



POW Serie

MIL-DTL-38999 type connector with compact design, offering extended safety power range and signal contacts for data transfers & communication.



Catalog

Version 2.1 - OCT 2020
www.bernier.tm.fr



a HEID Company

BERNIER

◆ Description and value added

- Visual identification of cable's current phase with colored rings (5 colors) setup on the connector's shells. Coupling error is avoided with this color coding between phases and battery connections, maintenance is facilitated on convertor power supplies.
- No specific tools needed to assemble connector' piece-parts, only crimping tools are necessary for contacts and lugs.
- Small connection footprint with weight & space saving for the robotic applications.
- The electrical values are 20% higher than the other existing contact technologies (De-rating curve on demand).
- BERNIER can provide a complete pre-wired solution with test report.

◆ Applications



Vehicles



Radar systems

Ergonomic locking system

High electrical performances

Various material and plating

Finger protection

Multi-Contacts

Color coding



Optronic
Devices



Weapon systems

◆ Technical Data

Quick Locking devices

Modular connector configuration in several sizes

MIL-DTL-38999 standard panel cutting interface

Low insertion and extraction force

Power range extended from **50A** to **1000A**

Reinforced security: **1000V AC / 1500V DC**

IP2X finger protection/ **IP 67** waterproof

Mating / Un-mating coupling:

- **Single Pole configuration: 500 cycles**
- **Mixed configuration for charging applications: 10 000 cycles**



◆ Configuration

4 sizes of connectors: **300, 400, 600 and 700**

2 types of configurations: **Single power pole** or **Mixed power and signal**.

3 types of shells: aluminum (standard), Stainless Steel and Plastic (options).

POW

Single power



Mixed power and signal



Thanks to the modular configuration of the connector, we can adapt them according to your need.

Please, don't hesitate to contact us. Our design office is keeping hearing from You.

◆ Technical specifications

POW series include a circular single pole modular connector, high current handling capability inside a small size design. Used for electrical power supply & distribution architecture.



With its easy mating and quick release mechanism, the POW series is designed for mass production in terms of optimizing the connector behavior and guarantees a high reliability; it has both electrical and mechanical characteristics.

Easy to assemble and customized according to specifications.

Two configurations of the connector are available: at 90° and straight for panel and cable to cable applications. Possibility to have a 360° feature EMI/RFI shielding and sealed to IP67.



Wall mount to cable connectors Description

RECEPTACLE

Square flange with 4
Screws shell style



Visual color coding

Finger protection

(IP2X)

PLUG

Straight backshell
With cable gland



Coupling Ring

Visual color coding

Jam nut shell style



Insulator with
Polarization
Key

Right angle
backshell



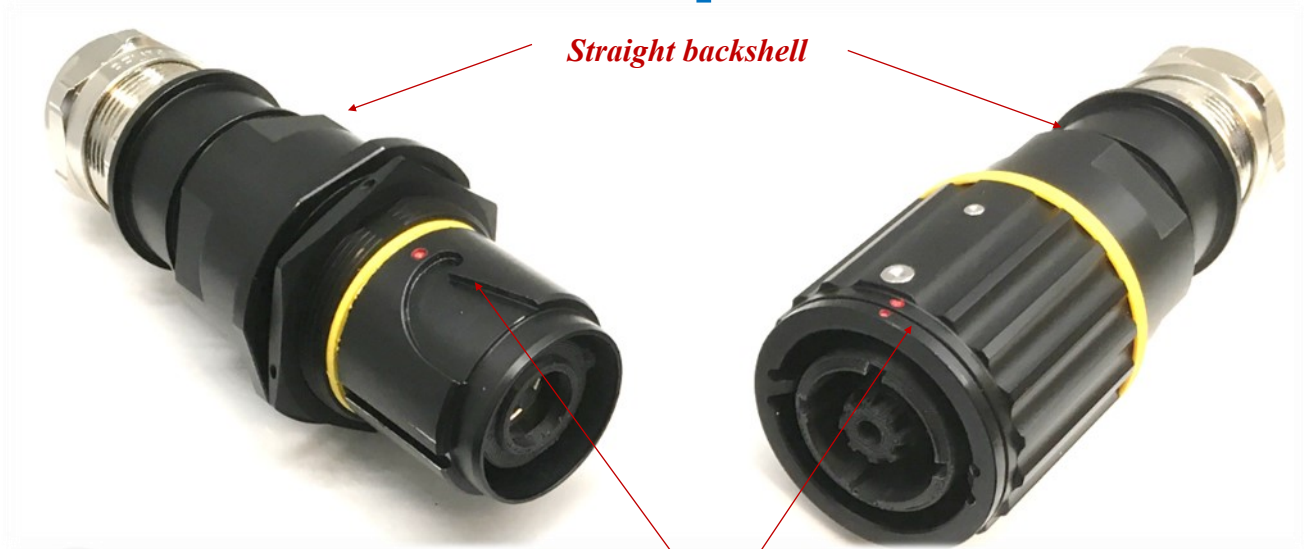
Orientation ring of the
Right angle backshell

POW

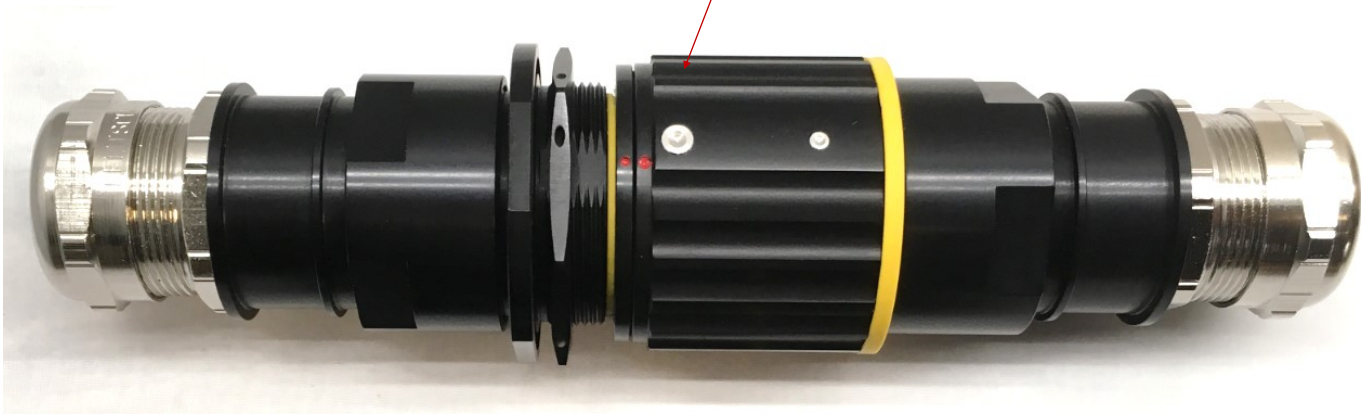
Cable to cable connectors Description

EXTENSION

PLUG



Red lock point for
easy positioning



Connector type



Two types of connectors: Compact / According to Mil 38999 /Bespoke.

- Single pole, only one contact inside of the connector.

POW-X00-XXXXX-XXX-XXXX-X



POW

- Bespoke solution (ex: mixed power contact & signal, special configurations, etc):

POW-X90-XXXXX-XXX-XXXX-X



◆ Electrical Performance

Due to the power contact technology, the connector has an exceptional ability to serve a multitude of applications in severe environments. The contact design, the contact resistance is very low (see table below).

- Vibration qualification of the contact (Done by existing customers):
- Military application: Qualified for MIL-DTL-D38999 Series 1 connector following EIA-364-38 E test (continuity letter V, condition letter E (0,2g²/Hz during 1,5 hours).
- Aeronautics application: Qualified for flying, following the VITA 4 -V3 norm.
- Mechanical and electrical behavior of the contact:

Usual cable and connector configurations:

Connector Size	Contact Insertion Force	Contact Extraction Force	Copper Contact Resistance (EIA-364-06)	Cable cross section (mm ²)	Continuous Maximum Current Rate (EIA-364-70)
300	20 N	20 N	0,10 mΩ	10 mm ²	120 A
400	50 N	60 N	0,02 mΩ	50 mm ²	300 A
600	70 N	80 N	0,01 mΩ	120 mm ²	600 A
700	120 N	130 N	0,01 mΩ	240 mm ²	1000 A

Cable*			Connector Size (single pole configuration)			
			300	400	600	700
10 mm ² (area)	Conductor Ø (mm)	4,59	X			
	Maximum Current (A)@ 30°C	120A				
16 mm ² (area)	Conductor Ø (mm)	6,15	X			
	Maximum Current (A)@ 30°C	160A				
25 mm ² (area)	Conductor Ø (mm)	7,25	X			
	Maximum Current (A)@ 30°C	210A				
35 mm ² (area)	Conductor Ø (mm)	8,68	X	X		
	Maximum Current (A)@ 30°C	265A				
50 mm ² (area)	Conductor Ø (mm)	10,15	X	X		
	Maximum Current (A)@ 30°C	330A				

Connector Performance



Cable*			Connector Size (single pole configuration)			
			300	400	600	700
70 mm ² (area)	Conductor Ø (mm)	12,32	Optional**	X	X	
	Maximum Current (A)@ 30°C	420A				
95 mm ² (area)	Conductor Ø (mm)	13,5		Optional**	X	
	Maximum Current (A)@ 30°C	500A				
120 mm ² (area)	Conductor Ø (mm)	15,84			X	X
	Maximum Current (A)@ 30°C	600A				
150 mm ² (area)	Conductor Ø (mm)	18			Optional**	X
	Maximum Current (A)@ 30°C	670A				
185 mm ² (area)	Conductor Ø (mm)	20,6			Optional**	X
	Maximum Current (A)@ 30°C	770A				
240 mm ² (area)	Conductor Ø (mm)	22			Optional**	X
	Maximum Current (A)@ 30°C	1000A				

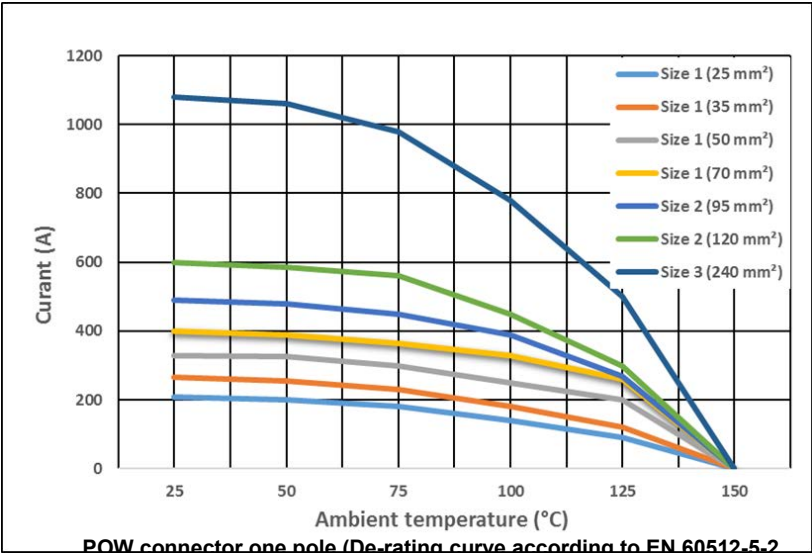
The connector was tested with different cable brands* including Axon, Nexans, Huber+Suhner, Prysmian, etc...

* For the other sizes of cables or other configurations, please contact us or our local representative.

** The maximum performance of the connector & cable, it depends on the cable brands* must be validated via testing.

POW

De-rating POW connector (EN 60512-5-2)



POW connector one pole (De-rating curve according to EN 60512-5-2)
Tested with cables and 1.5-meter length. For future application, the De-rating must be done with the cable application

◆ Electrical Performance

Screen continuity (in accordance with EIA-364-83) :

Shell to Backshell continuity resistance: less than 5.00mΩ initially

Shell to Shell continuity resistance: less than 2.50mΩ initially

Insulation Resistance: 5000MΩ

Max operation Voltage (see level) :

POW 600 & 700: 1000Vac RMS / 1500Vdc

POW 400: 800Vac RMS / 1000Vdc

POW 300: 500Vac RMS / 600Vdc

Dielectric Withstand Voltage (in accordance with EIA-364-2) :

POW 600 & 700: 4500Vac RMS, 2mA max current leakage

POW 400: 2600Vac RMS, 2mA max current leakage

POW 300: 1500Vac RMS, 2mA max current leakage

EMI 360° screening facilitated with straight or right angle EMC backshell

Option: Pilot contact

◆ Mechanical Performance

Endurance, mating & un-mating cycles minimum (EIA-364-09) :

POW 600 & 700: 500 cycles

POW 400: 800 cycles

POW 300: 1000 cycles

Connector mating & un-mating forces endurance (EIA-364-13) :

POW 600 & 700: 200N* max

POW 400: 160N* max

POW 300: 120N* max

*(*depending of the shell material and plating)*

Mechanical and visual polarization by color coding : 5 positions



◆ Environmental Performance

Operation Temperature: -55 °C to 155°C (optional 260°C).

Fire and smoke according to EN 45545-2 for railway application.

Sealing (mated / un-mated): IP69K, 1hr at 2 meters immersion and proof against high pressure steam jet cleaning.

Salt Spray (ISO 9227) :

Aluminum backshell & Anodic sulfuric oxidation: 500 hours

Aluminum backshell & Black Zink Nickel plated: 500 hours

Stainless steel backshell: +750 hours

Options (Olive Drab Cadmium) 750 hours

Vibration (EIA-364-28) :

Test Condition V, Test Condition Letter E (0.2 g²/Hz), duration 1.5 hours

Shock (EIA-364-27) :

Test condition A.

Fluid Resistance : AS Per Mil-DTL 38999L

Safety: IP2X Finger Protection in accordance with EN 60529 norm (mechanical finger)

RoHS & REACH : Compliant, unless Olive Drab Cadmium plating



◆ Plug > Straight for cable gland or shrink boots

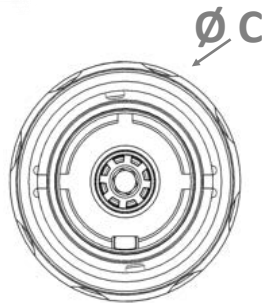
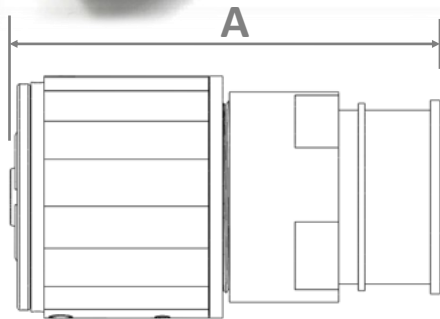
Cable gland configuration : **POW-XXX-0X5X2-XXX-XXXX-X**

Shrink boot configuration : **POW-XXX-0X5X1-XXX-XXXX-X**

Shrink boot



Cable gland

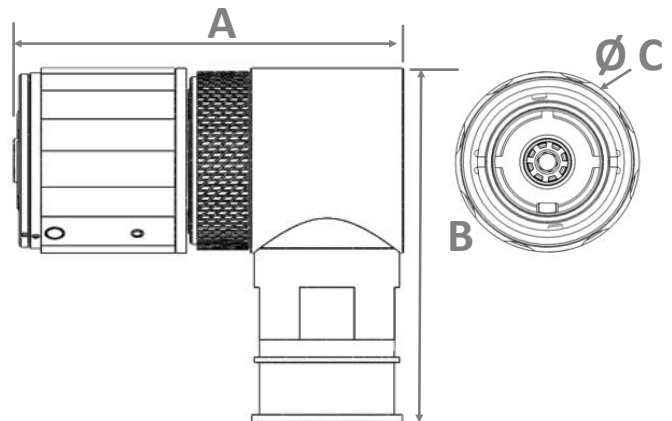


Connector type	Dimensions (mm)	
	A	Ø C
POW 300	48	35
POW 400	72	38
POW 600	98	47
POW 700	97	53

◆ Plug > Right angle for cable gland or shrink boots

Cable gland configuration : **POW-XXX-0X6X2-XXX-XXXX-X**

Shrink boot configuration : **POW-XXX-0X6X1-XXX-XXX-X**



Connector type	Dimensions (mm)		
	A	B	Ø C
POW 300	78	63	35
POW 400	95	64	38
POW 600	110	98	47
POW 700	110	98	53

Main dimensions

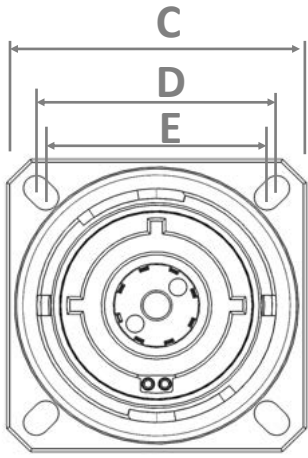
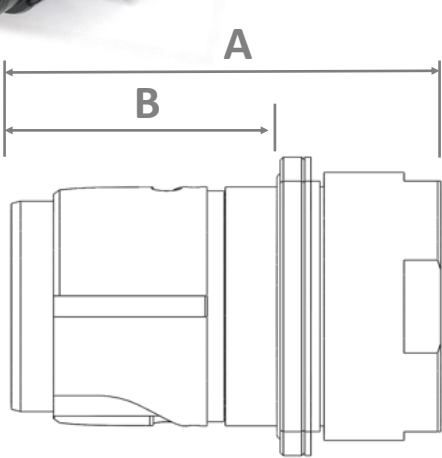


- ◆ RECEPTACLE Wall Mount square flange 4- screw shell equipped with crimp or screw contact.

POW-XXX-XX1XX-XXX-XXXX-X

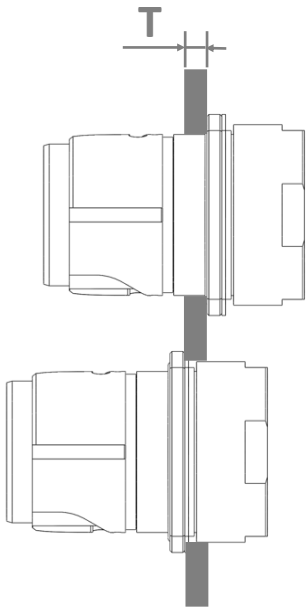


4-screw shell style



Back wall mounting
of the Receptacle

Frontal wall mounting
of the Receptacle



POW

Connector type	Standard Dimensions (mm)						Optional**		
	A*	B	C	D	E	T	Compatible with	Compatible with the MIL 38999	T
POW 300	46	32	36	27.60	26.70	7	POW Size 15	Size 15 & 17	4
POW 400	58	33	33.32	27.22	24.62	6	Mil 38999 Size 17	Size 21	6
POW 600	76	46	42.90	34.93	31.75	7	Mil 38999 Size 21	Size 23 & 25	7
POW 700	77	53	50.00	39.00	37.20	7	MIL 38999 Size 25	/	7

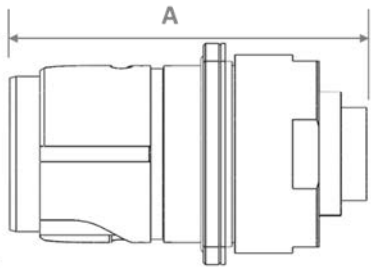
* Without the contact length
** For the other sizes of back shell or ther configurations, please contact us or our local representative.

◆ **RECEPTACLE** Wall Mount square flange 4-screw shell with crimp or screw contact.



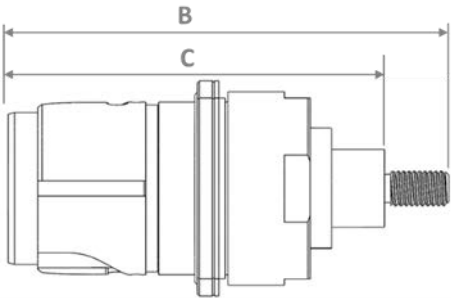
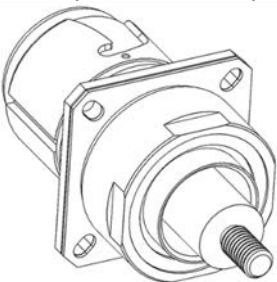
4-screw shell style

Wall mount 4-screw receptacle with screw contact (internal thread)



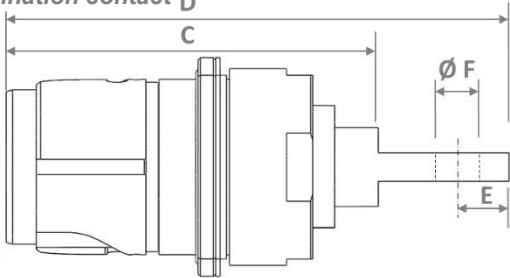
POW-XXX-1X1X0-XXX-XXXX-X

Wall mount 4-screw receptacle with screw contact (external thread)



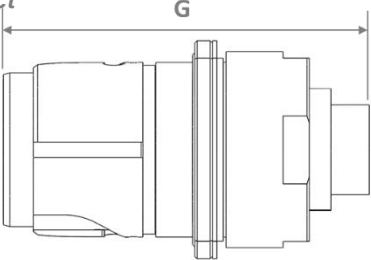
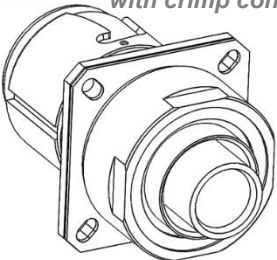
POW-XXX-4X1X0-XXX-XXXX-X

Wall mount 4-screw receptacle with flat tail termination contact D



POW-XXX-5X1X0-XXX-XXXX-X

Wall mount 4-screw receptacle with crimp contact



POW-XXX-0X1X0-XXX-XXXX-X

Connector type	Dimensions (mm)*						
	A	B	C	D	E	Ø F	G
POW 300	63	75	64	88	11	7.10	63
POW 400	72	90	76	98	11	11.20	75
POW 600	82	105	86	116	12	13.10	85
POW 700	82	105	86	116	12	13.10	85

*Only for information. Dimensions can be customized according to your needs. For more details, please contact us or our local representative.

Main dimensions



- ◆ RECEPTACLE > Wall Mount 4-screw shell, crimp contact with a straight termination for cable gland or shrink boots.

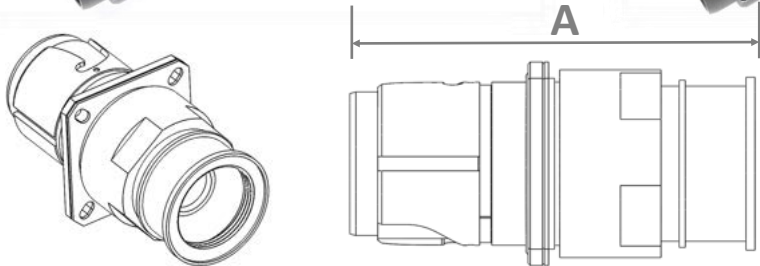
Shrink boot configuration: POW-XXX-0X1X1-XXX-XXXX-X

Cable gland configuration: POW-XXX-0X1X2-XXX-XXXX-X

4 screws shell with cable gland



4 screws shell with shrink boot

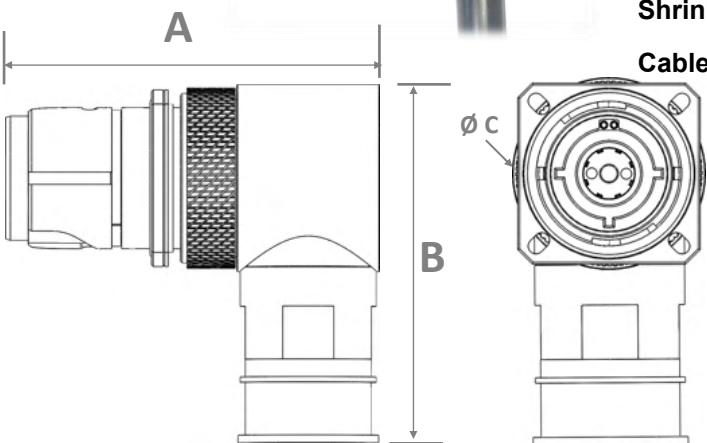


Connector type	Dimensions (mm)
	A
POW 300	58
POW 400	74
POW 600	104
POW 700	101

4-screw right angle shell with shrink boot



4-screw right angle shell with cable gland



Shrink boot configuration: POW-XXX-0XAX1-XXX-XXXX-X

Cable gland configuration: POW-XXX-0XAX2-XXX-XXXX-X

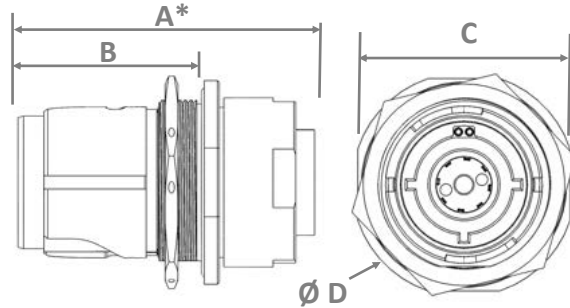
Connector type	Dimensions (mm)		
	A	B	Ø C
POW 300	88	63	37
POW 400	94	63	37
POW 600	113	97	46
POW 700	113	102	53

◆ RECEPTACLE > Wall Mount jam nut with crimp or screw contact.

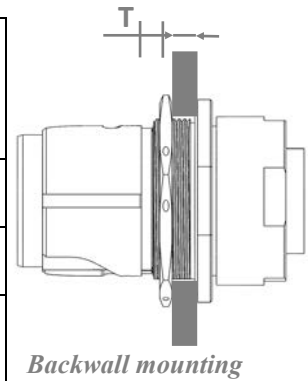
POW-XXX-XX9XX-XXX-XXXX-X



Jam nut receptacle shell type



Connector type	Standard Dimensions (mm)				Optional**		T (maxi wall thickness)
	A*	B	C	Ø D	Compatible with the MIL 38999	Compatible with the MIL 38999	
POW 300	44	32	36	46	Size 15	/	4 mm
POW 400	58	37	36	46	Size 15	Size 17 & 21	6 mm
POW 600	73	51	48	51	Size 21	Size 23 & 25	7 mm
POW 700	79	50	54	57	Size 25	/	



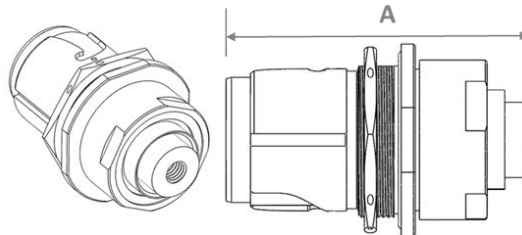
*Without the contact length

** For the other sizes of back shell or other configurations, please contact us or our local representative.

◆ RECEPTACLE Wall Mount jam nut with crimp or screw contact.

POW-XXX-1X9X0-XXX-XXXX-X

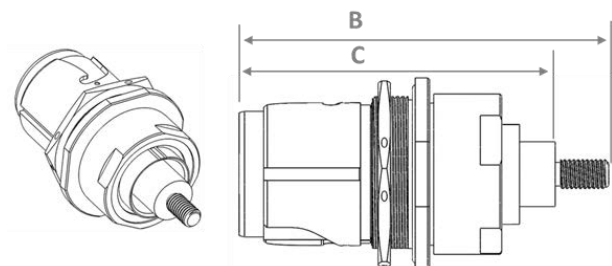
Wall mount Jam Nut receptacle with screw contact (internal thread)



Jam nut shell style

POW-XXX-4X9X0-XXX-XXXX-X

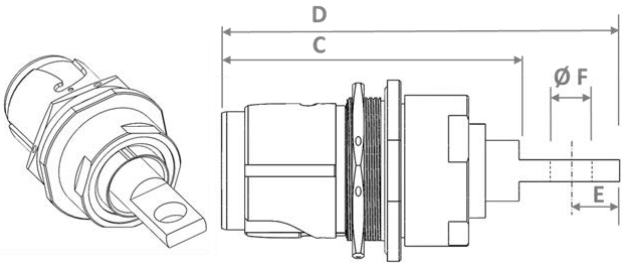
Wall mount Jam Nut receptacle with screw contact (external thread)



Main dimensions



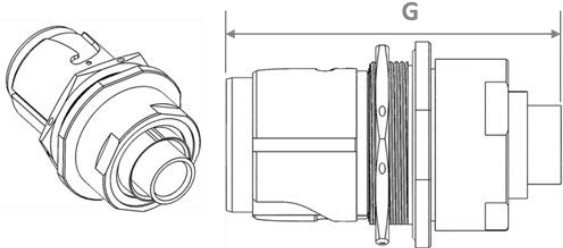
POW-XXX-5X9X0-XXX-XXXX-X



Wall mount Jam Nut receptacle with flat tail termination contact

POW-XXX-0X9X0-XXX-XXXX-X

Wall mount Jam Nut receptacle with crimp contact



Connector type	Dimensions (mm)						
	A	B	C	D	E	Ø F	G
POW 300	63	75	66	90	11	7.10	65
POW 400	72	90	78	101	11	11.20	77
POW 600	85	105	89	120	12	10	88
POW 700	85	105	89	120	12	10	88

POW

*Only for information. Dimensions can be customized according to your needs. For more details, please contact us or our local representative.

◆ RECEPTACLE Straight wall mount jam nut shell, crimp contact with a straight termination for cable gland or shrink boots.

Shrink boot configuration:

POW-XXX-0X9X1-XXX-XXXX-X

Cable gland configuration:

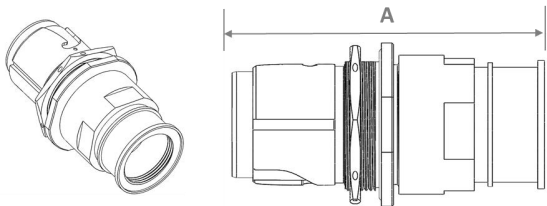
POW-XXX-0X9X2-XXX-XXXX-X



Jam nut shell with cable gland



Jam nut shell with shrink boot



Connector type	Dimensions (mm)
	A
POW 300	58
POW 400	72
POW 600	103
POW 700	106

- ◆ **RECEPTACLE > Straight wall mount jam nut shell, crimp contact with a straight termination for cable gland or shrink boots.**

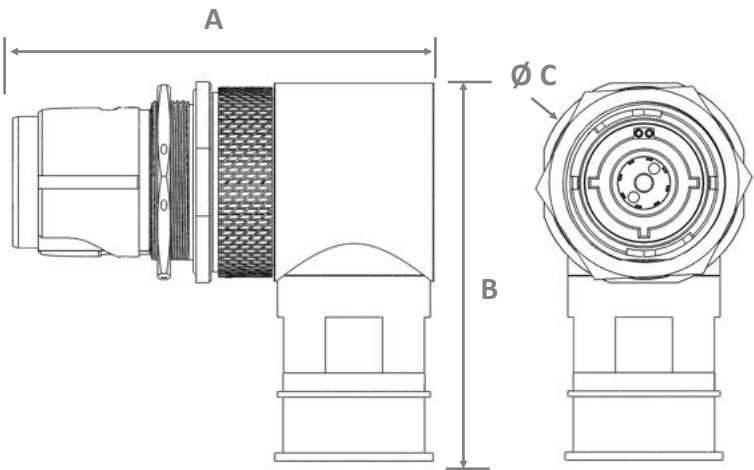
Shrink boot configuration: **POW-XXX-0XCX1-XXX-XXXX-X**

Cable gland configuration: **POW-XXX-0XCX2-XXX-XXXX-X**

Jam nut shell with cable gland



Jam nut shell with shrink boot



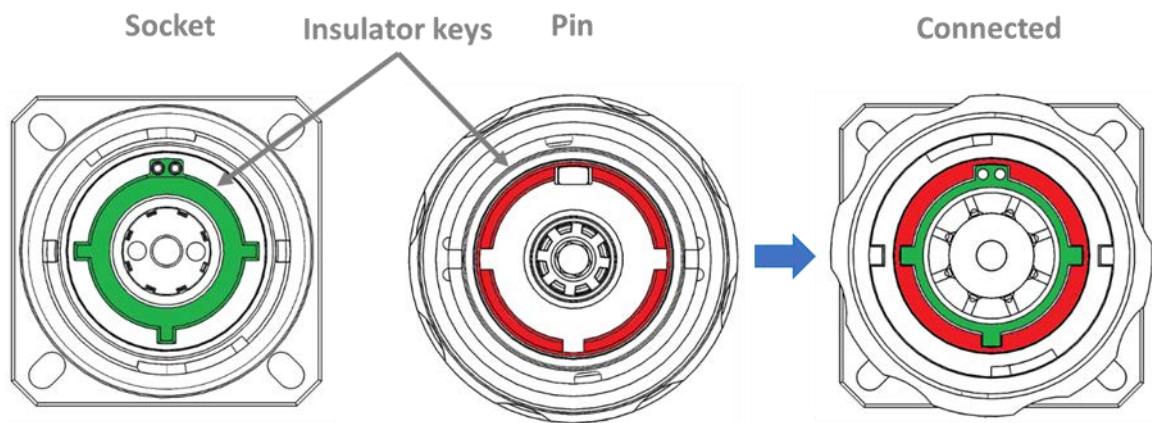
Connector type	Dimensions (mm)		
	A	B	Ø C
POW 300	88	63	37
POW 400	93	63	37
POW 600	115	97	46
POW 700	115	102	53

Connector polarization



The connector polarization is dependent on how the connector is assembled during the cabling process. With the same parts it is possible to setup 5 key positions. A visual coding can be added to help the end user to connect easily the right receptacle to associated plug.

◆ Connector mechanical keys



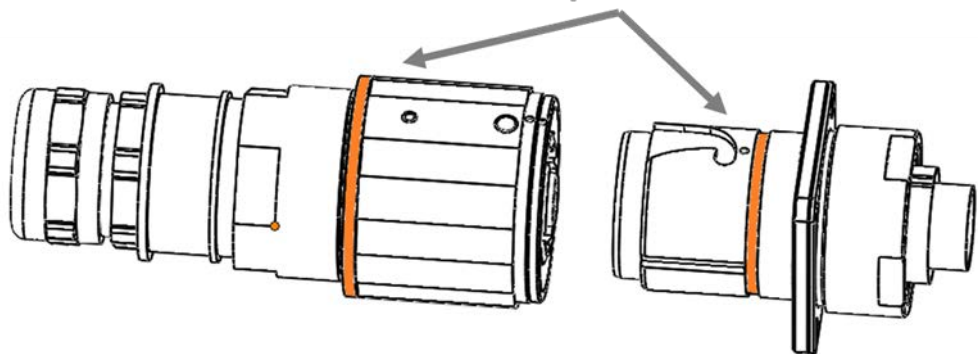
POW

◆ Connector visual coding

POW-X00-XXXXX-XXX-XXXX-X

Coding
color

Visual polarization

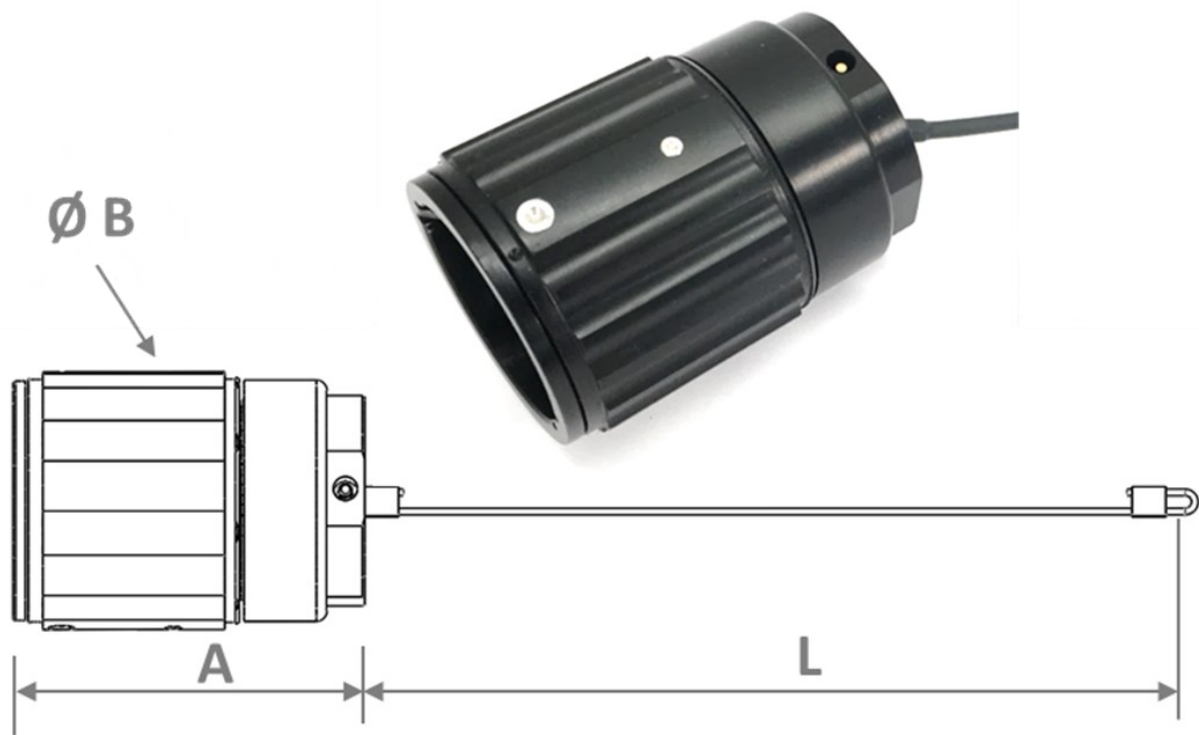


Color	Coding
No Coding	X
Red	R
Yellow	Y
Green	G
Blue	B
Orange	O

◆ Metal cap accessory for Plugs

POW-XXX-XOPX0-XXX-XXXX-X

Cable length (L)
 Type of the ring for fixing the cap
 Type of plating

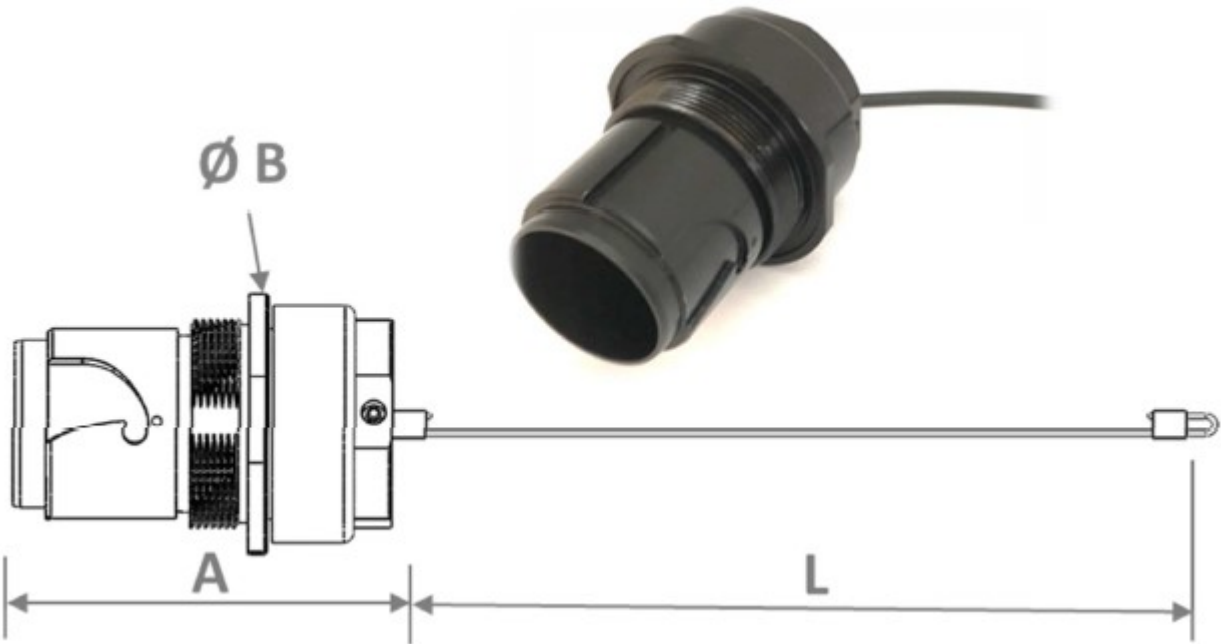


Connector type	Dimensions (mm)		
	A	Ø B	L
POW 300	45	35	Length 200 to 450 mm +/- 6 mm
POW 400	59	38	
POW 600	73	47	
POW 700	73	53	

◆ Metal cap accessory for Receptacles

POW-XXX-X0RX0-XXX-XXXX-X

Cable length (L)
Type of the ring for fixing the cap
Type of plating



POW

Connector type	Dimensions (mm)		
	A	Ø B	L
POW 300	50	40	Length 200 to 450 mm +/- 6 mm
POW 400	65	40	
POW 600	79	51	
POW 700	79	57	

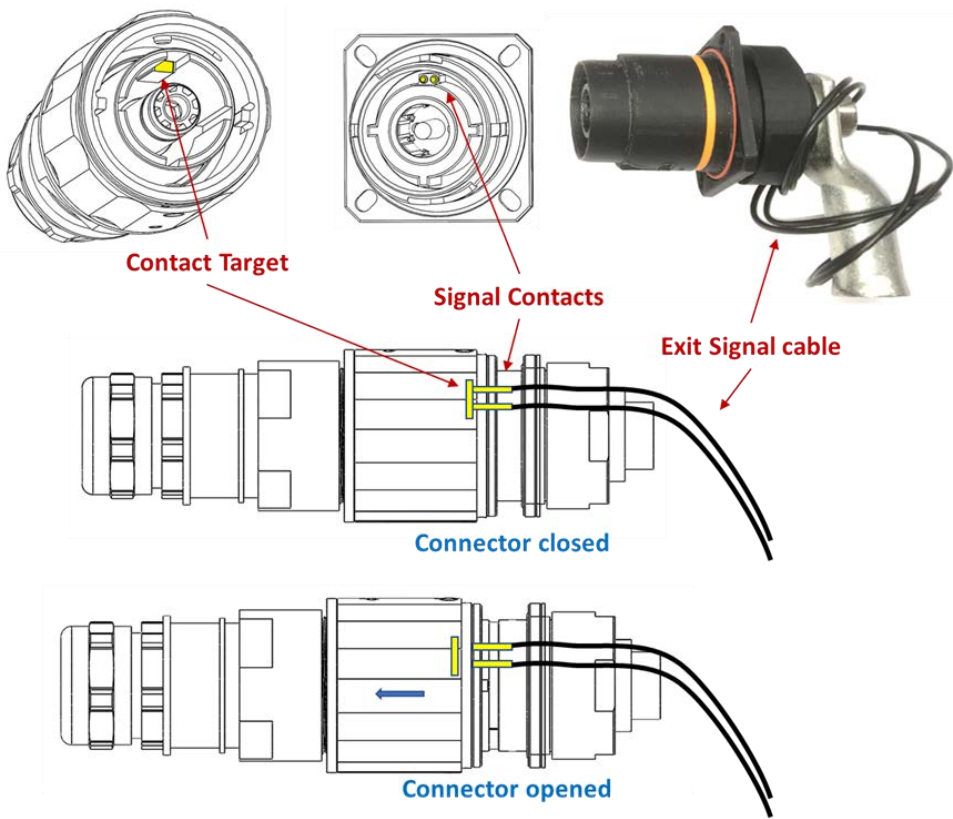
For special applications (high voltage) it is possible to integrate inside the connector a small system in order to monitor the power line, and if by inadvertence, someone tries to disconnect the connector, the power line is shut down before the connector will release.

The system is delivered with:

- Two signal contacts inside the socket insulator. The contacts will already be cabled with 1 m of cable.
- One contact “target” inside the pin insulator to close the electrical monitoring loop when the connector is

POW-XXX-XXXX-XXX-XXX-X

Pilot
contact



Insulator type	Pilot contact
Standard (150°C)	A
High temperature (230°C)	B

Panel mounted cutting interface

Three possibilities for mounting the receptacle to the panel: **Back, Jam-Nut and Front.**

◆ POW 300 connector :

Standard configuration of the POW 300:



Optional* configuration of the POW 300 (according to the MIL 38999 Panel mounted interface).



- Jam-Nut or Back and Front receptacle shells > Size 15
- > Size 17

◆ POW 400 connector :

Standard configuration of the POW 400:



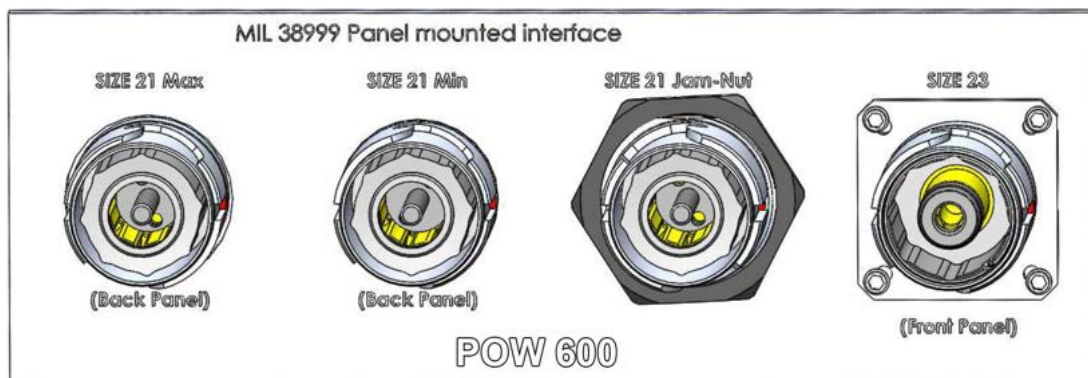
Optional* configuration of the POW 400 according to the MIL 38999 Panel mounted interface:

- Jam-Nut receptacle shell > Size 17 or Size 21
- 4 Screws receptacle shell for Back or Front mounted > Size 21

* Specific receptacle shell. For additional information, please contact us or our local representative.

• POW 600 connector :

Standard configuration of the POW 600:



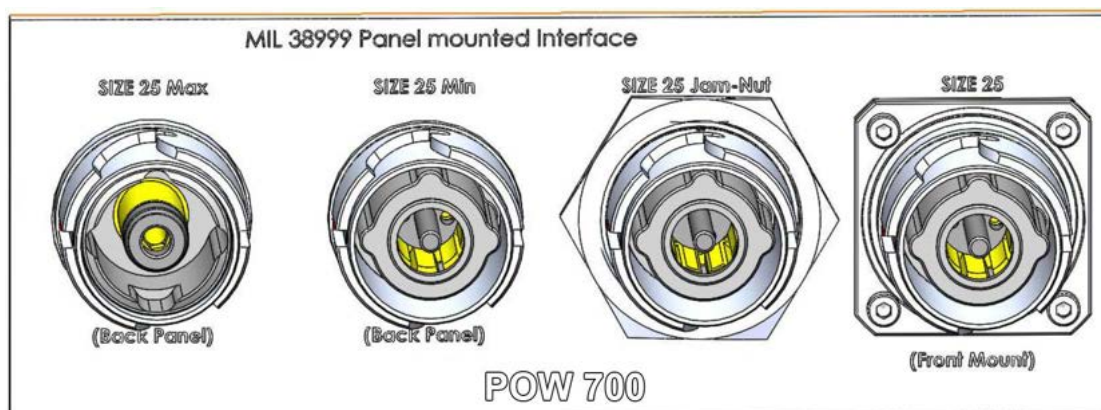
Optional* configuration of the POW 600 according to the MIL 38999 Panel mounted interface:

- Jam-Nut Size receptacle shell > Size 23 or 25
- 4-screw receptacle shell for back panel mounted > Size 23 or 25

POW

• POW 700 connector :

Standard configuration of the POW 700:

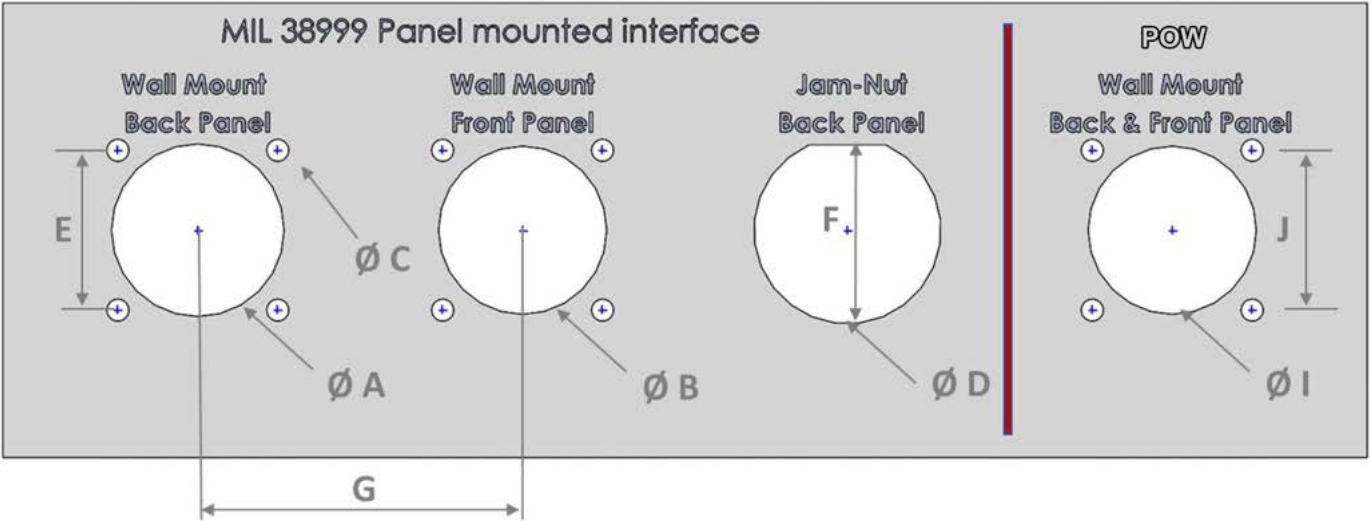


* receptacle shell. For additional information, please contact us or our local representative.

Specific

Panel mounted cutting interface

◆ Panel cutting interface table :



MIL 38999 Panel interface (mm)								POW Specific interface Back & Front Panel (mm)	
Connector type	$\varnothing A$ "Back Panel"	$\varnothing B$ "Front Panel"	$\varnothing C$	$\varnothing D$	E	F	G	I	J
Size 15	25.91	26.59	3.40	28.83	24.61	27.56	48	28.83	26.80
Size 17	29.46	30.96	3.40	32.00	26.97	30.73	50	/	/
Size 21	34.25	34.25	3.40	38.35	31.75	37.08	58	/	/
Size 23	38.43	38.43	4.50	41.53	34.93	40.26	58	40.60	34.93
Size 25	41.43	41.43	4.50	44.70	38.10	43.43	62	46.40	38.10

POW

Connector type	Standard configuration, panel interface (mm)				Optional* (according with Mil 38999)		
	Back Panel	Front Panel	Jam-Nut Back Panel	G	Back Panel	Front Panel	Jam-Nut Back Panel
POW 300	Size 15 (POW)	Size 15 (POW)	Size 15 (Mil 38999)	48	Size 17 ($\varnothing A$ & B)	Size 15 & 17 ($\varnothing A$ & B)	Size 17
POW 400	Size 17 (Mil 38999 / $\varnothing A$ & B)	Size 17 (Mil 38999 / $\varnothing A$ & B)	Size 15 (Mil 38999)	50	Size 21 ($\varnothing A$ & B)	Size 21 ($\varnothing A$ & B)	Size 17 & 21
POW 600	Size 21 (Mil 38999 / $\varnothing A$ & B)	Size 23 (POW Specific)	Size 21 (Mil 38999)	58	Size 23 & 25 ($\varnothing A$ & B)	/	Size 23 & 25
POW 700	Size 25 (Mil 38999 / $\varnothing A$ & B)	Size 25 (POW)	Size 25 (Mil 38999)	62	/	/	/

* Specific receptacle shell. For additional information, please contact us or our local representative.

◆ Crimp tooling:

Two types of crimping tools:

· **Manual mechanic tool** reference: **B -TO00058**
cable between 16mm² to 70mm² diameter.

· **Electrical hydraulic tool** reference: **B-TO00064**,
cable between 95 mm² to 240mm² diameter.



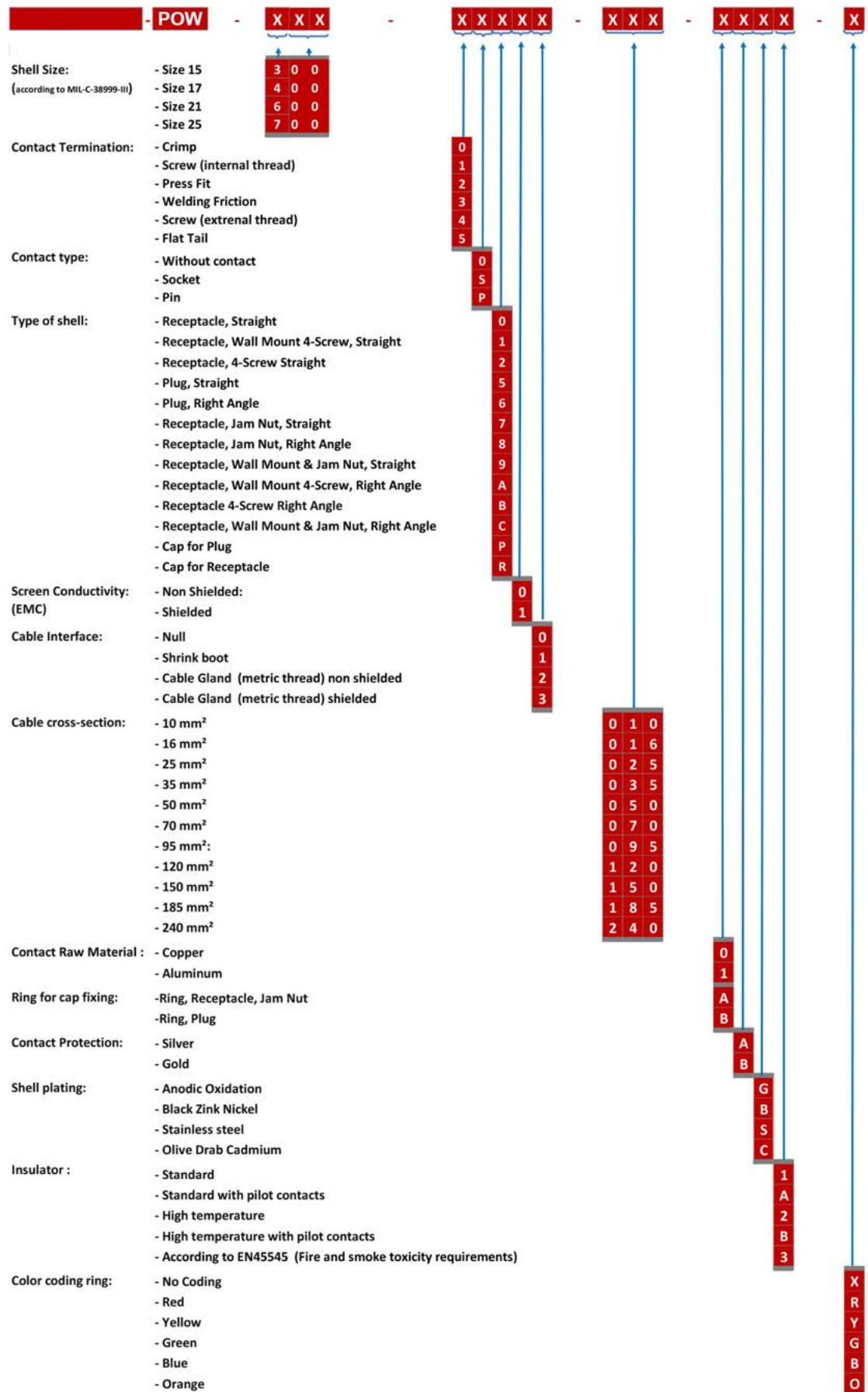
Cable*			Crimp Tool	Die	Die Interface
10 mm ² (area)	Conductor Ø (mm)	4,59	B-TO00058	B-TO00069	/
	Maximum Current (A)@ 30°C	120A			
16 mm ² (area)	Conductor Ø (mm)	6,15	B-TO00058	B-TO00063	/
	Maximum Current (A)@ 30°C	160A			
25 mm ² (area)	Conductor Ø (mm)	7,25	B-TO00058	B-TO00059	/
	Maximum Current (A)@ 30°C	210A			
35 mm ² (area)	Conductor Ø (mm)	8,68	B-TO00058	B-TO00060	/
	Maximum Current (A)@ 30°C	265A			
50 mm ² (area)	Conductor Ø (mm)	10,15	B-TO00058	B-TO00061	/
	Maximum Current (A)@ 30°C	330A			
70 mm ² (area)	Conductor Ø (mm)	12,32	B-TO00058	B-TO00062	/
	Maximum Current (A)@ 30°C	420A			
95 mm ² (area)	Conductor Ø (mm)	13,5	B-TO00064	B-TO00065	B-TO00068
	Maximum Current (A)@ 30°C	500A			
120 mm ² (area)	Conductor Ø (mm)	15,84	B-TO00064	B-TO00066	B-TO00068
	Maximum Current (A)@ 30°C	600A			
150 mm ² (area)	Conductor Ø (mm)	18	B-TO00064	B-TO00067	B-TO00068
	Maximum Current (A)@ 30°C	670A			
185 mm ² (area)	Conductor Ø (mm)	20,6	B-TO00064	B-TO00070	B-TO00068
	Maximum Current (A)@ 30°C	770A			
240 mm ² (area)	Conductor Ø (mm)	22	B-TO00064	B-TO00071	B-TO00068
	Maximum Current (A)@ 30°C	1000A			

Connector codification

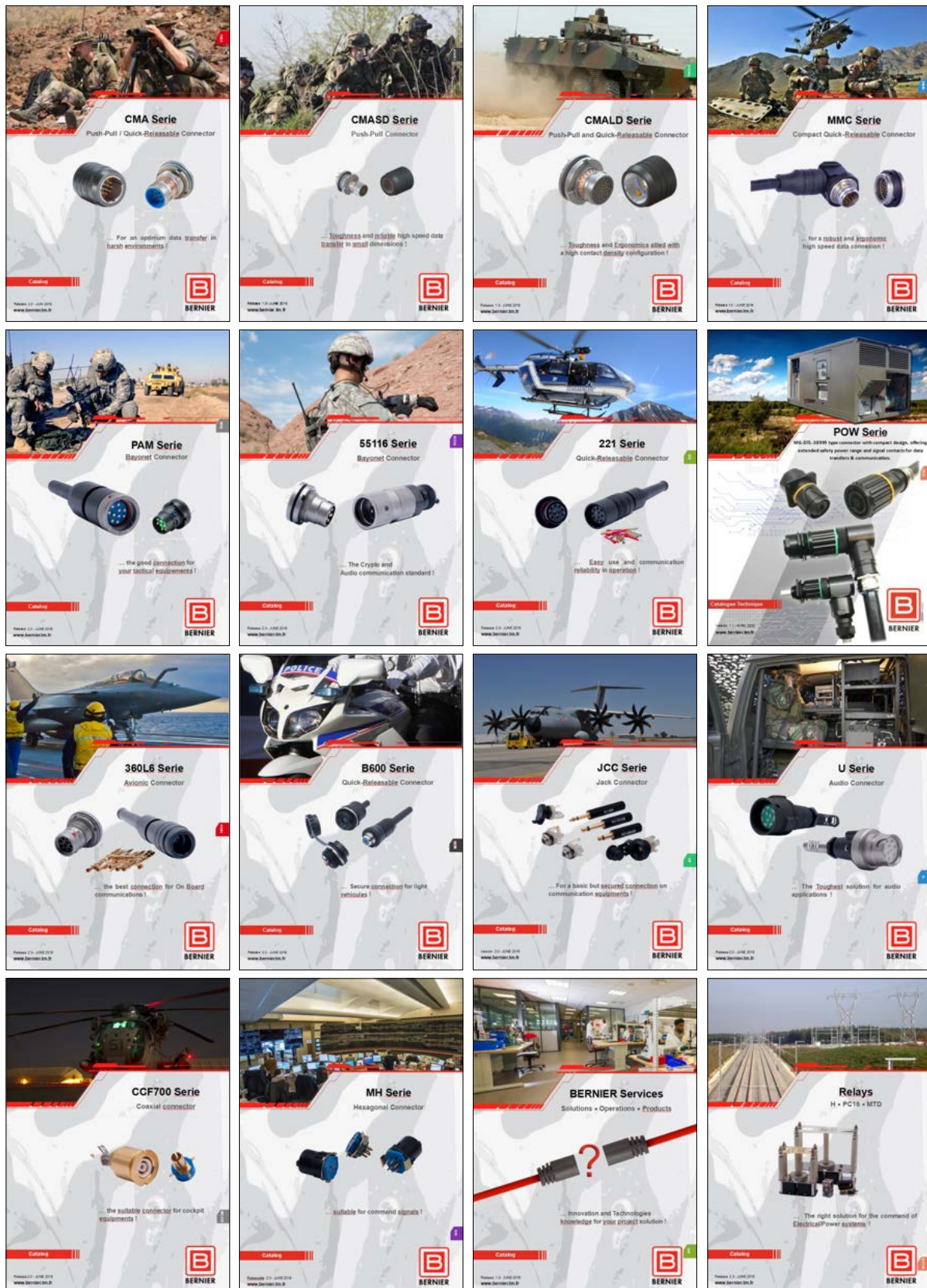


BERNIER

◆ Connector codification (how to order):



POW



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