

Absolute encoders - bus interfaces

Shaft with EURO flange B10

Single and multiturn encoders 13 bit ST / 12 or 16 bit MT

CANopen / SSI / Profibus / DeviceNet

AMG 11, AMG 11 + FSL



AMG 11

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
Interfaces	SSI, Profibus-DPV0, CANopen, DeviceNet
Function	Multiturn
Transmission rate	10...1000 kBaud (CANopen) 9.6...12000 kBaud (Profibus) 125...500 kBaud (DeviceNet)
Profile conformity	Profibus-DPV0 CANopen CiA DSP 406 V 3.0 Device Profile Encoder V 1.0
User address	Rotary switch in bus cover
Steps per turn	8192 / 13 bit
Number of turns	≤65536 / 16 bit
Additional output signals	Square-wave TTL (RS422) Square-wave HTL
Sensing method	Optical
Code	Gray or binary (version SSI)
Code sequence	CW default, programmable
Inputs	SSI clock (version SSI)
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Programmable parameters	Depending on the selected absolute interface
Diagnostic function	Position or parameter error
Status indicator	DUO-LED integrated in bus cover

AMG 11

Approval	UL approval / E256710
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AMG 11 + FSL

Switching rotation speed	850...2800 rpm
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Features

- Encoder multiturn SSI/Profibus/CANopen/DeviceNet
- Optical sensing
- Resolution: singleturn 13 bit, multiturn 12 bit / 16 bit
- EURO-flange B10 / shaft ø11 mm
- Multiturn sensing with microGen technologie, without gear or battery
- Available with redundant absolute signals
- Special protection against corrosion
- Also in combination with centrifugal switch FSL

Optional

- With additional incremental signals (TTL / HTL)

Technical data - mechanical design

Dimensions (flange)	ø122 mm
Shaft	ø11 mm
Flange	EURO flange B10
Protection DIN EN 60529	IP 67
Shaft loading	≤250 N axial, ≤350 N radial
Materials	Housing: aluminium alloy Shaft: stainless steel
Operating temperature	-20...+85 °C
Connection	Bus cover Terminal box (SSI/incremental)

AMG 11

Operating speed	≤3500 rpm (mechanical)
Operating torque typ.	12 Ncm
Rotor moment of inertia	780 gcm ²
Resistance	IEC 60068-2-6 Vibration 10 g, 10-2000 Hz IEC 60068-2-27 Shock 100 g, 6 ms
Explosion protection	II3G Ex nA IIC T4 Gc (gas) II3D Ex tc IIIC T135°C Dc (dust)
Weight approx.	3 kg (depending on model)

AMG 11 + FSL

Operating speed	≤1.25 x switching speed
Operating torque typ.	15 Ncm
Rotor moment of inertia	810 gcm ²
Resistance	IEC 60068-2-6 Vibration 5 g, 10-2000 Hz IEC 60068-2-27 Shock 50 g, 11 ms
Weight approx.	3.5 kg (depending on model)

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Part number

Absolute encoder

AMG 11

			<u>Additional incremental signals</u>
	Z0		Without
	T1024		TTL level, 1024 pulses*
	T2048		TTL level, 2048 pulses*
	H1024		HTL level, 1024 pulses*
	H2048		HTL level, 2048 pulses*
		<u>Absolute share</u>	
13			13 bit singleturn
25			13 bit singleturn + 12 bit multiturn (only S and SS version)
29			13 bit singleturn + 16 bit multiturn
		<u>Interface/interfaces</u>	
S			SSI
P			Profibus
C			CANopen
D			DeviceNet
SS			2 x SSI
PS			Profibus and SSI
CS			CANopen and SSI
DS			DeviceNet and SSI
PP			2 x Profibus
CP			CANopen and Profibus
DP			DeviceNet and Profibus
CC			2 x CANopen
DC			DeviceNet and CANopen
DD			2 x DeviceNet

Absolute encoder with centrifugal force switch FSL

AMG 11 + FSL

			<u>Additional incremental signals</u>
	Z0		Without
	T1024		TTL level, 1024 pulses*
	T2048		TTL level, 2048 pulses*
	H1024		HTL level, 1024 pulses*
	H2048		HTL level, 2048 pulses*
		<u>Absolute share</u>	
13			13 bit singleturn
25			13 bit singleturn + 12 bit multiturn (only S and SS version)
29			13 bit singleturn + 16 bit multiturn
		<u>Interface/interfaces</u>	
S			SSI
P			Profibus
C			CANopen
D			DeviceNet
SS			2 x SSI
PS			Profibus and SSI
CS			CANopen and SSI
DS			DeviceNet and SSI
PP			2 x Profibus
CP			CANopen and Profibus
DP			DeviceNet and Profibus
CC			2 x CANopen
DC			DeviceNet and CANopen
DD			2 x DeviceNet

* The incremental signals are duplicated with configuration SS

Please note: additional incremental output signals are not feasible with PP, CP, DP, CC, DC and DD interface.

Please indicate the required switching rotation speed when ordering with centrifugal force switch (permanent parameter defined at works).

Accessories

Connectors and cables

HEK 8 Sensor cable for encoders

Mounting accessories

K 35 Spring disk coupling for shaft ø6...12 mm

K 50 Spring disk coupling for shaft ø11...16 mm

K 60 Spring disk coupling for shaft ø11...22 mm

Diagnostic accessories

HENQ 1100 Analyzer for encoders

Absolute encoders - bus interfaces

Shaft with EURO flange B10

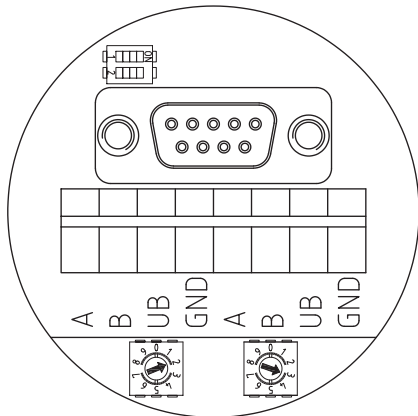
Single and multiturn encoders 13 bit ST / 12 or 16 bit MT

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Terminal assignment - Profibus

View A - Connecting terminal in cover



Terminal significance - Profibus

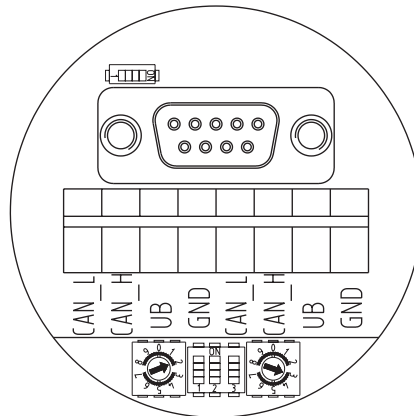
A	Negative serial data transmission, pair 1 and pair 2
B	Positive serial data transmission, pair 1 and pair 2
UB	Voltage supply +9 ... +30 VDC
GND	Ground connection for UB
Terminals with the same label are internally connected.	

Features - Profibus

Protocol	Profibus DP V0
Profibus features	Device Class 1 and 2
Data Exch. 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
Default settings	User address 00

Terminal assignment - CANopen

View A - Connecting terminal in cover



Terminal significance - CANopen

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 with the same label are internally connected.	

Features - CANopen

Protocol	CANopen
CANopen features	Device class 2 CAN 2.0B
Device profile	CANopen CiA DSP 406, V 3.0
Operation modes	Polling mode (asynch, via SDO) Cyclic mode (asynch-cyclic) Synch mode (synch-cyclic) Acyclic mode (synch-acyclic)
Diagnostic	The encoder supports the following error messages: - Position error
Default settings	User address 00

Absolute encoders - bus interfaces

Shaft with EURO flange B10

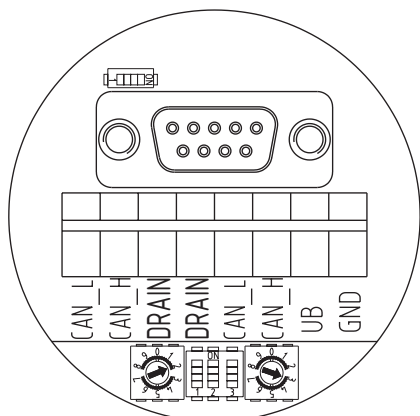
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CANopen / SSI / Profibus / DeviceNet

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Terminal assignment - DeviceNet

View A - Connecting terminal in cover



Terminal significance - DeviceNet

CAN_L	CAN bus Signal (dominant Low)
CAN_H	CAN bus Signal (dominant High)
DRAIN	Shield connection
UB	Voltage supply +9 ... +30 VDC
GND	Ground connection relating to UB

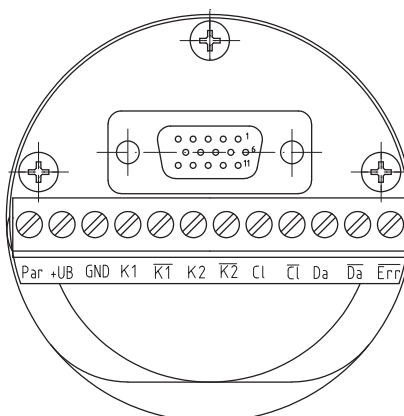
Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.

Features - DeviceNet

Protocol	DeviceNet
DeviceNet features	Device Profile 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
Default settings	User address 00

Terminal assignment - Incremental and/or SSI

View B - Connecting terminal in cover

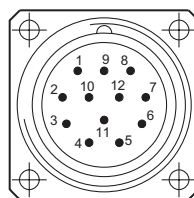


View C - Option

Connector M23, 12-pin, male contacts, counter-clockwise

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

* only for SSI



Absolute encoders - bus interfaces

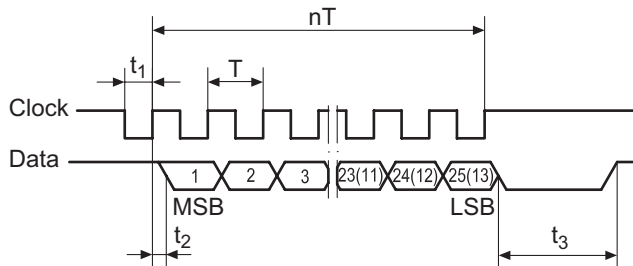
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Data transfer

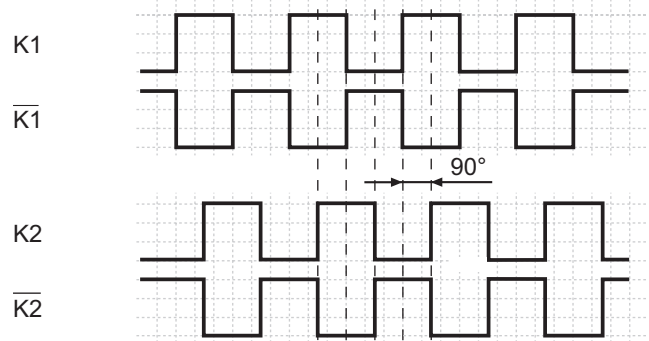


T	=	1.25 ... 10 μ s
t ₁	=	0.63 ... 5 μ s
t ₂	≤	0.4 μ s
t ₃	=	12 ... 30 μ s
n	=	Number of bits

Clock frequency	100...800 kHz
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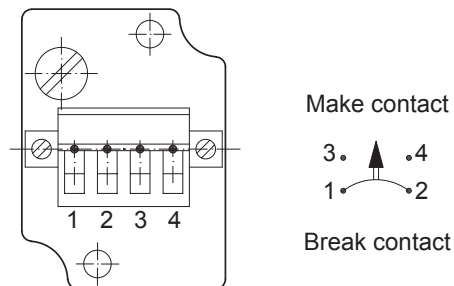
Output signals

Additional incremental signals
at positive rotating direction



Terminal assignment

Connecting terminal centrifugal switch FSL
View D



Absolute encoders - bus interfaces

Shaft with EURO flange B10

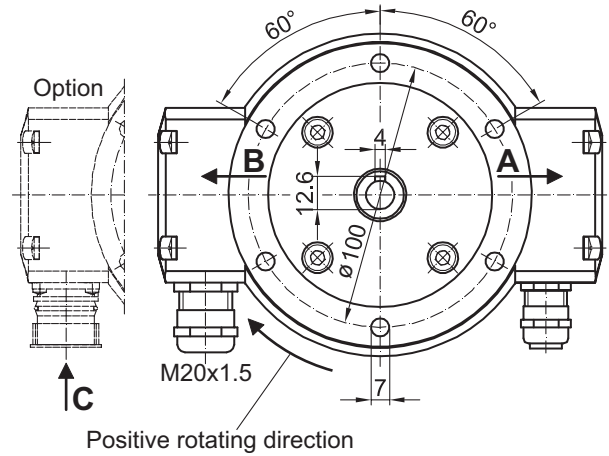
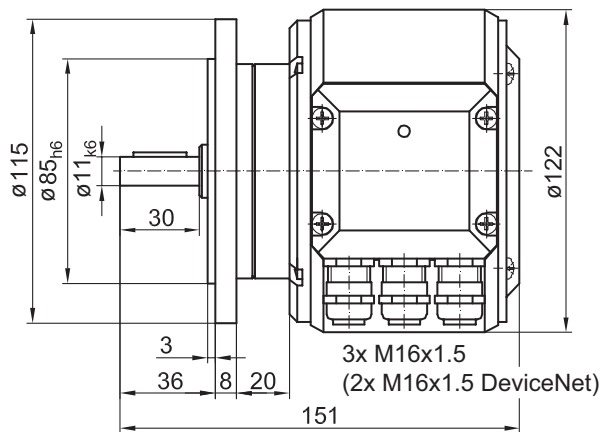
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Dimensions

AMG 11 - absolute encoders



AMG 11 + FSL - absolute encoder with centrifugal switch FSL

