

ECO

ECSData sheet $\frac{3}{5.658}$ E

10096



precision rotative transducer

— conductive plastic, economic series —

Low cost industrial motion transducers, conductive plastic track.

- SIZE 09
- LONG LIFE
- BUSH OR SERVO MOUNTING
- COMOLDED TERMINALS

Size	09			
Model	78 RS	78 RB	78 PS	78 PB

ELECTRICAL CHARACTERISTICS

Theoretical electrical angle (TEA)	AEA - 3°		
Independent linearity (over TEA)	A $\leq \pm 1\%$, on request: B $\leq \pm 0.5\%$, C $\leq \pm 0.35\%$		A $\leq \pm 2\%$
Actual electrical angle (AEA)	340° $\pm 5^\circ$		
Ohmic values (R_T)	1 - 2 - 5 - 10 k Ω , on request other values		1 - 2 - 5 - 10 k Ω
Ohmic value tolerances at 20°C	$\pm 20\%$, on request $\pm 10\%$		$\pm 20\%$
Output smoothness	0.1%		
Maximum power rating at 70°C	1 W		
Wiper current	recommended: a few μA - 1 mA max. (continuous)		
Tap (current or voltage)	1: on request		NA
Resistance load on wiper	$\geq 1.000 \times R_T$		
End voltage	0,5%		
Insulation resistance	$\geq 1000 \text{ M}\Omega$, 500 V DC		
Dielectric strength	$\geq 500 \text{ V RMS}$, 50 Hz		

MECHANICAL CHARACTERISTICS

Mechanical angle (MA)	360° continuous			
on request: stops	342° $\pm 5^\circ$			
Mounting type	servo	bushing	servo	bushing
Shaft guiding	sleeve bearings			
Shaft	stainless steel			
Option: Flat or screw driver slot on shaft	on request		NA	
Termination	turrets			
Wiper	precious metal multi-finger contact			
Starting torque (N.cm)	$\leq 0,5$			
Torque on stops (N.cm)	≥ 20			
Weight (g)	bushing 17 g ± 3 g		servo 12 g ± 3 g	

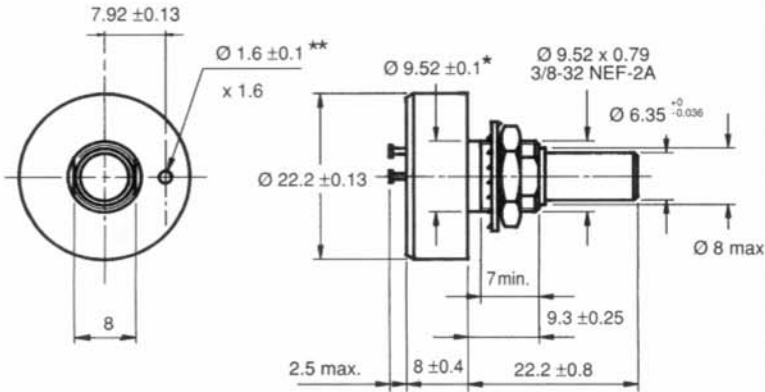
PERFORMANCES

Life (10^6 cycles)	10		3	
Temperature range	-55°C, +125°C			
Climatic category	55 / 125 / 04			
Speed rotation (RPM)	150			
Sine vibrations on 3 axes	15 g from 10 Hz to 2000 Hz			
Mechanical shocks on 3 axes	50 g - 11 ms - half sine			

ECS

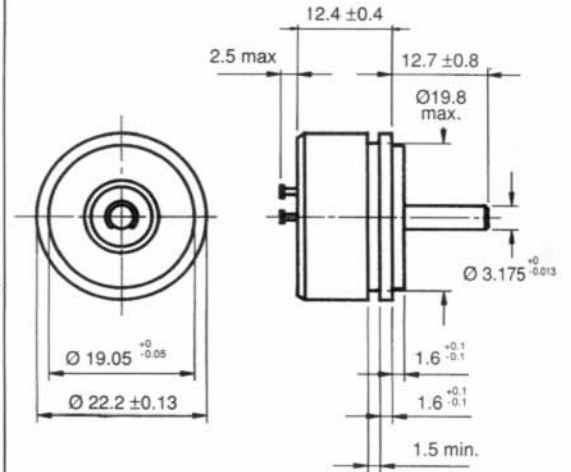
SIZE 09

78 PB
78 RB



SIZE 09

78 PS
78 RS



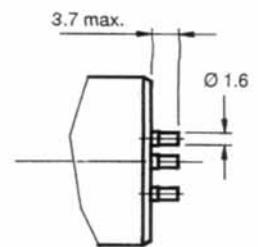
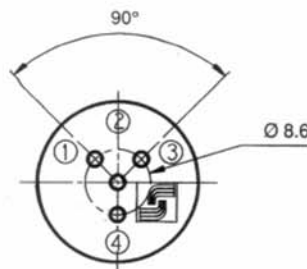
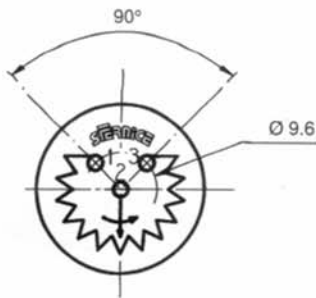
* On request $\varnothing 10.3$ mm or 12.3 mm
** Without antirotation pin on request

REAR VIEWS

SIZE 09

STANDARD
3 TURRETS

INTERMEDIATE
TAP ON REQUEST ④



Dimensions in mm.
General tolerance ± 0.5 mm.

ORDERING PROCEDURE

SERIES	MODEL	TYPE	FIXATION	MECHANICAL STOPS	LINEARITY	TAP	OHMIC VALUE	SPECIAL FEATURES
ECO	78	P R	S B Servo Bushing	M on request M	A A $\pm 1\%$ of $\pm 2\%$ B $\pm 0.5\%$ C $\pm 0.35\%$	T on request T: voltage U: current position to be specified	103 102: 1 k Ω 202: 2 k Ω 502: 5 k Ω 103: 10 k Ω	W... special code

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



FEATURES

- Size 05 - 09 - 13
- Reasonable Cost
- Long Life
- Accuracy $\pm 1\%$ down to $\pm 0.25\%$
- Bush or Servo Mounting
- 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

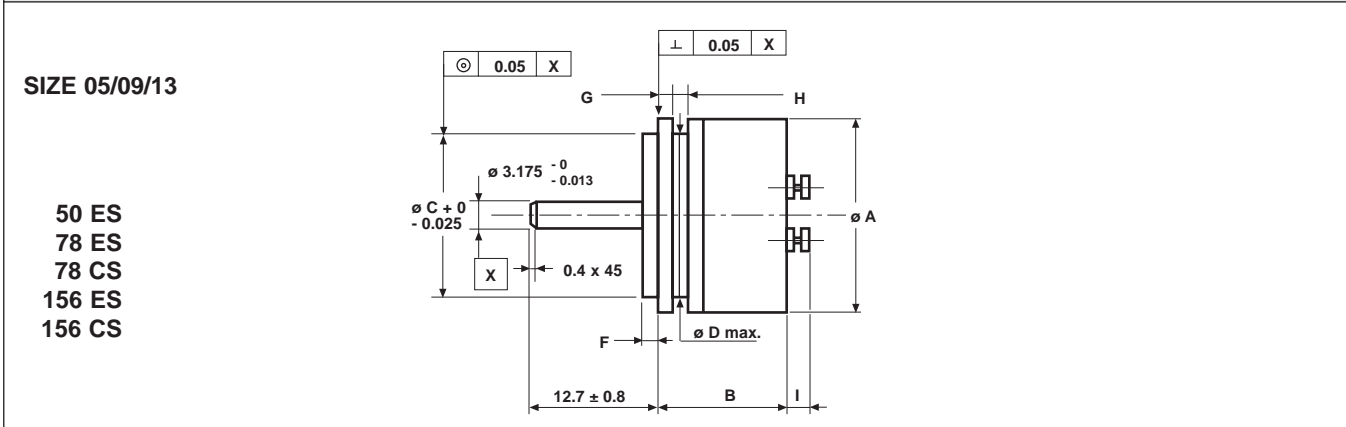
ELECTRICAL SPECIFICATIONS							
Theoretical electrical angle (TEA)	actual electrical angle (AEA) - 2°						
Independent linearity (over TEA)	$A \leq \pm 1\%$		$B \leq \pm 0.5\%$			$C \leq \pm 0.25\%$	
Actual electrical angle (AEA)	$330^\circ \pm 5^\circ$		$340^\circ \pm 5^\circ$			$350^\circ \pm 3^\circ$	
Ohmic values (Rt)	1k Ω - 5k Ω - 10k Ω - on request other values						
Ohmic value tolerances at 20°C	$\pm 10\%$	$\pm 20\%$	$\pm 10\%$	$\pm 20\%$	$\pm 10\%$	$\pm 20\%$	
Output smoothness	$\leq 0.05\%$						
Maximum power rating at 70°C	0.2W		0.3W			0.5W	
Wiper current	recommended: a few μA - 1mA max. (continuous)						
Tap (current or voltage)	NA		1 on request				
Resistance load on wiper	minimum $10^3 \times R_t$						
End voltage	$\leq 0.2\%$	$\leq 0.5\%$	$\leq 0.2\%$	$\leq 0.5\%$	$\leq 0.2\%$	$\leq 0.5\%$	
Insulation resistance	$\geq 1000M\Omega$, 500VDC						
Dielectric strength	$\geq 500VRMS$, 50Hz						

MECHANICAL SPECIFICATIONS							
Mechanical angle (MA)	360° continuous						
on request: stops	NA		$340^\circ \pm 3^\circ$			$350^\circ \pm 3^\circ$	
Mounting type	servo	bushing	servo	bushing	servo	bushing	
Shaft guiding	ball	sleeve	ball	sleeve	ball	sleeve	
	bearings	bearings	bearings	bearings	bearings	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	

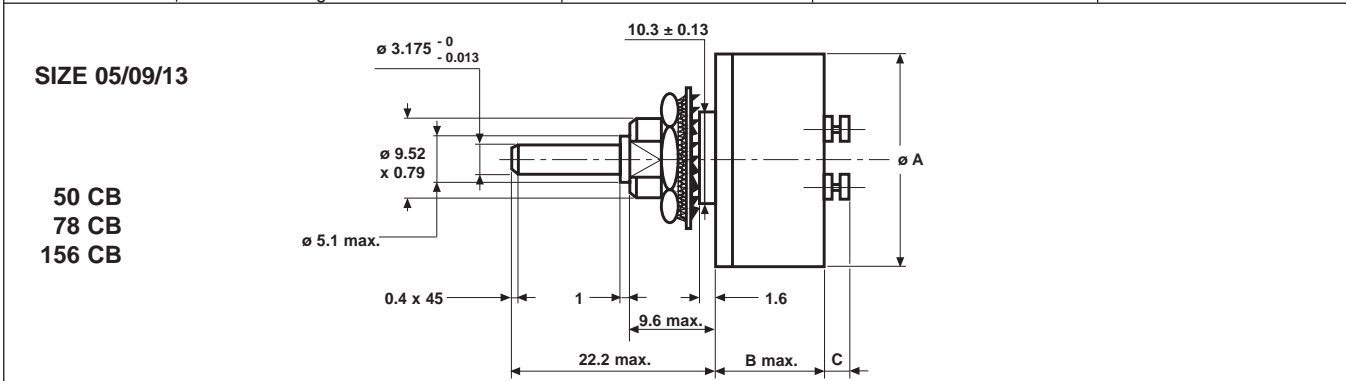
Precision Rotative Transducers, Conductive Plastic, Economic Series (ECO)

PERFORMANCE		
Life (10° cycles)	30 (on ES models)	20 (on CS and CB models)
Temperature range	- 55°C, + 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 20g from 10Hz to 2000Hz	
Mechanical shocks on 3 axes	50g - 11ms - half sine	

DIMENSIONS in millimeters, general tolerance $\pm 0.5\text{mm}$



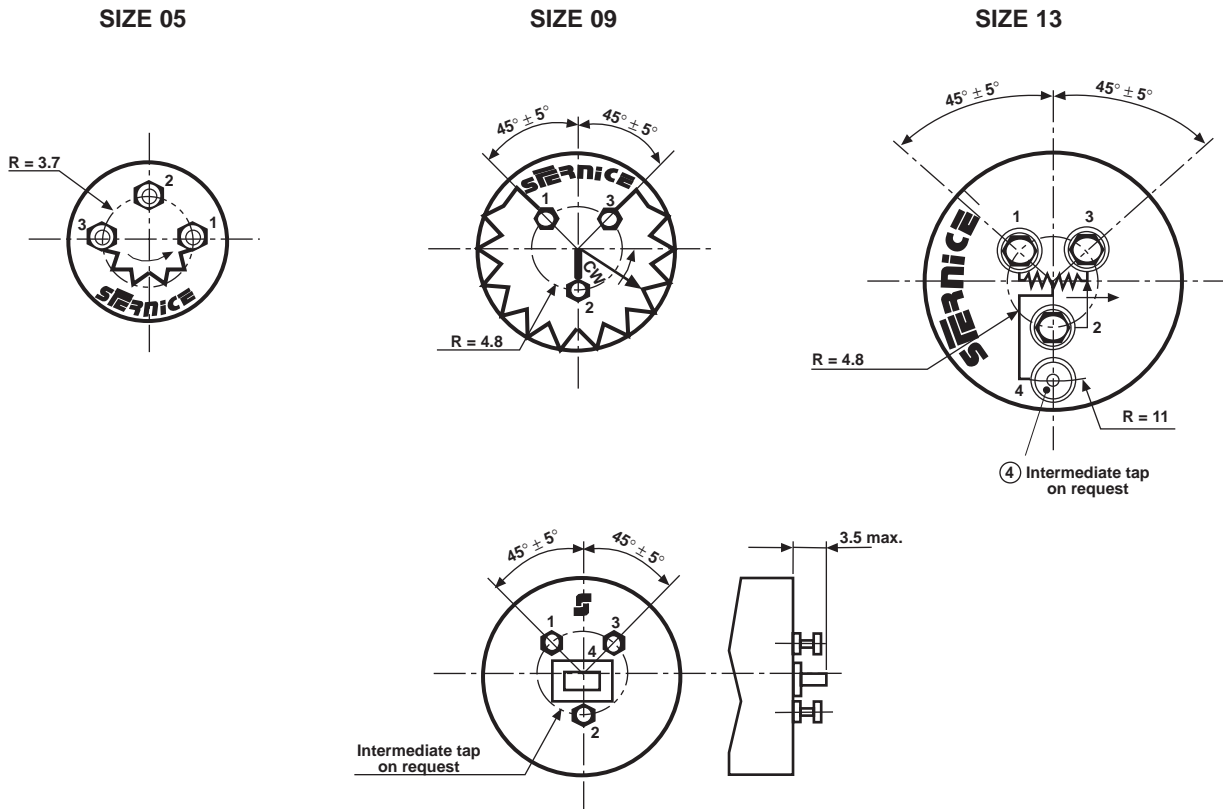
DIMENSIONS	DESIGNATION	SIZE 05	SIZE 09		SIZE 13	
		50 ES	78 ES	78 CS	156 ES	156 CS
$\varnothing A$	\varnothing housing	12.7	22.2		33.3	
B	length	13.0	13.5		18.0	
$\varnothing C$	\varnothing pilot	9.525	19.05		30.16	
$\varnothing D \text{ max.}$	\varnothing groove	11.45	19.64		30.9	
F	flange thickness	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	



DIMENSIONS	DESIGNATION	SIZE 05	SIZE 09	SIZE 13
		50 CB	78 CB	156 CB
$\varnothing A$	\varnothing 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

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

REAR VIEW DIMENSIONS in millimeters, general tolerance $\pm 0.5\text{mm}$



ORDERING INFORMATION

ECO	78	E	S	A	T	103	W...
SERIES	MODEL	TYPE	FIXATION	LINEARITY	TAP	OHMIC VALUE	MODIFICATION
		E = Ball bearings C = Sleeve bearings	S: Servo B: Bushing	Code 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 3rd digit indicates number of zeros	Special feature code number

Series ECS

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



FEATURES

- Size 09: (7/8") 22,2 mm
- Long life: 5 million cycles
- Bush or servo mounting types available
- Rear comolded terminals
- Cost effective solution for any industrial applications



Low cost industrial motion transducers, conductive plastic track.

SIZE	09			
MODEL	78 RS	78 RB	78 PS	78 PB

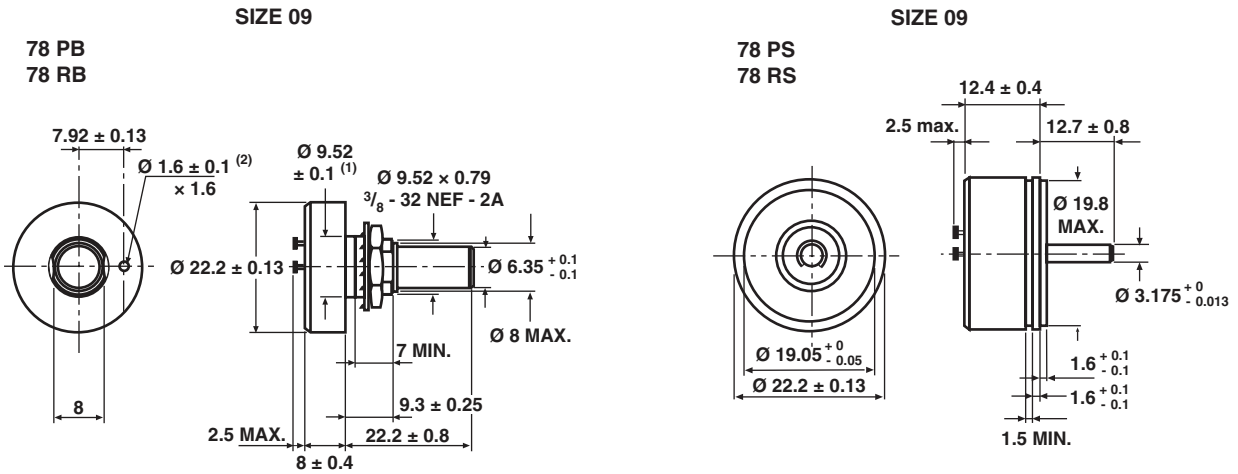
ELECTRICAL SPECIFICATIONS	
Theoretical Electrical Angle (TEA)	(AEA) - 3°
Independent Linearity (over TEA)	A ≤ ± 1 %, on request: B ≤ ± 0.5 % C ≤ ± 0.35 % A ≤ ± 2 %
Actual Electrical Angle (AEA)	340° ± 5°
Ohmic Values (R _T)	1 - 2 - 5 - 10 kΩ (on request other values) 1 - 2 - 5 - 10 kΩ
Ohmic Value Tolerances at 20 °C	Standard: ± 20 %/special: ± 10 % ± 20 %
Output Smoothness	0.1 %
Maximum Power Rating at 70 °C	0.3 W
Wiper Current	Recommended: a few μA - 1 mA max. (continuous)
Tap (Current or Voltage)	1: On request NA
Resistance Load on Wiper	≥ 1000 x R _T
End Voltage	≤ 0.5 %DC
Insulation Resistance	≥ 1000 MΩ, 500 V _{DC}
Dielectric Strength	≥ 500 V _{RMS} , 50 Hz

MECHANICAL SPECIFICATIONS	
Mechanical Angle (MA)	360° continuous
On Request: Stops	342° ± 5°
Mounting Type	Servo Bushing Servo Bushing
Shaft Guiding	Sleeve bearings
Shaft	Stainless steel
Option: Flat or Screw Driver Slot On Shaft	On request NA
Termination	Turrets
Wiper	Precious metal multi-finger contact
Starting Torque (N.cm)	≤ 0.5
Torque on Stops (N.cm)	≥ 20
Weight (g)	Bushing 17 g ± 3 g Servo 12 g ± 3 g

PERFORMANCE	
Life (10 ⁶ Cycles)	5
Temperature Range	- 55 °C to + 125 °C
Climatic Category	55/125/04
Speed Rotation (RPM)	150
Sine Vibration on 3 Axes	15 g from 10 Hz to 2000 Hz
Mechanical Shocks on 3 Axes	50 g - 11 ms - half sine

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

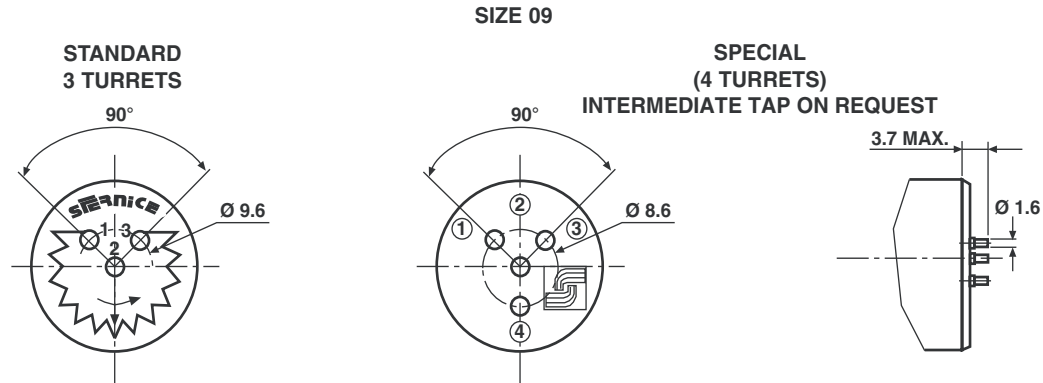
DIMENSIONS in millimeters, general tolerance ± 0.5 mm



Notes:

- (1) On request: \varnothing 10.3 mm or 12.3 mm
- (2) On request: without antirotation pin

REAR VIEW DIMENSIONS in millimeters, general tolerance 0.5 mm



General Tolerance ± 0.5 mm

ORDERING INFORMATION/DESCRIPTION

ECS	78	P	S	M	A	T	103	e4
SERIES	MODEL	TYPE	FIXATION	MECHANICAL STOPS	LINEARITY	TAP	OHMIC VALUE	LEAD
		P	S: Servo	On request	A: $\pm 1\%$ or $\pm 2\%$	On request	102: 1 k Ω	Finish
		R	B: Bushing	M	B: $\pm 0.5\%$	T: Voltage	202: 2 k Ω	
					C: $\pm 0.35\%$	U: Current	502: 5 k Ω	
						position to be specified	103: 10 k Ω	

SAP PART NUMBERING GUIDELINES

ECS	78RB	B	102
SERIES	MODEL	LINEARITY	OHMIC VALUE