

Customer: ALPS EUROPE DISTRIBUTION

No. 12E2006-3022

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Attention:

Your ref. No.:

Your Part No.: EC12E2424407

SPECIFICATIONS

ALPS' ;

MODEL: EC12E2424407

Spec. No.:

Sample No.: F 3 5 1 7 2 7 2 M

RECEIPT STATUS

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By Date

Signature

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Title

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S P E C I F I C A T I O N S

1. THIS SPECIFICATIONS APPLY TO EC12E2424407 ROTARY ENCODERS.

2. CONTENTS OF THIS SPECIFICATIONS.

F3517272M

LE212407

3. MARKING

- MARKING ON ALL UNITS
DATE CODE

• CAUTION

Regardless of the suggested applications of these products being introduced in the specifications, when using them for equipment and devices requiring a high degree of safety, respective manufacturers will please preserve safety of the planned equipment and devices by providing necessary protective circuits and redundancy circuits and reconfirm if safety is being duly preserved.

Products being introduced in the specifications have been designed and manufactured for applications to ordinary electronic equipment and devices such as the AV equipment, electric home appliances, office machines and communications equipment. Consequently, when employing these products for applications requiring a high degree of safety and reliability such as the medical equipment, aviation and aircraft equipment, space equipment and burglar alarm equipment, the using manufacturers will please thoroughly study the proprieties of these products for the planned applications.

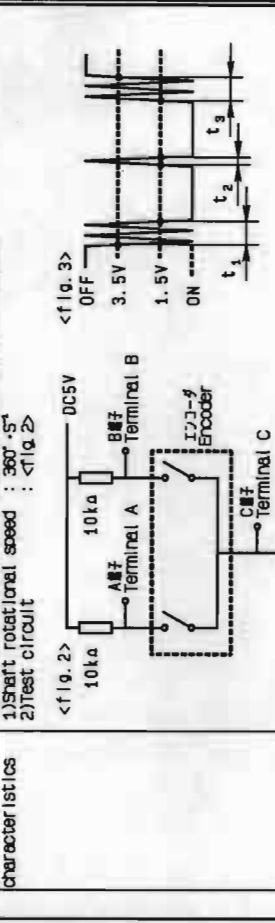
Although we are exerting our best efforts to maintain the quality of these products, we cannot guarantee that they will never cause short circuiting and open circuitry. Therefore, when designing an equipment or device with which the priority is given to the safety, you will please carefully study the influences to the whole equipment of a single function failure of Potentiometers and Encoders in advance to make out a fail-safe design providing.

4. 電気的仕様 Electrical characteristics

項目 Item	条件 Conditions	試験規格 Specifications
4-1 出力信号形式 Output signal format		<p>A, B 2相の信号出力とし、脈波は <Fig. 1> の通りとする。</p> <p>クリック性を有するクロック位置にて A 相時は出力 OFF の空室位置にあること B 相時は出力 ON (パルス) を出力する。</p> <p>2 Phase-different signals (Signal A, signal B)</p> <p>The debent position will always be at position A. If the encoder has no specific position, the broken line shows debent position of with-debent type.</p>
4-2 分解能 Resolution	回転方向 Shaft rotational direction	出力波形 Output
	時鐘方向 C.W.	OFF ON OFF ON
	逆時鐘方向 C.C.W.	OFF ON OFF ON
4-3 1/4ピッチ特性 Switching characteristics	回転方向 Shaft rotational direction	時鐘方向 C.W.
	時鐘方向 C.W.	OFF ON OFF ON
	逆時鐘方向 C.C.W.	OFF ON OFF ON

1 回転で出力されるパルス数
Number of pulses in 360° rotation.
仕様 24パルス/360°
24 pulses/360°
FOR EACH PHASE

下記測定回路 <Fig. 2> を用い、回転速度 360°/S の条件下で測定する。
Measurement shall be made under the condition as follows.
1) Shaft rotational speed : 360°/S
2) Test circuit : <Fig. 2>



<Fig. 2> DC5V
10kΩ
10kΩ
A端子 Terminal A
B端子 Terminal B
C端子 Encoder
Terminal C

(注記) コーロン接続 : 出力電圧が 1.5V 以下の状態を指す。
(note) CODE-ON area : 出力電圧が 3.5V 以上の状態を指す。
CODE-OFF area : The area which the voltage is 1.5V or less.

1) チャタリング Chattering
コーンOFF-ON状態+OFF状態の出力は、出力電圧が 1.5V 以下の状態を指す。
Specified by the signal's passage time from 3.5V to 1.5V or from 1.5V to 3.5V of each switching position (code OFF → ON or ON → OFF).
t₁, t₂ ≤ 3ms

SYMB	DATE	APPD	CHKD	DSGD	APPD.	CHKD.	DSGD.	TITLE	12 形回転编码器
					Apr. 22, '99	Apr. 22, '99	Apr. 22, '99	12mm Size Rotary encoder	
					K. ITO	Y. KANZAKI	H. MIURA	DOCUMENT NO.	F 3517272M (2/9)

ALPS ELECTRIC CO., LTD.									
SYMB	DATE	APPD	CHKD	DSGD	APPD.	CHKD.	DSGD.	TITLE	12 形回転编码器
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1. 一般事項 General

1-1 適用範囲 Scope
この仕様書は主として電子機器に用いられる 12 形ロータリーエンコーダに適用する。
This specification applies to 12mm size low-profile rotary encoder (incremental type) for microscopical current circuits used in electronic equipment.

1-2 標準状態 Standard atmospheric conditions
測定は標準状態で行われ、次の状態で実施する。
Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as follows:

- 温度 Ambient temperature : 15°C to 35°C
 - 湿度 Relative humidity : 25% to 85%
 - 気圧 Air pressure : 86kPa to 106kPa
- 但し、湿度は主として 50% 以下、気圧は 86kPa 以上とする。
If there is any doubt about the results, measurements shall be made within the following limits:
- 温度 Ambient temperature : 20 ± 1°C
 - 湿度 Relative humidity : 63% to 87%
 - 気圧 Air pressure : 86kPa to 106kPa

1-3 動作温度範囲 Operating temperature range : -10°C to +70°C

1-4 保存温度範囲 Storage temperature range : -40°C to +85°C

2. 構造 Construction

2-1 寸法 Dimensions
別添図面を参照。
Refer to attached drawing.

3. 定格 Rating

3-1 定格電圧 Rated voltage : D. C. 5V

3-2 動作電流 (抵抗性負荷) Operating current (resistive load)
各リード線毎に : 0.5mA (MAX) 5mA, MIN 0.5mA
共通リード線 : 1mA (MAX) 10mA, MIN 0.5mA

項目 Item	条件 Conditions	規格 Specifications
5-9 鉛はんだ溶接 Resistance to soldering heat	7頁の「鉛はんだ溶接条件」による。 Specified by the clause 7 "Soldering conditions".	鉛はんだ溶接、電気的強度を満足する こと。また、著しい劣化現象の発生 のないこと。 Electrical characteristics shall be satisfied. No mechanical abnormality such as a excessive play. 等製造時に発生する95% 以上腐しはんだを溶かすこと。 A new uniform coating of solder shall cover a minimum of 95% of the surface being immersed.

ALPS ELECTRIC CO., LTD.

APPD.	CHKD.	DSGD.	TITLE
Apr. 22, '99	Apr. 22, '99	Apr. 22, '99	12形回転符号エンコーダ 12mm Size Rotary Encoder
K. ITO			DOCUMENT NO.
Y. KANZAKI			F3517272M
H. MIURA			(5/9)

6. 耐久試験 Endurance characteristics.

項目 Item	条件 Conditions	規格 Specifications
6-1 回転寿命試験 Rotational life	振動試験を600~1000/Hの速度で、30,000回往復回転動作を行なう。 The shaft of encoder shall be rotated to 30,000 cycles at a speed of 600-1000/H without electrical load, after which measurements shall be made.	チャタリング $t_{1.5}$ 、 t_{5MS} バウンス t_{5MS} Bounce t_{5MS} クラック面が残っていないこと。 Detent feeling has to remain.
6-2 耐湿性 Damp heat	湿度40±2°C、湿度90~95%の恒温湿室中で240±10時間連続動作、常温中21.5時間経過させる。 The encoder shall be stored at a temperature of 40±2°C with relative humidity of 90% to 95% for 240±10H in a thermostatic chamber. And then the encoder shall be subjected to standard atmospheric conditions for 1.5H, after which measurement shall be made.	耐湿試験(4.1~4.5及び5.1)を満足すること。 Specifications in clause 4.1-4.5 and 5.1 shall be satisfied.
6-3 耐乾燥性 Dry heat	湿度85±3°Cの恒温湿室中で240±10時間連続動作、常温中21.5時間経過させる。 The encoder shall be stored at a temperature of 85±3°C for 240±10H in a thermostatic chamber. And then the encoder shall be subjected to standard atmospheric conditions for 1.5H, after which measurements shall be made.	
6-4 低温耐性 Cold	温度-40±3°Cの恒温湿室中で240±10時間連続動作、常温中21.5時間経過させる。 The encoder shall be stored at a temperature of -40±3°C for 240±10H in a thermostatic chamber. And then the encoder shall be subjected to standard atmospheric conditions for 1.5H, after which measurement shall be made.	
6-5 落下試験 Free falling	60cmの高さより製品の高さ方向に50mm×50mmの正方形のコンクリート板を落下させる。 The encoder shall be fallen freely at any posture from 60cm height to the concrete floor covered with vinyl-tile, after which measurement shall be made.	著しい劣化、破壊等がないこと。 Specifications in clause 4.1~4.5及び5.1を満足すること。 (但し、端子部の劣化を除く。) No excessive deformation or damage, (except the deformation of terminals.) And specifications in clause 4.1-4.5 and 5.1 shall be satisfied.
6-6 耐振動 Vibration	10~55~10Hzと変化させる振幅(1周毎1分/振幅1.5mm)をX、Y、Z、各方向に2時間動作させる。 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 transversed in 1 min. Amplitude(total excursion): 1.5mm. This motion shall be applied for a period of 2H in each of 3 mutually perpendicular axes (A total of 6H).	耐振動試験(4.1~4.5及び5.1)を満足すること。 Specifications in clause 4.1-4.5 and 5.1 shall be satisfied.

ALPS ELECTRIC CO., LTD.

APPD.	CHKD.	DSGD.	TITLE
Apr. 22, '99	Apr. 22, '99	Apr. 22, '99	12形回転符号エンコーダ 12mm Size Rotary Encoder
K. ITO			DOCUMENT NO.
Y. KANZAKI			F3517272M
H. MIURA			(6/9)

1. 定格電流 (定格負荷) D. C. 5V10mA (1mA MIN)
Switch rating (resistor load)

2. 電気的性質 Electrical characteristics

項目 Item	条件 Conditions	規格 Specifications
2-1 接点抵抗 Contact resistance	D. C. 5V10mA電圧降下法にて測定する。 Measured by the 1mA 5V D. C. voltage drop method.	100mA MAX.
2-2 チャタリング Chattering	1サイクル (OFF-ON-OFF) 1秒で動作させる。 Switch is operated at the rate of 1 cycle 1 sec. The 1 cycle shall be OFF-ON-OFF.	10msec以下 Less than 10msec
2-3 絶縁抵抗 Insulation resistance	端子-取付板間D. C. 50V10mA印加する。 Measurement shall be made under the condition which a voltage of 50V D. C. 1mA is applied between individual terminals and bracket.	端子-取付板間 $\geq 10M\Omega$ 以上 Between individual terminals and bracket: $\geq 10M\Omega$ MIN.
2-4 耐電圧 Dielectric strength	端子-取付板間D. C. 50V1秒間又は、A. C. 60V2秒間印加する。 A voltage of 50V A. C. shall be applied for 1min or a voltage of 60V A. C. shall be applied for 2sec between individual terminals and bracket. (Leak current: 1mA)	過電・アーク・絶縁破壊がないこと。 Without damage to parts, arcing or breakdown.

注: 軸・スイッチ端子間が絶縁されております。

Note: Shaft is insulated from switch terminal.

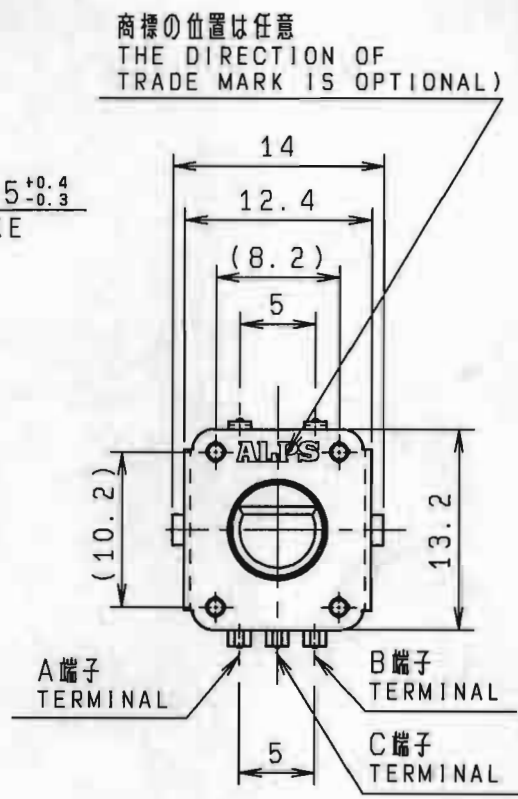
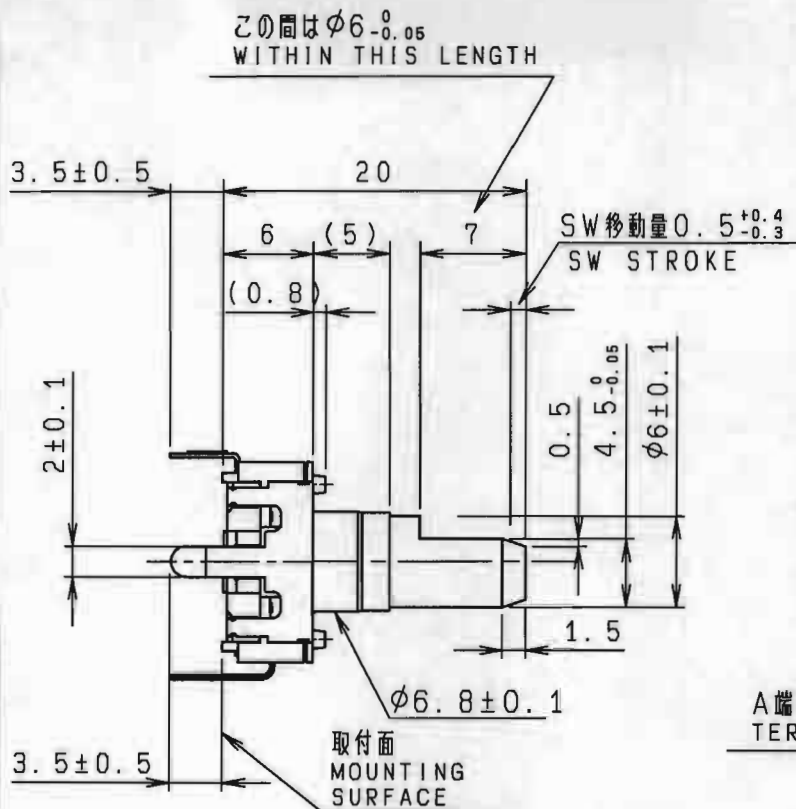
3. 機械的性質 Mechanical characteristics

項目 Item	条件 Conditions	規格 Specifications
3-1 スイッチ回路-並列接続 Contact arrangement		単極単投(Push on) S. P. S. T. (Push on)
3-2 スイッチ動作距離 Switching		0.5 \pm 0.1mm
3-3 スイッチ作動力 Switch operation force		3 \pm 1.5 N

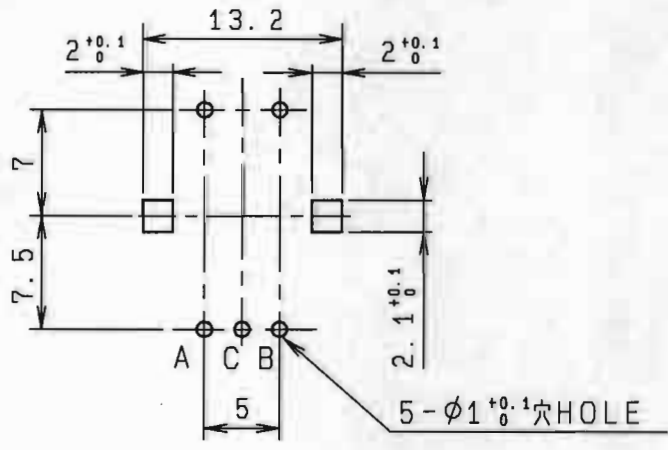
4. 耐久性質 Endurance characteristics.

項目 Item	条件 Conditions	規格 Specifications
4-1 寿命特性 Operating life	無負荷状態で毎時500回の速度で20,000回動作を行なう。 但し、試験中は5,000回中国語を行なう。(轉り力は10N以下) The shaft of switch shall be 20,000 times at a speed of 500times per hour without electrical load, after which measurements shall be made. However, an interim measurement shall be made immediately after 5,000 times. (strength of shaft 10N max.)	定格電流: 200mA以下 その際、初期抵抗を測定すること。 Switch contact resistance: 200mA MAX. Except above items, specifications in clause 2.2-4, and 3.1-3 shall be satisfied.

SYMB	DATE
APPD	CHKD
DSGD	DSGD
APPD.	CHKD.
DSGD.	DSGD.
TITLE 1.2 形回転スイッチ 12mm Size Rotary Encoder	
DOCUMENT NO. F3517272M (9/9)	

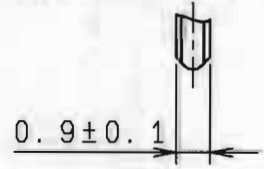


取付穴寸法図 (許容差±0.1)
*挿入側より見た図
P. W. B. MOUNTING DETAIL
(TOLERANCE±0.1)
VIEWED FROM MOUNTING SIDE



基板板厚 t=1.6mm
P. C. B.

端子先端詳細図 (10:1)
DETAIL OF TERMINALS



指定なき部分の許容差 TOLERANCES UNLESS OTHERWISE SPEC	
L ≤ 10	±0.3
10 < L < 100	±0.5
100 ≤ L	±0.8
角度 ANGULAR DIMENSION	±5°

			24ボルト SHAFT COLOR:BLACK		L=20 伏形 クリック付
PART NO.	NAME	MATERIAL NAME / CODE	FINISH		
ALPS ELECTRIC CO., LTD.					
		DSGD. セツケ12 H. MIURA '95-12-08	SCALE 2:1		
		CHKD. M. ENDOU '95-12-08		TITLE 12形 PUSH ON SW付 薄形エンコーダー	
		APPD. S. MIZOBUTI '95-12-08	UNIT mm	DOCUMENT NO. LE212407	
SYMB	DATE	APPD	CHKD	DSGD	