

**Ex 841**

Mounting instruction

**LEINE  LINDE**



## Mounting instruction, Ex 841

Part.no. 640016 Ver. 3.1

### INCREMENTAL ENCODER WITH FLAMEPROOF ENCLOSURE

**EEx Schedule drawing**  
 No modifications permitted  
 without reference to the  
 Notified Body

Certified according to ATEX and IECEX

#### ATEX



Certified according to II 2 GD Ex d IIC Tx Ex tD A21 IP65 Txx°C  
 as per SP 07ATEX3635X

#### CONDITIONS FOR THE CERTIFICATE

Part no	Tx	Txx°C	Tamb°C	Rpm max
841900001-841900099,	II 2 GD Ex d IIC T6 Ex tD A21 IP65	T71°C	-40...+40	4200
841910001-841910099,	II 2 GD Ex d IIC T5 Ex tD A21 IP65	T91°C	-40...+60	4200
841920001-841920099,	II 2 GD Ex d IIC T5 Ex tD A21 IP65	T95°C	-40...+70	1500

ATEX encoders 8419xxxx are certified for group II G or D (gas or dust), category 2, according to EEx d IIC T5/T6 and may thus be used in zone 1 (gas) or 21 (dust) with potentially explosive atmospheres.

#### IECEX

Certified according to Ex d IIC Tx Ex tD A21 IP65 Txx°C  
 as per IECEX SP 06.0001X

#### CONDITIONS FOR THE CERTIFICATE

Part no	Tx	Txx°C	Tamb°C	Rpm max
841900001-841900099, Ex d IIC T6 Ex tD A21 IP65		T71°C	-40...+40	4200
841910001-841910099, Ex d IIC T5 Ex tD A21 IP65		T91°C	-40...+60	4200
841920001-841920099, Ex d IIC T5 Ex tD A21 IP65		T95°C	-40...+70	1500

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## GENERAL INFORMATION

The optical encoder 8419xxxxx is intended for use on e.g. electrical motors for measurement and control of angular speed and position. The flameproof enclosure consists of aluminium flange, housing and back cover and a stainless steel hollow shaft. The encoder is used supported directly on the motor shaft or a shaft extension and exists in two versions for  $\varnothing 12$  or  $\varnothing 16$  mm shafts. The hollow shaft is fixed by tightening a special screw in the shaft centre. This screw is part of the flameproof enclosure and may not be exchanged. However it is allowed to shorten the threaded part if needed. The encoder housing is prevented from rotation by a torque arm with two rod ends. The torque arm can be connected either 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 closed circuit protected both to 0V and to supply voltage. The supply lines are protected against reverse polarity. Up to six output signals plus an optional diagnostic signal are delivered from the encoder via a certified cable gland through the housing. Cable and gland can be included as accessories in the original delivery or may be acquired elsewhere by the customer. The cable is joined to internal screw terminals inside the Ex d closure (direct entry) and fed through the housing via an Ex d IIC certified gland. This can be either a type certified for effectively filled cables or a cemented type used with standard cables.

It is recommended that the encoder shall be installed with a radial runout of less than 0.05 mm to reduce position and velocity errors. 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.

The surrounding temperature and the rotation speed influence the outside temperature and thus the temperature class and demands on cable and gland. For ambient temperature max 40°C, the encoder can be used up to 4200 rpm within temperature class T6, with Ex d IIC cable gland and cable specified for 75°C. At higher ambient temperatures and/or maximum speed temperature class has to be decreased and cable and gland service temperatures have to be checked, see the table under "Conditions for the certificate". Please, observe that the encoder is designed for max output frequency 100 kHz. This limits the maximum rotation speed for high pulse rates, i.e. max 2930 rpm for 2048 ppr and max 1465 rpm for 4096 ppr.

If the back cover has to be opened in Ex environment, please wait at least 15 minutes after electricity has been switched off before opening. This allows internal components that may be hot to cool to a safe temperature. If needed, screws in opposite M5 threads in the back cover can be used to help open it.

The encoder is not repairable by the user. The gaps below are narrower than the maximum gaps allowed in the standard. They are valid for encoders delivered from the manufacturer and should not be altered.

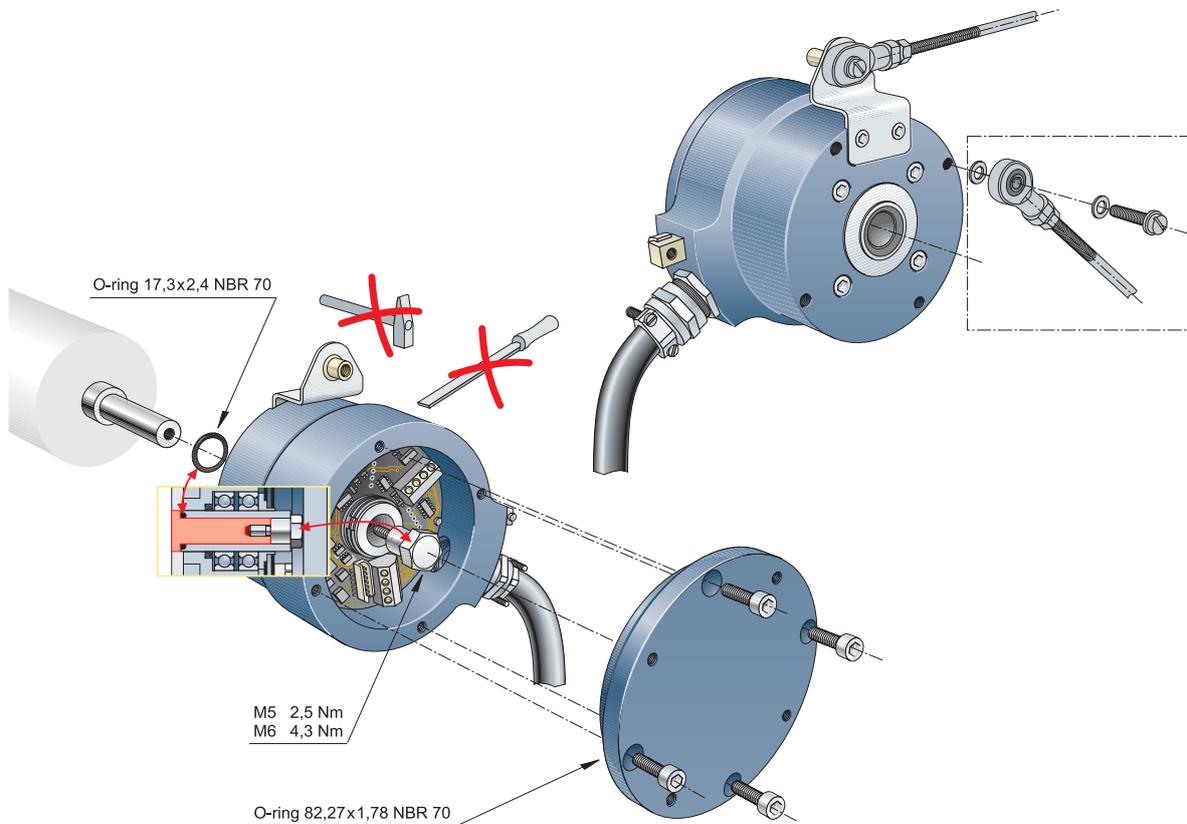
Maximum 0.13 mm gap is allowed in the internal  $\varnothing 70$  mm joint between flange and housing.  
Maximum 0.09 mm gap is allowed in the  $\varnothing 12$  mm /  $\varnothing 16$  mm joint between shaft bore and internal mounting screw.

Maximum 0.23 mm gap is allowed in the  $\varnothing 25$  mm joint between shaft and flange.

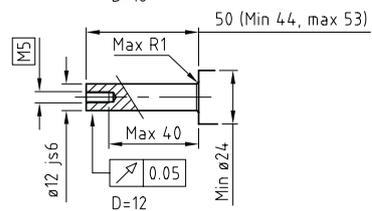
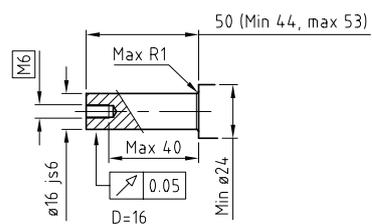
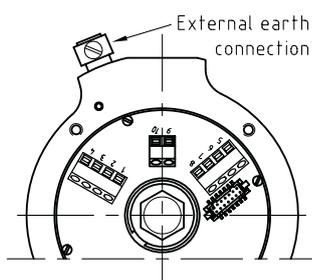
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## RECOMMENDED MOUNTING

Incremental encoders are precision measurement devices, handle with care.



## Recommended mating shafts



Internal earth connection  
in back cover

Back cover keying pin

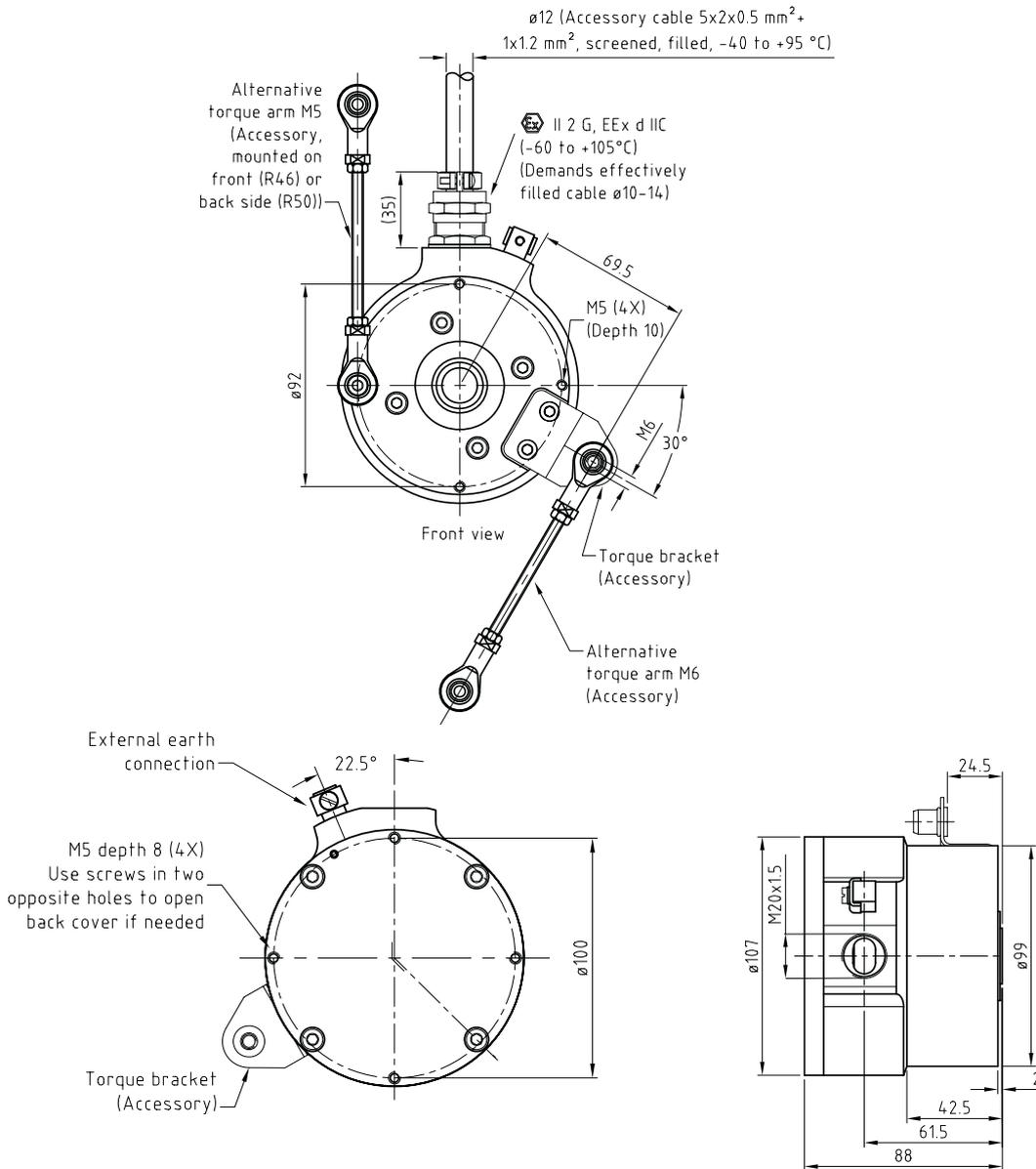
Earth conductor  
between washers



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## DIMENSIONS

Example of cable and EEx d IIC gland valid only for ATEX but is not covered by the ATEX-certificate.

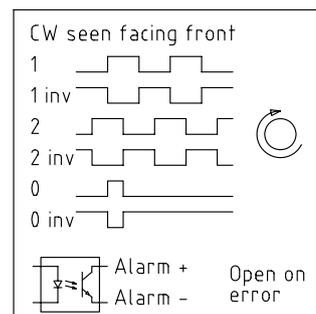


## ELECTRICAL INSTRUCTION

### Function

Terminal	6 signals	3 signals
1	+E Volt (9-30 Vdc)	+E Volt (9-30 Vdc)
2	0 Volt	0 Volt
3	Signal 0	Signal 0
4	Signal 0 inv	0 Volt
5	Signal 1	Signal 1
6	Signal 1 inv	0 Volt
7	Signal 2	Signal 2
8	Signal 2 inv	0 Volt
9	(Alarm +)	(Alarm +)
10	(Alarm -)	(Alarm -)

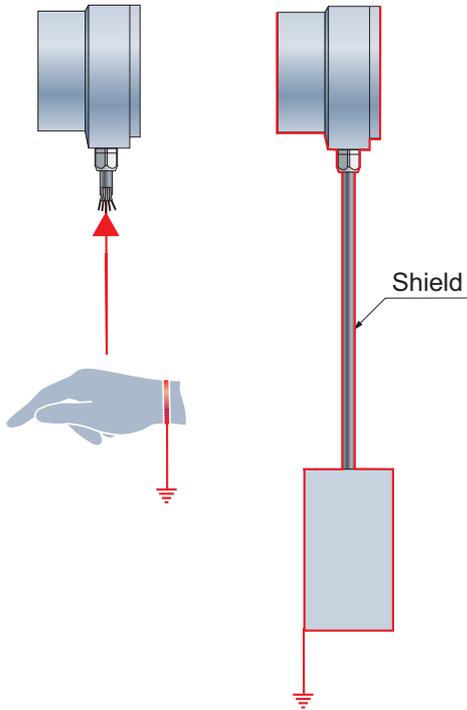
### Output signals



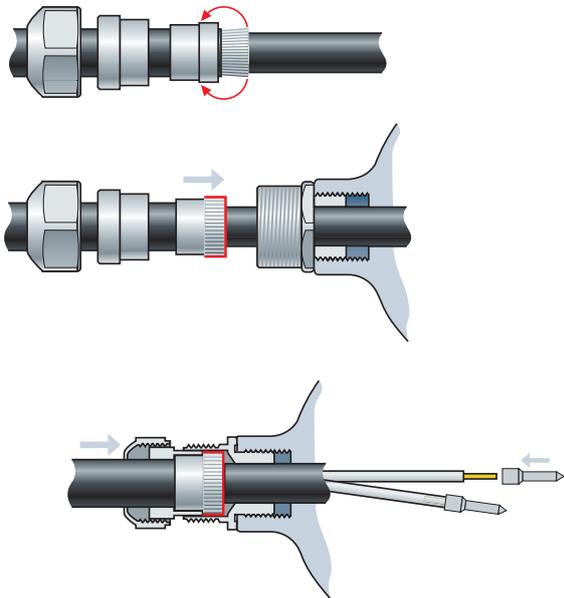
Alarm output only with ADS option

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## CAUTION



## SHIELD CONNECTION



Cableglad and cable are not covered by the ATEX or IECEx certificate but can be bought as accessories.

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