Precision Rotative Transducers, Conductive Plastic, Economic Series (ECO)

The “ECO” models are a comprehensive range of rational motion transducers for industrial applications.

All mechanical and electrical parameters can be adapted to meet your specifications.

FEATURES

- Size 05 - 09 - 13 are available
- Long life up to 30 million cycles
- Accuracy ± 1 % down to ± 0.25 %
- Bush or servo mounting types
- Rear mounted terminals
- Following MIL-R-39023 and NFC 93-255 requirements
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

QUICK REFERENCE DATA	
Sensor type	ROTATIONAL, conductive plastic
Output type	Output by turrets
Market appliance	Industrial
Dimensions	Various sizes

SIZE	05		09			13		
MODEL	50 ES	50 CB	78 ES	78 CS	78 CB	156 ES	156 CS	156 CB

ELECTRICAL SPECIFICATIONS								
Theoretical electrical travel (TET)	Actual electrical angle (AEA) - 2°							
Independent linearity (over TET)	A ≤ ± 1 % (standard)		B ≤ ± 0.5 % (special)			C ≤ ± 0.25 % (special)		
Actual electrical travel (AET)	330° ± 5°		340° ± 5°			350° ± 5°		
Ohmic values (R_T)	1 kΩ - 5 kΩ - 10 kΩ - on request other values							
Ohmic value tolerances at 20 °C	± 10 %	± 20 %	± 10 %	± 20 %		± 10 %	± 20 %	
Output smoothness	≤ 0.05 %							
Maximum power rating at 70 °C	0.2 W		0.3 W			0.5 W		
Wiper current	Recommended: a few µA - 1 mA max. (continuous)							
Tap (current or voltage)	NA		1 (on request)					
Resistance load on wiper	Minimum 10^3 x R_T							
End voltage	≤ 0.2 %	≤ 0.5 %	≤ 0.2 %	≤ 0.5 %		≤ 0.2 %	≤ 0.5 %	
Insulation resistance	≥ 1000 MΩ, 500 V_{DC}							
Dielectric strength	≥ 500 V_{RMS}, 50 Hz							

MECHANICAL SPECIFICATIONS								
Mechanical angle (MA)	360° continuous							
On request: stops	NA		340° ± 3°			350° ± 3°		
Mounting type	Servo	Bushing	Servo		Bushing	Servo		Bushing
Shaft guiding	Ball bearings	Sleeve bearings	Ball bearings	Sleeve bearings		Ball bearings	Sleeve bearings	
Shaft	Stainless steel							
Housing	Plastic molding							
Termination	Turrets							
Wiper	Precious metal multi-finger contact							
Starting torque (N.cm) in TET	≤ 0.2	≤ 0.5	≤ 0.2	≤ 0.5		≤ 0.2	≤ 0.5	
Torque on stops (N.cm)	50							
Weight (g)	5 ± 2	8 ± 2	13 ± 2	17 ± 2		29 ± 2	34 ± 2	
Moment of inertia (g cm^2)	≤ 0.5		≤ 1			≤ 2		

PERFORMANCE		
MODELS	**ES**	**CS and CB**
Life (10^6 cycles)	30	20
Temperature range	-55 °C to +125 °C	
Climatic category	55/125/04	
Speed rotation (RPM)	600	150
Sine vibration on 3 axes	1.5 mm or 20 *g* from 10 Hz to 2000 Hz	
Mechanical shocks on 3 axes	50 *g* - 11 ms - half sine	

Note

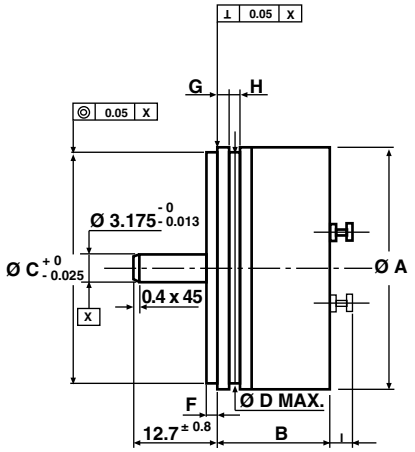
- Nothing stated herein shall be construed as a guarantee of quality or durability
- Life under Vishay laboratory conditions

DIMENSIONS in millimeters, general tolerance ± 0.5 mm

SIZE 05/09/13

SERVO MOUNT TYPE

50 ES
78 ES
78 CS
156 ES
156 CS

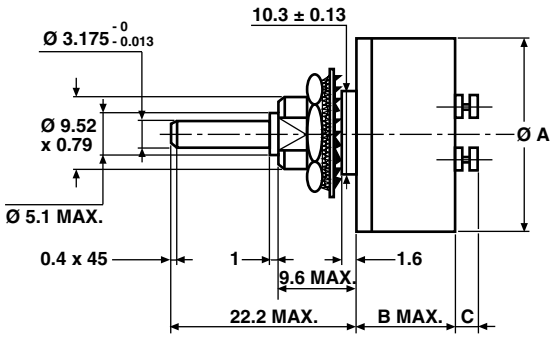


DIMENSIONS	DESIGNATION	SIZE 05	SIZE 09		SIZE 13	
		50 ES	78 ES	78 CS	156 ES	156 CS
Ø A	Ø housing	12.7	22.2		33.3	
B	Length	13.0	13.5		18.0	
Ø C	Ø pilot	9.525	19.05		30.16	
Ø D max.	Ø groove	11.45	19.64		30.9	
F	Flange thickness	1 ± 0.1	1.6 ± 0.1			
G	Shoulder	1.2 ± 0.1	1.6 ± 0.1			
H	Dia. of groove	1.2 ± 0.2	1.5 min.			
I max.	Height of the turret	2.5	2.5		3.6	

SIZE 05/09/13

BUSHING MOUNT TYPE

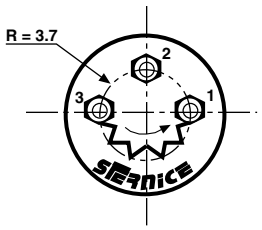
50 CB
78 CB
156 CB



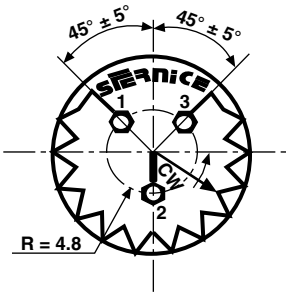
DIMENSIONS	DESIGNATION	SIZE 05	SIZE 09	SIZE 13
		50 CB	78 CB	156 CB
Ø A	Ø housing	12.7	22.2	33.3
B max.	Length	11	11.5	16
C max.	Height of the turret	2.5	2.5	3.6

DIMENSIONS in millimeters, general tolerance ± 0.5 mm

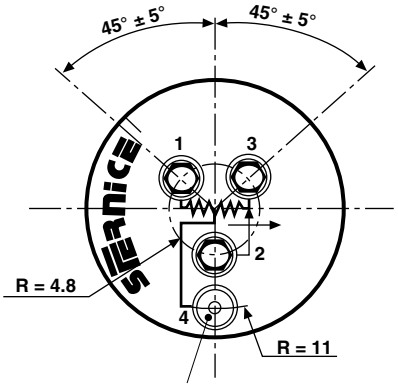
SIZE 05



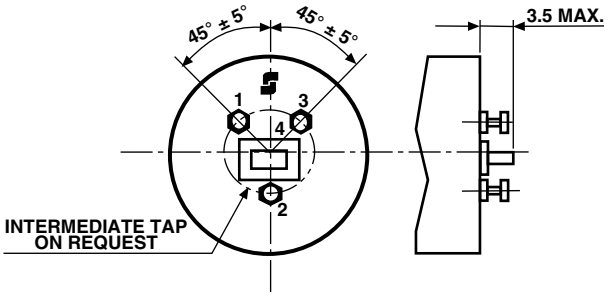
SIZE 09



SIZE 13



④ INTERMEDIATE TAP ON REQUEST



ORDERING INFORMATION/DESCRIPTION

ECO	78	E	S	A	T	103	e4
SERIES	MODEL	TYPE	FIXATION	LINEARITY CODE	TAP	OHMIC VALUE	LEAD FINISH
		E = Ball bearings C = Sleeve bearings	S: Servo B: Bushing	A: ± 1 % B: ± 0.5 % C: ± 0.25 %	On request T: Voltage U: Current position to be specified	First 2 digits are significant numbers 3rd digit indicates number of zeros	

Special characteristics and designs on request

SAP PART NUMBERING GUIDELINES

ECO	78CB	C	502
SERIES	MODEL	LINEARITY	OHMIC VALUE

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