

Combination

Encoder with integrated centrifugal switch

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

SSI / Profibus / CANopen® / DeviceNet

AMG 11 + FSL



AMG 11 + FSL

Features

- Multiturn / SSI / Profibus / CANopen® / DeviceNet
- Singleturn 13 bit, multiturn 12 bit / 16 bit
- Mechanical speed monitoring based on centrifugal force
- EURO flange B10 / solid shaft $\varnothing 11$ mm
- Multiturn sensing with microGen technologie, without gear or battery
- Available with redundant absolute signals
- Special protection against corrosion

Optional

- Additional incremental output (TTL / HTL)

Technical data - electrical ratings

Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Approval	CE

Technical data - electrical ratings (encoder)

Voltage supply	9...30 VDC
Consumption w/o load	≤ 100 mA (SSI); ≤ 250 mA (bus)
Sensing method	Optical
Initializing time	≤ 200 ms after power on
Interfaces	SSI, Profibus-DPV0, CANopen®, DeviceNet
Function	Multiturn
Transmission rate	9.6...12000 kBaud (Profibus) 10...1000 kBaud (CANopen®) 125...500 kBaud (DeviceNet)
Profile conformity	Profibus-DPV0 CANopen® CiA DSP 406 V 3.0 Device Profile Encoder V 1.0
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
Code	Gray (version SSI)
Code sequence	CW default
Inputs	SSI clock (version SSI)
Programmable parameters	Depending on the selected absolute interface
Diagnostic function	Position or parameter error
Status indicator	DUO-LED integrated in bus cover

Technical data - electrical ratings (centrifugal switch)

Switching accuracy	± 4 % ($\Delta n = 2$ rpm/s); $= +20$ % ($\Delta n = 1500$ rpm/s)
Switching deviation	≤ 3 % (cw-ccw rotation)
Switching hysteresis	~ 40 % of switching speed
Switching outputs	1 output, speed control
Output switching capacity	≤ 6 A / 230 VAC; ≤ 1 A / 125 VDC
Minimum switching current	50 mA

Technical data - mechanical design

Size (flange)	$\varnothing 115$ mm
Shaft type	$\varnothing 11$ mm solid shaft
Admitted shaft load	≤ 250 N axial, ≤ 350 N radial
Flange	EURO flange B10
Protection DIN EN 60529	IP 67
Speed (n)	$\leq 1.25 \cdot ns$
Range of switching speed (ns)	850...2800 rpm ($\Delta n = 2$ rpm/s)
Operating torque typ.	15 Ncm
Rotor moment of inertia	810 gcm ²
Materials	Housing: aluminium alloy Shaft: stainless steel
Operating temperature	-20...+85 °C
Resistance	IEC 60068-2-6 Vibration 5 g, 10-2000 Hz IEC 60068-2-27 Shock 50 g, 11 ms
Corrosion protection	IEC 60068-2-52 Salt mist for ambient conditions C5-M (CX) according to ISO 12944-2
Connection	Bus cover; Terminal box; Flange connector M23, 12-pin
Weight approx.	3 kg (depending on version)

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Part number

AMG11

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Switching speed (ns)

6	850...949 rpm ($\Delta n = 2$ rpm/s)**
5	950...1099 rpm ($\Delta n = 2$ rpm/s)**
4	1100...1299 rpm ($\Delta n = 2$ rpm/s)**
3	1300...1799 rpm ($\Delta n = 2$ rpm/s)**
2	1800...2499 rpm ($\Delta n = 2$ rpm/s)**
1	2500...2800 rpm ($\Delta n = 2$ rpm/s)**

Connection

Without SSI/incremental

KLK Terminal box, radial (only SSI/incremental)

ST-M23 Flange connector M23, radial (only SSI/incremental)

Additional output

Z0 Without

T1024 TTL level, 1024 pulses*

T2048 TTL level, 2048 pulses*

H1024 HTL level, 1024 pulses*

H2048 HTL level, 2048 pulses*

Absolute share

13 13 bit singleturn

25 13 bit singleturn + 12 bit multiturn (only S and SS version)

29 13 bit singleturn + 16 bit multiturn

Interface/interfaces

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

Combination

Encoder with integrated centrifugal switch

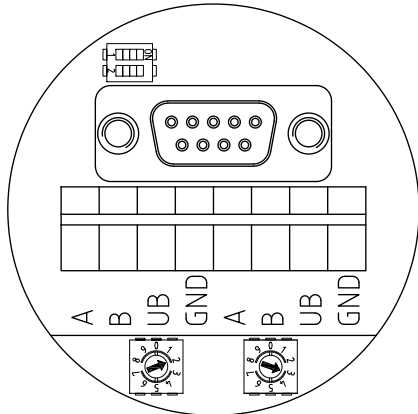
Single and multiturn 13 bit ST / 12 or 16 bit MT

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Terminal assignment - Profibus

View A - Connecting terminal in cover



Terminal significance - Profibus

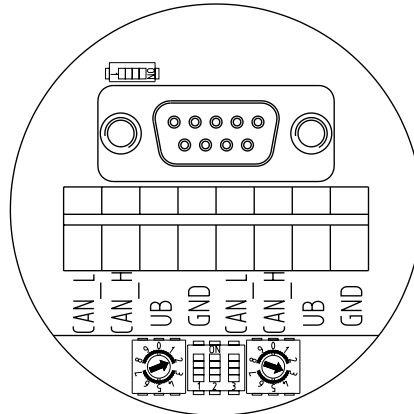
A	Negative serial data transmission, pair 1 and pair 2
B	Positive serial data transmission, pair 1 and pair 2
UB	Voltage supply 9...30 VDC
GND	Ground connection for UB
Terminals with the same label are internally connected.	

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

Combination

Encoder with integrated centrifugal switch

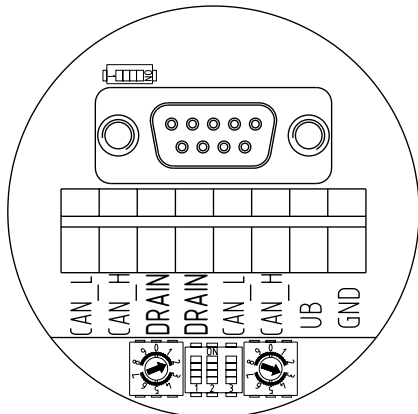
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Terminal assignment - DeviceNet

View A - Connecting terminal in cover



Terminal significance - DeviceNet

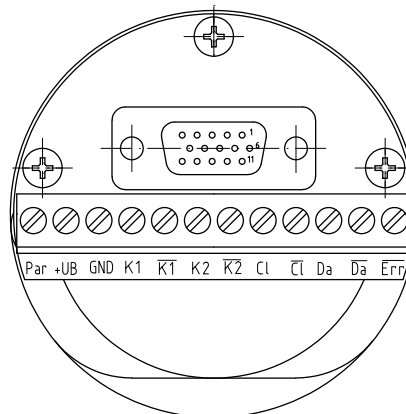
CAN_L	CAN bus Signal (dominant Low)
CAN_H	CAN bus Signal (dominant High)
DRAIN	Shield connection
UB	Voltage supply 9...30 VDC
GND	Ground connection relating to UB
Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections 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

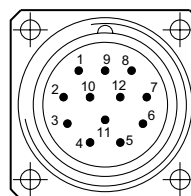


View C - Option

Flange 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



Combination

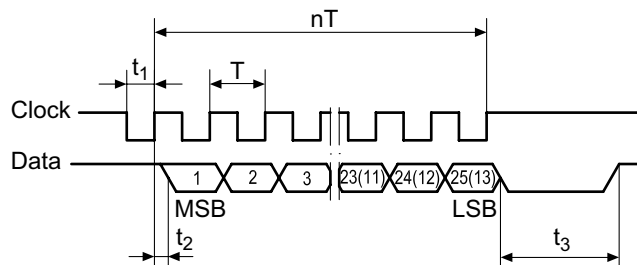
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Data transfer



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

Accessories

Connectors and cables

HEK 8 Sensor cable for encoders

Mounting accessories

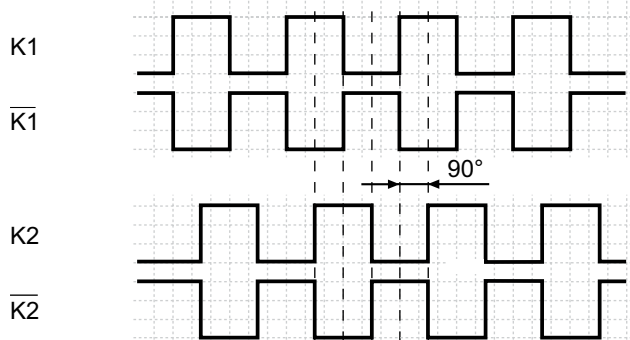
K 35	Spring washer coupling for solid shaft ø6...12 mm
K 50	Spring washer coupling for solid shaft ø11...16 mm
K 60	Spring washer coupling for solid shaft ø11...22 mm

Diagnostic accessories

11075858	Analyzer for encoders HENQ 1100
11075880	Analyzer for encoders HENQ 1100 with a power pack

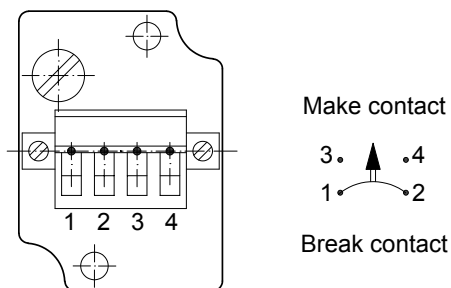
Output signals

Additional incremental signals at positive rotating direction



Terminal assignment

Connecting terminal centrifugal switch FSL
View D



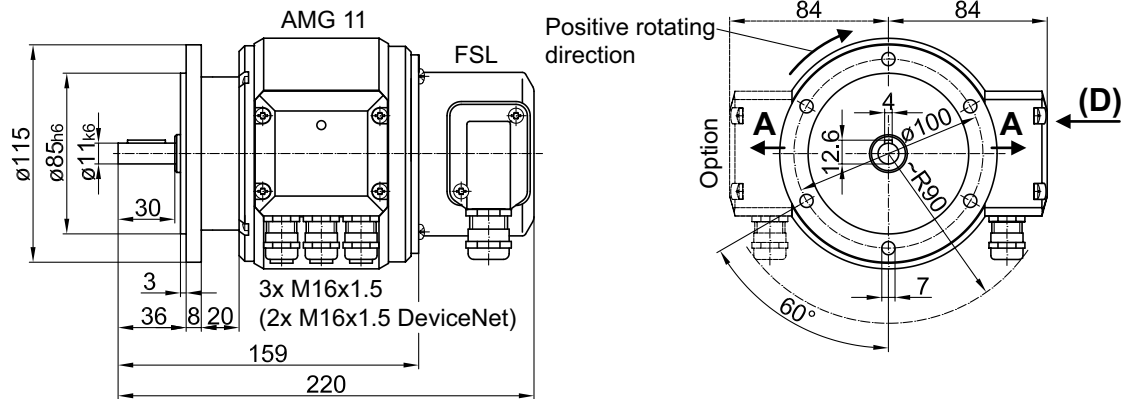
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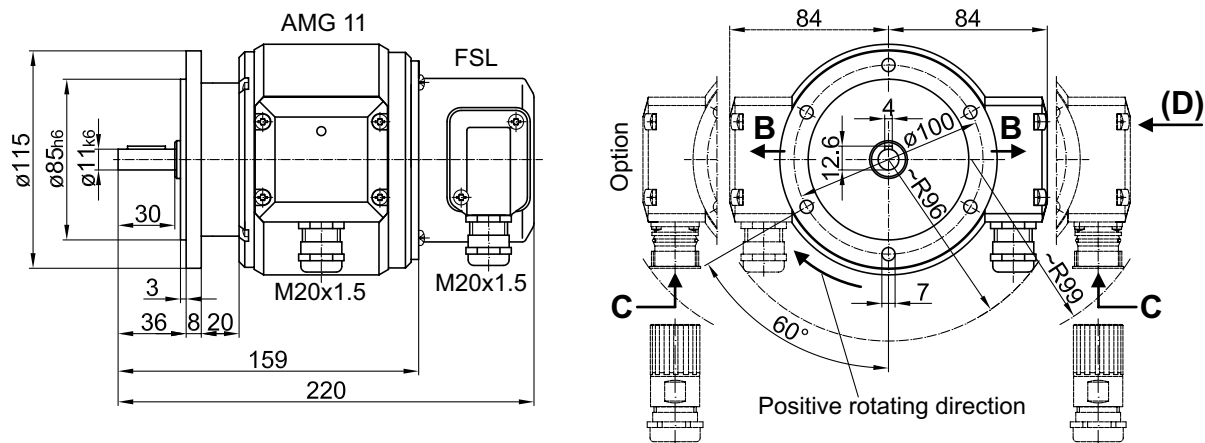
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Dimensions

Version with bus interface(s)



Version with SSI/incremental interface(s)



Version with bus and SSI/incremental interface(s)

