Absolute Rotary Encoder EXAG – Explosion Proof

Device Net

Main Features
- Approval: II 2 G/D EEx d II C T6
- Heavy-duty industrial model
- Interface: Device Net
- Max. 65536 steps per revolution (16 Bit)
- Max. 16384 revolutions (14 Bit)
- Code: Binary

Programmable Parameters
- Direction of rotation (complement)
- Resolution per revolution
- Total resolution
- Preset value
- Transmission mode:
  Polled mode, Change of State, Cyclic

Mechanical Structure
- Ex-proof, flameproof enclosure
- 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

Electrical Features
- Address and baudrate setting via rotary switches
- Connection via connection cap
- Temperature insensitive IR-opto-receiver-ASIC with integrated signal conditioning
- Highly integrated circuit in SMD-technology
- Polarity inversion protection
- Over-voltage-peak protection

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Technical Data

Electrical Data

Interface	Transceiver according ISO/DIS 11898, up to 64 nodes galvanically isolated by opto-couplers	
Transmission rate	150 kBaud, 250 kBaud, 500kBaud	
Device addressing	Adjustable by rotary switches in connection cap	
Supply voltage	10 – 30 V DC (absolute limits) *	
Current consumption	max. 230 mA with 10 V DC, max. 100 mA with 24 V DC	
Power consumption	max. 2.5 Watts	
Step frequency LSB	800 kHz	
Accuracy of division	± ½ LSB (12 bit), ± 2 LSB (16 bit)	
EMC	Emitted interference: EN 61000-6-4	
	Noise immunity: EN 61000-6-2	
Electrical lifetime	> 10^5 h	

* Supply voltage according to EN 50 178 (safety extra-low voltage)

Mechanical Data

Housing	Aluminum	
Max. shaft loading	Axial 50 N, radial 50 N	
Inertia of rotor	≤ 35 gcm^2	
Friction torque	IP65	≤ 0.05 Nm at 25°C
	IP67	≤ 0.2 Nm at 25°C
RPM max.	IP65	3,000 RPM
	IP54	6,000 RPM
	IP67	1,200 RPM
Shock (EN 60068-2-27)	≤ 100 g (halfsine, 11 ms)	
Vibration (EN 60068-2-6)	≤ 10 g (10 Hz ... 2,000 Hz)	
Weight (standard version)	Approx. 1200 g	
Flange	**Clamp (C)**	
Shaft diameter	10 mm	
Shaft length	20 mm	

Environmental Conditions

Operating temperature	- 40 .. + 70°C
Storage temperature	- 40 .. + 85 °C
Humidity	98 % (without liquid state)
Protection class (EN 60529)	IP 65 (others on request)

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Note:
For ambient temperatures below –10°C and above +60°C use field wiring suitable for both minimum and maximum ambient temperature.

Ex-Protection

SCANCON encoders type series EXAG are classified according to Ⓔx II 2 G/D EEx d II C T6:

Ⓔx	**II**	**2**	**G/D**	**EEx**	**d**	**II**	**C**	**T6**

T6: Temperature Class T6: Maximum surface temperature: + 85°C

C: Explosion Sub-Group C: Hydrogen (H_2) , Acetylene (C_2H_2), Carbon Disulfide (CS_2)

II: Explosion Group: for all areas except for mining

d: Method of protection: flameproof enclosure

EEx: Device in compliance with EN50014 and EN50018

G/D: Application Area: permitted for gas und dust

2: Equipment-Category 2: permitted for zone 1 / zone 21

II: Equipment-Group II: for all applications except for mining

Ex-Proof Device

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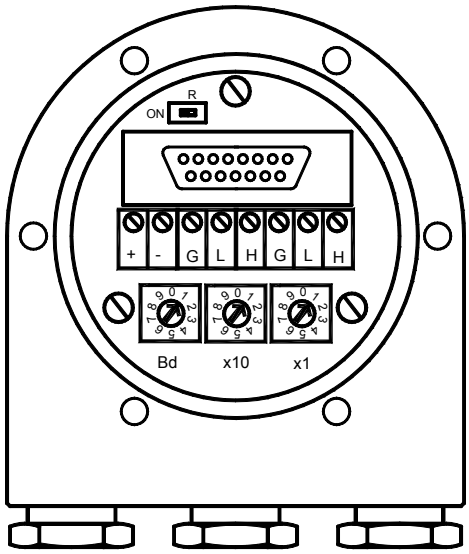
Interface

Installation connection cap

The rotary encoder is connected with 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 (unused cable entries have to be closed with a blind plug-> accessories). Two cable glands are suitable for cable diameters from 8 up to 9.5 mm (bus cable), one cable gland is suitable for cable diameters from 6.5 up to 8 mm (power supply).

Follow the instructions in the installation manual carefully, otherwise the ATEX-certification will repealed!



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)

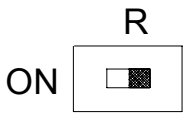
Configuration connection cap

The setting of the node number is achieved by 2 turn-switches in the connection cap. Possible addresses lie between 0 and 63 whereby every address can only be used once.

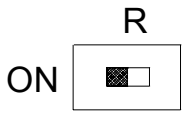
The baudrate is set with the third rotary switch in the cap.

The connection cap can be opened for installation by removing the six cap screws.

A termination resistor is integrated in the cap. The resistor must be switched on if the encoder is connected at the end or at the beginning of the bus:



device X



last device

Separation of Bus In and Bus Out signals if termination resistor is activated.

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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.

Programmable Transmission Modes

Polled Mode	By a 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.
Change of State	The absolute rotary encoder transmits the actual process value. The process value is transmitted when the position changes. This is useful to reduce the bus activity.
Cyclic	The absolute rotary encoder transmits the actual process value event controlled by an internal timer. This is also useful to reduce the bus activity.

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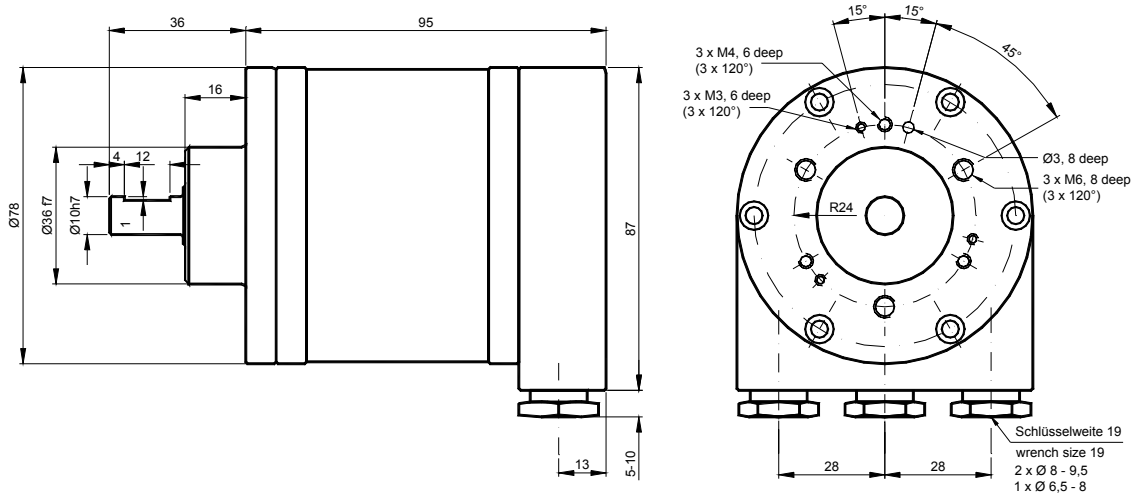
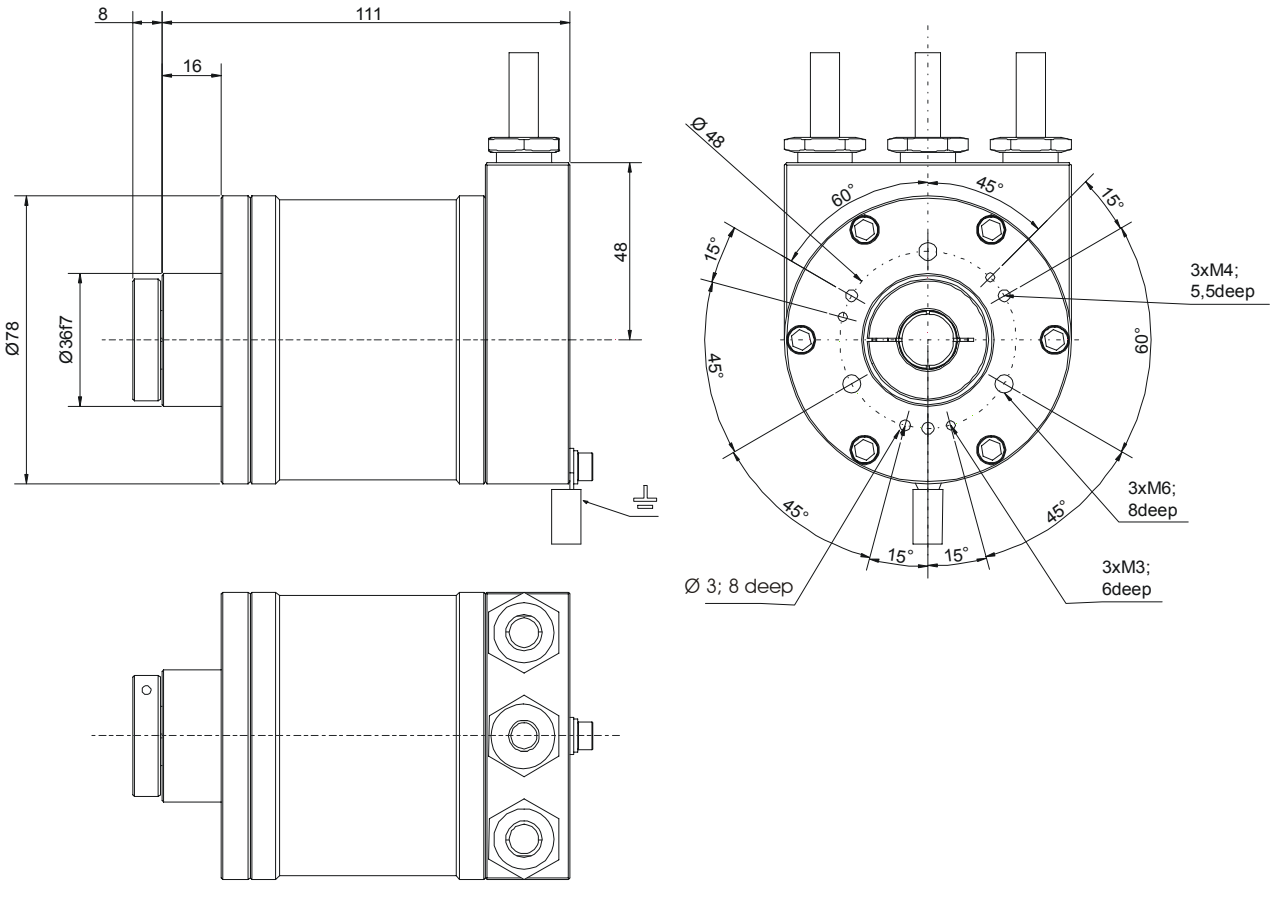
Mechanical Drawings

Clamp flange (C)

Shaft



Hollow Shaft



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Models/Ordering Description

Description	Type key												
Ex-Proof Optocode	**EXAG-**	_ _	_ _	_ -	_ _	_ _ -	_ -	_ _ -	_ _ -	_ _ -	_ _ -	_ -	_ _
Interface	DeviceNet	**D2**											
Version			**B1**										
Code	Binary			**B**									
Revolutions (Bits)	Singleturn				**00**								
	Multiturn (4096 revolutions)				**12**								
	Multiturn (16384 revolutions)				14								
Steps per Revolution	4096					12							
(Bits)	8192					**13**							
Shaft or	Solid Shaft						**A**						
Hollow Shaft	Hollow Shaft						H						
Material	Aluminum							**AL**					
	Stainless Steel							VA					
Shaft diameter	10 mm								**10**				
Shaft length	20 mm								**20**				
Hollow shaft diameter	14 mm									14			
Deep	35 mm									35			
IP Rating	IP65 (further on request)										**65**		
Flange	Clamping Flange											**C**	
Connection	Connection Cap Field Bus – radial cable outlets												**FS**
	2 x Ø 8-9.5 mm / 1 x Ø 6.5 - 8 mm												
	Hydraulic Hose												HS

Standard = bold, further models on request

Accessories and Documentation

Description		Type
EDS-File*	Disc containing EDS-file for configuration.	
Blind Plug	Blind plug for unused cable entries	EXAG-BL

* Can be downloaded free of charge from our homepage www.scancon.dk