

TC 3000



EUROTHERM

CONTROLS
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**Three phase thyristor for
simple resistive and inductive loads**



TC 3000

Three phase thyristor for simple resistive and inductive loads

The TC3000 is a full three phase thyristor power unit for all constant resistance or inductive three phase loads. Three wire star or delta, four wire star with neutral and six wire open delta load configurations can be used. It has all the firing modes needed for simple resistive and inductive loads including phase angle for inductive loads, single cycle for off-shore and generator applications, fast cycle for quick acting heaters and slow cycle for very large loads. Since it is a true phase unit the TC3000 fires evenly on all phases to match the load to the generator or supply. The self contained units are available for currents up to 500amps.

Safety - As with all Eurotherm products the TC 3000 has been designed to ensure operator safety and load protection. When installed and used in compliance with user manual HA174836 it meets the essential requirements of the EEC Low Voltage Directive. The self contained units are fully shrouded in an IP20 rated protective case with commissioning and diagnostics points available on the front fascia. High speed semiconductor fuses and other protection circuits are built in. Automatic alarm shutdown protects the load and supply by quenching the thyristors if the unit detects an abnormal event.

CE mark- The TC3000 is CE marked to show compliance with the essential protection requirements of the Low Voltage Directive. It is designed so that it can be used as part of a CE compliant system but it is the responsibility of the installer to establish the CE compliance of the overall system. The TC3000 technical construction file is approved by a Competent Body (LCIE France). A Declaration of Compliance with the European Directives is available on request.

EMC- Eurotherm certifies that the TC3000 products, when installed and used in accordance with their User Manual, meets the following test standards and enables the system or installation in which they are installed to comply with the EMC Directive with regard to the TC3000 products.

EMC tests		EMC test standards
Immunity	Electrostatic discharge	EN 61000-4-2, IEC1000-4-2 (06/1995)
	Fast transients	EN 61000-4-4, IEC1000-4-4 (01/1995)
	Radioelectric frequency electromagnetic fields	prEN 61000-4-3 (1984) IEC801-3
Emission	Radiated	EN 55011-2 (1991)
	The choice of the Conducted Emission application standard depends on the application: · EN50081-2 (1991) - Without external filter in Burst firing on resistive load up to 150A nominal - With an external series filter for other configurations · prEN 61800-3 (1996) - Without external filter Applies to the second environment (industrial environment)	

External series filters

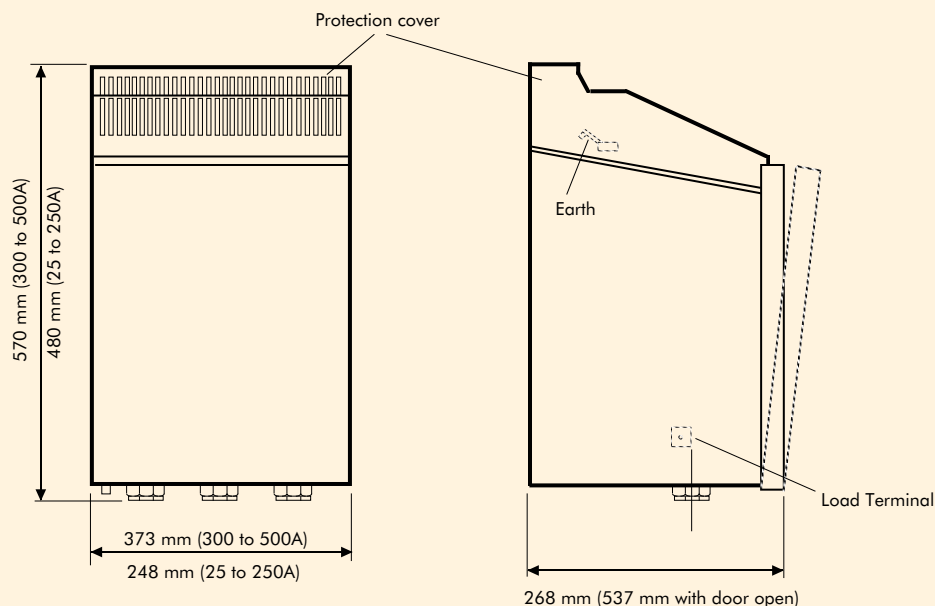
To reduce the conducted emissions that occur when using thyristor units, Eurotherm can supply external filters.

Nominal current of TC3000	Serial filter order code
25A to 60A	FILTER/TRI63A/00
75A and 100A	FILTER/TRI/100A/00
Above 100A consult your Eurotherm office.	

TECHNICAL SPECIFICATION

Current	25A to 500A
Voltage	240V to 500V (+10%, -15%) line voltage. 100V to 500V operating voltage
Supply frequency	42Hz to 68Hz with automatic sensing. Unit inhibited outside 40Hz to 70Hz
Auxiliary supply	100V to 240V (+10%, -15%). Selected when ordering. Consumption 20VA plus fans (see below)
Environment	Pollution degree 2 (IEC 664)
Altitude	Maximum altitude 2000m
Storage temperature	-10°C to 70°C
Operating temperature	0°C to 50°C with unit mounted vertically. 40°C for 500A units (50°C if derated to 450A)
Cooling	Natural cooling up to 75A Two fans for 100A and 250A, (additional auxiliary supply consumption 25VA per fan) Three fans from 300A to 500A, (additional auxiliary supply consumption 25VA per fan) Over temperature shut down for fan cooled units
Power dissipation	Allow for 2Watts per amp per phase (includes thyristors and fuses)
Humidity	5% to 95% RH non condensing
Enclosure protection	IP20 (IEC 529)
Electrical safety	Complies with EEC Low Voltage Directive 73/23/EEC dated 19/2/73 amended by directive 93/68/EEC dated 22/7/93 EN 61010 installation category 3 (voltage transients must not exceed 4.0KV)
Electrical protection	RC snubber network and varistor Built in high speed fuses for thyristor protection only. Line protection to be provided separately
Load	
Load types	Any three phase constant resistance or inductive load
Load configuration	3 wire star, 4 wire star with neutral, 3 wire delta, 6 wire open delta
Control type	Three phases of a three phase system
Phase rotation	Phase rotation insensitive - connect phases in any order
Operation	
Firing modes	Logic: Cycle time defined by logic input, Single Cycle, Burst (1-255 cycles), Phase Angle, Soft Start and/or End to burst
Power ramps	Setpoint ramp after reset
Control	
Analogue input	Voltage: 0-5V, 1-5V, 0-10V, 2-10V. Input impedance > 100kΩ Current: 0-20mA, 4-20mA. Input impedance = 100Ω
Second input	Same input ranges, as first input - lowest wins
Logic input	Range selected from analogue input. 50% =ON, <25%=OFF
Control mode	Open loop, V ² or external feedback
Linearity	Phase angle ±1% , Burst firing ±2% for all feedback modes
Stability	Phase angle ±1% , Burst firing ±2% for +10% to -15% supply variation, for 0°C to 50°C ambient temperature
Enable/inhibit	Logic input of +10V enables operation
Alarm	Loss of any supply phase, under voltage - below 70% or 50%, over voltage above 20% of nominal, frequency error, external measurement signal failure. Thermal switch operation. Any of these will give an alarm
Options	Fuse fail microswitches Alarm contacts closed in alarm state (open as standard)

DIMENSIONAL DETAILS



Weight: Up to 150A -16kg, 250A - 18kg, 300A to 500A - 21kg

ORDERING CODE

Basic Product	Current	Maximum Voltage	Auxiliary Supply	Operating Voltage	Input	Firing Mode	Ramp. soft start/end	Load Connection	Load Type	Controlled Parameter	Aux. Input/Outp	Options
TC 3000												

Current	Code	Code	Ramp, soft start/end	Code
25 amps	25A	220 volts	No ramp	220V
40 amps	40A	230 volts	Soft start of burst	230V
60 amps	60A	240 volts	Soft start and end of burst	240V
75 amps	75A	277 volts	Load Connection	277V
100 amps †	100A	380 volts	3 Wire delta	380V
150 amps †	150A	400 volts	3 Wire star	400V
250 amps †	250A	415 volts	4 Wire star with neutral	415V
300 amps †	300A	440 volts	6 Wire open delta	440V
400 amps †	400A	480 volts	Load Type	480V
500 amps †	500A	500 volts	Inductive	500V
† fan cooled		Input	Resistive	
Maximum Line to Line Voltage		0-5 volts	Control Mode (feedback)	
240 volts	240V	1-5 volts	V ²	0V5
440 volts	440V	0-10 volts	External (see inputs and outputs)	1V5
480 volts	480V	2-10 volts	Open loop	0V10
500 volts	500V	0-20mA	Inputs and Outputs	2V10
Auxiliary Supply		4-20mA	0-10V controlled parameter retransmission	0mA20
100 volts	100V	Firing Mode	0-10V external feedback (if "EX" selected)	4mA20
110 to 120 volts	110V120	Logic (On/Off)	0-10V second setpoint	LGC
200 volts	200V	Phase angle	Options	PA
220 to 240 volts	220V240	Burst	Fuse fail microswitch	FC1
Operating Voltage			Alarm contacts closed in alarm state	FC2
100 volts	100V			FC4
110 volts	110V			FC8
115 volts	115V			C16
120 volts	120V			C32
200 volts	200V			C64
				128
				255
				255

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