



Firma / Company : FRIWO

Gerätetyp / Type : OF250-24

Artikelnr. / Part-No. : 1891705

Zeichnungsnr. / Drawing-No. : 15.3331.500-00

Datum / Date : 2011-05-18

Sachbearbeiter Verkauf / Contact Sales : Bernsmann

Sachbearbeiter Mechanik / Contact Mech. Eng. : FEHVNL

Sachbearbeiter Elektronik / Contact Elec. Eng. : FESELU

Freigabe App. / Approved App. : FEPAZH

Freigabe / Approved : FELCCH

Wir bitten Sie, ein Exemplar mit Freigabevermerk an uns zurückzusenden. Sollten Sie dieser Spezifikation nicht unverzüglich widersprechen, gilt die Zustimmung und Fertigungsfreigabe auf Grundlage dieser Spezifikation als erteilt.

We may ask you to return one signed copy of this specification for our records as having your approval. Unless you do not enter your objection to the latest specification issue without delay, your acceptance and release for production on the basis of this specification is deemed to be given.

Kundenfreigabe / Customer Release:

Datum / Date:

Unterschrift / Signature:

Index / Rev.	Datum / Date	Name	Einzelheit / Detail
©	2011/06/22	Ulrich	add German
Ⓓ	2011/08/08	Kuhn	Label for housing corrected, see point 1.
Ⓔ	2012/03/07	Kuhn	Add label for ESD-Bag, see point 2.1.
Ⓘ	2012/03/27	Sean Liu	update the label and add the derating for installation positions....
Ⓞ	2014/02/21	Kuhn	Update label for PCB, see point 1.

Geschäftssitz / Headquarter
 FRIWO Gerätebau GmbH
 Von-Liebig-Straße 11
 D-48346 Ostbevern
 Tel +49 2532/ 81-0
 Fax +49 2532/ 81-112
 www.friwo.de
 WEEE-Reg.-Nr. DE 70846847

Geschäftsführung / Management Board
 Felix Zimmermann
 Peter Vogt
 Lothar Schwemm
 St.-Nr. 346/5840/0923
 Finanzamt Warendorf
 USt.-Ident.-Nr. DE811114890
 Amtsgericht Münster
 HRB 9325

Bankverbindung / Bank Details
 Sparkasse Münsterland-Ost
 BLZ 400 501 50 (EUR) Kto. 5 000 526
 IBAN DE42 4005 0150 0005 0005 26
 BLZ 400 501 50 (USD) Kto. 86 0000 23
 SWIFT WELADED1MST
 Commerzbank AG, Frankfurt a. M.
 BLZ 500 400 00 Kto. 5 811 419
 IBAN DE05 5004 0000 0581 1419 00

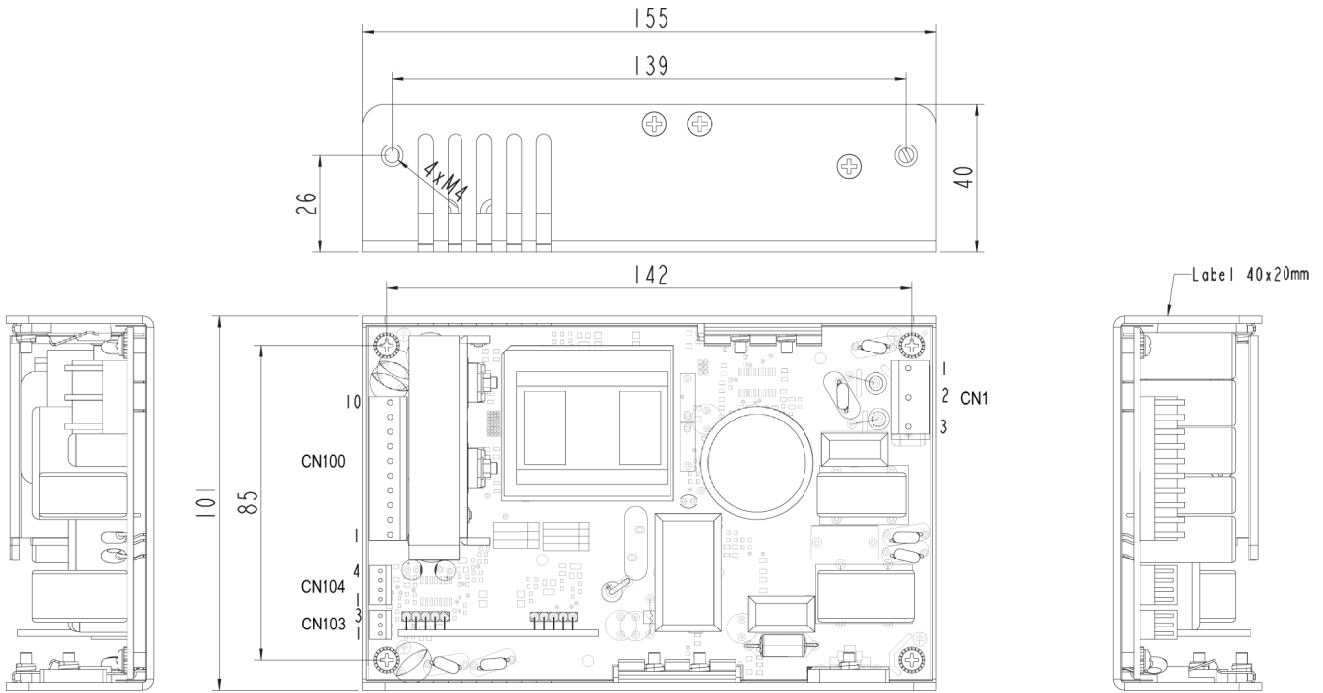
1 Gehäuse / Housing:

Gehäusetypp / housing-typ: OPEN FRAME

Material: -

Farbe Boden/ bottom colour: -

Farbe Deckel/ cover colour: -



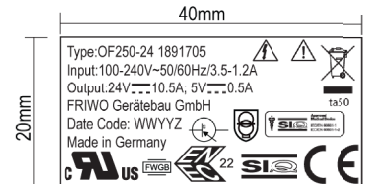
Item	Molex connector type or equivalent	Mating connector Molex type or equivalent
CN1	0010634037	0009503051
CN100	0026804100	0009503101
CN103	0022212031	0022235034
CN104	0022212041	0022235044

CN1	1	2	3
PIN	PE	L	N

CN103	1	2	3
PIN	Standby	5V	GND

CN104	1	2	3	4
PIN	PF	PG	+Vsense	-Vsense

CN100	1	2	3	4	5	6	7	8	9	10
PIN	GND	GND	GND	GND	GND	24V	24V	24V	24V	24V



Printing: Black letter on white base
 Material: copperplate paper with bright/shining surface (UL, CSA approval)
 Coating: Acrylic adhesive backing
 To be manufactured by UL/CSA qualified vendor
 Storage temperature: -20 degC ~ +70 degC
 The thickness of label is 0.12 +/- 0.02mm
 "WWYYZ": WW=week YY=year Z=Factory code
 (Note: without mark = FRIWO Gerätebau GmbH)

2 Verpackung / packaging:

2.1 Einzelverpackung / individual packaging:

Put the PCB/A into the ESD-Bag 152x254mm

Divider: 15.3331.556-xx

Paste label 1834442(40x20mm) on ESD bag to close the ESD bag

OF250/1891705 24V \equiv / 10.5A 5V \equiv / 0,5A

2.2 Sammelverpackung / bulk packaging:

28 er UMKARTON / Carton 28

2.2.1 Aussenabmessungen / Outer dimensions: 433mm x 338mm x 196mm

2.3 Anzahl der Geräte pro Umkarton / amount of units per master carton: 15

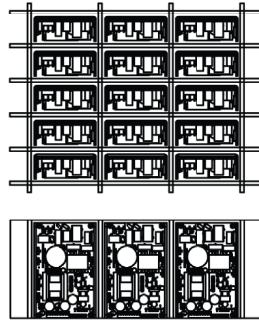
2.4 Gewicht pro Stück / weight per unit: 600 g

2.5 Lagertemperatur / storage temperature: -20°C - +85°C / 5 to 95 rel. hum.

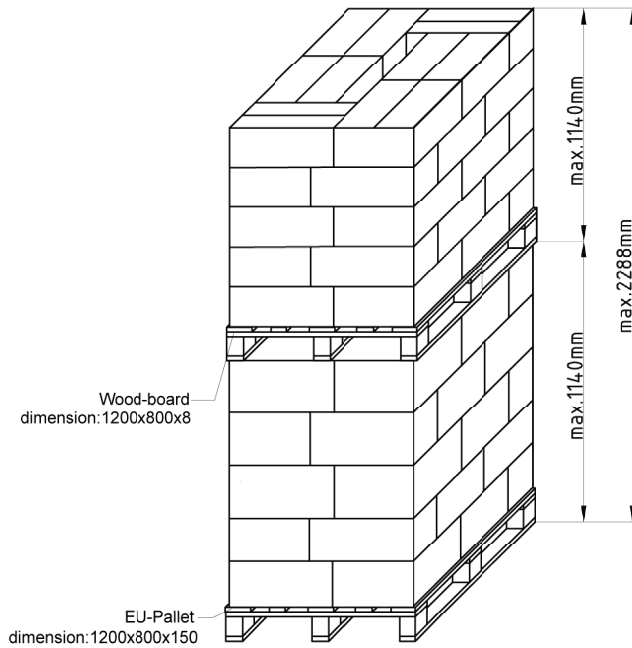
2.6 Verpackungsvorschriften / packaging specification:

- 1, White label(8001788) 101x158mm:for printing Model Number,Part Number etc.
- 2, One label on each master carton, labels must face out on a loaded pallet.

Inner Packaging



Pallet Packaging:



- Notes:
- 1) 15 pcs per carton
 - 2) 6 carton per layer
 - 3) 5 layer per pallet
 - 4) total 450 pcs per 5-layer-pallet

- Notes:
- 1) 15 pcs per carton
 - 2) 6 carton per layer
 - 3) 5 layer per pallet
 - 4) total 450 pcs per 5-layer-pallet

1 stack (5-layer-pallet and 5-layer-pallet)
 = (450pcs. + 450 pcs.)
 = 900 pcs per stack

22 pallets (11 stacks of each type)
 =9900 pcs. per 20ft container

48 pallets (24 stacks of each type)
 =21600 pcs. per 40ft container

3 Elektrische Prüfbedingungen / electrical tests:

3.1 Alle nachstehend aufgeführten Werte werden bei +20°C Raumtemperatur und nach 15 Minuten Einschaltdauer gemessen.

All values listed below are measured at an ambient temperature of +20°C and after 15 minutes of operation.

3.2 Eingangsdaten / Input data:

3.2.1 Input fuse:5AH/250V

3.2.2 Nenneingangsspannung : 100-240V AC +/-10%
 Nominal input voltage : 100-240V AC +/-10%

3.2.3 Nenneingangsfrequenz : 47-63Hz
 Nominal input frequency : 47-63Hz

3.2.4 Leerlaufleistungsaufnahme bei U_E : 115V AC,230V AC : $\leq 1W$
 Stand-by power consumption at U_{In} : 115V AC,230V AC : $\leq 1W$

3.3 Ausgangsdaten / Output data

Messaufbau siehe / Measuring setup see <http://www.friwo.de>

3.3.1 Ausgangsspannung:	U_{A1} : 24V DC +5%/-5%	U_{Br1} : $\leq 240mV_{ss}$
Nominal output voltage:	U_{out1} : 24V DC +5%/-5%	U_{Br1} : $\leq 240mV_{pp}$
	U_{A2} : 5V DC +5%/-5%	U_{Br2} : $\leq 50mV_{ss}$
	U_{out2} : 5V DC +5%/-5%	U_{Br2} : $\leq 50mV_{pp}$

3.3.2 Nennausgangsstrom:	I_{A1} :10500 mA
Nominal output current:	I_{out1} :10500 mA
	I_{A2} :500 mA
	I_{out2} :500 mA

3.3.3 Wirkungsgrad/Efficiency : 93%@230Vac full load

3.3.4 Leistungsfaktor/PowerFactor : ≥ 0.98 @ 115Vac and full load
 ≥ 0.95 @ 230Vac and full load

3.3.5 Life time5-7 yrs @ $T_{amb} = 30^\circ C$ and 80% nom.Load.

3.3.6 Hold up time
 20mS at 115/230VAC

3.4 Betriebstemperatur

0-70°C(Volllast bis 50°C,linear abnehmend auf 50% Last bei 70°C)

Operating temperature

0 - 70°C (Full load to 50°C,derate linearly to 50% load at 70°C)

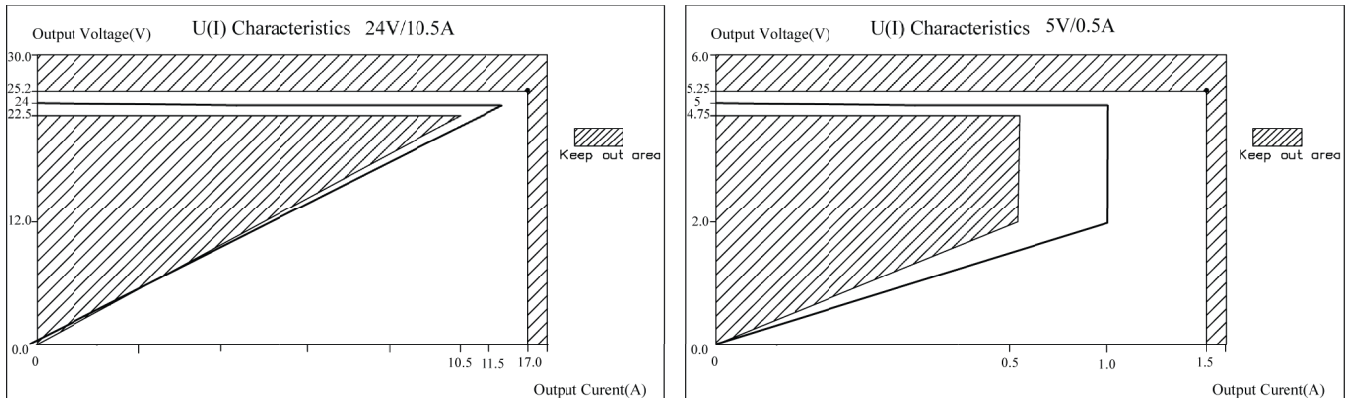
3.5 Überspannungsschutz: $\leq 33V$

Das Netzteil schaltet ab. Danach den Netzeingang abschalten und das Abfallen des 5V Ausgangs abwarten.Danach das Netzteil mit normaler Funktionalitat wieder einschalten.

Over voltage protection: $\leq 33V$

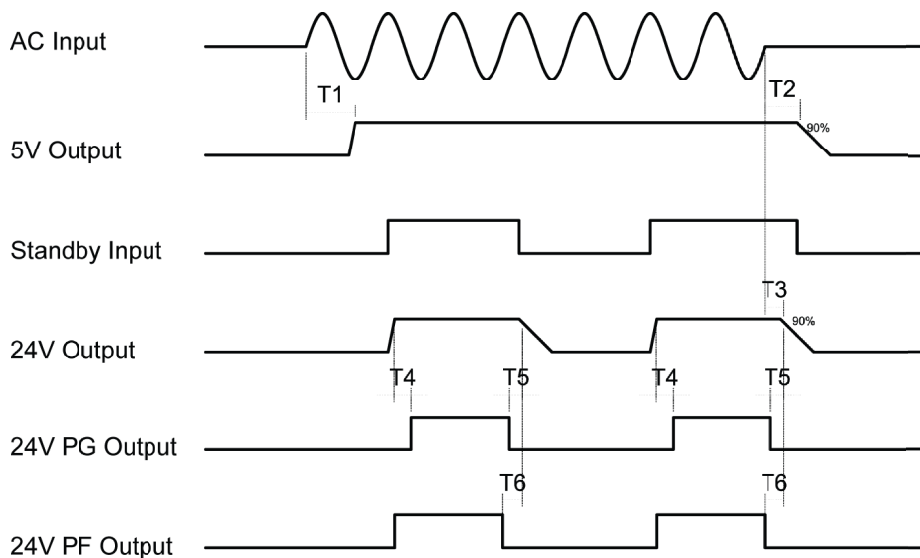
The PSU will be shut down. Switch off AC input and wait 5V output off, then restart the PSU back to normal.

3.6 Ausgangskennlinie / Output characteristic:



3.7 Anschlussignale/Interface signals

- 3.7.1 Leistungsnachregelung:Kompensiert Spannungsverluste auf der Leitung.
 Remote voltage sense: Compensates for wire voltage drop.
- 3.7.2 Standby:add a high DC signal (5V±10%) at standby pin,the PSU enter normal operation mode;add a low DC signal (0V,open or grounding),the PSU enter standby mode,the 24V output switch off.
- 3.7.3 Ausfall:TTL_{low} logisch " 0 " mindestens 2ms bevor der Ausgang 10% abfällt.
 Power fail: TTL_{low} logic " 0 " at least 2ms before output drops 10%.
- 3.7.4 Power good:Geht auf " High " innerhallb 100-500 ms nachdem der Ausgang in Regelung ist and auf " Low " mindestens 1ms bevor die Regelung aussetzt.
 Power good: goes " High " 100-500ms after output is in regulation and goes " Low " at least 1ms before loss of regulation.



- T1: 5V start up time $\leq 2S$
- T2: 5V keep up time $\geq 20ms$
- T3: 24V keep up time $\geq 20mS$
- T4: 24V ready detection time $\geq 100mS$
- T5: 24V fall detection time $\geq 1mS$
- T6: 24V fail detection time $\geq 2mS$

4 Safety details:

Sicherheitsstandards entsprechend EN60601,EN61558 und EN60950
 Safety-standard acc. to : EN60601,EN61558 and EN60950

Schutzklasse: I
 Protection class : I

Trennung (primär / sekundär): Galvanisch über Wandler
 Separation (prim.-sec.) :Galvanic by transformer

Luft- und Kriechwege: \geq Kriechweg 8 mm, Luftweg 5 mm
 Creepage distance and clearance : \geq Cr : 8mm,Cl : 5mm;

Erdableitstrom: \leq 500 μ A
 Earth leakage current : I leak \leq 500 μ A

Gehäuseableitstrom: \leq 100 μ A
 Enclosure leakage current : I leak \leq 100 μ A

Hochspannungstest: Primary to secondary \geq 4 KV AC; Primary to earth \geq 1.5 KV AC; Secondary to earth \geq 500V AC

High-voltage test : Primary to secondary \geq 4 KV AC; Primary to earth \geq 1.5 KV AC; Secondary to earth \geq 500V AC

Anwendungsbereich: Medizintechnik, Büro- und Telekommunikationstechnik
 Range of application : Medical applications,office and Telecommunication.

Umgebungstemperaturbereich: 0°C bis +70°C, bis zu +70°C mit 50% Leistungsabsenkung
 Ambient temperature range : 0°C to +70°C ,derate 50% load at 70°C.

5 CE-Konformitätserklärung / Declaration of Conformity

Wir, der Hersteller, erklären hiermit, dass das Produkt: /
 We, the manufacturer, hereby confirm, that the product:

Gerätetyp / Type: OF250-24
 Artikel-Nr. / Part-No.: 1891705
 Zeichnungs-Nr. / Drawing-No.: 15.3331.500-00

weitere Merkmale /
 additional information:

mit der beiliegenden Beschreibung die Anforderungen der Niederspannungsrichtlinie 2006/95/EG, der EMV-Richtlinie 2004/108/EG und Öko-Design Richtlinie 2009/125/EG erfüllt.

Hiermit bestätigen und garantieren wir, dass unsere Produkte, unabhängig von der Produktionsstätte, RoHS-konform produziert werden und die Anforderungen der EU Richtlinie 2002/95/EC (Neufassung der Richtlinie 2011/65/EU) erfüllen.

with the enclosed description fulfils the requirements of the Low Voltage Directive 2006/95/EC, the regulations of the EMC Directive 2004/108/EC and the eco design Directive 2009/125/EC.

Hereby, we certify and guarantee that our products, regardless of the production location, RoHS compliant and fulfill the directive 2002/95/EC (revised version: directive 2011/65/EU).

Das Gerät entspricht der / The unit corresponds to:

a) Niederspannungsrichtlinie / Low Voltage Directive	b) EMV-Richtlinie / EMC Directive	c) Öko Design / ECO Design
<input type="checkbox"/> EN 60950-1 01/2011	<input type="checkbox"/> EN 61000-3-2 03/2010	<input type="checkbox"/> Not applicable
<input type="checkbox"/> EN 60601-1 07/2007	<input type="checkbox"/> EN 60601-1-2 12/2007	
<input type="checkbox"/> IEC EN 61558-2-16 :2009	<input type="checkbox"/> EN 55022 05/2008	
	<input type="checkbox"/> EN 55024 10/2003	



Quality Manager

i. V. Michael Meibeck

Ausstelldatum / Date of issue: 2011-05-18




Firmenstempel / Company stamp

Manager Product Design FPS ppa. Armin Wegener

6 Links & Miscellaneous

EMC-specification

6.1 Noise-suppressed: acc. to EN55011 ,55022/B and FCC47 part 15 B

6.2 Harmonic current emissions ass.to IEC61000-3-2

6.3 Immunity to electrostatic discharge (ESD): acc. to IEC61000-4-2

Discharge characteristic	Test level	Assessment criteria Uin 120Vac	Assessment criteria Uin 230Vac
Air discharge	±8KV	B	B
Contact discharge	±6KV	B	B

6.4 Immunity to radiated electromagnetic field: acc. to IEC61000-4-3 Test characteristic: 80 - 2.5GHz; 80% AM (1 kHz)

Test level	Assessment criteria
10V/m	A

6.5 Immunity to fast electric transients (burst): acc. to IEC61000-4-4

Coupling	Test level	assessment criteria Uin 120Vac	assessment criteria Uin 230Vac
AC-input	±2KV	B	B

6.6 Surge capability: acc. to IEC61000-4-5

Surge voltage	assessment criteria Uin 120Vac	assessment criteria Uin 230Vac
±1KV(Line to Line)	B	B
±2KV(Line to earth)	B	B

6.7 Power frequency(50/60Hz) magnetic field.acc.to IEC61000-4-8

Test level	Assessment criteria
3A/m	A

6.8 Immunity to voltage dips, short interruptions and voltage variations

Test acc. to IEC61000-4-11

Test performed at $U_{in} = 120Vac/230VAC$

Voltage dips

Test level % U_N	Voltage dips and short interruptions	duration time of voltage dips (in halfsine)	Test result Uin 120Vac	Test result Uin 230Vac
0	100	0.5	B	B
		(5s)	B	B
40	60	5	B	B
70	30	25	B	B

6.9 Assessment criteria

a. Agreed operational behaviour within the specified limits.

b. Time limited functional diminishment of malfunction during the tests is permitted.The function is self-reactivated by the unit following completion of the tests.

c. Malfunction is permitted.The function can be reactivated either by reconnection to the mains or by operator intervention.

7 INSTALLATION INSTRUCTIONS

7.1 Rating

Type : OF250-24

Rated voltage : AC 100-240V

Nominal Current : Max 3.5A

Rated frequency : 50/60 Hz

Class : I

Protection against electric shock : By means of appropriate installation

Output voltages and currents DC24V/10.5A;5V/0.5A

Max. ambient temperature for rated output power : 50°C

Max. operating relative humidity : 95%,no condensation.

Storage : -20 to +85°C

Units should be allowed to warm-up under non-condensing conditions before application of power.

Remark : the end-use product shall provide an adequate enclosure to prevent access to the power supply and have an adequate enclosure for protection against the spread of fire.

7.2 Classification

Protection against electric shock = Class I,mains grounded input (protective earth must be connected to mains supply network).

Protection against moisture:

Have not been evaluated for use in the presence of a flammable anaesthetic mixture with air,oxygen,or nitrous oxide.This evaluation is to be made on the end equipment by the OEM.

Do not connect as direct power source to patient circuits.






Not to be used as single power source within critical life support systems,without prior request to FRIWO Geratebau GmbH and receipt of confirmation in writing from FRIWO Geratebau GmbH.

Ask for Application Engineering Support from FRIWO Geratebau GmbH.

7.3 Temperatures

The maximum operating temperatures of certain safety components, as defined in the applicable safety standards, must not be exceeded after installation to preserve the intended safety.The output power,ambient air temperature and the availability,amount,direction and/or restriction of airflow influence the temperatures of these components.

8 Explanation of symbols

EXPLANATION OF SYMBOLS	
	Alternating Current
	Direct Current
	Attention, Consult Accompanying Documents
	Attention, Dangerous Voltages
	Earth (Ground)

8.1 Fusing

Fuses for both Line and Neutral are provided in the power supply. Replace only with same type and rating of use.

8.2 Caution

Read instruction manual before connecting to mains.

8.3 Warning! Risk of fire!

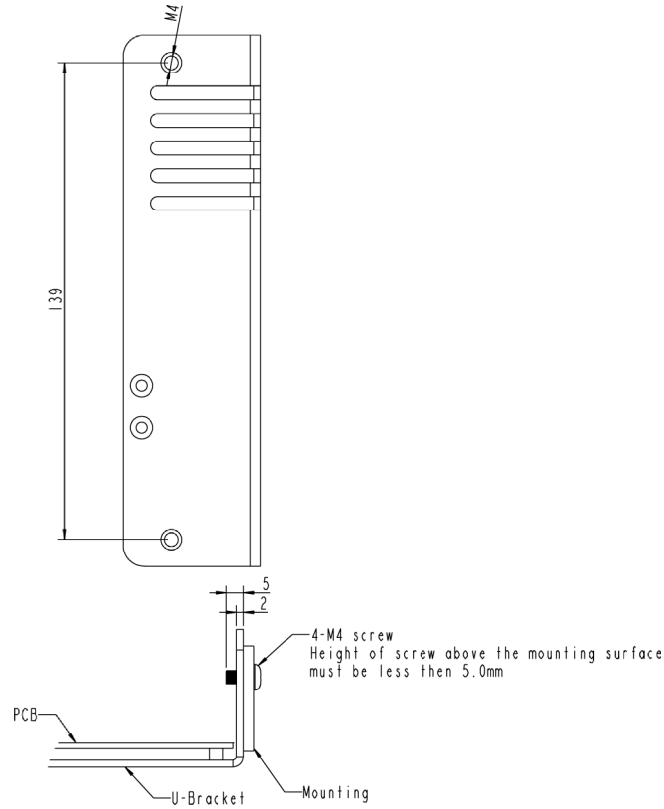
A blown internal fuse is an indication of catastrophic failure of circuit component(s). Refer to fuse marking on the supply for rating.

8.4 Warning! Shock Hazard!

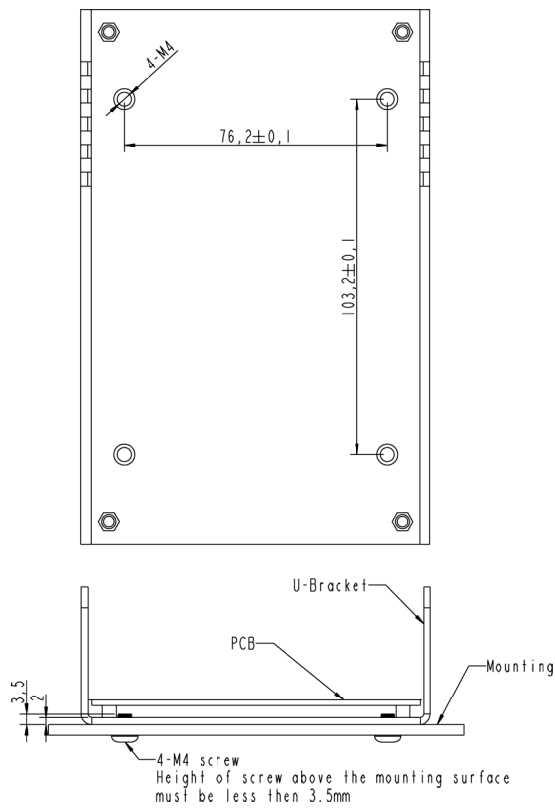
Dangerous voltages are present on some components, printed wiring traces and heatsinks.

9 Installation method

9.1 Assembly on side



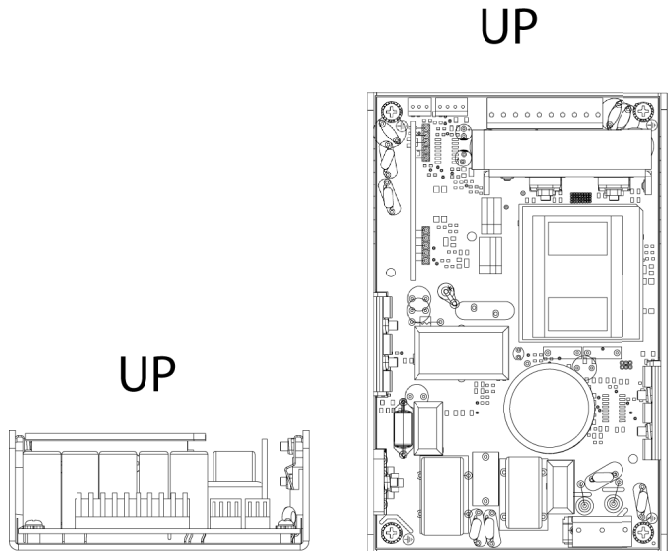
9.2 Assembly on front



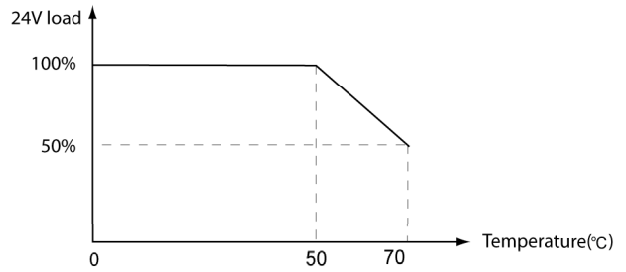
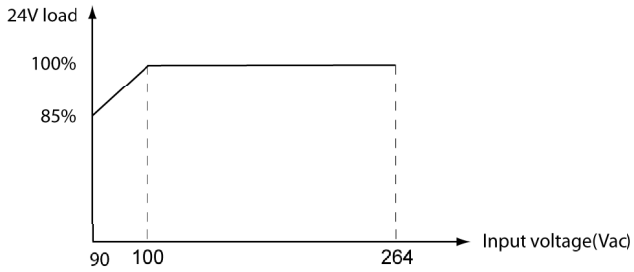
10 Installation positions versus output derating

Need to check all safety components' temperatures do not exceed the limits.

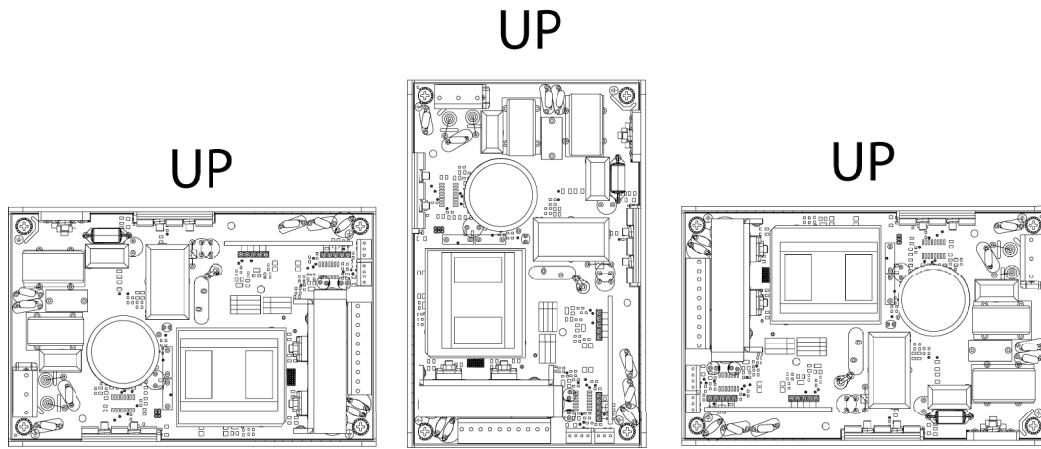
10.1 Ideal installation positions:



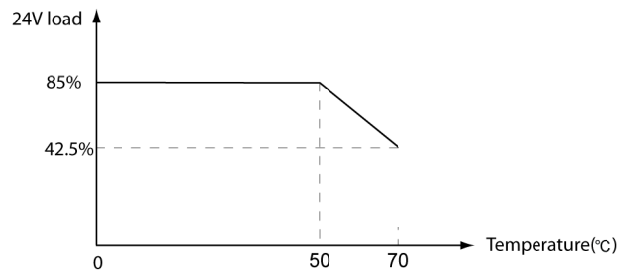
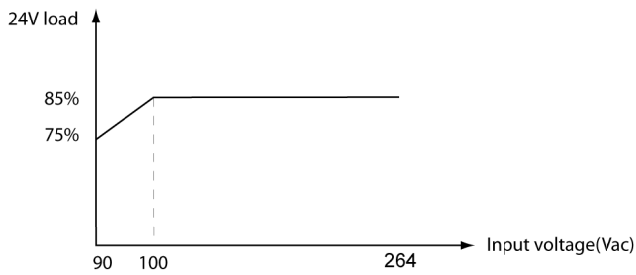
Output derating



10.2 Acceptable installation positions(See output derating below):



Output derating



10.3 Unacceptable installation position:

