TC3000

MODEL

Three Phase Thyristor for Simple Resistive and Inductive Loads

Specification Sheet

- **Current range from 25A to 500A at 40°C**
- **Voltage up to 500V**
- **Logic and analogue inputs**
- **Phase angle, burst firing, soft start and single cycle firing available**

The TC3000 is a three phase thyrsitor 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 indcutive loads including phase angle for inductive loads, single cycle for off-shore and generator applications, fast cycle for quick acting heaters ans slow cycle for very large loads. Since it uses true 3-phase control, the TC3000 fires evenly on all phases to match the load to the generator or supply. These self contained units are available for currents up to 500 amps.

Safety

As with all Eurotherm products the TC3000 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 semoconductor 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 complince 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 sonstruction file is approved by a Competent Body (LCIE France). A Declaration of Compliance with the European Directives is available on request.

EMC

Eurotherm certificates that the TC3000 products, when installed and used in accordance with their User manual, meets the following test standards and enables the system or installtion 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 61000-4-2. IEC1000-4-4 (01/1995)
	Radioelectric frequency electromagnetic fields	prEN 61000-4-2-3. (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 - preEN 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	

SPECIFICATION

Current:	25A to 500A
Voltage:	100V 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 used
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)

Ordering code

TC3000	1	2	3	4	5	6	7	8	9	10	11	12	13	14

96	00

Internal fuses

1 Current

25A	25 amps
40A	40 amps
60A	60 amps
75A	75 amps
100A	100 amps*
150A	150 amps*
250A	250 amps*
300A	300 amps*
400A	400 amps*
500A	500 amps*

** Fan cooled 25VA per fan, 2 fans 100A-250A, 3 fans 300A-500A*

2 Maximum Line to Line Voltage

240V	240 volts
440V	440 volts
480V	480 volts
500V	500 volts

3 Auxiliary Supply (20VA)

100V	100 volts
110V120	110-120 V
200V	200 volts
220V240	220-240 V

4 Operating Voltage

110V	110 volts
115V	115 volts
220V	220 volts
230V	230 volts
240V	240 volts
380V	380 volts
400V	400 volts
415V	415 volts
440V	440 volts
480V	480 volts
500V	500 volts

Other voltages available

5 Inputs

0V5	0-5 volts
1V5	1-5 volts
0V10	0-10 volts
2V10	2-10 volts
0mA20	0-20mA
4mA20	4-20mA

6 Firing Mode

LGC	Logic (On/Off)
PA	Phase angle
FC1	Single cycle
FC8	Burst 8 cycles
C64	64 cycles
255	255 cycles
128	128 cycles
C16	16 cycles
C32	32 cycles
FC2	2 cycles
FC4	4 cycles

7 Ramp, Soft Start/End

NRP	No ramp
URP	Soft start of burst
UDR	Soft start and end of burst

8 Load Connection

3D	3 Wire delta
3S	3 Wire star
4S	4 Wire star with neutral
6D	6 Wire open delta

9 Load Type

RES	Resistive
IND	Inductive

10 Feedback Mode

EX	External
V2	V^2
OL	Open Loop

11 Aux. Inputs and Outputs

RTR	Feedback retrans
External feedback (if mode EX is selected)	
E0V5	0-5V
E0V10	0-10V
E0mA20	0-20mA
E4mA20	4-20mA
Second setpoint input	
W0V5	0-5V
W0V10	0-10V
W0mA20	0-20mA
W4mA20	4-20mA

12 Language

ENG	English
FRA	French
GER	German

13 Fuse

FUSE	Standard fuses
FUMS	Microswitch fuses
NOFUSE	No fuse *

* High speed fuses are not recommended for SWIR loads

14 Options

IPU	PLU closed in alarm (open as standard)

Please note that replacement fuses are marked with a higher current rating than the thyristors. This allows correct operation at elevated temperatures and does not imply that higher current is permissible.

SPARE FUSE

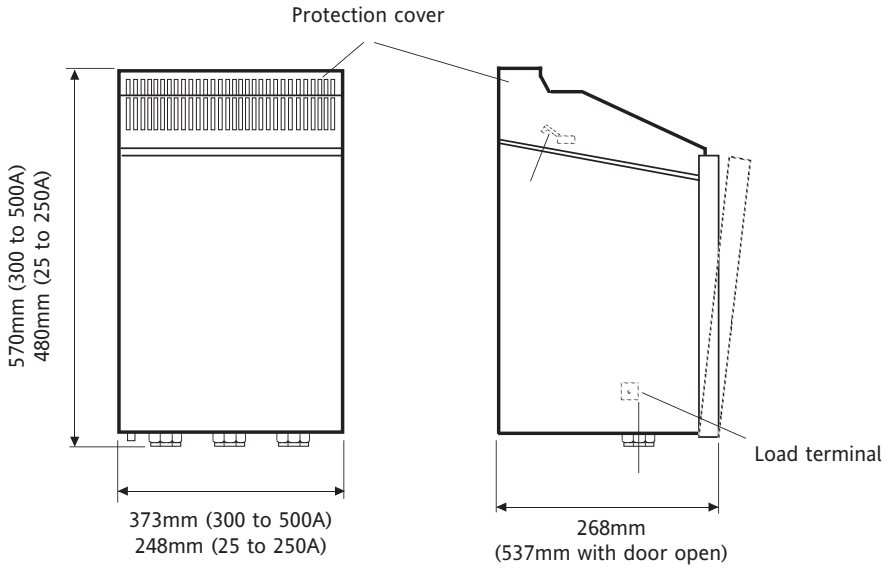
Current rating	Fuse rating	Fuse number
25A	50A	**LA172468U050**
40A	80A	**LA172468U080**
60A	80A	**LA172468U080**
75A	100A	**LA172468U100**
100A	125A	**LA172468U125**
150A	200A	**LA172468U200**
250A	315A	**LA172468U315**
300A	400A	**LA172468U400**
400A	500A	**LA172468U500**
500A	630A	**LA172468U630**

ACCESSORIES

	Code
Diagnostic 260	**260-13-00**

Dimensional details

TC3000



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

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