

## AC/DC Industrial Power Supply

## TIB 080 Series, 80 Watt

- Slim profile, for DIN-rail mounting
- Alternative side-mounting for flat panels
- Very high efficiency up to 90%
- Power Back immunity
- 150% peak current for 4 s
- Operating temperature range: -40°C to +70°C max.
- Adjustable output voltage
- Short circuit and overload protection
- 3-year product warranty



This generation of DIN-rail power supplies combines the most efficient circuit topology with optimized cost/performance ratio for industrial environments and for electrical control cabinets. They have a very high efficiency of up to 90.0% which allows a very slim package design. The output voltage is adjustable from -2% to +17%. The case offers the potentially useful feature to fix the DIN-rail clip to the side wall for the mounting inside flat panels. Over a period of minimum 4 seconds they can operate with a boost power of 150%. The boost power facilitates the activation of stepper motors, solenoids or actuators. The units operate with a high power factor by active power factor correction which also keeps the input inrush current low. The TIB series are also available with higher nominal power of 120, 240 or 480 Watt (+50% boost power). They come with the safety standard approvals for IEC/EN 60950-1, UL 60950-1 and UL 508.

### Models

Order Code	Output Power max.	Output Voltage nom. (adjustable)	Output Current max.	Output Current peak	Efficiency typ.
TIB 080-112	80 W	12 VDC (11.8 - 15.0 VDC)	6'700 mA	10'050 mA	88 %
TIB 080-124		24 VDC (23.5 - 28.0 VDC)	3'400 mA	5'100 mA	90 %
TIB 080-148		48 VDC (47.0 - 56.0 VDC)	1'700 mA	2'550 mA	90 %

### Options

TIB-RMK01	- Optional Ruggedized DIN-Rail Mounting Clip for EN 61373: <a href="http://www.tracopower.com/products/tib-rmk01.pdf">www.tracopower.com/products/tib-rmk01.pdf</a>
on demand (backorder with MOQ non stocking item)	- Optional models with certified DC input

### Input Specifications

Input Voltage	- AC Range	Operational Range: <b>85 - 264 VAC</b> (Full Range) Rated Range: <b>100 - 240 VAC</b> (Full Range)
	- DC Range	Operational Range: <b>90 - 350 VDC</b> Certified Range: <b>100 - 250 VDC</b> Polarity: <b>+DC: L / -DC: N</b> (Models with certified DC input are on-demand.)
Input Frequency		Operational Range: <b>45 - 65 Hz</b> Certified: <b>50/60 Hz</b>
Power Consumption	- No load & Vin = 230 VAC	<b>2'000 mW max.</b>
	- No load & Vin = 115 VAC	<b>2'000 mW max.</b>
Input Inrush Current	- At 230 VAC	<b>30 A max.</b>
	- At 115 VAC	<b>15 A max.</b>
Power Factor	- At 230 VAC	<b>0.48 min.</b>
	- At 115 VAC	<b>0.48 min.</b>
Recommended Input Fuse		(The need of an external fuse has to be assessed in the final application.)

### Output Specifications

Output Voltage Adjustment		12 VDC model: <b>11.8 - 15.0 VDC</b> 24 VDC model: <b>23.5 - 28.0 VDC</b> 48 VDC model: <b>47.0 - 56.0 VDC</b> (By trim potentiometer) Output power must not exceed rated power!
Voltage Set Accuracy		<b>±0.25% max.</b>
Regulation	- Input Variation (Vmin - Vmax)	<b>0.1% max.</b>
	- Load Variation (10 - 90%)	<b>0.5% max.</b>
Boost Power		<b>Output Current peak: See model table</b> <b>Peak power time: 4 s max. (auto switch off)</b> <b>Off Time: 10 s typ.</b>
Ripple and Noise (20 MHz Bandwidth)	12 VDC model:	<b>100 mVp-p max.</b>
	24 VDC model:	<b>100 mVp-p max.</b>
	48 VDC model:	<b>200 mVp-p max.</b>
Capacitive Load		<b>Infinite</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>160 ms min.</b>
	- At 115 VAC	<b>20 ms min.</b>
Start-up Time	- At 230 VAC	<b>2'000 ms max.</b>
	- At 115 VAC	<b>2'000 ms max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Overload Protection		<b>Constant Current Mode</b> <b>Switch off after 4 s delay, automatic restart</b>
Output Current Limitation		<b>155% min. of Iout max.</b>
Overvoltage Protection		<b>117 - 158% of Vout nom.</b> (depending on model)
		<b>16 - 19 VDC</b> (12 VDC model)
		<b>32 - 35 VDC</b> (24 VDC model)
		<b>56 - 60 VDC</b> (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 6 s.)
Transient Response	- Peak Variation	<b>600 mV max. (10% to 90% Load Step)</b>
	- Response Time	<b>2'500 µs typ. (10% to 90% Load Step)</b>

All specifications valid at nominal voltage, 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
	- Industrial Control Equipment - Measurement, Control & Lab.	UL 508 EN 61010-1 EN 61010-2-201 IEC 61010-1 IEC 61010-2-201 UL 61010-1 UL 61010-2-201
	- Certification Documents	<a href="http://www.tracopower.com/overview/tib080">www.tracopower.com/overview/tib080</a>
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
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, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A
	- RF Electromagnetic Field	EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-4, $\pm 2$ kV, perf. criteria B
		L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria B
		L to PE: EN 61000-4-5, $\pm 2$ kV, perf. criteria B
	- Conducted RF Disturbances	EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous: EN 61000-4-8, 30 A/m, perf. criteria A
	- Voltage Dips & Interruptions	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
	- Voltage Sag Immunity	SEMI F47, criteria A

### General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +70°C

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

Power Derating	- High Temperature - Low Input Voltage	2 %/K above 60°C (at standard operation) 3 %/K above 60°C (at peak power mode) 3 %/V below 90 VAC (at standard operation) 1.5 %/V below 100 VAC (at peak power mode) 1 %/V below 100 VDC (for DC models)
Over Temperature Protection Switch Off	- Protection Mode	Latch off
Cooling System		Natural convection (20 LFM)
Altitude During Operation		2'000 m max.
Regulator Topology		Flyback Converter
Switching Frequency		60 - 75 kHz (PWM)
Insulation System		Reinforced Insulation
Isolation Test Voltage	- Input to Output, 60 s - Input to Case or PE, 60 s - Output to Case or PE, 60 s	3'000 VAC 1'500 VAC 750 VDC
Creepage	- Input to Output - Input to Case or PE - Output to Case or PE	8 mm min. 4 mm min. 1.5 mm min.
Clearance	- Input to Output - Input to Case or PE - Output to Case or PE	8 mm min. 4 mm min. 1.5 mm min.
Isolation Resistance	- Input to Output, 500 VDC	4'000 MΩ min.
Leakage Current	- Earth Leakage Current - Touch Current	3500 μA max. 310 μA max.
Reliability	- Calculated MTBF	1'950'000 h (IEC 61709)
Environment	- Vibration  - Mechanical Shock	EN 61373 IEC 60068-2-6 2 g, 3 axis, sine sweep, 10-55 Hz, 11 oct/min EN 61373 IEC 60068-2-27 25 g, 3 axis, half sine, 11 ms
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		367 g
Thermal Impedance	- Case to Ambient	1.81 K/W typ.
Power Back Immunity		12 VDC model: 19 V max. 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	12 VDC model: 10.5 - 11.1 VDC 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

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

Environmental Compliance - REACH Declaration

[www.tracopower.com/info/reach-declaration.pdf](http://www.tracopower.com/info/reach-declaration.pdf)

- RoHS Declaration

REACH SVHC list compliant

REACH Annex XVII compliant

[www.tracopower.com/info/rohs-declaration.pdf](http://www.tracopower.com/info/rohs-declaration.pdf)

Exemptions: 7a, 7c-1

(RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule))

- SCIP Reference Number

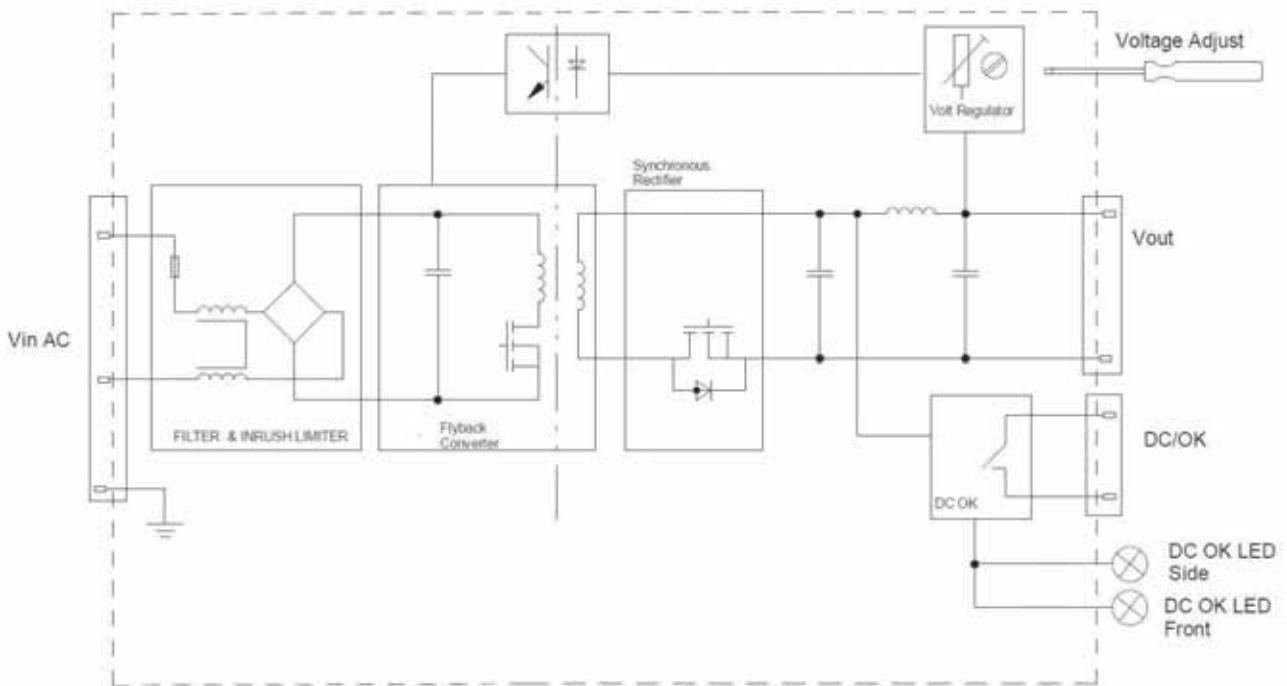
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### Supporting Documents

Overview Link (for additional Documents)

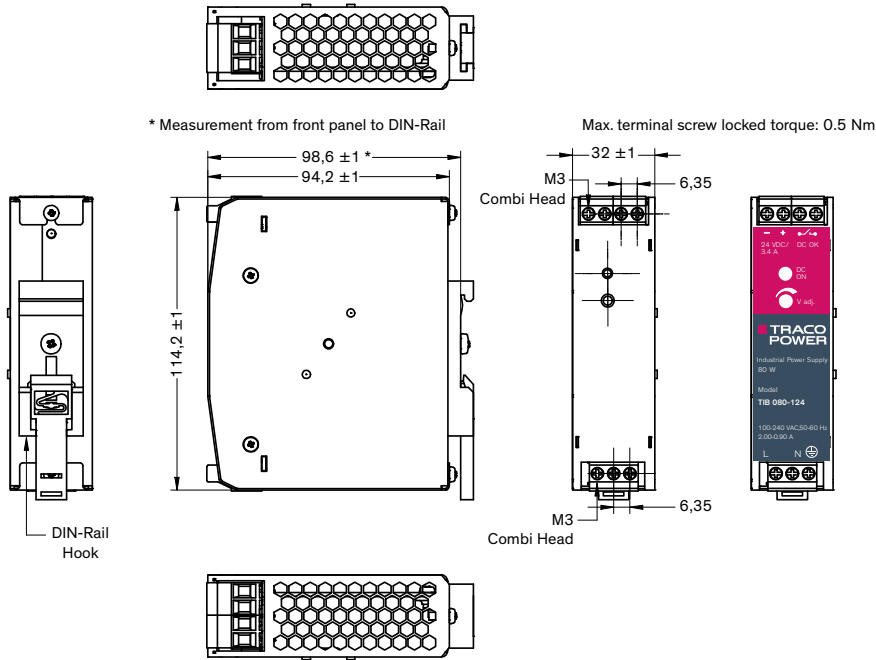
[www.tracopower.com/overview/tib080](http://www.tracopower.com/overview/tib080)

### Blockdiagram

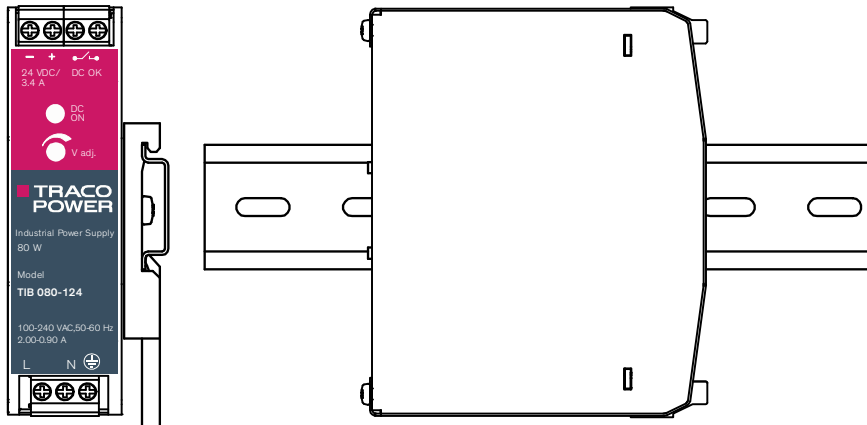


All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

### Outline Dimensions



### Alternative side mounting



## AC/DC Industrial Power Supply

## TIB 120 Series, 120 Watt

- Slim profile, for DIN-rail mounting
- Alternative side-mounting for flat panels
- High power factor by active power correction
- Very high efficiency up to 94%
- Power Back immunity
- 150% peak current for 4 s
- Operating temperature range: -40°C to +70°C max.
- Adjustable output voltage
- Short circuit and overload protection
- 3-year product warranty



This generation of DIN-rail power supplies combines the most efficient circuit topology with optimized cost/performance ratio for industrial environments and for electrical control cabinets. They have a very high efficiency of up to 94.0% which allows a very slim package design. The output voltage is adjustable from -2% to +17%. The case offers the potentially useful feature to fix the DIN-rail clip to the side wall for the mounting inside flat panels. Over a period of minimum 4 seconds they can operate with a boost power of 150%. The boost power facilitates the activation of stepper motors, solenoids or actuators. The units operate with a high power factor of up to 97% by active power factor correction which also keeps the input inrush current low. The TIB series are also available with other nominal power of 80, 240 or 480 Watt (+50% boost power). They come with the safety standard approvals for IEC/EN 60950-1, UL 60950-1 and UL 508.

Models					
Order Code	Output Power max.	Output Voltage nom. (adjustable)	Output Current max.	Output Current peak	Efficiency typ.
TIB 120-112	120 W	12 VDC (11.8 - 15.0 VDC)	10'000 mA	15'000 mA	94 %
TIB 120-124		24 VDC (23.5 - 28.0 VDC)	5'000 mA	7'500 mA	94 %
TIB 120-148		48 VDC (47.0 - 56.0 VDC)	2'500 mA	3'750 mA	94 %

Options	
TIB-RMK01	- Optional Ruggedized DIN-Rail Mounting Clip for EN 61373: <a href="http://www.tracopower.com/products/tib-rmk01.pdf">www.tracopower.com/products/tib-rmk01.pdf</a>
on demand (backorder with MOQ non stocking item)	- Optional models with certified DC input

### Input Specifications

Input Voltage	- AC Range	Operational Range: <b>85 - 264 VAC</b> (Full Range) Rated Range: <b>100 - 240 VAC</b> (Full Range)
	- DC Range	Operational Range: <b>90 - 350 VDC</b> Certified Range: <b>100 - 250 VDC</b> Polarity: <b>+DC: L / -DC: N</b> (Models with certified DC input are on-demand.)
Input Frequency		Operational Range: <b>45 - 65 Hz</b> Certified: <b>50/60 Hz</b>
Power Consumption	- No load & Vin = 230 VAC	<b>3'200 mW max.</b>
	- No load & Vin = 115 VAC	<b>3'200 mW max.</b>
Input Inrush Current	- At 230 VAC	<b>30 A max.</b>
	- At 115 VAC	<b>15 A max.</b>
Power Factor	- At 230 VAC	<b>0.8 min.</b> (Active Power Factor Correction)
	- At 115 VAC	<b>0.97 min.</b> (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		12 VDC model: <b>11.8 - 15.0 VDC</b> 24 VDC model: <b>23.5 - 28.0 VDC</b> 48 VDC model: <b>47.0 - 56.0 VDC</b> (By trim potentiometer) Output power must not exceed rated power!
Voltage Set Accuracy		<b>±0.25% max.</b>
Regulation	- Input Variation (Vmin - Vmax)	<b>0.1% max.</b>
	- Load Variation (10 - 90%)	<b>0.5% max.</b>
Boost Power		<b>Output Current peak: See model table</b> <b>Peak power time: 4 s max.</b> (auto switch off) <b>Off Time: 10 s typ.</b>
Ripple and Noise (20 MHz Bandwidth)	12 VDC model:	<b>100 mVp-p max.</b>
	24 VDC model:	<b>100 mVp-p max.</b>
	48 VDC model:	<b>200 mVp-p max.</b>
Capacitive Load		Infinite
Minimum Load		Not required
Temperature Coefficient		<b>±0.02 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>20 ms min.</b>
	- At 115 VAC	<b>20 ms min.</b>
Start-up Time	- At 230 VAC	<b>2'000 ms max.</b>
	- At 115 VAC	<b>2'000 ms max.</b>
Short Circuit Protection		Continuous, Automatic recovery
Overload Protection		Constant Current Mode Switch off after 4 s delay, automatic restart
Output Current Limitation		<b>155% min. of Iout max.</b>
Overvoltage Protection		<b>117 - 158% of Vout nom.</b> (depending on model) <b>16 - 19 VDC</b> (12 VDC model) <b>32 - 35 VDC</b> (24 VDC model) <b>56 - 60 VDC</b> (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	<b>800 mV max.</b> (10% to 90% Load Step)
	- Response Time	<b>2'000 µs typ.</b> (10% to 90% Load Step)

All specifications valid at nominal voltage, 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
	- Industrial Control Equipment - Measurement, Control & Lab.	UL 508 EN 61010-1 EN 61010-2-201 IEC 61010-1 IEC 61010-2-201 UL 61010-1 UL 61010-2-201
	- Certification Documents	<a href="http://www.tracopower.com/overview/tib120">www.tracopower.com/overview/tib120</a>
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
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, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A
	- RF Electromagnetic Field	EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-4, $\pm 2$ kV, perf. criteria B
	- Conducted RF Disturbances	L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria B
	- PF Magnetic Field	L to PE: EN 61000-4-5, $\pm 2$ kV, perf. criteria B
	- 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
	- Voltage Sag Immunity	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

## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +70°C

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

Power Derating	- High Temperature - Low Input Voltage	2 %/K above 60°C (at standard operation) 3 %/K above 60°C (at peak power mode) 3 %/V below 90 VAC (at standard operation) 1.5 %/V below 100 VAC (at peak power mode) 1 %/V below 100 VDC (for DC models)
Over Temperature Protection Switch Off	- Protection Mode	Automatic recovery
Cooling System		Natural convection (20 LFM)
Altitude During Operation		2'000 m max.
Regulator Topology		LCC Converter
Switching Frequency		70 - 100 kHz (PWM)
Insulation System		Reinforced Insulation
Isolation Test Voltage	- Input to Output, 60 s - Input to Case or PE, 60 s - Output to Case or PE, 60 s	3'000 VAC 1'500 VAC 750 VDC
Creepage	- Input to Output - Input to Case or PE - Output to Case or PE	8 mm min. 4 mm min. 1.5 mm min.
Clearance	- Input to Output - Input to Case or PE - Output to Case or PE	8 mm min. 4 mm min. 1.5 mm min.
Isolation Resistance	- Input to Output, 500 VDC	4'000 MΩ min.
Leakage Current	- Earth Leakage Current - Touch Current	3500 μA max. 310 μA max.
Reliability	- Calculated MTBF	1'450'000 h (IEC 61709)
Environment	- Vibration  - Mechanical Shock	EN 61373 IEC 60068-2-6 2 g, 3 axis, sine sweep, 10-55 Hz, 11 oct/min EN 61373 IEC 60068-2-27 25 g, 3 axis, half sine, 11 ms
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		461 g
Thermal Impedance	- Case to Ambient	0.8 K/W typ.
Power Back Immunity		12 VDC model: 19 V max. 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	12 VDC model: 10.5 - 11.1 VDC 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

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

Environmental Compliance - REACH Declaration

[www.tracopower.com/info/reach-declaration.pdf](http://www.tracopower.com/info/reach-declaration.pdf)

- RoHS Declaration

REACH SVHC list compliant

REACH Annex XVII compliant

[www.tracopower.com/info/rohs-declaration.pdf](http://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

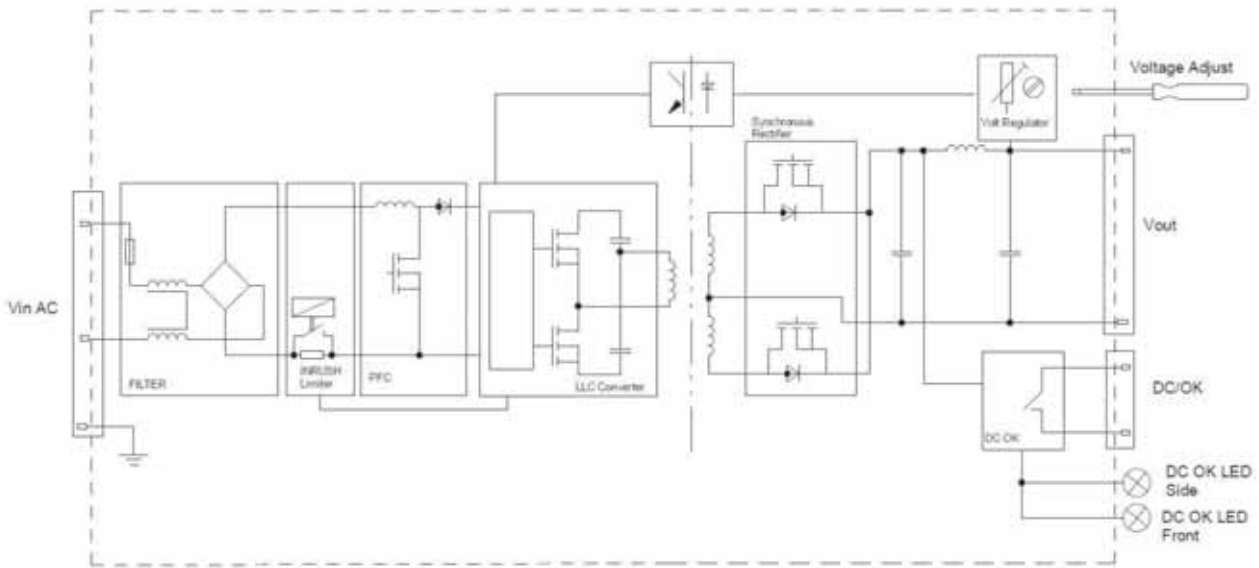
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**Supporting Documents**

Overview Link (for additional Documents)

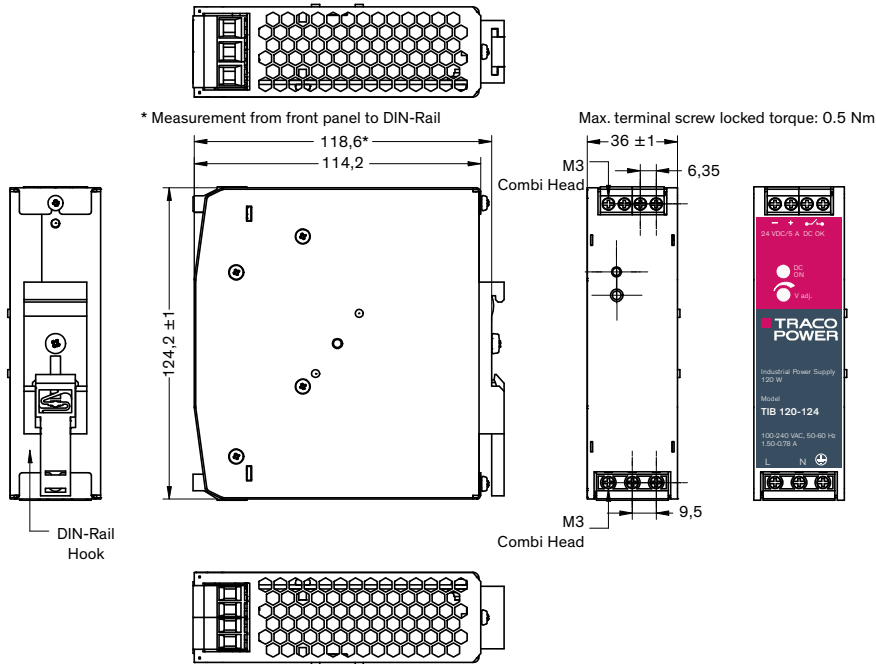
[www.tracopower.com/overview/tib120](http://www.tracopower.com/overview/tib120)

**Blockdiagram**

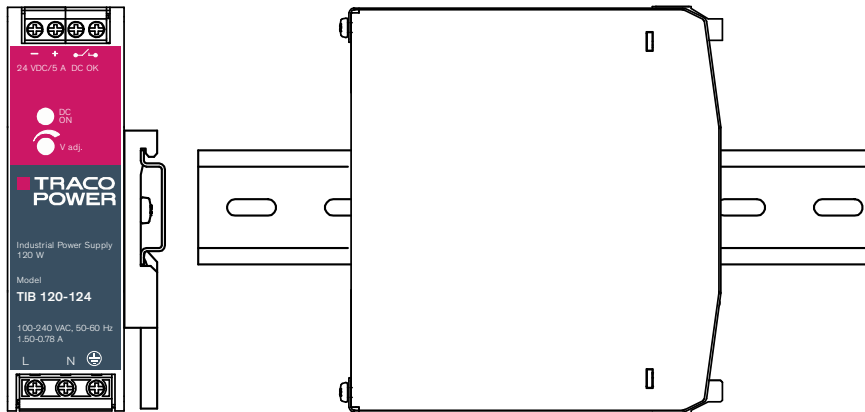


All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

### Outline Dimensions



### Alternative side mounting



## AC/DC Industrial Power Supply

## TIB 240 Series, 240 Watt

- Slim profile, for DIN-rail mounting
- Alternative side-mounting for flat panels
- High power factor by active power correction
- Very high efficiency up to 95%
- Power Back immunity
- 150% peak current for 4 s
- Operating temperature range: -40°C to +70°C max.
- Adjustable output voltage
- Short circuit and overload protection
- 3-year product warranty



This generation of DIN-rail power supplies combines the most efficient circuit topology with optimized cost/performance ratio for industrial environments and for electrical control cabinets. They have a very high efficiency of up to 95.0% which allows a very slim package design. The output voltage is adjustable from -2% to +17%. The case offers the potentially useful feature to fix the DIN-rail clip to the side wall for the mounting inside flat panels. Over a period of minimum 4 seconds they can operate with a boost power of 150%. The boost power facilitates the activation of stepper motors, solenoids or actuators. The units operate with a high power factor of up to 98% by active power factor correction which also keeps the input inrush current low. The TIB series are also available with other nominal power of 80, 120 or 480 Watt (+50% boost power). They come with the safety standard approvals for IEC/EN 60950-1, UL 60950-1 and UL 508.

### Models

Order Code	Output Power max.	Output Voltage nom. (adjustable)	Output Current max.	Output Current peak	Efficiency typ.
TIB 240-124	240 W	24 VDC (23.5 - 28.0 VDC)	10'000 mA	15'000 mA	95 %
TIB 240-148		48 VDC (47.0 - 56.0 VDC)	5'000 mA	7'500 mA	95 %

### Options

TIB-RMK01	- Optional Ruggedized DIN-Rail Mounting Clip for EN 61373: <a href="http://www.tracopower.com/products/tib-rmk01.pdf">www.tracopower.com/products/tib-rmk01.pdf</a>
on demand (backorder with MOQ non stocking item)	- Optional models with certified DC input

### Input Specifications

Input Voltage	- AC Range	Operational Range: <b>85 - 264 VAC</b> (Full Range) Rated Range: <b>100 - 240 VAC</b> (Full Range)
	- DC Range	Operational Range: <b>90 - 350 VDC</b> Certified Range: <b>100 - 250 VDC</b> Polarity: <b>+DC: L / -DC: N</b> (Models with certified DC input are on-demand.)
Input Frequency		Operational Range: <b>45 - 65 Hz</b> Certified: <b>50/60 Hz</b>
Power Consumption	- No load & Vin = 230 VAC	<b>3'000 mW max.</b>
	- No load & Vin = 115 VAC	<b>3'500 mW max.</b>
Input Inrush Current	- At 230 VAC	<b>30 A max.</b>
	- At 115 VAC	<b>15 A max.</b>
Power Factor	- At 230 VAC	<b>0.92 min.</b> (Active Power Factor Correction)
	- At 115 VAC	<b>0.98 min.</b> (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: <b>23.5 - 28.0 VDC</b> 48 VDC model: <b>47.0 - 56.0 VDC</b> (By trim potentiometer) Output power must not exceed rated power!
Voltage Set Accuracy		<b>±0.25% max.</b>
Regulation	- Input Variation (Vmin - Vmax)	<b>0.1% max.</b>
	- Load Variation (10 - 90%)	<b>0.5% max.</b>
Boost Power		<b>Output Current peak: See model table</b> <b>Peak power time: 4 s max.</b> (auto switch off) <b>Off Time: 10 s typ.</b>
Ripple and Noise (20 MHz Bandwidth)		24 VDC model: <b>100 mVp-p max.</b> 48 VDC model: <b>200 mVp-p max.</b>
Capacitive Load		<b>Infinite</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>20 ms min.</b>
	- At 115 VAC	<b>20 ms min.</b>
Start-up Time	- At 230 VAC	<b>2'000 ms max.</b>
	- At 115 VAC	<b>2'000 ms max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Overload Protection		<b>Constant Current Mode</b> <b>Switch off after 4 s delay, automatic restart</b>
Output Current Limitation		<b>155% min. of Iout max.</b>
Overvoltage Protection		<b>117 - 146% of Vout nom.</b> (depending on model) <b>32 - 35 VDC</b> (24 VDC model) <b>56 - 60 VDC</b> (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	<b>600 mV max.</b> (10% to 90% Load Step)
	- Response Time	<b>2'000 µs typ.</b> (10% to 90% Load Step)

All specifications valid at nominal voltage, 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
	- Industrial Control Equipment	UL 508
	- 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	<a href="http://www.tracopower.com/overview/tib240">www.tracopower.com/overview/tib240</a>
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
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, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A
	- RF Electromagnetic Field	EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-4, $\pm 2$ kV, perf. criteria B
		L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria B
		L to PE: EN 61000-4-5, $\pm 2$ kV, perf. criteria B
	- Conducted RF Disturbances	EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous: EN 61000-4-8, 30 A/m, perf. criteria A
	- Voltage Dips & Interruptions	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
	- Voltage Sag Immunity	SEMI F47, criteria A

## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +70°C

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

Power Derating	- High Temperature - Low Input Voltage	2 %/K above 60°C (at standard operation) 3 %/K above 60°C (at peak power mode) 3 %/V below 90 VAC (at standard operation) 1.5 %/V below 100 VAC (at peak power mode) 1 %/V below 100 VDC (for DC models)
Over Temperature Protection Switch Off	- Protection Mode	Automatic recovery
Cooling System		Natural convection (20 LFM)
Altitude During Operation		2'000 m max.
Regulator Topology		LCC Converter
Switching Frequency		75 - 100 kHz (PWM)
Insulation System		Reinforced Insulation
Isolation Test Voltage	- Input to Output, 60 s - Input to Case or PE, 60 s - Output to Case or PE, 60 s	3'000 VAC 1'500 VAC 750 VDC
Creepage	- Input to Output - Input to Case or PE - Output to Case or PE	8 mm min. 4 mm min. 1.5 mm min.
Clearance	- Input to Output - Input to Case or PE - Output to Case or PE	8 mm min. 4 mm min. 1.5 mm min.
Isolation Resistance	- Input to Output, 500 VDC	4'000 MΩ min.
Leakage Current	- Earth Leakage Current - Touch Current	3500 μA max. 310 μA max.
Reliability	- Calculated MTBF	1'300'000 h (IEC 61709)
Environment	- Vibration  - Mechanical Shock	EN 61373 IEC 60068-2-6 2 g, 3 axis, sine sweep, 10-55 Hz, 11 oct/min EN 61373 IEC 60068-2-27 25 g, 3 axis, half sine, 11 ms
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		643 g
Thermal Impedance	- Case to Ambient	0.95 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

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

Environmental Compliance - REACH Declaration

[www.tracopower.com/info/reach-declaration.pdf](http://www.tracopower.com/info/reach-declaration.pdf)

- RoHS Declaration

REACH SVHC list compliant

REACH Annex XVII compliant

[www.tracopower.com/info/rohs-declaration.pdf](http://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

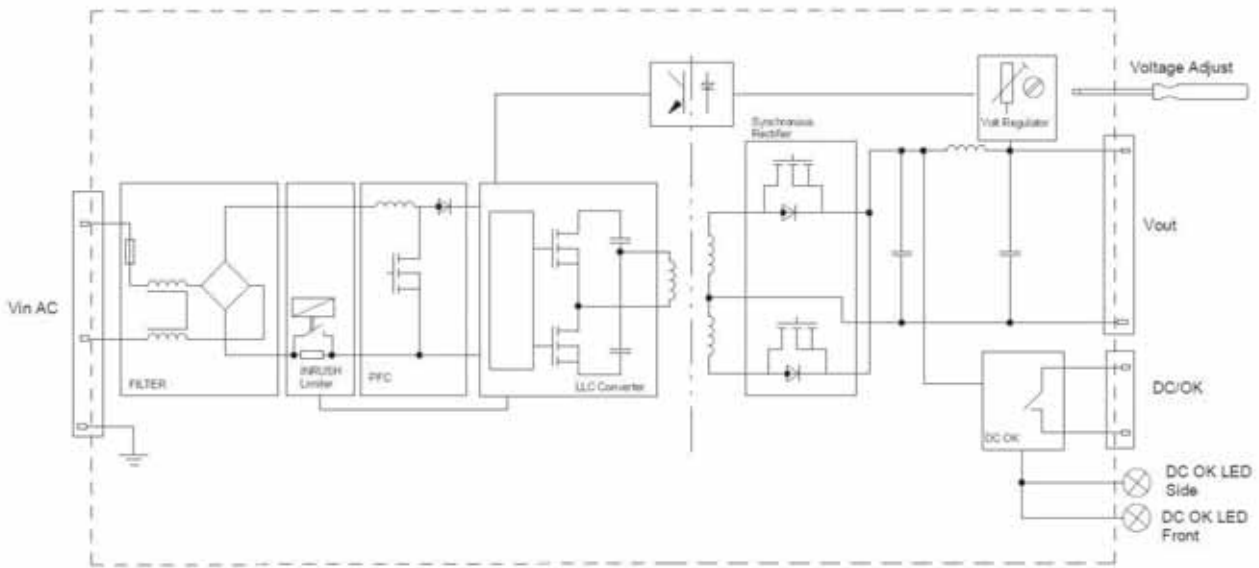
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**Supporting Documents**

Overview Link (for additional Documents)

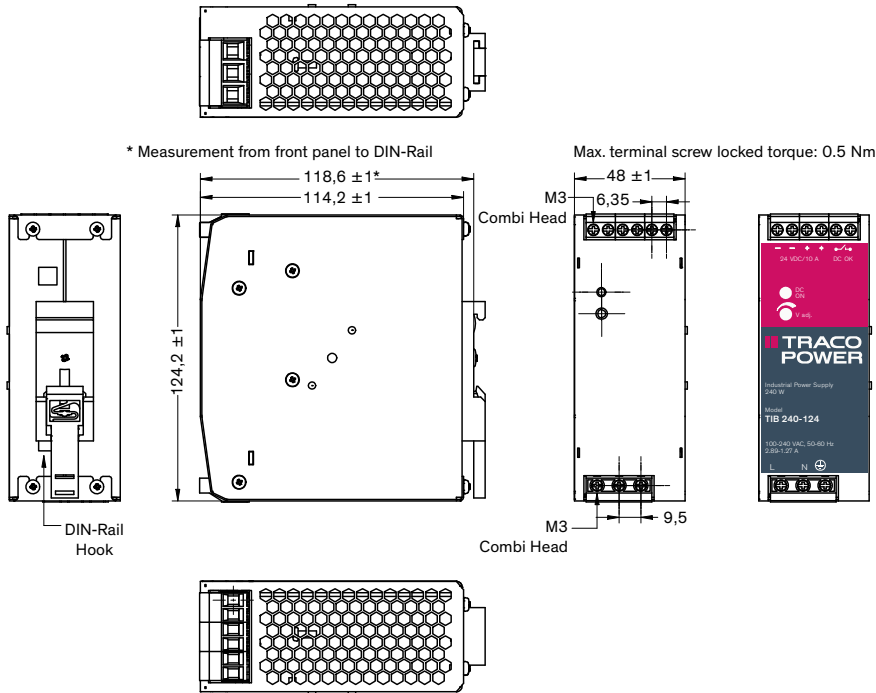
[www.tracopower.com/overview/tib240](http://www.tracopower.com/overview/tib240)

**Blockdiagram**

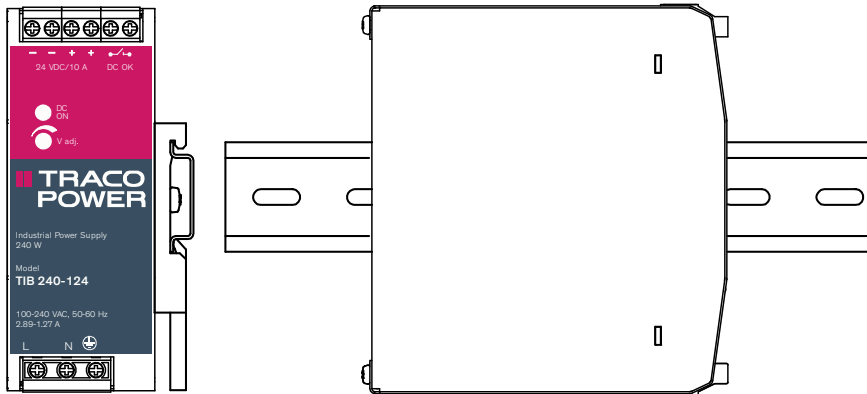


All specifications valid at nominal voltage, resistive full load and +25°C after warm-up time, unless otherwise stated.

### Outline Dimensions



### Alternative side mounting



## AC/DC Industrial Power Supply

## TIB 480 Series, 480 Watt

- Slim profile, for DIN-rail mounting
- Alternative side-mounting for flat panels
- High power factor by active power correction
- Very high efficiency up to 95%
- Power Back immunity
- 150% peak current for 4 s
- Operating temperature range: -40°C to +70°C max.
- Adjustable output voltage
- Short circuit and overload protection
- 3-year product warranty



This generation of DIN-rail power supplies combines the most efficient circuit topology with optimized cost/performance ratio for industrial environments and for electrical control cabinets. They have a very high efficiency of up to 95.0% which allows a very slim package design. The output voltage is adjustable from -2% to +17%. The case offers the potentially useful feature to fix the DIN-rail clip to the side wall for the mounting inside flat panels. Over a period of minimum 4 seconds they can operate with a boost power of 150%. The boost power facilitates the activation of stepper motors, solenoids or actuators. The units operate with a high power factor of up to 99% by active power factor correction which also keeps the input inrush current low. The TIB series are also available with lower nominal power of 80, 120 or 240 Watt (+50% boost power). They come with the safety standard approvals for IEC/EN 60950-1, UL 60950-1 and UL 508.

### Models

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

### Options

<b>TIB-RMK01</b>	- Optional Ruggedized DIN-Rail Mounting Clip for EN 61373: <a href="http://www.tracopower.com/products/tib-rmk01.pdf">www.tracopower.com/products/tib-rmk01.pdf</a>
<b>on demand</b> (backorder with MOQ non stocking item)	- Optional models with certified DC input

### Input Specifications

Input Voltage	- AC Range	Operational Range: <b>85 - 264 VAC</b> (Full Range) Rated Range: <b>100 - 240 VAC</b> (Full Range)
	- DC Range	Operational Range: <b>90 - 350 VDC</b> Certified Range: <b>100 - 250 VDC</b> Polarity: <b>+DC: L / -DC: N</b> (Models with certified DC input are on-demand.)
Input Frequency		Operational Range: <b>45 - 65 Hz</b> Certified: <b>50/60 Hz</b>
Power Consumption	- No load & Vin = 230 VAC	<b>3'500 mW max.</b>
	- No load & Vin = 115 VAC	<b>4'900 mW max.</b>
Input Inrush Current	- At 230 VAC	<b>30 A max.</b>
	- At 115 VAC	<b>15 A max.</b>
Power Factor	- At 230 VAC	<b>0.97 min.</b> (Active Power Factor Correction)
	- At 115 VAC	<b>0.99 min.</b> (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: <b>23.5 - 28.0 VDC</b> 48 VDC model: <b>47.0 - 56.0 VDC</b> (By trim potentiometer) Output power must not exceed rated power!
Voltage Set Accuracy		<b>±0.25% max.</b>
Regulation	- Input Variation (Vmin - Vmax)	<b>0.1% max.</b>
	- Load Variation (10 - 90%)	<b>0.5% max.</b>
Boost Power		<b>Output Current peak: See model table</b> <b>Peak power time: 4 s max.</b> (auto switch off) <b>Off Time: 10 s typ.</b>
Ripple and Noise (20 MHz Bandwidth)		24 VDC model: <b>100 mVp-p max.</b> 48 VDC model: <b>200 mVp-p max.</b>
Capacitive Load		<b>Infinite</b>
Minimum Load		<b>Not required</b>
Temperature Coefficient		<b>±0.02 %/K max.</b>
Hold-up Time	- At 230 VAC	<b>20 ms min.</b>
	- At 115 VAC	<b>20 ms min.</b>
Start-up Time	- At 230 VAC	<b>2'000 ms max.</b>
	- At 115 VAC	<b>2'000 ms max.</b>
Short Circuit Protection		<b>Continuous, Automatic recovery</b>
Overload Protection		<b>Constant Current Mode</b> <b>Switch off after 4 s delay, automatic restart</b>
Output Current Limitation		<b>155% min. of Iout max.</b>
Overvoltage Protection		<b>117 - 146% of Vout nom.</b> (depending on model) <b>32 - 35 VDC</b> (24 VDC model) <b>56 - 60 VDC</b> (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	<b>600 mV max.</b> (10% to 90% Load Step)
	- Response Time	<b>5'000 µs typ.</b> (10% to 90% Load Step)

All specifications valid at nominal voltage, 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
	- Industrial Control Equipment - Measurement, Control & Lab.	UL 508 EN 61010-1 EN 61010-2-201 IEC 61010-1 IEC 61010-2-201 UL 61010-1 UL 61010-2-201
	- Certification Documents	<a href="http://www.tracopower.com/overview/tib480">www.tracopower.com/overview/tib480</a>
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
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, $\pm 8$ kV, perf. criteria A Contact: EN 61000-4-2, $\pm 4$ kV, perf. criteria A
	- RF Electromagnetic Field	EN 61000-4-3, 10 V/m, perf. criteria A
	- EFT (Burst) / Surge	EN 61000-4-4, $\pm 2$ kV, perf. criteria B L to L: EN 61000-4-5, $\pm 1$ kV, perf. criteria B L to PE: EN 61000-4-5, $\pm 2$ kV, perf. criteria B
	- Conducted RF Disturbances	EN 61000-4-6, 10 Vrms, perf. criteria A
	- PF Magnetic Field	Continuous: EN 61000-4-8, 30 A/m, perf. criteria A
	- Voltage Dips & Interruptions	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
	- Voltage Sag Immunity	SEMI F47, criteria A

## General Specifications

Relative Humidity		95% max. (non condensing)
Temperature Ranges	- Operating Temperature	-40°C to +70°C

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

Power Derating	- High Temperature - Low Input Voltage	2 %/K above 60°C (at standard operation) 3 %/K above 60°C (at peak power mode) 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: <a href="http://www.tracopower.com/overview/tib480">www.tracopower.com/overview/tib480</a> (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 - Input to Case or PE, 60 s - Output to Case or PE, 60 s	3'000 VAC 1'500 VAC 750 VDC
Creepage	- Input to Output - Input to Case or PE - Output to Case or PE	8 mm min. 4 mm min. 1.5 mm min.
Clearance	- Input to Output - Input to Case or PE - Output to Case or PE	8 mm min. 4 mm min. 1.5 mm min.
Isolation Resistance	- Input to Output, 500 VDC	4'000 MΩ min.
Leakage Current	- Earth Leakage Current - Touch Current	3500 μA max. 880 μA max.
Reliability	- Calculated MTBF	1'000'000 h (IEC 61709)
Environment	- Vibration  - Mechanical Shock  - Mechanical Shock	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) 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)
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.)

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

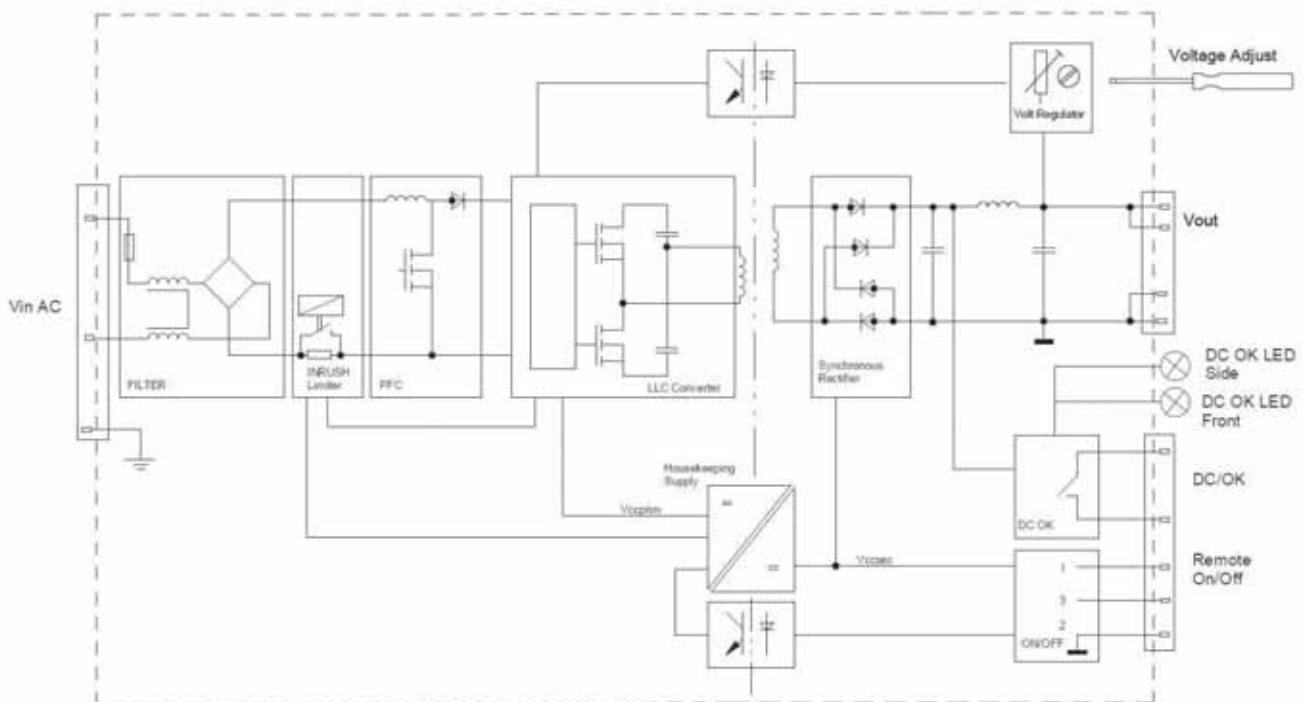
<b>Power OK Signal</b> - Trigger Threshold - Power OK - Power Off - Pin Specifications	24 VDC model: 48 VDC model:	<b>Relay Output</b> 21 - 23 VDC 42 - 46 VDC Relay contact closed Relay contact open 30 VDC / 1 A max.
<b>Status Indicator</b>	Also indicated by green LEDs: front and side	
<b>Environmental Compliance</b> - REACH Declaration  - RoHS Declaration  - SCIP Reference Number	<a href="http://www.tracopower.com/info/reach-declaration.pdf">www.tracopower.com/info/reach-declaration.pdf</a> REACH SVHC list compliant REACH Annex XVII compliant <a href="http://www.tracopower.com/info/rohs-declaration.pdf">www.tracopower.com/info/rohs-declaration.pdf</a> Exemptions: 7a, 7c-I (RoHS exemptions refer to the component concentration only, not to the overall concentration in the product (O5A rule)) 01ea7faa-024f-4f9e-962c-7a89c50c26b2	

### Supporting Documents

Overview Link (for additional Documents)

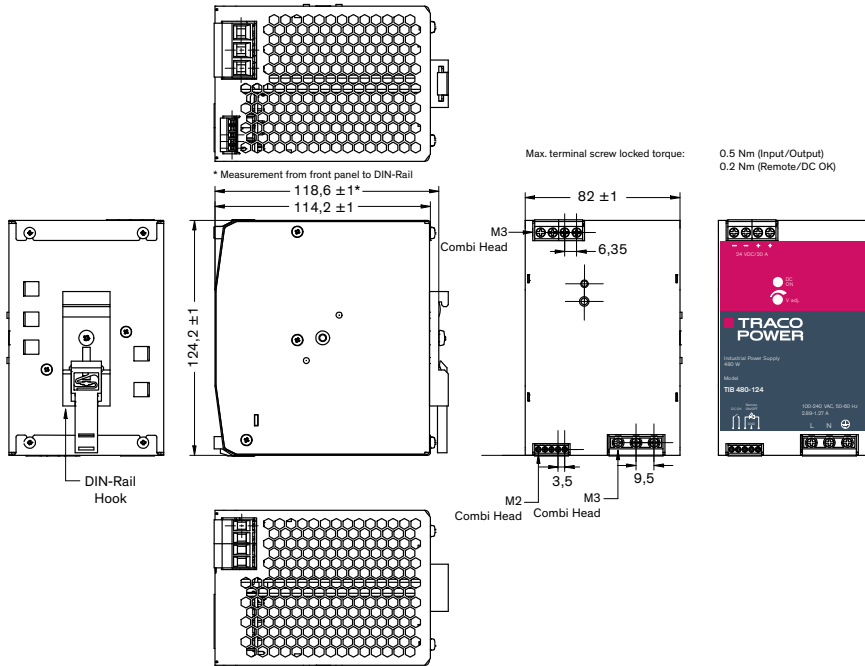
[www.tracopower.com/overview/tib480](http://www.tracopower.com/overview/tib480)

### Blockdiagram



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

### Outline Dimensions



### Alternative side mounting

