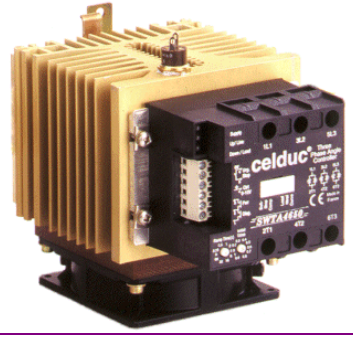


DIGITAL THREE PHASE ANGLE CONTROLLER

- ▶ Allows to set the voltage applied to different sort of loads with 3 wires, 4 wires or inside the delta wiring:
 - ▶ Resistive (Bulbs, UV and IR lamps, ovens, ...),
 - ▶ Inductive (inductors, transformers, ...),
 - ▶ Motor (motorfan speed control (60 to 100% from the nominal speed),
 - ▶ Rectified (power supplies, ...).
- ▶ Small housing, easy and ready to use.
- ▶ Large mains frequency and voltage range.
- ▶ Fully optoisolated full cycle three phase phase angle controller (balanced currents, less harmonics, ...)
- ▶ Dynamic control voltage range according to the power factor of the load.
- ▶ Softstart and softstop functions (increase lifetime expectancy of the load).
- ▶ Adjustable filter regarding fast input voltage changes (ramps).
- ▶ Motor softstarting functions to control its speed within the stable area.
- ▶ Input-output transfert characteristic linearization function (resistive load).
- ▶ Diagnostic features : Status given on LED and AC/DC switches.

SWTA4650



Proportionnal analog voltage control input

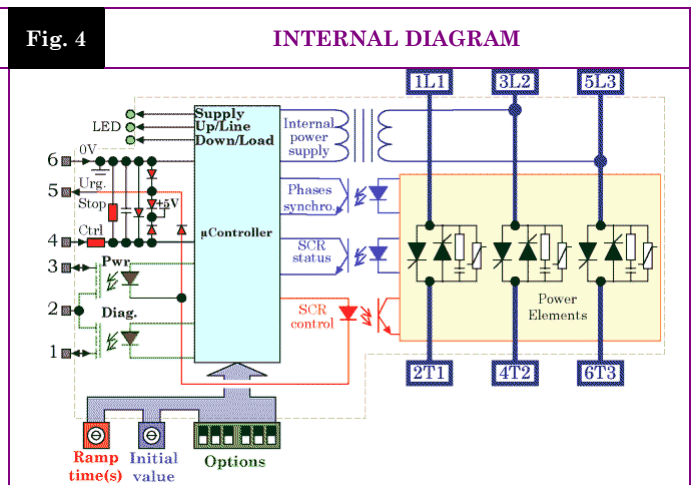
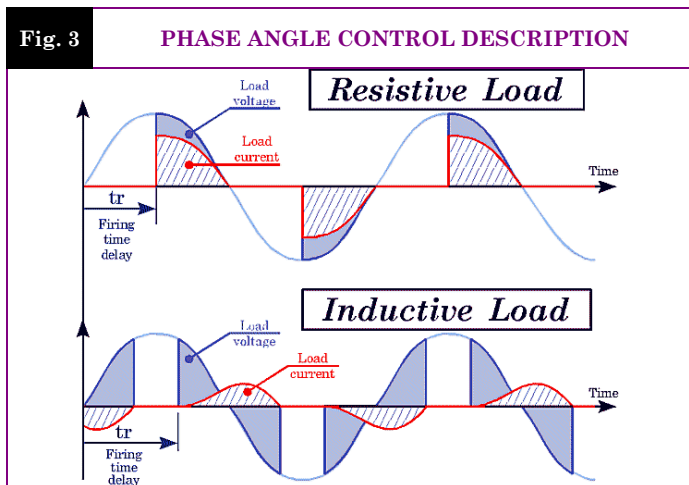
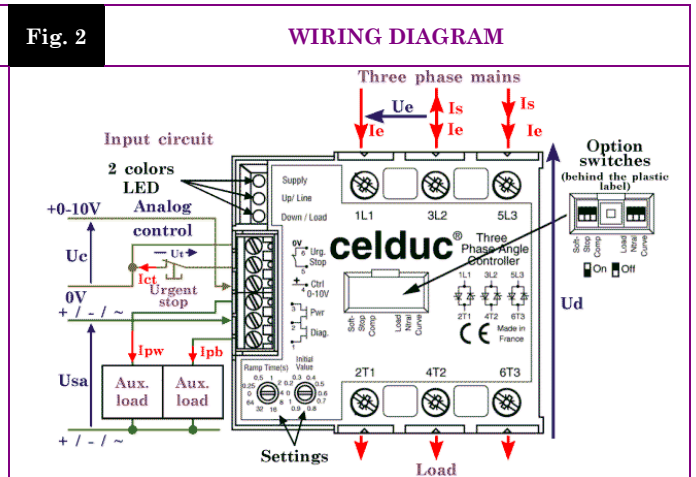
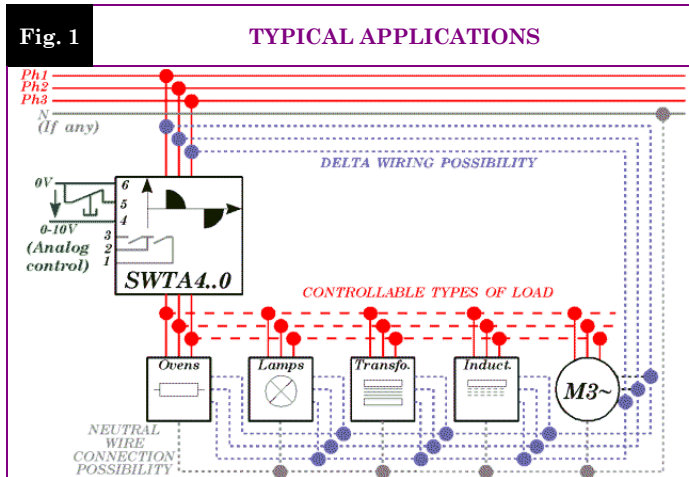
0-10V

200->480VAC

50A AC-51 @40°C

(heatsink fan voltage = 230VAC)

Mains Voltage	Mains Frequency	Max AC-51 Current	Max AC-53a Current	Control Input	Status Outputs	In / Out Insulation	Wire Size	Dimensions (WxHxD)	Weight
200 to 480VAC	40 to 65Hz	50A (70A) @40°C	30A @40°C	0-10VDC	0 to 24VDC 1A AC/DC	4kV	In=2.5mm ² Out=10mm ²	110x141x180 (mm)	2600g



Proud to serve you

SETTINGS

SETTINGS AND OPTIONS	Label	“Ramp Time (s)”	“Initial Value”	“Soft Stop”	“Comp”	“Load”	“Ntrl”	“Curve”
	Description							
	Function	Ramp up time (Softstart and smooth transients)	Initial load voltage (footstep)	Ramp down time	Allows to adapt the control signal range whatever the power factor of the load	Ask the unit to make a softstart up to the max. before analog control.	Tells the unit the load star point is connected to the mains neutral	Tells the unit what kind of in-out response to use (angle or RMS voltage linearity)
	Setting possibilities	Ts= 0 to 64s	Vi=0 to 100 %	0 x ts = 	On (Up)	On (Up)	On (Up)	On (Up)
	White squares = buttons Example : 			0.5 x ts = 	Inductive load	Motor	Star wiring with neutral (4 wires)	RMS voltage control
= all switches down (OFF) (factory setting)	ts = 			Off (Down)	Off (Down)	Off (Down)	Off (Down)	
	2 x ts = 			Resistive load	Other loads than motors	Delta or star without neutral	Phase angle control	

INPUT CHARACTERISTICS

INPUT CIRCUIT	CHARACTERISTIC	LABEL	VALUE		INFO.
	Labels			“0-10V”	“Urg. Stop”
Function			Analog control input	Stop the thyristor controls	
Control type			DC control voltage	Opening the connection between 5 & 6	
Terminals			4 & 6	5 & 6	
Control voltage range		Uc	0-10VDC	-	
Release and control threshold voltage		Ucsmin	0.3VDC	-	
Full power threshold control voltage		Ucsmax	9.7VDC	-	
Max. input voltage		Ucmax	30VDC	6VDC	
Max. reverse voltage		-Ucmax	30VDC	6VDC	
Release voltage		Ut		>1,5V	
Input impedance		Re	100kΩ	-	See fig. 5
Current to switch		Ict	-	20mADC	Ict=f(Ut)

STATUS OUTPUTS	Labels		“Diag. “	“Pwr“	
	Terminals		1 & 2	2 & 3	
	Function		Indicates a problem detected in the circuit configuration	Indicates the load is supplied	
	Nominal operating voltage	Usan	24VAC/DC		
	Operating voltage range	Usa	0->28VAC/DC		
	Max. peak voltage	Usap	60V		
	Overvoltage protection		Built-in 25V size7 varistors		
	Minimum load current	Ipw/Ipb	0A		
	Maximum load current	Ipw/Ipb	1A AC/DC		See fig. 6
	Maximum overload current	Ipw/Ipb	2.4A AC/DC		@100ms 10% of the cycle
	On and off state switch resistance	Ron / Roff	500mΩ / 100MΩ		See fig. 6
On and off time delay	Ton / Toff	0.5ms / 2ms			

OUTPUT CHARACTERISTICS

CHARACTERISTIC	LABEL	VALUE				INFO.
		Resistive I _{thmax} AC51	Resistive I _{th} AC51	Motor I _{emax} AC53a	Motor I _e AC53a	
Mains voltage range	U _e	200 -> 480VAC				
Non-repetitive peak voltage	U _{ep}	1200V				
Oversvoltage protection	VDR	Built-in 510V size 14 varistors				
Maximum nominal currents Nota : Wire cross section limited to 10mm ² (50A) by the terminals	I _e	50A (70A)	50A (EN60947-4-3)	30A	22A (EN60947-4-2)	@40°C See fig. 7 Delta wiring : See installation manual
Maximum line currents in delta wiring	I _{Line}	87A (121A)	87A (EN60947-4-3)	52A	38A (EN60947-4-2)	
Puissance moteur max.	P _e	15kW @400VAC connexion étoile				@40°C
Non-repetitive peak overload current (1 cycle of 10ms)	ITSM	2000A				See fig. 8
Melting limit for choosing the protective fuses	I ² t	20000A ² s				@10ms
Minimum load current	I _{emin}	100mA				
Maximum leakage current	I _{elk}	7mA				@400VAC 50Hz
Power factor	Pf	0->1				
Mains frequency range	F	40->65Hz				
Max. off-state voltage rise	dv/dt	500V/μs				
Protection against fast voltage transients		Buit-in RC network				
Max. current rise	di/dt	50A/μs				
On-state voltage drop	U _d	1.4V				@I _{th}
Resistive part of the voltage drop	r _t	2mΩ				@125°C
Potential part of the voltage drop	V _{to}	0.9V				@125°C
Maximum junction temperature	T _{jmax}	125°C				
Junction/case thermal resistance per power element	R _{thjc}	0.25K/W				Total = 3 power elements
Case heatsink thermal resistance	R _{thcs}	0.05K/W				
Built-in heatsink thermal resistance vertically mounted	R _{thra}	0.3K/W				@ΔTra=60°C
Heatsink thermal time constant	T _{thra}	15min				@ΔTra=60°C
Inputs/power outputs insulation voltage	U _{imp}	4kV				
Input/status outputs insulation voltage	U _{ied}	2.5kV				
Inputs/case insulation voltage	U _{imp}	4kV				
Status outputs/case insulation voltage	U _{imp}	4kV				
Isolation resistance	R _{io}	1GΩ				
Isolation capacitance	C _{io}	<8pF				
Storage ambient temperature	T _{stg}	-40->+100°C				
Operating ambient temperature	T _{amb}	-40->+90°C				See fig. 7
Max. heatsink temperature	T _c	100°C				

POWER CIRCUIT

INTERNAL POWER SUPPLY

INTERNAL POWER SUPPLY	CHARACTERISTIC	LABEL	VALUE	INFO.
	Terminals		3L2 & 5L3	
	Mains voltage range	Ue	200->480VAC	
	Consumption	Is	1mA typical	
	Mains frequency range	F	40-65Hz	
	Turn-on time	tm	100ms	

GENERAL INFORMATION

CONNEC- TIONS	Connections		Power	Input terminal block	
	Screwdriver advised		Posidriv 2 or 0.8 x 5.5mm	0.8 x 2mm	
	Min and max tightening torque		1.8->3N.m		
	Number and cross section of the wires		2 x 1.5->6mm ² (10mm ² without ferrule)	1 x 2.5mm ²	
	Screwdriver for settings		0.8 x 2mm		
MISC.	Housing		UL94V0		
	Mounting		Omega DIN rail (DIN50022) or screwed		
	Noise level		Low audible vibrations		
	Weight		2600g		

STANDARDS

GENERAL	Standards	EN60947-4-2 & EN60947-4-3
	Protection level	IP2L0
	Protection against direct touch	Accordin to V.D.E. 160 part 100 : Back hand and finger safety
	CE marking	Yes
	UL, cULUS and VDE approvals	Pending

E.M.C. IMMUNITY	TYPE OF TEST	STANDARD	LEVEL	EFFECT
	E.S.D. (Electrostatic discharges)	EN61000-4-2	8kV (air) 4kV (touch)	No effect
	Radiated electromagnetic fields	EN61000-4-3	10V/m	No effect
	Fast transients bursts	EN61000-4-4	2kV direct coupling on the power side 2kV coupling by clamp on the input side	No effect
	Electric chocks	EN61000-4-5	1kV direct coupling differential mode (input and output) 2kV direct coupling common mode (input and output)	No effect
	Voltage drop	EN61000-4-11	-	

E.M.C. EMISSION	Radiated and conducted disturbances	NFEN55011	<p>The conducted or radiated disturbances generated by solid state relays depend on the wiring and load configuration.</p> <p>The test method recommended by the European standards and concerning electromagnetic compatibility leading to results far from reality, we decided to advise our customer in order to adapt their filtering scheme to their application.</p> <p>Please refer to the SVTA – SWTA installation manual.</p>

CHARACTERISTIC CURVES

Fig. 5 INPUT CHARACTERISTIC

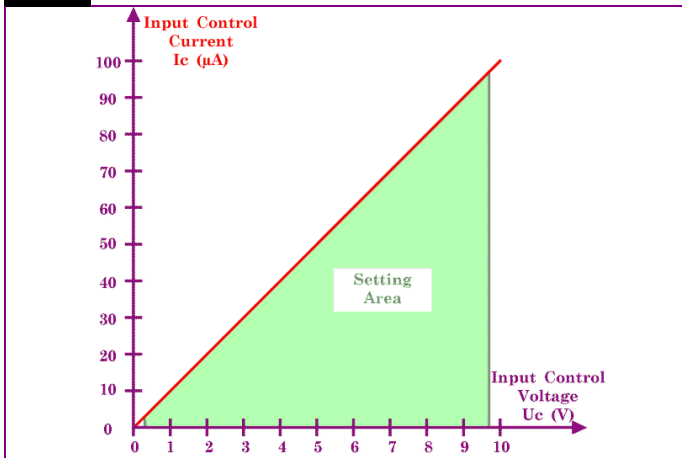


Fig. 6 CURRENT AND ON RESISTANCE VS TEMPERATURE

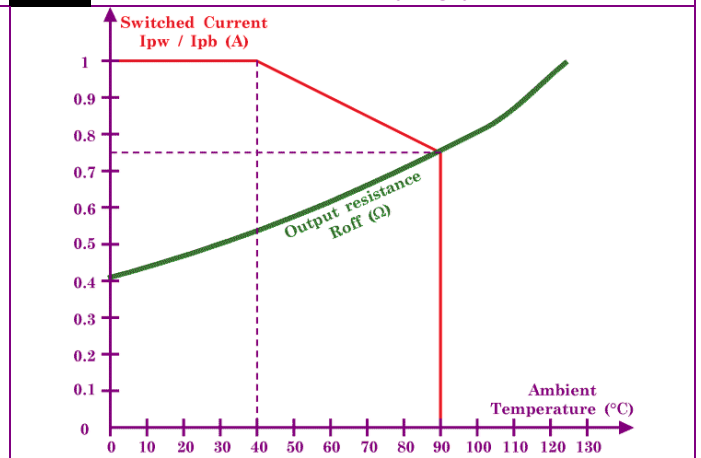


Fig. 7 POWER DISSIPATED AND LOAD CURRENT LIMIT VS TEMPERATURE

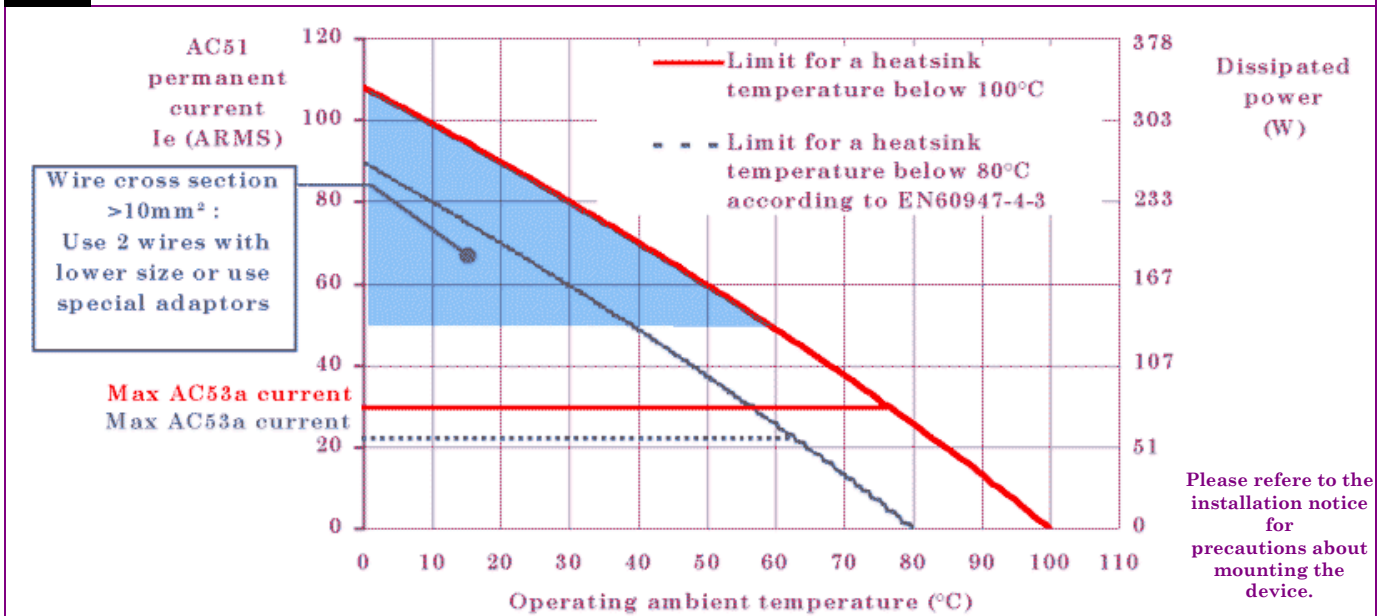
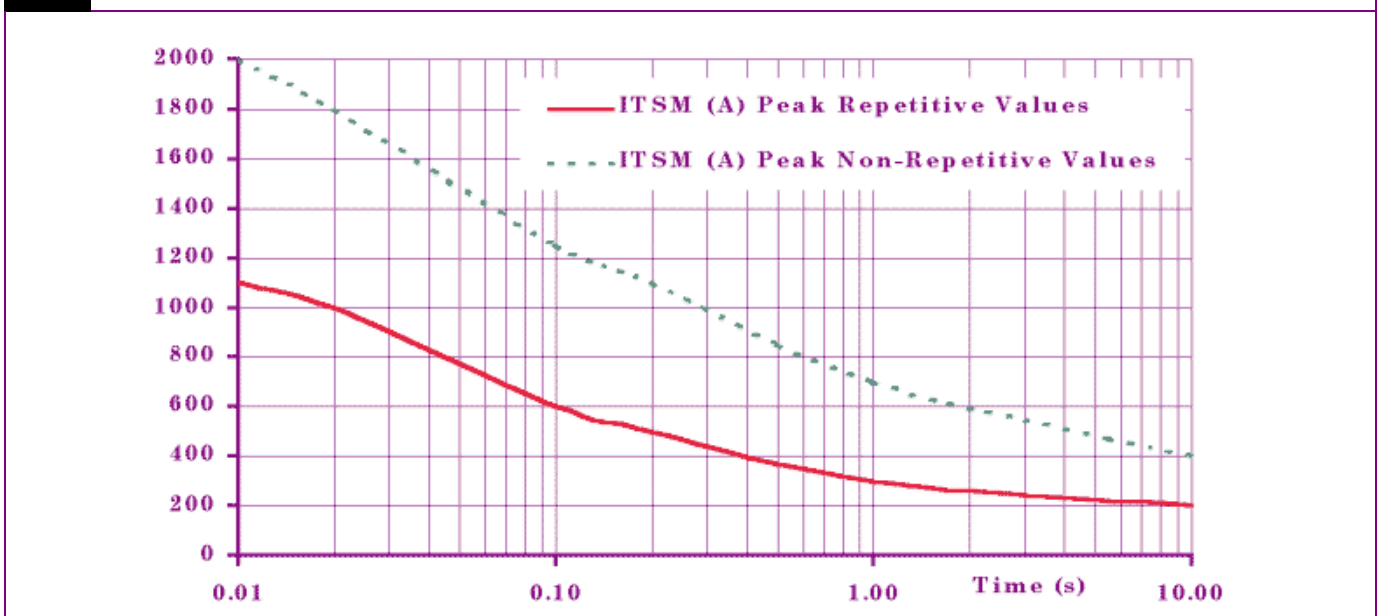


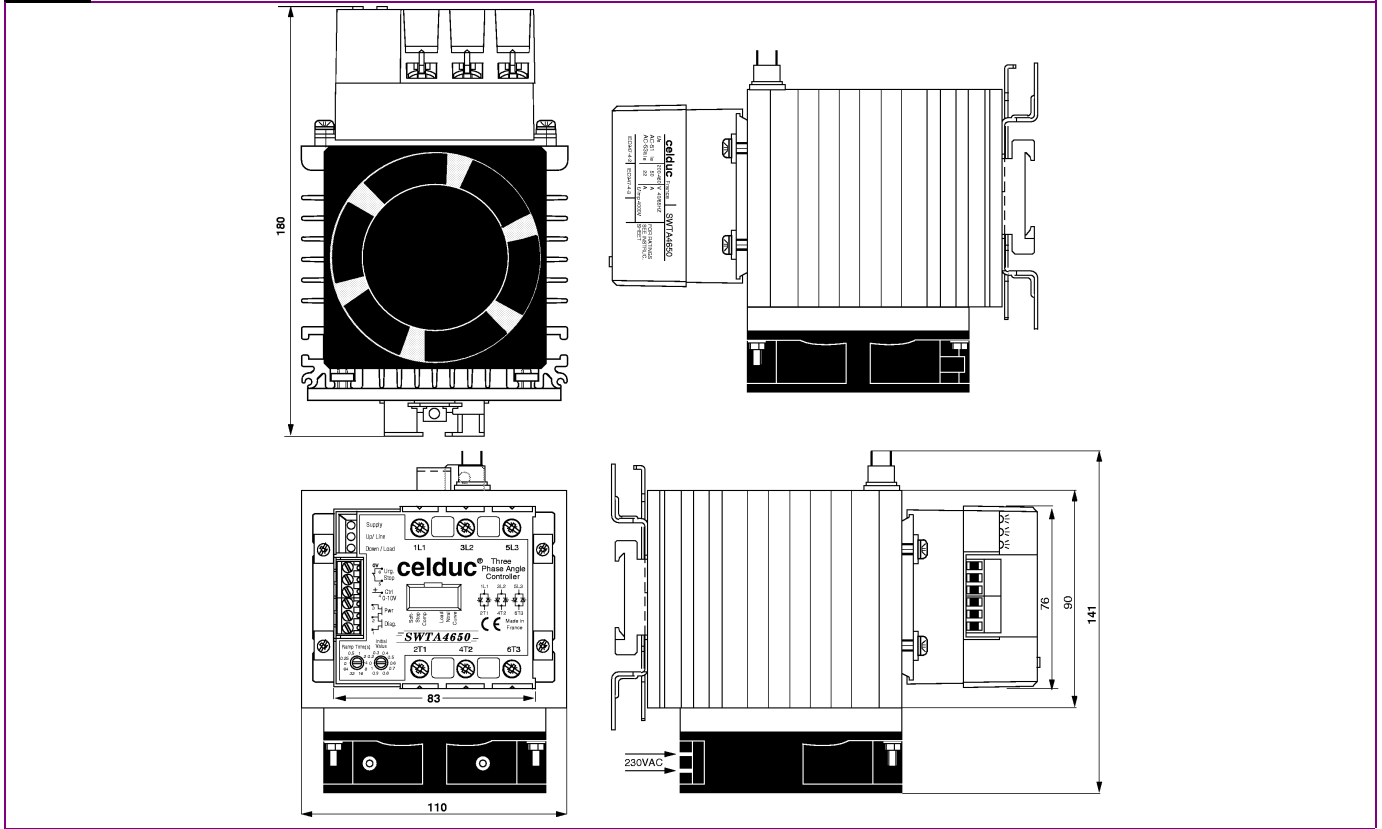
Fig. 8 CURRENT OVERLOAD CHARACTERISTIC (ITSM PER POWER ELEMENT)



DIMENSIONS AND ACCESSORIES

Fig. 9

DIMENSIONS



	CHARACTERISTIC	LABEL	VALUE	INFO.
THERMAL PROTECTION	Contact type		Normally closed	
	Closing temperature		90°C +/-3°C	
	Opening temperature		80°C	
	Nominal voltage		250VAC/DC	
	Nominal current		6A	
	Contact resistance		10mΩ	
	Insulation between opened contacts		10GΩ	
	Insulation between housing and contacts		4kV	
	Isolation resistance		10GΩ	
	Connections		2.8mm flat tabs or welded wires	
FAN	Motor		Shaded pole induction motor	
	Supply voltage		230VAC	
	Consumption		9W 68mA	
	Supply frequency		50->60Hz	
	Speed		2600 RPM	
	Noise level		35dbA	
	Connections		2.8mm flat tabs	



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