TE300

THREE PHASE
BURST FIRING THYRISTOR

CE

EUROTHERM
CONTROLS

Product data

TE300 Three phase burst firing thyristor

Multiple applications

The TE300 is designed for general purpose three phase applications where a resistive load or infrared heaters are involved. Typical applications include paint drying (car industry), metallurgy, plastics, food sector and environmental temperature control.

Ergonomic design

The TE300 is easily integrated into a control system because of its compact size, simplicity of wiring and DIN rail mounting.

Flexibility

The TE300 is controlled by an analogue signal which is selectable for DC current or voltage. A 5V user voltage allows local control by a potentiometer. The TE300 can be used to control non standard three phase voltages by using an optional auxiliary supply input.

CE marking/safety

TE300 units meet the essential requirements of the European Low Voltage Directive. No exposed parts are at a dangerous voltage.
Eurotherm certifies that TE300 products installed and used in compliance with User Manual (HA175437ENG) meet the necessary EMC test standards. EMC filters are internal to the unit.
A copy of Eurotherm's Electromagnetic Compatibility Installation Guide (ref. HA025464) is available on request.

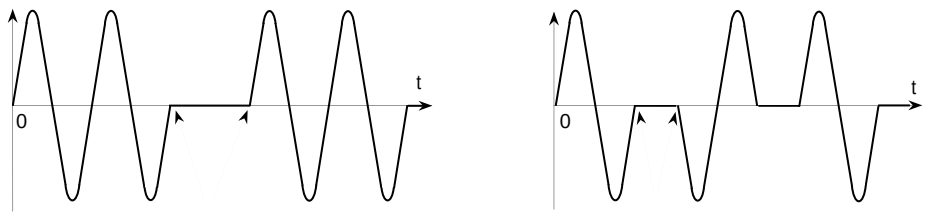
High performance

The TE300 has, in addition to the standard burst firing and single cycle firing modes, an Advanced Single Cycle mode. This mode allows a complete number of half cycles switching for the non firing period and a complete number of full cycles switching for the firing period. This mode reduces the annoying visual flickering when controlling short wave infrared elements. With advanced single cycle firing, the cycle time is reduced compared with normal single cycle operation. This is advantageous when phase angle firing is not acceptable and zero crossing is required.

Load voltage examples (67% nominal power)

Burst firing and Single-cycle modes
For use with: any three-phase resistive load with a low temperature coefficient (Nickel-Chrome, Iron-Chrome-Aluminium...)

'Advanced' Single-Cycle mode
For use with:
Short-wave infrared elements



No interference: Stop and start at zero voltage
No DC component: equal number of positive and negative half-cycles

TECHNICAL SPECIFICATION

Power

Nominal current (per phase)	16A, 25A, 40A, 50A or 63A (at 45°C)
Line-to-line supply voltage	230V to 500V (+10%, -15%)
Supply frequency	50Hz and 60Hz (±2Hz). Automatic selection
Dissipated power	1.3W (approx.) per amp, per phase. Fuses are external and produce 0.7W (approx) per amp and per phase
Cooling	Natural convection for 16A, 25A & 40A ratings. Permanent fan-cooling for 50A & 63A ratings Fan supply 115V or 230V (to be specified)
Insulation (1 min test)	In series, 2000Vac between power and earth and 3600Vac between power and control
Load type	Resistive three-phase load with a low temperature coefficient or short-wave infrared elements (except for 63A rating)
Load configuration	Closed delta (3-wire) or open (6-wire). Star without neutral (3-wire) or with neutral (4-wire) Load configuration set by soldering 'coffee beans' on driver board.

Control performance

Control type	Power control: load voltage squared The power dissipated in the load is proportional to the setpoint
Linearity & Stability	Better than ±2% for variations of the supply voltage +10%, -15% and of the temperature from 0 to 45°C.
Firing modes	**Burst-firing** (number of firing cycles configurable: 1, 8, 16 or 128 cycles) **Advanced Single-cycle** (star with neutral or open delta loads) Firing by complete cycles separated by half-cycles of non-firing without DC component **On/Off (Logic)**
Switching	Conduction starts and ends at zero voltage
Indication	Thyristor firing is signalled by a green LED

Control

External control signal	**Analogue** (in Burst-firing and Single-cycle modes): voltage 0 to 5V or 0 to 10V or current 4 to 20mA **Logic** (in On/Off mode), nominal levels: voltage 5V or 10V or current 20mA On state ≥ 50% nominal value. Off state ≤ 25% nominal value.
Configuration	Soldering of 'Coffee beans' on driver board
Input impedance	Voltage input: ≥ 100kΩ, current input: 250Ω
Local control	'5V user' voltage available for control by 10kΩ potentiometer or by 'dry' contact (logic operation)

Options

Auxiliary power supply	For use when operating with non-standard three-phase supply. The control electronics is powered separately with 115V or 230V (as specified).
Elimination of DC component	For loads configured as star without neutral or closed delta (no DC component in star with neutral or open delta configurations).

European Directives

CE marking/Electrical safety	TE300 controllers carry the CE mark in compliance with the essential requirements of the European Low Voltage Directive 73/23/EEC (amended by the Directive 93/68/EEC)
Electromagnetic compatibility	
Immunity and Emissions	TE300 products comply with Electromagnetic Compatibility test standards EN 50081-2, EN 50082-2, EN 61000-4-2, EN 61000-4-4, EN 55011, ENV 50140, ENV 50141, IEC 1800-3 EMC filters are incorporated in the TE300 to reduce conducted emission in accordance with the test standard.

Environment

Operating temperature	0°C to +45°C (60°C with derating)
Storage temperature	-10°C to +70°C
Safety standards	EN61010, installation category 3 (voltage transients must not exceed 4.0KV)
Atmospheres	Electrically conductive pollution must be excluded from the cabinet in which this controller is mounted. This product is not suitable for use above 2000m or in corrosive or explosive atmospheres without further protection.
Thyristor protection	High-speed external fuses (except for short-wave infrared element applications) Internal MOVs (varistors) and RC snubbers
Protection	IP20 on the front facia (to comply with Standard IEC 529)
External wiring	To be carried out in compliance with Standard IEC 364 or any other current National Standard
Humidity	RH: 5% to 95%, non-condensing and non-streaming
Dimensions (H x W x D mm)	215 x 141 x 186 (non fan-cooled unit) 233 x 141 x 186 (fan-cooled unit)
Weight (kg)	3.1 (non fan-cooled unit) 3.5 (fan-cooled unit)
Mounting	DIN rail or bulkhead mounting, leave gap of 5cm between units

In order to maintain its 'leading edge', Eurotherm may have to make changes to its specifications without advance notice.
For any further information, or if in doubt, please contact Eurotherm Controls.

ORDERING CODE

Basic product	Nominal current	Nominal voltage	Fan supply	Input signal	Thyristor firing mode	Load configuration	Mounting	Manual language	Options	End
TE300										00

Basic product	Code
	TE300
Nominal current	
16 amps	16A
25 amps	25A
40 amps	40A
50 amps †	50A
63 amps †	63A
† Fan cooled (13 watts)	
Nominal voltage *	
230 volts	230V
240 volts	240V
277 volts	277V
380 volts	380V
400 volts	400V
415 volts	415V
440 volts	440V
480 volts	480V
500 volts	500V

Fan supply	Code
Without fan-cooling (16A to 40A rating)	000
With fan-cooling (50A & 63A):	
115V	115V
230V	230V
Input signal	
0 to 5 volts	0V5
0 to 10 volts	0V10
4 to 20 milliamps	4mA20
Thyristor firing mode	
Logic (On/Off)	LGC
Burst firing:	
1 cycle (Single-cycle)	FC1
8 cycles	FC8
16 cycles	C16
128 cycles	128
Advanced Single-cycle (4- or 6-wire configuration)	SCA

Load configuration	Code
Star without neutral (3-wire)	3S
Star with neutral (4-wire)	4S
Closed delta (3-wire)	3D
Open delta (6-wire)	6D
Mounting	
Bulkhead	BKD
DIN rail	DIN
Manual language	
French	FRA
English	ENG
German	GER
Italian	ITA
Options	
Auxiliary power supply 115 volts	115V
Auxiliary power supply 230 volts	230V
Elimination of DC component (3-wire load configuration)	WDC

* The nominal voltage is the line-to-line mains voltage. The controller is calibrated to the nominal voltage. For non-standard mains: use the coding for the voltage immediately above and choose the option of power supply separated from electronics.

FUSES AND FUSEHOLDER

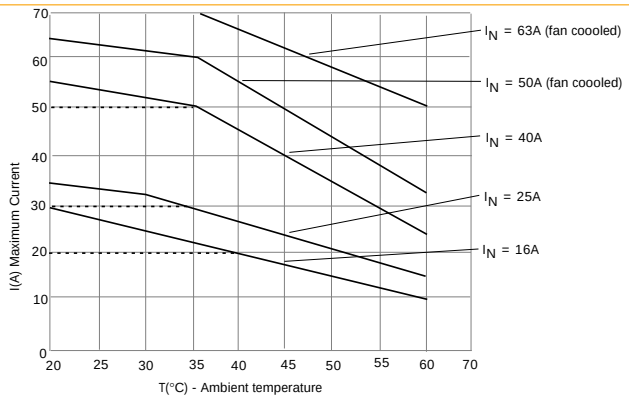
Nominal current of TE300	Fuse rating	Fuse & fuseholder code	Dimensions H x W x D (mm)
16A	20A	FU3038/16A/00	81 x 52.5 x 68
25A	30A	FU3038/25A/00	81 x 52.5 x 68
40A	50A	FU3451/40A/00	95 x 79 x 86
50A	63A	FU3258/50A/00	140 x 108 x 90
63A	80A	FU3760/63A/00	240 x 114 x 107

Remember!

The external high-speed fuses recommended in the table are used only for thyristor protection and under no circumstances should they be used to protect the installation.
These fuses must not be installed in short-wave infrared applications.

The code given above covers three fuses and a tri-polar fuseholder.

CURRENT DERATING



RMS current per phase, derating as a function of ambient temperature.
(Dotted line: limit of recommended fuse)

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