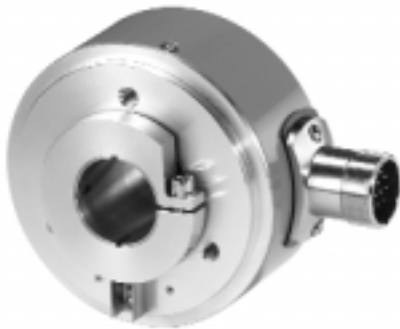


Multiturn Type 9081 SSI, programmable



- Electronic multiturn gear with patented intelligent sensing technology (IST)
- Hollow shaft up to $\varnothing 28$ mm or shaft $\varnothing 12$ mm
- Shock resistant up to 250 g
- Only 50 mm clearance needed
- Programming parameters include*: code type, resolution per revolution, total resolution, direction of rotation (cw or ccw), zero point.
- Very easy mounting of the hollow shaft

* with optional programming kit (Ezturn®) see accessories

version. The encoder is mounted directly on the drive shaft without couplings. This saves up to 30 % cost and 50 % clearance compared to shaft versions.

- Divisions: 8192 (13 bits) per revolution, 4096 (12 bits) revolutions
- SSI interface, additional interfaces include RS 485 and OEM specific protocols
- IP 65
- Four programmable outputs
- optional with incremental track

Mechanical characteristics:

| | |
|---|--|
| Speed: ¹⁾ | max. 6000 min ⁻¹ |
| Rotor moment of inertia: | appr. 65×10^{-6} kgm ² |
| Starting torque hollow shaft version: | < 0,2 Nm |
| Starting torque shaft version: | < 0,05 Nm |
| Radial load capacity of shaft (hollow shaft): ²⁾ | 80 N |
| Axial load capacity of shaft: (shaft): ²⁾ | 40 N |
| Weight: | appr. 0,7 kg |
| Protection acc. to EN 60 529: | IP 65 |
| Working temperature: | -20° C ... +70 °C |
| Operating temperature: | -20° C ... +80 °C |
| Shaft: | stainless steel |
| Shock resistance acc. to DIN-IEC 68-2-27 | 2500 m/s ² , 6 ms |
| Vibration resistance acc. to DIN-IEC 68-2-6: | 100 m/s ² , 10 ... 2000 Hz |

¹⁾ for continuous operation 3000 min⁻¹

²⁾ at shaft version only (at shaft end)

Electrical characteristics:

| | | |
|---|--|----------------------------|
| Interface type: | Synchronous-Serial (SSI) ³⁾ | SSI with incremental track |
| Supply voltage (U _B): | 5,0 ... 30 V DC ⁴⁾ | |
| Output driver: | RS 485 | RS 422 |
| Current consumption type: | 89 mA | 20 mA |
| (no load) max.: | 138 mA | - |
| Permissible load/channel: | max. +/-20 mA | 20 mA |
| SSI pulse rate min./max.: | 100 kHz/500 kHz | - |
| Signal level high: | type. 3,8 V | 5,0 V |
| Signal level low (I _{Load} = 20 mA): | type. 1,3 V | 0,5 V |
| Rise time t _r (without cable): | max. 100 ns | 200 ns |
| Fall time t _f (without cable): | max. 100 ns | 200 ns |
| Short circuit proof outputs: ¹⁾ | yes ²⁾ | Yes |
| Reverse connection protection at U _B : | yes | Yes |
| Conforms to CE requirements acc. to EN 50082-2, EN 50081-2, EN 55011 Class B EN 61000-4-8 | | |
| Performance against magnetic influence acc. to EN61000-4, 5 | | |

¹⁾ When supply voltage correctly applied

²⁾ Only one channel at a time:

(when U_B = 5 V, short-circuit to channel, 0 V, or +U_B is permitted.)

(when U_B > 5 V short-circuit to channel or 0 V is permitted.)

³⁾ Optional status bit

⁴⁾ Please note: the minimum voltage supply must be 5.0 V DC

Patented "Integrated Technology®" uses single board construction, deliberate assembly techniques, and two ASIC design:

- Shock up to 250gs
- Higher vibration specs and thermal shock performance
- Lower parts count, elimination of potentiometers
- Higher resistance to EMI

Electronic multiturn increases performance, eliminates gears

- Reliability - No backlash errors, resistant to EMI, lower parts count
- Higher life - No mechanical wear, lower internal temperature
- Higher performance - Higher operating speeds
- Lower profile - compact size, hollow shaft
- Economical - Lower cost

Patented "Intelligent Sensing Technology®"

- Multiturn design that protects encoder from EMI and increases battery life to 10 years.
- The battery outlasts both application requirements and system components (LEDs & bearings)
- Redundant multiturn sensors and counters increase reliability & life
- Active system output monitoring using digital filters to compare data to logical & target bits.

Multiturn Type 9081 SSI, programmable

Control inputs:

Up/down input to switch counting direction

As a standard, absolute encoders deliver increasing code values when the shaft rotates clockwise (cw), when looking from the shaft side. When the shaft rotates counter-clockwise (ccw), the output delivers decreasing code values. If a corresponding signal (high) is applied to this input when switching on the power supply, this feature is reversed. Clockwise rotation will deliver decreasing code values while

counter-clockwise rotation will deliver increasing code values. Response time: at 5-30 V DC supply voltage, 10 ms.

SET input

This input is used to reset (to zero) the encoder. A control pulse (high) sent to this input allows storing the current position value as new zero position in the encoder.

Note :

before activating the SET input after supplying the encoder with the supply voltage, a counting direction (cw or ccw) must be defined univocally on the Up/down input! Response time: at 5-30 V DC supply voltage, 10 ms.

Switching level of the control inputs:

| | |
|--------------------|-----------------------------|
| low | max. 25% U_B |
| high | min. 60% U_B , max. U_B |
| Max. current input | $\leq 0,5$ mA |

| HW-Setting | SW-Setting | Function |
|------------|------------|----------|
| cw | cw | cw |
| ccw | cw | ccw |
| cw | ccw | ccw |
| ccw | ccw | ccw |

Encoder outputs

| Output | Default-function: |
|--------|-------------------|
| A1: | battery control* |
| A2: | not activated* |
| A3: | not activated* |
| A4: | not activated* |

*programmable with the optional programming software Ezturn®

| | |
|---------------------------|--------------------|
| Permissible load/channel: | $\pm 9,0$ mA |
| Signal level | |
| high: | min. $U_B - 3,0$ V |
| low: | max. 1,5 V |
| Rise time: | max. 240 μ s |
| Fall time: | max. 300 μ s |

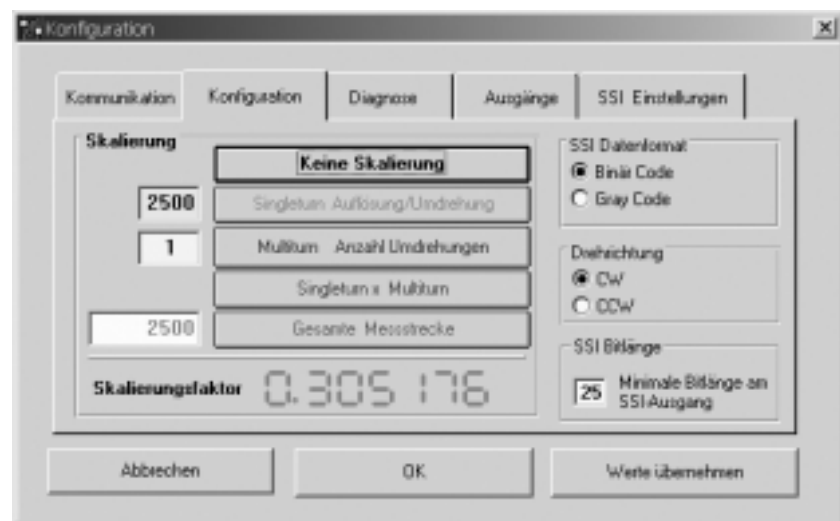
The outputs are not activated in the factory setting (default). They can be activated and defined with the optional Ezturn® programming software e.g. limit switch, overspeed and temperature control etc.

Programmable function with optional Ezturn® software

Programmable features with optional programming tool Ezturn®:

- Type of code
- Resolutions per revolution
- Number of revolution
- Total resolution
- Direction of rotation
- Offset for mechanical zero point compensation
- etc....

Programming tool Ezturn



Multiturn Type 9081 SSI, programmable

Terminal assignment (SSI Synchronous Serial interface with 12pin plug)

| | | | | | | | | | | | | | | |
|---------|-----|-----------------|----|----|----|----|----|----|----|----|-------|-------|----|--|
| Signal: | 0 V | +U _B | +T | -T | +D | -D | ST | VR | A1 | A2 | A3 | A4 | ⏏ | |
| Pin: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | PH | |
| Col.: | WH | BN | GN | YE | GY | PK | BU | RG | BK | VT | GY PK | RD BL | | |

T: Clock signal
 D: Data signal
 ST: SET input. The current position value is stored as new zero position (or the actual value is set to the preset value when using the programmable version).

VR: Up/down input. As long as this input is active, decreasing code values are transmitted when shaft turning clockwise.
 PH: Plug housing
Insulate unused outputs before initial start-up.

A1, A2, A3, A4: outputs, with Ezturn programmable

Terminal assignment RS 485 and 12pin plug

| | | | | | | | | | | | | | | |
|---------|-----|-----------------|------|------|---|---|----|----|---|----|----|----|----|--|
| Signal: | 0 V | +U _B | -R/T | +R/T | | | | VR | | | | | ⏏ | |
| Pin: | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8 | 9 | 10 | 11 | 12 | PH | |
| Col.: | WH | BN | YE | GN | | | | RD | | | | | | |

R = Receive-channel
 T = Transmit-channel
 VR: Up/down input. As long as this input (High-Level = +U_B) is active,

decreasing code values are transmitted when shaft turning clockwise.
 PH = Plug housing

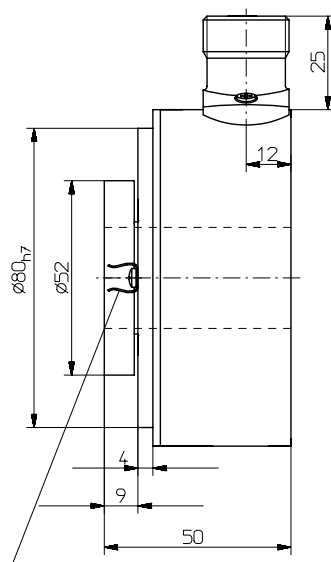
* There is no set input for P3001 version, but it can be realised also with command "<ESC> G" (write preset).

SSI interface with incremental track (A, B):

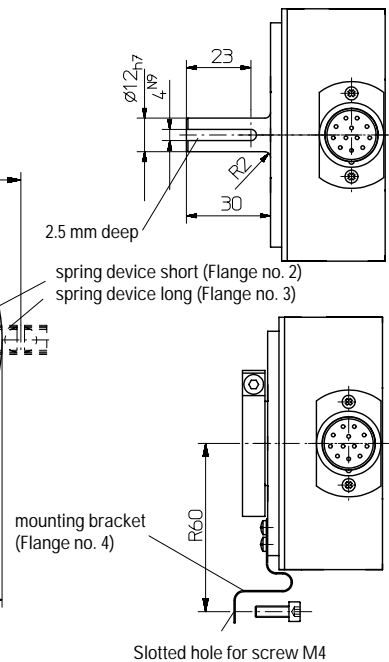
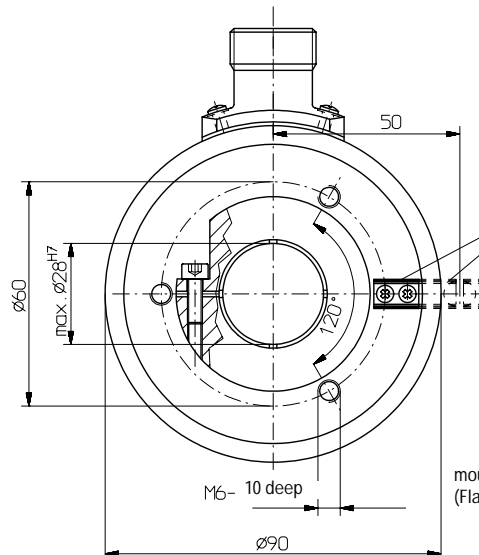
| | | | | | | | | | | | | | | |
|----------|----|-----|-------|-------|--------|--------|-------|----|----|----|----|----|----|--|
| Signal : | 0V | +UB | Takt+ | Takt- | Daten+ | Daten- | Set 0 | VR | B̄ | B | Ā | A | ⏏ | |
| Pin | 1 | 2 | 3 | 4 | 5 | 6 | 7* | 8 | 9 | 10 | 11 | 12 | PH | |

Dimensions:

shaft version Ø12x30 mm

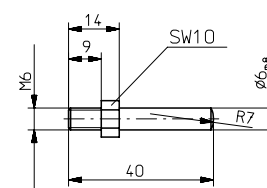


Spring device for pin acc. to DIN 6325 Ø6



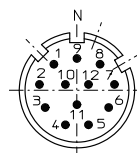
Mounting advice:

- Do not connect encoder and drive rigidly to one another at shafts and flanges!
- Delivery includes a corresponding cylindrical pin (see drawing), when the encoder is ordered with flange type 2 (short spring device) or type 3 (long spring device).



Top view of mating connector, male contact base:

12 pin plug

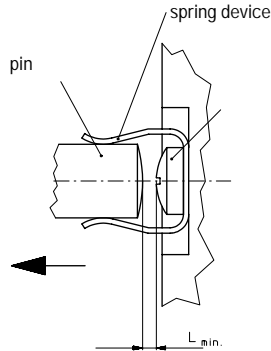


Multiturn Type 9081 SSI, programmable

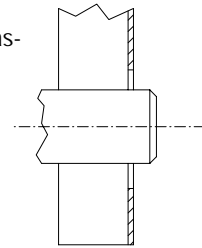
Max. permissible drive shaft impact:

| Type of flange: | Permissible axial impact | Permissible radial play | Permissible angular play |
|--------------------------------------|-------------------------------|-------------------------|--------------------------|
| Flange type 2 (short spring device): | max. ± 1 mm ¹⁾ | max. ± 0.3 mm | max. $\pm 2^\circ$ |
| Flange type 3 (long spring device): | ∞ ²⁾ | max. ± 0.3 mm | max. $\pm 2^\circ$ |
| Flange type 4 (mounting bracket): | max. ± 0.5 mm | max. ± 0.3 mm | max. $\pm 2^\circ$ |

¹⁾When mounting the encoder ensure that $L_{min.}$ is larger than the axial play of the drive.

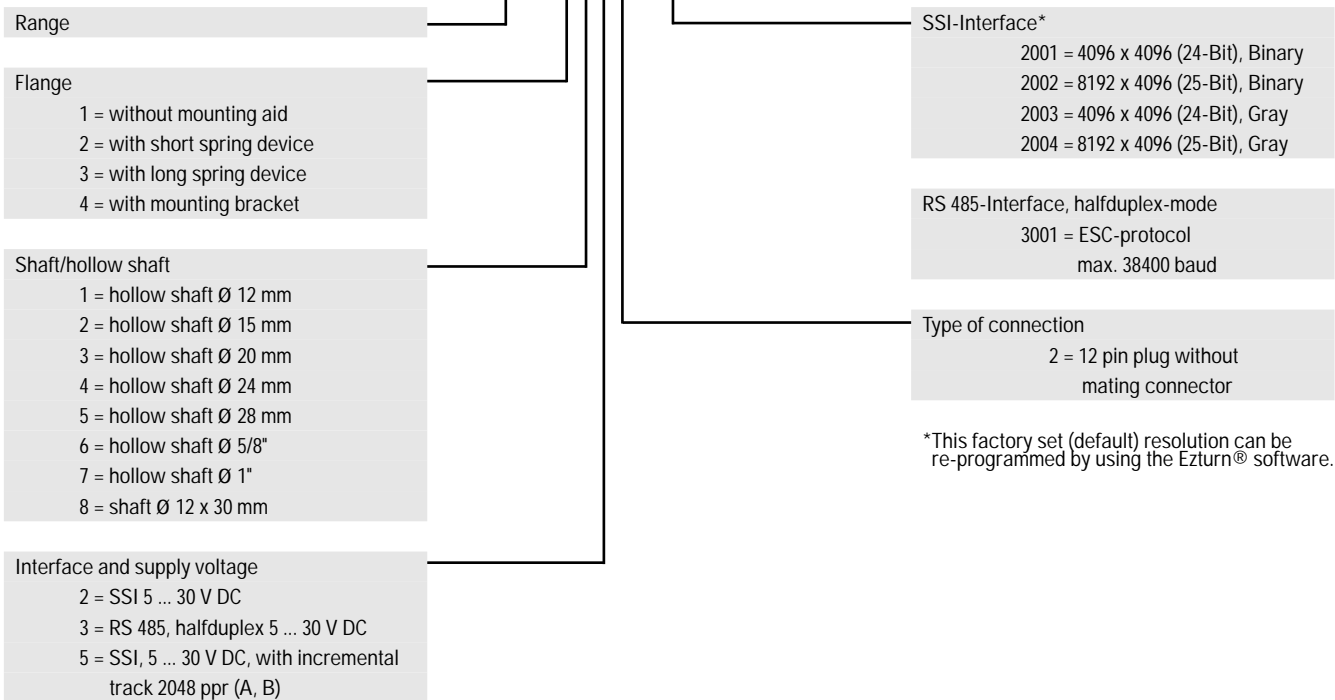


²⁾When mounting as shown. In all other cases view flange type 2



Order code:

8.9081.XXXX.XXXX



*This factory set (default) resolution can be re-programmed by using the Ezturn® software.

Accessories:

Corresponding mating connector to connection type 2
Ord.No 8.0000.5012.0000

Programming kit Ezturn® includes

- Interface converter
- Connection cable with the interface converter encoder – PC
- 90-250 V AC power supply
- CD-ROM with Ezturn® software

Order code 8.0010.9000.0004

Further accessories see accessories chapter in the encoder catalogue

Cable with plug:
Order-No.: 8.0000.6901.00XX.0031
XX = length in m (3, 5, 8, 10, 15)