

Customer: ALPS EUROPE DISTRIBUTION

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Date: Nov. 06, 2006

Attention:

Your ref. No.:

Your Part No.: EC12E1220401

## SPECIFICATIONS

ALPS' ;

MODEL: EC12E1220401

Spec. No.:

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

RECEIPT STATUS

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Sales

B6523

Q1003#03A (EA)

# SPECIFICATIONS

1. THIS SPECIFICATIONS APPLY TO EC12E1220401 ROTARY ENCODERS.

2. CONTENTS OF THIS SPECIFICATIONS.

F3517221M

LE2120N

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.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| <p>1. 一般事項 General</p> <p>1-1 適用範囲 Scope<br/>この仕様書は主として電子機器に用いられる小型低圧12桁ロータリーエンコーダに適用する。<br/>This specification applies to 12mm size low-profile rotary encoder (Incremental type) for microscopical current circuits, used in electronic equipment.</p> <p>1-2 標準状態 Standard atmospheric conditions<br/>測定は標準状態で行われ、次の範囲で行なう。<br/>Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as follows:<br/>           温度 Ambient temperature : 15°C to 35°C<br/>           湿度 Relative humidity : 25% to 85%<br/>           気圧 Air pressure : 86kPa to 106kPa<br/>           但し、湿度を主として測定する場合は、次の標準状態で行なう。<br/>           If there is any doubt about the results, measurements shall be made within the following limits:<br/>           温度 Ambient temperature : 20 ± 1°C<br/>           湿度 Relative humidity : 63% to 87%<br/>           気圧 Air pressure : 86kPa to 106kPa</p> <p>1-3 動作温度範囲 Operating temperature range : -10°C to +70°C</p> <p>1-4 保存温度範囲 Storage temperature range : -40°C to +85°C</p> |  |  |  |
| <p>2. 構造 Construction</p> <p>2-1 寸法 Dimensions<br/>参照図に示す。<br/>Refer to attached drawing.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |
| <p>3. 定格 Rating</p> <p>3-1 定格電圧 Rated voltage : D.C. 5V</p> <p>3-2 定格電流 (抵抗負荷) Operating current (resistive load)<br/>各端子ごとの電流<br/>Each lead current<br/>コモン端子は共通<br/>Common lead<br/>           : 0.5mA (MAX 5mA, MIN 0.5mA)<br/>           : 1mA (MAX 10mA, MIN 0.5mA)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |

|              |              |              |                          |                  |
|--------------|--------------|--------------|--------------------------|------------------|
| APPRO.       | CHKD.        | DSGD.        | TITLE                    | 12 桁ロータリーエンコーダ   |
| APR. 22, '99 | APR. 22, '99 | APR. 22, '99 | 12mm Size Rotary encoder |                  |
| K. ITO       | Y. KANZAKI   | H. MIURA     | DOCUMENT NO.             | F 3517221M (1/8) |
| SYMB         | DATE         | APPD         | CHKD                     | DSGD             |

4. 電気的特性 Electrical characteristics

| 項目 Item                                | 条件 Conditions                                                                                                                                                                             | 試験方法 Test method                                                                      |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 4-1 出力信号 Output signal format          | <p>Shift rotational direction</p> <p>出力信号 A (A-C端子) A(Terminal A-C)</p> <p>出力信号 B (B-C端子) B(Terminal B-C)</p> <p>出力信号 A (A-C端子) A(Terminal A-C)</p> <p>出力信号 B (B-C端子) B(Terminal B-C)</p> | <p>出力信号 Output</p> <p>OFF ON</p> <p>OFF ON</p> <p>OFF ON</p> <p>OFF ON</p>            |
|                                        | <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p>                                                                                                     | <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> |
|                                        | <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p>                                                                                                     | <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> |
|                                        | <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p>                                                                                                     | <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> |
| 4-2 分解能 Resolution                     | 100% 出力電圧 1.5V                                                                                                                                                                            | 100% 出力電圧 1.5V                                                                        |
| 4-3 スイッチング特性 Switching characteristics | <p>1) Shift rotational speed : 360°/5°</p> <p>2) Test circuit</p>                                                                                                                         | <p>1) Shift rotational speed : 360°/5°</p> <p>2) Test circuit</p>                     |
| 1) チャタリング Chattering                   | <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p>                                                                                                     | <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> <p>100% 出力電圧 1.5V</p> <p>100% 出力電流 5mA</p> |

|              |              |              |                          |                  |
|--------------|--------------|--------------|--------------------------|------------------|
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| APR. 22, '99 | APR. 22, '99 | APR. 22, '99 | 12mm Size Rotary encoder |                  |
| K. ITO       | Y. KANZAKI   | H. MIURA     | DOCUMENT NO.             | F 3517221M (2/8) |
| SYMB         | DATE         | APPD         | CHKD                     | DSGD             |

| 項目<br>Item                       | 条件<br>Conditions                                                                                                                                                                                                                                                                                                                                                                                                                 | 規格<br>Specifications                                                 |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| 2) 滑動ノイズ (Sliding noise)         | コードONの時の1.5V以上の電圧変動を認めない。チャタリング、1.5V以上の電圧変動は1ms以上、1.5Vの電圧変動を認める。また、電圧ノイズは1ms以上、1.5Vの電圧変動を認める。<br>Specified by the time of voltage change exceed 1.5V in code-ON area.<br>When the bounce has code-ON time less than 1ms between chatterings ( $t_1$ or $t_2$ ), the voltage change shall be regarded as a part of chattering.<br>When the code-ON time between 2 bounces is less than 1ms, they are regarded as 1 linked bounce. | $t_2 \leq 2ms$                                                       |
| 3) 滑動ノイズ (Sliding noise)         | コードOFFの時の電圧変動<br>The voltage change in code-OFF area.                                                                                                                                                                                                                                                                                                                                                                            | 3.5V以上<br>3.5V MIN                                                   |
| 4-4 絶縁抵抗 (Dielectric strength)   | 端子-接地間C.A. C. 50V1分間耐電圧 (リーク電流1mA)<br>A voltage of 50VDC shall be applied for 1min between individual terminals and bracket (Leak current 1mA)                                                                                                                                                                                                                                                                                   | 絶縁破壊のないこと<br>Without arcing or breakdown                             |
| 4-5 絶縁抵抗 (Insulation resistance) | 端子-接地間D.C. 50V耐電圧。<br>Measurement shall be made under the condition which a voltage of 50VDC is applied between individual terminals and bracket.                                                                                                                                                                                                                                                                                | 端子-接地間にて10MΩ以上<br>Between individual terminals and bracket: 10MΩ MIN |
| 4-6 位相差 (Phase-difference)       | 定速で動作する回転子。<br>Measurement shall be made under the condition which the shaft is rotated in constant speed.<br>$<fig. 4>$<br>時計方向<br>CW<br>A信号 (A-C線)<br>Signal A<br>B信号 (B-C線)<br>Signal B<br>OFF<br>ON<br>OFF<br>ON<br>反時計方向<br>CCW<br>A信号 (A-C線)<br>Signal A<br>B信号 (B-C線)<br>Signal B<br>OFF<br>ON<br>OFF<br>ON                                                                                                               | $<fig. 4>$<br>$\Delta T = 0.08T$ 以上<br>MIN<br>IN<fig. 4>             |

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|----------------------------|--------------|--------------|------------------------------------------|
| APPRO.                     | CHKD.        | DSGD.        | TITLE                                    |
| ADR. 22. '99               | ADR. 22. '99 | ADR. 22. '99 | 12 形回転子エンコーダ<br>12mm Size Rotary encoder |
| K. ITO Y. KANZAKI H. MIURA |              |              | DOCUMENT NO.                             |
| F 3517221M                 |              |              | (3/8)                                    |

| 項目<br>Item                                       | 条件<br>Conditions                                                                                                                                                                                          | 規格<br>Specifications                                                                                                                                                                      |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5-1 全回転角度 (Total rotational angle)               |                                                                                                                                                                                                           | 360° (エンドレス)<br>360° (Endless)                                                                                                                                                            |
| 5-2 クリックトルク (Click torque)                       | (クリック時のみ適用)<br>(Applied for with-detent type)                                                                                                                                                             | 3~20mN・m                                                                                                                                                                                  |
| 5-3 クリック位置と位置 (Number and position of detents)   |                                                                                                                                                                                                           | 12クリック<br>12 detents<br>(ステップ角 30°±3°)<br>(Step angle: 30°±3°)                                                                                                                            |
| 5-4 軸の押し引き強度 (Push-pull strength of shaft)       | 軸の押し引き及び方向に80Nの静荷重を10秒間加える。(PCB実装時仕様)<br>Push and pull static load of 80N shall be applied to the shaft in the axial direction for 10s.<br>(After soldering of the PC board)                              | 軸の破損、歪み、回転、及びその他の異常な動作を認めないこと。<br>Without damage to, or excessive play in shaft.<br>No excessive abnormality in rotational feeling.<br>And electrical characteristics shall be satisfied. |
| 5-5 端子強度 (Terminal strength)                     | 端子強度の任意の一方に3Nの静荷重を10秒間加える。<br>A static load of 3N shall be applied to the tip of terminals for 10s in any direction.                                                                                      | 歪み、及び軸の破損を認めないこと。<br>Without excessive play in terminals or poor contact.                                                                                                                 |
| 5-6 軸ガタ (Shaft wobble)                           | 軸先端から55mmの位置に50mN・mのモーメントを加える。<br>A momentary load of 50mN-m shall be applied at the point 55mm from the tip of the shaft in a direction perpendicular to the axis of shaft.                              | 0.7xL/30mmp-D以内<br>0.7xL/30mmp-D MAX<br>(Lは軸長さ、Dは軸径、) (L: Shaft length)                                                                                                                   |
| 5-7 軸のラスト方向の軸ガタ (Shaft play in axial direction)  | 軸に3Nの押し引き荷重を加える。<br>Push and pull static load of 3N shall be applied to the shaft in the axial directions.                                                                                                | 0.4mmp-D以内<br>0.4mmp-D MAX                                                                                                                                                                |
| 5-8 軸の歪み耐力 (Side thrust strength of shaft)       | 軸先端から55mmの位置に20Nの静荷重を10秒間加える。(PCB実装時仕様)<br>A load of 20N shall be applied at the point 55mm from the tip of the shaft in a direction perpendicular to the axis of shaft (After soldering of the PC board) | 歪み、及び軸の破損、及びその他の異常な動作を認めないこと。<br>Without excessive play or bending in shaft.<br>No mechanical abnormality.                                                                                |
| 5-9 軸の回転方向の軸ガタ (Shaft play in rotational wobble) | 角度計で測定する。<br>Measure with Jig for rotational angle                                                                                                                                                        | 3° 以内<br>3° MAX                                                                                                                                                                           |

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| K. ITO Y. KANZAKI H. MIURA |              |              | DOCUMENT NO.                             |
| F 3517221M                 |              |              | (4/8)                                    |

| 項目<br>Item                                   | 条<br>Conditions                                                       | 規<br>格<br>Specifications                                                                                                                                                                                                                                                                                             |
|----------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5-10 是んだ阻<br>Resistance to<br>soldering heat | 7条の“はんだ付け条件”による。<br>Specified by the clause 7 "Soldering conditions". | はんだ付け後、電気的性質を満足する<br>こと。また、著しいメカニカルな異常<br>の生じないこと。<br>Electrical<br>characteristics shall<br>be satisfied.<br>No mechanical<br>abnormality such as a<br>excessive play.<br>電気的性質は、溶接後の95%<br>以上高いレベルで保たれること。<br>A new uniform coating<br>of solder shall cover<br>a minimum of 95% of the<br>surface being immersed. |

| 項目<br>Item                    | 条<br>Conditions                                                                                                                                                                                                                                                                                                                                                                                                          | 規<br>格<br>Specifications                                                                                                                                                                                                              |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6-1 回転寿命試験<br>Rotational life | 振動で600~1000/Hの速度で、30,000回回転試験動作を行う。<br>The shaft of encoder shall be rotated to 30,000 cycles at<br>a speed of 600~1000/H without electrical load, after<br>which measurements shall be made.                                                                                                                                                                                                                            | チャタリング $t_v \leq 5\text{ms}$<br>ハウジング $t_h \leq 3\text{ms}$<br>Chattering $t_v \leq 5\text{ms}$<br>Bounce $t_h \leq 3\text{ms}$<br>クリップが残っていること。<br>Detent Feeling has to<br>remains.                                                 |
| 6-2 耐湿性<br>Damp heat          | 温度40 $\pm$ 2 $^{\circ}$ C、湿度90~95%の恒温恒湿槽で240 $\pm$ 10時間放置後、常温、常湿で1.5時間<br>放置する。<br>The encoder shall be stored at a temperature of 40 $\pm$ 2 $^{\circ}$ C with<br>relative humidity of 90% to 95% for 240 $\pm$ 10H in a<br>thermostatic chamber.<br>And then the encoder shall be subjected to standard<br>atmospheric conditions for 1.5H, after which measurement<br>shall be made.                                  | 耐湿試験(4.1~4.5及び5.1)<br>を満足すること。<br>Specifications in<br>clause 4.1~4.5 and 5.1<br>shall be satisfied.                                                                                                                                  |
| 6-3 耐乾燥性<br>Dry heat          | 温度85 $\pm$ 3 $^{\circ}$ Cの恒温槽で240 $\pm$ 10時間放置後、常温、常湿で1.5時間放置する。<br>The encoder shall be stored at a temperature of 85 $\pm$ 3 $^{\circ}$ C for<br>240 $\pm$ 10H in a thermostatic chamber. And then the encoder<br>shall be subjected to standard atmospheric conditions for<br>1.5H, after which measurements shall be made.                                                                                           |                                                                                                                                                                                                                                       |
| 6-4 低温特性<br>Cold              | 温度-40 $\pm$ 3 $^{\circ}$ Cの恒温槽で240 $\pm$ 10時間放置後、常温、常湿で1.5時間放置する。<br>The encoder shall be stored at a temperature of -40 $\pm$ 3 $^{\circ}$ C<br>for 240 $\pm$ 10H in a thermostatic chamber.<br>And then the encoder shall be subjected to standard<br>atmospheric conditions for 1.5H, after which measurement<br>shall be made.                                                                                       |                                                                                                                                                                                                                                       |
| 6-5 耐落下性<br>Free falling      | 60cmの高さより製品の任意の方向からビニールを被ったコンクリートの床に自由落下させる。<br>The encoder shall be fallen freely at any posture from 60cm<br>height to the concrete floor covered with vinyl-tile, after<br>which measurement shall be made.                                                                                                                                                                                                           | 著しい変形、破損等がなく組立検査<br>(4.1~4.5及び5.1)を<br>満足すること。<br>(但し、端子部の変形は除く。)<br>No excessive<br>deformation or damage.<br>(Except the<br>deformation of<br>terminals.)<br>And specifications in<br>clause 4.1~4.5 and 5.1<br>shall be satisfied. |
| 6-6 耐振動<br>Vibration          | 10~55~10Hzと定まる振動(1時間1分/総計1.5mm)をX、Y、Z、各方向<br>2軸連続させる。<br>The following vibration shall be applied to the encoder,<br>after which measurement shall be made:<br>The entire frequency range, from 10Hz to 55Hz and return to<br>10Hz, shall be transversed in 1 min.<br>Amplitude(total excursion): 1.5mm.<br>This motion shall be applied for a period of 2H in each of<br>3 mutually perpendicular axes (A total of 6H). | 耐振動試験(4.1~4.5及び5.1)<br>を満足すること。<br>Specifications in<br>clause 4.1~4.5 and 5.1<br>shall be satisfied.                                                                                                                                 |

| SYMB | DATE | APPD | CHKD | DSGD | APPD.  | CHKD.      | DSGD.    | TITLE      | 12 形回転エンコーダ<br>12mm Size Rotary encoder | DOCUMENT NO. | (5/8) |
|------|------|------|------|------|--------|------------|----------|------------|-----------------------------------------|--------------|-------|
|      |      |      |      |      | K. ITO | Y. KANZAKI | H. MIURA | F 3517221M |                                         |              |       |

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|------|------|------|------|------|--------|------------|----------|------------|-----------------------------------------|--------------|-------|
|      |      |      |      |      | K. ITO | Y. KANZAKI | H. MIURA | F 3517221M |                                         |              |       |

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9. その他、取扱い上の注意

9-1. 保管は高温、高湿の場所及び腐食性ガス中を避けて下さい。  
During operation, storage in high temperature and humidity, and in corrosive gas, should be avoided.

9-2. エンコーダーのハルスカウンタ処理の設計図については動作シート、サンプリングタイム、マスクキングタイム等ご注意ください。安振装置の上部使用願います。

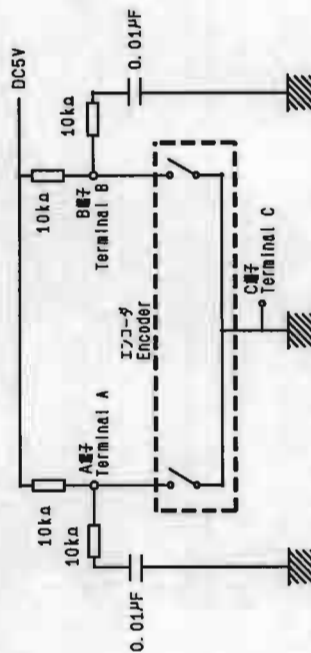
In case of pulse count process design, operational speed, sampling time, and masking time etc should be taken into the consideration.

9-3. 本製品はクリック位置にてA相はOFF状態で安定となりますので、ソフト設計時A相基準で設計願います。

A phase should be design criterion prior to B phase.  
Because A phase has steady off signal at detent position.

9-4. インコター-のハ・ムスカウト処理の回数は下図のフィルムター-をいれることを推奨します。

**For your pulse count design, it should be considered to add C/R filter on your circuit shown as below.**



9-5. 本製品①本体に直接水分が分かちますと、ハ'ルス液が同様に発生する可能性があります②で、製品に直接水分が分かちません③ように配慮します。

Care must be taken not to expose this product to water or dew to prevent possible problem in pluse output wave form.

9-6. 医療用器具、器具への本品の製品の使用は下記下さい。

**PLEASE AVOID TO MEDICAL INSTRUMENT BECAUSE THIS ENCODER IS AUDIO USE.**

[illegible][illegible]

## 7. はんぞ付け条件 Soldering conditions

## 7-1 手はんだの適合 Manual soldering

温度350°C以下、時間3分以内  
 Bit temperature of soldering iron : 350°C or less.  
 Application time of soldering iron : within 3s.

7-2 ティンパハンダロ合 Dip soldering

绝缘板 : t1. 6片铜芯铜板  
Printed wiring board: Single-sided copper clad laminate board with thickness of 1.6mm.

フラックス : 比重0.82以上のフラックスを用い発泡式フラクサーにて発泡面高さは、基板厚の半分を目とし、かつ基板表面にフラックスの侵入がないこと。

FL11Y:

- Specific gravity: 0.92 or more.
- Flux shall be applied to the board using a bubble foaming type fluxer.
- The board shall be soaked in the flux bubble only to the middle of its
- Flux shall not come into contact with the component side surface.

プリヒート : 基板表面温度100°C以下、時間1分以内

Preheating:

- Surface temperature of board: 110°C
- Preheating time: within 1 min.

温度  $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 、时间 3 份 + 1 份以内

Soldering: 60/40

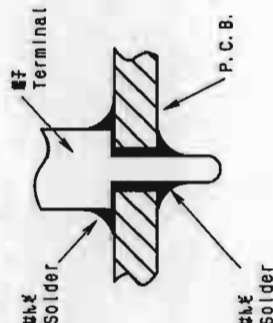
- Solder temperature: 260°C ±5
- Immersion time: within 3±1s

以上の工程を1回または2回通ずる。

Apply the above soldering process for 1 or 2 times.

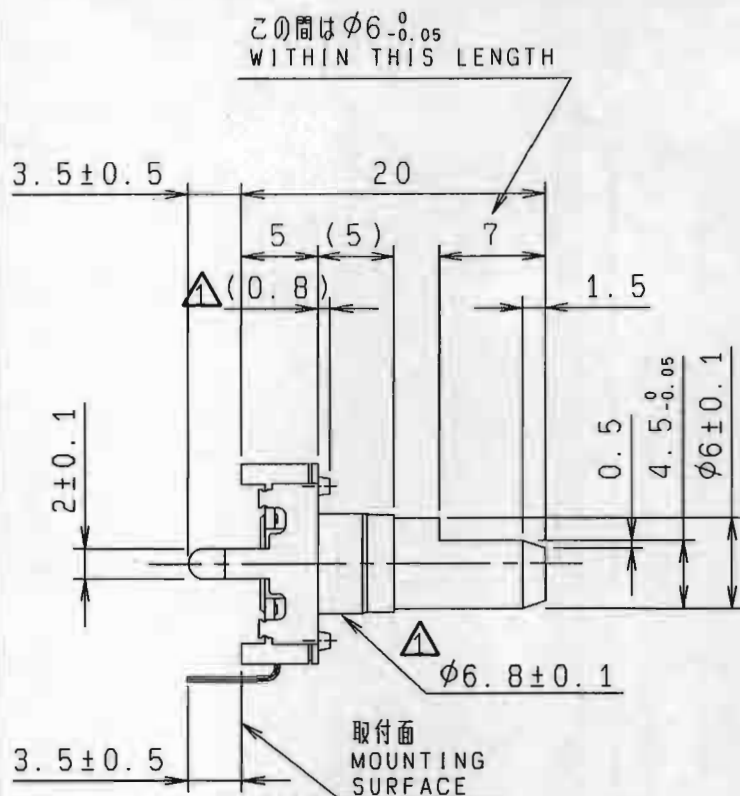
8. はんだ付け時の注意事項 Note for soldering method.

8-1 下のようP、C、B、G上面に溶け付ける型は、必ず使ってください。  
Please avoid soldering on upper surface (the component side surface) of the PC board as shown below.

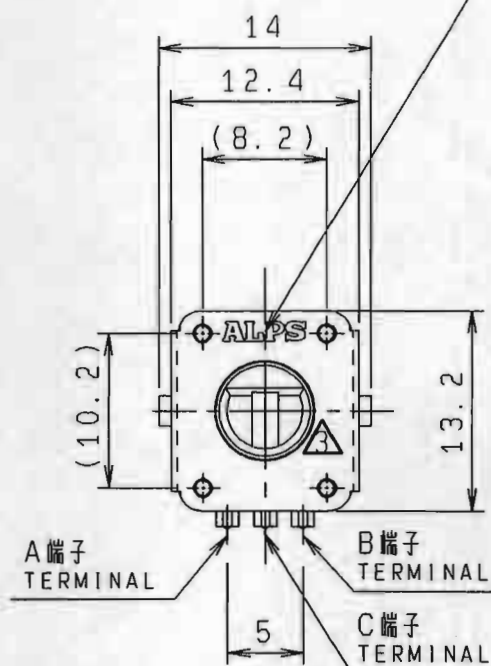


8-2 半田テ・ IPP' 壁の姿勢についてはエンコーダ - 内圧フラックスが流入する場合があり、  
地盤不安の原因となり、またそのアブレーションも、

位置不良の原因は、以下のとおりと見られています。  
Please avoid cleaning of PCB board, because the flux used during the dip soldering process may enter the encoder and cause poor contact.

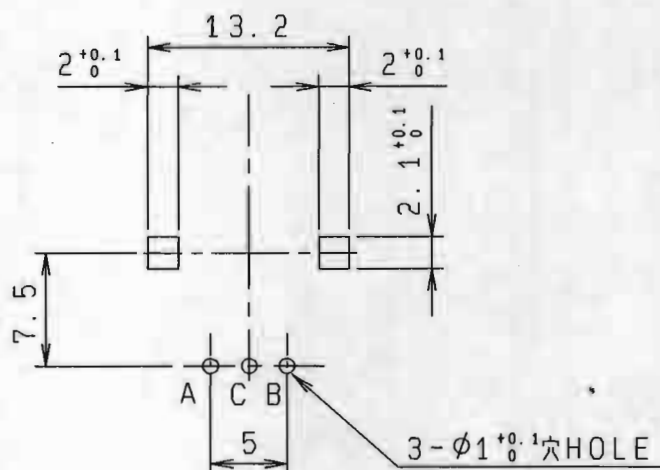


商標の位置は任意  
THE DIRECTION OF  
TRADE MARK IS OPTIONAL



取付穴寸法図 (許容差  $\pm 0.1$ )

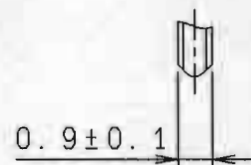
\* 挿入側より見た図  
P.W.B. MOUNTING DETAIL  
(TOLERANCE  $\pm 0.1$ )  
VIEWED FROM MOUNTING SIDE



基板板厚  $t = 1.6\text{mm}$   
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<br>TOLERANCES UNLESS OTHERWISE SPEC |               |
|------------------------------------------------|---------------|
| $L \leq 10$                                    | $\pm 0.3$     |
| $10 < L < 100$                                 | $\pm 0.5$     |
| $100 \leq L$                                   | $\pm 0.8$     |
| 角度<br>ANGULAR DIMENSION                        | $\pm 5^\circ$ |

|                                                                                       |  |            |  |                      |  |                                                                                                                    |  |                                                                                                   |  |
|---------------------------------------------------------------------------------------|--|------------|--|----------------------|--|--------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------|--|
|                                                                                       |  |            |  |                      |  | 12ハ'ルス 12PLUSE<br>SHAFT COLOR:GRAY                                                                                 |  | L=20 伏形<br>クリック付き                                                                                 |  |
| PART NO.                                                                              |  | NAME       |  | MATERIAL NAME / CODE |  | FINISH                                                                                                             |  |                                                                                                   |  |
|                                                                                       |  |            |  |                      |  |  <b>ALPS ELECTRIC CO., LTD.</b> |  |                                                                                                   |  |
|                                                                                       |  |            |  |                      |  | DSGD. ツツケ11-8501351<br>H. Shimomura98-01-29                                                                        |  | SCALE<br>2:1                                                                                      |  |
|                                                                                       |  |            |  |                      |  |                                                                                                                    |  | NO.<br>_____                                                                                      |  |
|  1 |  | 2001/09/13 |  | S.M H. OY. F         |  | CHKD.                                                                                                              |  | TITLE                                                                                             |  |
|  1 |  | 99/12/14   |  | K. IY. KH. O         |  | S. Inoue 98-02-02                                                                                                  |  |  12形薄形エンコータ' |  |
|  2 |  | 99/8/23    |  | K. KK. IY. K         |  | APPD.                                                                                                              |  | DOCUMENT NO.                                                                                      |  |
| SYMB                                                                                  |  | DATE       |  | APPD CHKD DSGD       |  | K. Kawasaki 98-02-02                                                                                               |  | UNIT<br>mm                                                                                        |  |
|                                                                                       |  |            |  |                      |  |                                                                                                                    |  | LE2120N                                                                                           |  |