



syntax
no compromise

NEW
SPX
SPY & SPZ
POWERSYNTAX
CONNECTOR
SERIES

SPX - SPZ - SPY PowerSyntax

SPX and SPZ are the new PowerSyntax series of single pole electrical connectors. PowerSyntax are specifically suited for the electrical supply management from 650A in continuous work up to 750A for brief periods (see technical data table at the bottom of this page). Although fully intermateable with the original (and all the previous Syntax versions), the new SPX PowerSyntax features a number of mechanical and technical enhancements which have been designed and incorporated to redefine the standards on this category of connectors as for safety, reliability, ease of handling and robustness in the harshest conditions.

TYPICAL APPLICATIONS

- Electrical power systems
- Power distribution
- Outdoor concerts and sporting events
- Outdoor broadcasting
- Theatres
- Mobile generators
- Industrial vehicles
- Railway installations
- Military installations
- Load banks
- Backup power systems
- Electrical power supply companies
- Heavy industry

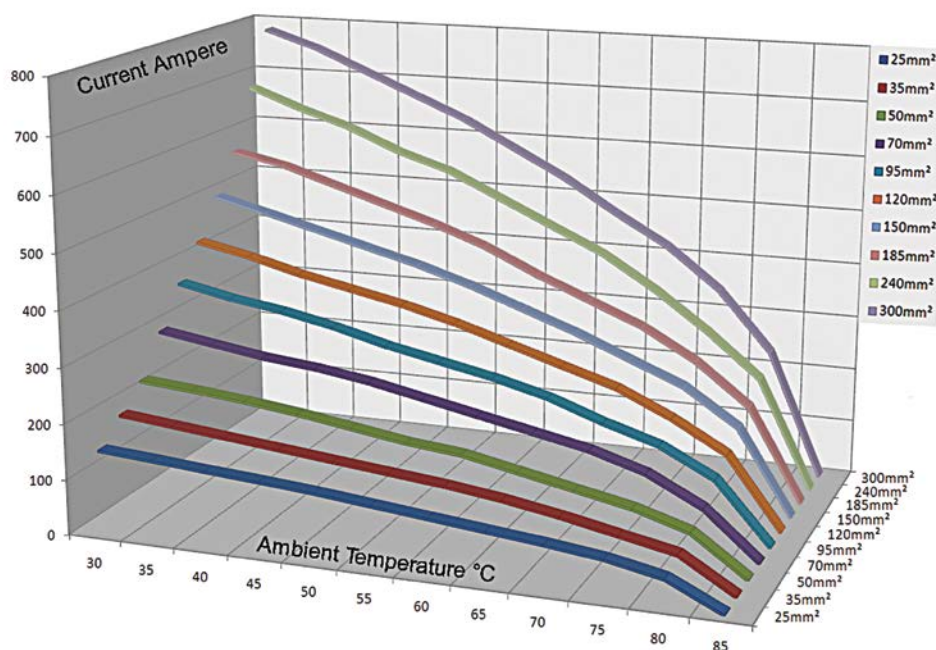
TECHNICAL DATA

• Number of contacts:	single pole
• Max continuous current rating with 300 mm ² cable:	650A
• Max current with 300 mm ² cable:	750A
• Test Voltage:	4500 V AC
• Short Circuit Rating:	35.5kA peak
• Insulation Resistance:	>5000 MOhm @500V
• IP rating when mated:	IP67
• Protection against electric shock:	IP2X
• Contact resistance:	<0.1 mOhm
• Housing material:	high temperature thermoplastic
• Flammability:	UL94 V0
• Coupling method:	bayonet lock with secondary locking pin
• Number of mating cycles:	>500
• Operating temperature:	-30°C/+125°C

GENERAL FEATURES

- Intermateable with other versions
- CE compliant
- EN/ESI compliant
- Contact retained within the thermoplastic housing with a flame-retardant UL94-V0 plastic pin.
This method ensures quick assembling and disassembling. No special extracting tools are needed
- Heavy-duty ergonomic hand grip, with sides specifically designed for easy pushing/pulling when mating/unmating
- Metric thread M40 cable gland IP68 watertight compliant with EN/CE, adapters available for cables over 32 mm diameter
- Screw, Crimp and Lug terminals to facilitate cables from 25mm² to 300 mm²
- Mechanically keyed to prevent mating errors
- Permanent marking to identify phase/line and safety information embossed on connector's body
- Multipoint contact area
- Silver Plated Contacts
- High Impact bodies
- EN harmonized color coding (Europe). Also available in UK, Australia and USA color codes

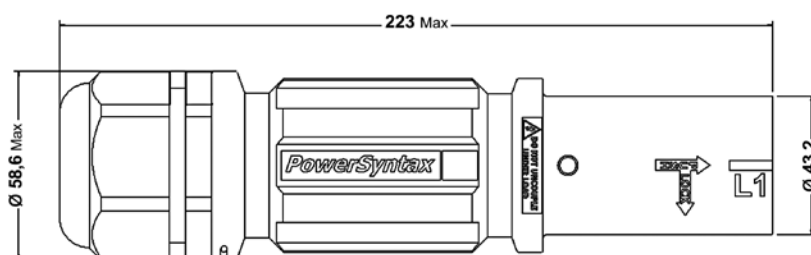
RATED CURRENT



DATA FOR 85° C CABLE RATINGS

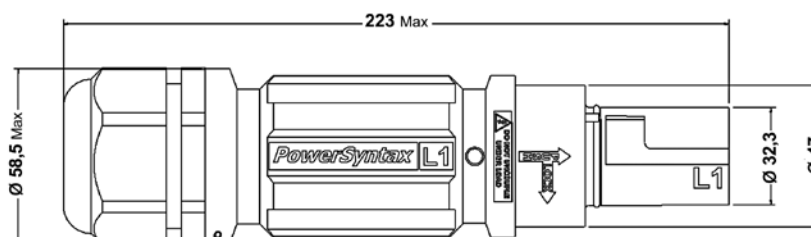
LINE SOURCE

Innovative ergonomic hand grip for easy handling.
 Finger protection IP2X to prevent accidental touching of live contact parts.
 Contact to housing retention through flame-retardant UL94-VO plastic cotter pin.
 No special tools required for assembling.
 Special ergonomic Release-key (supplied separately) for the releasing of the secondary locking pin.
 Set Screw termination for cables 25 mm² -150 mm²
 Crimp termination for cables up to 300 mm²
 Watertight IP68 plastic cable gland M40 for cable strain relief retention range 15 - 32 mm.
 Permanent markings to identify phase/line and safety information are embossed on connector's shell.
 No additional information sticker is applied.
 400A and 650A versions available.



LINE DRAIN

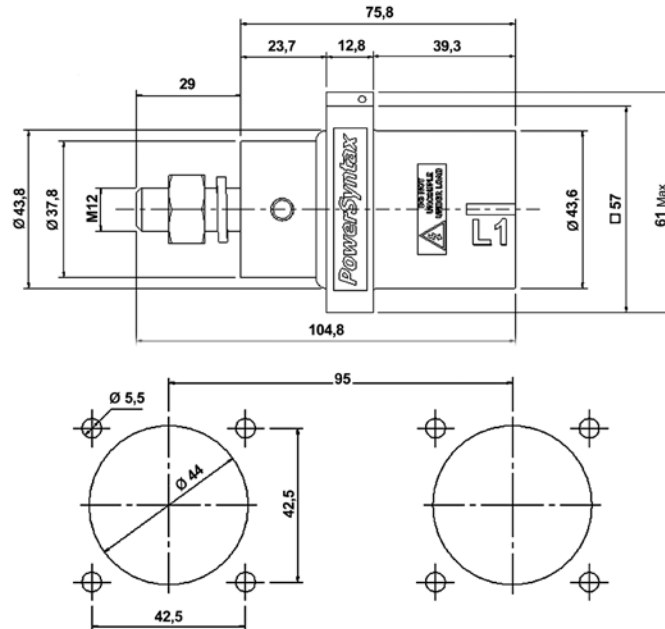
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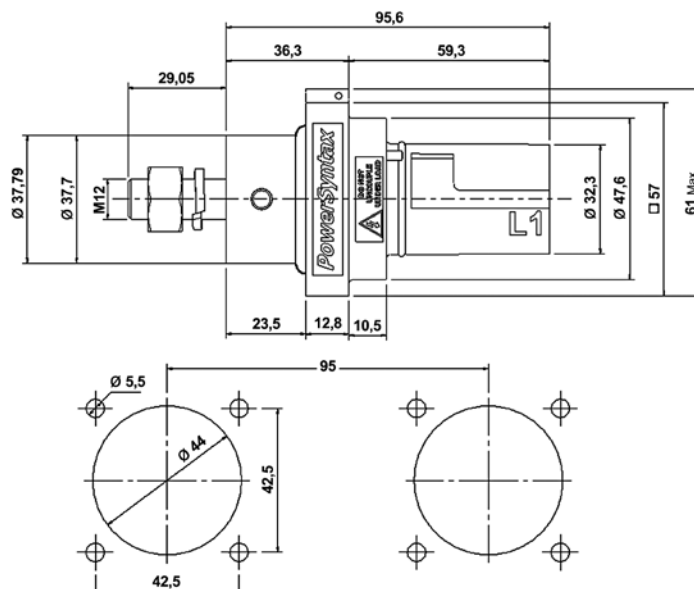
PANEL SOURCE

Specific housing for protection cap lacing moulded on the plastic body of the flange. Finger protection IP2X to prevent accidental touching of live contact parts. Contact to housing retention through flame-retardant UL94-VO plastic cotter pin. No special tools are required for assembling. Special ergonomic Release-key (supplied separately) for the releasing of the secondary locking pin. Front or rear panel mount. M12 Thread for cable attachment. Permanent markings to identify phase/line and safety information are embossed on connector's shell. No additional information sticker is applied. 400A and 650A versions available.



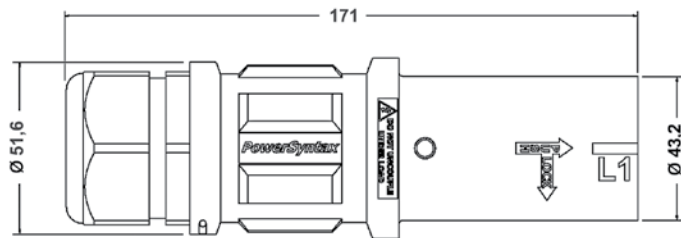
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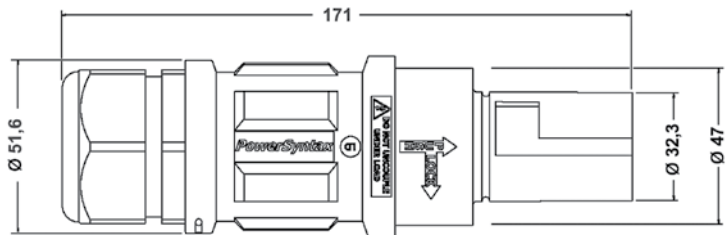
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 No special tools required for assembling.
 Special ergonomic Release-key (supplied separately) for the releasing of the secondary locking pin. Set Screw termination for cables 25 mm² - 95 mm².
 Watertight IP68 plastic cable gland M40 for cable strain relief retention range 15 - 28 mm. Permanent markings to identify phase/line and safety information are embossed on connector's shell.
 No additional information sticker is applied.
 400A version available.



LINE DRAIN

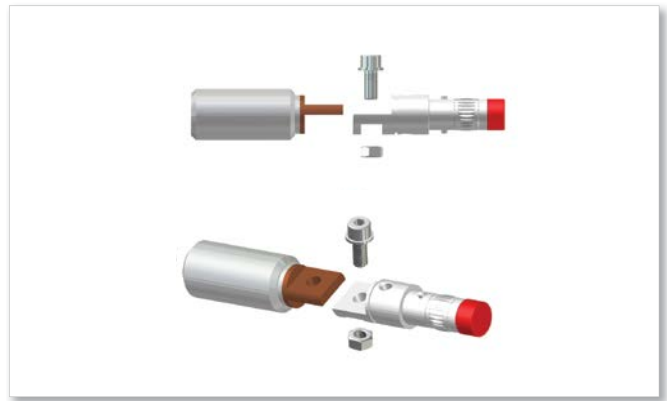
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 400A version available.



Two sizes available



SPY EasiLUG PowerSyntax



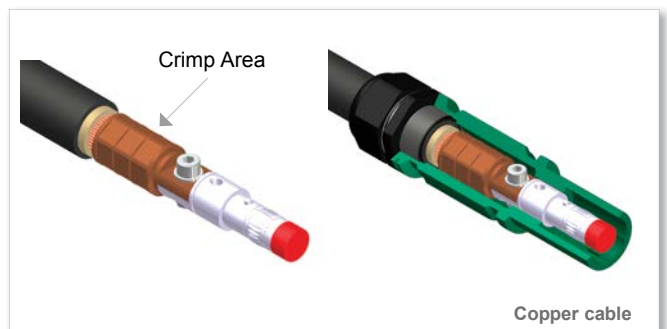
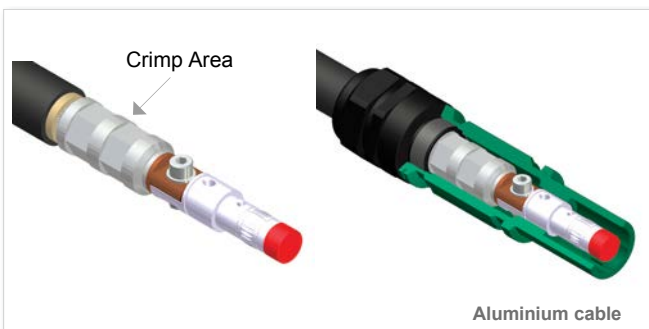
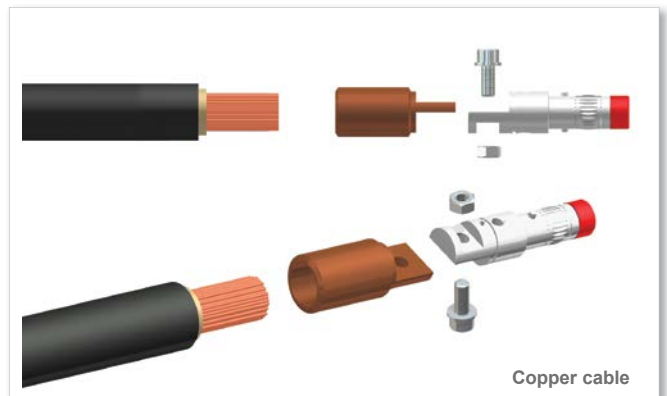
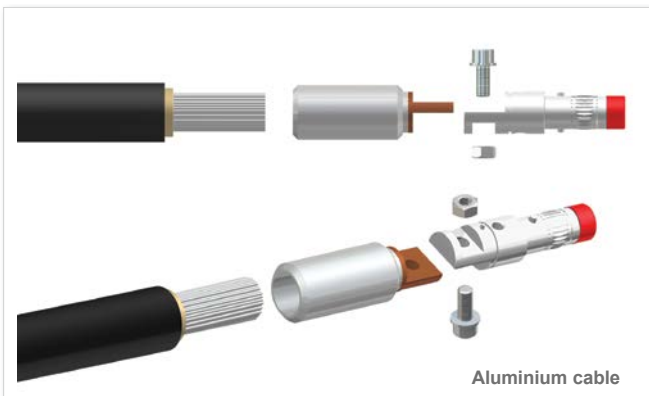
SPY EasiLUG. An evolution of SPX

It is a quick, safe and easy means to fit lug terminal single core aluminium or copper cables into a classical PowerSyntax single pole connector.

SPY EasiLUG combines the reliability of a lug termination cable with the convenience of a PowerSyntax connector. The result is an IP67 waterproof terminal block, which also enables to disconnect the line without need of any tools (this operation must be carried out in absence of voltage).

- provides greater versatility than any other high power single pole connection.
- versions available for cable up to 300 mm² (aluminium or copper !)
- less maintenance than cables fitted with set screws /sleeve systems, or crimped cables.
- super quick assembly.
- standardises the single pole connections, by using the same connector's body as SPX/SPZ with crimped or set screw contacts.
- allows to quickly connect cables with lug terminals into power distro devices equipped with PowerSyntax (or PowerSyntax compatible) panel-mount connectors.
- reusable to fit cables of different lengths.
- lug terminal cables directly fitted into mechanically keyed, color coded PowerSyntax connectors. This grants electrical safety and easy phase identification without need of other devices.

Assembling elements



Phase Inverters/Adaptors PowerSyntax



Say goodbye to those uncomfortable last minute adaptors on cable...

The PowerSyntax Phase Inverters/Adaptors (up to 400A) have been designed to solve two specific problems

- reverse the rotation direction in three-phase motors, etc... by changing the phase sequence (L1-L2-L3) between the power source and the connected devices
- provide those who use only one model of phase conductor (L1, L2 or L3) to operate L1-L2-L3+Neutral systems with an interface between standard 3-phase power generators / distros and their devices.

The former is a common demand in industrial applications.

The latter is a specific need of entertainment and cinema industries.

Available versions and Part Number				
Input male	Color	Output female	Color	P/N
L1	Orange	L2	Black	SPZ4LD1BR-LS2BK
L1	Orange	L3	Grey	SPZ4LD1BR-LS3GY
L2	Black	L1	Orange	SPZ4LD2BK-LS1BR
L2	Black	L3	Grey	SPZ4LD2BK-LS3GY
L3	Grey	L1	Orange	SPZ4LD3GY-LS1BR
L3	Grey	L2	Black	SPZ4LD3GY-LS2BK

Panels PowerSyntax



Available versions and Part Number		
Rack unit 19" 2U, 5p (L1-L2-L3-N-E) EU standard coloration		
Drain	400Amp 5p	p/n RK400PDR
Source	400Amp 5p	p/n RK400PSR
Drain	750Amp 5p	p/n RK750PDR
Source	750Amp 5p	p/n RK750PSR

Protection Cap PowerSyntax

PASSIVE SAFETY



Important details, such as newly conceived protection caps with special lacing, have been introduced in the design. A specific housing for the cap's lacing has been moulded on the flange of the panel-mount versions and on the body of the inline versions. The protection caps are laced to the connector's body through a special high-resistance cable made up of seven stainless strands, and covered by anti-scratch teflon black tubing.

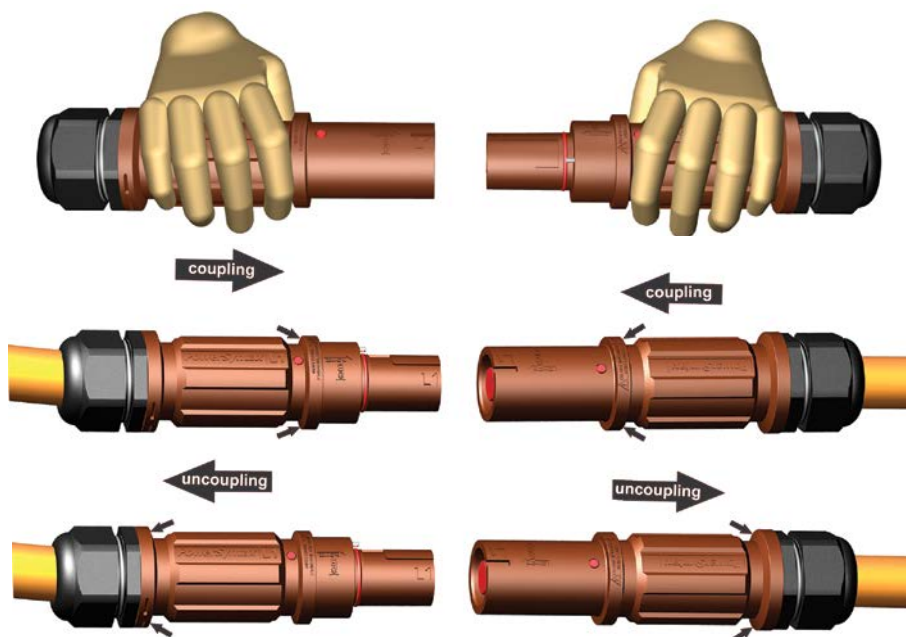
The use of protective caps results in:

- **Extended life span of the connectors** - the mating faces are protected against impact damage and abrasion.
- **Improved safety** - also when the connectors are uncoupled, the contact is protected against dust and water.

Specific housing for protection cap lacing moulded on cap (Pic. 1) for panel version (Pic. 2) and inline version (Pic. 3).

ERGONOMICS

The external shell has an ergonomic design which grants optimal handling and grip, also when operating with gloves. In particular, the sides of the hand grip are specifically designed for easy pushing/pulling of the connector when mating/unmating.

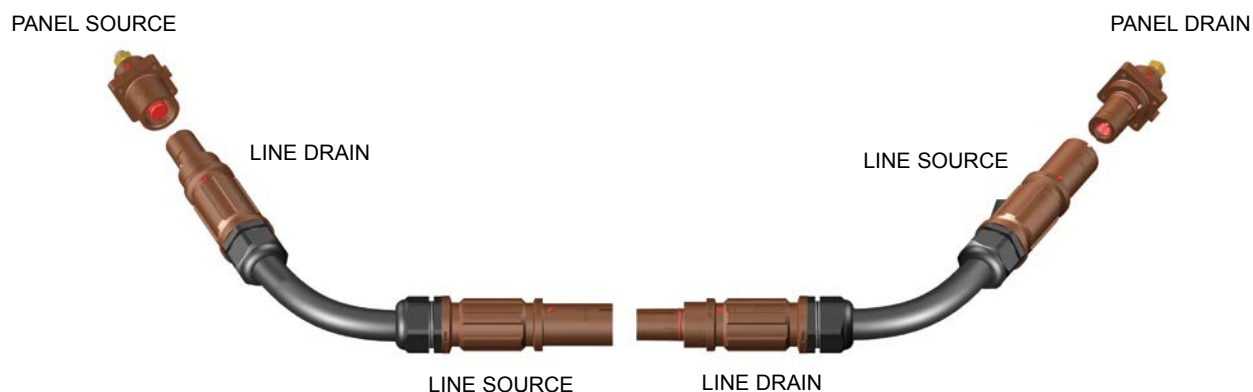


SECONDARY LOCK AND RELEASE KEY

The secondary lock prevents unintentional disconnection under load. It is obtained through a simple locking pin on the drain connector which snaps into a slot on the mating source connector. As an extra safety device, each pole is mechanically keyed to prevent connection errors.



DAISY-CHAIN HOOK-UP PATTERN



MULTILOUVER CONTACT BAND LOCKING MECHANISM



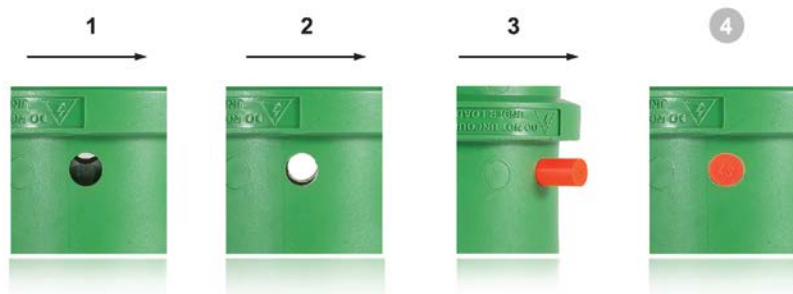
Enhanced Syntax® single pole source contacts.

We have further improved the heart of our connector. If the multilouver contact band gets out of its recess, the conductive surfaces will no longer be in contact, thus impeding the current transfer (1). To ensure the efficiency of the connection in any situation, we adopted a solution which keeps the multilouver spring loaded band in its positive location.

The contact band is held in its locked position by a special ring, on which a 2.5 ton. pressure has been applied (2). This solution prevents unintentional derailment of the multilouver contact band (3).



CONTACT GUIDE PIN

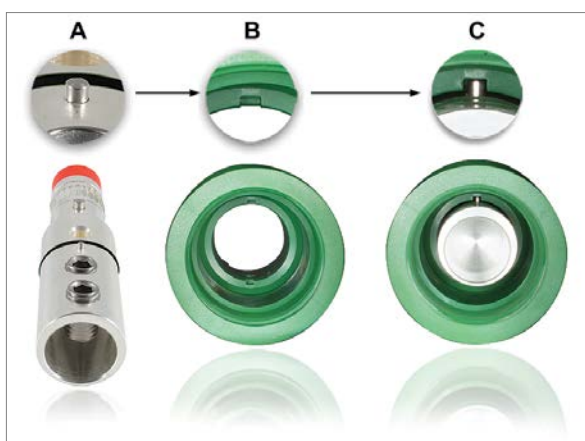


To align the holes (1 & 2) on the contact and the insulator, and insert the red dowel pin (3 & 4), we created a guide pin (A) on the contact and a corresponding recess (B) in the insulator.

With the guide pin in its location (C), the assembling operations are easier and quicker.

Thanks to this solution, you can perform the needed operations even in harsh environmental situations...

The red dowel pin is reusable, so there is no need for new spare parts as it can be removed and inserted again...



NEW THREADED IP2X PROTECTION CAPS



We reinvented the attachment system of the touch-proof protection on source contacts to improve safety in case of damaging the plastic insulating cap.

Since this type of connection was first introduced on the market, many technicians had been experiencing breakage of the insulation cap due to strong blows. As a result, the edges of the metal conductive parts were exposed, with consequent risks for the operators' safety (Pic. 1). Thanks to the innovative solution by Syntax®, the touch-proof protection cap is positively threaded and then blocked with specific adhesives to make it immovable. This system considerably reduces the exposure of the metal parts, as a portion of the insulating cap will remain in its position on top of the source contact even in case of damage (Pic. 2).



On legacy connectors, in case the plastic cap is damaged, the conductive parts are totally exposed.



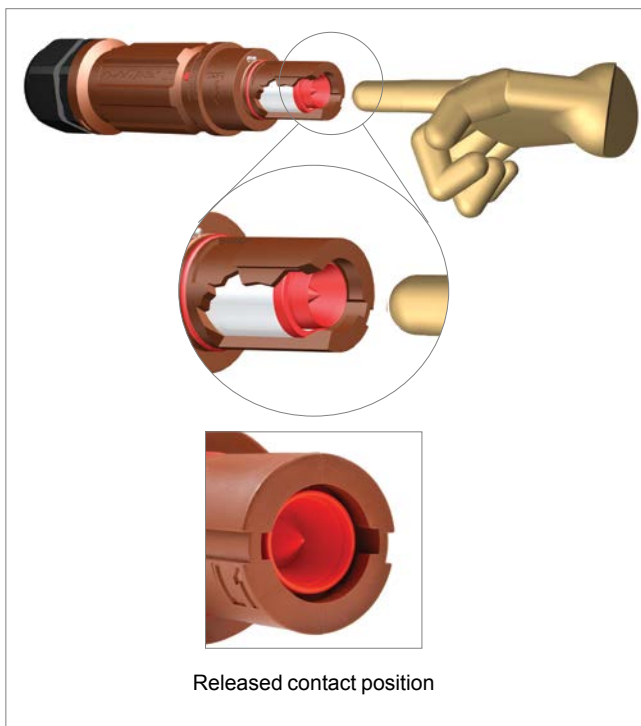
On PowerSyntax, the exposure of live parts is reduced even when the cap is damaged

ELECTRICAL PROTECTION OF CONTACTS

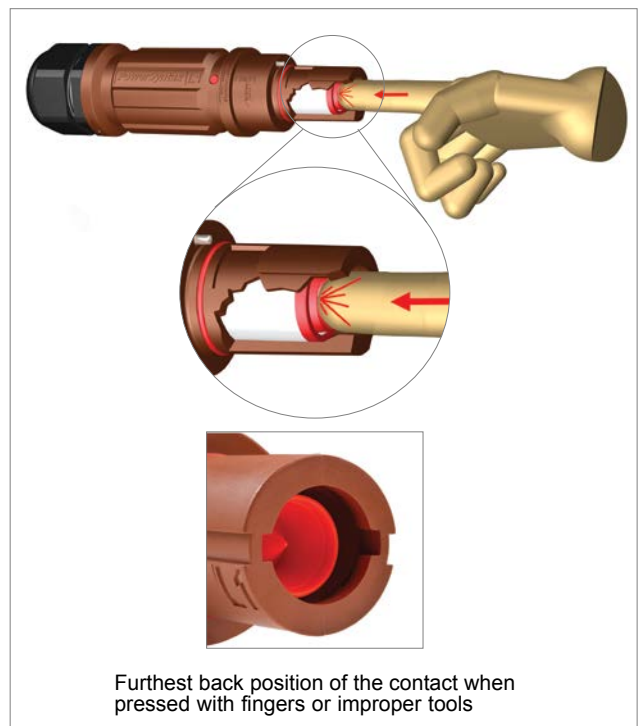


Both gender contacts are compliant with IP2X electrical safety standard, which guarantees touch-proof protection of live parts.

On Drain connectors, the protective plastic elements feature a sharp-pointed insulated tip which prevents the possibility of pushing the contact inwards with fingers and are also designed so as to provide mechanical lock in case of improper pushing of the contact.



Released contact position



Furthest back position of the contact when pressed with fingers or improper tools

IDENTIFICATION
COLOR CODES

	GROUND	NEUTRAL	LINE 1	LINE 2	LINE 3
EUROPE					
UK					
AUSTRALIA					
U.S.A.					

EUROPEAN SERIES EXAMPLE

	LINE SOURCE	LINE DRAIN	PANEL SOURCE	PANEL DRAIN
LINE 1				
	LINE 1 - Line Source	LINE 1 - Line Drain	LINE 1 - Panel Source	LINE 1 - Panel Drain
LINE 2				
	LINE 2 - Line Source	LINE 2 - Line Drain	LINE 2 - Panel Source	LINE 2 - Panel Drain
LINE 3				
	LINE 3 - Line Source	LINE 3 - Line Drain	LINE 3 - Panel Source	LINE 3 - Panel Drain
NEUTRAL				
	NEUTRAL - Line Source	NEUTRAL - Line Drain	NEUTRAL - Panel Source	NEUTRAL - Panel Drain
GROUND				
	GROUND - Line Source	GROUND - Line Drain	GROUND - Panel Source	GROUND - Panel Drain

CABLE RETENTION SYSTEM

According to the contact type, 3 different cable retention methods are used:

- 1 - Contact up to 400A: on line connectors, cable retained through set screws and reduction sleeve.
- 2 - Contact up to 750A (pure copper): on line connectors, cable retained through crimping.
- 3 - Contact up to 400A or 750A (pure copper): on panel connectors, lug terminal retained through M12 nut.

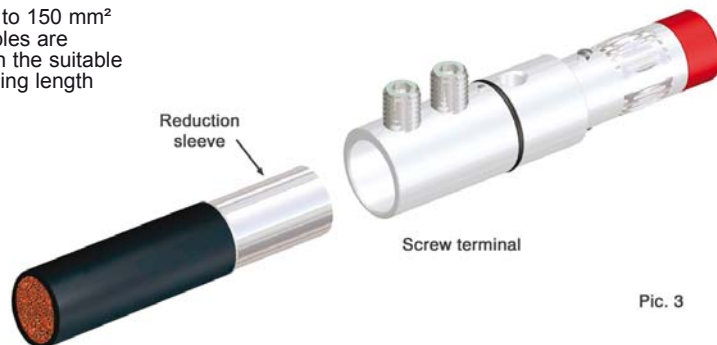


TIGHTENING TORQUE FOR SET SCREW CONTACTS (LINE CONNECTORS) AND M12 LOCKING NUT (PANEL CONNECTORS) TABLE - in Nm	Tightening torque	Cable section in mm ²	Cable retention method
1	12 Nm	25-150 mm ² up to 400A	Reduction sleeve
3	12 Nm	25-150 mm ² up to 400A e 750A	Lug terminal

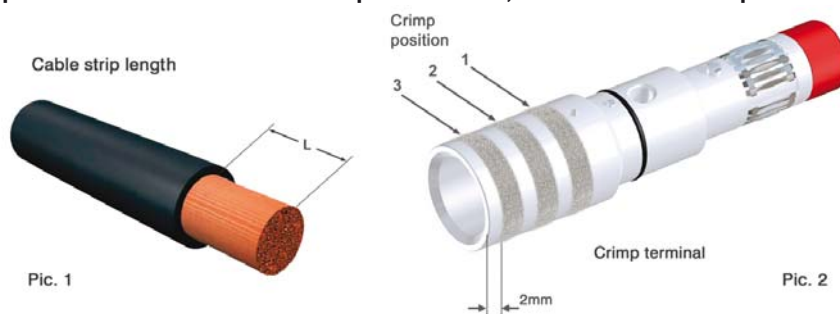
CABLE STRIPPING

For contacts up to 400A and cable sections up to 150 mm² (set-screw contact terminal)

For contacts up to 400A and cable sections up to 150 mm² (set-screw contact terminal) 25 to 150 mm² cables are inserted into the set-screw contact terminal with the suitable reduction sleeve (Pic. 3). In this case the stripping length will be 33 mm (Pic. 1).



For contacts up to 750A and cable sections up to 300 mm², the cables are crimped



2 CRIMP CONTACT TERMINAL TABLE	cable size 185 mm ²	cable size 240 mm ²	cable size 300 mm ²
Insulation strip length = L (Pic.1)	42 mm	42 mm	42 mm
Number of compressions (Pic.2)	2	3	3
Hand operated hydraulic crimp tool	HPI130-C2	HPI130-C2	HPI130-C2
Cordless hydraulic crimp tool	B131-C	B131-C	B131-C
Crimp die set	ME 37-C	ME 48-C	ME 60-C



Hand operated hydraulic crimp tool

HPI130-C2



Cordless hydraulic crimp tool

B131-C

SPX - SPZ PowerSyntax



PART NUMBER EXPLANATION

Part N.							
EXAMPLE Part N.	SPX	4	LD	1	BR	120	MR

CONNECTOR SERIES	
Power Syntax SPX Series	SPX
Power Syntax SPZ Series	SPZ

MAXIMUM CURRENT RATING	
Up to 400 Amp SCREW (25 to 150 mm ²)	4
Up to 750 Amp CRIMP (185 to 300 mm ²)	7

CONNECTOR STYLE	
Line Drain	LD
Line Source	LS
Panel Drain M 12 Thread	PD
Panel Source M 12 Thread	PS

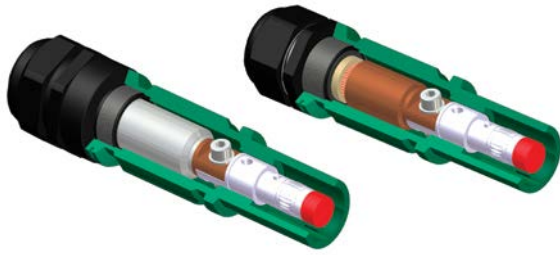
KEY COMPOSITION	
Earth	E
Neutral	N
Phase 1	1
Phase 2	2
Phase 3	3

INSULATOR COLOR	
GREEN	GN
BLUE	BL
BROWN	BR
BLACK	BK
GREY	GY
RED	RD
YELLOW	YE
WHITE	WH

CABLE CONDUCTOR SIZE (For 25-150 mm ² cables the reduction sleeves are included)	
25 mm ² (SPX and SPZ series)	025
35 mm ² (SPX and SPZ series)	035
50 mm ² (SPX and SPZ series)	050
75 mm ² (SPX and SPZ series)	075
95 mm ² (SPX and SPZ series)	095
120 mm ² (SPX and SPZ series)	120
150 mm ² (SPX and SPZ series)	150
185 mm ² (SPX series)	185
240 mm ² (SPX series)	240
300 mm ² (SPX series)	300

CABLE GLAND	
M 40 x 1,5 Clamping Range 15 - 23 mm diameter (SPX and SPZ series)	MQ
M 40 x 1,5 Clamping Range 19 - 28 mm diameter (SPX and SPZ series)	MP
M 40 x 1,5 Clamping Range 22 - 32 mm diameter (SPX series)	MR
M 50 x 1,5 Clamping Range 30 - 38 mm diameter (SPX series)	MU

ACCESSORIES	
Secondary lock	SPXTKEY
Protective plastic cap kit for source connectors	SPXDCS-SC
Protective plastic cap kit for drain connectors	SPXD-SC



PART NUMBER EXPLANATION

Part N.							
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EXAMPLE Part N.	SPY	41	LD	1	BR	120	MR
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CONNECTOR SERIES	
SPY EasiLUG Series	SPY

MAXIMUM CURRENT RATING	
For aluminium cable up to 400 Amp	41
For aluminium cable up to 750 Amp	72
For copper cable up to 750 Amp	73

CONNECTOR STYLE	
Line Drain	LD
Line Source	LS
Panel Drain M 12 Thread	PD
Panel Source M 12 Thread	PS

KEY COMPOSITION	
Earth	E
Neutral	N
Phase 1	1
Phase 2	2
Phase 3	3

INSULATOR COLOR	
GREEN	GN
BLUE	BL
BROWN	BR
BLACK	BK
GREY	GY
RED	RD
YELLOW	YE
WHITE	WH

CABLE CONDUCTOR SIZE (For 25-150 mm² cables the reduction sleeves are included)	
75 mm²	075
95 mm²	095
120 mm²	120
150 mm²	150
185 mm²	185
240 mm²	240
300 mm²	300

CABLE GLAND	
M 40 x 1,5 Clamping Range 22-32	MR
M 50 x 1,5 Clamping Range 27-35 (adaptor included)	MT
M 50 x 1,5 Clamping Range 30-38 (adaptor included)	MU

ACCESSORIES	
Secondary lock	SPXTKEY
Protective plastic cap kit for source connectors	SPXDCS-SC
Protective plastic cap kit for drain connectors	SPXDCD-SC

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