

# AMG 81

Encoder with solid shaft  $\varnothing 11$  mm and EURO flange B10

Single and multiturn 13 bit ST / 12 or 16 bit MT SSI / Profibus / CANopen®

## Overview

- Multiturn / SSI / Profibus / CANopen®
- Optical sensing method
- Singleturn 13 bit, multiturn 12 bit / 16 bit
- EURO flange B10 / solid shaft  $\varnothing 11$  mm



## Technical data

### Technical data - electrical ratings

Voltage supply	9...30 VDC
Consumption w/o load	$\leq 100$ mA (per interface SSI) $\leq 250$ mA (per interface bus)
Initializing time	$\leq 200$ ms after power on
Interface	SSI Profibus-DPV0 CANopen®
Function	Multiturn
Transmission rate	9.6 ... 12000 kBaud (Profibus) 10 ... 1000 kBaud (CANopen®)
Profile conformity	Profibus-DPV0 CANopen® CiA DSP 406 V 3.0
Device address	Rotary switches in bus cover
Steps per revolution	8192 / 13 bit
Number of revolutions	4096 / 12 bit 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)
Incremental output	2048 pulses per revolution
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)	$\varnothing 115$ mm
Shaft type	$\varnothing 11$ mm solid shaft
Flange	EURO flange B10
Protection EN 60529	IP 55
Operating speed	$\leq 3500$ rpm (mechanical)
Operating torque	$\leq 10$ Ncm
Rotor moment of inertia	1.4 kgcm <sup>2</sup>
Admitted shaft load	$\leq 50$ N axial $\leq 60$ N radial
Material	Housing: aluminium alloy Shaft: stainless steel
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 IIIB T120°C Dc (dust) (only with option ATEX)
Weight approx.	1.7 kg (depending on version)
Connection	Bus cover Flange connector M23, 12-pin (SSI/incremental)

## Optional

- Additional incremental output (TTL / HTL)

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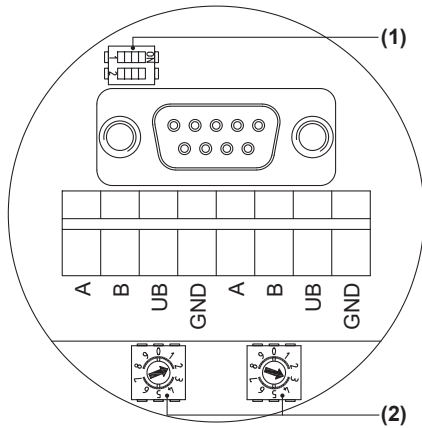
Encoder with solid shaft  $\varnothing 11$  mm and EURO flange B10

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## Terminal assignment

### Profibus-DP - View A (see dimension)

View inside bus connecting box Profibus



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.

### Profibus-DP - Terminating resistor (1)

ON = Last user

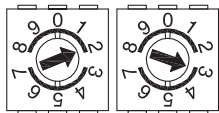
OFF = User x



### User address (2)

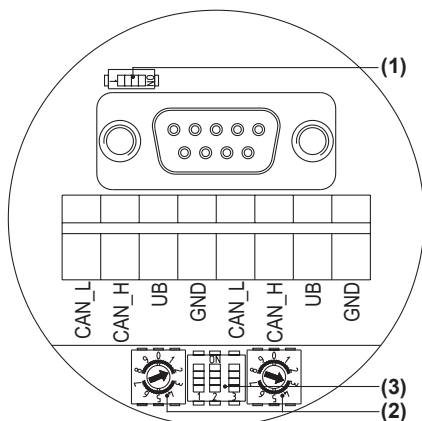
Defined by rotary switch.

Example: User address 23



### CANopen - View A (see dimension)

View inside bus connecting box CANopen®



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.

## Terminal assignment

### Terminating resistor (1)

ON = Last user

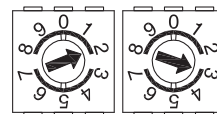
OFF = User x



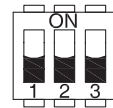
### CANopen - User address (2)

Defined by rotary switch.

Example: User address 23



### CANopen - Transmission rate (3)



Transmission rate	Setting DIP switches		
	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

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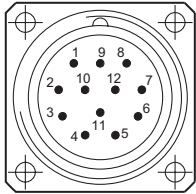
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## Terminal assignment

### SSI - View B (see dimension)

Assignment flange connector

SSI / incremental output (HTL, TTL)



Flange connector M23, male, 12-pin, counter-clockwise (CCW)

Pin	Assignment
1	$\overline{K2}$
2	Clock*
3	Data*
4	$\overline{\text{Data}}$ *
5	K1
6	$\overline{K1}$
7	Param*
8	K2
9	$\overline{\text{Error}}$ *
10	0V ( $\perp$ )
11	$\overline{\text{Clock}}$ *
12	+UB

\* Only for SSI

## Terminal significance

### Profibus

Connection	Description
GND	Ground for UB
UB	Voltage supply 10...30 VDC
A	Negative serial data transmission
B	Positive serial data transmission
dnu	Do not use

### CANopen®

Connection	Description
GND	Ground for UB
UB	Voltage supply 10...30 VDC
CAN_H	CAN Bus signal (dominant HIGH)
CAN_L	CAN Bus signal (dominant LOW)

## Terminal significance

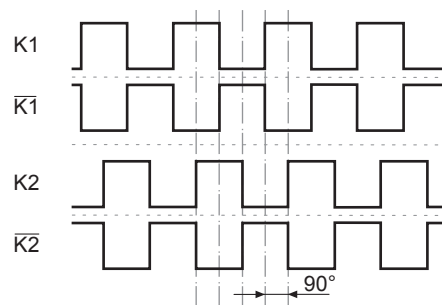
### SSI / incremental output (HTL, TTL)

+UB	Voltage supply
0V ( $\perp$ )	Ground
K1	Output signal channel 1
$\overline{K1}$	Output signal channel 1 inverted
K2	Output signal channel 2 (offset by 90° to channel 1)
$\overline{K2}$	Output signal channel 2 inverted
Clock	SSI clock
$\overline{\text{Clock}}$	SSI clock inverted
Data	SSI data
$\overline{\text{Data}}$	SSI data inverted
Param	Parameter
$\overline{\text{Error}}$	Error output

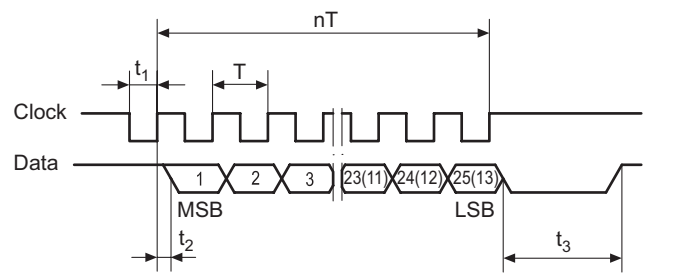
## Output signals incremental

### HTL/TTL

At positive rotating direction (see dimension)



## Data transfer



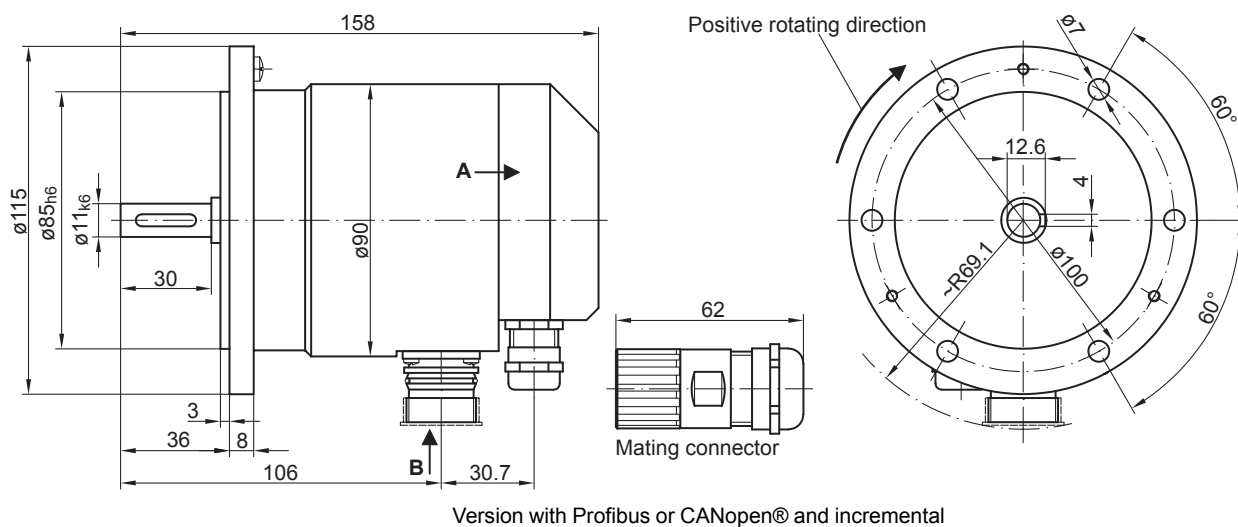
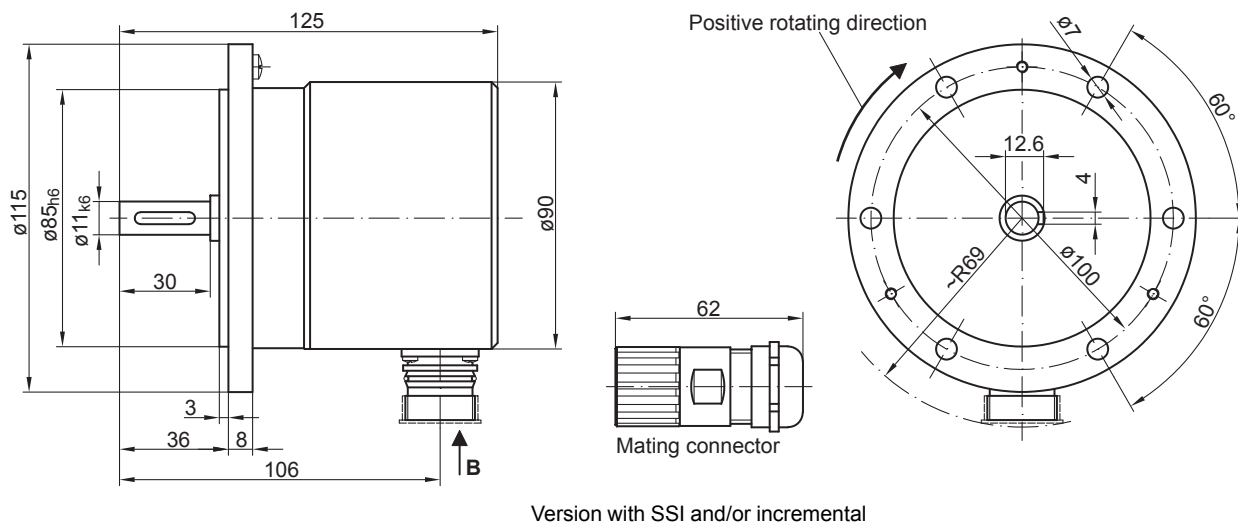
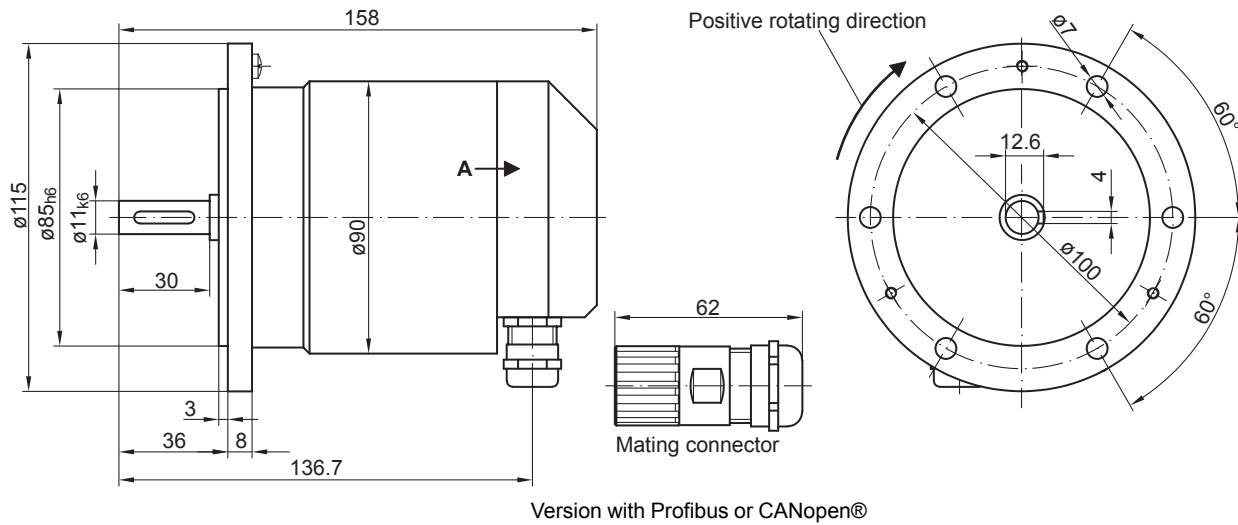
T =	1.25...10 $\mu\text{s}$
t <sub>1</sub> =	0.63...5 $\mu\text{s}$
t <sub>2</sub> =	0.4 $\mu\text{s}$
t <sub>3</sub> =	12...30 $\mu\text{s}$
n =	Number of bits
Clock frequency	100...800 kHz

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## Dimensions



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## Ordering reference

	AMG81	#	##	####
<b>Product</b>	Absolute encoder	AMG81		
<b>Interface/interfaces</b>				
SSI			S	
Profibus			P	
CANopen®			C	
<b>Absolute share</b>				
13 bit singleturn				13
13 bit singleturn + 12 bit multiturn <sup>(1)</sup>				25
13 bit singleturn + 16 bit multiturn <sup>(2)</sup>				29
<b>Additional output</b>				
Without				Z0
TTL level, 2048 pulses				T2048
HTL level, 2048 pulses				H2048

(1) Only version S

(2) Only version P und C

## Accessories

### Mounting accessories

 Spring disk coupling K 35 (shaft  $\varnothing 6...12$  mm)

 Spring disk coupling K 50 (shaft  $\varnothing 11...16$  mm)