

Non-Contacting Angle Sensors Measuring Absolute up to 360°

RSC3700 Series



Special features

- rugged design in stainless steel sealed housing (IP67)
- contactless measuring method VERT-X®
- high lifetime
- high resolution
- high accuracy of measurement
- high adjusting speed
- output characteristic programmable on request
- applications under adverse ambient conditions possible (humidity/dampness, oil, dust, vibrations...)

VERT-X® is a technology with absolute measurement for angles up to 360°. The absolute value measurement is referred to a mechanical index point, so that in case of a rotation during a power failure the new angular position is still held.

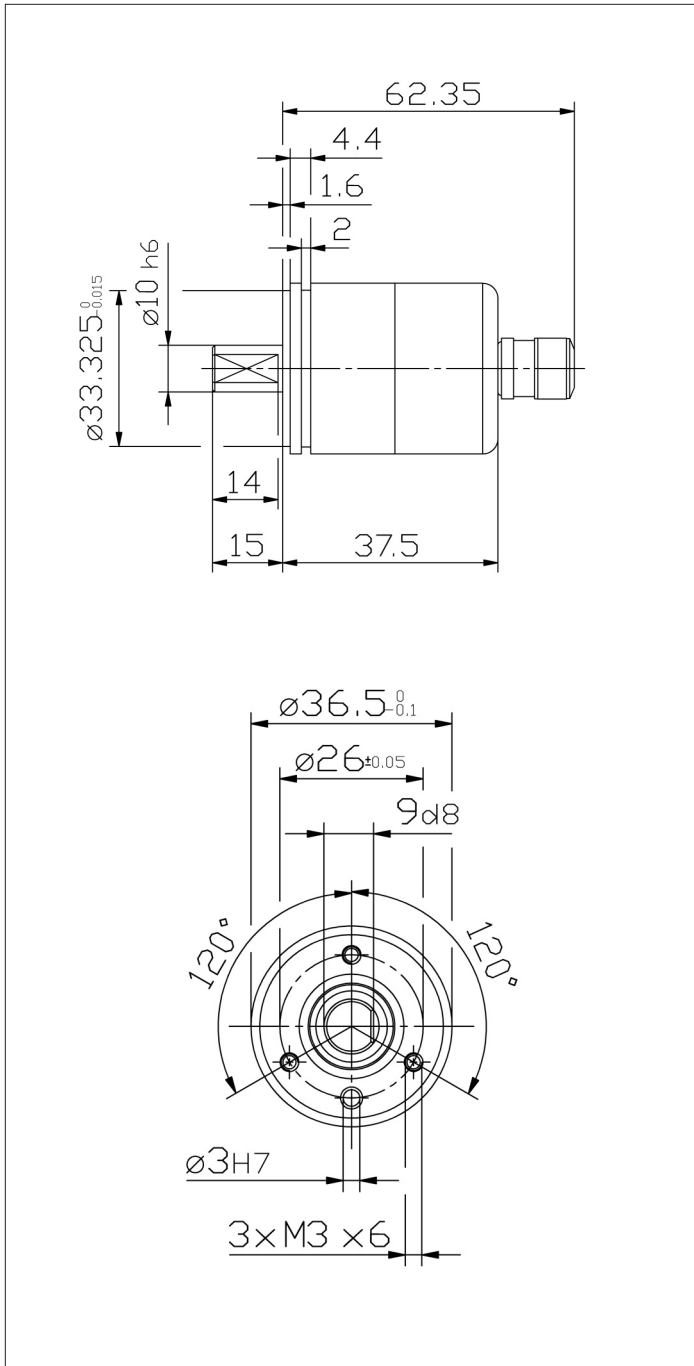
The rotation angle sensor is available in three versions: 5 VDC $\pm 10\%$, 8 to 36 VDC (12/24 V) or 12 to 36 VDC (24 V). The outputs are digital and/or analog and the output characteristic curve can be programmed prior to delivery in accordance with the customer's requirements. The angle sensor is suitable for all applications in which an angle has to be converted into an analog voltage, current or digital value.

The RSC3700 has a microprocessor incorporated into it to provide 12-bit resolution at 360° and custom performance enhancements including pre-delivery custom programmable digital switches.

This measuring system is protected against overvoltage, pole reversal and short-circuits (only analog output signals 0.5 V to 4.5 VDC).

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Description	
Dimensions	see drawing
Housing	stainless steel
Shaft	stainless steel
Bearings	ball bearings
Mounting	Synchro flange, size 13
Electrical connections	shielded 3core cable, AWG 20-7, diameter 5.3 ± 0.16 mm bending radius 27 mm

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Electrical Data		
Power supply voltage 5 V (at +25°C, $U_b = +5\text{ V}$ and $R_L = 5\text{ kW}$, unless otherwise indicated)		
Power supply voltage U_b	5 ($\pm 10\%$)	VDC
Max. permitted power supply voltage	6.0 (10s)	VDC
Current consumption, typical, without load	6	mA
Ohmic load at output 10 - 90%	≥ 5	k Ω
Ohmic load at output PWM	≥ 10	k Ω
Capacitive load at output 10 - 90%/PWM	≤ 5	nF
Output voltage	10...90 (ratiometric)	% of U_b
PWM output (500 Hz, TTL-level)	0...100 (5...95 on request)	%
Current for digital output (switch, TTL-level)	1	mA
Power supply voltage 12/24 V (at +25°C, $U_b = +12\text{V}/+24\text{ V}$ and $R_L = 10\text{ k}\Omega$, unless otherwise indicated)		
Power supply voltage U_b		
12/24 V-version	8...36	VDC
24 V-version	12...36	VDC
Current consumption, typical, without load	10	mA
Outputs:		
Voltage interface	0.5...4.5 0...10 (at $U_b > 10.8\text{ V}$)	V V
Current interface (load $< 500\Omega$)	4...20	mA
PWM output (500 Hz, TTL-level)	on request	
Ohmic load at output 0.5 - 4.5 V	≥ 5	k Ω
Ohmic load at output 0 - 10 V at $U_b > 10.8\text{ V}$	≥ 10	k Ω
Burden at output 4...20 mA at $U_b > 18\text{ V}$	0...500	Ω
Burden at output 4...20 mA at $U_b > 10.8\text{ V}$	0...100	Ω
Ohmic load at output PWM	≥ 10	k Ω
Capacitive load at output 0.5 - 4.5 V	≤ 5	nF
Capacitive load at output 0 - 10 V	≤ 1	mF
Capacitive load at output 4 - 20 mA	≤ 0.1	mF
Capacitive load at output PWM	≤ 5	nF
Load for digital output (switch, TTL-level)	1	mA
General		
Measuring range (programmable)	360	°
Mechanical range	360 continuous	°
Resolution	0.09 (= 12 bit at 360°)	°
Absolute linearity	$\pm 0.1\%$ of the measuring range	
Hysteresis	$\leq 0.05\%$ of the measuring range	
Repeatability	$< 0.15\%$ of the measuring range	
Sample rate	1000 (330 for PWM)	Hz
Mechanical Data		
Starting torque (IP 67)	≤ 4	Ncm
Highest permitted speed (IP 67)	3000	1/min.
Environmental Data		
Lifetime	360 Mio.	movements
Based on speed	60	1/min.
Based on axial load or radial load	10	N
Max. permitted shaft loading	axial 250 radial 100	N N
Operating temperature range	-40...+85	°C
Storage temperature range	-40...+85	°C
Vibration ($A_{max} = 0.75\text{ mm}$, $f = 5...2000\text{ Hz}$)	20	g
Shock	50	g
Protection class	IP 67	
Temperature coefficient	≤ 50	ppm/K
Weight (with 1 m cable)	~300	g
EMC according to EN 50081-2 (1993), EN 61000-6-2 (1999, industrial)		
Insulation resistance	20	G Ω
Dielectric strength (AC, 50...60 Hz, 1 min)	1	kV

Ordering specifications

<p>Operating voltage (Ub)</p> <p>1 Standard: 24 VDC (12.0 VDC...30.0 VDC) 2 Optional: 5 VDC (4.5 VDC...5.5 VDC) 6 Optional: 12/24 VDC (8.0 VDC...36.0 VDC)</p>		<p>Output signal at 24 VDC supply (Ub1)</p> <p>1 Standard: 0.1 VDC...10 VDC 2 Standard: 0.5 VDC...4.5 VDC 4 Optional: PWM (500 Hz, 5%...95%) 5 Standard: 4 mA...20 mA</p>	
		<p>Output signal at 5 VDC supply (Ub2)</p> <p>2 Standard: 10%...90% of Ub2 4 Optional: PWM (500 Hz, 5%...95%)</p>	
		<p>Output signal at 12/24 VDC supply (Ub6)</p> <p>1 Optional: 0.1 VDC...10 VDC 2 Optional: 0.5 VDC...4.5 VDC 4 Optional: PWM (500 Hz, 5%...95%) 5 Optional: 4 mA...20 mA</p>	
		<p>Output characteristics</p> <p>1 Standard: Positive gradient CW 2 Optional: Positive gradient CCW 9 Optional: Special output characteristics</p>	
		<p>Electrical connections</p> <p>402 Standard: Standard cable 3-pol. 1.0 m 406 Optional: Standard cable 3-pol. 3.0 m 410 Optional: Standard cable 3-pol. 5.0 m 999 Optional: Special cable/special length</p>	
R	S	C	
Series			
3	7	2	2
Mechanical specifications			
3722 Standard: Servo mount 13; 10 mm shaft D-form; IP 54; axial			
3762 Standard: Servo mount 13; 10 mm shaft D-form; IP 67; axial			
2	3	6	
Electrical angle, analog interface			
36 Standard: electrical angle 0°...360°			
1	1	1	
Sensor principle			
2 Standard: Vertical-Hall			
4	0	2	

Pin assignment

The pin assignment of the connectors depends on the respective version.

Possible Options:

- max. 2 logic switches programmable as requested – TTL-Level