



Model 148, 149

Vishay Spectrol

1/2" (12.7mm) Conductive Plastic and Cermet Potentiometers



148 FEATURES

- Conductive Plastic Element
- Smooth Feel
- High Rotational Life
- Quiet Electrical Output
- Robust Construction

149 FEATURES

- Cermet Element
- Smooth Feel
- Temperature Stable
- Robust Construction

ELECTRICAL SPECIFICATIONS

PARAMETER	MODEL 148	MODEL 149
Resistance Range	10 to 5.0M Linear 500 to 2M Non-linear	100 to 2.0M Linear 250 to 1M Non-linear
Resistance Tolerance	Standard $\pm 10\%$ to 500K, $\pm 20\%$ over 500K Standard $\pm 10\%$ to 100K, $\pm 20\%$ over 100K	
Linear		
Non-Linear		
Taper Tolerance	20% of the Nominal R @ 50 mechanical rotation	
Linearity	$\pm 5\%$ Independent	
End Resistance	4 maximum each end 4 maximum low side: 1% total R high side	
Linear		
Non-Linear		
Power Rating	0.5 watts @ 70°C 0 watts @ 120°C	1 watt @ 70°C 0 watt @ 150°C
Effective Rotation	Non-Linear or PC mount, derate 50% 265° $\pm 5^\circ$ without rotary switch 240° $\pm 5^\circ$ with rotary switch	
Dynamic Noise	1.5% of total resistance	3% of total resistance
Maximum Continuous Working Voltage	350VAC across end terminals, but within power rating	
Dielectric Withstanding Voltage	Sea Level - 750VAC 70,000 feet - 350VAC	
Switch Specifications	Rotary (AL) switch: S.P.S.T and S.P.D.T 125mA, 28VDC CCW or CW, rotational life 250,000 cycles (rated load)	

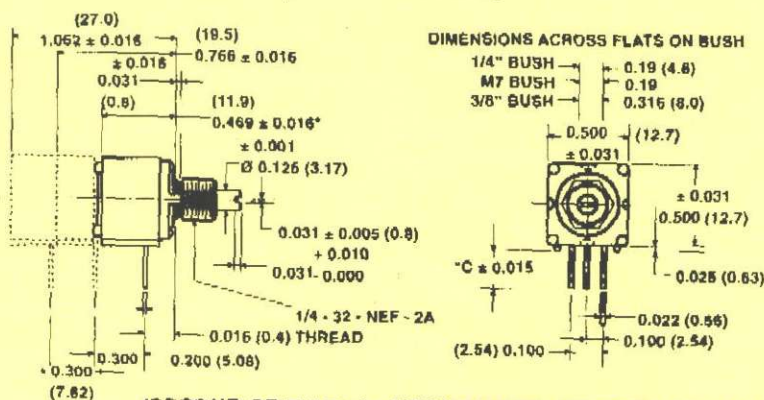
ORDERING INFORMATION

148 MODEL	S NUMBER OF SECTIONS	X MECHANICAL CONFIGURATION	M METRIC BUSHING SIZE & SHAFT	16 MATCHING METRIC	S SHAFT STYLE	103 RESISTANCE CODE	S TAPER	P TERMINAL CONFIGURATION
148 CP	S: Single	X: None (single shaft D, T sections)	M: M7 x 0.75; 6mm L Shaft, 3mm Dia	Shaft length Code mm	S: Slotted F: Platted P: Plain	EIA code - first 2 significant digits 3rd is number of zeros	S: Linear $\pm 10\%$ Z: CW Log, $\pm 10\%$ to 500K $\pm 20\%$ over 500K R: CCW Log, $\pm 10\%$ to 500K $\pm 20\%$ over 500K	P: PC, 0.250 E: PC terminals with E support plate F: PC terminals F: support plate S: Solder Hook A: Type A Mounting C: Type C Mounting L: long Terminals (0.85 in)
149 Cer	D: Duals, T: Triple	S: Single w/rotary switch P: Dual w/rotary switch D: Single w/center detent (1/4 Dia Bush) E: Dual w/center detent (1/4 Dia Bush)	N: 1/4 Dia x 1/4 L English Bushing size Shaft 1/8 Dia J: 1/4 Dia x 3/8 L Shaft, 1/8 Dia G: 3/8 Dia x 3/8 L Shaft, 1/4 Dia P: As G but plastic shaft	10: 10mm 13: 13mm 16: 16mm 22: 22mm 25: 25mm Matching English Shaft length code in 64th in Single Shaft 32: 1/2 in 40: 5/8 in 48: 3/4 in 56: 7/8 in 64: 1 in 80: 1 1/4 in		100 10K 500K 250 20K 750K 500 25K 1meg 750 50K 2meg 1K 75K 5 meg 2.5K 100K 5K 250K		

Example: 148 - S - X - M - 16 - S - 103 - S - P

Model 148, 149

Vishay Spectrol

1/2" (12.7mm) Conductive Plastic and Cermet Potentiometers**DIMENSIONS** in inches (millimeters)**SINGLE, DUAL OR TRIPLE****SOLDER LUG TERMINALS**

(SECOND OR THIRD SECTION MAY BE ALL SERIES ROTARY SWITCH)

PRINTED CIRCUIT TYPE B - 22A

"C" TERMINAL LENGTH: 0.850 MAX

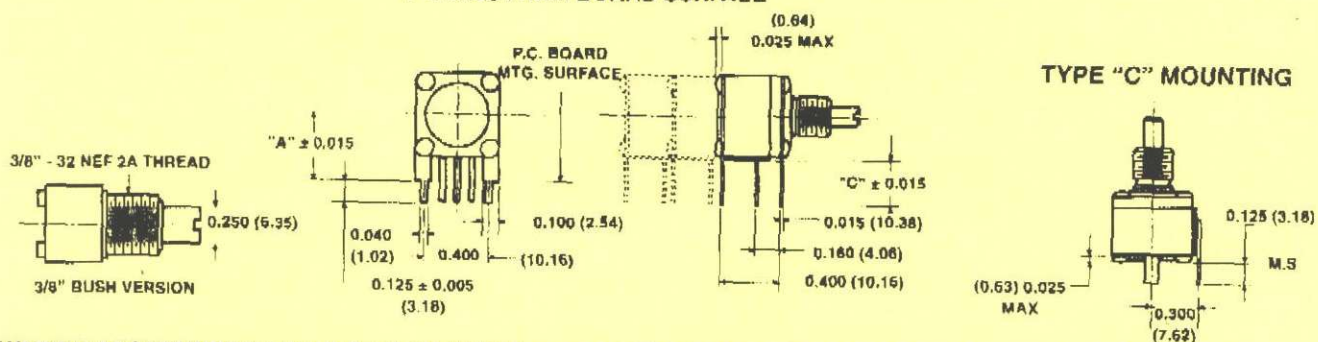
STANDARD P.C. TERMINAL LENGTH: 0.250

* DIMENSIONS INCREASES TO 0.583 WITH CENTER DETENT

FRONT AND REAR SUPPORT PLATES - HORIZONTAL MOUNTING

E = FLUSH WITH BOARD SURFACE

F = 0.125 FROM BOARD SURFACE

**MOUNTING ACCESSORIES:** PRODUCT IS SUPPLIED WITH A NUT & SHAKE - PROOF WASHER EXCEPT C, E & F SUPPORT PLATE VERSION**OPTIONAL FEATURES**

Up to three sections PC support plates, Type A forward mount, Type C rear mount

Plastic shafts Rotary switches Valley detents Solder hook terminals 3/8 bush, 1/4 shaft M7 bush, 3mm shaft Shaft seal

Mounting seal Not sealed for board washing

CONSTRUCTION MATERIALS

Housing - Moulded thermoplastic black

Shaft - Brass, nickel plated

Bushing - Brass, nickel plated

Wiper - Metal contact spring

MECHANICAL SPECIFICATIONS

PARAMETER	
Mechanical Rotation	295°C ± 5°
Torque	
Operating	Single section 0.2 to 3.0 oz - in Dual or triple section 0.3 to 4.5 oz - in
Variation in a control	0.5 oz - in
Centre Detent	0.6 to 3.0 oz - in
Stop Strength	3 in - lbs min
Weight (approx)	
Single	0.19 oz
Dual	0.27 oz
Triple	0.35 oz

**Model 148, 149****1/2" (12.7mm) Conductive Plastic and Cermet
Potentiometers****Vishay Spectrol****ENVIRONMENTAL SPECIFICATIONS**

PARAMETER	148	149
Operating Temperature	- 40°C to + 120°C	- 40°C to + 150°C
Storage Temperature	- 55°C to + 120°C	- 55°C to + 150°C
Temperature Cycling	- 40°C to + 120°C (4% ΔR_t)	- 40°C to + 150°C (3% ΔR_t)
Load Life	1000hrs. Rated Load @ 70°C	
	10% ΔR_t	5% ΔR_t
Rotational Load Life	50,000 cycles	25,000 cycles
TCR	$\pm 1000\text{ppm}/^\circ\text{C}$	$\pm 150\text{ppm}/^\circ\text{C}$

MARKING

Unit Identification	Ink stamp on periphery or rear per EIA standard
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NOBEL ELECTRONICS

**TUDOR COTTAGES FOOTSCRAY HIGH STREET
SIDCUP KENT DA14 5HN**

Telephone: 020 8309 0500 Fax: 020 8302 7901

Email: sales@nobelelectronics.fsnet.co.uk

www.nobelelectronics.co.uk

To: Viamed Ltd

Date: 06/04/05

Attention of: Steve Nixon

A/C No: BD207D

Fax No: 01535 635582

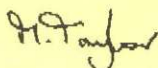
No. of pages: 4

From: Nick Noakes

Area: 5

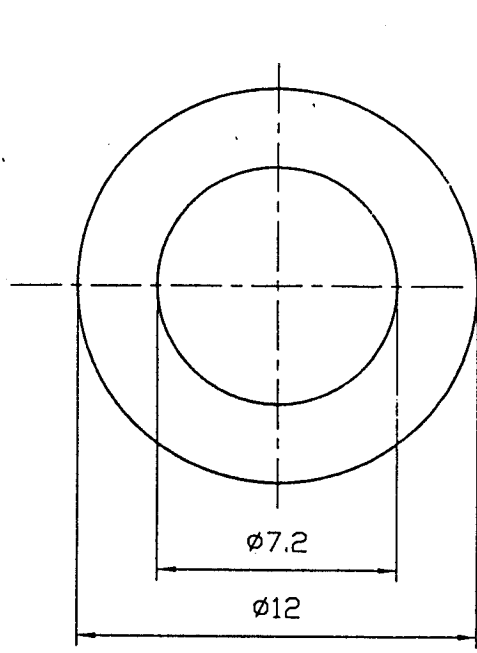
As requested, please find attached data sheet for the old style (Mexico sourced) model 149.

Regards

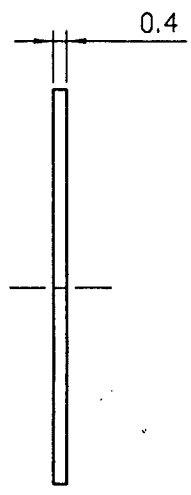


Nick Noakes

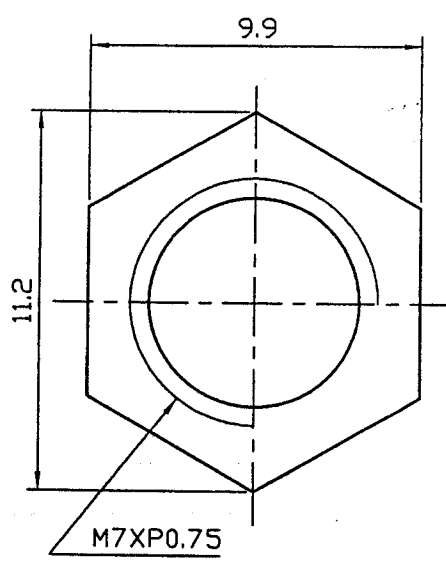
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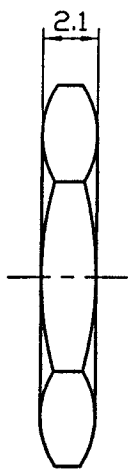
WASHER



DOCUMENT CONTROLLED
08 JUL 2004
ENG. DEPT

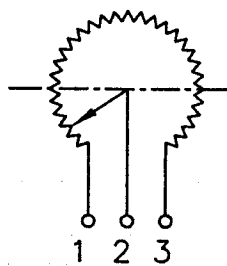
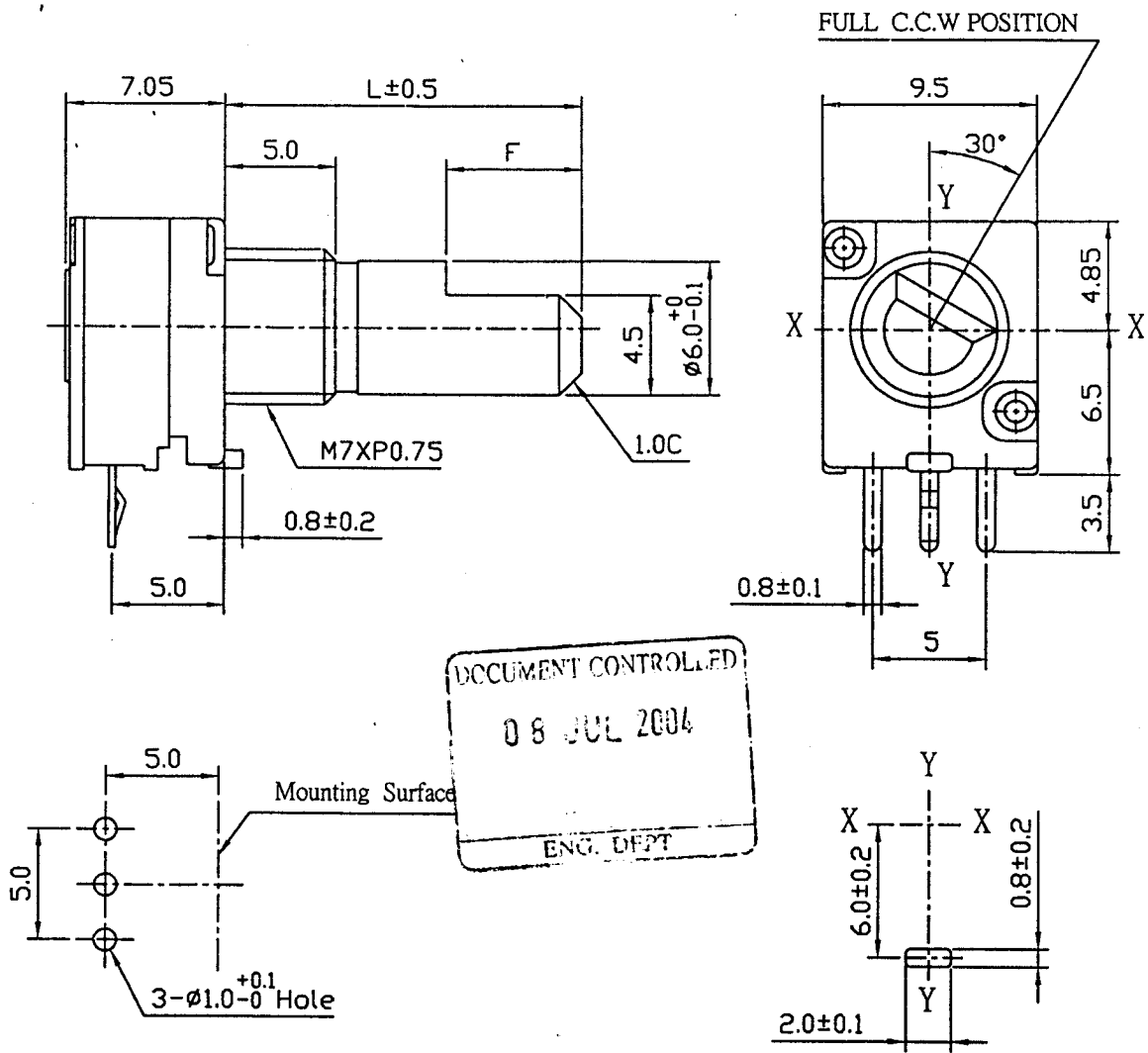


NUT



未指定容許±尺寸之公差	
10以下	±0.3
10~100	±0.5
100以上	±0.8
角 度	±5°

MTL		SPEC		DISPOSAL			
△				UNIT	SCALE	TITLE	
△				MM	2 / 1		
△				DRAWN	DESIGN	CHECK	APPROVAL
△				王坤	王坤		
△				2004.02.21			
DEVISION	DATE	DESIGN				DWG NO. F-ACCESSORY-08-002	
						DWG NAME M7xP0.75	



CIRCUIT

L	14.6	12.5	15
F	7	6	7

Full C.C.W Position Type	
D ☐	C ☒
Full C.C.W Position	Full C.C.W Position

未指定容許±尺寸之公差	
10以下	±0.3
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角 度	±5°

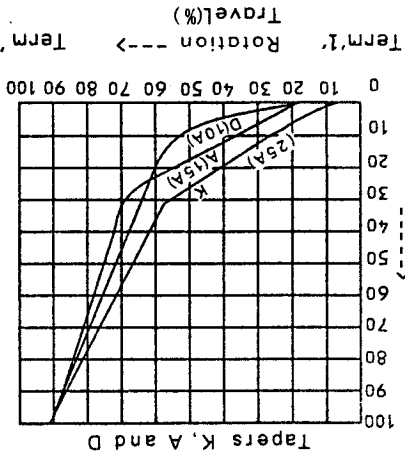
MTL		SPEC		DISPOSAL		UNIT		SCALE		TITLE	
△								3	/ 1		
△											
△											
△											
△	2003.09.02	寧望東	馬俊朝	寧望東						DWG NAME (Die casting shaft)	
DEVISION	DATE	DESIGN	2003.07.17							DWG NO. F-091-08-001	

Electrical Characteristics

Resistance Taper Characteristics

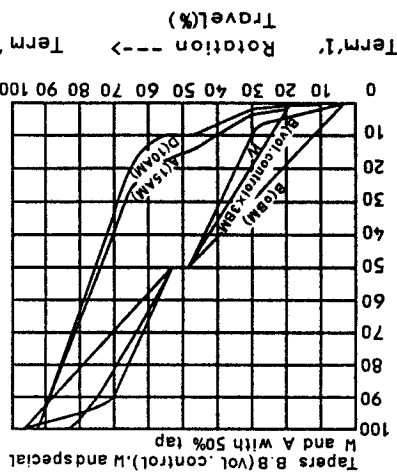
Resistance Taper	Characteristic	Test point Rotation (%)	Resistance Taper Characteristics		
			$\frac{V1-2}{V1-3} \times 100$	$\frac{V1-3}{V2-3} \times 100$	(%)
A	50	10-25	—	—	—
B	50	40-60	—	—	—
C	50 (started from 31)	—	—	—	—
D	50	6-15	—	—	—
E	50	—	—	—	—
W	(±5-degree)	30	5-15	—	—
		50	40-60	—	—
		70	85-95	—	—

Output Volt across Term. 1-2 x100(%)
Input Volt across Term. 1-3

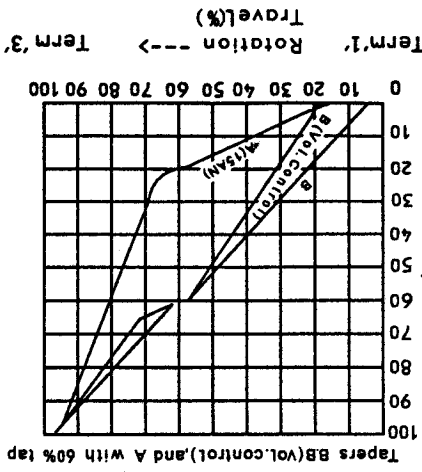


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COMMENT CONTROL UNIT

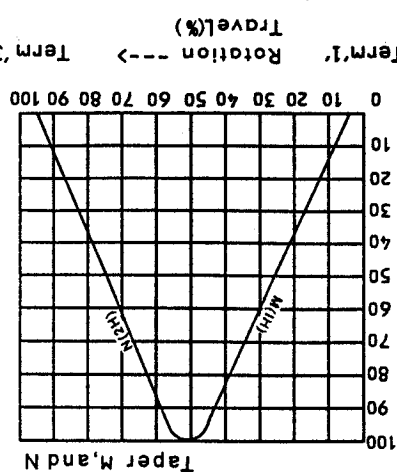
Output Volt across Term. 1-2 x100(%)
Input Volt across Term. 1-3



Output Volt across Term. 1-2 x100(%)
Input Volt across Term. 1-3

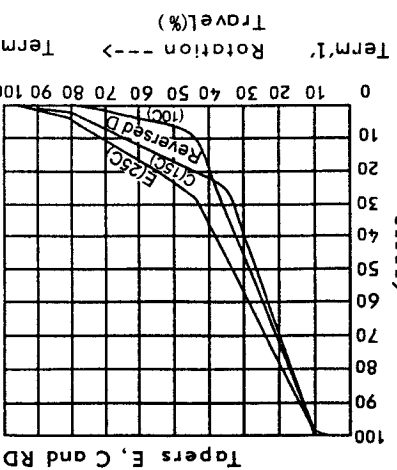


Output Volt across Term. 1-2 x100(%)
Input Volt across Term. 1-3
Taper M
Output Volt across Term. 1-2 x100(%)
Input Volt across Term. 1-3
Taper N
Output Volt across Term. 1-2 x100(%)
Input Volt across Term. 1-3



NOTE: Resistance characteristic of curve N is plotted with respect to terminal 3.

Output Volt across Term. 2-3 x100(%)
Input Volt across Term. 1-3



16 mm Metal Shaft



Dia = 16. Bush = M7 x 0.75,
M9 x 0.75 (Dual)

Power rating 0.05W (Log)
0.1W (Linear)
Voltage rating 150V a.c.
Resistance tolerance $\pm 20\%$

- Audio potentiometer for use in TV, radio and general applications
- Three styles: linear with flatted shaft, logarithmic with slotted shaft, dual logarithmic center dent and slotted shaft.

Mfrs. List No. RK16311120K = 642-964,
RK16312150K = 642-976,
RK16311110K = 642-988

Price Each

Logarithmic	Order Code	1+	10+	25+	50+
20K Slotted shaft	642-964	1.69	1.38	1.14	0.99
50K Center dent slotted shaft	642-976	2.78	2.28	1.88	1.69
Linear					
10K Flatted shaft	642-988	1.69	1.38	1.14	0.99

27 mm sq - Dual



Power rating 0.05W
Voltage rating 30V a.c.
Resistance tolerance $\pm 20\%$
Motor voltage 4 to 6V d.c.
Motor current at end slip 150 mA @ 4.5V d.c.

- High quality audio potentiometers for volume control in amplifiers and associated audio equipment
- Available with d.c. motor for remote control applications.

Bush = M9 x 0.75

Mfrs. List No. RK27111220K = 642-990,
RK2711250K = 697-928,
RK27112MC = 697-930

Price Each

	Order Code	1+	10+	25+	50+
20K dual	642-990	13.58	11.12	9.23	8.50
50K dual with centre detent	697-928	13.58	11.12	9.23	8.50
50K dual with motor	697-930	21.42	17.52	14.83	14.50

1Watt - P16NP Series Integrated Potentiometers and Knob (Replaces P16 Series)



Power rating @ 40°C 1W
Voltage rating 350V ac
Resistance tolerance $\pm 20\%$
Electrical rotation $270^\circ \pm 10^\circ$

- Miniature linear cermet potentiometer uniquely integrated into a black plastic knob
- Hermetically sealed and fitted with a panel seal

L = 23.0 (overall)
Dia = 16.0 (knob)
Panel cut-out = 10.1 dia
with 8mm double flat

Mechanical rotation $300^\circ \pm 5^\circ$
Limiting element voltage 750V RMS
Dielectric strength 2500V RMS
Operating temperature -40°C to $+85^\circ\text{C}$

Stocked in the following OHMIC Values:

470R = 350-618 4K7 = 350-643 47K = 350-679 470K = 350-709
1K = 350-620 10K = 350-655 100K = 350-680 1M = 350-710
2K2 = 350-631 22K = 350-667 220K = 350-692

Mfrs. List No. P16NP + Value

Price Each

Order Code	1+	10+	25+	100+
.All Values	3.72	3.55	3.35	2.72

ALPS

1 Watt - CT1301 Series Cermet



L = 15 (body), L = 15.9 (spindle slotted, inc bush),
Dia = 24 (body), 635 (spindle)

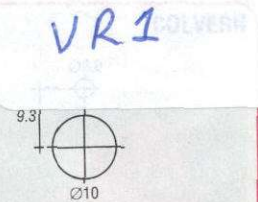
Power rating @ 70°C 1W
Voltage rating 700V
Resistance tolerance $\pm 20\%$
Effective rotation $265^\circ \pm 5^\circ$

Mechanical rotation $285^\circ \pm$
Technical resistance 2Ω or 1% whichever >
Isolation voltage 1000V ac
Operating temperature -40°C to 70°C

Stocked in the following OHMIC Values:

1K = 350-722 10K = 350-746 100K = 350-760 1M = 350-783
5K = 350-734 25K = 350-758 500K = 350-771

Mfrs. List No. CT1301/9S + Value



Panel cut-out

Price Each

Order Code	1+	25+	50+	100+	250+
.All Values	9.54	8.63	7.75	6.66	6.17

1 Watt - 6639 Series Conductive Plastic



- High quality conductive plastic potentiometers
- Essentially infinite resolution and excellent rotational life

L = 11.3 (body), 22.2 (spindle, inc bush)
Dia = 22.2 (body), 6.35 (spindle) Mounting
bush = $\frac{3}{8} \times 32$ UNEF

Power rating @ 70°C 1W
Voltage rating 300V ac (or limited by power
dissipation whichever <)
Resistance tolerance $\pm 15\%$
Linearity $\pm 2\%$
Electrical rotation $340^\circ \pm 3^\circ$

Mechanical rotation 360° continuous
Rotational life 10,000,000 cycles
Output smoothness 0.1% max.
Insulation resistance 500M Ω
Operating temperature -65°C to $+125^\circ\text{C}$

Stocked in the following OHMIC Values:

1K = 107-687 5K = 107-688 10K = 107-689

Mfrs. List No. 6639S-001 + Value

Price Each

Order Code	1+	10+	25+	50+	100+
.All Values	10.13	9.12	8.29	7.60	7.02

1 Watt - 357 Series Conductive Plastic



- Single turn conductive plastic
- Continuous 360° rotation
- Plastic moisture resistant housing

L = 8.77 (body), 22.22 (spindle inc bush)
Dia = 22.22 (body), 6.34 (spindle)
Mounting bush = $\frac{3}{8} \times 32$ UNEF

Power rating @ 70°C 1W
Linearity $\pm 2\%$
Output smoothness 0.1% max
Rotational life 10,000,000 cycles

Resistance tolerance $\pm 20\%$
Electrical rotation $340^\circ \pm 3^\circ$
Mechanical rotation 360° continuous
Shaft material Stainless steel

Stocked in the following OHMIC Values

1K = 868-826 5K = 868-840 20K = 868-863
2K = 868-838 10K = 868-851 50K = 868-875

Price Each

	1+	10+	25+	50+	100+
.All Values	7.66	6.25	5.35	4.62	4.20

Continued



Slider Knobs See Page 660
Push On Knobs See Page 661
Grub Screw Knobs See Page 661
Collet Knobs See Page 663

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