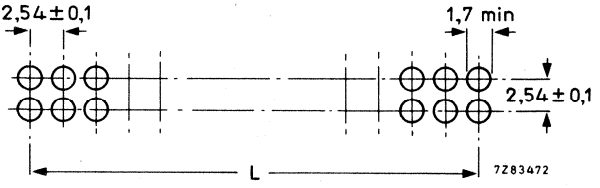


Fig. 4 Hole pattern for double-row bottom-entry sockets; see Table 1 for dimension L.

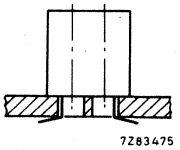


Fig. 5 Double-row bottom-entry socket in mounted position.

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 solder stop

single row: 2422 062 89001

double row: 2422 062 89011.

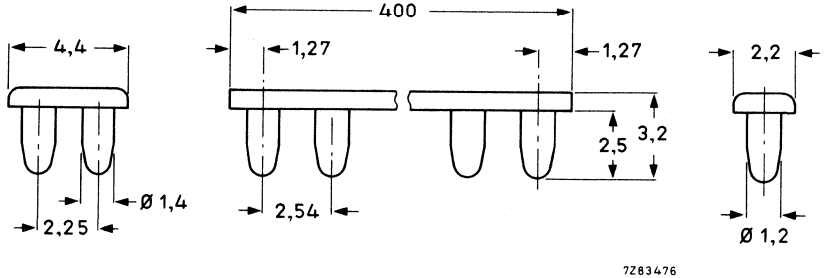


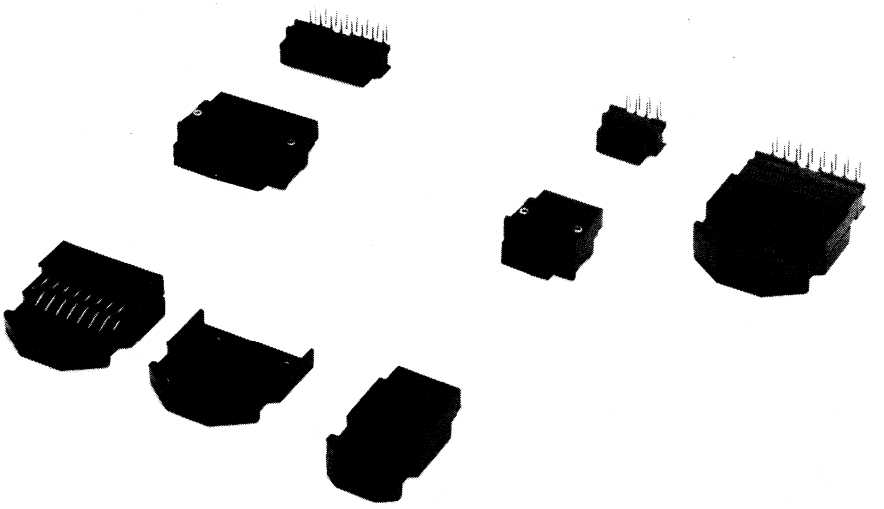
Fig. 6 Solder stop for bottom-entry socket.

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	
spring contact box	dip-solder pins
test cord plug	solder pins
Current at T_{amb} = 20 °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 °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	⩽ 10 mΩ per contact
after damp heat test	⩽ 10 mΩ per contact
Insulation resistance	
initially	> 10^6 MΩ
after damp heat test	> 10^4 MΩ
Creepage distance	
between adjacent contacts	⩾ 0,9 mm
between opposite contacts	⩾ 0,5 mm
Clearance	
between adjacent contacts	⩾ 0,9 mm
between opposite contacts	⩾ 0,5 mm
Proof voltage for 1 min, at 20 °C	
between adjacent contacts	1000 V (r.m.s.), 50 Hz
between opposite contacts	1000 V (r.m.s.), 50 Hz

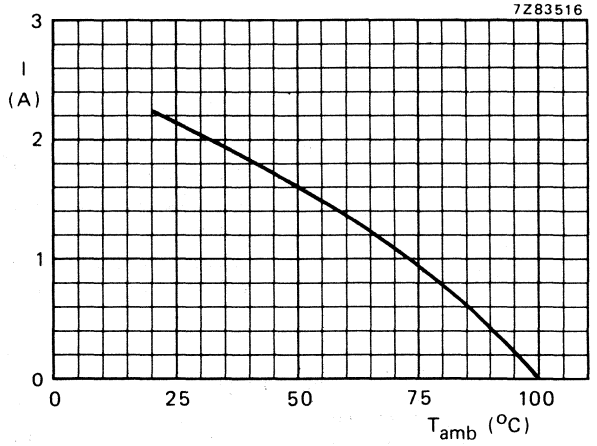


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature.

* 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	springs	pins
material	phosphor bronze	phosphor bronze
shape	solid cantilever	square wire
finish of contact surfaces	⩾ 2,5 μm rolled-on gold on ⩾ 1 μm nickel	⩾ 2,5 μm gold plate on ⩾ 1 μm nickel plate
type of termination	dip-solder pin	solder pin
finish of termination	tinned	⩾ 2,5 μm gold plate on ⩾ 1 μm nickel plate
contact force	⩾ 0,75 N	
contact mating length	⩾ 1,2 mm	
Mass	see Table 1	
Solderability	235 °C, 2 s } according to IEC 68, test T	
Resistance to heat	260 °C, 10 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, 0,7 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% H_2S, 24 h; 1% SO_2, 24 h
Flammability	according to UL94, category V1

DIMENSIONAL DATA

Dimensions in mm

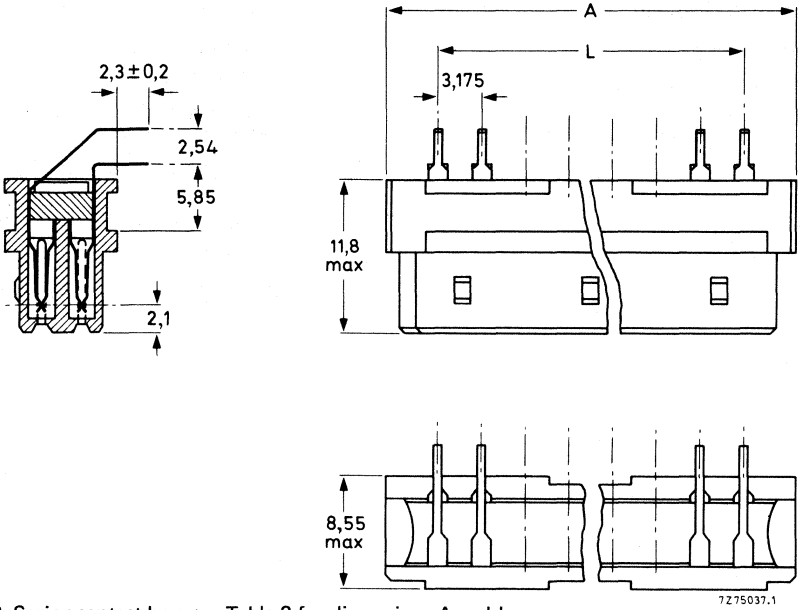


Fig. 2 Spring contact box; see Table 2 for dimensions A and L.

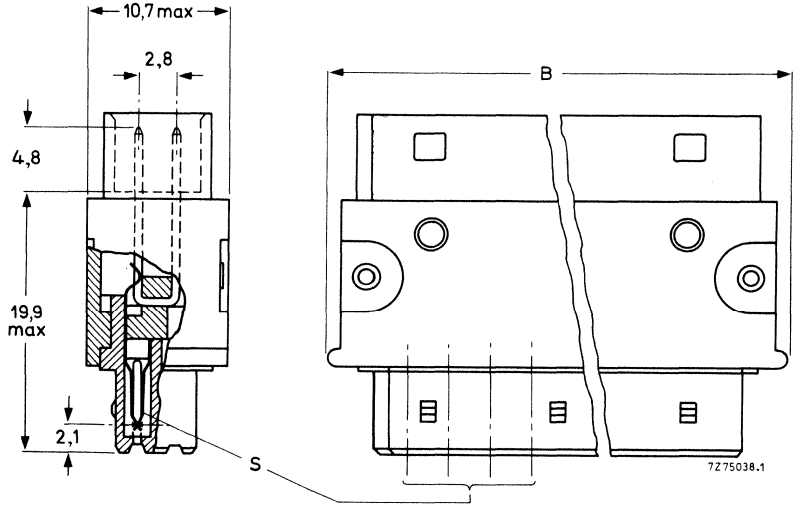


Fig. 3 U-link; see Table 3 for dimension B.
The U-link with 8 contacts and the U-link with 16 contacts have 4 springs (S).
The U-link with 8 contacts has a hold rim on the four sides (max. thickness = 12,2 mm) that with 16 contacts has a hold rim on the shorter sides only.

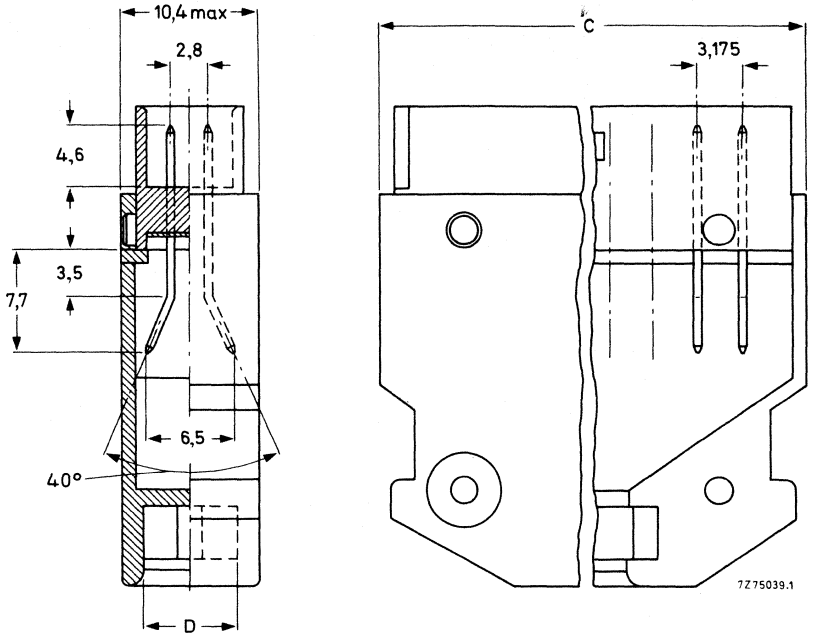


Fig. 4 Test cord plug with cable hood. See Table 4 for dimensions C and D.

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

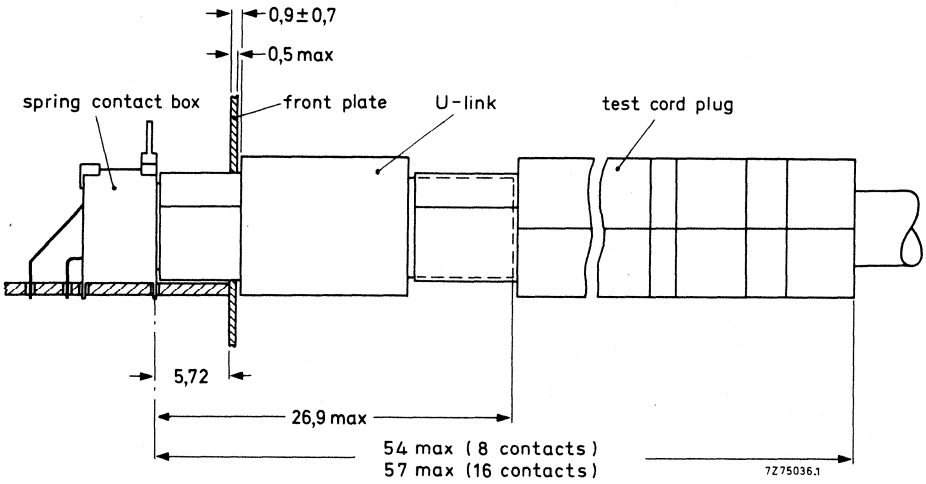


Fig. 5 Mounting of test connector assembly.

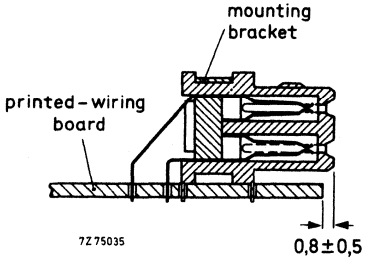


Fig. 6 Fitting of spring contact box by means of a bracket.

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.

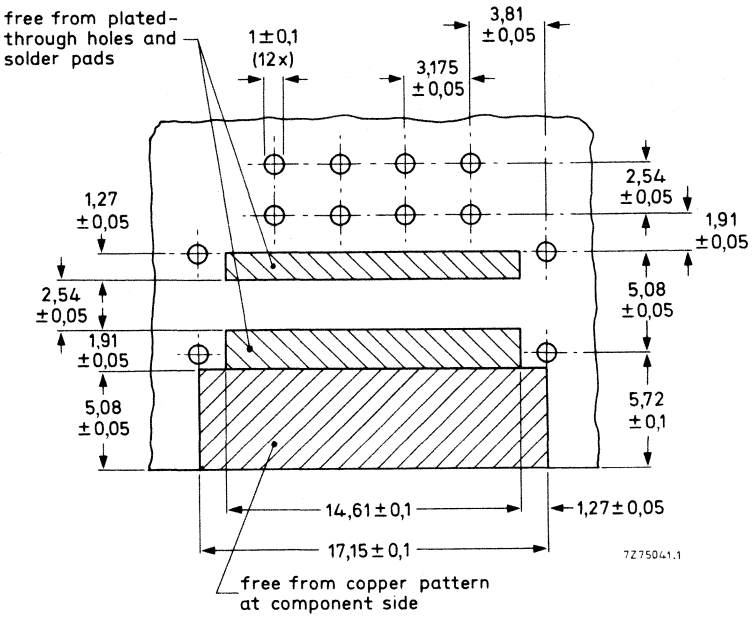


Fig. 7a Hole pattern for the spring contact box with 8 pins.

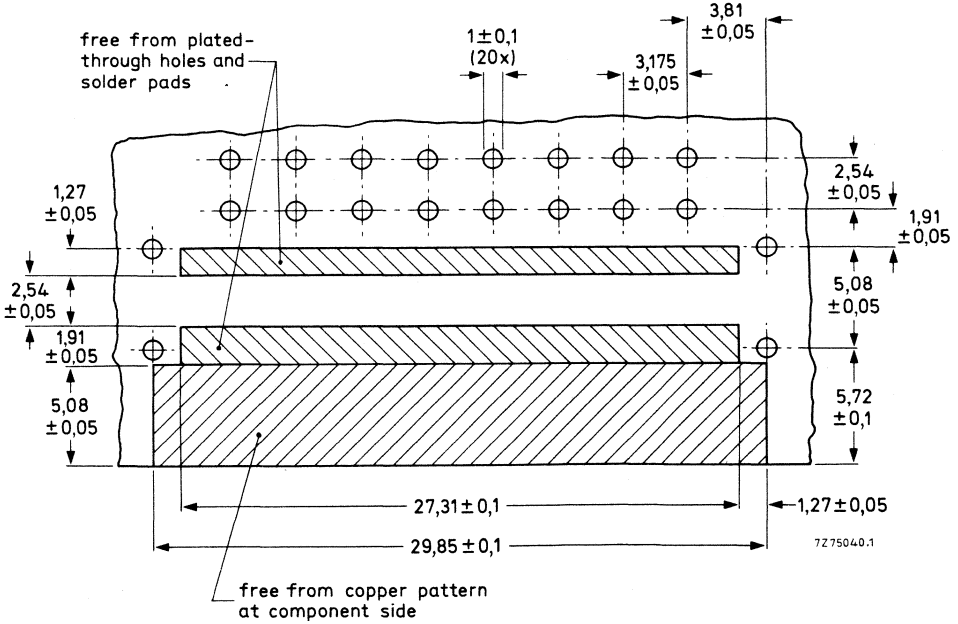


Fig. 7b Hole pattern for the spring contact box with 16 pins.

MARKING

The package is marked with:

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

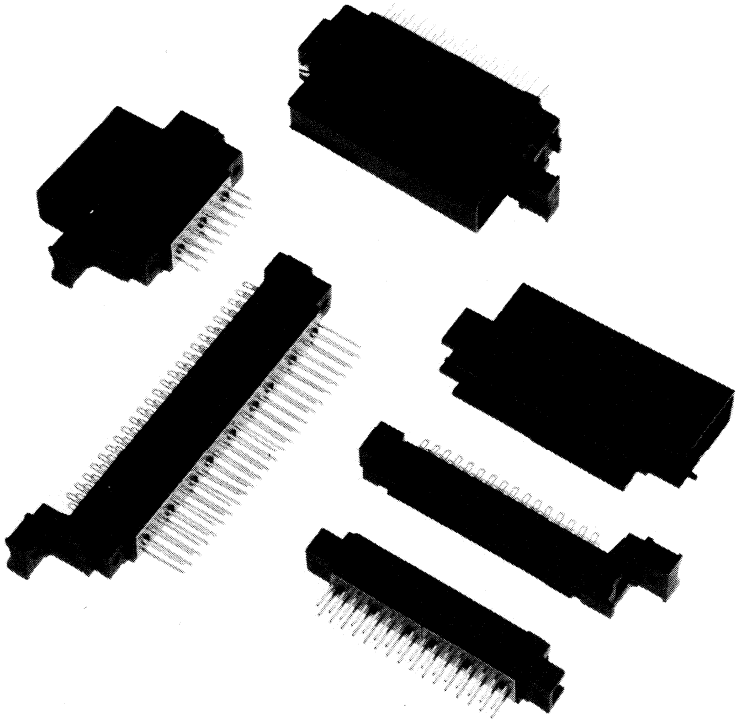
PACKING

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	
male part	straight or 90° angled dip-solder pins, or pins for wire wrapping
female part	solder tags
Current at T_{amb} = 20 °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 nickel plating.

The connectors are provided with a locking device.

No special provisions are required for polarization.

ELECTRICAL DATA

Current at T_{amb} = 20 °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	$\leqslant$ 10 mΩ
after damp heat test	$\leqslant$ 10 mΩ
Insulation resistance	
initially	$> 10^6$ MΩ
after damp heat test	$> 10^4$ MΩ
Creepage distance	
between adjacent contacts	$\geqslant$ 0,7 mm
between opposite contacts	$\geqslant$ 2,2 mm
Clearance	
between adjacent contacts	$\geqslant$ 0,7 mm
between opposite contacts	$\geqslant$ 1,4 mm
Proof voltage for 1 min, at 20 °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

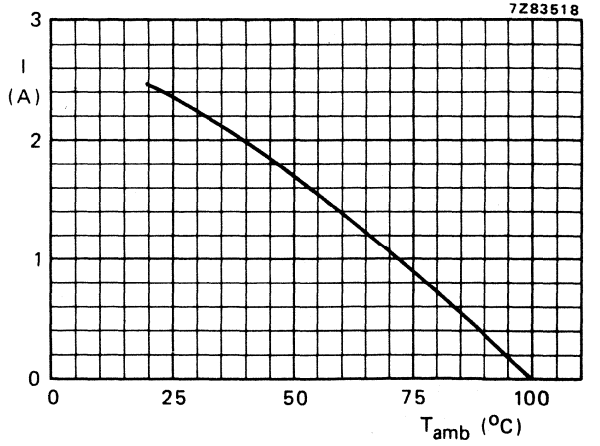


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

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	⩾ 2,5 μm gold plate on ⩾ 1 μm nickel	⩾ 2,5 μm rolled-on gold on ⩾ 1 μm nickel plate
contact force	⩾ 0,70 N	
type of termination	straight or 90° angled dip-solder pin pin for wire wrapping	solder tag
finish of termination	⩾ 2,5 μm gold plate on ⩾ 1 μm nickel	tinned
Contact mating length	⩾ 0,8 mm	
Mass	see Table 1	
Solderability	235 °C, 2 s	according to IEC 68, test T
Resistance to heat	350 °C, 3,5 s	
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	approx. mass (g) 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% H_2S, 24 h; 1% SO_2, 24 h
Flammability	according to UL94, category V1

DIMENSIONAL DATA

Dimensions in mm

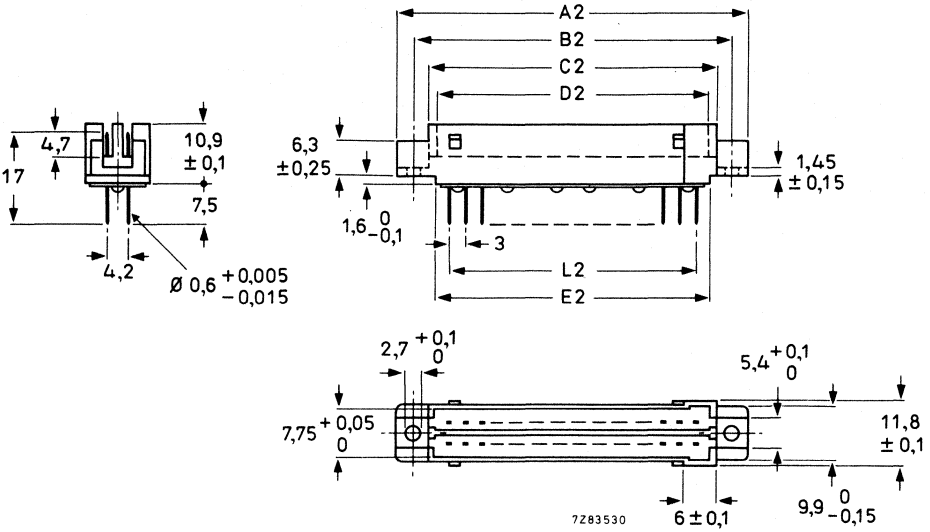


Fig. 2 Male part with straight dip-solder pins; see Table 2 for dimensions A2, B2, C2, D2, E2 and L2.

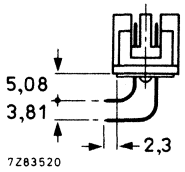


Fig. 3 Male part with 90° angled dip-solder pins; dimensions are identical with those in Fig. 2, except as shown.

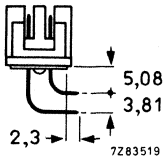


Fig. 4 Male part with 90° angled dip-solder pins; dimensions are identical with those in Fig. 2, except as shown.

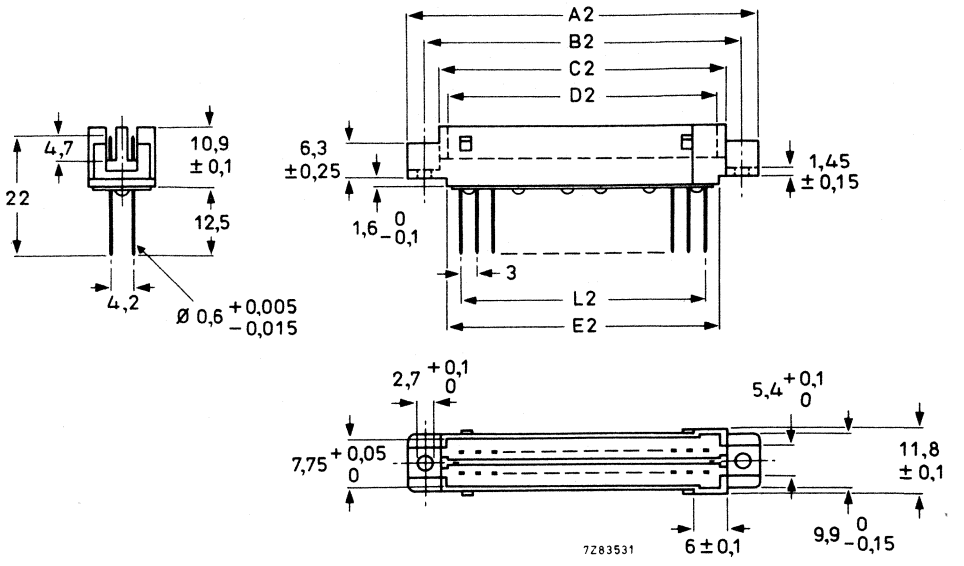


Fig. 5 Male part with pins for wire wrapping; see Table 2 for dimensions A2, B2, C2, D2, E2 and L2.

Table 2

number of contacts	Fig.	dimensions (mm)						catalogue number
		$A2_{max}$	B2	$C2_{max}$	D2	$E2_{max}$	L2	
16	2	40	34	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 ± 0,1	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

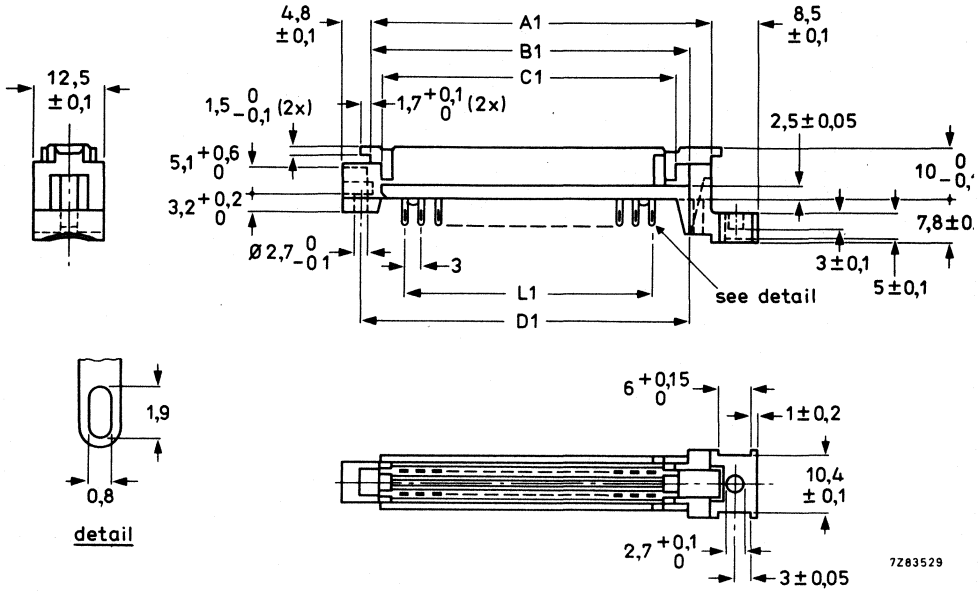


Fig. 6 Female part with solder tags; see Table 3 for dimensions A1, B1, C1, D1 and L1.

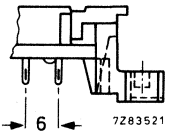


Fig. 7 Female part with 24 solder tags; dimensions are identical with those in Fig. 6, except as shown.

Table 3

number of contacts	Fig.	dimensions (mm)					catalogue number
		A1	B1	C1	D1	L1	
16	6	38 ± 0,1	34	28,8	35,6	21	2422 025 88015
32	6	62 ± 0,1	58	52,8	59,6	45	88017
48	6	86 ± 0,1	82	76,8	83,6	69	88019
24	7	86 ± 0,1	82	76,8	83,6	66	88025

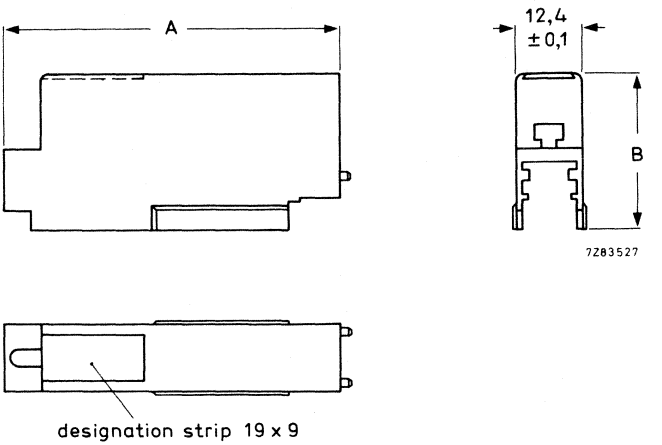


Fig. 8 Cable hood; see Table 4 for dimensions A and B.

Table 4

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

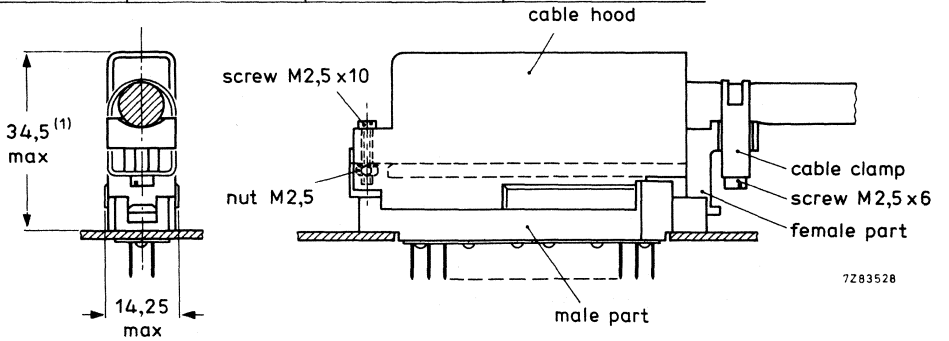


Fig. 9 Rack and panel connector assembly; see also Accessories.
(1) 41,5 mm for cable hood 4322 027 78470.

* Also to be used for 24 contacts.

MOUNTING

Dimensions in mm

Panel cut-out for female parts

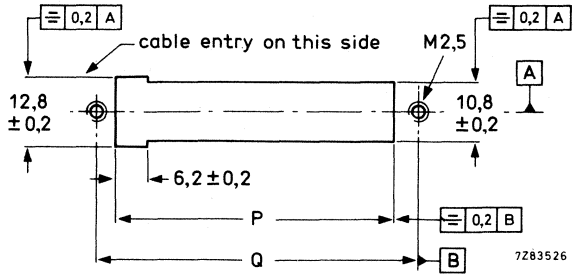


Fig. 10 Panel cut-out for the female part; see Table 5 for dimensions P and Q.

Table 5

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

Hole patterns on printed boards for male parts

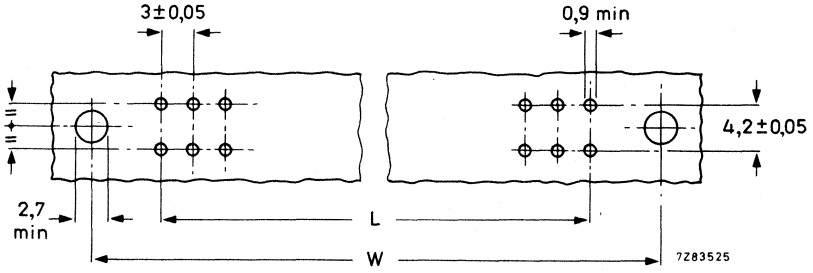


Fig. 11 Hole pattern for a male part with straight dip-solder pins.
See Table 6 for dimensions L and W.

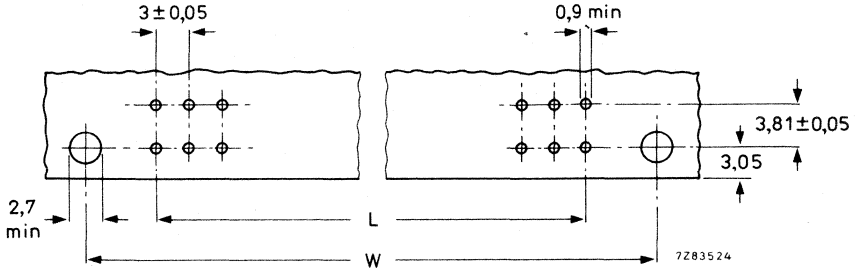


Fig. 12 Hole pattern for a male part with 90° angled dip-solder pins.
See Table 6 for dimensions L and W.

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

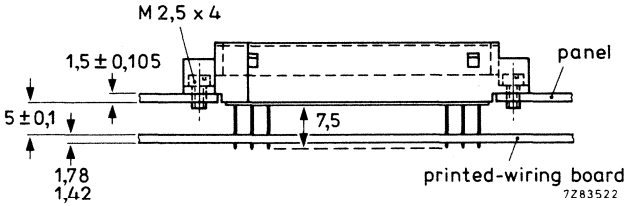


Fig. 13 Mounting example of a male part with dip-solder pins (7,5 mm).

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.

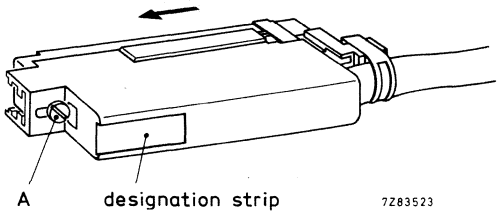
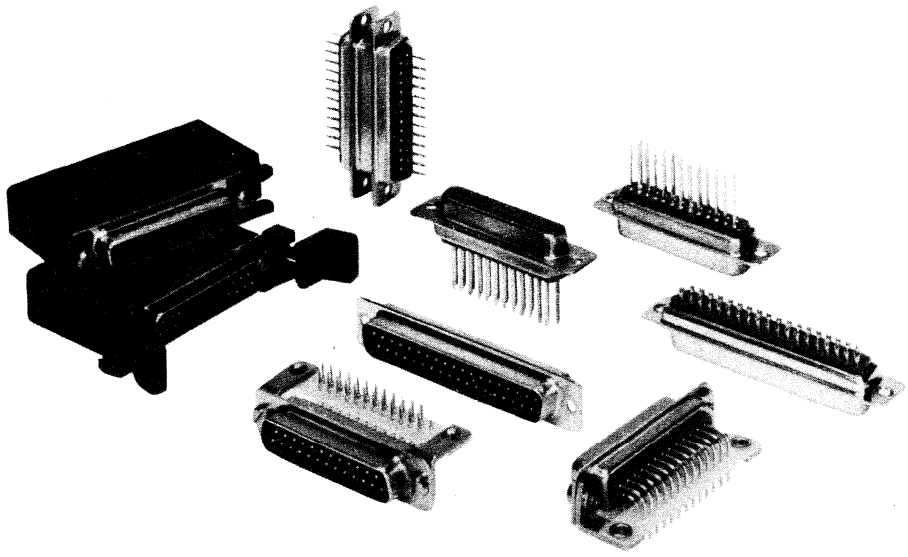


Fig. 14.

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 °C	7,5 A
Mechanical endurance	500 insertions
Climatic category (IEC 68)	55/125/21
Dimensions	according to MIL-STD-C-24308



Contents

	page
Application	2
Description	2
Electrical data	3
Mechanical data	4
Environmental data	5
Dimensional data	
Connectors with solder cups	6
Connectors with straight dip-solder pins	8
Connectors with 90° angled dip-solder pins	10
Connectors with pins for wire wrapping	12
Connectors for crimp-on snap-in connections	14
Mounting	16
Marking	20
Accessories	21
Packing	23

APPLICATION

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

DESCRIPTION

The connectors consist of a red glass-fibre polycarbonate insulating block, mounted in a shell of passivated, cadmium-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 latter 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-STD-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 DATA

Current at T_{amb} = 20 °C	7,5 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 outside the body	
initially	$\leqslant$ 3 mΩ
after damp heat test	$\leqslant$ 5 mΩ
Insulation resistance	
initially	$> 10^5$ MΩ
after damp heat test	$> 10^3$ MΩ
Creepage distance	
between contacts	$\geqslant$ 1 mm
between a contact and earth	$\geqslant$ 1 mm
Clearance distance	
between contacts	$\geqslant$ 1 mm
between a contact and earth	$\geqslant$ 1 mm
Proof voltage for 1 min, at 20 °C	
between contacts	1000 V (r.m.s.), 50 Hz
between a contact and earth	1000 V (r.m.s.), 50 Hz

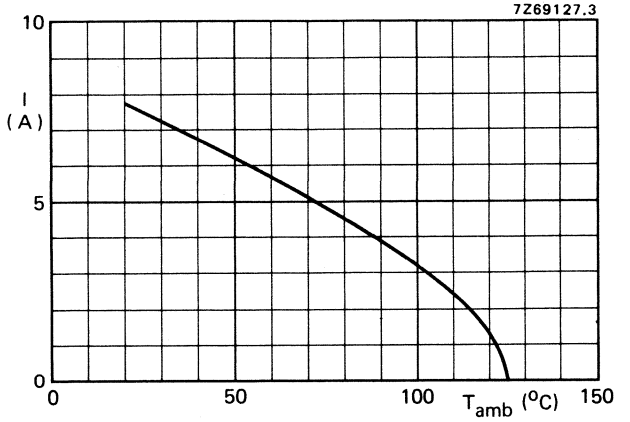


Fig. 1 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).

MECHANICAL DATA

Contact pitch	see piercing diagrams, Figs 31-35
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 512-5, test 9a
Connector body material	glass-fibre polycarbonate
Contacts	
material	copper alloy
shape	round pins and cylindrical sockets with a two-fold spring facility
finish	$\geqslant$ 0,5 μm hard gold on $\geqslant$ 2 μm nickel plating
type of termination	solder cup, dip-solder pin (straight or 90° angled), wire wrapping pin, crimp-on snap-in
Contact retention in insert	$\geqslant$ 40 N
Mass	see Table 1
Solderability	according to IEC 68, test T, 235 °C, 2 s*
Shock	according to IEC 68, test Ea, 50g, 11 ms, 6 directions, 3 shocks per direction
Vibration	according to IEC 68, test Fc, 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	$\leqslant$ 46	$\leqslant$ 27	6	7
2	15	$\leqslant$ 78	$\leqslant$ 46	8	9
3	25	$\leqslant$ 129	$\leqslant$ 78	12	14
4	37	$\leqslant$ 180	$\leqslant$ 111	16	20
5	50	$\leqslant$ 226	$\leqslant$ 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 68, test Ca, 21 days, 40 °C, R.H. 90 to 95%
Flammability	according to UL94, category V1

DIMENSIONAL DATA

Dimensions in mm

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

Connectors with 9, 15, 25 and 37 contacts

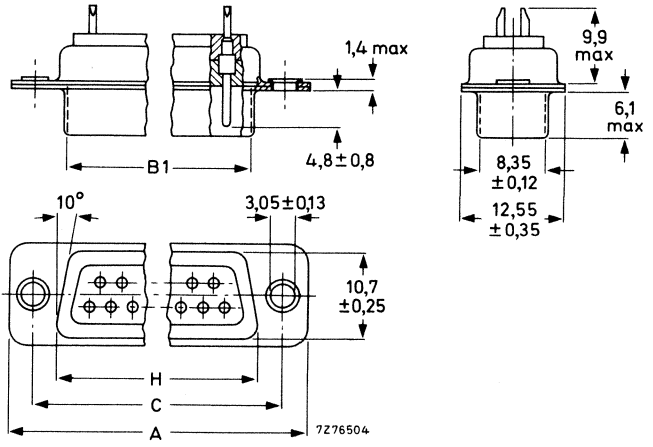


Fig. 2 Pin connector; see also Table 2.

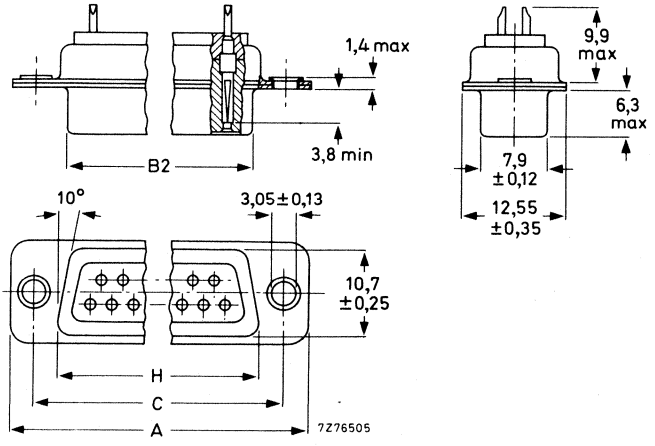


Fig. 3 Socket connector; see also Table 2.

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.

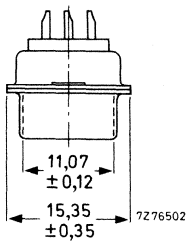


Fig. 4 Side view of pin connector.

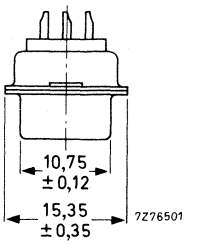


Fig. 5 Side view of socket connector.

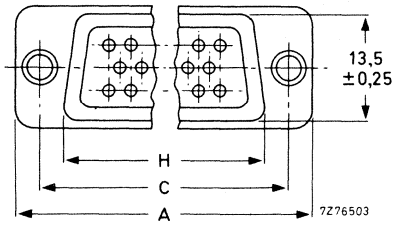


Fig. 6 Terminal side of pin (or socket) connector; see also Table 2.

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

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

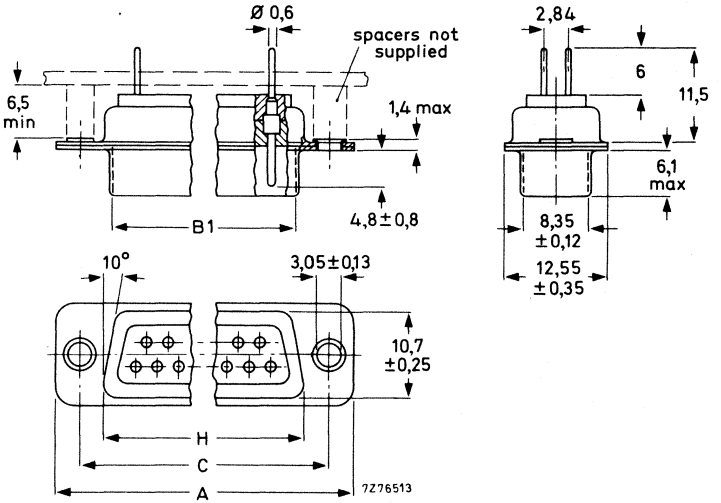


Fig. 7 Pin connector; see also Table 3.

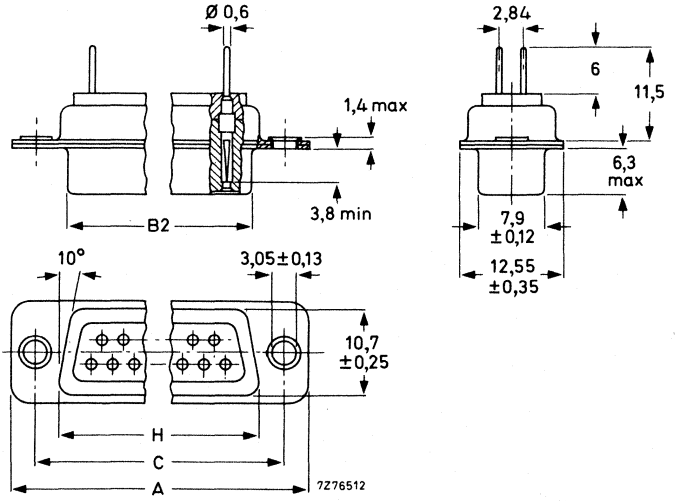


Fig. 8 Socket connector; see also Table 3.

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.

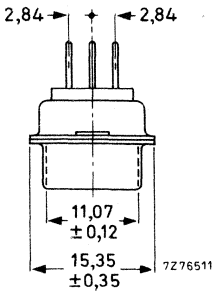


Fig. 9 Side view of pin connector.

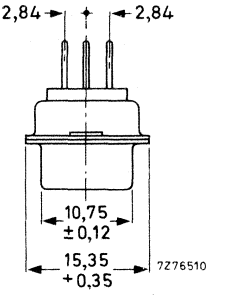


Fig. 10 Side view of socket connector.

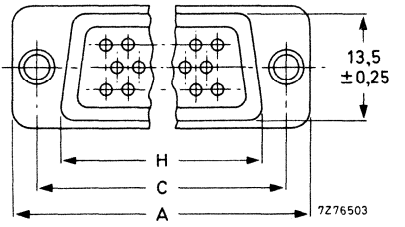


Fig. 11 Terminal side of pin (or socket) connector; see also Table 3.

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

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

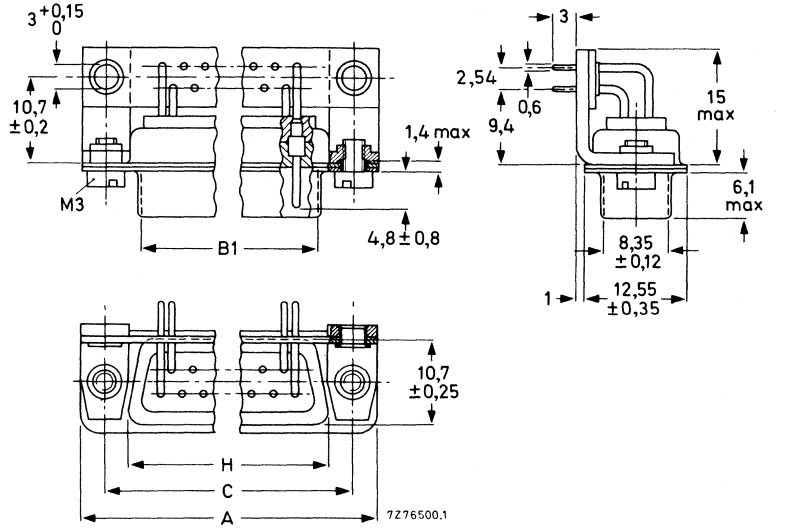


Fig. 12 Pin connector; see also Table 4.

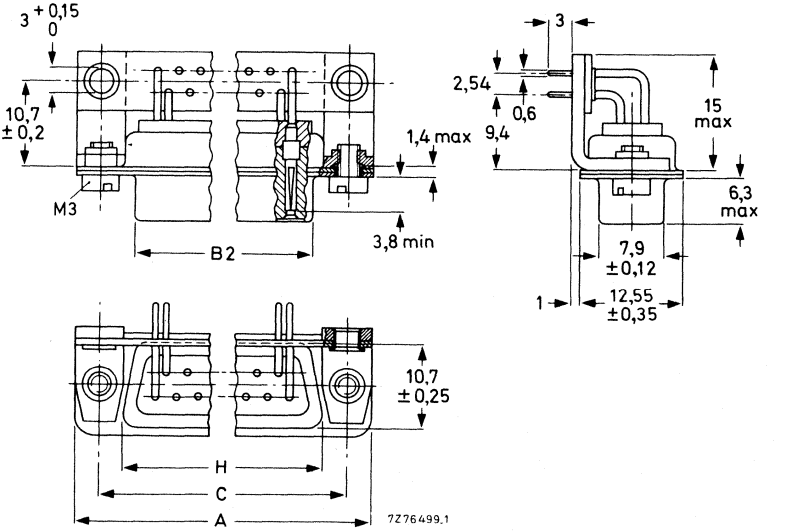


Fig. 13 Socket connector; see also Table 4.

Connectors with 50 contacts

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

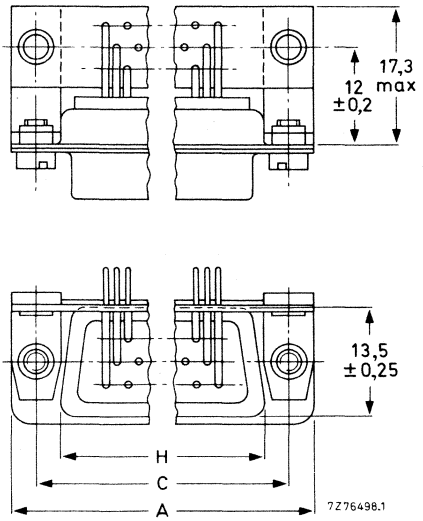


Fig. 14 Pin connector; see also Table 4.

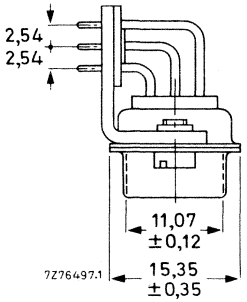


Fig. 15 Side view of pin connector.

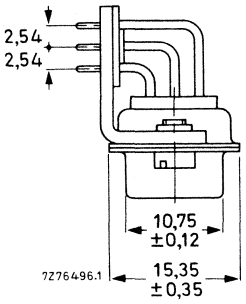


Fig. 16 Side view of socket connector.

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

Notes: See *Mechanical Data* for solder conditions.
Connectors with 90° angled dip-solder pins, without mounting brackets and pin-alignment plate, are available on request. ←

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

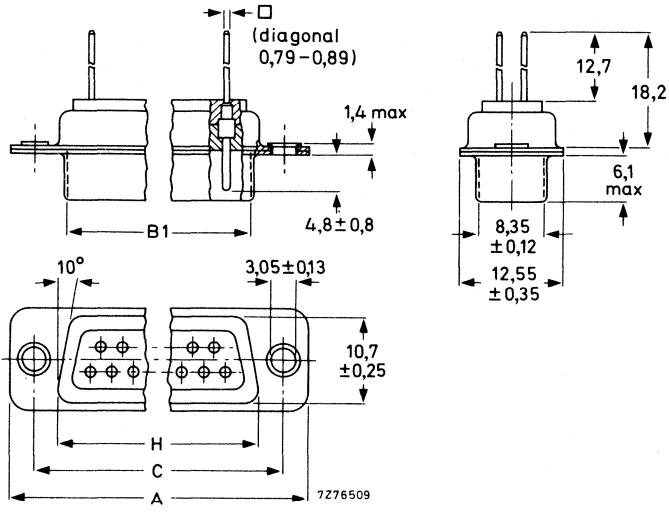


Fig. 17 Pin connector; see also Table 5.

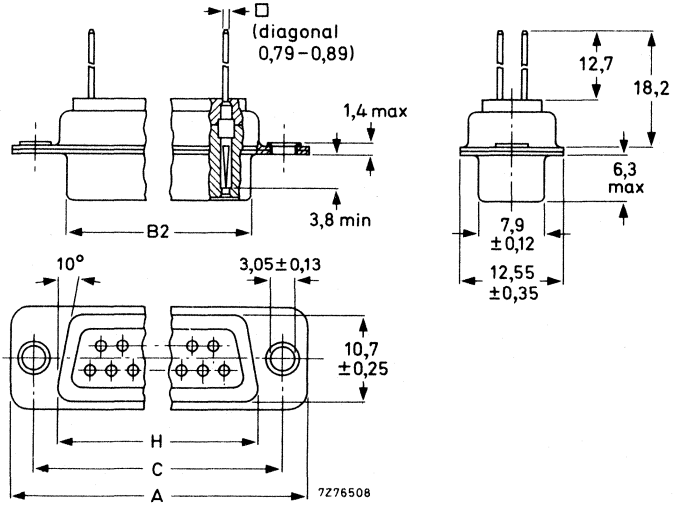


Fig. 18 Socket connector; see also Table 5.

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.

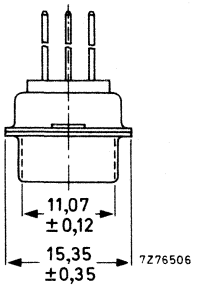


Fig. 19 Side view of pin connector.

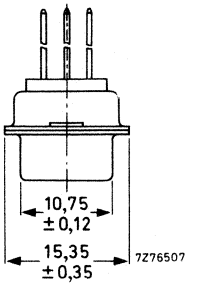


Fig. 20 Side view of socket connector.

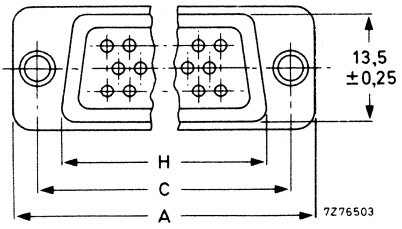


Fig. 21 Terminal side of pin (or socket) connector; see also Table 5.

Table 5

	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

Connectors for crimp-on snap-in connections (accommodate AWG20 to AWG24 wire; 0,6 to 0,23 mm^2). These connectors are supplied without contacts; loose crimp contact pins and sockets are available.

Connectors for 9, 15, 25 and 37 contacts

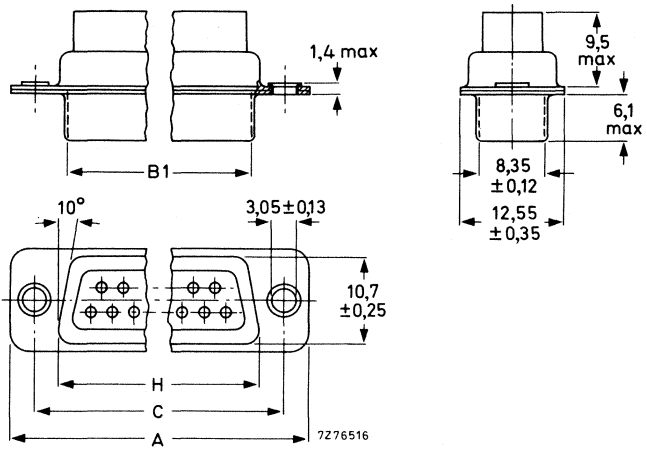


Fig. 22 Pin connector; see also Table 6.

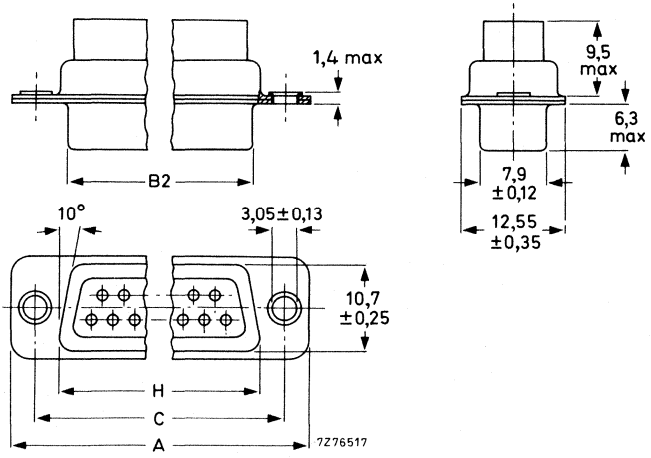


Fig. 23 Socket connector; see also Table 6.

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.

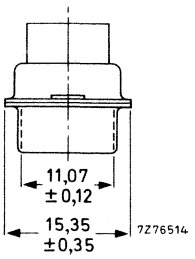


Fig. 24 Side view of pin connector

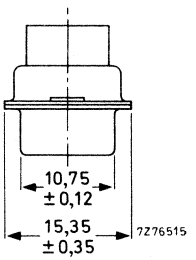


Fig. 25 Side view of socket connector.

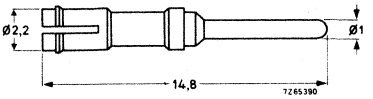


Fig. 27 Crimp contact pin.

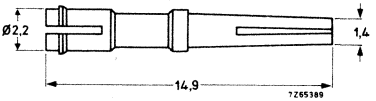


Fig. 28 Crimp contact socket.

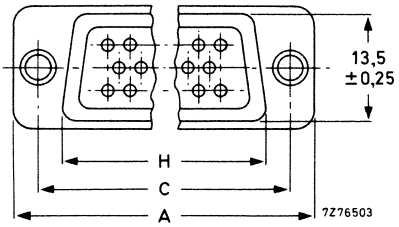


Fig. 26 Terminal side of pin (or socket) connector; see also Table 6.

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		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.

MOUNTING

Panel cut-outs for all versions

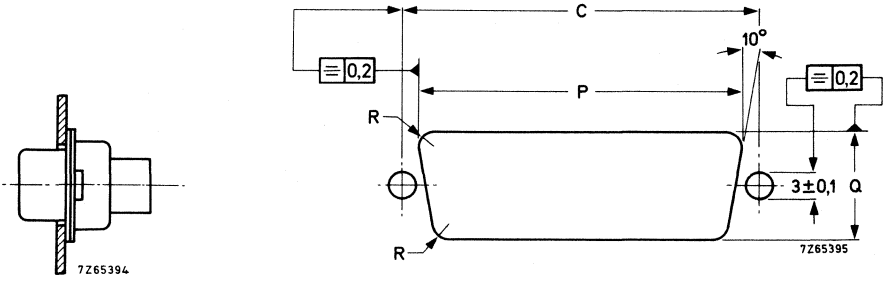


Fig. 29 Rear flange mounting.

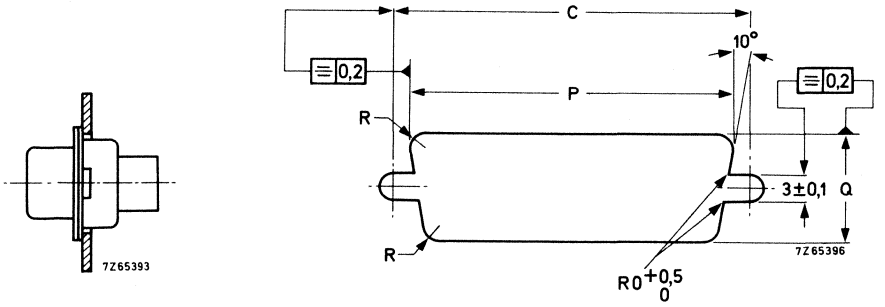


Fig. 30 Front flange mounting.

Table 7

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

Piercing diagrams for connectors with straight or 90° angled dip-solder pins

Notes

The pitch tolerances are ± 0,05 mm.

The contact pitch X is 2,84 ± 0,05 mm for straight dip-solder pins, and 2,54 ± 0,05 mm for 90° angled dip-solder pins.

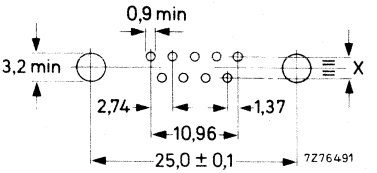


Fig. 31 For 9 contacts.

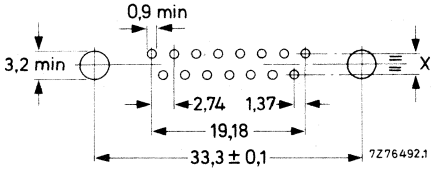


Fig. 32 For 15 contacts.

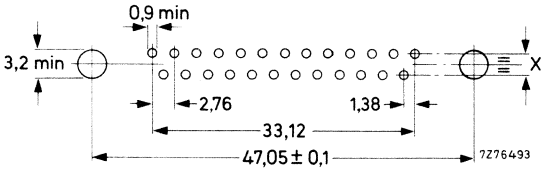


Fig. 33 For 25 contacts.

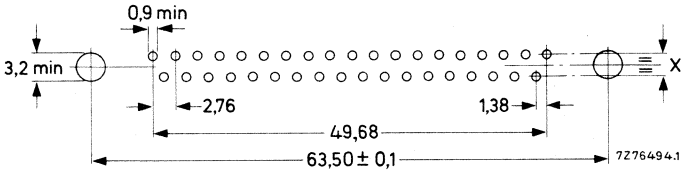


Fig. 34 For 37 contacts.

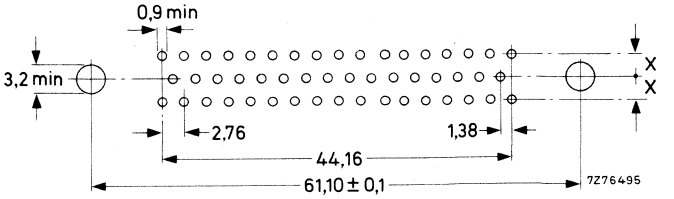


Fig. 35 For 50 contacts.

Crimping and mounting of contacts for crimp connections

Mounting tools

Contact insertion tool (white), see Fig. 36: catalogue number 4332 026 22500.
Contact extraction tool (red) , see Fig. 37: catalogue number 4332 026 22510.

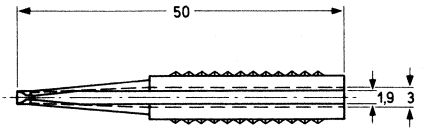


Fig. 36 Insertion tool (white).

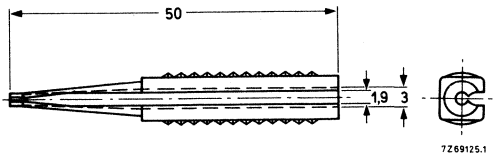


Fig. 37 Extraction tool (red).

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 38 and 39, depending on the diameter of the wire.

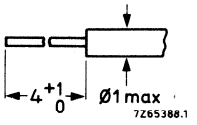


Fig. 38 Wire diameter max. 1 mm.

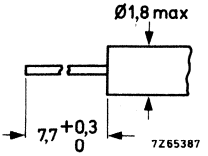


Fig. 39 Wire diameter greater than 1 mm (max. 1,8 mm).

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 mm^2) use the white insertion tool shown in Fig. 36: 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. 37). 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 following tools:

	catalogue number	Buchanan* catalogue number
(a) Hand crimping tool, MS 3198-1	2622 540 10004	612596
Positioner to hand crimping tool, MS 3198-5P	2622 540 10907	613533
Hand crimping tool MS 3198-1, including positioner MS 3198-5P	2622 540 09151	

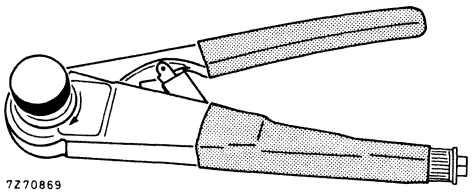


Fig. 40 Hand crimping tool.

	catalogue number	Buchanan* catalogue number
(b) Manual feed pneumatic crimping tool	2622 540 10003	612768
Bench mount assembly	2622 540 10906	11380
Positioner for pin and socket contact with ejector	2622 540 10905	616265
Positioner for pin contact	4332 026 26970	
Positioner for socket contact	4332 026 26980	
Contact feeder	4332 026 26960	
Gauge pin for AWG20 (0,6 mm^2)	4332 026 26930	
Gauge pin for AWG22 (0,36 mm^2)	4332 026 26940	
Gauge pin for AWG24 (0,23 mm^2)	4332 026 26950	

Notes

The use of the contact feeder facilitates the contact positioning. The feeder can be fitted by means of the four screws of the crimping tool.

The gauge pins for adjustment and control of crimp depth are also suitable for check with hand tool.

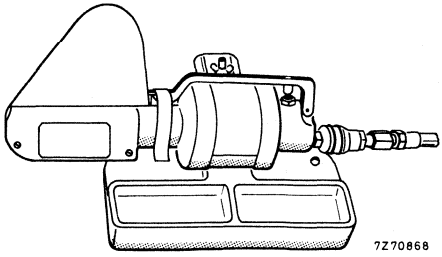


Fig. 41 Pneumatic crimping tool.

* Registered trade name of Buchanan Electrical Products Corporation.

MARKING

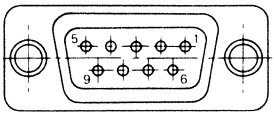
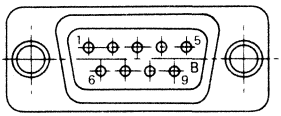
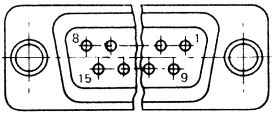
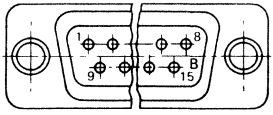
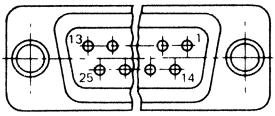
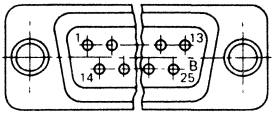
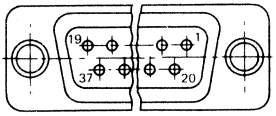
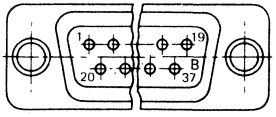
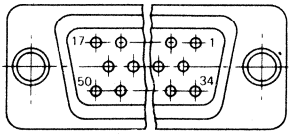
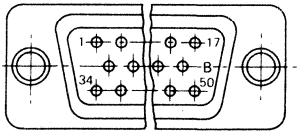
Package

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 8.

Table 8

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

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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 9

version	shell size	number of contacts	dimensions (mm)					catalogue number
			l	w	d	p	q	
straight (Fig. 42)	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. 43)	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

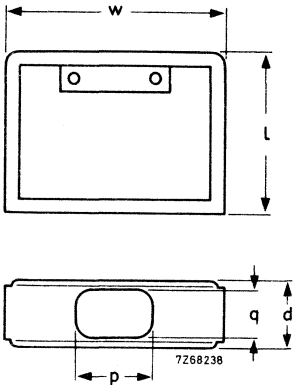


Fig. 42 Straight cable hood.

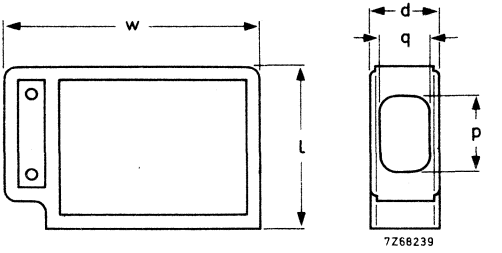


Fig. 43 90° angled cable hood.

Locking devices

Locking clips and handles of thermoplastic material are available for locking pin connectors to socket connectors (see Fig. 44).

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 42 and 43, they can be secured with ordinary screws and nuts.

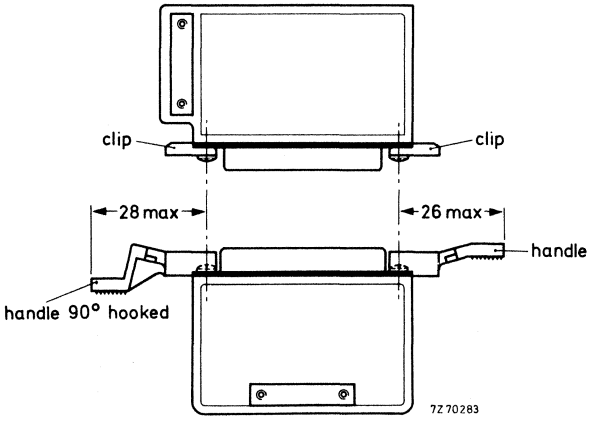


Fig. 44.

PACKING

Connectors

The connectors are packed in boxes. The number of connectors per box is given in Table 10.

Table 10

shell size	number of connectors per box	
	type with 90° angled pins	other types
1	170	170
2	130	140
3	90	100
4	70	70
5	35	80

Please order in multiples of these quantities.

Cable hoods

The cable hoods are packed in plastic bags, containing 5 hoods and associated clamps and screws; please order in multiples of this quantity.

Locking devices

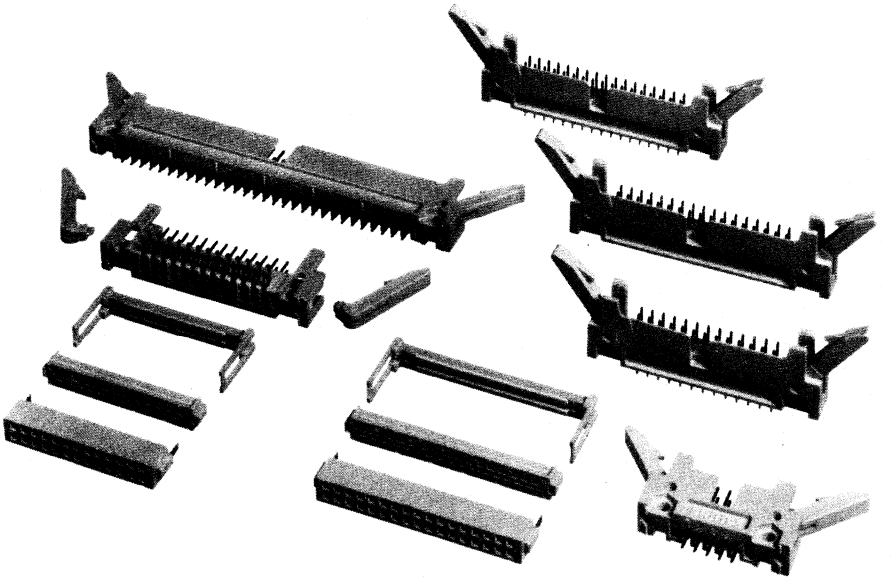
The locking devices are packed in plastic bags; handles 50 per bag; clips 100 per bag. Please order in multiples of these quantities.

RIBBON CABLE CONNECTOR SYSTEM

- Cable connectors with insulation displacement contacts
- Mating male headers with dip-solder pins or pins for wire wrapping
- Ribbon cables with solid or stranded wires, AWG28

QUICK REFERENCE DATA

Contact pitch	2,54 mm (0,1 in)
Number of contacts, double row	10, 14, 16, 20, 26, 34, 40, 50 and 60
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} = 20 °C	1 A*
Mechanical endurance	200 insertions
Climatic category, IEC 68	55/105/21



* Current restriction of 1 A is caused by cable specification.

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 pressure block in which the cable has to be inserted. During the insulation displacing both blocks are firmly pressed together and locked by two retaining barbs, which enter lugs at the ends of the pressure block. The contacts of the assembled cable connector can be electrically probed through holes in the upper surface of the pressure block.

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

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

A range of accessories is available:
- clamp/ejectors for clamping a cable connector to a male header, which also serve as ejectors for easy separation;
- strain relief bridge, for relieving stress on the terminations of the cable connector;
- internal coding system, to ensure correct positioning;
- appropriate tools for terminating the cable connectors to ribbon cables.

Note: The cable connectors also mate with male headers of the F095 modular connector system.

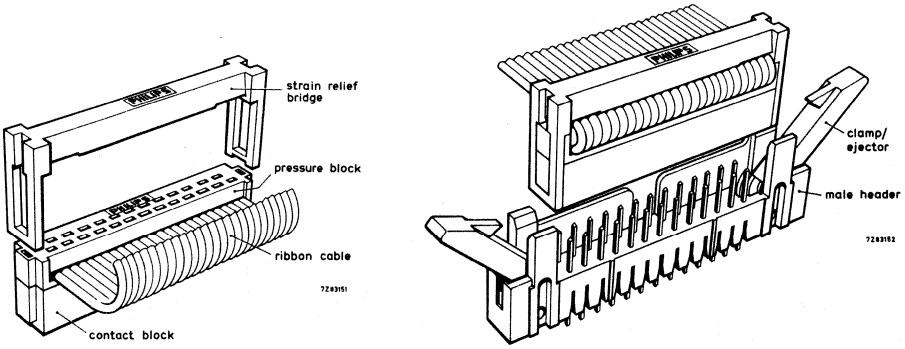
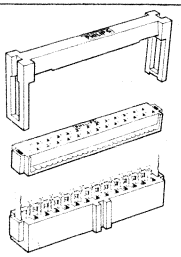
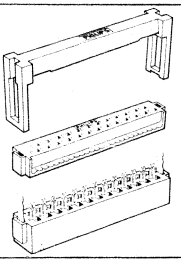
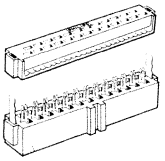
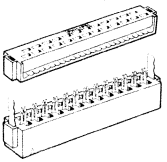
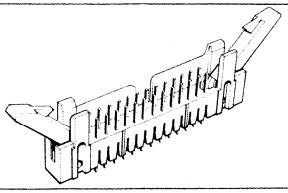
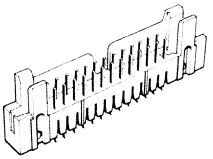
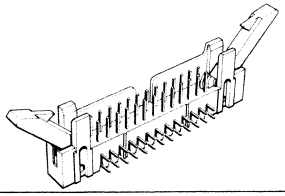
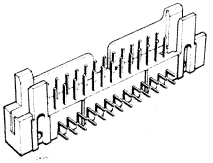
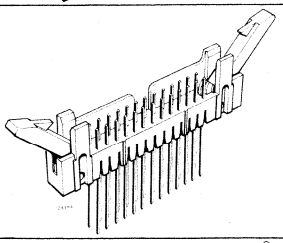
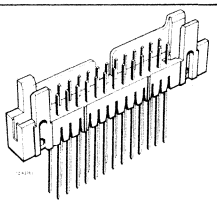
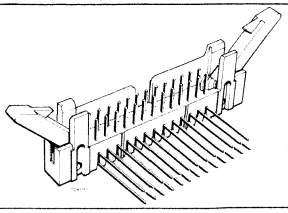
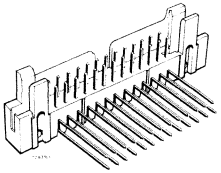


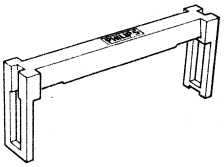
Fig. 1 Connector system.

Cable connectors		with polarizing key	without polarizing key
with strain relief bridge	see page 8		
without strain relief bridge	see page 9		

Male headers		with clamp/ejectors	without clamp/ejectors
with straight dip-solder pins	see pages 10 and 12		
with 90°-angled dip-solder pins	see pages 11 and 13		
with straight pins for wire wrapping	see pages 10 and 12		
with 90°-angled pins for wire wrapping	see pages 11 and 13		

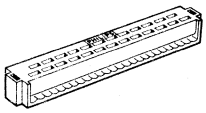
Accessories

strain relief bridge



see page 14

pressure block

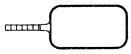


see page 14

clamp/ejector

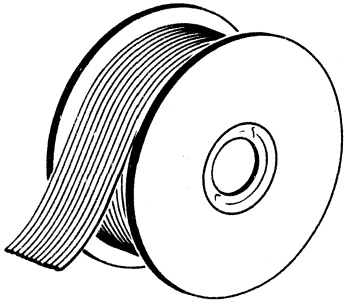
see page 15

coding peg



see page 15

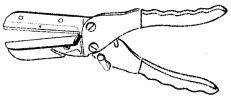
Ribbon cable



see page 16

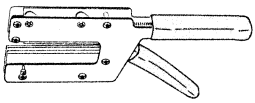
Assembling tools

cable shears



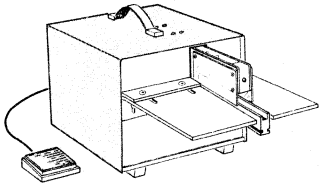
see page 19

manual jig holder



see page 19

electrical assembling unit



see page 19

ELECTRICAL DATA

Current at T_{amb} = 20 °C	1 A*
Derated current curve	according to IEC 512-3, test 5b, see Fig. 2
Contact resistance (including material resistance) at 10 mA, max. 20 mV (peak) open circuit voltage, 1 kHz	
initially	⩽ 15 mΩ
after mechanical endurance	⩽ 15 mΩ
after damp heat test	⩽ 20 mΩ
Insulation resistance	
initially	> 10^5 MΩ
after damp heat test	> 10^3 MΩ
Creepage distance	
between adjacent or opposite contacts	⩾ 0,8 mm
Clearance	
between adjacent or opposite contacts	⩾ 0,8 mm
Proof voltage for 1 min, at 20 °C	500 V (r.m.s.), 50 Hz

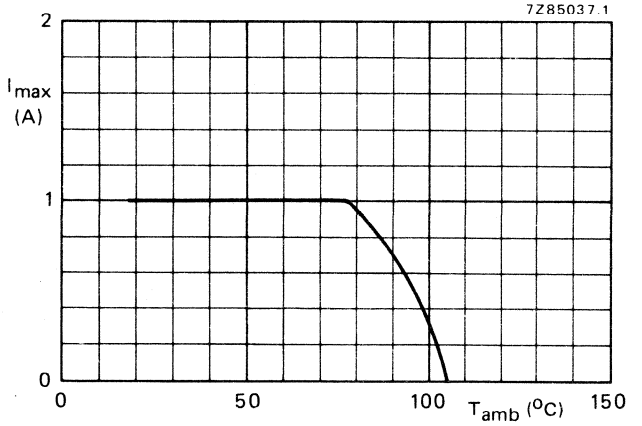


Fig. 2 Maximum current per contact, equally on all contacts, as a function of ambient temperature (20% derated).*

* The current restriction of 1 A in the temperature range 20 to 75 °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
Board thickness (for male headers)	1,42 to 1,78 mm
Polarization	achieved by polarizing key on cable connector and keyway in male header
Insertion force per contact	$\leqslant$ 2,25 N
Withdrawal force per contact	$\geqslant$ 0,15 N; $\leqslant$ 2,25 N
Mechanical endurance	200 insertions, according to IEC 512-5, test 9a
Body	
material	glass-fibre-filled thermoplastic polyester
colour	grey (RAL 7032)

Contacts	cable connector	male header
material	beryllium copper	brass
shape	solid cantilever	square pin, chamfered at both ends
finish of contact surfaces	$\geqslant$ 0,75 μm gold plate on $\geqslant$ 2,5 μm nickel plate	$\geqslant$ 0,75 μm gold plate on $\geqslant$ 2,5 μm nickel plate
type of termination	• insulation displacement	• straight dip-solder pin • 90°-angled dip-solder pin • straight pin for wire wrapping* • 90°-angled pin for wire wrapping*
finish of termination	$>$ 0,15 μm gold flash	$\geqslant$ 0,15 μm gold flash
contact mating length	$\geqslant$ 2 mm	

Solderability	235 °C, 2 s / 260 °C, 10 s — according to IEC 512, test 12
Resistance to soldering heat	
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

* Accommodate AWG28 and AWG30 wire; 0,32 and 0,25 mm diameter.

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
Salt mist	according to IEC 512, test 11t, 48 h
Flammability	according to UL94, category V0

DIMENSIONAL DATA

Dimensions in mm

Cable connectors with strain relief bridge

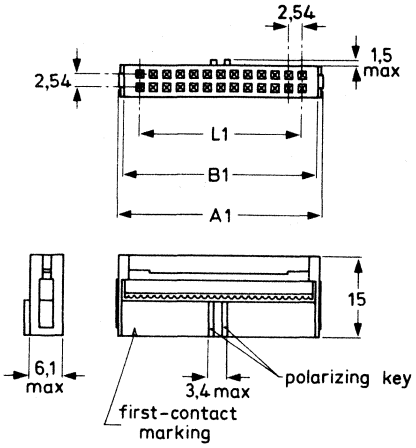


Fig. 3a Cable connector with polarizing key; for dimensions A1, B1 and L1, see Table 1.

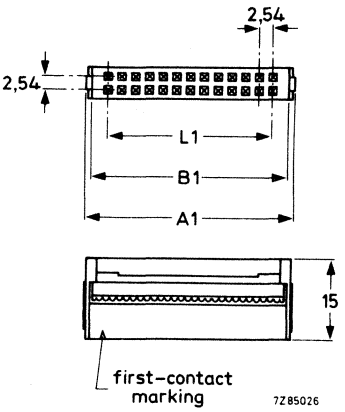


Fig. 3b Cable connector without polarizing key, for dimensions A1, B1 and L1, see Table 1.

Table 1 Cable connectors with strain relief bridge

number of contacts	$A1_{max}$	$B1_{max}$	L1 tol. ± 0,15	catalogue number		number per box
				with polarizing key	without polarizing key	
10	17,70	17,35	10,16	2432 023 51031	2432 023 41031	200
14	22,88	22,43	15,24	51431	41431	160
16	25,42	24,97	17,78	51631	41631	140
20	30,50	30,05	22,86	52031	42031	120
26	38,00	37,67	30,48	52631	42631	100
34	48,28	47,83	40,64	53431	43431	80
40	55,90	55,45	48,26	54031	44031	60
50	68,60	68,15	60,96	55031	45031	50
60	81,15	80,85	73,66	56031	46031	40

Packing

The cable connectors are supplied in loose parts: pressure blocks, contact blocks and strain relief bridges. They are packed in boxes; the number per box is given in Table 1. PLease order in multiples of these quantities.

Cable connectors without strain relief bridge

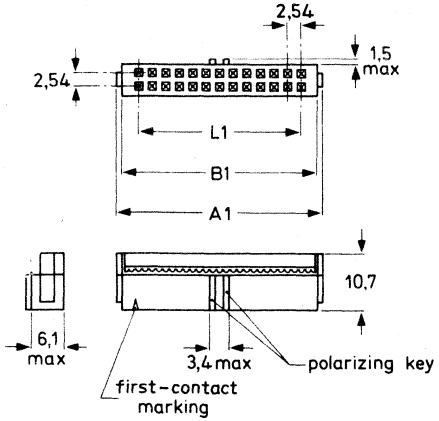


Fig. 4a Cable connector with polarizing key; for dimensions A1, B1 and L1, see Table 2.

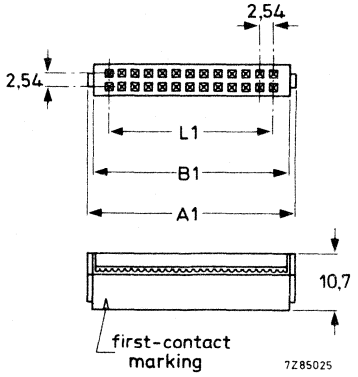


Fig. 4b Cable connector without polarizing key; for dimensions A1, B1 and L1, see Table 2.

Table 2 Cable connectors without strain relief bridge

number of contacts	$A1_{max}$	$B1_{max}$	L1 tol. ± 0,15	catalogue number		number per box
				with polarizing key	without polarizing key	
10	17,70	17,35	10,16	2432 023 51021	2432 023 41021	200
14	22,88	22,43	15,24	51421	41421	160
16	25,42	24,97	17,78	51621	41621	140
20	30,50	30,05	22,86	52021	42021	120
26	38,00	37,67	30,48	52621	42621	100
34	48,28	47,83	40,64	53421	43421	80
40	55,90	55,45	48,26	54021	44021	60
50	68,60	68,15	60,96	55021	45021	50
60	81,15	80,85	73,66	56021	46021	40

Packing

The cable connectors are supplied in loose parts: pressure blocks and contact blocks. They are packed in boxes; the number per box is given in Table 2. Please order in multiples of these quantities.

Male headers with clamp/ejectors and straight pins

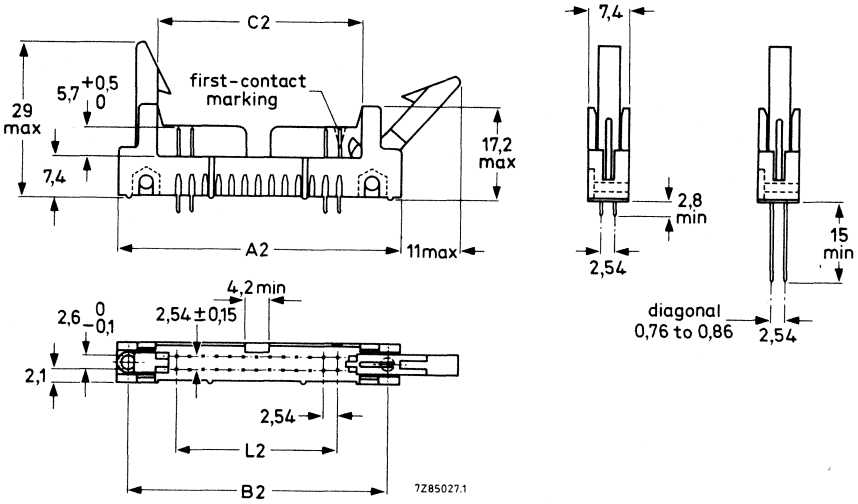


Fig. 5 Male header with clamp/ejectors, with straight dip-solder pins and pins for wire wrapping respectively; for dimensions A2, B2, C2 and L2, see Table 3.

Table 3 Male headers with clamp/ejectors, with straight pins

number of contacts	$A2_{max}$	B2 tol. ± 0,2	$C2_{min}$	L2 tol. ± 0,15	catalogue number 2432 023		number per box	
					with dip-solder pins	with pins for wire wrapping	with dip-solder pins	with pins for wire wrapping
10	32,25	27,94	17,85	10,16	21011	01011	150	150
14	37,33	33,02	22,93	15,24	21411	01411	130	130
16	39,87	35,56	25,47	17,78	21611	01611	130	130
20	44,95	40,64	30,55	22,86	22011	02011	110	110
26	52,57	48,26	38,17	30,48	22611	02611	100	100
34	62,73	58,42	48,33	40,64	23411	03411	80	80
40	70,35	66,04	55,95	48,26	24011	04011	70	70
50	83,05	78,74	68,65	60,96	25011	05011	60	60
60	95,75	91,44	81,35	73,66	26011	06011	50	50

Packing

The male headers are packed in boxes; the number per box is given in Table 3. Please order in multiples of these quantities.

Male headers with clamp/ejectors and 90°-angled pins

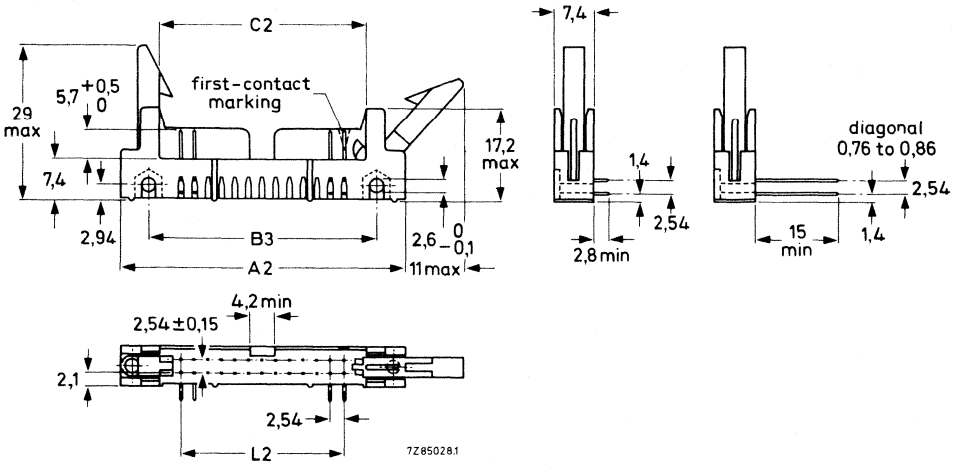


Fig. 6 Male header with clamp/ejectors, with 90°-angled dip-solder pins and pins for wire wrapping respectively; for dimensions A2, B3, C2 and L2, see Table 4.

Table 4 Male headers with clamp/ejectors, with 90°-angled pins

number of contacts	$A2_{max}$	B3 tol. ± 0,2	$C2_{min}$	L2 tol. ± 0,15	catalogue number 2432 023		number per box	
					with dip-solder pins	with pins for wire wrapping	with dip-solder pins	with pins for wire wrapping
10	32,25	21,84	17,85	10,16	31011	11011	150	75
14	37,33	26,92	22,93	15,24	31411	11411	130	65
16	39,87	29,46	25,47	17,78	31611	11611	130	65
20	44,95	34,54	30,55	22,86	32011	12011	110	55
26	52,57	42,16	38,17	30,48	32611	12611	100	50
34	62,73	52,32	48,33	40,64	33411	13411	80	40
40	70,35	59,94	55,95	48,26	34011	14011	70	35
50	83,05	72,64	68,65	60,96	35011	15011	60	30
60	95,75	85,34	81,35	73,66	36011	16011	50	25

Packing

The male headers are packed in boxes; the number per box is given in Table 4. Please order in multiples of these quantities.

Male headers without clamp/ejectors and straight pins

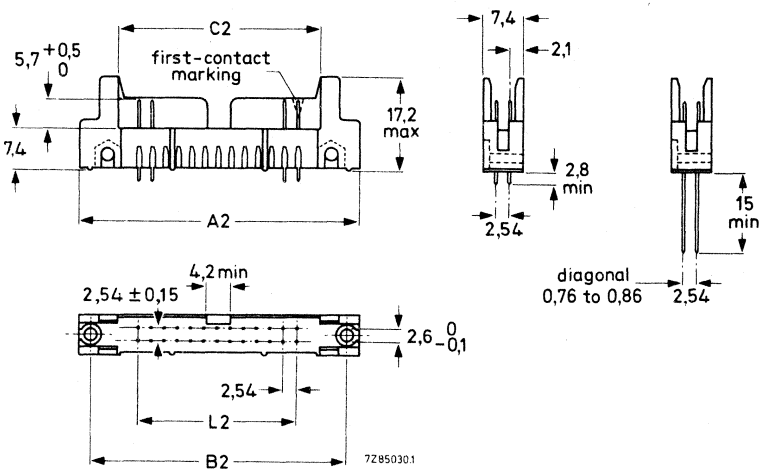


Fig. 7 Male header with straight dip-solder pins and pins for wire wrapping respectively; for dimensions A2, B2, C2 and L2, see Table 5.

Table 5 Male headers without clamp/ejectors, with straight pins

number of contacts	$A2_{max}$	B2 tol. ± 0,2	$C2_{min}$	L2 tol. ± 0,15	catalogue number 2432 023		number per box	
					with dip-solder pins	with pins for wire wrapping	with dip-solder pins	with pins for wire wrapping
10	32,25	27,94	17,85	10,16	21001	01001	150	150
14	37,33	33,02	22,93	15,24	21401	01401	130	130
16	39,87	35,56	25,47	17,78	21601	01601	130	130
20	44,95	40,64	30,55	22,86	22001	02001	110	110
26	52,57	48,26	38,17	30,48	22601	02601	100	100
34	62,73	58,42	48,33	40,64	23401	03401	80	80
40	70,35	66,04	55,95	48,26	24001	04001	70	70
50	83,05	78,74	68,65	60,96	25001	05001	60	60
60	95,75	91,44	81,35	73,66	26001	06001	50	50

Packing

The male headers are packed in boxes; the number per box is given in Table 5. Please order in multiples of these quantities.

Male headers without clamp/ejectors and 90°-angled pins

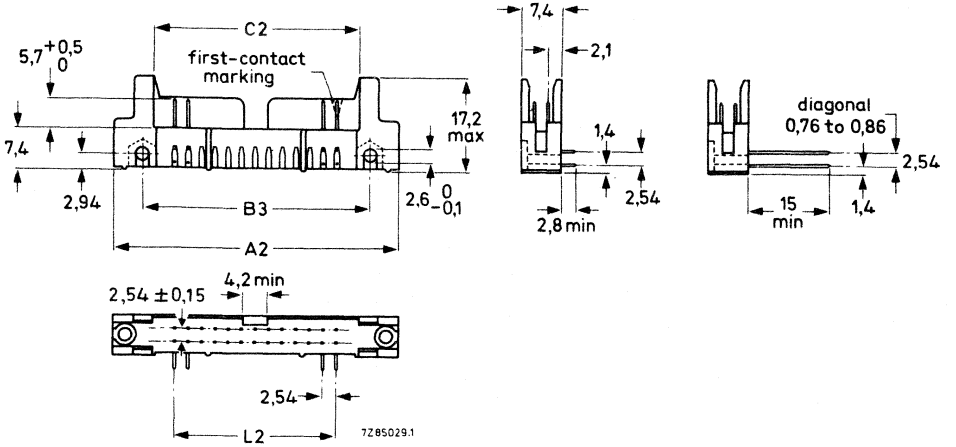


Fig. 8 Male header with 90°-angled dip-solder pins and pins for wire wrapping respectively; for dimensions A2, B3, C2 and L2, see Table 6.

Table 6 Male headers without clamp/ejectors, with 90°-angled pins

number of contacts	$A2_{max}$	B3 tol. ± 0,2	$C2_{min}$	L2 tol. ± 0,15	catalogue number 2432 023		number per box	
					with dip-solder pins	with pins for wire wrapping	with dip-solder pins	with pins for wire wrapping
10	32,25	21,84	17,85	10,16	31001	11001	150	75
14	37,33	26,92	22,93	15,24	31401	11401	130	65
16	39,87	29,46	25,47	17,78	31601	11601	130	65
20	44,95	34,54	30,55	22,86	32001	12001	110	55
26	52,57	42,16	38,17	30,48	32601	12601	100	50
34	62,73	52,32	48,33	40,64	33401	13401	80	40
40	70,35	59,94	55,95	48,26	34001	14001	70	35
50	83,05	72,64	68,65	60,96	35001	15001	60	30
60	95,75	85,34	81,35	73,66	36001	16001	50	25

Packing

The male headers are packed in boxes; the number per box is given in Table 6. Please order in multiples of these quantities.

ACCESSORIES

Strain relief bridges

Separate strain relief bridges can be ordered under the catalogue numbers mentioned in Table 7.

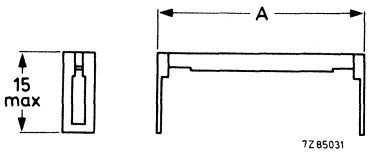


Fig. 9 Strain relief bridge; for dimension A, see Table 7.

Table 7 Strain relief bridges

number of contacts	A_{max}	catalogue number	number per bag
10	17,68	2432 023 90001	200
14	22,76	90002	160
16	25,30	90003	140
20	30,38	90004	120
26	38,00	90005	100
34	48,16	90006	80
40	55,78	90007	60
50	68,48	90008	50
60	81,18	90009	40

Note: Strain relief bridges are also available together with cable connectors, see Table 1, page 8.

Strain relief bridges are packed in plastic bags; the number per bag is given in Table 7.

Pressure blocks

Separate pressure blocks can be ordered under the catalogue numbers mentioned in Table 8.

Table 8 Pressure blocks

number of contacts	catalogue number	number per bag	number of contacts	catalogue number	number per bag
10	2432 023 90021	200	34	2432 023 90026	80
14	90022	160	40	90027	60
16	90023	140	50	90028	50
20	90024	120	60	90029	40
26	90025	100			

Pressure blocks are packed in plastic bags; the number per bag is given in Table 8.

Clamp/ejectors

Separate clamp/ejectors can be ordered under catalogue number 2432 023 90041. They must be inserted vertically into the male header, and clicked into holes at the ends (Fig. 11).
See also the caption of Fig. 14.

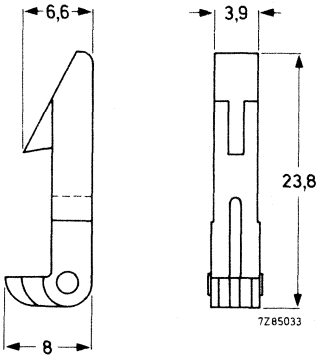


Fig. 10 Clamp/ejector.

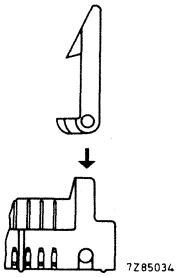


Fig. 11 Inserting a clamp/ejector into a male header.

Note: Male headers provided with clamp/ejectors are also available, see pages 10 and 11.

Clamp/ejectors are packed in plastic bags, containing 100 pieces; please order in multiples of this quantity.

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.

Catalogue number: 2432 023 90051.

Coding pegs are packed in plastic bags, containing 120 pieces; please order in multiples of this quantity.

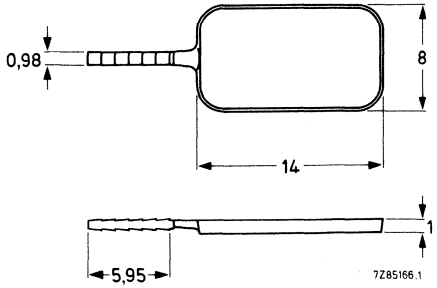


Fig. 12 Coding peg.

RIBBON CABLE

Type		AWG 28/1 (solid) or AWG 28/7 (stranded)
UL style number		2678
Length		50 m
Colour		grey (RAL7032)
Insulation material		PVC
Conductor material		tinned copper
Number of strands	for stranded wires only	7
Thickness of strands	for stranded wires only	AWG36 (0,012 mm^2)
Maximum current at T_{amb} = 20 °C		1 A
Propagation delay time		4,5 ns/m
Impedance at 100 kHz		100 Ω ± 10%
Capacitance		46 pF/m
Ambient temperature range		−55 to + 105 °C
Colour coding		1st wire marked red (visible at both sides), every 5th wire marked black
Flammability		according to UL94, category V0

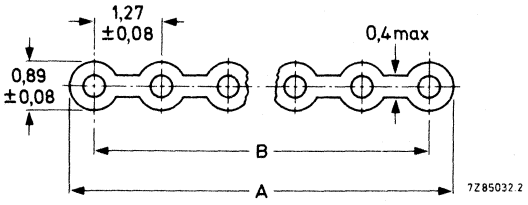


Fig. 13 Ribbon cable; see Table 9 for dimensions A and B.

Table 9 Ribbon cables

number of wires	A		B		catalogue number	
					cable with solid wires; AWG 28/1	cable with stranded wires; AWG 28/7
10	12,70	± 0,18	11,43	± 0,18	0712 236 00022	0712 150 02007
14	17,78		16,51		00023	02008
16	20,32	± 0,25	19,05	± 0,25	00024	02009
20	25,40		24,13		00025	04005
26	33,02		31,75		00026	04006
34	43,18		41,91		00027	06003
40	50,80	± 0,38	49,53	± 0,38	00028	06004
50	63,50		62,23		00029	06005
60	76,20		74,93		00031	06006

MOUNTING

Dimensions in mm

Hole pattern on printed boards for male headers viewed from components side

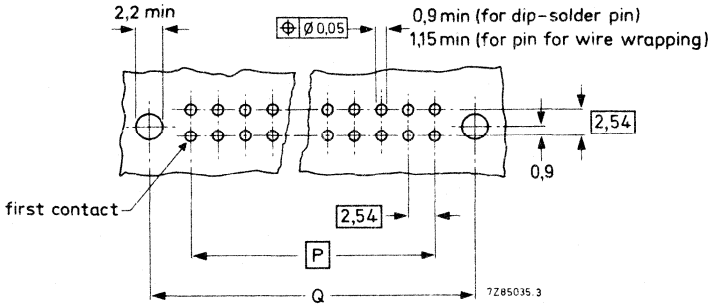


Fig. 14 Hole pattern for male headers with straight dip-solder pins or straight pins for wire wrapping; for dimensions P and Q, see Table 10. Fixing of the male headers can be done by means of M2 screws and nuts. Mounting is only possible when the clamp/ejectors are not inserted.

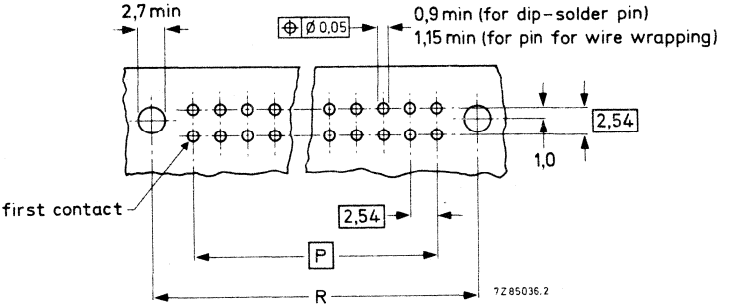


Fig. 15 Hole pattern for male headers with 90°-angled dip-solder pins or 90°-angled pins for wire wrapping; for dimensions P and R see Table 10.

Table 10

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	± 0,1	42,16	± 0,1
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	

Note: For the hole pattern for male headers F095, to be used with cable connectors F303, see the data sheet F095.

Cable/connector assembling

The unstripped ribbon cable has to be inserted into the corrugated slot in the pressure block of the cable connector (Fig. 16).

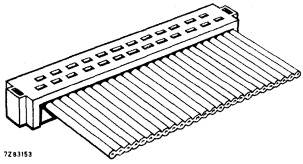


Fig. 16.

The contact block is then pushed downwards to the pressure block by the electrical assembling unit or manual jig holder (Fig. 17).

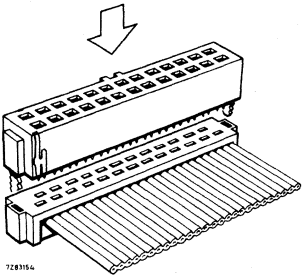


Fig. 17.

After pressing, the two parts of the cable connector remain firmly locked together by two retaining barbs, which enter lugs at the ends of the pressure block during the pressing operation (Fig. 18).

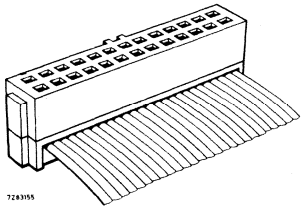


Fig. 18.

The ribbon cable is then folded over the cable connector and the strain relief bridge is snapped over the end lugs of the connector (Fig. 19).

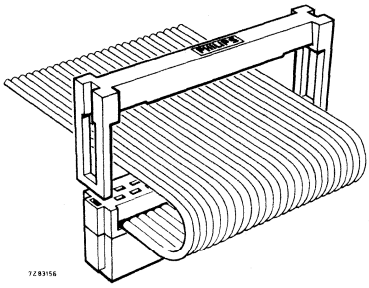


Fig. 19.

The ribbon cable has to be pulled to complete the assembling procedure (Fig. 20).

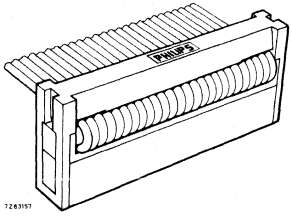


Fig. 20.

Assembly tools

A range of portable and bench-mounted tools for assembling the connectors during production and maintenance is available.

– For cable cutting manual cable shears are supplied, making a right-angled cut of the ribbon cable. Catalogue number: 2432 023 90125.

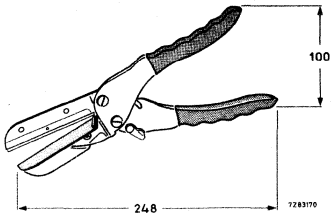


Fig. 21 Cable shears.

– For small-scale assembly of connectors a dual-purpose manual jig holder is available. The jig holder is used with a cable cutting jig, and for insulation displacement with a connector assembling jig, which applies the correct pressure required and properly assembles the contact block and pressure block of the cable connector.

The jig holder is supplied including the following parts:

- cable cutting jig;
- connector assembling jig with cable stop;
- connector assembling jig without cable stop (for bussing purposes);
- cable guide;
- brackets for bench mounting;

Catalogue number of jig holder: 2432 023 90111.

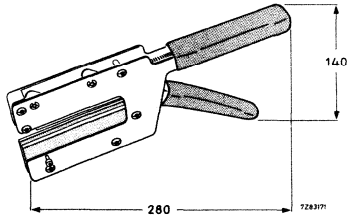


Fig. 22 Manual jig holder.

– For large-scale assembly an electrical assembling unit is available. This unit is supplied including the following parts:

- jig holder;
- cable cutting jig;
- connector assembling jig with cable stop;
- connector assembling jig; without cable stop (for bussing purposes);
- assembly plate with cable guides;
- foot switch.

Catalogue number: 2432 023 90141.

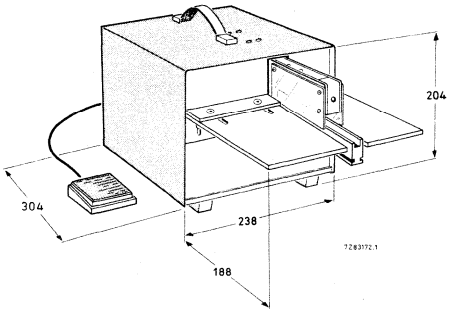


Fig. 23 Electrical assembling unit.

The main characteristics of the electrical assembling unit are:

required mains voltage	220 V, 50/60 Hz
power consumption	150 W
length of mains cable	1,5 m
mass	approx. 16 kg

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

The first contact of the cable connectors, and that of the male headers, are identified by a Δ sign.

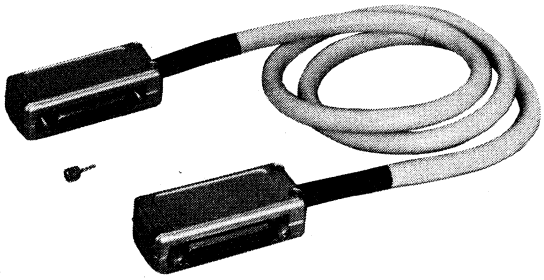
CABLE ASSEMBLY

- 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 °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 °C	1,5 A
Proof voltage for 1 min, at 20 °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	$\leqslant$ 5 mΩ
Insulation resistance	
initially	$> 10^5$ MΩ
after damp heat test	$> 10^3$ MΩ
Creepage distance	
between contacts	$\geqslant$ 1 mm
between a contact and earth	$\geqslant$ 1 mm
Clearance distance	
between contacts	$\geqslant$ 1 mm
between a contact and earth	$\geqslant$ 1 mm

Cable

Capacitance between any signal line and all other lines at 1 kHz	$\leqslant$ 150 pF/m
Resistance of	
each signal line	$\leqslant$ 0,14 Ω/m
signal line ground return	$\leqslant$ 0,14 Ω/m
common logic ground return	$\leqslant$ 0,085 Ω/m
overall shield	$\leqslant$ 0,0085 Ω/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	⩾ 0,5 μm hard gold on ⩾ 2 μm 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

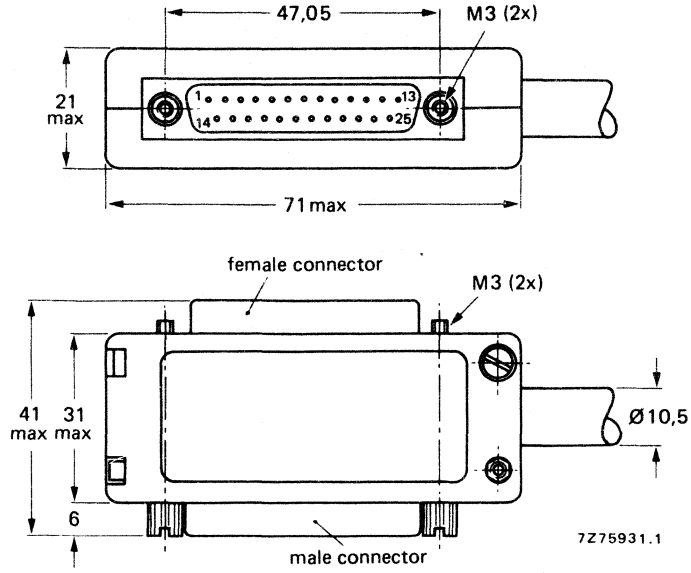


Fig. 1.

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.

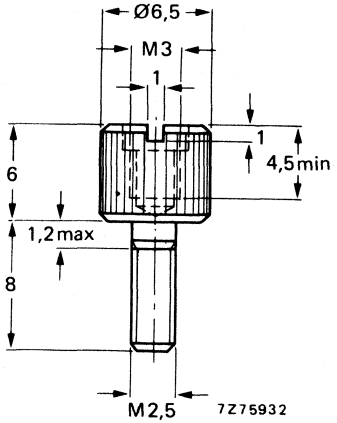


Fig. 2.

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.

ADRESLIJST ELCOMA

Argentina: FAPESA I.y.C., Av. Crovara 2550, Tablada, Prov. de BUENOS AIRES, Tel. 652-7438/7478.
Australia: PHILIPS INDUSTRIES HOLDINGS LTD., Elcoma Division, 67 Mars Road, LANE COVE, 2066, N.S.W., Tel. 427 08 88.
Austria: ÖSTERREICHISCHE PHILIPS BAUELEMENTE Industrie G.m.b.H., Triester Str. 64, A-1101 WIEN, Tel. 62 91 11.
Belgium: M.B.L.E., 80, rue des Deux Gares, B-1070 BRUXELLES, Tel. 523 00 00.
Brazil: IBRAPE, Caixa Postal 7383, Av. Brigadeiro Faria Lima, 1735 SAO PAULO, SP, Tel. (011) 211-2600.
Canada: PHILIPS ELECTRONICS LTD., Electron Devices Div., 601 Milner Ave., SCARBOROUGH, Ontario, M1B 1M8, Tel. 292-5161.
Chile: PHILIPS CHILENA S.A., Av. Santa Maria 0760, SANTIAGO, Tel. 39-40 01.
Colombia: SADAPE S.A., P.O. Box 9805, Calle 13, No. 51 + 39, BOGOTA D.E. 1., Tel. 600 600.
Denmark: MINIWATT A/S, Emdrupvej 115A, DK-2400 KØBENHAVN NV., Tel. (01) 69 16 22.
Finland: OY PHILIPS AB, Elcoma Division, Kaivokatu 8, SF-00100 HELSINKI 10, Tel. 1 72 71.
France: R.T.C. LA RADIOTECHNIQUE-COMPELEC, 130 Avenue Ledru Rollin, F-75540 PARIS 11, Tel. 355-44-99.
Germany: VALVO, UB Bauelemente der Philips G.m.b.H., Valvo Haus, Burchardstrasse 19, D-2 HAMBURG 1, Tel. (040) 3296-1.
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