SP MAX

POWER & SIGNAL CONNECTORS FOR RUGGED ENVIRONMENTS

- Developed specifically for power and signal management in military, space, satellite, and commercial air applications
- Precision machined shell, available in three sizes, provides EMI/RFI protection
- Combine a multitude of contact sizes in a single connector including #12, #16, #18, and #22 contacts
- Performance compatibility to EN4165 and DO-160

Positronic®
an **Amphenol** company

THE SCIENCE OF **CERTAINTY**®

M027 rev.A1 24/04

Positronic
SP Max General Information

FEATURES

- Liquid crystal polymer (LCP) insulators ensure proper operation from -55°C to 175°C
- Rated up to 35A per contact at 30ºC temperature rise
- Integral blind mating allows for up to 2mm of offset
- Machined contacts in crimp, solder, or press-fit termination options
- Slim metal housing allows for heat dissipation and shielding
- Hardware options include angle brackets, boardlocks and jackscrews
- Sequential mating, selective loading, and customized contact positioning helps solve difficult application solutions

APPLICATIONS

- Power and signal I/O
- LRUs for military, space, satellite, and commercial air applications
- Ground-based, air/space transport, and operation in rugged environments (deep space complex and planetary-based communications)
- Battery and solar power distribution and management
- High-wattage switchable power supplies
- Inside-the-box power and signal distribution

TECH SPECS

GENERAL	
Part Number Prefix	SM
Performance Level	Mil/Aero Spaceflight
Qualifications	FAR-25-853(a) FAR-25-855(d)
RoHS Compliance	Yes (by default)

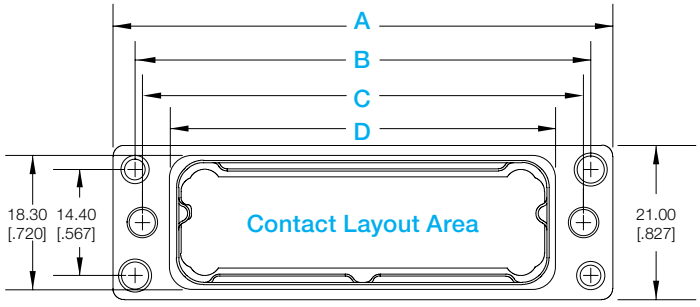
MATERIAL AND FINISHES	
Insulator	LCP
Insulator Color	Black
Flammability Rating	UL 94V-0
Contact Material	Copper alloy
Contact Plating	Gold flash 0.76µm Au (min) 1.27µm Au (min)
Shell Material	Aluminum

ELECTRICAL		
Insulator Resistance	2.5 GΩ	
Proof Voltage (rms)	Up to 2200V	
Working Voltage (rms)	Up to 600V	
Initial Contact Resistance	As low as 0.5 mΩ	
Contact Current Rating at 30°C Temperature Rise	Standard Conductivity	High Conductivity
Size 12	27A	35A
Size 16	15A	21A
Size 18	13A	17A
Size 22	3A	

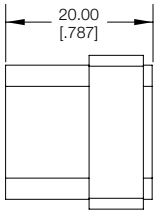
MECHANICAL	
Shape	Rectangular
Body Style	Free cable Panel mount
Insulator Construction	One-piece
Locking System	Optional
Contact Style	Fixed Removable
Contact Size	#22 #18 #16 #12
Female Contact Design	Closed entry
Contact Retention Mechanism	Metal clip Press-in
Contact Retention	27N to 67N (6 lbs to 15 lbs)
Contact Termination	Wire PCB
Mating Cycles	500
Blind Mating Allowance	Up to 2mm offset
Shock	EIA 364-27 Condition D
Vibration	Random vibration per EN 60068-2-64 Method B Sine vibration per MIL-DTL-202 Procedure 204

ENVIRONMENTAL	
Operating Temperature	-55 to 175ºC

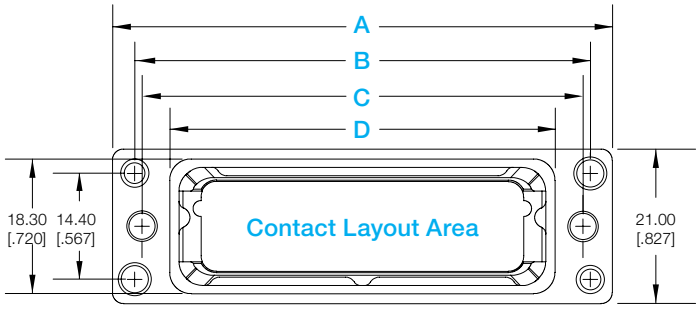
MALE FACE VIEW



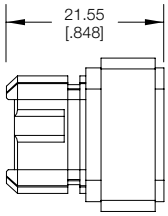
MALE SIDE VIEW



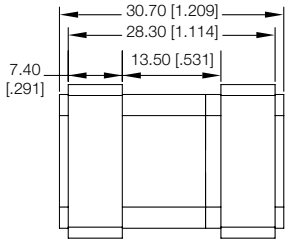
FEMALE FACE VIEW



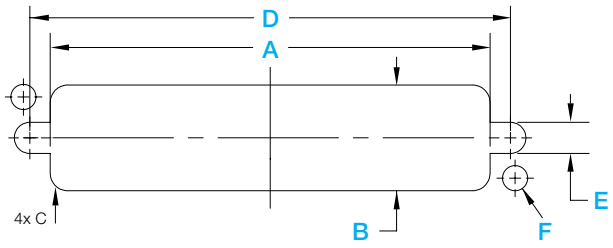
FEMALE SIDE VIEW



MATING VIEW



SHELL SIZE	Contact Layout Dimenison	A	B	C	D
X	18.00 [.709]	46.00 [1.811]	40.00 [1.575]	38.00 [1.496]	30.40 [1.197]
S	40.00 [1.574]	68.00 [2.678]	62.00 [2.441]	60.00 [2.363]	52.40 [2.063]
M	65.00 [2.362]	93.00 [3.662]	87.00 [3.426]	85.00 [3.347]	77.40 [3.048]

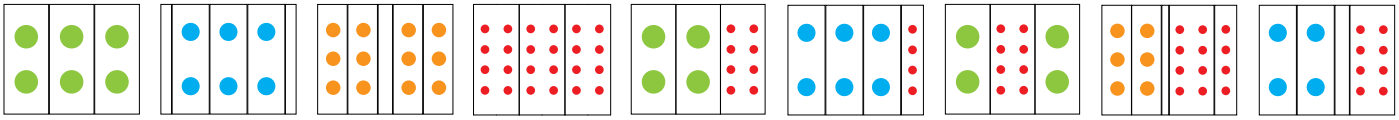


SHELL SIZE	A	B	C	D	E	F
X	30.80 [1.213]	18.70 [.736]	3.10 [.122]	38.00 [1.496]	5.50 [.216]	4.50 [.177]
S	52.80 [2.078]			60.00 [2.362]		
M	77.80 [3.063]			85.00 [3.346]		

Positronic
SP Max Contact Layouts

Scale 1:1

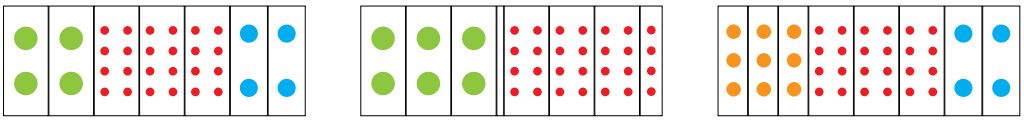
Shell Size X



A033 (6) #12 | **A049** (6) #16 | **A050** (12) #18 | **A051** (24) #22 | **A062** (4) #12, (8) #22 | **A063** (6) #16, (4) #22 | **A064** (4) #12, (8) #22 | **A065** (6) #18, (12) #22 | **A066** (4) #16, (8) #22

All 'X' modules measure 14.60 [.575] in height and 18.00 [.708] in length

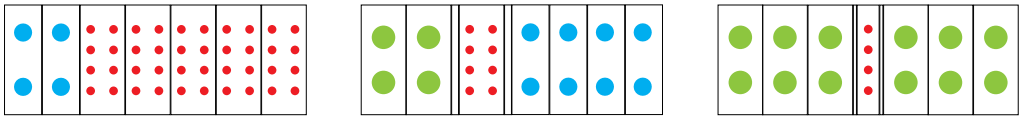
Shell Size S



A067 (4) #12, (4) #16, (24) #22

A068 (6) #12, (28) #22

A069 (4) #16, (9) #18, (24) #22



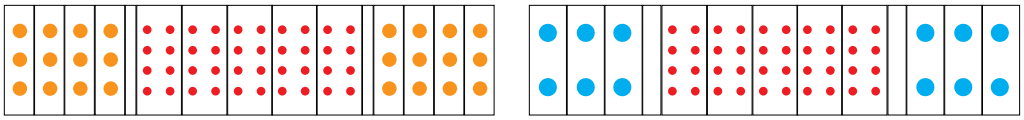
A070 (4) #16, (40) #22

A071 (4) #12, (8) #16, (8) #22

A072 (12) #12, (4) #22

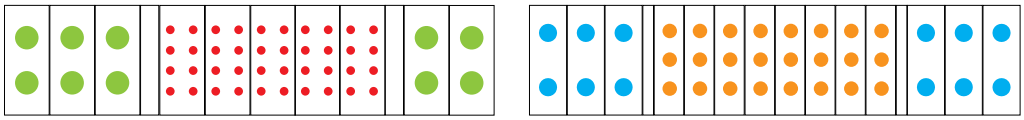
All 'S' modules measure 14.60 [.575] in height and 40.00 [1.574] in length

Shell Size M



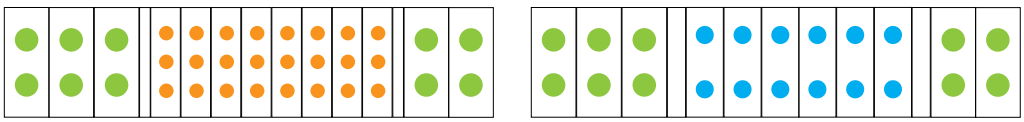
A036 (24) #18, (40) #22

A037 (12) #16, (40) #22



A038 (10) #12, (40) #22

A039 (12) #16, (24) #18



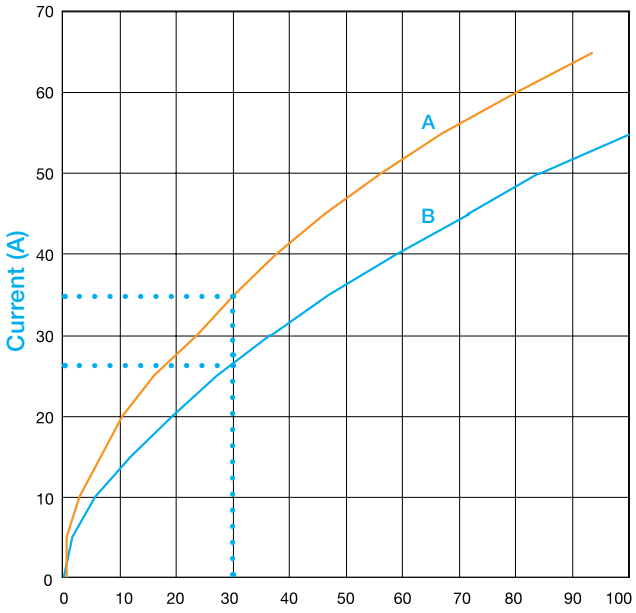
A040 (10) #12, (24) #18

A041 (10) #12 (12) #16

All 'M' modules measure 14.60 [.575] in height and 65.00 [2.560] in length

Contact Size Chart			
#12	#16	#18	#22
●	●	●	●

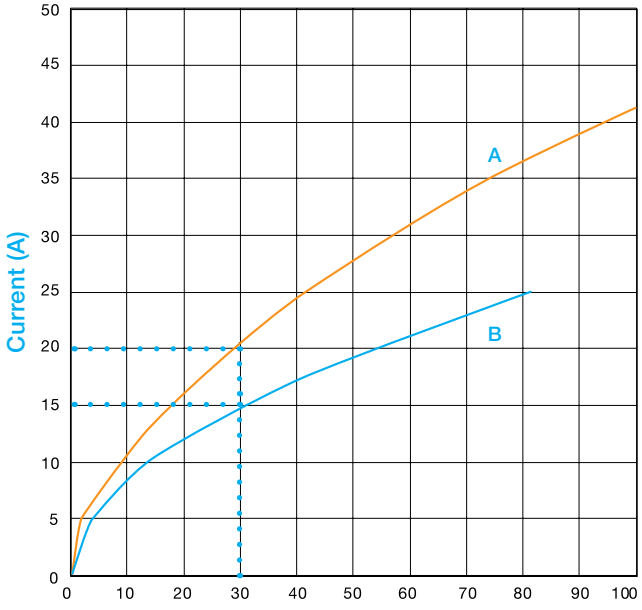
Tested per IEC Publication 60512-3, Test 5a



Size 12 Temperature rise (°C)

A Developed with (6) #12 high conductivity contacts

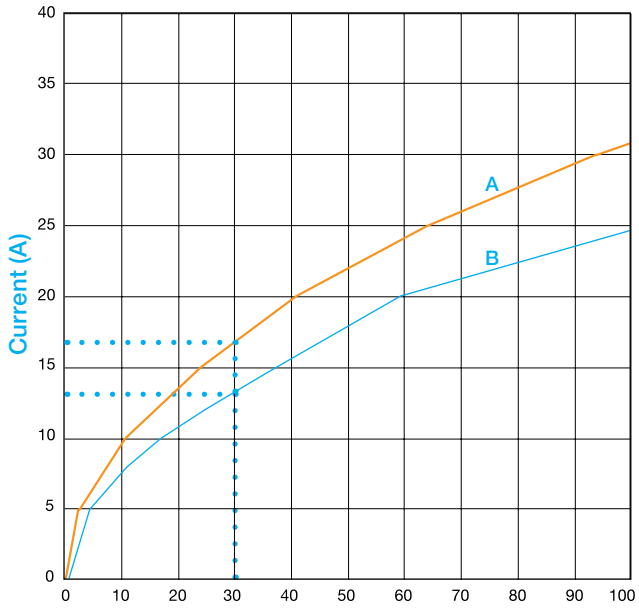
B Developed with (6) #12 standard conductivity contacts



Size 16 Temperature rise (°C)

A Developed with (6) #16 high conductivity contacts

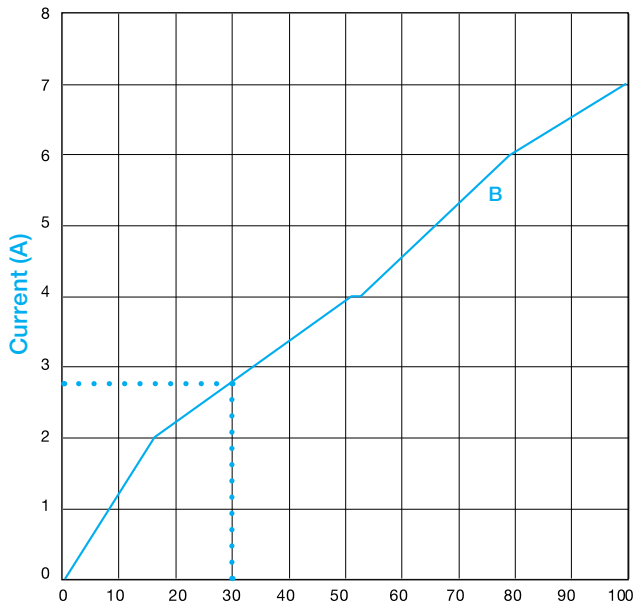
B Developed with (6) #16 standard conductivity contacts



Size 18 Temperature rise (°C)

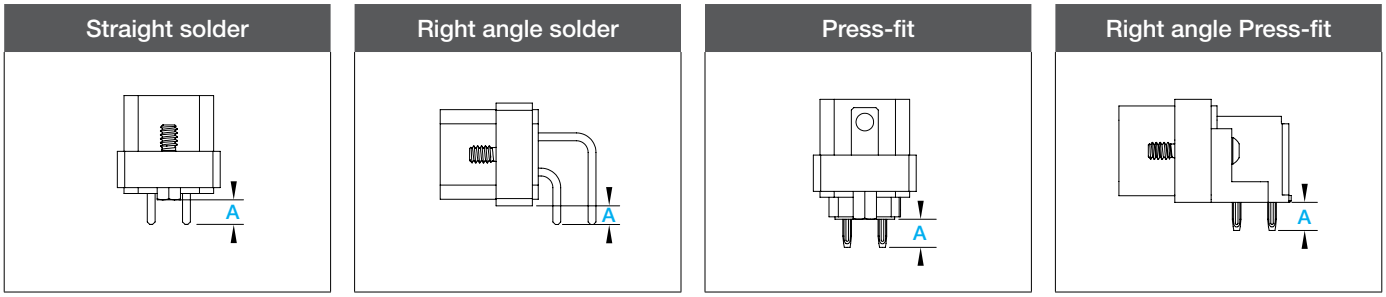
A Developed with (6) #18 high conductivity contacts

B Developed with (6) #18 standard conductivity contacts



Size 22 Temperature rise (°C)

B Developed with (6) #22 standard conductivity contacts



Code	Termination type	A
30	Straight solder	5.00 [.197]
38	Straight solder, high conductivity power contacts (from size 18)	5.00 [.197]
40	Right angle solder	5.00 [.197]
48	Right angle solder, high conductivity power contacts (from size 18)	5.00 [.197]
63	Right angle press-fit, for use with PCBs >= 2.29 [.090]	5.72 [.225]
93	Straight press-fit, for use with PCBs >= 2.29 [.090]	5.72 [.225]

Size	Standard Conductivity Female	High Conductivity Female	Stranded AWG [mm²]
12	FC1210P2/AA	FC1210P2S/AA	#10 [6.0]
12	FC1212P2/AA	FC1212P2S/AA	#12 [4.0]
16	FC112P2/AA-PA907	FC112P2S/AA-PA907	#12 [4.0]
16	FC114P2/AA-PA907		#14-16 [2.5-1.5]
16	FC116P2/AA-PA907		#16-18-20 [1.5-1.0-0.5]
16	FC120P2/AA-PA907		#20-22-24 [0.5-0.3-0.25]
18	FC1816P2/AA	FC1816P2S/AA	#16-18 [1.5-1.0]
18	FC1820P2/AA	FC1820P2S/AA	#20 [0.5]
22	FC422P9/AA		#22-26 [0.3-0.12]

PLATING

Standard finish Gold flash over nickel plate.

Optional finishes 0.76µm Au (min) over 0.76µm Ni (min) over Cu by adding "-14" suffix onto part number.
Example: FC1212P2/AA-14
1.27µm Au (min) over 1.52µm Ni (min) over Cu by adding "-15" suffix onto part number.
Example: FC1212P2/AA-15

SM	X	A049	-	M	A	30	C	-	T7	S1

All SP Max products are RoHS-compliant by default.

Series

SM SP MAX

Shell Sizes

X 18 mm of active insulator
S 40 mm of active insulator
M 65 mm of active insulator

Contact Layout

Axxx Select from layout codes on page 4

Contact Gender

M Male pin
S Female socket
R Female socket with sealing ring
C Female socket with conductive sealing ring

Shell Options

A Electroless nickel
B Electroless nickel, non-conductive panel gasket
C Electroless nickel, conductive panel gasket
D[*2] Electroless nickel PTFE
E[*2] Electroless nickel PTFE, non-conductive panel gasket
F[*2] Electroless nickel PTFE, conductive panel gasket

Termination Type

00[*1] Wire, order contacts separately
30 Straight solder
38 Straight solder, high conductivity power contacts (from size 18)
40 Right angle solder
48 Right angle solder, high conductivity power contacts (from size 18)
63[*3] Right angle press-fit, for use with PCBs >= 2.29 [.090]
93 Straight press-fit, for use with PCBs >= 2.29 [.090]

Termination Side Accessories

XX None
B1 Angle brackets, through holes
B2 Angle brackets, threaded holes
B3 Angle brackets, integrated boardlocks
S1 Standoffs, 4-40
S2 Standoffs, boardlocks

Mating Side Accessories

XX None
T7 Fixed male jackscrews
E7 Rotating female jackposts
K1 Keying guide, 2x male pins, for use with K2
K2 Keying guide, 2x female sockets, for use with K1
K3 Keying guide, 1x male pin (left), 1x female socket (right), for use with K4
K4 Keying guide, 1x female socket (left), 1x male pin (right), for use with K3

Contact Plating

X No contacts
A Gold flash, Au over 0.51µm Ni (min) over Cu
C 0.76µm Au (min) over 0.76µm Ni (min) over Cu
D 1.27µm Au (min) over 1.52µm Ni (min) over Cu
E 1.27µm Au (min) over Cu

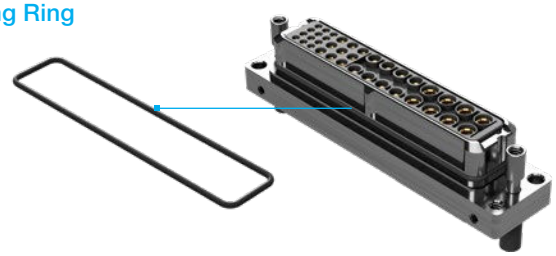
[*1] Available on female connector only. Contact Technical Sales for availability of crimp contacts on male connector.
[*2] Mating force reduces when PTFE plating selected
[*3] Contact Technical Sales for availability

COMING SOON!

- MACHINED BACKSHELL
- MALE CRIMP CONNECTOR
- QUICK LOCKING SYSTEM
- FIBER OPTIC MT FERRULE

Positronic
SP Max Accessories

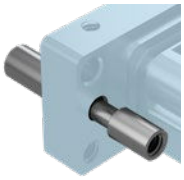
Sealing Ring



Conductive or non-conductive perimeter sealing ring for female connectors using code 'R' and 'C' in Contact Gender step

Gasket

Conductive or non-conductive panel gasket for shell using code 'B', 'C', 'E', 'F' in Shell Options step



E7
Rotating female jackposts

T7
Fixed male jackscrews

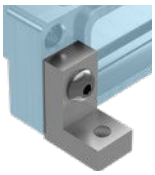
K1
Keying guide, 2x male pins, for use with K2

K2
Keying guide, 2x female sockets, for use with K1

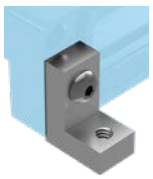
K3
Keying guide, 1x male pin (left), 1x female socket (right), for use with K4

K4
Keying guide, 1x female socket (left), 1x male pin (right), for use with K3

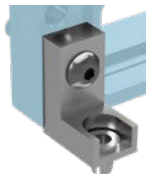
B1
Angle brackets, through holes



B2
Angle brackets, threaded holes



B3
Angle brackets, integrated boardlocks



S1
Standoffs, 4-40

S2
Standoffs, boardlocks

Positronic | Americas
1325 N Eldon Ave
Springfield MO 65803 USA
+1 800 641 4054
info@connectpositronic.com

Positronic | Europe
46 route d'Engachies
F-32020 Auch Cedex 9 France
+33 5 6263 4491
contact@connectpositronic.com

Positronic | Asia
3014A Ubi Road 1 #07-01
Singapore 408703
+65 6842 1419
singapore@connectpositronic.com

Sales Offices
Positronic has local sales representation all over the world.

For the nearest sales office visit
www.connectpositronic.com/sales