

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



### 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



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

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

| 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 %<br>(standard)                        |         | B ≤ ± 0.5 %<br>(special) |         | C ≤ ± 0.25 %<br>(special) |         |
| Actual Electrical Angle (AEA)      | 330° ± 5°                                      |         | 340° ± 5°                |         | 350° ± 5°                 |         |
| Ohmic Values (R <sub>T</sub> )     | 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 <sup>3</sup> x R <sub>T</sub>       |         |                          |         |                           |         |
| End Voltage                        | ≤ 0.2 %                                        | ≤ 0.5 % | ≤ 0.2 %                  | ≤ 0.5 % | ≤ 0.2 %                   | ≤ 0.5 % |
| Insulation Resistance              | ≥ 1000 MΩ, 500 V <sub>DC</sub>                 |         |                          |         |                           |         |
| Dielectric Strength                | ≥ 500 V <sub>RMS</sub> , 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)                 | $\leq 0.2$                          | $\leq 0.5$      | $\leq 0.2$         | $\leq 0.5$      | $\leq 0.2$         | $\leq 0.5$      |
| Torque on Stops (N.cm)                 | 50                                  |                 |                    |                 |                    |                 |
| Weight (g)                             | 5 $\pm 2$                           | 8 $\pm 2$       | 13 $\pm 2$         | 17 $\pm 2$      | 29 $\pm 2$         | 34 $\pm 2$      |
| Moment of Inertia (g cm <sup>2</sup> ) | $\leq 0.5$                          |                 | $\leq 1$           |                 | $\leq 2$           |                 |

## PERFORMANCE

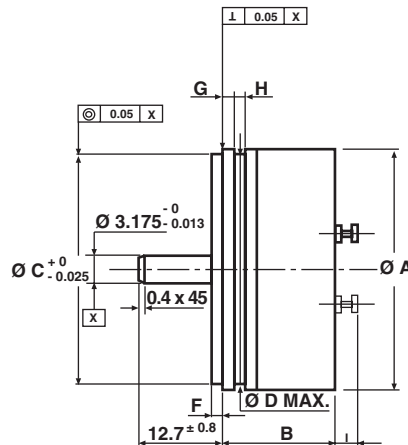
|                               |                                      |                           |
|-------------------------------|--------------------------------------|---------------------------|
| Life (10 <sup>6</sup> Cycles) | 30 (on ES models)                    | 20 (on CS and CB models)  |
| 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             |                           |

## DIMENSIONS in millimeters, general tolerance $\pm 0.5$ mm

### SIZE 05/09/13

#### SERVO MOUNT TYPE

50 ES  
78 ES  
78 CS  
156 ES  
156 CS

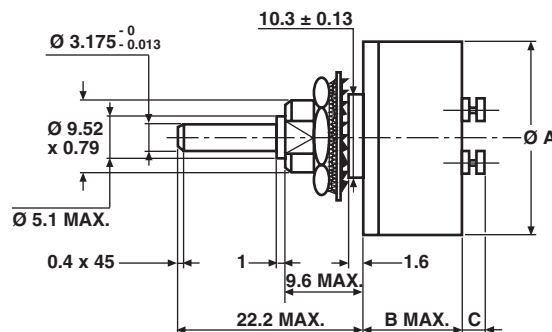


| DIMENSIONS | DESIGNATION          | SIZE 05   | SIZE 09   |       | SIZE 13 |        |
|------------|----------------------|-----------|-----------|-------|---------|--------|
|            |                      | 50 ES     | 78 ES     | 78 CS | 156 ES  | 156 CS |
| Ø A        | Ø housing            | 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

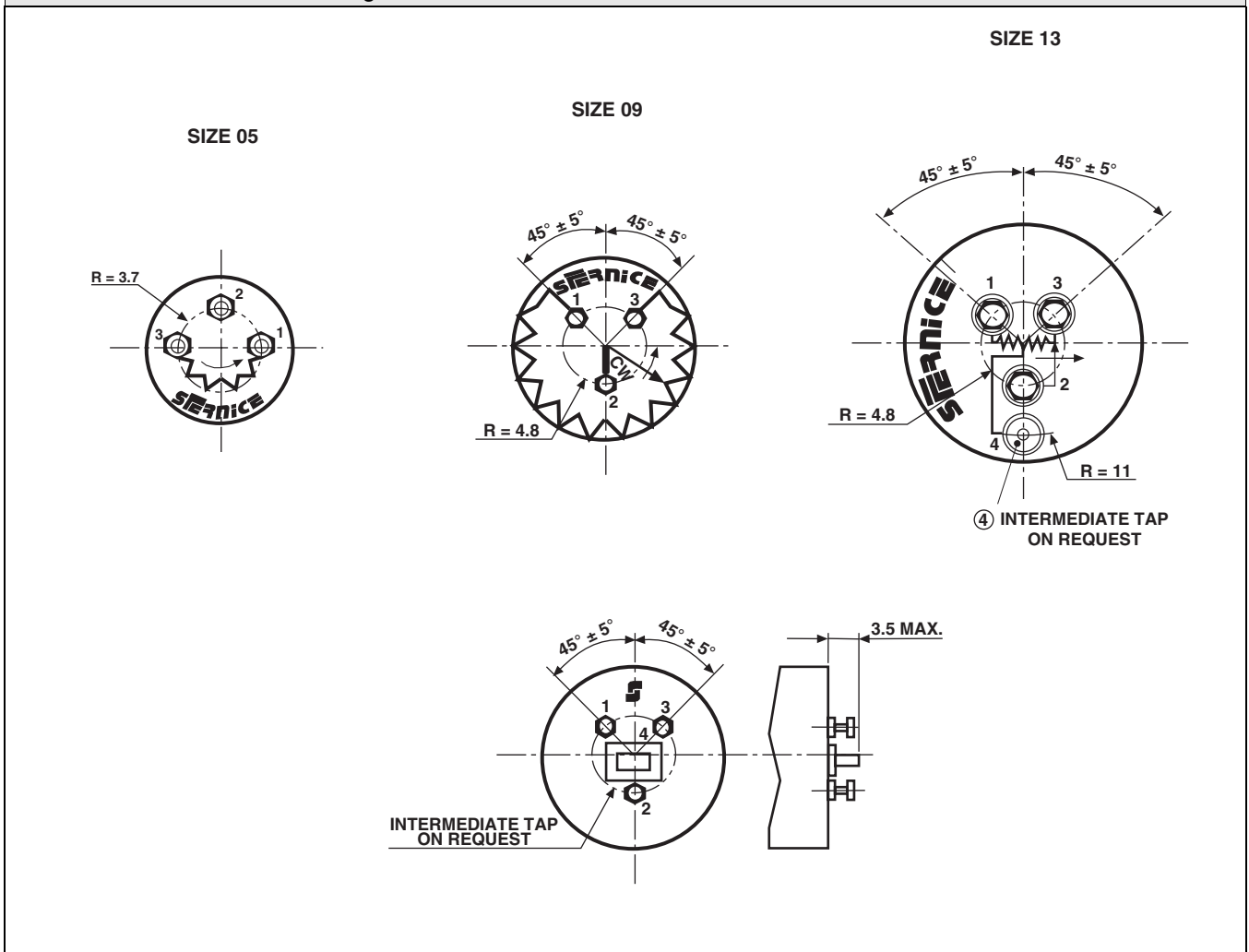
#### BUSHING MOUNT TYPE

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  $\pm 0.5$  mm



**ORDERING INFORMATION/DESCRIPTION**

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

**SAP PART NUMBERING GUIDELINES**

|        |       |           |             |
|--------|-------|-----------|-------------|
| ECO    | 78CB  | C         | 502         |
| SERIES | MODEL | LINEARITY | OHMIC VALUE |



### Disclaimer

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