

EGSTON

Switch Mode Power Supply Product Name:

E2OFxW3 120 12V 10A

E2OFxW3 120 24V 5,0A

Input:

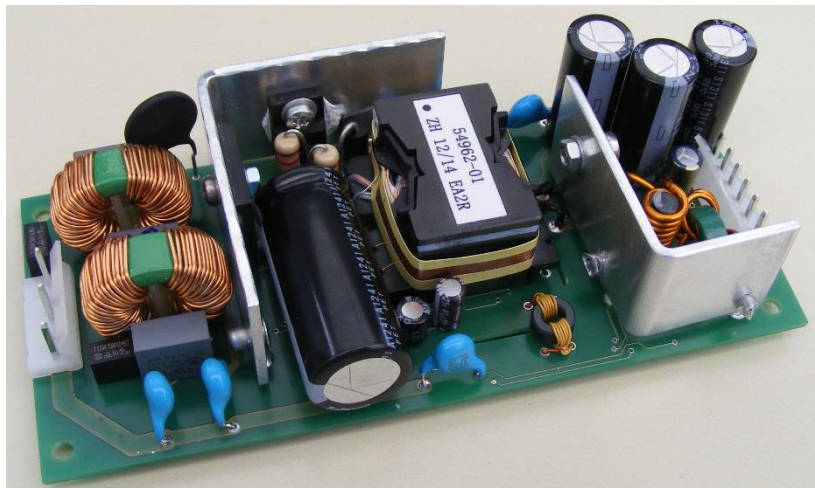
100 - 240 V AC

Output :

max. 120W

Type:

E2OFxW3



CONFIDENTIAL

This document contains proprietary information originated and/or owned by EGSTON System Electronics Eggenburg GmbH.

This information shall not be duplicated, used or disclosed in whole, or in part, to any other party or used for any other purpose without the prior consent of EGSTON System Electronics Eggenburg GmbH.

Copyright © 2015 EGSTON System Electronics Eggenburg GmbH


A-3730 Eggenburg, Grafenberger Strasse 37

All Rights Reserved.



PERFORMANCE SPECIFICATION		Page 2/16	
Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance	
Approved by M. Obritzhauser		Day 14	Month Year Revision 12 15 I

1	Evolution.....	3
2	Scope	3
3	Technical Specification Sheet	4
3.1	Input Specification	4
3.2	Safety and Environmental Conditions	4
3.3	Output Specification	5
3.3.1	Output template.....	6
3.4	Mechanical Parameters.....	7
3.4.1	Dimensions of PCBA.....	7
3.4.2	Mounting	7
3.4.3	Connectors and Polarity.....	7
3.5	Marking.....	8
4	Reliability.....	9
4.1	MTBF / Life Time	9
4.2	Maintainability	9
4.3	Temperature cycle test.....	9
5	Safety	10
5.1	Dielectric Strength.....	10
5.2	Over-current Protection.....	10
5.3	Single Component Failure	10
5.4	Short Circuit.....	10
6	EMC (only for medical devices)	11
6.1	General.....	11
6.2	EMC Environment.....	11
6.3	Distances to RF Communication.....	14
7	Approvals and test standards.....	15
7.1	General.....	15
7.2	Test Standards	15
7.3	Approvals - Pending.....	15
7.4	Description of symbols from marking plate.....	16

	PERFORMANCE SPECIFICATION			Page 3/16
	Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance	
	Approved by M. Obritzhauser		Day 14	Month 12


1 EVOLUTION

Edition	Date	Responsible	Reason of change
A	22.05.2014	Mauritz	First edition
B	14.07.2014	Mauritz	Output power adapted
C	28.01.2015	Vařacha	Output power, Input Current, Efficiency, Stand-by Power, Ripple Voltage adapted
D	11.02.2015	Obritzhauser	Output Power at 115V Input Changed
E	19.03.2015	Vařacha	Output Power at 100V input changed
F	14.4.2015	Vařacha	Output Power at 100V input changed
G	16.07.2015	Obritzhauser	Output Power range corrected
H	17.11.2015	Mauritz	Altitude difference and atmospheric pressure added, Description of symbols from marking plate added, Mechanical parameters changed
I	14.12.2015	Mauritz	EMC added

2 SCOPE

This document describes a switch mode power supply unit (AC/DC converter) with fixed output voltage.

The unit is designed as open frame power supply.

	PERFORMANCE SPECIFICATION			Page 4/16		
	Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance			
	Approved by M. Obritzhauser		Day 14	Month 12	Year 15	Revision I


3 TECHNICAL SPECIFICATION SHEET

3.1 Input Specification

Parameter	Key	Min	Typ.	Max	Unit	Test Cond.
Input Voltage	U_{IN}	90		264	V	AC
Input Current	I_{IN}	15		2000	mA	
Input Frequency	f_{IN}	47	50	63	Hz	
Efficiency	η	90			%	Average 25%, 50%, 75% and 100% load at 230V/50Hz input
		According EuP Tier II Already designed to meet ErP III Tier2 / DoE 2016 requirement				
Switching Frequency	f_{sw}		65		kHz	
Stand-by power	P_{stb}	170			mW	230V/50Hz Input, no output load
		According EuP Tier II Already designed to meet ErP III Tier2 / DoE 2016 requirement				

3.2 Safety and Environmental Conditions

Parameter	Key	Min	Typ.	Max	Unit	Test Cond.
Dielectric Strength		4			KV _{AC}	Medical
		3			KV _{AC}	IT and Household
Leakage current				100	μ A	Secondary to earth
Operating Temperature		0		50/70	$^{\circ}$ C	See output specification
Storage Temperature		-20	25	80	$^{\circ}$ C	
Humidity				95	%	Non condensing
Atmospheric pressure		70		106	kPa	
Altitude difference		0		3000	m	

	PERFORMANCE SPECIFICATION			Page 5/16		
	Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance			
	Approved by M. Obritzhauser		Day 14	Month 12	Year 15	Revision I

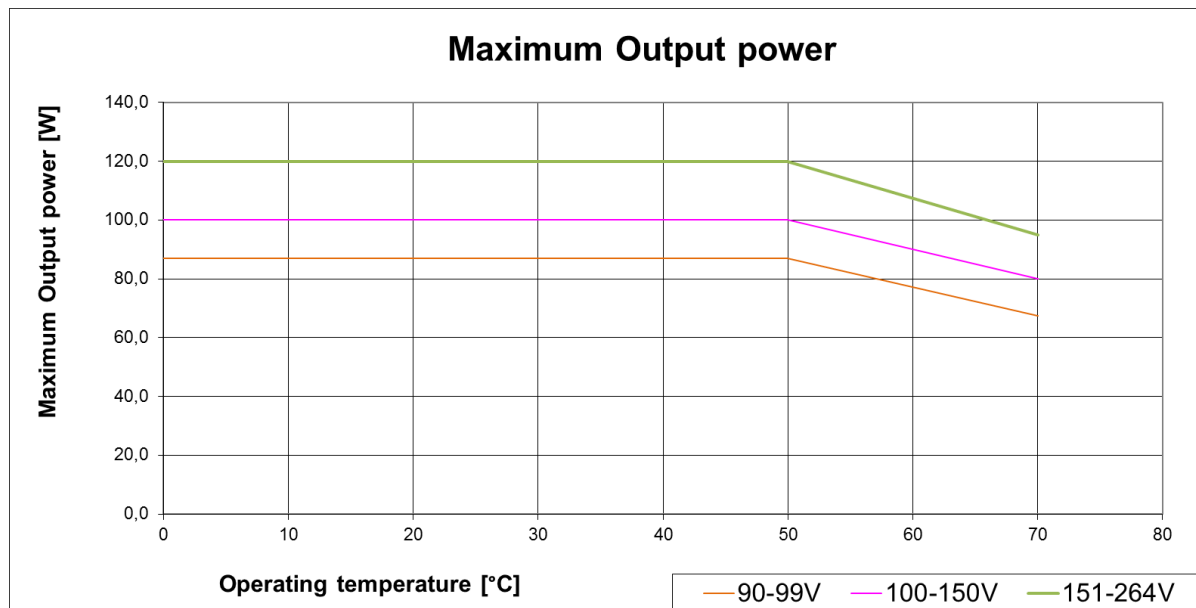
3.3 Output Specification


Parameter	Key	Min	Typ.	Max	Unit	Test Cond.
Output Voltage	U ₂	11,64	12	12,36	V	0-9,2A
	U ₂	23,28	24	24,72	V	0-4,6A
Output voltage tolerance	T _{U2}			3	%	at PCB
Output power	P ₂			*	W	See table
Ripple Voltage	U _{2,rms}			20	mV _{rms}	230V/50Hz full Load
	U _{2,pp}			90	mV _{pp}	230V/50Hz full Load

* Maximum Output power at convection cooling:

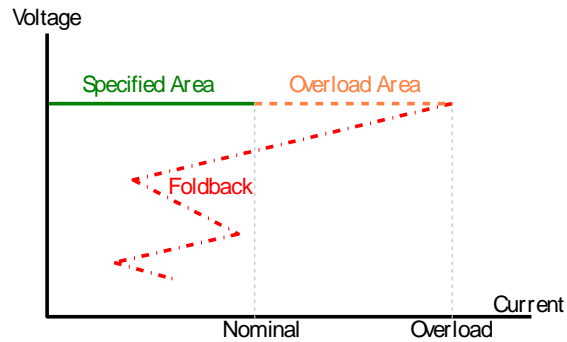
Operating Temperature	Input voltage: 90-99V	Input voltage: 100-150V	Input voltage: 151-264V
0-50°C	87W	100W	120W
51-70°C	87-67,5W*	100-80W*	120-95W*

* Derating linearly with ambient temperature



	PERFORMANCE SPECIFICATION			Page 6/16		
	Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance			
	Approved by M. Obritzhauser		Day 14	Month 12	Year 15	Revision I

3.3.1 Output template



Specified area:

At an output current from 0A to $I_{2\text{ Nominal}}$ the unit fulfills all specified data.


Overload area:

At an output current from $I_{2\text{ Nominal}}$ to $I_{2\text{ Overload}}$ the power supply delivers the specified output voltage U_2 .

The unit is not long time overload proof. If the unit is powered longer than 1 min in overload conditions, the device can be damaged. The period between two overload conditions has to be at least 15 minutes.

Fold back area:

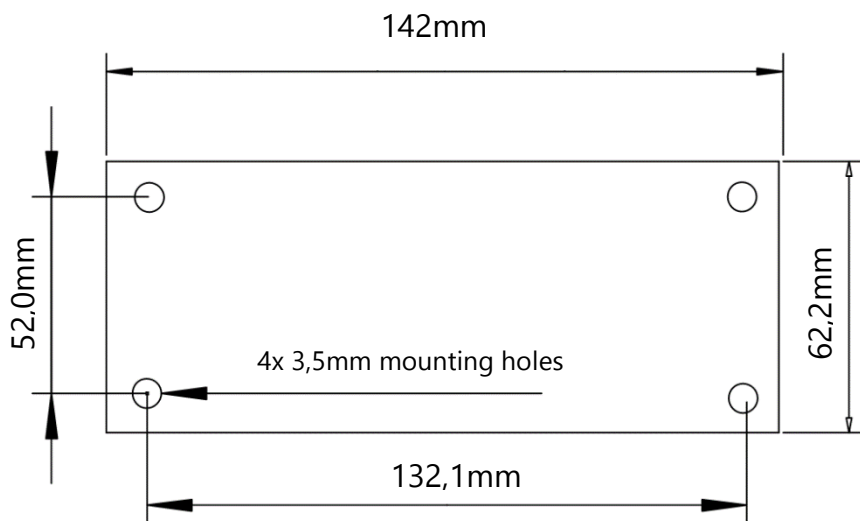
If the power demand would be greater than $I_{2\text{ Overload}}$ or the power supply works in short circuit the output voltage and current can not be defined (this parameters are not stable). The wattage of the SMPS is de-rated. In this mode the unit can not be damaged. After removing these conditions the unit fulfills the specification.

	PERFORMANCE SPECIFICATION			Page 7/16		
	Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance			
	Approved by M. Obritzhauser		Day 14	Month 12	Year 15	Revision I

3.4 Mechanical Parameters

3.4.1 Dimensions of PCBA

Approx: 142mm x 62,2mm x 40mm
All Dimensions +/- 0,5mm



3.4.2 Mounting

PCBA can be fixed onto customer application with screws M3 DIN 931 (max. torque 1Nm) and lock washers DIN 6797 which are positioned on the corners.

The PCBA has to be mounted without mechanical stress to protect the PCBA from distortion.

3.4.3 Connectors and Polarity

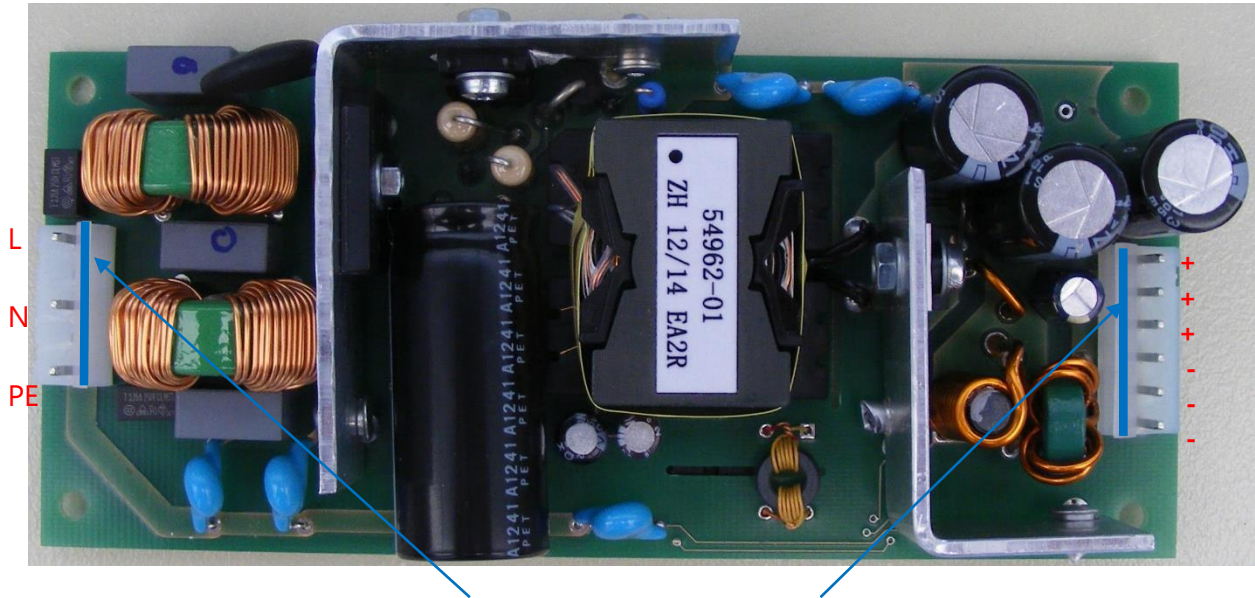
Primary:

L/N/PE with connector – Molex 10-63-4037

Secondary:

+/- with connector - Molex 09-65-2068


Connection Diagram:



Position of Locking Tab

3.5 Marking

- Product name
- Input parameters
- Output parameters
- Safety instructions
- Date code of production
- CE marking
- Approval marks

	PERFORMANCE SPECIFICATION			Page 9/16
	Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance	
	Approved by M. Obritzhauser		Day 14	Month 12

4 RELIABILITY

4.1 MTBF / Life Time

MTBF: TBD

Life time:


50000h @ 25°C ambient temperature and full load

4.2 Maintainability

The power supply is not to be repaired.

4.3 Temperature cycle test

During quality approval the unit passed the EGSTON standard temperature cycle test.

	PERFORMANCE SPECIFICATION			Page 10/16
	Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance	
	Approved by M. Obritzhauser		Day 14	Month 12
		Revision I		

5 SAFETY

The units pass the following tests:

5.1 Dielectric Strength

The input isolation test voltage is 4KV 50/60Hz AC for medical application and 3KV 50/60Hz AC for IT and Household application, Sinusoidal waveform. Test duration is 2 seconds for 100% test, 1minute for lot-test.

5.2 Over-current Protection


The unit is not long time over-current proof. If the unit is powered longer than 1 min in overload conditions, the device can be damaged. The period between two overload conditions has to be at least 15 minutes.

5.3 Single Component Failure

A single component failure does not cause any damage to persons or ambient (fire, explosions, etc).

5.4 Short Circuit

The power supply is designed with a short circuit protection. A shortened output does not cause any damage to persons or ambient (fire, explosions, etc.) After removing these conditions the unit fulfills the specification.

	PERFORMANCE SPECIFICATION			Page 11/16
	Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance	
	Approved by M. Obritzhauser		Day 14	Month 12
				Revision I

6 EMC (ONLY FOR MEDICAL DEVICES)

6.1 General

WARNING:

The ME EQUIPMENT or ME SYSTEM should not be used adjacent to or stacked with other equipment and if adjacent or stacked use is necessary, the ME EQUIPMENT or ME SYSTEM should be observed to verify normal operation in the configuration in which it will be used.

Medical electrical equipment needs special precautions regarding EMC and needs to be installed according to EMC information.

Mobile RF communications equipment can effect medical electrical equipment.

6.2 EMC Environment

The "E2OFxW3 120" is intended for use in the electromagnetic environment specified below. The customer or the user of the "E2OFxW3 120" should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The "E2OFxW3 120" uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The "E2OFxW3 120" is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations / flicker emissions IEC 61000-3-3	Complies	



PERFORMANCE SPECIFICATION

Document prepared:

M. Mauritz

Document No.

E2OFxW3 120 – Performance

Approved by

M. Obritzhauser

Day

14

Month

12

Year

15

Revision

I

The "E2OFxW3 120" is intended for use in the electromagnetic environment specified below. The customer or the user of the "E2OFxW3 120" should assure that it is used in such an environment.

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 610004-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % UT (>95 % dip in UT) for 0.5 cycle 40 % UT (60 % dip in UT) for 5 cycles 70 % UT (30 % dip in UT) for 25 cycles <5 % UT (>95 % dip in UT) for 5 sec	<5 % UT (>95 % dip in UT) for 0.5 cycle 40 % UT (60 % dip in UT) for 5 cycles 70 % UT (30 % dip in UT) for 25 cycles <5 % UT (>95 % dip in UT) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the "E2OFxW3 120" requires continued operation during power mains interruptions, it is recommended that the "E2OFxW3 120" is powered from an uninterruptible power supply or battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE UT is the a.c. mains voltage prior to application of the test level.

Document prepared:

M. Mauritz

Document No.

E2OFxW3 120 – Performance

Approved by

M. Obritzhauser

Day

14

Month

12


Year

15

Revision

I

The "E2OFxW3 120" is intended for use in the electromagnetic environment specified below. The customer or the user of the "E2OFxW3 120" should assure that it is used in such an environment.


Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	Portable and mobile RF communications equipment should not be used no closer to any part of the "E2OFxW3 120", including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.2\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	$d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey a should be less than the compliance level in each frequency range.b Interference may occur in the vicinity of equipment marked with the following symbol: 

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.


^a Field strengths from fixed transmitters such as base stations for radio (cellular/cordless) telephones, land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast, cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters an electromagnetic site survey should be considered. If the measured field strength in the location in which the "E2OFxW3 120" is used, exceeds the applicable RF compliance level above, the "E2OFxW3 120" should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the "E2OFxW3 120".

^b Over the frequency range 150 kHz to 80 MHz, field strength should be less than 3 V/m.

	PERFORMANCE SPECIFICATION			Page 14/16		
	Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance			
	Approved by M. Obritzhauser		Day 14	Month 12	Year 15	Revision I

6.3 Distances to RF Communication

Recommended separation distances between portable and mobile RF communications equipment and the "E2OFxW3 120"			
<p>The "E2OFxW3 120" is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the "E2OFxW3 120" can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the "E2OFxW3 120" as recommended below, according to the maximum output power of the communication equipment.</p>			
Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1.2\sqrt{P}$	80 MHz to 800 MHz $d = 1.2\sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
<p>For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be determined using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.</p>			
<p>NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.</p>			
<p>NOTE 4 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			

	PERFORMANCE SPECIFICATION			Page 15/16
	Document prepared: M. Mauritz		Document No. E2OFxW3 120 – Performance	
	Approved by M. Obritzhauser		Day 14	Month 12

7 APPROVALS AND TEST STANDARDS

7.1 General

The device is galvanically isolated with safety extra low voltage (SELV) output.
The output fulfills 2 MOPP for medical application.

7.2 Test Standards

EN / UL 60601-1 (2xMOPP)
EN 60335-1
EN / UL 60950-1
EN 60601-1-2 / EN 55011
EN 61000-3-2
EN 61000-3-3

7.3 Approvals - Pending

Following approvals will be available




Conformity with the EU low voltage directive, EMC directive and ROHS directive




or



C/US NRTL approval

	PERFORMANCE SPECIFICATION			Page 16/16
	Document prepared: M. Mauritz	Document No. E2OFxW3 120 – Performance		
	Approved by M. Obritzhauser	Day 14	Month 12	Year 15

7.4 Description of symbols from marking plate

 Conformity with the relevant EU directives

RoHS conform



The power supply has to be disposed appropriately according the local regulations for Waste Electrical and Electronic Equipment.



For indoor use only



Read instruction manual



Attention! Please note accompanying documents