

# Absolute encoders - bus interfaces

Solid shaft  $\varnothing 11$  mm with EURO flange B10 or housing foot B3

CANopen® / 13 bit ST / 16 bit MT / Speed switch

## PMG10 - CANopen®



PMG10 - picture similar

### Technical data - electrical ratings

Voltage supply	10...30 VDC
Short-circuit proof	Yes
Consumption w/o load	$\leq 200$ mA
Initializing time	$\leq 500$ ms after power on
Interface	CANopen®
Function	Multiturn
Transmission rate	10...1000 kBaud
Device address	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
Approval	CE

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

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

### Features

- Interface CANopen®
- 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 - mechanical design

Size (flange)	$\varnothing 115$ mm
Shaft type	$\varnothing 11$ mm solid shaft
Flange	EURO flange B10 Housing foot B3
Protection DIN EN 60529	IP 66/IP 67
Operating speed	$\leq 6000$ rpm
Range of switching speed	ns (off) = $\pm 2$ ...6000 rpm, factory setting 6000 rpm
Operating torque typ.	10 Ncm
Rotor moment of inertia	1 kgcm <sup>2</sup>
Admitted shaft load	$\leq 450$ N axial $\leq 650$ 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.	2.7 kg (depending on version)
Connection	Bus connecting box Terminal box incremental

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**PMG10 - CANopen®**

**Part number**

PMG10 

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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 multiturm

- 0 Without
- 6 16 bit

Voltage supply / interface

C6 10...30 VDC, CANopen® (DS 406)

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

1  $\varnothing$ 11 mm with key 4 mm

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 EURO flange B10, shaft insulation hybrid bearing
- A Housing foot B3, 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

#### Additional output\*

0 (Without)
Q (8192 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)
P (8192 ppr TTL/RS422, 6 channels)
G (5000 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)
H (5000 ppr TTL/RS422, 6 channels)
K (4096 ppr TTL/HTL (Vin=Vout), 6 channels, electrically isolated)
J (4096 ppr TTL/RS422, 6 channels)
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)

### Accessories

#### Mounting accessories

K 35	Spring washer coupling for solid shaft $\varnothing 6...12$ mm
K 50	Spring washer coupling for solid shaft $\varnothing 11...16$ mm
K 60	Spring washer coupling for solid shaft $\varnothing 11...22$ mm

# Absolute encoders - bus interfaces

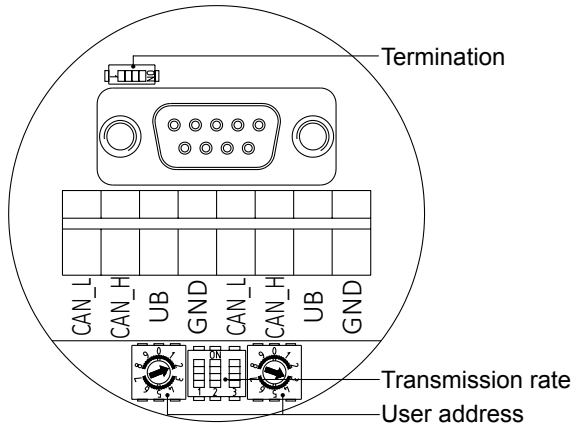
## Solid shaft $\varnothing 11$ mm with EURO flange B10 or housing foot B3

### CANopen® / 13 bit ST / 16 bit MT / Speed switch

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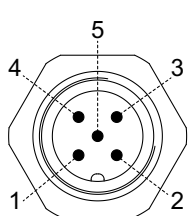
### CANopen® - Terminal assignment

View A<sup>1)</sup> - View inside bus connecting box

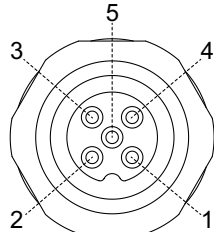


View A<sup>1)</sup> and A<sup>2)</sup> - View into connector

male / female	Connection	Description
1	GND	Ground for UB
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<sup>1)</sup>)  
5-pin, A-coded



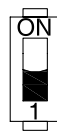
Connector M12 (female, A<sup>2)</sup>)  
5-pin, A-coded

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.

### CANopen® - Features

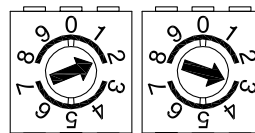
Bus protocol	CANopen®
CANopen®-Features	Device Class 2 CAN 2.0B
Device profile	CANopen® CiA DSP 406, V 3.0
Operating mode	Polling mode (asynch, via SDO) Cyclic mode (asynch-cyclic) Synch mode (synch-cyclic) Acyclic mode (synch-acyclic)
Diagnosis	The encoder supports the following error warnings: - Position error
Factory setting	User address 00

### CANopen® - Termination



ON = final user  
OFF = user x

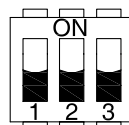
### CANopen® - User address



Defined by rotary switch.  
Example: User address 23

### CANopen® - Transmission rate

Transmission rate	Dip switch position		
	1	2	3
10 kBaud	OFF	OFF	OFF
20 kBaud	OFF	OFF	ON
50 kBaud*	OFF	ON	OFF
125 kBaud	OFF	ON	ON
250 kBaud	ON	OFF	OFF
500 kBaud	ON	OFF	ON
800 kBaud	ON	ON	OFF
1000 kBaud	ON	ON	ON



\* Factory setting

<sup>1)</sup> See dimensions

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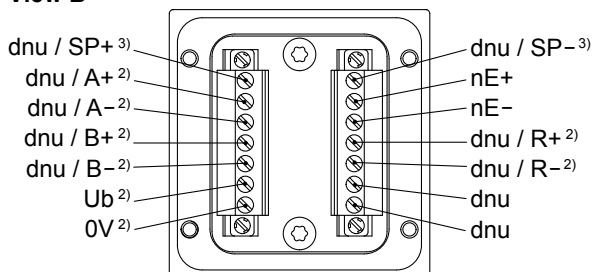
## PMG10 - CANopen®

### Speed switch / additional output incremental - Terminal significance

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

### Speed switch / additional output incremental - Terminal assignment terminal box

#### View B<sup>1)</sup>



### Additional output incremental - Trigger level

Trigger level	TTL/RS422
High / Low	$\geq 2.5$ V / $\leq 0.5$ V
Transmission length	$\leq 550$ m @ 100 kHz
Output frequency	$\leq 600$ kHz
Trigger level	TTL/HTL (Vin = Vout)
High / Low	$\geq 2.5$ V / $\leq 0.5$ V (TTL) $\geq U_b - 3$ V / $\leq 1.5$ V (HTL)
Transmission length	$\leq 550$ m @ 100 kHz (TTL) $\leq 350$ m @ 100 kHz (HTL)
Output frequency	$\leq 600$ kHz (TTL); $\leq 350$ kHz (HTL)

Electrically isolated:

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

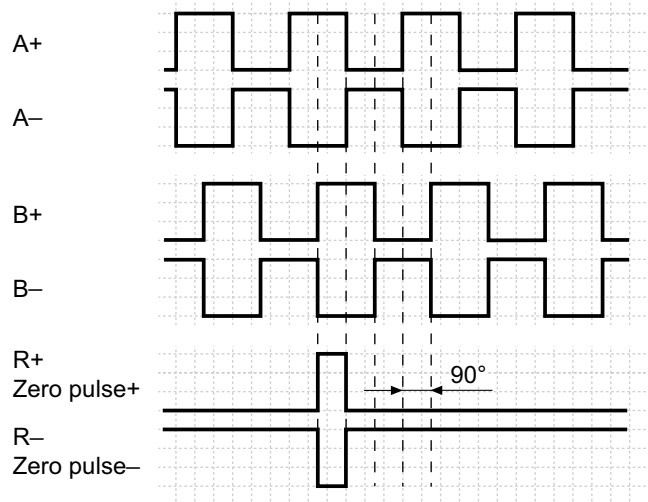
<sup>1)</sup> See dimensions

<sup>2)</sup> Additional output incremental (option)

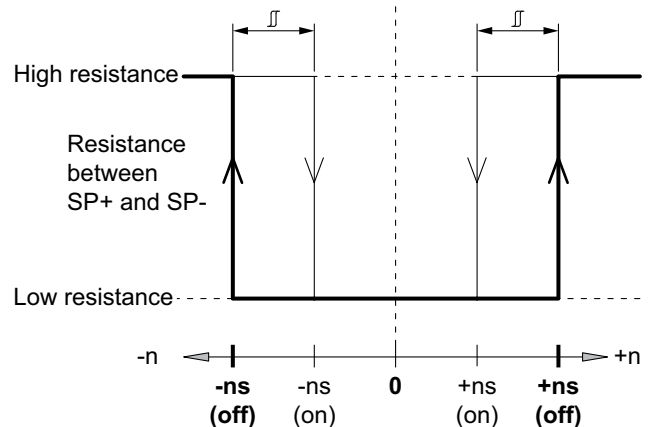
<sup>3)</sup> Speed switch (option)

### Additional output incremental - Output signals

Version with additional output incremental at positive rotating direction<sup>1)</sup>



### Speed switch - Switching characteristics



n = Speed

+ns (off) = Switch-off speed at shaft rotation in positive rotating direction<sup>1)</sup>.

-ns (off) = Switch-off speed at shaft rotation in negative rotating direction<sup>1)</sup>.

Switching hysteresis  $\ddot{\Gamma}$ :  
5...100 % (factory setting = 10 % min. 1 Digit)

+ns (on) = Switch-on speed at shaft rotation in positive rotating direction<sup>1)</sup>.

-ns (on) = Switch-on speed at shaft rotation in negative rotating direction<sup>1)</sup>.

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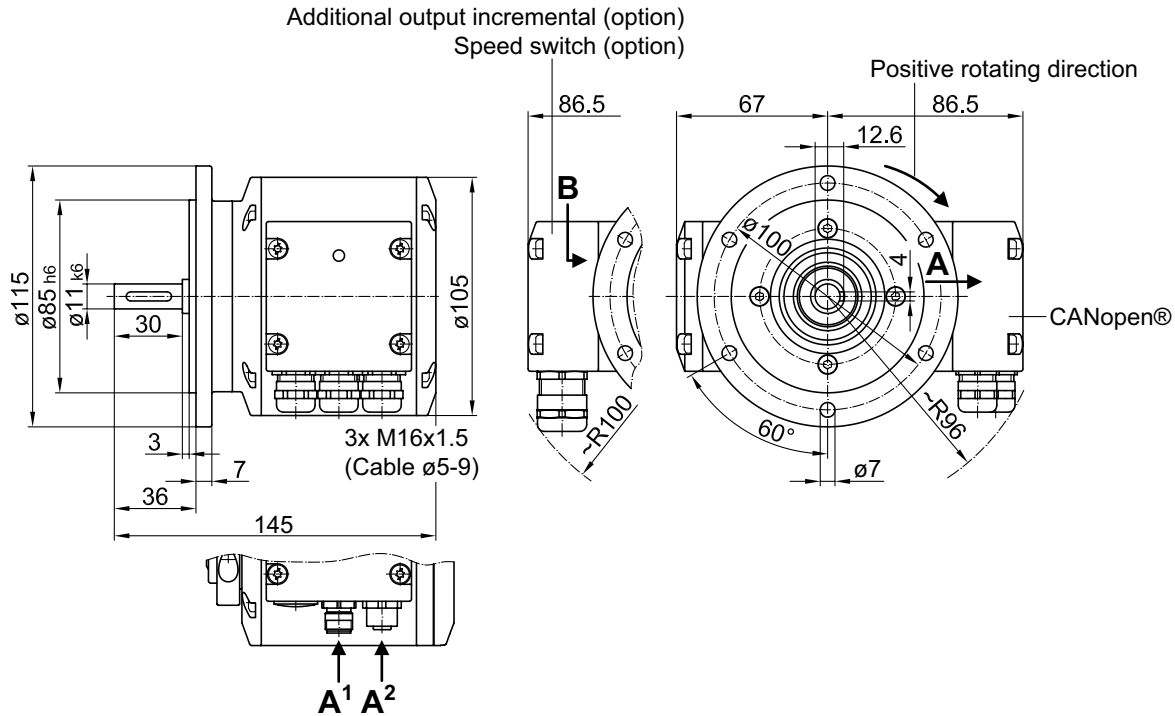
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## Dimensions

### Version with EURO flange B10



### Version with housing foot B3

