

# TE10P

MODEL



## Single phase true power controller

### Specification Sheet

#### Ideal for :

- Loads requiring high stability and accuracy
- Moving loads where the temperature is difficult to monitor
- Loads with characteristics that change with time or temperature

#### Features :

- 16 - 400 amps
- Voltage up to 500V
- True power control
- High precision control
- Modbus + Profibus comms
- Drives all load types

#### High precision control; accuracy and stability better than 1%

The TE10P provides accurate power control for a wide range of industrial, single phase loads. By using either an analogue or digital setpoint, the TE10P can be used for the precise control of power in loads that would otherwise prove difficult to accurately regulate.

#### Flexibility

The TE10P is configurable for different types of input, firing mode, feedback and load type. It is suitable for driving either simple resistive loads or complex loads such as Silicon Carbide, Platinum, Molybdenum or Short Wave Infrared lamps.

Dynamic load fault detection allows continuous monitoring of loads, including those with characteristics that are dependent on temperature or time.

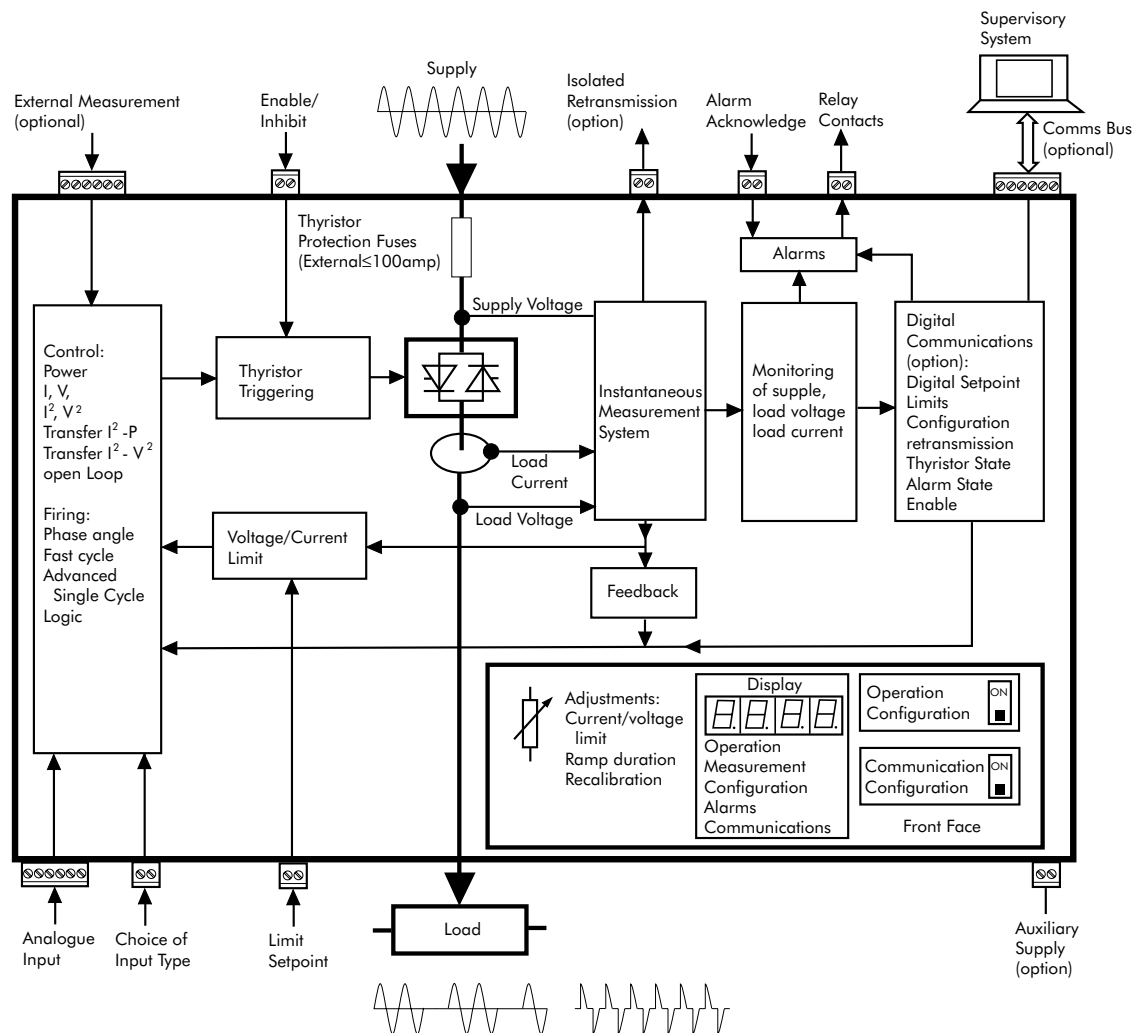
The feedback type can be selected from; RMS Voltage, RMS Current,  $I^2$ ,  $V^2$ , Transfer Between  $I^2$  and  $V^2$ , transfer between  $I^2$  and Power, True Power or Open Loop.

#### Communications

Optional RS422 or RS485 communications with Modbus or Profibus protocol allow the TE10P to be configured or controlled from an external supervisory system.

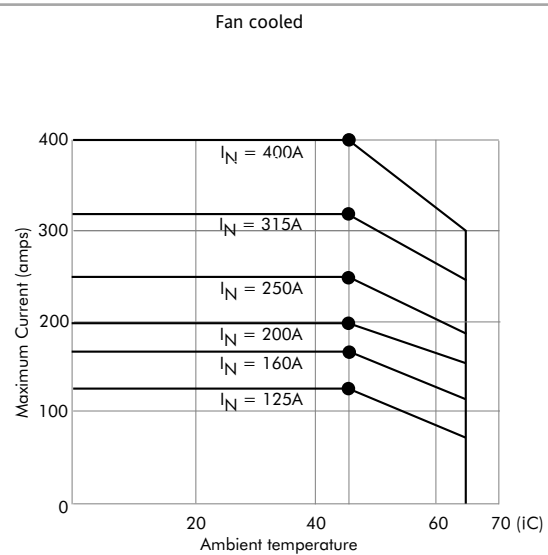
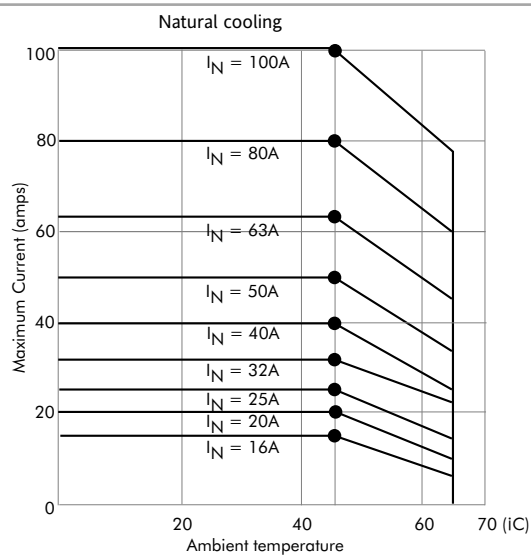
#### Features

- Current range from 16 to 400 amps, voltage range from 100 to 500 volts.
- Four digit display and single push button, simplify Operating, Commissioning, Maintenance and Configuration.
- Isolated Analogue retransmission of power.
- Configurable Alarm Relay.



Functional diagram of TE10P

## Current Derating Curves



## TECHNICAL SPECIFICATION

Additional information and documentation available on [www.eurotherm.co.uk](http://www.eurotherm.co.uk)

### ELECTRICAL

Nominal current (at 45 Deg. C)	16A to 400A
Nominal voltage	100V to 500V (+10%, -15%) as product code
Supply frequency	40 to 70 Hz automatic adaptation
Electronics supply	Internal or optionally 115V or 230V external (10VA)
Power dissipation	1.3 watts per amp
Fusing	High speed fuses: External for 16A to 100A (order separately), internal for 125A to 400A
Cooling	Natural cooling up to 100amps Fan cooled from 125 amps upwards (25VA fan)
Load	Any type of single phase load (except capacitive)

### OPERATING

Inputs	0-5V or 0-10V (Input impedance >100K) 0-20mA or 4-20mA (input impedance 250 Ohms) Logic: 5V, 10V or 20mA Digital Comms (optional): RS422 or RS485
Firing modes	Logic (ON/OFF) Burst firing (selectable soft start) Advanced Single Cycle Phase Angle (selectable ramp)
Control mode	Power - calculated from instantaneous measurements RMS voltage RMS current $V^2$ $I^2$ Automatic transfer $I^2 \leftrightarrow P$ Automatic transfer $I^2 \leftrightarrow V^2$ Open Loop
Linearity and stability	Better than $\pm 1\%$ of full scale
Input limit	Analogue- by potentiometer or by external signal Digital- by communications bus (optional)
Current or voltage limit	Either chop-off (with alarm) or revert to phase angle and reduce firing angle
Retransmission	Analogue 0-10V or 4-20mA isolated (accuracy $\pm 1\%$ ) Digital via comms link
Diagnostics	Diagnostics port available for use with model 260 Diagnostic unit

### DIGITAL COMMUNICATIONS

Protocol	PROFIBUS-DP or MODBUS
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### ALARMS

Mains	Under or over voltage, frequency out of range
Load	Over current or load fault (static or dynamic)
Thyristors	Short circuit or over temperature (fan cooled units)

### ENVIRONMENT

Temperature	0 to 45°C operating, -10 to 70°C storage
Humidity	5% to 95% RH Non condensing, non streaming
Altitude	2000 metres maximum
Atmosphere	Non explosive, non conductive and non corrosive
Pollution	Pollution degree 2 admissible, defined by IEC664
Protection (mechanical)	IP20 on front face according to IEC529
Dimensions	16 to 100A: 225mm (H) x 116mm (W) x 169mm (D) 125 to 400A: 470mm (H) x 133mm (W) x 260mm (D)
Weight	16A to 100A: 3.2kg. 125 to 400A: 11.5kg
Mounting	DIN rail mounting up to 100amps Bulkhead mounting available for all units

### EUROPEAN DIRECTIVES

Safety	The TE10P carries the CE mark to show compliance with the European Low Voltage Directive 73/23/EEC
EMC- Immunity	Conforms to: EN 500082-2, EN 61000-4-2, EN 61000-4-4, ENV 50204, ENV 50140, ENV 50141
EMC- radiated emission	Conforms to: EN 55011 class A
EMC- conducted Emmission	Conforms to: EN 500081-2 without filter in Burst Firing modes for resistive loads up to 100amps. An external filter may be required for other operating conditions Conforms to IEC 1800-3 (EN610800-3) without filter For use in second (industrial) environment
UL approval	Products $\leq 100A$ are UL approved

## ORDERING CODE

TE10P	1	2	3	4	5	6	7	8	9	10	11	12	13	14
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15	16	17	18	19	20	21	22	23	24	25	26
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1 Current	3 Auxiliary Supply Voltage	6 Input Limit	10 Load Type	12 Current/Voltage Limit*	15 Alarm Relay	19 Option 1
<b>16A</b> 16 amps <b>20A</b> 20 amps <b>25A</b> 25 amps <b>32A</b> 32 amps <b>40A</b> 40 amps <b>50A</b> 50 amps <b>63A</b> 63 amps <b>80A</b> 80 amps <b>100A</b> 100 amps <b>125A</b> 125 amps <b>160A</b> 160 amps <b>200A</b> 200 amps <b>250A</b> 250 amps <b>315A</b> 315 amps <b>400A</b> 400 amps	<b>AUTO</b> None (Internal) <b>External</b> <b>115V</b> 115 volts (10VA) <b>230V</b> 230volts (10VA)	<b>SPOT</b> Potentiometer On Unit <b>External</b> <b>S0V5</b> 0 - 5 volts <b>S0V10</b> 0-10 volts <b>S0mA20</b> 0-20 mA <b>S4mA20</b> 4-20 mA	<b>LTCL</b> Low temperature coefficient load <b>HTCL</b> High temperature coefficient load (molybdenum, tungsten, molybdenum disilicide) <b>TTDL</b> Time and/or temp. dependent loads (Silicon carbide) <b>SWIR</b> Short wave infrared load	<b>ICHO</b> Stop conduction at current limit <b>ILI</b> Reduce firing angle at current limit (PA only) <b>VLI</b> Reduce firing angle at voltage limit (PA only)  <i>* For SWIR loads in Phase Angle mode only.            For HTCL loads use ICHO for SCA firing mode and ILI in other modes.</i>	<b>NC NO</b> Closed in alarm Open in alarm	<b>Retransmission:</b> <b>R0V10</b> 0-10V <b>R4mA20</b> 4-20mA <b>-</b> No option
2 Voltage	4 Fan Supply Voltage	7 Firing Mode	11 Controlled Parameter	13 Current/Voltage Signal	16 Communications Protocol	20 Option 2
<b>100V</b> 100 volts <b>115V</b> 115 volts <b>200V</b> 200 volts <b>230V</b> 230 volts <b>240V</b> 240 volts <b>277V</b> 277 volts <b>380V</b> 380 volts <b>400V</b> 400 volts <b>415V</b> 415 volts <b>440V</b> 440 volts <b>460V</b> 460 volts <b>480V</b> 480 volts <b>500V</b> 500 volts	<b>000</b> None (Internal) <b>External</b> <b>115</b> 115 volts (10VA) <b>230</b> 230volts (10VA)	<b>LGC</b> Logic (ON/OFF) <b>PA</b> 4-20 mA <b>Burst firing cycle</b> <b>FC1</b> 1 cycle <b>FC8</b> 8 cycles <b>C16</b> 16 cycles <b>128</b> 128 cycles <b>SCA</b> Advanced single cycle	<b>P</b> Power <b>IE</b> RMS current <b>VE</b> RMS voltage <b>I2</b> I <sup>2</sup> <b>V2</b> V <sup>2</sup> <b>OL</b> Open loop <b>Transfer of controlled parameter</b> <b>I2V2</b> I <sup>2</sup> < - > V <sup>2</sup> <b>I2P</b> I <sup>2</sup> < - > P	<b>LPOT</b> Potentiometer On Unit <b>External Signal</b> Trim potentiometer on unit <b>L0V5</b> 0-5 volts <b>L0V10</b> 0-10 volts <b>L0mA20</b> 0-20mA <b>L4mA20</b> 4-20mA	<b>000</b> No digital communications <b>MOP</b> Modbus protocol <b>PFP</b> Profibus-DP protocol	<b>DB9</b> 9 Pin comms connectors <b>-</b> No option
	5 Analogue Input	8 Ramp Start of Burst (or PA)		14 Fixing	17 Communications Speed	21 Option 3
	<b>0V5</b> 0 - 5 volts <b>0V10</b> 0 - 10 volts <b>0mA20</b> 0 - 20mA <b>4mA20</b> 4 - 20mA	<b>URP</b> Ramp <b>NRP</b> No ramp		<b>BKD</b> Bulkhead <b>DIN</b> DIN rail (≤100A)	<b>Profibus</b> <b>RAUT</b> Read only 1.5M bauds <b>WAUT</b> Read and write 1.5M bauds <b>Modbus</b> <b>R96</b> Read only 9.6 kbauds <b>R192</b> Read only 19.2 kbauds <b>W96</b> Read/write 9.6 kbauds <b>W192</b> Read/write 19.2 kbauds	<b>IEXT</b> External current measurement <b>-</b> No option
		9 Ramp Safety			18 8 Default Configuration	22 Option 4
		<b>AR</b> Safety ramp active <b>NR</b> No safety ramp			<b>CSW</b> Configuration by switches <b>CEP</b> Configuration held in memory	<b>External voltage measurement</b> <b>XXXV</b> (select range XXX from Voltage field)
						23 Internal Filter
						<b>FILT</b> ≤100A: Internal EMC filter (fast cycle) <b>-</b> No internal filter
						24 Fuse
						<b>FUSE</b> Fuse and fuseholder <b>MSFUSE</b> Microswitch fuse <b>NOFUSE</b> No fuse
						25 Language
						<b>ENG</b> English <b>FRA</b> French <b>GER</b> German
						26 Special
						<b>99</b> Special <b>-</b> No special

## FUSES - NO MICROSWITCH/TRIP INDICATOR

External fuses (order separately)

Current rating amps	Fuse holder	Fuse and fuseholder assembly Reference	H x W x D	Replacement fuse
16	CP018525	FU1038/16A/00	81 x 17.5 x 68	CH260024
20	CP018525	FU1038/20A/00	81 x 17.5 x 68	CH260034
25	CP018525	FU1038/25A/00	81 x 17.5 x 68	CH260034
32	CP171480	FU1451/32A/00	95 x 30 x 86	CH330044
40	CP171480	FU1451/40A/00	95 x 30 x 86	CH330054
50	CP173083	FU2258/50A/00	140 x 35 x 90	CS173087U063
63	CP173083	FU2258/63A/00	140 x 35 x 90	CS173087U080
80	CP173083	FU2258/80A/00	140 x 35 x 90	CS173087U100
100	CP173245	FU2760/100A/00	150 x 38 x 107	CS173246U125

Internal fuses (included)

Unit rating	Fuse rating	Reference
125A	200A	LA172468U200
160A	200A	LA172468U200
200A	400A	LA172468U400
250A	400A	LA172468U400
315A	400A	LA172468U400
400A	500A	LA172468U500

Note: For Fuses with Microswitch/Trip Indicators consult Eurotherm Sales

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ED43

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