POLYAMP

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

INPUT / OUTPUT

- Wide input voltage ranges, 10 to 500 Vd.c.
- Single outputs from 5 to 48 Vd.c.
- Two or three outputs from 5 to 24 Vd.c. up to 2 A
- Reverse input voltage protection

FEATURES

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

OPERATION

- Operating temperature range -25 to +70 °C
- High efficiency
- Fully encapsulated, meets IP30 as standard
- Convection cooled
- Low voltage alarm, open collector
- Inhibit / Power Down input

EMC

- EN IEC 61000-6-3, Emission
- EN IEC 61000-6-2, Immunity
- EN IEC 61000-4-4, 4 kV
- EN IEC 61000-4-5 level 2 & 3

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

Other input ranges on demand.

DC INPUTS MOBILE		
Uin 0.1 s - S2	**Continous range**	**Code**
14.4-33-6 Vd.c.	16.8-30 Vd.c.	24T
21.6-50.4 Vd.c.	25.2-45 Vd.c.	36T
28.8-67.2 Vd.c.	33.6-60 Vd.c.	48T
43.2-100.8 Vd.c.	50.4-90 Vd.c.	72T
66-154 Vd.c.	77-137.5 Vd.c.	110T

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 EN 50155:2001 and IEC 60571:1998.

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

2 TO 3 OUTPUTS		
Master output	**Auxiliary output**	**Total Power**
5 V 10-20 A	±12 V 1.2-2.0 A	100-150 W
5 V 10-20 A	12 V 1.2-2.0 A	100-150 W
5 V 10-20 A	±15 V 1.2-1.7 A	100-150 W
5 V 10-20 A	15 V 1.2-1.7 A	100-150 W
12 V 7.3-11 A	5 V 2.5 A[2]	100-150 W
12 V 7-11 A	12 V 1.2-2.0 A	100-150 W
15 V 5-8 A	15 V 1.2-2.0 A	100-150 W
24 V 3-4.2 A	24 V 1.2-2.0 A	100-150 W

2. Common zero on the output.

SINGLE OUTPUT 100 TO 150 W

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 RATING & TYPE CODE 100-150 W

OUTPUT			INPUT					
Voltage	**Current**	**Power**	**10 - 30 V**	**20 - 60 V**	**40 - 100 V**	**50 - 150 V**	**90 - 270 V**	**250 - 500 V**
5 V	20.0 A[1]	100 W	PSC100A5	PSC100B5	PSC100CT5	PSC100C5	PSC100D5	---
5 V	30.0 A[1]	150 W	PSC150A5	PSC150B5	PSC150CT5	PSC150C5	PSC150D5	---
12 V	8.3 A	100 W	PSC100A12	PSC100B12	PSC100CT12	PSC100C12	PSC100D12	---
12 V	12.5 A	150 W	PSC150A12	PSC150B12	PSC150CT12	PSC150C12	PSC150D12	---
13.6 V	7.40 A	100 W	PSC100A13.6	PSC100B13.6	PSC100CT13.6	PSC100C13.6	PSC100D13.6	---
13.6 V	11.0 A	150 W	PSC150A13.6	PSC150B13.6	PSC150CT13.6	PSC150C13.6	PSC150D13.6	---
15 V	6.7 A	100 W	PSC100A15	PSC100B15	PSC100CT15	PSC100C15	PSC100D15	---
15 V	10.0 A	150 W	PSC150A15	PSC150B15	PSC150CT15	PSC150C15	PSC150D15	---
24 V	4.2 A	100 W	PSC100A24	PSC100B24	PSC100CT24	PSC100C24	PSC100D24	PSC100E24
24 V	6.3 A	150 W	PSC150A24	PSC150B24	PSC150CT24	PSC150C24	PSC150D24	PSC150E24
48 V	2.1 A	100 W	PSC100A48	PSC100B48	PSC100CT48	PSC100C48	PSC100D48	PSC100E48
48 V	3.1 A	150 W	PSC150A48	PSC150B48	PSC150CT48	PSC150C48	PSC150D48	PSC150E48

1) Operating temperature range, see 2 outputs. Other input and outputs combination on demand.
Case on all models in the table: 10TE

How to read our product code:
Example PSC100A24
PSC100 = Family code
A = input voltage code A
24 = Output voltage 24 V

PIN-OUT, SINGLE OUTPUT

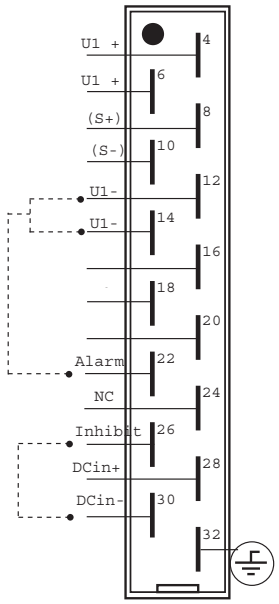


Figure 1. Pin-out single output with connector DIN41612, H15.

PIN-OUT 2 & 3 OUTPUTS

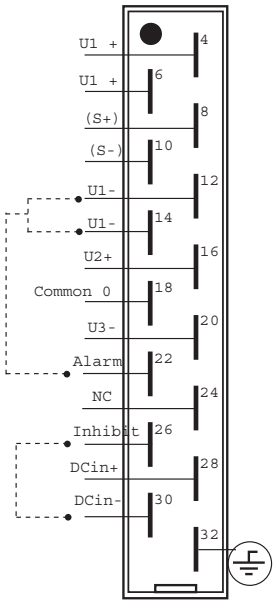


Figure 2. Pin-out 2 to 3 outputs with connector DIN41612, H15.

TWO AND THREE OUTPUTS 100 TO 150 W

FEATURES

- Master Outputs from 5 to 48 V
- One auxiliary voltage 5 to 30 V
- Second auxiliary voltage 5 to 15 V
- Operating temperature range -25 to +55 °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

OUTPUT			INPUT					
Master Output	**Auxiliary Output**	**Total Power**	**10 - 30 V**	**20 - 60 V**	**40 - 100 V**	**50 - 150 V**	**90 - 270 V**	**Case**
5 V 17 A	12 V 1.2 A	100 W	PSC100A5S12	PSC100B5S12	PSC100CT5S12	PSC100C5S12	PSC100D5S12	10TE
5 V 20 A	12 V 2.0 A	124 W	PSC150A5S12	PSC150B5S12	PSC150CT5S12	PSC150C5S12	PSC150D5S12	12TE
5 V 17 A	15 V 1.2 A	100 W	PSC100A5S15	PSC100B5S15	PSC100CT5S15	PSC100C5S15	PSC100D5S15	10TE
5 V 20 A	15 V 2.0 A	130 W	PSC150A5S15	PSC150B5S15	PSC150CT5S15	PSC150C5S15	PSC150D5S15	12TE
12 V 7.3 A	5 V 2.5 A[2]	100 W	PSC100A12S5	PSC100B12S5	PSC100CT12S5	PSC100C12S5	PSC100D12S5	10TE
12 V 11.5 A	5 V 2.5 A[2]	150 W	PSC150A12S5	PSC150B12S5	PSC150CT12S5	PSC150C12S5	PSC150D12S5	12TE
12 V 7 A	12 V 1.2 A	100 W	PSC100A12S12	PSC100B12S12	PSC100CT12S12	PSC100C12S12	PSC100D12S12	10TE
12 V 10.5 A	12 V 2.0 A	150 W	PSC150A12S12	PSC150B12S12	PSC150CT12S12	PSC150C12S12	PSC150D12S12	12TE
15 V 5.5 A	15 V 1.2 A	100 W	PSC100A15S15	PSC100B15S15	PSC100CT15S15	PSC100C15S15	PSC100D15S15	10TE
15 V 8 A	15 V 2.0 A	150 W	PSC150A15S15	PSC150B15S15	PSC150CT15S15	PSC150C15S15	PSC150D15S15	12TE
24 V 3 A	24 V 1.2 A	100 W	PSC100A24S24	PSC100B24S24	PSC100CT24S24	PSC100C24S24	PSC100D24S24	10TE
24 V 4.2 A	24 V 2.0 A	150 W	PSC150A24S24	PSC150B24S24	PSC150CT24S24	PSC150C24S24	PSC150D24S24	12TE

Operating temperature range -25 to +55 °C. For 70 °C derate PSC100 to 75 W and PSC150 to 110 W.
2. Common zero on the output. The secondary output voltage are only factory adjustable. Higher continous auxilliary current up to 2.5 A if the input voltage range is derated.

THREE OUTPUTS 24, 48 INPUT CODES

OUTPUT			INPUT		
Master Output	**Auxiliary Output**	**Total Power**	**10 - 30 V**	**20 - 60 V**	**Case**
5 V 14 A	±12 V 1.2 A	100 W	PSC100A5S12-12	PSC100B5S12-12	10TE
5 V 20 A	±12 V 2.0 A	150 W	PSC150A5S12-12	PSC150B5S12-12	12TE
5 V 13 A	±15 V 1.2 A	100 W	PSC100A5S15-15	PSC100B5S15-15	10TE
5 V 20 A	±15 V 1.7 A	150 W	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 B
12 = Master Output 12 V
S5 = Stabilized slave output

THREE OUTPUTS 110, 220 INPUT CODES

OUTPUT						
Master Output	**Auxiliary Output**	**Total Power**	**40 - 100 V**	**50 - 150 V**	**90 - 270 V**	**Case**
5 V 14 A	±12 V 1.2 A	100 W	PSC100CT5S12-12	PSC100C5S12-12	PSC100D5S12-12	10TE
5 V 20 A	±12 V 2.0 A	150 W	PSC150CT5S12-12	PSC150C5S12-12	PSC150D5S12-12	12TE
5 V 13 A	±15 V 1.2 A	100 W	PSC100CT5S15-15	PSC100C5S15-15	PSC100D5S15-15	10TE
5 V 20 A	±15 V 1.7 A	150 W	PSC150CT5S15-15	PSC150C5S15-15	PSC150D5S15-15	12TE

Operating temperature range -25 to +55 °C. For 70 °C derate PSC100 to 75 W and PSC150 to 110 W.
The two secondary outputs use common zero for ±12 or ±15 application or to supply -24 V or 30 V.
The secondary outputs voltage are only factory adjustable.
Higher continous auxilliary current up to 2.5 A 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 continuosly 1.2 A 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.

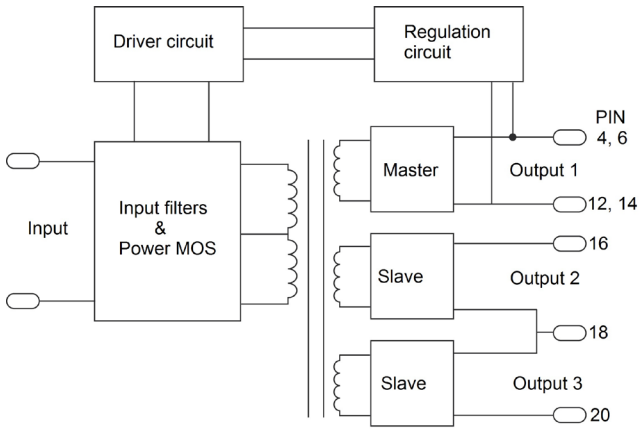


Figure 3. Master slave configuration.

AUXILIARY VOLTAGE CURRENT CHARACTERISTIC

Each auxiliary output is regulated by a step down regulator that have a continuous output current of 1.2 to 2.0 A.
A peak current during 2 to 3 ms can be supplied up to 3 A. The current is protected by the faster current limit and a slower thermal limit. The voltage regulation is 2 % (0 to 100 % load).

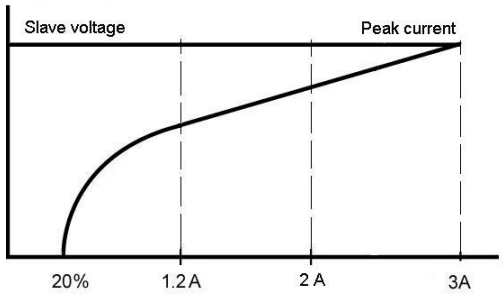


Figure 4. Current characteristic on slave voltage.

If the input voltage range is limited to handle a specific battery voltage the auxilliary continous current can be increased to 2.5 A, 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 < 1 V is normal operating condition. In alarm state the output can drive max 20 mA 60 V. The logic alarm works if a voltage is applied through a resistor on the collector output max voltage 60 V.
For relay output, see option B.

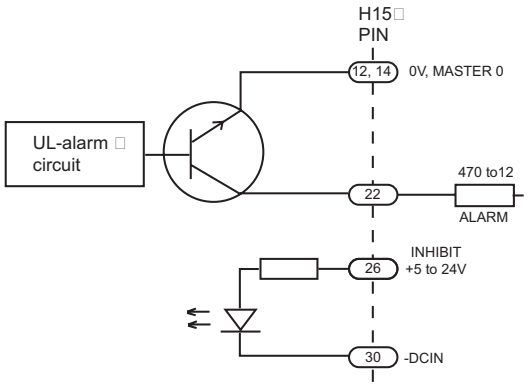


Figure 5. Open collector alarm and inhibit input.

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 2. 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 D and E.

Adjustment & measurement

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

Conformal coating

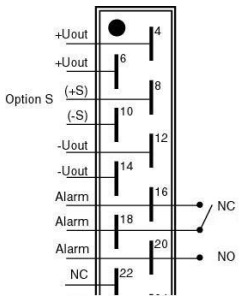
The PSC-series is conformally coated to withstand non-condensing tropical environment Rh 95 %.

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 5 V outputs, which triggers at 6.2 V.

Undervoltage alarm with relay -B



The logic alarm is replaced by a dual relay NO/NC (Normally Open) in alarm state. (Alarm state = no input or low output), see figure.

The relay rating is 30 V 0.5 A (a.c. & d.c.). Other ratings on demand.

This option is only available on single output models.

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 achive redundancy.

Built in series diode with resistor - CR

The CR option automatically balance the load between two or more paralleled PSC units.

Remote sense -S

The voltage sensing can be put at the load to compensate for voltage drop. Is a standard feature on 5 V 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 1 V 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 180 Vd.c.

2.5 kVa.c. isolation Input/case -E1

On 24 and 48 inputs.

2.5 kVa.c. isolation Output/case -E2

Euro panel -L, 10, 12 or 14TE see figure 8

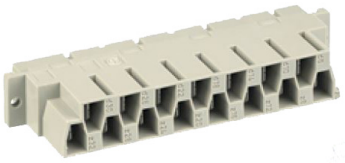
Wall mounting panels -N, see figure 9 & 10

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.

Extra cooler, option T3

The PSC case can accommodate 2 extra coolers. Some options e.g series diode will require an extra cooler to avoid derating 20% or the EN 50155/IEC 60571 T3 temperature classification requiring +85°C during 10 min. Each cooler is 10 mm, which increase the size and weight accordingly.

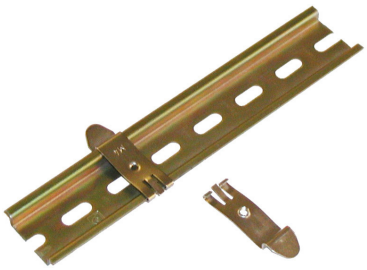
CONNECTOR OPTIONS



H15 FastOn 6.3 mm female - H15-T

H15 Cage Clamp type female - H15-CC

The cable rating is AWG16 or < 1.5 mm2. That makes it not usable for A-input and 5 V outputs.



DIN-rail Clips

GENERAL DATA / INPUT DATA

LABEL	VALUE
Design topology	Push-Pull
Switching frequency	50 kHz
Emission / Immunity	See page 8
Max. accepted input ripple 50-400 Hz	1 % of nominal voltage
Power consumption at no load	3 to 5 W
Reverse input voltage protection	Parallel diode
Inrush current limit	
A, B, CT input code	No
C input code	Optional NTC
D, E input code	Yes with NTC
Insulation	See page 8
Fire Protection EN 45545-2 HL 3 level 4.3.2 rule 1 and figure 1	"Non listed product" < 100 g
Dimensions	See below
Weight	See below

Type	PSC100	PSC150
d (mm)	48	57
d (TE)	10	12
Weight: 1 output (kg)	1.0	1.2
Weight : 2 & 3 outputs (kg)	1.1	1.3
Wall mounting set		
e (mm)	53	63
Weight incl. connector (kg)	1.2	1.3

OUTPUT DATA

LABEL	VALUE
Source regulation	0.2 %
Load regulation (0 to 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 load step 10 to 100 % voltage deviation	< 2 ms 3 %
Output ripple (50 kHz)[1]	10 mV p-p
Input ripple attenuation to output (50 to 400 Hz)	150:1
Emission / Immunity	See page 8
Temperature coefficient	0.02 %/°C
Min output adjustment range adjustable with a 15 turn potentiometer	90 - 110 %
Current limit, rectangular.	105 %
Remote sense	Option S
Soft start	Yes
Isolation output / case	See page 8
Start-up time	1 s
Hold-up time, contact factory	2 - 25 ms
Efficiency[2]	80 - 91 %
Operating temperature range at 100 % load. Conduction cooling Single outputs > 10 V Single outputs < 10 V Dual % tripple outputs	 -25 to +70 °C -25 to +55 °C -25 to +55 °C
Storage temperature range	-40 to +85 °C

1. Output ripple might increases when EN/IEC 61000-4-3 10 V/m test is applied to max 0.5 %VRMS

2. Lowest efficiency measured within the whole input voltage range at 100 % load.

N-option for wall, chassis and DIN rail mount

N-option, fixed against external cooler. The spacers hold the H15 connector

L-option 10TE, 12TE, 14TE

MECHANICAL DRAWING

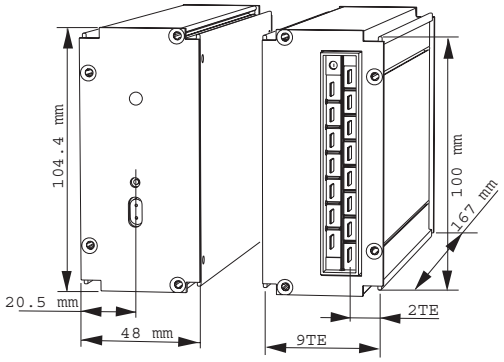


Figure 6. Front and connector side of PSC100

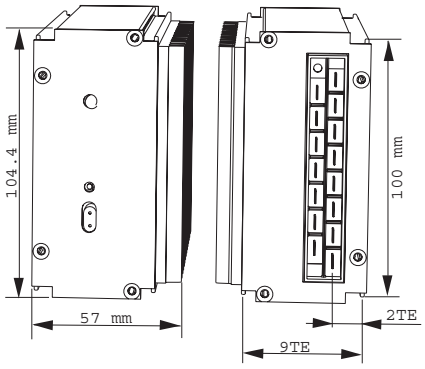


Figure 7. Front and connector side of PSC150

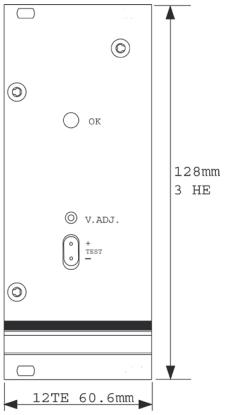


Figure 8. Front panel 3HE option L

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 DIN 431605: 6 g 10 ms (5000 times in 3 directions)
Higher as 15 g 50 ms or 30 g 10 ms can also be provided on demand.

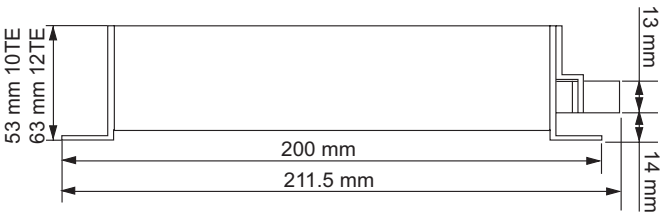


Figure 9. Side view on wall mounting option N

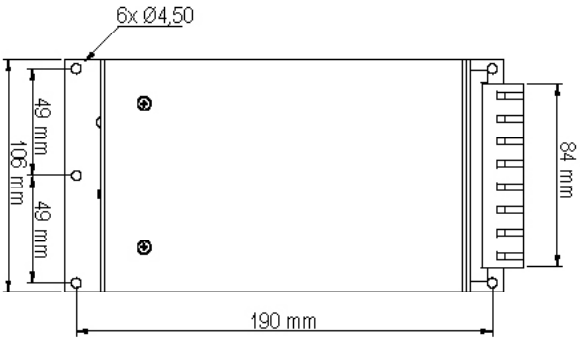
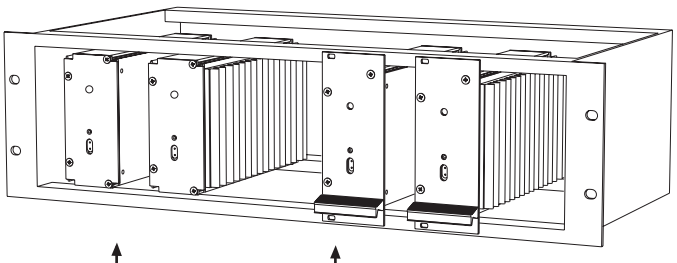
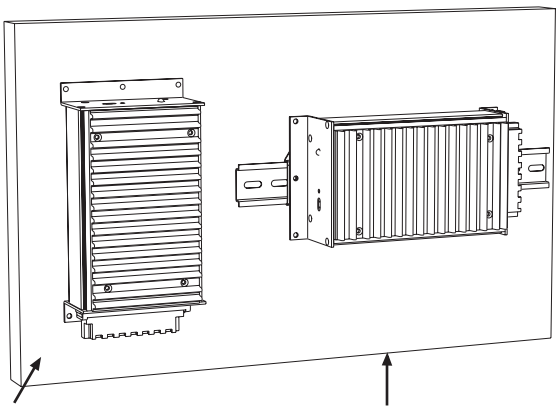


Figure 10. Top view on wall mounting option N



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)

CE MARK

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

PSC-series meets requirements of EMC directive and low voltage directive (LVD) and RoHS II directive.

The PSC-series family is in respect to EMC, a stand alone unit that can also be installed in any other environment by a professional installer.

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

SAFETY STANDARD EN/IEC 60950

ISOLATION TESTABLE LEVELS		TEST VOLTAGE
Input / Output:	Input code: A, B, CT	2 kVd.c.
	Input code: C, D, E	2.5 kVa.c. / 4 kVd.c.
Input / Case:	Input code: A, B, CT	2 kVd.c.
	Input code: C, D, E	2.5 kVa.c. / 4 kVd.c.
Output / Case all outputs		2 kVd.c.
Master Output / Auxiliary Outputs		2 kVd.c.
Alarm / Input:	Input code: A, B, CT	2 kVd.c.
	Input code: C, D, E	2.5 kVa.c. / 4 kVd.c.
ISOLATION TESTABLE LEVELS		**SAFETY ISOLATION**
Transformer isolation In / Out:		
	Input code: A, B, CT	2 kVd.c.
	Input code: C, D, E	4 kVa.c. / 8 mm

Installation Class I

EMC

EMC STANDARDS	EMC PERFORMANCE		REMARKS
Emission standards	**EN IEC 61000-6-3**		**Commercial and light-industrial environments**
	Input	**Output**	
EN 55016 CISPR 16 (0.15-30 MHz)	OK	OK	opt.EN 55022 level B
EN 55016 CISPR 16 (30-1000 MHz)	OK		Enclosure test
Immunity standards	**EN IEC 61000-6-2**		**Industrial environments**
EN IEC 61000-4-2	8 kV / 15 kV		Contact / air, Enclosure test
EN IEC 61000-4-3	10 V/m AM-Modulated[2]		Output ripple can increase to 0.5% of Vout Enclosure test
EN IEC 61000-4-4	± 4 kV	± 4 kV	
EN IEC 61000-4-5, Input code A, B, CT	± 0.5 kV / ± 1 kV	± 0.5 kV / ± 1 kV	Line-line 2 Ω / Line-case 12 Ω
EN IEC 61000-4-5, Input code C, D, E	± 1 kV / ± 2 kV[1]	± 0.5 kV / ± 1 kV	Line-line 2 Ω / Line-case 12 Ω
EN 50121-3-2, IEC 62236-3-2	± 1 kV / ± 2 kV	± 1 kV / ± 2 kV	Line-line 42 Ω / Line-case 42 Ω
EN IEC 61000-4-6	10 V_{RMS}	10 V_{RMS}	AM-Modulated
EN IEC 61000-4-8	Not sensitive		Enclosure test
EN IEC 61000-4-10	Not sensitive		Enclosure test

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

We use the EMC product standard "Low voltage power supplies DC output" EN 61204-3 as base for measurement principles. The Immunity EMC levels are elevated in order to comply to EN 50121-3-2 (IEC 62236-3-2) Railway application: Rolling stock – Apparatus, and EN 50121-4 (IEC 62236-4) Railway application: Signaling and telecommunication apparatus. Also to meet relevant parts of IEC 61000-6-5 Generic Standards – Immunity for power stations and substation environments.

POLYAMP

- A secure part of your system

50 YEARS EST.1966

HEAD OFFICE
Polyamp AB
Box 925
SE-191 29 Sollentuna
Sweden
Phone: +46 8 594 693 00
Telefax: +46 8 594 693 05

SALES OFFICE
Polyamp AB
Box 229
SE-597 25 Åtvidaberg
Sweden
Phone: +46 120 854 10
Telefax: +46 120 854 05

Email: info@polyamp.se
www.polyamp.com

SALES OFFICE
Switch Craft S.A
Ruel bel Air 63
CH-2300 La Chaux-de-fonds
Switzerland
Phone: +41 32 96 78800
Telefax: +41 32 96 78809