TRACO[®] POWER

Industrial DC/DC-Converter

TCL-DC Series, 24 to 60 Watt

CB cUL 508

Features

- Ultra-wide input voltage range
- Output voltage adjustable
- Overload and short circuit protection
- Low ripple and noise
- I/O isolation 1500 VDC
- Compact, slim plastic case
- Reliable snap-on mount on DIN-rail
- Bracket for wall mount included
- 3-year product warranty



In the TCL range of DIN-rail power supplies are 6 models for DC input voltage available. The wide input ranges of 9.5–18 VDC resp. 18–75 VDC means these models can be operated from all popular DC supply voltage systems.

With tightly regulated output voltage these DC/DC converters provide a reliable power source for sensitive loads in industrial process controls, factory automation and other equipment exposed to a critical industrial environment. Further applications for these converters are isolation of a specific load or refreshing the 24 V bus voltage. Easy installation is provided with snap-on mounting on DIN-rails and detachable screw terminal block.

Models				
Order Code	Input Voltage Range	Output Voltage	Output Current max.	
TCL 012-124 DC	9.5 - 18.0 VDC	24 VDC	1.0 A	
TCL 024-105 DC		5 VDC	5.0 A	
TCL 024-112 DC	18 – 75 VDC	12 VDC	2.0 A	
TCL 024-124 DC		24 VDC	1.0 A	
TCL 060-112 DC	18 – 75 VDC	12 VDC	5.0 A	
TCL 060-124 DC	10-75 VDC	24 VDC	2.5 A	

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Industrial DC/DC-Converter TCL-DC Series 24 to 60 Watt

Input prover at no load Input protection Start-up voltage/under voltage shut down ICL 024 & ICL 000 models ICL 0107 models ICL	Input Specifications				
TCI 024 & TCI 060 models 122 VDC / 15.7 VDC Reverse polarity protection by internal fuse Efficiency 66 % typ. Output Specifications 50 – 525 VDC Output variation Vin min. to Vin max. – Load variation Vin min. to Vin max. – S0 m V pc pk Overvoltage protection 5 WDC model: 24 VDC model: -53 max Overvoltage protection. 5 WDC model: 24 VDC model: -64 S V Overvoltage protection. 5 WDC model: 24 VDC model: -64 S V Overvoltage protection. 5 WDC model: 24 VDC model: -64 S V Overvoltage protection. 5 WDC model: 24 VDC model: -62 V Centeral Specifications -0 pertaing - Sterage Inon operating) -25°C to +70°C max. -25°C to +65°C Temperature derating TCI 02 & ICI 024 Model: -63 V Temperature derating 15 %/C hoodel: 15 %/C hoodel: -16% VDC Switching frequency 55 % Tel H max. Temperature coefficient Humidity (non condensing) 002 8 Å/K 500 VDC Relability, calculated MIBF d+25°C [according to IEC 61/09] >2.5 Kinch 40°C0 1 [output SEU), UL Skid			1.0 Watt max.		
Efficiency 86 % typ. Output Specifications 50 CC model: 50 - 5.25 VpC Output voltage adj. range 5 VDC model: 12 VpC model:					
Output Specifications SVDC model: 12 VDC models: 24 VDC models: 25 VDC models: 25 VDC models: 25 VDC models: 26 VDC models: 26 VDC models: 26 VDC models: 27 VDC models: 27 VDC models: 28 VDC models: 29 VDC models: 29 VDC models: 29 VDC models: 29 VDC models: 20 VDC model VDC model	Reverse polarity protection		by internal fuse		
Output veltage adj. range 5 VDC model: 5.0 - 5.25 VDC Regulation - Input variation Vin min. to Vin max. 0.5 % max All December 24 VDC models: 2.4 - 28.0 VDC Regulation - Input variation Vin min. to Vin max. 0.5 % max Ripple and noise (20 MHz bandwidth) <50 mV pk-pk	Efficiency		86 % typ.		
Output veltage adj. range 5 VDC model: 5.0 - 5.25 VDC Regulation - Input variation Vin min. to Vin max. 0.5 % max All December 24 VDC models: 2.4 - 28.0 VDC Regulation - Input variation Vin min. to Vin max. 0.5 % max Ripple and noise (20 MHz bandwidth) <50 mV pk-pk	Output Specifications	5			
- Loid variation 0100% 0.5 % max Ripple and noise (20 MHz bandwidth) <50 mV pkpk		5 VDC model: 12 VDC models:	12.0 – 15.0 VDC		
Electronic short circuit protection current limitation at 110 % typ. (constant/current, aubmatic recovery) Overvoltage protection, trigger point 5 VDC models: 22 VDC models: < 6.5 V	Regulation	 Input variation Vin min. to Vin max. Load variation 0100% 	0.5 % max 0.5 % max		
(constant current, automatic recovery) Overvoltage protection, trigger point 12 VDC model: <24 V	Ripple and noise (20 MHz l	pandwidth)	<50 mV pk-pk		
12 VDC models: -24 V Centeral Specifications -25°C to +70°C max. Temperature ranges - Operating - Storage (non operating) -25°C to +85°C Temperature derating TCL 012 & TCL 024 models: 12 VDC models: 20 %/K above +40°C Humidity (non condensing) 95 % rel. H max. Temperature coefficient 0.02 %/K Switching frequency 55 - 180 kHz depending on load (frequency modulation) Isolation voltage (60 sec.) - Input/Output Isolation voltage (60 sec.) - Input/Output Safety standards - Information technology equipment - Industrial control equipment IEC 60950-1, EN 60950-1 (output SELV), UL Stid. 40950-1 (output SELV), UL Stid. 40950-1 (2nd Edition) +Ami:2011, CAN/CSA-C222 No. 60950-1-07 +Ami:2011 - Industrial control equipment for machines EN 50178 - Electrical equipment for machines EN 5002 class B Electromagnetic compatibility (EMC), immunity EN 51002-4.2 - Bectractic discharge (ESD) EN 61000-4.2 - Bectractic discharage	Electronic short circuit protect		(constant current, automatic recovery)		
Temperature ranges Operating - Storage (non operating) -25°C to +70°C max. -25°C to +85°C Temperature derating TCL 012 & TCL 024 models: TCL 060 models: 1.5 %/K above +50°C Humidity (non condensing) 95 % rel. H max. Temperature coefficient 0.02 %/K Switching frequency 55 - 180 kHz depending on load (frequency modulation) Isolation voltage (60 sec.] - Input/Output 150 kHz depending on load (frequency modulation) Isolation voltage (60 sec.] - Input/Output 150 kHz depending on load (frequency modulation) Safety standards - Information technology equipment IEC 60950-1 [No 6950-1 [output SELV], UL 508 Safety approvals - UL approval www.uL com >> certifications UL 508C listed, CSA C22.2 No. 60950-107 +Am1:2011 UL 508 Electronic equipment for machines EN 51078 EN 51078 Electronic equipment for power installation - Electrical equipment for machines EN 50026 listed, CSA C22.2 No.14 File e210002 Electromagnetic compatibility (EMC), immunity - Radiated RI suppression on input - Radiated RI suppression on input - Radiated RF field immunity - Surge immunity - Electrical fast transient / burst immunity - Radiated RF field immunity - Radiated RF field immunity - Radiated RF field immunity - Su	Overvoltage protection, trig	12 VDC models:	<24 V		
Temperature ranges - Operating - Storage (non operating) -25°C to +70°C max. -25°C to +85°C Temperature derating TCL 012 & TCL 024 models: TCL 060 models: 1.5 %/K above +50°C Humidity (non condensing) 95 % rel. H max. Temperature coefficient 0.02 %/K Switching frequency 55 - 180 kHz depending on load (frequency modulation) Isolation voltage (60 sec.) - Input/Output 150 kHz depending on load (frequency modulation) Isolation voltage (60 sec.) - Input/Output 150 kHz depending on load (frequency modulation) Safety standards - Information technology equipment IEC 60950-1 [N 60950-1 [output SELV], UL 508 Safety approvals - UL approval www.uL com >> certifications UL 5008 (Isted, CSA C22.2 No. 60950-107 +Am1:2011 UL 508 Electronic equipment for machines EN 61000-6-3 EN 61000-6-3 Electronic equipment for machines EN 55022 class B - Conducted RI suppression on input - Radiated RI suppression on input - Radiated RF lied immunity EN 61000-6-2 kK / 8 kV - Electrical fast transient / burst immunity EN 61000-6-2 kK / 8 kV - Radiated RF field immunity EN 61000-4-2 kK / 8 kV - Radiated RF field immunity EN 61000-4-2 kK / 8 kV - Rochided RF field immunity EN	General Specifications				
TCL 060 models: 20 %/K above +40°C Humidity [non condensing] 95 % rel. H max. Temperature coefficient 0.02 %/K Switching frequency 55 - 180 kHz depending on load (frequency modulation) Isolation voltage (60 sec.) - Input/Output Reliability, calculated MTBF at +25°C [according to IEC 61709] >2.5 Mio h Safety standards - Information technology equipment UE Stat. 60950-1 [cutput SELV], UL Std. 60950-1 [cutput SelV], Std. 8000-45 [cutput SelV], S	-	– Operating			
Temperature coefficient 0.02 %/K Switching frequency 55 - 180 kHz depending on load (frequency modulation) Isolation voltage (60 sec.) - Input/Output Reliability, calculated MTBF at +25°C (according to IEC 61709) >2.5 Mio h Safety standards - Information technology equipment IEC 60950-1, EN 60950-1 (output SELV), UL 5td. 60950-1 (2nd Edition) +Am1:2011, CAN/CSA-C22.2 No. 60950-1-07 +Am1:2011 - Industrial control equipment for power installation EN 50178 - Electrical equipment for power installation EN 5022 class B - Electrical equipment for machines EN 60204 Safety approvals - UL approval www.ul.com -> certifications - - Conducted RI suppression on input EN 55022 class B - - Electricosticic discharge (ESD) EN 61000-6-2 - - Electricostici discharge (ESD) EN 61000-4-2 4 kV / 8 kV - Rodiated RF field immunity EN 61000-4-2 Level 3 EN 61000-4-2 - Surge immunity - Electricostatic discharge (ESD) EN 61000-4-2 Level 3 - - Rodiated RF field immunity EN 61000-4-2 Level 3 EN 61000-4-2	Temperature derating				
Switching frequency 55 - 180 kHz depending on load (frequency modulation) Isolation voltage (60 sec.) - Input/Output 1500 VDC Reliability, calculated MTBF at +25°C (according to IEC 61709) >2.5 Mio h Safety standards - Information technology equipment IEC 60950-1, EN 60950-1 (output SELV), UL Std. 60950-1 (2nd Edition) +Am1:2011, CAN/CSA-C22.2 No. 60950-107 +Am1:2011, UL 508 - - Industrial control equipment - Electrical equipment for power installation - Electrical equipment for machines EN 50178 EN 50178 Safety approvals - UL approval www.ul.com -> certifications UL 508C listed, CSA C22.2 No.14 File e210002 Electromagnetic compatibility (EMC), emissions - Conducted RI suppression on input - Radiated RI suppression EN 61000-6-3 EN 55022 class B Electrostatic discharge (ESD) - Radiated RF field immunity - Electrical fast transient / burst immunity - Surge immunity - Surge immunity - Immunity to conducted RF disturbances EN 61000-4-2 4 kV / 8 kV Environmental compliance - Reach - RoHS www.utcopower.com/info/reach-dedaration.pdf RoHS directive 2011/65/EU Case protection IP 20 (IEC 60529) Enclosure material Mounting DIN-rails as per EN 50022-35x15/7.5 (snapo-with seHocking spring) bracket for wall/chassis mount included	Humidity (non condensing)		95 % rel. H max.		
Isolation voltage (60 sec.) - Input/Output 1500 VDC Reliability, calculated MTBF at +25°C (according to IEC 61709) >2.5 Mio h Safety standards - Information technology equipment IEC 60950-1 [2nd Edition] +Am1:2011, CAN/CSA-C22.2 No. 60950-1 (2nd Edition] +Am1:2011, CAN/CSA-C22.2 No. 60950-1 (2nd Edition] +Am1:2011, UL 508 Safety approvals - UL approval EN 50178 EN 60204 Safety approvals - UL approval EN 60204 Electromagnetic compatibility (EMC), emissions - Conducted RI suppression on input - Radiated RI suppression EN 61000-6-3 EN 55022 class B Electromagnetic compatibility (EMC), immunity - Electrostic discharge (ESD) - Radiated RF field immunity - Electroal fat transient / burst immunity - Electrical fas transient / burst immunity - Electrical fas transient / burst immunity - Electroal field transient / burst immunity - Electrical fas transient / burst immunity - Electrical fas transient / burst immunity - Electrical fas transient / burst immunity - Electrical fast tra	·				
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Safety standards - 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 UL 508 - Industrial control equipment - Electronic equipment for power installation - Electrical equipment for machines EN 50178 EN 50178 Safety approvals - UL approval www.ul.com -> certifications UL 508C listed, CSA C22.2 No.14 File e210002 Electromagnetic compatibility (EMC), emissions - Conducted RI suppression on input - Radiated RI suppression on input - Radiated RI suppression EN 61000-6-3 EN 55022 class B Electrostatic discharge (ESD) - Radiated RF field immunity - Electrostatic discharge (ESD) - Radiated RF field immunity - Surge immunity - Surge immunity - Surge immunity - Immunity to conducted RF disturbances EN 61000-4-2 EN 61000-4-3 10 V/m Environmental compliance - Reach - RoHS - Reach - RoHS www.tracopower.com/info/reach-declaration.pdf RoHS directive 2011/65/EU Case protection IP 20 (IEC 60529) IP 20 (IEC 60529) Enclosure material plastic UL 94V-0 rated Mounting DIN-rails as per EN 50022-35x15/7.5 [snap-on with self-locking spring] bracket for wall/chassis mount included					
Image: Control equipment UL Std. 60950-1 (2nd Edition) + Am1:2011, CAN/CSA-C22.2 No. 60950-1-07 + Am1:2011 Image: Control equipment for power installation Electronic equipment for power installation Electrical equipment for machines EN 50178 Safety approvals - UL approval With Control equipment for machines EN 60204 Safety approvals - UL approval Electromagnetic compatibility (EMC), emissions EN 61000-6-3 - Conducted RI suppression on input EN 55022 class B - Radiated RI suppression EN 61000-6-2 - Electrostatic discharge (ESD) EN 61000-4-2 - Radiated RF field immunity EN 61000-4-2 - Surge immunity EN 61000-4-2 - Surge immunity EN 61000-4-2 - Electrical fast transient / burst immunity EN 61000-4-2 - Immunity EN 61000-4-4 - Surge immunity EN 61000-4-4 - Surge immunity EN 61000-4-4 - Reach www.tracopower.com/info/reach-declaration.pdf - RoHS RoHS directive 2011/65/EU Case protection IP 20 (IEC 60529) Enclosure material plastic UL 94V-0 rated Mounting DIN-rails					
UL 508C listed, CSA C22.2 No.14 File e210002 Electromagnetic compatibility (EMC), emissions EN 61000-6-3 - Radiated RI suppression on input EN 55022 class B - Radiated RI suppression EN 61000-6-2 Electromagnetic compatibility (EMC), immunity EN 61000-6-2 - Electrostatic discharge (ESD) EN 61000-4-2 - Radiated RF field immunity EN 61000-4-2 - Electrical fast transient / burst immunity EN 61000-4-3 - Surge immunity EN 61000-4-4 - Surge immunity EN 61000-4-5 - Immunity to conducted RF disturbances EN 61000-4-4 Environmental compliance - Reach - ROHS RoHS directive 2011/65/EU Case protection IP 20 (IEC 60529) Enclosure material plastic UL 94V-0 rated Mounting DIN-rails as per EN 50022-35x15/7.5 (snap-on with self-locking spring) bracket for wall/chassis mount included	Safety standards	 Industrial control equipment Electronic equipment for power installation 	UL Std. 60950-1 (2nd Edition) +Am1:2011, CAN/CSA-C22.2 No. 60950-1-07 +Am1:2011 UL 508 EN 50178		
- Conducted RI suppression on input EN 55022 class B - Radiated RI suppression EN 55022 class B Electromagnetic compatibility (EMC), immunity EN 61000-6-2 - Electrostatic discharge (ESD) EN 61000-4-2 4 kV / 8 kV - Radiated RF field immunity EN 61000-4-3 10 V/m - Electrical fast transient / burst immunity EN 61000-4-4 Level 3 - Surge immunity - Immunity to conducted RF disturbances EN 61000-4-5 Level 3 Environmental compliance - Reach www.tracopower.com/info/reach-declaration.pdf RoHS RoHS RoHS directive 2011/65/EU Enclosure material plastic UL 94V-0 rated Mounting DIN-rails as per EN 50022-35x15/7.5 (snap-on with self-locking spring) bracket for wall/chassis mount included	Safety approvals	– UL approval	www.ul.com -> certifications UL 508C listed, CSA C22.2 No.14 File e210002		
- Electrostatic discharge (ESD) EN 61000-4-2 4 kV / 8 kV - Radiated RF field immunity EN 61000-4-3 10 V/m - Electrical fast transient / burst immunity EN 61000-4-4 Level 3 - Surge immunity EN 61000-4-5 Level 3 - Immunity to conducted RF disturbances EN 61000-4-6 10 Vrms Environmental compliance - Reach - ROHS Www.tracopower.com/info/reach-declaration.pdf RoHS RoHS directive 2011/65/EU Case protection IP 20 (IEC 60529) Enclosure material plastic UL 94V-0 rated Mounting DIN-rails as per EN 50022-35x15/7.5 (snap-on with self-locking spring) bracket for wall/chassis mount included	- Conducted RI suppression on input		EN 55022 class B		
- RoHS RoHS directive 2011/65/EU Case protection IP 20 (IEC 60529) Enclosure material plastic UL 94V-0 rated Mounting DIN-rails as per EN 50022-35x15/7.5 (snap-on with self-locking spring) bracket for wall/chassis mount included	Electromagnetic compatibilit	 Electrostatic discharge (ESD) Radiated RF field immunity Electrical fast transient / burst immunity Surge immunity 	EN 61000-4-2 4 kV / 8 kV EN 61000-4-3 10 V/m EN 61000-4-4 Level 3 EN 61000-4-5 Level 3 EN 61000-4-6 10 Vrms		
Enclosure material plastic UL 94V-0 rated Mounting DIN-rails as per EN 50022-35x15/7.5 (snap-on with self-locking spring) bracket for wall/chassis mount included	Environmental compliance				
Mounting DIN-rails as per EN 50022-35x15/7.5 (snap-on with self-locking spring) bracket for wall/chassis mount included	· · · · · · · · · · · · · · · · · · ·		IP 20 (IEC 60529)		
(snap-on with self-locking spring) bracket for wall/chassis mount included	Enclosure material		•		
	Mounting		(snap-on with self-locking spring)		
	Installation instructions		www.tracopower.com/overview/tcl-dc		

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



Industrial DC/DC-Converter TCL-DC Series 24 to 60 Watt



TCL 012 and TCL 024 models







00000 123 INPUT 75.0 (2.95)

TCL 060 model

DC-ON LED

Output voltag adjust OutputInput1 + Vout1 Functional Ground2 - Vout2 -Vin3 +Vin

Weight: 140g (4.9 oz)



Output

1 + Vout

2 - Vout

Weight: 265 g (9.4 oz)

Input 1 Functional Ground 2 –Vin 3 +Vin



Instead on a DIN-rail, the modules can be also mounted on a chassis or wall with help of a <u>mounting bracket which is supplied as standard</u> <u>with each Converter</u>



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

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.tracopower.com

