Baumer
Passion for Sensors

Absolute encoders

HMG 11

Encoder with hollow shaft max. ø20 mm or cone shaft ø17 mm (1:10)
Single and multiturn 13 bit ST / 12 or 16 bit MT / SSI / Profibus / CANopen® / DeviceNet / PROFINET

Overview

- Multiturn / SSI / Profibus / CANopen® / DeviceNet / PROFINET
- Optical sensing method
- Singleturn 13 bit, multiturn 12 bit / 16 bit
- Blind or through hollow shaft or cone shaft ø16...20 mm
- Multiturn sensing with microGen technologie, without gear or battery
- Available with redundant absolute signals
- Special protection against corrosion

microGen Energy Harvesting
HUBNER BERLIN A Baumer Brand

Technical data

Technical data - electrical ratings	
Voltage supply	9...30 VDC
Consumption w/o load	≤100 mA (per interface SSI) ≤250 mA (per interface bus)
Initializing time	≤200 ms after power on
Interface	SSI Profibus-DPV0 CANopen® DeviceNet PROFINET
Function	Multiturn
Transmission rate	9.6 … 12000 kBaud (Profibus) 10 … 1000 kBaud (CANopen®) 125 … 500 kBaud (DeviceNet) 100 MBaud (PROFINET)
Profile conformity	Profibus-DPV0 CANopen® CiA DSP 406 V 3.0 Device Profile Encoder V 1.0 Encoder profile PNO 3.162
Device adress	Rotary switches in bus cover
Steps per revolution	8192 / 13 bit
Number of revolutions	≤65536 / 16 bit
Additional outputs	Square-wave TTL (RS422) Square-wave HTL
Sensing method	Optical
Code	Gray (version SSI)
Code sequence	CW default
Inputs	SSI clock (version SSI)
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Programmable parameters	Depending on the selected absolute interface

Technical data - electrical ratings	
Diagnostic function	Position or parameter error
Status indicator	DUO-LED integrated in bus cover
Approval	CE UL approval / E217823

Technical data - mechanical design	
Size (flange)	ø122 mm
Shaft type	ø16...20 mm (blind hollow shaft) ø17 mm (cone shaft 1:10)
Protection EN 60529	IP 67
Operating speed	≤3500 rpm (mechanical)
Operating torque typ.	12 Ncm
Rotor moment of inertia	760 gcm²
Admitted shaft load	≤250 N axial, ≤400 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	-20...+85 °C
Resistance	IEC 60068-2-6 Vibration 10 g, 10-2000 Hz IEC 60068-2-27 Shock 100 g, 6 ms
Explosion protection	II 3 G Ex ec IIC T4 Gc (gas) II 3 D Ex tc IIIC T135°C Dc (dust) (only with option ATEX)
Weight approx.	3.5 kg (depending on version)
Connection	Bus cover Terminal box or flange connector M23, 12 pin (SSI/incremental)

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Optional

- Additional incremental output (TTL / HTL)

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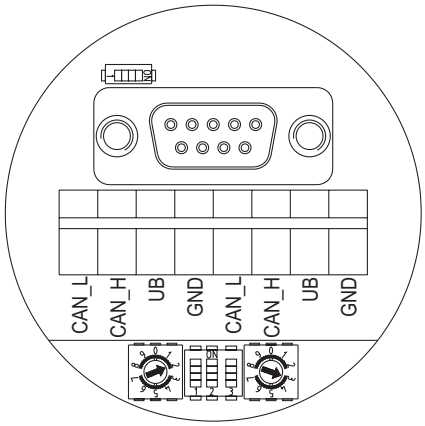
CANopen® features

Terminal assignment

View A - Connecting terminal in bus cover



Terminal significance

CAN_L	CAN Bus signal (dominant Low)
CAN_H	CAN Bus signal (dominant High)
UB	Voltage supply 9...30 VDC
GND	Ground connection for UB

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.

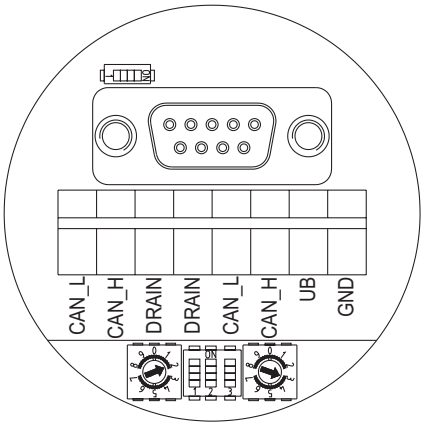
Features

Bus protocol	CANopen®
Features	Device Class 2 CAN 2.0B
Device profile	CANopen® CiA DSP 406, V 3.0
Operating modes	▪ 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 errror
Factory setting	User address 00

DeviceNet features

Terminal assignment

View A - Connecting terminal in bus cover



Terminal significance

CAN_L	CAN Bus Signal (dominant Low)
CAN_H	CAN Bus Signal (dominant High)
DRAIN	Shield
UB	Voltage supply 9...30 VDC
GND	Ground for UB

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.

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 predefined 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

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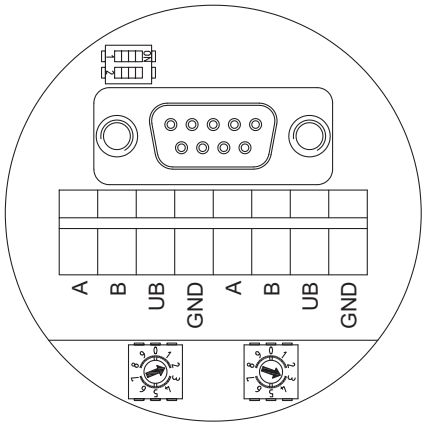
Profibus-DP features

Terminal assignment

View A - Connecting terminal in bus cover



Terminal significance

A	Negative serial data transmission, pair 1 and pair 2
B	Positive serial data transmission, pair 1 and pair 2
UB	Voltage supply 9...30 VDC
GND	Ground connection for UB

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.

Features

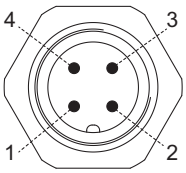
Bus protocol	Profibus-DP V0
Features	Device Class 1 and 2
Data exchange functions	Input: Position value Output: Preset value
Preset value	The „Preset“ parameter can be used to set the encoder to a predefined value that corresponds to a specific axis position of the system.
Parameter functions	Rotating 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 messages: ▪ Position error
Factory setting	User address 00

PROFINET features

Terminal assignment

View D - View onto connector „Voltage supply“

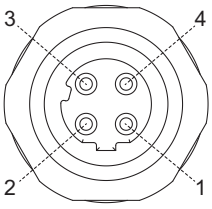
Male	Connection	Description
1	UB	Voltage supply 10...30 VDC
2	–	Do not use
3	GND	Ground for UB
4	–	Do not use



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

View E - View into connector „Data transmission“

Female	Connection	Description
1	TxD+	Transmission data+
2	RxD+	Receiving data+
3	TxD−	Transmission data−
4	RxD−	Receiving data−



Connector M12 (female)
4-pin, D-coded

Features

Bus protocol	PROFINET
Device profile	Encoder Profil PNO 3.162
Features	▪ 100 MBaud Fast Ethernet ▪ IP address programmable ▪ Realtime (RT) Class 1, IRT Class 2, IRT Class 3
Process data	Position value 32 bit input data

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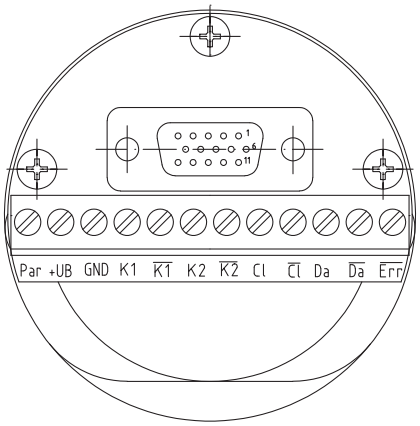
SSI/Incremental features

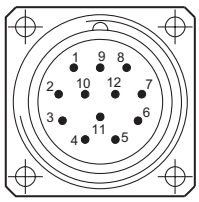
Terminal assignment

View B - Connecting terminal in cover



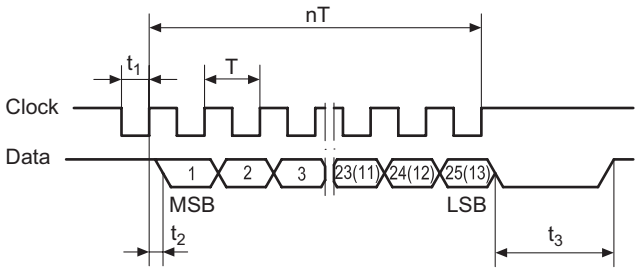
View C - Option
Flange connector M23, 12-pin, male contacts, counter-clockwise

Male	Assignment
1	$\overline{K2}$
2	Clock *
3	Data *
4	$\overline{Data}$ *
5	K1
6	$\overline{K1}$
7	Param *
8	K2
9	$\overline{Error}$ *
10	GND
11	$\overline{Clock}$ *
12	+UB *



* only for SSI

Data transfer



T =	1.25...10 µs
t_1 =	0.63...5 µs
t_2 =	0.4 µs
t_3 =	12...30 µs
n =	Number of bits
Clock frequency	100...800 kHz

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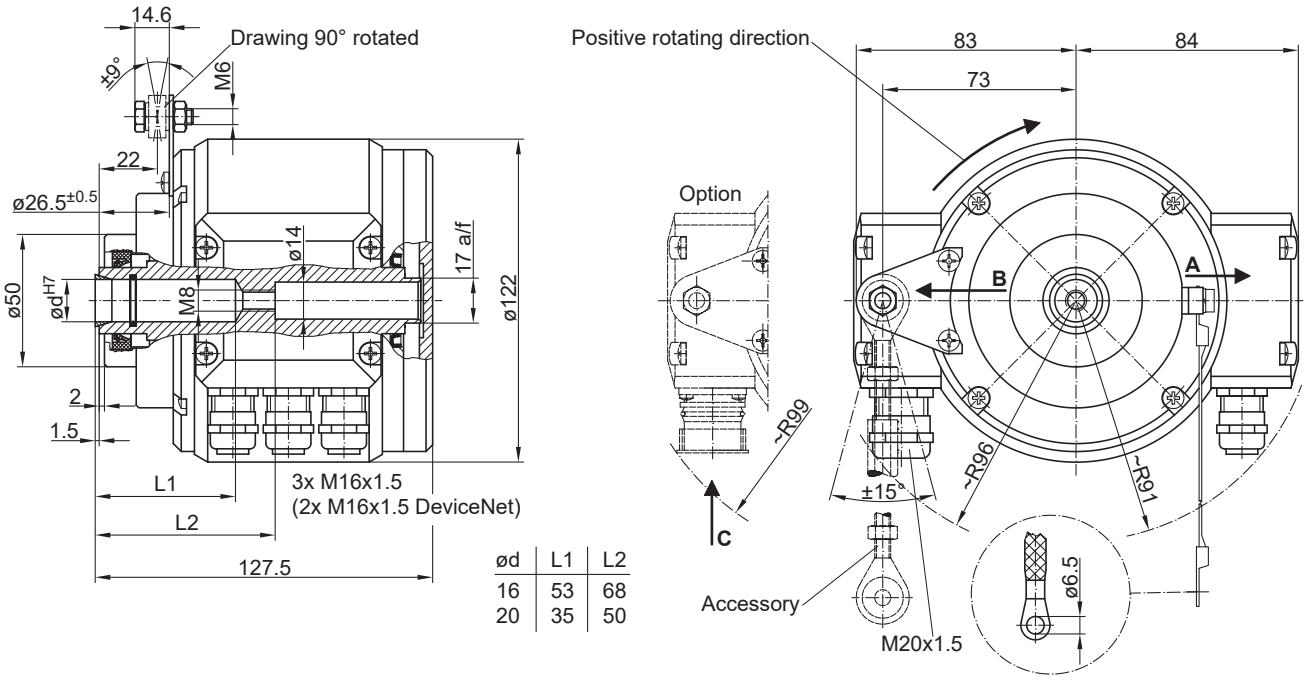
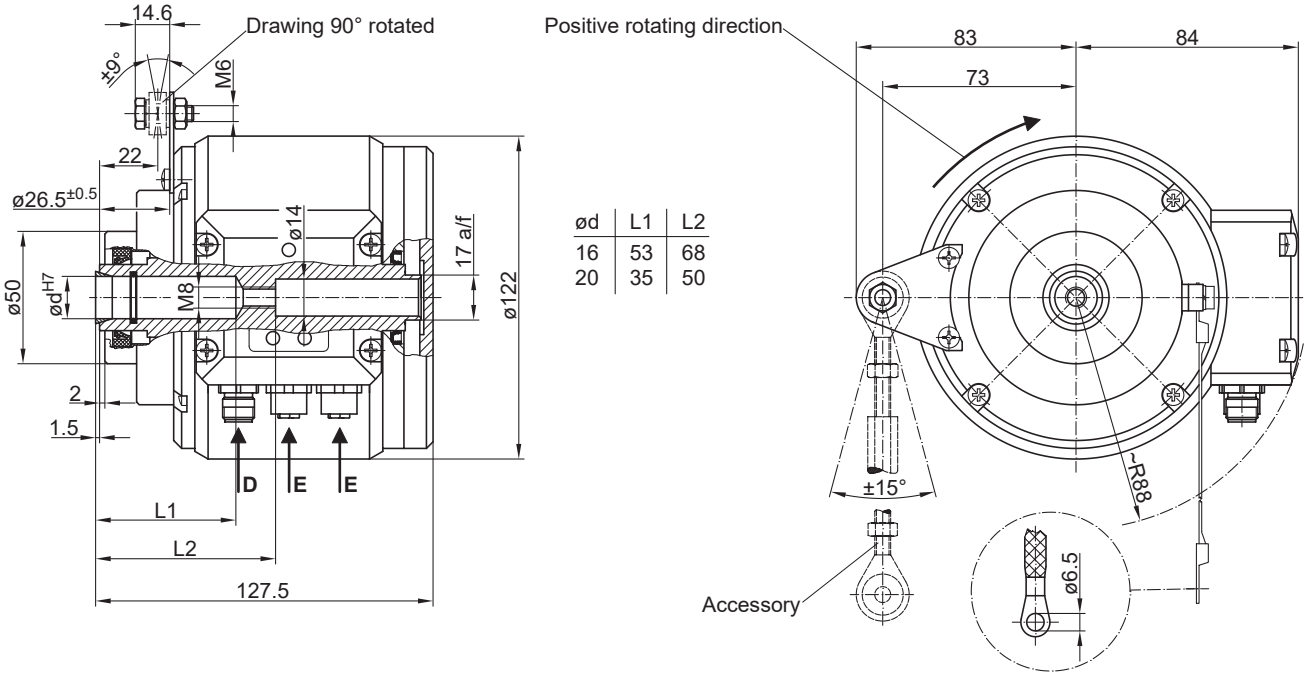
Dimensions



ød	L1	L2
16	53	68
20	35	50

HMG 11 - blind hollow shaft - SSI / Profibus / CANopen® / DeviceNet



ød	L1	L2
16	53	68
20	35	50

HMG 11 - blind hollow shaft - PROFINET

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Ordering reference

	HMG11	#	##	#####	######	######
Product						
	HMG11					
Interface/interfaces(2)						
SSI		S				
Profibus		P				
CANopen®		C				
DeviceNet		D				
PROFINET		N				
2 x SSI		SS				
Profibus and SSI		PS				
CANopen® and SSI		CS				
DeviceNet and SSI		DS				
2 x Profibus		PP				
CANopen® and Profibus		CP				
DeviceNet and Profibus		DP				
2 x CANopen®		CC				
DeviceNet and CANopen®		DC				
2 x DeviceNet		DD				
Absolute share						
13 bit singleturn			13			
13 bit singleturn + 12 bit multiturn			25			
13 bit singleturn + 16 bit multiturn			29			
Additional output						
Without				Z0		
TTL level, 1024 pulses(1)				T1024		
TTL level, 2048 pulses(1)				T2048		
HTL level, 1024 pulses(1)				H1024		
HTL level, 2048 pulses(1)				H2048		
Shaft diameter						
Blind hollow shaft ø16 mm					16H7	
Through hollow shaft ø19 mm					19H7	
Blind hollow shaft ø20 mm					20H7	
Cone shaft ø17 mm (1:10)					17K	
Connection						
Without SSI/incremental						
Terminal box, radial						KLK
Flange connector M23, radial (only SSI/incremental)						ST-M23

(1) The incremental signals are duplicated with configuration SS
(2) Please note: additional incremental output signals are not feasible with PP, CP, DP, CC, DC and DD interface.

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Accessories

Mounting accessories

11077197	Mounting kit for torque arm size M6 and earthing strap
11077087	Mounting and dismounting set
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)