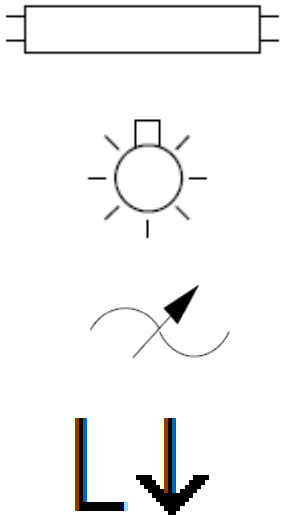
Safety for Control

IEC/EN 61058-2-4
安 規 簡 介

Cerpass Group
世騰認證集團

Marking 要求

- 在產品的本體上須標示：
  - 商標或公司名稱
  - 型號
  - 額定電壓(V~)及額定頻率
  - 額定電流 [resistive (pf>0.9), motor (pf>0.6), capacitive load, tungsten lamp等]
  - 不能只標額定功率
  - 最小負載
  - Disconnection : μ or ε
  - Micro-disconnection or electronic disconnection不能標O或OFF
  - IP值



16(3) A 250 V ~

2/8 A 250 V ~

6[3] A 250 V ~

6 ⊗ 1 A 250 V ~

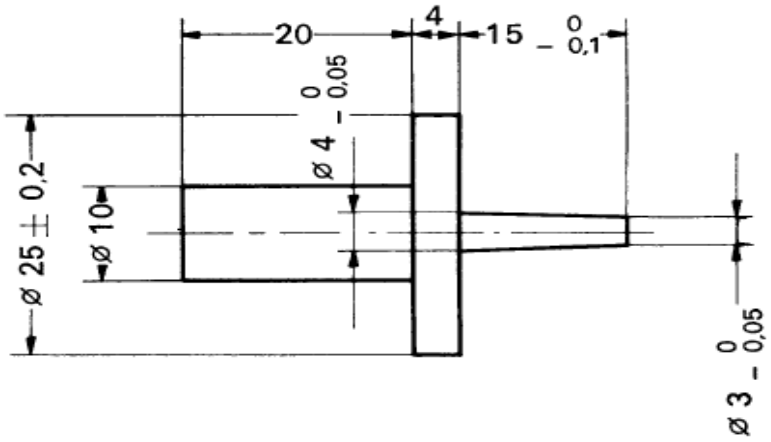
Manual 要求

- 在說明書上須標示：
  - 標籤內容
  - 安裝方法
  - 使用方法
  - Pollution Degree (1, 2, 3)
  - 室溫 (0~35度)
  - 壽命 (Number of operating cycle: 1E5)
  - 訊號說明

Safety for Control

結 構 要 求

- 內配線不能貼焊(tack soldering)
- 外殼開孔須符合test pin試驗
- 插頭插座須符合相關標準
- 保險絲須為防爆型(High Breaking, 1500A)



結 構 要 求

- 跨於L/N或跨大地的電容或短路該電容時電流會大於0.5A者，須用IEC60384-14的電容。

Table 27 – Requirements for capacitors

Application of capacitors	Types of capacitors (according to IEC 60384-14)		
		125 V < U_n ≤ 250 V	
	U_n ≤ 125 V	Without overcurrent protection[1)]	With overcurrent protection[1)]
Between live conductor (L or N) and earth (PE)	Y4	Y2	Y2
Between live conductors (L and N or L1 and L2)			
– without impedance in series	X2	X1	X2
– with impedance in series which, by short-circuiting of the capacitor, limits the current to a value			
• of 0,5 A and higher	X3	X2	X3
• below 0,5 A	No special requirement	No special requirement	No special requirement

[1)] Fusing resistor (built-in or external).

結 構 要 求

距離要求

Table 23 – Minimum creepage distances for basic insulation

Rated voltage r.m.s.[a] V	Creepage distance in millimetres [b]						
	Pollution degree 1	Pollution degree 2			Pollution degree 3		
		Material group			Material group		
		I	II	IIIa/IIIb	I	II	IIIa
50[c]	0,2	0,6	0,9	1,2	1,5	1,7	1,9
125	0,3	0,8	1,1	1,5	1,9	2,1	2,4
250	0,6	1,3	1,8	2,5	3,2	3,6	4,0
320	0,75	1,6	2,2	3,2	4	4,5	5
400	1,0	2,0	2,8	4,0	5,0	5,6	6,3
500	1,3	2,5	3,6	5,0	6,3	7,1	8,0

Safety for Control

結 構 要 求

距離要求

Table 24 - Minimum creepage distances for functional insulation

Working voltage r.m.s. [1]	Printed board assemblies		Pollution degree [2] [6]						
	Pollution degree								
	1 [3]	2 [4]	1 [3]	2			3		
				Material group			Material group		
V				I	II	III [5]	I	II	III [5]
	mm	mm	mm	mm	mm	mm	mm	mm	mm
125	0,16	0,25	0,28	0,75	1,05	1,5	1,8	2,0	2,2
160	0,25	0,4	0,32	0,8	1,1	1,6	1,9	2,1	2,4
200	0,4	0,63	0,42	1	1,4	2	2,0	2,2	2,5
250	0,56	1	0,56	1,25	1,8	2,5	2,5	2,8	3,2
320	0,75	1,6	0,75	1,6	2,2	3,2	3,2	3,6	4,0

結 構 要 求

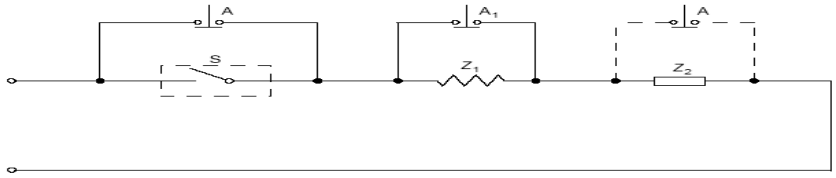
- 安全接地要求
  - 接地線不能小於電源線
  - 以25A測試，接地內阻不能大於0.05Ω
- 電氣螺絲須有spring washer
- 電氣連接的應力不能作用於絕緣材料

測 試 要 求

壽命測試 (Endurance Test):

Table 17 – Test loads for electrical endurance tests for a.c. circuits

Type of circuit as classified in 7.1.2	Operation of contacts	Test voltage	Test current r.m.s.	Power factor [3]
Substantially resistive (classified in 7.1.2.1)	Making and breaking	Rated voltage	*I*-*R*	≥0,9
Resistive and/or motor (classified in 7.1.2.2)	Making [2]	Rated voltage	6 × *I*-*M* or *I*-*R* [1]	0,60 (+0,05) ≥0,9
	Breaking	Rated voltage	*I*-*R* or *I*-*M* [1]	≥0,9 ≥0,9 [5]
Circuit for specific load of motor with a locked rotor and with a power factor not less than 0,6 (classified in 7.1.2.9)	Making	Rated voltage	6 × *I*-*M*	0,60 (+0,05)
	Breaking	Rated voltage	6 × *I*-*M*	0,60 (+0,05)
Circuit for an inductive load (classified in 7.1.2.8)	Making [2]	Rated voltage	6 × *I*-*I*	0,60 (+0,05)
	Breaking	Rated voltage	*I*-*I*	0,60 (+0,05)
Resistive and capacitive (classified in 7.1.2.3)	Making and breaking	Tested in a circuit as shown in figure 9a		
Tungsten filament lamp load (classified in 7.1.2.4)	Making and breaking	Tested in a circuit as shown in figure 9a [4] Rated voltage ≥ 110 V a.c., *X* = 16 Rated voltage < 110 V a.c., *X* = 10		
Circuit for specific lamp load (classified in 7.1.2.7)	Making and breaking	Rated voltage	As determined by load	
Specific declared (classified in 7.1.2.5)	Making and breaking	Rated voltage	As determined by load	

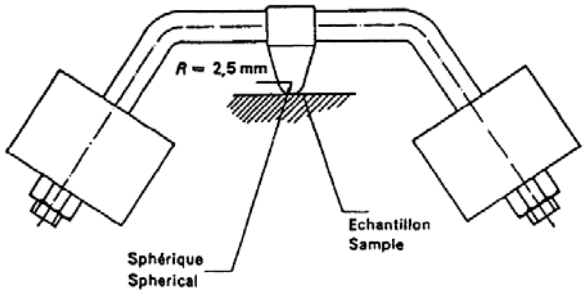


測 試 要 求

- Glow-wire test:
  - For enclosure and other parts: 650°C
  - For Parts in contact with or support current-carrying parts :
    - Level 1: 650°C
    - Level 2: 750°C
    - Level 3: 850°C

測 試 要 求

- Ball Pressure test:
  - For enclosure and other parts: 20°C+T (Min. 75 °C)
  - For Parts in contact with or support current-carrying parts: 20°C+T (Min. 125 °C)
  - Limit: 2mm max.



測 試 要 求

- 溫昇測試 **(Temperature Test):**
  - 以0.94或1.06額定電壓來進行測試，測至溫度穩定為止
  - 輸出為1.06額定電流值
  - 插頭及插座之端子的溫昇不能超過45度
  - 室溫35度

Parts	Maximum temperature	
	Normal conditions Subclauses 16.3.2 and 16.3.3 °C	Abnormal conditions Clause 23 °C
Inside of enclosures of insulating material [5]		
Windings – Thermal classification [6]:		
– class A	100	135
– class E	115	150
– class B	120	155
– class F	145	180
– class H	165	200
– class 200	185	220
– class 220	205	240
– class 250	235	270
Terminals and terminations for unprepared conductors according to Table 4	80 [7]	125 [8]
Other terminals and terminations	[7]	125 [8]

$$t = (R_2 - R_1)(234{,}5 + t_1) / R_1 - (t_2 - t_1)$$

測 試 要 求

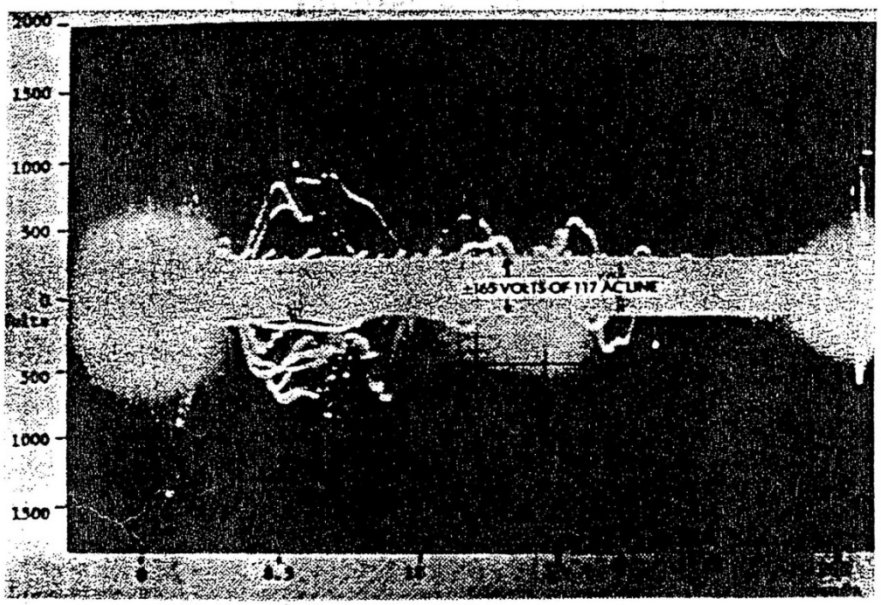
溫昇測試 (Temperature Test):

Table 13 *(suite)*

Parts	Maximum temperature	
	Normal conditions Subclauses 16.3.2 and 16.3.3 °C	Abnormal conditions Clause 23 °C
Inside of enclosures of insulating material	5)	5)
Windings – Thermal classification 6):		
– class A	100	135
– class E	115	150
– class B	120	155
– class F	145	180
– class H	165	200
– class 200	185	220
– class 220	205	240
– class 250	235	270
Terminals and terminations for unprepared conductors	80 7)	125 8)
Other terminals and terminations	7)	125 8)

測 試 要 求

- **耐壓測試 (Dielectric Strength Test):**
  - 電子開關不作開關間測試 (Relay則要)
  - 施以電壓5秒



Typical surge voltages on residential power line; recordings taken over 24-hour period *(Photography courtesy F. Martzloff, General Electric Company)*

Insulation or disconnection to be tested [2]	Rated voltage above 130 V up to and including 250 V V
Functional insulation [3]	1 500
Basic insulation [4]	1 500
Supplementary insulation [4]	1 500
Reinforced insulation [4] [5]	3 000
Across electronic disconnection	500
Across micro-disconnection	500
Across full disconnection	1 500

測 試 要 求

Safety for Control

異常測試 (Abnormal Test)

- 零件之短路及開路試驗
- For independently mounted switch:
  - 若產品有保險絲，負荷保險絲安培數的2.1倍迄30分鐘(在保險絲短路狀況下測試)
  - 若產品無保險絲，負荷26A迄60分鐘
  - 除了短路輸出，以上有溫昇限制
- Protect by opening the PCB trace?

Safety for Control

……. thanks !