# **PowerSyntax**<sup>®</sup>

## PowerSyntax family of single pole connectors for high currents.

The new PowerSyntax series of powerlock-style single pole connectors are specifically suited for the electrical supply management for currents up to 480amp or 750amp. Although fully intermateable with the original (and all the previous Syntax versions), the new 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.



### **General features**

- Powerlock compatible
- Intermateable with other versions
- CE compliant
- EN/ESI compliant
- Contact retained within the thermoplastic housing with a flame-retardant UL94-VO plastic pin
- 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
- Multipoint contact area
- Silver Plated Contacts
- Mechanically keyed to prevent mating errors
- High impact bodies
- Screw, Crimp and Lug terminals to facilitate cables from 25mm<sup>2</sup> to 300 mm<sup>2</sup>
- Permanent marking to identify phase/line and safety information embossed on connector's body

### Identification color codes







## Typical applications

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

### **Technical data**

- Number of contacts: single pole
- Max continuous current rating with brass or bimetal contact: 480amp
- Max continuous current rating with copper contact: 750amp
- Operating Voltage: 1000V AC / 1500V DC
- Test Voltage: 4500 V AC
- **Short Circuit Rating:** 16.1kA (1 sec) 13.8kA (2sec)11.5kA (3 sec) 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 VO
- Coupling method: bayonet lock with secondary locking pin
- Number of mating cycles: >500
- Operating temperature: -30°C/+125°C
- Contact termination tightening torques: Set screw 12Nm max
  M12 threaded post 30Nm max
  M12 threaded hole 30Nm max
  EasiLug 20Nm max
  ComLug L (480A) 30Nm max
  ComLug L2 (750A) 30Nm max
  ComLug XL (750A) 30Nm max



### **Rated current**



Data for 90° Copper cable ratings - For aluminium cable, ratings decrease by approximately 25%

### IP2X drain contact safety lock Patented by Syntax

On our drain single pole connectors, the IP2X protection is obtained through a patented safety lock of the sharp-pointed insulated cap. This proprietary solution prevents pushing the contact inwards with fingers and provides mechanical lock in case of improper pushing of the contact.







#### **Multilouver contact band** and locking mechanism

To prevent a faulty retention of the contact band 1 and to ensure the efficiency of the connection, we adopted a solution which keeps the multilouver spring loaded band positively locked. 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 derailment of the multilouver contact band 3.

#### Source contact IP2X threaded protection

The touch-proof protection on source contacts features a threaded attachment. A breakage of the insulation caps is a risk for the operators' safety. Thanks to this solution, the touch-proof cap is threaded and then blocked with specific adhesives. The bond between the protective elements and the live parts is strengthened, improving safety through a reduced exposure of the metal parts, as a portion of the cap will remain in position even in case of damage.



#### PowerSyntax contact guide pin

For easy alignment of the holes on contact and insulating body, and quick insertion of the white dowel pin, the PowerSyntax contacts feature a guide pin with a corresponding recess in the insulator. After locating recess A in the body, find guide pin **B** on the contact, then insert guide pin **B** inside recess A, as shown in picture C.For contact fastening, after locating hole **D** on the body, insert dowel pin **E** in hole **D**. Contact retention is then completed F.

### **Ergonomics shapes our world**

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.





### Chain pilot Drain and source panel connectors with Microswitch



The new CHAIN PILOT system is an evolution of the PowerSyntax panel-mount single pole connectors. VALENTINI - Syntax® has become the first manufacturer in the world to have developed and marketed powerlock-style panel-mount connectors with built-in microswitch (international patent). Now protective electrical interlocking and/or additional controls can now be obtained, allowing constant monitoring of all the conductors in a power circuit. When a Chain Pilot is mated, a spring device pressed by the line connector is operated, activating the pilot microswitch housed in the rear of the flange. The Chain Pilot connectors are suitable for currents up to 480amp or up to 750amp. They are fully intermateable with standard PowerSyntax or other powerlock-style connectors.



## Technical data

#### **Pilot microswitch**

- Switching function: Changeover switch (spdt momentary)
- Number of poles: 1 pole
- Connections: Quick-connect terminal, 2.8 x 0.5, sealed
- Mechanical life endurance: 10E6
- Rating IEC / Rating North America: 10 (3) a 250 v ac 10E3
- Design: DIN 41635 B
- Contact resistance (new condition): < 100 (1 A 12 V DC Mohm
- Insulation resistance (new condition): > 100 (500 V DC) Mohm
- Voltage strength at 250V:
- function insulation / basic insulation 1500 V
- small contact distance 500 V
- Insulation spacing: acc. to EN 61058 for reinforced or double insulation
- Flammability: UL 94 V-0
- Glow wire test temperature: 850 °C





### **Activation button**



**Built-in pilot Microswitch** 



#### Panel drain With microswitch

On the panel drain, the spring device activating the microswitch is placed outside the mating part of the connector's shell.

On the panel source, the spring device activating the microswitch is placed inside the mating part of the connector's shell.

### **Examples of connection applications**



#### **5 Panel drain circuit**

5 PowerSyntax series panel drain connectors with built-in microswitches for phase conductors "L1, L2 & L3", neutral "N"and ground "E".



### **5 Panel source circuit**

5 PowerSyntax series panel source connectors with built-in microswitches for phase conductors "L1, L2 & L3", neutral "N" and ground "E".

### Contacts

The PowerSyntax Chain Pilot Panel connectors are equipped with different contact types, depending on current rating (480amp or 750amp) and cable terminations.



#### M12 threaded post

M12 threaded-post contact, up to 480 amp or 750 amp (all-copper contact). Lug terminal retained through M12 nut.



#### Extended length contact M12 threaded post

M12 threaded-post contact, up to 480 amp or 750 amp (all-copper contact). Lug terminal retained through M12 nut.



#### M12 threaded hole

M12 threaded-hole contact, up to 480 amp or 750 amp (all-copper contact). Lug terminal retained through M12 bolt.



#### Extended length contact M12 threaded hole

M12 threaded-hole contact, up to 480 amp or 750 amp (all-copper contact).Lug terminal retained through M12 nut.

### **Overall dimensions**

Chain pilot panel connector



Panel drain with M12 threaded post



Panel drain with M12 threaded hole



Panel drain Extended length contact with M12 threaded post



Panel drain Extended length contact with M12 threaded hole



Panel source with M12 threaded post



Panel source with M12 threaded hole



Panel source Extended length contact with M12 threaded post



Panel source Extended length contact with M12 threaded hole

### Panel mount cut-out dimensions



Panel drain front/rear



Panel source front/rear



## PowerSyntax 45 PowerSyntax 90

Single pole 45 or 90 degree angled panel connectors

PowerSyntax 45 and PowerSyntax 90 are designed to provide space saving options for your operations and a better management of your single pole, Powerlock compatible, panel-mount connections. Thanks to their versatile design they are an ideal combo with our patented Chain Pilot models, with our Basic panel connectors as a further option. PowerSyntax 45 and PowerSyntax 90 are available for current ratings up to 480 amp or 750 amp, Source and Drain versions.



### **PowerSyntax 45**

#### Drain and Source | 480 or 750 amp

Extra grip on plastic materials thanks to A2 stainless steel screws with pan heads. Knurled brass threaded inserts providing secure fixing to panels. IP2X protection through patented drain contact lock. Secondary locking safety system. Permanent phase identification and safety information markings engraved on connector's body. No stickers applied.









#### **PowerSyntax 90**

#### Drain and Source | 480 or 750 amp

Extra grip on plastic materials thanks to A2 stainless steel screws with pan heads. Knurled brass threaded inserts providing secure fixing to panels. IP2X protection through patented drain contact lock. Secondary locking safety system. Permanent phase identification and safety information markings engraved on connector's body. No stickers applied.



### Contacts

for PowerSyntax 45



M12 threaded hole

Standard contactfor PowerSyntax 45

Up to 480 amp or 750 amp (all copper contact). Lug terminal retained through M12 bolt. Tightening torque 30Nm max.

for PowerSyntax 90



#### M12 threaded post

Standard contact for PowerSyntax 90

Up to 480 amp or 750 amp (all copper contact). Lug terminal retained through M12 nut. Tightening torque 30Nm max.

### **Essential when mounting PowerSyntax 45 on metal panels**

#### **Insulating plastic ring**

Being safety always our first priority, we designed an extra protection, necessary when installing our PowerSyntax 45 on metal or conductive panels. This plastic ring, placed on the back of the panel, helps preventing any possible contact between the lug and the panel itself.

Caution: on metal panels the cut-out diameter is 48mm.



### Knurled brass threaded inserts Providing secure fixing to panels

The PowerSyntax 45 & 90 are attached to panels through special brass threaded inserts. Their knurled bands on the outside will grip the plastic of the base element as the screws are tightened into the insert.



Compatible screws: Stainless steel; ISO 7380-1; Metric M5; 3mm Hex socket; Button head screw; Head height 2.75mm; Head diameter 9.5mm.

Thread lengths, depending on the thickness of the panel: 16mm (panel thickness 0-5mm); 20mm (panel thickness 5-10mm)









For non-conductive panels Panel drain/source



For metal or conductive panels and insulating plastic ring Panel drain/source



Panel cut-out Panel drain/source