



High Efficiency
Thyristors

celpac®

PRELIMINARY

勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-34970699
勝特力电子(深圳) 86-755-83298787
Http://www.100y.com.tw

SUL867070

功率固态继电器 Power Solid State Contactor

输出/OUTPUT: 24-510VAC 35A (*)

输入/INPUT: 3.5V-32VDC

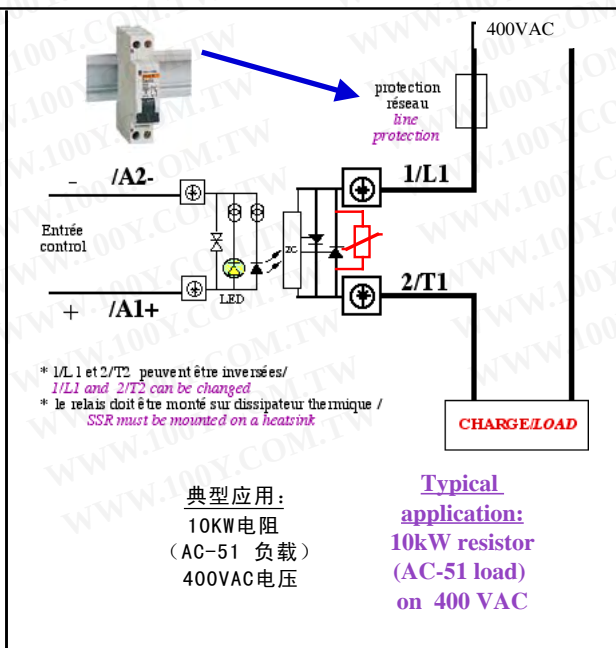
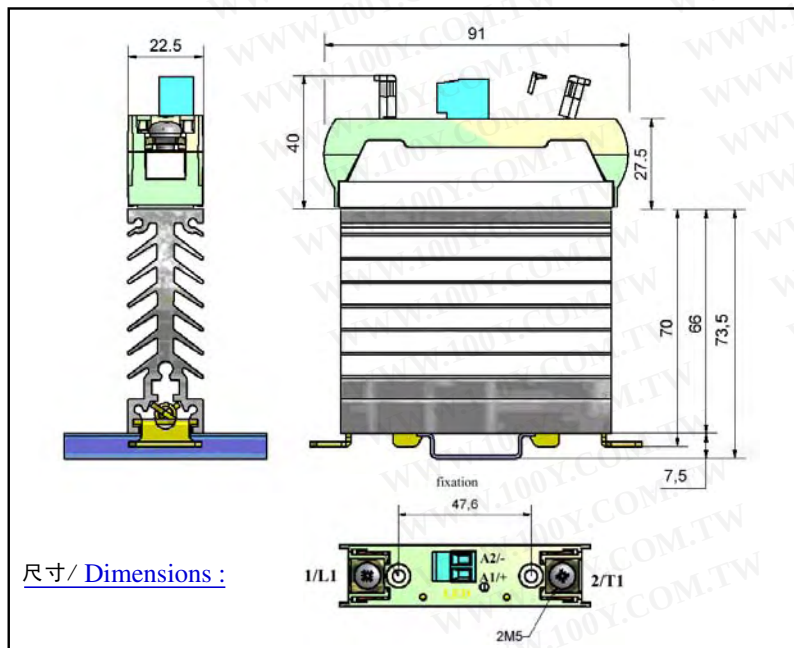
Install it & Forget it!

- 采用节省空间设计, 厚度为22.5mm的固态接触器. 带散热器.
被设计用于大部分类型负载的过零触发固态接触器.
22,5mm Solid State Contactor for space-saving design.
Ready to use with its heatsink
Zero Cross Solid State Contactor designed for most of loads.
- 为了预期的长的寿命, 采用了使用 TMS² 技术的新的高效能背对背闸流管 (*)
SCR额定值为: 24-510VAC 75A. $I^2t > 5000A^2s$ 这个数值是为了断路器保护.
New High Efficiency Back to back thyristors on output with TMS²
technology() for a long lifetime expectancy: 24 to 510VAC 75A.*
I²t value > 5000A²s for circuit breakers protection.
- Haute Immunité et Protection de la tension de sortie par varistor.
High Immunity and output voltage protection by VDR
- 大的控制范围: 3.5 - 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: 3.5 - 32VDC with input current limiter.
Yellow LED visualization on the input. / Input over-voltage protection.
- 有IP20保护翼式盖
IP20 protection with flaps
- 设计符合标准 EN60947-4-3 (IEC947-4-3) 和 EN60950/VDE0805 (绝缘增强)
- U.C - c.U.L 申请中
Designed in conformity with EN60947-4-3 (IEC947-4-3)
and EN60950/VDE0805 (Reinforced Insulation) -UL-cUL pending



SUL867070=
SU867070 SSR
+
WF311100 heatsink

(*) 24A @ 40°C AC-51
16A AC-53
见降容曲线/
see derating curve



(*) : Thermo Mechanical Stress Solution

Proud to serve you

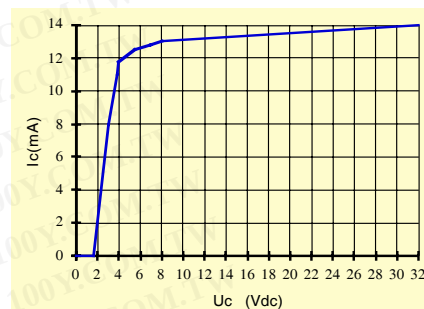
All technical characteristics are subject to change without previous notice.
Caractéristiques sujettes à modifications sans préavis.

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

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

Input : Ic = f(Uc)

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

参数 / <i>Parameter</i>	Conditions	Symbol	Min	Typ.	Max	Unit
工作电压范围 / <i>Operating voltage range</i>		Ue	24	400	510	V rms
峰值电压 (VDR电压钳位) / <i>Peak voltage (CLAMP VOLTAGE VDR)</i>		Up	1200 (950)			V
过零电位 / <i>Zero cross level</i>		U _{sync}			20	V
门电压 / <i>Latching voltage</i>	Ie nom	Ua			10	V
额定电流 / <i>nominal current</i> (AC-51)		Ie AC-51	see derating curve (page 3)			A rms
非重复过载电流 / <i>Non repetitive overload current</i>	tp=10ms (Fig. 3)	I _{tsm}	1000	1200		A
通态电压降 / <i>On state voltage drop</i>	@ 25°C	Vt			0,9	V
通态动态电阻 / <i>On state dynamic resistance</i>		rt			4,5	mΩ
输出消耗功率 (最大值) / <i>Output power dissipation (max value)</i>		Pd	0,9x0,9xIe + 0,0045 x Ie ²			W
连接点到外壳之间的导热电阻 / <i>Thermal resistance between junction to case</i>		Rthj/c		0,4	0,5	K/W
断态漏电流 / <i>Off state leakage current</i>	@Ue typ, 50Hz	I _{lk}			1	mA
最小负载电流 / <i>Minimum load current</i>		I _{emin}	5			mA
导通时间 / <i>Turn on time</i>	@Ue typ, 50Hz	ton max			10	ms
关断时间 / <i>Turn off time</i>	@Ue typ, 50Hz	toff max			10	ms
工作频率范围 / <i>Operating frequency range</i>	F mains	f	0,1	50-60	800	Hz
断态dv/dt / <i>Off state dv/dt</i>		dv/dt	500			V/μs
非重复最大di/dt / <i>Maximum di/dt non repetitive</i>		di/dt			50	A/μs
I _{2t} (<10ms)		I _t ²	5000	7200		A ² s
抗传导等级 / <i>Conducted immunity level</i>	IEC/EN61000-4-4 (bursts)		2kV criterion B			
抗传导等级 / <i>Conducted immunity level</i>	IEC/EN61000-4-5 (surge)		2kV criterion A with external VDR			
传导和辐射干扰 / <i>Conducted & emitted interference</i>	IEC60947-4-3		Class A for Industrial applications			
短路保护 / <i>Short circuit protection</i>	voir/see page 5	Example	miniature circuit breaker			

通用特性 / *General characteristics (at 25 °C)*

	Symbol		
输入和输出绝缘 / <i>Input to output insulation</i>	Ui	4000	VRMS
输出和外壳绝缘 / <i>Output to case insulation</i>	Ui	4000	VRMS
绝缘电阻 / <i>Insulation resistance</i>	Ri	1000 (@500VDC)	MΩ
额定冲击电压 / <i>Rated impulse voltage</i>	Uimp	4000	V
保护等级 / <i>Protection level</i> / CEI529		IP20 (with cover or flaps)	
抗震动10-55Hz / <i>Vibration withstand 10 -55 Hz according to IEC 60068-2-6</i>	10/55Hz	1,5	mm
抗冲击符合 IEC60068-2-27 / <i>Shocks withstand according to IEC 60068-2-27</i>	Half sinus /11ms	30	gn
环境温度 (无结冰和凝结) / <i>Ambient temperature (no icing, no condensation)</i>	-	-40 /+80	°C
储存温度 (无结冰和凝结) / <i>Storage temperature (no icing, no condensation)</i>		-40/+125	°C
环境湿度 / <i>Ambient humidity</i>	HR	40 to 85	%
重量 / <i>Weight</i>		230	g
符合 / <i>Conformity</i>		EN60947-4-3 (IEC947-4-3)	
符合 / <i>Conformity</i>		EN60950 / UL/cUL	
外壳材料 / <i>Housing Material</i>		PA 6 UL94V0	
底板 / <i>Base plate</i>		Aluminium	

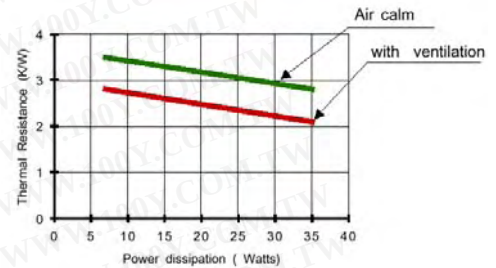
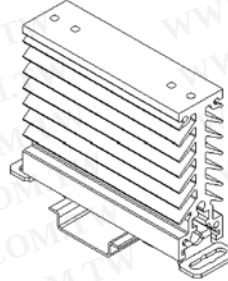
ISO 9001
N° 1993/1106a

热量曲线和散热器的选择 / *Thermal curves and heatsink choice*

对应于额定负载电流和环境温度，工作周期为100%的功率损耗曲线（持续电流） /

Power Dissipation curve in compliance with nominal load current and ambient temperature for a duty cycle of 100% (permanent current).

散热器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，散热器WF311100的热阻（Rth）在2K/W到3K/W之间，具体取决于应用和安装。



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

热量特性：电流对应环境温度：

曲线“1” 获得产品的极限值。对与元件这个被达到的温度是可接受的。这些数值符合大部分的固态继电器生产商。在一个箱子中有非常小的通风或一个非持续电流，这些数字是可以接受的。

曲线“2” 给出了产品符合EN60947-4-3标准，最大温升50 °C (@40 °C)，在静止空气中持续工作的限定值。（连续试验8小时）

对于非持续电流，你可以计算平均功率= $P_d \times$ 任务周期，核对温升： $T_j = P_d \times R_{thj/a}$ （ P_d 和 $R_{thj/a}$ 在第二页），在最大环境温度下结温不允许超过125 °C 最大的电流根据晶闸管的体积来限定。

产品的热常数（Cth）是7分钟，意思是运行7分钟温升仅是稳定温度的63%。

Thermal specifications: Current according ambient temperature :

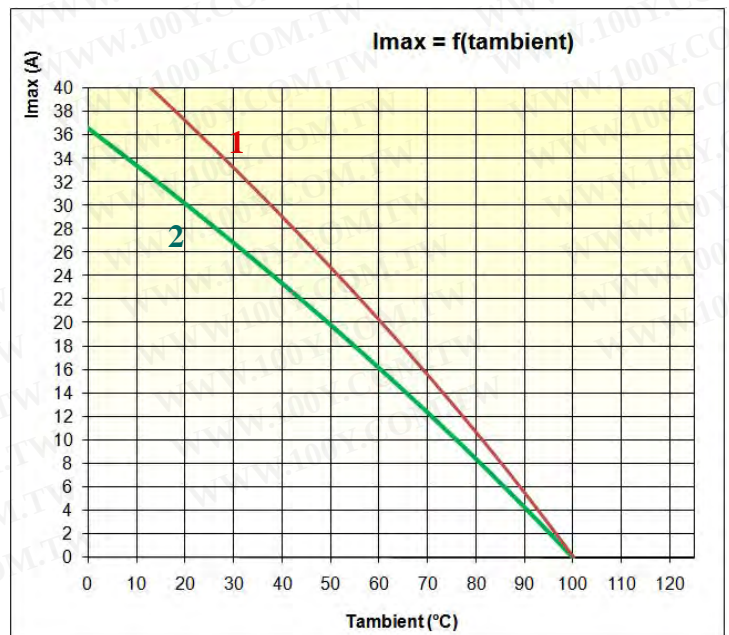
曲线“1” gives the limits of the product. The temperature reached are acceptable for the components. These values are in compliance with most of SSRs manufacturers. In a cabinet with a minimum of ventilation or a non permanent current, these values are acceptable.

曲线“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 current and in air calm (test during 8 hours).

For a non permanent current, you can calculate the average power = $P_d \times$ duty cycle and check the rise temperature : $\Delta T_j = P_d \times R_{thj/a}$ (P_d and $R_{thj/a}$ 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 thyristors.

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.



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

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

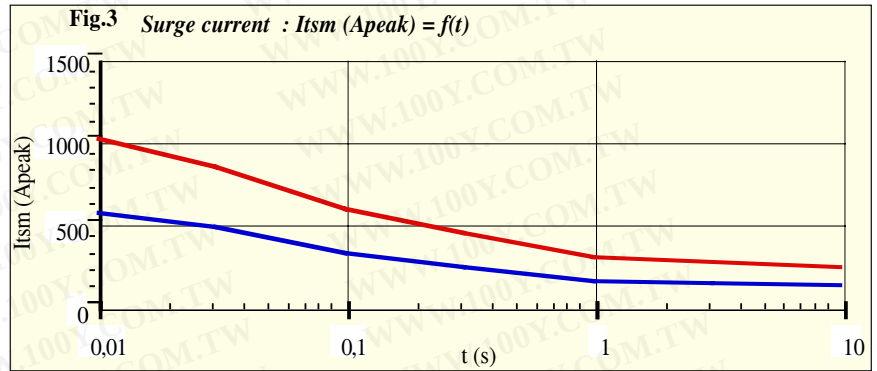
2 - 重复 I_{tsm} 是初始温度 $T_j = 70^\circ\text{C}$ 时的涌入电流, 这个曲线不能被超越。

注意: 重复的浪涌电流会减小固态继电器的预期寿命。

2 - *Repetitive I_{tsm} is given for inrush current with initial $T_j = 70^\circ\text{C}$. In normal operation, this curve mustn't be exceeded.*

Be careful, repeated surge currents decrease life expectancy of the SSR.

图 3: 过载电流/ *Overload currents*

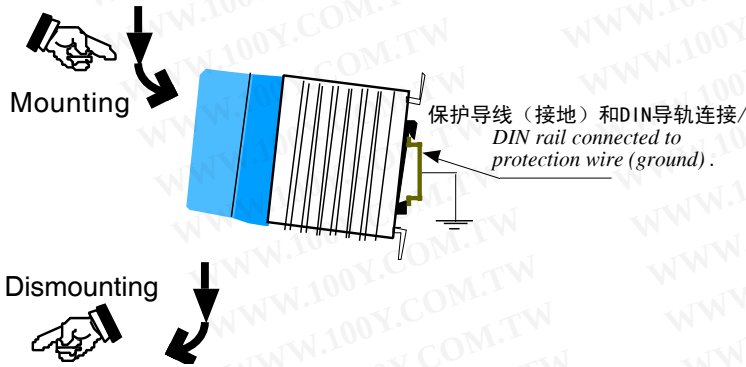


→ 警告: 在负载和主回路之间, 半导体继电器不提供任何的电隔离, 当继电器必须和主回路隔离或发生故障时确保可靠的绝缘, 通常使用一个带隔离的断路器或一个类似的装置。

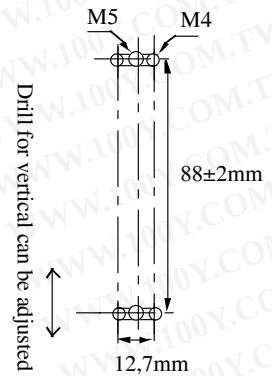
→ **Warning !** *semiconductor relays don't provide any galvanic insulation between the load and the mains. Always use in conjunction with an adapted circuit breaker with isolation feature or a similar device in order to ensure a reliable insulation in the event of wrong function and when the relay must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

在DIN导轨上安装和拆卸无需工具/

Mounting and dismounting on DIN rail without any tool.



面板安装/
Panel Mounting



警告: 用户应该保护热敏感材料并且防止人与散热器接触, 为一好冷却, SSR需要空气对流, 较少对流空气会导致异常发热, 实际上在两个SSR之间没有空间 (在两个SSR之间零空间) 请减少负载电流。

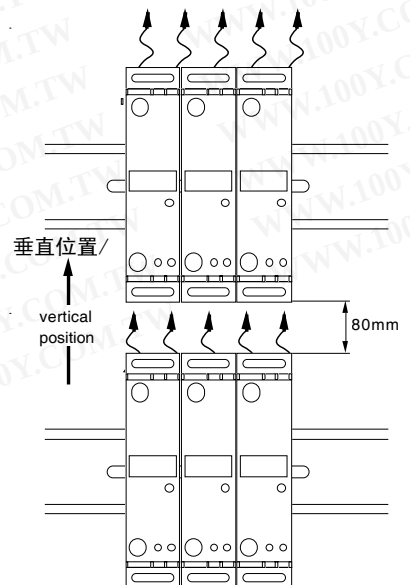
一个强制冷却 (箱体内部安装风扇) 可以较大的改善散热的效果。

在任何情况下请检查散热器温度不能超出 90°C 。

Warning : *The user should protect heat sensitive materials as well as persons against any contacts with the heatsink. For a good cooling, the SSR needs an air convection. Less convection air produces an abnormal heating. In case of no space between two SSR (zero space between two SSRs), please reduce the load current.*

A forced cooling (fan inside the cabinet) improves significantly the thermal performances.

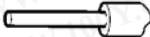
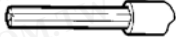
In all cases please check the heatsink temperature never exceed 90°C .



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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 mm ² AWG16....AWG8	1,5 ... 6 mm ² AWG16....AWG10	1,5 ... 10 mm ² AWG16....AWG8	1,5 ... 6 mm ² 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

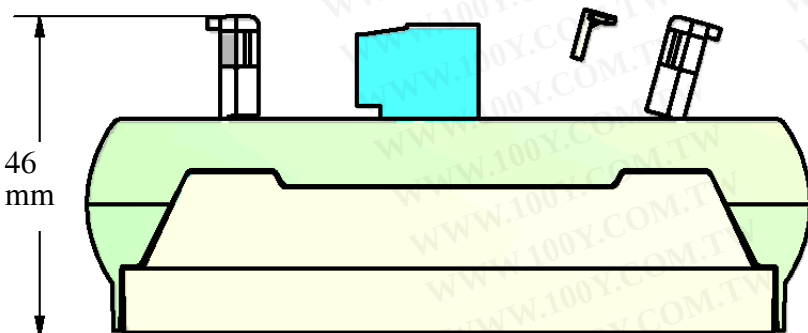
环形压线端子/
With ring terminals



Washer for vibrations



celpac® 控制接线/ Control wiring		型号/ Reference
有2点连接的可插拔连接器/ With 2 points pluggable connector		1Y020915
0,13 ... 3,3 mm ² AWG26...AWG12	 EN60999 a x b ; d 2,8mm x 2mm ; 2,4mm	Weidmuller BLZ5,08/2/90SN SW 155 271 0000



power input



control

power output

标签条也可以安装在翼型保护盖上。
(1MZ09000)/

Marking labels are also possible. Mounting on flaps (1MZ09000)



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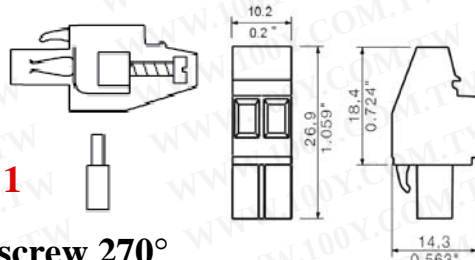
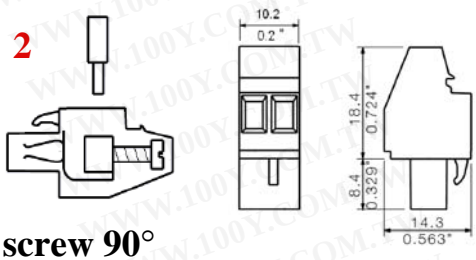
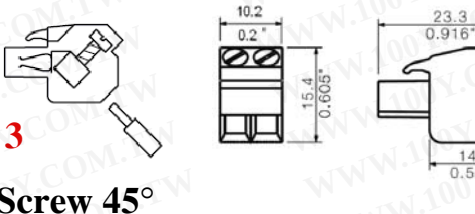
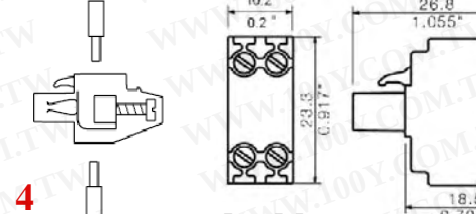
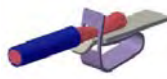
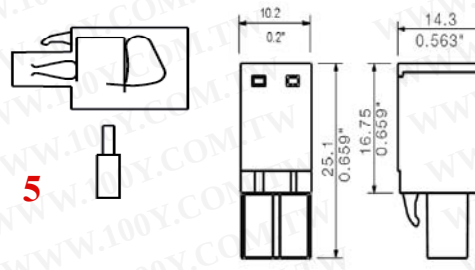
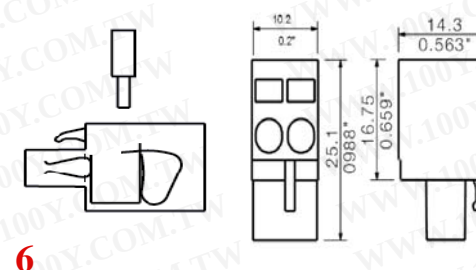
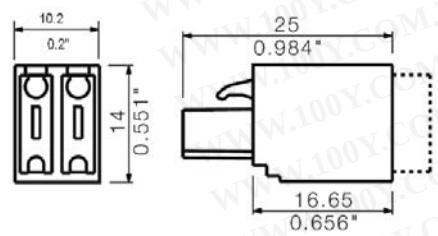
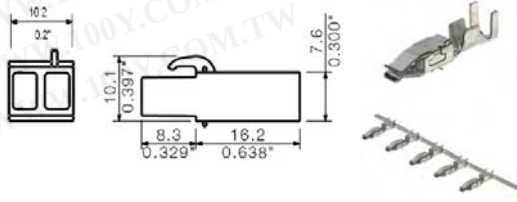
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通过可插拔连接器的控制接线/

Control connections by pluggable connector

2 points

可能的不同连接和输出/ Different possibilities of connectors and outputs

螺丝连接方案/ Screw solution  Single wire = 0,15...2,5mm² 26-12AWG Wire strip length = 7mm	Ref : 1Y022715 Weidmuller: BLZ5,08/2/270SN SW 1  screw 270°	Ref : 1Y020915 Weidmuller: BLZ5,08/2/90SN SW 2  screw 90°
	Ref : 1Y022217 Weidmuller: BLZ5,08/2/225SN SW 3  Screw 45°	Ref : 1Y021660 Weidmuller: BLDT5,08/2 SN SW 4  double
弹簧连接方案/ Spring solutions  Single wire = 0,15...2,5mm² 26-12AWG Wire strip length = 10mm	Ref : 1Y022716 270° Weidmuller: BLZF5,08/2/270 SW 5 	Ref : 1Y020916 90° Weidmuller: BLZF5,08/2/90 SW 6 
Insulation Displacement Connection  consult us Weidmuller: BLIDC 	Cosses Crimp solutions  consult us Weidmuller: BLC 	

典型负载 / *Typical LOADS*

- > SUL8 系列产品设计用于大部分类型的负载。
SUL8 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 = $1/2 \times$ (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5000A²s)。

-> 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.

This relay with high I^2t value can be protected against short-circuit on the load by Miniature Circuit Breaker.

This protection is possible with a limited short-circuit prospective current. See application note : SSR protection.



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 responsibility 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.

说明书的修改不另行通知。 / Specifications are subject to change without notice



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