

Absolute encoders - SSI

Blind / through hollow shaft or cone shaft (1:10)

ST and MT 20 bit each / Speed switch

HMG10 - SSI



HMG 10 - picture similar

Technical data - electrical ratings

| | |
|-----------------------|---------------------------------------|
| Voltage supply | 4.75...30 VDC |
| Short-circuit proof | Yes |
| Consumption w/o load | ≤100 mA (SSI) |
| Initializing time | ≤500 ms after power on |
| Interface | SSI |
| Function | Multiturn |
| Steps per turn | 1048576 / 20 bit |
| Number of turns | 1048576 / 20 bit |
| Additional outputs | Square-wave HTL/TTL (RS422) |
| Sensing method | Magnetic |
| Code | Gray (default) or binary |
| Code sequence | CW/CCW programmable CW default |
| Input signals | SSI clock, PRESET, rotating direction |
| Interference immunity | EN 61000-6-2 |
| Emitted interference | EN 61000-6-3 |
| Diagnostic function | Self-diagnosis |
| Status indicator | 4 LEDs in device back side |
| Approvals | CE, UL approval / E256710 |

Technical data - electrical ratings (speed switches)

| | |
|---------------------------|--|
| Interface | RS485 |
| Switching accuracy | ±2 % (or Digit) |
| Switching outputs | 1 output (Open-Collector or Solid State Relay) |
| Output switching capacity | 30 VDC; ≤100 mA |
| Switching delay time | ≤20 ms |

Features

- Interface SSI
- Magnetic sensing method
- Resolution: singleturn 20 bit, multiturn 20 bit
- Function display via LEDs
- Multiturn sensing with Energy Harvesting technologie, without gear or battery
- Two hybrid bearings, one at each end
- Special protection against corrosion C5-M

Optional

- Integrated speed switch, programmable
- Additional outputs incremental with zero pulse

Technical data - mechanical design

| | |
|--------------------------|--|
| Size (flange) | ø105 mm |
| Flange | Support plate, 360° freely positionable |
| Protection DIN EN 60529 | IP 66/IP 67 |
| Operating speed | ≤12000 rpm |
| Range of switching speed | ±2...12000 rpm, default 12000 rpm |
| Operating torque typ. | 10 Ncm |
| Rotor moment of inertia | 950 gcm ² |
| Admitted shaft load | ≤450 N axial ≤650 N radial |
| Materials | Housing: aluminium alloy Shaft: stainless steel |
| Operating temperature | -40...+85 °C |
| Relative humidity | 95 % non-condensing |
| Resistance | IEC 60068-2-6 Vibration 30 g, 10-2000 Hz IEC 60068-2-27 Shock 400 g, 1 ms |
| Corrosion protection | IEC 60068-2-52 Salt mist Complies to ISO 12944-5:1998 Protective paint systems (C5-M) |
| Weight approx. | 1.6 kg (depending on version) |
| Connection | Terminal box Flange connector M23 |
| HMG10-B - SSI | |
| Shaft type | ø16...20 mm (blind hollow shaft) ø17 mm (cone shaft 1:10) |
| HMG10-T - SSI | |
| Shaft type | ø16...20 mm (through hollow shaft) |

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Part number - tables

Resolution singleturn

| | | | |
|-------------|------------|------------|------------|
| 0 (Without) | 2 (12 bit) | 5 (15 bit) | 8 (18 bit) |
| A (10 bit) | 3 (13 bit) | 6 (16 bit) | 9 (19 bit) |
| 1 (11 bit) | 4 (14 bit) | 7 (17 bit) | B (20 bit) |

Resolution multiturn

| | | | |
|-------------|------------|------------|------------|
| 0 (Without) | 2 (12 bit) | 5 (15 bit) | 8 (18 bit) |
| A (10 bit) | 3 (13 bit) | 6 (16 bit) | 9 (19 bit) |
| 1 (11 bit) | 4 (14 bit) | 7 (17 bit) | B (20 bit) |

Resolution speed

| | |
|-----------------------|-----------------------|
| 0 (Without) | 5 (15 bit, ±6000 rpm) |
| A (10 bit, ±6000 rpm) | 6 (16 bit, ±6000 rpm) |
| 1 (11 bit, ±6000 rpm) | 7 (17 bit, ±6000 rpm) |
| 2 (12 bit, ±6000 rpm) | 8 (18 bit, ±6000 rpm) |
| 3 (13 bit, ±6000 rpm) | 9 (19 bit, ±6000 rpm) |
| 4 (14 bit, ±6000 rpm) | B (20 bit, ±6000 rpm) |

Additional output 1

| |
|---|
| 0 (Without) |
| Q (8192 ppr TTL/HTL push-pull (Vin=Vout), 4 channels) |
| P (8192 ppr TTL (RS422), 4 channels) |
| G (5000 ppr TTL/HTL push-pull (Vin=Vout), 4 channels) |
| H (5000 ppr TTL (RS422), 4 channels) |
| K (4096 ppr TTL/HTL push-pull (Vin=Vout), 4 channels) |
| J (4096 ppr TTL (RS422), 4 channels) |
| 7 (3072 ppr TTL/HTL push-pull (Vin=Vout), 4 channels) |
| 8 (3072 ppr TTL (RS422), 4 channels) |
| 9 (2048 ppr TTL/HTL push-pull (Vin=Vout), 4 channels) |
| 4 (2048 ppr TTL (RS422), 4 channels) |
| 5 (1024 ppr TTL/HTL push-pull (Vin=Vout), 4 channels) |
| 6 (1024 ppr TTL (RS422), 4 channels) |
| 1 (512 ppr TTL/HTL push-pull (Vin=Vout), 4 channels) |
| 2 (512 ppr TTL (RS422), 4 channels) |

Additional output 2*

| |
|---|
| 0 (Without) |
| Q (8192 ppr TTL/HTL push-pull (Vin=Vout), 6 channels) |
| P (8192 ppr TTL (RS422), 6 channels) |
| G (5000 ppr TTL/HTL push-pull (Vin=Vout), 6 channels) |
| H (5000 ppr TTL (RS422), 6 channels) |
| K (4096 ppr TTL/HTL push-pull (Vin=Vout), 6 channels) |
| J (4096 ppr TTL (RS422), 6 channels) |
| 7 (3072 ppr TTL/HTL push-pull (Vin=Vout), 6 channels) |
| 8 (3072 ppr TTL (RS422), 6 channels) |
| 9 (2048 ppr TTL/HTL push-pull (Vin=Vout), 6 channels) |
| 4 (2048 ppr TTL (RS422), 6 channels) |
| 5 (1024 ppr TTL/HTL push-pull (Vin=Vout), 6 channels) |
| 6 (1024 ppr TTL (RS422), 6 channels) |
| 1 (512 ppr TTL/HTL push-pull (Vin=Vout), 6 channels) |
| 2 (512 ppr TTL (RS422), 6 channels) |

* Only for connection M or S

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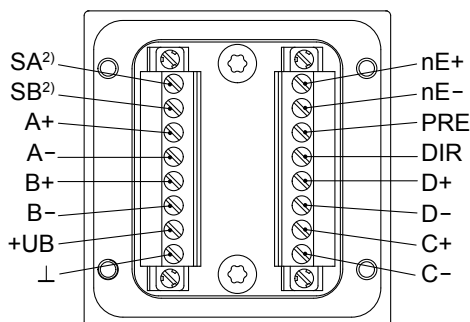
HMG10 - SSI

Terminal significance

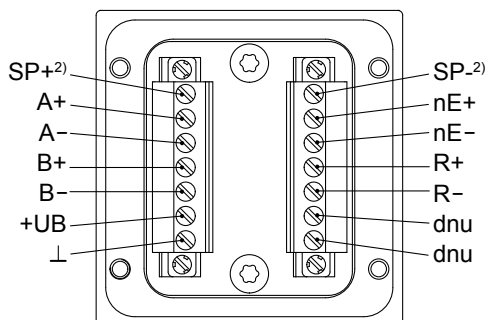
| | |
|-------------------|---|
| +UB | Voltage supply |
| ⊥ | Ground |
| A+ | Channel A+ |
| A- | Channel A- (channel A+ inverted) |
| B+ | Channel B+ |
| B- | Channel B- (channel B+ inverted) |
| R+ | Zero pulse (reference signal) |
| R- | Zero pulse inverted |
| nE+ | System OK+ / error output |
| nE- | System OK- / error output inverted |
| PRE | PRESET/RESET |
| DIR | Rotating direction |
| SP+ ²⁾ | DSL_OUT1 / speed switch (Open-Collector or Solid State Relay) |
| SP- ²⁾ | DSL_OUT2 / speed switch (0 V or Solid State Relay) |
| SA ²⁾ | RS485+ / programming interface |
| SB ²⁾ | RS485- / programming interface |
| D+ | SSI DATA+ |
| D- | SSI DATA- |
| C+ | SSI CLOCK+ |
| C- | SSI CLOCK- |
| dnu | Do not use |

Terminal assignment terminal box

View A¹⁾ - SSI



View B¹⁾ - Speed switch/incremental



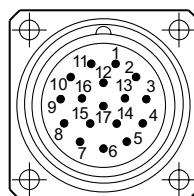
¹⁾ See dimensions

²⁾ Do not use at version without speed switch

Terminal assignment flange connectors

View C¹⁾ - SSI, flange connector M23 (male, 17-pin)

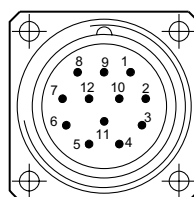
| | |
|----|------------------|
| 1 | nE- |
| 2 | DIR |
| 3 | SB ²⁾ |
| 4 | nE+ |
| 5 | PRE |
| 6 | SA ²⁾ |
| 7 | +UB |
| 8 | C+ |
| 9 | C- |
| 10 | ⊥ |
| 11 | Internal shield |
| 12 | B+ |
| 13 | B- |
| 14 | D+ |
| 15 | A+ |
| 16 | A- |
| 17 | D- |



Clockwise (CW)

View C¹⁾ - Speed switch/incremental, flange connector M23 (male, 12-pin)

| | |
|----|-------------------|
| 1 | B- |
| 2 | nE- |
| 3 | R+ |
| 4 | R- |
| 5 | A+ |
| 6 | A- |
| 7 | SP+ ²⁾ |
| 8 | B+ |
| 9 | SP- ²⁾ |
| 10 | ⊥ |
| 11 | nE+ |
| 12 | +UB |



Clockwise (CW)

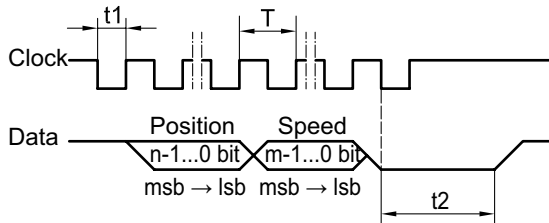
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Data transfer

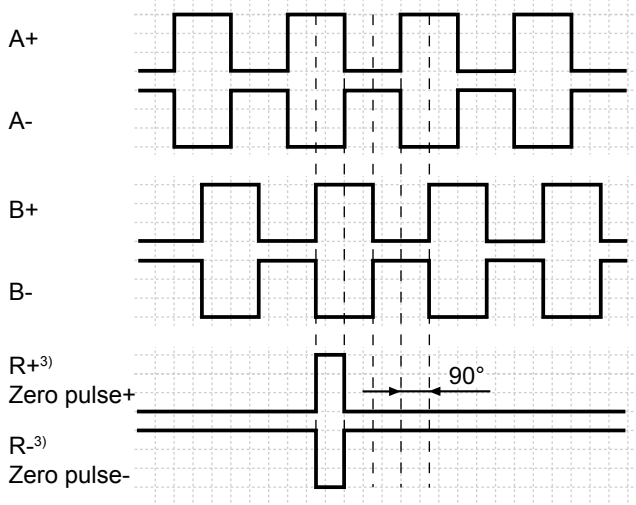


| | |
|--------------------|-----------------------|
| Clock frequency | 100 kHz...2 MHz |
| Period (T) | 0,5...10 μ s |
| Time lag (t1) | 0,25...5 μ s |
| Monoflop time (t2) | 20 μ s (internal) |
| n, m | Number of bits |

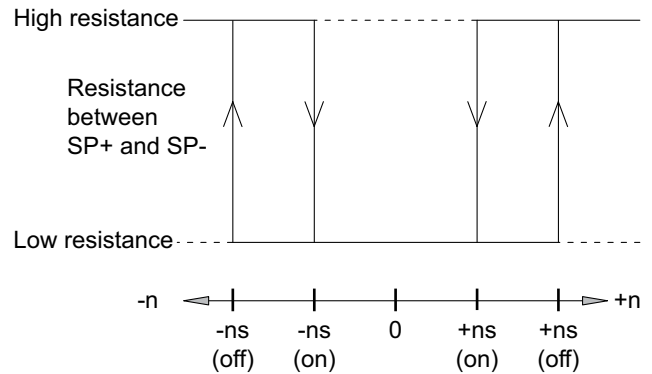
For continuous clocking, the SSI word is transmitted only once followed by zero values (no ring register operation).

Incremental - Output signals

Version with additional incremental output at positive rotating direction



Speed switch - Switching characteristics



- n = Speed
- +ns (on) = Activation speed at shaft rotation in positive rotating direction¹⁾.
- +ns (off) = Deactivation speed at shaft rotation in positive rotating direction¹⁾.
- ns (on) = Activation speed at shaft rotation in negative rotating direction¹⁾.
- ns (off) = Deactivation at shaft rotation in negative rotating direction¹⁾.

¹⁾ See dimensions

³⁾ Only additional output 2

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Accessories

Connectors and cables

| | |
|----------|---|
| HEK 8 | Sensor cable for encoders |
| HEK 17 | Sensor cable for encoders |
| 11068577 | Mating connector M23, solder version, 12-pin, CCW |
| 11068551 | Mating connector M23, solder version, 17-pin, CCW |

Mounting accessories

| | |
|----------|---|
| 11043628 | Torque arm M6, length 67-70 mm |
| 11004078 | Torque arm M6, length 120-130 mm (≥ 71 mm) |
| 11002915 | Torque arm M6, length 425-460 mm (≥ 131 mm) |
| 11054917 | Insulated torque arm M6, length 67-70 mm |
| 11072795 | Insulated torque arm M6, length 120-130 mm (≥ 71 mm) |
| 11082677 | Insulated torque arm M6, length 425-460 mm (≥ 131 mm) |
| 11077197 | Mounting kit for torque arm size M6 and earthing strap |
| 11077087 | Mounting and dismounting set |

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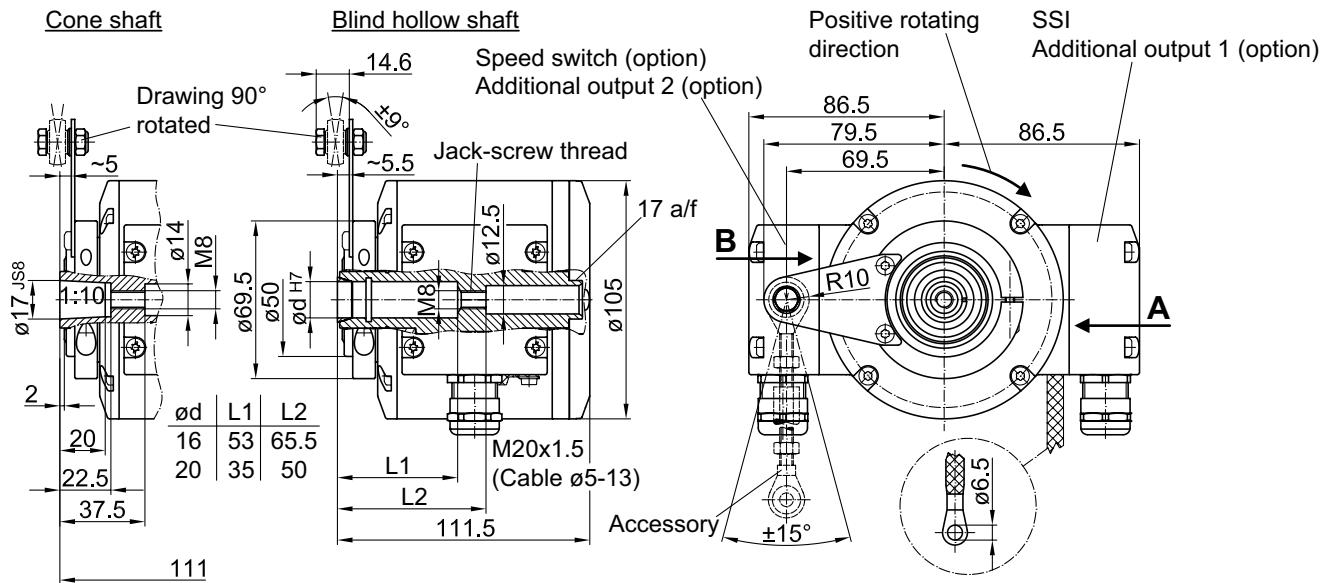
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Dimensions

Blind hollow shaft and cone shaft with radial terminal boxes



Blind hollow shaft and cone shaft with radial flange connectors M23

