

Analog Displacement Sensors for Transportation Applications



FEATURES

- Conductive plastic potentiometer technology
- Use in engine compartment
- Lever drive with return spring
- Wire outputs
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



LINKS TO ADDITIONAL RESOURCES



QUICK REFERENCE DATA

Sensor type	ROTATIONAL, conductive plastic
Output type	Output by wires
Market appliance	Transportation
Dimensions	39.2 mm (or 42 mm, or 47 mm) x 31.5 mm (or 34.2 mm) x 23.37 mm

ELECTRICAL SPECIFICATIONS

PARAMETER	
Total electrical travel	$94^{\circ} \pm 2^{\circ}$
Independent linearity standard	$\pm 1.5 \%$
Total resistance (R_n)	$3.85 \text{ k}\Omega \pm 20 \%$
Output smoothness	$< 0.1 \%$ (NFC 93255)
Power rating at $+40^{\circ}\text{C}$	0.5 W
Power rating at $+125^{\circ}\text{C}$	0.05 W
Wiper current limiting resistance (R_p)	$1.7 \text{ k}\Omega \pm 20 \%$
Recommended wiper current	$< 100 \mu\text{A}$
Maximum wiper current	15 mA for 1 min
Recommended load impedance	$\geq 100 R_n$

MECHANICAL SPECIFICATIONS

PARAMETER	
Mechanical travel	$125^{\circ} \pm 4^{\circ}$
Lever return torque at start of travel	$\geq 1 \text{ N cm}$
Lever return torque at end of travel	$\leq 10 \text{ N cm}$
Stop strength	60 N cm
Lever return	Counterclockwise
Protection class	See "Specific Characteristics" table
Mounting screw tightening torque	1.2 N m maximum

PERFORMANCE

PARAMETER	
Operating temperature range	-40°C to $+125^{\circ}\text{C}$
Storage temperature range	-55°C to $+135^{\circ}\text{C}$
Vibrations	Severity 10 Hz to 2000 Hz, 10 mm or 50 g
Life	See "Specific Characteristics" table
Micro-movements (dither stroke)	$> 50\text{M}$ cycles

**SAP PART NUMBERING GUIDELINES**

MODEL	TYPE	LEVER TYPE	VALUE	ANGLE	LEADS	PACKAGING
PMR4	03	A = lever A C = lever C	392 = 3K9	094	W = wire	C = 20 pcs G = 100 pcs P = 500 pcs
	23					
	02					
	22					
	04					
	24					
	01					
	21					
	11					
	31					
	12					
	16					
	26					
	18					
	28					
	(see "Specific Characteristics")					

SPECIFIC CHARACTERISTICS

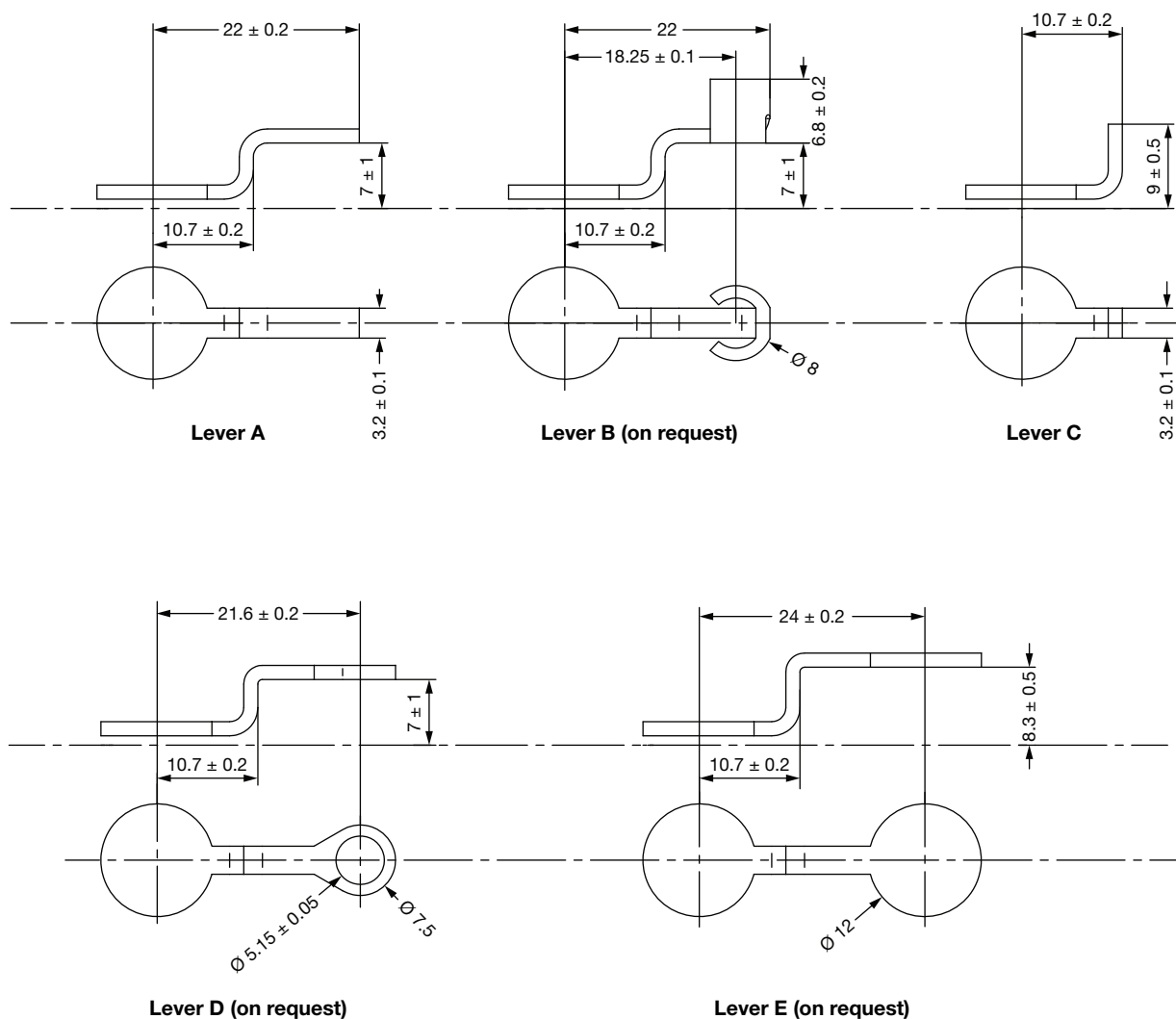
SENSOR TYPE	LIFE		PROTECTION CLASS	PACKAGE TYPE ⁽¹⁾
	MICRO-MOVEMENTS (dither stroke)	NUMBER OF CYCLES ELECTRICAL TRAVEL		
403	10 x 10 ⁶	5 x 10 ⁶	IP64	1
423	10 x 10 ⁶	5 x 10 ⁶	IP64	2
402	10 x 10 ⁶	5 x 10 ⁶	IP64	3
422	10 x 10 ⁶	5 x 10 ⁶	IP64	4
404	10 x 10 ⁶	5 x 10 ⁶	IP66	1
424	10 x 10 ⁶	5 x 10 ⁶	IP66	2
401	10 x 10 ⁶	5 x 10 ⁶	IP66	3
421	10 x 10 ⁶	5 x 10 ⁶	IP66	4
411	50 x 10 ⁶	5 x 10 ⁶	IP64	1
431	50 x 10 ⁶	5 x 10 ⁶	IP64	2
412	50 x 10 ⁶	5 x 10 ⁶	IP64	3
416	50 x 10 ⁶	5 x 10 ⁶	IP66	1
426	50 x 10 ⁶	5 x 10 ⁶	IP66	2
418	50 x 10 ⁶	5 x 10 ⁶	IP66	3
428	50 x 10 ⁶	5 x 10 ⁶	IP66	4

Notes

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

⁽¹⁾ Package types

- | | |
|--------------------------|---------------------------------------|
| 1: Little ears | Fixation: 2 screws M4 with Ø: 31.5 mm |
| 2: Little tightened ears | Fixation: 2 screws M4 with Ø: 31.5 mm |
| 3: Big ears | Fixation: 2 screws M4 with Ø: 34 mm |
| 4: Big tightened ears | Fixation: 2 screws M4 with Ø: 34 mm |

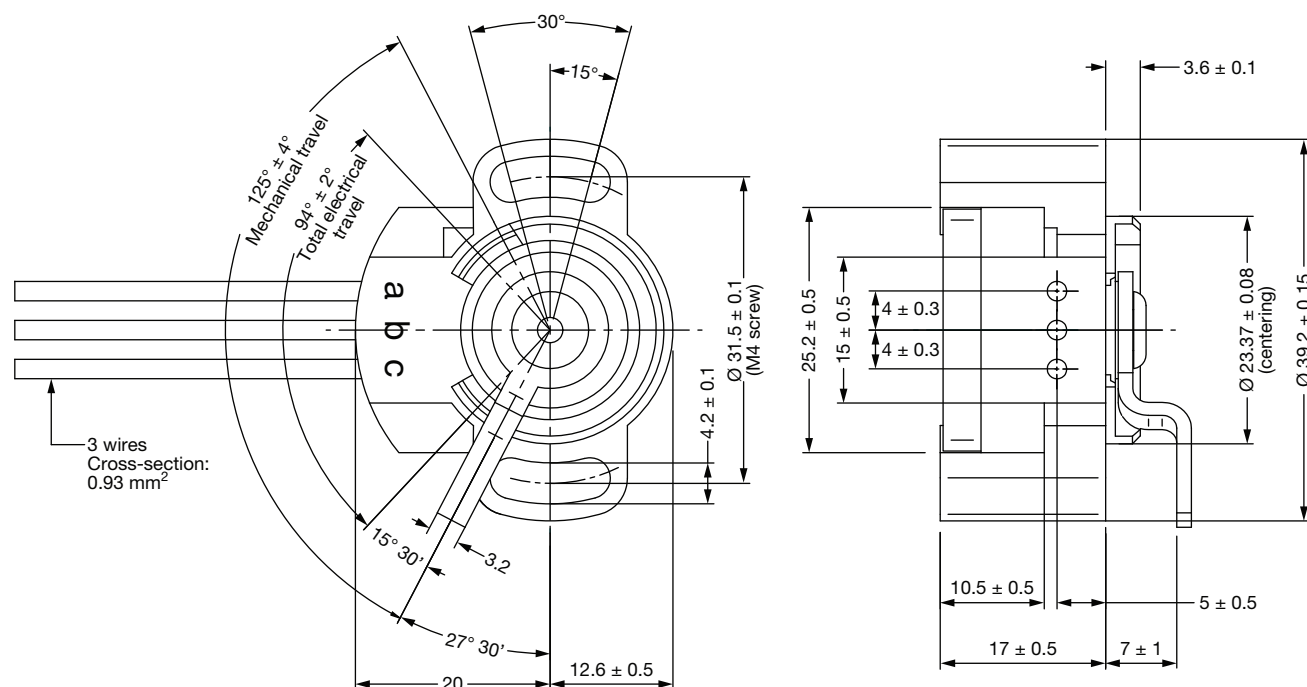
LEVER OPTIONS

CONNECTIONS

Wire Outputs: -40 °C to +105 °C (3 x 0.93 mm² length 300 mm)

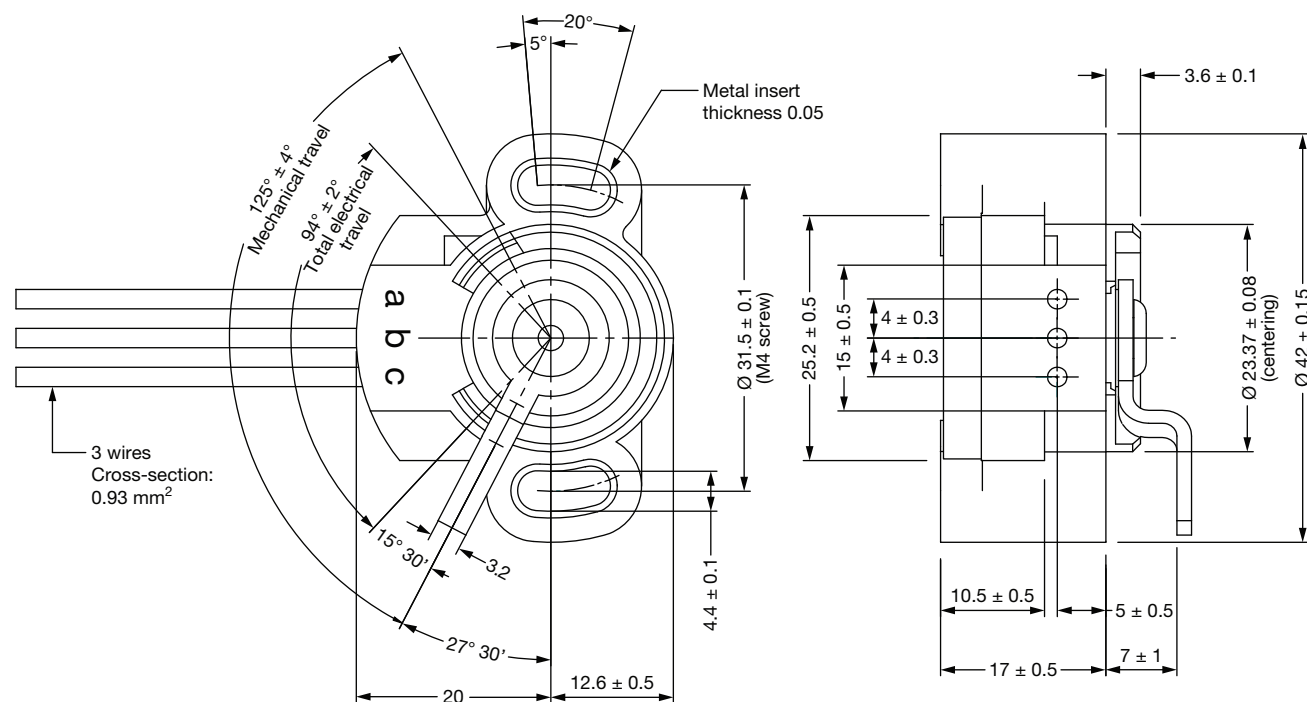
Sheathed Wire Outputs: -40 °C to +125 °C optional

DIMENSIONS in millimeters

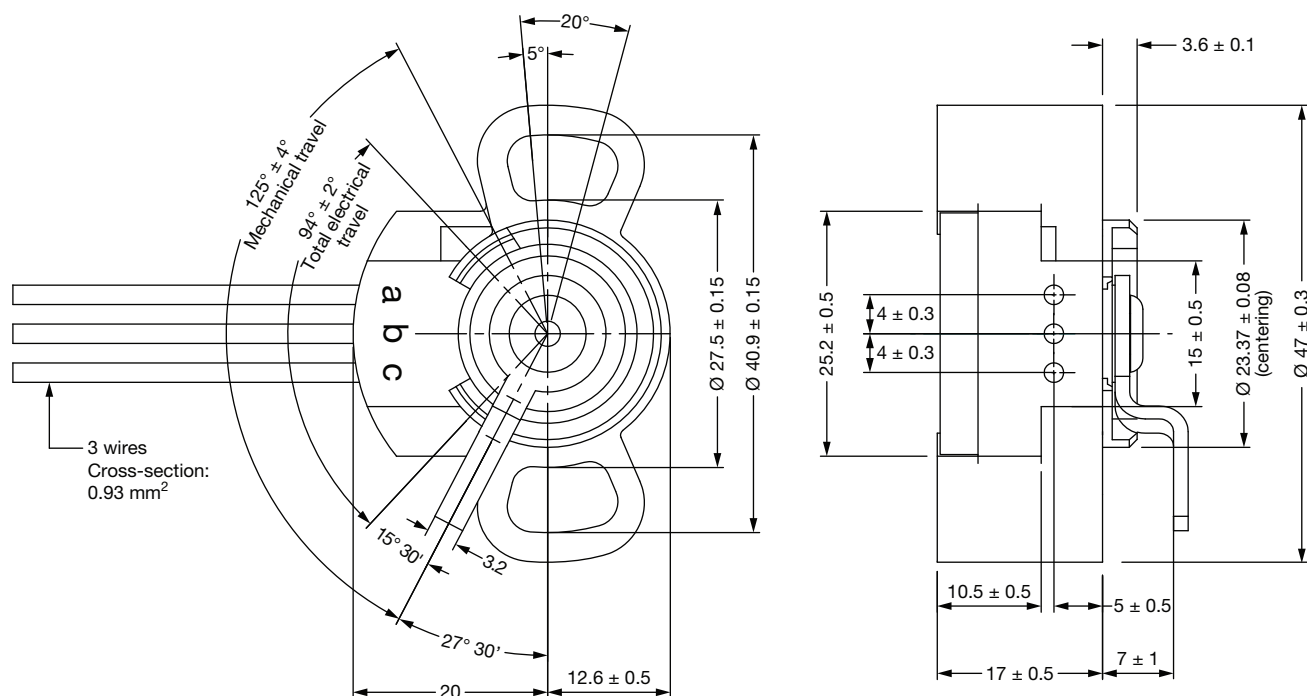
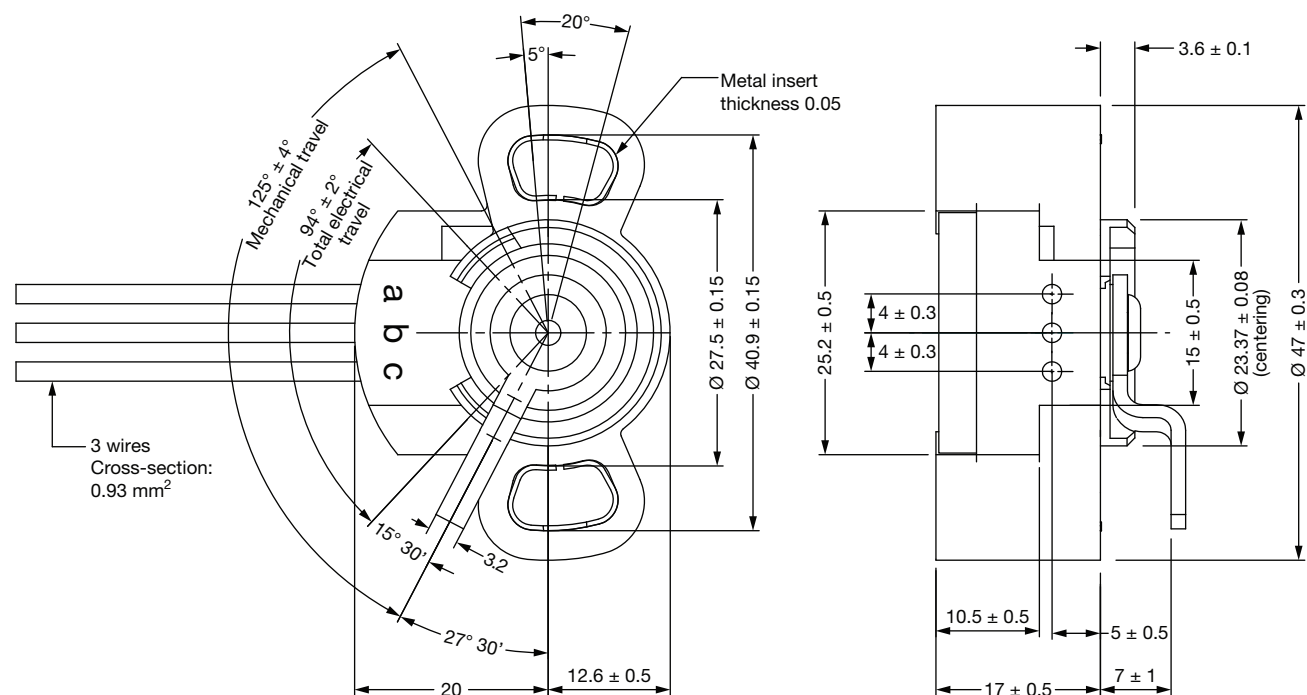
PACKAGE TYPE 1 (FOR SENSOR TYPES 403, 404, 411, AND 416)

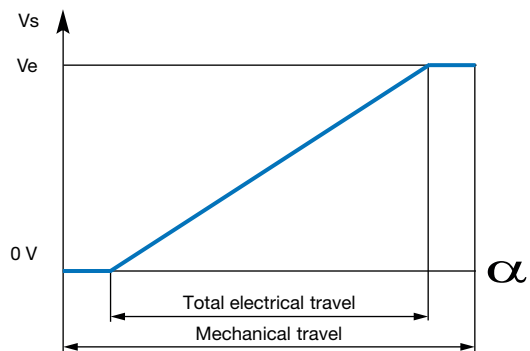
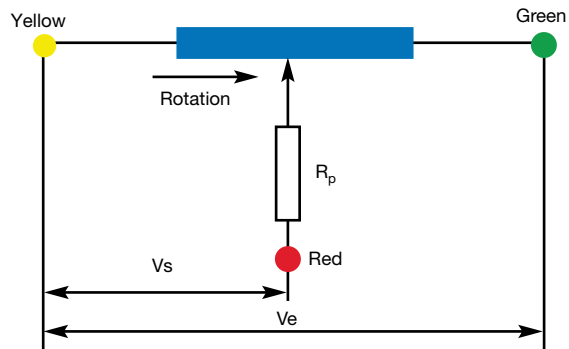


PACKAGE TYPE 2 (FOR SENSOR TYPES 423, 424, 426, AND 431)



DIMENSIONS in millimeters

PACKAGE TYPE 3 (FOR SENSOR TYPES 401, 402, 412, AND 418)

PACKAGE TYPE 4 (FOR SENSOR TYPES 421, 422, AND 428)


ELECTRICAL DIAGRAM

OPTIONS (on request)

- Other total electrical travel
- Other resistance values
- Other linearity
- No protection resistance (R_p)
- High temperature sheathed wire outputs
- Specific connections
- Clockwise spring lever direction
- Other lever



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