



SIMULA
TECHNOLOGY INC.

**Circular Push-Pull
Connector**



ABOUT SIMULA

Simula Technology Inc. is a publicly listed company in Taiwan, who designs and manufactures high-performing connectors, cables and accessories. Established in 1990, Simula's mission is to lead the industry with excellent R&D technology, constant innovation and exceptional customer service.

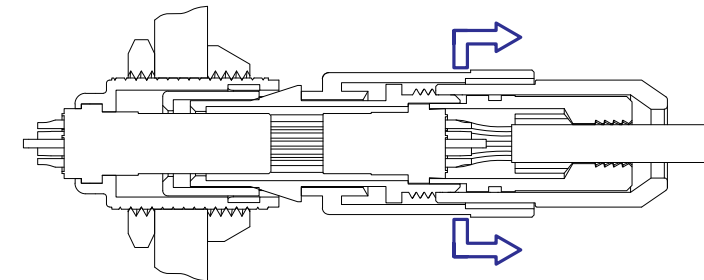
Simula provides both off-the-shelve and customized solutions to accommodate customers in various market segments. To ensure the quality and standard of the products we provide to our customer who puts their trust in us, Simula is in compliance with International Standards recognized worldwide such as ISO13485, ISO 9001, ISO14001 and IATF16949.



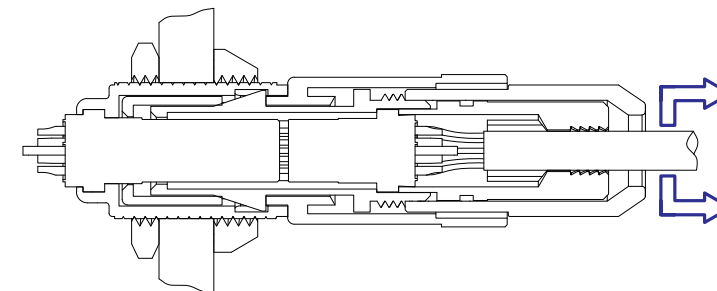
PRINCIPLE & APPLICATION

Simula Push-Pull-Locking Connection System

This push-pull-locking system is renowned worldwide for its easy and quick mating and unmating features. It provides absolute security against vibration, shock or pull on the cable and facilitates operation in a very limited space.



Pulling on the housing of the outer plug disengages the "jaws" from the receptacle groove, separating the connector easily.

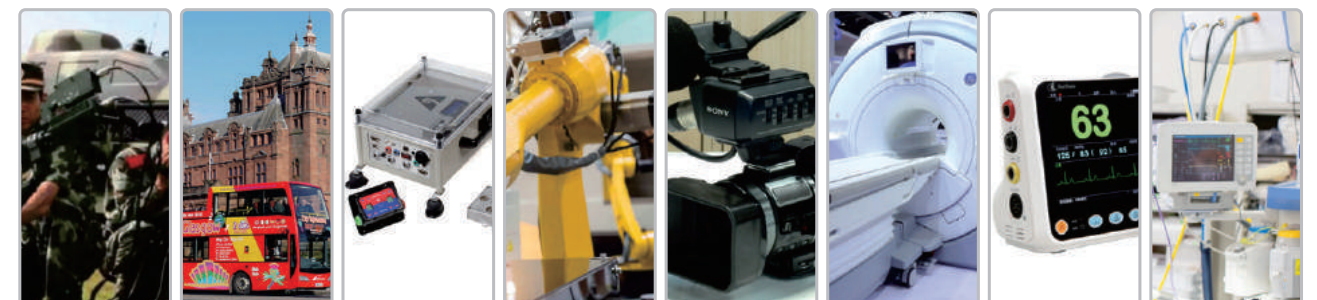


Pulling on the cable or on the back nut alone will cause the "jaws" to grip harder into the groove of the receptacle, making it virtually impossible to separate.

- Quick and easy mating and unmating
- Blind Mating made easy in places difficult to reach
- Less panel space required
- Definite and secure locking condition
- Less mating force required

Important Applications for Push-Pull-Locking Connectors:

- Medical Electronics
- Test and Laboratory
- Measurement Instrumentation
- Data and Telecom Systems
- Audio and Video Applications
- Military and Aerospace
- Industrial Controls
- Nuclear Technology



PRODUCT LINE INTRODUCTION

	Plastic IP Series	Metal B Series	Metal K Series
Picture			
Model Series Description	Standard plastic push-pull, multi-contact connectors with alignment key options	Metal push-pull, multi-contact connectors with alignment key options, rugged shell for rough working conditions	Watertight metal push-pull, multi-contact connectors with alignment key options, rugged shell for rough working conditions
Environment	Indoor	Indoor	Outdoor
Ingress Protection	IP50/IP64(mated)	IP50(mated)	IP67(mated)*
Contact Configuration	2 to 14 contacts solder& print contacts	2 to 32 contacts solder print crimp contact	2 to 32 contacts solder print crimp contact
Temperature	PSU:-50 to 150°C PEI:-50 to 170°C	-55 to 250°C	-55 to 200°C
Major Features	push-pull self latching 6 keying options 7 color codings Gray or black outer shell options For cable Φ 2.7 to 6.5mm	push-pull self latching Multiple sizes Multiple keying options For cable Φ 1.1 to 9.7mm	push-pull self latching Multiple sizes Multiple keying options For cable Φ 1.0 to 9.7mm
Characteristics	Current rating:2 to 10A Dielectric with standing voltage:0.6 to 1.2KV rws Insulation resistance:10 ¹² Ω Durability:1000 cycles	Current rating:1.5 to 25A Dielectric with standing voltage:0.6 to 2.4KV rms Insulation resistance:10 ¹² Ω Durability: >5000 cycles Shielding: >75dB at 10M Hz >40dB at 1G Hz	Current rating:1.5 to 25A Dielectric with standing voltage:0.6 to 2.4KV rms Insulation resistance:10 ¹² Ω Durability: >5000 cycles Shielding: >95dB at 10M Hz >80dB at 1G Hz

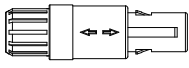
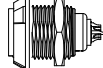
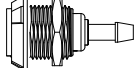
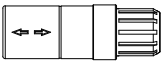
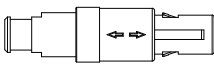
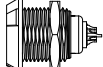
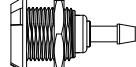
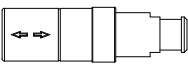
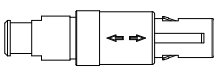
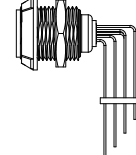
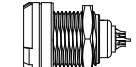
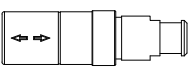
* IP68 requires perfectly circular cable and high integrity sealing assembly.

PRODUCT INTRODUCTION

PLASTIC IP SERIES CONNECTORS



INTERCONNECTION

Straight Plugs	Fixed Sockets		Free Sockets
MX SERIES	FX SERIES		SX SERIES
 H21PM1XX-XXXXXX-AX0XX	 H31PF1XX-XXXXXX-AX0XX	 H31PF4XX-XXXXXX-AX0XX	 H31PS1XX-XXXXXX-AX0XX
 H21PM1XX-XXXXXX-BX0XX	 H31PF2XX-XXXXXX-AX0XX	 H31PF5XX-XXXXXX-AX0XX	 H31PS1XX-XXXXXX-BX0XX
 H21PM1XX-XXXXXX-BX4XX	 H31PF3XX-XXXXXX-AX0XX	 H31PF1XX-XXXXXX-AX4XX	 H31PS1XX-XXXXXX-BX4XX

MODEL DESCRIPTION

- M1A

●

Straight plug with cable collet
- M1B

●

Straight plug with cable collet and nut for fitting a bend relief
- M1B4

●

Straight plug with cable collet and nut for fitting a bend relief, watertight (IP64)
- F1A

●

Fixed socket with two nuts (back panel mounting)
- F2A

●

Fixed socket, nut fixing
- F3A

●

Fixed socket with two nuts, with 90°contacts for printed circuit board (back panel mounting)
- F4A

●

Fixed socket with two nuts, fluid (back panel mounting)
- F5A

●

Fixed socket, nut fixing, fluid
- F1A4

●

Fixed socket with two nuts, water tight IP64 (back panel mounting)
- S1A

●

Free socket with cable collet
- S1B

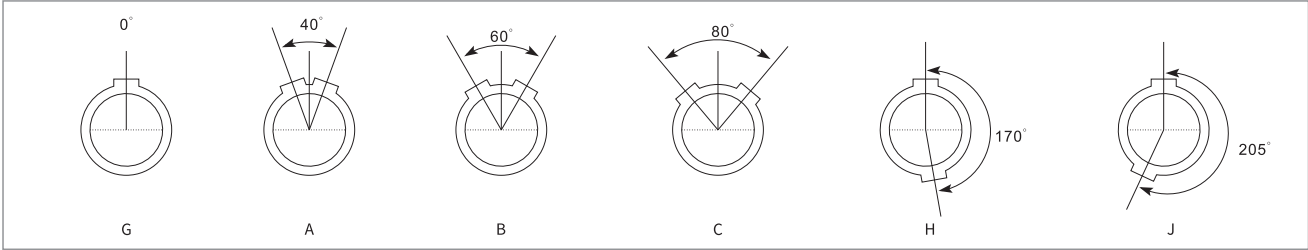
●

Free socket with cable collet and nut for fitting a bend relief
- S1B4

●

Free socket with cable collet and nut for fitting a bend relief, watertight (IP64)

ALIGNEMENT KEY AND POLARIZED KEYING SYSTEM



PRODUCT INTRODUCTION

TECHNICAL CHARACTERISTICS

Characteristics		Value	Standard
Average retention force when pulling on the cable	1 N = 0.102 Kg	90 N	IEC 60512-8 test 15f
Cable retention force (depends on cable construction)	1 N = 0.102 Kg	50 ~ 150 N	IEC 60512-9 test 17f
Endurance		> 1000 cycles	IEC 60512-5 test 9a
Working temperature range (PSU shell)		-50 °C ~ +150 °C	-
Working temperature range (PEI shell)		-50 °C ~ +170 °C	-

TYPES

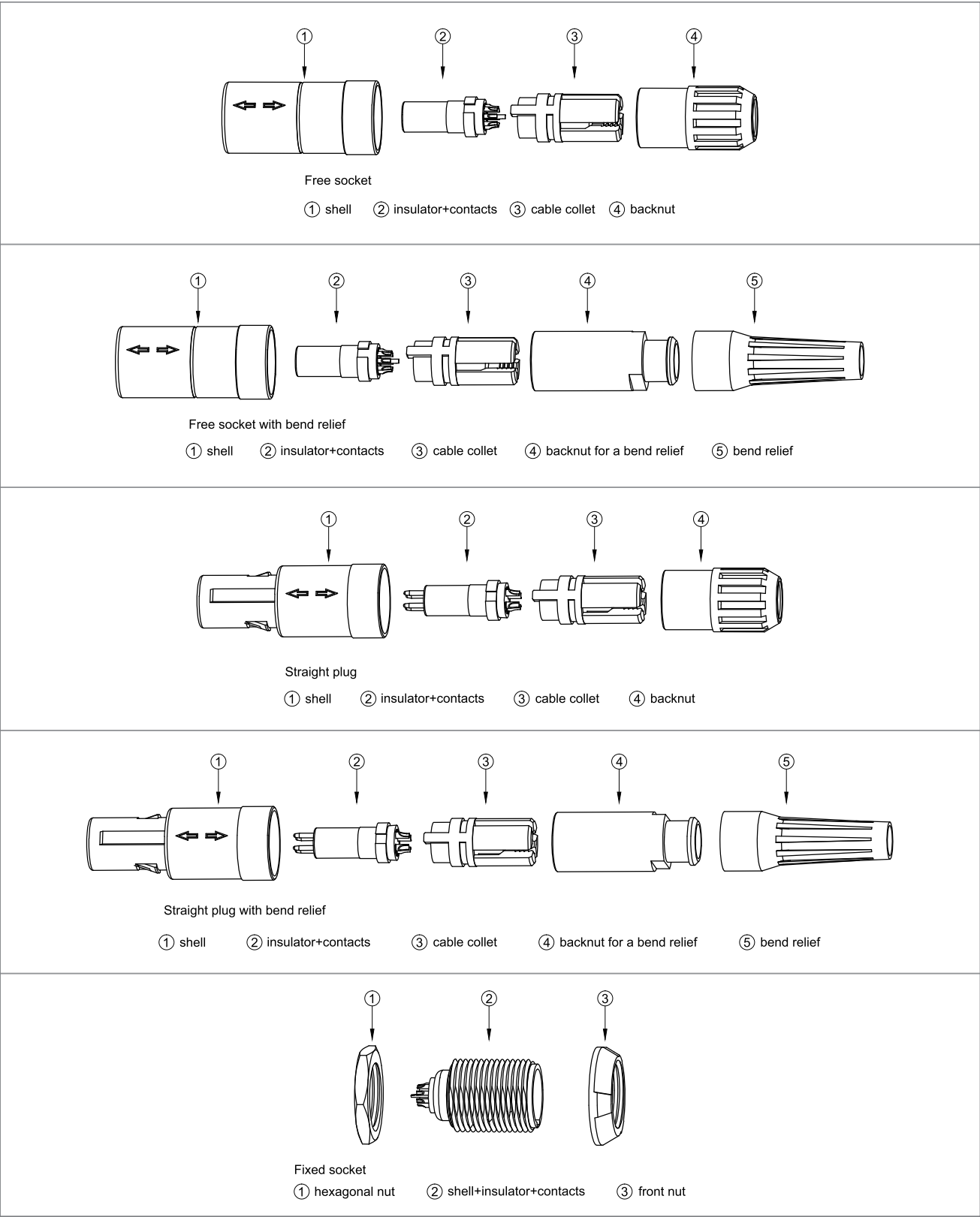
Characteristics Eigenschaften	Standards Normen	Units Einheit									
Number of contacts			2	4	5	6	7	8	9	10	14
Contact ø (male pin)		mm	1.3	0.9	0.9	0.7	0.7	0.7	0.5	0.5	0.5
Solder bucket ø		mm	1.1	0.85	0.85	0.6	0.6	0.6	0.45	0.45	0.45
AWG max.			20	22	22	26	26	26	28	28	28
Crimp bucket ø		mm	1.4	1.1	1.1	0.8	0.8	0.8	-	-	-
AWG max. - min. ³⁾			18-20	20-24	20-24	22-26 ⁴⁾	22-26 ⁴⁾	22-26 ⁴⁾	-	-	-
Wire insulator ø max.		mm	2.2	1.7	1.7	1.4	1.4	1.4	-	-	-
Contact resistance ²⁾	IEC 60512-2 test 2a	m Ω	< 3.5	< 4.5	< 4.5	< 6.5	< 6.5	< 6.5	< 8.5	< 8.5	< 8.5
Insulation resistance	IEC 60512-2 test 3a	Ω	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²	> 10 ¹²
Air clearance min. ⁵⁾	IEC 60664-1 (§ 1.3.2)	mm	1.3	1.2	0.8	0.85	0.85	0.6	0.6	0.45	0.5
Creepage dist. min. ⁶⁾	IEC 60664-1 (§ 1.3.3)	mm	1.3	1.2	0.8	0.85	0.85	0.6	0.6	0.45	0.5
Operating voltage ¹⁾		kV dc	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.3
Operating voltage ¹⁾		kV rms	0.4	0.4	0.35	0.35	0.35	0.35	0.29	0.29	0.2
Test voltage	IEC 60512-2 test 4a	kV dc	1.8	1.8	1.5	1.5	1.5	1.5	1.2	1.2	0.9

Notes:

- > Sterilization of connectors:
Housing material PSU/PPSU/PEI: Autoclaving/Steam Sterilization
- > More than 1,000 mating cycles.
- > Mating compatible to many LEMO Redel types of Series 1P and ODU Medi-Snap
- > Simula can provide connector solutions up to IP64 (International Protection)

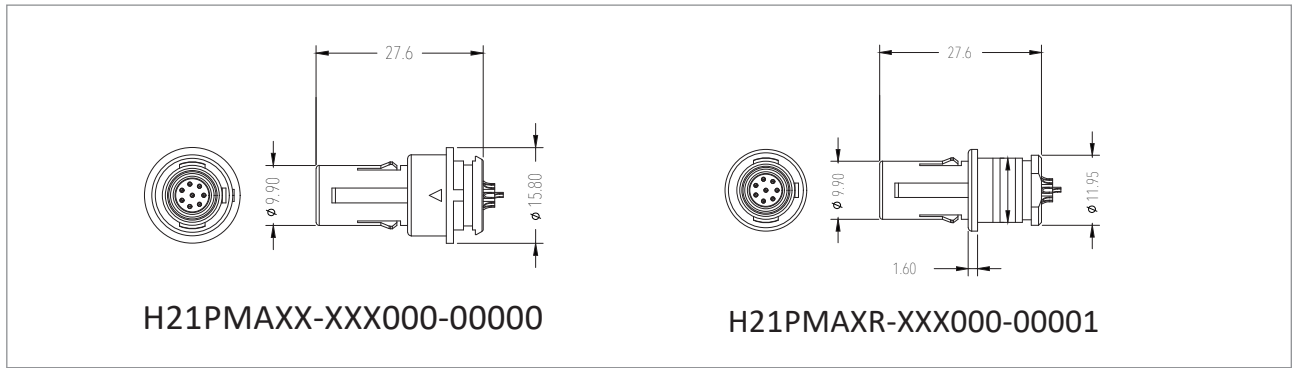
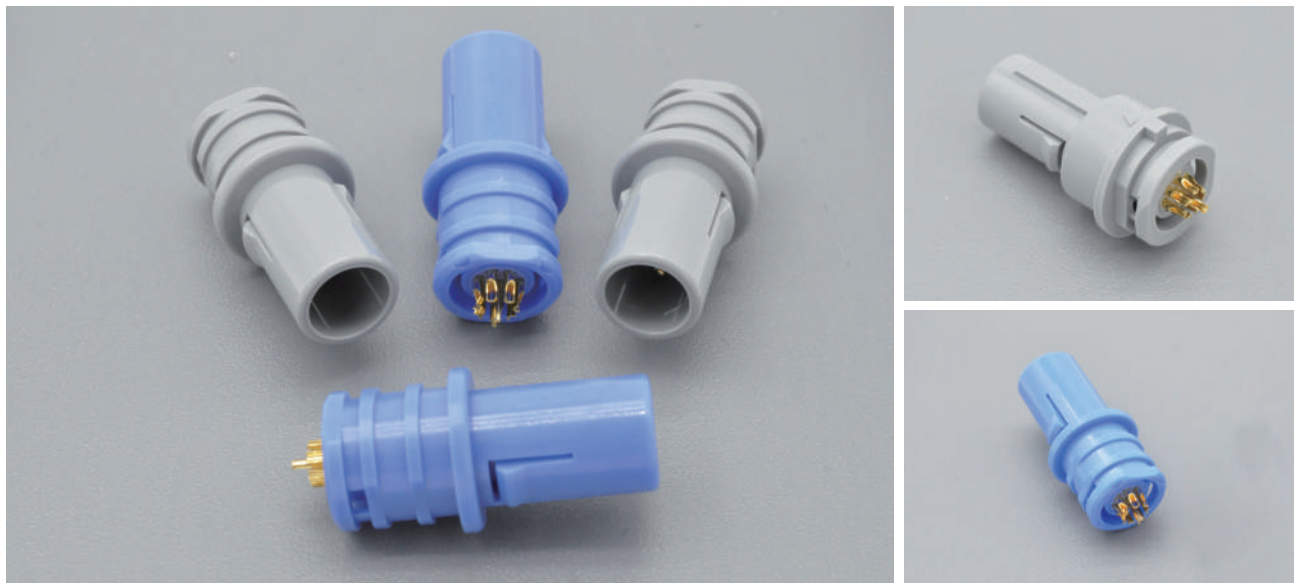
PRODUCT INTRODUCTION

EXPLODED VIEW OF THE PLASTIC IP SERIES



PRODUCT INTRODUCTION

PLASTIC 1P DISPOSABLE PLUG CABLE



SOCKET

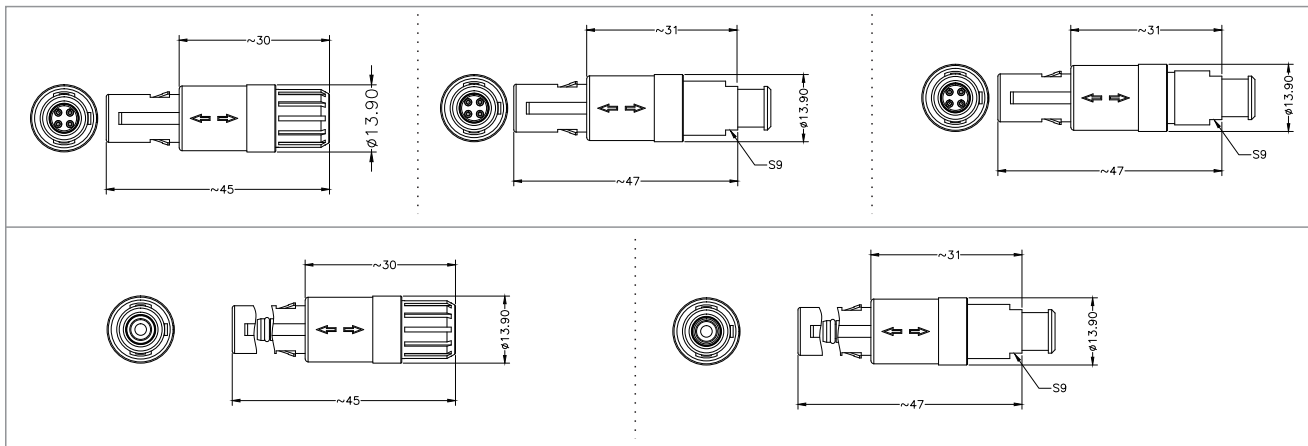
2 PIN	3 PIN	4 PIN	5 PIN	6 PIN	7 PIN	8 PIN	9 PIN	10 PIN	14 PIN

Plug

2 PIN	3 PIN	4 PIN	5 PIN	6 PIN	7 PIN	8 PIN	9 PIN	10 PIN	14 PIN

PRODUCT INTRODUCTION

PLASTIC 1P PLUG FOR CABLE



SOCKET

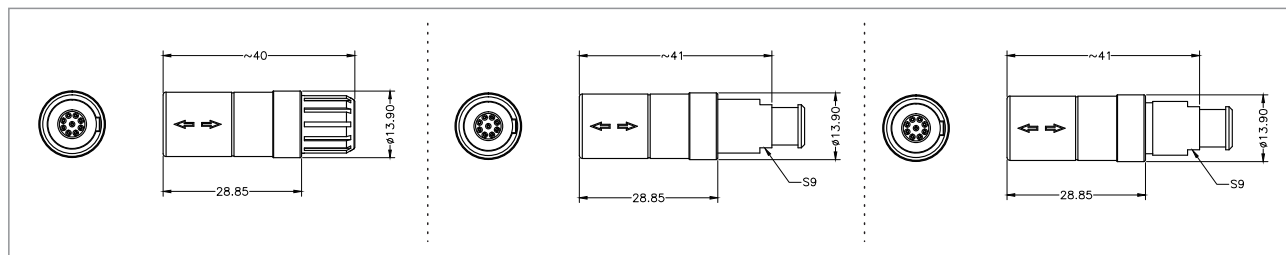
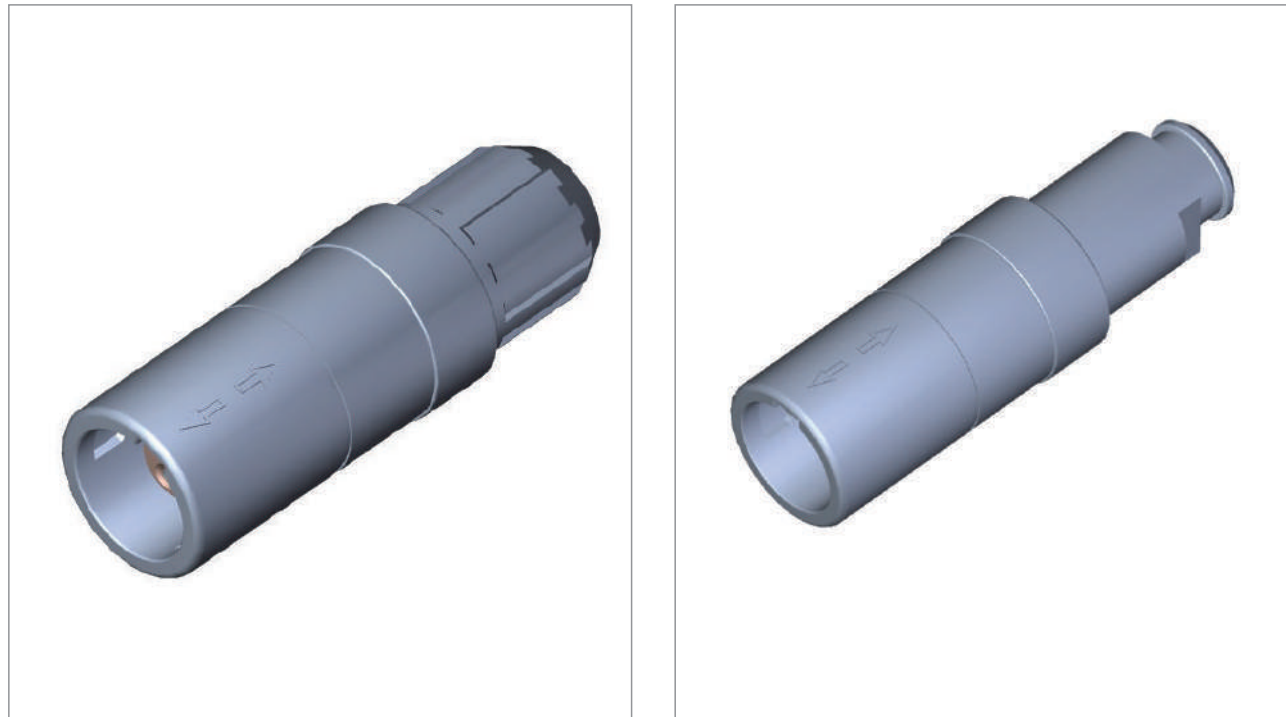
2 PIN	3 PIN	4 PIN	5 PIN	6 PIN	7 PIN	8 PIN	9 PIN	10 PIN	14 PIN

Plug

2 PIN	3 PIN	4 PIN	5 PIN	6 PIN	7 PIN	8 PIN	9 PIN	10 PIN	14 PIN

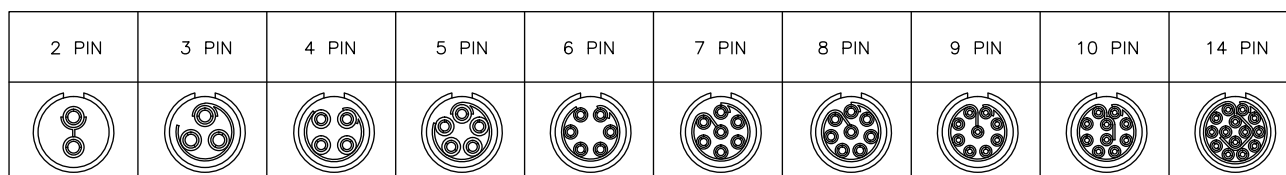
PRODUCT INTRODUCTION

PLASTIC IP SOCKET FOR CABLE //////////////////////////////////////

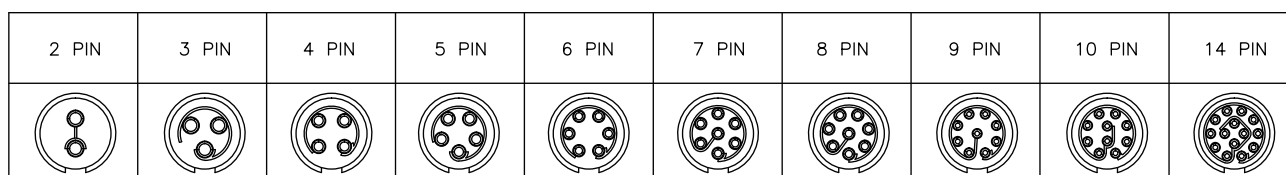


PIN LAYOUT

SOCKET

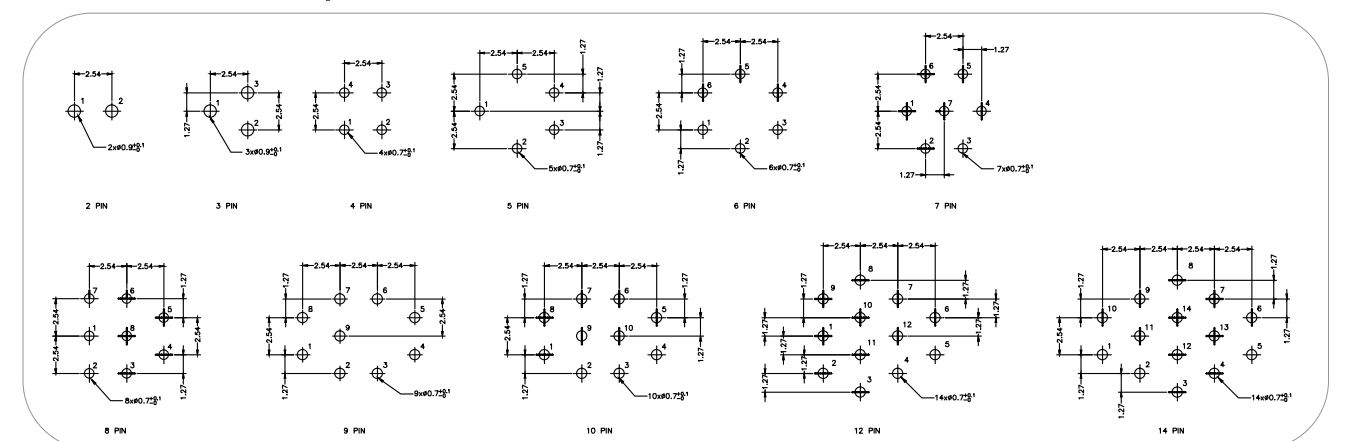
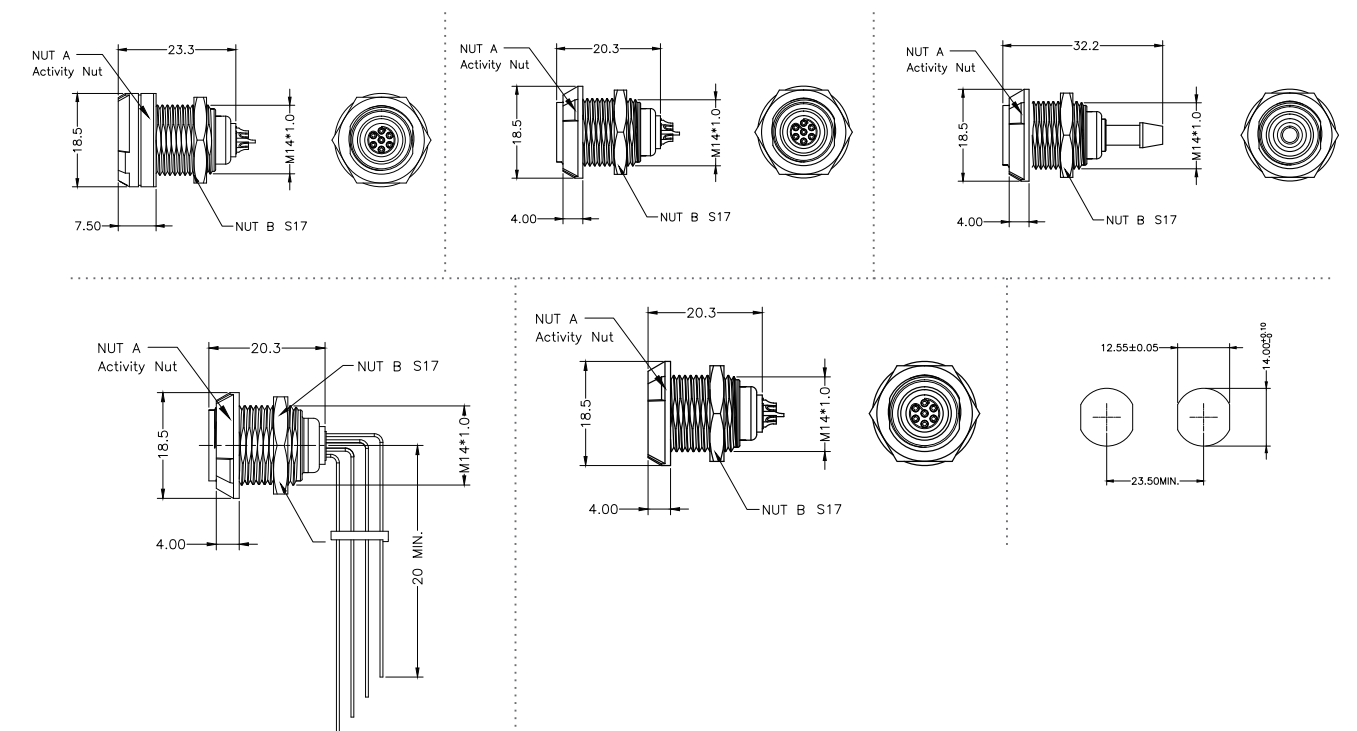


Plug



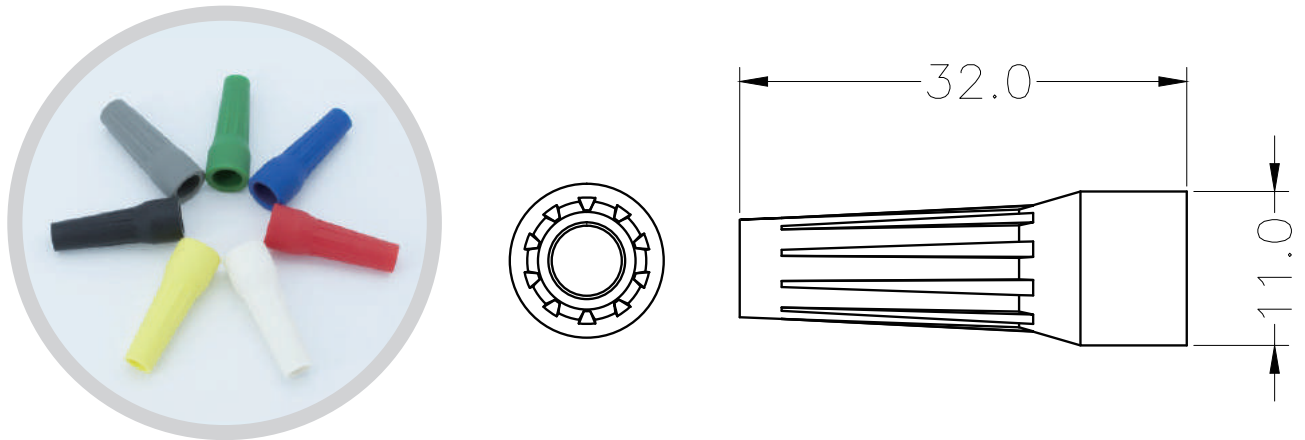
PRODUCT INTRODUCTION

PLASTIC IP SOCKET FOR PANEL



PRODUCT INTRODUCTION

PLASTIC IP BEND RELIEF



PART NO.	CABLE O.D.	
	min.	max.
SP901K-1P30-1XD	2.50	3.00
SP901K-1P35-1XD	3.00	3.50
SP901K-1P40-1XD	3.50	4.00
SP901K-1P45-1XD	4.00	4.50
SP901K-1P50-1XD	4.50	5.00
SP901K-1P55-1XD	5.00	5.50
SP901K-1P60-1XD	5.50	6.00
SP901K-1P65-1XD	6.00	6.50

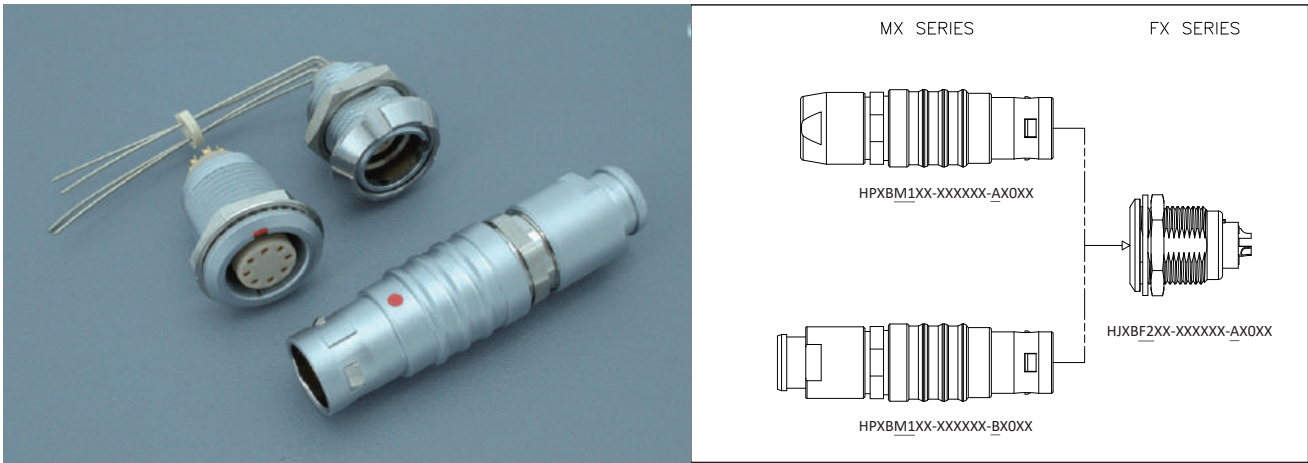
COLOR	
R	RED
W	WHITE
Y	YELLOW
G	GREEN
B	BLUE
E	GREY
K	BLACK

Temperature range:

Silicon -50℃ to +200℃
Short-term up to +230℃

PRODUCT INTRODUCTION

METAL B SERIES CONNECTOR



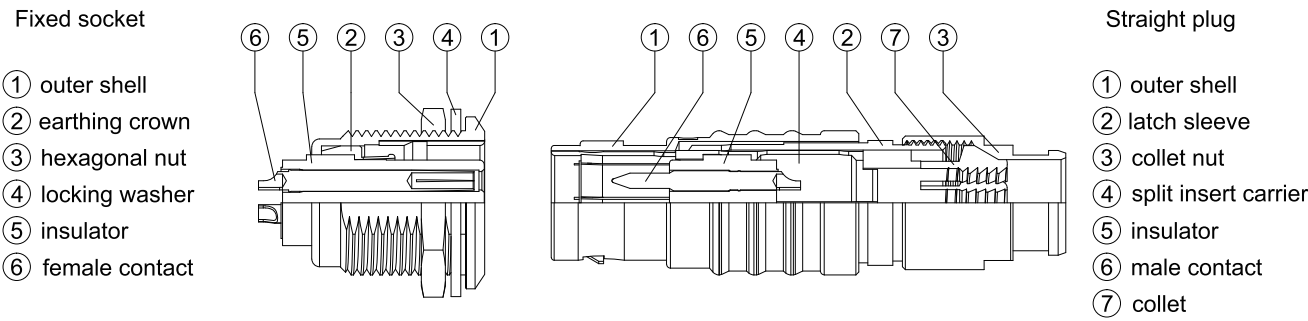
B series connectors have the following main features:

- Security of the push-pull self-latching system
- Multi contact types 2 to 32 contacts
- Hybrid types (multicontact,high voltage,low voltage,coaxial)
- Solder,crimp or printed circuit contacts (straight or elbow)
- Keying system (《G》 key standard) for connector alignment

multiple key options to avoid cross mating of similar connectors
high packing density for space savings
-360° screening for full EMC shielding

MODEL DESCRIPTION

- M1A ● Straight plug with cable collet M1B ● Straight plug with cable collet and nut for fitting a bend relief
- F2A ● Fixed socket, nut fixing



Technical Characteristics

Mechanical and Climatrical

Characteristics	Value	Standard
Endurance	> 5000 cycles	IEC 60512-5 test 9a
Humidity	up to 95% at 140 °C	
Temperature range ¹⁾	-67° F, +482° F	
Resistance to vibrations	10-2000Hz, 15g	IEC 60512-4 test 6d
Shock resistance	100g,6ms	IEC 60512-4 test 6c
Salt spray corrosion test	> 144h	IEC 60512-6 test 11f
Protection index(mated)	IP 50	IEC 60529
Climatrical category	50/175/21	IEC 60068-1

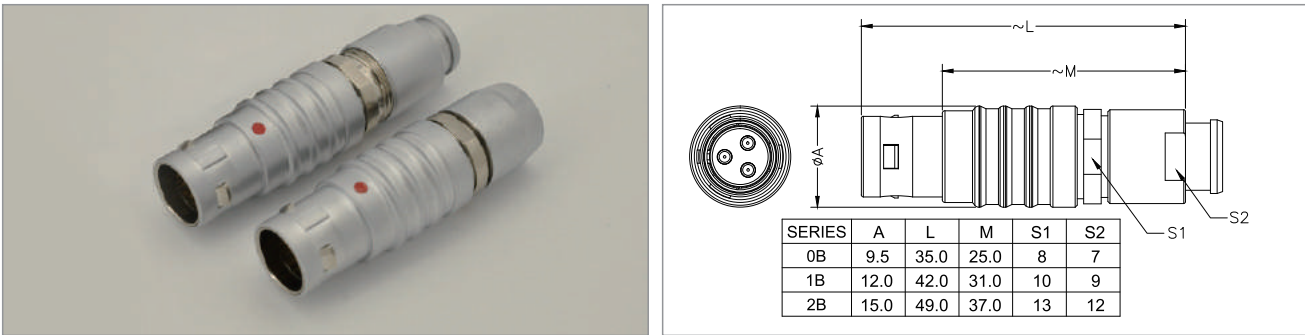
Electrical

Characteristics	Value	Standard
Shielding efficiency	at 10MHz	> 75dB IEC 60169-1-3
	at 1 GHz	> 40dB IEC 60169-1-3

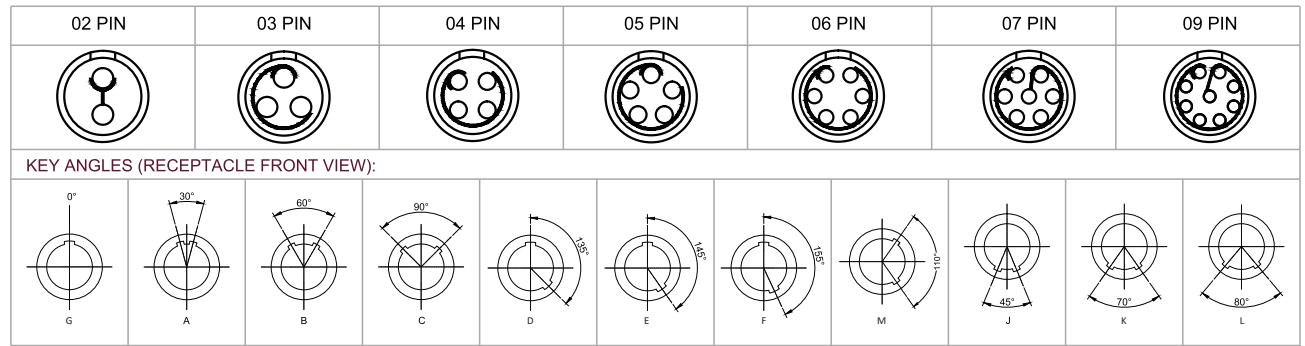
Note:
The various tests have been carried out with M1A and F2A connector pairs, with chrome-plated brass shell and PEEK insulator .

PRODUCT INTRODUCTION

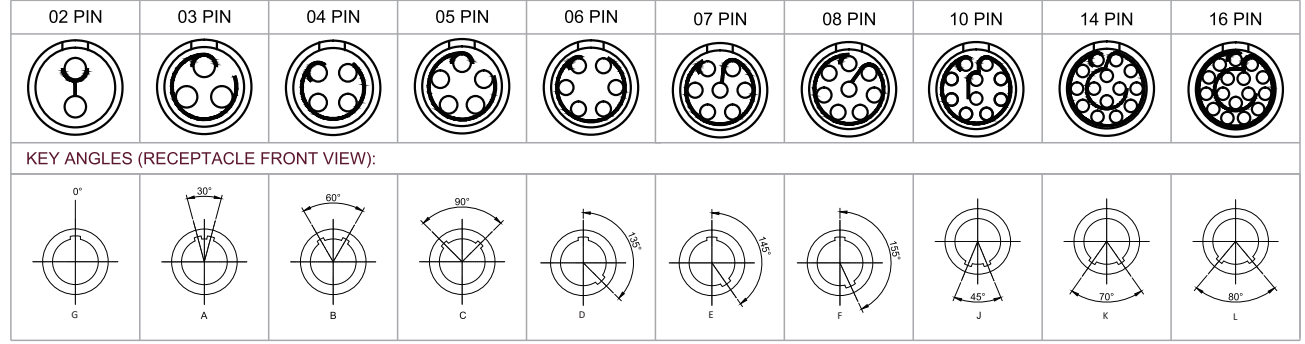
METAL B SERIES PLUG FOR CABLE



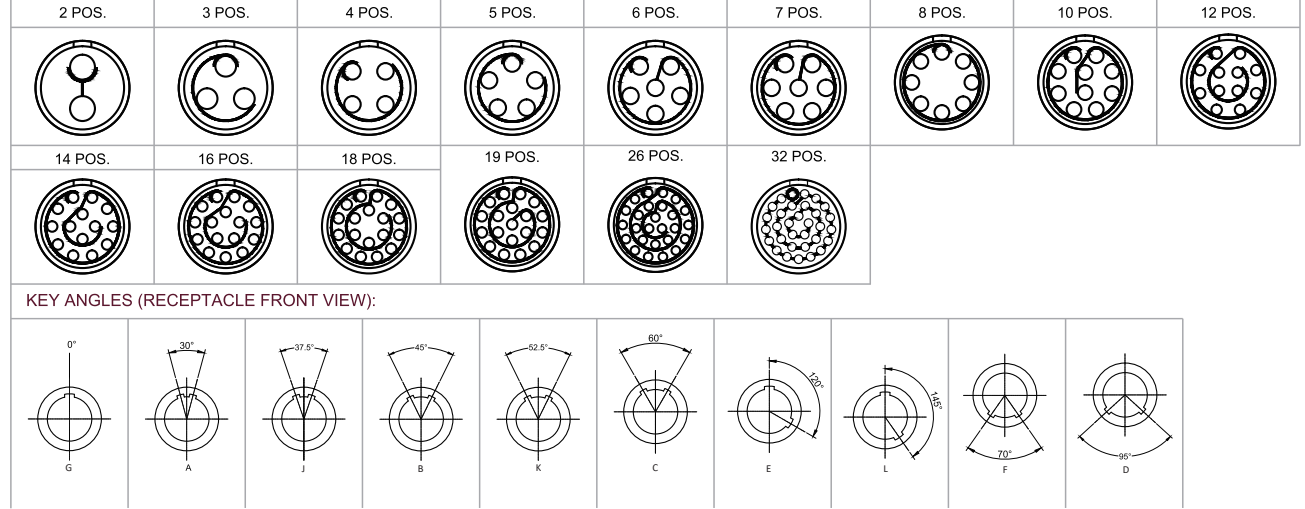
0B MALE



1B MALE

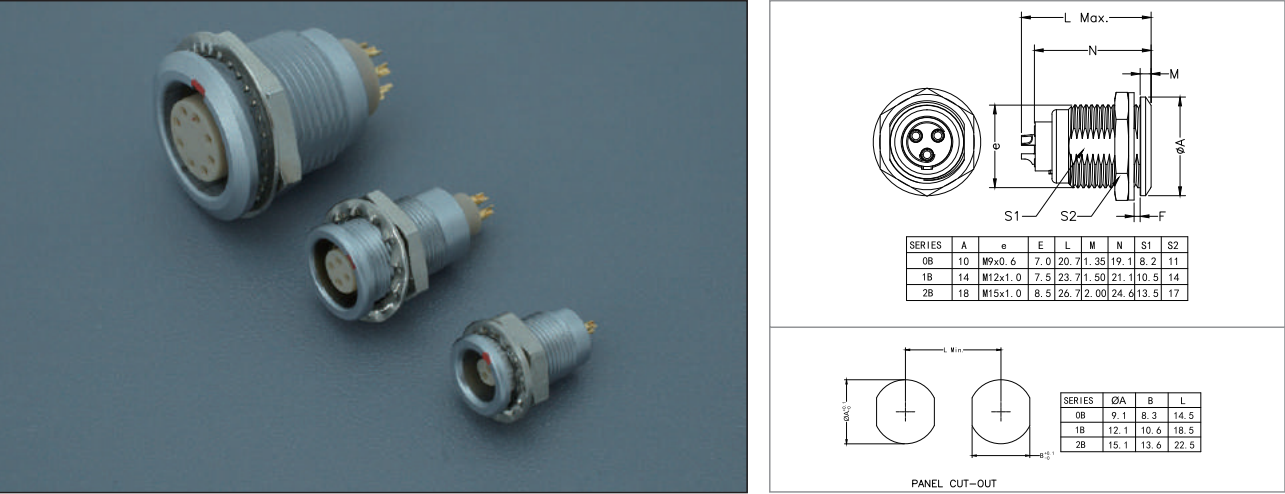


2B MALE

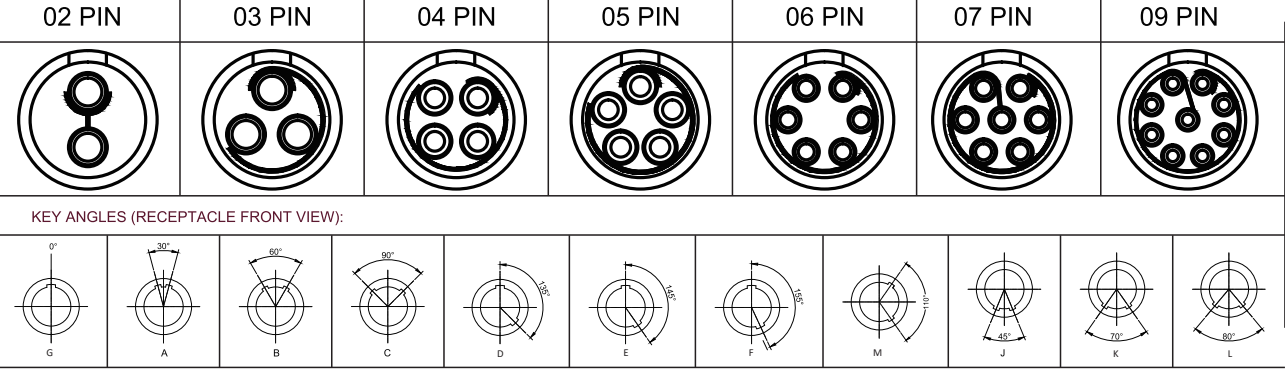


PRODUCT INTRODUCTION

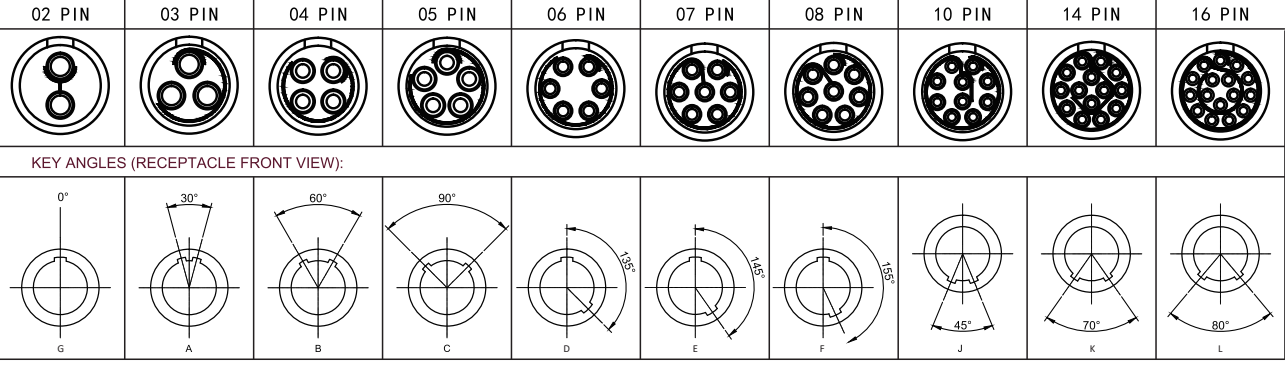
METAL B SERIES SOCKET FOR PANEL



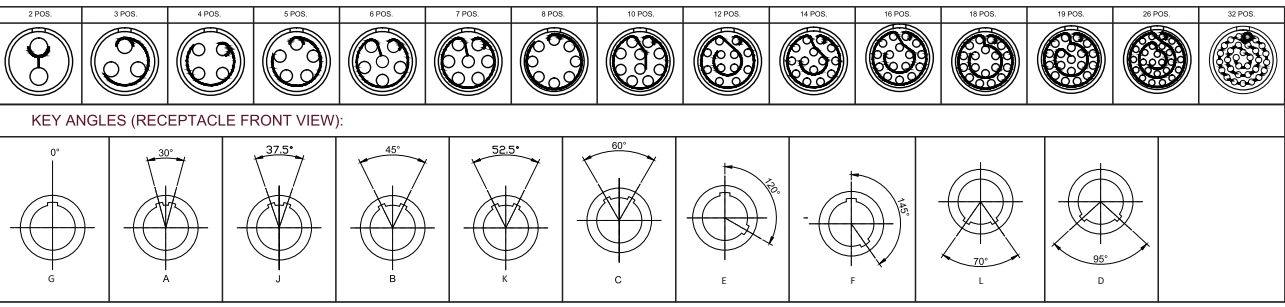
0B FEMALE



1B FEMALE

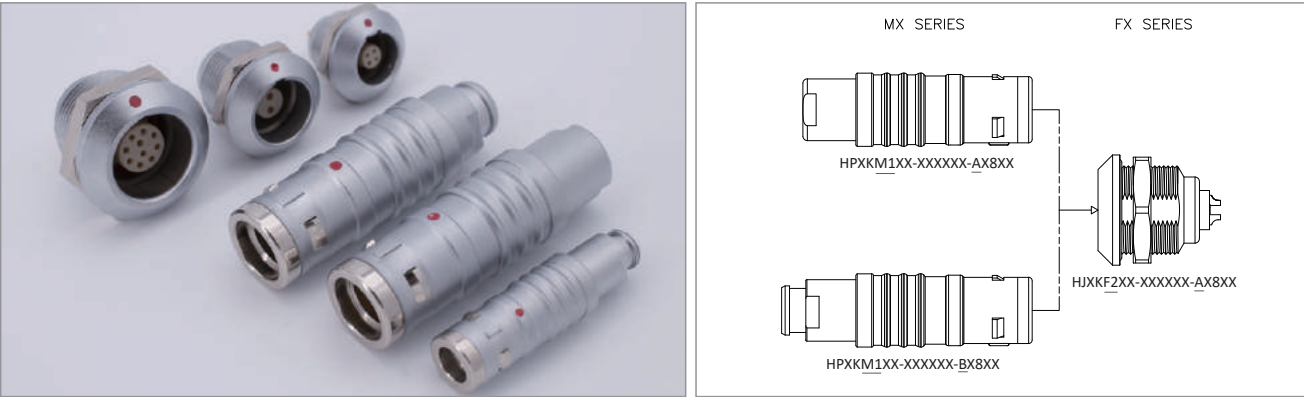


2B FEMALE



PRODUCT INTRODUCTION

METAL K SERIES CONNECTOR



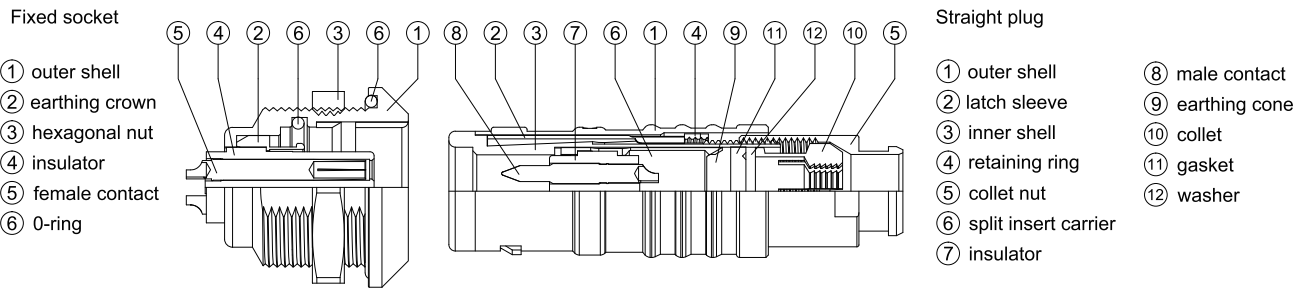
K series connectors have been specifically designed for outdoor applications. They include an inner sleeve and two seals is to prevent penetration of solids or liquid into the housing formed by the plug, free socket, fixed socket or coupler. All models of this series are watertight when mated to give a protection index of IP67 as per IEC 60529 standard (in mated condition) when correctly assembled to an appropriate cable (IP67).

K series connectors have the same insulators as the B series and have the following main features:

- Security of the Push-Pull latching system
- Multi contact types 2 to 32 contacts
- Keying system for connector alignment
- 360° screening for full EMC shielding
- Rugged housing for extreme working conditions.
- Watertight connection (IP67)
- Solder, crimp or print (straight or elbow) contacts
- Multiple key options to avoid cross mating of similar connectors
- High packing density for space savings

MODEL DESCRIPTION

- M1A ● Straight plug with cable collet, watertight (IP67)
- M1B ● Straight plug with cable collet and nut for fitting a bend relief , watertight (IP67)
- F2A ● Fixed socket, nut fixing, watertight (IP67)



Technical Characteristics

Mechanical and Climatical

Characteristics	Value	Standard
Endurance	> 5000 cycles	IEC 60512-5 test 9a
Humidity	up to 95% at 60 °C	
Temperature range ¹⁾	-55 °C, +200 °C	
Resistance to vibrations	10-2000Hz, 15g	IEC 60512-4 test 6d
Shock resistance	100g, 6ms	IEC 60512-4 test 6c
Salt spray corrosion test	> 144h	IEC 60512-6 test 11f
Protection index(mated) ²⁾	IP 68/IP 66	IEC 60526
Climatical category	50/175/21	IEC 60068-1

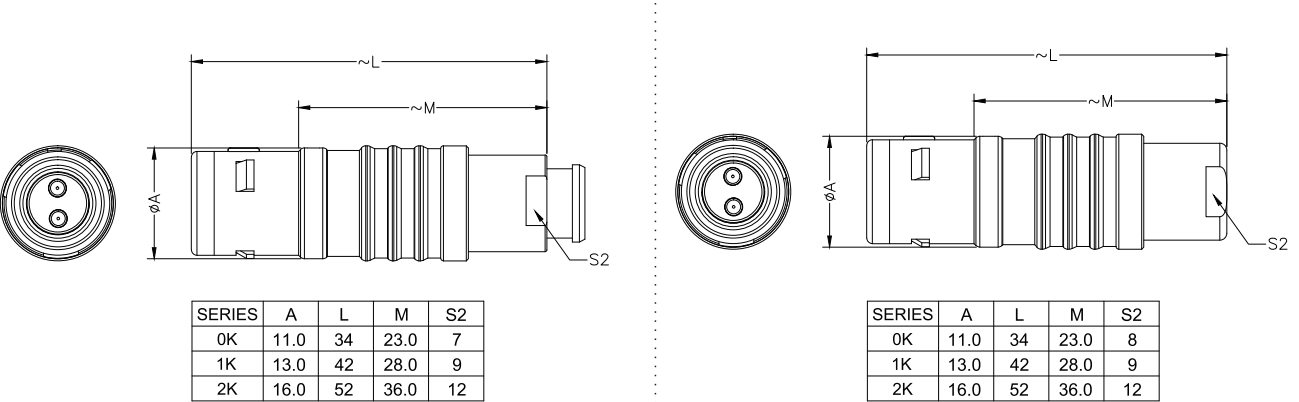
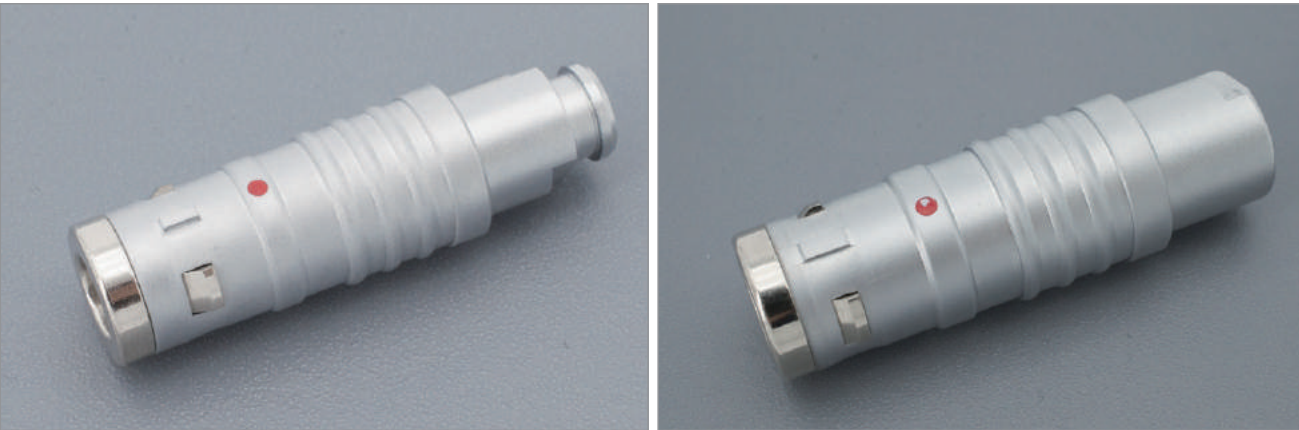
Electrical

Characteristics	Value	Standard
Shielding efficiency	at 10MHz	> 95dB
	at 1 GHz	> 80dB

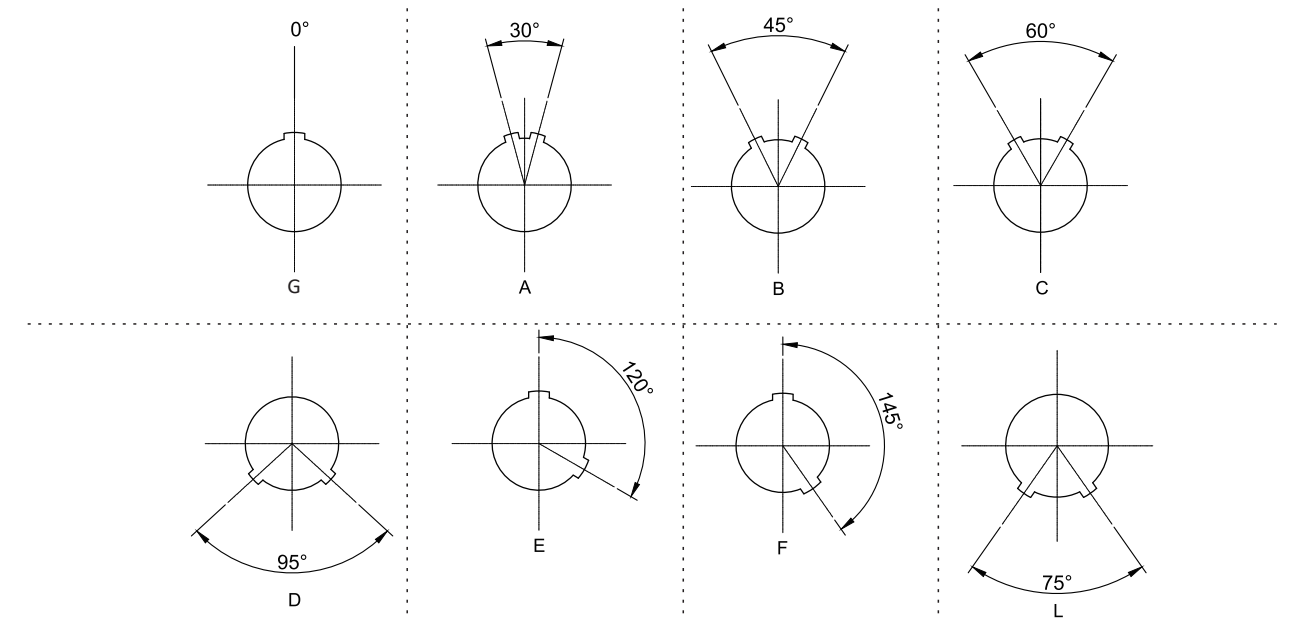
Note:
the various tests have been carried out with M1A and F1A connector pairs, with chrome-plated brass shell, PEEK insulator and silicone O- ring.
1) minimum operating temperature is -20°C for sockets fitted with an FPM (Viton®) O-ring
2) Ip67 achieved providing that the cable is perfectly circular and that assembly process ensures a high integrity seal.

PRODUCT INTRODUCTION

METAL K SERIES PLUG FOR CABLE

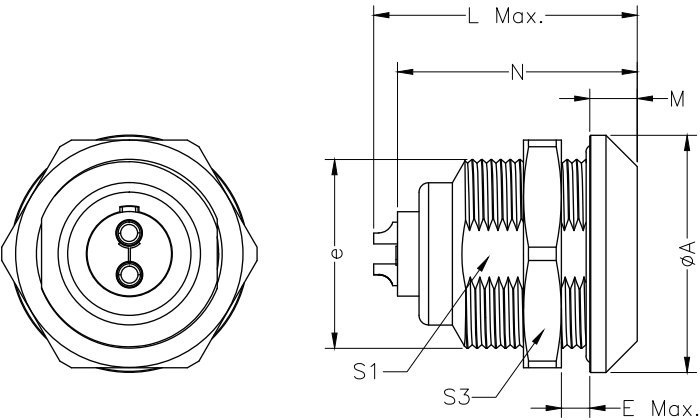
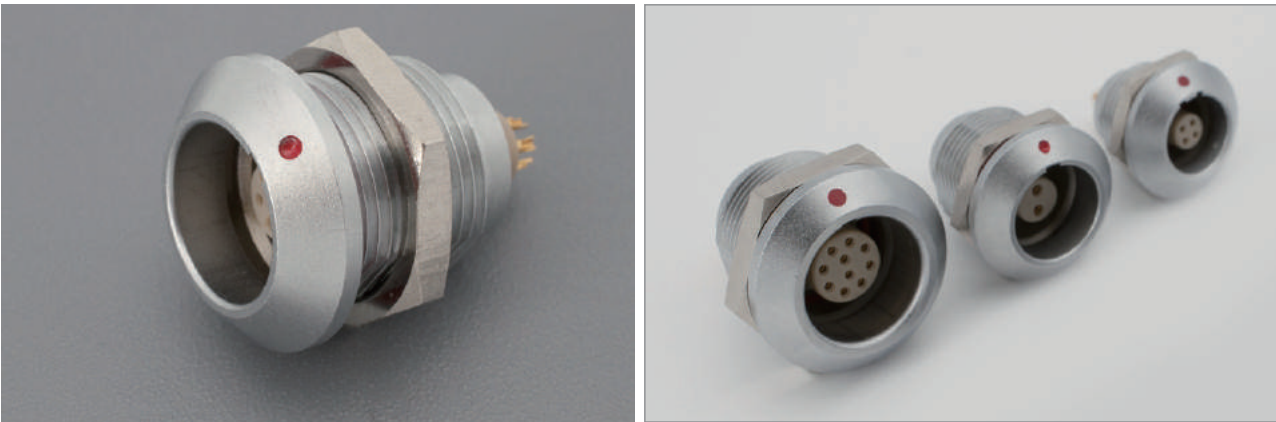


0K/1K/2K FEMALE

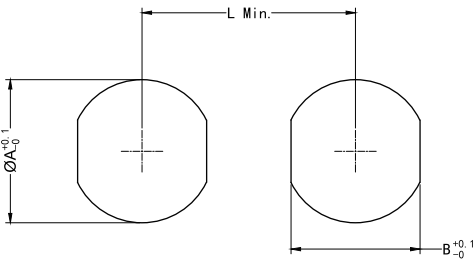


PRODUCT INTRODUCTION

METAL K SERIES SOCKET FOR PANEL



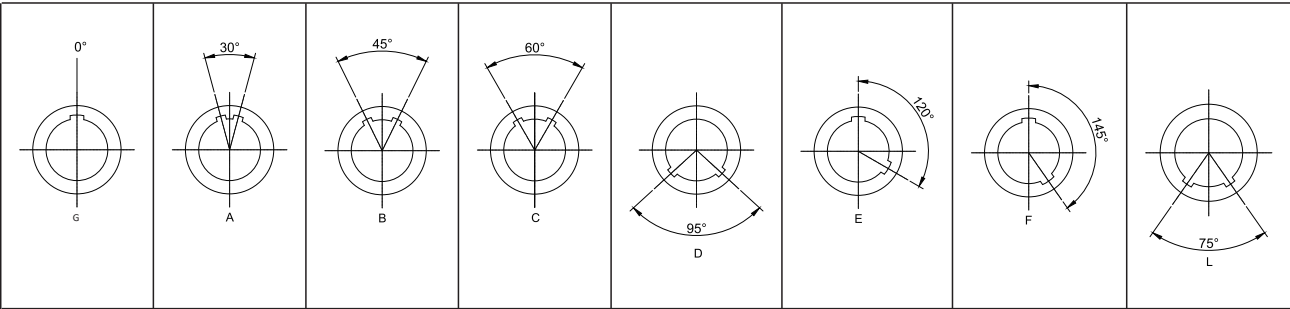
SERIES	A	e	E	L	M	N	S1	S3
0K	18	M14x1.0	6.0	21.7	4.0	20.1	12.5	17
1K	20	M16x1.0	9.0	27.0	4.5	25.1	14.5	19
2K	25	M20x1.0	9.0	30.7	5.0	28.6	18.5	24



PANEL CUT-OUT

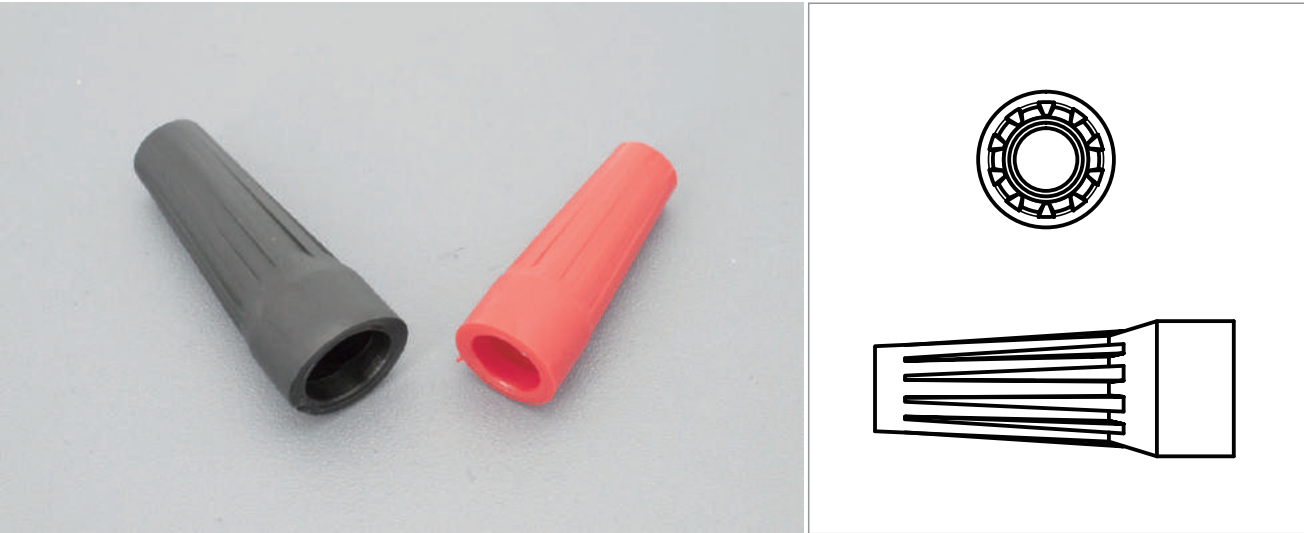
SERIES	ØA	B	L
0K	14.1	12.6	20.5
1K	16.1	14.6	22.5
2K	20.2	18.6	29.0

0K/1K/2K FEMALE



PRODUCT INTRODUCTION

METAL CONNECTOR BEND RELIEF



0B/0K

PART NO.	CABLE O.D	
	min.	max.
SP901K-0B12-1XD	1.0	1.2
SP901K-0B15-1XD	1.3	1.5
SP901K-0B20-1XD	1.6	2.0
SP901K-0B25-1XD	2.1	2.5
SP901K-0B25-1XD	2.1	2.5
SP901K-0B30-1XD	2.6	3.0
SP901K-0B30-1XD	2.6	3.0
SP901K-0B35-1XD	3.1	3.5
SP901K-0B40-1XD	3.6	4.0
SP901K-0B45-1XD	4.1	4.5
SP901K-0B50-1XD	4.6	5.0

COLOUR	
B	Blue
W	White
E	Grey
Y	Yellow
N	Brown
K	Black
R	Red
A	Orange
G	Green

1B/1K

PART NO.	CABLE O.D	
	min.	max.
SP901K-1B15-1XD	1.3	1.5
SP901K-1B20-1XD	1.6	2.0
SP901K-1B25-1XD	2.1	2.5
SP901K-1B30-1XD	2.6	3.0
SP901K-1B35-1XD	3.1	3.5
SP901K-1B40-1XD	3.6	4.0
SP901K-1B45-1XD	4.1	4.5
SP901K-1B50-1XD	4.6	5.0
SP901K-1B55-1XD	5.1	5.5
SP901K-1B60-1XD	5.6	6.0
SP901K-1B65-1XD	6.1	6.5
SP901K-1B70-1XD	6.6	7.0
SP901K-1B75-1XD	7.1	7.5
SP901K-1B80-1XD	7.6	8.0
SP901K-1B85-1XD	8.1	8.5

COLOUR	
B	Blue
W	White
E	Grey
Y	Yellow
N	Brown
K	Black
R	Red
A	Orange
G	Green

2B/2K

PART NO.	CABLE O.D	
	min.	max.
SP901K-2B15-1XD	1.3	1.5
SP901K-2B20-1XD	1.6	2.0
SP901K-2B25-1XD	2.1	2.5
SP901K-2B30-1XD	2.6	3.0
SP901K-2B35-1XD	3.1	3.5
SP901K-2B40-1XD	3.6	4.0
SP901K-2B45-1XD	4.1	4.5
SP901K-2B50-1XD	4.6	5.0
SP901K-2B55-1XD	5.1	5.5
SP901K-2B60-1XD	5.6	6.0
SP901K-2B65-1XD	6.1	6.5
SP901K-2B70-1XD	6.6	7.0
SP901K-2B75-1XD	7.1	7.5
SP901K-2B80-1XD	7.6	8.0
SP901K-2B85-1XD	8.1	8.5
SP901K-2B90-1XD	8.6	9.0
SP901K-2B95-1XD	9.1	9.5
SP901K-2B10-1XD	9.6	10.0
SP901K-2B11-1XD	10.1	10.5

COLOUR	
B	Blue
W	White
E	Grey
Y	Yellow
N	Brown
K	Black
R	Red
A	Orange
G	Green

Temperature range
Silicon -50°C to +200°C
Short-term up to +230°C

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