



## PSC-series DC/DC 100-150W 1 to 3 Outputs

### Input / Output

- Wide input voltage ranges.
- Single outputs from 5 to 48V.
- Two or three output 5V to 24V.
- Reverse input voltage protection.

### Operation

- High efficiency.
- Operating temperature range -25 to +70°C with no derating.
- Fully encapsulated, meets IP30 as standard.
- Convection cooled.
- Inhibit /Power Down input.
- Low voltage alarm, open collector.

### Features

- Conformally coating, tropic.
- Under voltage logic alarm.
- Accessible on front panel:
  - Output voltage adjustment.
  - Output voltage measurement.
  - Output OK status green LED.

### EMC

- EN61000-6-3, Emission.
- EN61000-6-2, Immunity.
- EN/IEC61000-4-4, 4kV.
- EN/IEC61000-4-5 level 2&3.

### Input Voltage ranges

| Nominal inputs          | Input range  | Code |
|-------------------------|--------------|------|
| 12, 24 Vd.c.            | 10 to 30V    | A    |
| 24, 28, 36, 48 Vd.c.    | 20 to 60V    | B    |
| 48, 60, 72 Vd.c.        | 40 to 100 V  | CT   |
| 72, 96, 110, 127 Vd.c.  | 50 to 150 V  | C    |
| 110, 127, 220, 250Vd.c. | 90 to 270 V  | D    |
| 350, 440Vd.c.           | 250 to 500 V | E    |

Other input ranges on demand.

### Single output ratings

| Output  |           |            |
|---------|-----------|------------|
| Voltage | Current   | Power      |
| 5V      | 20 - 30A  | 100 - 150W |
| 12V     | 8 - 12.5A | 100 - 150W |
| 15V     | 7 - 10A   | 100 - 150W |
| 24V     | 4 - 6A    | 100 - 150W |
| 36V     | 3 - 4A    | 100 - 150W |
| 48V     | 2 - 3A    | 100 - 150W |

### T-input for Mobile application ranges

| Code | Continous range | Uin 0.1s- S2      |
|------|-----------------|-------------------|
| 24T  | 16.8 - 30Vd.c.  | 14.4 - 33.6Vd.c.  |
| 36T  | 25.2 - 45Vd.c.  | 21.6 - 50.4Vd.c.  |
| 48T  | 33.6 - 60Vd.c.  | 28.8 - 67.2Vd.c.  |
| 72T  | 50.4 - 90Vd.c.  | 43.2 - 100.8Vd.c. |
| 110T | 77 - 137.5Vd.c. | 66 - 154Vd.c.     |

The total output power can be derated on a T-range compared to the above output rating table page 2. Input voltage range according to train standard EN50155:2001 and IEC60571:1998.

### 2-3 outputs ratings

| Master Output | Auxiliary Output     | Total Power |
|---------------|----------------------|-------------|
| 5V 15 - 25A   | ±12V 1.2A            | 100 - 150W  |
| 5V 15 - 25A   | 12V 1.2A             | 100 - 150W  |
| 5V 15 - 25A   | ±15V 1.2A            | 100 - 150W  |
| 5V 15 - 25A   | 15V 1.2A             | 100 - 150W  |
| 12V 7.3 - 11A | 5V 2.5A <sup>2</sup> | 100 - 150W  |
| 12V 7 - 11A   | 12V 1.2A             | 100 - 150W  |
| 15V 5 - 8A    | 15V 1.2A             | 100 - 150W  |
| 24V 3 - 4.3A  | 24V 1.2A             | 100 - 150W  |

2. Common zero on the output.

## 100 - 150 W Single output

### Features

- Single outputs from 5 to 48 V.
  - Operating temperature range -25 to +70°C.
  - Fully Encapsulated meets IP30.
  - Convection cooled
  - Low voltage alarm, open collector
  - Inhibit / Power Down input
  - Conformal coating, Tropic
  - Compatible AC inputs models.
- Please ask for PSC-AC Datasheet.



## Single Output 100 - 150W

| Output  |                    |       | Input       |             |              |             |             |            |      |
|---------|--------------------|-------|-------------|-------------|--------------|-------------|-------------|------------|------|
| Voltage | Current            | Power | 10 - 30V    | 20 - 60V    | 40 - 100V    | 50 - 150V   | 90 - 270V   | 250 - 500V | Case |
| 5V      | 20.0A <sup>1</sup> | 100W  | PSC100A5    | PSC100B5    | PSC100CT5    | PSC100C5    | PSC100D5    | ---        | 10TE |
| 5V      | 30.0A <sup>1</sup> | 150W  | PSC150A5    | PSC150B5    | PSC150CT5    | PSC150C5    | PSC150D5    | ---        | 12TE |
| 12V     | 8.3A               | 100W  | PSC100A12   | PSC100B12   | PSC150CT12   | PSC150C12   | PSC150D12   | ---        | 10TE |
| 12V     | 12.5A              | 150W  | PSC150A12   | PSC150B12   | PSC150CT12   | PSC150C12   | PSC150D12   | ---        | 12TE |
| 13.6V   | 7.4A               | 100W  | PSC100A13.2 | PSC100B13.2 | PSC100CT13.2 | PSC100C13.2 | PSC100D13.2 | ---        | 10TE |
| 13.6V   | 11.0A              | 150W  | PSC150A13.2 | PSC150B13.2 | PSC150CT13.2 | PSC150C13.2 | PSC150D13.2 | ---        | 12TE |
| 15V     | 6.7A               | 100W  | PSC100A15   | PSC100B15   | PSC100CT15   | PSC100C15   | PSC100D15   | ---        | 10TE |
| 15V     | 10.0A              | 150W  | PSC150A15   | PSC150B15   | PSC150CT15   | PSC150C15   | PSC150D15   | ---        | 12TE |
| 24V     | 4.2A               | 100W  | PSC100A24   | PSC100B24   | PSC100CT24   | PSC100C24   | PSC100D24   | PSC100E24  | 10TE |
| 24V     | 6.3A               | 150W  | PSC150A24   | PSC150B24   | PSC150CT24   | PSC150C24   | PSC150D24   | PSC150E24  | 12TE |
| 48V     | 2.1A               | 100W  | PSC100A48   | PSC100B48   | PSC100CT48   | PSC100C48   | PSC100D48   | PSC100E48  | 10TE |
| 48V     | 3.1A               | 150W  | PSC150A48   | PSC150B48   | PSC150CT48   | PSC150C48   | PSC150D48   | PSC150E48  | 12TE |

1. Operating temperature range, see 2 outputs  
Other input and outputs combination on demand.

### How to read our product code:

Example **PSC100C24**

**PSC100** = Family code

**C** = input voltage code

**24** = Output voltage 24V

## Pin-out, Single output

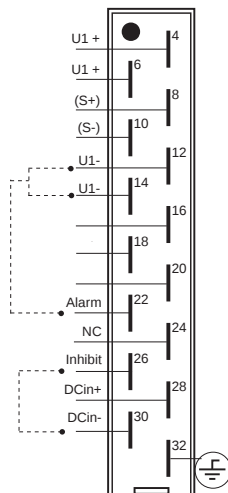


Figure 1. Pin-out single output with connector DIN41612, H15.

## Pin-out 2 & 3 outputs

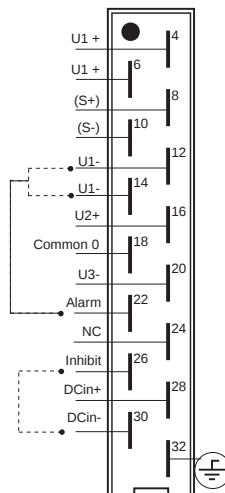


Figure 2. Pin-out 2 to 3 output with connector DIN41612, H15.

## 100 to 150W High Power 2&3 Outputs

### Features

- Master Outputs from 5 to 48 V
  - One auxiliary voltage 5 to 30V
  - Second auxiliary voltage 5 to 15V
  - Operating temperature range -25 to +70°C. +70°C with derating.
  - Fully Encapsulated meets IP30.
  - Convection cooled
  - Low voltage alarm, open collector
  - Inhibit / Power Down input
  - Conformal coating, Tropic
  - Compatible AC input models.
- Please ask for PSC-AC datasheet.



### Two outputs all input codes

| Master Output | Auxiliary Output     | Total Power | Input        |              |               |              |              | Case |
|---------------|----------------------|-------------|--------------|--------------|---------------|--------------|--------------|------|
|               |                      |             | 10 - 30V     | 20 - 60V     | 40 - 100V     | 50 - 150V    | 90 - 270V    |      |
| 5V 17A        | 12V 1.2A             | 100W        | PSC100A5S12  | PSC100B5S12  | PSC100CT5S12  | PSC100C5S12  | PSC100D5S12  | 10TE |
| 5V 25A        | 12V 1.2A             | 150W        | PSC150A5S12  | PSC150B5S12  | PSC150CT5S12  | PSC150C5S12  | PSC150D5S12  | 12TE |
| 5V 17A        | 15V 1.2A             | 100W        | PSC100A5S15  | PSC100B5S15  | PSC100CT5S15  | PSC100C5S15  | PSC100D5S15  | 10TE |
| 5V 25A        | 15V 1.2A             | 150W        | PSC150A5S15  | PSC150B5S15  | PSC150CT5S15  | PSC150C5S15  | PSC150D5S15  | 12TE |
| 12V 7.3A      | 5V 2.5A <sup>2</sup> | 100W        | PSC100A12S5  | PSC100B12S5  | PSC100CT12S5  | PSC100C12S5  | PSC100D12S5  | 10TE |
| 12V 11A       | 5V 2.5A <sup>2</sup> | 150W        | PSC150A12S5  | PSC150B12S5  | PSC150CT12S5  | PSC150C12S5  | PSC150D12S5  | 12TE |
| 12V 7A        | 12V 1.2A             | 100W        | PSC100A12S12 | PSC100B12S12 | PSC100CT12S12 | PSC100C12S12 | PSC100D12S12 | 10TE |
| 12V 11A       | 12V 1.2A             | 150W        | PSC150A12S12 | PSC150B12S12 | PSC150CT12S12 | PSC150C12S12 | PSC150D12S12 | 12TE |
| 15V 5.5A      | 15V 1.2A             | 100W        | PSC100A15S15 | PSC100B15S15 | PSC100CT15S15 | PSC100C15S15 | PSC100D15S15 | 10TE |
| 15V 9A        | 15V 1.2A             | 150W        | PSC150A15S15 | PSC150B15S15 | PSC150CT15S15 | PSC150C15S15 | PSC150D15S15 | 12TE |
| 24V 3A        | 24V 1.2A             | 100W        | PSC100A24S24 | PSC100B24S24 | PSC100CT24S24 | PSC100C24S24 | PSC100D24S24 | 10TE |
| 24V 5A        | 24V 1.2A             | 150W        | PSC150A24S24 | PSC150B24S24 | PSC150CT24S24 | PSC150C24S24 | PSC150D24S24 | 12TE |

Operating temperature range -25 to +55°C. For 70°C derate PSC100 to 75 W & PSC150 to 110W.

2. Common zero on the output.

The secondary output voltage are only factory adjustable.

Higher continuous auxiliary current up to 2.5A if the input voltage range is derated.

### Three outputs 24, 48 Input codes

| Master<br>Output | Auxiliary<br>Output | Total<br>Power | Input          |          |      |
|------------------|---------------------|----------------|----------------|----------|------|
|                  |                     |                | 10 - 30V       | 20 - 60V | Case |
| 5V 11A ±12V 1.2A | 100W                | PSC100A5S12-12 | PSC100B5S12-12 | 10TE     |      |
| 5V 20A ±12V 1.2A | 150W                | PSC150A5S12-12 | PSC150B5S12-12 | 12TE     |      |
| 5V 10A ±15V 1.2A | 100W                | PSC100A5S15-15 | PSC100B5S15-15 | 10TE     |      |
| 5V 20A ±15V 1.2A | 150W                | PSC150A5S15-15 | PSC150B5S15-15 | 12TE     |      |

See comments below

#### How to read our product code:

Example PSC150B12S5

**PSC150** = Family code & output power

**B** = Input voltage code

**S5** = Master output

**S5** = Stabilized slave output

### Three outputs 110, 220 Input codes

| Master Output | Auxiliary Output | Total Power | Input           |                |                | Case |
|---------------|------------------|-------------|-----------------|----------------|----------------|------|
|               |                  |             | 40 - 100V       | 50 - 150V      | 90 - 270V      |      |
| 5V 11A        | ±12V 2A          | 100W        | PSC100CT5S12-12 | PSC100C5S12-12 | PSC100D5S12-12 | 10TE |
| 5V 20A        | ±12V 2A          | 144W        | PSC150CT5S12-12 | PSC150C5S12-12 | PSC150D5S12-12 | 12TE |
| 5V 10A        | ±15V 2A          | 100W        | PSC100CT5S15-15 | PSC100C5S15-15 | PSC100D5S15-15 | 10TE |
| 5V 20A        | ±15V 2A          | 150W        | PSC150CT5S15-15 | PSC150C5S15-15 | PSC150D5S15-15 | 12TE |

Operating temperature range -25 to +55°C. For 70°C derate PSC100 to 75 W & PSC150 to 110W.

The two secondary output use common zero for ±12 or ±15 application or to supply -24V or 30V.

The secondary output voltage are only factory adjustable.

Higher continuous auxiliary current up to 2.5A if the input voltage range is derated.

## Auxiliary outputs

### Master - slave

The PSC-series uses a master slave configuration on the auxiliary outputs. The main power circuit is regulated by the master output. The auxiliary circuits use step down regulators. The advantage is high efficiency in all parts and we can supply continuously 1.2A on each of the auxiliary voltages. On special demand we can supply units with higher continuous auxiliary voltage. The disadvantage is that the master output need to take minimum 1/3 of the total load and do not supply any current if the master is unloaded.

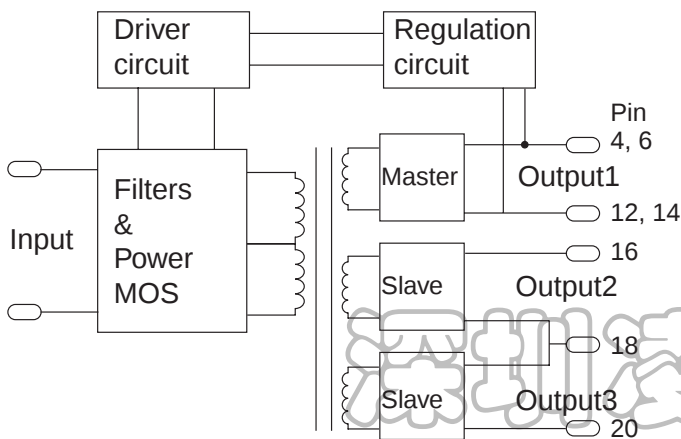


Figure 3. Master slave configuration.

## Auxiliary voltage current characteristic

### Auxiliary voltage current characteristic

Each auxiliary output is regulated by a step down regulator that have a continuous output current of 1.2A but can supply peak current during 2-3 ms. The voltage regulation is 2% (0-100% load). The current is protected by the faster current limit and a slower thermal limit.

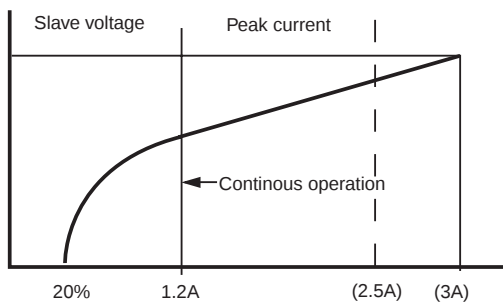


Figure 4. Current characteristic on slave voltage.

If the input voltage range is limited to handle a specific battery voltage the auxilliary continous current can be increased to 2.5A, please contact factory or your local contact.

## Features

### Under voltage logic alarm

On DC-inputs a built in logic alarm changes to alarm state if the converter output voltage drops 10% below nominal output. The DC OK LED is also controlled by the alarm circuit. The alarm has an open collector configuration. A voltage < 1V is normal operating condition. In alarm state the output can drive max 20mA 60V. The logic alarm works if a voltage is applied through a resistor on the collector output max voltage 60V. For relay output, see option B.

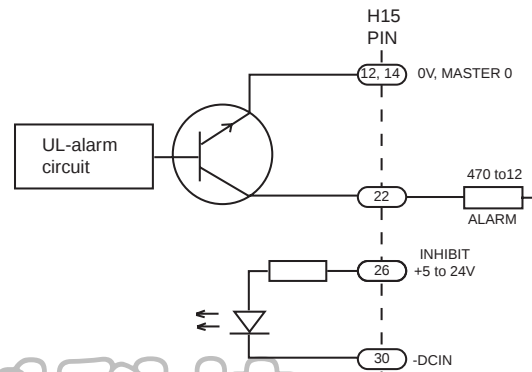


Figure 5. Open collector alarm and inhibit input.

### Inhibit – power down signal

To stop the converter, an external voltage (5 to 24 V) can be put between pin 26 and input zero (pin 30), see page 3. Do not use the output voltage to supply the inhibit.

### Reverse input voltage protection

Is provided by a parallel diode on the input. This diode is only intended to blow an external input fuse. See option K for more possibilities.

### Inrush current limit

A NTC resistor is provided on models with input code 220.

### Adjustment & measurement

Output voltage adjustment potentiometer and output voltage measurement points are accessible from the front panel.

### Conformal coating

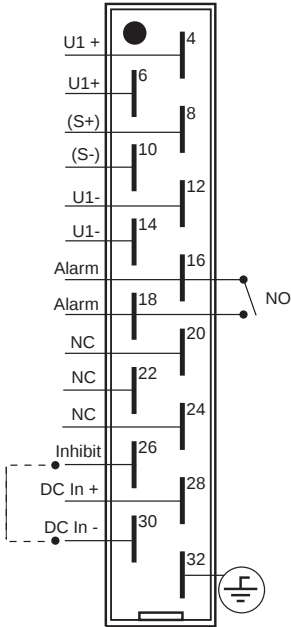
The PSC-series is conformally coated to withstand non-condensing tropical environment Rh 95%.

## Optional Features

### Overvoltage protection OVP-A

The output voltage is limited to 15% over nominal output voltage. A SCR short-circuits the output. It is reset by switching off the input or by an Inhibit signal. The OVP circuit is a standard feature on 5V outputs, which triggers at 6.2V

### Undervoltage alarm with relay -B



The standard under voltage logic alarm circuit output is replaced by a relay fault signalling output. The relay logic is NO (Normally Open) in alarm state. (Alarm state = no input or low output.) The relay rating is 30V 0.5A (a.c. & d.c.) Connect according to figure between Pin 16 and 18 on the H15 connector. Only possible on single output.

On PSC100 & PSC150 with E input code models the user can select NO or NC function. Then pin20 is also used.

### Built in series diode -C

A series diode on the output, which is mounted inside the case. Use this option when output is connected in parallel with other power supplies to achieve redundancy.

### Remote sense -S

The voltage sensing can be put at the load to compensate for voltage drop. Is a standard feature on 5V output.

### Inrush current limit with NTC

Reduce the inrush current during start up. The input voltage range might be affected. This feature or option is not recommended for stand-by operation (One supplies the load and the other is used as an idling back-up). The stand-by unit might not be able to supply enough current until the NTC warms up.

### Input diode for reverse voltage protection - K

Parallel diode reverse protection is a standard feature.

**K1.** Reverse protection with a series diode on the input. The input voltage range is affected with 1V higher start/stop voltage. On A and B this option derates the output power by the increased heat losses produced by such diode. Contact factory for details.

**K2.** Addition of a glass fuse. Can not be used on higher inputs than 180Vd.c.

### 2.5 kVa.c. isolation Input/case -E1

On 24 and 48 inputs.

The emission level increase to level A.

### 2.5 kVa.c. isolation Output/case -E2

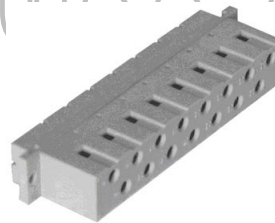
The emission level increase to level A.

### Euro panel -L, 10TE, 12TE see figure 7

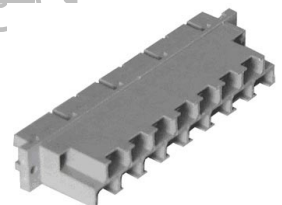
### Wall mounting panels -N, see figure 8 & 9

Includes H15 connector holder. The female connector has to be added. To mount on a DIN TS-35 rail, we can supply an optional DIN rail clips

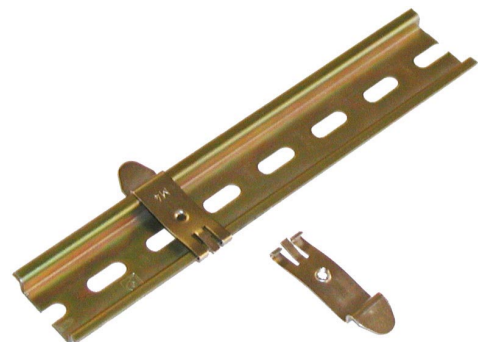
## Connector Options



H15 female Screw  
Connector H15-S



FastOn 6.3mm  
Connector H15-T



DIN-rail Clips

## General data DC/DC Converters

|                                      |                    |
|--------------------------------------|--------------------|
| Design topology                      | Push-Pull          |
| Switching frequency                  | 50 kHz             |
| Emission / immunity                  | See below          |
| Safety EN/IEC60950                   | Class I            |
| Max accepted input ripple 50 - 400Hz | 1% of nom. Voltage |
| Power consumption at no load         | 3 to 5W            |
| Reverse input voltage protection     | Parallel diode     |
| <b>Inrush current limit with</b>     |                    |
| Input Code A, B, CT                  | No                 |
| Input Code C                         | Optional NTC       |
| Input Code D, E                      | Yes with NTC       |
| Insulation                           | See below          |

## Safety and EMC



PSC-Series meets the requirements defined by CE mark as apparatus.

PSC-Series meets requirements of EMC directive and low voltage directive (LVD).

Thus a PSC-Series can be used as free standing unit or in installations as well as systems designed according to "The modular approach".

PSC-Series can be used in installation without further EMC tests, if our installation instructions are followed.

Please note that product standards can demand different levels or other basic standard tests. We test according to levels below. For higher levels or other tests, contact factory.

|                                                                          |              |
|--------------------------------------------------------------------------|--------------|
| Source regulation                                                        | 0.2%         |
| Load regulation (0-100% load) master                                     | 0.2%         |
| Cross regulation 25 to 100% load step on master                          | 0.2%         |
| Secondary regulation 0 to 100%                                           | 2%           |
| Transient recovery time for a load step of 10% to 100% voltage deviation | <2ms<br>3%   |
| Output ripple (50kHz) 2 Vp-p <sup>2</sup>                                | Typ. 10mV    |
| Input ripple attenuation on output 50 to 400Hz                           | 150:1        |
| Emission / Immunity                                                      | See below    |
| Temperature coefficient                                                  | 0.02% /°C    |
| <b>Min output adjustment range</b>                                       |              |
| adjustable with a 15 turn potentiometer                                  | 90% to 110%  |
| Current limit, rectangular.                                              | 105%         |
| Remote sense                                                             | Option S     |
| Soft start                                                               | Yes          |
| Isolation output / case                                                  | See below    |
| Start-up time                                                            | 1s           |
| Hold-up time, contact factory                                            | 2-25ms       |
| Efficiency <sup>3</sup>                                                  | 80 - 91%     |
| Operating temperature range at 100% load. Conduction cooling             |              |
| Single outputs >10 V                                                     | -25 to +70°C |
| Single outputs <10 V                                                     | -25 to +55°C |
| Dual & Tripple outputs                                                   | -25 to +55°C |
| Storage temperature range                                                | -40 to +85°C |

- Output ripple might increase when IEC/EN61000-4-3 10V/m test is applied to max 0.5%  $V_{RMS}$
- Lowest efficiency measured within the whole input voltage range at 100% load.

## Safety standard IEC60950

| Isolation testable levels                             | Input code |                     |
|-------------------------------------------------------|------------|---------------------|
|                                                       | A, B, CT   | C, D, E             |
| Input / output:                                       | 2kVd.c.    | 2.5kVa.c. / 4kVd.c. |
| Input / Case                                          | 2kVd.c.    | 2.5kVa.c. / 4kVd.c. |
| Output / Case all outputs                             | 2kVd.c.    | 2kVd.c.             |
| Master output / Auxiliary outputs                     | 2kVd.c.    | 2kVd.c.             |
| Alarm / Input                                         | 2kVd.c.    | 2.5kVa.c. / 4kVd.c. |
| <b>Isolation, not testable level Safety Isolation</b> |            |                     |
| Transformer isolation In/Out:                         | 2kVd.c.    | 4 kVa.c./8mm        |

We use the product standard Low voltage power supplies, DC outputs EN/IEC61204-3 and the generic EMC standards: EN/IEC61000-6-2 (Immunity) EN/IEC61000-6-3 (Emission)

## EMC

| EMC-standards                                                                      | EMC-performance     |                     |                                                                |
|------------------------------------------------------------------------------------|---------------------|---------------------|----------------------------------------------------------------|
| Emission standards                                                                 | Input               | Output              | Remarks                                                        |
| EN55011/EN55022 (0.15-30MHz)                                                       | Level B             | Level B             |                                                                |
| EN55011/EN55022 (30-1000MHz)                                                       | Level B             |                     | Enclosure test                                                 |
| Immunity standards                                                                 | IEC/EN61000-6-2     |                     |                                                                |
| EN/IEC61000-4-2                                                                    | 8 kV/15 kV          |                     | Contact / air, Enclosure test                                  |
| EN/IEC61000-4-3                                                                    | 10 V/m AM-Modulated |                     | Output ripple can increase to 0.5% of $V_{out}$ Enclosure test |
| EN/IEC61000-4-4                                                                    | 4 kV                | 4 kV                |                                                                |
| EN/IEC61000-4-5, Input code 24, 48                                                 | 0.5kV / 1 kV        | 0.5kV / 1 kV        | Line-line 2Ω / Line-case 12Ω                                   |
| EN/IEC61000-4-5, Input code 110 <sup>1</sup> , 220 <sup>1</sup> , 440 <sup>1</sup> | 1kV / 2 kV          | 0.5kV / 1 kV        |                                                                |
| EN50155 Figure 4, 1.8kV 1.5/50μs                                                   | Yes                 |                     | Line-line 100 Ω                                                |
| EN/IEC61000-4-6                                                                    | 10 V <sub>RMS</sub> | 10 V <sub>RMS</sub> | AM-Modulated                                                   |
| EN/IEC61000-4-8                                                                    | Not sensitive       |                     | Enclosure test                                                 |
| EN/IEC61000-4-10                                                                   | Not sensitive       |                     | Enclosure test                                                 |

<sup>1</sup> Higher level 2kV / 4kV with external filters, contact factory.

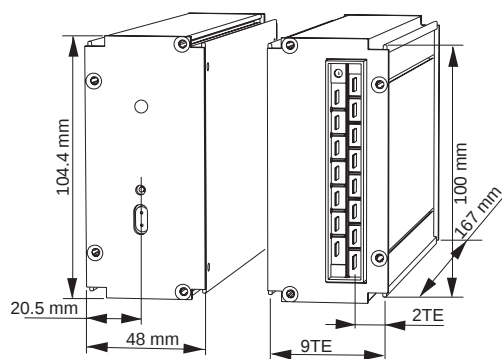


Figure 5. Front and connector side of PSC100

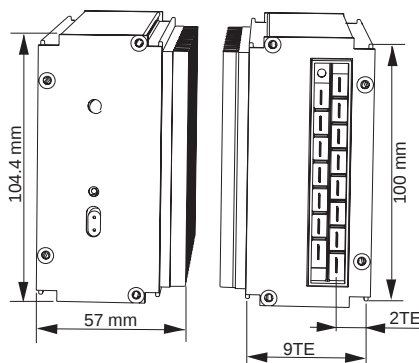


Figure 6. Front and connector side of PSC150

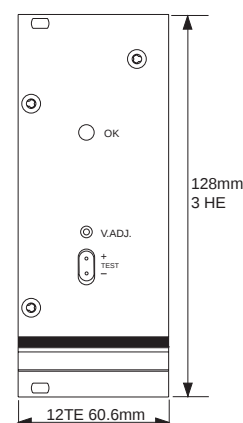


Figure 7. Front panel 3HE option L

The PSC-family are built in a tubular aluminium extrusion, with high thermal conductance which also work as a good EMC shield. The mechanical design permits use in vehicles and heavy industrial environments. The IP class is IP30. On special demand up to IP54 can be supplied using special connectors.

Vibration and shock resistance is high in standard DIN431605: 6g 10ms (5000 times in 3 directions) Higher as 15g 50ms or 30g 10ms can also be provided on demand.

| Type                   | PSC100 | PSC150 |
|------------------------|--------|--------|
| d (mm)                 | 50.4   | 60.6   |
| d (TE)                 | 10     | 12     |
| Weight 1 Output        | 1.0 Kg | 1.2 Kg |
| Weight 2&3 outputs     | 1.1 Kg | 1.3 Kg |
| Wall mounting set      |        |        |
| e (mm)                 | 53     | 63     |
| Weight incl. connector | 1.2 Kg | 1.3 Kg |

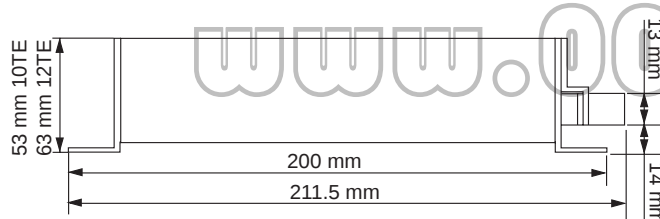


Figure 10. Side view on wall mounting option N

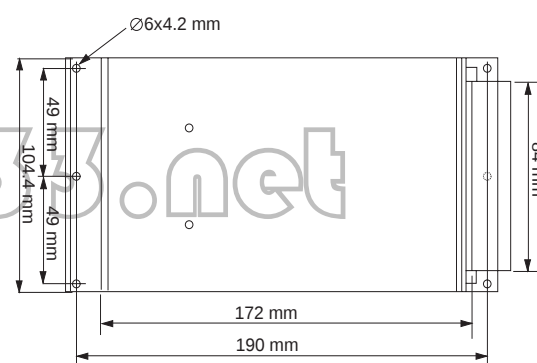
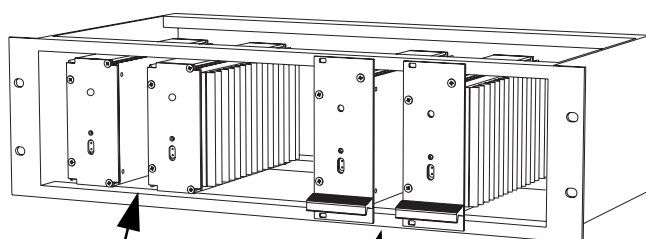
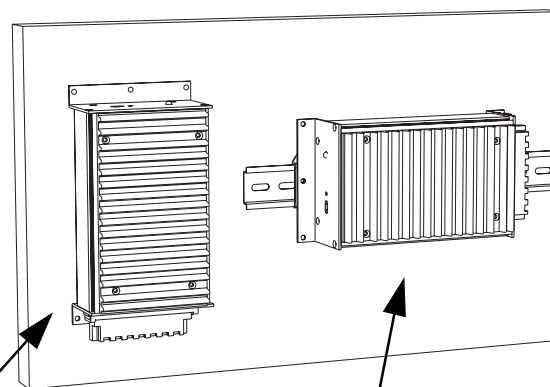


Figure 11. Top view on wall mounting option N



PSC mounted in a 19" Sub-rack. Standard unit.

PSC mounted in a 19" Sub-rack with L panel (Optional)



PSC wall mounted. Using PSC wall mounting kit including connector holder. The female H15 connector is optional. See page 5 for the selection

PSC DIN-rail mounted. Using PSC wall mounting kit with H15 connector, connector holder and DIN-rail clips (Optional).

Note: Wall mounting is standard on the swedish market.