Combination

Encoder with integrated centrifugal switch
Single and multiturn 13 bit ST / 12 or 16 bit MT
SSI / Profibus / CANopen® / DeviceNet

AMG 11 + FSL

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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 ø11 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 (per interface SSI) ≤250 mA (per interface 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 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
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 % (Δn = 2 rpm/s); = +20 % (Δn = 1500 rpm/s)
Switching deviation cw-ccw rotation	≤3 %
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)	ø115 mm
Shaft type	ø11 mm solid shaft
Admitted shaft load	≤250 N axial ≤350 N radial
Flange	EURO flange B10
Protection DIN EN 60529	IP 67
Speed (n)	≤1.25 · ns
Range of switching speed (ns)	850...2800 rpm (Δn = 2 rpm/s)
Operating torque typ.	15 Ncm
Rotor moment of inertia	810 gcm²
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
Connection	Bus cover; Terminal box or flange connector M23, 12-pin (SSI/incremental); Terminal box (FSL)
Weight approx.	3 kg (depending on version)

Part number

AMG11 [ ][ ][ ][ ] **+ FSL** [ ]

Switching speed (ns)
- 6 850...949 rpm (Δn = 2 rpm/s)**
- 5 950...1099 rpm (Δn = 2 rpm/s)**
- 4 1100...1299 rpm (Δn = 2 rpm/s)**
- 3 1300...1799 rpm (Δn = 2 rpm/s)**
- 2 1800...2499 rpm (Δn = 2 rpm/s)**
- 1 2500...2800 rpm (Δn = 2 rpm/s)**

Additional incremental signals
- 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 setted threshold).

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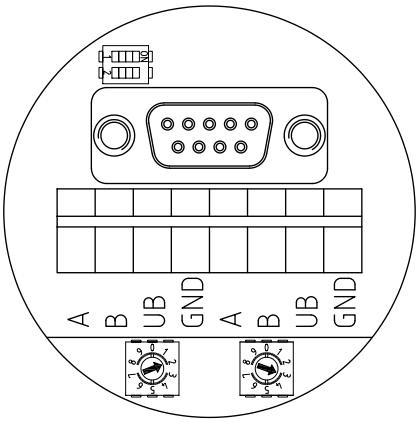
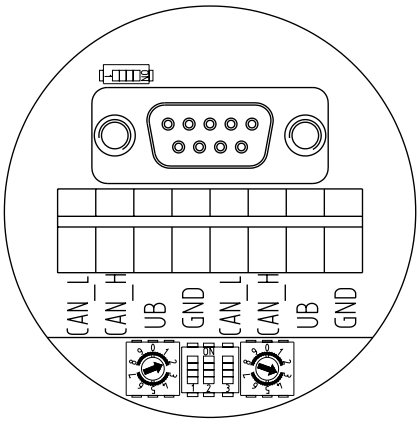
Terminal assignment - Profibus

View A - Connecting terminal in cover



Terminal assignment - CANopen®

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.

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 - Profibus

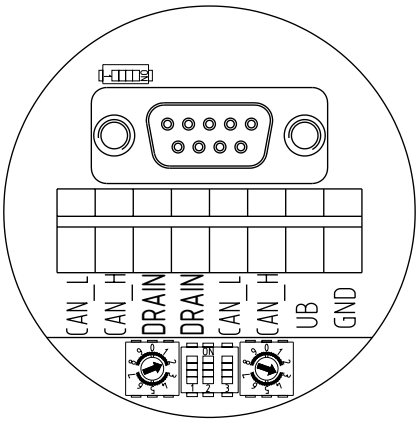
Protocol	Profibus DP V0
Profibus features	Device Class 1 and 2
Data Exch. functions	Input: Position value Output: Preset value
Preset value	The „Preset“ parameter can be used to set the encoder to a predefined value that corresponds to a specific axis position of the system.
Parameter functions	Rotating 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

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

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

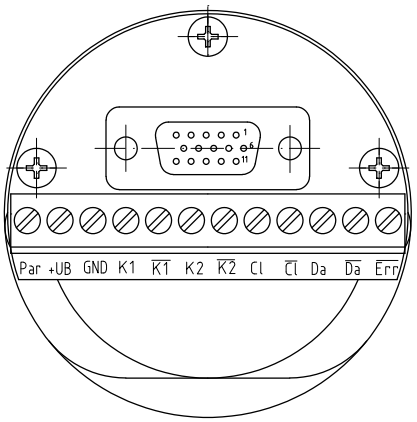
Terminals of the same significance are internally connected and identical in their functions. Max. load on the internal terminal connections UB-UB and GND-GND is 1 A each.

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

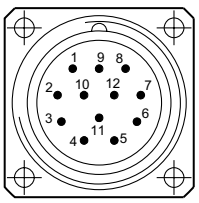
View B - Connecting terminal in cover



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



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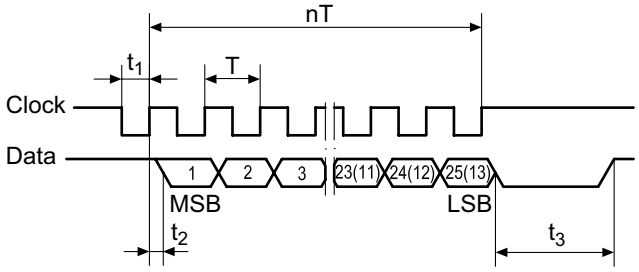
Data transfer



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

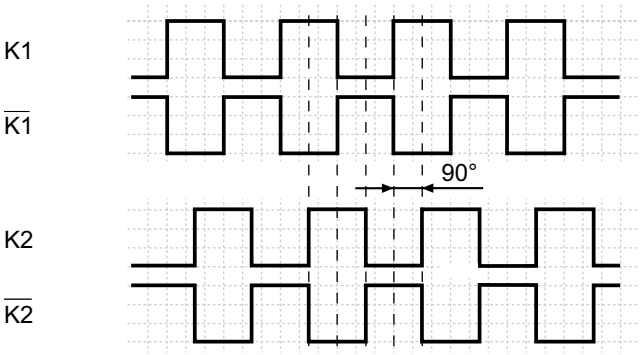
K 35	Spring washer coupling for solid shaft ø6...12 mm
K 50	Spring washer coupling for solid shaft ø11...16 mm
K 60	Spring washer coupling for solid shaft ø11...22 mm

Diagnostic accessories

HENQ 1100	Analyzer for encoders

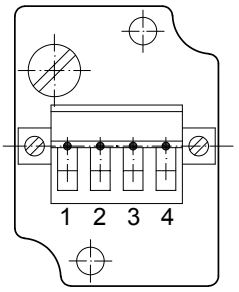
Output signals

Additional incremental signals
at positive rotating direction

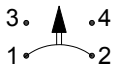


Terminal assignment

Connecting terminal centrifugal switch FSL
View D



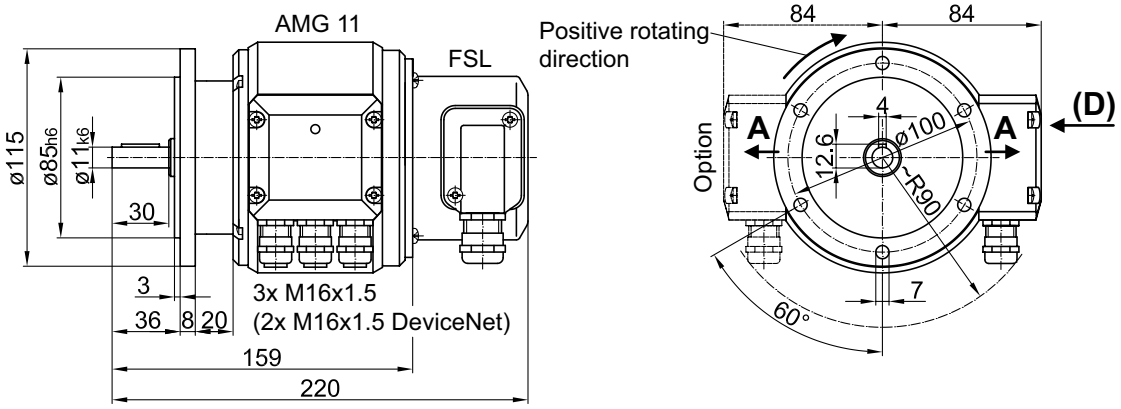
Make contact



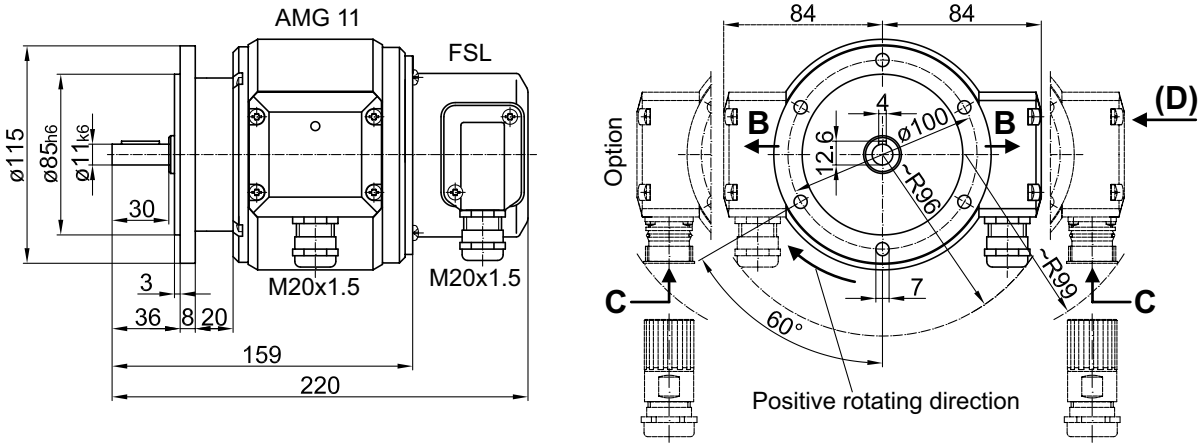
Break contact

Dimensions

AMG 11 + FSL - Version with bus interface(s)



AMG 11 + FSL - Version with SSI/incremental interface(s)



AMG 11 + FSL - Version with bus and SSI/incremental interface(s)