

**Confidential**

Customer: YATELIAN TECHNOLOGY (HONG KONG)  
CO., LIMITE.

No. VR213000A

Date: Jan. 05, 2021

Attention:

Your Ref. No. :

Your Part No. : RK16812MG098

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

ALPS Model : RK16812MG098

ALPS Spec. No. :

ALPS Sample No. : 0027559724

RECEIPT STATUS
RECEIVED
By. Date _____
Signature _____
Name
Title

**ALPSALPINE**  
ALPSALPINE CO.,LTD.

DSG'D  
APP'D

*K. Abe*

ENG. DEPT.

*K. Suzuki*

Sales \_\_\_\_\_

HEAD OFFICE  
1-7, Yukigaya-otsuka-machi, Ota-ku, Tokyo. 145-8501 JAPAN  
Phone +81 3-3726-1211

ACY04-G03B (EA)

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

1. THIS SPECIFICATIONS APPLY TO RK16812MG098 POTENTIOMETER.

2. CONTENTS OF THIS SPECIFICATIONS.

0027559724

K162FMG01L

3. MARKING

- MARKING ON ALL UNITS  
DATE CODE, RESIST. VALUE, TAPER

4. REMARKS

- FURNISH PACKAGE  
NUT:1 WASHER:1

## · CAUTION

There is a possibility that might be affected by contact resistance of resistive element and wiper in case of low impedance of output side in voltage regulation circuit.

For this reason, we require that you adjust to impedance of output side more than 100 times of total resistance.

1. For the export of products which are controlled items subject to foreign and domestic export laws and regulations, you must obtain approval and/or follow the formalities of such laws and regulations.

2. Products must not be used for military and/or antisocial purposes such as terrorism, and shall not be supplied to any party intending to use the products for such purposes.

3. Unless provided otherwise, the products have been designed and manufactured for application to equipment and devices which are sold to end-users in the market, such as AV (audio visual) equipment, home electric equipment, office and commercial electronic equipment, information and communication equipment or amusement equipment. The products are not intended for use in, and must not be used for, any application of nuclear equipment, driving control equipment for aerospace or any other unauthorized use.

With the exception of the above mentioned banned applications, for applications involving high levels of safety and liability such as medical equipment, burglar alarm equipment, disaster prevention equipment and undersea equipment, please contact an Alps sales representative and/or evaluate the total system on the applicability. Also, implement a fail-safe design, protection circuit, redundant circuit, malfunction protection and/or fire protection into the complete system for safety and reliability of the total system.

4. Before using products which were not specifically designed for use in automotive applications, please contact an Alps sales representative.

5. Please store the product without open package, keep same condition as delivery, under normal temperature and humidity, prevent direct sunlight, and corrosive gas exposure then use product as soon as you can within about six months after delivery. Once you open package, please use plastic bag which is used for packaging and prevent product from exposure of outside air then store the product under same condition as above.

6. Any characteristic and condition for test or measurement are not mentioned on this document should be examined by each product number in order to specify them.

If it is necessary, please contact our sales representative.

In case if you use this product under different condition from the past or introduce this product to your another model, please confirm in advance all the content of this product specification is appropriate.

SPECIFICATIONS

Feature

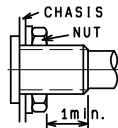
This is a potentiometer with D.C. magnet motor and it is adjustable by both manual shaft and motor.

Temperature for operating and storage

1. Dimensions : See attached drawing.
2. Operating temperature : -10°C ~ +70°C
3. Storage temperature : -20°C ~ +80°C
4. Motor : D.C. magnet motor  
(With 6V Disk Varistor)

Mechanical specifications.

1. Operation : Manual operation and motor drive.
2. Total rotational angle : 300°±5°.
3. Rotational speed : 12±3 sec/300°  
(at 4.5V D.C. applied to motor.)
4. Direction of rotation : C.W. rotation at normal polarity.  
(When the potentiometer is looked at from the shaft side.)
5. Mechanical noise :  
Continuous, monotonous, not unpleasant sound to heard.  
To be mutually discussed when questionable.  
(at 4.5V D.C. applied to motor)
6. Rotational torque : 10~40mN·m (Rotational speed 60°/sec.)
7. Stopper strength of shaft  
With manual operation : No damage with an application of 0.9N·m.  
With motor drive : Shaft must be slipped at the both ends of manual rotation.
8. Bushing nut tightening strength : Tightening torque to be no greater than 1.2N·m.  
(Pay attention otherwise the strength may not be assured.)



9. Push / pull strength :  
No damages with an application of push or pull force 100N for 10 sec.
10. Resistance to soldering heat :  
After soldering there shall be no evidence of poor contact between resistance element and terminals, or any physical damages as a result of the test.  
The terminal of the potentiometer  
less than 300°C and within 3 sec.  
The terminal of the motor  
less than 350°C and within 2 sec.

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APPD.	CHKD.	DSGD.	TITLE
Nov. 08. '93	Nov. 08. '93	Nov. 08. '93	0027559724
S. Aizawa M. Satoh Y. Saitoh			DOCUMENT NO. RK168

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SPECIFICATIONS

Electrical specifications

1. Total resistance : 100kΩ ±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.

$$E = \sqrt{P \cdot R} \text{ (V)}$$

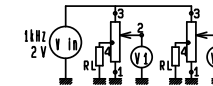
Where E : Rated voltage (V)  
P : Rated power (dissipation) (W)  
R : Nominal total resistance (Ω)

Maximum working voltage : 50V A.C.

(This potentiometer is designed for A.C. voltage only).

4. Resistance taper : B (Tap at 150°)  
Tap residual resistance between term. 2&4 : 1kΩ max.  
Tap resistance between term. 1&4 : 50kΩ±30%  
Tap position : 150°
5. Maximum attenuation level at full C.C.W. position : 90 dB min.
6. Insertion loss at full .C.W. position : 0.1dB max.
7. Sliding noise : Less than 100mV. (Measured by JIS C 6443)

8. Gang error : 5 dB max. between -60dB less than -40dB  
3 dB max. between -40dB ~ 0dB  
(Connected 10kΩ between terminals 1&4)



9. Insulation resistance  
Potentiometer section : More than 100 MΩ at 250V D.C.  
Motor section : More than 1 MΩ at 100V D.C.
10. Withstand voltage  
Potentiometer section : 300V A.C. for 1 minute.
11. Supply voltage for motor : 4~6V D.C.
12. Rated voltage for motor : 4.5V D.C.
13. Motor current (at 4.5V D.C. applied to motor)  
Normal operation : 100mA max.  
Slipping operation  
at both ends : 150mA max.

Endurance specifications

1. Rotational life : 15,000 cycles min.

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# SPECIFICATIONS

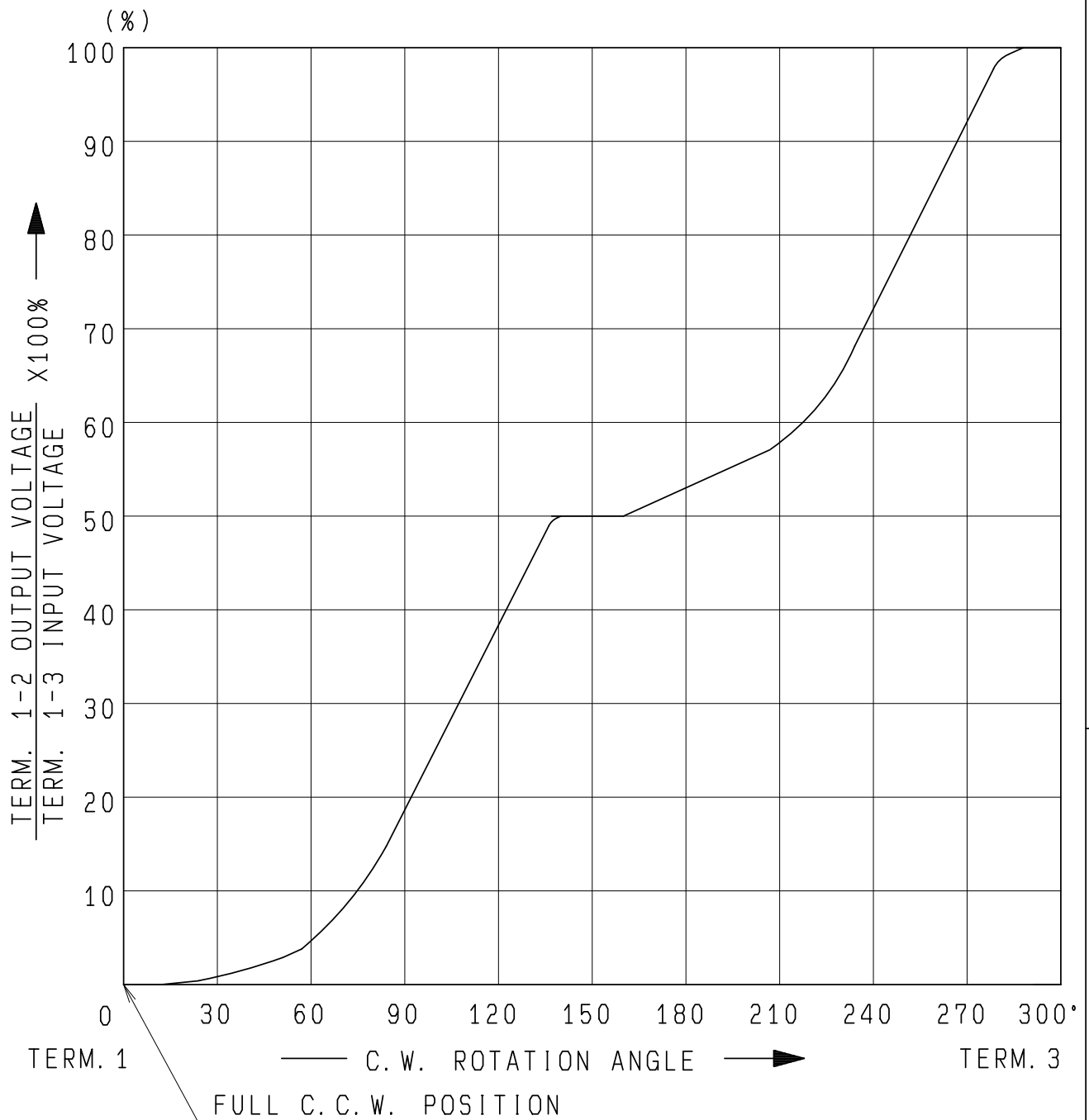
**Note**

1. The standard test shall be subject to temperature from 5°C to 35°C and relative humidity from 45% to 85%. Test shall be done under environmental requirements of a temperature of 20±2°C and relative humidity of 65±5% if a decision is in question.
  
2. Notice on motor
  - 1). Motor terminals shall not be bent more than twice.
  
  - 2). Soldering to the motor terminals shall be within a few second, not to cause the transformation of terminal base plastics. And ,avoid that the flux flows into the motor. Pay special attention to the terminals when they are wave soldered. If the flux flows into the motor, it may cause a poor contact .
  - 3). Motor terminal should not be pressed inside the motor. It may cause a poor contact in the motor.
  
  - 4). Pay attention that a piece of iron and an alien substance are not crepted into the motor.
  - 5). In operation, temperature arround the motor produce an effect on the performance and life. Pay special attention in high temperature and humidity. Storage in high temperature and humidity, and in corrosive gas, shall be avoided.
  
  - 6). In case using the adhesive agent and the seal agent etc. for fit up, make sure that there is no generation of the harmful gas for motor. (including all chemicals arround the motor.) Pay special attention to cyanogen system adhesive agent and organically system silicone.
  
3. Power supply.
 

Regulated D. C. power supply shall be used.  
 (ripple to be 1% max.) Motor terminal shall not be conected with fixed resistors in series. And supply current is to be 350mA min.
  
4. The items except above mentioned items shall meet or exceed JIS C 6443.

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					Nov 08. '93	Nov 08. '93	Nov 08. '93	0027559724
					S. Aizawa	M. Satoh	Y. Saitoh	DOCUMENT NO.
SYMB	DATE	APPD	CHKD	DSGD				RK168

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TAP POSITION : 150° (TAP RESISTANCE BETWEEN TERMS. 1&4; 50kΩ±30% )  
 TAP RESISTANCE; 50%

					APPD.	CHKD.	DSGD.	NAME
					Nov. 05. '93	Nov. 05. '93	Nov. 05. '93	RESISTANCE TAPER ( B )
SYMB	DATE	APPD	CHKD	DSGD	K. Magami	K. Sasaki	K. Suzuki	DOCUMENT NO.
								0027559724

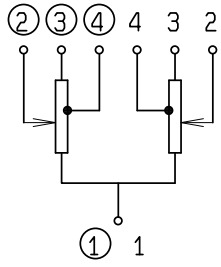


CIRCUIT

R1, R2

2 連  
DUAL  
UNIT

ACのみ  
AC  
ONLY

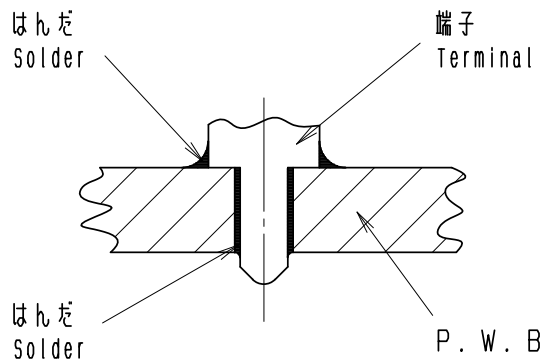


					<b>ALPSALPINE CO., LTD.</b>		
					DSG1. ㊦ツケ41-9066011	SCALE	NO.
					Y. SAITOH 96-03-29		0027559724
					CHKD.		TITLE
					Y. OHYA 96-03-29		
					APPD.	UNIT	DOCUMENT NO.
					Y. YOSHIOKA 96-03-29	m m	タップ付
SYMB	DATE	APPD	CHKD	DSGD			

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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.

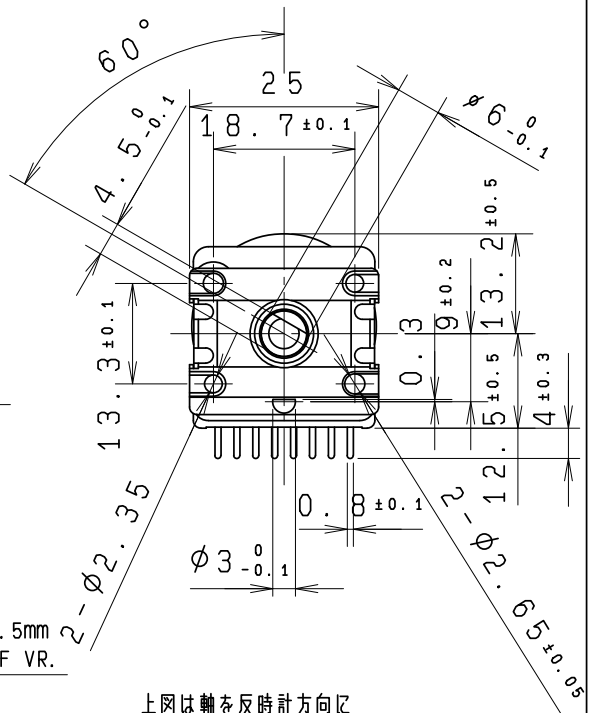
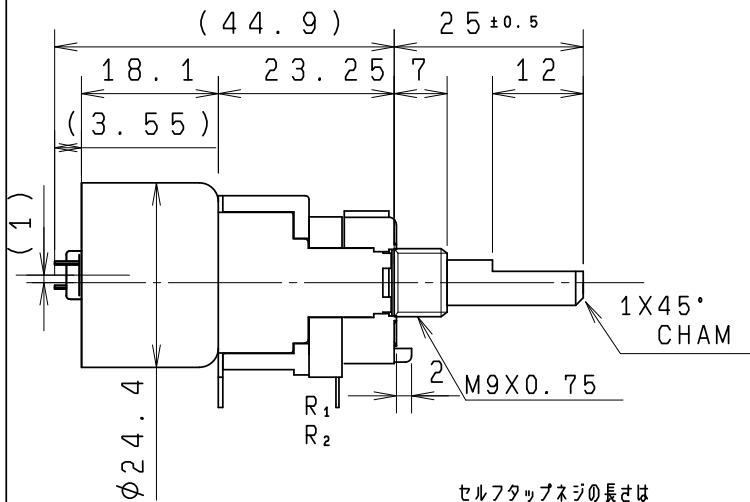
					<b>ALPSALPINE CO.,LTD.</b>			
					APPD.	CHKD.	DSGD.	TITLE
					Oct. 29. 2015	Oct. 29. 2015	Oct. 29. 2015	その他注意事項 (手はんだ) Other precautions (Manual soldering)
					S. Urushihara	J. Yashiro	H. Kimura	DOCUMENT NO.
SYMB	DATE	APPD	CHKD	DSGD				C-1 (1/1)

### 1. ご使用上の注意 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使用にならないで下さい。  
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%の環境条件に限りです。  
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>			
					APPD.	CHKD.	DSGD.	TITLE
					Oct. 15. 2015	Oct. 15. 2015	Oct. 15. 2015	ご使用上の注意（共通） Precautions in use (Common)
					S.Urushihara	K. Sasaki	Y. Ashida	DOCUMENT NO.
SYMB	DATE	APPD	CHKD	DSGD				C - 4 ( 1 / 1 )



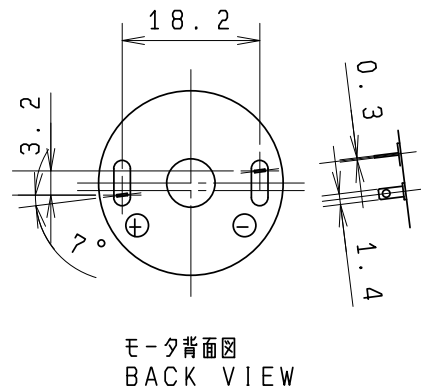
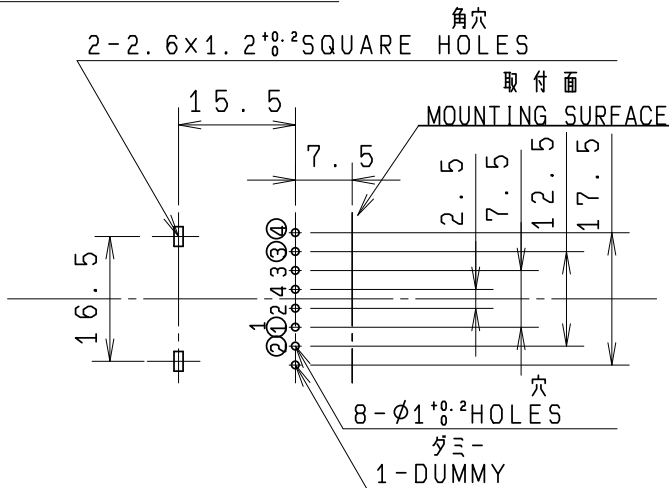


セルフタッピングネジの長さは  
取付面より6.5mm以下のこと  
LENGTH OF SELF-TAPPING  
SCREW SHALL BE WITHIN 6.5mm  
FROM MOUNTING SURFACE OF VR.

取付穴寸法図 許容差±0.1  
(挿入側から見た図)

P. W. B. MOUNTING DETAIL  
TOLERANCE±0.1  
VIEWED FROM MOUNTING SIDE

上図は軸を反時計方向に  
回し切った状態を示す  
SHAFT SHOWN  
IN FULL CCW POSITION



R1 ① ② ③ ④  
R2 1 2 3 4

モータ背面図  
BACK VIEW

製品質量: 58.2 g  
NET WEIGHT

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°

PART NO.	NAME	MATERIAL NAME / CODE	FINISH
<b>ALPSALPINE CO., LTD.</b>			
		DSGN. 1-設計1課 Y. Saitoh 93-11-08	SCALE 1 : 1
		CHKD. M. Satoh 93-11-08	TITLE 1軸2連 照光無し モータ駆動ボリューム組立図
		APPD. S. Aizawa 93-11-08	UNIT m m
SYMB	DATE	APPD	DOCUMENT NO. K162FMG01L

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