

AC/DC Industrial Power Supply

TIB 480-EX Series, 480 Watt

- **UL Hazloc Class I, division 2 approval and ATEX certification**
- **SEMI F47 compliant for voltage sag immunity**
- **Rugged metal case with optional side-mounting**
- **Power Back immunity**
- **150% peak current for 4 s**
- **Operating Temp -40°C to +70°C (full load up to 60°C)**
- **Adjustable output voltage**
- **High Reliability: MTBF 1 mill hrs per IEC 61709**
- **Short circuit and overload protection**
- **3-year product warranty**



The TIB 480-EX family of next generation of 480 Watt din rail power supplies feature high efficiency operation of up to 95% enabling a slim design with alternative side-mounting for flat panels (DC OK Indicator on both front and side panel). These products certified to UL Hazloc Class 1 / Div 2, and ATEX (EN 60079-0, EN 60079-7, EN 60079-15) for operation in hazardous locations. These convection cooled power supplies have a -40°C to +60°C full load operating temperature range. 150% peak power for up to 4 seconds which is ideal for stepper motors, solenoids or actuators. The TIB 080-EX series has an important Back Power Immunity feature that helps protect against shut-down or malfunction with loads such as inductors and decelerating motors that can feed voltage back to the power supply. Outputs are radio-interference-suppressed to impede radiation at long output lines which reduces the common mode current to within limits of telecommunication ports. The series operate with a high power factor of up to 99% which also minimizes inrush current. Additional qualifications include IEC/EN/UL 62368-1, IEC/EN/UL 61010-1, UL 508 and CB Report with EMC compliance to IEC/EN 61000-6-2 and IEC/EN 61000-6-3.

Models

Order Code	Output Power max.	Output Voltage nom. (adjustable)	Output Current max.	Output Current peak	Efficiency typ.
TIB 480-124EX	480 W	24 VDC (23.5 - 28.0 VDC)	20'000 mA	30'000 mA	95 %
TIB 480-148EX		48 VDC (47.0 - 56.0 VDC)	10'000 mA	15'000 mA	95 %

Options

TIB-RMK01	- Optional Ruggedized DIN-Rail Mounting Clip for EN 61373: www.tracopower.com/overview/tib-rmk01
on demand (backorder with MOQ non stocking item)	- Optional models with certified DC input - Optional models with additional IECEx certification

Input Specifications

Input Voltage	- AC Range	Operational Range: 85 - 264 VAC (Full Range) Rated Range: 100 - 240 VAC (Full Range)
	- DC Range	Operational Range: 90 - 350 VDC Certified Range: 100 - 250 VDC Polarity: +DC: L / -DC: N (Models with certified DC input are on-demand.)
Input Frequency		Operational Range: 45 - 65 Hz Certified: 50/60 Hz
Power Consumption	- No load & Vin = 230 VAC	3'500 mW max.
	- No load & Vin = 115 VAC	4'900 mW max.
Input Inrush Current	- At 230 VAC	30 A max.
	- At 115 VAC	15 A max.
Power Factor	- At 230 VAC	0.97 min. (Active Power Factor Correction)
	- At 115 VAC	0.99 min. (Active Power Factor Correction)
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)

Output Specifications

Output Voltage Adjustment		24 VDC model: 23.5 - 28.0 VDC 48 VDC model: 47.0 - 56.0 VDC (By trim potentiometer) Output power must not exceed rated power!
		±0.25% max.
Voltage Set Accuracy		±0.25% max.
Regulation	- Input Variation (Vmin - Vmax)	0.1% max.
	- Load Variation (10 - 90%)	0.5% max.
Boost Power		Output Current peak: See model table Peak power time: 4 s max. (auto switch off) Off Time: 10 s typ.
Ripple and Noise (20 MHz Bandwidth)		24 VDC model: 100 mVp-p max. 48 VDC model: 200 mVp-p max.
		Infinite
Capacitive Load		Infinite
Minimum Load		Not required
Temperature Coefficient		±0.02 %/K max.
Hold-up Time	- At 230 VAC	20 ms min.
	- At 115 VAC	20 ms min.
Start-up Time	- At 230 VAC	2'000 ms max.
	- At 115 VAC	2'000 ms max.
Short Circuit Protection		Continuous, Automatic recovery
Overload Protection		Constant Current Mode Switch off after 4 s delay, automatic restart
Output Current Limitation		155% min. of Iout max.
Overvoltage Protection		117 - 146% of Vout nom. (depending on model) 32 - 35 VDC (24 VDC model) 56 - 60 VDC (48 VDC model) (In case of an internal error a second voltage regulation loop keeps the output voltage at a save level, the power supply turns off and tries to restart after 10 s.)
Transient Response	- Peak Variation	600 mV max. (10% to 90% Load Step)
	- Response Time	5'000 µs typ. (10% to 90% Load Step)

All specifications valid at 230 VAC, resistive full load and +25°C after warm-up time, unless otherwise stated.

Safety Specifications

Standards	- IT / Multimedia Equipment	CSA-C22.2, No. 60950-1 EN 60950-1 EN 62368-1 IEC 60950-1 IEC 62368-1 UL 60950-1 UL 62368-1
	- Industrial Control Equipment	UL 508
	- ATEX	EN 60079-0 EN 60079-15 EN 60079-7 EX II3G Ex nA nC IIC T4 GC
	- HazLoc	UL 121201 Class I; Div 2; Groups A,B,C,D; T4
	- Measurement, Control & Lab.	EN 61010-1 EN 61010-2-201 IEC 61010-1 IEC 61010-2-201 UL 61010-1 UL 61010-2-201
	- Certification Documents	www.tracopower.com/overview/tib480-ex (When operating in ex environments such as ATEX, Hazloc, etc.: Check certification documents for special conditions for safe use.))
Protection Class		Class I (Prepared): Connection to PE
Pollution Degree		PD 2
Over Voltage Category		OVC II

EMC Specifications

EMI (Emissions)		EN 61000-6-3 (Generic Residential) EN 61204-3 (Low Voltage Power Supplies) EN 50121-3-2 (EMC for Rolling Stock) EN 50121-4 (Railway Application Signalling)
	- Conducted Emissions	EN 55011 class B (internal filter) EN 55032 class B (internal filter)
	- Radiated Emissions	EN 55011 class B (internal filter) EN 55032 class B (internal filter)
	- Harmonic Current Emissions	EN 61000-3-2, class A

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EMS (Immunity)		EN 61000-6-2 (Generic Industrial) EN 61204-3 (Low Voltage Power Supplies) EN 50121-3-2 (EMC for Rolling Stock) EN 50121-4 (Railway Application Signalling)
- Electrostatic Discharge	Air:	EN 61000-4-2, ± 8 kV, perf. criteria A
- RF Electromagnetic Field	Contact:	EN 61000-4-2, ± 4 kV, perf. criteria A
- EFT (Burst) / Surge		EN 61000-4-3, 10 V/m, perf. criteria A
		EN 61000-4-4, ± 2 kV, perf. criteria B
	L to L:	EN 61000-4-5, ± 1 kV, perf. criteria B
- Conducted RF Disturbances	L to PE:	EN 61000-4-5, ± 2 kV, perf. criteria B
- PF Magnetic Field		EN 61000-4-6, 10 Vrms, perf. criteria A
- Voltage Dips & Interruptions	Continuous:	EN 61000-4-8, 30 A/m, perf. criteria A
	230 VAC / 50 Hz:	EN 61000-4-11
		20%, 250 periods, perf. criteria C
		30%, 25 periods, perf. criteria C
		60%, 10 periods, perf. criteria C
		>95%, 1 period, perf. criteria B
		>95%, 5 periods, perf. criteria C
	115 VAC / 60 Hz:	EN 61000-4-11
		20%, 250 periods, perf. criteria C
		30%, 25 periods, perf. criteria C
		60%, 10 periods, perf. criteria C
		>95%, 1 period, perf. criteria B
		>95%, 5 periods, perf. criteria C
		SEMI F47, criteria A
- Voltage Sag Immunity		
EMC / Environmental	- Certification Documents	www.tracopower.com/overview/tib480-ex

General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +70°C
Power Derating	- High Temperature	2 %/K above 60°C (at standard operation)
		3 %/K above 60°C (at peak power mode)
	- Low Input Voltage	3 %/V below 90 VAC (at standard operation)
		1.5 %/V below 100 VAC (at peak power mode)
		1 %/V below 110 VDC (48 Vout DC model)
		1 %/V below 100 VDC (other DC models)
Over Temperature Protection Switch Off	- Protection Mode	Automatic recovery
Cooling System		Natural convection (20 LFM)
Remote Control	- Voltage Controlled Remote	See application note: www.tracopower.com/overview/tib480-ex
		(The unit can be controlled by external relay contact or open collector signal.)
Altitude During Operation		2'000 m max.
Regulator Topology		LCC Converter
Switching Frequency		70 - 90 kHz (PWM)
Insulation System		Reinforced Insulation
Isolation Test Voltage	- Input to Output, 60 s	3'000 VAC
	- Input to Case or PE, 60 s	1'500 VAC
	- Output to Case or PE, 60 s	750 VDC
Creepage	- Input to Output	8 mm min.
	- Input to Case or PE	4 mm min.
	- Output to Case or PE	1.5 mm min.
Clearance	- Input to Output	8 mm min.
	- Input to Case or PE	4 mm min.
	- Output to Case or PE	1.5 mm min.
Isolation Resistance	- Input to Output, 500 VDC	4'000 M Ω min.

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Leakage Current	- Earth Leakage Current - Touch Current	3500 μ A max. 880 μ A max.
Reliability	- Calculated MTBF	1'000'000 h (IEC 61709)
Environment	- Vibration	EN 61373 IEC 60068-2-6 2 g, 3 axis, sine sweep, 10-55 Hz, 11 oct/min (Compliance to EN 61373 only with optional DIN-Rail Clip TIB-RMK01)
	- Mechanical Shock	EN 61373 IEC 60068-2-27 25 g, 3 axis, half sine, 11 ms (Compliance to EN 61373 only with optional DIN-Rail Clip TIB-RMK01)
	- Mechanical Shock	(Compliance to EN 61373 only with optional DIN-Rail Clip TIB-RMK01)
Housing Material		Aluminum (Chassis) Stainless Steel (Cover)
Housing Type		Metal Case
Mounting Type		DIN-Rail Mount (EN 60715 - 35x7.5mm/35x15mm)
Connection Type		Screw Terminal
Weight		1'018 g
Thermal Impedance	- Case to Ambient	0.6 K/W typ.
Power Back Immunity		24 VDC model: 35 V max. 48 VDC model: 60 V max. (When external voltage is supplied above set output voltage and below OVP threshold, the power supply will function normally without switch off or destruction, even if external voltage is applied continuously.)
Power OK Signal	- Trigger Threshold - Power OK - Power Off - Pin Specifications	24 VDC model: 21 - 23 VDC 48 VDC model: 42 - 46 VDC Relay Output Relay contact closed Relay contact open 30 VDC / 1 A max.
Status Indicator		Also indicated by green LEDs: front and side
Environmental Compliance	- REACH Declaration	www.tracopower.com/info/reach-declaration.pdf REACH SVHC list compliant REACH Annex XVII compliant
	- RoHS Declaration	www.tracopower.com/info/rohs-declaration.pdf Exemptions: 7a, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule))
	- SCIP Reference Number	dcdfe03f-01a2-4900-ab4c-08ff29edae1f

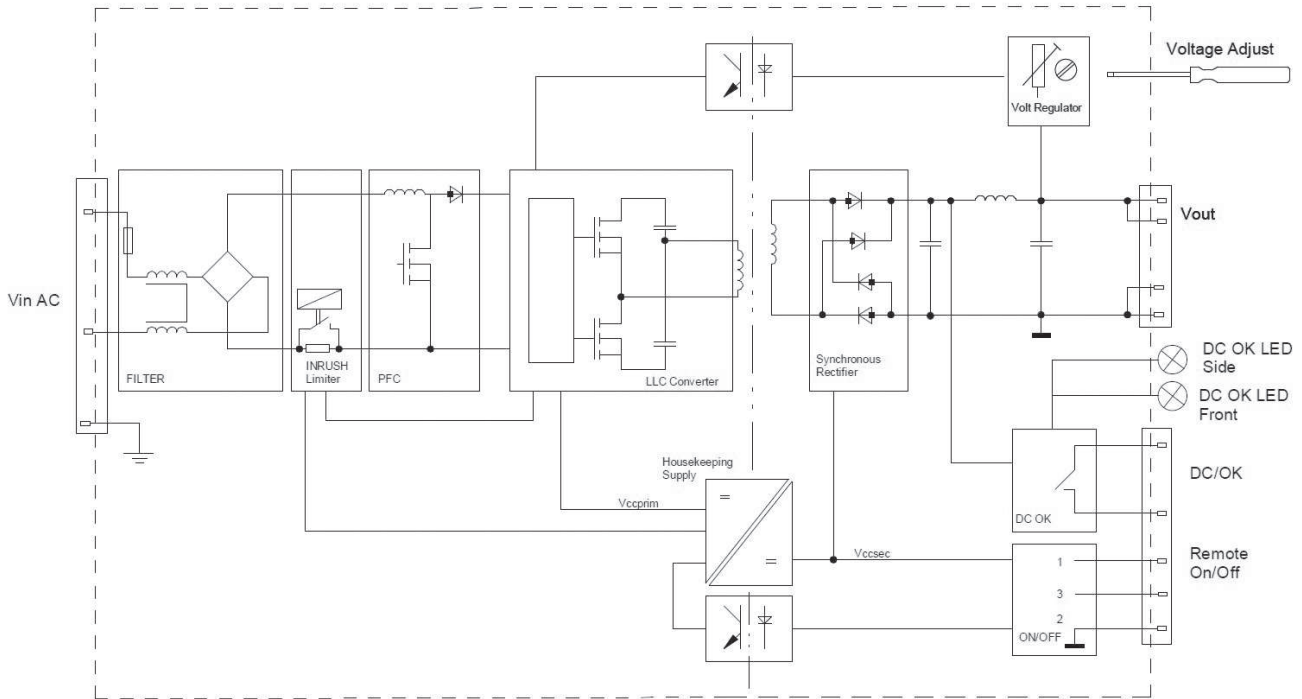
Supporting Documents

Overview Link (for additional Documents)

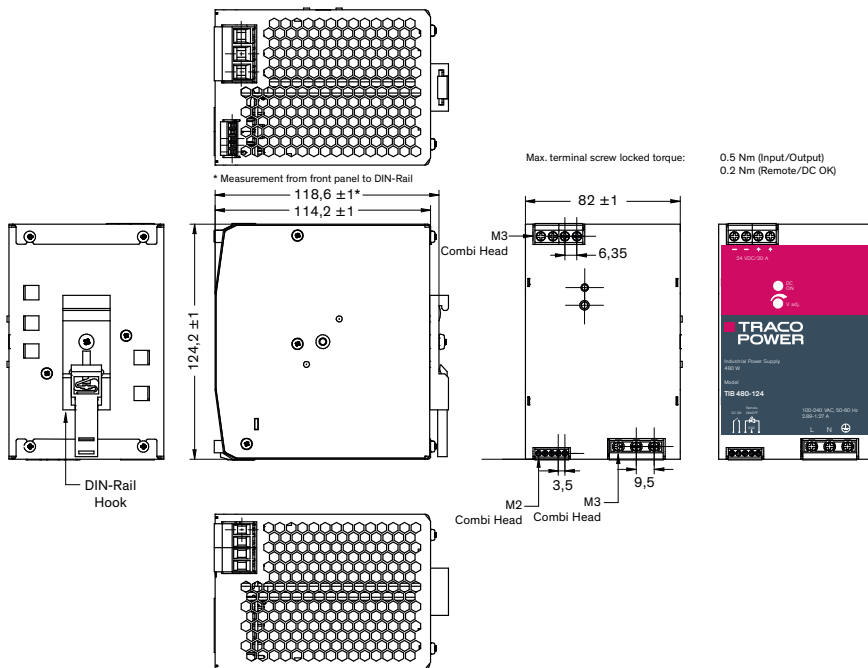
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Blockdiagram



Outline Dimensions



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Alternative side mounting

