FRIWO®

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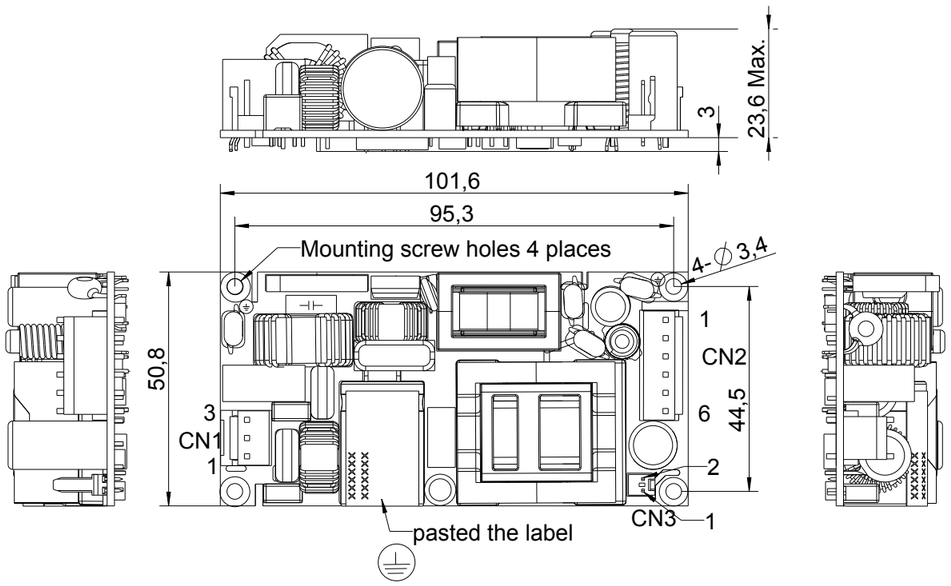
Switchmode power supply
OPEN FRAME

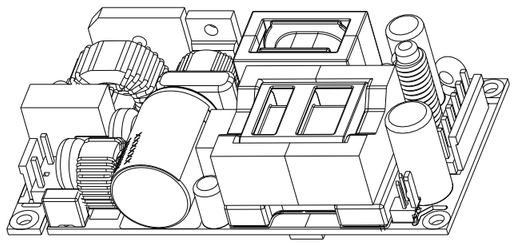
All products conform to IEC 60601-1,
IEC 60950 and IEC 61558.

FRIWO®

Mechanical Drawings



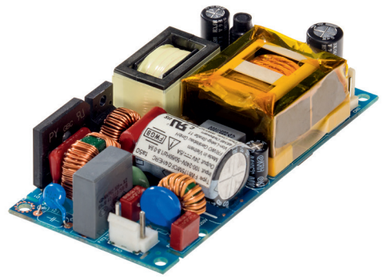
Alle Abmessungen in Inch, Abweichung ± 0.02
All Dimensions in Inch, Deviation 0.02



Connector	P1	P2	P3	P4	P5	P6	Connector type
CN1	L	N					JST:b3p-vh
CN2	+	+	+	-	-	-	JST:b6p-vh
CN3	+	-					Molex:022041021

HERC175 MEDICAL POWER SUPPLY

*Approval in progress. Please refer to our homepage for the current approval status.



Characteristics

- High efficiency: up to 94%
- Low no load power consumption <210mW
- Low leakage current ≤100µA
- IEC 60601-1-2, 4th edition ready
- Wide operating temperature range 0 - 70°C
- Wide input voltage range 85 - 264 VAC
- Isolation 2x MOPP
- Operating altitude 5000m
- Convection cooled 120 W / Forced cooled 175 W
- EN 55011/32 Class B conform

HERC175 175W MEDICAL POWER SUPPLY

FRIWO is revolutionizing its existing open-frame product portfolio by adding the new product line „HERC“. The product name stands for “High Efficiency and Rapid Customization” and features two essential characteristics of the compact built-in components: very high efficiency meets an easy-to adapt open design for fast customer-specific modifications. All this on market standard PCB measures of 3”x2”, 4”x2” and 5”x3” for the different power ratings – combined with minimal height of only 1”- 1.3”.

With up to 94 % efficiency, the power supplies belong to the top tier. FRIWO also sets new standards for idle power consumption: the DOE VI requirements for external power supplies are exceeded, which is quite unusual for open-frame power supplies. The first lines of the new product series include output voltages of 5 - 48 VDC for power classes of 18 W, 30 W and 175 W. Further power ratings of the new product line are still being engineered and will be launched shortly.

The new HERC series complements FRIWO’s established OF product family: compact, open-frame power supplies for the most demanding applications. Designed for maximum vibration, shock and temperature resistance, the incredible operating life of these devices sets new standards. Support also comes from their compact design, which dispenses with active fans. All the devices are purely convection cooled, which makes them far quieter in operation and avoids the need for a component that is prone to failure.

Model Selection: Output Specifications

Article no.	FW Type	Voltage	Current CC* (Convection Cooled)	Output Power CC*	Current FC (Forced Cooled)	Output Power FC	Ripple voltage**	Efficiency (typ)	No-Load Power Consumption (typ)
1899208	FW8175M/OF/12/HERC	12 V	10000 mA	120 W	14600 mA	175 W	150 mV pp	84.5 %	210 mW
1899209	FW8175M/OF/15/HERC	15 V	8000 mA	120 W	11600 mA	175 W	120 mV pp	88.5 %	210 mW
1899059	FW8175M/OF/24/HERC	24 V	5000 mA	120 W	7300 mA	175 W	150 mV pp	88.5 %	210 mW
1899726	FW8175M/OF/28/HERC	28 V	4300 mA	120 W	6250 mA	175 W	180 mV pp	88.0 %	210 mW
1899210	FW8175M/OF/48/HERC	48 V	2500 mA	120 W	3650 mA	175 W	200 mV pp	89.0 %	210 mW

* Forced cooled with 200LFM airflow
** Ripple measured with 20MHz Bandwidth Oscilloscope and 0.1uF/50V ceramic capacitor and 10uF/47V aluminum electrolytic capacitor across the output terminal.

HERC175

175W MEDICAL POWER SUPPLY

*Approval in progress. Please refer to our homepage for the current approval status.

Input Specifications

Input voltage	100-240 V +10%/-15%
Frequency	50-60 Hz
Input current	1800-900 mA
Inrush current (@240V)	<80A

General Specifications

Operating temperature	-20..+70°C (above 50°C derated output power see derating curve)
Operating humidity	10..95 %
Operating altitude	≤5000 m
Storage temperature	-40°C..+85°C
Storage humidity	10..95 %
Atmospheric pressure	50-106kPa
Output voltage tolerance	±3 %
Line regulation	±0.5 %
Load regulation	±2.5 %
Turn-on delay	≤2 s
Hold-up time	>10ms (120V) >50 ms (230 V)
PCB Material	FR4
Dimensions	101.6x50.8x26.6mm (4"x2"x1.1")
Weight	160 g
AC input	JST B3P-VH
DC output	JST B6P-VH

Safety

Safety standards	IEC/EN/ANSI 60601-1 Edition 3.1, IEC/EN62368:2014
Approbations	Europe, USA
Protection class	Class II configuration
Isolation	Input - Output 2xMOPP
Leakage Current	≤ 100 µA
Flame class	UL 94 V0
Electric Strength Test	4.2kV Input - Output
Overload protection	Yes
Overvoltage protection	Yes
Short ciruit protection	Yes

EMC Compliance

Conducted and radiated Emmisions	EN55032 Class B, EN55011 Class B, FCC15, Class B, EN60601-1-2 4th Edition				
Immunity	EN55024, EN60601-1-2 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	1kV / 2kV		Criteria B 100V	Criteria B 240V
Immunity against conducted disturbances	EEN61000-4-6	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

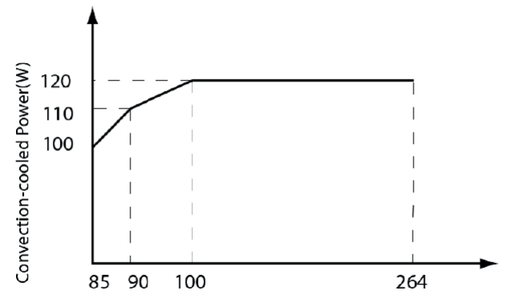
Shock Test

Standard	IEC 60068-2-27
Peak acceleration	30g
Pulse width	11 ms
Numbers of pulses (total)	18

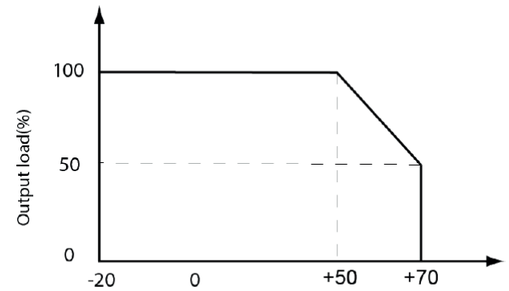
Vibration

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

Input derating curve



Thermal derating curve



Output Characteristics