

# SPECIFICATIONS

## ELECTRICAL

1. Total resistance : 10k  $\Omega$   $\pm$ 20%
2. Rated power : 0.05 W
3. Rated voltage :  
 The rated voltage shall be the voltage of D.C. or A.C. (commercial frequency ,effective value ) corresponding to the rated power (dissipation),and be obtained from the following formula. When the obtained rated voltage exceeds the maximum working voltage given in the following, however, the maximum working voltage of the following shall be the rated voltage.  

$$E = \sqrt{P \cdot R} \text{ (V)}$$
 Where E : Rated voltage (V)  
 P : Rated power(dissipation) (W)  
 R : Nominal total resistance ( $\Omega$ )  
 Maximum working voltage : 50 V A.C. , 20 V D.C.
4. Residual resistance between terminals  
 between term.1&2, term.2&3 : 300 $\Omega$  max.
5. Sliding noise : Less than 100 mV measured by method of JIS C 6443.
6. Insulation resistance : Greater than 100 M $\Omega$  measured by D.C. 250V.
7. Withstand voltage: More than 1 minute with an application of A.C. 250 V.
8. Taper : B

## MECHANICAL

1. Overall rotational angle : 280° $\pm$ 5°
2. Operation torque : 1~8mN·m (Rotational speed 60°/sec.)
3. Shaft end stop strength : No damage with an application of 0.3N·m.
4. Starting torque : 10mN·m MAX.
5. Resistance to soldering heat :  
 After manual soldering (Less than 350°C and quicker than 3 seconds) there shall be no evidence of poor contact between resistance element and terminals, or any physical damages as a result of the test.
6. Play of shaft :  
 The resistor shall be mounted by soldering the mounting legs on the panel. Then a side thrust of 25mN·m at the end of the shaft shall be applied, then the total play of the shaft shall not exceed 0.8 x L / 20 mm p-p.  
 (L:Shaft length)
7. Inclination of shaft :  
 The eccentricity of the root of shaft shall not exceed 0.35mm against the center of the mounting position.
8. Eccentricity of shaft :  
 The inclination of shaft shall be within 0.35mm to the center of shaft, which is parallel to the mounting surface.
9. Robustness of shaft against end thrust :  
 The shaft shall withstand against end thrust of 50N for 3 seconds.
10. Robustness of shaft against side thrust :  
 The shaft shall withstand against side thrust of 40N for 3 seconds on the end of the shaft at right angles to the axis of the shaft after mounting the resistor by soldering.

## ENDURANCE

1. Rotational life : 5,000 cycles min.

## NOTE

1. The items except above mentioned items shall meet or exceed JIS C 6443.
2. Operating temperature : -10°C~+70°C, 3. Storage temperature : -30°C~+70°C.

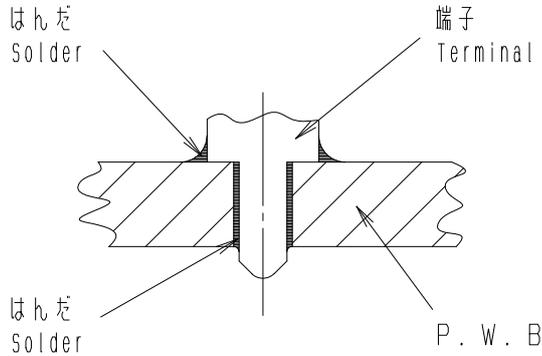
					<b>ALPSALPINE CO., LTD.</b>			
					APPD.	CHKD.	DSGD.	TITLE
					<i>Sep. 13, '96</i>	<i>Sep. 13, '96</i>	<i>Sep. 13, '96</i>	
					<i>S. Aizawa</i>	<i>M. Satoh</i>	<i>Y. Saitoh</i>	DOCUMENT NO.
SYMB	DATE	APPD	CHKD	DSGD				

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1. はんだ付けに関するその他注意事項  
Other precautions for Soldering

- 1) 図のようにP.W.Bの上面にはんだ付けをする配線は、お避け下さい。  
Please avoid soldering on upper surface of P.W.B. as shown below.



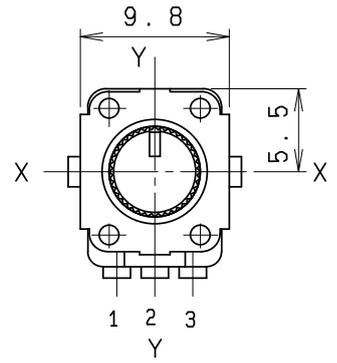
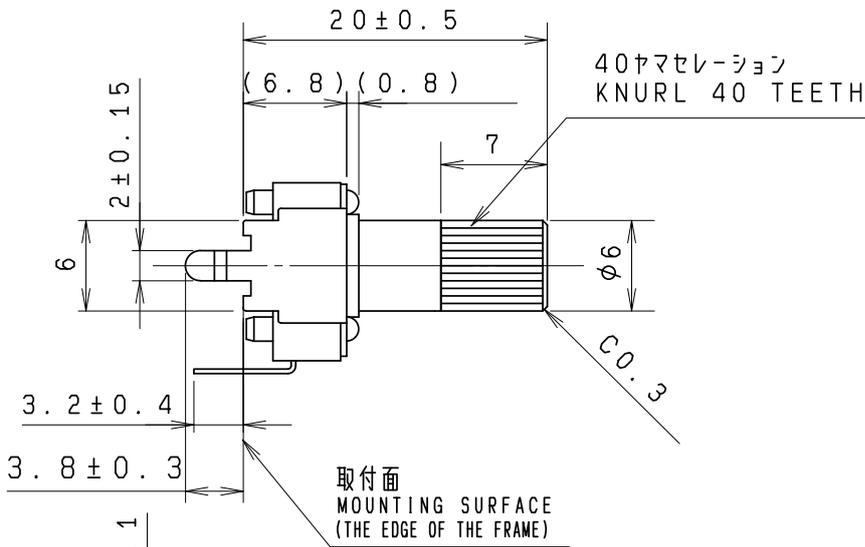
- 2) 基板に挿入される金属足ははんだ付けしてご使用願います。  
Please solder all inserted metal terminals and bracket to a PWB.
- 3) はんだ付け後、溶剤などで製品を洗浄しないで下さい。  
After soldering, please not to wash or clean products by liquid such as solvent or any similar.

					<b>ALPSALPINE CO., LTD.</b>			
					<b>APPD.</b>	<b>CHKD.</b>	<b>DSGD.</b>	<b>TITLE</b> その他注意事項 (手はんだ) Other precautions (Manual soldering)
					Oct. 29, 2015	Oct. 29, 2015	Oct. 29, 2015	
					S. Urushihara	J. Yashiro	H. Kimura	<b>DOCUMENT NO.</b>
<b>SYMB</b>	<b>DATE</b>	<b>APPD</b>	<b>CHKD</b>	<b>DSGD</b>				C - 1 (1/1)

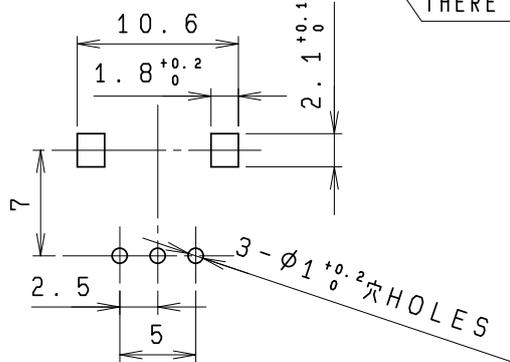
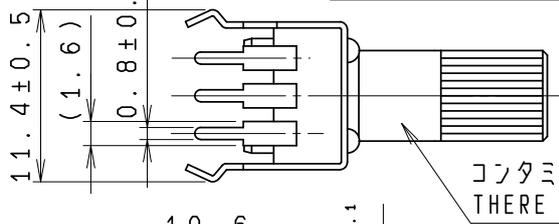
1. ご注意上の注意 precautions in use

- 1) 当製品は密閉構造ではありませんので、使用環境によって外部ガスが製品内部に侵入し接点障害を起こす場合があります。  
同一セット内に以下の様な部材を使用しないで下さい。  
・硫化、酸化ガスを発生する部材（例：ゴム材、接着剤、合板、潤滑剤、梱包材）  
・低分子シロキサンガスを発生する部材（例：シリコン系ゴム、潤滑剤、接着剤）  
As this product does not have hermetical structure, it is possible gas from outside get inside of product and may cause contact failure depends on using environment.  
Please avoid using following materials. If you have to use any of material in parentheses, please pay special attention and confirm it does not influence to products through tests under actual using conditions.  
-materials which may generate sulfide gas or oxidized gas.  
(rubber, glue, adhesive, plywood, packaging material)  
-materials which may generate low-molecular-weight siloxane gas.  
(silicone base rubber, lubricant, glue)
- 2) 高湿度環境下、又は結露する環境下、液体が製品にかかる環境下では、端子間の電流リークが発生する恐れがありますのでご注意ください。  
Please not to use this product under the atmosphere with high humidity, with possibility of dew condensation or of direct splash of liquid. Because it may cause leak between terminals.
- 3) ツマミを挿入する際に、軸に規定荷重以上の力や衝撃荷重が加わると製品が破壊する場合があります。  
ツマミの寸法や挿入治具の圧力管理は、規定荷重以下で挿入できる設定の配慮をお願いします。  
The product may have malfunction if excessive stress or impact than specified value is applied when insert knob to the shaft.  
Please fix appropriate dimension for knob or fix insertion force of knob of mounting equipment which can avoid excessive stress to the product than specified value.
- 4) 使用温度範囲の上限、下限付近で長期間の連続使用はできません。  
動作寿命の規定は常温15℃～35℃、常湿25%～85%の環境条件に限ります。  
使用温度範囲の上限、下限付近で長期間の連続動作を行う場合は、機種毎に仕様規定が可能かどうか確認が必要になります。  
This product can't be continuously used under high operating temperature or low operating temperature specified in this document.  
Unless otherwise specified, the durability is specified only under normal conditions, temperature 15 to 35 degree Celsius and related humidity 25 to 85%.  
When this product is operated at temperature near from upper or lower limit of operating temperature range, feasibility must be examined by each product specification.
- 5) 製品本体を規定の取付面まで挿入して水平になるように取付けて下さい。  
水平にならないまま取付けますと、動作不良の要因となります。  
Insert these switches to the specified mounting surface and mount them horizontally.  
If not mounted horizontally, these switches will malfunction.
- 6) 塵埃が多い環境で使用されますと塵埃が開口部から入り出力不良や動作不良の原因となることがありますのでセット設計時に予めご配慮ください。  
If this product is used under dusty conditions, dust or debris may get inside of product from openings and possible to cause output failure or malfunction. Please consider protections against dust when surrounding parts of the product are designed.

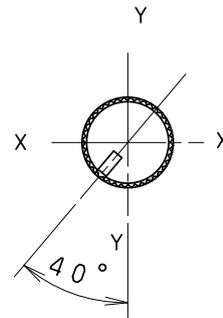
					<b>ALPSALPINE CO., LTD.</b>			
					<b>APPD.</b>	<b>CHKD.</b>	<b>DSGD.</b>	<b>TITLE</b>
					Oct. 15. 2015	Oct. 15. 2015	Oct. 15. 2015	ご注意上の注意（共通） Precautions in use (Common)
					S. Urushihara	K. Sasaki	Y. Ashida	<b>DOCUMENT NO.</b>
<b>SYMB</b>	<b>DATE</b>	<b>APPD</b>	<b>CHKD</b>	<b>DSGD</b>				C-4 (1/1)



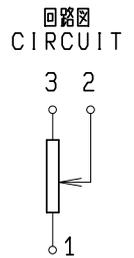
軸はセンター位置を示す。  
SHAFT SHOWN IN  
CENTER POSITION.



端子取付穴寸法図(挿入側より見た図)  
(許容差±0.1)  
MOUNTING HOLE DETAIL  
(TOLERANCE±0.1)  
VIEWED FROM MOUNTING SIDE



軸は反時計方向に回し切った状態を示す。  
SHAFT SHOWN IN  
FULL C.C.W. POSITION.



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

			軸：透明 TRANSPARENT SHAFT	
PART NO.	NAME	MATERIAL NAME / CODE	FINISH	
<b>ALPSALPINE CO., LTD.</b>				
		DSGD. FF. Liu 2011-05-09	SCALE 2 : 1	NO. _____
		CHKD. XD. Wang 2011-05-09		TITLE 9形1軸単連絶縁軸VR
	1	2013-03-29	S. MK. SY. A	APPD. Y. ASHIDA 2011-05-10
SYMB	DATE	APPD	CHKD	DSGD
				UNIT m m
				DOCUMENT NO. K091C0Z5Z

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