

**New Solid State Relay compact size
pitch 22,5mm with spring terminals**

SIR852160-WJ

Output : 12-440VAC 20A(*)
Input : 4-30VDC

- ❑ Ready to use Single-Phase Relay: " Install it & Forget it!"
- ❑ Zero cross model : 12-440VAC 25A(*) alternistor on output. I^2t value > 312A²s .
- ❑ Quick connection : Spring terminals (2,5mm² : 16A max)
- ❑ Specially design for AC-51 resistive loads
- ❑ 4-30VDC control with LED
- ❑ IP20 housing
- ❑ Low leakage current (<1mA) and low zero cross voltage (<10V)
- ❑ Mounting and dismounting on DIN rail without any tool or directly mountable on panel.
- ❑ Designed in conformity with EN60947-4-3 (IEC947-4-3)-UL-cUL pending



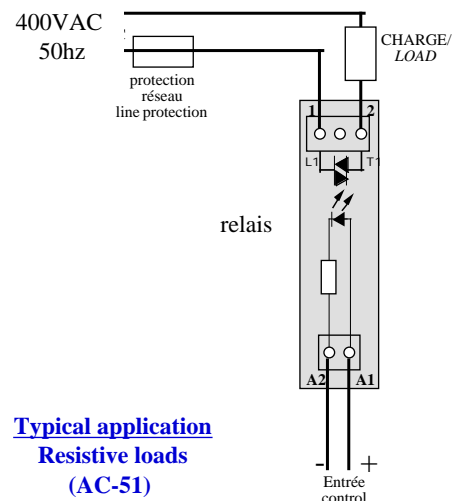
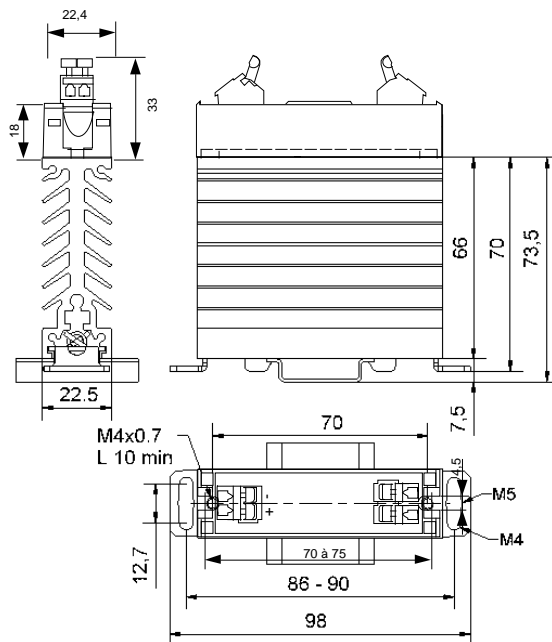
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(*) see conditions (thermal curve page 3)

16A : Limited by terminals

Dimensions :



Typical application
Resistive loads
(AC-51)
230 or 400 VAC

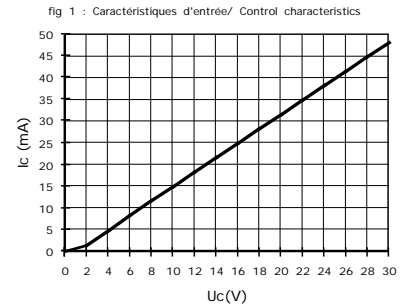
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Control characteristics (at 25°C)

Paramètre / Parameter	Symbole	DC			Unit
		Min	Nom	Max	
Control voltage	Uc	4	24	30	V
Control current (@ Uc)	Ic	4	courbe	48	mA
Release voltage	Uc off	1			V
Input internal resistor fig.1	Rc		600		
Reverse voltage	Urv		30		V
Input LED			green		

Input : Ic = f(Uc)



Output characteristics (at 20°C)

Parameter	Conditions	Symbol	Typ.	Unit
Load voltage		Ue	400	V rms
Operating range		Uemin-max	12-440	V rms
Peak voltage		Up	800	V
Clamping voltage		Uclamp		
Zero cross level		Usync	10	V
Latching voltage	Ie nom	Ua	8	V
AC-51 nominal current : permanent (terminals limitation)	(voir Fig. 2)	Ie AC-51	20 (16A)	A rms
		Ie AC-53		
Non repetitive overload current	tp=10ms (Fig. 3)	Itsm	250	A
On state voltage drop (typical value)	@ 25°C	Vt	0,85	V
Dynamic resistance (typical value)		rt	15	m
Output Power dissipation (typical value)		Pd	0,76xIe+0,015xIe ²	
Thermal resistance between junction to air : calm air (ventilation in the cabinet)	(see Fig. 2)	Rthj/a	3,8 (3,3)	K/W
Off state leakage current	@Ue, 50Hz	Iik	<1	mA
Minimum load current		Iemin	5	mA
Turn on time	Uc nom DC ,f=50Hz	ton max	10	ms
Turn off time	Uc nom DC ,f=50Hz	toff max	10	ms
Operating frequency range		f	0,1-440	Hz
Off state dv/dt		dv/dt	200	V/µs
Maximum di/dt non repetitive		di/dt	50	A/µs
I _{2t} (<10ms)		I ² _t	312	A ² s
Conducted immunity level	IEC 1000-4-4 (burst)		2kV criterion B	
Conducted immunity level				
Short circuit protection	FERRAZ		gRC 25A 14x51 165A ² s	

General characteristics (at 20°C)

Input-output isolation @500m	Ui	4000	VRMS
Output-case isolation @500m	Ui	2500	VRMS
Insulation resistance	Ri	100 (@500VDC)	M
Rated impulse voltage	Uimp	4000	V
Protection level / CEI529	-	IP20	
Pollution degree	-	2	
Vibration resistance 10 -55 Hz according to CEI68 :	-	1,5	mm
Shocks resistance according to CEI68 (on DIN rail / with screws)	-	30/50	g
Ambient temperature (with no icing or condensation)	-	-30 /+80	°C
Storage temperature (with no icing or condensation)	-	-30/+100	°C
Ambient humidity	HR	40 à 85%	
Weight		260	g
Conformity		EN60947-4-3 (IEC947-4-3)	
Conformity		UL/cUL pending	



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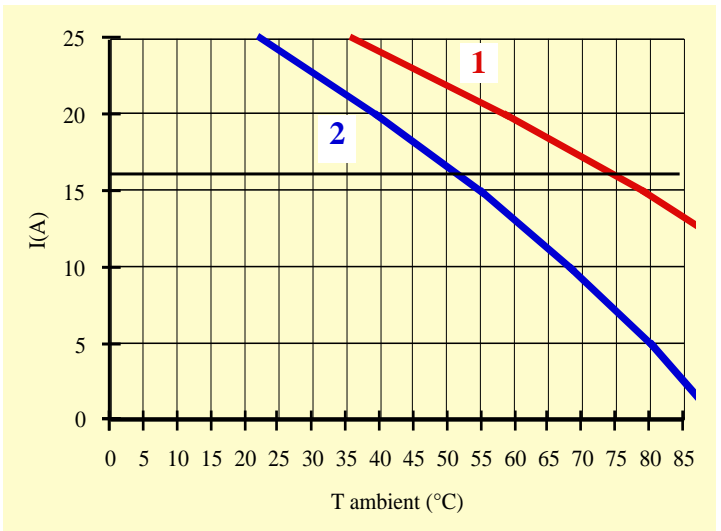
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Thermal specifications .

Current according ambient temperature :

- **The curve "1"** gives the limits of the product.
The temperature reached are acceptable for the components. These values are in compliance with most of SSRs manufacturers.
In a cabinet with a minimum of ventilation or a non permanent current, these values are correct.
- **The curve "2"** gives the limits of the product according to EN60947-4-3 with a maximum rise temperature of 50°C (@40°C) for a permanent working and in air calm (test during 8 hours).
- For a non permanent current, you can calculate the average power = Pd x duty cycle and check the rise temperature : $\Delta T_j = Pd \times R_{thj/a}$ (Pd and Rthj/a are given page 2). The junction temperature must not exceed 125°C at the maximum ambient temperature. **The maximum current is limited to the size of the alternistor = 25A.**
- The thermal constant (Cth) of the product is 7 minutes. That means the rise temperature is only 63% of the stabilized temperature after a running time of 7 minutes.



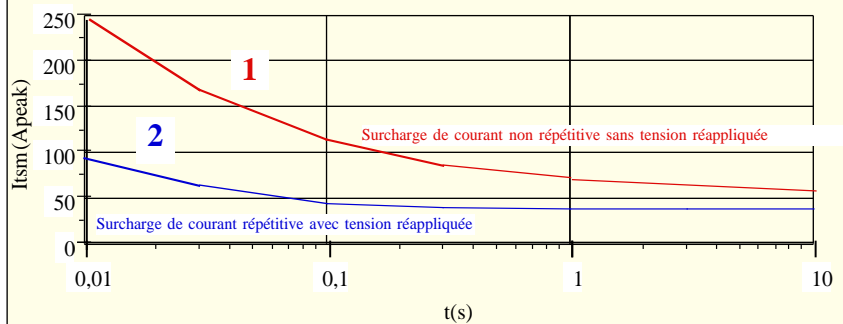
terminal limit : 16A

fig 2

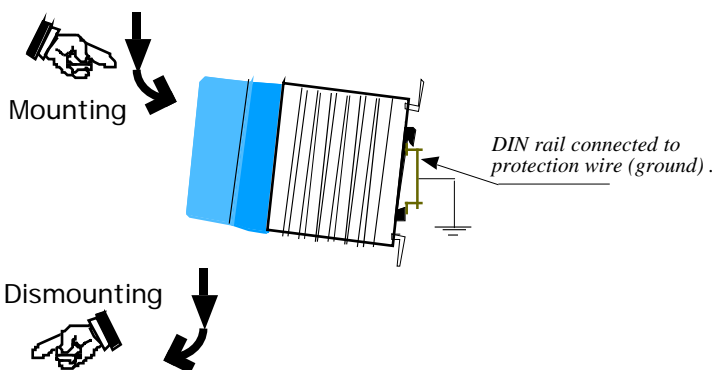
Overload current .

- 1 - **No repetitive I_{tsm}** is given without voltage reapplied . This curve is used for the determination of the protection.
- 2 - **Repetitive I_{tsm}** is given for inrush current with initial T_j = 70°C. In normal working , this curve musn't be exceed. Be carefull, the repetition of the surge current decrease the lifetime SSR's .

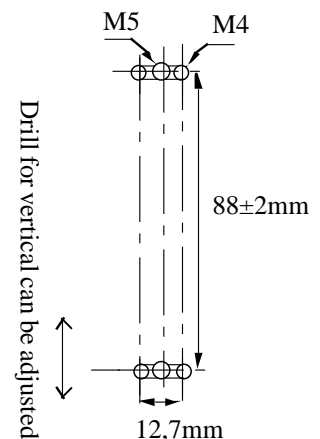
Fig.3 Surcharge de courant : I_{tsm} (Apeak) = f(t) pour modèle 25A (I_{tsm}=250A) /



Mounting and dismounting on DIN rail without any tool.




Panel Mounting



➤ **Warning !** semiconductor relays don't provide any galvanic insulation between the load and the mains. Always use in conjunction with an adapted circuit breaker with isolation feature or a similar device in order to ensure a reliable isolation in the event of wrong function and when the relay must be insulated from the mains (maintenance ; if not used for a long duration ...).



Connections .

Is/wires	outillage/tool
 1 x(0,14-->2,5mm ²) 1 x(22-->12AWG) L = 6mm	tournevis ou doigts/ screwdriver or fingers

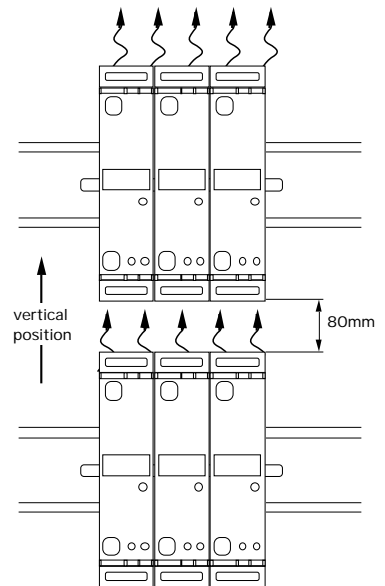


Mounting

➤ **Warning :** only in vertical position. The user should protect heat sensitive materials as well as persons against any contacts with the heatsink. For non vertical mounting , the load current must be 50% lower than the rated one . For a good cooling, the SSR needs an air convection. Less convection air produces an abnormal heating. Keep a distance between the upper SSR and the lower SSR. In case of no space between two SSR (zero space between two SSRs) , please reduce the load current. For further details refer to below :

➤ **Derating current with no space between SSRs**

AC-51 nominal currents are given with a space of 22,5mm between each SSR, for a permanent current during a minimum time of 8 hours in air calm according to IEC60947-4-3. In case of non permanent currents or in case of SSRs are mounted with no space, you must check the heatsink temperature never exceed 90°C. When the SSRs are mounted side to side (no space between each relay) a derating current of 25% must be take into account. A forced cooling (fan inside the cabinet) improves significantly the thermal performances.



Typical application : LOADS

LOADS

This SIR product is designed mainly for AC-51 résistive load.

Protection :

To protect the SSR against a short-circuit of the load , use a fuse with a I^2t value = $1/2 I^2t$ value specified page 2. A test has been made with FERRAZ fuse (see page 2). It is possible to protect SSR by MCB (miniature circuit breaker). In this case, see application note (SSR protection) and use a SSR with high I^2t value (5000A²s minimum)

EMC :

➤ **Immunity :**

We give in our data-sheets, the immunity level of our SSRs according to the main standards for this type of products : EN61000-4-4 & 5. You can see the high immunity level in comparison with the products on the market.

➤ **Emission:**

SSRs are complex devices which must be interconnected with other equipment (loads, cables,etc.) to form a system. Because the other equipment or the interconnections may not be under the control of celduc, it shall be the responsibility of the system integrator to ensure that systems containing SSRs comply with the requirements of any rules and regulations applicable at the system level. The very low zero cross voltage (<10V) improves the conducted emission level in comparison with most of SSR on the market with zero cross voltage higher than 25V. Consult celduc laboratory which can make some tests in your application.



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