

**GUEMISA**

Sta. Virgilia, 29 - 28033 Madrid - Tfno.: 91 764 21 00
 Desde 1986 suministrando sensores e instrumentación
<http://www.guemisa.com> - ventas@guemisa.com



NOVOHALL
Rotary Sensor
non-contacting

Series RSC2800
 digital
 SSI, SPI, Incremental

**Special features**

- non-contacting, magnetic
- measuring range 360°
- SSI, SPI and Incremental output
- available with push-on coupling or marked shaft
- simple mounting
- protection class IP54, IP65, IP67
- long life
- very small hysteresis
- resolution 9 - 14 bit
- linearity $\leq \pm 0.5\%$

Versions with analog interfaces see separate data sheet

The contactless sensor utilizes the orientation of a magnetic field for the determination of the measurement angle. The magnetic field orientation is captured with an integrated circuit. A digital output signal represents the calculated angle.

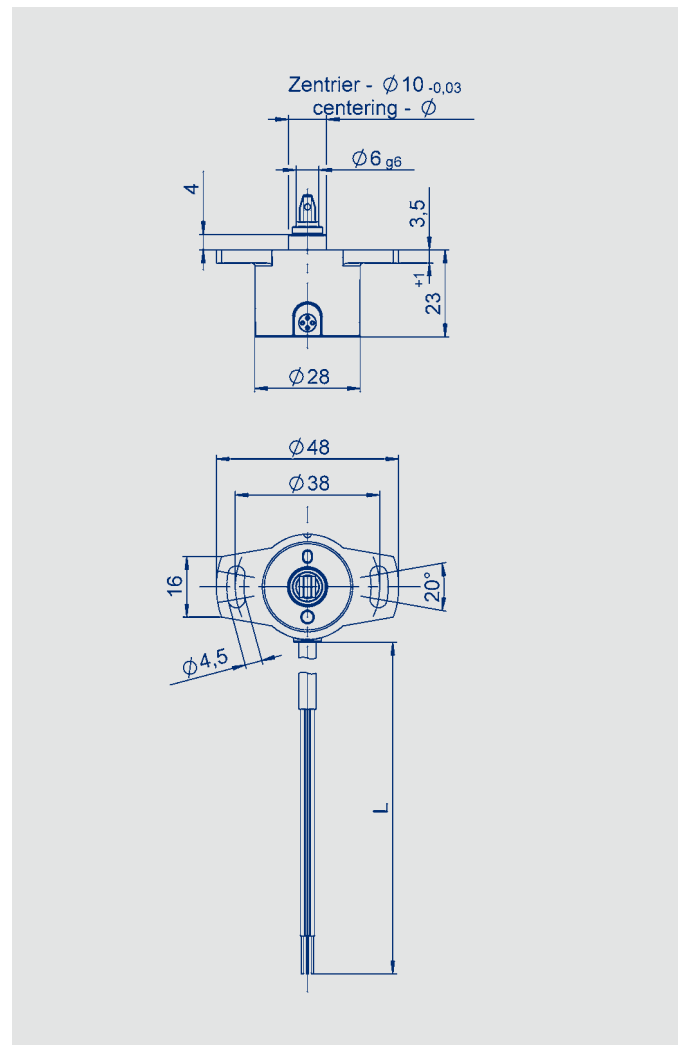
The housing is made of a special high grade temperature-resistant plastic material. Fixings are in the form of elongated slots which allow simplicity in mounting together with ease of mechanical adjustment.

The special backlash-free push-on coupling ensures extremely quick and simple installation. The transducer is not sensitive to either dirt or humidity.

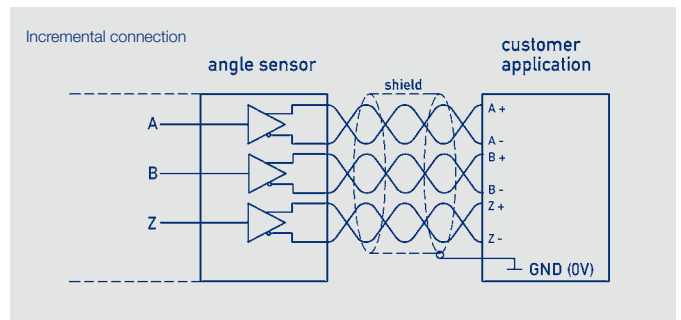
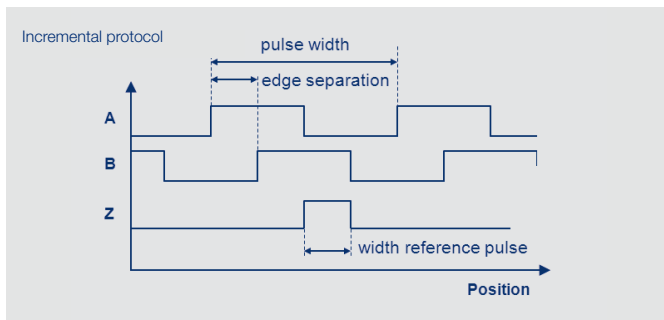
Electrical connection is made via a shielded cable which is sealed into the housing. M12 connector or other connectors are available on request.

Description

Housing	high grade, temperature resistant plastic
Shaft	stainless steel
Bearings	bronze sleeve bearing
Electrical connections	shielded cable, AWG 24 (0.25 mm ²) SSI, INC shielded cable, AWG 26 (0.14 mm ²) SPI



Incremental Interface



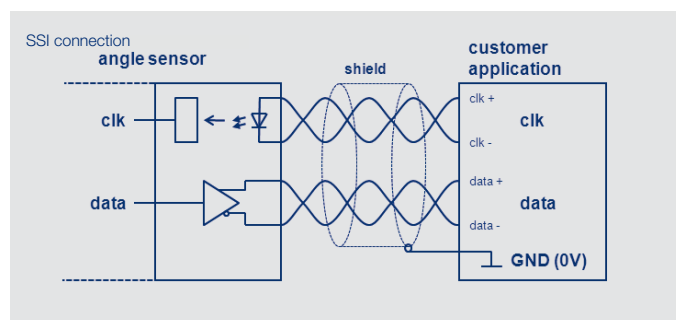
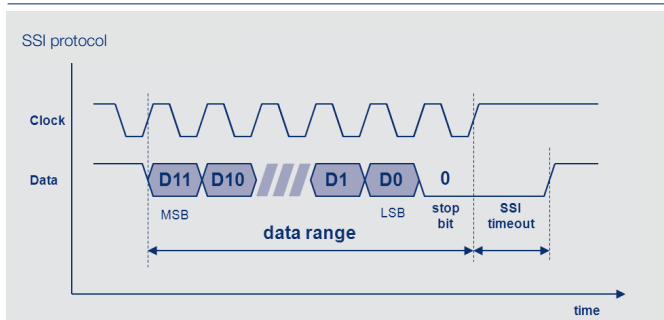
Connections Incremental

Signal	wire colour
Supply voltage Ub	Green
Supply voltage GND	Brown
A+	Yellow
A-	Grey
B+	Red
B-	Pink
Z+	White
Z-	Blue



When the shaft marking is opposite to the cable outlet, the sensor is located at the reference pulse (Z).

SSI Interface



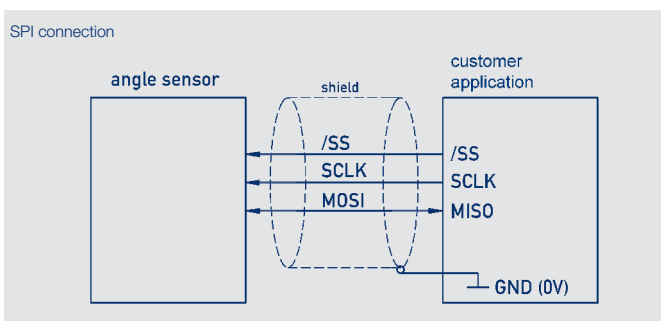
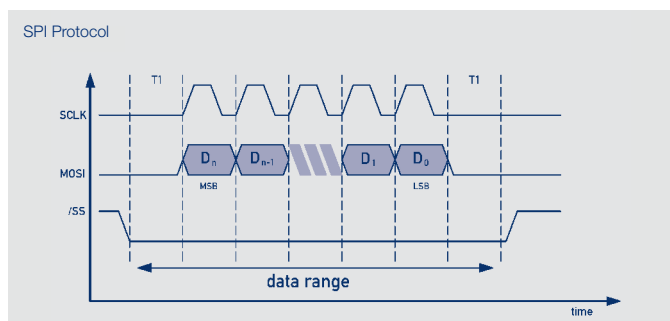
Connections SSI

Signal	wire colour
Supply voltage Ub	Green
Supply voltage GND	Brown
Signal output SSI Data+	Red
Signal output SSI Data-	Yellow
Clock input SSI Clk+	Pink
Clock input SSI Clk-	Blue
Not assigned	White
Not assigned	Grey



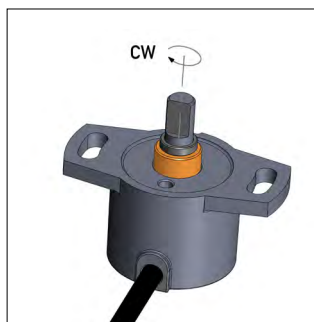
When the shaft marking points to the cable outlet, the sensor is located in the electrical center position.

SPI Interface

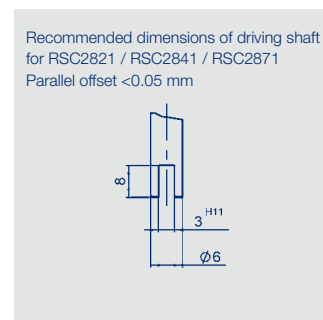
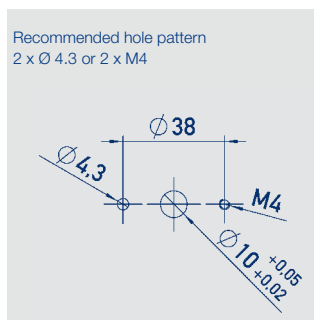
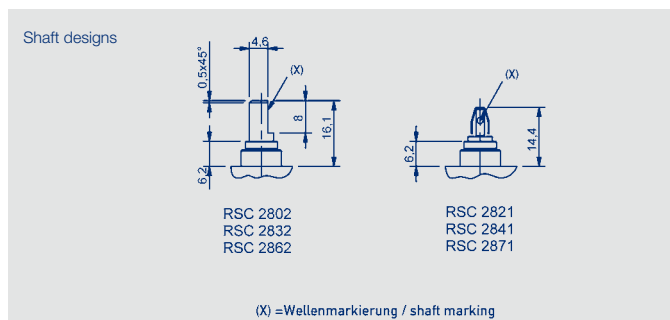


Connections SPI

Signal	wire colour
Supply voltage Ub	Green
Supply voltage GND	Brown
MOSI / MISO	Yellow
SCLK	Grey
/SS (slave select)	White



When the shaft marking points to the cable outlet, the sensor is located in the electrical center position.



Technical Data SSI Interface

Type	RSC - 28 _ _ - 2 _ _ - 4 _ _ - _ _ _ Supply voltage 5 VDC	
Mechanical Data		
Dimensions	see dimension drawing	
Mounting	with 2 screws M4 and washer	
Starting torque of mounting screws at housing flange	180	Ncm
Mechanical travel	360 continuous	°
Permitted shaft loading (axial and radial) static or dynamic force	20	N
Torque	1.0 (IP67); 0.5 (IP65); 0.15 (IP54)	Ncm
Maximum operational speed	120	min-1
Weight	approx. 50	g
Electrical Data		
Supply voltage U_b	5 (4.5 ... 5.5)	VDC
Current consumption (w/o load)	typ. 27	mA
Reverse voltage	yes, supply lines	
Short circuit protection	yes (vs. GND and U_b)	
Measuring range	360	°
Max. Clock rate	1	MHz
Inputs	RS422 compatible, CLK lines electrically isolated via optocouplers	
Protocol	SSI 13 bit (12 bit data + 1 stop bit)	
Encoding	Gray code	
Update rate	34 (at CLK = 1 MHz)	kHz
Monoflop time (t_m)	20	µs
Resolution across 360°	12	bit
Repeatability	0.1	°
Hysteresis	Standard 0.7	°
Independent linearity	typ. 0.5	± % FS
Temperature error	±0.375	% FS
Insulation resistance (500 VDC)	≥ 10	MΩ
Cross-section cable	AWG 24, 0.25	mm ²
Environmental Data		
Temperature range	-40...+85	°C
Vibration IEC 60068-2-6	5...2000 Amax 0.75 amax = 20	Hz mm g
Shock IEC 60068-2-27	50 (6 ms)	g
Life	> 50x10 ⁶	
MTTF (DIN EN ISO 13849-1 parts count method, w/o load)	148	years
Functional safety	When using our products in safety-related systems please contact us	
Protection class (DIN EN 60529)	IP54 / IP65 / IP67	
EMC compatibility	EN 61000-4-2 electrostatic discharges (ESD) 4kV, 8kV EN 61000-4-3 electromagnetic fields 10V/m EN 61000-4-4 electrical fast transients (Burst) 1kV EN 61000-4-6 conducted disturbances, induced by RF fields 10 V/m eff. EN 55011/EN 55022/a1 Radiated disturbances class B	

Technical Data Incremental Interface

Type	RSC - 28 _ _ - 2 _ _ - 5 _ _ - _ _ _ Supply voltage 5 VDC	
Mechanical Data		
Dimensions	see dimension drawing	
Mounting	with 2 screws M4 and washer	
Starting torque of mounting screws at housing flange	180	Ncm
Mechanical travel	360 continuous	°
Permitted shaft loading (axial and radial) static or dynamic force	20	N
Torque	1.0 (IP67); 0.5 (IP65); 0.15 (IP54)	Ncm
Maximum operational speed	120	min-1
Weight	approx. 50	g
Electrical Data		
Supply voltage U_b	5 (4.5 ... 5.5)	VDC
Current consumption (w/o load)	typ. 20	mA
Reverse voltage	yes, supply lines and outputs	
Short circuit protection	yes (vs. GND and U_b)	
Measuring range	360	°
Outputs	A+ / A- B+ / B- Z+ / Z-	
Length Z-pulse	= distance between 2 edges A / B	
Ohmic load at outputs	> 1.2 per channel A / B / Z	k Ω
Update rate internal	500 typ.	ns
Resolution across 360° (with 4 times interpolation)	12 (11 / 10 / 9)	bit
Repeatability	0.1	°
Hysteresis	Standard 0.7	°
Independent linearity	typ. 0.5	± % FS
Temperature error	±0.375	% FS
Insulation resistance (500 VDC)	≥ 10	M Ω
Cross-section cable	AWG 24, 0.25	mm ²
Environmental Data		
Temperature range	-40...+85	°C
Vibration IEC 60068-2-6	5...2000 Amax 0.75 amax = 20	Hz mm g
Shock IEC 60068-2-27	50 (6 ms)	g
Life	> 50x10 ⁶	movements
MTTF (DIN EN ISO 13849-1 parts count method, w/o load)	246	years
Functional safety	When using our products in safety-related systems please contact us	
Protection class (DIN EN 60529)	IP54 / IP65 / IP67	
EMC compatibility	EN 61000-4-2 electrostatic discharges (ESD) 4kV, 8kV EN 61000-4-3 electromagnetic fields 10V/m EN 61000-4-4 electrical fast transients (Burst) 1kV EN 61000-4-6 conducted disturbances, induced by RF fields 10 V/m eff. EN 61000-4-8 Power frequency magnetic fields 3A/m EN 55011/EN 55022/a1 Radiated disturbances class B	

Technical Data SPI Interface

Type	RSC - 28 _ _ - 214 - 8 _ _ - _ _ _ Supply voltage 5 VDC	
Mechanical Data		
Dimensions	see dimension drawing	
Mounting	with 2 screws M4 and washer	
Starting torque of mounting screws at housing flange	180	Ncm
Mechanical travel	360 continuous	°
Permitted shaft loading (axial and radial) static or dynamic force	20	N
Torque	1.0 (IP67); 0.5 (IP65); 0.15 (IP54)	Ncm
Maximum operational speed	120	min ⁻¹
Weight	approx. 50	g
Electrical Data		
Supply voltage Ub	5 (4.5 ... 5.5)	VDC
Current consumption (w/o load)	typical 15	mA
Reverse voltage	yes, supply lines	
Short circuit protection	yes (vs. GND and Ub)	
Measuring range	360	°
Max. Clock rate	400	kHz
Level SCLK, MOSI, /SS	TTL level (see application note SPI protocol)	
Protocol	SPI	
Update rate	≤ 1	kHz
Resolution	14	bit
Repeatability	0.1	°
Hysteresis	< 0.1	°
Independent linearity	≤ 0.5	± % FS
Temperature error	±0.625	% FS
Insulation resistance (500 VDC)	≥ 10	MΩ
Cross-section cable	AWG 26, 0.14	mm ²
Environmental Data		
Temperature range	-40...+85	°C
Vibration IEC 60068-2-6	5...2000 Amax 0.75 amax = 20	Hz mm g
Shock IEC 60068-2-27	50 (6 ms)	g
Life	> 50x10 ⁶	movements
MTTF (DIN EN ISO 13849-1 parts count method, w/o load)	316	years
Functional safety	When using our products in safety-related systems please contact us	
Protection class (DIN EN 60529)	IP54 / IP65 / IP67	
EMC compatibility	EN 61000-4-2 electrostatic discharges (ESD) 4kV, 8kV EN 61000-4-3 electromagnetic fields: 10V/m EN 61000-4-4 electrical fast transients (Burst) 1kV EN 61000-4-6 conducted disturbances, induced by RF fields 10 V/m eff. EN 61000-4-8 Power frequency magnetic fields 3A/m EN 55011/EN 55022/a1 Radiated disturbances class B	



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Ordering specifications

Preferred types printed in bold:

- delivery time up to 25 pcs. within 10 working days
- no low volume surcharge

Interface

- 4: Synchronous-Serial Interface (SSI)
- 5: Incremental Interface A / B / Z
- 8: SPI Interface

Interface parameter for SSI Interface (4 _ _)

- 11: 5 V (4.5 ... 5.5 V) supply, output RS422 comp., Gray code, rising cw
- 12: 5 V (4.5 ... 5.5 V) supply, output RS422 comp., Gray code, rising ccw

Interface parameter for Incremental Interface (5 _ _)

- 10: 5 V (4.5 ... 5.5 V) supply, output RS422 comp., rising cw
High side and low side outputs on request
UVW signals instead of ABZ signals for motor commutation on request

Interface parameter for SPI Interface (8 _ _)

- 31: 5 V (4.5 V ... 5.5 V) supply, Binary code, rising cw

Electrical connection

- 302: Round cable 5-pol. 1 m (0.14mm²; shielded) SPI
 - 432: Round cable 8-pol. 1 m (0.25 mm²; shielded) SSI INC
- Cable versions and assembled connectors on request.

R S C - 2 8 3 2 - 2 1 2 - 4 1 1 - 4 3 2

Series

Resolution (SSI interface)

- 12: 12 bit - 4096 steps
- other resolutions on request

Resolution (Incremental interface)

- 12: 1024 ppr - 4096 increments resolution (at 4-fold interpolation)
- 11: 512 ppr - 2048 increments resolution (at 4-fold interpolation)
- 10: 256 ppr - 1024 increments resolution (at 4-fold interpolation)
- 09: 128 ppr - 512 increments resolution (at 4-fold interpolation)
- other resolutions on request

Resolution (SPI interface)

- 14: SPI 14 bit

Model

- 2: digital interface

Mechanical version

- 2802: 6 mm-shaft with flattening; IP54
- 2832: 6 mm-shaft with flattening; IP65**
- 2862: 6 mm-shaft with flattening; IP67
- 2821: push-on-coupling; IP54
- 2841: push-on-coupling; IP65**
- 2871: push-on-coupling; IP67

Available on request

- Driver configurations for 120 Ohm load
- Absolute position via incremental interface at power on (Power on Burst)