



Safety recommendations for electrical apparatus to be used in hazardous areas

The rotary pulse encoder Type 14000 is an explosion-containing electrical apparatus that converts rotational motion into electrical signals.

Data on gas-hazardous and dust-hazardous areas for incremental rotary encoder series 14-14***-****

Conformity EC-type examination certificate	EN 60079-0:2012 + A11:2013, EN 600079-1:2014, EN 60079-31:2014 ZELM 02 ATEX0078 X, edition Rev. 0
Identification	II 2G Ex db IIC T6 Gb II 2D Ex tb IIIC T80°C Db
Permissible ambient temperature, gas-hazardous area-	40 °C to + 55 °C
Permissible ambient temperature, dust-hazardous area-	30 °C to + 55 °C
Degree of protection as per EN 60529	IP 66
Max. momentary rated speed	6.000 RPM
Max. power dissipation	5 W

Data on gas-hazardous and dust-hazardous areas for versions of absolute rotary encoders labeled as “absolute encoder”

Conformity EC-type examination certificate	EN 60079-0:2012 + A11:2013, EN 600079-1:2014, EN 60079-31:2014 ZELM 02 ATEX0078 X, edition Rev. 0
Identification	II 2G Ex db IIC T6 Gb II 2D Ex tb IIIC T80°C Db see table below

rotational speed [RPM]	max ambient temperature	Temperature class	Dust explosion protection
6000	+ 55 °C	T5	T 95°C
6000	+ 40 °C	T6	T 80°C
4500	+ 45 °C	T6	T 80°C
3000	+ 50 °C	T6	T 80°C

Rotational-speed table for absolute encoder

Permissible ambient temperature , gas hazardous area-	40 °C up to max. see rotational-speed table
Permissible ambient temperature , dust-hazardous area-	30 °C up to max. see rotational-speed table
Degree of protection as per EN 60529	IP 66
Max. momentary rated speed	max. see rotational-speed table
Max. power dissipation	5 W
Shaft load	axial 60 N/ radial 80 N

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Commissioning and installation

Information on hazardous areas and the manufacturer data sheets, as well as all laws or guidelines applying to the use or the intended purpose are to be followed.

Standard 60079-14, in its valid version, is especially to be heeded.

The device is to be shielded from strong electro-magnetic fields and from mechanical damage.

The following applies in addition to use in the dust-explosion protection area:

The device belongs to Category 2D and may be implemented in dust-zone 21. In particular, the requirements of EN 60079-14, in its valid version, are to be met for set-up, operation and upkeep. Maximum surface temperature is 80 °C. Dust must not be allowed to accumulate to more than 5 mm.

Ambient conditions in which the device will be used are to be checked for the influence of strong corrosive influences on the aluminum housing.

Application areas in which ambient conditions may damage the sealing material NBR are to be checked and avoided where possible.

The permissible ambient temperature range listed in these instructions indicates the temperature range for which this device is approved. In order to ensure the electrical operation of the rotary encoder, its data sheet specifications are to be observed. To minimize the risk of electrostatic discharge, the cleaning should only be carried out with a damp cloth.

Operation

The device must not be opened.

Electrostatic charging of the metal housing parts should be avoided. Hazardous electrostatic charging of metal-housing parts can be prevented by grounding or integration into potential equalization, whereby very small metal-housing parts (e.g. screws) need not be considered. The rotary-pulse encoder includes an appropriate connection on the housing.

Special conditions

The manual has to be considered, especially for the ambient temperature range, temperature class or maximum surface temperature.

The whole system consisting of rotary pulse encoder and control electronics is designed for a temporary speed of max. 6000 rpm. Due to deterioration of sealing gaskets, a permanent speed of more than 3000 rpm shall be avoided.

The electrical part shall be protected with a fuse in series of not more than 6 A.

If the equipment was used in gas atmosphere, it is not allowed to use the same product again in dust atmosphere.

Upkeep and maintenance

The values given in the data sheet on degree of protection, climate testing, electromagnetic compatibility and shock and vibration resistance were tested and released in accordance with the specified standard. Encoder operation is assured with regard to these definitions.

Physical, chemical and mechanical influences determine the useful life of the shaft-side sealing rings. Deterioration, ambient agents, temperature, and wear and dirt combining with rotational speed are all involved.

The interaction of these influences is very complex. Hence there is no basis for calculating the useful life of the seal rings, but rather only values gleaned from experience. According to seal-ring manufacturers, under normal conditions, apparatus seals can reach a useful life of 10,000 operating hours at continuous operation or 3 to 5 years.

Since the fields of application and the demands made on apparatus can be very different, there is no general maintenance cycle prescribed for these apparatus. Depending on the application, sealing elements on the apparatus such as shaft seal rings or ball-bearing sealing disk and cable entry point are to be checked for wear at appropriate intervals.

The calculated service life of the apparatus bearing unit relevant to explosion-protection comes to $9.5 \cdot 10^9$ rotations; the electrical service life of the scanning LED comes to 100,000 h. These theoretical values are valid for normal use in accordance with the data sheet specifications for the apparatus. Service life may vary in practice, according to area of application and ambient conditions (load/force, rotational speed, shock, temperature, surroundings..). The bearing unit should be checked at the appropriate intervals in accordance with application requirements.

No changes may be made. Only the manufacturer may perform repair work.