

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 $\pm 1\%$ down to $\pm 0.25\%$
- 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/doc299912



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 angle (TEA) | Actual electrical angle (AEA) - 2° | | | | | |
| Independent linearity (over TEA) | A ≤ ± 1 % (standard) | | B ≤ ± 0.5 % (special) | | C ≤ ± 0.25 % (special) | |
| Actual electrical angle (AEA) | 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° $\pm 3^\circ$ | | 350° $\pm 3^\circ$ | |
| 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 moulding | | | | | |
| Termination | Turrets | | | | | |
| Wiper | Precious metal multi-finger contact | | | | | |
| Starting torque (N.cm) | ≤ 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

| | | |
|-------------------------------|--------------------------------------|---------------------------|
| Life (10 ⁶ cycles) | 30 (on ES models) | 20 (on CS and CB models) |
| Temperature range | -55 °C to +125 °C | |
| Climatic category | 55/125/04 | |
| Speed rotation (RPM) | 600 (on ES models) | 150 (on CS and CB models) |
| 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 | |

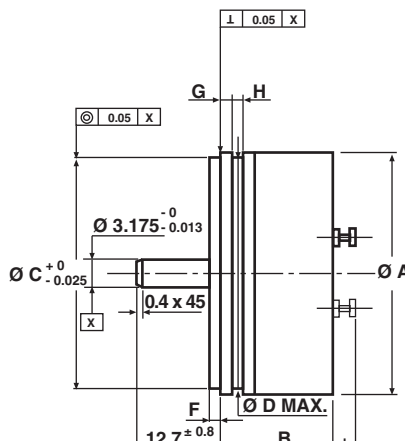
Note

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

DIMENSIONS in millimeters, general tolerance ± 0.5 mm

SIZE 05/09/13
SERVO MOUNT TYPE

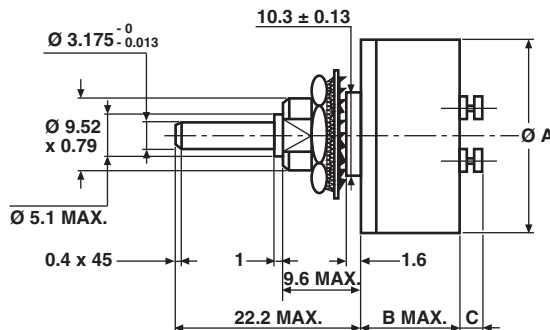
50 ES
78 ES
78 CS
156 ES
156 CS



| 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 \pm 0.1 | 1.6 \pm 0.1 | | | |
| G | Shoulder | 1.2 \pm 0.1 | 1.6 \pm 0.1 | | | |
| H | Dia. of groove | 1.2 \pm 0.2 | 1.5 min. | | | |
| I max. | Height of the turret | 2.5 | 2.5 | | 3.6 | |

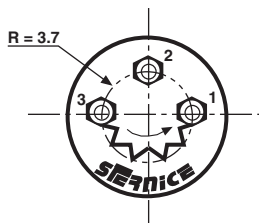
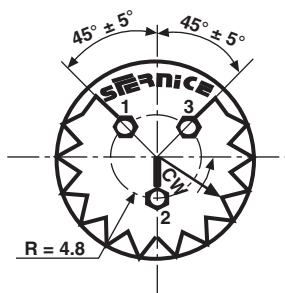
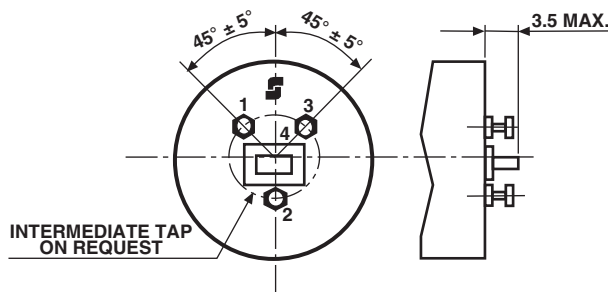
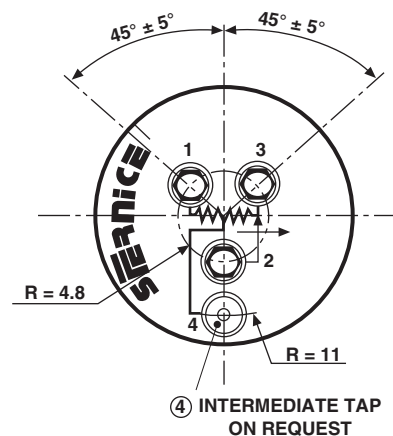
SIZE 05/09/13
BUSHING MOUNT TYPE

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

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: $\pm 1\%$ B: $\pm 0.5\%$ C: $\pm 0.25\%$ | On request T: Voltage U: Current position to be specified | First 2 digits are significant numbers 3 rd 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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