

Customer :

No. _____

Attention : _____

Date : _____

Your ref. No. : _____

Your Part No. : See REMARKS

SPECIFICATIONS

PURPOSE OF THIS DOCUMENT;

☐ PRELIMINARY copy.

☒ Request for your APPROVAL.

(☒ New, ☐ Engineering Change)

Please sign and return one copy.

APPROVED BY, Date: _____

X

Name

Title

☐ For PRODUCTION.

ALPS' ;

MODEL: See REMARKS

Fig.No.: See REMARKS

Spec. No.: See REMARKS

Sample No.: See REMARKS

REMARKS: MARKING ON ALL UNITS	Your Part No.	MODEL	Fig.No.	Sample No.
			Spec.No.	
DATE CODE RESIST, VALUE TRADE MARK JAPAN FURNISH PACKAGE NUT WASHER	180762	RK40312A0	K402A003N	G4205781M
		(10k x 2) log	4K402A0236	
	180763	RK40312A0	K402A003N	GG205803M
		(100k x 2) log	4K402A-22	
	180764	RK40312A0	K402A003N	G4205811M
		(10k x 2) Lin	4K402A0225	
	180765	RK40312A0	K402A003N	G4205838M
		(50k x 2) Lin	4K402A-24	



ALPS ELECTRIC CO., LTD.

HEAD OFFICE

1-7, YUKIGAYA-OHTSUKA-CHO,
OHTA-KU, TOKYO 145 JAPAN

DSG'D

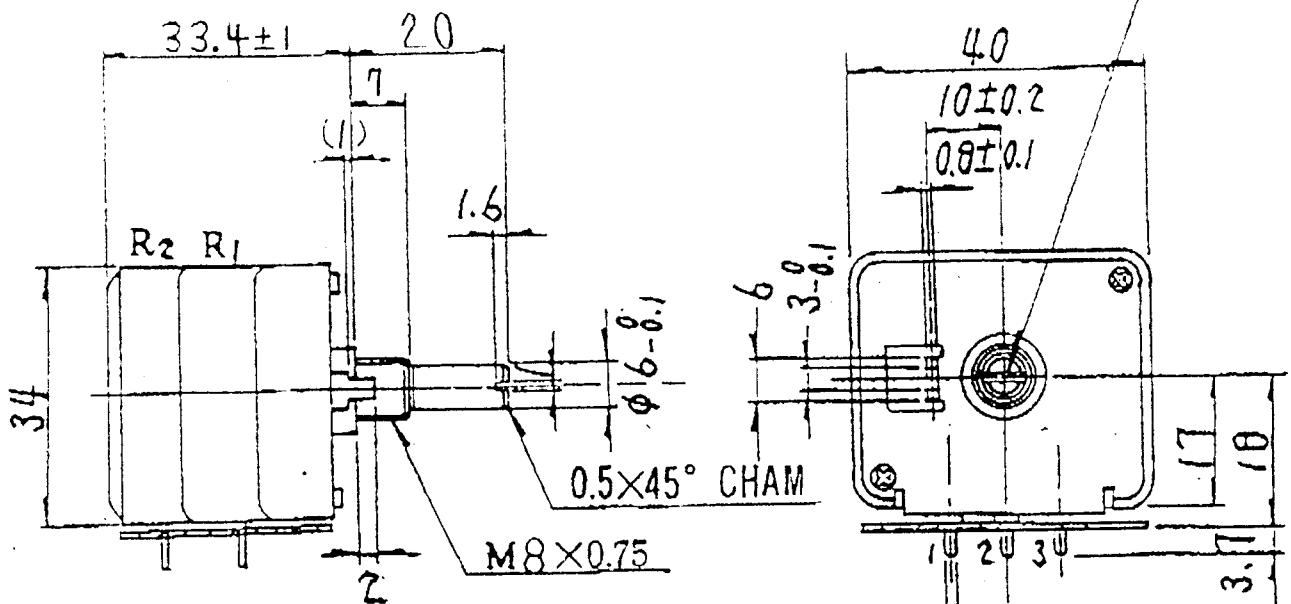
T. Yamaguchi

APP'D

S. Sato

ENG. DEPT. WAKUYA DIVISION

SHAFT SLOT IS OPTIONAL ANGLE
スリ割角度は任意とする。

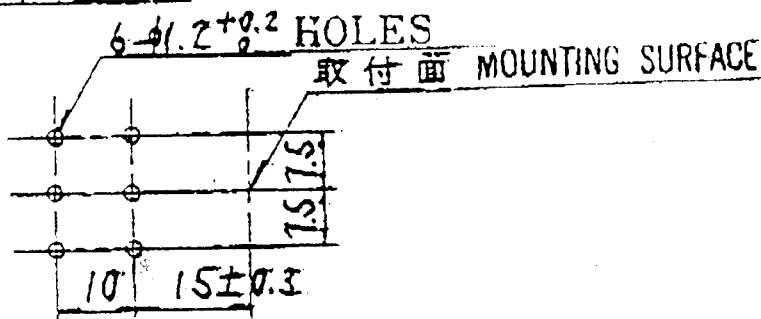


P.W.B. MOUNTING DETAIL (TOLERANCE ±0.1)

VIEWED FROM MOUNTING SIDE

取付穴寸法図

許容差±0.1



許容差の指定なき寸法の公差 TOLERANCES UNLESS OTHERWISE SPEC	
BASIC DIMENSIONS	TOLERANCE
L ≤ 10	±0.3
10 < L < 100	±0.5
100 ≤ L	±0.8
角度 ANGULAR DIMENSION	±5°

記号		名称		材料		単位		公差		図名	
		三角法		単位 mm		公差		300°±3°			
承認		照査		設計		図名		1軸2連ニューデテントVR組立図			
記号		承認		設計		図名		K402A003N			
記号		承認		設計		図名					

CLASS NO.

TITLE

SPECIFICATIONS

ELECTRICAL

1. Total resistance tolerance: $10\text{ K}\Omega \pm 20\%$
2. Maximum operating voltage: 30V A.C.
3. Attenuation level:

Measuring point(°)	0	15	30	45	60	75	90	105	120	135	150
Att.level(-dB)	∞	50	42	36	31	27	24	22	20	18	16
Measuring point(°)	165	180	195	210	225	240	255	270	285	300	
Att.level(-dB)	14	12	10	8	6	5	4	3	1.5	0	

But allowable angle on each measuring point is $\pm 3^\circ$

Taper value tolerance: $\pm 2\text{ dB}$ max. between 50 dB ~ 0dB

4. Maximum attenuation level on full C.C.W. position: 80 dB min.
5. Insertion loss on full C.W. position: 0.1dB max.
6. Slider noise: less than 47mV(by method of JIS C 6443)
7. Insulation resistance: $100\text{ M}\Omega$ min. at 500V D.C.
8. Dielectric strength: Units shall be designed to withstand 500V A.C.
50Hz R.M.S. between resistance element and case for a period of one minute without damage or arcing
9. Gang error :

1.5dB max.between - 60 dB ~ 0 dB

Measure between R1&R2

($\frac{\text{term 1-2 output V}}{\text{term 1-3 in out V}}$)

MECHANICAL

1. Total rotation angle: $300^\circ \pm 3^\circ$
2. Operation torque: 100 ~ 400gf·cm(at 20°C)
3. Shaft end stop strength: 12kgf·cm min.
4. Resistance to soldering heat: After soldering (less than 350°C and quicker than 5 seconds)there shall be no evidence of poor contact between resistance element and terminals, or any physical damages as a result of the test
5. Nut tightening strength: 15kgf·cm min.
(Pay attention as following otherwise the strength may not be assured)
6. Shaft push / pull strength:
No damages with an application of push or pull force 10kgf for 10 seconds



DURABILITY PERFORMANCE

CLASS NO.

TITLE

SPECIFICATIONS

ELECTRICAL

1. Total resistance tolerance: Nominal $\pm 20\%$ ($50\text{K}\Omega \leq R \leq 250\text{K}\Omega$)
2. Maximum operating voltage: 30V A.C.
3. Attenuation level:


Measuring point(°)	0	15	30	45	60	75	90	105	120	135	150
Att.level(-dB)	∞	54	40	32	25	20	15	12	9	7	6
Measuring point(°)	165	180	195	210	225	240	255	270	285	300	
Att.level(-dB)	5	4	3.5	3	2.5	2	1.5	1	0.5	0	

But allowable angle on each measuring point is $\pm 3^\circ$

Taper value tolerance: $\pm 3\text{dB}$ max. between - 54 dB less than - 20 dB
 $\pm 2\text{dB}$ max. between - 20 dB ~ 0 dB

4. Maximum attenuation level on full C.C.W. position:

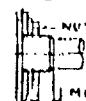
Nominal total resistance value	Max.att.level
$R_a \geq 100\text{K}\Omega$	100dB min.
$100\text{K}\Omega > R_a \geq 50\text{K}\Omega$	90dB min.

 ~~-54dB ~ -20dB~~
~~-15dB ~ 0dB~~

5. Insertion loss on full C.W. position: 0.1dB max.
6. Slider noise: less than 47mV (by method of JIS C 6443)
7. Insulation resistance: 100M Ω min. at 500V D.C.
8. Dielectric strength: Units shall be designed to withstand 500V A.C.
 50Hz R.M.S. between resistance element and case for a period of one
 minute without damage or arcing
9. Gang error : 1.5dB max. between -60dB less than -40dB
 1dB max. between -40dB ~ 0dB

MECHANICAL

1. Total rotation angle: $300^\circ \pm 3^\circ$
2. Operation torque: 100 ~ 400gf·cm (at 20°C)
3. Shaft end stop strength: 12kgf·cm min.
4. Resistance to soldering heat: After soldering (less than 350°C and
 quicker than 5 seconds) there shall be no evidence of poor contact
 between resistance element and terminals, or any physical damages as
 a result of the test
5. Nut tightening strength: 15kgf·cm min.
 (Pay attention as following otherwise the strength may not be assured)
6. Shaft push / pull strength:



No damages with an application of push or pull force 10kgf for 10 seconds

DURABILITY PERFORMANCE

1. Rotation life: 15000 cycles min.

NOTE

1. Other performance characteristics shall conform to JIS C 6443,
 Variable Carbon Resistors for General Use.

				ALPS ELECTRIC CO., LTD.			
				APPD.	CHKD.	DSGD.	TITLE
				Jul 31 '86	Jul 31 '86	Jul 31 '86	
				11	11	11	
				DOCUMENT NO.			
				2B			

SPECIFICATIONS

ELECTRICAL

1. Total resistance tolerance: $10\text{ K}\Omega \pm 20\%$
2. Maximum operating voltage: 30V A.C.
3. Attenuation level:

Measuring point(°)	0	15	30	45	60	75	90	105	120	135	150
Att.level(-dB)	∞	(54)	40	32	25	20	15	12	9	7	6
Measuring point(°)	165	180	195	210	225	240	255	270	285	300	
Att.level(-dB)	5	4	3.5	3	2.5	2	1.5	1	0.5	0	

But allowable angle on each measuring point is $\pm 3^\circ$

Taper value tolerance: $\pm 3\text{ dB max. between } -40\text{ dB} \sim -20\text{ dB}$
 $\pm 2\text{ dB max. between } -15\text{ dB} \sim 0\text{ dB}$

4. Maximum attenuation level on full C.C.W. position: 80 dB min.
5. Insertion loss on full C.W. position: 0.1dB max.
6. Slider noise: less than 47mV (by method of JIS C 6443)
7. Insulation resistance: 100M Ω min. at 500V D.C.
8. Dielectric strength: Units shall be designed to withstand 500V A.C.
50Hz R.M.S. between resistance element and case for a period of one minute without damage or arcing
8. Gang error :

1.5 dB max. between -40 dB ~ 0 dB

Measure between R1&R2

(term 1-2 output V
term 1-3 in out V)

MECHANICAL

1. Total rotation angle: $300^\circ \pm 3^\circ$
2. Operation torque: 100 ~ 400gf·cm (at 20°C)
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5. Nut tightening strength: 15kgf·cm min.
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SYMB.	DATE	APPD.	CHKD.	DSGD.	TITLE
					2B
					DOCUMENT NO.
					4 K 4 0 2 A 0 2 2 5 (/)

CLASS.NO.

TITLE

SPECIFICATIONS

ELECTRICAL

1. Total resistance tolerance: Nominal $\pm 20\%$ ($50K\Omega \leq R \leq 2M\Omega$)
2. Maximum operating voltage: 30V A.C.
3. Attenuation level:

Measuring point(°)	0	15	30	45	60	75	90	105	120	135	150
Att.level(-dB)	∞	66	54	45	38	32	28	25	22	19	16
Measuring point(°)	165	180	195	210	225	240	255	270	285	300	
Att.level(-dB)	14	12	10	8	6	4	3	2	1	0	

But allowable angle on each measuring point is $\pm 3^\circ$

Taper value tolerance: $\pm 2\text{dB}$ max. between $-66\text{dB} \sim 0\text{dB}$

4. Maximum attenuation level on full C.C.W. position:

Nominal total resistance value	Max.att.level
$R_a \geq 100K\Omega$	100dB min.
$100K\Omega > R_a \geq 50K\Omega$	90dB min.

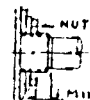
5. Insertion loss on full C.W. position: 0.1dB max.
6. Slider noise: less than 47mV (by method of JIS C 6443)
7. Insulation resistance: 100M Ω min. at 500V D.C.
8. Dielectric strength: Units shall be designed to withstand 500V A.C. 50Hz R.M.S. between resistance element and case for a period of one minute without damage or arcing
9. Gang error: 1.5dB max. between -70dB less than -60dB
1dB max. between $-60\text{dB} \sim 0\text{dB}$

Measure between R1&R2

($\frac{\text{term 1-2 output V}}{\text{term 1-3 in out V}}$)

MECHANICAL

1. Total rotation angle: $300^\circ \pm 3^\circ$
2. Operation torque: 100 ~ 400gf·cm (at 20°C)
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ALPS ELECTRIC CO., LTD.

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					Oct 26 '87		Oct 23 '87	
								DOCUMENT NO.
								4K402A-22 (✓)
SYMB	DATE	APPD.	CHKD.	DSGD.				