



Ref. Certif. No.

SI-776

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST
CERTIFICATES FOR ELECTRICAL EQUIPMENT
(IECEE) CB SCHEMESYSTEME CEI D'ACCEPTATION MUTUELLE DE
CERTIFICATS D'ESSAIS DES EQUIPEMENTS
ELECTRIQUES (IECEE) METHODE OC**CB TEST CERTIFICATE
CERTIFICAT D'ESSAI OC**Product
Produit

Buffer Unit

Name and address of the applicant
Nom et adresse du demandeurPULS Elektronische Stromversorgungen GmbH
Arabellastraße 15, D-81925 München, GermanyName and address of the manufacturer
Nom et adresse du fabricantPULS Elektronische Stromversorgungen GmbH
Arabellastraße 15, D-81925 München, GermanyName and address of the factory
Nome et adresse de l'usinePULS Elektronische Stromversorgungen GmbH
Arabellastraße 15, D-81925 München, GermanyRatings and principal characteristics
Valeurs nominales et caractéristiques principales

See annex to the certificate.

Trademark (if any)
Marque de fabrique (si elle existe)

PULS

Model / Type Ref.
Ref. De typeSLV20.X0W (X and W are numerical characters and
stands for non safety relevant options like label color)Additional information (if necessary)
Information complémentaire (si nécessaire)A sample of the product was tested and found
to be in conformity with
Un échantillon de ce produit a été essayé et a été
considéré conforme à la

PUBLICATION	EDITION
IEC60950:99	3rd

As shown in the Test Report Ref. No. which forms part
of this Certificate
Comme indiqué dans le Rapport d'essais numéro de
référence qui constitue partie de ce Certificat

T223-0314/02

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**Slovenski institut za kakovost in meroslovje
Slovenian Institute of Quality and Metrology
Tržaška c. 2, 1000 Ljubljana, Slovenia

Date: 2002-10-15

Signature:



Slovenski inštitut za
kakovost in meroslovje
Slovenian Institute of
Quality and Metrology

ANNEX to CB Test Certificate No.: SI-776

page 2 of 2

Input rating: 24-28,8 Vdc, Stand by current: 80 mA, Charging current: 500 mA.

Class II unit.

Output rating: 24-28,8 Vdc / 20 A / 200 msec.

Ljubljana, 2002-10-15

Podpis pooblašćene osebe / Authorized signature

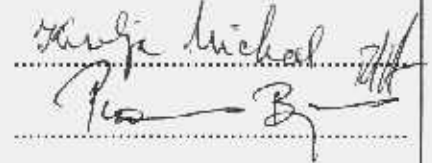
A handwritten signature in black ink, consisting of a series of loops and strokes, positioned below the authorized signature line.

TEST REPORT**IEC 60 950****Safety of Information technology equipment**

Report reference No : T223-0314/02

Tested by (printed name and
signature) : Mihael KiseljaApproved by (printed name and
signature) : Bojan Pečavar

Date of issue : 2002-10-09



This report is based on a blank test report that was prepared by FIMKO using information obtained from the TRF originator (see below).

Testing Laboratory Name : Slovenian Institute of Quality and Metrology

Address : Tržaška c. 2, SI-1000 Ljubljana, Slovenia

Testing location : Same as above

Applicant's Name : PULS Elektronische Stromversorgungen GmbH

Address : Arabellastraße 15, D-81925 München, Germany

Test specification

Standard..... : IEC 60 950, 3rd Edition (1999)

Test procedure : CB-scheme

Procedure deviation : none

Non-standard test method : None

Test Report Form

Test Report Form No. : I950__F/00-03

TRF originator : FIMKO

Master TRF : dated 00-02

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Test item description : Buffer Unit

Trademark : PULS

Model and/or type reference : SLV20.X0W (X and W are numerical characters and stands for non safety relevant options like label color)

Rating(s) : Input: 24 – 28,8 Vdc, Stand-by current: 80 mA, Charging current: 500 mA, Class II unit.

Output: 24 – 28,8 Vdc / 20 A / 200 msec.

Particulars: test item vs. test requirements	
Equipment mobility	Built in equipment, not intended for direct connection to mains.
Operating condition	Continuous stand-by mode and intermittent charging/ hold-up time mode.
Mains supply tolerance (%)	22,5 Vdc – 30 Vdc (charging from 23 Vdc to 28 Vdc)
Tested for IT power systems	No
IT testing, phase-phase voltage (V) :	-
Class of equipment	class II
Mass of equipment (kg).....	0,7 kg.
Protection against ingress of water ..	IP20
Test case verdicts	
Test case does not apply to the test object :	N/A
Test item does meet the requirement	P (ass)
Test item does not meet the requirement ...:	F (ail)
Testing	
Date of receipt of test item	2002-09-10
Date(s) of performance of test	2002-09-10 to 2002-10-08
General remarks	
<p>"This report is not valid as a CB Test Report unless appended to a CB Test Certificate issued by a NCB, in accordance with IEC 60384-1".</p> <p>This report shall not be reproduced except in full without the written approval of the testing laboratory.</p> <p>The test results presented in this report relate only to the item(s) tested.</p> <p>"(see remark #)" refers to a remark appended to the report.</p> <p>"(see Annex #)" refers to an annex appended to the report.</p> <p>Throughout this report a comma is used as the decimal separator.</p> <p>This Test Report includes the following documents:</p> <ol style="list-style-type: none"> 1. Test Report - 34 pages 2. National Differences - Enclosure 1 - 52 pages 3. Additional Test Data - Enclosure 2 - 5 pages 4. Pictures - Enclosure 3 - 5 pages 5. Schematics - Enclosure 4 - 10 pages 	

Copy of marking plate and summary of test results (information/comments):

SLV20.200-PM


Building-In Buffer Unit for Professional Use

Power Port:
IN: DC 24 - 28.8V
80mA Standby / 600mA Charging Mode


OUT: 200msec at 20A ... 4sec at 1A
Shutdown after 4sec

Operational temp. range -10... +70°C

CE **Engineering sample**
Unit is subject to
change without notice!

 **Installation by service personnel only**
Do not open, risk of electrical shock

Label-No.: 346.921.00B www.puls-power.com



PULS

Buffer Unit
SLV 20

Back-up Threshold

1-2 Vin - 1V
 2-3 22.5 Vdc fixed

Status ● 24 - 28.8V / 20A

Ready + + - - **Housing Connection (optional)**

Charging

Discharging

6 +
 7 Active
 8 Ready
 9 Inhibit

Summary of Testing

Summary of testing:

This component has been judged on the basis of the required spacings in the Standard for Safety of Information Technology Equipment, IEC60950 and CSA C22.2 No. 60950 * UL60950, Third Edition, dated December 1, 2000.

1. The products were tested on a DC source with the current capability of 40 A.
2. The input and output is rated SELV, hazardous energy level.
3. The terminals and connectors are suitable for field wiring only.
4. The unit generates internally voltage exceeding the limits of SELV. The unit is class II. The hazard internal voltage is separated from the enclosure by double insulation. The metal enclosure of the unit can be connected to Protective Earth. The input of the unit is also allowed to be connected to Protective Earth.
5. The unit is intended for built in use. It is not required, that the unit will be earthed within the application.
6. The maximum working voltage present is 188 V rms; 192 V pk.
7. The equipment has been evaluated for use in a Pollution Degree 2 environment.
8. A suitable Electrical and Fire enclosure shall be provided.

General product information:

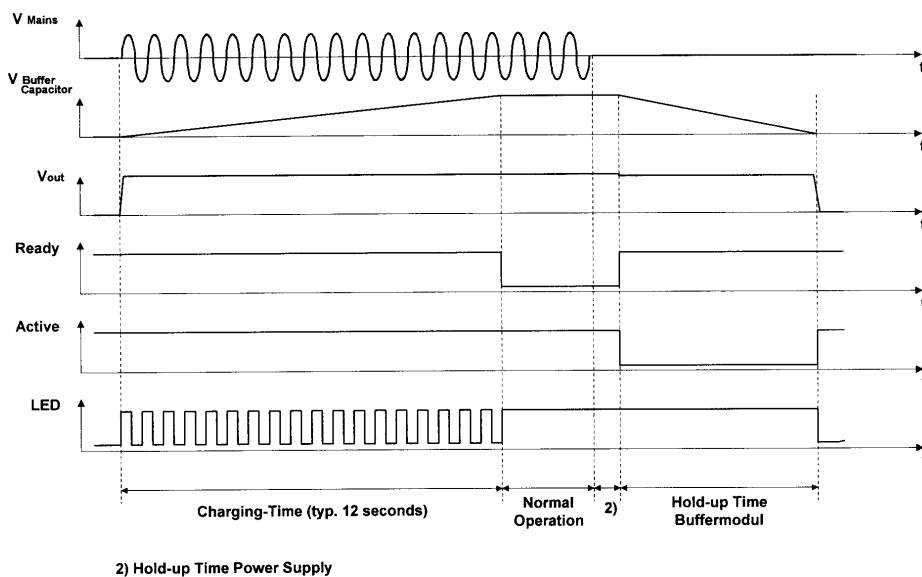
The unit is in parallel to a 24 Vdc output. It generates internally out of the 24 Vdc a high secondary voltage of 180 Vdc loading internal capacitors. In case mains gets away, the unit transfers the internal loaded energy to 24 Vdc and buffers for around 400 msec. the output. (see drawing below)

The unit has a threshold adjustment via a jumper in front. It starts supplying energy to the output (to buffer) if the voltage of the external power supply drops either below 22,5 Vdc or 1 Vdc below the average.

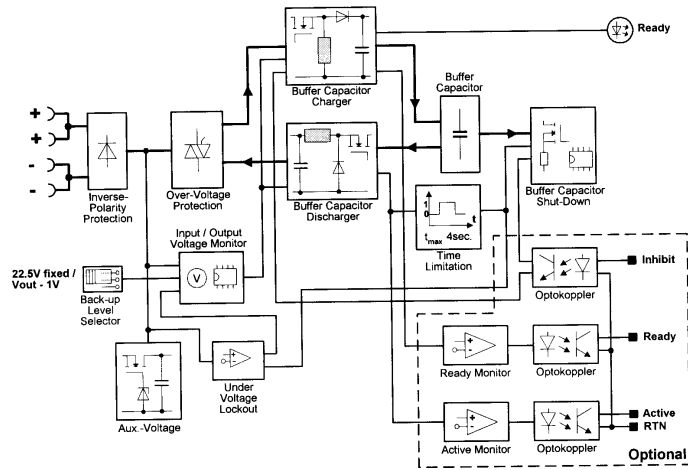
Safety aspects:

1. The unit has protection by diodes against wrong connection (+ and – exchanged).
2. The unit provides an voltage regulation of the internal hazard voltage and an over voltage protection, in case the voltage regulation would fail to avoid overload of the capacitors.
3. The unit provides a current limitation at the output.
4. The unit provides for the output voltage regulation, current limitation and over voltage protection. In case of an error, the internal capacitors (high voltage) will be deloaded immediately. In addition transorb diodes rated 36 Vdc, which limit the output voltage in case any electrical protection would fail to assure, that the output will stay SELV. The input is protected by two diodes, transistors against back-feeding of the internal hazard voltage. Additional abnormal testing was performed to assure, that the input will remain SELV in case of an failure.

The loading current is adjusted, therefore there is no high inrush current.



Funktionsschaltbild SLV20:



IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
1.5	Components		P
1.5.1	Comply with IEC 60950 or relevant component standard	(see appended table 1.5.1)	P
1.5.2	Evaluation and testing of components	<p>Certified components are used in accordance with their ratings, certifications and they comply with applicable parts of this standard.</p> <p>Components not certified are used in accordance with their ratings and they comply with applicable parts of IEC 60950 and the relevant component standard.</p> <p>Components, for which no relevant IEC-standard exists, have been tested under the conditions occurring in the equipment, using applicable parts of IEC 60950.</p>	P
1.5.3	Thermal controls	No thermal controls.	N/A
1.5.4	Transformers		N/A
1.5.5	Interconnecting cables	No interconnecting cables.	N/A
1.5.6	Capacitors in primary circuits	The unit is SELV in / SELV out and does not provide primary voltage.	N/A
1.5.7	Double or reinforced insulation bridged by components	No such components bridging double or reinforced insulation.	N/A
1.5.7.1	Bridging capacitors		N/A
1.5.7.2	Bridging resistors		N/A
1.5.7.3	Accessible parts		N/A
1.5.8	Components in equipment for IT power systems	No primary circuit.	N/A
1.6	Power interface		N/A
1.6.1	AC power distribution systems		N/A
1.6.2	Input current	(see appended table 1.6.2)	N/A
1.6.3	Voltage limit of hand-held equipment	The equipment is not hand-held.	N/A
1.6.4	Neutral conductor	No Neutral is provided	N/A
1.7	Marking and instructions		P

IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
1.7.1	Power rating		P
	Rated voltage(s) or voltage range(s) (V)	See Type Label	P
	Symbol for nature of supply, for d.c. only.....	“DC” is used.	P
	Rated frequency or rated frequency range (Hz) :		N/A
	Rated current (A)	See Type Label	P
	Manufacturer’s name/Trademark	See Type Label	P
	Type/model	See Type Label	P
	Symbol of Class II	The unit is for built in use. The function of the unit is to simulate a back-up battery for short interruptions.	N/A
	Other symbols		N/A
	Certification marks	Refer to copy of markings.	P
1.7.2	Safety instructions	See manual enclosed.	P
1.7.3	Short duty cycles		N/A
1.7.4	Supply voltage adjustment		N/A
1.7.5	Power outlets on the equipment	No standard power outlet.	N/A
1.7.6	Fuse identification	No fuse is provided.	N/A
1.7.7	Wiring terminals	The terminals are properly marked, see photo enclosed.	P
1.7.7.1	Protective earthing and bonding terminals		N/A
1.7.7.2	Terminal for a.c. mains supply conductors		N/A
1.7.8	Controls and indicators	A diffuse status LED is provided. This was not considered as an indicator relevant for safety.	N/A
1.7.8.1	Identification, location and marking	There are no controls affecting safety.	N/A
1.7.8.2	Colours	For functional indication a LED lights when the equipment is operating	N/A
1.7.8.3	Symbols according to IEC 60417.....	There are no switches in the equipment.	N/A
1.7.8.4	Markings using figures	No controls in the sense of this clause.	N/A
1.7.9	Isolation of multiple power sources	Only one connection supplying hazardous voltages and energy levels to the equipment.	N/A
1.7.10	IT power distribution systems		N/A

IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
1.7.11	Thermostats and other regulating devices	No thermostats or other regulating devices.	N/A
1.7.12	Language	Instructions and markings shall be in a language acceptable for the country where the equipment is to be used.	—
1.7.13	Durability	The marking withstands required tests.	P
1.7.14	Removable parts	No removable parts.	N/A
1.7.15	Replaceable batteries	No battery is in the equipment.	N/A
	Language		—
1.7.16	Operator access with a tool	Built in unit, not for operator access.	N/A
1.7.17	Equipment for restricted access locations	Equipment not intended for installation in RAL.	N/A

2	PROTECTION FROM HAZARDS		P
2.1	Protection from electric shock and energy hazards		P
2.1.1	Protection in OPERATOR access areas	Component level power supply not intended for operator access. Must be checked in the end product.	N/A
2.1.1.1	Access to energized parts	This is a component level power supply. Protection must be checked in the end product.	N/A
	Test by inspection		N/A
	Test with test finger		N/A
	Test with test pin		N/A
	Test with test probe		N/A
2.1.1.2	Battery compartments		N/A
2.1.1.3	Access to ELV wiring		N/A
	Working voltage (V); minimum distance (mm) through insulation	(see appended table 2.10.5)	—
2.1.1.4	Access to hazardous voltage circuit wiring	The internal parts and circuits containing hazard secondary energy are separated from the enclosure (not operator accessibly) by reinforced insulation. Therefore, the enclosure was treated within this report as dead metal.	N/A

IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
2.1.1.5	Energy hazards	The output of the unit represents an energy hazard.(see Enclosure 2 for test results)	N/A
2.1.1.6	Manual controls	No shafts of knobs etc. at ELV or hazardous voltage.	N/A
2.1.1.7	Discharge of capacitors in the primary circuit		N/A
	Time-constant (s); measured voltage (V)		—
2.1.2	Protection in service access areas	Checked by inspection, unintentional contact is unlikely during service operations.	P
2.1.3	Protection in restricted access locations		N/A

2.2	SELV circuits		P
2.2.1	General requirements	SELV limits (at accessible parts) are not exceeded under normal condition and after a single fault.	P
2.2.2	Voltages under normal conditions (V)..... :	Within SELV limits	P
2.2.3	Voltages under fault conditions (V)..... :	Single fault conditions: < 60 Vdc. (see appended table 5.3).	P
2.2.3.1	Separation by double insulation or reinforced insulation (method 1)	There is distance between PWB traces and enclosure which could be connected to PE which meets double insulation. See appended table 2.10.3. There are also two diodes D200 and D201 connected between + and – pole of input/output.The diodes are voltage protection if internal voltage Vboost comes to input/output.	P
2.2.3.2	Separation by earthed screen (method 2)		N/A
2.2.3.3	Protection by earthing of the SELV circuit (method 3)		N/A
2.2.4	Connection of SELV circuits to other circuits..... :	The unit generates internally hazardous secondary voltage. Reliability testing was performed to make sure., that in case of one failure the output will remain SELV.	P

2.3	TNV circuits		N/A
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IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
2.5	Limited power sources		N/A

2.6	Provisions for earthing and bonding		N/A
2.6.1	Protective earthing	The unit is rated SELV in and SELV out. The unit contains hazard internally secondary voltage. The hazard secondary voltage is separated from the enclosure by double insulation. The enclosure of the unit is allowed to be connected to PE.	N/A

2.7	Overcurrent and earth fault protection in primary circuits		N/A
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2.8	Safety interlocks		N/A
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2.9	Electrical insulation		P
2.9.1	Properties of insulating materials	Neither natural rubber, materials containing asbestos nor hygroscopic materials are used as insulation. No driving belts or couplings used.	P
2.9.2	Humidity conditioning	Humidity treatment performed for 48h at 91-95%.	P
2.9.3	Requirements for insulation	The insulation complies with sub-clauses 4.5.1, 5.2 and 2.10.	P
2.9.4	Insulation parameters	Application of insulation and working voltage are considered.	P
2.9.5	Categories of insulation	Input to Output: SELV to SELV, no separation. Input and output to enclosure: Double insulation between part at 190 Vdc and enclosure.	P

2.10	Clearances, creepage distances and distances through insulation		P
2.10.1	General		P
2.10.2	Determination of working voltage		P
2.10.3	Clearances		P
2.10.3.1	General		P
2.10.3.2	Clearances in primary circuit	No primary circuit.	N/A

IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
2.10.3.3	Clearances in secondary circuits	(see appended table 2.10.3 and 2.10.4)	P
2.10.3.4	Measurement of transient voltage levels		N/A
2.10.4	Creepage distances	(see appended table 2.10.3 and 2.10.4)	P
	CTI tests.....:	III	—
2.10.5	Solid insulation		P
2.10.5.1	Minimum distance through insulation	Insulation foil below PCB (basic insulation). (see appended table 2.10.5). This insulation meets the requirements for basic insulation.	P
2.10.5.2	Thin sheet material		N/A
	Number of layers (pcs).....:		—
	Electric strength test	(see appended table 5.2)	—
2.10.5.3	Printed boards		N/A
	Distance through insulation		N/A
	Electric strength test for thin sheet insulating material	(see appended table 5.2)	—
	Number of layers (pcs).....:		N/A
2.10.5.4	Wound components		N/A
	Number of layers (pcs).....:		N/A
	Two wires in contact inside wound component; angle between 45° and 90°		N/A
2.10.6	Coated printed boards		N/A
2.10.6.1	General		N/A
2.10.6.2	Sample preparation and preliminary inspection		N/A
2.10.6.3	Thermal cycling		N/A
2.10.6.4	Thermal ageing (°C).....:		N/A
2.10.6.5	Electric strength test		—
2.10.6.6	Abrasion resistance test		N/A
	Electric strength test		—
2.10.7	Enclosed and sealed parts.....:		N/A
	Temperature $T_1=T_2 = T_{ma} - T_{amb} + 10K$ (°C).....:		N/A
2.10.8	Spacings filled by insulating compound	Approved optocouplers are used.	P
	Electric strength test		—
2.10.9	Component external terminations		P
2.10.10	Insulation with varying dimensions		N/A

IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
3	WIRING, CONNECTIONS AND SUPPLY		P
3.1	General		N/A
3.1.1	Current rating and overcurrent protection	No internal wires.	N/A
3.1.2	Protection against mechanical damage	No internal wires.	N/A
3.1.3	Securing of internal wiring	No internal wires.	N/A
3.1.4	Insulation of conductors		N/A
3.1.5	Beads and ceramic insulators	No beads or similar ceramic insulators on conductors.	N/A
3.1.6	Screws for electrical contact pressure		N/A
3.1.7	Non-metallic materials in electrical connections	No contact pressure through insulating material.	N/A
3.1.8	Self-tapping and spaced thread screws	Thread-cutting or space thread screws are not used for electrical connections.	N/A
3.1.9	Termination of conductors	Terminations cannot become displaced so that clearances and Creepage distances can not be reduced.	N/A
	10 N pull test		N/A
3.1.10	Sleeving on wiring	.	N/A

3.2	Connection to a.c. mains supplies		N/A
3.2.1	Means of connection	Built in Power Supply with approved connector (see list of safety critical components).	N/A
3.2.2	Multiple supply connections	Only one supply connection.	N/A
3.2.3	Permanently connected equipment	The equipment is not intended for permanent connection to the mains.	N/A
	Number of conductors, diameter (mm) of cable and conduits		—
3.2.4	Appliance inlets	No appliance inlet is used.	N/A
3.2.5	Power supply cords	Power supply cord is not provided (built in Power Supply).	N/A
	Type		—
	Rated current (A), cross-sectional area (mm ²), AWG		—
3.2.6	Cord anchorages and strain relief	Equipment not provided with a non-detachable power supply cord.	N/A
	Mass of equipment (kg), pull (N)		—
	Longitudinal displacement (mm)		—

IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
3.2.7	Protection against mechanical damage	No sharp points or cutting edges on the equipment surfaces.	P
3.2.8	Cord guards	The equipment is neither hand-held nor intended to be moved during operation.	N/A
	D (mm); test mass (g)		—
	Radius of curvature of cord (mm).....		—
3.2.9	Supply wiring space	Not permanently connected equipment or equipment with connection of ordinary non-detachable power supply cord.	N/A

3.3	Wiring terminals for connection of external conductors		N/A
3.3.1	Wiring terminals	Unit is intended for connection to SELV voltage and not to mains supply. The unit is for building-in. Approved terminals are used.	N/A
3.3.2	Connection of non-detachable power supply cords		N/A
3.3.3	Screw terminals	Screws do not clamp the external supply wiring.	N/A
3.3.4	Rated current (A), cord/cable type, cross-sectional area (mm ²).....		N/A
3.3.5	Rated current (A), type and nominal thread diameter (mm)		N/A
3.3.6	Wiring terminals design		N/A
3.3.7	Grouping of wiring terminals		N/A
3.3.8	Stranded wire	Only SELV connections, therefore this test is not relevant.	N/A

3.4	Disconnection from the a.c. mains supply		N/A
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3.5	Interconnection of equipment		N/A
3.5.1	General requirements		N/A
3.5.2	Types of interconnection circuits.....		N/A
3.5.3	ELV circuits as interconnection circuits		N/A

4	PHYSICAL REQUIREMENTS		P
4.1	Stability		N/A

IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
	Angle of 10°	The unit is for built in use. Therefore, the test is not applicable.	N/A
	Test: force (N).....:		N/A

4.2	Mechanical strength		P
4.2.1	General		P
4.2.2	Steady force test, 10 N	See enclosed test results.	P
4.2.3	Steady force test, 30 N	No operator access part protected by a door or cover.	N/A
4.2.4	Steady force test, 250 N		N/A
4.2.5	Impact test		N/A
4.2.6	Drop test		N/A
4.2.7	Stress relief		N/A
4.2.8	Cathode ray tubes		N/A
	Picture tube separately certified.....:		N/A
4.2.9	High pressure lamps		N/A
4.2.10	Wall or ceiling mounted equipment; force (N) ...:		N/A

4.3	Design and construction		P
4.3.1	Edges and corners	All edges and corners are rounded and/or smoothed.	P
4.3.2	Handles and manual controls; force (N)		N/A
4.3.3	Adjustable controls		N/A
4.3.4	Securing of parts	All hazardous parts are fixed to retain position in event of termination failure.	P
4.3.5	Connection of plugs and sockets		N/A
4.3.6	Direct plug-in equipment	Not intended to plug directly into a wall socket-outlet.	N/A
	Dimensions (mm) of mains plug for direct plug-in		N/A
	Torque (Nm)		N/A
4.3.7	Heating elements in earthed equipment	No heating elements provided.	N/A
4.3.8	Batteries		N/A
4.3.9	Oil and grease		N/A

IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
4.3.10	Dust, powders, liquids and gases		N/A
4.3.11	Containers for liquids or gases		N/A
4.3.12	Flammable liquids		N/A
	Quantity of liquid (l)		N/A
	Flash point (°C)		N/A
4.3.13	Radiation; type of radiation		N/A
	Equipment using lasers		N/A

4.4	Protection against hazardous moving parts		N/A
4.4.1	General	No moving parts	N/A
4.4.2	Protection in operator access areas		N/A
4.4.3	Protection in restricted access locations		N/A
4.4.4	Protection in service access areas		N/A

4.5	Thermal requirements		P
4.5.1	Temperature rises	(see appended table 4.5)	P
	Normal load condition per Annex L		N/A
4.5.2	Resistance to abnormal heat	No thermoplastic parts carrying hazardous voltages.	N/A

4.6	Openings in enclosures		N/A
4.6.1	Top and side openings	The enclosure of this component is not rated as fire or electrical enclosure. For description of the enclosure refer to the list of safety critical components.	N/A
	Dimensions (mm)		—
4.6.2	Bottoms of fire enclosures		N/A
	Construction of the bottom		—
4.6.3	Doors or covers in fire enclosures		N/A
4.6.4	Openings in transportable equipment		N/A
4.6.5	Adhesives for constructional purposes		N/A
	Conditioning temperature /time		—

4.7	Resistance to fire		P
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IEC 60 950			
Clause	Requirement – Test	Result – Remark	Verdict
4.7.1	Reducing the risk of ignition and spread of flame	The unit uses appropriate and approved components.	P
4.7.2	Conditions for a fire enclosure	Fire enclosure must be considered for the end product.	N/A
4.7.2.1	Parts requiring a fire enclosure	The fire enclosure is required to cover all parts.	N/A
4.7.2.2	Parts not requiring a fire enclosure	The fire enclosure is required to cover all parts.	N/A
4.7.3	Materials		P
4.7.3.1	General	Components and materials have adequate flammability classification.	P
4.7.3.2	Materials for fire enclosures		N/A
4.7.3.3	Materials for components and other parts outside fire enclosures	No parts outside the fire enclosure.	N/A
4.7.3.4	Materials for components and other parts inside fire enclosures		N/A
4.7.3.5	Materials for air filter assemblies	No air filters in the equipment.	N/A
4.7.3.6	Materials used in high-voltage components		N/A

5	ELECTRICAL REQUIREMENTS AND SIMULATED ABNORMAL CONDITIONS		P
5.1	Touch current and protective conductor current		N/A
5.1.1	General	Unit is not intended for connection to mains supply.	N/A
5.1.2	Equipment under test (EUT)		N/A
5.1.3	Test circuit		N/A
5.1.4	Application of measuring instrument		N/A
5.1.5	Test procedure		N/A
5.1.6	Test measurements		N/A
	Test voltage (V)		—
	Measured (mA)		—
	Max. allowed current (mA)		—
5.1.7	Equipment with touch current exceeding 3.5 mA		N/A
5.1.8	Touch currents to and from telecommunication networks		N/A
5.1.8.1	Limitation of the touch current to a telecommunication network		N/A
	Test voltage (V)		—

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Clause	Requirement – Test	Result – Remark	Verdict
	Measured current (mA)		—
	Max. allowed current (mA)		—
5.1.8.2	Summation of touch currents from telecommunication networks		N/A

5.2	Electric strength		P
5.2.1	General	(see appended table 5.2)	P
5.2.2	Test procedure	(see appended table 5.2)	P

5.3	Abnormal operating and fault conditions		P
5.3.1	Protection against overload and abnormal operation	(see appended table 5.3)	P
5.3.2	Motors		N/A
5.3.3	Transformers		N/A
5.3.4	Functional insulation	Complies with a) and c).	P
5.3.5	Electromechanical components		N/A
5.3.6	Simulation of faults	(see appended table 5.3)	P
5.3.7	Unattended equipment	No thermostats, temperature limiters or thermal cutouts.	N/A
5.3.8	Compliance criteria for abnormal operating and fault conditions	No fire or molten metal occurred and no deformation of enclosure during the tests. No reduction of clearance and Creepage distances.	P

6	CONNECTION TO TELECOMMUNICATION NETWORKS		N/A
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A	ANNEX A, TESTS FOR RESISTANCE TO HEAT AND FIRE		N/A
A.1	Flammability test for fire enclosures of movable equipment having a total mass exceeding 18 kg, and of stationary equipment (see 4.7.3.2)		N/A
A.1.1	Samples		—
	Wall thickness (mm)		—
A.1.2	Conditioning of samples; temperature (°C).....		N/A
A.1.3	Mounting of samples		N/A
A.1.4	Test flame		N/A
A.1.5	Test procedure		N/A
A.1.6	Compliance criteria		N/A
	Sample 1 burning time (s).....		—
	Sample 2 burning time (s).....		—
	Sample 3 burning time (s).....		—

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Clause	Requirement – Test	Result – Remark	Verdict
A.2	Flammability test for fire enclosures of movable equipment having a total mass not exceeding 18 kg, and for material and components located inside fire enclosures (see 4.7.3.2 and 4.7.3.4)		N/A
A.2.1	Samples, material		—
	Wall thickness (mm)		—
A.2.2	Conditioning of samples		N/A
A.2.6	Compliance criteria		N/A
	Sample 1 burning time (s).....		—
	Sample 2 burning time (s).....		—
	Sample 3 burning time (s).....		—
A.2.7	Alternative test acc. to IEC 60695-2-2, cl. 4, 8		N/A
	Sample 1 burning time (s).....		—
	Sample 2 burning time (s).....		—
	Sample 3 burning time (s).....		—
A.3	High current arcing ignition test (see 4.7.3.2)		N/A
A.3.1	Samples, material		N/A
	Wall thickness (mm)		N/A
A.3.5	Compliance criteria		N/A
	Sample 1 number of arcs to ignition (pcs)		N/A
	Sample 2 number of arcs to ignition (pcs)		N/A
	Sample 3 number of arcs to ignition (pcs)		N/A
	Sample 4 number of arcs to ignition (pcs)		N/A
	Sample 4 number of arcs to ignition (pcs)		N/A
A.4	Hot wire		N/A
A.4.1	Samples, material		N/A
	Wall thickness (mm)		N/A
A.4.5	Compliance criteria		N/A
	Sample 1 ignition time (s)		N/A
	Sample 2 ignition time (s)		N/A
	Sample 3 ignition time (s)		N/A
	Sample 4 ignition time (s)		N/A
	Sample 5 ignition time (s)		N/A
A.5	Hot flaming oil test (see 4.6.2)		N/A
A.6	Flammability tests for classifying materials V-0, V-1 or V-2		N/A
A.6.1	Samples, material		—
	Wall thickness (mm)		—
A.6.5	Compliance criteria		N/A
A.6.6	Permitted retest		N/A

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Clause	Requirement – Test	Result – Remark	Verdict
A.7	Flammability test for classifying foamed materials HF-1, HF-2 or HFB		N/A
A.7.1	Sample, material		—
	Wall thickness (mm)		—
A.7.4	Compliance criteria		N/A
A.7.5	Compliance criteria, HF-2		N/A
A.7.6	Compliance criteria, HF-1		N/A
A.7.7	Compliance criteria, HBF		N/A
A.7.8	Permitted retest, HF-1 or HF-2		N/A
A.7.9	Permitted retest, HBF		N/A
A.8	Flammability test for classifying materials HB		N/A
A.8.1	Samples, material		N/A
	Sample thickness (mm)		—
A.8.2	Conditioning of samples; temperature (°C).....		N/A
A.8.4	Test procedure		N/A
A.8.5	Compliance criteria		N/A
A.8.6	Permitted retest		N/A
A.9	Flammability test for classifying materials 5V		N/A
A.9.1	Samples, material		—
	Sample thickness (mm)		—
A.9.4	Test procedure, test bars		N/A
A.9.5	Test procedure, test plaques		N/A
A.9.6	Compliance criteria		N/A
A.9.7	Permitted retest		N/A
A.10	Stress relief conditioning (see 4.2.7)		N/A
	Temperature (°C).....		—
B	ANNEX B, MOTOR TESTS UNDER ABNORMAL CONDITIONS (see 4.7.2.2 and 5.3.2)		N/A
C	ANNEX C, TRANSFORMERS (see 1.5.4 and 5.3.3)		N/A
G	ANNEX G, ALTERNATIVE METHOD FOR DETERMINING MINIMUM CLEARANCES		N/A
H	ANNEX H, IONIZING RADIATION (see 4.3.13)		N/A
J	ANNEX J, TABLE OF ELECTROCHEMICAL POTENTIALS (see 2.6.5.6)		P

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Clause	Requirement – Test	Result – Remark	Verdict
	Metal used		—
K	ANNEX K, THERMAL CONTROLS (see 1.5.3 and 5.3.7)		N/A
U	ANNEX U, INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION (see 2.10.5.4)		N/A
		See separate test report	—

*This is an extract of the CB-Scheme report with the most important information.
If a complete copy of the report is required, please contact your PULS sales representative.*