celpac®

PRELIMINARY

SA842070

输出/OUTPUT：12-275VAC 25A
输入/INPUT：3V-32VDC

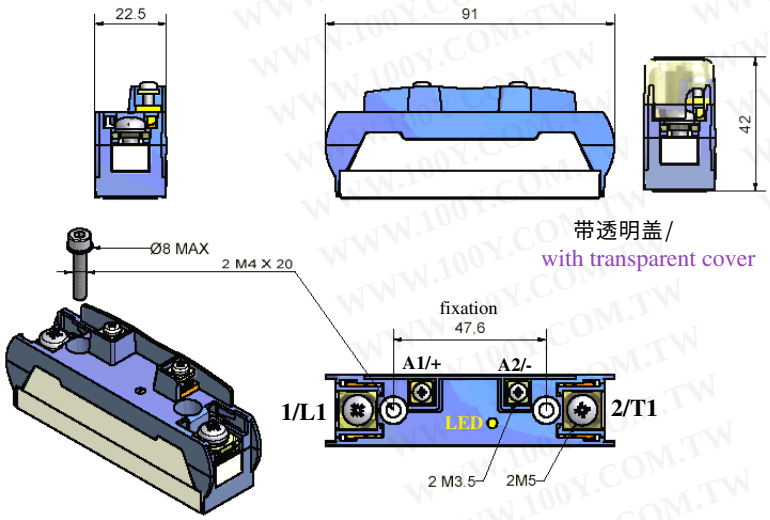
功 率 固 态 继 电 器
Power Solid State Relay

- ❑ 22.5mm宽的固态继电器采用了节省空间的设计
  安装尺寸和“hockey puck"固态继电器完全兼容（安装孔中心距为47.6mm）
  被设计用于大部分类型负载的过零触发固态继电器
  22,5mm Pitch Solid State Relay for space-saving design. Mounting compatible with sandard "hockey puck" SSRs (47,6mm between screws) Zero Cross Solid State Relay designed for most of loads.
- ❑ 功率输出 12到275VAC 25A ，内置电压保护.
  *Power output **12 to 275VAC 25A with internal voltage protection** .*
- ❑ 大的控制范围：3-32VDC,有电流限制器
  输入端由可见的黄色LED指示
  输入有过电压保护

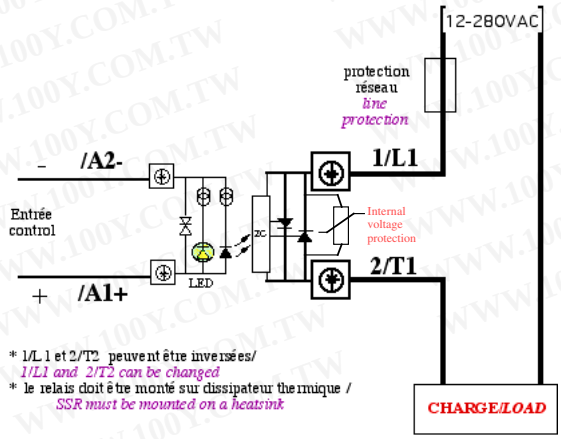
  *Large control range: **3 -32VDC** with input current limiter.*
  Yellow LED visualization on the input.
  Input over-voltage protection.
- ❑ 有IP20保护盖（1K522000)或可选的翼式盖
  IP20 protection with cover (1K522000) or in option by flaps
- ❑ 设计符合标准EN60947-4-3(IEC947-4-3)和EN60950/VDE0805(绝缘增强)
  -UC-cUL申请中
  Designed in conformity with EN60947-4-3 (IEC947-4-3) and EN60950/VDE0805 (Reinforced Insulation) -UL-cUL pending

有透明盖可以订货/
delivered with transparent cover

尺寸/ Dimensions :



带透明盖/
with transparent cover



典型应用：
马达，灯，
加热器，...

Typical application:
Motors, lamps, heaters,....

(*) : Thermo Mechanical Stress Solution

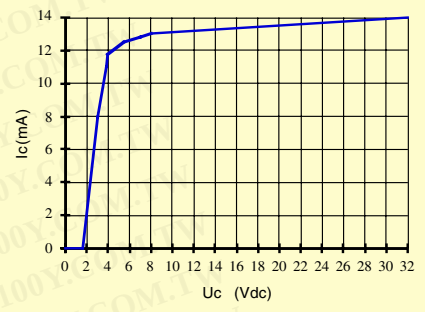
Proud to serve you

celduc® relais

控制特性/ ***Control characteristics (at 25°C)***

参数/ *Parameter*	Symbol	DC Min	DC Typ	DC Max	Unit
控制电压/ Control voltage	Uc	3	5-12-24	32	V
控制电流/ Control current (@ Uc)	Ic	<10	<14	<14	mA
释放电压/ Release voltage	Uc off	2			V
输入LED/ Input LED		jaune / yellow			
反向电压/Reverse voltage	Urv	32			V
钳位电压/ *Clamping voltage (Transil)*	Uclamp	36			V
输入免疫/ *Input immunity : EN61000-4-4*		2kV			
输入免疫 / *Input immunity : EN61000-4-5*		2KV			

Input : Ic = f(Uc)

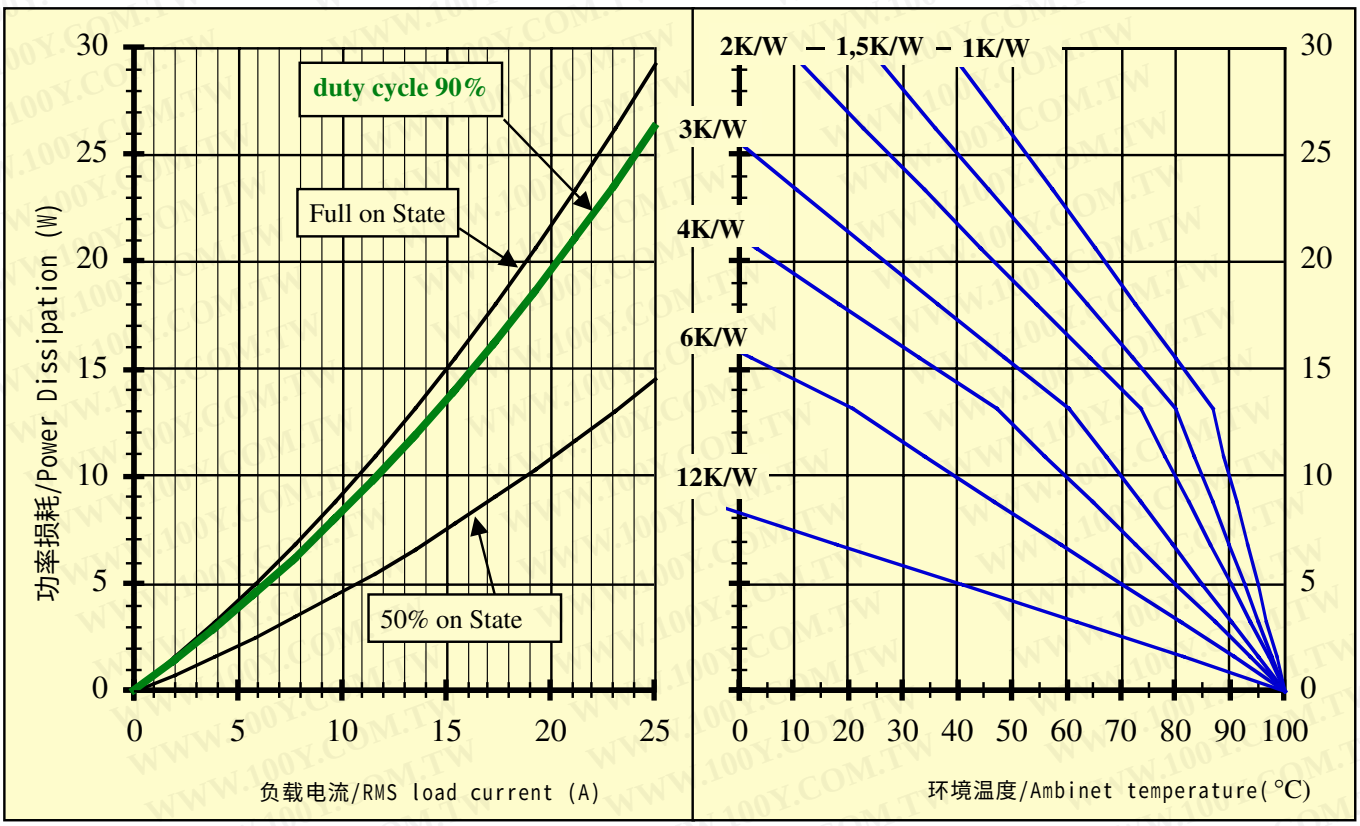


输出特性/ ***Output characteristics (at 25° C)***

参数 */ Parameter*	Conditions	Symbol	Min	Typ.	Max	Unit
工作电压范围/ *Operating voltage range*		Ue	12	230	275	V rms
峰值电压/ *Peak voltage*		Up	600 (450)			V
过零电位/ *Zero cross level*		Usync			20	V
门闩电压/ *Latching voltage*	Ie nom	Ua			10	V
额定电流/ *nominal current* (AC-51)		Ie AC-51		**25**		A rms
非重复过载电流/ *Non repetitive overload current*	tp=10ms *(Fig. 3)*	Itsm		250		A
通态电压降/ *On state voltage drop*	@ 25°C	Vt			0,85	V
通态动态电阻/ *On state dynamic resistance*		rt			16	mΩ
输出消耗功率（最大值）/ *Output power dissipation (max value)*		Pd	0,9x0,85xIe + 0,016 x Ie^2			W
连接点到外壳之间的导热电阻/ *Thermal resistance between junction to case*		Rthj/c		1,8		K/W
断态漏电流/ *Off state leakage current*	@Ue typ, 50Hz	Ilk			1	mA
最小负载电流/ *Minimum load current*		Iemin	5			mA
导通时间/ *Turn on time*	@Ue typ, 50Hz	ton max			10	ms
关断时间/ *Turn off time*	@Ue typ, 50Hz	toff max			10	ms
工作频率范围/ *Operating frequency range*	F mains	f	0,1	50-60	800	Hz
断态dv/dt / *Off state dv/dt*		dv/dt	500			V/µs
非重复最大di/dt / *Maximum di/dt non repetitive*		di/dt			50	A/µs
I2t (<10ms)		I^2t		340		A^2s
抗传导等级/ *Conducted immunity level*	IEC/EN61000-4-4 (bursts)		2kV criterion A			
抗传导等级/ *Conducted immunity level*	IEC/EN61000-4-5 (surge)		2kV criterion A			
传导和辐射干扰/ Conducted & emitted interference	IEC60947-4-3		Class A for Industrial applications			
短路保护/ *Short circuit protection*	voir/see page 5	Example	Fuse Ferraz gRC 25A/32A/50A			

通用特性/ ***General characteristics (at 25°C)***	Symbol		
输入和输出绝缘/ *Input to output insulation*	Ui	4000	VRMS
输出和外壳绝缘/ *Output to case insulation*	Ui	4000	VRMS
绝缘电阻/ *Insulation resistance*	Ri	1000 (@500VDC)	MΩ
额定冲击电压/ *Rated impulse voltage*	Uimp	4000	V
保护等级/ *Protection level* / CEI529		IP20 (with cover or flaps)	
抗震动10-55Hz / *Vibration withstand 10 -55 Hz according to IEC 60068-2-6*	10/55Hz	1,5	mm
抗冲击符合IEC60068-2-27/ *Shocks withstand according to IEC 60068-2-27*	Half sinus /11ms	30	gn
环境温度（无结冰和凝结）/ *Ambient temperature (no icing, no condensation)*	-	-40 /+80	°C
储存温度（无结冰和凝结）/ *Storage temperature (no icing, no condensation)*		-40/+125	°C
环境湿度/ *Ambient humidity*	HR	40 to 85	%
重量/ *Weight*		85	g
符合/ *Conformity*		EN60947-4-3 (IEC947-4-3)	
符合/ *Conformity*		EN60950 / UL/cUL	
外壳材料/ *Housing Material*		PA 6 UL94V0	
底板/ *Base plate*		Aluminium	

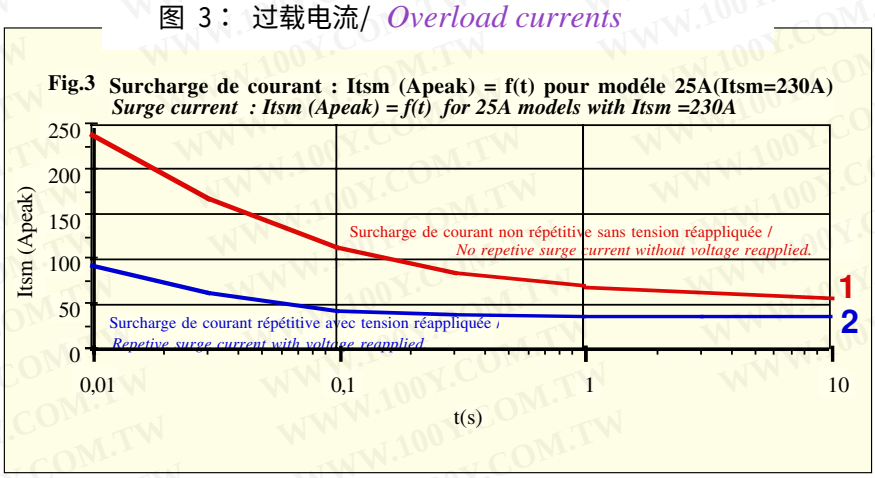
图2：导热曲线和散热器的选择/ *Thermal curves and heatsink choice*



对于额定负载电流，ON/OFF占空比，导热电阻和环境温度的功率损耗曲线.

Power Dissipation curve in compliance with nominal load current, ON/OFF duty cycle, thermal resistance of the heatsink and ambient temperature.

图 3： 过载电流/ *Overload currents*



1 - 在不能再通电时获得的非重复Itsm,这个曲线被用于确认保护（熔丝）.

1 - *No repetitive Itsm is given without voltage reapplied . This curve is used to define the protection (fuses).*

2 - 重复Itsm是初始温度 Tj =70°C 时的涌入电流，这个曲线不能被超越.

注意：重复的浪涌电流会减小固态继电器的预期寿命.

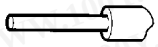
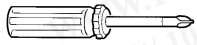
2 - *Repetitive Itsm is given for inrush current with initial Tj = 70°C. In normal operation , this curve musn't be exceeded.*
Be careful, repeated surge currents decrease life expectancy of the SSR.

-> 警告：在负载和主回路之间，半导体继电器不提供任何的电隔离,当继电器必须和主回路隔离或发生故障时确保可靠的绝缘，通常使用一个带隔离的断路器或一个类似的装置.

-> ***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 insulation in the event of wrong function and when the relay must be insulated from the mains (maintenance ; if not used for a long duration ...).*

连接/ *Connections*

celpac® 功率接线/ Power wiring

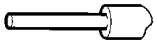
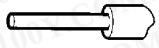
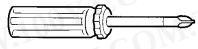
导线的数量和大小 / Number of wires				螺丝刀类型/ Screwdriver type	推荐的扭矩/ Recommended Torque
1		2			
Fil rigide (sans embout) SOLID (No ferrule)	Fil multibrins (avec embout) FINE STRANDED (With ferrule)	Fil rigide (sans embout) SOLID (No ferrule)	Fil multibrins (avec embout) FINE STRANDED (With ferrule)		M5
					N.m
1,5 ... 10 mm² AWG16....AWG8	1,5 ... 6 mm² AWG16....AWG10	1,5 ... 10 mm² AWG16....AWG8	1,5 ... 6 mm² AWG16....AWG10	POZIDRIV 2	2

带或不带压线端子的导线直接连接/
Direct connection with wires with or without ferrules

Washer for vibrations

环形压线端子/
With ring terminals

celpac® 控制接线/ Control wiring

导线的数量和大小 / Number of wires				螺丝刀类型/ Screwdriver type	推荐的扭矩/ Recommended Torque
1		2			
Fil rigide (sans embout) SOLID (No ferrule)	Fil multibrins (avec embout) FINE STRANDED (With ferrule)	Fil rigide (sans embout) SOLID (No ferrule)	Fil multibrins (avec embout) FINE STRANDED (With ferrule)		M3,5
					N.m
0,75 ... 2,5 mm²	0,75 ... 2,5 mm²	0,75 ... 2,5 mm²	0,75 ... 2,5 mm²	POZIDRIV 2 or 0,8 x5,5mm	1,2

FASTONS : 咨询我们 / *Consult us*

安装 / *Mounting:*

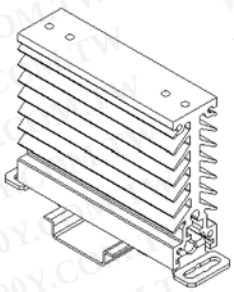
–> SA **celpac**® 固态继电器必须被安装在散热器上，有一个大的系列的散热器可以用.
见下面的举例和 . 网站上的"WF"系列散热器.

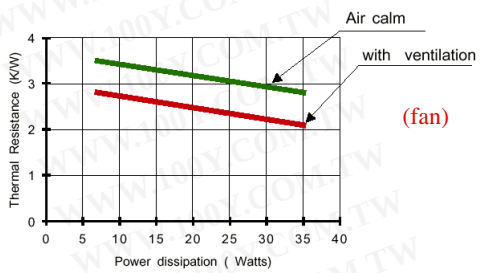
SA celpac® *SSRs must be mounted on heatsinks. A large range of heatsinks is available.*
See below some examples and "WF" range on -

–> 关于散热器的安装，必须使用导热脂.
For heatsink mounting, it is necessary to use thermal grease

使用WF311100散热器举例/ Example with a WF311100 heatsink

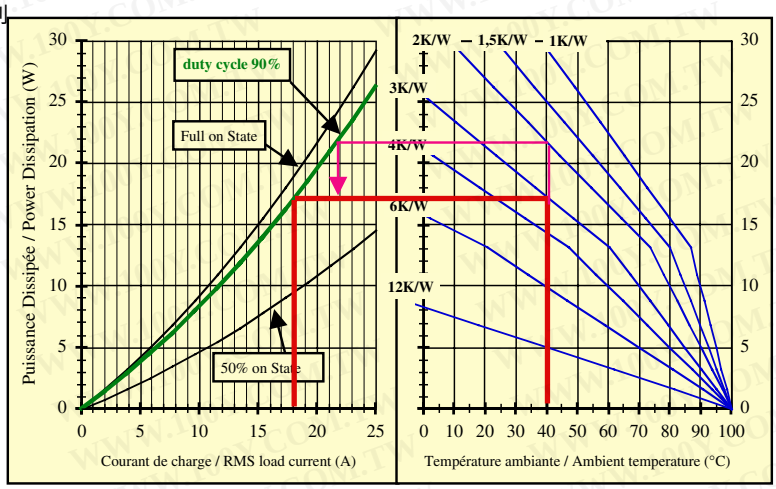
–> 散热器WF311100的热阻取决于底板必须垂直安装，SSR的限制，箱子的通风环境（风扇），通常，热阻（Rth)在2.2K/W到3.2K/W之间，具体取决于应用和安装.





Thermal resistance of WF311100 heatsink depends on mounting which must be vertical, confinement of the SSR, ventilation(fan) in the cabinet. Generally, thermal resistance (Rth) is between 2,2 à 3,2K/W depending on application and installation

根据环境温度为40° C ，通/断任务周期（通常为90%），我们能得到电流最大值，例如一个3KW热阻的散热器能驱动18A电流，事实上，一个好的通风环境（风扇），散热器热阻会减小，同时能使SSR驱动更大的电流（例如热阻为2K/W时能驱动22A电流）.



According ambient temperature (40°C in this example), ON/OFF duty cycle (often take 90%), we can determine the maximum current. In this example with an heatsink of 3K/W we can drive 18A.
In case of a good ventilation (fan) , the heatsink Rth decreases and we can use the SSR at an higher current (22A in the example with 2K/W)

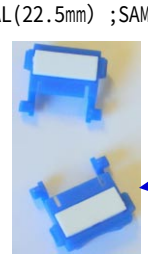
可选 */Options:*

–> **SA celpac**® 系列固态继电器能提供防止触碰的保护盖：透明的盖子（IP20）

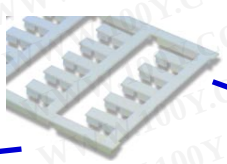
SA celpac® *SSRs are delivered with protection against touch : transparent cover (--> IP20)*
有两种类型的IP20保护盖可供选择/ 2 types of protection are possible for IP20
a) 翼型保护盖 / Flaps protection
b) 透明保护盖/ Transparent cover

标签条也是可选的，安装在翼型保护盖或透明保护盖上.
Marking labels are also possible. Mounting on flaps or transparent cover
直接可使用系列SAL(22.5mm) ;SAM(45mm) / Ready to use versions SAL (22,5mm); SAM (45mm)

翼型/ Flap
(1K52300)



+标签条/ + marking label
(1MZ09000)



盖/ Cover
(1K522000)

+标签条/ + marking label
(1MZ09000)

Ready to use = SAL842060
(SA842060 + WF311100)

典型负载/ *Typical LOADS*

–> SA8 产品设计用于大多数的负载.
SA8 products are designed for most of loads.

保护/ Protection :

–> 固态继电器对于负载短路的保护取决于希望的协调.
允许有两种类型的协调，类型1和类型2.

a) 类型1协调要求，在短路时，设备不会对人和装置产生危害，同时不需要更多的维护，无需维修和更换元件.
在此情况下，使用一个合适的保护是为了在短路后对带有SSR的设备的维修.

b) 类型2协调要求，在短路情况下，设备不会导致危险给人或到装置，并且适和更长远的使用.
在类型2协调的情况下,为保护固态继电器以抵抗负载的短路,使用熔丝的 I^2t的值 = 1/2*(第二页规定的 I^2t的值).
所做的试验是用 FERRAZ 熔丝.
用MCB保护固态继电器也是可行的(微型断路器).
在此情况下,看应用指南 (固态继电器保护) 和使用一个有高的 I^2t 值的固态继电器 (最小5000A^2s).

–> SSRs protection against short circuit of the load depends on the coordination wished.
Two types of coordination are permissible, type 1 or type 2.
a) Type 1 coordination requires that, under short-circuit conditions, the device shall cause no danger to persons or to the installation and may not be suitable for further service without repair and replacement of parts.
In this case, use a protection adapted to the installation with the risk of SSR maintenance after a short circuit.
b) Type 2 coordination requires that, under short-circuit conditions, the device shall cause no danger to persons or to the installation and shall be suitable for further use.
In case of Type 2 coordination, to protect the SSR against a short-circuit of the load , use a fuse with an I2t value = 1/2 I2t value specified page 2. A test has been made with FERRAZ fuses .
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 I2t value (5000A2s minimum).

EMC :

–> 干扰： 在数据页中固态继电器的抗干扰等级符合这些产品的主要标准：EN61000-4-4&5.

Immunity :
We give in our data-sheets the immunity level of our SSRs according to the main standards for these products: EN61000-4-4 &5.

–> 辐射： celduc固态继电器的设计主要符合元器件的标准 classe A (工业).
在家庭环境中使用这些产品可能会引起无线电干扰,在这种情况下用户必需使用另外的设备.
固态继电器是一个综合设备它必须和别的元器件相互连接(负载,电缆,等)构成的系统.因为别的元器件或相互的连接不在 **celduc**®的控制下,确定包含固态继电器的系统遵从可适用的系统水平的任何规则和规章的需求将是系统整合之人的职责.
考虑 **celduc**® 的建议,在我们的实验室试验被预先完成.

Emission: celduc® SSRs are mainly designed in compliance with standards for class A equipment (Industry).
Use of this product in domestic environments may cause radio interference. In this case the user may be required to employ additionnal devices to reduce noise. SSRs are complex devices that 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 responsability of the system integrator to ensure that systems containing SSRs comply with the requirement of any rules and regulations applicable at the system level.
Consult **celduc**® for advices. Tests can be preformed in our laboratory.