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ABSOLUTE ROTARY ENCODER
CANOPEN

Main Features

- Compact and heavy-duty industrial model
- Interface: CAN according to CAL
- Housing: 58 mm ∅
- Shaft: 6 or 10 mm ∅
- Hollow Shaft: 12 mm ∅
- Resolution: Max. 25 Bit = 33,554,432 steps over 4,096 revolutions
- Code: Binary

Mechanical Structure

- Flange and housing of Aluminum
- Shaft of stainless steel
- Precision ball bearings with sealing or cover rings
- Code disc made of unbreakable and durable plastic

Programmable Parameters

- Direction of rotation (complement)
- Resolution per revolution
- Total resolution
- Preset value
- Cams
- Two limit switches
- Baud-rate and CAN-identifier
- Transmission mode: Polled mode, cyclic mode, sync mode, or cos mode

Electrical Features

- Temperature insensitive IR-opto-receiver-array
- status indication with two LEDs in the connection cap
- Optional programmable LED-Dot-Matrix display integrated in connection cap
- Only one IR-transmitter-diode per opto-array
- Highly integrated circuit in SMD-technology
- Polarity inversion protection
- Over-voltage-peak protection

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Technical Data

Electrical Data

Supply voltage	10 - 30 V DC (absolute limits)
Power consumption	max. 3.5 Watts
EMC	EN 50081-2, EN 61000-6-2
Bus connection	Line-driver according to RS 485 galvanically isolated by opto-couplers
Transmission rate	max. 12 MBaud
Accuracy of division	± ½ LSB
Step frequency LSB	Max. 100 kHz (valid code)
Electrical lifetime	> 10^5 h
Device addressing	Programmable by rotary switches in connection cap

Mechanical Data

Housing	Aluminum, optional stainless steel		
Lifetime	Fa ≤ 250 N, Fr ≤ 250 N: 1 * 10^8 revolutions		
	Fa ≤ 40 N, Fr ≤ 110 N: 3 * 10^9 revolutions		
Inertia of rotor	≈ 50 gcm^2		
RPM	Max. 6,000 (continuously)		
Shock (EN 60068-2-27)	≤ 30 g (halfsine, 11 ms)		
Permanent shock (EN 60028-2-29)	≤ 10 g (halfsine, 16 ms)		
Vibration (EN 60068-2-6)	≤ 10 g (10 Hz ... 1,000 Hz)		
Weight, Singleturn / Multiturn	≈ 500 g / ≈ 700 g		
Friction torque	≤ 5 Ncm		
Flange	**Synchro (Y)**	**Clamp (F), Synchro (Z)**	**Hollow shaft (H)**
Shaft diameter	6 mm	10 mm	12 mm
Shaft length	10 mm	20 mm	
Hollow Shaft depth min. / max.			15 / 30 mm

Environmental Conditions

Operating temperature	- 40 ... + 80 °C
Storage temperature	- 40 ... + 85 °C
Humidity	98 % (without liquid state)
Protection class (EN 60529)	
Casing side	IP 65
Shaft side	IP 65* (* up to 0.5 bar)

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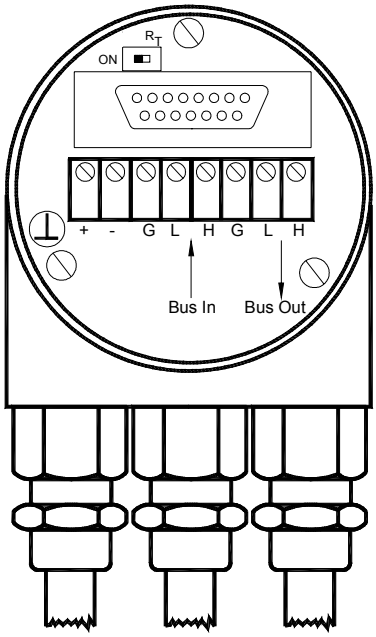
Interface

Installation connection cap

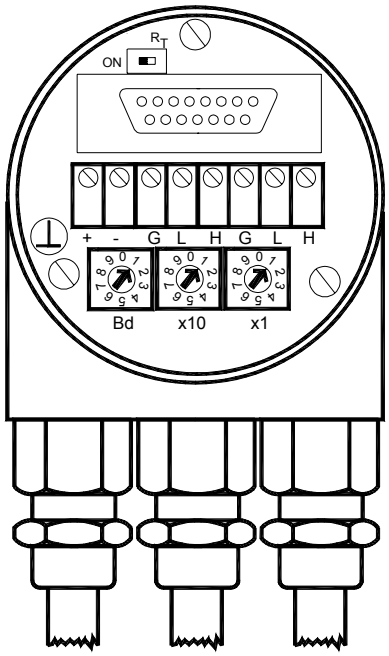
The rotary encoder is connected by two or three cables depending on whether the power supply is integrated into the bus cable or connected separately. If the power supply is integrated into the bus cable, one of the cable glands can be fitted with a plug. The cable glands are suitable for cable diameters from 5.5 up to 9 mm.



Clamp	Description
⊥	Ground
+	24 V Supply voltage
-	0 V Supply voltage
G (left)	CAN Ground (Bus In)
L (left)	CAN Low (Bus In)
H (left)	CAN High (Bus In)
G (right)	CAN Ground (Bus Out)
L (right)	CAN Low (Bus Out)
H (right)	CAN High (Bus Out)

Configuration connection cap

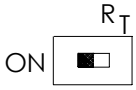
The setting of the node number is achieved by 2 turn-switches in the connection cap. Possible addresses lie between 0 and 90 whereby every address can only be used once. Inside the encoder the defined address is increased by one.The connection cap can easily be opened for installation by removing the two cap screws.



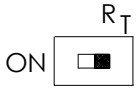
A termination resistor is integrated in the connection cap. The resistor must be switched on if the encoder is connected at the end or at the beginning of the bus. Separation of Bus In and Bus Out signals if termination resistor is activated.

Resistor:

Last Device



Device X



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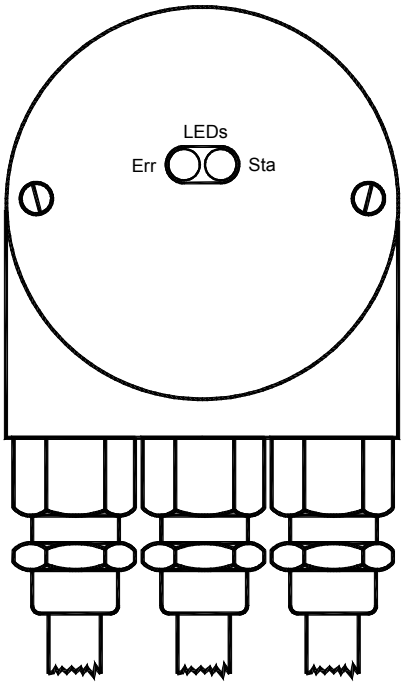
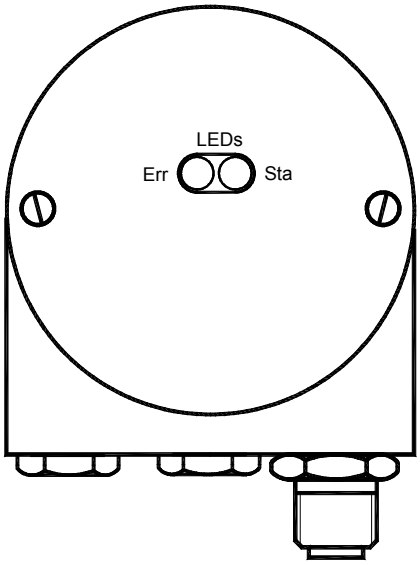
Diagnostic connection cap

Two LEDs on the backside of the connection cap show the operating status of the encoder.
This can be very useful for installing and setting-up the encoder.



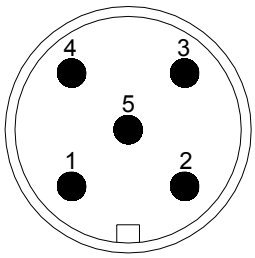
Connection cap with round connector

The connection cap type AH58-B1CA-1BW is equipped with a 5 pole connector in M12 dimensions. All other cable glands are replaced by blind caps.



Following table indicates pinning of the micro style connector:

Pin number	Signal
1	(CAN Ground)
2	24 V Supply voltage
3	0 V Supply voltage
4	CAN High
5	CAN Low



Pinning (Male)

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Programmable Encoder - Parameter

Operating Parameters	As operating parameters the code sequence (complement) can be programmed. This parameter determines the counting direction, in which the output code increases or decreases.
Resolution per Revolution	The parameter resolution per revolution is used to program the desired number of steps per revolution. Each value between 1 and 4,096 can be programmed.
Total Resolution	This parameter is used to program the desired number of measuring units over the total measuring range. This value may not exceed the total resolution of the absolute rotary encoder. If the encoder is used in a continuous measuring application, certain rules for the setting of this parameter must be followed. These rules are outlined in the manual.
Preset Value	The preset value is the desired position value, which should be reached at a certain physical position of the axis. The position value is set to the desired process value by the parameter pre-set.
Limit Switch, Min. and Max.	Two position values can be programmed as limit switches. By reaching these values one bit of the 32 bit process value is set to high.
Cam	One free programmable cam can be set in the total measaring range. The same functionality is realised like a mechanical cam unit.

Programmable CAN Transmission Modes

Polled Mode	By a remote-transmission-request telegram the connected host calls for the current process value. The absolute rotary encoder reads the current position value, calculates eventually set-parameters and sends back the obtained process value by the same identifier.
Cyclic Mode	The absolute rotary encoder transmits cyclically - without being called by the host - the current process value. The cycle time can be programmed in milliseconds for values between 1 ms and 65536 ms.
Sync Mode	After receiving a sync telegram by the host, the absolute rotary encoder answers with the current process value. If more than one node number (encoder) shall answer after receiving a sync telegram, the answer telegrams of the nodes will be received by the host in order of their node numbers. The programming of an offset-time is not necessary. If a node should not answer after each sync telegram on the CAN network, the parameter sync counter can be programmed to skip a certain number of sync telegrams before answering again.

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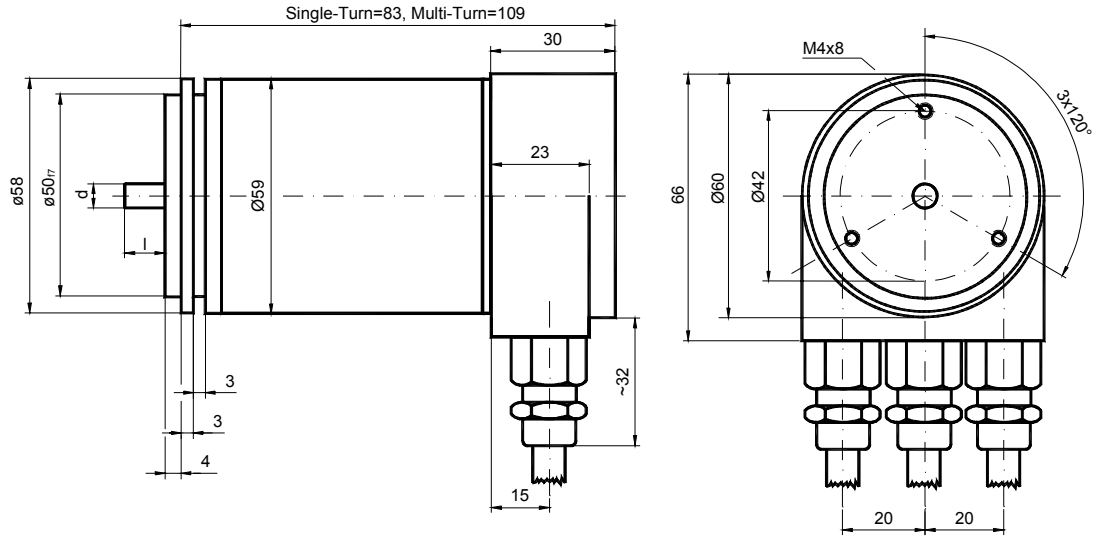
Mechanical Drawings

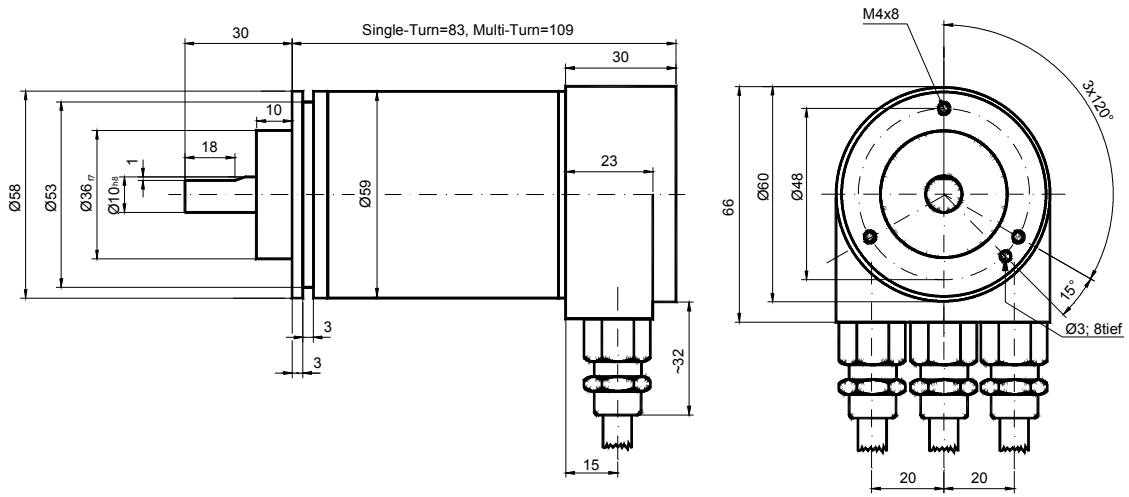
Synchro Flange (Y, Z)

The only difference between the Y- and Z-Flange is the shaft size (6 or 10 mm, refer to the table besides).

	d / mm	l / mm
Y-Flange	6_{f6}	10
Z-Flange	10_{h8}	20



Clamp Flange (F)



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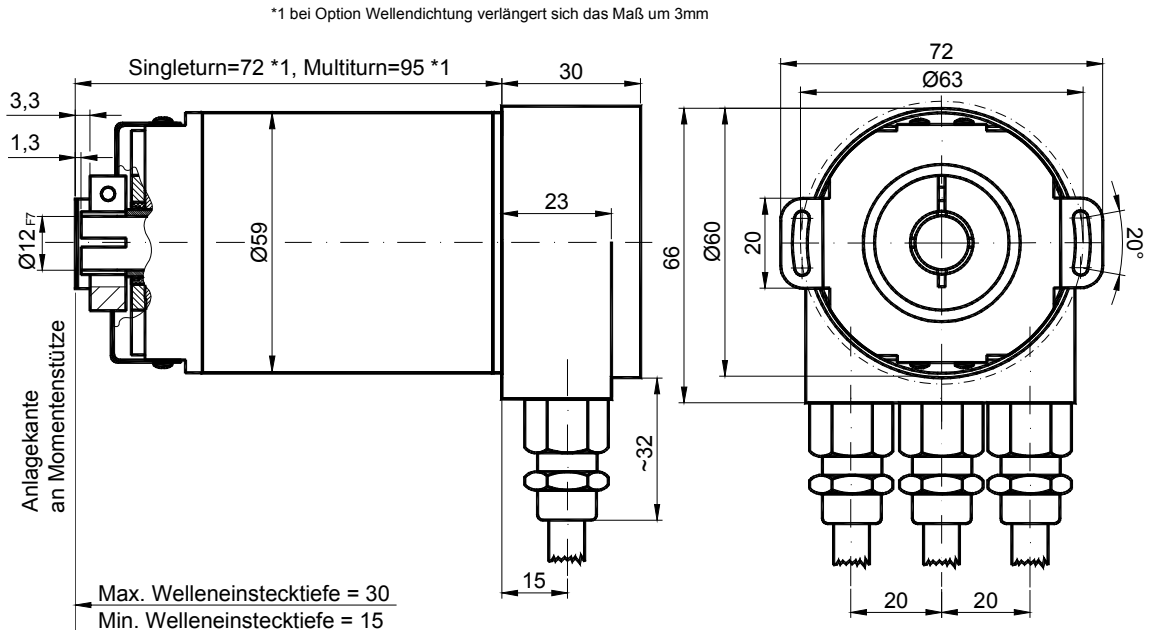
Hollow Shaft (H)



Mounting instructions

The clamp ring may only be tightened if the shaft of the driving element is in the hollow shaft.
The diameter of the hollow shaft can be reduced to 10 mm or 8 mm by using an adapter (this reducing adapter can be pushed into the hollow shaft).

Allowed shaft movements of the drive element are listed in the table.

	axial	radial
static	± 0.3 mm	± 0.5 mm
dynamic	± 0.1 mm	± 0.2 mm

ABSOLUTE ROTARY ENCODER
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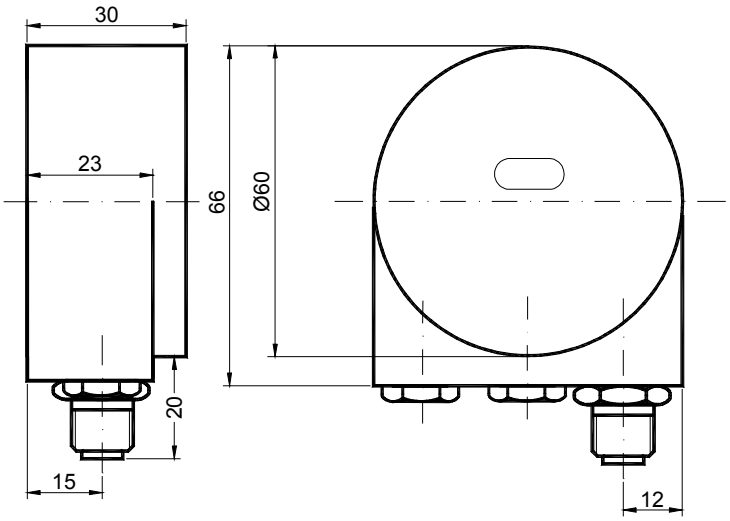
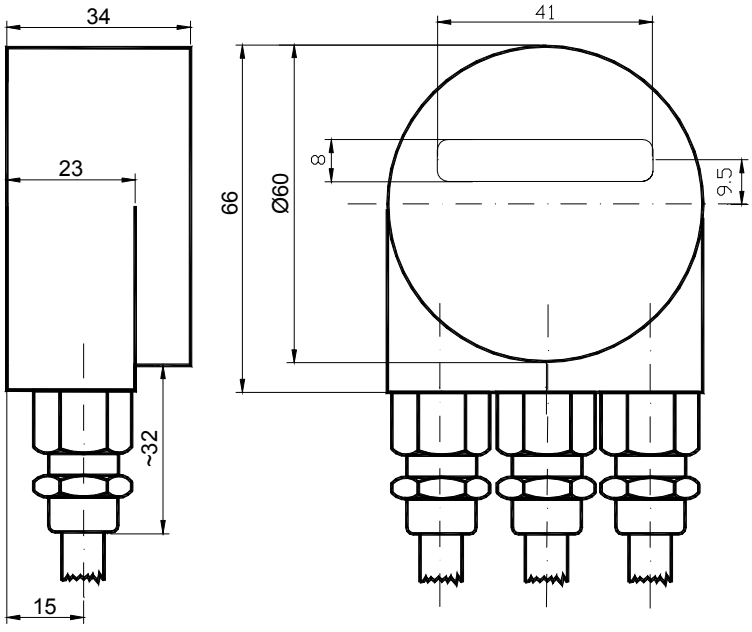
Connection cap AH58-B1CA-1BW, 5pin round connector M12, Micro style



Connection cap with LED-Display



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Models/Ordering Description

Description	Type Key									
Absolute rotary encoder	**AWC**	**58**	. . -	. . . . -	.	B	B1	C2	.	3PG
Diameter in mm										
Steps per revolution	4096		**12**							
	8192		13							
No. of revolutions	1			**1**						
	4096			**4096**						
Flange	Clamp Flange (Shaft = 10 mm ∅)				**F**					
	Synchro Flange (Shaft = 6 mm ∅)				**Y**					
	Synchro Flange (Shaft = 10 mm ∅)				Z					
	Hollow Shaft (12 mm)				H					
Code	Binary					**B**				
Version							**B1**			
Interface	CANopen programmable acc. Class 2							**C2**		
Options	Without								**0**	
	Shaft sealing (not possible for Z-Flange)								W	
	Stainless steel configuration (flange, housing)								Q	
Connection	Realized with connection cap *1)									**3PG**
	Realized with LED display in connection cap *1)									3PG-D

*1) The connection cap has to be ordered separately !

Standard = bold, further models on request

Accessories and Documentation

Description		Type
Connection cap*1)	T-coupling-functionality with integrated address setting is necessary to use the encoder	
	Standard	AH 58-B1CA-3PG
	Stainless steel configuration	AH 58-B1CA-3PG-VA
	Connection with 5pin round connector, Micro style	AH 58-B1CA-1BW
	Integrated LED display to indicate position value	AH58-B1CA-3PG-DSP
- special version -	2 cable glands for cable diameter: 9 - 13 mm	AH58-B1CA-2M20
Shaft coupling**	Drilling: 10 mm	GS 10
	Drilling:: 6 mm	GS 06
Clamp disc**	4 pcs. / AWC	SP 15
Clamp ring**	2 pcs. / AWC	SP H
User Manual*2)	Installation and configuration manual, German	UMD-CA
User Manual*2)	Installation and configuration manual, English	UME-CA
EDS-File*2)	Disc containing EDS-file for coniguration.	DK-CA

** needless for hollow shaft

*2) These can be downloaded free of charge from our Homepage www.posital.de.

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