

FOX12-X

Switchmode power supply

INDUSTRIAL / ITE

With interchangeable adapter system



Description

FOX power supply units are smaller, more powerful and more efficient than their predecessors. FRIWO's new technical concept has again increased energy density. Thanks to a patented interchangeable adapter system, its devices are suitable for use under the toughest conditions and in the harshest environments. New: the optional IP42 adapter from FRIWO is an interchangeable adapter system that offers additional protection for use in damp environments.

Minimal leakage current means that FRIWO's power supply units are also ideally suited for use with measurement technologies, because they prevent unwanted influences that distort measured values. The FOX product family already meets the U.S. Department of Energy's stringent 2016 DOE energy-efficiency standards, which include stricter requirements regarding the efficiency and standby loss of power supply units. As a result, FRIWO already offers devices that exceed future statutory requirements, ensuring the worldwide use of your application. Choosing FOX today is an investment in the future, offering security tomorrow and beyond.

Features

- High efficiency: up to 85.5 %
- Low no load power consumption < 90 mW
- Meets DoE efficiency level VI
- CoC version 5 ready
- Ultra-low leakage current $\leq 10 \mu\text{A}$
- IEC 60950-1
- Wide operating temperature range 0 - 45°C
- Double housing safety: snapped & welded
- IP42 approved interchangeable plug system as additional accessories
- Also available as version with fixed plugs: FOX12-F

FRIWO Gerätebau GmbH
 Von-Liebig-Straße 11
 48346 Ostbevern
 Deutschland

Tel. +49 2532 81-0
 Fax +49 2532 81-112
 E-Mail: hello@friwo.com
 Web: www.friwo.com

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Model Selection: Output Specifications

Article no.	FW Type	Voltage	Current	Power	Ripple voltage*	Efficiency (typ)	No-Load Power
1898115	FW8000/5	5 V	2200 mA	11.0 W	150 mV pp	79.5 %	< 50 mW
1898116	FW8000/6	5.9 V	2000 mA	11.8 W	150 mV pp	80.5 %	< 80 mW
1898117	FW8000/8	7.5 V	1600 mA	12.0 W	150 mV pp	83.0 %	< 80 mW
1898118	FW8000/9	9 V	1300 mA	11.7 W	150 mV pp	83.2 %	< 60 mW
1897510	FW8000/12	12 V	1000 mA	12.0 W	150 mV pp	84.5 %	< 80 mW
1898120	FW8000/15	15 V	800 mA	12.0 W	150 mV pp	85.3 %	< 80 mW
1898121	FW8000/18	18 V	670 mA	12.1 W	180 mV pp	85.5 %	< 90 mW
1898122	FW8000/24	24 V	500 mA	12.0 W	240 mV pp	85.0 %	< 95 mW
1898123	FW8000/48	48 V	250 mA	12.0 W	480 mV pp	85.5 %	< 90 mW

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

Input Specifications		General Specifications	
Input voltage	100-240 V ±10 %	Operating temperature	0..+45°C
Frequency	50-60 Hz	Operating humidity	10..95 %
Input current	300-150 mA	Operating altitude	3000 m
Inrush current (@240 V)	< 35 A	Storage temperature	-40°C..+70°C
		Storage humidity	10..95 %
		Non-operating altitude	3000 m
		Atmospheric pressure	70-106 kPa
		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 ⁽¹⁾
		Housing material	PC-ABS
		Dimensions	77.5x31.5x41 mm
		Weight	127 g
		AC input	see page 5 ⁽²⁾
		DC output	see page 6 ⁽³⁾

(1): based on calculations at 120 Vac/ 60 Hz & 230 Vac/ 50 Hz, ambient 25°C and 100 % load

(2): FRIWO interchangeable mains plug system: see Primary Adapters

(3): FRIWO Universal output plug system: see Secondary Adapters

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Safety

Safety standards	IEC/EN/UL60950-1	Flame class	UL 94 V0
Approbations	Europe, USA, Australia, Japan	IP code	IP40 (IP42 adapters optionally available)
Protection class	II	Overload protection	Yes
Isolation	Input-Output 2x MOPP, Input-Ground 1x MOPP	Overvoltage protection	Yes
Leakage Current	≤ 10 µA	Short circuit protection	Yes

EMC Compliance

Conducted and radiated Emmissions	EN55032, FCC15, Class B, EN60601-1-2				
Immunity	EN55024				
Harmonics	EN61000-3-2	Class A			
Flicker noise	EN61000-3-3	Yes			
ESD (contact / air)	EN61000-4-2	4 kV / 8 kV	Criteria B 100 V	Criteria B 240 V	
Immunity against radiated field	EN61000-4-3	10 V/m	Criteria A 100 V	Criteria A 240 V	
ETF / Burst	EN61000-4-4	2 kV	Criteria B 100 V	Criteria B 240 V	
Surge	EN61000-4-5	2 kV / 2 kV	Criteria B 100 V	Criteria B 240 V	
Immunity against conducted disturbances	EN61000-4-6	10 V	Criteria A 100 V	Criteria A 240 V	
Voltage dips	EN61000-4-11	0 %	0.5 Cycle	Criteria B 100 V	Criteria A 240 V
		40 %	5 Cycle	Criteria B 100 V	Criteria B 240 V
		70 %	25 Cycle	Criteria B 100 V	Criteria B 240 V
		0 %	5 s	Criteria B 100 V	Criteria B 240 V
Immunity against magnetic field	EN61000-4-8	30 A/m	Criteria A 100 V	Criteria A 240 V	

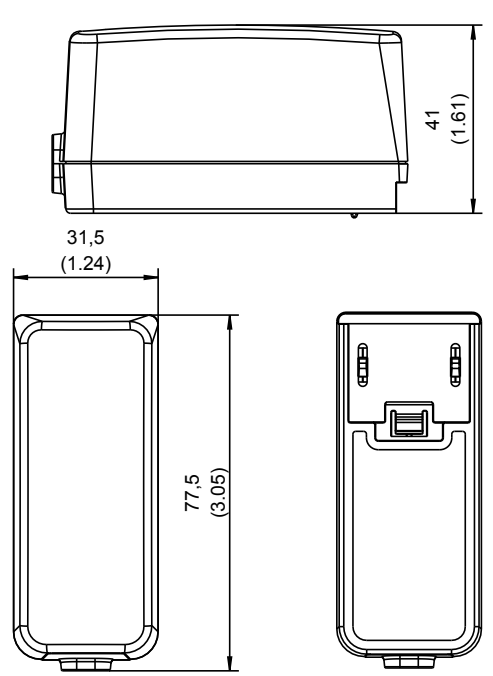
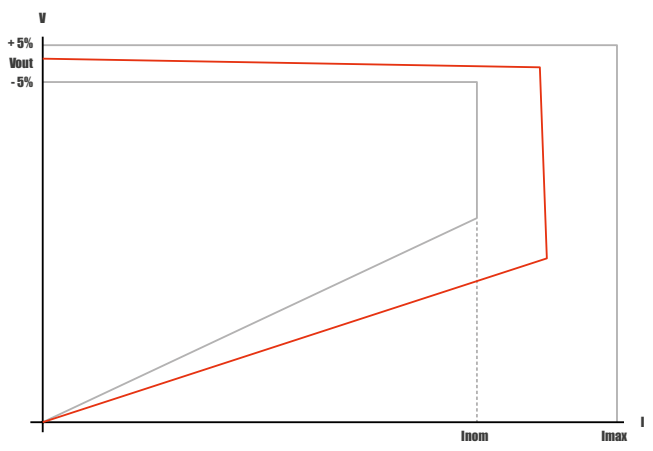
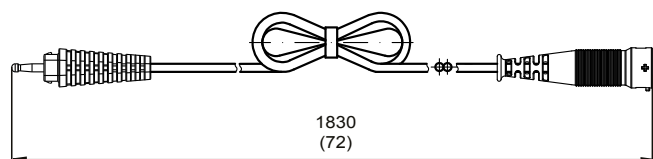
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Drop Test		Vibration	
Standard	IEC 60068-2-32	Standard	IEC 60068-2-6
Surface	Steel	Frequency range	10–500 Hz
Drop height	1 m	Cross-over-frequency	58–62 Hz
Numbers of Drops (total)	3	Displacement amplitude	0.2 mm
		Peak acceleration	3 g
		Number of cycles	10 per axis

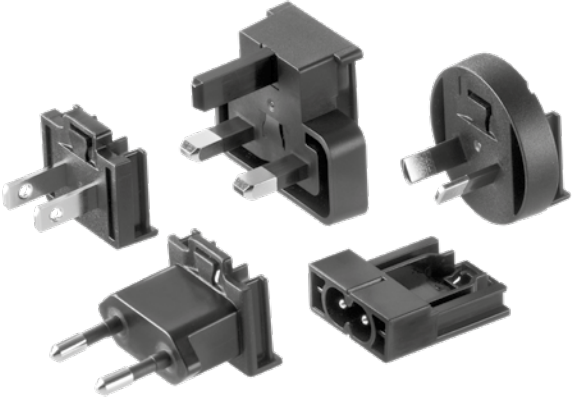
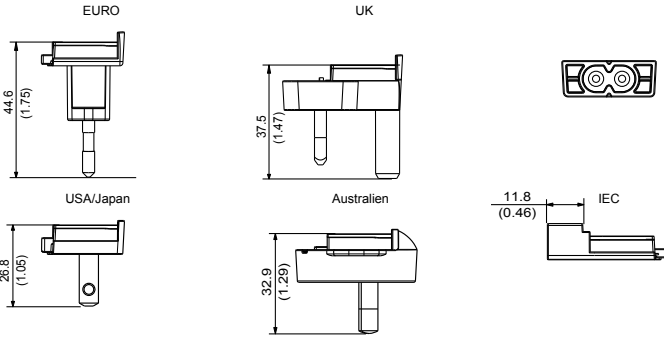
Mechanical Drawings	Output Characteristics
 <p>Alle Abmessungen in Millimeter (Inch), Abweichung ± 0,5 (0.02) All Dimensions in Millimeter (Inch), Deviation ± 0,5 (0.02)</p>	  <p>Alle Abmessungen in Millimeter (Inch), Abweichung ± 0,5 (0.02) All Dimensions in Millimeter (Inch), Deviation ± 0,5 (0.02)</p>

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Primary Adapters	Mechanical Drawings
	 <p>EURO: 44.6 (1.75) UK: 37.5 (1.47) USA/Japan: 26.8 (1.05) Australien: 32.9 (1.29) IEC: 11.8 (0.46)</p> <p>Alle Abmessungen in Millimeter (Inch), Abweichung ± 0,5 (0.02) All Dimensions in Millimeter (Inch), Deviation ± 0.5 (0.02)</p>

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	–

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Secondary Adapters

Straight coaxial connectors				Angled coaxial connectors			
∅ out.	∅ in.	Length mm	Article no.	∅ out.	∅ in.	Length mm	Article no.
3.5	1.3	9.5	1807699	3.5	1.3	9.5	1822478
4.0	1.7	9.5	1822557	4.0	1.7	9.5	1822558
4.0	1.7	11.0	1811994	4.0	1.7	11.0	1822482
4.8	1.7	9.5	1822559	4.8	1.7	9.5	1822560
5.5	2.1	9.5	1807700	5.5	2.1	9.5	1822479
5.5	2.1	11.5	1807701	5.5	2.1	11.5	1822480
5.5	2.1	14.0	1807697	5.5	2.1	14.0	1822476
5.5	2.5	9.5	1807698	5.5	2.5	9.5	1822477
5.5	2.5	11.5	1807702	5.5	2.5	11.5	1822481
5.5	3.3	9.5	1822561	5.5	3.3	9.5	1822562
DIN 45323			1807703	DIN 45323			1822483

Straight jack connectors			Angled jack connectors		
∅ out.	Length mm	Article no.	∅ out.	Length mm	Article no.
2.5	13	1807704	2.5	13	1822484
3.5	14	1807705	3.5	14	1822485

Connectors / Sockets					
Model	Article no.	Model	Article no.	Model	Article no.
Texas connector		Texas sockets 2-pin		Texas sockets 3-pin	
Straight texas connector	1807706	Snap-in type	1323938	Snap-in type	1327259
Angled texas connector	1822486	PCB type	1321609	PCB type	1363506