

# 7100A

MODEL



## Single Phase Thyristor Units for all Load types Specification Sheet

### Ideal for :

- Glass lehrs
- Metal furnaces
- Ceramic furnaces
- Semi-conductor manufacture
- Induction heating
- Transformer coupled loads
- Time/temperature dependant

### Features :

- **Current range: from 16 to 250 amps at 45°C**
- **Voltage up to 500V**
- **Inputs**  
current:  
**0-20mA or 4-20mA**  
voltage:  
**0-5V or 0-10V**
- **Firing modes:**  
Phase angle  
Fast cycle  
Single cycle  
Advanced single cycle  
Transformer burst firing
- **Suitable for virtually all types of load**
- **Current limit**
- **Alarm options include:**  
Thyristor short circuit  
Load open circuit  
Partial load failure  
Thyristor overtemperature (250A unit)
- **Power control**

### Ratings

The current ratings of the 7100A cover the range from 16 amps up to 250 amps, with only the 250A unit being fan cooled. The voltage rating can go up to a maximum of 500 volts.

### Inputs

The 7100A can accept analogue voltage (0-5V or 0-10V) or current (0-20mA or 4-20mA) inputs.

### Firing Modes

The 7100A is available with a selection of firing modes to suit most applications.

It is suitable for controlling resistive loads with high or low temperature coefficient, short wave infrared (SWIR) or inductive loads.

### Control mode

7100A units use one of the following control parameters:  
RMS load voltage squared  $V^2$   
RMS load current squared  $I^2$   
Load power P (up to 100 amps)  
Open loop OL

### Limits and alarms

Optional current limit which can work in all firing modes prevents excessive currents from flowing in the load circuit. Optional alarms can warn of thyristor short circuit or load open circuit (GRF alarm). Additionally partial load failure with automatic set up can detect the loss of one out of six parallel loads (DLF alarm). Overtemperature shutdown is provided with 250A fan cooled units with optional alarm.

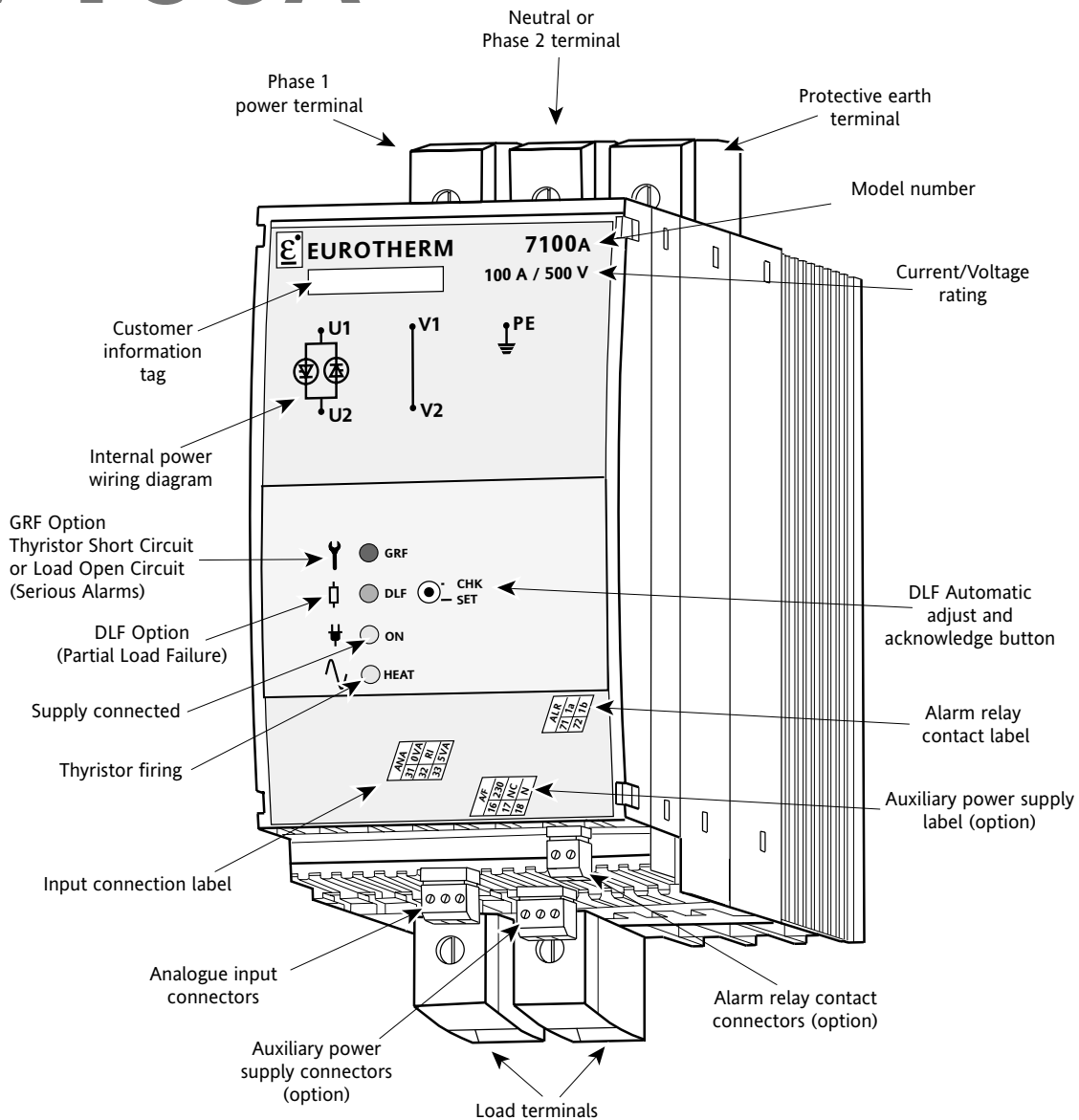
### Fusing

High speed fuses are recommended for most applications except SWIR. The fuses are external for units up to and including 100 amps and internal above 100 amps. Fuses are available either with or without microswitch indication.

### International approvals

CE (EN60947-4-3); UL and cUL available up to 100A

# 7100A



Example of 7100A layout

## Signal connections

Terminal Block	Terminal		Purpose	Option
	No.	Label		
ANA	31	0VA	0V analogue signal	Basic or Options
	32	RI	+analogue signal	
	33	5VA	5V user supply	
A/F	16	230	Auxiliary 230V or	
	17	115	115V supply	
	18	0V	Neutral or 2 <sup>nd</sup> phase	
DIG.IN	61	0VD	0V logic signal	Overload alarm
	62	ACK	ICO acknowledgement	
	63	5VD	5V user supply	
ALR	71	1a	Alarm relay contact (NC code)	Alarms
	72	1b	Alarm relay contact (NO code)	
	73	1a	Alarm relay contact (NO code)	
	74	1b	Alarm relay contact (NO code)	
ADJ.CAL	66	0VC	0V calibration	V x I control
	67	HRC	Calibration control	
MSF	75	3a	Fuse with microswitch connect	≥125A
	76	3b	Fuse with microswitch connect	
EXT	21	L2	Neutral or 2nd phase	Alarms
	22	N/A	in case of alarm option	

## Safety specification

**PRODUCT STANDARD** The 7100A products comply with the terms of product standard EN 60947-4-3. Contactors and motor-starters - AC semiconductor controllers and contactors for non-motor loads.

## CE LABELLING

Complies with essential requirements of the European Low Voltage Directive 73/23 EEC dated 19 February 1973, modified by 93/68/EEC dated 22 July 1993 and the Electromagnetic Compatibility Directive 89/336/EEC dated 3 May 1989 modified by 92/31/EEC dated 28 April 1992 and 93/68/EEC dated 22/07/93.

## TECHNICAL SPECIFICATION

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

### POWER

Nominal Current	16 A to 250 A at 45°C ambient (see order code)
Nominal Voltage	100 VAC to 500 VAC (see order code)
Frequency	47 to 63 Hz
Auxiliary supply	Self-powered from supply network or external (115 Vac or 230 Vac +10%; 15%) depending on order code. Consumption: 10 VA
Dissipated power	1.3 W (approx): per amp. Allow 2W per amp to include fuse dissipation
Cooling	Rating ≤200 A: Natural convection. Rating 250A: Fan-cooled

### LOAD

Use category	Single-phase industrial load: · AC-51 Resistive load with low temperature coefficient · AC-55b Short wave infrared elements for units ≤100A · AC-56a Transformer primary and Resistive load with high temperature coefficient
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### CONTROL

Control type	Analogue · Remote analogue setpoint: 0-5 Vdc or 0-10Vdc (100 kΩ input), 0-20 mA or 4-20 mA (250Ω input) · Potentiometer for manual setpoint (5 Vdc supply available)
Control parameter	· Standard: Load voltage squared ( $V^2$ ) · Option: Apparent power ( $V \times I$ , up to 100 amps), Load current squared ( $I^2$ ), Open loop
Linearity and stability	Better than ±2% of full scale
Current limit (option)	· Phase angle: Automatic control transfer from $V^2$ to $I^2$ or, from $V \times I$ to $I^2$ with current recalibration set by potentiometer on front panel. · Burst mode 16 cycle base: Current limited by threshold set using potentiometer on front panel. A monitor signal is available in $V \times I$ for power and current calibration and maintenance
Transient current limit	Option for transformer primary control in burst firing mode: · Safety firing angle ramp on first firing · First firing delay adjustable using potentiometer on front panel

### FIRING MODE

Firing at zero crossings	· 'Burst mode' base time: 16 or 64 cycles · 'Single-cycle': base time 1 cycle · Advanced single-cycle: base firing time 1 cycle; non conduction by half-cycles.
Firing angle variation	· 'Phase angle'

### LOAD MONITORING (OPTIONS)

Serious alarms (GRF)	Total load failure and thyristor short circuit detection. Signalled by red 'GRF' LED and alarm relay contact
Diagnostic alarm (DLF)	Partial load failure detection. Signalled by orange 'DLF' LED and alarm relay contact Sensitivity: Detects the failure of at least one heating element for up to six LTCL or four SWIR identical elements connected in parallel The DLF option includes serious alarm monitoring (GRF)
Overtemperature alarm	For fan cooled units operation stops if the temperature is exceeded. Signalled by red GRF LED and alarm relay (with GRF option)

### OVERLOAD ALARMS (OPTION)

Over-current alarm	Operation stopped if current threshold exceeded.
(ICO Chop Off option)	Only available with zero crossing firing and DLF option (except for short wave infrared elements, transformers and codes V1CL and V2CL). Alarm threshold adjustable from 20 to 100% using potentiometer on front panel. Signalled by red 'ICO' LED and alarm relay contact.

### ALARM RELAY

Available with alarm options. The relay contact (0.25 A 230 Vac; 32 Vdc) is either open or closed on alarm depending on the product code.

### ENVIRONMENT

Temperature	Use 0°C to 45°C at max. altitude of 2000m. Storage -10°C to 70°C
Pollution	Degree 2 acceptable (defined by IEC 664)
Humidity	RH 5% to 95% Non condensing, non streaming

### INSTALLATION

Mounting.	Rating from 16 to 63A: Two symetric DIN rail EN50022 or bulkhead mounting (4 x M4 screws) Rating from 80 to 100A: Bulkhead mounting (4 x M4 screws) Rating from 125 to 200A: Bulkhead mounting (4 x M6 screws) Allow a minimum of 10mm between units. Units must be mounted with fins running vertically
Max. cable size.	16 and 25 amp: 6mm <sup>2</sup> . 40 and 63 amp: 16mm <sup>2</sup> . 80 and 100 amp: 35mm <sup>2</sup> . 125 to 250 amp: 120mm <sup>2</sup>

### PROTECTION

Thyristor protection at zero crossings	Varistor and RC snubber. High speed fuse: Rating ≤100A; external, >100A; internal. No fuse for short wave infrared (SWIR) elements if firing or in phase angle firing mode without current limit.
Electrical protection	IP20 without additional protection. Overvoltage category II

### WARRANTY

2 years

### PHYSICAL DATA

Rating (A)	Height (mm)	Width (mm)		Depth (mm)		
		Lite (*)	Full (**)	Lite		Full
				Base (1)	Option (2)	
16 to 40	156	52,5	70	193	218	237
63	156	70	70	212	237	237
80 to 100	226	96	96	215	243	243
125 to 250	423	144	N/A	372	372	N/A

(\*) Lite;

(1) Basic product, without alarm option or control (except V2 and OL)

(2) Product with code: I2 / V2CL or GRF / DLF

(\*\*) Full; Product with code: V1CL, ICO or V2CL / I2 + GRF / DLF

## ORDERING CODE

7100A	1	2	3	4	5	6	7 XXXX	8	9	10
11	12	13	14	15	16	17 XXXX	18 XXXX	19	20 NONE	

1 Current	2 Voltage	3 Aux. voltage <sup>(1)</sup>	5 Fuse	7	9 Manual Language
<b>16A</b> 16 amps <b>25A</b> 25 amps <b>40A</b> 40 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>100V</b> 100 volts <b>115V</b> 115 volts <b>120V</b> 120 volts <b>127V</b> 127 volts <b>200V</b> 200 volts <b>208V</b> 208 volts <b>220V</b> 230 volts <b>230V</b> 230 volts <b>240V</b> 240 volts <b>277V</b> 277 volts <b>400V</b> 400 volts <b>460V</b> 460 volts <b>480V</b> 480 volts <b>500V</b> 500 volts	<b>SELF</b> None (standard) <b>115V</b> 115 volt supply <b>230V</b> 230 volt supply	<b>FUSE</b> Fuse without microswitch <b>MSFU</b> Fuse with microswitch <b>NONE</b> No fuse	XXXX	<b>ENG</b> English <b>FRA</b> French <b>GER</b> German
4 Fan Supply	6 Firing Mode	8 Input	10 Options		
<b>16A-200A</b> <b>XXXX</b> No fan <b>250A</b> <b>115V</b> 115V fan and 115V or self Aux supply <b>480V</b> 480V fan and 115V or self Aux supply <b>230V</b>	<b>PA</b> Phase angle <b>FC1</b> Single cycle <b>ASC</b> Advanced Single cycle <b>C16</b> Burst 16 cycles <b>C64</b> Burst 64 cycles	<b>0V5</b> 0-5VDC <b>0V10</b> 0-10VDC <b>0mA20</b> 0-20mA <b>4mA20</b> 4-20mA	<b>NONE</b> No options standard V <sup>2</sup> control End of code (specify further code) <b>YES</b>		

Note  
(1) Auxiliary supply only required for voltages not shown in field 2.

## Options (If Options 'Yes')

11 Control Options	12 Delay on First Firing	14 Load Type (for DFL)	16 Alarm Relay Contact	18
<b>Any firing:</b> <b>V2</b> Voltage control(V <sup>2</sup> ) <b>V2CL</b> Current Limit and voltage control <b>VICL</b> Power control (VxI) and current limit (≤100A) <b>PA Firing only:</b> <b>I2</b> Current control (I <sup>2</sup> ) <b>OL</b> Open Loop	<b>XFMR</b> Transformer primary <b>XXXX</b> Other configurations	With DLF option: <b>SWIR</b> Short wave infrared elements <b>LTCL</b> Low temperature coefficient load <b>XXXX</b> Without DLF option or High temperature coefficient load	With Alarm option: <b>NC</b> Contact closed on alarm <b>NO</b> Contact open on alarm <b>XX</b> Without alarm option	XXXX
13 Load Monitoring	15 Overload Alarm	17	19 Compliance Certificate	20
<b>GRF</b> Serious alarms: thyristor short-circuit, total load failure <b>DLF</b> Partial load failure + GRF <b>NONE</b> No alarms	<b>ICO</b> Overload alarm (≤100A) <b>XXXX</b> No overload alarm	XXXX	<b>NONE</b> No certificate <b>CFMC</b> With certificate	NONE

## SPARE FUSE AND HOLDER

Current rating amps	Fuse and holder assembly	Fuse and Holder with Microswitch
16	FU1038/16A/00	MSFU1451/16A
25	FU1038/25A/00	MSFU1451/25A
40	FU1451/40A/00	MSFU1451/40A
63	FU2258/63A/00	MSFU2258/63A
80	FU2258/80A/00	MSFU2258/80A
100	FU2760/100A/00	MSFU2760/100A

## SPARE FUSE

Current rating amps	Fuse number	Fuse Trip with Indicator
16	CH260024	CS176513U020
25	CH260034	CS176513U032
40	CH330054	CS176513U050
63	CS173087U080	CS176461U080
80	CS173087U100	CS176461U100
100	CS173246U125	CS173246U125

## INTERNAL FUSE

Current rating amps	Fuse Trip with Indicator
125	CS173246U160
160	CS173246U250
200	CS173246U315
250	CS176762U315

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