



### Features

- ◆ For industrial, office and residential applications
- ◆ Ultracompact plastic housing
- ◆ Connection by spring clamp terminals or detachable screw terminal block
- ◆ Reliable snap-on mounting on DIN-rails
- ◆ Adaptor for wall mounting
- ◆ Universal input 85–264 VAC, 50/60 Hz
- ◆ Models with 5, 12, 24 & 48 VDC output
- ◆ Output voltage adjustable
- ◆ Power OK signal
- ◆ Low ripple and noise
- ◆ Overload and short-circuit protection
- ◆ Parallel operation possible
- ◆ Worldwide safety approvals
- ◆ Redundancy module
- ◆ 3-year product warranty



The TRACOPOWER TCL series is a family of DIN-rail power supplies with an excellent price/performance ratio. With tightly regulated output voltage and high immunity against electrical disturbances on the mains they provide a reliable power source for sensitive loads in industrial process controls, machine tools and other equipment exposed to a difficult industrial environment. Compact size, light weight, easy snap-on mounting on DIN-rails and the choice of two connection terminal versions are other features of these power supplies. The TCL series complies with all major safety standards for Europe (EN60950-1, EN50178), North America (UL/cUL 60950, UL 508 listed) or elsewhere in the world (CB-Report).

### Models

Order Code	Input Voltage Ranges	Output Power max.	*Output Voltage nom.	Output Current max.	Connection
TCL 024–105	85 – 264 VAC Universal Input 50/60 Hz	20 W	5 VDC	4.0 A	Detachable screw terminal blocks
TCL 024–112		24 W	12 VDC	2.0 A	
TCL 024–124		24 W	24 VDC	1.0 A	
TCL 060–112		60 W	12 VDC	4.0 A	
TCL 060–124		60 W	24 VDC	2.5 A	
TCL 060–148		85 – 375 VDC	48 VDC	1.25 A	
TCL 120–112		120 W	12 VDC	8.0 A	
TCL 120–124		120 W	24 VDC	5.0 A	
TCL 240–124	85–132/187–264 VAC	240 W	24 VDC	10.0 A	Spring clamp terminals
TCL 024–124C	85 – 264 VAC Universal Input 50/60 Hz	24 W	24 VDC	1.0 A	
TCL 060–112C		60 W	12 VDC	4.0 A	
TCL 060–124C		60 W	24 VDC	2.5 A	
TCL 060–148C		48 VDC	1.25 A		
TCL 120–112C	85 – 375 VDC	120 W	12 VDC	8.0 A	
TCL 120–124C	120 W	24 VDC	5.0 A		

\* adjustable

### Input Specifications

Input voltage range		85–264 VAC/85–375 VDC TCL 240 model: 85–132/187–264 VAC autoselect (no DC input)
Output derating	– at operation between 85...93 VAC/85...130 VDC	15% for TCL 060 & TCL 120 20% for TCL 024-112 & TCL 024-124 & TCL 240 30% for TCL 024-105
Input frequency		47–63 Hz
Harmonic limits		EN 61000-3-2, Class A
Input current at full load (typ.) (115 VAC / 230 VAC)		TCL 024 models: 0.35 A / 0.2 A TCL 060 models: 1.2 A / 0.6 A TCL 120 models: 2.0 A / 1.0 A TCL 240 model: 3.3 A / 1.7 A
Recommended circuit breaker (characteristic C or slow blow fuse)		5.0 A

### Output Specifications

Output voltage adjustable range (potentiometer on frontpanel)		5.1 VDC model: 5.0 – 5.25 VDC 12 VDC models: 12 – 15 VDC (12 - 16 VDC for TCL 024-112) 24 VDC models: 24 – 28 VDC 48 VDC models: 48 – 56 VDC												
Output regulation (10 to 90% load variation)		2.5 % (1 % for TCL 60-112)												
Ripple and noise (20MHz bandwidth)		<50 mV pk-pk												
Electronic short circuit protection		current limitation at 120 % typ. (constant current, automatic recovery TCL 24 models: foldback, automatic recovery)												
Parallel operation		output current characteristic suitable for parallel operation of max. 5 units (not for TCL 240-124)												
Overvoltage protection, trigger point		5.1 VDC model: <6.5 VDC 12/24 VDC models: <40 VDC 48 VDC models: <60 VDC												
Hold-up time (115 VAC / 230 VAC)		min. 15 ms / min. 125 ms TCL 240 model: min. 15 ms / min. 40 ms												
Power OK signal (TCL 60, 120 & 240 models only)		<table border="0"> <tr> <td></td> <td>trigger point</td> <td>output signal (reference to – Vout)</td> </tr> <tr> <td></td> <td>12 VDC models: &gt;11V</td> <td>11.0 V ±1.0 V / 60 mA max.</td> </tr> <tr> <td></td> <td>24 VDC models: &gt;22V</td> <td>22.0 V ±2.0 V / 30 mA max.</td> </tr> <tr> <td></td> <td>48 VDC models: &gt;44V</td> <td>44.0 V ±4.0 V / 15 mA max.</td> </tr> </table>		trigger point	output signal (reference to – Vout)		12 VDC models: >11V	11.0 V ±1.0 V / 60 mA max.		24 VDC models: >22V	22.0 V ±2.0 V / 30 mA max.		48 VDC models: >44V	44.0 V ±4.0 V / 15 mA max.
	trigger point	output signal (reference to – Vout)												
	12 VDC models: >11V	11.0 V ±1.0 V / 60 mA max.												
	24 VDC models: >22V	22.0 V ±2.0 V / 30 mA max.												
	48 VDC models: >44V	44.0 V ±4.0 V / 15 mA max.												

### General Specifications

Temperature ranges	– Operating – Storage (non operating)	–10°C to +70°C max. –25°C to +85°C
Temperature derating	– at 187...264 VAC or 265...375 VDC operation – at 93...132 VAC or 130...187 VDC operation – at 85...130 VDC operation	1.7 %/K above +50°C 1.1 %/K above +40°C 1.3 %/K above +30°C
Humidity (non condensing)		95 % rel. H max.
Temperature coefficient		0.02 %/K
Switching frequency		55 – 180 kHz depending on load (frequency modulation)
Efficiency		88 % typ.
Isolation voltage	– I/O isolation voltage (60 s)	3000 VAC

**General Specifications**

Reliability, calculated MTBF at +25°C (according to IEC-1709)	TCL 024 models: >2.68 Mio h TCL 060 models: >2.70 Mio h TCL 120 models: >1.62 Mio h TCL 240 models: >1.38 Mio h
Safety standards	<ul style="list-style-type: none"> <li>- Information technology equipment IEC 60950-1, EN 60950-1 (output SELV), UL Std. 60950-1 (2nd Edition) +Am1:2011, CAN/CSA-C22.2 No. 60950-1-07 +Am1:2011</li> <li>- Industrial control equipment UL 508</li> <li>- Electronic equipment for power installation EN 50178</li> <li>- Electrical equipment for machines EN 60204</li> <li>- Safety transformers for SMPS EN 61558-2-16</li> </ul>
Safety approvals	<ul style="list-style-type: none"> <li>- CB test certificate IEC 60950-1</li> <li>- UL approval UL 508 listed, CSA C22.2 No. 14 File e210002 <a href="http://www.ul.com">www.ul.com</a> -&gt; certifications</li> <li>- UL approval UL 60950, File e181381 (except TCL 240) <a href="http://www.ul.com">www.ul.com</a> -&gt; certifications</li> <li>- CSA certification UL 60950-1, CSA 60950-1-03</li> <li>- Certification documents <a href="http://www.tracopower.com/overview/tcl">www.tracopower.com/overview/tcl</a></li> </ul>
Environmental compliance	<ul style="list-style-type: none"> <li>- Reach <a href="http://www.tracopower.com/products/reach-declaration.pdf">www.tracopower.com/products/reach-declaration.pdf</a></li> <li>- RoHS RoHS directive 2011/65/EU</li> </ul>
Electromagnetic compatibility (EMC), emissions	EN 61000-6-3
Electromagnetic compatibility (EMC), immunity	EN 61000-6-2
- Voltage Sag immunity	<a href="http://www.tracopower.com/overview/tcl">www.tracopower.com/overview/tcl</a>
Safety class	degree of protection class 1
Case protection	IP 20 (IEC 60529)
Enclosure material	plastic 94V-0 rated
Mounting	DIN-rails as per EN 50022-35x15/7.5 (snap-on with self-locking spring) Adapter for wall-/chassis mounting (included)
Options	output characteristic optimized for battery charging available on request
Installation instructions	<a href="http://www.tracopower.com/overview/tcl">www.tracopower.com/overview/tcl</a>

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

**TCL-REM240 Redundancy Module**

This module enables redundant operation of any two TCL models by decoupling the 2 power supplies. It can also be used to separate sensitive loads from the main power source.



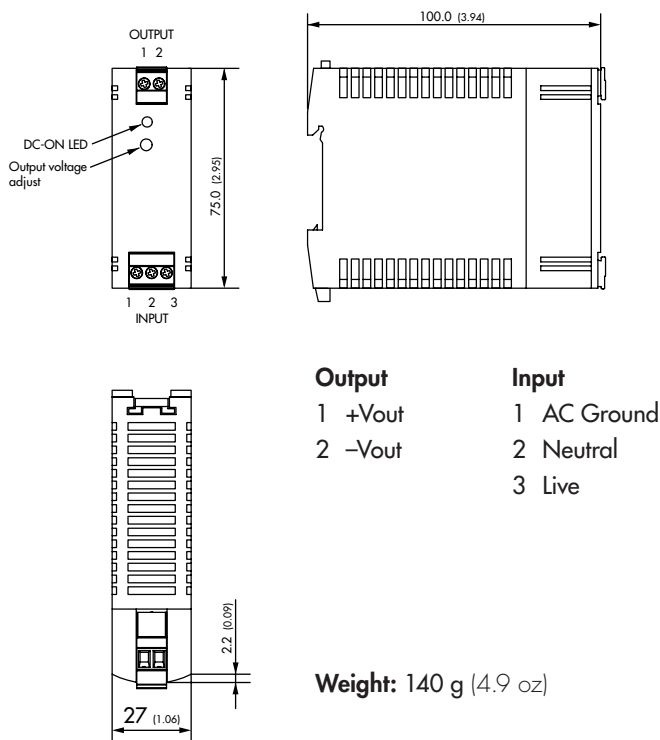
Order Code	Nominal Input Voltage	Input Voltage Range	Max Power per Input	Output Voltage	Output Current max.
TCL-REM240	5...48 VDC	5...60 VDC	200 W	V <sub>in</sub> - 0.9 VDC	8 A

**Specifications**

Operating temperature	-10°C to +70°C max. (14°F ... +158°F) derating above +40°C (104°F): 1.5 %/K
Electromagnetic compatibility	in correspondence to connected units (no internal switching device)
Dimensions	same as model TCL 024 (see page 4)
Connection	detachable screw terminal block
Installation instructions	<a href="http://www.tracopower.com/overview/tcl">www.tracopower.com/overview/tcl</a>

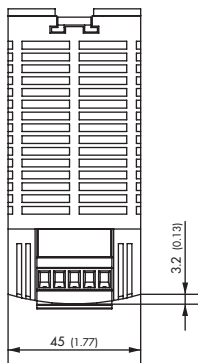
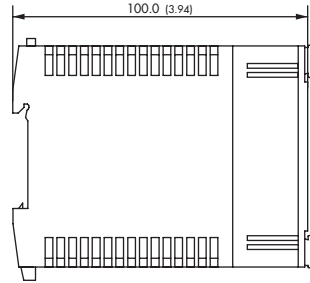
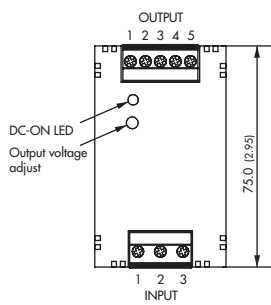
**Case Dimensions**

**TCL 024 and TCL-REM240 models**



**Case Dimensions**

**TCL 60 models**



**Output**

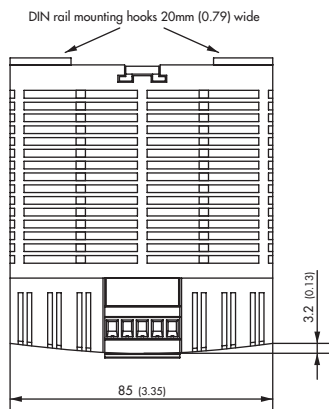
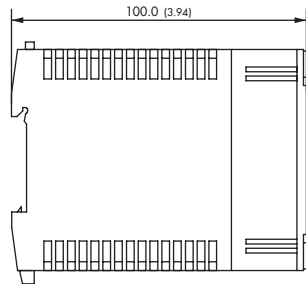
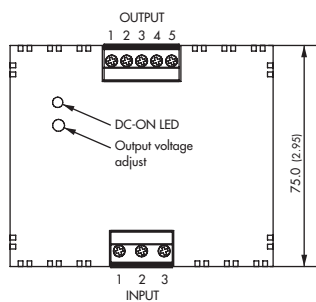
- 1 +Vout
- 2 +Vout
- 3 -Vout
- 4 -Vout
- 5 Power OK

**Input**

- 1 AC Ground
- 2 Neutral
- 3 Live

**Weight:** 265 g (9.4 oz)

**TCL 120 models**



**Output**

- 1 +Vout
- 2 +Vout
- 3 -Vout
- 4 -Vout
- 5 Power OK

**Input**

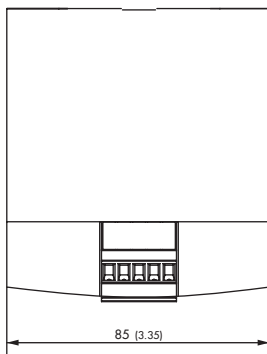
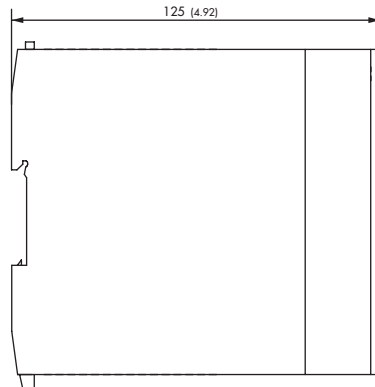
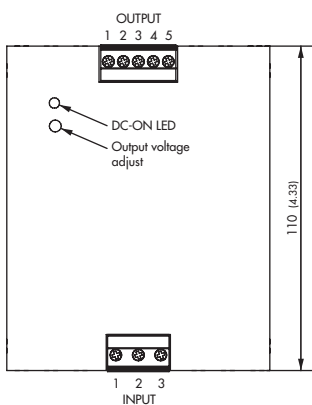
- 1 AC Ground
- 2 Neutral
- 3 Live

**Weight:** 440 g (15.5 oz)

Dimensions in [mm], ( ) = Inch  
Tolerances:  $\pm 0.5$  mm ( $\pm 0.02$ )

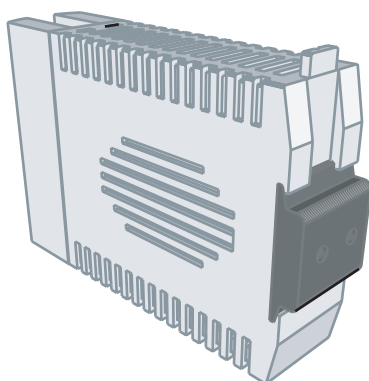
**Case Dimensions**

TCL 240 model



Output	Input
1 +Vout	1 AC Ground
2 +Vout	2 Neutral
3 -Vout	3 Live
4 -Vout	
5 Power OK	

**Weight:** 950 g (33.5 oz)



**Wall Mounting Bracket**

Instead on a DIN-rail, the modules can be also mounted on a chassis or wall with help of a mounting bracket which is supplied as standard with each power supply

Dimensions in [mm], ( ) = Inch  
Tolerances:  $\pm 0.5$  mm ( $\pm 0.02$ )