RSG 10 C - SSI

Absolute multi-turn encoder with stainless steel cover (PC-programmable)

- schockproof up to 200g
- very high bearing load
- SSI synchronous serial interface
- protection class IP 67
- zero-setting, electronical
- optional with cooling or heating

The shaft encoder system **RSG 10** was especially constructed for use under the conditions of heavy and plant making industries. The consderably lowers the costs of the mechanical adaption of the encoder, as a high efficient measuring system, to the different constructions.
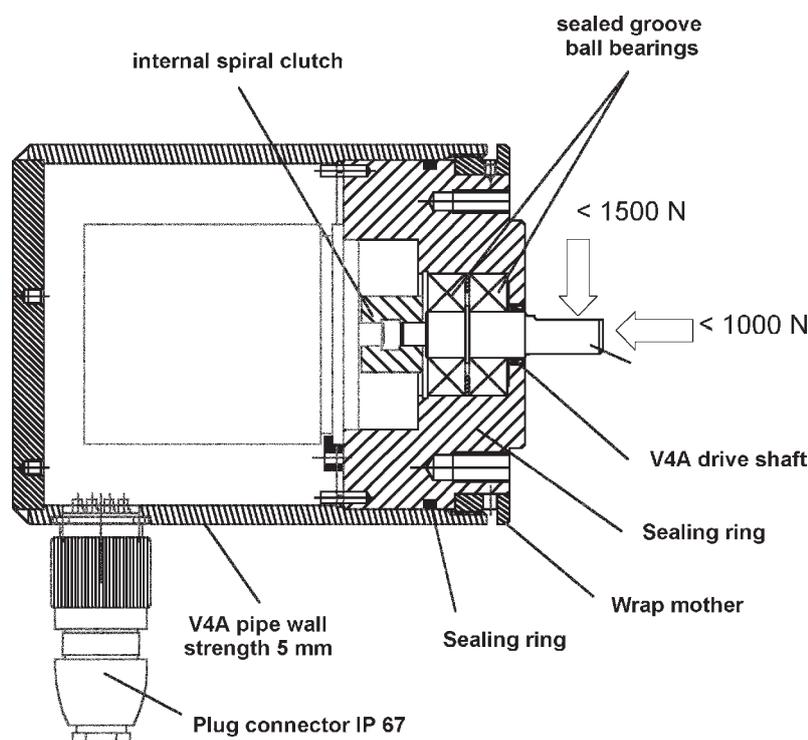
System **RSG 10** was developed in close cooperation with engineers of electrical maintenance and plant making departments of the heavy industries. Because of this the already known dimensions of the standard shaft encoder system have been maintained. The system stays compatible to the mostly required encoders, inspite of its very high mechanical resistivity. Because of the extremely high mechanical and atmospheric loads all parts have been manufactured in stainlees steel **(V4A 1.4571).**

The high protection class of IP 67 and the very high bearings loads of 100 kg axial and 150 kg radial ease the use of this encoder under the conditions of the heavy and plant making industries. Additionally the internal encoder is separated form the shaft of the protection cover by means of a coupling, that e.g. guarantees a protection of the internal encoder shaft against shocks.

An additional protection cover is not necessary even under the conditions of heavy industries.

Electrical data see data sheet RSC 58 - SSI

Mechanical data

sealed groove ball bearings
internal spiral clutch
< 1500 N
< 1000 N
V4A drive shaft
Sealing ring
Wrap mother
V4A pipe wall strength 5 mm
Sealing ring
Plug connector IP 67

Technical data

Total count	25 Bit
Steps/turn	8192 (programmable)
Turns	4096 (programmable)
Code	Gray, Binary (programmable)
Interface	SSI (programmable and RS 232)
Function outputs	Preselection 1 + 2, Speed monitoring Encoder monitoring

Electrical data

Operating voltage	UB = 10...30 VDC
Current consumption	Max. 80 mA (w/o load), at 24 VDC
Code change frequency	Max. 800 kHz
SSI pulse frequency	62,5 kHz to 1,5 MHz
Monoflop time	16...26 µs
Pulse break	Min. 50 µs
Accuracy	± 0,025° with 400 kHz ± 0,05° with 800 kHz

Inputs

Control signals	CW/CCW and Preset-in
Level High	> 0,7 UB
Level Low	< 0,3 UB
Connection	CW/CCW input with 10 kohms to UB, zeroing input with 10 kohms to GND SSI-pulse Optocoupler inputs for electrical isolation.

Outputs

SSI data	RS 485
Special outputs	
Level High	> UB - 3,5 V (with I = 20 mA)
Level Low	< 0,5 V (with I = 20 mA)
Loading High	≤ - 20 mA
Loading Low	≤ 20 mA

All special outputs with short-circuit-proof push-pull output stages.

Mechanical data

Speed (mechanical)	≤ 10.000 min $^{-1}$
Drehzahl (electrical)	≤ 6.000 min $^{-1}$
Start-up torque	< 0,3 Ncm (20° C)
Shaft loading	< 1.500 N radial < 1.000 N axial
Moment of inertia	10^4 rad/s^2

Material

Housing	stainless steel V4A 1.4571.
Flange	stainless steel V4A 1.4571.
Weight	approx. 5,2 kg

Ambient conditions

Vibration	DIN EN 60068-2-6 ≤ 100 m/s^{-2} (16...2000 Hz)
Shock	DIN EN 600068-2-27 ≤ 2.000 m/s^2,6 ms
Operating temperature	- 20... + 85° C
Humidity	Max. relative humidity 95 % no-condensing
Protection type	IP 67
Interference resistance	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4

Description of diagnostic functions

The following is montored during operation:
- Consistency test of code
- Exceeding of the permissible signal frequency
- LED failure, aging
- Receiver failure
- Code disk, glass breakage
- Power supply of electronic gear unit

Special functions
- Two „limit switch function" preselection
- Programmable speed monitoring
- Diagnosis and operating status

Contact Description

12pol. plug

1 UB	Encoder power supply connection
2 GND	Encoder ground connection. The voltage drawn to GND is UB.
3 Pulse +	Positive SSI pulse input. Pulse + forms a current loop with pulse -. A current of approx. 7 mA in direction of Pulse + input generates a logical 1 in positive logic.
4 Data +	Positve, serial data output of the differential line driver. A High level at the output corresponds to logical 1 in positive logic.
5 Adjustment	Electronic adjustment (take over of the pre-programmed value) can be done by generating a steep edge from GND to UB (is activated with a falling edge). Adjustment must be done after selecting the direction of rotation (CW/CCW). Set to GND for max. immunity after adjustment. Impulse length ³100 ms.
6 Data -	Negative, serial data output of the differential line driver. A High level at the output corresponds to logical 0 in positive logic.
7 Pulse -	Negative SSI pulse input. Pulse -forms a current loop with pulse +. A current of approx. 7 mA in direction of Pulse -input generates a logical 0 in positive logic.
8	Surrogate for DV
9 CW/CCW	CW/CCW determines the direction of turn. From the point of view of the shaft CW means that the code increases when the shaft turns to the right. When the GND is added, the code changes to CCW (descending sequence). The unit leaves the factory in CW.
10	Report heating on
11	power supply heating 24 VDC
12	mass connection heating

9pol. plug

1,2,3 and 4	The special outputs 1, 2, 3 und 4 may be optionally assigned the special functions preselection 1, preselection 2, speed monitoring and diagnosis status by programming.
5 TxD	Transmitting output of the encoder for the RS232 programming interface.
6 RxD	Receiving input of the encoder for the RS232 programming interface.
7	Programming enable
g	GND
9	not in use

PIN - assignment RSG 10 C

PIN-Occupation RSG 10 C 12pol. plug

signal	PIN
UB	1
GND	2
Pulse +	3
Data +	4
Adjustment	5
Data-	6
Pulse -	7
Surrogate for DV	8
CW/CCW	9
Report heating on	10
Heating +	11
Heating-	12

PIN-Occupation RSG 10 C 9pol. plug

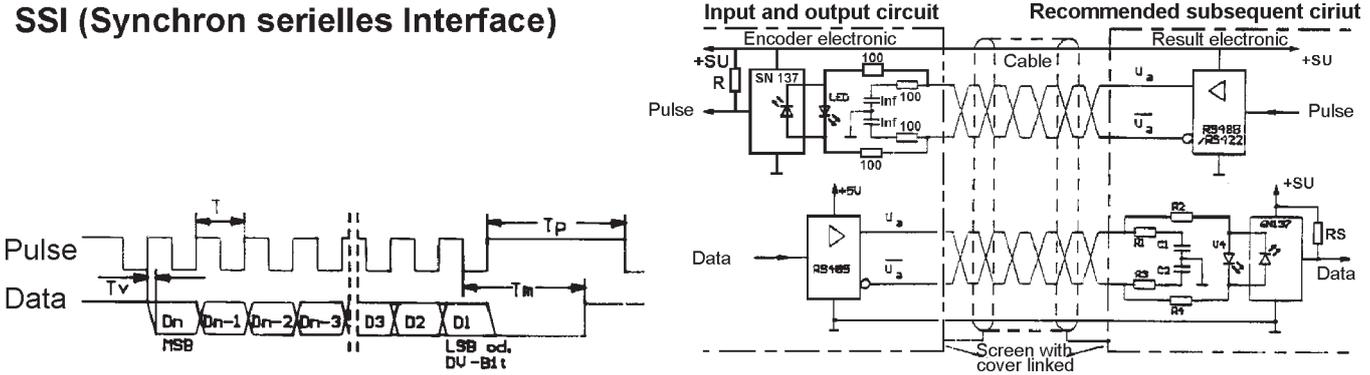| signal	PIN
Output 1	1
Output 2	2
Output 3	3
Output 4	4
TxD (RS 232)	5
RxD (RS 232)	6
Programming enable	7
GND	8
not in use	9

Important

DV is the diagnostics output of the sensor (contact) and is allocated in the programme to an **output**. After switching on, the RSC 58 carries out a self-test. During operation, the following features are monitored: consistency of the code, overstepping of the maximum signal frequency, LED shutdown, ageing, receiver shutdown, code disk, glass breakage, and power supply to the electronic drive. If there is a malfunction, the DV changes its output level (low to high or vice versa, depending on the programming). There are three more **outputs** available and to these you can allocate two end switch functions and one speed monitor via the programme. Programming the sensor is via the RS232 (please request our programming handbook), the programming software, and the connection cable from sensor ⇔ PC (if you wish, the sensors can be pre-programmed before they leave our factory).

To start programming, connect to GND (go into GND). During operation, this input should be to set to UB. **CW/CCW** controls the direction of rotation. For the shaft, CW indicates a rising code for rotation to the right. In GND the code changes to CCW (falling code). The unit comes to you in the CW mode.

Electronic **adjustment** (takeover of the pre-programmed value) can be done by generating a steep edge from GND to UB (is activated with a falling edge). Adjustment must be done after selecting the direction of rotation (CW/CCW). Set to GND for max. immunity after adjustment. Impulse length ≥100 ms. Please refer to the rating plate for the correct **power supply**.
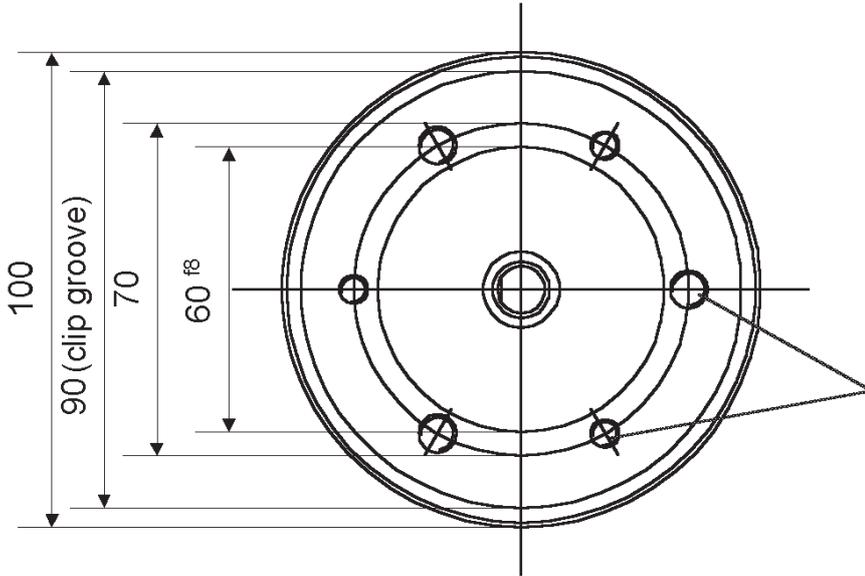
SSI (Synchron serielles Interface)

Type key of Encoder

Encoder Type	Bit/turnings	Turnings	Code	Voltage	Flange	Output	Options
RSG 10 C	13 = 8192 S/T	12 = 4096 T	P =programmable	3 = 10 - 30 VDC	V1 = 10 mm shaft servo flange	2SS = 2 plugs radial 1 x 12pol. 1 x 9pol.	L = air cooling
RSG 10 C							W = water cooling
RSG 10 C							H = electrical heating
RSG 10C	13	12	P	3	V 1	2SS	_____

Preferred type:

RSG 10 C - 13 + 12 - P - 3 - V1 - 2SS - H
Short designation 'RSG-HKM3'. Multi-turn, 25 Bit, Gray-Code, UB 10 - 30 VDC, 10 mm shaft, servo flange, 12pol. plug radial (data communication) and 9pol. radial (programming), with electrical heating and thermostat. Standard-Encoder a. o. t. at HKM.

Dimensions and cutout RSG 10 C - SSI

100

90 (clip groove)

70

60 f8

Connection thread
3 x M6 (120°) and M6 (120°), 10 mm deep

10 g6

6

20

18

4

3,1

3,1

160

90

100

ca. 60