



Switchmode power supply

MEDICAL

with interchangeable adapter system.
All products conform to IEC 60601-1.



FOX12-XM-USB

11 W MEDICAL POWER SUPPLY



c  us



Characteristics

- High efficiency
- Low no load power consumption 50mW
- Meets DoE efficiency level VI
- Meets CoC version 5 Tier 2 ready
- Ultra-low leakage current $\leq 10\mu\text{A}$
- IEC 60601-1-2, 4th edition ready
- Wide operating temperature range 0 - 45°C
- Isolation 2x MOPP
- Double housing safety: snapped & welded
- Also available as version with fixed plugs: FOX12-FM-USB

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FRIWO's medical products are designed for the most sensitive applications and for use under the harshest conditions. They must continue to work perfectly despite falls in the emergency room while protecting patients by offering the lowest possible levels of leakage current. FRIWO develops and manufactures power supply units you can trust. In order to ensure maximum patient safety, FRIWO medical technology devices are equipped with its 2 x MOPP (Means of Patient Protection) safety system and feature a minimal leakage current of $\leq 10 \mu\text{A}$ as well as double-sealed housings.

The power supply will operate at universal input voltage range of 90Vac to 264Vac in a wide temperature range of 0-45°C without derating. In addition to patient safety, efficiency plays a major role: with low standby losses of 50mW and high efficiency rates the medical FOX line complies with the demanding US efficiency standard DOE (Department of Energy) and its European counterpart ErP (Energy related Products).

Model Selection: Output Specifications

Article no.	FW Type	Voltage	Current	Power	Ripple voltage*	Efficiency (typ)	No-Load Power
1898350	FW8000M/USB	5 V	2200 mA	11 W	150 mV pp	$\geq 79.5\%$	<50mW

* Ripple measured with 20MHz Bandwidth Oscilloscope and 0.1uF/50V ceramic capacitor and 10uF/50V aluminum electrolytic capacitor across the output terminal.

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Input Specifications

Input voltage	100-240 V ±10%
Frequency	50-60 Hz
Input current	300-150 mA
Inrush current (@240V)	< 35 A

General Specifications

Operating temperature	0..+45°C
Operating humidity	10..95 %
Operating altitude	3000 m
Storage temperature	-40°C..+70°C
Storage humidity	10..95 %
Non-operating altitude	3000 m
Atmospheric pressure	70-106kPa
Output voltage tolerance	±5 %
Line regulation	±1 %
Load regulation	±4 %
Turn-on delay	≤2 s
Hold-up time	>5 ms (120 V) >50 ms (230 V)
MTBF calculation	200.000 h acc. Mil217F (based on calculations at 120Vac/60Hz & 230Vac/50Hz, ambient 25°C and 100% load)
Housing material	PC-ABS
Dimensions	77,5x31,5x41 mm
Weight	65 g
AC input	FRIWO interchangeable mains plug system: see Primary Adapters
DC output	USB socket type A

Safety

Safety standards	IEC/EN/UL60601-1 3.1 Edition
Approbations	Europe, USA, Australia, Japan
Protection class	II
Isolation	Input - Output 2xMOPP, Input - Ground 1xMOPP
Leakage Current	≤ 10 µA
Flame class	UL 94 V0
IP code	IP40
Overload protection	Yes
Overvoltage protection	Yes
Short circuit protection	Yes

EMC Compliance

Conducted and radiated Emissions	EN55022, EN55011, FCC15, Class B, EN60601-1-2, IEC60601-1-2 4th Edition			
Immunity	EN55024, EN60601-1-2, IEC60601-1-2 4th Edition			
Harmonics	EN61000-3-2	Class A		
Flicker noise	EN61000-3-3	Yes		
ESD (contact / air)	EN61000-4-2	8kV / 15kV	Criteria B 100V	Criteria B 240V
Immunity against radiated field	EN61000-4-3	10V/m	Criteria A 100V	Criteria A 240V
ETF / Burst	EN61000-4-4	2kV	Criteria B 100V	Criteria B 240V
Surge	EN61000-4-5	2kV / 2kV	Criteria B 100V	Criteria B 240V
Immunity against conducted disturbances	EN61000-4-6	10V	Criteria A 100V	Criteria A 240V
Voltage dips	EN61000-4-11	0% 0,5 Cycle	Criteria B 100V	Criteria A 240V
		40% 5 Cycle	Criteria B 100V	Criteria A 240V
		70% 25 Cycle	Criteria B 100V	Criteria A 240V
		0% 5s	Criteria B 100V	Criteria B 240V
Immunity against magnetic field	EN61000-4-8	30A/m	Criteria A 100V	Criteria A 240V

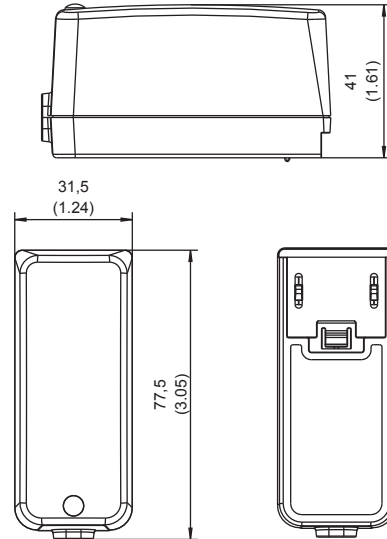
Drop Test

Standard	IEC 60068-2-32
Surface	Steel
Drop height	1 m
Numbers of Drops (total)	3

Vibration

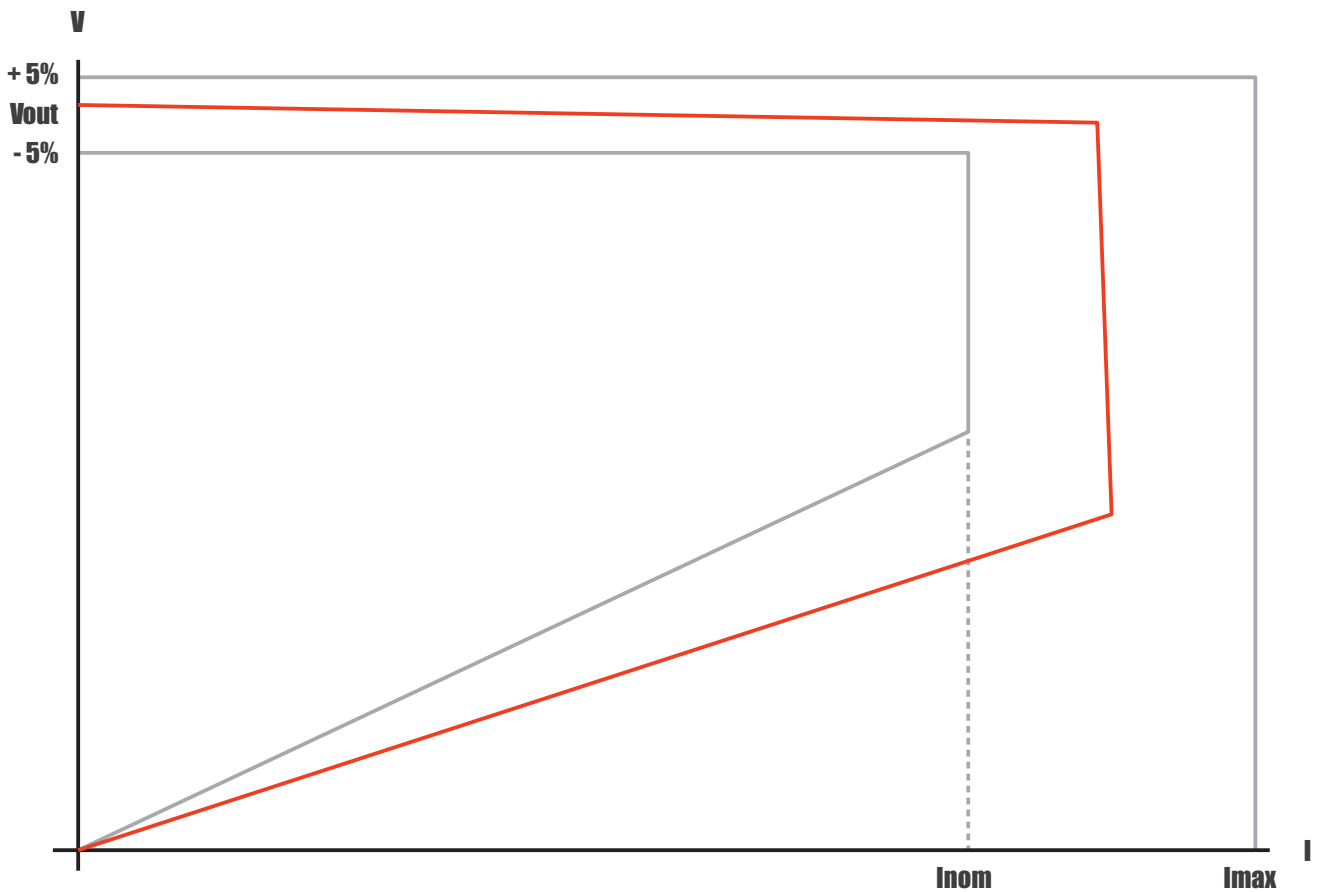
Standard	IEC 60068-2-6
Frequency range	10 – 500 Hz
Cross-over-frequency	58 – 62 Hz
Displacement amplitude	0.2 mm
Peak acceleration	3 g
Number of cycles	10 per axis

Mechanical Drawings



Alle Abmessungen in Millimeter (Inch), Abweichung ± 0,5 (0.02)
All Dimensions in Millimeter (Inch), deviation ± 0,5 (0.02)

Output Characteristics





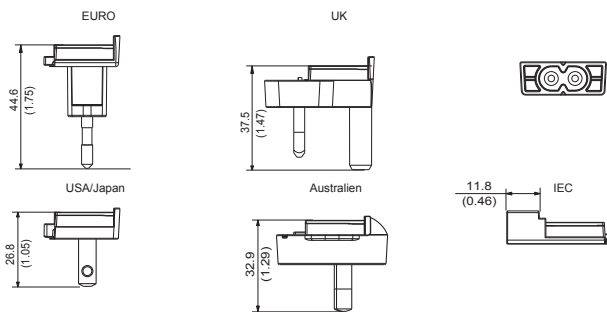
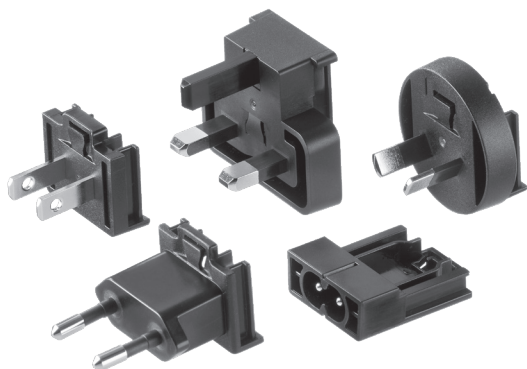
FRIWO Gerätebau GmbH
 Von-Liebig-Straße 11 · 48346 Ostbevern · Germany
 Tel. +49 2532 81-0 · www.friwo.com

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Primary Adapters

Mechanical Drawings



Alle Abmessungen in Millimeter (Inch), Abweichung ± 0,5 (0.02)
 All Dimensions in Millimeter (Inch), Deviation ± 0.5 (0.02)

FOX	IPx0	IPx2	FOX	IPx0	IPx2	FOX	IPx0	IPx2
Country	Article no.	Article no.	Country	Article no.	Article no.	Country	Article no.	Article no.
EURO	1847556	1847618	IEC	1847552	–	IND 2-polig	1847547	–
UK	1847544	1847606	ARG	1847548	–	IND 3-polig	1847546	–
USA / JPN	1847554	1847604	BRA	1847551	–	KOR	1847545	–
AUS	1847553	1847624	CHN	1847550	–	ZAF	1847549	–