

Absolute encoders - bus interfaces

Through hollow shaft

DeviceNet / 13 bit ST / 16 bit MT / Speed switch

HMG10-T - DeviceNet



HMG10-T - 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
- Additional output incremental with zero pulse

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
Programmable parameters	Steps per revolution Number of revolutions Preset, scaling, rotating direction
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 - 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

Technical data - mechanical design

Size (flange)	ø105 mm
Shaft type	ø16...20 mm (through hollow shaft)
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 gcm ²
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

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Part number

HMG10

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Additional output*

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

Resolution multiturn

- 0 Without
- 6 16 bit

Voltage supply / interface

DN 10...30 VDC, DeviceNet

Connection

- 5 1x bus connecting box with 3 cable glands M16, radial
- 1 1x bus connecting box with 2 connectors M12, radial
- 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

- C ø16 mm, clamping ring on drive side
- F ø20 mm, clamping ring on drive side
- P ø16 mm, clamping ring on drive side with keyway

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 *)**)
(Standard: Open collector, solid state relay on request)

* Only for connection with 1x bus connecting + 1x terminal box (F or Z)

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

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Part number - tables	Accessories
Additional output*	Mounting accessories
0 (Without)	11043628 Torque arm M6, length 67-70 mm
Q (8192 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)	11004078 Torque arm M6, length 120-130 mm (shortenable ≥71 mm)
P (8192 ppr TTL/RS422, 6 channels)	11002915 Torque arm M6, length 425-460 mm (shortenable ≥131 mm)
G (5000 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)	11054917 Torque arm M6 insulated, length 67-70 mm
H (5000 ppr TTL/RS422, 6 channels)	11072795 Torque arm M6 insulated, length 120-130 mm (shortenable ≥71 mm)
K (4096 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)	11082677 Torque arm M6 insulated, length 425-460 mm (shortenable ≥131 mm)
J (4096 ppr TTL/RS422, 6 channels)	11077197 Mounting kit for torque arm size M6 and earthing strap
7 (3072 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)	
8 (3072 ppr TTL/RS422, 6 channels)	
9 (2048 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)	
4 (2048 ppr TTL/RS422, 6 channels)	
5 (1024 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)	
6 (1024 ppr TTL/RS422, 6 channels)	
1 (512 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)	
2 (512 ppr TTL/RS422, 6 channels)	

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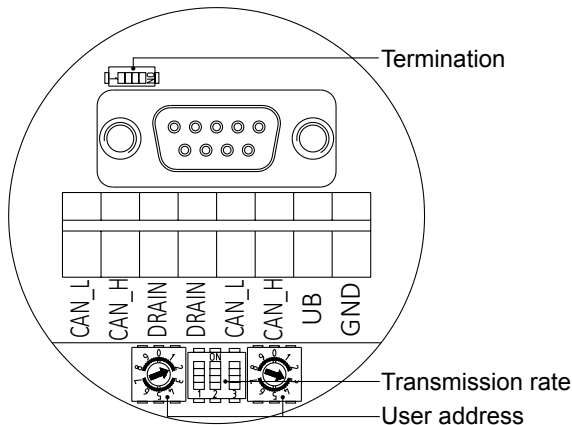
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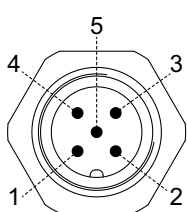
DeviceNet - Terminal assignment

View A¹⁾ - View inside bus connecting box

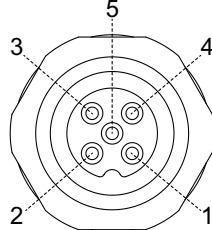


View A¹⁾ and A²⁾ - View into connector

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, A¹⁾)
5-pin, A-coded



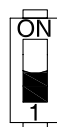
Connector M12
(female, A²⁾)
5-pin, A-coded

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

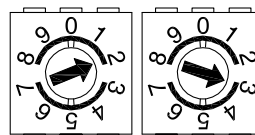
Bus protocol	DeviceNet
Device profile	Device Profil for Encoders V 1.0
Operating modes	I/O-Polling Cyclic Change of State
Preset value	The „Preset“ parameter can be used to set the encoder to a pre-defined value that corresponds to a specific axis position of the system. The offset of encoder zero point 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

Transmissi- on 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

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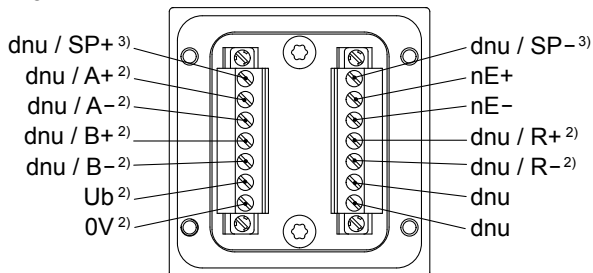
HMG10-T - DeviceNet

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)
dnu	Do not use

Speed switch / additional output incremental - Terminal assignment terminal box

View B¹⁾



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.

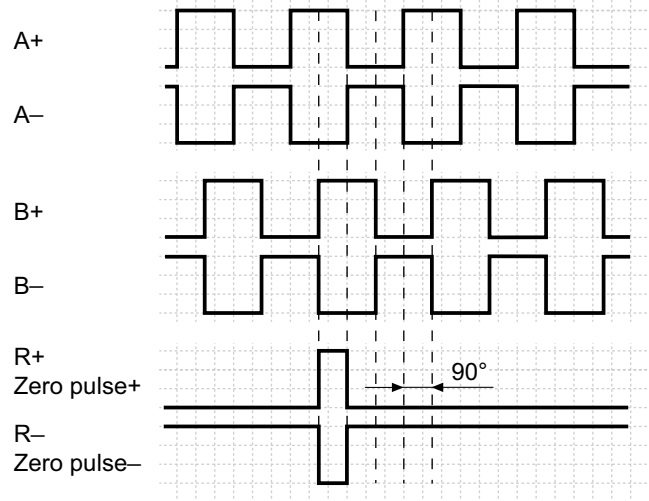
¹⁾ See dimensions

²⁾ Additional output incremental (option)

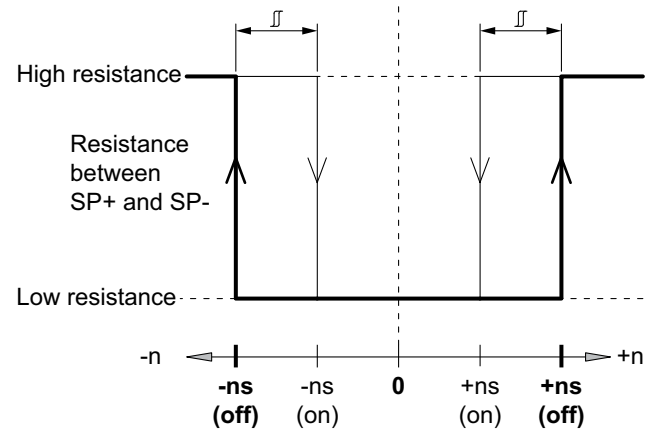
³⁾ Speed switch (option)

Additional output incremental - Output signals

Version with additional output incremental at positive rotating direction¹⁾



Speed switch - Switching characteristics



n = Speed

+ns (off) = Switch-off speed at shaft rotation in positive rotating direction¹⁾.

-ns (off) = Switch-off speed at shaft rotation in negative rotating direction¹⁾.

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

+ns (on) = Switch-on speed at shaft rotation in positive rotating direction¹⁾.

-ns (on) = Switch-on speed at shaft rotation in negative rotating direction¹⁾.

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Dimensions

