



PSE250-series DC/DC 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
- Low ripple and noise

FEATURES

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

OPERATION

- Operating temperature range -25 to +70 °C
- High efficiency >88%
- Fully encapsulated, meets IP20 as standard
- Convection cooled
- Low voltage alarm, with logic signal
- Input overvoltage switch-off

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

OUTPUT RATING & TYPE CODE

OUTPUT			INPUT				Case
Voltage	Current	Power	18 - 32 V	38 - 60 V	88 - 150 V	185 - 300 V	
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

How to read our product code:

Example PSE250 48/24

PSE250 = Family code

48 = input voltage code 48

24 = Output voltage 24 V

Other input and outputs combination on demand.

Within the range we guarantee full output performance, Uout +10% Iout +5%

INPUT VOLTAGE RATINGS

INPUT			
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

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.

DC INPUTS MOBILE		
U _{in} 0.1 s - S2	Continuous 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 table at page 1.

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 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.

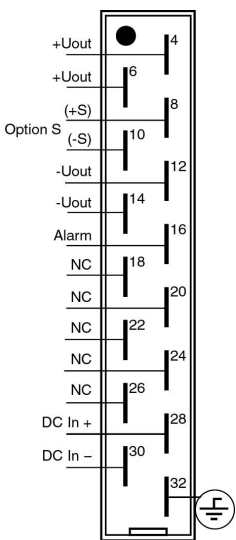


Figure 1. Pin-out DIN 41612, H15

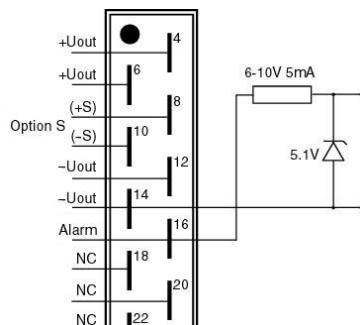


Figure 2. 5 V logic alarm signal

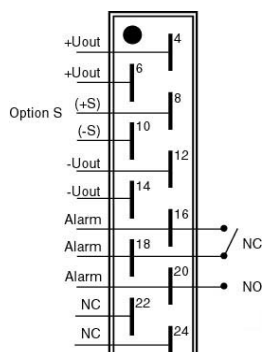


Figure 3. Alarm relay output Option B

OPTIONAL FEATURES

Over voltage protection OVP, option A

The output voltage 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 might be derated. It is model dependent, 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 kVa.c. isolation input/case, option E1

On 24, 36 and 48 inputs.

2.5 kVa.c. isolation output/case, option E2 Train input

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

Extra cooler, option T3

The PSE 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.

GENERAL DATA / INPUT DATA

LABEL	VALUE
Design topology	Push-Pull
Switching frequency	100 kHz
Emission / Immunity	See page 4
Max. accepted input ripple ¹ 50-400 Hz	2 % of nominal voltage
Power consumption at no load	3 to 5 W
Inrush current limit with NTC	220 input code
Reverse input voltage protection	Parallel diode
Isolation	See table page 4
Vibration EN/IEC 61373	Body mounted class B
Fire Protection EN 45545-2 HL 3 level 4.3.2 rule 1 and figure 1	"Non listed product" < 100 g
Dimensions (D x H x W) mm	167 x 106 x 37 47 57
Weight	0.8 - 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, option N, see figure 7 and 8

Including connector holder.

H15 Cage Clamp type female - H15-CC (The cable rating is AWG16 or < 1.5 mm². That makes it not usable for 24-input)

H15 FastOn 6.3 mm female - H15-T

DIN rail TS35 clips -Q, see figure 8

2. The output ripple might increase to 0.5% RMS of Vout, when EN IEC 61000-4-3, 10 VIm test is applied.

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

OUTPUT DATA

LABEL	VALUE
Source regulation	0.2%
Load regulation (0 to 100% load)	0.2%
Transient recovery time for 10 to 100 % voltage deviation	<2 ms 3%
Output ripple (100 kHz) ²	Typ 10 mV p-p ²
Input ripple attenuation to 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

MECHANICAL DRAWING

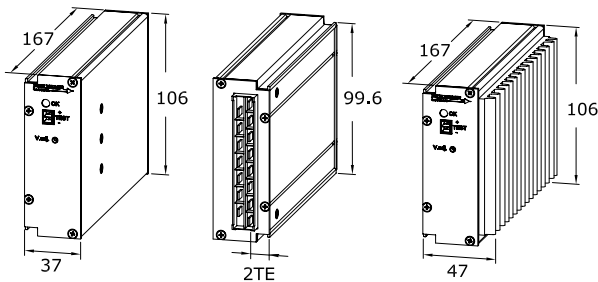


Figure 4. Dimensions.

Weight: 0.8 kg.

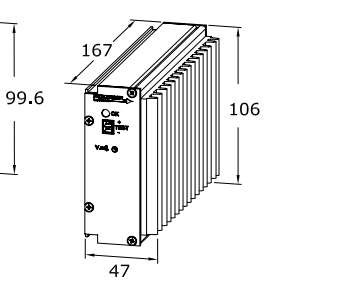


Figure 5. Optional extra cooler version.

Weight: 1xT3 1.1 | 2xT3 1.3 kg

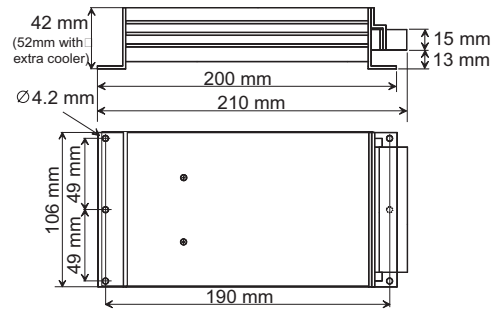
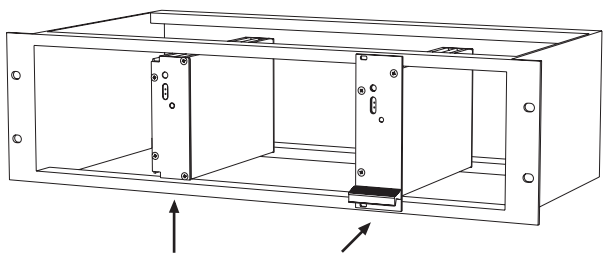


Figure 7. Dimensions with option N, wall mounting

Weight: 0.95 kg and with extra cooler T3 | 2xT3: 1.1 | 1.3 kg.



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

PSE mounted in a 19" Sub-rack with L panel 8, 10 or 12TE (Optional)

Figure 6. 3HE 19" sub rack mounting.

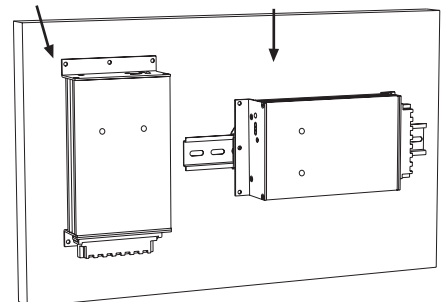
PSE wall mounted.

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

PSE DIN-rail mounted.

Using PSE wall mounting kit, option N with addition of 2x DIN-rail clips, (Optional)

Figure 8. Wall mounting Option -N.



CE MARK

PSE250 meets the requirements defined by CE mark as apparatus.

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

The PSE250 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 < 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 TESTABLE LEVELS	SAFETY ISOLATION
Transformer isolation In / Out	4 kVa.c. / 8 mm

Installation Class I, optional Class II

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	± 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	± 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.

2. Level increased to 20 V/m on T-inputs.

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.



- A secure part of your system



Your distributor:



Schulz-Electronic GmbH
 Dr.-Rudolf-Eberle-Straße 2
 D-76534 Baden-Baden
 Fon + 49.7223.9636.0
 Fax + 49.7223.9636.90
 vertrieb@schulz-electronic.de
 www.schulz-electronic.de