

# 12.5 mm Modular High Torque Panel Potentiometer



## FEATURES

- Keep the setting under high mechanical constraints (vibrations, shocks, ...)
- High torque (8 Ncm) with smooth feeling during all potentiometer life
- Torque stability under high environmental constraints
- 12.5 mm square single turn panel control with 6.35 mm shaft diameters
- Custom designs upon request
- Compact, versatile, modular, and robust
- Tests according to CECC 41000 or IEC 60393-1
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS COMPLIANT

## LINKS TO ADDITIONAL RESOURCES



QUICK REFERENCE DATA	
Multiple module	Up to 7 modules
Switch module	Yes
Detent module	n/a
Special electrical laws	A: linear
Sealing level	IP 64
Lifespan	50K cycles

**CONFIGURATION EXAMPLE** - Dimensions in millimeters (inches) ± 0.5 mm (± 0.02")

EXAMPLE: P11H1F0GHFW10102KA

3/8" 32 UNEF

6.35 (0.250)

10.2 ± 0.5 (0.402 ± 0.020)

2.54 (0.100)

2.54 (0.100)

35.6 (1.402)

11.2 (0.441)

16.5 (0.650)

8 (0.315)

8 (0.315)

5.5 (0.217)

9.4 (0.370)

19.05 (0.750)

15.4 (0.606)

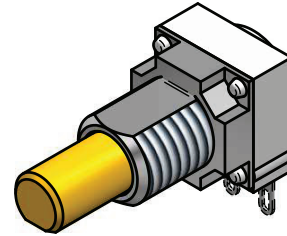
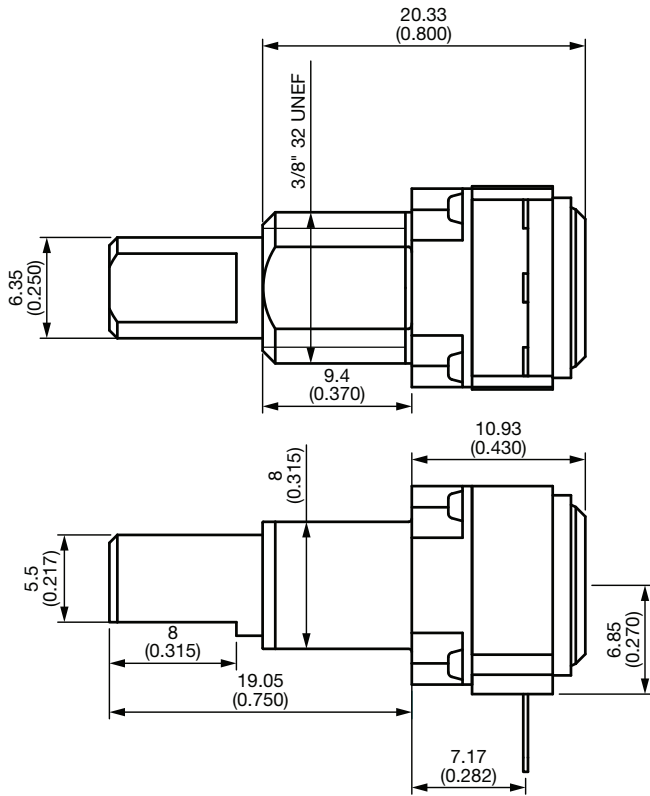
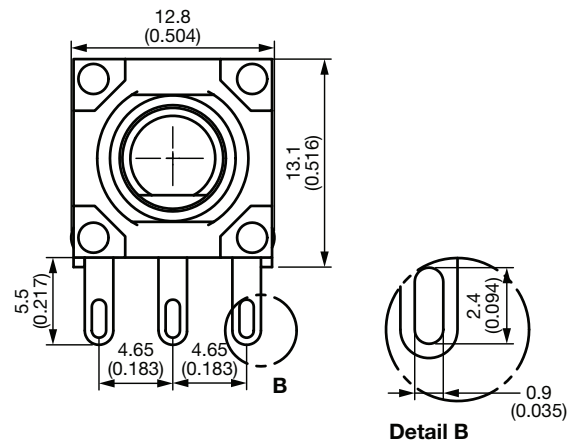
12.8 (0.504)

13.6 (0.540)

6.85 (0.270)

Shaft view at middle travel

**CONFIGURATION EXAMPLE** - Dimensions in millimeters (inches)  $\pm 0.5$  mm ( $\pm 0.02$ " )

**EXAMPLE: P11H1F0GHFY00102KA**

**Shaft view at middle travel**

**CUSTOM CAPABILITIES**

P11H model can be fully customized:

- Custom shafts
- Switch option
- Connector and wire
- Special leads
- Special taper
- One to 7 modules
- ...

When special shafts are required (special shaft lengths, diameter etc.) a drawing is required.

Hardware supplied in separate bags.



GENERAL SPECIFICATIONS

<b>ELECTRICAL</b> (initial)																												
Resistive element	Cermet element																											
Electrical travel	270° ± 10°																											
Resistance range <sup>(1)</sup>	1 kΩ, 4.7 kΩ, 10 kΩ, 47 kΩ, 100 kΩ																											
Tolerance	± 10 %, ± 20 %																											
Taper	Linear																											
Power rating at 70 °C	<p>1 W for single module or 0.5 W per module</p> <table border="1"> <caption>Power Rating Data</caption> <thead> <tr> <th>Ambient Temperature (°C)</th> <th>Rated Power (W) - 1 W Module</th> <th>Rated Power (W) - 0.5 W Module</th> </tr> </thead> <tbody> <tr><td>0</td><td>1.0</td><td>0.5</td></tr> <tr><td>20</td><td>1.0</td><td>0.5</td></tr> <tr><td>40</td><td>1.0</td><td>0.5</td></tr> <tr><td>60</td><td>1.0</td><td>0.5</td></tr> <tr><td>70</td><td>1.0</td><td>0.5</td></tr> <tr><td>80</td><td>0.75</td><td>0.375</td></tr> <tr><td>100</td><td>0.25</td><td>0.125</td></tr> <tr><td>125</td><td>0</td><td>0</td></tr> </tbody> </table>	Ambient Temperature (°C)	Rated Power (W) - 1 W Module	Rated Power (W) - 0.5 W Module	0	1.0	0.5	20	1.0	0.5	40	1.0	0.5	60	1.0	0.5	70	1.0	0.5	80	0.75	0.375	100	0.25	0.125	125	0	0
Ambient Temperature (°C)	Rated Power (W) - 1 W Module	Rated Power (W) - 0.5 W Module																										
0	1.0	0.5																										
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70	1.0	0.5																										
80	0.75	0.375																										
100	0.25	0.125																										
125	0	0																										
Temperature coefficient (typical)	± 150 ppm																											
Limiting element voltage	350 V																											
End resistance (typical)	2 Ω																											
Contact resistance variation (typical)	2 % or 3 Ω																											
Independent linearity (typical)	± 5 %																											
Insulation resistance	10 <sup>6</sup> MΩ min.																											
Dielectric strength	1500 V <sub>RMS</sub> min.																											
Mechanical endurance	50 000 cycles																											

Note

(1) Consult Vishay Sfernice for other ohmic values

<b>MECHANICAL</b> (initial)	
Mechanical travel	300° ± 5°
Operating torque (typical)	8 Ncm ± 2 Ncm (8.49 oz.-inch to 14.16 oz.-inch)
End stop torque	80 Ncm max. (6.8 lb-inch max.)
Tightening torque	250 Ncm max. (21 lb-inch max.)
Weight	7 g to 9 g per module (0.25 oz. to 0.32 oz.)

<b>ENVIRONMENTAL</b>	
Operating temperature range	-55 °C to +125 °C
Climatic category	55 / 125 / 56
Sealing	IP64

<b>MARKING</b>
Potentiometer module Vishay logo, SAP code of ohmic value and tolerance in %, variation law, manufacturing date (four digits), "3" for the lead 3

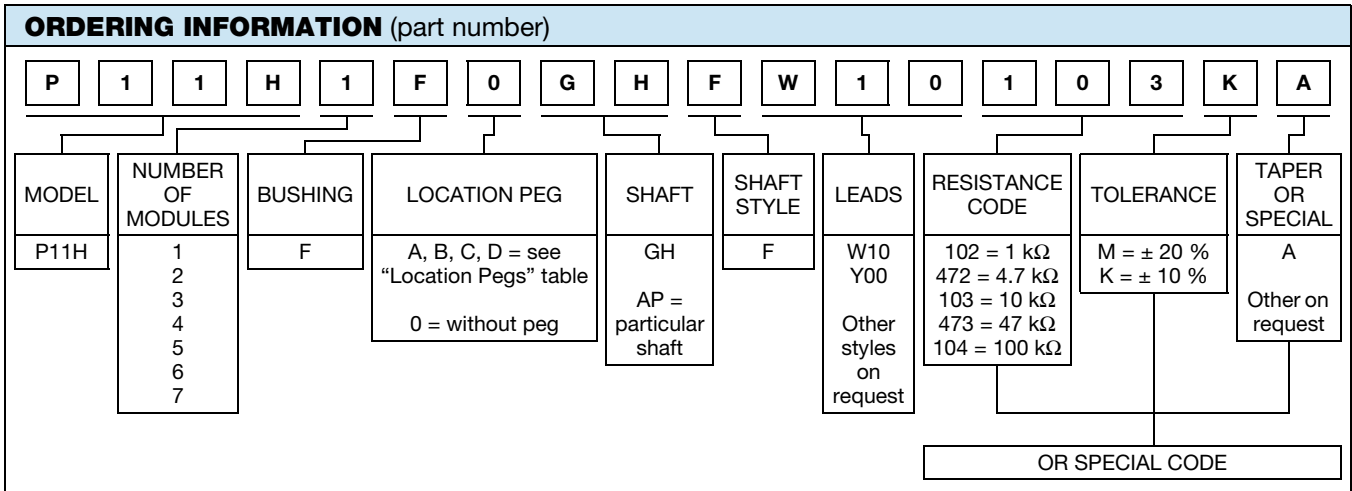
<b>PACKAGING</b>
• Box



PERFORMANCES			
TESTS	CONDITIONS	TYPICAL VALUE AND DRIFTS	
Electrical endurance	1000 h at rated power 90'/30' at ambient temp. 70 °C	$\Delta R_T/R_T$ Contact resistance variation	$\pm 2\%$ $\pm 4\%$
Change of temperature	5 cycles, -55 °C to +125 °C, 30' per cycle	$\Delta R_T/R_T$ Operating torque	$\pm 0.2\%$ > 2 Ncm (2.8 oz.-inch)
	Severe stress: 90 cycles, -40 °C to +80 °C, 4 h per cycle	$\Delta$ Operating torque / torque (%)	< 35 %
Damp heat, steady state	+40 °C, 93 % relative humidity, 56 days	$\Delta R_T/R_T$ Insulation resistance	$\pm 2\%$ > 1000 M $\Omega$
		$\Delta$ Operating torque / torque (%)	< 20 %
Mechanical endurance	50 000 cycles	$\Delta R_T/R_T$ Contact resistance variation	$\pm 5\%$ $\pm 5\%$
		$\Delta$ Operating torque / torque (%)	< 20 %
Shock	50 g, 11 ms 3 shocks - 3 directions	$\Delta R_T/R_T$ $\Delta R_{1-2}/R_{1-2}$	$\pm 0.2\%$ $\pm 0.5\%$
		$\Delta$ Operating torque / torque (%)	< 11 %
Vibration	10 Hz to 55 Hz 0.75 mm or 10 g, 6 h	$\Delta R_T/R_T$ $\Delta V_{1-2}/V_{1-3}$	$\pm 0.2\%$ $\pm 0.5\%$
		$\Delta$ Operating torque / torque (%)	< 11 %

**Note**

- Nothing stated herein shall be construed as a guarantee of quality or durability

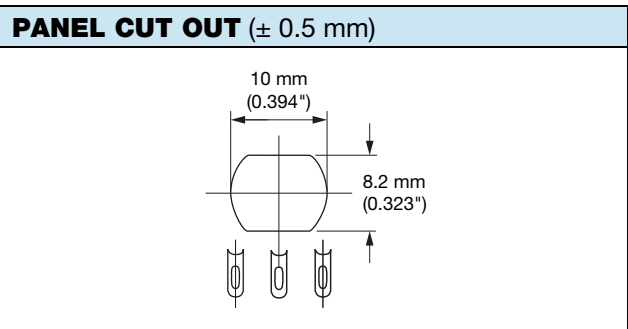


**SPECIAL CODES GIVEN BY VISHAY**

Options available:

- Custom shaft
- Specific linearity, interlinearity, taper
- Multiple assemblies with various modules
- Wires, connectors
- Switch modules
- PCB adding
- Custom design on request

STANDARD RESISTANCE ELEMENT DATA			
STANDARD RESISTANCE VALUES	MAX. POWER AT 70 °C	MAX. WORKING VOLTAGE	MAX. WIPER CURRENT
$\Omega$	W	V	mA
1K	1	31.6	31.6
4.7K	1	69	14.5
10K	1	100	10
47K	1	217	4.61
100K	1	316	3.16



**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	EFFECTIVE HIGH PEG
A	$\varnothing$ d mm	2	0.7
	L mm	6.2	
B	$\varnothing$ d mm	2	0.7
	L mm	7.75	
C	$\varnothing$ d mm	3.5	1.1
	L mm	13.5	

Locating pegs are supplied in separate bags with nuts and washers.

**LEADS CONFIGURATION EXAMPLES (on request) - Dimensions in millimeters (inches)**

**SOLDER LUGS Y**

**PCB PIN OUT**

**HORIZONTAL MOUNTING**

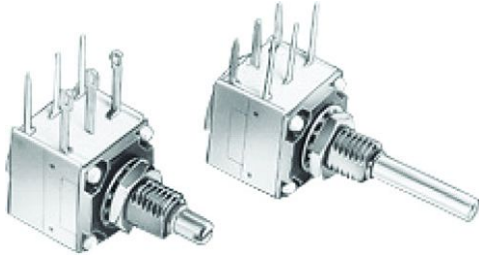
**FRONT AND REAR SUPPORT PLATES**

**FRONT SUPPORT PLATE**

**VERTICAL MOUNTING**

**Note**

- Standard version: Y00 W10. Other styles on request

**P11 OPTION: ROTARY SWITCH MODULES**


- Rotary switches
- Current up to 2 A
- Actuation CW or CCW position
- Sealing IP 60

The position of each switch module is free. Leads finish: Gold plated  
 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 one 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 modules is 238° ± 10°.

**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.

**RSD SPST:** single pole, open switch in CCW position - 2 pins

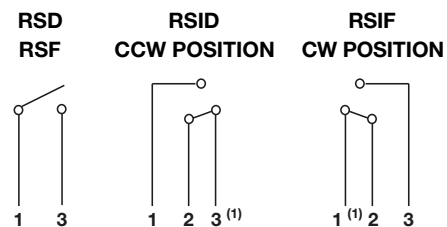
**RSF SPST:** single pole, open switch in CW position - 2 pins

**RSID SPDT:** single pole, changeover switch in CCW position - 3 pins

**RSIF SPDT:** single pole, changeover switch in CW position - 3 pins

**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	100 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**  
 (1) Common

**RELATED DOCUMENTS**
**APPLICATION NOTES**

Potentiometers and Trimmers	<a href="http://www.vishay.com/doc?51001">www.vishay.com/doc?51001</a>
Guidelines for Vishay Sfernice Resistive and Inductive Components	<a href="http://www.vishay.com/doc?52029">www.vishay.com/doc?52029</a>



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