

EXAG - Dual Output Profibus / Incremental Removable End Cap



- Shaft Encoder - Ø 78 mm
- Shaft: Ø 10 mm and Ø 12mm
- Provides simultaneous Profibus and Incremental outputs
- Absolute Resolution up to 30 bits
- Incremental Resolution up to 8192 ppr
- ATEX, IECEx, and Profibus Trade Org. certified
- North America Class I Div. 2, Ex db IIC.



Encoder Description

The EXAG encoder is intended for use in Oil & Gas industry. It is suitable for use in Class I Division 2 Groups ABCD or Class II Division 2 Groups FG, Class I Zone 1 or non-hazardous locations. EXAG encoder can be provided with interfaces as for example: Profibus, CanOpen DeviceNet, Ethernet, SSI, etc.

Electrical Specifications - General

Code:	Absolute (Binary) & Incremental
Supply Voltage:	10 to 30 Vdc
Current Consumption:	Max. 230 mA with 10 Vdc Max. 100 mA with 24 Vdc
Power Consumption:	Max. 2.5 watts
Electrical Lifetime:	> 10 ⁵ hours
Electrical Protection:	Reverse polarity and over-voltage-peak protection
Noise Immunity:	EN61000-6-2
Emitted Interference:	EN 61000-6-4

Environmental Specifications

Operating Temp.:	-40° C to + 70° C
Storage Temp.:	-40° C to + 70° C
Humidity:	98% RH without condensation
Enclosure Rating:	IP 64 / Nema 4 (approx.) IP 65 / Nema 5 (approx.) IP 66 / Nema 6 (approx.) IP 67 / Nema 6 (approx.) IP 68 (1hour/1 meter) / Nema 6P (approx.)

Mechanical Specifications

Material:	Housing: Aluminum or Stainless Steel Cap: Aluminum or Stainless Steel Shaft: Stainless Steel
Weight:	Aluminum: ~ 1600 gr (56,44 oz) Stainless Steel: ~ 3100 gr (109,35 oz)
Bearing Life:	> 1,9 x 10 ¹⁰ revolutions at rated load
Shaft Speed:	6.000 rpm (max.) IP 64 3.000 rpm (max.) IP 65/66/67/68
Starting Torque:	≤ 0,01 Nm at 25° C (no seal) ≤ 0,03 Nm at 25° C (with seal)
Rotor Mass Moment of Inertia:	42 gcm ² (5,95 x 10 ⁻⁴ oz-in-sec ²)
Shaft Loads:	Axial: 60 N (13,50 lbs) max. Radial: 80 N (17,98 lbs) max.
Shock:	100g @ 11 ms
Vibration:	10g @ 10-2000 Hz
Bump:	10g @ 16 ms (1000 x 3 axis)

Connection Options

Cable Outlets:	M20 threaded M25 threaded
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Electrical Specifications - Absolute

Interface:	Profibus - DP DPV2 – Functionality Line Driver according to RS 485; galvanically isolated by opto-couplers
Resolution:	Max. 14 bit (16384) revolutions Max. 16 bit (65536) steps per rev.
Device Addressing:	Adjustable by rotary switches in the connection cap
Transmission Rate:	Max. 12 MBaud
Step Frequency LSB:	800 kHz
Accuracy of Division:	+/- ½ LSB (12 bit) +/- 2 LSB (16 bit)

Electrical Specifications - Incremental

Output:	RS422 Line Driver (TTL compatible) 10 to 30V input – 5V output HTL Driver 10 to 30 V input – 10 to 30 V output
Output Current:	40 mA load per output channel
Output Format:	Two channel (A, B) quadrature with Index (Z) and complementary (A-, B-, Z-) outputs
Phase Sense:	A leads B clockwise from the mounting end of the encoder
Index:	½ period gating with Ch. B low
Maximum Frequency:	1 Mhz
Resolution:	1024, 2048, 4096, 8192 ppr

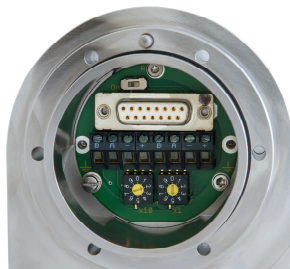
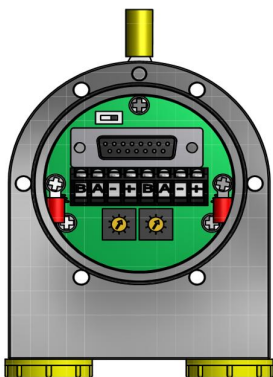
Certifications

ATEX:	Certificate No.: ITS09ATEX16867X II 2 G Ex db IIC T5 Gb II 2 D Ex tb IIIC T100°C Db -40°C ≤ Ta ≤ +70°C
IECEX:	Certificate No.: IECEX ITS 10.0016X Ex db IIC T5 Gb, Ex tb IIIC T100°C Db -40°C ≤ Ta ≤ +70°C
North America:	Certificate No: LR1192-5 Class I Division 2 Groups ABCD T5, Class II Division 2 Groups FG, Class I Zone 1AEx db IIC T5 Gb, Ex db IIC T5 Gb, Zone 21 AEx tb IIIC T100°C Db, Ex tb IIIC T100°C Db, Tamb= -40 °C to +70 °C
EAC Ex:	НАННО «ІЦБЭ» No. EAЭC RU C-DK.AA87.B.00266/19 1Ex db IIC T5 Gb X, Ex tb IIIC T100°C Db X -40°C < T.amb < +70°C

Interface

Installation

This rotary encoder provides simultaneous Profibus and Incremental outputs. It is connected by two cables, a Profibus cable and an Incremental cable. The power supply must be integrated into the bus cable. Any unused cable outlets must be closed using an suitably certified - proof blind plug. The threaded entries are M20x1,5 and M25x1,5.



Profibus Output

The Profibus-DP device address is set by user-friendly rotary switches in the connection cap. Allowed addresses are between 1 and 99. Each can only be used once.

The connection cap can easily be opened by removing the six screws in the cap.

The Termination Resistor is integrated into the connection cap. It must be switched on if the encoder is connected at the end or the beginning of the bus.



The power supply has to be connected once (no matter which clamps). If the Termination Resistor is switched on, the outgoing lines are disconnected.

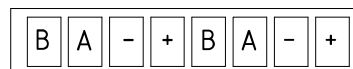
The GSD file is necessary for installing the encoder. The GSD file and the detailed user manual can be downloaded from our homepage: www.scancon.dk

Interface

The Profibus-DP interface supports CLASS 1 and CLASS 2 functionality according to the encoder profile*. In addition to these functions, the GSD file supports further features, for example software limit switches. Furthermore, the following encoder parameters can be programmed directly via the Profibus-DP network without any extra device:

Parameter	Comment
Counting Direction	The counting direction parameter defines whether the output code increases when the shaft rotates clockwise.
Resolution per Revolution	The parameter "resolution per revolution" is used to program the desired number of steps per revolution. Each value between 1 and the physical resolution per revolution 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 physical resolution of the absolute rotary encoder.
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 preset.
Velocity	The implemented software can additionally deliver the current velocity. This value is transmitted in binary code, 16 Bit, in addition to the process value. It is possible to choose between four different units; steps per 10 ms, per 100 ms, per 1000 ms, and revolutions per minute.
Software Limit Switches Function	Two software limit switches can be set. If the position value falls below the lower or exceeds the higher limit switch, a status bit in the process value is set.
Teach-in (On-line Parameterization)	A special mode is available for the commissioning phase of the device. This makes it possible to change parameters while the encoder is in data exchange mode. For continuous operation, another mode is available in which the parameters are protected against unintentional changes.

Connections for the data lines and power supply:



Terminal	Description
B (left)	Bus line B (Bus in)
A (left)	Bus line A (Bus in)
-	0V
+	10-30V
B (right)	Bus line B (Bus out)
A (right)	Bus line A (Bus out)
-	0V
+	10-30V

* The Profibus-DP profile for the encoder can be ordered using Order No. 3.062 from:

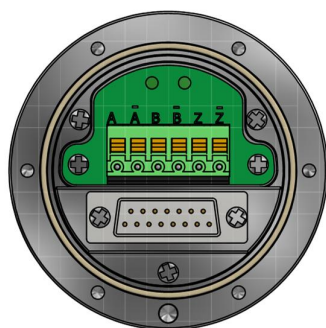
Profibus Nutzerorganisation e.V.
 Haid und Neu-Str. 7
 D-76131 Karlsruhe
 Germany

Incremental Output

The Incremental output consists of two channel (A, B) quadrature with an index channel (Z) as well as complementary (A-, B-, and Z-) outputs.

The Incremental output terminal block is found on the encoder body cover. This can be accessed once the connection cap has been removed.

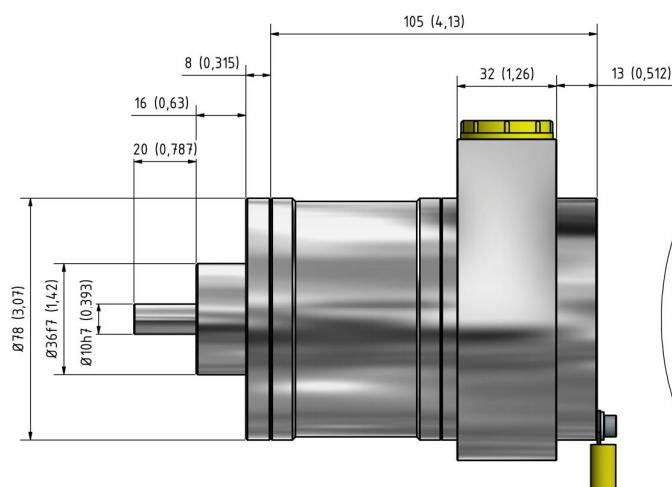
Connections for the incremental wires.



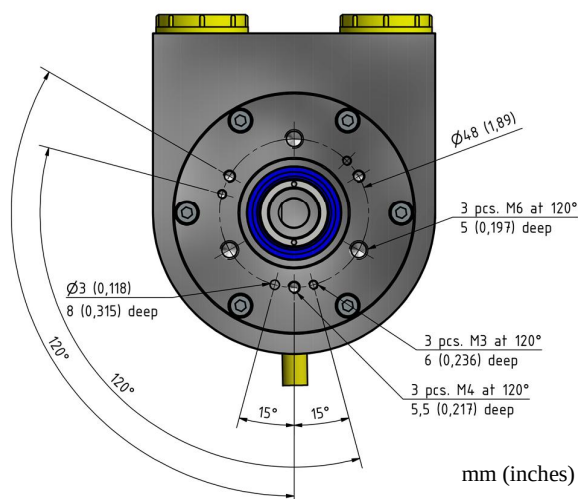
A	$\bar{A}$	B	$\bar{B}$	Z	$\bar{Z}$
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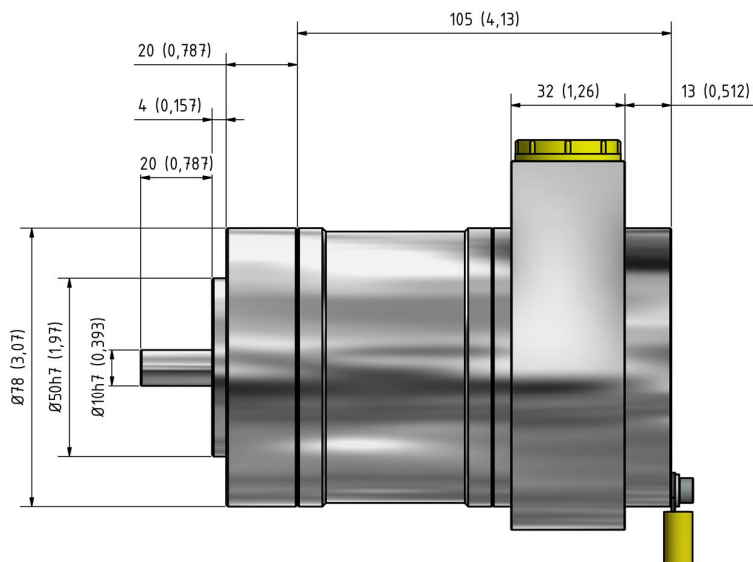
Terminal	Description
A	Channel A
A not	Channel A not
B	Channel B
B not	Channel B not
Z	Channel Z
Z not	Channel Z not

Face Mounts

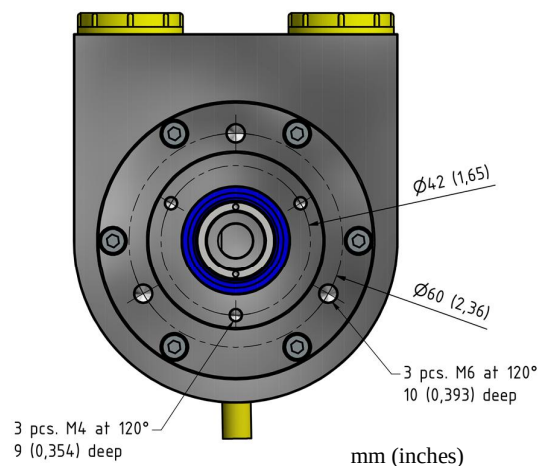


Face Mount C
Clamping Flange

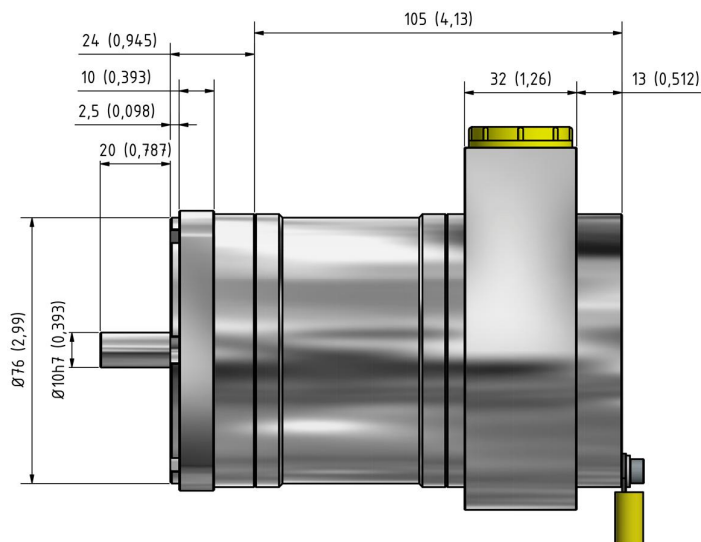




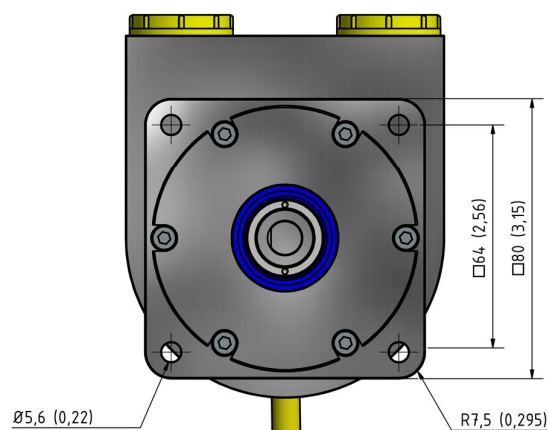
Face Mount S
Servo Flange



mm (inches)

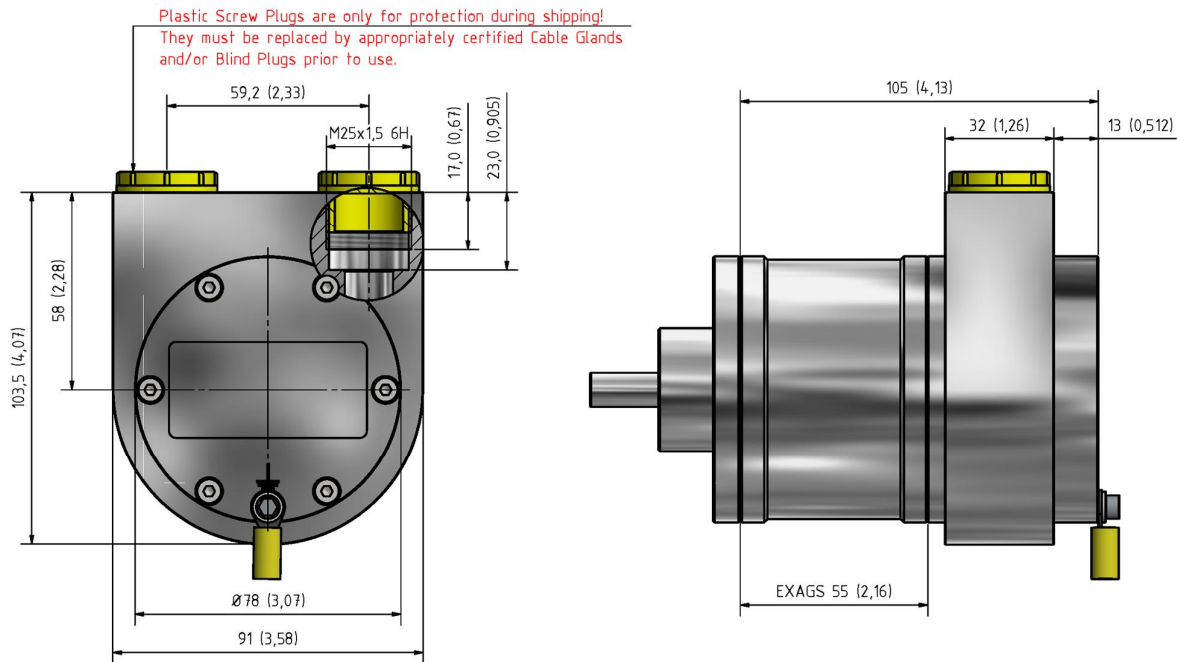


Face Mount Q
Square Flange



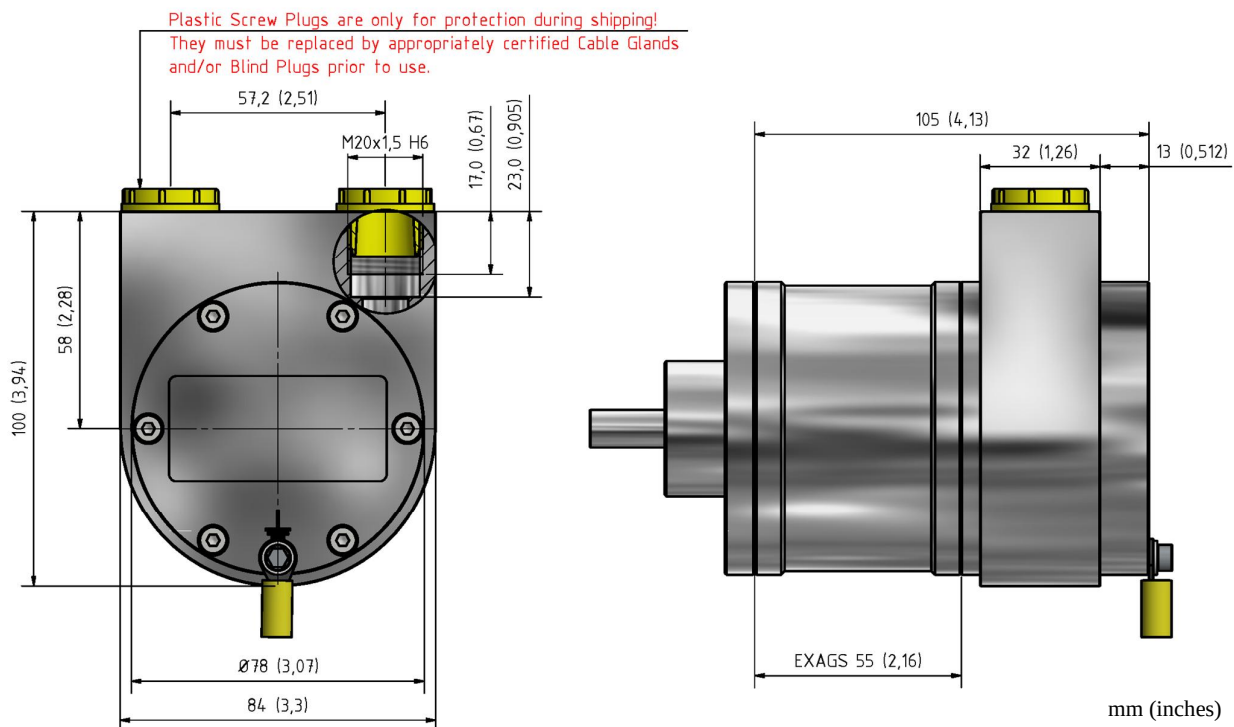
mm (inches)

End Caps with Cable Outlets



Side Standard End Cap (FI)

mm (inches)



Side Standard End Cap (FN)

mm (inches)

Ordering Code

Example: EXAGS - DP6AB - 14 - 16 - A - SA - 02 - 67 - 00 - FI - C - 00

EXAG	S	-	DP		B	-		-		-	A	-		-		-	00	-		-		-	00
1			2	3			4		5		6		7		8		9		10		11		12

1. Housing

Delivered ONLY
As a short "S" version

2. Incremental Output

RS422 Driver (TTL compatible)5
10 to 30V input – 5V output
HTL Driver 6
10 to 30V input – 10 to 30V output

3. Incremental Revolution

1024 ppr A
2048 ppr B
4096 ppr C
8192 ppr D

4. Absolute revolution

Single Turn.....00
Multiturn 12 bits (4096)12
Multiturn 14 bits (16384).....14

5. Absolute Steps per Resolution

12 bits (4096) (0.09°).....12
13 bits (8192) (0.04°).....13
16 bits (65536) (0.005°).....16

6. Composition

Aluminum AL
Stainless Steel* SA
**AISI316*

7. Shaft (diameter x length)

10 mm x 20 mm 2 flats, 8mm Length01
12 mm x 25 mm 2 flats, 8 mm length 02
10 mm x 20 mm 1 flat, 15 mm length 03

8. IP Rating

IP 64 64
IP 65 65
IP 66 66
IP 67 67
IP 68* 68
**1 meter/1 hour*

9. Cable

No cable..... 00

10. Cable Outlets

Side Standard 2 outlets - M20 FN
Side Standard 2 outlets - M25 FI

11. Flange

Clamping flangeC
Synchro flangeS
Square VA/SA option only.....Q

12. Accessory

No accessory..... 00