

## HMG10P-B - EtherCAT

Blind hollow shaft or cone shaft (1:10) / EtherCAT / 13 bit ST / 16 bit MT

Speed switch, number of pulses and switching speed freely programmable

### Overview

- Interface EtherCAT
- Magnetic sensing method
- Resolution: singleturn 13 bit, multiturn 16 bit
- 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	10...30 VDC
Short-circuit proof	Yes
Consumption w/o load	≤200 mA
Initializing time	≤ 500 ms after power on
Interface	EtherCAT
Function	Multiturn
Transmission rate	100 MBaud
Device address	Automatic address designation
Steps per revolution	8192 / 13 bit
Number of revolutions	65536 / 16 bit
Additional outputs	Square-wave TTL/HTL, TTL/RS422
Sensing method	Magnetic
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Programming interface	RS485 (≤600 m)
Programmable parameters	Bus system: see bus features Additional output (number of pulses), switch-off and switch-on speeds
Diagnostic function	Position or parameter error
Status indicator	DUO-LED and LEDs link/activity in bus connecting box 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)

#### Technical data - electrical ratings (speed switch)

Output switching capacity	30 VDC; ≤100 mA
Switching delay time	≤20 ms
<b>Technical data - mechanical design</b>	
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	≤6000 rpm
Range of switching speed	ns (off) = ±2...6000 rpm, factory setting 6000 rpm
Operating torque typ.	10 Ncm
Rotor moment of inertia	950 gcm <sup>2</sup>
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) accord- ing to ISO 12944-2
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
Weight approx.	2.2 kg (depending on version)
Connection	Bus connecting box Terminal box incremental

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### Optional

- Integrated speed switch programmable
- Additional output incremental programmable

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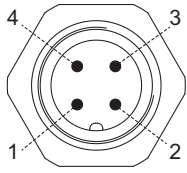
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## Terminal assignment

### View A1 (see dimension)

View into connector bus "voltage supply"

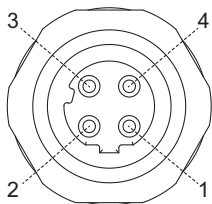


Connector M12 (male)  
4-pin, A-coded

Pin	Connection
1	UB
2	dnu
3	GND
4	dnu

### View A2 and A3 (see dimension)

View into connector bus „data transmission“



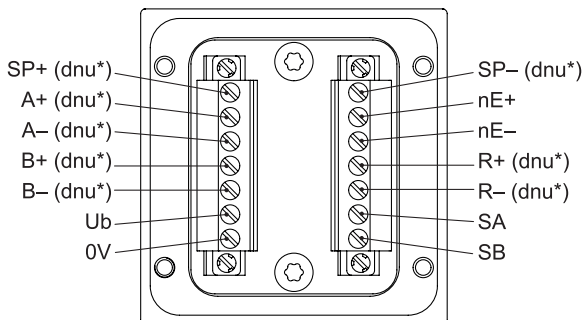
Connector M12 (female)  
4-pin, D-coded

Pin	Connection
1	TxD+
2	RxD+
3	TxD-
4	RxD-

### View B (see dimension)

Connecting terminal terminal box  
Programming interface / speed switch /  
additional output II (HTL, TTL)

\* Assignment depends on encoder version



## Terminal significance

### Bus interface

Connection	Description
GND	Ground for UB
UB	Voltage supply 10...30 VDC
TxD+	Transmission data+
TxD-	Transmission data-
RxD+	Receiving data+
RxD-	Receiving data-
dnu	Do not use

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
SP+	DSL_OUT1 / speed switch (open collector, solid state relay on request)
SP-	DSL_OUT2 / speed switch (0V, solid state relay on request)
SA	RS485+ / programming interface
SB	RS485- / programming interface
dnu	Do not use

## EtherCAT features

Bus protocol	EtherCAT
Device profile	CoE (CANopen over EtherCAT) DSP406
Features	<ul style="list-style-type: none"> <li>100 MBaud Ethernet</li> <li>Automatic address designation</li> <li>Distributed clock for precise synchronization. Optional device configuration as „Reference Clock“</li> <li>Factory setting 10 byte PDO, configurable 4 byte PDO / 2 byte PDO for shorter cycle times</li> </ul>
Process data	Position value, Warnings, System time
Cycle times	Depending on sensor type, enabled scaling functionality and length of PDO. Minimum cycle time: 62,5 µs
Synchronization	<ul style="list-style-type: none"> <li>0x00 Free Run, not synchronized</li> <li>0x03 Distributed clocks DC, synchronized with SYNCO/SYNC1 Event</li> </ul>

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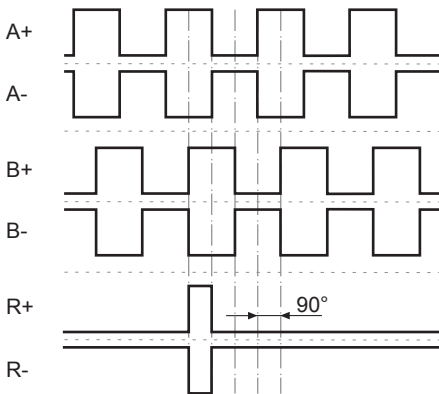
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## Output signals

### Additional output II (HTL/TTL)

At positive rotating direction (see dimension)



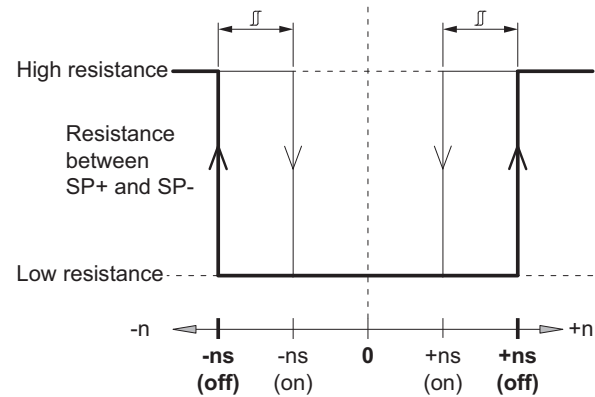
## Trigger level

### 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)

## Switching characteristics speed switch



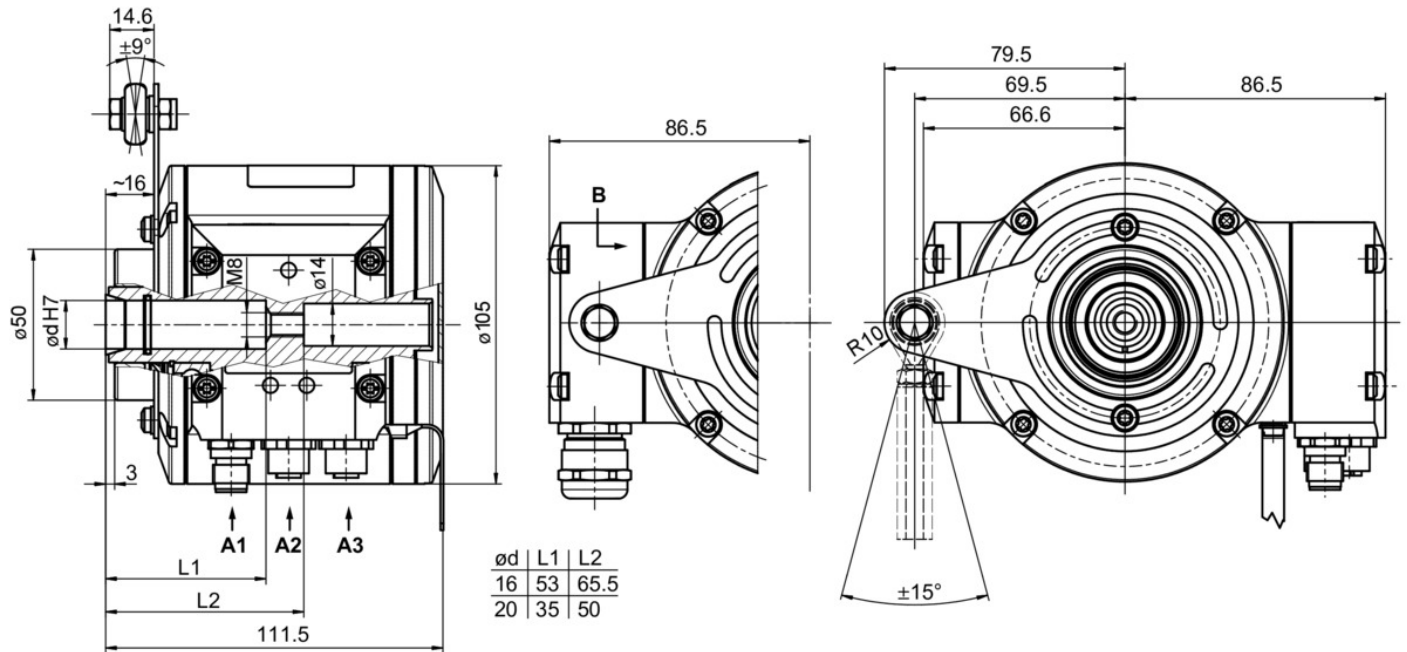
$n$	Speed
<b>+ns (off)</b>	Switch-off speed at shaft rotation in positive rotating direction (see dimension).
<b>-ns (off)</b>	Switch-off speed at shaft rotation in negative rotating direction (see dimension).
	Switching hysteresis $\Delta$ : 10...100 % (factory setting = 10 % min. 1 Digit)
<b>+ns (on)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

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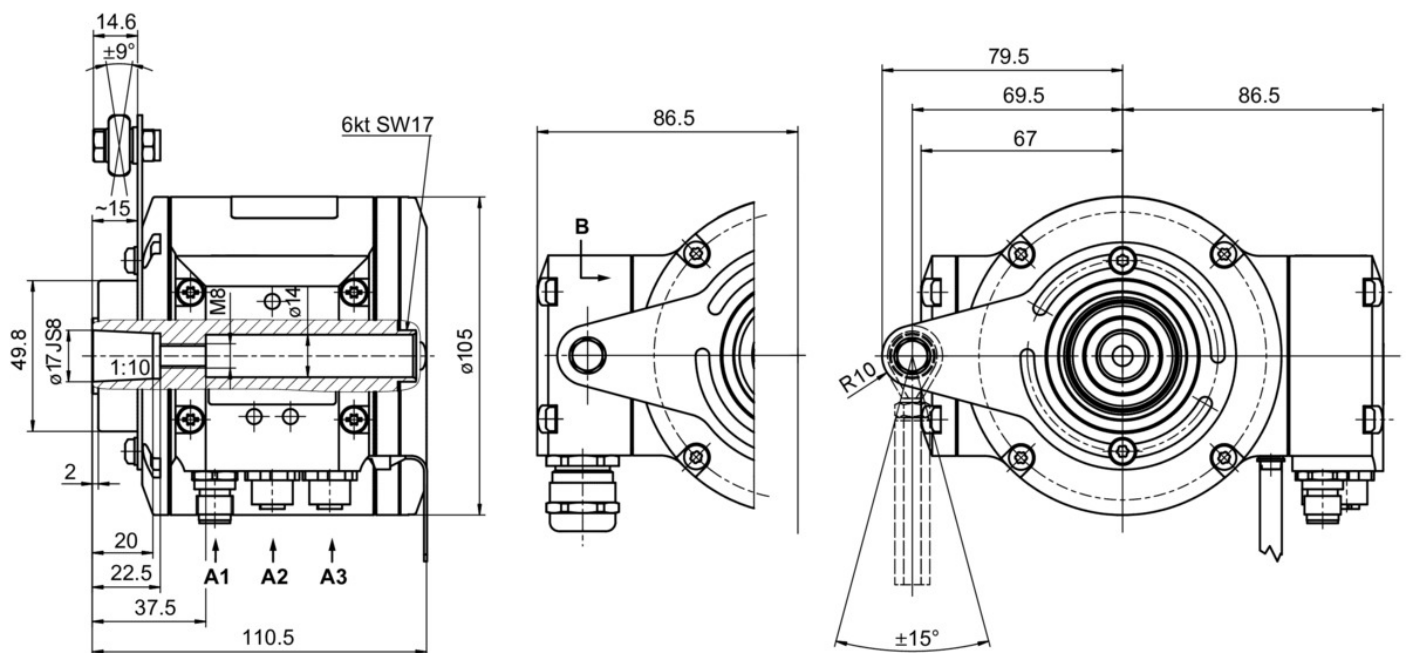
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## Dimensions



Blind hollow shaft with terminal box



Cone shaft with terminal box

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**Ordering reference**

	HMG10P	#	-	B	H	#	.	#	G	EC	.	3	#	0	0	#	.	A
<b>Product</b>	HMG10P																	
Absolute encoder	HMG10P																	
<b>Digital speed switch</b>																		
Without	-																	
With	D																	
<b>Shaft type</b>																		
Blind hollow shaft	B																	
<b>Flange (Hollow shaft)</b>																		
Support (Support plate) for torque arm, hybrid bearings	H																	
<b>Protection class</b>																		
IP 66 and IP 67, optimized for dusty, abrasive environment	D																	
IP 66 and IP 67, optimized for oily, wet environment	L																	
<b>Blind hollow shaft</b>																		
Ø16 mm, central screw	6																	
Ø17 mm cone 1:10, central screw	7																	
Ø20 mm, central screw	Z																	
<b>Connection</b>																		
Bus connecting box with 3 connectors M12, radial + terminal box with 1 cable gland M20, radial	G																	
<b>Supply voltage (field bus)</b>																		
10...30 VDC, EtherCAT	EC																	
<b>Resolution singleturn position</b>																		
13 Bit	3																	
<b>Resolution multiturn position</b>																		
No multiturn signal	0																	
16 Bit	6																	
<b>Resolution speed</b>																		
No speed signal	0																	
<b>Resolution supplement I</b>																		
No additional output I	0																	
<b>Resolution supplement II</b>																		
No additional output II	0																	
1024 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated	5																	
1024 ppr TTL (RS422), 6 channels	6																	
<b>Operating temperature</b>																		
-40...+85 °C																		

- (1) Switching speed 6000 rpm / factory setting, programmable  
 (2) Factory setting, programmable

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### Accessories

#### Mounting accessories

11043628	Torque arm M6, length 67...70 mm
11004078	Torque arm M6, length 120...130 mm ( $\geq 71$ mm)
11002915	Torque arm M6, length 425...460 mm ( $\geq 131$ mm)
11054917	Torque arm M6 insulated, length 67...70 mm
11072795	Torque arm M6 insulated, length 120...130 mm ( $\geq 71$ mm)
11082677	Torque arm M6 insulated, length 425...460 mm ( $\geq 131$ mm)
11077197	Mounting kit for torque arm size M6 and earthing strap
11077087	Mounting and dismounting set
11238694	CAM12.WS13-11238694

#### Programming accessories

11190106	Z-PA.SDL.1 - WLAN-Adapter
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