Industrial Power Supplies

TIS Series 75 - 600 Watt

Features

- Switch mode power supplies for DIN-rail mounting
- 4 power ranges with 3, 6, 12 and 24 A output current (24 VDC models)
- Selectable 115 / 230 VAC input
- Very low ripple and noise
- EMI complies with EN50081-2 and EN50082-2
- Conducted EMI to EN55011 class B
- For system operation available with built-in functions:
  - RED: Redundancy module for N+1 systems with true current sharing.
  - SIG: Signal module with AC-Power-fail, DC- OK Signal and external ON / OFF control
  - UDS: DC-UPS module for uninterruptable battery backed-up power systems.
- Worldwide Safety Approvals
- Easy snap-on mounting on DIN-rails or chassis mounting
- 2 Year Product Warranty



The switching power supplies of the TIS series have been particulary designed for applications in industrial process control systems and machine tools. Excellent specifications and high immunity against electrical disturbances guarantee reliable power for sensitive loads in rugged industrial environments. With help of optional function modules specific requirements for system applications can be met by a standard product. With the UDS module the power supplies can be extended to a perfect DC-UPS with automatic battery- backup. This function is very often required in applications where a time delayed shutdown of a system is necessary. To monitor and control the power supply a signal module can be installed. For parallel operation with active power sharing a redundancy option is available. This flexibility makes the TIS series power supplies a cost effective solution for many industrial applications.

Models

Ordercode (includes terminal plugs)	Input Voltage	Output Power max.	Output Voltage nom.	Output Current max.
TIS 75-112 TIS 75-124 TIS 75-148	115 / 230 VAC selectable	75 W	12 VDC 24 VDC 48 VDC	6.0 A 3.0 A 1.5 A
TIS 150-124 TIS 150-148	115 / 230 VAC selectable	150 W	24 VDC 48 VDC	6.0 A 3.0 A
TIS 300-124 TIS 300-148 TIS 300-172	115 / 230 VAC selectable	300 W	24 VDC 48 VDC 72 VDC	12 A 6.0 A 4.2 A
TIS 500-124	230 VAC	500 W	24 VDC	20 A
TIS 600-124 TIS 600-128 TIS 600-148 TIS 600-172	115 / 230 VAC selectable	600 W	24 VDC 28 VDC 48 VDC 72 VDC	24 A 22 A 12 A 8.5 A
TIS 300-124 DCI	300 - 800 VDC	300 W	24 VDC	12 A

Input Specifications

Input voltage range	– TIS 75, TIS 150, TIS 300, TIS 600	93 – 132 VAC /	187 – 264 VAC
	– TIS 500		187 – 264 VAC
	– TIS 300 DCI		300 – 800 VDC
Input frequency		47 – 63 Hz	
Input current at full load (typ.)		115 VAC	230 VAC
– TIS 75		1.7 A	0.9 A
– TIS 150		3.0 A	1.7 A
– TIS 300		5.4 A	3.3 A
– TIS 500			5.5 A
– TIS 600		10.5 A	6.4 A
Inrush current (< 2 ms)		115 VAC	230 VAC
– TIS 75		< 16.5 A	< 33 A
– TIS 150		< 35 A	< 70 A
– TIS 300		< 35 A	< 70 A
– TIS 500			< 70 A
– TIS 600		< 70 A	< 80 A

Output Specifications

Output voltage adj. range	– 12 VDC models	12 – 14 VDC	
	– 24 VDC models	24 – 28 VDC	
	– 28 VDC models	28 – 32 VDC	
	– 48 VDC models	48 – 52 VDC (48 – 55 VDC on request))	
	– 72 VDC models	60 – 76 VDC	
Regulation	– Input variation	± 0.2 % max.	
	– Load variation (10 – 90 %) – TIS 75, TIS 150	± 1.0 % max.	
	– TIS 300, TIS 500, TIS 600	± 0.3 % max.	
		(± 1.5 % in parallel operation)	
Ripple and Noise (20MHz Bandwidth)		< 50 mV pk-pk	
Electronic short circuit protection		current limitation at 110 % typ.	
		(constant current, automatic restart)	
Overvoltage protection, triggerpoint at		140 % typ. Vout nom.	
Hold-up time		115 VAC	230 VAC
– TIS 75 ... TIS 300		min. 25 ms	min. 30 ms
– TIS 500			min. 40 ms
– TIS 600		min. 15 ms	min. 25 ms

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

General Specifications

Temperature ranges	– Operating (ambient temp.)		– 25 °C...+70 °C max.
	– Derating above 50 °C		2% / °C
	– Storage (non operating)		– 25 °C...+ 85 °C
Humidity (non condensing)			95 % rel H max.
Temperature coefficient			0.02 % / °C
Switching frequency			80 kHz typ. (Pulswidth modulation)
Efficiency	– TIS 75 ... TIS 300		85 % typ.
	– TIS 500		90 % typ.
	– TIS 600		88 % typ.
Isolation			according to EN 60950, UL 1950, UL 508C
Reliability, calculated MTBF (MIL-HDBK-217 E)		– TIS 75 / 150	450000 h @ +25°C / 420000 h @ +25°C
		– TIS 300 / 500	360000 h @ +25°C / 340000 h @ +25°C
		– TIS 600	300000 h @ +25°C
Safety standards			IEC 60950, EN 60950 (SELV), UL/cUL 1950, UL 508C
Safety approvals			UL/cUL 1950 recognized, File E18138 UL/cUL 508C listed, File E210002 UL/cuL 1604 listed, File E213613 (Class I,Division 2, Groups A, B, C and D hazardous locations) CB-Scheme
Electromagnetic compatibility (EMC), Emissions			EN 50081-1 / EN 50081-2
– Conducted RI suppression on input			EN 55011 class B, EN 55022 class B, FCC part 15, level B
– Radiated RI suppression			EN 55011 class A, EN 55022 class A, FCC part 15, level A
Electromagnetic compatibility (EMC), Immunity			EN 50082-2
– Electrostatic discharge (ESD)			IEC / EN 61000-4-2 4 kV / 8 kV
– Radiated RF field immunity			IEC / EN 61000-4-3 10 V / m
– Electrical fast transient / burst immunity			IEC / EN 61000-4-4 2 kV
– Surge immunity			IEC / EN 61000-4-5 2 kV / 4 kV
– Immunity to conducted RF disturbances			IEC / EN 61000-4-6 10 V
– Power frequency field immunity			IEC / EN 61000-4-8 30 A / m
Safety class			Degree of Protection 1 (IEC 536)
Case protection			IP 20 (IEC 529)
Environment	– Vibration		IEC 60068-2-6,1 gn, 200 sweeps, each axis
	– Shock		IEC 60068-2-27, 15 gn, 11 ms, each axis
Enclosure material			Aluminium (chassis) / stainless steel (cover)
Mounting (snap-on with selflocking spring)			for 35 mm DIN-rails as per EN 50022
Connection			Plugable screw terminals (plugs included) (TIS 600: screw terminal blocks)

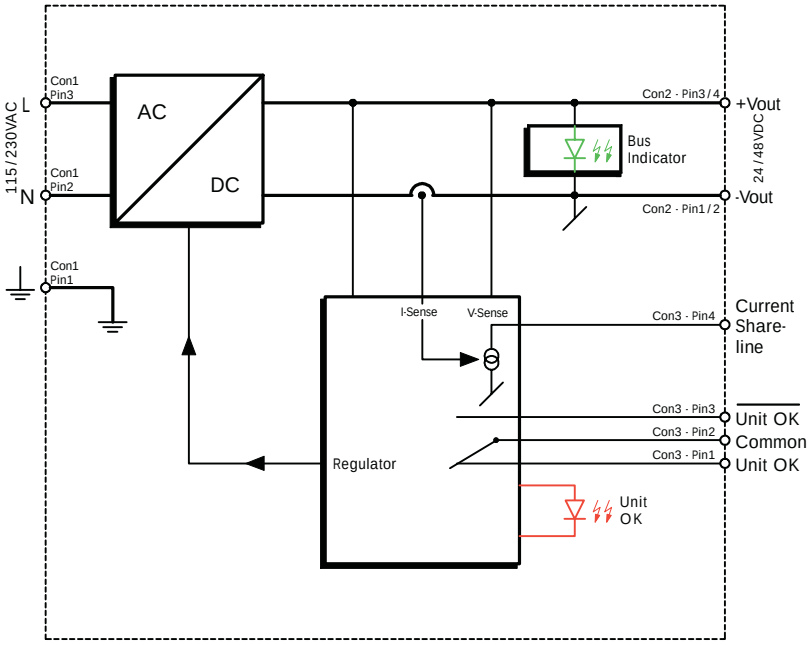
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.

Power Supplies with Redundancy Function

With this option a parallel operation of up to 5 units is possible. Decoupling diodes and current share lines allow to build true N +1 redundant systems with active current sharing for all units. This function also includes an alarm relay to signal a single unit failure.
This option is available for TIS 150 W, TIS 300 W and TIS 600 W models. Please note: A combination with other options is not possible.

Models

Ordercode (includes terminal plugs)	Input Voltage	Output Power max.	Output Voltage nom.	Output Current max.
TIS 150-124 RED **TIS 150-148 RED**	115 / 230 VAC selectable	150 W	**24 VDC** **18 VDC**	**6.0 A** **12 A**
TIS 300-124 RED **TIS 300-148 RED**	115 / 230 VAC selectable	300 W	**24 VDC** **48 VDC**	**12 A** **6.0 A**
TIS 600-124 RED **TIS 600-148 RED**	115 / 230 VAC selectable	600 W	**24 VDC** **48 VDC**	**24 A** **12 A**



Specifications

Raiting per relay contact	60 VDC / 0.36 A max.

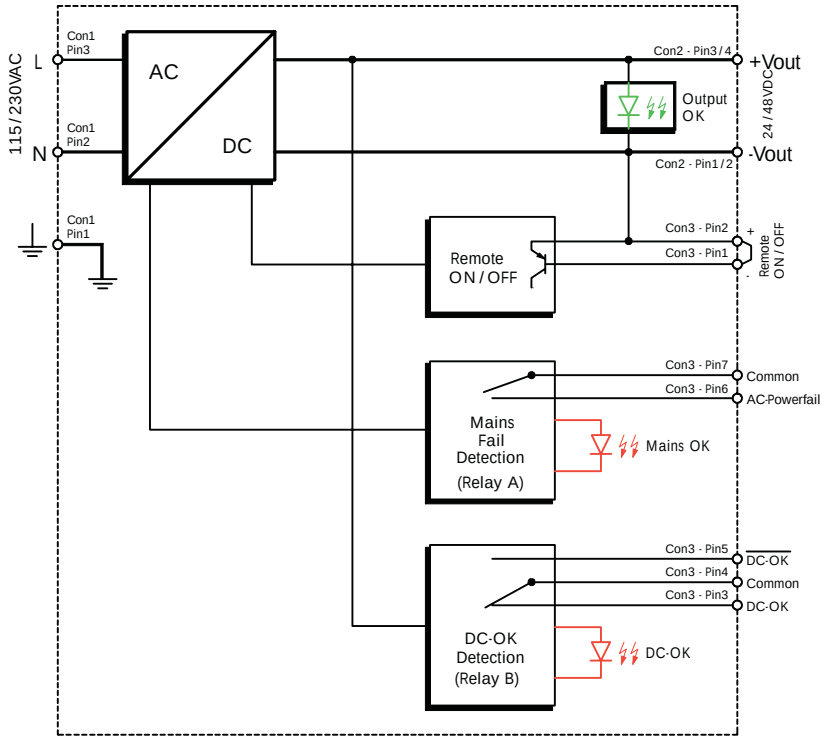
Specifications can be changed without notice

Power Supplies with Powerfail Functions

These models provide 3 functions required in many process control system applications:
- AC-Powerfail signal (relay contact)
- DC-OK signal (relay contact)
- Remote ON / OFF

Models

Ordercode (includes terminal plugs)	Input Voltage	Output Power max.	Output Voltage nom.	Output Current max.
TIS 150-124 SIG **TIS 150-148 SIG**	115 / 230 VAC selectable	150 W	**24 VDC** **48 VDC**	**6.0 A** **3.0 A**
TIS 300-124 SIG **TIS 300-148 SIG**	115 / 230 VAC selectable	300 W	**24 VDC** **48 VDC**	**12 A** **6.0 A**
TIS 600-124 SIG **TIS 600-148 SIG**	115 / 230 VAC selectable	600 W	**24 VDC** **48 VDC**	**24 A** **12 A**



Specifications

DC-OK signal trigger point	– Models with 24 Vout	> 22.8 VDC ± 0.5 V	relay B closed (pin 4 – pin 3)
	– Models with 48 Vout	> 45.6 VDC ± 1.0 V	relay B closed (pin 4 – pin 3)
AC-Powerfail signal		Vin < 93 resp. < 187 VAC	relay A closed (pin 7 – pin 6)
Raiting per relay contact		60 VDC / 0.36 A max.	

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

DC-UPS-System



In addition to the standard power supply function, these models include a professional battery management system to charge and monitor an external battery. In case of a power failure the battery is switched automatically and without any interruption to the DC-output. If mains power is available again, the battery is switched off. The hold-up time is limited only by battery capacity and load. Charge current and voltage can be adjusted to values as required by battery type. Power fail and low battery alarm signals are available via two independent relay contacts. During normal operation the battery status is monitored by periodically loading the battery for short time. If a cell resistance is high, there is a relay alarm available. The battery is fully protected under any operational conditions. The power supply is short circuit protected even in battery-backup operation, however for safety reason the battery should be fused with a fast blow fuse. Battery mode can be activated by connection of Pin 7 and 8.

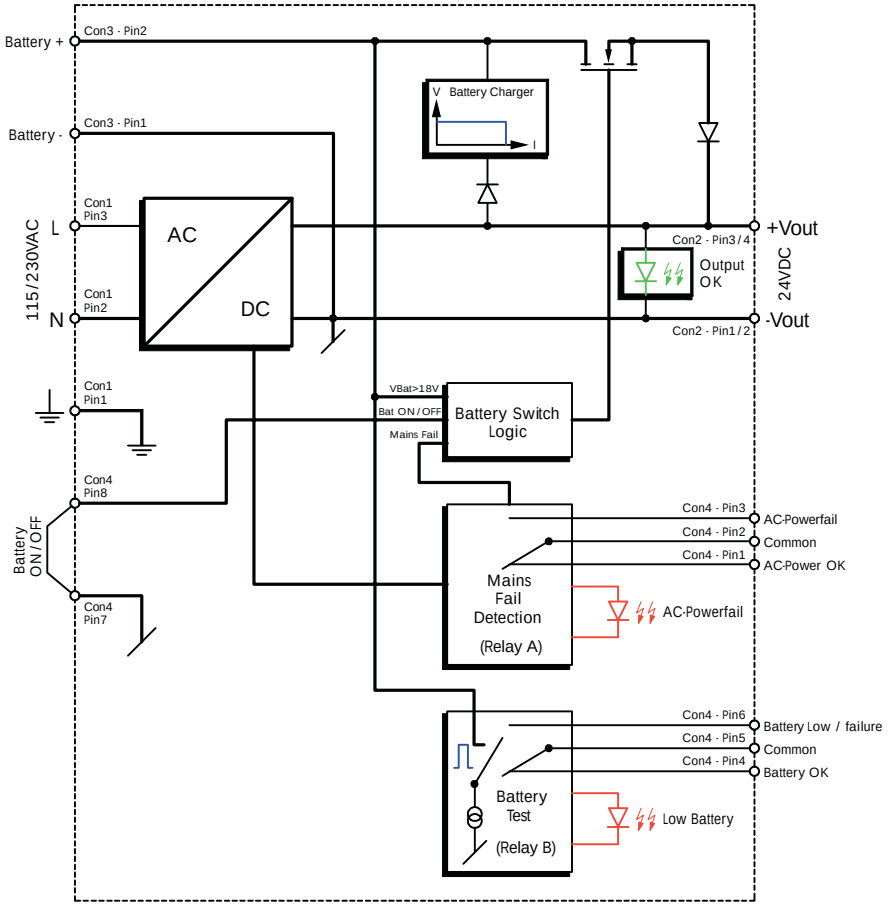
Complete external battery modules (3.2 Ah or 7 Ah standard) with lead batteries are available on request.

Models

Ordercode (includes terminal plugs)	Input Voltage	Output Power max.	Output Voltage nom.	Output Current max.
TIS 300-124 UDS	115 / 230 VAC selectable	300 W	**24 VDC**	**12 A**
TIS 600-124 UDS	115 / 230 VAC selectable	600 W	**24 VDC**	**24 A**

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

DC-UPS-System



Specifications

Charging current (factory set)	– TIS 300-124 UDS	1.2 A
	– TIS 600-124 UDS	2.4 A
Adjustment range of charging current	– TIS 300-124 UDS	0.15...1.5 A
	– TIS 600-124 UDS	0.25...2.5 A
Holding current for charging battery atvoltage 27.3 VDC		< 50 mA
Overload at short circuit during battery operation		system switches off
AC-Powerfail signal	Vin < 93 resp. < 187 VAC	relay A closed (pin 2 – pin 3)
Low battery signal	Battery voltage below 22 V	relay B closed (pin 5 – pin 6)
Raiting per relay contact		60 VDC / 0.36 A max.
During battery charge operation	output current reduction by 1.4 x battery charge current	

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

Battery-Pack for DC-UPS Systems

The Battery Pack contains high quality, maintenance free lead-acid batteries with 3.2 Ah resp. 7.0 Ah capacity. The batteries are fixed together with a re-settable electronic fuse on a solid mounting frame. Together with power supply models TIS 300-124 UDS or TIS 600-124 UDS the battery pack provides a complete and reliable DC-UPS system. Backup time is depending on load current and battery capacity.

Models

Ordercode	Battery Voltage	Battery Capacity (25°C, 20h-rate)	Permissable Charge Current max.
TIS 24-32 AP	**24 VDC**	**3.2 Ah**	1.2 A
TIS 24-70 AP	**24 VDC**	**7.0 Ah**	2.4 A

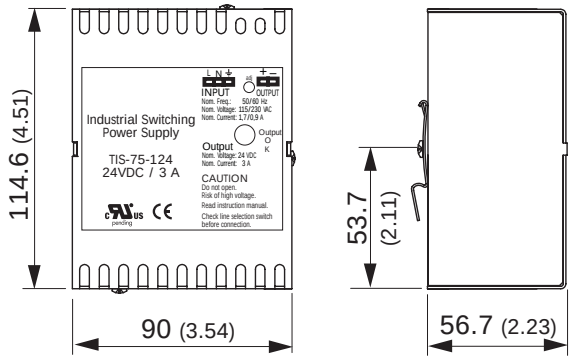
Specifications

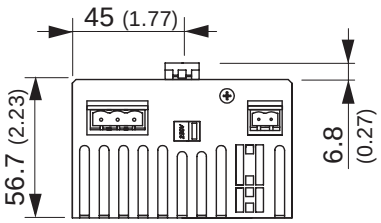
Max. charge voltage		27...27.6 VDC
Temperature coefficient		– 36mV / °C
Temperature range	– at charge operation	– 15 °C...+50 °C
	– at load operation	– 20 °C...+60 °C
	– Storage	– 20 °C...+60 °C
Average lifetime on standby operation at tA =20 °C		4...5 years
Cable length		1.0 m
Cable diameter	– TIS 24-32 AP	2.5 mm^2 (AWG 12)
	– TIS 24-70 AP	4.0 mm^2 (AWG 11)
Weight	– TIS 24-32 AP	4.6 kg (10.1 lb)
	– TIS 24-70 AP	5.9 kg (13.0 lb)
Recommended combinations (power supplies)	– TIS 24-32 AP	TIS 300-124 UDS
	– TIS 24-70 AP	TIS 600-124 UDS

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

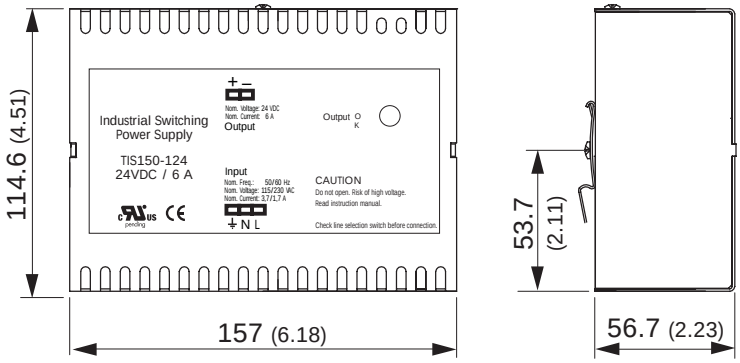
Optional Mounting Systems Dimensions mm (inches)

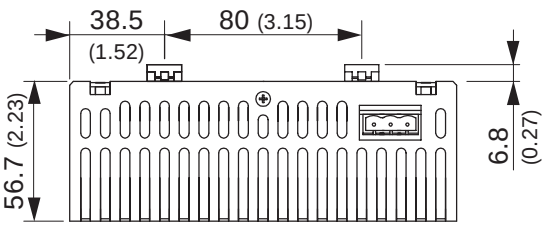
TIS 75





TIS 150



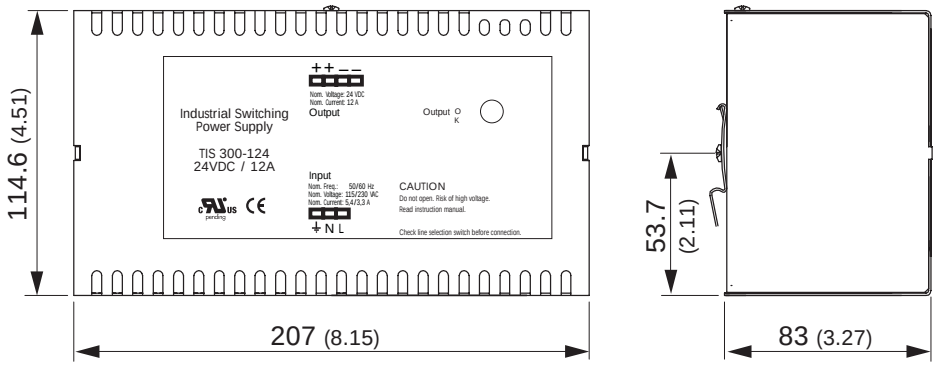


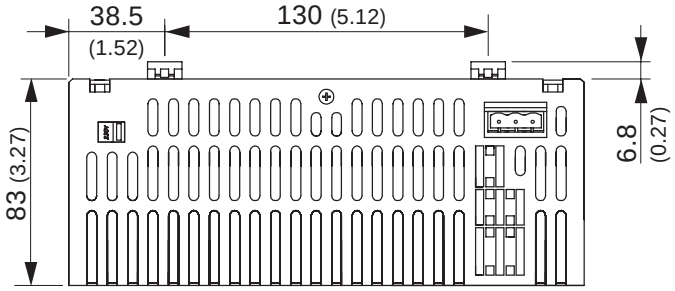
Weight:

TIS 75 0.48 kg (1.06 lb)

TIS 150 0.80 kg (1.76 lb)

TIS 300





Weight:

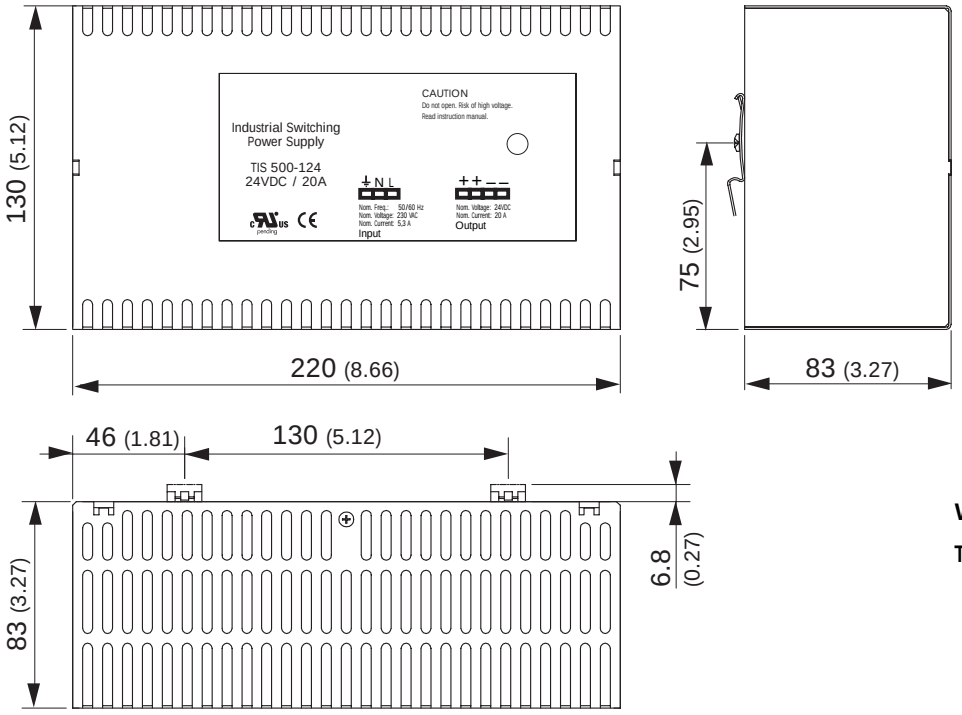
TIS 300 1.4 kg (3.09 lb)

Specifications can be changed without notice

Tolerances: ±0.5 mm (±0.02)

Optional Mounting Systems Dimensions mm (inches)

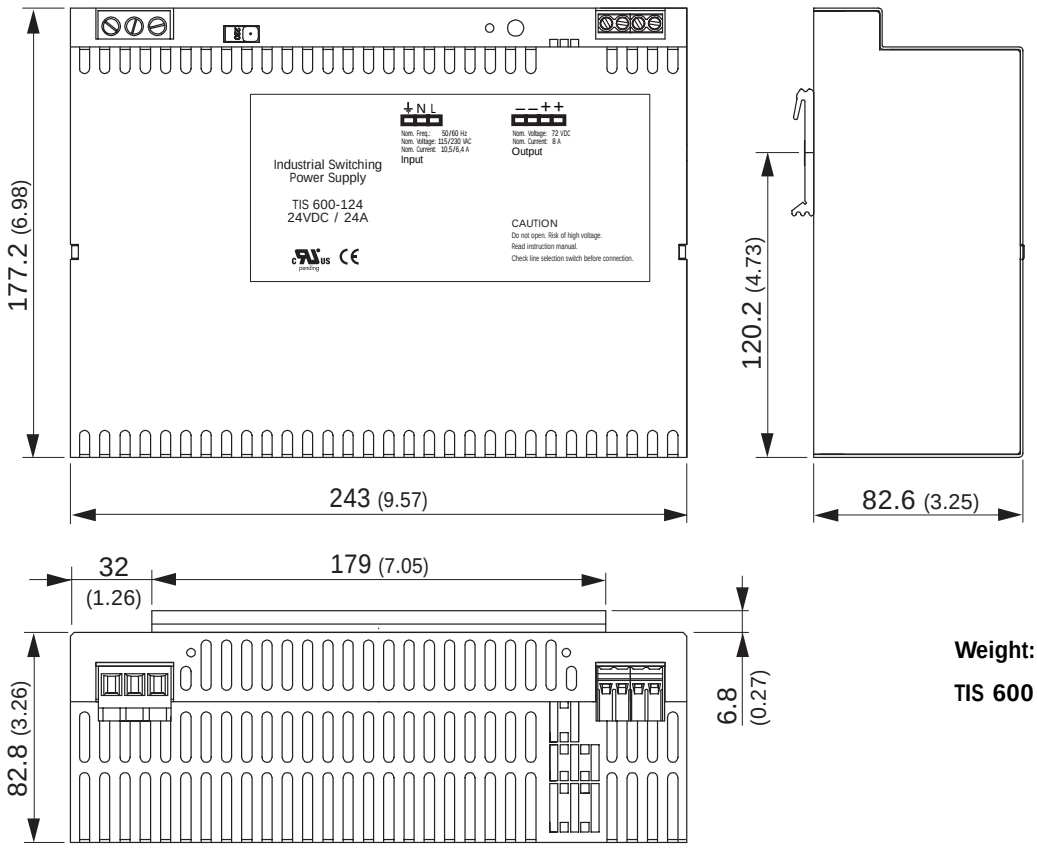
TIS 500



Weight:

TIS 500 1.9 kg (4.19 lb)

TIS 600



Weight:

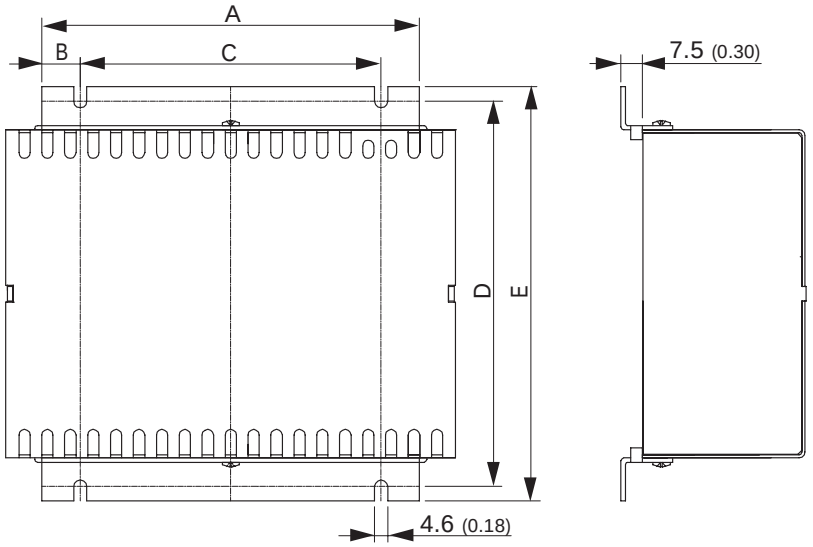
TIS 600 2.0 kg (4.41 lb)

Specifications can be changed without notice

Tolerances: ±0.5 mm (±0.02)

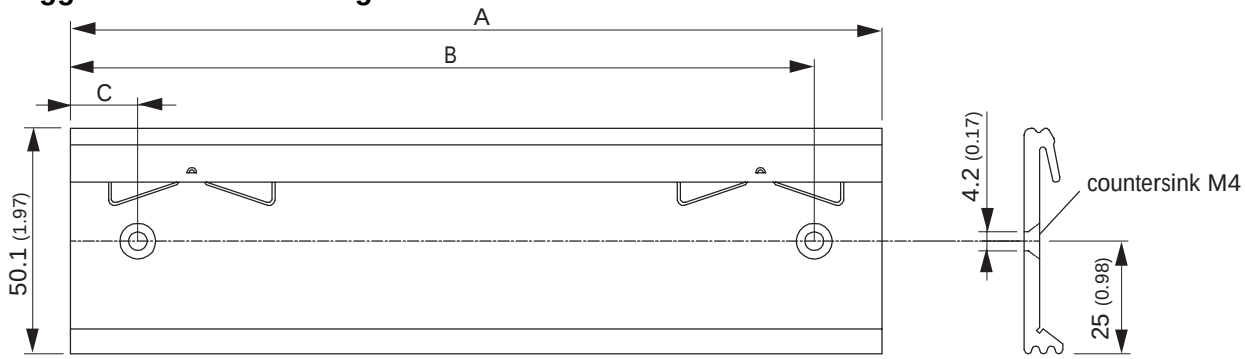
Optional Mounting Systems Dimensions mm (inches)

Wall mounting



Models	Order code	A	B	C	D	E
TIS 75W	**MK-75**	37 (1.46)	14.5 (0.57)	–	134.5 (5.30)	150.5 (5.93)
TIS 150W	**MK-150**	132 (5.20)	13.5 (0.53)	105 (4.13)	134.5 (5.30)	150.5 (5.93)
TIS 300W	**MK-300**	132 (5.20)	13.5 (0.53)	105 (4.13)	134.5 (5.30)	150.5 (5.93)
TIS 500W	**MK-500**	132 (5.20)	13.5 (0.53)	105 (4.13)	134.5 (5.30)	150.5 (5.93)
TIS 600W	**MK-600**	190 (7.48)	37.5 (1.48)	115 (4.53)	197.0 (7.76)	207.0 (8.15)

Rugged DIN-Rail mounting



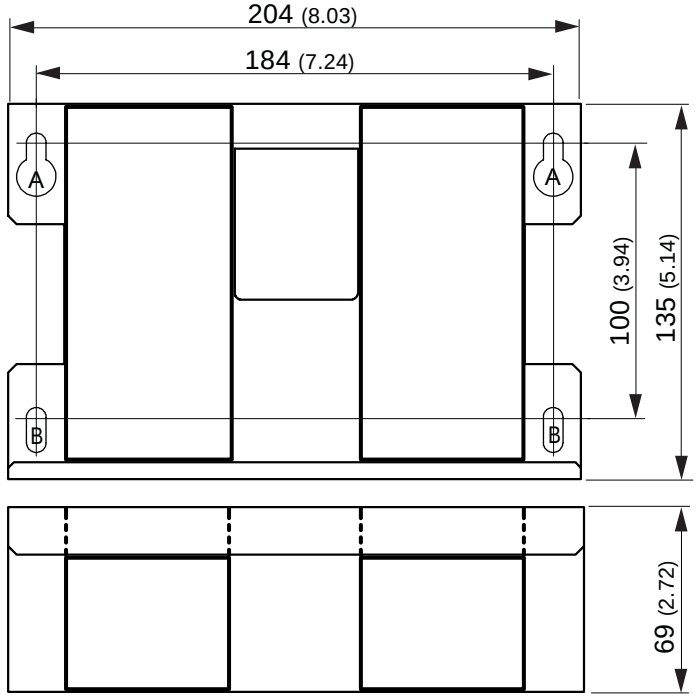
Models	Order code	A	B	C
TIS 150W	**RMK-150**	t.b.a.	t.b.a.	t.b.a.
TIS 300W	**RMK-300**	t.b.a.	t.b.a.	t.b.a.
TIS 500W	**RMK-500**	t.b.a.	t.b.a.	t.b.a.
TIS 600W	standard	180 (7.09)	165 (6.50)	15.0 (0.59)

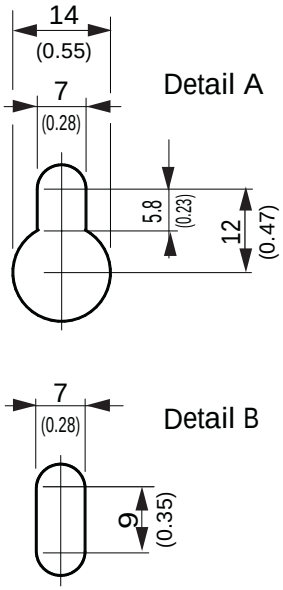
Specifications can be changed without notice

Tolerances: ±0.5 mm (±0.02)

Outline Dimensions mm (inches)

TIS-24-32 AP

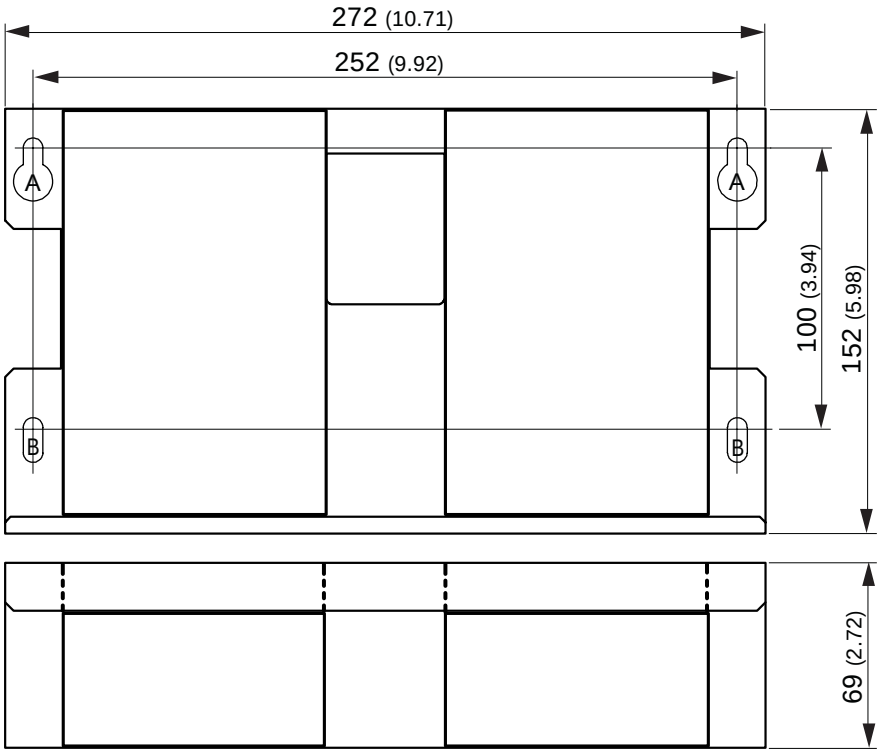




Weight (incl. batteries)**:**

TIS-24-32 AP	4.6 kg (10.1 lb)
TIS-24-70 AP	5.9 kg (13.0 lb)

TIS-24-70 AP



Specifications can be changed without notice

Tolerances: ±0.5 mm (±0.02)

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