

HMG10-B - SSI

Blind hollow shaft or cone shaft (1:10)

ST and MT 20 bit each / Speed switch

Overview

- Magnetic sensing method
- Function display via LEDs
- Multiturn sensing with Energy Harvesting technology "MicroGen", without gear or battery
- Two-sided bearing system with hybrid bearings
- Special protection against corrosion CX (C5-M)



Picture similar

HUBNER
BERLIN
A Baumer Brand

microGen
Energy Harvesting

Technical data

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 revolution | 1048576 / 20 bit |
| Number of revolutions | 1048576 / 20 bit |
| Additional outputs | Square-wave TTL/HTL,TTL/RS422 |
| Sensing method | Magnetic |
| Code | Gray or binary |
| Code sequence | CW (factory setting) |
| Input signals | SSI clock, PRESET, rotating direction |
| Interference immunity | EN 61000-6-2 |
| Emitted interference | EN 61000-6-3 |
| Diagnostic function | Function control |
| Status indicator | 4 LEDs in device back side |
| Approval | CE UL approval / E217823 EAC |

Technical data - electrical ratings (speed switch)

| | |
|---------------------------|---|
| Switching accuracy | ± 2 % (or 1 Digit) |
| Switching outputs | 1 output (Open collector, solid state relay on request) |
| Output switching capacity | 30 VDC; ≤100 mA |

Technical data - electrical ratings (speed switch)

| | |
|---|--|
| Switching delay time | ≤20 ms |
| Technical data - mechanical design | |
| Size (flange) | ø105 mm |
| Shaft type | ø16...20 mm (blind hollow shaft) ø17 mm (cone shaft 1:10) |
| Flange | Support plate, 360° freely positionable |
| Protection EN 60529 | IP 66/IP 67 |
| Operating speed | ≤12000 rpm |
| Range of switching speed | ns (off) = ±2...12000 rpm |
| Operating torque typ. | 10 Ncm |
| Rotor moment of inertia | 950 gcm ² |
| Admitted shaft load | ≤450 N axial ≤650 N radial |
| Material | Housing: aluminium alloy Shaft: stainless steel |
| Corrosion protection | IEC 60068-2-52 Salt mist for ambient conditions CX (C5-M) according to ISO 12944-2 |
| Operating temperature | -40...+95 °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 |
| Weight approx. | 1.6 kg (depending on version) |
| Connection | Terminal box Flange connector M23 |

Optional

- Integrated speed switch
- Additional outputs incremental with zero pulse

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Terminal assignment

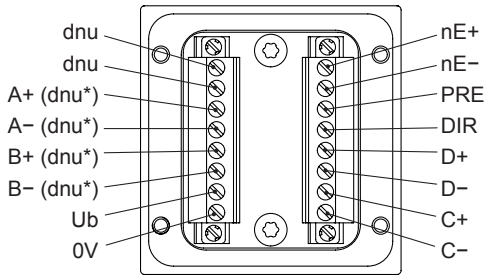
View A (see dimension)

Connecting terminal terminal box

SSI /

additional output I (HTL, TTL)

* Assignment depends on encoder version



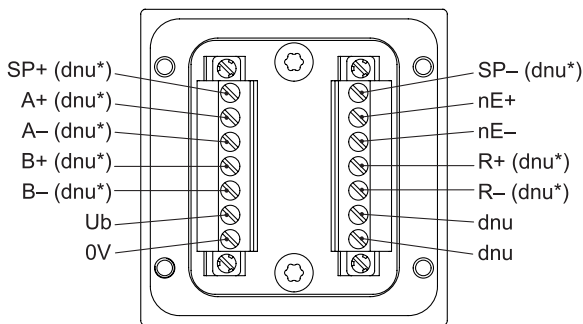
View B (see dimension)

Connecting terminal terminal box

Speed switch /

additional output II (HTL, TTL)

* Assignment depends on encoder version



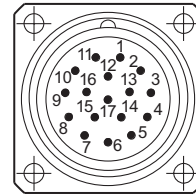
Terminal assignment

View C (see dimension)

Assignment flange connector

SSI / additional output I (HTL, TTL)

* Assignment depends on encoder version



Flange socket M23
(male, 17-pin),
CW

| Pin | Assignment |
|-----|-----------------|
| 1 | nE- |
| 2 | DIR |
| 3 | dnu |
| 4 | nE+ |
| 5 | PRE |
| 6 | dnu |
| 7 | Ub |
| 8 | C+ |
| 9 | C- |
| 10 | 0V |
| 11 | Internal shield |
| 12 | B+ (dnu*) |
| 13 | B- (dnu*) |
| 14 | D+ |
| 15 | A+ (dnu*) |
| 16 | A- (dnu*) |
| 17 | D- |

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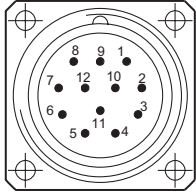
Terminal assignment

View D (see dimension)

Assignment flange connector

Speed switch / additional output II (HTL, TTL)

* Assignment depends on encoder version



Flange socket M23
(male, 12-pin),
CW

| Pin | Assignment |
|-----|------------|
| 1 | B- (dnu*) |
| 2 | nE- |
| 3 | R+ (dnu*) |
| 4 | R- (dnu*) |
| 5 | A+ (dnu*) |
| 6 | A- (dnu*) |
| 7 | SP+ (dnu*) |
| 8 | B+ (dnu*) |
| 9 | SP- (dnu*) |
| 10 | 0V |
| 11 | nE+ |
| 12 | Ub |

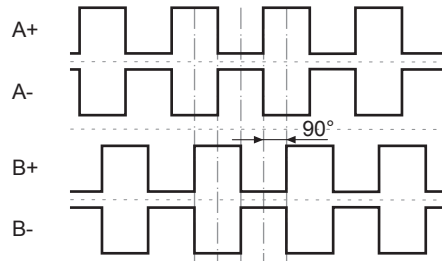
Terminal significance

| | |
|-----|---|
| Ub | Voltage supply |
| 0V | Ground |
| A+ | Output signal channel 1 |
| A- | Output signal channel 1 inverted |
| B+ | Output signal channel 2 (offset by 90° to channel 1) |
| B- | Output signal channel 2 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+ | DSL_OUT1 / speed switch (Open collector, solid state relay on request) |
| SP- | DSL_OUT2 / speed switch (0V, solid state relay on request) |
| D+ | SSI data+ |
| D- | SSI data- |
| C+ | SSI clock+ |
| C- | SSI clock- |
| dnu | Do not use |

Output signals

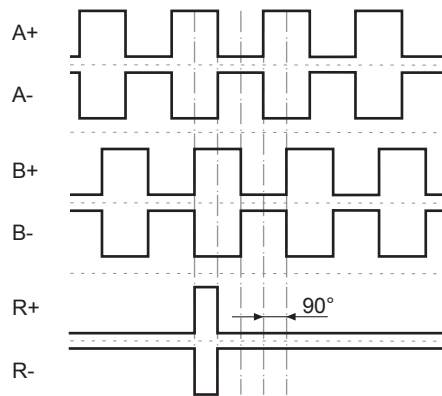
Additional output I (HTL/TTL)

At positive rotating direction (see dimension)



Additional output II (HTL/TTL)

At positive rotating direction (see dimension)



Trigger level

Incremental HTL/TTL

Electrically isolated:

The output TTL/HTL ($V_{in} = V_{out}$) at the additional output II is electrically isolated and requires a separate power supply.

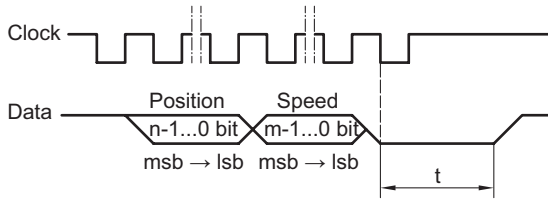
| Trigger level | TTL/RS422 |
|---------------------|--|
| High / Low | $\geq 2.5 \text{ V} / \leq 0.5 \text{ V}$ |
| Transmission length | $\leq 550 \text{ m @ } 100 \text{ kHz}$ |
| Output frequency | $\leq 600 \text{ kHz}$ |
| Trigger level | TTL/HTL ($V_{in} = V_{out}$) |
| High / Low | $\geq 2.5 \text{ V} / \leq 0.5 \text{ V (TTL)}$ $\geq U_b - 3 \text{ V} / \leq 1.5 \text{ V (HTL)}$ |
| Transmission length | $\leq 550 \text{ m @ } 100 \text{ kHz (TTL)}$ $\leq 350 \text{ m @ } 100 \text{ kHz (HTL)}$ |
| Output frequency | $\leq 600 \text{ kHz (TTL); } \leq 350 \text{ kHz (HTL)}$ |

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Data transfer



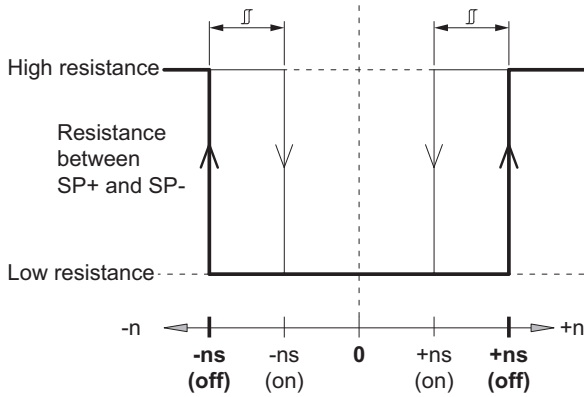
Clock frequency 100 kHz...2 MHz

Monoflop time (t) 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).

Switching characteristics speed switch

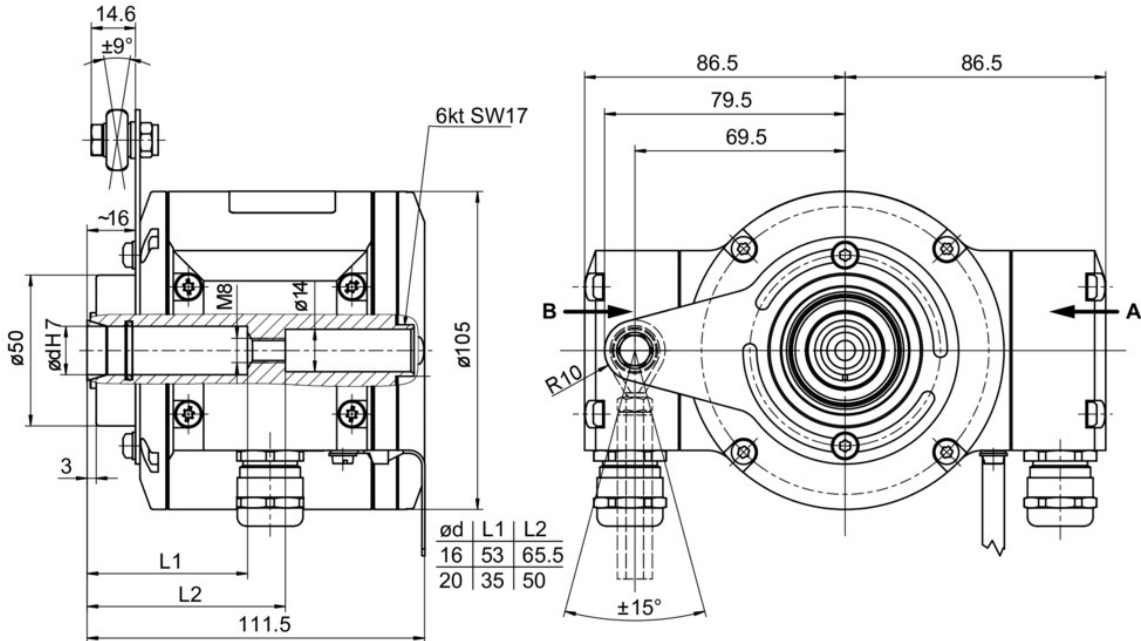


| n | Speed |
|------------------|---|
| +ns (off) | Switch-off speed at shaft rotation in positive rotating direction (<i>see dimension</i>). |
| -ns (off) | Switch-off speed at shaft rotation in negative rotating direction (<i>see dimension</i>). |
| | Switching hysteresis Δ : 10...100 % (factory setting = 10 % min. 1 Digit) |
| +ns (on) | Switch-on speed at shaft rotation in positive rotating direction (<i>see dimension</i>). |
| -ns (on) | Switch-on speed at shaft rotation in negative rotating direction (<i>see dimension</i>). |

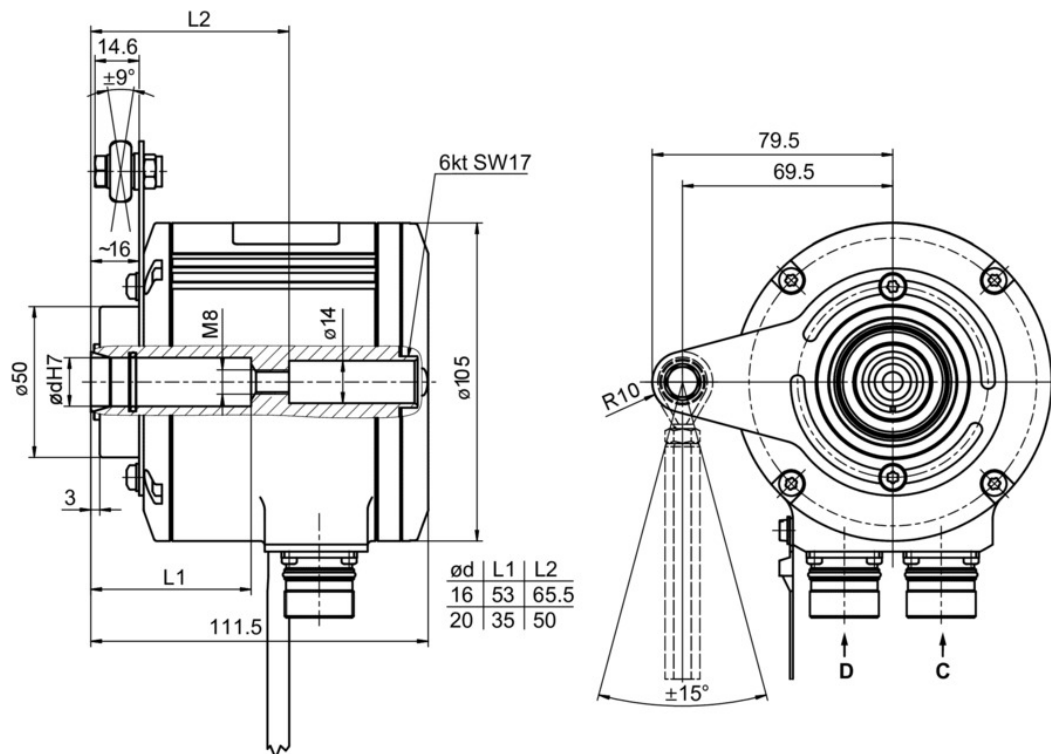
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Dimensions



Blind hollow shaft with terminal box

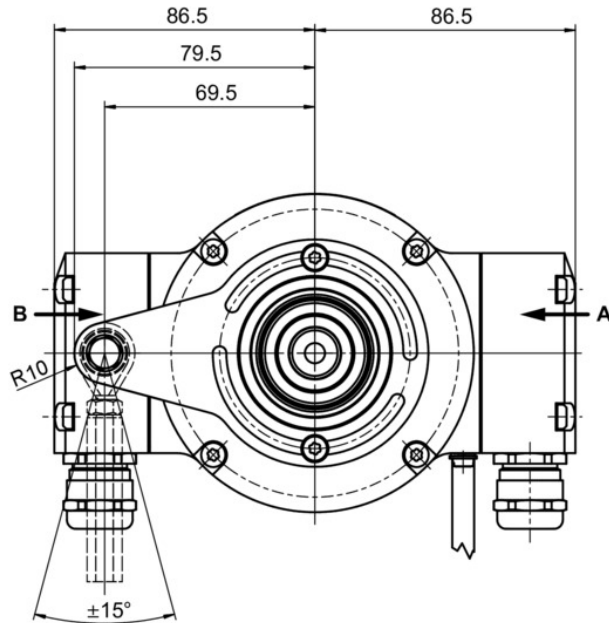
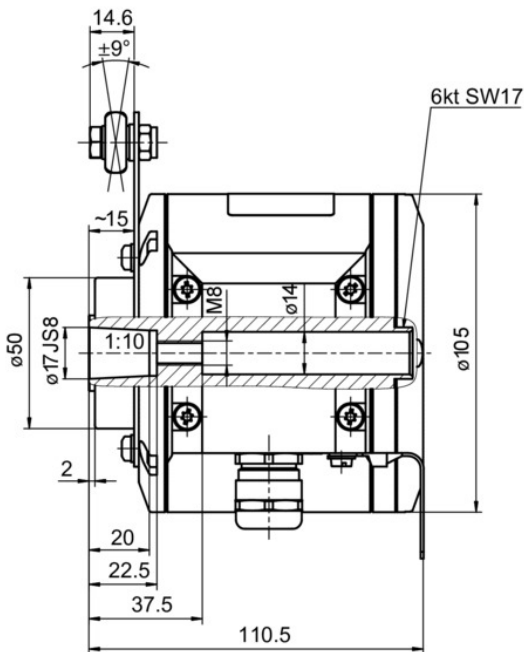


Blind hollow shaft with connector M23

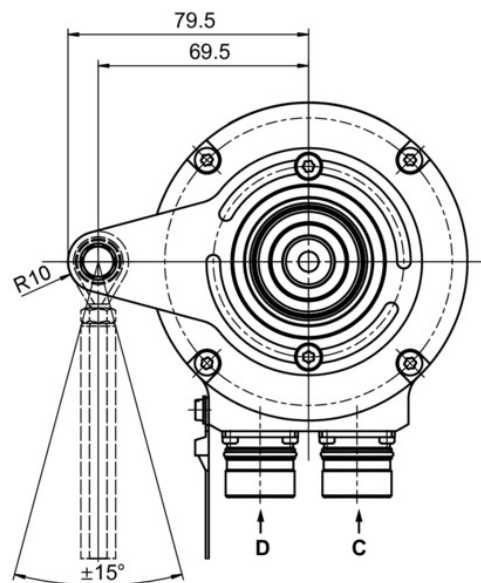
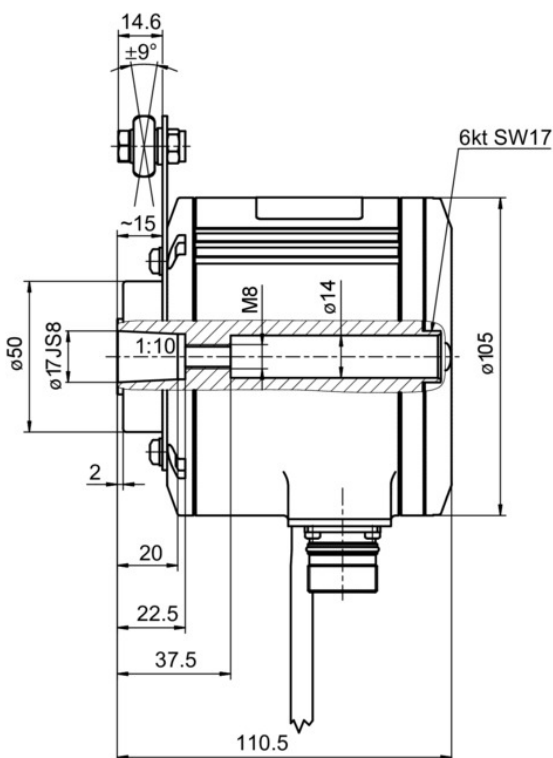
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Blind hollow shaft or cone shaft (1:10)
ST and MT 20 bit each / Speed switch

Dimensions



Cone shaft with terminal box



Cone shaft with connector M23

HMG10-B - SSI

Blind hollow shaft or cone shaft (1:10)

ST and MT 20 bit each / Speed switch

Ordering reference

| | HMG10 | # | - | B | H | # | . | # | # | ## | . | # | # | # | # | # | . | # |
|--|-------|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|---|
| Product | HMG10 | | | | | | | | | | | | | | | | | |
| Absolute encoder | HMG10 | | | | | | | | | | | | | | | | | |
| Digital speed switch | | | | | | | | | | | | | | | | | | |
| With ⁽¹⁾ | | | | | | | | | | | | | | | | | | |
| Without | | | | | | | | | | | | | | | | | | |
| Shaft type | | | | | | | | | | | | | | | | | | |
| Blind hollow shaft | | | | | | | | | | | | | | | | | | |
| Flange (Hollow shaft) | | | | | | | | | | | | | | | | | | |
| Support (Support plate) for torque arm, hybrid bearings | | | | | | | | | | | | | | | | | | |
| Protection class | | | | | | | | | | | | | | | | | | |
| IP 66 and IP 67, optimized for dusty, abrasive environment | | | | | | | | | | | | | | | | | | |
| IP 66 and IP 67, optimized for oily, wet environment | | | | | | | | | | | | | | | | | | |
| Blind hollow shaft | | | | | | | | | | | | | | | | | | |
| Ø16 mm, central screw | | | | | | | | | | | | | | | | | | |
| Ø17 mm cone 1:10, central screw | | | | | | | | | | | | | | | | | | |
| Ø20 mm, central screw | | | | | | | | | | | | | | | | | | |
| Connection | | | | | | | | | | | | | | | | | | |
| Terminal box radial, cable gland M20 | | | | | | | | | | | | | | | | | | |
| Terminal box 2x radial, cable gland M20 | | | | | | | | | | | | | | | | | | |
| Flange socket radial, M23, 17 pin, male, CW | | | | | | | | | | | | | | | | | | |
| Flange socket radial, 1x M23, 17 pin, male, CW + 1x M23, 12 pin, male, CW | | | | | | | | | | | | | | | | | | |
| Flange socket radial, 1x M23, 17 pin, male, CW + 1x M23, 12 pin, male, CCW | | | | | | | | | | | | | | | | | | |
| Supply voltage | | | | | | | | | | | | | | | | | | |
| 4,75...30 VDC, SSI binary | | | | | | | | | | | | | | | | | | |
| 4,75...30 VDC, SSI Gray | | | | | | | | | | | | | | | | | | |
| Resolution singleturn position | | | | | | | | | | | | | | | | | | |
| No position signal | | | | | | | | | | | | | | | | | | |
| 10 Bit | | | | | | | | | | | | | | | | | | |
| 11 Bit | | | | | | | | | | | | | | | | | | |
| 12 Bit | | | | | | | | | | | | | | | | | | |
| 13 Bit | | | | | | | | | | | | | | | | | | |
| 14 Bit | | | | | | | | | | | | | | | | | | |
| 15 Bit | | | | | | | | | | | | | | | | | | |
| 16 Bit | | | | | | | | | | | | | | | | | | |
| 17 Bit | | | | | | | | | | | | | | | | | | |
| 18 Bit | | | | | | | | | | | | | | | | | | |
| 19 Bit | | | | | | | | | | | | | | | | | | |
| 20 Bit | | | | | | | | | | | | | | | | | | |

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Resolution multiturn position

| | |
|---------------------|---|
| No multiturn signal | 0 |
| 10 Bit | A |
| 11 Bit | 1 |
| 12 Bit | 2 |
| 13 Bit | 3 |
| 14 Bit | 4 |
| 15 Bit | 5 |
| 16 Bit | 6 |
| 17 Bit | 7 |
| 18 Bit | 8 |
| 19 Bit | 9 |
| 20 Bit | B |

Resolution speed

| | |
|-------------------|---|
| No speed signal | 0 |
| 10 Bit, ±6000 rpm | A |
| 11 Bit, ±6000 rpm | 1 |
| 12 Bit, ±6000 rpm | 2 |
| 13 Bit, ±6000 rpm | 3 |
| 14 Bit, ±6000 rpm | 4 |
| 15 Bit, ±6000 rpm | 5 |
| 16 Bit, ±6000 rpm | 6 |
| 17 Bit, ±6000 rpm | 7 |
| 18 Bit, ±6000 rpm | 8 |
| 19 Bit, ±6000 rpm | 9 |
| 20 Bit, ±6000 rpm | B |

Resolution supplement I

| | |
|---|---|
| No additional output I | 0 |
| 8192 ppr TTL/HTL push-pull (Vin=Vout), 4 channels | Q |
| 8192 ppr TTL (RS422), 4 channels | P |
| 5000 ppr TTL/HTL push-pull (Vin=Vout), 4 channels | G |
| 5000 ppr TTL (RS422), 4 channels | H |
| 4096 ppr TTL/HTL push-pull (Vin=Vout), 4 channels | K |
| 4096 ppr TTL (RS422), 4 channels | J |
| 3072 ppr TTL/HTL push-pull (Vin=Vout), 4 channels | 7 |
| 3072 ppr TTL (RS422), 4 channels | 8 |
| 2048 ppr TTL/HTL push-pull (Vin=Vout), 4 channels | 9 |
| 2048 ppr TTL (RS422), 4 channels | 4 |
| 1024 ppr TTL/HTL push-pull (Vin=Vout), 4 channels | 5 |
| 1024 ppr TTL (RS422), 4 channels | 6 |
| 512 ppr TTL/HTL push-pull (Vin=Vout), 4 channels | 1 |
| 512 ppr TTL (RS422), 4 channels | 2 |

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| | HMG10 | # | - | B | H | # | . | # | # | ## | . | # | # | # | # | # | . | # | |
|--|-------|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|---|---|
| Resolution supplement II | | | | | | | | | | | | | | | | | | | |
| No additional output II | | | | | | | | | | | | | | | | | | | 0 |
| 8192 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | | | Q |
| 8192 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | | | P |
| 5000 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | | | G |
| 5000 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | | | H |
| 4096 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | | | K |
| 4096 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | | | J |
| 3072 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | | | 7 |
| 3072 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | | | 8 |
| 2048 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | | | 9 |
| 2048 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | | | 4 |
| 1024 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | | | 5 |
| 1024 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | | | 6 |
| 512 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated | | | | | | | | | | | | | | | | | | | 1 |
| 512 ppr TTL (RS422), 6 channels | | | | | | | | | | | | | | | | | | | 2 |
| Operating temperature | | | | | | | | | | | | | | | | | | | |
| -40...+85 °C | | | | | | | | | | | | | | | | | | | A |
| -40...+95 °C | | | | | | | | | | | | | | | | | | | G |

(1) Please specify the exact switching speed in addition to the part number (factory setting).

It may happen that not all variants of the type code can be combined. Any restrictions can be found in the web configurator at www.baumer.com or on request.

Accessories

Mounting accessories

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

Connectors and cables

| | |
|----------|---|
| | Sensor cable for encoders HEK 8 |
| | Sensor cable for encoders HEK 17 |
| 11068577 | Mating connector M23, solder version, 12-pin, CCW |
| 11068551 | Mating connector M23, solder version, 17-pin, CCW |
| 11172482 | Mating connector M23 (11 pins assigned) 17-pin, CCW with sensor cable HEK 17, length 1 m |
| 11172481 | Mating connector M23 (11 pins assigned) 17-pin, CCW with sensor cable HEK 17, length 3 m |
| 11172499 | Mating connector M23 (11 pins assigned) 17-pin, CCW with sensor cable HEK 17, length 5 m |
| 11172580 | Mating connector M23 (11 pins assigned) 17-pin, CCW with sensor cable HEK 17, length 10 m |
| 11172463 | Mating connector M23 (17 pins assigned) 17-pin, CCW with sensor cable HEK 17, length 3 m |