Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
DeviceNet / 13 bit ST / 16 bit MT / Speed switch
Number of pulses and switching speed freely programmable

HMG10P-B - DeviceNet

HMG10P-B - picture similar

Features

– **Interface DeviceNet**
– **Magnetic sensing method**
– **Resolution: singleturn 13 bit, multiturn 16 bit**
– **Function display via LEDs**
– **Multiturn sensing with Energy Harvesting technology, without gear or battery**
– **Two-sided bearing system with hybrid bearings**
– **Special protection against corrosion C5-M**

Optional

– **Integrated speed switch programmable**
– **Additional output incremental programmable**

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	DeviceNet
Function	Multiturn
Transmission rate	125...500 kBaud
Device adress	Rotary switches in bus connecting box
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 (bus connecting box) 4 LEDs in device back side
Approvals	CE, UL approval / E256710

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 DIN 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
Materials	Housing: aluminium alloy Shaft: stainless steel
Corrosion protection	IEC 60068-2-52 Salt mist for ambient conditions C5-M (CX) 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

Technical data - electrical ratings (speed switches)

Switching accuracy	±2 % (or 1 Digit)
Switching outputs	1 output (Open collector, solid state relay on request)
Output switching capacity	30 VDC; ≤100 mA
Switching delay time	≤20 ms

Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
DeviceNet / 13 bit ST / 16 bit MT / Speed switch
Number of pulses and switching speed freely programmable

HMG10P-B - DeviceNet

Part number

HMG10P		-B	H		.		DN	.3	00		.A

Additional output
- 0 Without
- 5 1024 ppr* TTL/HTL (Vin=Vout), 6 channels, electrically isolated
- 6 1024 ppr* TTL/RS422, 6 channels

Resolution multiturn
- 0 Without
- 6 16 bit

Voltage supply / interface
- DN 10…30 VDC, DeviceNet

Connection
- F 1x bus connecting box with 3 cable glands M16, radial + 1x terminal box with 1 cable gland M20, radial
- Z 1x bus connecting box with 2 connectors M12, radial + 1x terminal box with 1 cable gland M20, radial

Shaft diameter
- 6 ø16 mm, central screw
- 7 ø17 mm cone 1:10, central screw
- Z ø20 mm, central screw

Protection
- D IP 66 and IP 67, optimized for dusty environments
- L IP 66 and IP 67, optimized for oily and wet environments

Flange
- H Support for torque arm, shaft insulation hybrid bearing

Speed switch
- Without
- D With speed switch / switching speed 6000 rpm* (Standard: Open collector, solid state relay on request)

* Factory setting, programmable

Absolute encoders - bus interfaces

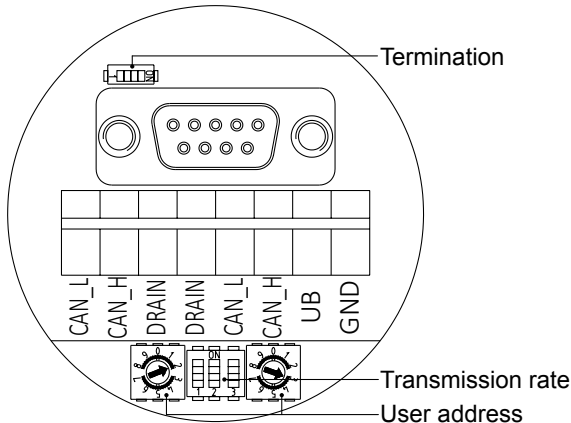**Blind hollow shaft or cone shaft (1:10)**
DeviceNet / 13 bit ST / 16 bit MT / Speed switch
Number of pulses and switching speed freely programmable
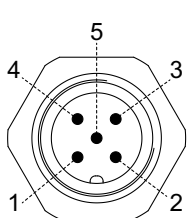
HMG10P-B - DeviceNet

DeviceNet - Terminal assignment

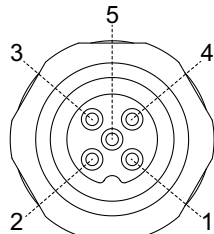**View A** [1] - View inside bus connecting box

Termination

Transmission rate
User address

View A[1] [1] and A[2] [1] - View into connector

| male / female	Connection	Description
1	DRAIN	Shield
2	UB	Voltage supply 10...30 VDC
3	GND	Ground for UB
4	CAN_H	CAN Bus signal (dominant HIGH)
5	CAN_L	CAN Bus signal (dominant LOW)

Connector M12
(male, **A[1]** [1])
5-pin, A-coded

Connector M12
(female, **A[2]** [1])
5-pin, A-coded

Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.

DeviceNet - Features

Bus protocol	DeviceNet
Device profile	Device Profil for Encoders V 1.0
Operating modes	I/O-Polling Cyclic Change of State
Preset value	The „Preset" parameter can be used to set the encoder to a pre-defined value that corresponds to a specific axis position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Parameter functions	Rotating direction: The relationship between the rotating direction and rising or falling output code values can be set in the operating parameter. Scaling: The parameter values set the number of steps per turn and the overall resolution.
Diagnostic	The encoder supports the following error warnings: - Position and parameter error
Factory setting	User address 00

DeviceNet - Termination
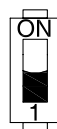
ON = final user
OFF = user xx

DeviceNet - User address
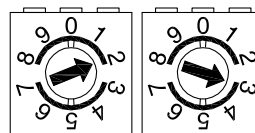
Defined by rotary switch.
Example: User address 23

DeviceNet - Transmission rate

Transmission rat	Dip switch position		
	1	2	3
125 kBaud*	X	OFF	OFF
250 kBaud	X	OFF	ON
500 kBaud	X	ON	OFF
125 kBaud	X	ON	ON

X = Without function
* Factory setting

[1] See dimensions

Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
DeviceNet / 13 bit ST / 16 bit MT / Speed switch
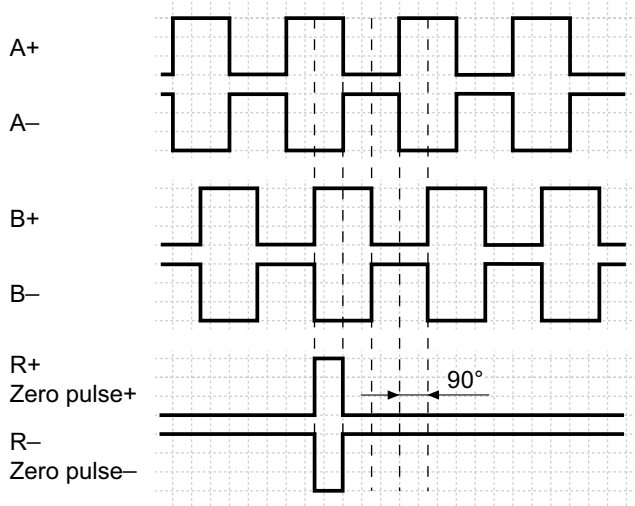### Number of pulses and switching speed freely programmable

HMG10P-B - DeviceNet

Speed switch / additional output incremental - Terminal significance

Ub [2]	Voltage supply
0V [2]	Ground
A+ [2]	Output signal channel 1
A− [2]	Output signal channel 1 inverted
B+ [2]	Output signal channel 2 (offset by 90° to channel 1)
B− [2]	Output signal channel 2 inverted
R+ [2]	Zero pulse (reference signal)
R− [2]	Zero pulse inverted
nE+	System OK+ / error output
nE−	System OK− / error output inverted
SP+ [3]	DSL_OUT1 / speed switch (Open collector, solid state relay on request)
SP− [3]	DSL_OUT2 / speed switch (0V, solid state relay on request)
SA	RS485+ / programming interface
SB	RS485− / programming interface
dnu	Do not use

Speed switch / additional output incremental - Terminal assignment terminal box

View B [1]

dnu / SP+ [3]
dnu / A+ [2]
dnu / A− [2]
dnu / B+ [2]
dnu / B− [2]
Ub [2]
0V [2]

dnu / SP− [3]
nE+
nE−
dnu / R+ [2]
dnu / R− [2]
SA
SB

Additional output incremental - Trigger level

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)

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

[1] See dimensions
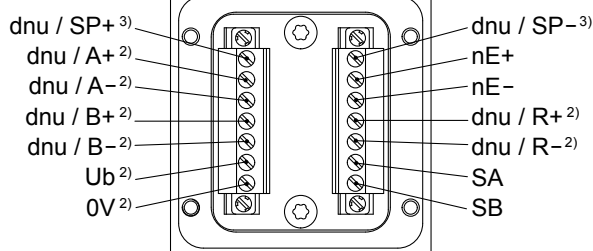[2] Additional output incremental (option)
[3] Speed switch (option)

Additional output incremental - Output signals

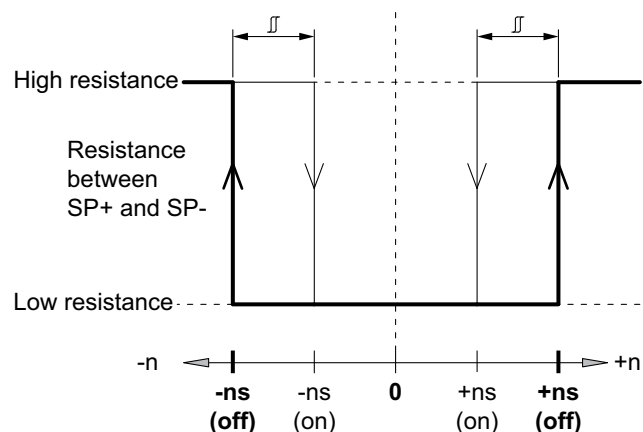Version with additional output incremental at positive rotating direction [1]

A+

A−

B+

B−

R+
Zero pulse+

R−
Zero pulse−

90°

Speed switch - Switching characteristics

High resistance

Resistance between SP+ and SP-

Low resistance

-n

-ns (off)   -ns (on)   0   +ns (on)   +ns (off)

+n

n = Speed

+ns (off) = Switch-off speed at shaft rotation in positive rotating direction [1].

-ns (off) = Switch-off speed at shaft rotation in negative rotating direction [1].

Switching hysteresis ⎍:
5...100 % (factory setting = 10 % min. 1 Digit)

+ns (on) = Switch-on speed at shaft rotation in positive rotating direction [1].

-ns (on) = Switch-on speed at shaft rotation in negative rotating direction [1].

Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
DeviceNet / 13 bit ST / 16 bit MT / Speed switch
Number of pulses and switching speed freely programmable

HMG10P-B - DeviceNet

Accessories

Connectors and cables

11191145	Adapter cable for programming the HMG10P/PMG10P bus interfaces series D-SUB connector (male) 15-pin with connecting cable, D-SUB connector (male) 9-pin and 7-pin connecting terminal

Mounting accessories

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

Programming accessories

11190106	Z-PA.SDL.1 - *WLAN-Adapter* Programming unit for xMG10P series

Absolute encoders - bus interfaces
Blind hollow shaft or cone shaft (1:10)
DeviceNet / 13 bit ST / 16 bit MT / Speed switch
Number of pulses and switching speed freely programmable

HMG10P-B - DeviceNet

Dimensions

Cone shaft

Blind hollow shaft

Drawing 90° rotated

Jack-screw thread

17 a/f

ø14
M8
ø69.5
ø50
ød H7
M8
ø12.5
ø105

ød	L1	L2
16	53	65.5
20	35	50

~5
~5.5
14.6
±9°

ø17 JS8
1:10

2
20
22.5
37.5
111

L1
L2
111.5
3x M16x1.5 (Cable ø5-9)

A¹ A²

Programming interface
Additional output incremental (option)
Speed switch (option)

Positive rotating direction

86.5
79.5
69.5
86.5

B
R10
A
DeviceNet

Accessory
±15°
ø6.5