Safety recommendations for electrical apparatus to be used in hazardous areas

The rotary encoder RVI58X / RSI58X is an electrico-mechanical apparatus that converts rotational motion into electrical signals.

Information on the dust explosion area:

Dust-explosion protected Zone 22 apparatus

Certificate	PF 18 CERT 4775 X
Conformity	EN IEC 60079-0:2018-07, EN 60079-31:2014, ignition protection class “t”
Identification RVI58X, RSI58X	Ex II 3D Ex tc IIIC T105°C Dc X

Information on the gas-hazardous area:

Gas-explosion protected Zone 2 apparatus

Certificate	PF 18 CERT 4775 X
Conformity	EN IEC 60079-0:2018-07, EN 60079-15:2010, ignition protection class “nA”
Identification	Ex II 3G Ex nA IIB T4 Gc

General technical information:

RVI58X

permissible ambient temperature	- 30 °C to + 70 °C
Degree of protection RVI58X as per EN 60529	
shaft-side	IP 64
housing-side	IP 65
Max. momentary rated speed	6.000 RPM

RSI58X

permissible ambient temperature	- 30 °C to + 60 °C (at 3000 RPM) - 30 °C to + 48 °C (at 6000 RPM)
Degree of protection RVI58X as per EN 60529	IP 54
Max. momentary rated speed	6.000 RPM

Commissioning and installation

Information on hazardous areas and the manufacturer data sheets, as well as all laws or guidelines applying to use or planned application 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 apparatus must be protected from excessive heat due to mechanical or electrical overloads.

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

Rotary encoder spurs must be protected from pull and torsion stress.

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Operation

The mechanical and electrical key values (e.g. ambient temperature, speed, mechanical load, max. supply voltage, etc.) of the acquired apparatus may in no case exceed the permitted manufacturer data.

The overall system of rotary encoders with evaluation electronics is designed for a maximum momentary rated speed of 6.000 RPM. Sustained operation of over 3000 RPM is to be avoided, due to the expected premature wear of sealing elements.

Longer–lasting interferences that cause the rated voltage to be exceeded must be suppressed through appropriate measures taken by the operator.

Dust must not be allowed to accumulate to more than 5 mm.

The device must not be opened.

Special conditions

The permitted ambient temperature is to be taken from this operating instructions (see „General technical information“) depending on the applicable construction and rotational speed.

The maximum rated voltage of the apparatus, depending on version, ranges from 5 volts to 30 volts and may be exceeded by a maximum of 10%. The rated voltage should only briefly be exceeded in order to ensure the lasting technical operation of the apparatus.The operator must take measures to prevent the rated voltage from being exceeded by more than 40% through temporary interference (transients).

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. To minimize risk from electrostatic discharge - clean only with a damp cloth.

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 this 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 (L_{10}) relevant to explosion-protection comes to 70 x 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.

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