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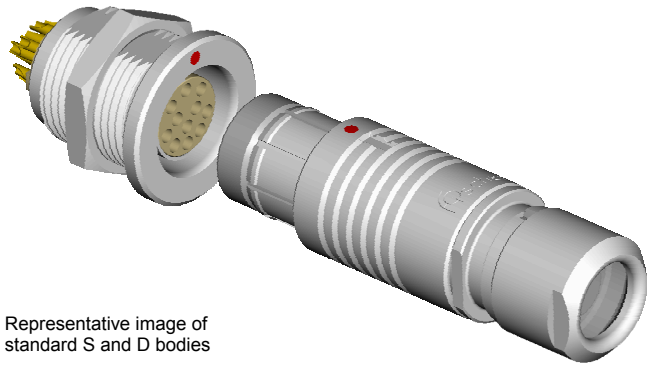
104 Series
Multipole

Technical Specifications

Product range covered:
S / SC / SA / SV / SOV / SS / SSC / WSO / SF / SFE / SFU / SFPE / SFPU / D / DB / DBP / DBPC / DG / DGP
DEE / DEU / DBEE / DBEU / DBPE / DBPU / DBPLE / DBPLU / K / KE / KS / KSE / DKBE / WDE



Representative image of
standard S and D bodies

Product Benefits

- Up to a maximum of 27 contacts
- Unsealed (IP50), waterproof (IP68) or hermetically sealed
- 3 keying-codes
- Reverse contact variants
- Standard matt silver chrome or non-reflective matt black chrome finish
- Full range of accessories including bend reliefs and sealing caps available
- Scoop-proof (IEC 60512-1-4)

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Information provided herein is believed to be accurate at time of publishing. Fischer Connectors reserves the right to make modifications on products for continuous improvement without prior notice.

Environmental & Mechanical Data

Characteristic	Product Type	Value	Standard
Sealing Performance	Unsealed Connectors (mated)	IP50	IEC 60529
	Plugs with General Purpose Sealed Clamps (mated) **(1)**	IP68: 2 m submersion for 24 hours IP69K **(2)**	
	Receptacles "U" Body Style	IP68: 2 m submersion for 24 hours	
	Receptacles "E" Body Style	Hermetic: Tested: < 10^{-8} mbar l/sec. IP69K **(2)**	
Operating Temperature Range	Unsealed Connectors	-65°C to +200°C	IEC 60512-6-11 i+j IEC 60068-2-14-Nb
	Plugs Using General Purpose Sealed Clamps	-65°C to +130°C	
	Receptacles "U" Body Style	-50°C to +200°C **(3)**	
	Receptacles "E" Body Style	-50°C to +150°C **(3)**	
Corrosion Resistance		Salt mist, 96 hours, 5% salt solution, 35°C	IEC 60068-2-11 Test Ka MIL-STD-202 Method 101 Condition A
Endurance		5'000 mating cycles	IEC 60512-5-9a EIA-364-09
Vibration		10 to 2000 Hz, 1.5 mm or 15 g, 12 sweep cycles per axis, 20 minutes per 10-2000-10 Hz sweep cycle, no discontinuity > 1 us	MIL-STD-202 Method 204 Condition B
Radiation Resistance (4)	Unsealed Connectors	PEEK: 10^6 Gy (=100M Rads)	
	Sealed Receptacles	Viton® O-rings: 10^5 Gy (=10M Rads)	

(1) The sealing performance can be affected by the long term quality of the cable.
(2) Dust tight, protected against the effects of high-pressure liquids. The test requirements for IP69K exist only in DIN 40050-9, the German version of IEC 60529.
(3) With Viton® O-ring (standard) in receptacle interface: Operating temperature of Viton® O-ring: -20°C to +200°C. Min mating temperature of 0°C.
With EPDM O-ring (Low temp) on request in receptacle interface: Operating temperature of EPDM O-ring: -50°C to +160°C. Min mating temperature of -20°C.
(4) For information only. Not tested by Fischer Connectors.

Material & Surface Treatments

Metal Parts	Material			Finish	
	Designation ISO		Standard	Designation	Standard
Body Shell	Brass	CuZn39Pb3	CW614N UNS C 38500	Chrome over Nickel	SAE-AMS-QQ-C-320
Cable Clamps, Nuts and other Inner Parts	Brass	CuZn39Pb3	CW614N UNS C 38500	Nickel	SAE-AMS-QQ-N-290 SAE-AMS2404
Contacts - Male (solder)	Brass	CuZn39Pb3	CW614N UNS C 38500	1 µm Gold over Nickel	MIL-DTL-45204D Type I ASTM B488
- Female, - Male (crimp)	Bronze	CuSn4Zn4Pb4	CW456K ASTM B 139, UNS C 54400		

Insulator and Sealing	International Symbol	Flammability	Standard
Insulator	PEEK	UL 94 V-0	MIL-P-46183
Interface O-rings (Receptacles)	Viton® EPDM	UL 94 V-0 UL 94 HB	~SAE-AMS7276
Sealant Material (Receptacles) - IP68 - Hermetic	Silicon compound Epoxy compound	UL 94 V-0 UL 94 HB	
Cable Sealing (Plugs) - IP68	TPE-S	UL 94 HB	

Our products are RoHS compliant and conform with the EC Directive 2002/95/EC

Electrical Data

Characteristic	Contact Size	Typical Values	Standard
Contact Resistance over 5'000 Mating Cycles	Ø0.5 mm Ø0.7 mm Ø0.9 mm Ø1.3 mm Ø1.6 mm Ø2.3 mm	5 mΩ 5 mΩ 4 mΩ 2.5 mΩ 2.5 mΩ 2.5 mΩ	IEC 60512-2-2a/b
Shell Resistance		20 mΩ	IEC 60512-2-2f
Insulation Resistance		> 10^{10} Ω	IEC 60512-2-3a, Method C
Shielding Effectiveness		> 60 dB up to 1GHz	IEC 60512-23-3

Contact Configurations

Type	Pin Layout	Number of Contacts	Contact Diameter [mm]	Wire Size (2)		Current Rating [A]	Rated Voltage r.m.s. [V]	Insertion/Extraction Force (typ.) [N] (5)	
				Solder (1) Contacts	Crimp Contacts	IEC 60512-3-5b	IEC 60664-1	IEC 60512-7-13a, MIL-STD-1344	
						(3)	(4)	Unsealed	Sealed
104 A Z 051		2	1.6	Max Ø1.86 mm AWG13 [1] AWG14 [7/22]	-	20	≤ 500	~20	~35
104 A Z 040		3	1.6	Max Ø1.86 mm AWG13 [1] AWG14 [7/22]	Max 1.78 mm Min 1.17 mm AWG14-18	18	≤ 500	~20	~40
104 A Z 037		4	1.3	Max Ø1.18 mm AWG17 [1] AWG18 [16/30]	Max 1.18 mm Min 0.58 mm AWG18-24	12	≤ 500	~20	~40
104 A Z 087		4 = 2	2.3	Max Ø2.48 mm AWG11 [1] AWG12 [7/20]	-	28	≤ 400	~25	~45
		2	0.9	Max Ø0.79 mm AWG21 [1] AWG22 [7/30]	-	3.0			
104 A Z 053		5	1.3	Max Ø1.18 mm AWG17 [1] AWG18 [16/30]	-	11	≤ 320	~25	~40
104 A Z 065		6	0.9	Max Ø0.79 mm AWG21 [1] AWG22 [7/30]	Max 0.83 mm Min 0.48 mm AWG22-26	6.5	≤ 400	~20	~40
104 A Z 054		7	0.9	Max Ø0.79 mm AWG21 [1] AWG22 [7/30]	-	6.5	≤ 320	~25	~40
104 A Z 066		8	0.9	Max Ø0.79 mm AWG21 [1] AWG22 [7/30]	Max 0.83 mm Min 0.48 mm AWG22-26	6.2	≤ 320	~25	~40
104 A Z 055		9 = 1	1.3	Max Ø1.18 mm AWG17 [1] AWG18 [16/30]	-	12	≤ 250	~25	~45
		8	0.9	Max Ø0.79 mm AWG21 [1] AWG22 [7/30]	-	6.0			

(1) Stranding values in brackets.

(2) Exceptionally for a given AWG, the diameter of some stranded conductor designs could be larger than the hole diameter of the barrel. Trials may be required.

(3) Recommended max. operating current per contact at 40°C temperature rise.

(4) Recommended operating voltage at sea level.

This rated voltage is a general purpose guideline where no other electrical safety standard applies. In case other standards rule a specific use of the connector, then the application specific safety criteria shall be considered first. This must be evaluated in the frame of equipment engineering.
In case other calculation methods are preferred, please refer to general catalogue for test voltage data.

(5) Values may vary strongly depending on environmental conditions, ageing, finish or type of seal.

Contact Configurations (cont.)

Type	Pin Layout	Number of Contacts	Contact Diameter [mm]	Wire Size (2)		Current Rating [A]	Rated Voltage r.m.s. [V]	Insertion/Extraction Force (typ.) [N] (5)	
				Solder Contacts (1)	Crimp Contacts	IEC 60512-3-5b	IEC 60664-1	IEC 60512-7-13a, MIL-STD-1344	
						(3)	(4)	Unsealed	Sealed
104 A/Z **056**		11	0.9	Max Ø0.79 mm AWG21 [1] AWG22 [7/30]	Max 0.83 mm Min 0.48 mm AWG22-26	5.8	≤ 250	~30	~45
104 A/Z **086**		16	0.7	Max Ø0.79 mm AWG21 [1] AWG22 [7/30]	Max 0.62 mm Min 0.38 mm AWG24-28	4.0	≤ 200	~35	~55
104 A/Z **092**		19	0.7	Max Ø0.79 mm AWG21 [1] AWG22 [7/30]	Max 0.62 mm Min 0.38 mm AWG24-28	3.5	≤ 200	~40	~60
104 A **124** **(6)**		27	0.5	-	Max 0.43 mm Min 0.20 mm AWG28-32	2.0	≤ 200	~40	~60

(1) Stranding values in brackets.

(2) Exceptionally for a given AWG, the diameter of some stranded conductor designs could be larger than the hole diameter of the barrel. Trials may be required.

(3) Recommended max. operating current per contact at 40°C temperature rise.

(4) Recommended operating voltage at sea level.

This rated voltage is a general purpose guideline where no other electrical safety standard applies. In case other standards rule a specific use of the connector, then the application specific safety criteria shall be considered first. This must be evaluated in the frame of equipment engineering.
In case other calculation methods are preferred, please refer to general catalogue for test voltage data.

(5) Values may vary strongly depending on environmental conditions, ageing, finish or type of seal.

(6) This configuration has different environmental performances than those shown on page 2 due to the use of another sealant material.
Please contact us for more information.

Tooling

	Designation	Contact Gender	Size [mm]	Part Number
	**Crimp Tool (1)**			TX00.240
	**Crimp Positioner (1)**	Male	Ø0.7	TX00.304
		Female	Ø0.7	TX00.305
		Male	Ø0.9	TX00.307
		Female	Ø0.9	TX00.309
		Male	Ø1.3	TX00.311
		Female	Ø1.3	TX00.312
		Male	Ø1.6	TX00.313
		Female	Ø1.6	TX00.314
	**Contact Insertion Tool**		Ø0.7	TX00.210
			Ø0.9	TX00.211
			Ø1.3	TX00.273
	**Contact Extraction Tool**		Ø0.7	TX00.200
			Ø0.9	TX00.205
			Ø1.3	TX00.212
			Ø1.6	TX00.201
	**Double-End Open Spanner Extra Thin**		12	TX00.012
			13	TX00.013
			14	TX00.014
	**Open-End Spanner Extra Thin**		17	TX00.017
			19	TX00.019
	**Nut Driver with T-Handle and Hex Drive for Decorative Slotted Nut**		M 15 x 1	TK00.000
			M 16 x 1	TK00.002

(1) For detailed crimping instructions, log on to our online technical library at www.fischerconnectors.com/technical

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