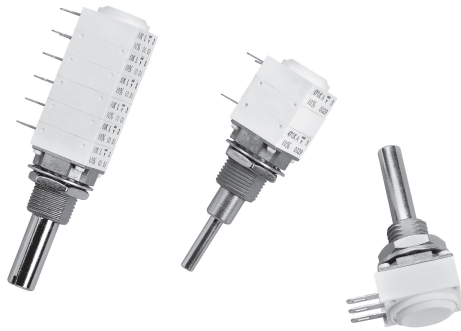


## 12.5 mm Modular Panel Potentiometers Cermet (P11S) or Conductive Plastic Elements (P11A)



### FEATURES

- 12.5 mm square single turn panel control
- Five shaft diameters and 29 terminal styles
- Multiple assemblies - up to seven modules
- Tests according to CECC 41 000
- GAM T1
- P11S version for industrial, military and aeronautics applications
- P11A version for professional audio applications
- Low current compatibility
- Shaft and panel sealed version
- Up to twenty-one indent positions
- Rotary and push/push switch options
- Concentric shafts
- Custom designs on request
- Trimmer version T11 (see document no. 51021)
- Compliant to RoHS directive 2002/95/EC



**RoHS**  
COMPLIANT

VERSATILE

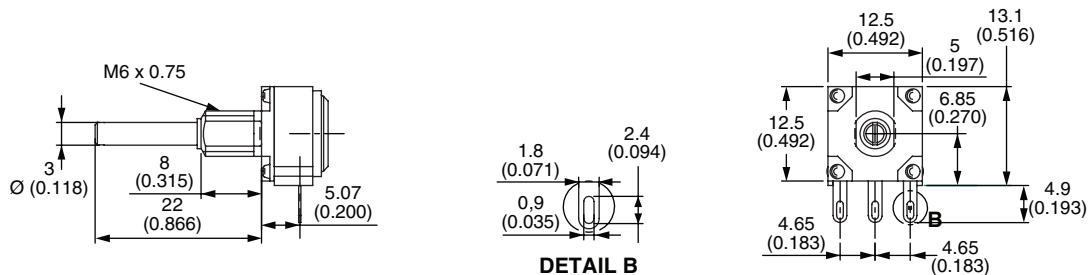
MODULAR

COMPACT

ROBUST

### CONFIGURATION EXAMPLE - Dimensions in mm (Inches)/Tolerance $\pm 0.5$ mm ( $\pm 0.02$ " )

Single module, single shaft, solder lugs, metric bushing and shaft



Single module, single shaft, vertical mounting, PC pins with support plate, metric bushing and shaft



Dual modules, single shaft, PC pins with front support plates, imperial bushing and shaft



**GENERAL SPECIFICATIONS**

<b>ELECTRICAL (INITIAL)</b>		
	<b>P11A</b>	<b>P11S</b>
<b>Resistive Element</b>	Conductive plastic	Cermet
<b>Electrical Travel</b>	270° ± 10°	270° ± 10°
<b>Resistance Range <sup>(1)</sup></b>	<b>Linear Law</b> 1 kΩ to 1 MΩ	20 Ω to 10 MΩ
	<b>Non Linear Law</b> 470 Ω to 500 kΩ	100 Ω to 2.2 MΩ
<b>Tolerance</b>	<b>Standard</b> ± 20 %	± 20 %
	<b>On request</b> -	± 5 % or ± 10 %
<b>Power Rating at 70 °C</b>	<b>Linear Law</b> 0.5 W at + 70 °C	1 W at + 70 °C
	<b>Non Linear Law</b> 0.25 W at + 70 °C	0.5 W at + 70 °C
	<b>Multiple Assemblies</b> 0.25 W at + 70 °C per module	0.5 W at + 70 °C per module
<b>Temperature Coefficient (Typical)</b>	± 500 ppm	± 150 ppm
<b>Limiting Element Voltage</b>	350 V	350 V
<b>End Resistance (Typical)</b>	2 Ω	2 Ω
<b>Contact Resistance Variation</b>	<b>Linear Law</b> 1 %	2 % or 3 %
<b>Independent Linearity (Typical)</b>	<b>Linear Law</b> ± 5 %	± 5 %
<b>Insulation Resistance</b>	10 <sup>6</sup> MΩ min.	10 <sup>6</sup> MΩ min.
<b>Dielectric Strength</b>	1500 V <sub>RMS</sub> min.	1500 V <sub>RMS</sub> min.
<b>Attenuation</b>	90 dB max./0.05 dB min.	-
<b>Mechanical Rotation Life</b>	50 000 cycles	50 000 cycles

**Note**<sup>(1)</sup> Consult Vishay Sfernice for other ohmic values

<b>MECHANICAL (INITIAL)</b>	
<b>Mechanical Travel</b>	300° ± 5°
<b>Operating Torque (Typical)</b>	
<b>Single and Dual Assemblies</b>	0.4 Ncm to 1.8 Ncm max. (0.57 oz.-inch to 2.55 oz.-inch max.)
<b>Three to Seven Modules (Per Module)</b>	0.2 Ncm to 0.3 Ncm max. (0.28 oz.-inch to 0.42 oz.-inch max.)
<b>End Stop Torque (All Bushing Except G)</b>	
<b>3 mm, 4 mm (1/8") Dia. Shafts</b>	25 Ncm max. (2.1 lb-inch max.)
<b>6 mm (1/4") Dia. Shafts</b>	80 Ncm max. (6.8 lb-inch max.)
<b>End Stop Torque for Bushing G</b>	
<b>All Shafts Dia.</b>	40 Ncm max. (3.4 lb-inch max.)
<b>Tightening Torque</b>	
<b>6 mm, 7 mm (1/4") Dia. Bushings</b>	150 Ncm max. (13 lb-inch max.)
<b>10 mm (3/8") Dia. Bushings</b>	250 Ncm max. (21 lb-inch max.)
<b>Weight</b>	7 g to 9 g per module (0.25 oz. to 0.32 oz.)

<b>ENVIRONMENTAL</b>		
	<b>P11A</b>	<b>P11S</b>
<b>Operating Temperature Range</b>	- 55 °C to + 125 °C	- 55 °C to + 125 °C
<b>Climatic Category</b>	55/125/21	55/125/56
<b>Sealing</b>	IP64	IP64

<b>MARKING</b>
<ul style="list-style-type: none"> <li>• <b>Potentiometer Module</b> VISHAY logo, nominal ohmic value (Ω, kΩ, MΩ), two stars identify P11A version, tolerance in % - variation law, manufacturing date (four digits), "3" for the lead 3</li> <li>• <b>Switch Module</b> Version, manufacturing date (four digits), "c" for common lead</li> <li>• <b>Indent Module</b> Version, manufacturing date (four digits)</li> </ul>

<b>PACKAGING</b>
<ul style="list-style-type: none"> <li>• Box</li> </ul>

## PERFORMANCES

TESTS	CONDITIONS	TYPICAL VALUE AND DRIFTS		
			P11S	P11A
Load Life	1000 h at + 70 °C (90°/30°)	$\Delta R_T/R_T$ contact resistance variation	± 2 % ± 4 %	± 10 % ± 5 %
Temperature Cycle	- 55 °C to + 125 °C, 5 cycles	$\Delta R_T/R_T$	± 0.2 %	± 0.5 %
Moisture	+ 40 °C, 93 % relative humidity P11S: 56 days, P11A: 21 days	$\Delta R_T/R_T$ insulation resistance	± 2 % > 1000 MΩ	± 5 % > 10 MΩ
Rotational Life	P11S/P11A: 50 000 cycles	$\Delta R_T/R_T$ contact resistance variation	± 5 % ± 5 %	± 6 % ± 4 %
Climatic Sequence	Dry heat at + 125 °C/damp heat cold - 55 °C/damp heat 5 cycles	$\Delta R_T/R_T$	± 1 %	-
Shock	50 g, 11 ms 3 shocks - 3 directions	$\Delta R_T/R_T$ resistance setting change	± 0.2 % ± 0.5 %	± 0.2 % ± 0.5 %
Vibration	10 Hz to 55 Hz 0.75 mm or 10 g, 6 h	$\Delta R_T/R_T$ voltage setting change	± 0.2 % ± 0.5 %	± 0.2 % ± 0.5 %

## ORDERING INFORMATION (Part Number 18 digits)

P	1	1	S	2	Q	0	E	A	S	Y	0	0	1	0	3	M	A
MODEL	STYLE		NUMBER OF MODULES	BUSHING	LOCATING PEG	SHAFT	SHAFT STYLE	LEADS	RESISTANCE CODE/ TOLERANCE/ TAPER OR SPECIAL								
P11	S = CERMET ELEMENT  A = CONDUCTIVE PLASTIC (AUDIO)		1 2 3 4 5 6 7														

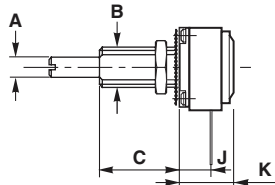
## STANDARD RESISTANCE ELEMENT DATA

STANDARD RESISTANCE VALUES	P11S CERMET						P11A CONDUCTIVE PLASTIC LINEAR LAW			TYPICAL TCR - 55 °C/+ 125 °C	
	LINEAR LAW			NON LINEAR LAW							
	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH WIPER	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH WIPER	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. CUR. THROUGH WIPER	P11S	P11A
Ω	W	V	mA	W	V	mA	W	V	mA	ppm/°C	
22	1	4.69	213	0.5	15.3	32.7	0.5	22.4	22.4	± 150	± 500
47		6.85	146								
50		7.07	141								
100		10	100								
200		14.8	67.4								
470		21.6	46.1								
500		22.4	44.7								
1K		31.6	31.6								
2.2K		46.9	21.3								
4.7K		63.5	14.5								
5K		70.7	14.1								
10K		100	10								
22K		148	6.7								
47K		217	4.6								
50K		224	4.47								
100K	1	316	3.16	0.5	224	2.24	0.5	224	2.24		
220K	0.56	350	1.59	0.26	332	1.51	0.5	332	1.51		
470K	0.26	350	0.75	0.12	350	0.74	0.26	350	0.74		
500K	0.25	350	0.70	0.25	350	0.70	0.25	350	0.70		
1M	0.12	350	0.35		350	0.35					
2.2M	0.05	350	0.16								
4.7M	0.02	350	0.07								

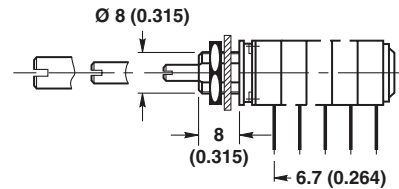
### ORDERING INFORMATION (Part Number 18 digits)

P	1	1	S	2	Q	0	E	A	S	Y	0	0	1	0	3	M	A																																															
MODEL	STYLE	NUMBER OF MODULES	BUSHING			LOCATING PEG	SHAFT	SHAFT STYLE	LEADS	RESISTANCE CODE/ TOLERANCE/ TAPER OR SPECIAL																																																						
P11			<table><tr><td></td><td>Ø</td><td>L</td><td>Old Codes</td></tr><tr><td>A</td><td>1/4"</td><td>1/4"</td><td>7, 77, 77-3</td></tr><tr><td>B</td><td>1/4"</td><td>3/8"</td><td>71</td></tr><tr><td>C</td><td>1/4"</td><td>1/2"</td><td>72</td></tr><tr><td>D</td><td>1/4"</td><td>3/8"</td><td>71H</td></tr><tr><td>E</td><td>1/4"</td><td>1/2"</td><td>72H</td></tr><tr><td>F</td><td>3/8"</td><td>3/8"</td><td>2, 03, 0-</td></tr><tr><td>G</td><td>8</td><td>8</td><td>TP, QP, VP, 2P, 7P</td></tr><tr><td>Q</td><td>7</td><td>8</td><td>Q</td></tr><tr><td>T</td><td>6</td><td>8</td><td>T</td></tr><tr><td>V</td><td>10</td><td>9.5</td><td>V, CC, CC-3</td></tr></table>				Ø	L	Old Codes	A	1/4"	1/4"	7, 77, 77-3	B	1/4"	3/8"	71	C	1/4"	1/2"	72	D	1/4"	3/8"	71H	E	1/4"	1/2"	72H	F	3/8"	3/8"	2, 03, 0-	G	8	8	TP, QP, VP, 2P, 7P	Q	7	8	Q	T	6	8	T	V	10	9.5	V, CC, CC-3															
	Ø	L	Old Codes																																																													
A	1/4"	1/4"	7, 77, 77-3																																																													
B	1/4"	3/8"	71																																																													
C	1/4"	1/2"	72																																																													
D	1/4"	3/8"	71H																																																													
E	1/4"	1/2"	72H																																																													
F	3/8"	3/8"	2, 03, 0-																																																													
G	8	8	TP, QP, VP, 2P, 7P																																																													
Q	7	8	Q																																																													
T	6	8	T																																																													
V	10	9.5	V, CC, CC-3																																																													

### BUSHING DIMENSIONS

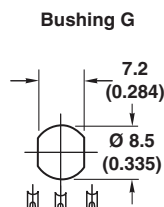
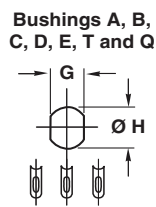
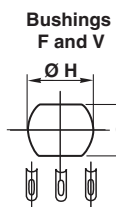


### PANEL AND SHAFT SEALED: BUSHING G

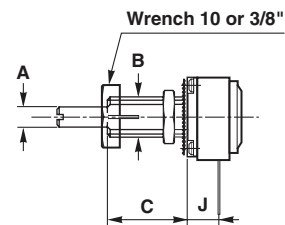


All models have the same bushing Dia. 8 mm - L 8 mm

### PANEL CUT OUT



### BUSHING D AND E WITH LOCKING NUT



BUSHINGS			G	T	Q	V	A	B	C	D	E	F
			DIMENSIONS mm (± 0.5)				DIMENSIONS INCHES (± 0.01)					
A	Shafts	Ø	All Dia.	3	4	6	1/8"	1/8"	1/8"	1/8"	1/8"	1/4"
B	Bushing	Ø	8	6	7	10	1/4"	1/4"	1/4"	1/4"	1/4"	3/8"
C	Lead Versions	L	8	8	8	9.5	1/4"	3/8"	1/2"	3/8"	1/2"	3/8"
J	X... Y...		6.7	5	5	7	0.200	0.200	0.200	0.200	0.200	0.278
K			10.4	9.1	9.1	11.1	0.357	0.357	0.357	0.357	0.357	0.436
G	Panel		7.2	5.2	6.2	8.2	0.197	0.197	0.197	0.197	0.197	0.323
H	Cutout	Ø	8.5	6.5	7.5	10.5	0.268	0.268	0.268	0.268	0.268	0.394
Threat			0.75				32 threads/inch					
Wrench Nut			12	8	10	12	0.313	0.313	0.313	0.313	0.313	0.500
Style										Slotted	Slotted	

#### Notes

- Hardware supplied in separate bags
- Slotted bushing for locking nut option

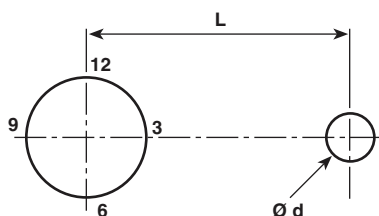
## ORDERING INFORMATION (Part Number 18 digits)

P	1	1	S	2	Q	0	E	A	S	Y	0	0	1	0	3	M	A
MODEL	STYLE	NUMBER OF MODULES	BUSHING	LOCATING PEG	SHAFT			SHAFT STYLE	LEADS	RESISTANCE CODE/ TOLERANCE/ TAPER OR SPECIAL							
				Old Codes A = B24 B = B30 C = B53 0 = Without peg													

## LOCATING PEGS (Anti-Rotation Lug)

The locating peg is provided by a plate mounted on the bushing and positioned by the module sides. Four set positions are available, clock face orientation: 12, 3, 6, 9.

All P11 bushings have a double flat. When panel mounting holes have been punched accordingly, an anti-rotation lug is not necessary.



CODE	VERSION	BUSHING A, B, C, D, E, T, Q	BUSHING F, V	EFFECTIVE HIGH PEG
A	Ø d mm	2	2	0.7
	L mm	6.2	6.2	
B	Ø d mm	2	2	0.7
	L mm	7.75	7.75	
C	Ø d mm	-	3.5	1.1
	L mm	-	13.5	

Locating pegs are supplied in separate bags with nuts and washers

### ORDERING INFORMATION (Part Number 18 digits)

P	1	1	S	2	Q	0	E	A	S	Y	0	0	1	0	3	M	A
MODEL	STYLE	NUMBER OF MODULES	BUSHING	LOCATING PEG	SHAFT				SHAFT STYLE	LEADS	RESISTANCE CODE/ TOLERANCE/ TAPER OR SPECIAL						
						Ø	L	Old Codes	S = Slotted R = Round F = Flatted K = Knurled/ splined D = Custom								
					AA	3	9.5	K									
					AB	3	12.5	M									
					AJ	3	22	R									
					AP = Custom shaft												
					BA	1/8"	3/8"	CK									
					BB	1/8"	1/2"	CM									
					BG	1/8"	5/8"	CDM									
					BG	1/8"	5/8"	CD									
					BH	1/8"	3/4"	CH									
					BJ	1/8"	7/8"	CR									
					CC = Concentric shaft												
					EA	4	9.5	E									
					EB	4	12.5	F									
					EJ	4	22	G									
					FG	6	16	D									
					FH	6	19	I									
					FL	6	25	N									
					FR	6	50	S									
					GG	1/4"	5/8"	VD									
					GH	1/4"	3/4"	VHM, VH									
					GJ	1/4"	7/8"	VR									
					GL	1/4"	1"	VN									
					GO	1/4"	1.5"	VL									

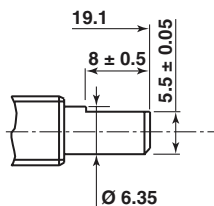
### SHAFTS

The shaft length are always measured from the mounting face.  
Standard shafts are designed by a 3 letter code (3 digits). Shafts slots are aligned to  $\pm 10^\circ$  of the wiper position.

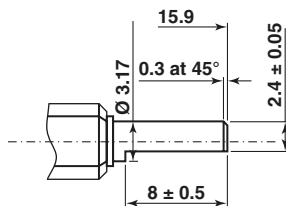
All standard shafts are slotted except flatted and splined, see exeptions for bushing.

#### FLATTED SHAFT

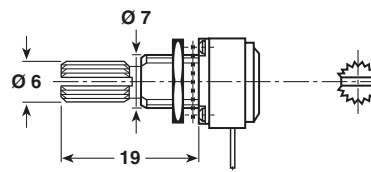
BUSHING: F  
SHAFT: GHF



BUSHING: A  
SHAFT: BGF



BUSHING: Q  
SPLINED SHAFT: FHK



#### CUSTOM SHAFTS

When special shafts are required - flat, threaded ends, special shaft lengths, etc. a drawing is required.

### STANDARD COMBINATION OF SHAFT STYLES AND BUSHINGS

SHAFT DIA.	BUSHING CODE	SHAFT LENGTH AND STYLE AVAILABLE IN STANDARD (Others on request)						
3	T	AAS	ABS	AJS				
3.17	A	BAS	BBS	BGS	BGF	BHS	BJS	
3.17	B	BBS	BGS	BHS	BJS			
3.17	C	BGS	BHS	BJS				
4	Q	EAS	EBS	EJS	FHK			
6	V	FGS	FLS	FRS				
6.35	F	GGs	GHS	GJS	GLS	GOS	GHF	

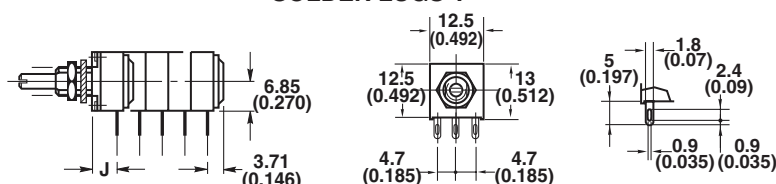
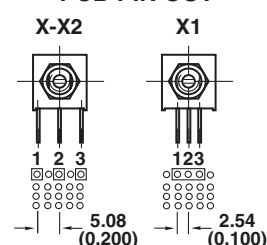
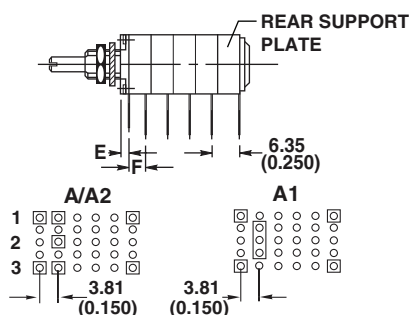
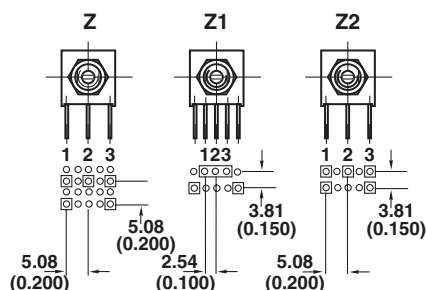
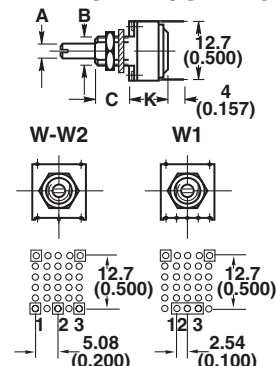
**ORDERING INFORMATION** (Part Number 18 digits)

P	1	1	S	2	Q	0	E	A	S	Y	0	0	1	0	3	M	A
MODEL	STYLE	NUMBER OF MODULES	BUSHING	LOCATING PEG	SHAFT	SHAFT STYLE	LEADS				RESISTANCE CODE/ TOLERANCE/ TAPER OR SPECIAL						
							Available leads										
							A00	W00	X00	Y00	Z00						
							A10	W10	X03	Y03	Z03						
							A13	W20	X04	Y04	Z04						
							A14		X10		Z10						
							A20		X13		Z13						
							A23		X14		Z14						
							A24		X20		Z20						
									X23		Z23						
									X24		Z24						

FIRST DIGIT	
Y	Soldering lugs
X	PCB pins
Z	PCB pins with front support plate
A	PCB pins with front and back support plates
W	PCB pins - vertical mounting with 2 extra pins - 1 module only

SECOND DIGIT	
0	Y = 4.65 mm (0.183") A, X, Z, W = 5.08 mm (0.200") pin spacing pins section 0.9 x 0.3 mm <sup>2</sup> (0.035" x 0.012")
1	2.54 mm (0.100") pin spacing pin section 0.6 x 0.3 mm <sup>2</sup> (0.024" x 0.012")
2	5.08 mm (0.200") pin spacing pins section 0.6 x 0.3 mm <sup>2</sup> (0.024" x 0.012")

THIRD DIGIT	
0	5.08 mm (0.200") space between modules
3	7.62 mm (0.300") space between modules
4	10.16 mm (0.400") space between modules

**DIMENSIONS****SOLDER LUGS Y****PCB PIN OUT****HORIZONTAL MOUNTING****FRONT AND REAR SUPPORT PLATES****FRONT SUPPORT PLATE****VERTICAL MOUNTING****THE POSITION OF EACH MODULE IS FREE**

BUSHINGS	DIMENSIONS mm (± 0.5)				DIMENSIONS INCHES (± 0.02)					
	G	T	Q	V	A	B	C	D	E	F
E Leads Z00	3.15	1.85	1.85	3.85	0.071	0.071	0.071	0.071	0.071	0.150
E Leads Z1, Z2, A..	2.8	1.6	1.6	3.6	0.063	0.063	0.063	0.063	0.063	0.140
F Leads Z0.: 5.08 mm (0.200")										
J Leads X.. Y..	6.7	5	5	7	0.200	0.200	0.200	0.200	0.200	0.278
E Leads Z0. with Rotary Switch	1.45	0.15	0.15	2.15	0.006	0.006	0.006	0.006	0.006	0.0846

### ORDERING INFORMATION (Part Number 18 digits)

P	1	1	S	2	Q	0	E	A	S	Y	0	0	1	0	3	M	A
MODEL	STYLE	NUMBER OF MODULES	BUSHING	LOCATING PEG	SHAFT	SHAFT STYLE	LEADS	RESISTANCE CODE/ TOLERANCE/ TAPER OR SPECIAL									
								Resistance Code: 200 = 20 $\Omega$ to 106 = 10 M $\Omega$  Tolerance Code: M = 20 %, K = 10 %, J = 5 %  Taper: A, L, W, F, S, R or special code given by Vishay									

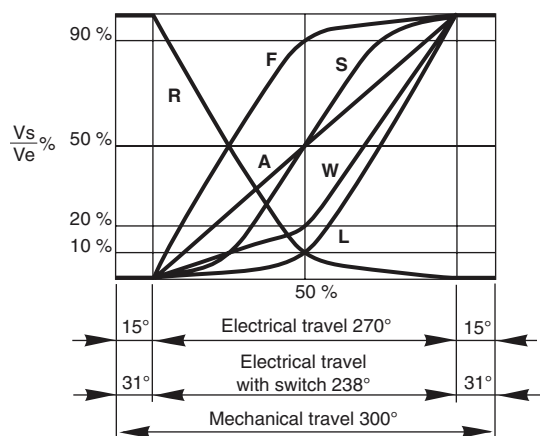
### RESISTANCE CODE

See Conversion Table for ohmic value

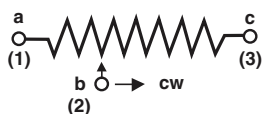
### TOLERANCE

Standard: M =  $\pm 20\%$   
On request: K =  $\pm 10\%$ , J =  $\pm 5\%$  (cermet only)

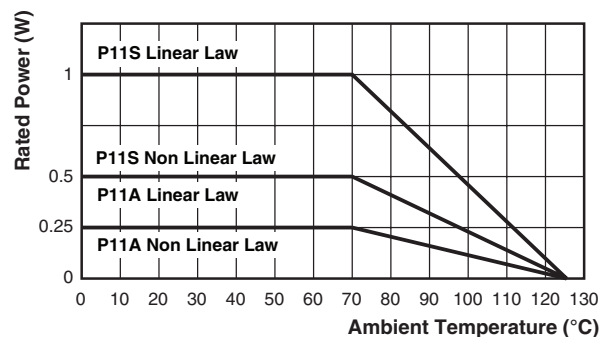
### VARIATION LAWS



### CIRCUIT DIAGRAM



### POWER RATING CHART

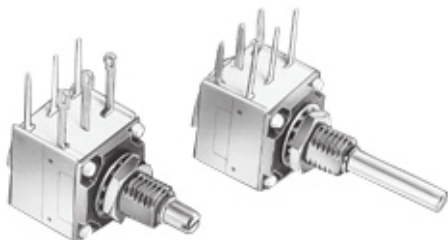


### SPECIAL CODES GIVEN BY VISHAY

#### OPTION AVAILABLE

- Custom shaft
- Custom design on request
- Specific linearity
- Specific interlinearity
- Specific variation law
- Multiple assemblies with various modules



**P11 OPTION: ROTARY SWITCH MODULES**

- Rotary switches
- Current up to 2 A
- Actuation CW or CCW position

**MODULES: RS ON/OFF SWITCH  
RSI CHANGEOVER SWITCH**

The position of each module is free.  
RS and RSI rotary switches are housed in a standard P11 module size 12.7 mm x 12.7 mm x 5.08 mm (0.5" x 0.5" x 0.2"). They have the same terminal styles as the assembled electrical modules.

An assembly can comprise 1 or more switch modules.

Switch actuation is described as seen from the shaft end.

D: means actuation in maximum CCW position

F: means actuation in maximum CW position

The switch actuation travel is 25° with a total mechanical travel of 300° ± 5° and electrical travel of electrical module is 238° ± 10°.

Leads finish: Gold plated.

**RDS SINGLE POLE SWITCH, NORMALLY OPEN**

In full CCW position, the contact between 1 and 3 is open. It is made at the beginning of the travel in CW direction.

**RSF SINGLE POLE SWITCH, NORMALLY OPEN**

In full CW position, the contact between 1 and 3 is open. It is made at the beginning of the travel in CCW direction.

**RSID SINGLE POLE CHANGEOVER**

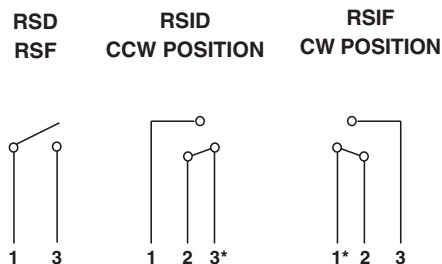
In full CCW position, the contact is made between 3 and 2 and open between 3 and 1. Switch actuation (CW direction) reverses these positions.

**RSIF SINGLE POLE CHANGEOVER**

In full CW position, the contact is made between 1 and 2 and open between 1 and 3. Switch actuation (CCW direction) reverses these positions.

**SWITCH SPECIFICATIONS**

Switching Power Maximum		62.5 VA v 15 VA =
Switching Current Maximum		0.25 A 250 V v 0.5 A 30 V =
Maximum Current Through Element		2 A
Contact Resistance		30 mΩ
Dielectric Strength	Terminal to Terminal	1000 V <sub>RMS</sub>
	Terminal to Bushing	2000 V <sub>RMS</sub>
Maximum Voltage Operation		250 V v 30 V =
Insulation Resistance Between Contacts		10 <sup>6</sup> MΩ
Life at P <sub>max</sub> .		10 000 actuations
Minimal Travel		25°
Operating Temperature		- 40 °C to + 85 °C

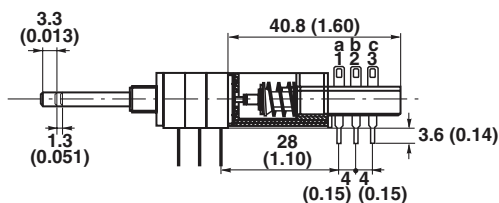
**ELECTRICAL DIAGRAM****Note**

- Common

**ORDERING INFORMATION** (First order only)**RSID**

<b>RSD</b>	SPST: Single pole, open switch in CCW position - 2 pins
<b>RSF</b>	SPST: Single pole, open switch in CW position - 2 pins
<b>RSID</b>	SPDT: Single pole, changeover switch in CCW position - 3 pins
<b>RSIF</b>	SPDT: Single pole, changeover switch in CW position - 3 pins

### P11 OPTION: PUSH/PUSH OR MOMENTARY/PUSH SWITCH MODULES



- Push/push or momentary push
- Current up to 2 A

#### MODULES: PUSH/PUSH SWITCH RSPP MOMENTARY/PUSH SWITCH RSMP

They have to be the last element of potentiometer

Options:

2 reversing switches F2      4 reversing switches F4  
6 reversing switches F6      8 reversing switches F8

Not available with panel sealed option.

Number of modules before the switch limited to 3 modules.  
Length of shaft (FMF) 25 mm maximum.

#### RSPP F2: PUSH/PUSH SWITCH WITH TWO REVERSING SWITCHES

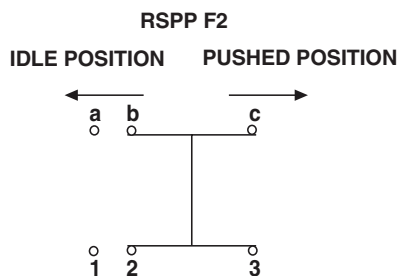
Idle position: The contact is made between 1 and 2 and a and b. It is open between 2 and 3 and b and c.

Pushed position: The contact is made between 2 and 3 and b and c. It is open between 1 and 2 and a and b.

#### SWITCH SPECIFICATIONS

Switching Power Maximum		50 VA v
Switching Current Maximum		0.5 A v
Maximum Current Through Element		2 A
Contact Resistance		100 mΩ
Dielectric Strength	Terminal to Terminal	1500 V <sub>RMS</sub>
	Terminal to Bushing	2000 V <sub>RMS</sub>
Maximum Voltage Operation		250 V v
Insulation Resistance Between Contacts		10 <sup>3</sup> MΩ
Life at P <sub>max</sub> .		100 000 actuations
Minimal Travel		3.3 mm to 4.7 mm
Operating Temperature		- 40 °C to + 70 °C

#### ELECTRICAL DIAGRAM



#### ORDERING INFORMATION (First order only for special code creation)

**RSPP**

**RSPP:** Push/push

**RSMP:** Momentary/push

**F2**

**F2:** 2 reversing switches (standard version)

**F4:** 4 reversing switches

**F6:** 6 reversing switches

**F8:** 8 reversing switches

**P11 OPTION: CONCENTRIC SHAFTS**

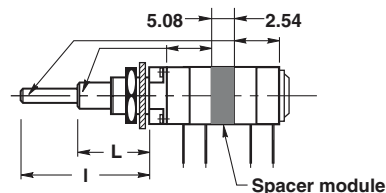
The CC concentric shaft versions allies the total flexibility of the P11 modular system to the advantage of having two separate shafts.

The outer 6 mm or 1/4" or 1/8" dia. shaft drives the modules situated immediately behind the panel, before the spacer module.

The inner 3 mm or 1/8" or 0.07" dia. shaft drives the modules situated after the spacer module.

Spacer is available with a choice of two spacer thickness:

5.08 mm designations or 2.54 mm designation. See dimensional drawing



BUSHING CODE	OUTER SHAFT DIAMETER			INNER SHAFT DIAMETER		
	DIAMETER	LENGTH L	SHAFT STYLE	DIAMETER	LENGTH I	SHAFT STYLE
V	6	16	R	3	28.5	R
F	6.35 (1/4")	16	R	3.17 (1/8")	28.5	R
A	3.17 (1/8")	12.7 (1/2")	R	1.8 (0.07")	22.2 (7/8")	R

**ORDERING INFORMATION** (First order only for special code creation)

5.08

**2.54:** Mechanical spacer of 2.54 mm

**5.08:** Mechanical spacer of 5.08 mm

Customer should define which modules is driven by each shaft (see example of ordering information at the end of the data sheet)

**P11 OPTION: DETENT MODULES**

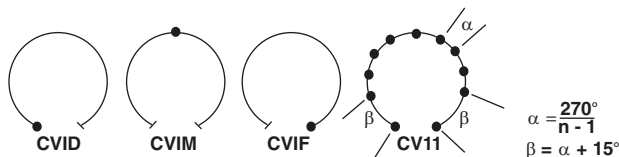
The valley detents mechanism is housed in a standard P11 module. Up to 21 detents position available.

Count detents as follows: 1 for CCW position, 1 for full CW position, plus the other positions forming equal resistance increments (linear taper) - not equal angles.

Available now: CVID - CVIF - CVIM

CV3 - CV11 - CV21

Rotational life: 10 000 cycles

**ORDERING INFORMATION** (First order only for special code creation)

CV1M

**CV1M** 1 detent at half travel

**CV1M J84** CV1M with accuracy of center point  $\pm 2\%$  (all laws except S)

**CV1D** 1 detent at CCW position

**CV1F** 1 detent at CW position

**CV3** 3 detents

**CV11** 11 detents

**CV21** 21 detents

**P11 OPTION: NEUTRAL MODULES "EN"**

Neutral or screen module is housed in a standard P11 module.

It is used as a screen between two electrical modules.

The leads can be connected to ground.

**ORDERING INFORMATION** (First order only for special code creation)

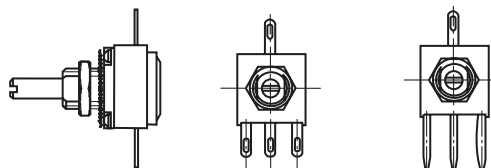
EN

**EN** Neutral module

### P11 OPTION: CENTER CURRENT TAP "J"

The extra terminal is a solder lug connected at 50 % of electrical travel and situated in the potentiometer module opposite the terminals.

Center tap presents a short circuit of 11° of travel.

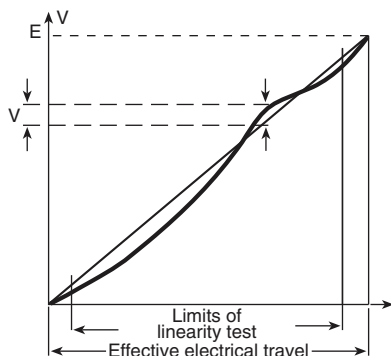


#### ORDERING INFORMATION (First order only)

**J**

**J** Center tap

### P11 OPTION: SPECIAL LINEARITY - CONFORMITY



The independent linearity (conformity for the non linear laws) is the maximum gap  $\Delta V$  between the actual variation curve and the theoretical variation curve the nearest to it. The linearity and the conformity are expressed in percentage of the total applied voltage E

$$\text{linearity conformity} = \frac{\pm \Delta V_{\max}}{E}$$

They are measured over 90 % of actual electrical travel (centered).

On request linearity can be guaranteed in linear law.

#### ORDERING INFORMATION (First order only)

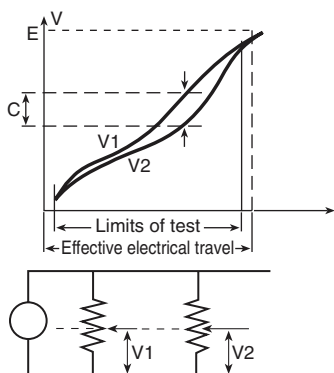
**J123**

**J123** Independent linearity  $\pm 3\%$  (linear law)

**J145** Independent linearity  $\pm 2\%$  (linear law)

For other request, contact us.

### P11 OPTION: SPECIAL INTERLINEARITY - INTERCONFORMITY



It is the maximum deviation between the actual voltage outputs of 2 or more pot modules in the same assembly. It is expressed as a percentage of the total applied voltage, or in dB attenuation.

Interlinearity is measured between 2 pot modules, over 10 to 90 % of the attenuation.

The interlinearity or interconformity is expressed as a percentage of the total applied voltage:

$$I\% = \frac{|C|}{E}$$

Or in decibels by comparison between outputs V1 and V2

$$I \text{ dB} = 20 \log \frac{V_1}{V_2}$$

#### ORDERING INFORMATION (First order only)

**J44**

**J44** Interlinearity  $\pm 2\%$  (linear law)

For other request, contact us.

**EXAMPLES OF FIRST ORDER INFORMATION****FIRST EXAMPLE: Triple module (switch is counted as a module)**

P	1	1	S	3	Q	0	A	P	S	Y	0	0							
MODEL P11	STYLE S	3 MODULES	BUSHING Q (Ø7: L8)	WITHOUT LOCATING PEG	CUSTOM SHAFT SLOTTED	SOLDER LUGS	SPECIAL TO BE DEFINED BY VISHAY												

**ORDERING INFORMATION:**

PART NUMBER	P11S3Q0APSY00.....	
SHAFT AND BUSHING	See drawing of special shaft attached	
MODULE NO. 1	RSID	
MODULE NO. 2	103 M A	J123
MODULE NO. 3	503 M A	J

**SECOND EXAMPLE: Concentric shaft with 2 modules on each shaft**

P	1	1	S	5	V	0	C	C	R	Y	0	0							
MODEL P11	STYLE S	5 MODULES	BUSHING V (Ø10: L9,5)	WITHOUT LOCATING PEG	STANDARD CONCENTRIC SHAFT CCR	SOLDER LUGS	SPECIAL TO BE DEFINED BY VISHAY												

**ORDERING INFORMATION:**

PART NUMBER	P11S5V0CCRY00.....	
SHAFT AND BUSHING		
MODULE NO. 1	CV1M	Driven by outer shaft
MODULE NO. 2	502 K A	Driven by outer shaft
MODULE NO. 3	5.08	Mechanical spacer 5,08 mm
MODULE NO. 4	103 K A	J44 Driven by inner shaft
MODULE NO. 5	103 K A	J44 Driven by inner shaft

**PART NUMBER DESCRIPTION** (used on some Vishay document or label, for information only)

P11S	2	Q	0	EA	S	Y00	10K	20 %	A			e3
MODEL	MODULES	BUSHING	LOCATING PEG	SHAFT	SHAFT STYLE	LEADS	VALUE	TOL.	TAPER	SPECIAL	SPECIAL	LEAD (Pb)- FREE



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