SONG HUEI ELECTRIC CO.,LTD

11mm Rotary type Encoders-With Switch (11mm 旋轉式編碼器-附開關)

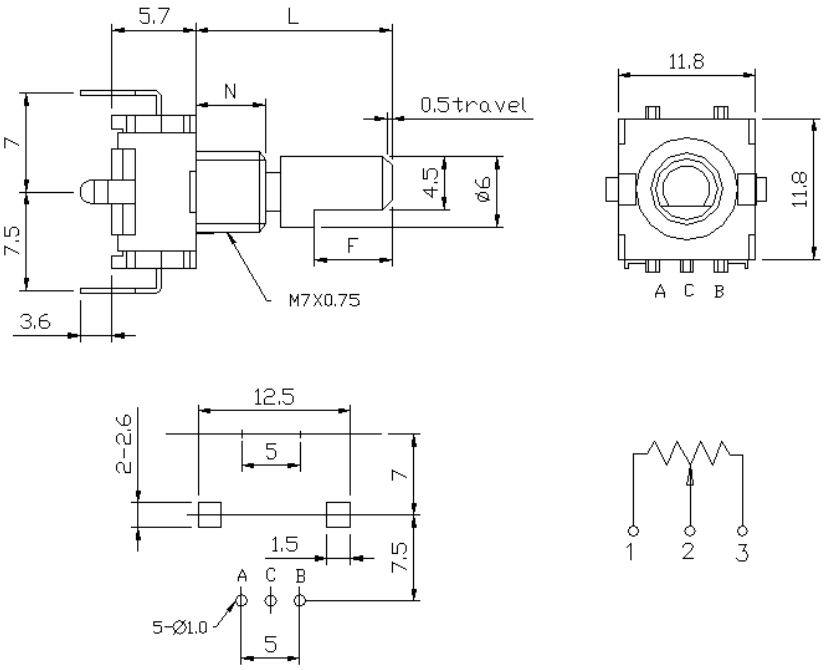
ED1112S

Part Number

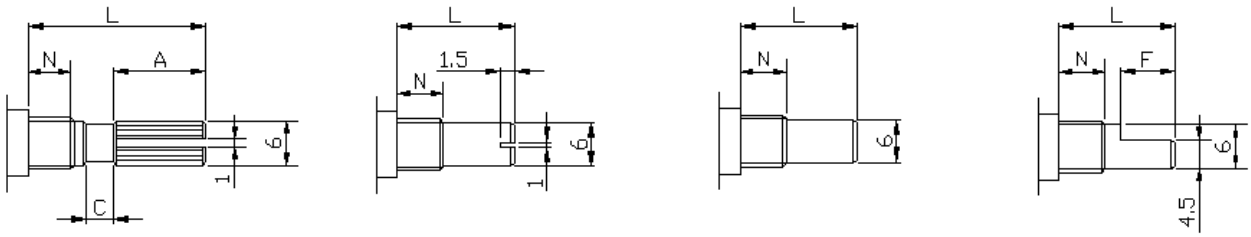
ED1112S – 20 -L 20 F

- 20: 20 clicks / 20 卡點
- 20: Shaft Length / 軸長
- F: Shaft Type / 軸型

Dimensions 規格尺寸



Shaft Type 軸型



SHAFT-TYPE	L	15	20	25
KC	A	7	12	12
F	F	7	12	12
R,RE	L	15	20	25

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11mm Rotary type Encoders-With Switch (11mm 旋轉式編碼器-附開關)

General 一般特性

(1) Scope

This specification applies to 12mm size low-profile rotary encoder (incremental type) for microscopic current circuits used in electronic equipment.

(2) Standard atmospheric conditions

Unless otherwise specified, the range of atmospheric conditions for making measurements and test is as following limits:

Ambient temperature	:	15℃ 35℃
Relative humidity	:	25 % 85 %
Air pressure	:	86k Pa 106k Pa

If there is any objection, the inspection should be preceded as following:

Ambient temperature		
Relative humidity	:	63 % 67 %
Air pressure	:	86k Pa 106k Pa

(3) Operating temperature range : －10℃ ＋70℃

(4) Storage temperature range : －40℃ ＋85℃

Rating 額定功率

(1) Rated Voltage : D.C. 5V.10mA (1 mA / min.)

(2) Maximum operating current (resistive load)

Each lead	: 0.5 mA (Max. : 5mA Min. : 0.5 mA)
Common lead	: 1.0 mA (Max. : 10mA Min. : 0.5 mA)

Mechanical characteristics 機械特性

(1) Total rotational 360°(Endless)

(2) Detent torque 5 ~ 19 mN. (51.0 ~ 193.8 gf. cm.) Shaft rotational at -10℃~ +5℃

(3) Number and Position of detents 20 detents (Step angle : 18°±3°)

(4) Terminal strength A static load of 5N (0.51Kgf) shall be applied to the tip of terminals for 1 min any direction.

(5) Push-pull Strength of shaft Push and pull static load of 10 N (10.2 Kgf) shall be to the shaft in the axial direction for 10S. (After installing)

(6) Shaft wobble 0.7 xL/30 mm p-p MAX.(L : shaft length) Under Conditions as below. A momentary load of 50mN.m shall be applied at the point 5 mm form the tip of the shaft in a direction perpendicular to the axis of shaft.

(7) Side thrust strength of shaft Static load of 20 N (2.04 Kg) shall be to the shaft in the axial direction for 10S. (After installing)

(8) Using angle of rotary shaft 5°MAX.

Electrical characteristics 電氣特性

(1) Output signal format 2 phase - different signals(signal A signal B)Details shown in < PH 1 > (The broken line shows detente position)

Shaft rotational Direction	Signal	Output
C . W .	A (Terminal A ~ C)	OFF / ON
	B (Terminal B ~ C)	OFF / ON
C . C . W .	A (Terminal A ~ C)	OFF / ON
	B (Terminal B ~ C)	OFF / ON

『PH 1.』

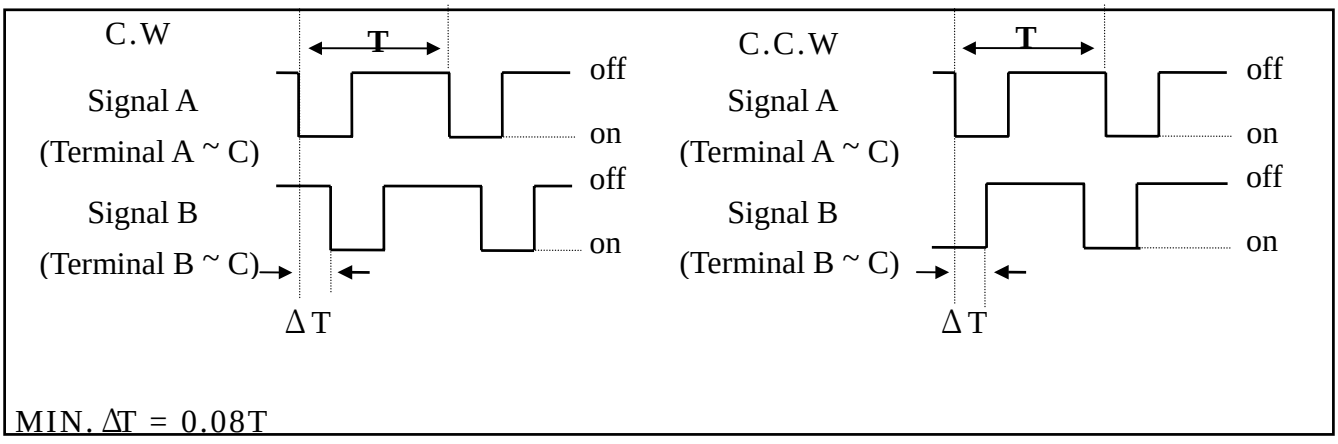
(2) Resolution 20 pulses /360°for each phase . Under Conditions as below, number of pulses in 360°rotation.

(3) Withstand Voltage A voltage of 300V A.C. shaft be applied for 1min between individual terminals and bushing.

(4) Insulation resistance Between individual terminals and bushing ; 100 MΩmin.

Under conditions as bushing, Measurement shaft be made under the condition which a voltage 250V D.C. is applied between individual terminals and bushing.

(5) Phase-difference Measurement shaft be made under the condition which the shaft is rotated in constant speed. In < PH2 >



※ MIN. ΔT = 0.08T

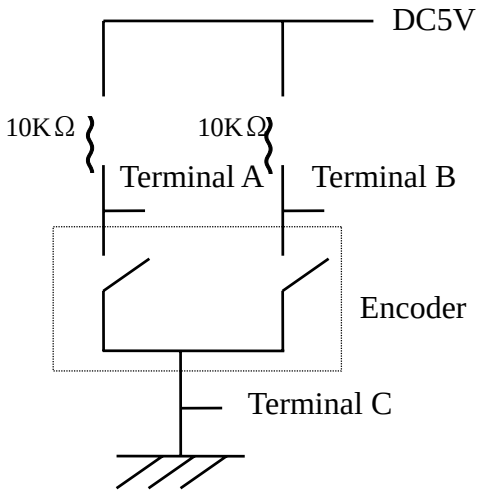
(6) Switching Characteristics Measurement shall be made under the condition as follows.

① Shaft rotational speed **:** 360° S

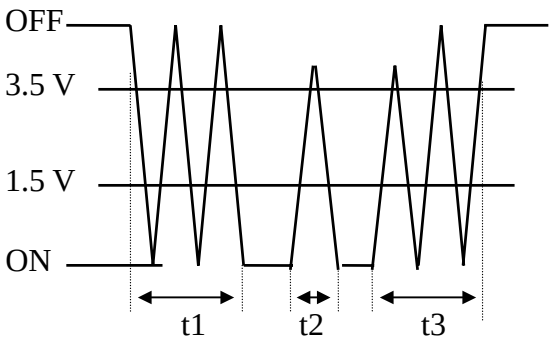
② Test circuit **:** < PH3 >

(note) Code－ ON area **:** The area which the voltage is 1.5V or less.

Code－OFF area **:** The area which the voltage is 3.5V or more.



『PH3. 』



『PH4. 』

(6-1) Chattering Conditions **:** Specified by the signals' passage time form 1.5V to 3.5V of each switching position (code OFF ⇨ ON or ON ⇨ OFF)

Specifications **:** t 1 , t 3 ≦ 2 mS

(6-2) Noise (Bounce) Conditions: Specified by the time of voltage change exceed 1.5V in code-ON area. When the bounce has code-ON time Less than 1 mS between chattering (t1 or t3) , the voltage change shall be regarded as a part of chattering. When the code-ON time between 2 bounces is less than 1 mS , hey are regarded as 1 linked bounce.

Specifications **:** t 2 ≦ 2 mS

(6-3) Noise Conditions**:** The voltage change in code-OFF area.

Specifications**:** 3.5V MIN.

Endurance characteristics 耐久特性

(1) Rotational life Conditions**:** The shaft of encoder shall be rotated to 30,000 cycles at a speed of 600~1000H without electrical load, after which measurements shall be made.

Specifications **:** Chattering t1 , t2≦3 mS

Detent Toque -30% ~ +10%

(2) Damp heat The encoder shall be stored at temperature of 40±2℃ with relative humidity of 90% to 95% for 240±10 in a thermostatic chamber. And then the encoder shall be subjected to standard atmospheric conditions for 1.5 H. After which measurements shall be made.

(3) Dry heat The encoder shall be stored at a temperature of 80℃±3℃for 240 ±10 H in a thermostatic chamber . And then the encoder shall be subjected to standard atmospheric conditions for 1.5H.After witch measurement shaft be made.

(4) Cold The encoder shall be stored at a temperature of –40℃±3℃ for 240±10 H in a thermostatic chamber . And then the encoder shall be subjected to standard atmospheric conditions for 1.5 H. After witch measurement shall be made.

(5) Free falling The encoder shall be fallen freely at any posture from 60 cm. height to the concrete floor covered with vinyl - tile. After which measurement shall be made.

(6) Vibration The following vibration shall be applied to the encoder, after which measurement shall be made: The entire frequency range from 10Hz to 55Hz and return to 10Hz shall be transverse in 1 min. Amplitude (total excursion): 1.5 mm This motion shall be applied for a period of 2H in each of 3mutually perpendicular axes.

Soldering conditions 焊接條件

(1) Manual soldering Bit temperature of soldering iron **:** 300℃or less.
Application time of soldering iron **:** within 3s.

(2) Dip soldering Printed-wiring board**:** Single-sided copper clad laminate board with thickness of 1.6mm.

Flex **:** ① Specific gravity **:** 0.82 or more.
② Flux shall be applied to the board using a bubble foaming type fluxer.
③ The board shall be soaked in the flux bubble only to the middle of its thickness.
④ Flux shall not come into contact with the component side surface.

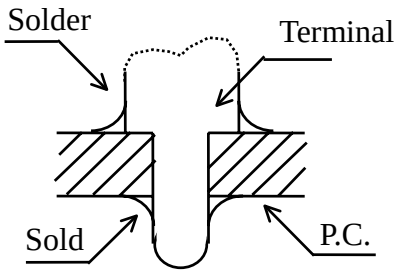
Preheating **:** ① Surface temperature of board **:** 100℃or less.
② Preheating time **:** Within 2 min.

Soldering **:** ① Solder temperature **:** 260℃or less.
② Immersion time **:** Within 3 s±1s.

Maintaining **:** ① The encoder has to maintain temperature between at 25±2℃in the house , and the relative humidity should be within at 35% 85%PH. Keep out of humidity and sun.
② Apply the above soldering process for 1 or 2 times.

(3) Note for soldering method

Avoid wiring and soldering that causes solder to flow out to the top of P.C. Board as shown. A contact failure may occur in the terminal section.



Other 其他

(1) To assure smooth rotation of a potentiometer at extremely low temperature, dry and no silicon or cyanogen base gas atmosphere.

(2) The process and design of encoder switch numbers of pulse. Please be considered speed, time and noise of pules. After all confirmation then using the encoder switch.

(3) The detent stability on a signal is standard. A signal with OFF position is more stability.

(4) Avoid contacting dew or water drops with base body might occur extraordinary on the output wherefrom.

Push Switch part 開關推部分

1. Rating D.C. 5V 10mA (1 mA min.)

2. Electrical Characteristics

(1) Contact Resistance Conditions **:** Testing method under DC 5V 1mA min.
Specifications **:** First period ⇨100MΩ; 200MΩafter the end of useful life is reached.

(2) Sliding Noise Conditions **:** specified by the signals'passage time from 1 second for each time rotation.(OFF⇨ON⇨OFF) Specifications**:** 10ms max.

(3) Insulation Resistance Between terminal and installment board has DC50V 1mA. Insulation resistance 10MΩmax.

(4) Withstand Voltage Between terminal and installment board has AC50V / 1 minute.

(5) Remark Between shaft and terminal of switch are insulated.

3. Mechanical characteristics

(1) Switch circuit, the number of contact Single pole and single throw.

(2) Travel of switch 0.5 mm **(3) Operating Force of Switch** 360 gf

4. Reliability

The shaft of encoder shall be rotated to 20,000 cycles at a speed of 500 cycles per hour without electrical load, after which measurements should be made. However, an interim measurement should be made immediately after 5,000 cycles. The contact resistance should be 200 mΩmax. (Shaft push-pull strength shall be 1 kgf.cm max.)