Absolute encoders - bus interfaces
Blind / through hollow shaft or cone shaft (1:10)
DeviceNet / 13 bit ST / 16 bit MT / Speed switch

HMG10 - DeviceNet

HMG 10 - picture similar

Features	
– **Interface DeviceNet**	
– **Magnetic sensing method**	
– **Resolution: singleturn 13 bit, multiturn 16 bit**	
– **Function display via LEDs**	
– **Multiturn sensing with Energy Harvesting technologie, without gear or battery**	
– **Two hybrid bearings, one at each end**	
– **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 switch in bus connecting box (type-specific)
Steps per turn	8192 / 13 bit
Number of turns	65536 / 16 bit
Additional outputs	Square-wave 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 in bus connecting box 4 LEDs in device back side
Approvals	CE, UL approval / E256710

Technical data - electrical ratings (speed switches)

Interface	RS485
Switching accuracy	±2 % (or Digit)
Switching outputs	1 output (Open-Collector or Solid State Relay)
Output switching capacity	30 VDC; ≤100 mA
Switching delay time	≤20 ms

Technical data - mechanical design

Size (flange)	ø105 mm
Flange	Support plate, 360° freely positionable
Protection DIN EN 60529	IP 66/IP 67
Operating speed	≤6000 rpm
Range of switching speed	±2...6000 rpm, default 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 Complies to ISO 12944-5:1998 Protective paint systems (C5-M)
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
HMG10-T - DeviceNet	
Shaft type	ø16...20 mm (through hollow shaft)
HMG10-B - DeviceNet	
Shaft type	ø16...20 mm (blind hollow shaft) ø17 mm (cone shaft 1:10)

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HMG10 - DeviceNet

Part number

Encoder with through hollow shaft

HMG10   **-T H   .   DN .3   00   .A**

Additional output *
0	Without
5	1024 ppr TTL/HTL push-pull (Vin=Vout, electrically isolated), 6 channels
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 / Programming
	Without
D	With speed switch *)**) (Standard: Open Collector, Solid State Relais 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 setted threshold).

Absolute encoders - bus interfaces
Blind / through hollow shaft or cone shaft (1:10)
DeviceNet / 13 bit ST / 16 bit MT / Speed switch

HMG10 - DeviceNet

Part number

Encoder with blind hollow shaft / cone shaft

HMG10 | -B | H | | . | | | DN | .3 | 00 | | .A

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

Shaft diameter
6   ø16 mm, central screw

Flange
H   Support for torque arm, shaft insulation hybrid bearing

Speed switch / Programming
Without
D   With speed switch *)**)
(Standard: Open Collector, Solid State Relais 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 setted threshold).

Absolute encoders - bus interfaces
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HMG10 - DeviceNet

Part number - tables

Additional output *

0   (Without)

Q   (8192 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated)

P   (8192 ppr TTL (RS422), 6 channels)

G   (5000 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated)

H   (5000 ppr TTL (RS422), 6 channels)

K   (4096 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated)

J   (4096 ppr TTL (RS422), 6 channels)

7   (3072 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated)

8   (3072 ppr TTL (RS422), 6 channels)

9   (2048 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated)

4   (2048 ppr TTL (RS422), 6 channels)

5   (1024 ppr TTL/HTL push-pull (Vin=Vout, electrically isolated), 6 channels)

6   (1024 ppr TTL (RS422), 6 channels)

1   (512 ppr TTL/HTL push-pull (Vin=Vout), 6 channels, electrically isolated)

2   (512 ppr TTL (RS422), 6 channels)

Accessories

Mounting accessories

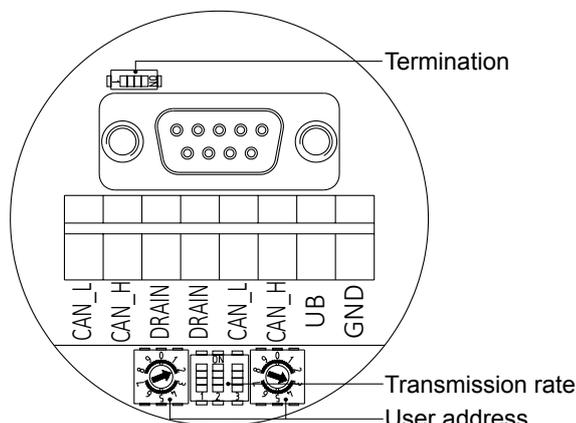|	
11043628	Torque arm M6, length 67-70 mm
11004078	Torque arm M6, length 120-130 mm (≥71 mm)
11002915	Torque arm M6, length 425-460 mm (≥131 mm)
11054917	Insulated torque arm M6, length 67-70 mm
11072795	Insulated torque arm M6, length 120-130 mm (≥71 mm)
11082677	Insulated torque arm M6, length 425-460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

Absolute encoders - bus interfaces
Blind / through hollow shaft or cone shaft (1:10)
## DeviceNet / 13 bit ST / 16 bit MT / Speed switch

HMG10 - DeviceNet

DeviceNet - Terminal assignment
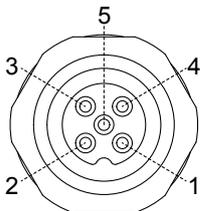
View A[1] - View inside bus connecting box

Termination

CAN_L | CAN_H | DRAIN | DRAIN | CAN_L | CAN_H | UB | GND

Transmission rate
User address

View C[1] / **View D**[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)
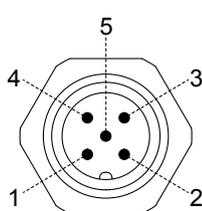
Connector M12 (male, **C**[1])
5-pin, A-coded

Connector M12 (female, **D**[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
Default settings	User address 00

DeviceNet - Termination
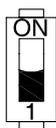
ON = final user
OFF = user xx

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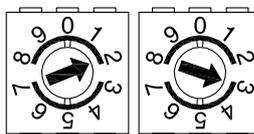
Defined by rotary switch.
Example: User address 23

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
* Default

[1] See dimensions

Absolute encoders - bus interfaces
Blind / through hollow shaft or cone shaft (1:10)
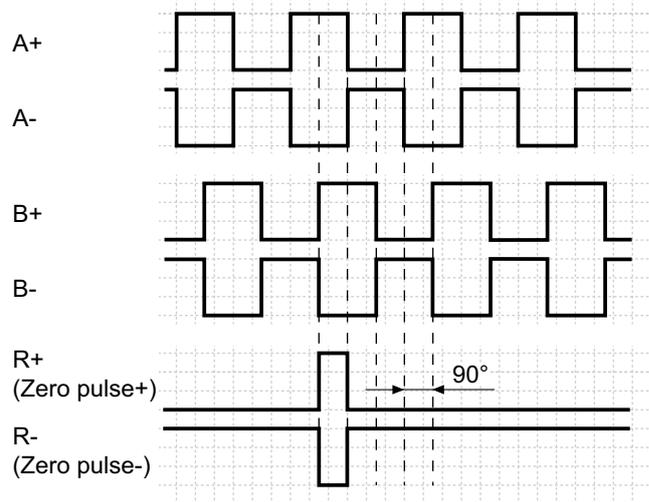### DeviceNet / 13 bit ST / 16 bit MT / Speed switch

HMG10 - DeviceNet

Speed switch/incremental - Terminal significance

+UB	Voltage supply
⊥	Ground
A+	Channel A+
A−	Channel A− (channel A+ inverted)
B+	Channel B+
B−	Channel B− (channel B+ inverted)
R+	Zero pulse (reference signal)
R−	Zero pulse inverted
nE+	System OK+ / error output
nE−	System OK− / error output inverted
SP+[2]	DSL_OUT1 / speed switch (Open-Collector or Solid State Relay)
SP−[2]	DSL_OUT2 / speed switch (0 V or Solid State Relay)
SA[2]	RS485+ / programming interface
SB[2]	RS485− / programming interface

Speed switch/incremental - Terminal assignment terminal box

View B[1]

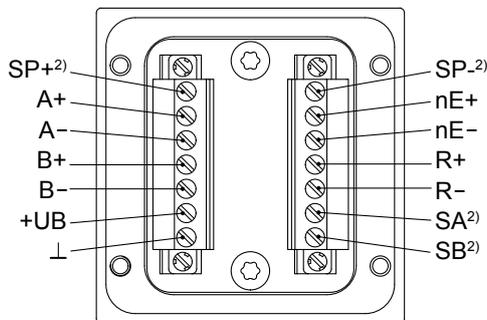## Incremental - Output signals

Version with additional incremental output at positive rotating direction

Speed switch - Switching characteristics
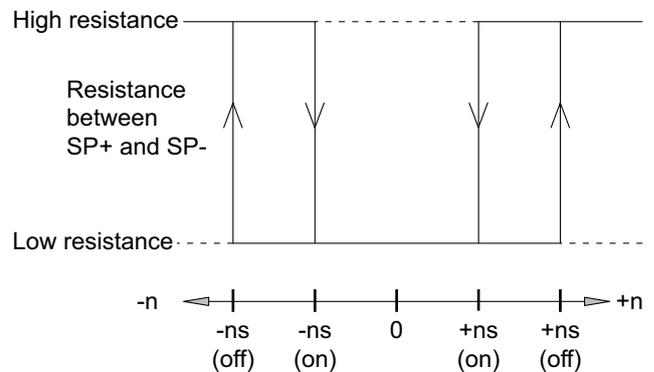
n	=	Speed
+ns (on)	=	Activation speed at shaft rotation in positive rotating direction[1].
+ns (off)	=	Deactivation speed at shaft rotation in positive rotating direction[1].
-ns (on)	=	Activation speed at shaft rotation in negative rotating direction[1].
-ns (off)	=	Deactivation at shaft rotation in negative rotating direction[1].

[1] See dimensions

[2] Do not use at version without speed switch

Absolute encoders - bus interfaces
Blind / through hollow shaft or cone shaft (1:10)
DeviceNet / 13 bit ST / 16 bit MT / Speed switch

HMG10 - DeviceNet

Blind hollow shaft and cone shaft with radial terminal boxes

Cone shaft

Blind hollow shaft

Speed switch (option)
Additional output incremental

Positive rotating direction

Drawing 90° rotated

Jack-screw thread

17 a/f

øN	L1	L2
16	53	65.5
20	35	50

3x M16x1.5
(Cable ø5-9)

Accessory

DeviceNet

Through hollow shaft with radial terminal boxes

Speed switch (option)
Additional output incremental

Positive rotating direction

Drawing 90° rotated

øN = 16, 20

3x M16x1.5
(Cable ø5-9)

Accessory

DeviceNet