TE10P

SINGLE PHASE
TRUE POWER CONTROLLER

TE10P Single phase true power controller

High Accuracy 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. These include loads that have special requirements such as:
Loads requiring high stability and accuracy e.g. in the semiconductor industry.
Moving loads the temperatures of which are difficult to monitor.
Loads with characteristics that change with time or temperature.

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

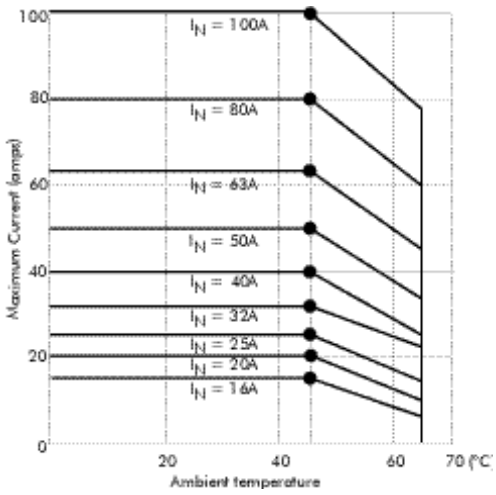
Optional RS422 or RS485 communications with Modbus or Profibus protocol allow the TE10P to be configured or controlled from an external supervisory system.

Features

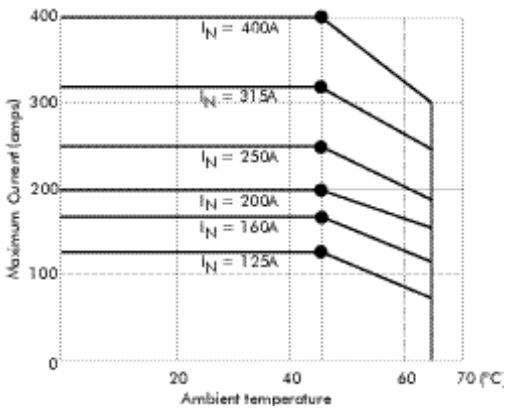
Current range from 16 to 400 amps. Voltage range from 100 to 500 volts. A four digit display and single push button simplify Operating, Commissioning, Maintenance and Configuration.
Isolated Analogue retransmission of power.
Configurable Alarm Relay.

CURRENT DERATING CURVES

Natural cooling

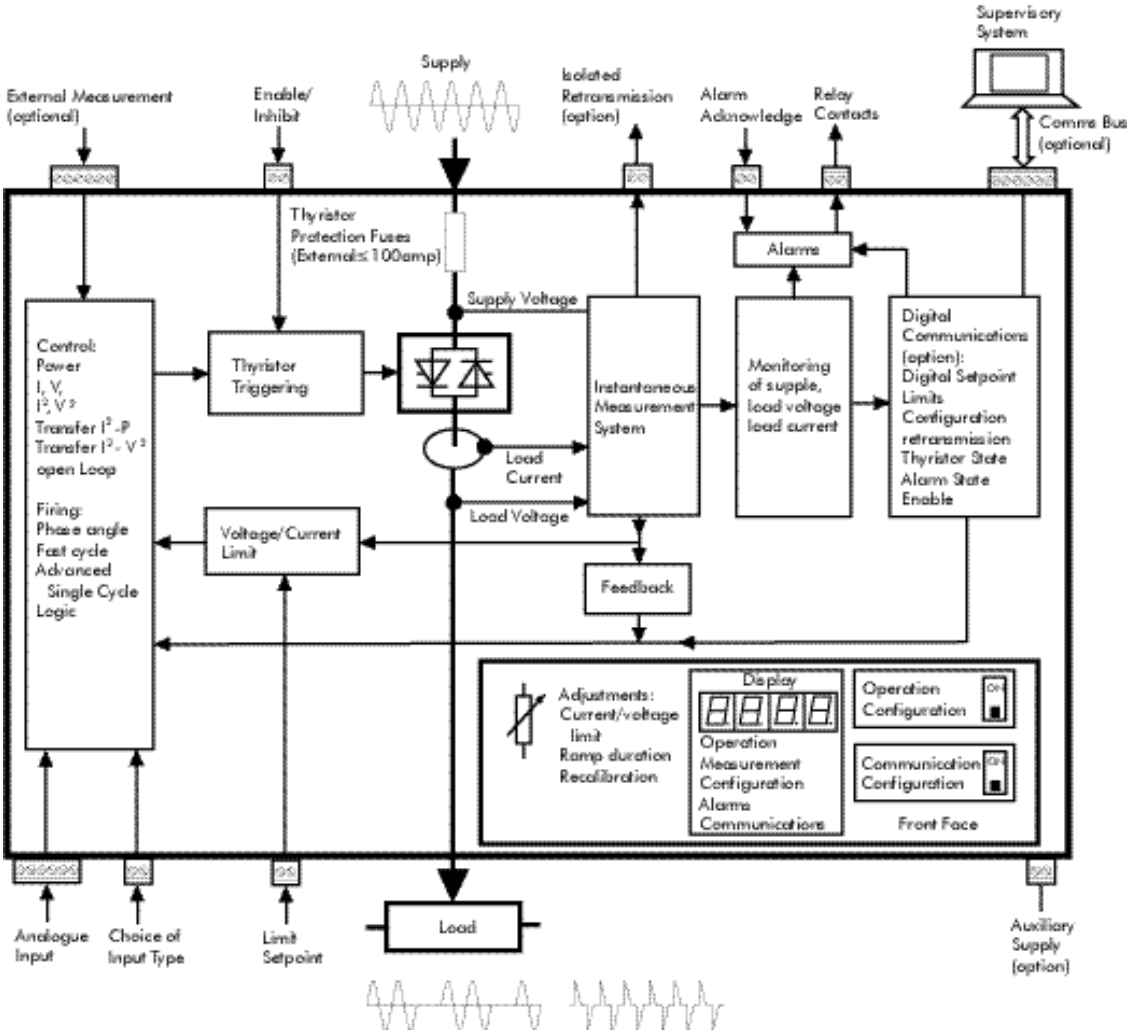


Fan cooled



I_N = Nominal current rating of unit

FUNCTIONAL DIAGRAM OF TE10P



FUSES (not recommended for short wave infrared loads)

External fuses (order separately)

Unit rating	Fuse holder	Fuse and fuseholder assembly		Replacement fuse
		Reference	H x W x D	
16A	CP018525	FU1038/16A/00	81 x 17.5 x 68	CH260024
20A	CP018525	FU1038/20A/00	81 x 17.5 x 68	CH260034
25A	CP018525	FU1038/25A/00	81 x 17.5 x 68	CH260034
32A	CP171480	FU1451/32A/00	95 x 30 x 86	CH330044
40A	CP171480	FU1451/40A/00	95 x 30 x 86	CH330054
50A	CP173083	FU2258/50A/00	140 x 35 x 90	CS173087U063
63A	CP173083	FU2258/63A/00	140 x 35 x 90	CS173087U080
80A	CP173083	FU2258/75A/00	140 x 35 x 90	CS173087U100
100A	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

TECHNICAL SPECIFICATION

Electrical

Nominal current (at 45 Deg. C)	16A, 25A, 40A, 63A, 80A, 100A, 125A, 160A, 200A, 250A, 315A and 400A (see derating curves)
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	0-5 or 0-10V (Input impedance >100K) 0-20 or 4-20mA (input impedance 250 Ohm) 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 <->P Automatic transfer I^2 <->V^2 Open Loop
Linearity and stability	Better than ±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 ±1%) Digital via comms link
Diagnostics	Diagnostics port available for use with model 260 Diagnostic unit

Digital communications

Protocol	PROFIBUS-DP or MODBUS
Bus	RS232 or RS422

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 fiter 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

ORDERING CODE

Basic Product	Current	Voltage	Aux. Supply Voltage	Fan Supply Voltage	Analogue Input	Input Limit	Firing Mode	Ramp Start of Burst	Initial Start Up Ramp	Load Type	Controlled Parameter
TE10P											

Current/Volt. Limit Type	Current/Volt. Limit Signal	Fixing	Alarm Relay	Comms. Protocol	Comms. Speed	Default Config.	Options	Language
								96/00

Note: An end code of 96/00 denotes unit can form part of C.E. compliant system

Current	Code
16 amps	16A
20 amps	20A
25 amps	25A
32 amps	32A
40 amps	40A
50 amps	50A
63 amps	63A
80 amps	80A
100 amps	100A
125 amps	125A
160 amps	160A
200 amps	200A
250 amps	250A
315 amps	315A
400 amps	400A

Voltage	Code
100 volts	100V
115 volts	115V
200 volts	200V
230 volts	230V
240 volts	240V
277 volts	277V
380 volts	380V
400 volts	400V
415 volts	415V
440 volts	440V
460 volts	460V
480 volts	480V
500 volts	500V

Auxiliary Supply Voltage		Code
None (Internal)		AUTO
External	115 volts (10VA)	115V
	230 volts (10VA)	230V

Fan Supply Voltage	Code
None (16 to 100A)	000
115V, 25VA (≥125A)	115
230V, 25VA (≥125A)	230

Analogue Input	
0 - 5 volts	0V5
0 -10 volts	0V10
0 - 20 mA	0mA20
4 - 20 mA	4mA20

Input limit		Code
Potentiometer On Unit		SPOT
External Signal:	0-5 volts	S0V5
	0-10 volts	S0V10
	0-20 mA	S0mA20
	4-20 mA	S4mA20

Firing Mode		Code
Logic (ON/OFF)		LGC
Phase angle		PA
Burst firing cycle	1 cycle	FC1
	8 cycles	FC8
	16 cycles	C16
	128 cycles	128
Advanced single cycle		SCA

Ramp Start of Burst (or PA)	Code
Ramp	URP
No ramp	NRP

Initial Start Up Ramp (not for SCA)	
Ramp	AR
No ramp	NR

Load Type	Code
Low temperature coeffient load	LTCL
High temperature coeffient load (molybdenum, tungsten, molybdenum disilicide)	HTCL
Time and/or temp. depedent loads (Silicon carbide)	TTDL
Short wave infrared load	SWIR

Controlled Parameter	Code
Power	P
RMS current	IE
RMS volatge	VE
I^2	I2
V^2	V2
Open loop	OL
Transfer of controlled parameter	
I^2 <-> V^2	I2V2
I^2 <-> P	I2P

Current/Voltage Limit Type*	Code
Stop conduction at current limit	ICHO
Reduce firing angle at current limit (PA only)	ILI
Reduce firing angle at voltage limit (PA only)	VLI

* For **SWIR** loads in Phase Angle mode only.
For **HTCL** loads use **ICHO** for **SCA** firing mode and **ILI** in other modes.

Current/Voltage Limit Signal	Code
Potentiometer On Unit	LPOT
External Signal:	
0-5 volts	L0V5
0-10 volts	L0V10
0-20 mA	L0mA20
4-20 mA	L4mA20
In cascade with potentiometer	

Fixing	Code
Bulkhead	BKD
DIN rail (≤100A)	DIN

Alarm Relay	Code
Closed in alarm	NC
Open in alarm	NO

Communications Protocol	Code
No digital communications	000
Modbus protocol	MOP
Profibus-DP protocol	PFP

Communications Speed	Code
Profibus:	
Read only 1.5M bauds	RAUT
Read and write 1.5M bauds	WAUT
Modbus:	
Read only 9.6 kbauds	R96
Read only 19.2 kbauds	R192
Read/write 9.6 kbauds	W96
Read/write 19.2 kbauds	W192

Default Configuration	Code
Configuration by switches	CSW
Configuration held in memory	CEP

Options	Code
Retransmission:	
0-10 V	R0V10
4-20 mA	R4mA20
9 Pin comms connectors	DB9
External current measurement	IEXT
External voltage measurement (select range XXX from Voltage' list)	XXXV
≤100A: Internal EMC filter (fast cycle)	FILT
≥125A:: Fuse fail microswitch	FUMS

Language	Code
English	ENG
French	FRA

EUROTHERM CONTROLS LIMITED http://www.eurotherm.co.uk

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