

# 450/460

SERIES

Single phase thyristor units

CE



EUROTHERM  
CONTROLS

Product  
data

# 450/460

## Single phase thyristor units

A family of plug-in low to medium current thyristor units covering single phase electrical heating applications up to 150 amps and 500 volts.

### 450 Series Solid State Relay

Plug-in for rapid maintenance

Logic input - can work with low cost temperature controllers

Zero voltage switching to minimise electrical noise when controlling resistive loads.

Built in fuses (except 150 amp unit) with fuse fail indication

Partial load failure is available as an option

Can be used with a 460 Series "Master" unit for control of some three phase loads

### 460 Series Analogue Input Thyristor Unit

Plug-in for rapid maintenance

Analogue input also allows manual control for open loop application

Configurable firing modes to suit most applications

Built in fuses (except 150 amp unit) with fuse fail indication

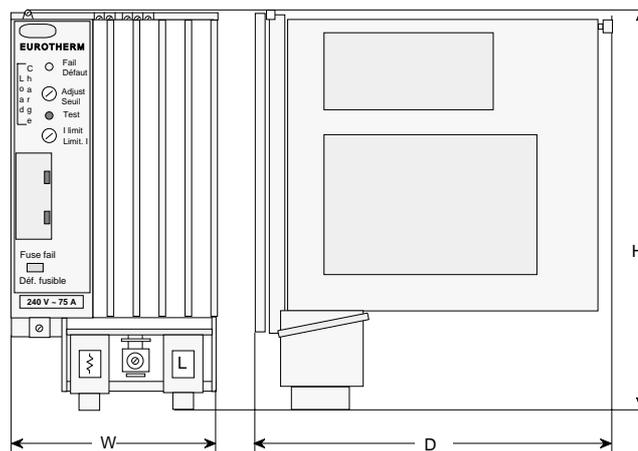
Current limit for protection of load and thyristors

Can be used as a "master" which drives Solid State Relay "slave" units for control of some three phase loads

### CE Marking /safety

The CE mark on the 450 and 460 series thyristor units denotes that when installed and used in accordance with user manuals HA174912 and HA174913ENG, they meet the essential requirements of the European Low Voltage Directive 73/23/EEC dated 19/02/73 (amended by directive 93/68/EEC dated 22/07/93). The Technical Construction File is approved by LCIE (Laboratoire Central des Industries Electriques), a Notified Body.

### Installation and maintenance



### Spare fuses

Unit current	Fuse part no.
15A 240V	CH380163
15A 440V	CH110153
25A 240V	CH380253
25A 440V	CH110253
40A	CH110044
55A	CH120094
75A	CH120114
100A	CH120154
125A	CH120154
150A*	CH340025

\*External fuse using CP171482 fuseholder

Model	Height(H) mm	Width(W) mm	Depth(D) mm	Weight kg
451/461	247	76	236	3
452/462	247	114	236	4
453/463	247	152	236	5
454/464	280	152	236	5
150 amp Ext. fuseholder	220	50	110	-

## TECHNICAL SPECIFICATION

Current rating	15A to 150A: 15A to 125A with internal high speed fuses, external fuse required for 150 amps		
Voltage	115V to 500V		
Supply frequency	50 or 60Hz (+/- 2Hz).		
Auxiliary supply	100V and 230V, or 115V and 230V, or 200V and 230V, or 277V and 230V, or 380V and 230V, or 440V and 230V, or 480/500V and 230V. This supply powers the fan when fitted and also the control electronics for the 460 series. Consumption 7VA non fan cooled, 30VA fan cooled units.		
Dissipated power	Allow 2 watts per amp		
Cooling	Natural cooling below 100A. Fan cooled 100, 125 and 150A. (see Auxiliary supply)		
Load configuration	Single phase: Line to line or line to neutral		
<b>Environment</b>			
Temperature	Operating: 0 to 50 Deg.C. Storage: -10 to +70 Deg. C.		
Humidity	5% to 95% RH. Non condensing		
Atmosphere	Electrically conductive pollution must be excluded. Not suitable for use above 2000m or in corrosive or explosive atmospheres without further protection.		
Pollution	Pollution degree 2 admissible, defined by IEC664.		
Protection (mechanical)	IP00, can be opened without tools according to IEC529.		
<b>Safety and EMC standards</b>			
	450 and 460 series products installed and used in compliance with their user manuals (HA174912 for 450 series and HA174913ENG for 460 Series) are designed to comply with the European Low Voltage Directive 73/23/EEC dated 19/02/73 (amended by directive 93/68/EEC dated 22/07/93)		
Immunity	General standard EN 50082-2; test standards EN 61000-4-2, EN 61000-4-4, ENV 50140, ENV 50141		
Emissions	General standard EN 50081-2 (with filter) test standard. EN55011. Product standard IEC 1800-3 (without filter)		
<b>EMC filters</b>			
	To reduce the conducted emissions, Eurotherm can supply a range of filters.		
450 series	Up to 55amps standard (internal) 75amps to 125amps options "filt" (internal) 150 amps external parallel filter/PAR/425S/00		
460 series (External filters)			
	15A and 25A	FILTER/MON/25A/00	Series filter
	40A and 55A	FILTER/MON/63A/00	Series filter
	75A and 100A	FILTER/MON/100A/00	Series filter
	125A and 150A	2 x FILTER/MON/100A/00	Series filters in parallel
<hr/>			
<b>450 Series</b>			
Load type	Constant resistance		
Input	Logic (standard)	ON > 3.5V	OFF < 2V impedance 2.5k $\Omega$
	TTL input	ON > 2.5V	OFF < 1.5V impedance 1k $\Omega$
	Multi drive input	ON > 2.5V	OFF < 1.2V impedance 500 $\Omega$
	Maximum ratings 28V and 25mA		
Firing mode	Logic firing with zero crossing switching		
Options	Partial load failure alarm (PLF): detects failure of one in up to five identical, parallel elements Overload: Detects a load current of more than 150% of nominal. Only used with PLF.		
<hr/>			
<b>460 Series</b>			
Load type	Constant or variable resistance, inductive or transformer		
Input	0-5V, 1-5V, 0-10V. impedance 100k $\Omega$ 0-5mA, 0-10mA, 0-20mA, 4-20mA, impedance 250 $\Omega$ (20mA) or 1000 $\Omega$ (5mA, 10mA) Manual input using 4.7k to 10k pot on 0-10V range (can be powered from internal supply)		
Firing mode	Phase angle, single cycle, fast cycle, slow cycle, fast cycle with soft start, fast cycle with soft start and end, slow cycle with soft start, slow cycle with soft start and end, delayed firing fast or slow cycle for inductive loads		
Feedback	Squared load current or squared voltage (automatic selection of highest) supply voltage compensation		
Current limit	Two types are available: "Linear" (internal) current limit or "Threshold" (external) current limit The threshold current limit can be set by an external voltage or by an external 10k pot.		
Partial load failure	The PLF alarm detects failure of one in up to five identical, parallel elements		
Slave drive output	A 10V, 10mA logic output signal is available when the 460 "master" is in slow cycle fast cycle or single cycle firing mode. This output can be used to control 'slave' solid state contactors such as the 450 series. The master/slave combination can be used for controlling three phase three wire resistive loads.		
Inhibition	The firing of the 460 can be inhibited by applying a 10Vdc signal to the inhibit/enable input. This can be powered from internal supply.		
Retransmission	0-5V retransmission signals corresponding to load voltage and load current are available on the 460		
Diagnostic	Front panel socket provided for use with model 260 diagnostic unit.		

## ORDERING CODE - 450 Series plug-in solid state relay

Basic Product	Current	Voltage	Aux. Supply	Language	Options	
						96/00

Basic Product	Code	Voltage	Code	Language	Code
15A	451	115 volts	10	English	ENG
25A	451	240 volts	13	French	FRA
40A	451	277 volts	32	German	GER
55A	452	440 volts	28	Italian	ITA
75A	452	480 volts	29	Dutch	NED
100A*	453			Swedish	SWE
125A*	454				
150A* †	454				
* Fan cooled					
† Requires external fuse CH340025 and fuseholder CP171482					
Current	Code	Aux. Supply (Fan cooled units only)	Code	Options	Code
15A	081	115V	11	TTL high sensitivity input	10
25A	082	230V	36	Multi control input	24
40A	082	100V and 230V	41	Partial load failure alarm open in alarm state	37
55A	083	115V and 230V	19	Partial load failure alarm closed in alarm state	37/83
75A	062	200V and 230V	42	No backplate	76
100A	113	277V and 230V	46	Overload detection (only with PLF option)	68
125A	114	380V and 230V	43	Filter	FILT
150A	117	440V and 230V	47		
	100	480/500V and 230V	44		

## ORDERING CODE - 460 Series plug-in analogue thyristor

Basic Product	Current	Voltage	Aux. Supply	Language	Input	Firing Mode	Options	
								96/00

Basic Product	Code	Voltage	Code	Input	Code
15A	461	110/115 volts	10	0-5V	008
25A	461	240 volts	13	1-5V	068
40A	461	277 volts	32	0-10V	060
55A	462	440 volts	28	0-5mA	069
75A	462	480/500 volts	29	0-10mA	071
100A*	463			0-20mA	072
125A*	464			4-20mA	073
150A* †	464				
* Fan cooled					
† Requires external fuse CH340025 and fuseholder CP171482					
Current	Code	Aux. Supply	Code	Firing Mode	Code
15A	081	100V and 230V	41	Phase angle	002
25A	082	115V and 230V	19	Single cycle	160
40A	083	200V and 230V	42	Fast cycle (0.8s)	001
55A	062	277V and 230V	46	Fast cycle with soft-start	055
75A	113	380V and 230V	43	Fast cycle with soft-start & end	SDF
100A	114	440V and 230V	47	Slow cycle (8s)	050
125A	117	480/500V and 230V	44	Slow cycle with soft-start	056
150A	100			Slow cycle with soft-start & end	SDS
Language	Code	Options	Code	Options	Code
English	ENG	Frequency 60Hz	69	PLF closed in alarm	83
French	FRA	No backplate	76		
German	GER				
Italian	ITA				
Dutch	NED				
Swedish	SWE				

**EUROTHERM CONTROLS LIMITED** <http://www.eurotherm.co.uk>

### UK SALES OFFICE

Eurotherm Controls Limited, Faraday Close, Durrington, Worthing. West Sussex BN13 3PL. Telephone Sales:(01903) 695888, Technical:(01903) 695777, Service:(01903) 695444, Fax (01903) 695666

### Sales and support in over 30 countries worldwide

Enquiries/orders to: Eurotherm Controls Limited Export Dept., Faraday Close, Durrington, Worthing. West Sussex BN13 3PL. Telephone (01903) 268500, Fax (01903) 265982

© Copyright Eurotherm Controls Limited 1990

All rights strictly reserved. No part of this document may be stored in a retrieval system, or any form or by any means without prior written permission from Eurotherm Controls Limited. Every effort has been taken to ensure the accuracy of this specification. However in order to maintain our technological lead we are continuously improving our products which could, without notice, result in amendments or omissions to this specification. We cannot accept responsibility for damage, injury loss or expenses resulting therefrom.

Part No. HA016953 Issue 7

Printed in England 0199