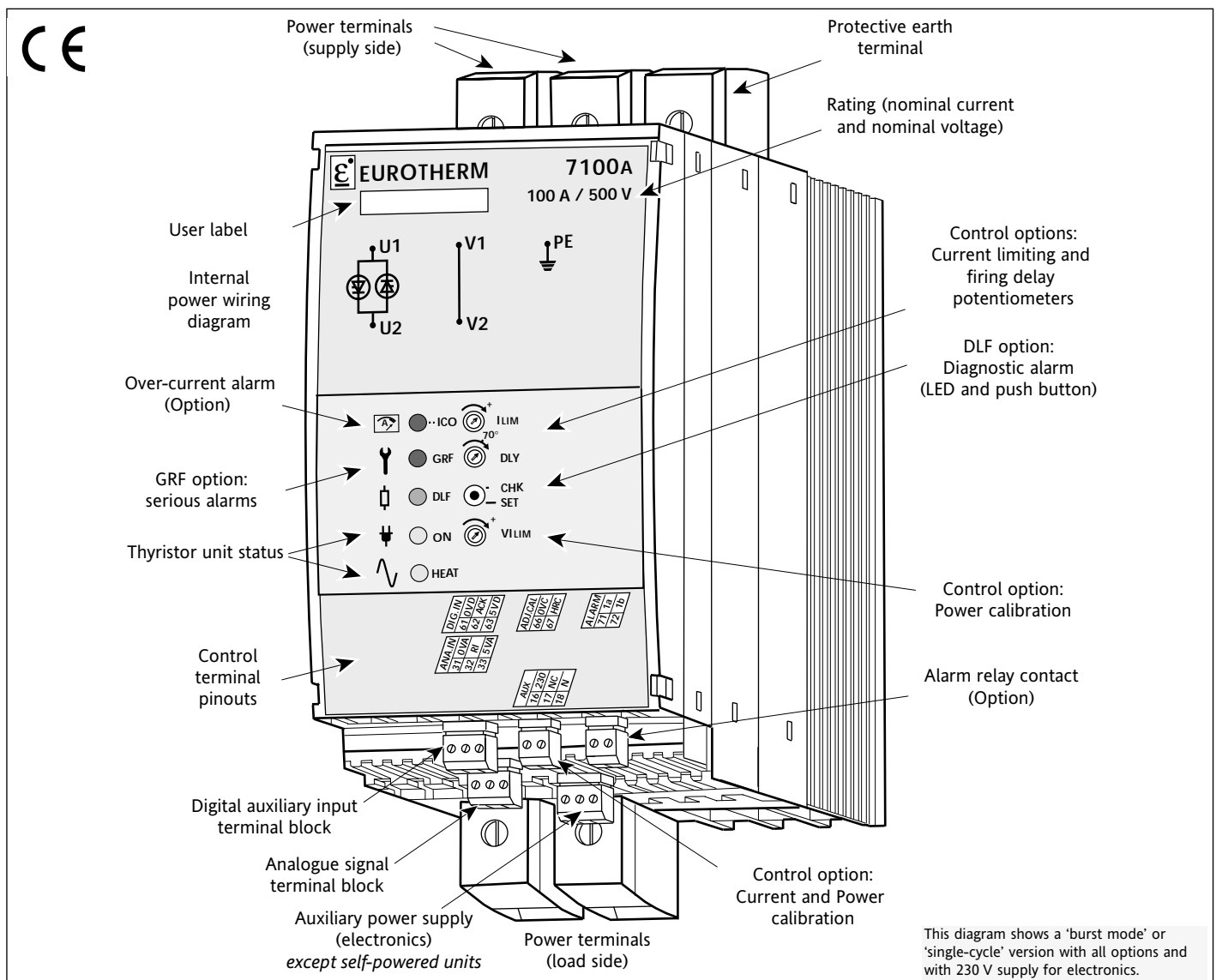


IDENTIFICATION

The 7100A series of power thyristor units can control all types of single phase electric load using 'Phase angle' mode or zero-crossing firing ('Burst mode' or 'Single-cycle mode'). For current ratings up to 100 A, the 7100A units comprise two channels, one controlled by the thyristor (U1 - U2) and one direct internal channel (V1 - V2).

These units are available with an extensive choice of current rating, supply type (including self-powered directly from the supply network) and firing type as well as numerous options to match all user requirements.

The options include selection of the control mode, current limiting as well as alarms to diagnose and signal the status of the thyristors and the load as well as over-temperatures or over-currents.



OPTIONS

The following options are available on 7100A series power thyristor units:

- current limiting, power calibration and various control modes,
- transient limiting by delaying the first thyristor firing and by using a safety ramp.

7100A series power thyristor units can optionally signal the following alarms:

- serious alarms (thyristor short circuit, total load failure)
- load fault diagnosis and monitoring
- over-temperature (for fan-cooled units with current rating ≥ 125 A)
- over-current (for 'burst mode' or 'single-cycle' operation)

TECHNICAL SPECIFICATIONS

Power		Type 1 alarms (Options)	
Nominal current	16 A to 630 A at 45 °C (see order code)	Serious alarms (GRF option)	Total load failure and thyristor short circuit detection.
Nominal voltage	100 V to 690 V (see order code).		Signalled by red 'GRF' LED and alarm relay contact.
Frequency	Use from 47 to 63 Hz		Partial load failure detection.
Dissipated power	1,3 W (approx.) per amp.	Diagnostic alarm (DLF option)	Signalled by orange 'DLF' LED and alarm relay contact.
Cooling	Ratings ≤ 100 A: Natural convection Ratings ≥ 125 A: Fan-cooled		The DLF option includes serious alarm monitoring.
	115 V or 230 V fan, consumption 10 VA		Settings: Monitoring diagnosis, alarm adjustment and resetting using push button on front panel
Load	Single-phase industrial load: Resistive load with low or high temperature coefficient, Short wave infrared elements, Transformer primary.	Over-temperature alarm	Sensitivity: Detects the failure of at least one heating element for six identical elements connected in parallel.
			For all fan-cooled units (≥125 A) operation stops if the temperature threshold is exceeded
Control			Signalled by red 'T°' LED and alarm relay (if GRF or DLF option selected).
Supply	Self-powered from supply network or external (115 V or 230 V +10%; -15%) depending on order code. Consumption: 10 VA.	Type 2 alarms (Option)	
Control type	Analogue (optional digital communication) • Remote analogue setpoint: 0-5 V or 0-10 V (100 kΩ ≈ input), 0-20 mA or 4-20 mA (250 Ω input) • Potentiometer for manual setpoint (5 V supply available).	Over-current alarm (ICO Chop Off option)	Operation stopped if current threshold exceeded.
Firing mode			Only available with <i>zero crossing</i> firing and <i>DLF</i> option (except for <i>short wave infrared</i> elements, <i>transformers</i> and codes <i>VICL</i> and <i>V2CL</i>).
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.		Alarm threshold adjustable from 20 to 100% using potentiometer on front panel.
Firing angle variation	• 'Phase angle'	Alarm relay	Signalled by red 'ICO' LED and alarm relay contact.
Control			Available with alarm options.
Control parameter	• Standard: Load voltage squared (V ²) • Option: - Apparent power (V × I) - Load current squared (I ²) - Open loop.	Communication	The relay contact (0.25 A/230 Vac; 32 Vdc) is either open on alarm or closed on alarm depending on the product code.
Linearity and Stability	Better than ±2% of full scale.	Environment	Available later.
Current limit	Option, depending on firing mode: • Phase angle: Automatic control transfer - from V ² to I ² or - from V × 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 control signal is available in V × I and I ² to adjust the limit and perform maintenance.	Use	0°C to 45°C at max. altitude of 2000 m.
		Storage	-10°C to 70°C.
Transient current limit	Option for transformer primary control in burst mode firing: • Safety firing angle ramp on first firing. • First firing delay adjustable using potentiometer on front panel.	Pollution	Degree 2 acceptable (defined by IEC 664).
		Humidity	RH 5% to 95%, non-condensing, non-streaming.
Emitted interference reduction	Internal EMC filter for 'burst mode' : ratings ≤ 40 A: standard ratings 63 A to 100 A: optional.	Protection	IP20 without adding additional protection.
		Thyristor protection	Overvoltage category 3 (defined by IEC 664). Varistor and RC snubber. High speed fuse: • rating ≤ 100 A: external • rating ≥ 125 A: internal.
			No fuse for short wave infrared elements in firing at zero crossings or in phase angle firing mode without current limit.
		Signalling	Electronics supply present: green 'ON' LED. Thyristor firing request: green 'HEAT' LED.
		CE labelling	Complies with the essential requirements of the European Low Voltage Directive 73/23 EEC (93/68 EEC).
		EMC	Complies with EMC standard tests, enabling systems which incorporate 7100A products to be declared compliant with the EMC directive 89/336/EEC with respect to the 7100A products.

Dimensions

CODES (see coding) :

A Options : V2, OL, XFMR

B Options : DLF, GRF, I2, V2I2, V2CL

C Options : ICO, VICL, VII2,

DLF/GRF + I2,

DLF/GRF + V2I2,

DLF/GRF + V2CL

Rating (A)	Height (mm)	Width (mm)			Depth (mm)			Max. weight (kg)
		Basic or A Options	B Options or A + B	C Options or A + C	Basic or A Options	B Options or A + B	C Options or A + C	
16 to 40	156	52.5	52.5	70	193	218	238	0.8
63	156	70	70	70	213	238	238	1.9
80 and 100	226	96	96	96	215	243	243	2.2

Coding:	Ratings										Options									
	7100A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

Ratings

1. Nominal current	Code	2. Nominal voltage	Code	3. Power supply for electronics	Code
16 amps	16A	100 volts	100V	Self-powered	
25 amps	25A	115 volts	115V	(100 V to 500 V only)	SELF
40 amps	40A	120 volts	120V	External 115 V supply	115V
63 amps	63A	127 volts	127V	External 230 V supply	230V
80 amps	80A	200 volts	200V		
100 amps	100A	230 volts	230V		
125 amps	125A*	277 volts	277V		
160 amps	160A*	400 volts	400V		
200 amps	200A*	460 volts	460V		
250 amps	250A*	480 volts	480V		
315 amps	315A*	500 volts	500V		
400 amps	400A*	690 volts	690V*		
500 amps	500A*				
630 amps	630A*				

Basic selection

5. Thyristor fuse	Code	7. Internal EMC filter	Code	9. Manual language	Code
Fuse without fuse blown microswitch	FUSE	'Phase angle' or ratings ≥ 125 A: no filter	XXXX	French	FRA
Fuse with fuse blown microswitch	MSFU	'Burst mode' or 'Single-cycle'		English	ENG
No fuse (<i>short wave infrared elements</i>)	NONE	16 A to 40 A: filter as standard	FILT	German *	GER
		63 A to 100 A: with filter	FILT		
		no filter	NONE		

6. Firing mode	Code	8. Input	Code	10. Selected options	Code
'Phase angle'	PA	Analogue signal:		Base version:	
'Burst mode':		current from 0 mA to 20 mA	0mA20	No options,	
base time 16 cycles	C16	current from 4 mA to 20 mA	4mA20	Standard V ² control	
base time 64 cycles	C64	voltage from 0 V to 5 V	0V5	End of code	NONE
'Single-cycle': 1 base cycle	FC1	voltage from 0 V to 10 V	0V10	Version with options:	
'Advanced single-cycle': 1 base cycle				Selection of options	YES
non-firing by half cycles	ASC				

Options for Phase Angle firing

11. Control options	Code
Voltage control (V ²)	V2
Current control (I ²)	I2
Current limit by control transfer (V ² to I ²)	V2I2
Current limit by control transfer (V×I to I ²)	VII2
Open loop	OL

12. Delay on first firing	Code
No delay on first firing	XXXX

13. Type 1 alarms	Code
Serious Alarms: thyristor short-circuit, total load failure, over-temperature for ratings ≥ 125 A	GRF
Partial load failure and Serious Alarms	DLF
No alarms	NONE

14. Load type	Code
With DLF option: Short wave infrared elements	SWIR
Low temperature coefficient load	LTCL
Without DLF option or High temperature coefficient load	XXXX

15. Type 2 alarms	Code
No over-current alarm	XXXX

16. Alarm relay contact	Code
With alarm option: Contact closed on alarm	NC
Contact open on alarm	NO
Without alarm option	XX

Options for Burst / Single-Cycle firing

11. Control options	Code
Voltage control (V ²)	V2
Burst firing C16 only:	
Voltage control (V ²) and current limit	V2CL
Power control (V×I) and current limit	VICL

12. Delay on first firing	Code
Burst firing C16 or C64 : Transformer primary	XFMR
Other configurations	NONE
Single-cycle (FC1/ASC)	XXXX

13. Type 1 alarms	Code
Serious Alarms: thyristor short-circuit, total load failure, over-temperature for ratings ≥ 125 A	GRF
Partial load failure and Serious Alarms	DLF
No alarms	NONE

14. Load type	Code
With DLF option: Short wave infrared elements	SWIR
Low temperature coefficient load	LTCL
Without DLF option or High temperature coefficient load	XXXX

15. Type 2 alarms	Code
Over-current alarm (<i>for DLF option</i>)	
except codes: SWIR , XFMR , VICL and V2CL	ICO
No over-current alarm	NONE

16. Alarm relay contact	Code
With alarm option: Contact closed on alarm	NC
Contact open on alarm	NO
Without alarm option	XX

Communication and Certification

17 / 18 Communication options *	Code	19. Certification option	Code
Available later	NONE	No certificate of 'Compliance with Order'	NONE
		Certificate of 'Compliance with Order'	CFMC

* Available later

SAFETY DURING USE

- Eurotherm Limited shall not be held responsible for any damage, injury, losses or expenses caused by inappropriate use of the product or failure to comply with this manual.
- The protective earth must be connected before any other connections are made and should be the last cable to be disconnected.
- The high speed fuse merely protects the thyristors. A suitable device must be fitted to protect the installation and isolate it from the supply, in accordance with applicable standards.
- The user must not attempt to access internal parts. Disconnect the unit before disassembling.
- Avoid touching the heatsink when the unit is operating and for 15 minutes after shutting down.

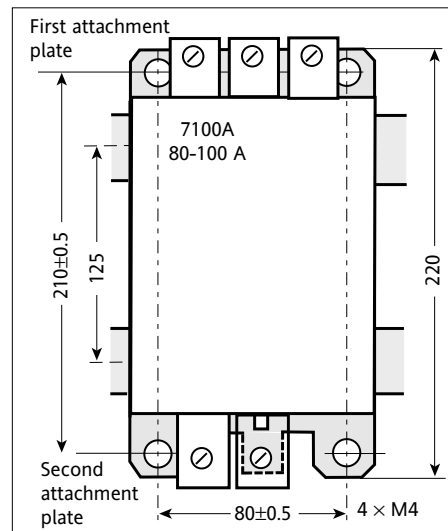
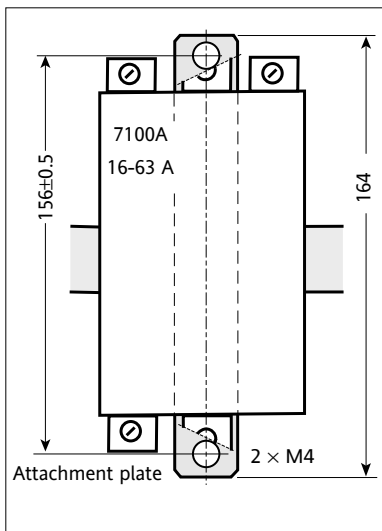
MOUNTING using attachment plate

Layout:

Leave a gap of at least 10 mm between adjacent units.
Arrange units such that air from one unit is not drawn in by the unit above.

Mounting type: DIN rail or bulkhead mounting
(≥ 125A bulkhead mounting only).

Rating A	Attachment plate	Mounting	
		Symmetric DIN rails	Bulkhead
		EN 50022 rails	Attachment screws
16 to 63	1 vertical plate	1 rail	2 × M4
80 and 100	2 horizontal plates	2 rails	4 × M4



WIRING

Power terminals (cage terminals):
supply: U1 and V1; load: U2 and V2;
protective earth: PE

Rating A	Terminal capacity mm ² / AWG	Tightening torque Nm
16 to 25	2.5 / 13 to 6 / 9	1.2
40 to 63	6 / 9 to 16 / 5	1.8
80 to 100	16 / 5 to 35 / 2	3.8

The cross-section of conductors must correspond to the IEC 943 standard.

Control terminals

Terminal block	Terminal			
	No.	Label	Purpose	
ANA.IN	31	0VA	0 V analogue signal	Base
	32	RI	+ analogue signal	
	33	5VA	5 V user supply	
AUX	16	230	Auxiliary 230 V	
	17	115	or 115 V supply	
	18	N	Neutral or 2 nd phase	
DIG.IN	61	0VD	0 V logic signal	
	62	ACK	Acknowledgement	
	63	5VD	5 V user supply	
ALARM	71	1a	Alarm relay	Alarm Options
	72	1b	contacts	
ADJ.CAL	66	0VC	0 V calibration	VI** options
	67	HRC	Calibration control	

Capacity of ANA.IN; DIG.IN; ADJ/CAL terminals:
1.5 mm² / 16 AWG; tightening torque: 0.5 Nm.
Capacity of AUX; ALARM terminals:
2.5 mm² / 14 AWG; tightening torque: 0.7 Nm

Fuse without microswitch reference (code FUSE)

Rating	Fuse	With fuse-holder / Dimensions (mm) H x W x D
16 A	CH260024	FU1038/16A 81 x 17,5 x 94
25 A	CH260034	FU1038/25A 81 x 17,5 x 94
40 A	CH330054	FU1451/40A 97 x 26,5 x 86
63 A	CS173087U080	FU2258/63A 128 x 35 x 90
80 A	CS173087U100	FU2258/80A 128 x 35 x 90
100 A	CS173246U125	FU2760/100A 240 x 38 x 107

Fuse with microswitch reference (code MSFU)

Rating	Fuse	With fuse-holder / Dimensions (mm) H x W x D
16 A	CS176513U020	MSFU1451/16A 110 x 26,5 x 94
25 A	CS176513U032	MSFU1451/25A 110 x 26,5 x 94
40 A	CS176513U050	MSFU1451/40A 110 x 26,5 x 94
63 A	CS176461U080	MSFU2258/63A 127,5 x 35 x 96,5
80 A	CS176461U100	MSFU2258/80A 127,5 x 35 x 96,5
100 A	CS173246U125	MSFU2760/100A 240 x 53 x 107

CONNECTION DIAGRAM

