



Positronic Industries
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ORDERING INFORMATION

Front
Runner

ORDERING INFORMATION - CODE NUMBERING SYSTEM

Specify Complete Connector By Selecting An Option From Step 1 Through 6

STEP	1	2	3	4	5	6	7	8
EXAMPLE	FR	11	MF	922	K	0	/AA	-1554.0

STEP 1 - BASIC SERIES

FR - Front Runner Series

STEP 2 - HOUSING SIZE

11 - Size 11 Housing
19 - Size 19 Housing

STEP 3 - HOUSING STYLE AND GENDER

MP - Free In-line, Male Contacts with Plug Housing
FP - Free In-line, Female Contacts with Plug Housing
MF - Fixed Flange Mount, Male Contacts with Receptacle Housing
FF - Fixed Flange Mount, Female Contacts with Receptacle Housing
MJ - Fixed Jam Nut, Male Contacts with Receptacle Housing
FJ - Fixed Jam Nut, Female Contacts with Receptacle Housing
MR - Free In-line, Male Contacts with Receptacle Housing
FR - Free In-line, Female Contacts with Receptacle Housing

STEP 4 - CONTACT ARRANGEMENTS AND SIZE

SIZE 11 HOUSING

316 - Three (3) Size 16 Contacts
420 - Four (4) Size 20 Contacts
520 - Five (5) Size 20 Contacts
722 - Seven (7) Size 22 Contacts
822 - Eight (8) Size 22 Contacts
922 - Nine (9) Size 22 Contacts

SIZE 19 HOUSING

312 - Three (3) Size 12 Contacts
512 - Five (5) Size 12 Contacts
712 - Seven (7) Size 12 Contacts
716 - Seven (7) Size 16 Contacts
916 - Nine (9) Size 16 Contacts
920 - Nine (9) Size 20 Contacts
1220 - Twelve (12) Size 20 Contacts
1822 - Eighteen (18) Size 22 Contacts
1920 - Nineteen (19) Size 20 Contacts
2922 - Twenty-nine (29) Size 22 Contacts

STEP 5 - SERVICE CLASS

K - Non-Environmental
L - Environmental
M - EMI/RFI Shielded
LM - Environmental and EMI/RFI Shielded

Note: Crimp contacts must be ordered separately. Select desired contact size and wire gauge size from pages 18 - 19.

Order thermocouple contacts from page 20.
Order size 16 micro-coaxial contacts from page 22.

STEP 8 - SPECIAL OPTIONS

FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 13.

STEP 7 - ENVIRONMENTAL COMPLIANCE OPTIONS



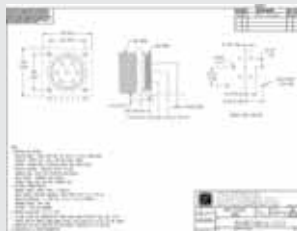
/AA - Compliant per EU Directive 2002/95/EC (RoHS)

Note: If compliance to environmental legislation is not required, this step will not be used. Example: FR11MP922K1

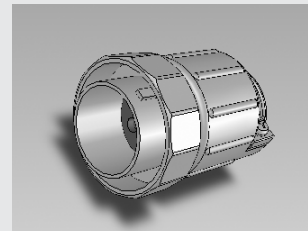
STEP 6 - CABLE ADAPTERS (HOOD)

0 - None
1 - Long, Straight, Non-Environmental
2 - Short, Straight, Non-Environmental
4 - Long, Straight, Environmental
41- Long, Straight, Environmental with single cable seal. (Size 11 - 0.150 [3.81] ID, size 19 - 0.345 [8.76] ID)
42- Long, Straight, Environmental with single cable seal. (Size 11 - 0.200 [5.08] ID, size 19 - 0.420 [10.67] ID)
43- Long, Straight, Environmental with single cable seal. (Size 11 - 0.250 [6.35] ID, size 19 - 0.495 [12.57] ID)
44- Long, Straight, Environmental with single cable seal. (Size 11 - 0.300 [7.62] ID, size 19 - 0.570 [14.48] ID)
5 - Long, Straight, EMI/RFI
6 - Short, Straight, EMI/RFI

NOTE: Once you have made a connector selection, contact Technical Sales if you would like to receive a drawing in DXF, PDF format or a 3-dimensional IGES, STEP, or SOLIDWORKS file.



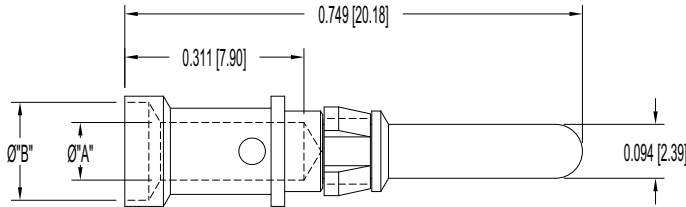
2-dimensional drawing



3-dimensional model

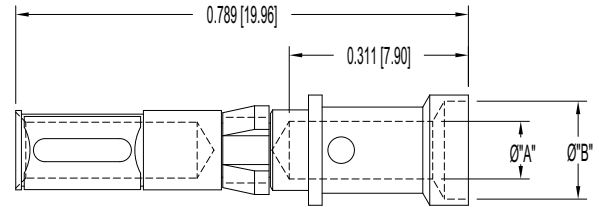


SIZE 12 REMOVABLE CONTACTS



MALE

MALE CONTACT PART NUMBER	WIRE SIZE AWG [mm ²]	Ø "A"	Ø "B"
MC612N	12 [4.0]	0.100 [2.54]	0.170 [4.32]



FEMALE

FEMALE CONTACT PART NUMBER	WIRE SIZE AWG [mm ²]	Ø "A"	Ø "B"
FC612N2	12 [4.0]	0.100 [2.54]	0.170 [4.32]

MATERIALS AND FINISHES:

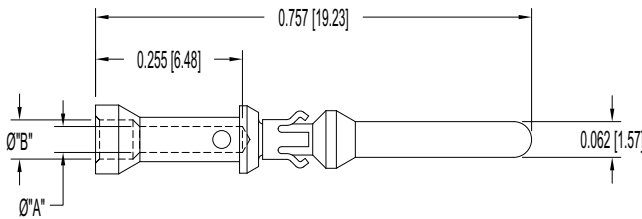
Material: Copper Alloy.

Finish: Gold flash over nickel.

0.000030 inch [0.76 µ] gold over nickel available by adding "-14" suffix onto the part number.

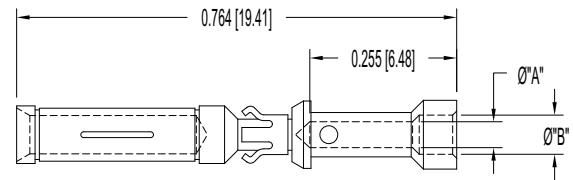
Example: MC612N-14.

SIZE 16 REMOVABLE CONTACTS



MALE

MALE CONTACT PART NUMBER	WIRE SIZE AWG [mm ²]	Ø "A"	Ø "B"
MC114N	14 / 16 [2.5 / 1.5]	0.081 [2.06]	0.105 [2.67]
MC116N	16 / 18 [1.5 / 1.0]	0.067 [1.70]	0.093 [2.36]
MC120N	20 / 22 / 24 [0.5 / 0.3 / 0.25]	0.045 [1.14]	0.065 [1.65]



FEMALE

FEMALE CONTACT PART NUMBER	WIRE SIZE AWG [mm ²]	Ø "A"	Ø "B"
FC114N2	14 / 16 [2.5 / 1.5]	0.081 [2.06]	0.105 [2.67]
FC116N2	16 / 18 [1.5 / 1.0]	0.067 [1.70]	0.093 [2.36]
FC120N2	20 / 22 / 24 [0.5 / 0.3 / 0.25]	0.045 [1.14]	0.065 [1.65]

MATERIALS AND FINISHES:

Material: Copper Alloy.

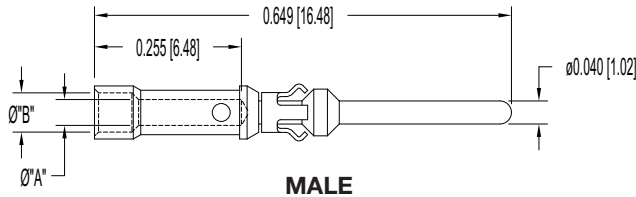
Finish: Gold flash over nickel.

0.000030 inch [0.76 µ] gold over nickel available by adding "-14" suffix onto the part number.

Example: FC612N-14.

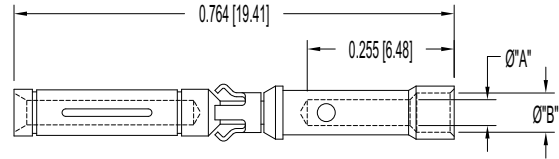


SIZE 20 REMOVABLE CONTACTS



MALE

MALE CONTACT PART NUMBER	WIRE SIZE AWG [mm ²]	ϕ "A"	ϕ "B"
MC720N3	20 / 22 / 24 [0.5 / 0.3 / 0.25]	0.045 [1.14]	0.068 [1.73]



FEMALE

FEMALE CONTACT PART NUMBER	WIRE SIZE AWG [mm ²]	ϕ "A"	ϕ "B"
FC720N2	20 / 22 / 24 [0.5 / 0.3 / 0.25]	0.045 [1.14]	0.068 [1.73]

MATERIALS AND FINISHES:

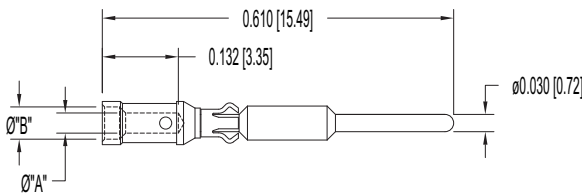
Material: Copper Alloy.

Finish: Gold flash over nickel.

0.000030 inch [0.76 μ] gold over nickel available by adding "-14" suffix onto the part number.

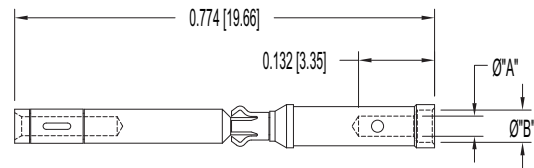
Example: FC720N2-14.

SIZE 22 REMOVABLE CONTACTS



MALE

MALE CONTACT PART NUMBER	WIRE SIZE AWG [mm ²]	ϕ "A"	ϕ "B"
MC422N	22 / 24 / 26 [0.3 / 0.25 / 0.12]	0.035 [0.89]	0.056 [1.42]



FEMALE

FEMALE CONTACT PART NUMBER	WIRE SIZE AWG [mm ²]	ϕ "A"	ϕ "B"
FC422N6	22 / 24 / 26 [0.3 / 0.25 / 0.12]	0.035 [0.89]	0.056 [1.42]

MATERIALS AND FINISHES:

Material: Copper Alloy.

Finish: Gold flash over nickel.

0.000030 inch [0.76 μ] gold over nickel available by adding "-14" suffix onto the part number.

Example: MC422N-14.

ADVANTAGES OF REAR INSERTION-FRONT RELEASE CONTACT RETENTION SYSTEM

CONSIDERATION	FRONT RELEASE ADVANTAGE
1. Size	Will accept a wire with oversized insulation diameter.
2. Connector Wiring	Less open wiring is required between the connector and the lacing or between the connector and the cable jacket. Minimum service time is required for repairs.
3. Shielded Wires	Provides the most effective RFI shielding as the shielding can be brought closer to the grommet surface for terminations to the connector shell.
4. Contact Servicing	Since the removal tool is inserted from the front, finding the correct position is relatively simple.
5. Wire Breakage	The standard removal tool can be used to remove a contact which has a broken wire at the contact crimp joint.
6. Service Tools	Metal tools are available for inserting and removing contacts.

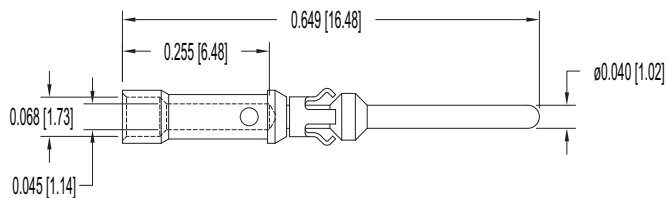


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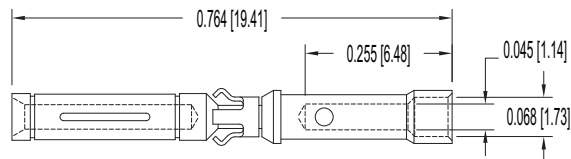
THERMOCOUPLE CONTACTS

Front
Runner

SIZE 20 CRIMP THERMOCOUPLE CONTACTS



MALE



FEMALE

TYPE	MATERIAL	MALE PART NUMBER	FEMALE PART NUMBER	COLOR CODE	WIRE SIZE AWG [mm ²]
K	CHROMEL (+)	MC720N3CH	FC720N2CH	WHITE	20 / 22 / 24 [0.5 / 0.3 / 0.25]
	ALUMEL (-)	MC720N3AL	FC720N2AL	GREEN	20 / 22 / 24 [0.5 / 0.3 / 0.25]
T	COPPER (+)	MC720N3CU	FC720N2CU	RED	20 / 22 / 24 [0.5 / 0.3 / 0.25]
	CONSTANTAN (-)	MC720N3CO	FC720N2CO	YELLOW	20 / 22 / 24 [0.5 / 0.3 / 0.25]
E	CHROMEL (+)	MC720N3CH	FC720N2CH	WHITE	20 / 22 / 24 [0.5 / 0.3 / 0.25]
	CONSTANTAN (-)	MC720N3CO	FC720N2CO	YELLOW	20 / 22 / 24 [0.5 / 0.3 / 0.25]

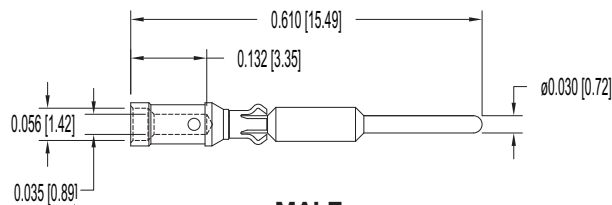
For more information on the availability of Type J thermocouple contacts, please contact Technical Sales.

For more information about thermocouple contacts with PCB solder termination, please contact Technical Sales.

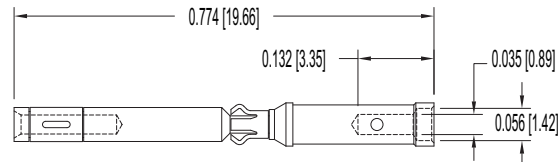
See page 24 for Crimp Tool information.

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SIZE 22 CRIMP THERMOCOUPLE CONTACTS



MALE



FEMALE

TYPE	MATERIAL	MALE PART NUMBER	FEMALE PART NUMBER	COLOR CODE	WIRE SIZE AWG [mm ²]
K	CHROMEL (+)	MC422NCH	FC422N6CH	WHITE	22 / 24 / 26 [0.3 / 0.25 / 0.12]
	ALUMEL (-)	MC422NAL	FC422N6AL	GREEN	22 / 24 / 26 [0.3 / 0.25 / 0.12]
T	COPPER (+)	MC422NCU	FC422N6CU	RED	22 / 24 / 26 [0.3 / 0.25 / 0.12]
	CONSTANTAN (-)	MC422NCO	FC422N6CO	YELLOW	22 / 24 / 26 [0.3 / 0.25 / 0.12]
E	CHROMEL (+)	MC422NCH	FC422N6CH	WHITE	22 / 24 / 26 [0.3 / 0.25 / 0.12]
	CONSTANTAN (-)	MC422NCO	FC422N6CO	YELLOW	22 / 24 / 26 [0.3 / 0.25 / 0.12]

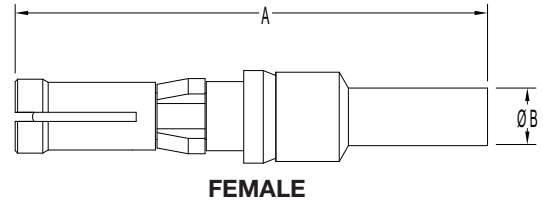
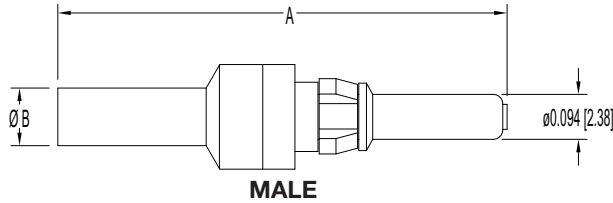
For more information on the availability of Type J thermocouple contacts, please contact Technical Sales.

For more information about thermocouple contacts with PCB solder termination, please contact Technical Sales.

See page 24 for Crimp Tool information.

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SIZE 12 CRIMP SHIELDED CONTACTS



CONTACT DESIGNATION	PART NUMBER	A	Ø B	CABLE SIZE
MALE	MC601D	0.936 [23.77]	0.041 [1.04]	RG 178 B/U RG 196 B/U
FEMALE	FC601D	0.984 [24.99]	0.041 [1.04]	RG 178 B/U RG 196 B/U
MALE	MC602D	0.936 [23.77]	0.070 [1.78]	RG 179 B/U RG 316 /U
FEMALE	FC602D	0.984 [24.99]	0.070 [1.78]	RG 179 B/U RG 316 /U

TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

Insulating Material: (Dielectric) PTFE, Teflon.
Inner Contacts: Brass & Phosphor bronze, 0.000030 inch [0.76 microns] gold over nickel and 0.000050 inch [1.27 microns] gold over nickel.

Contact Body: Brass and Phosphor bronze, gold flash over nickel.

MECHANICAL CHARACTERISTICS:

Removable Contacts: Rear insertion, front release.
Durability: 100 cycles minimum.
Vibration: 20g from 10 HZ to 500 HZ.
Shock: 30g - 11rms.

ELECTRICAL CHARACTERISTICS:

Initial Contact Resistance: 0.010 ohms maximum.
Nominal Impedance: 50 ohms.
Insertion Loss: 0.35 dB at 1 GHz
 1.35 dB at 2 GHz
 1.53 dB at 3 GHz
VSWR: 1.20 average at 1 GHz
 1.45 average at 2 GHz
 1.63 average at 3 GHz
Proof Voltage: 600 V r.m.s.

Above values measured using frequency domain techniques.

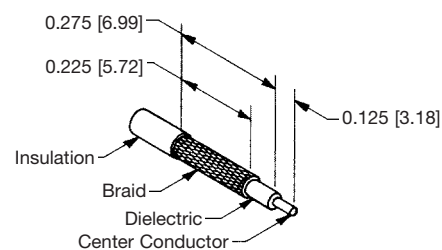
CLIMATIC CHARACTERISTICS:

Temperature Range: -55°C to +125°C.

CRIMP TOOL

Use 9504-0-0-0 Crimp Tool

SHIELDED CABLE STRIP LENGTH



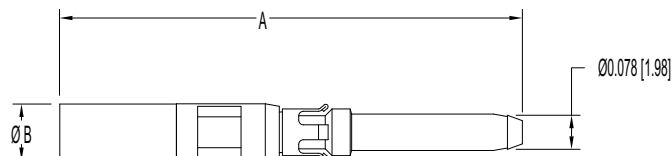


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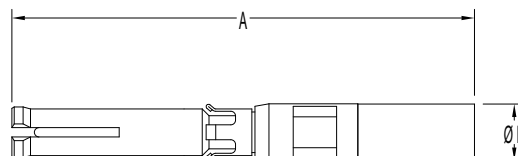
CRIMP SHIELDED CONTACTS

Front
Runner

SIZE 16 CRIMP SHIELDED CONTACTS



MALE



FEMALE



CONTACT DESIGNATION	PART NUMBER	A	Ø B	CABLE SIZE
MALE	MCS126N	0.993 [25.22]	0.045 [1.14]	RG 178 B/U RG 196 A/U
FEMALE	FCS126N2	0.967 [24.56]	0.045 [1.14]	RG 178 B/U RG 196 B/U
MALE	MCS226N	1.048 [26.62]	0.070 [1.78]	RG 179 B/U RG 316 /U
FEMALE	FCS226N2	1.022 [25.96]	0.070 [1.78]	RG 179 B/U RG 316 /U

TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

- Insulating Material:** (Dielectric) Teflon.
- Inner Contacts:** Phosphor bronze, 0.000030 inch [0.76 microns] gold over nickel.
- Outer Contacts:** Brass and beryllium copper, gold flash over nickel.

MECHANICAL CHARACTERISTICS:

- Contact Retention in Insulator:** 20 lbs. [89N].
- Removable Contacts:** Rear insertion, front removable.
- Insertion Force per Contact:** 8 oz. [2.2 N] per contact maximum.
- Durability:** 100 cycles minimum.
- Vibration:** 20g from 10 HZ to 500 HZ.
- Shock:** 30g - 11rms.

ELECTRICAL CHARACTERISTICS:

MICRO-COAXIAL CONTACTS	CONTACT/WIRE COMBINATIONS			
	126N		226N	
	RG178	RG196	RG179	RG316
Characteristic Impedance (ohms)	50	50	75	50
Frequency Range	0-500 MHz			
VSWR				
0 to 200 MHz	1.25			
200 to 500 MHz	1.70		2.25	
Insertion Loss @ 500 MHz	0.2 dB		1.0 dB	

- Dielectric Strength at Sea Level:** 600 V rms.
- Initial Contact Resistance:** 0.012 ohms maximum.
- Insulator Resistance:** 5 G ohms.

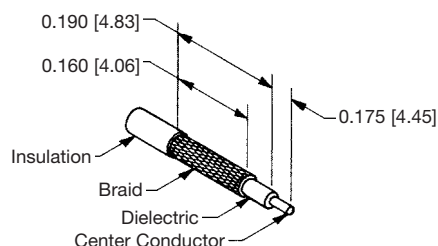
CLIMATIC CHARACTERISTICS:

- Temperature Range:** -55°C to +125°C



9506-0-0-0 CRIMP TOOL

SHIELDED CABLE STRIP LENGTH



POSITRONIC INDUSTRIES

Connector Excellence[®]

Connector Families

Power

D-SUBMINIATURE

Circular

RECTANGULAR

Hermetic

THERMOCOUPLE

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