



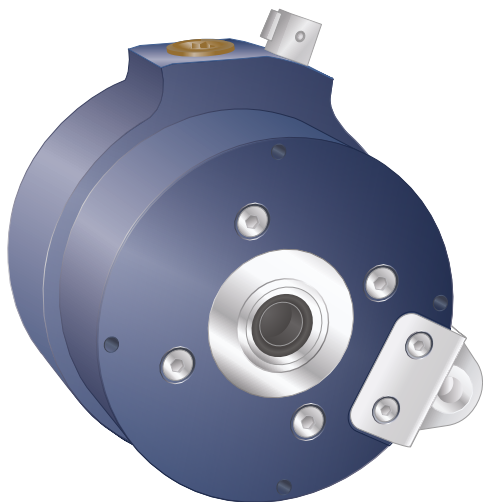
Automation and Metrology International, LLC

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Encoder model
Drehgebermodelle
编码器型号

841



Mounting instructions

LEINE  LINDE



1366954-01
1366954-00-A-02



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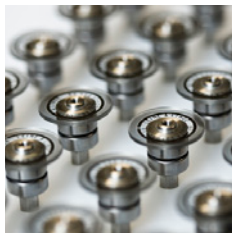
For further contact information, please visit our website at

www.leinelinde.com



Leine Linde is a Swedish company dedicated to production of encoders for heavy duty applications. Some of the values offered by Leine Linde are local technical support and possibility of 24 hours express delivery.

On our website **www.leinelinde.com** you can find data sheets and other product information.





Before installation please read this manual carefully. Failure to follow the instructions in this manual will render the ATEX/IECEX certifications **INVALID**.



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Specifications and content in this document are subject to change without prior notice due to our continuous strives to improve functionality and performance of our products.



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General information



The optical encoder 841xxxxxx is intended for use on e.g. electrical motors for measurement and control of angular speed and position. The flameproof enclosure consists of aluminium housing, and a stainless steel shaft. The encoder is installed directly on the motor shaft or on a shaft extension. The hollow shaft is fixed by tightening a special screw in the shaft centre. This screw is part of the flameproof enclosure and must be used for the installation. However it is allowed to shorten the threaded part if needed. The encoder is prevented from rotation by a torque arm. The torque arm can be mounted to the front or back of the encoder in four different positions each (M5 torque arm) or to a separate torque bracket (M6 torque arm).

The electrical outputs are all short circuit protected both to 0V and to supply voltage. The supply lines are protected against reversed polarity. Electrical outputs are either 3 or 6 channels, an optional diagnostic signal is also available.

The encoder needs no service during use and is not repairable by the end user. The anticipated life in continuous use is at least 5 years, limited mainly by the bearing grease lifetime.

Installation shall be performed according to applicable national provisions. For European Union, provisions based on Directive 1999/92/EC shall be considered and for European member countries of CENELEC, national standards based on EN 60079-14 and EN 60079-17 shall be considered.

If the encoder has to be opened in Ex environment, wait at least 15 minutes after power has been switched off before opening. This allows internal components that may be hot to cool to a safe temperature.

In order to unfasten the cover, it may be helpful to insert the screws in the spare M5 threads. When tightening the screws in this position, cover will open.



Encoder types

All of the variants within the code keys are certified according to ATEX and IECEx with the following certificates and standards:

8	4	1	-	9					
---	---	---	---	---	--	--	--	--	--

Ex classes

0 = Tamb = -40°C...+40°C, RPMmax = 4200 (T6)

1 = Tamb = -40°C...+60°C, RPMmax = 4200 (T5)

2 = Tamb = -40°C...+70°C, RPMmax = 1500 (T5)

Created variants

0001 - 9999

8	4	1	-							-					
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Ex classes

0 = Tamb = -40°C...+40°C, RPMmax = 4200 (T6)

1 = Tamb = -40°C...+60°C, RPMmax = 4200 (T5)

2 = Tamb = -40°C...+70°C, RPMmax = 1500 (T5)

3 = Tamb = -40°C...+70°C, RPMmax = 6000 (T4)

Flange

0 = Standard

1 = Torque bracket 120°

Shaft

XX = 0-99

Electronics

5 = HCHTL (supply 9-30 Vdc, output 9-30 Vdc)

Functionality

4 = Standard, output with 3 channels

5 = Standard, output with 6 channels

6 = ADS Classic, output with 6 channels

Resolution

XXXXX ppr (pulses per revolution)

1	2	3a	4a	5a	6a	7a
	II	2G	Ex db	IIC	T6	Gb
	II	2D	Ex tb	IIIC	T85°C	Db
		3b	4b	5b	6b	7b

Explanation of marking

- 1 ATEX Symbol.
- 2 Equipment Group. II is equipment intended for use in non-mining plants.
- 3a 2G Equipment designed for zones 1 and 2 generated by gases or vapors.
- 3b 2D Equipment designed for zones 21 and 22 generated by dusts.
- 4a Equipment protection by flameproof enclosures "d", b signifies validity for EPL Gb.
- 4b Equipment dust ignition protection by enclosure "t", b signifies validity for EPL Db.
- 5a Subgroup Gas, for IIC the representative gas is Hydrogen/Acetylene. Includes subgroups IIA and IIB.
- 5b Subgroup Dust, for IIIC the dust type is conductive. Includes subgroups IIIA and IIIB.
- 6a Temperature class for Gas. Please consider that operating conditions like ambient temperature and rotational speed of the machine affect the temperature class.
- 6b Temperature class for Dust. Please consider that operating conditions like ambient temperature and rotational speed of the machine affect the temperature class.
- 7a Equipment protection level Gb: equipment for explosive gas atmospheres, having a "high" Level of Protection, which is not a source of ignition in normal operation or during expected malfunctions.
- 7b Equipment protection level Db: equipment for explosive dust atmospheres, having a "high" Level of Protection, which is not a source of ignition in normal operation or during expected malfunctions.



Certificates and markings

ATEX TÜV IT 25 ATEX 0302 X

EN IEC 60079-0:2018

EN 60079-1:2007

EN IEC 60079-31:2024

ATEX:

Certification with temperature class	Tamb °C	RPM max
Ex II 2G Ex db IIC T6 Gb	-40°C...+40°C	4200
Ex II 2D Ex tb IIIC T85°C Db		
Ex II 2G Ex db IIC T5 Gb	-40°C...+60°C	4200
Ex II 2D Ex tb IIIC T100°C Db		
Ex II 2G Ex db IIC T5 Gb	-40°C...+70°C	1500
Ex II 2D Ex tb IIIC T100°C Db		
Ex II 2G Ex db IIC T4 Gb	-40°C...+70°C	6000
Ex II 2D Ex tb IIIC T135°C Db		

IECEx: IECEx TPS 25.0041X

IEC 60079-0:2017

IEC 60079-1:2014

IEC 60079-31:2022

IECEx:

Certification with temperature class	Tamb °C	RPM max
Ex db IIC T6 Gb	-40°C...+40°C	4200
Ex tb IIIC T85°C Db		
Ex db IIC T5 Gb	-40°C...+60°C	4200
Ex tb IIIC T100°C Db		
Ex db IIC T5 Gb	-40°C...+70°C	1500
Ex tb IIIC T100°C Db		
Ex db IIC T4 Gb	-40°C...+70°C	6000
Ex tb IIIC T135°C Db		

3



Specific conditions of use



The encoders are certified according to the ATEX Directive 2014/34/EU and the IECEx-system. The following special conditions for safe use shall be considered according to the certificates:

1. The encoder shall be fitted with certified Ex Equipment cable glands, certified Ex blanking elements (blind plugs) or other equipment certified cable entry devices, in accordance with applicable installation provisions.
2. Prior to use in Ex environment the encoder must be installed according to instructions in chapter 7. This is required to ensure a dust-tight joint between the external shaft and the hollow shaft of the encoder and to fix the special screw at the center of the hollow shaft to form a flameproof joint.
3. In order to minimize the risk of hazards caused by electrostatic charges, cleaning the encoder should be done using a damp cloth or similar.
4. The encoder, including flameproof joints, is not intended to be repaired. The four M5x12 hexagon socket head cap screws for the cover and the flange respectively are of property class A2-70 with minimum tensile strength 700 N/mm².

Only skilled/authorized persons are allowed to install the encoder. Information on hazardous areas and the manufacturer datasheets, as well as laws or guidelines applying to the use or the intended purpose, are to be followed.

4



Risk of bodily injury

4.1)



4.2)





Important before mounting begins:

- 4.1 Switch off power supply before installation.
- 4.2 Make sure the machine is at a standstill. The product is to be mounted on a rotating part that can cause bodily injury when in motion.

5

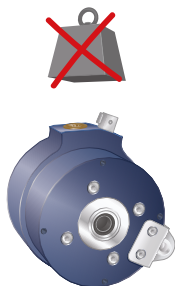


**Risk of damage
to the product**

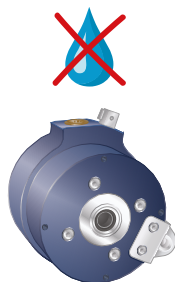
5.1)



5.2)



5.3)



5.4)



5.5)



5.6)



5.7)



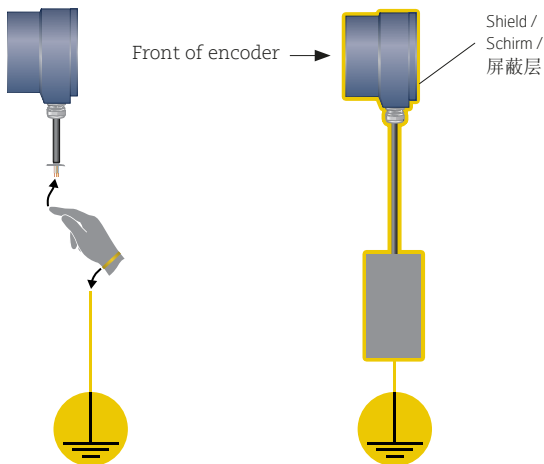


The product is a precision measuring instrument. It should be handled with care, by experienced personnel. The warnings below apply in the event of effects outside the limit values stated in the product's data sheet.

The product may be damaged

- 5.1 by ESD discharges if the electronics are touched
- 5.2 if the shaft is exposed to high mechanical forces
- 5.3 by moisture or chemical fluids (do not install cable pointing upwards)
- 5.4 if it is exposed to extreme temperatures
- 5.5 if it is exposed to powerful vibrations or shock
- 5.6 by short-circuits or an excessively high supply voltage
- 5.7 by impacts or other physical damage

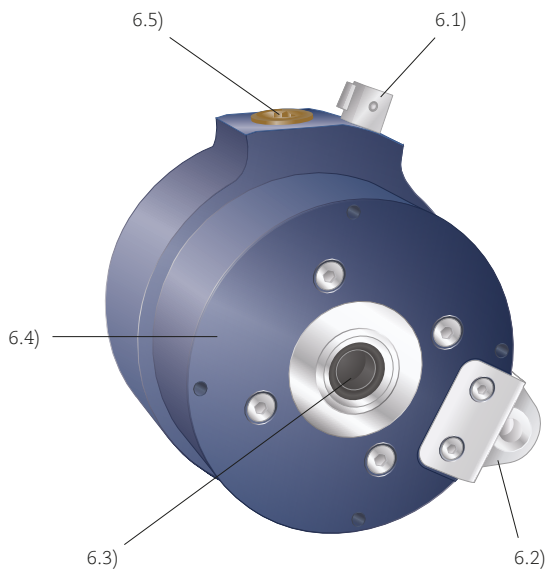
The encoder is not intended to carry circulating currents (e.g. generated by large electrical machines connected to the shaft of the encoder)



6



Parts of the product





- 6.1 External earth connection
- 6.2 Torque bracket
- 6.3 Hollow shaft
- 6.4 Flange
- 6.5 Cable gland entry

7.1



Mechanical installation



Installation of encoder

To achieve the rated performance and EX protection the following installation instructions must be followed.

Required tools for mounting:

- Slot-head screwdriver 6.5 mm for internal and external earth connection
- Hex-head screwdriver 4 mm for cover screws
- Slot head screw driver 3 mm for PCB terminal screws
- Socket or wrench 15/17 mm for shaft screw, depending on shaft dimension

Prior to installation or removal of encoder, ensure the working environment is safe.

Warning label

WARNING
After de-energizing
delay 15 minutes before opening
For cable temperature and
entry threads, refer to manual

Mounting of cable

The encoder is delivered with an empty threaded hole M20 x 1,5 with depth 16 mm to be fitted with equipment certified Ex cable gland or Ex blanking element. The cable gland and cable to be mounted must be selected according to applicable installation provisions. Depending on the rating of the encoder, the rated temperature for the cable gland and cable must be selected according to the table below.

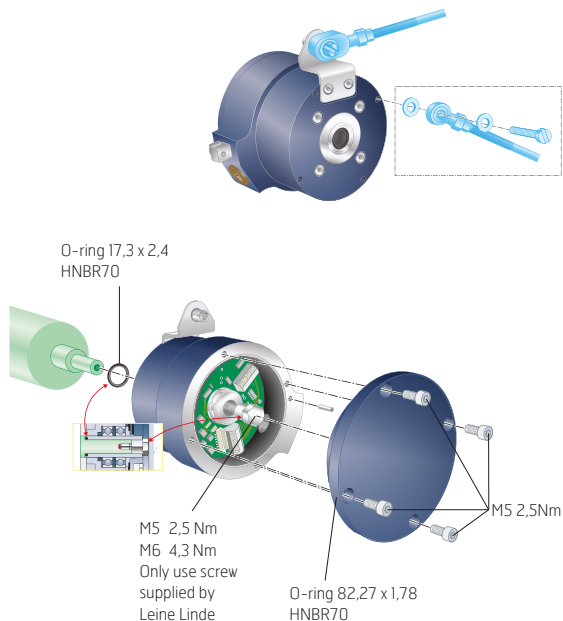
Required temperature range for cable and cable entry

Rated ambient temperature "TX" marked on encoder	Rated maximum rotational speed marked on encoder (RPM)	Required rated temperature range for cable and cable gland
-40 °C to +40 °C	4200	-40 °C to +70 °C
-40 °C to +70 °C	1500	-40 °C to +90 °C
-40 °C to +60 °C	4200	-40 °C to +90 °C
-40 °C to +70 °C	6000	-40 °C to +110 °C

7.1



Mechanical installation



O-rings damaged during installation shall only be replaced by o-rings provided by Leine Linde.

In order to unfasten the cover, it may be helpful to insert the screws in the spare M5 threads. When tightening the screws in this position, cover will open.



Part from customer



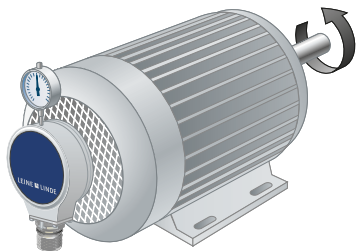
Accessories, Torque arm M6

Part number 1254632-XX, specify length (L) when ordering



Tools for mounting

Check the encoder's radial runout with slow rotation of complete assembly. The runout should not exceed 0.1 mm, as this may shorten the encoder's service life or influence the system accuracy.

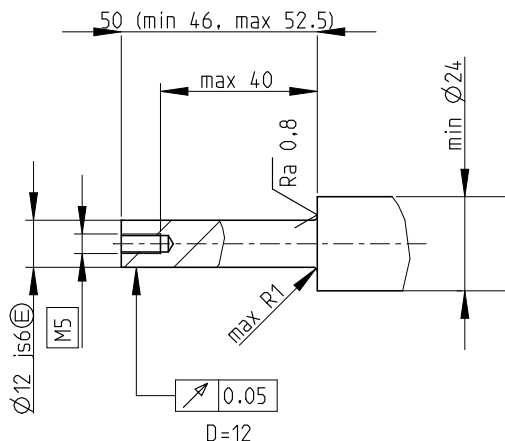
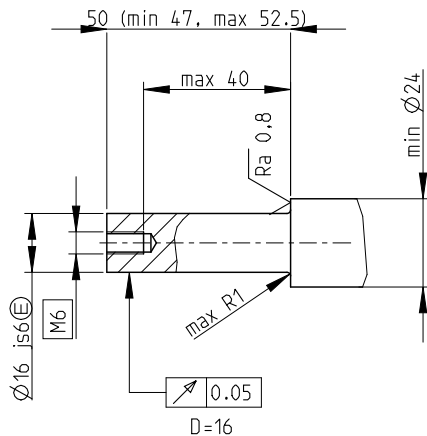


7.1



Mechanical installation

Required mating shafts



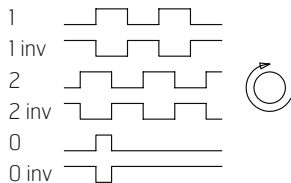
7.2



Electrical installation

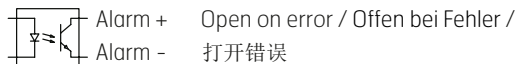
Terminal / Anschluss / 端子	6 signals / 6 Signale / 6 信号	3 signals / 3 Signale / 3 信号
1	+E Volt (9...30Vdc) / +E V (9-30 V GS) /	+E Volt (9...30Vdc) / +E V (9-30 V GS) /
2	0 Volt	0 Volt
3	Signal 0 / 0 信号	Signal 0 / 0 信号
4	Signal 0 inv. 0 (反向) . 信号	0 Volt 0 Volt
5	Signal 1 1 信号	Signal 1 1 信号
6	Signal 1 inv. 1 (反向) . 信号	0 Volt 0 Volt
7	Signal 2 2 信号	Signal 2 2 信号
8	Signal 2 inv. 2 (反向) . 信号	0 Volt 0 Volt
9 (Optional)	(Alarm +) 警报 +	(Alarm +) 警报 +
10 (Optional)	(Alarm -) 警报 -	(Alarm -) 警报 -

CW seen facing front /
Im Uhrzeigersinn von vorn /
CW 面对前面



Alarm output only with ADS option /
Alarmausgabe nur bei ADS-Option /

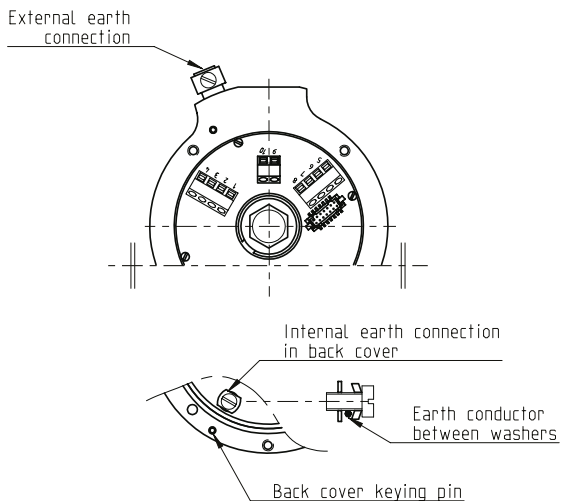
警报输出（仅 ADS 选项）



7.2



Electrical installation



When installing earth conductors ensure these are not contacting the aluminium housing directly.

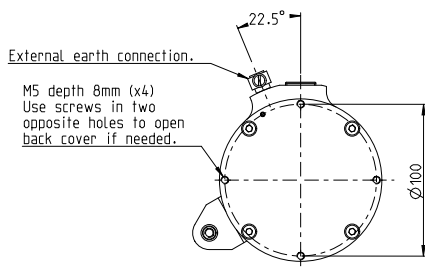
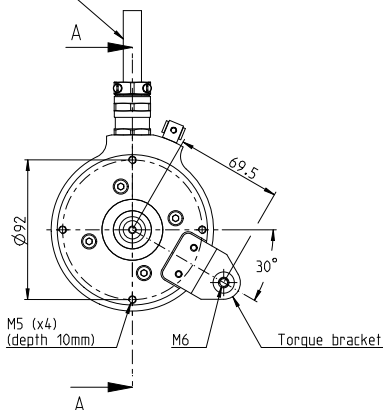
8



Dimensions

Example of cable and Ex gland
(Accessories, not included in encoder)

($\varnothing 12$ Accessory cable $5 \times 2 \times 0.5 \text{ mm}^2 + 1 \times 1.2 \text{ mm}^2$, screened, filled, -40 to $+95^\circ\text{C}$)





The examples of cable and Ex-gland in the drawing are valid for ATEX but is not included in the ATEX-certificate of the encoder.

For mounting instruction of the cable gland, please refer to the cable gland manufacturer's instructions.

Products from Leine Linde are usually components in larger systems. These applications require the system as a whole to be tested, and do not depend on the component specifications only.

Instructions in these mounting instructions apply to products from Leine Linde, not for the system as a whole. If products are used in a way for which they are not intended, this is at the user's own risk.

9



Declaration of conformity

LEINE LINDE



EU - Declaration of Conformity

The manufacturer:

Leine & Linde AB
Olivehällsvägen 8
SE-645 42 Strängnäs
SWEDEN
T +46-(0)152-265 00
info@leinelinde.se

declares under sole responsibility, that the products:

XHI 841 Incremental Encoders

comply with the relevant harmonized legislations of the European Union:

EMC Directive 2014/30/EU
ATEX Directive 2014/34/EU
RoHS Directive 2011/65/EU

Compliance with the provisions of the above directives is demonstrated by compliance with the relevant harmonized standards:

EN 61000-6-2:2005, EN 61000-6-2:2005/AC:2005 Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

EN 61000-6-4:2007, EN 61000-6-4:2007/A1:2011 Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments

EN IEC 60079-0:2018 Explosive atmosphere - Part 0: Equipment - General requirements

EN 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures

EN 60079-31:2014, EN IEC 60079-31:2024 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

EU-Type examination: TÜV IT 25 ATEX 0302 X

Strängnäs, 21 November 2025

Stefani Langer
R&D manager

Notified body for certificate: TUV ITALIA SRL (0948); Viale Fulvio Testi, 280/6, 20124 - Milano (MI)

Notified body for quality assessment report: RISE Research Institutes of Sweden AB (0402), Box 857, 501 15 BORÅS

Document nr: 1460412-02-A-01



ATEX and IECEx documents can be downloaded from
www.leinelinde.com.

DECEMBER 2025



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