

Customer: ALGE DISTRIBUTOR

No. ECR2005-6189

Date: Aug. 30, 2005

Attention:

Your ref. No.: 21 8015

Your Part No.: STEC11B03 PROMOTION

SPECIFICATIONS

ALPS;

MODEL EC11B15244

Spec. N

Sample No.: F 2 5 8 3 8 2 4 M

RECEIPT STATUS

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By Date

Signature

Name

Title

ALPS[®]
ALPS ELECTRIC CO., LTD.

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Phone,+81(3)3726-1211

DSG'D *H. Minura*

APP'D *S. IZAWA*

ENG. DEPT. DIVISION

Sales

B6523

Q1003#03A (EA)

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

1. THIS SPECIFICATIONS APPLY TO EC11B152442D ROTARY ENCODERS.

2. CONTENTS OF THIS SPECIFICATIONS.

F2583824M
LA211446S

3. MARKING
• MARKING ON ALL UNITS
EIA DATE CODE

4. REMARKS
• FURNISH PACKAGE
NUT: 1 WASHER: 1

• 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, resp- cations, 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 properties of these products for the

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.

CLASS No.	TITLE
	11 形回転エンコーダ規格書 11mm Size Rotary Encoder Specification

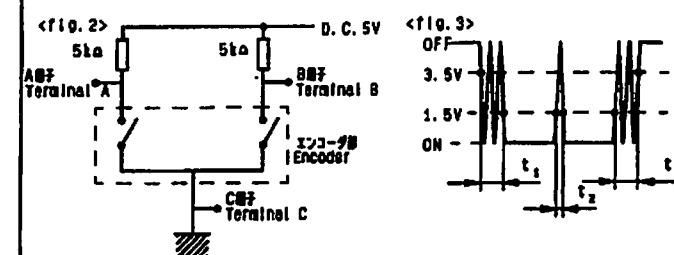
1. 一般事項 General (SW01), (SW02)
- 1-1 適用範囲 Scope
この規格書は主として電子機器に用いられる微小電流駆動型11形ロープロフィール回転エンコーダ(増分型)のマイクロ電流回路に用いられる。 This specification applies to 11mm size low-profile rotary encoder (incremental type) for microscopic current circuits, used in electronic equipment.
- 1-2 標準状態 Standard atmospheric conditions
規定がなければ、次の範囲で測定する。 Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as follows:
 周囲温度 Ambient temperature : 15°C to 35°C
 相対湿度 Relative humidity : 25% to 85%
 気圧 Air pressure : 88kPa to 108kPa
 但し、疑念が生じた場合は、次の範囲で測定する。 If there is any doubt about the results, measurements shall be made within the following limits:
 周囲温度 Ambient temperature : 20 ± 1°C
 相対湿度 Relative humidity : 63% to 87%
 気圧 Air pressure : 88kPa to 108kPa
- 1-3 動作温度範囲 Operating temperature range : -40°C to +85°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
図面を参照せよ。 Refer to attached drawing.
3. 定格 Rating
- 3-1 定格電流 (SW01) Rating : D.C. 5V 10mA (1mA MIN)
4. 電気的特性 Electrical characteristics (SW01)

項目 Item	条件 Conditions	規格 Specifications
4-1 出力信号形式 Output signal format		<p>A, B 2相信号を出力とし、図1 <Fig. 1>の通りとする。 (図1は2相信号の各パルスが互いに90°位相をなす。)</p> <p>2 Phase-different signals (Signal A, signal B) Details shown in <Fig. 1>. (The broken line shows detent position of with-detent type.)</p>
<Fig. 1>		
回転方向 Shaft rotational direction		信号 Signal
時計方向 C. V.	A (A-C端子) A(Terminal A-C)	OFF ON
	B (B-C端子) B(Terminal B-C)	OFF ON
逆時計方向 C. C. V.	A (A-C端子) A(Terminal A-C)	OFF ON
	B (B-C端子) B(Terminal B-C)	OFF ON

ALPS ELECTRIC CO., LTD.

APPD.	CHKD.	DESD.	TITLE
Mar. 22, '88	Mar. 22, '88	Mar. 22, '88	11 形回転エンコーダ 11mm Size Rotary encoder
Y. YOSHIOKA M. SATOH Y. ISAWA			DOCUMENT NO. F2583824M (1/6)

CLASS No.	TITLE
	11 形回転エンコーダ規格書 11mm Size Rotary Encoder Specification

項目 Item	条件 Conditions	規格 Specifications
4-2 分解能 Resolution	1回転で出力されるパルス数 Number of pulses in 360° rotation.	9相 15パルス/360° 15 pulses/360° for each phase (2パルス/1パルス) (2Clicks 1Pulse)
4-3 スイッチング特性 Switching characteristics	<p>下記の条件で測定する。 Measurement shall be made under the condition as follows. 1) Shaft rotational speed : 380°/s 2) Test circuit : <Fig. 2></p> <p><Fig. 2> </p> <p>(注) コ-FOFF状態 : 出力電圧が 3.5V以上を指す。 コ-FON状態 : 出力電圧が 1.5V以下を指す。 (note) Code-OFF area : The area which the voltage is 3.5V or more. code-ON area : The area which the voltage is 1.5V or less.</p>	
1) チョッピング Chattering	コ-FOFF+ONとON+OFFの各パルスは、出力電圧が 1.5V~3.5Vの範囲で発生する。 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).	t ₁ , t ₂ ≤ 2ms
2) 振動/バウンス (バウンス) Sliding noise (bounces)	コ-FON状態が 1.5V以上の電圧を維持し、バウンス時間 t ₁ , t ₂ が 2ms以上を超過する場合は、振動/バウンスとみなす。 Specified by the time of voltage change exceed 1.5V in code-ON area. When the bounce has code-ON time less than 1ms between chattering (t ₁ or t ₂), the voltage change shall be recorded as a part of chattering. when the code-ON time between 2 bounces is less than 1ms, they are regarded as 1 linked bounce.	t ₂ ≤ 2ms
3) 振動/バウンス Sliding noise	コ-FOFF状態が 3.5V以上の電圧を維持し、バウンス時間 t ₁ , t ₂ が 2ms以上を超過する場合は、振動/バウンスとみなす。 Specified by the time of voltage change exceed 3.5V in code-OFF area.	3.5V以上 3.5V MIN

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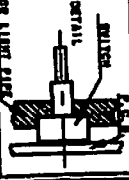
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Y. YOSHIOKA M. SATOH Y. ISAWA			DOCUMENT NO. F2583824M (2/6)

CLASS NO.	TITLE	SPECIFICATIONS	
CLASS NO.	11 型歯車工コ-9 歯車	11M Size Helix Encoder Specification	
1-4 歯差 3000-difference	条件 360°-5°の歯差を有する歯車は、 Measurement shall be made under the condition which the shaft is rotated in 360°-5° (constant speed). (16.4)	条件 (11.4) 3000P ATZ Base Indict (17)	
4-0 絶縁 Insulation resistance	条件 300V C, 500V Y, 300V B, 300V G Management shall be made under the condition which a voltage of 300V C, 500V Y, 300V B, 300V G is applied between individual terminals and bushing. (17)	条件 300V C, 500V Y, 300V B, 300V G (17)	
4-0 絶縁 Dielectric strength	条件 300V C, 500V Y, 300V B, 300V G Management shall be made under the condition which a voltage of 300V C, 500V Y, 300V B, 300V G is applied between individual terminals and bushing. (test current: 5mA) (18)	条件 300V C, 500V Y, 300V B, 300V G (18)	
5. 機械的 Mechanical	条件 Characteristics (19)	条件 Specifications (19)	
5-1 総回転 Total rotations angle		条件 360° (271/2) 300° (Endless)	
5-2 20°のトルク Torque for 20°		条件 1237m-N	
5-3 20°のトルク Torque for 20° of detents.		条件 3062N-cm 30 detents (27°/18 12°/18°) (Step angle: 45°)	
5-4 静電 Terminal static strength	条件 A static load of 5N be applied to the tip of terminals for minute in any direction.	条件 5N (Step angle: 45°)	
5-5 静電 Push-pull strength of the shaft	条件 A static load of 5N be applied to the shaft in the axial direction for 30s (after installing)	条件 5N (Step angle: 45°)	

ALPS ELECTRIC CO., LTD.

APPRO. DATE: APR. 22, '88
 Y. YOSHIDA, M. SATOH, Y. ISAWA
 F 2583824M (3/6)

CLASS NO.	TITLE	SPECIFICATIONS	
CLASS NO.	11 型歯車工コ-9 歯車	11M Size Helix Encoder Specification	
7-0 歯差 Shaft scable	条件 11.6.5) 歯差は、 Tighten the nut according to (16.5)	条件 (11.6) 5	
7-0 歯差 Shaft scable	条件 11.6.6) 歯差は、 A momentary load of 500mN shall be applied at the point 8mm from the tip of the shaft in a direction perpendicular to the axis of shaft.	条件 500mN 8mm	
7-0 歯差 Shaft scable	条件 11.6.7) 歯差は、 Measure with jig for rotational angle.	条件 5mm 0.4mm-DIT 0.4mm-DUX	
7-0 歯差 Shaft scable	条件 11.6.8) 歯差は、 Specified by the clause 7 "soldering conditions".	条件 Soldering conditions (11.6.8)	



CLASS NO.	TITLE	SPECIFICATIONS	
CLASS NO.	11 型歯車工コ-9 歯車	11M Size Helix Encoder Specification	
8. 機械的 Endurance characteristics.	条件 Characteristics (20)	条件 Specifications (20)	
8-1 総回転 Total rotations angle		条件 360° (271/2) 300° (Endless)	
8-2 20°のトルク Torque for 20°		条件 1237m-N	
8-3 20°のトルク Torque for 20° of detents.		条件 3062N-cm 30 detents (27°/18 12°/18°) (Step angle: 45°)	
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ALPS ELECTRIC CO., LTD.

APPRO. DATE: APR. 22, '88
 Y. YOSHIDA, M. SATOH, Y. ISAWA
 F 2583824M (4/6)

CLASS No.	TITLE
	11 形回転エンコーダ仕様書 11mm Size Rotary Encoder Specification
<p>7. 溶んだめ付け条件 Soldering conditions (SW01), (SW02)</p> <p>7-1 手溶んだめ付け Manual soldering</p> <p>温度 350°C 以下、時間 30 秒以内 Bit temperature of soldering iron : 350°C or less. Application time of soldering iron : within 3s.</p> <p>7-2 チップ溶んだめ付け Dip soldering</p> <p>基板仕様 : 1.6mm 厚銅箔被覆基板 Printed wiring board: Both-sided copper clad laminate board with thickness of 1.6mm.</p> <p>フラックス : 比重 0.82 以上のフラックスを泡型または超音波フラックスにて塗布する。各種塗布の割合は 0.2。 Flux: - Specific gravity: 0.82 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 2/3 of its thickness.</p> <p>予熱 : 表面温度 100°C 以下、時間 2 分以内 Preheating: - Surface temperature of board: 100°C or less. - Preheating time: within 2 min.</p> <p>はんだ : 純度 260±5°C、時間 5±1 秒 Soldering: - Solder temperature: 260±5°C. - Immersion time: 5±1 sec.</p> <p>以上の工程を 1 回または 2 回繰り返す。 Apply the above soldering process for 1 or 2 times.</p>	

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Y. YOSHIOKA	M. SATOH	Y. ISAWA	DOCUMENT NO.
			F 2583824M (5/6)

SYND.	RATE	APPD.	CHGD.	DRGD.
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CLASS No.	TITLE																																	
	7 ヲッシュモーメントリスイッチ仕様書 PUSH MOMENTARY SWITCH SPECIFICATION (SW02)																																	
<p>1. 定格電圧(抵抗負荷) D.C. 16V3A (10mA MIN) Switch rating (Resistor load)</p> <p>2. 電気特性 Electrical characteristics</p> <table border="1"> <thead> <tr> <th>項目 Item</th> <th>条件 Conditions</th> <th>仕様 Specifications</th> </tr> </thead> <tbody> <tr> <td>2-1 接触抵抗 Contact resistance</td> <td>D.C. 5V10mA 電圧降下法にて測定する。 Measured by the 10mA 5V D.C. voltage drop method.</td> <td>100mΩ 以下 100mΩ MAX.</td> </tr> <tr> <td>2-2 チョッピング Chattering</td> <td>1サイクル (OFF-ON-OFF) 100回/秒にて測定する。 Switch is operated at the rate of 1 cycle 1 sec. The 1 cycle shall be OFF-ON-OFF.</td> <td>10msec 以下 Less than 10msec</td> </tr> <tr> <td>2-3 絶縁抵抗 Insulation resistance</td> <td>端子-端子間 D.C. 250V1mA 測定する。 Measurement shall be made under the condition which a voltage of 250V D.C. 1mA is applied between individual terminals and bushing.</td> <td>端子-端子間にて 100MΩ 以上 Between individual terminals and bushing: 100MΩ MIN.</td> </tr> <tr> <td>2-4 耐電圧 Dielectric strength</td> <td>端子-端子間 A.C. 300V1分測定。A.C. 360V2分測定する。(0-2mA 電流 1mA) A voltage of 300V A.C. shall be applied for 1min or a voltage of 360V A.C. shall be applied for 2sec between individual terminals and bushing. (Leak current: 1mA)</td> <td>端子-7-7-2 絶縁破壊等せず。 Without damage to parts arcing or breakdown.</td> </tr> </tbody> </table> <p>注: シャフト端子間は絶縁されておらず。 Note: Shaft is insulated from switch terminal.</p> <p>3. 機械特性 Mechanical characteristics</p> <table border="1"> <thead> <tr> <th>項目 Item</th> <th>条件 Conditions</th> <th>仕様 Specifications</th> </tr> </thead> <tbody> <tr> <td>3-1 スイッチ配置・接点配置 Contact arrangement</td> <td></td> <td>標準型 (Push on) S.P.S.T. (Push on)</td> </tr> <tr> <td>3-2 スイッチ行程 Switching stroke</td> <td></td> <td>0.5^{+0.4}_{-0.3} mm</td> </tr> <tr> <td>3-3 スイッチ作動力 Switch operation force</td> <td></td> <td>833mN</td> </tr> </tbody> </table> <p>4. 耐久特性 Endurance characteristics.</p> <table border="1"> <thead> <tr> <th>項目 Item</th> <th>条件 Conditions</th> <th>仕様 Specifications</th> </tr> </thead> <tbody> <tr> <td>4-1 動作寿命 Operating life</td> <td>定格電圧にて 25,000 回動作し、25,000 回動作後 5 分間、定格電圧 5,000V 以下にて動作させる。 The shaft of switch shall be 25,000 times at a speed of 500 times per hour without electrical load, after which measurements shall be made. However, an interim measurement shall be made immediately after 5,000 times.</td> <td>接触抵抗: 200mΩ 以下。 絶縁抵抗: 100MΩ 以上。 Switch contact resistance: 200mΩ MAX. Except above items, specifications in clause 2.2-4, and 3.1-3 shall be satisfied.</td> </tr> </tbody> </table>		項目 Item	条件 Conditions	仕様 Specifications	2-1 接触抵抗 Contact resistance	D.C. 5V10mA 電圧降下法にて測定する。 Measured by the 10mA 5V D.C. voltage drop method.	100mΩ 以下 100mΩ MAX.	2-2 チョッピング Chattering	1サイクル (OFF-ON-OFF) 100回/秒にて測定する。 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-端子間 D.C. 250V1mA 測定する。 Measurement shall be made under the condition which a voltage of 250V D.C. 1mA is applied between individual terminals and bushing.	端子-端子間にて 100MΩ 以上 Between individual terminals and bushing: 100MΩ MIN.	2-4 耐電圧 Dielectric strength	端子-端子間 A.C. 300V1分測定。A.C. 360V2分測定する。(0-2mA 電流 1mA) A voltage of 300V A.C. shall be applied for 1min or a voltage of 360V A.C. shall be applied for 2sec between individual terminals and bushing. (Leak current: 1mA)	端子-7-7-2 絶縁破壊等せず。 Without damage to parts arcing or breakdown.	項目 Item	条件 Conditions	仕様 Specifications	3-1 スイッチ配置・接点配置 Contact arrangement		標準型 (Push on) S.P.S.T. (Push on)	3-2 スイッチ行程 Switching stroke		0.5 ^{+0.4} _{-0.3} mm	3-3 スイッチ作動力 Switch operation force		833mN	項目 Item	条件 Conditions	仕様 Specifications	4-1 動作寿命 Operating life	定格電圧にて 25,000 回動作し、25,000 回動作後 5 分間、定格電圧 5,000V 以下にて動作させる。 The shaft of switch shall be 25,000 times at a speed of 500 times per hour without electrical load, after which measurements shall be made. However, an interim measurement shall be made immediately after 5,000 times.	接触抵抗: 200mΩ 以下。 絶縁抵抗: 100MΩ 以上。 Switch contact resistance: 200mΩ MAX. Except above items, specifications in clause 2.2-4, and 3.1-3 shall be satisfied.
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			F 2583824M (6/6)

SYND.	RATE	APPD.	CHGD.	DRGD.
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SYMB	DATE	APPD	CHKD	DSSGD
3	98-09-18	TOKA		

APPR	UNIT	SCALE
9.11.16	MM	1-数2
CHKD		
9.11.15		
DSSGD		
1-数2		
9.11.15		

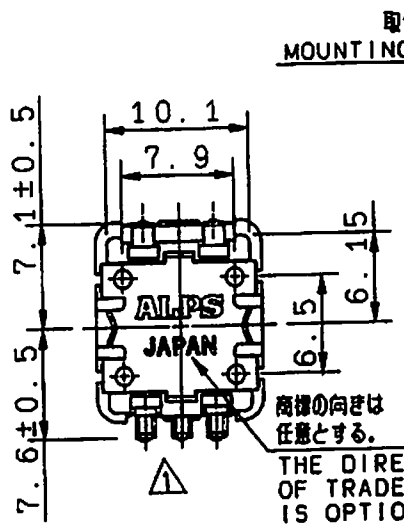
TITLE 11形1軸
PUSH ON SW付薄形ソコ-9'-
DOCUMENT NO. LA211446S

4.6g

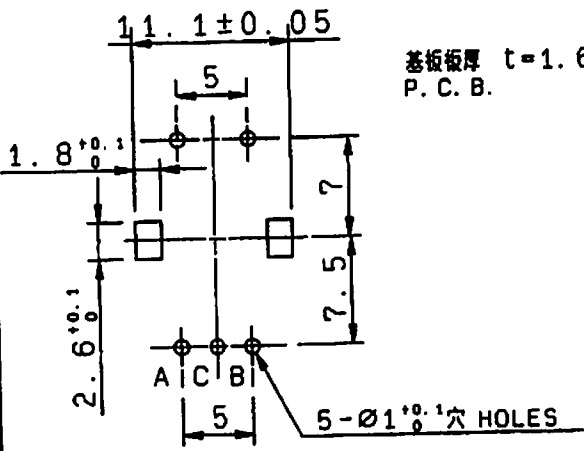
OR

PART NO.	NAME	MATERIAL NAME & CODE	FINISH
		ALPS ELECTRIC CO. LTD.	

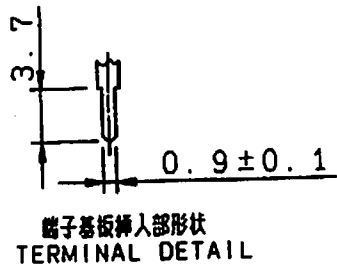
注記 軸受材質:亜鉛ダイキャスト
軸材質:アルミニウム
NOTES BUSHING MATERIAL: ZINC ALLOY DIE CASTING
SHAFT MATERIAL: ALUMINIUM



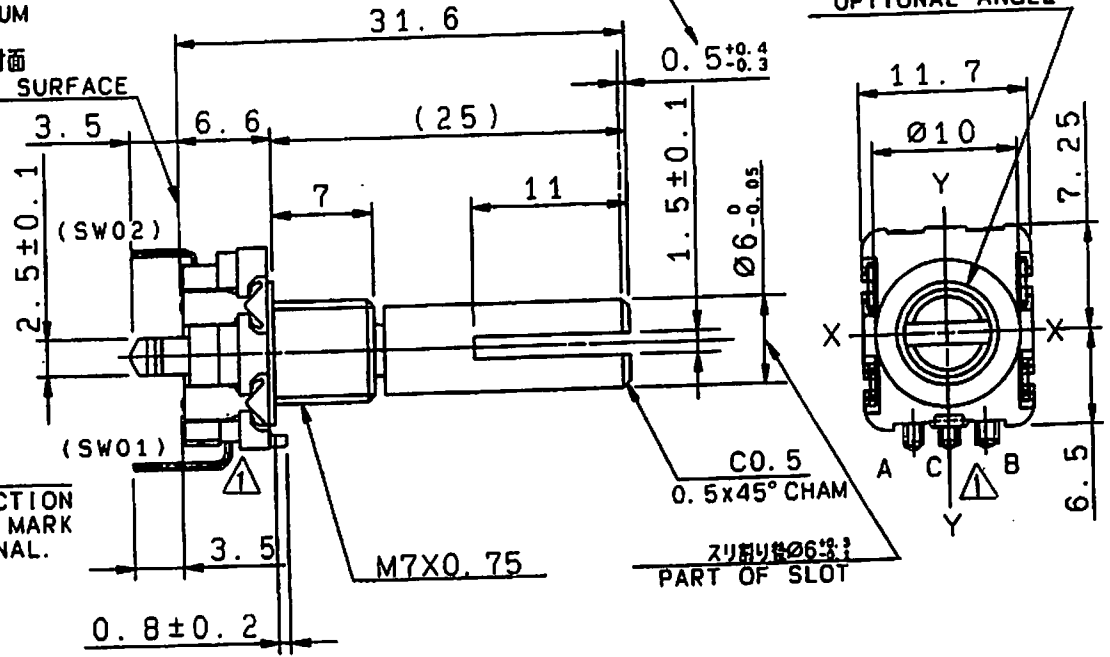
取付穴寸法図 許容差±0.1
(挿入側より)
P. W. B. MOUNTING DETAIL
TOLERANCE±0.1
VIEWED FROM MOUNTING SIDE



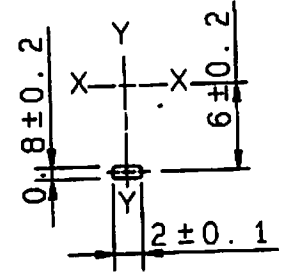
基板板厚 t=1.6mm
P. C. B.



端子基板挿入部形状
TERMINAL DETAIL



シャ-シ止め詳細図
LOCATING LUG DETAIL



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°