

PSE250

DC-DC Converter



PSE250-series 150 to 250 W

Input / Output

- Optimized input voltage ranges.
- Input ranges from 18 to 300 Vd.c.
- Single outputs from 12 to 125 Vd.c.
- Reverse input voltage protection.

Operation

- High efficiency >88 %.
- Operating temperature range -25 to +70 °C.
- Fully encapsulated, meets IP30 as standard.
- Convection cooled.
- Low voltage alarm, with logic signal.
- Input overvoltage switch-off.

Features

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

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.
- Both input and output.

Input and output ratings

Standard input ranges			
Nominal inputs	Input range	Stop level ¹	Code
24 Vd.c.	18 - 32 V	<16.8 Vd.c.	24
48 Vd.c.	38 - 60 V	<33.6 Vd.c.	48
110 - 125 Vd.c.	88 - 150 V	<77 Vd.c.	110
220 Vd.c.	185 - 300 V	<154 Vd.c.	220

Output		
Voltage	Current	Power
12 V	12.5 A	150 W
13.2 V	11.3 A	150 W
15 V	10.0 A	150 W
24 V	8.3 - 10.4 A	200 - 250 W
48 V	4.1 - 5.2 A	200 - 250 W
110 V	1.8 - 2.3 A	200 - 250 W

DC Inputs Mobile

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 - 150 Vd.c.	110T

The total output power can be derated on a T-range compared to the above output rating table.

Other input and outputs combination on demand.
Input range:

Within the range we guarantee full output performance, $U_{out} + 10\%$ $I_{out} + 5\%$.

Note 1. Stop level:

The converter works down to the stop level.

The output voltage might decrease to approx -10% of nominal output at the stop level.

Output ratings and type code

Output			Input				
Voltage	Current	Power	18 - 32 V	38 - 60 V	88 - 150 V	185 - 300 V	Case
12 V	12.5 A	150 W	PSE150 24/12	PSE150 48/12	PSE150 110/12	PSE150 220/12	8TE
13.2 V	11.3 A	150 W	PSE150 24/13.2	PSE150 48/13.2	PSE150 110/13.2	PSE150 220/13.2	8TE
15 V	10.0 A	150 W	PSE150 24/15	PSE150 48/15	PSE150 110/15	PSE150 220/15	8TE
24 V	8.3 A	200 W	PSE200 24/24	PSE200 48/24	PSE200 110/24	PSE200 220/24	8TE
24 V	10.4 A	250 W	PSE250 24/24	PSE250 48/24	PSE250 110/24	PSE250 220/24	10TE
48 V	4.1 A	200 W	PSE200 24/48	PSE200 48/48	PSE200 110/48	PSE200 220/48	8TE
48 V	5.2 A	250 W	PSE250 24/48	PSE250 48/48	PSE250 110/48	PSE250 220/48	10TE
110 V	1.8 A	200 W	PSE200 24/110	PSE200 48/110	PSE200 110/110	PSE200 220/110	8TE
110 V	2.3 A	250 W	PSE250 24/110	PSE250 48/110	PSE250 110/110	PSE250 220/110	10TE

How to read our product code:

Example **PSE250 48/24** PSE250 = Family code, 48 = Input voltage code, 24 = Output voltage 24 V

Features

Conformal coating

PSE250 is conformal coated to withstand noncondensing tropical environment.

Under voltage logic alarm

On DC-inputs a built in logic alarm changes to alarm state if the converter voltage drops below -10 % of nominal output. The alarm circuit also controls the DC OK LED. The DC OK or POWER GOOD signal is logic 1. The drive voltage is 8 to 10 V, 5 mA = logic 1. See also Figure 2.

Over Voltage Limit OVL

A second regulation circuit takes over in case the main regulation fails. The output voltage is limited to approximately +15 % over nominal output voltage.

Over Voltage Limit Input OVLIN

The unit switch-off in case of an over voltage on the input. This circuit protects the semiconductors for failures due to over voltage.

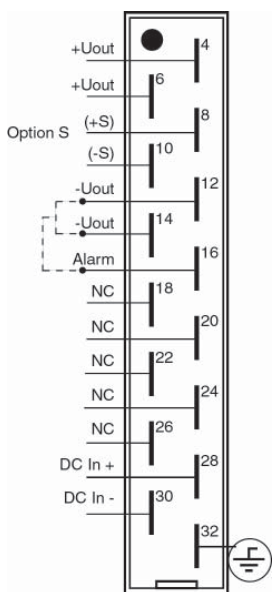


Figure 1. Pin-out DIN 41612, H15

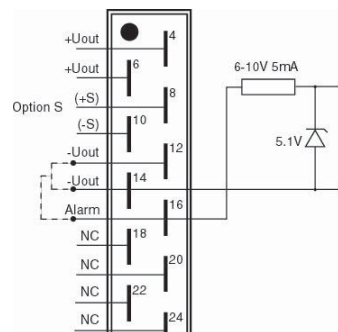


Figure 2. 5 V logic alarm signal

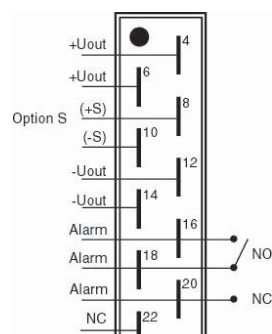


Figure 3. Alarm relay output Option -B

Optional Features

Over voltage protection OVP, option A

The output filter is limited to 15 % over nominal output voltage. A thyristor short-circuits the output.

Under voltage alarm with relay, option B

The logic alarm output is replaced with a relay with selectable alarm logic NO or NC.

Alarm = No input or low output <-10 % of nominal output, see figure 3.

The relay is rated 30 V 0.5 A (a.c. & d.c.).

Built in series diode, option C (Derating 20 %)

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. The output power is derated. It is model depend, contact factory.

Built in series diode with resistor, option CR

With a series resistor the output can be parallel connected with 2 or more units which passively balance the load between the units.

Remote sense, option S

The voltage sensing can be put at the load to compensate for voltage drop.

Inrush current limit with NTC, option H

Only for 110 or 110T input code. Reduce the inrush current during start up will be affected.

Contact factory for other inputs.

Series diode on input, option K1

If hold-up time is specified, a series diode on the input is needed. Depending on input voltage the unit will be derated due to the diode losses. The series diode also provides reverse voltage protection and is recommended if long distance between input fuse and unit input (>3 m).

2.5 kV.a.c. isolation Input/case, option E1

On 24, 36 and 48 inputs.

The emission level increase to level A.

2.5 kV.a.c. isolation Output/case, option E2

The emission level increase to level A.

Train input

Input voltage range according to train standard EN 50155 and IEC 60571. See Mobile Inputs, page 1.

Extra cooler, option T3

To meet EN 50155/IEC 60571 specified T3 ambient temperature demand +85 °C during 10 minutes.

The unit is then 12TE wide as a slide in unit. With option N, wall/chassi mount, the unit will be 58 mm high.

General data / input data

Design topology	Push-Pull
Switching frequency	100 kHz
Emission / Immunity	See page 4
Safety EN/IEC 60950	Class I
Max accepted input ripple ¹ 50 - 400 Hz	2 % of nominal voltage
Power consumption at no load	3 to 5 W
Reverse input voltage protection	Parallel diode
Inrush current limit with NTC	220 input code
Isolation	See table page 4
Vibration EN/IEC 61373	Body mounted class B
Dimension (D x H x W) mm	167 x 106 x 36.3 46.3 56.3
Weight, see mechanical drawings	0.80 - 1.35 kg

1. Higher ripple affects the input, contact factory

Mechanical Options

Front panel for Euroformat

8TE 3HE on PSE150 and PSE200

10TE or 12TE 3HE on PSE250 See figure 6.

Wall mounting panels -N, see figure 7 & 8

Including connector holder.

H15 Screw type female-H15-S

H15 FastOn 6.3 mm female -H15-T

DIN rail TS35 clips -Q

Output data

Source regulation	0.2 %
Load regulation (0 to 100 % load)	0.2 %
Transient recovery time for a load step of 10 to 100 % voltage deviation	<2 ms 3 %
Output ripple (100 kHz) ²	Typ. 10 mV p-p ²
Input ripple attenuation on output 50 to 400 Hz	150:1
Emission / Immunity	See page 4
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
Start-up time	<1 s
Reverse voltage protection on output	Parallel diode
Hold-up time, see option K1 & contact factory	2 - 10 ms
Efficiency ³	>88 %
Operating temperature range at 100 % load, conduction cooling	-25 to +70 °C
At 100 % load forced air cooling	-25 to +85 °C
Optional	-40 °C
Storage temperature range	-40 to +85 °C

- Output ripple might increase to 0.5 % RMS of V_{out} , when EN/IEC 61000-4-3, 10 V/m test is applied
- Lowest efficiency measured within the whole input voltage range at 100 % load.

Mechanical drawing

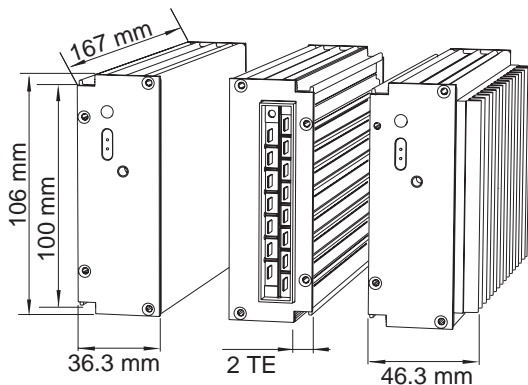


Figure 4. Dimensions.
Weight: 0.80 kg.

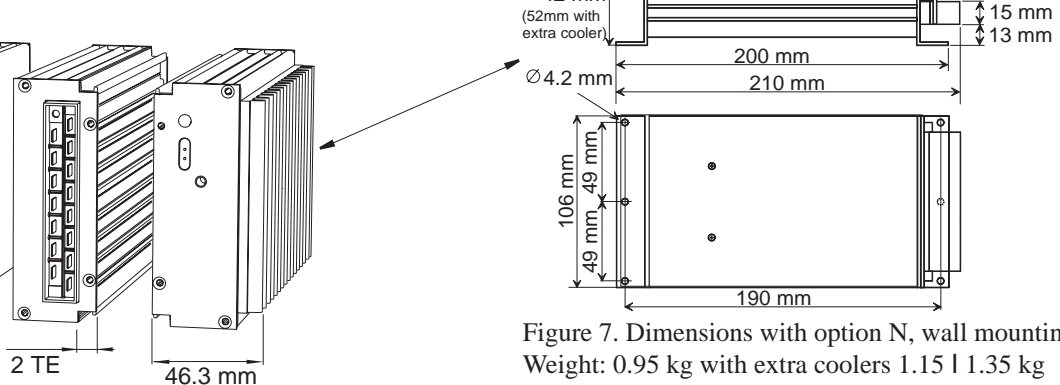
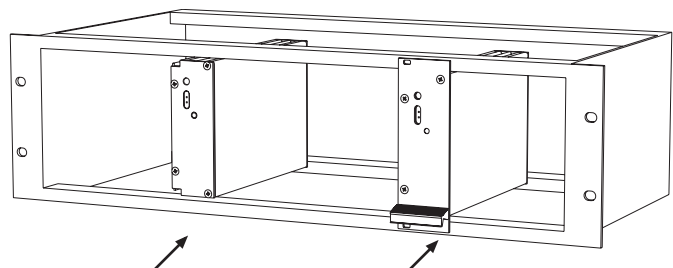


Figure 5. Optional
extra cooler version
Weight: 1.00 | 1.20 kg



PSE mounted in a 19" Sub-rack. Standard unit. PSE mounted in a 19" Sub-rack with optional L panels 8, 10 or 12TE

Figure 6. 3HE 19" sub rack mounting.

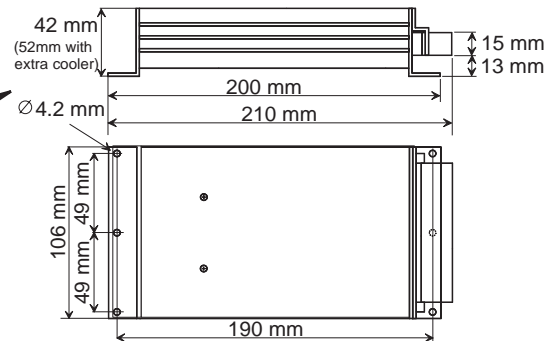


Figure 7. Dimensions with option N, wall mounting
Weight: 0.95 kg with extra coolers 1.15 | 1.35 kg

PSE wall mounted.

Using PSE wall mounting kit, option N, with connector holder, female H15 connector with screw or tab connectors (Optional).

PSE DIN-rail mounted.

Using PSE wall mounting kit, option N with addition of 2x DIN-rail clips, Option Q

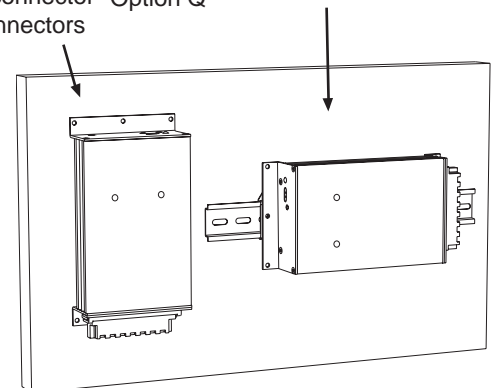


Figure 8. Wall mounting
Option -N.

Safety and EMC



Safety standard EN/IEC 60950

PSE250 meets the requirements defined by CE mark as apparatus.

PSE250 meets requirements of EMC directive and low voltage directive (LVD).

Thus a PSE250 can be used as free standing unit or in installations as well as systems designed according to "The modular approach". PSE250 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.

Isolation testable levels	Test voltage
Input / Output: Input code <75	2 kVd.c.
Input code >75	2.5 kVa.c. / 4 kVd.c.
Input / Case: Input code <75	2 kVd.c.
Input code >75	2.5 kVa.c. / 4 kVd.c.
Output / Case all outputs	2 kVd.c.
Isolation, not testable level	Safety isolation
Transformer isolation In / Out	4 kVa.c. / 8 mm

We use the product standard Low voltage power supplies, DC outputs EN/IEC 61204-3 and the generic EMC standards:
EN/IEC 61000-6-2 (Immunity)
EN/IEC 61000-6-3 (Emission)

EMC

EMC-standards	EMC-performance		
Emission standards	Input	Output	Remarks
EN 55011/EN 55022 (0.15-30 MHz)	Level B	Level B	
EN 55011/EN 55022 (30-1000 MHz)	Level B		Enclosure test
Immunity standards	EN/IEC 61000-6-2		
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 V _{out} , Enclosure test
EN/IEC 61000-4-4	4 kV	4 kV	
EN/IEC 61000-4-5, Input code <60 EN/IEC 61000-4-5, Input code >60	0.5 kV / 1 kV 1 kV / 2 kV ¹	0.5 kV / 1 kV 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.
2. Level increased to 20 V/m on T-Inputs

Contact

For updates on this datasheet we refer to www.polyamp.com
Specifications subject to change without notice.



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