Absolute encoders

HMG10P-T - EtherCAT

Through hollow shaft / 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 adress	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
Technical data - mechanical design	
Size (flange)	ø105 mm
Shaft type	ø16...20 mm (through hollow shaft)
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 gcm²
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...+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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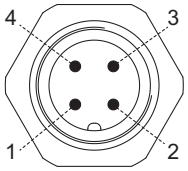
Terminal assignment

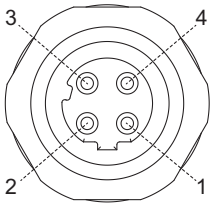
View A1 *(see dimension)*
View into connector bus "voltage supply"



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

Pin	Connection
1	UB
2	dnu
3	GND
4	dnu

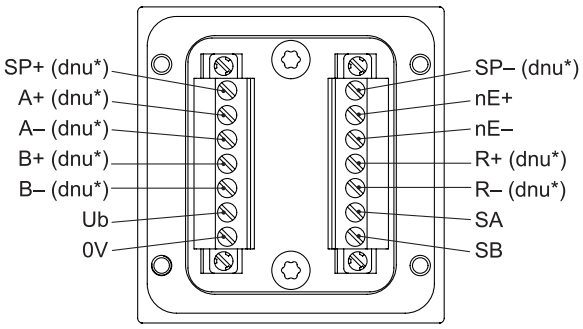
View A2 and A3 *(see dimension)*
View into connector bus „data transmission“



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	▪ 100 MBaud Ethernet ▪ Automatic address designation ▪ Distributed clock for precise synchronization. Optional device configuration as „Reference Clock“ ▪ Factory setting 10 byte PDO, configurable 4 byte PDO / 2 byte PDO for shorter cycle times
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	▪ 0x00 Free Run, not synchronized ▪ 0x03 Distributed clocks DC, synchronized with SYNCO/SYNC1 Event

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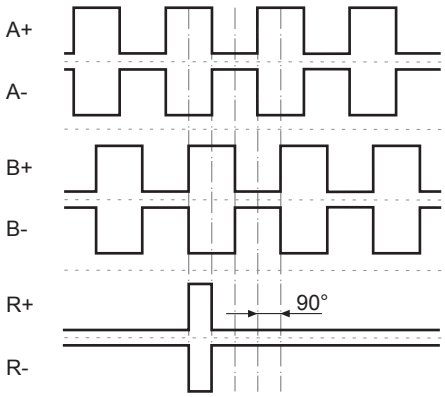
Output signals

Additional output II (HTL/TTL)

At positive rotating direction *(see dimension)*



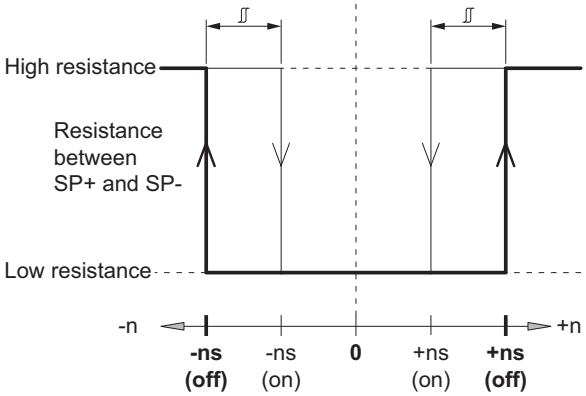
Trigger level

Incremental HTL/TTL

Electrically isolated:
The output TTL/HTL (Vin = Vout) at the additional output II is electrically isolated and requires a separate power supply.

Trigger level	**TTL/RS422**
High / Low	≥2.5 V / ≤0.5 V
Transmission length	≤550 m @ 100 kHz
Output frequency	≤600 kHz
Trigger level	**TTL/HTL (Vin = Vout)**
High / Low	≥2.5 V / ≤0.5 V (TTL) ≥Ub -3 V / ≤1.5 V (HTL)
Transmission length	≤550 m @ 100 kHz (TTL) ≤350 m @ 100 kHz (HTL)
Output frequency	≤600 kHz (TTL); ≤350 kHz (HTL)

Switching characteristics speed switch



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

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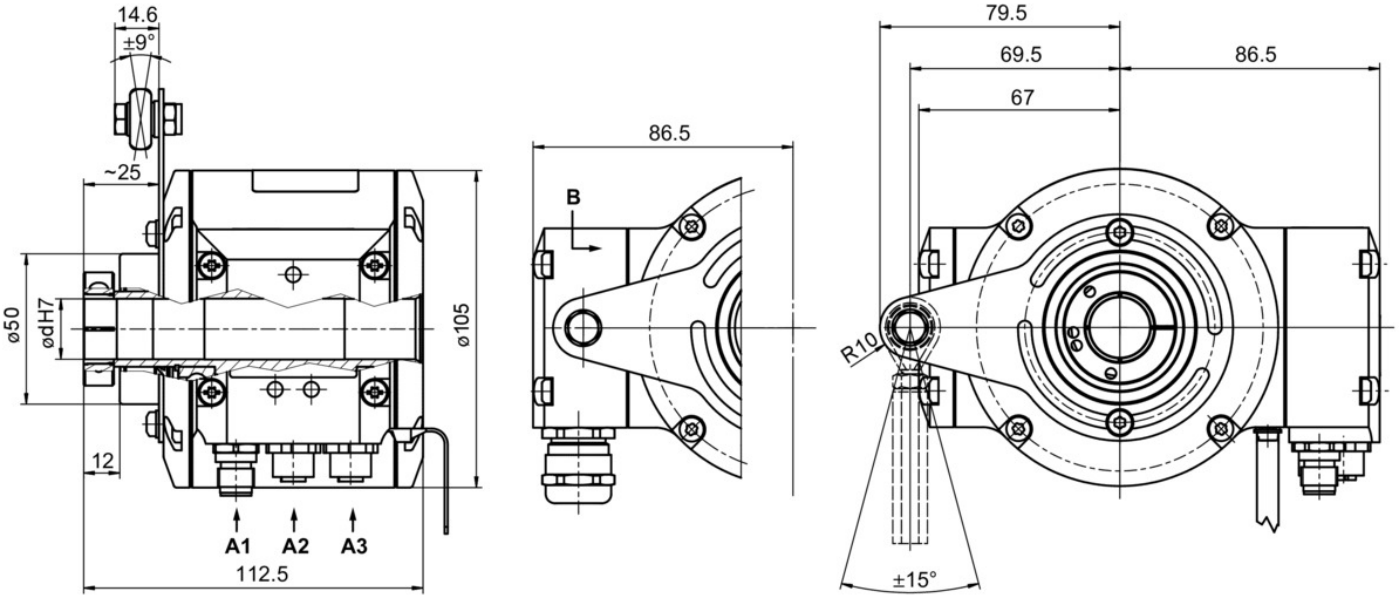
Dimensions



Through hollow shaft with terminal box

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Ordering reference

	HMG10P	#	-	T	H	#	.	#	G	EC	.	3	#	0	0	#	.	A
Product																		
Absolute encoder	HMG10P																	
Digital speed switch																		
Without		-																
With		D																
Shaft type																		
Through hollow shaft				T														
Flange (Hollow shaft)																		
Support (Support plate) for torque arm, hybrid bearings					H													
Protection class																		
IP 66 and IP 67, optimized for dusty, abrassive environment						D												
IP 66 and IP 67, optimized for oily, wet environment						L												
Through hollow shaft																		
Ø16 mm, clamping ring, A end								C										
Ø20 mm, clamping ring, A end								F										
Ø16 mm, keyway								P										
Connection																		
Bus connecting box with 3 connectors M12, radial + terminal box with 1 cable gland M20, radial									G									
Supply voltage (field bus)																		
10...30 VDC, EtherCAT										EC								
Resolution singleturn position																		
13 Bit												3						
Resolution multiturn position																		
No multiturn signal													0					
16 Bit													6					
Resolution speed																		
No speed signal														0				
Resolution supplement I																		
No additional output I															0			
Resolution supplement II																		
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		
Operating temperature																		
-40...+85 °C																		A

(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 (≥71 mm)
11002915	Torque arm M6, length 425...460 mm (≥131 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
11238694	CAM12.WS13-11238694

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