TECHNICAL DATASHEET

Ex Incremental Encoders RX 70TI / 71TI



Version RX70 - Aluminum



Version RX71 - Stainless Steel

- ATEX certification for gas and dust explosion proof
- Protection class up to IP67
- Resolution up to 10.000 ppr
- Robust design
- Also available with stainless steel (RX 71)
- Applications: enamelling production line, surfacing machines, bottling machines, mixers, silo works, mills

NUMBER OF PULSES
1 / 2 / 3 / 4 / 5 / 10 / 15 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 60 / 64 / 70 / 72 / 80 / 100 / 125 / 128 / 144 / 150 / 180 / 200 / 230 / 250 / 256 / 300 / 314 / 350 / 360 / 375 / 400 / 460 / 480 / 500 / 512 / 600 / 625 / 635 / 720 / 750 / 900 / 1000 / 1024 / 1200 / 1250 / 1500 / 1600 / 1800 / 2000 / 2048 / 2500 / 3000 / 3480 / 3600 / 3750 / 3968 / 4000 / 4096 / 4800 / 5000 / 5400 / 6000 / 7200 / 7680 / 8000 / 8192 / 9000 / 10000
Other number of pulses on request

EX-CLASSIFICATION

The incremental shaft encoder is available in explosion proof design with explosion proof enclosure under RX70 and RX71(stainless steel).
The PTB has assured with the **EC-TYPE-Examination Certificate PTB 10 ATEX 1036 X** that the RX70/71 meets the requirements of safety and health according to IEC 60079-0:2018+AC:2020; EN 60079-1:2014+AC:2018 and EN 60079-31:2014. Therefore it is approved in explosive areas, code:
"Ex II 2 G Ex db IIC T6 Gb and Ex II 2 D Ex tb IIIC T85°C Db" and
"Ex II 2 G Ex db IIC T4 Gb and Ex II 2 D Ex tb IIIC T135°C Db"
Additionally the encoder is certified according the IECEx standards IEC 60079-0:2017; IEC 60079-1:2014 and IEC 60079-31:2022. Assured according **IECEx PTB 12.0002X** certification.
For applications under tough environmental conditions and food industry the stainless steel version RX71 is available.

II	2	G	Ex	db	IIC	T6/ T4	Gb	gas
II	2	D	Ex	tb	IIIC	T85°C/T135°C	Db	dust

- Equipment protection level (EPL)
- Temperature class
- Explosion group
- Explosion proof enclosure (db) (gas); Protection by enclosure (tb) (dust)
- Explosion-proof operating material
- For use in areas with gas, vapours, mist and cloud of dust
- Category 2
- Device group II (all area expect mining)
- Explosion proof enclosure with EC-TYPE-Examination Certificate

T6 = Highest permissible surface temperature +85°C
T4 = Highest permissible surface temperature +135°C
T3 = Highest permissible surface temperature +200°C

TECHNICAL DATASHEET

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TECHNICAL DATA
Mechanical

Housing diameter	70 mm
Shaft diameter	10 mm (solid shaft)
Flange (Mounting of housing)	Clamping flange, fastening screw thread 3x M6x12
Protection class housing [1] (EN 60529/ A1:2000-02)	T4: IP65 or IP67 T6: IP65
Protection class shaft [1, 2] (EN 60529/ A1:2000-02)	T4: IP64 or IP67 T6: IP64
Starting torque typ.	< 1 Ncm
Moment of inertia	ca. 20 gcm^2
Max. shaft load	axial 40 N / radial 100 N
Vibration resistance (IEC 68-2-6)	100 m/ s^2 (10 - 500 Hz)
Shock resistance (IEC 68-2-27)	1000 m/ s^2 (6 ms)
Operating temperature	Operating temperature correlating with Ex-requirements, please see following tab showing allowed ambient temperature in relation to different conditions
Storage temperature [3]	-25°C … +85°C
Material shaft	Stainless Steel
Material housing	Aluminum (RX70); Stainless Steel (RX71)
Weight	RX70: approx. 1,4 kg; RX71: approx. 4,8 kg
Connection [4]	Cable, axial or radial

[1] no standing water allowed at the shaft entrance or cable entrance or at the ball bearing.
[2] no dust explosion-proof certification for IP64
[3] due to packaging
[3] Connection cable for fixed installation

Protection class	Max. speed	Ambient temperature	Temperature class
IP64	1000 rpm	-40 °C … +60 °C	T6
	10000 rpm	-40 °C … +40 °C	T6
	10000 rpm	-40 °C … +60 °C	T4
IP67	1000 rpm	-40 °C … +60 °C	T6
	6000 rpm	-40 °C … +60 °C	T4
	10000 rpm	-40 °C … +55 °C	T4

TECHNICAL DATASHEET

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TECHNICAL DATA
Electrical

General Design	As per EN 61010-1, Protection class III, Contamination level 2, Overvoltage class II
Supply voltage [1]	RS422 + Sense (T): DC 5 V ±10 % RS422 + Alarm (R): DC 5 V ±10 % or DC 10 - 30 V Push-pull (K), Push-pull complementary (I): DC 10 - 30 V
Max. current w/o load	40 mA (DC 5 V), 60 mA (DC 10 V), 30 mA (DC 24 V)
Max. pulse frequency	RS422: 300 kHz Push-pull: 200 kHz
Standard output versions [2]	RS422 + Alarm (R): A, B, N, $\overline{A}$, $\overline{B}$, $\overline{N}$, $\overline{Alarm}$ RS422 + Sense (T): A, B, N, $\overline{A}$, $\overline{B}$, $\overline{N}$, Sense Push-pull (K): A, B, N, $\overline{Alarm}$ Push-pull complementary (I): A, B, N, $\overline{A}$, $\overline{B}$, $\overline{N}$, $\overline{Alarm}$
Pulse width error	± max. 25° electrical
Number of pulses	1 ... 10.000
Output current	RS 422: ±30 mA Push-pull with short-circuit protection: 30 mA (DC 10 - 30 V)
Alarm output	NPN-O.C., max. 5 mA
Pulse scape	Square wave
Pulse duty factor	1:1

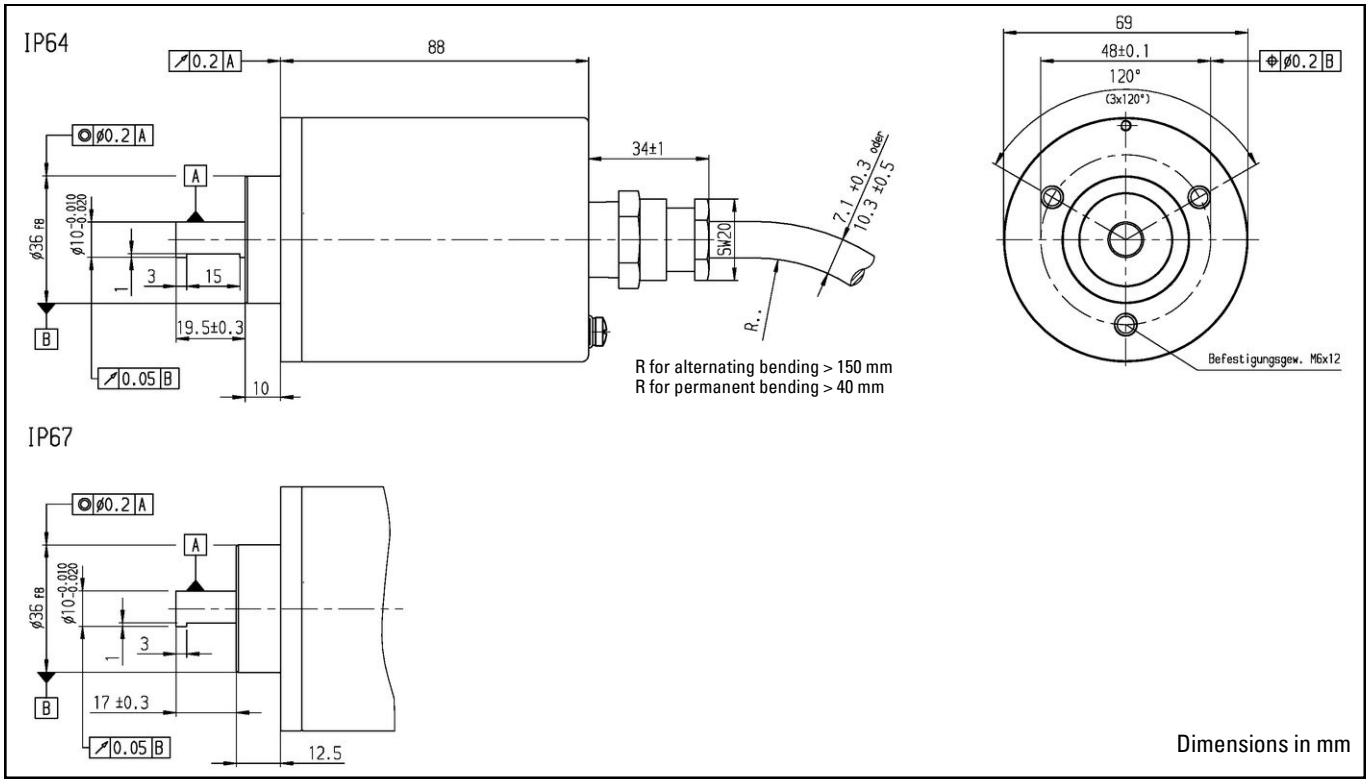
[1] Pole protection with supply voltage DC 10 - 30 V
[2] Output code “K” and “I”: short-circuit-proof

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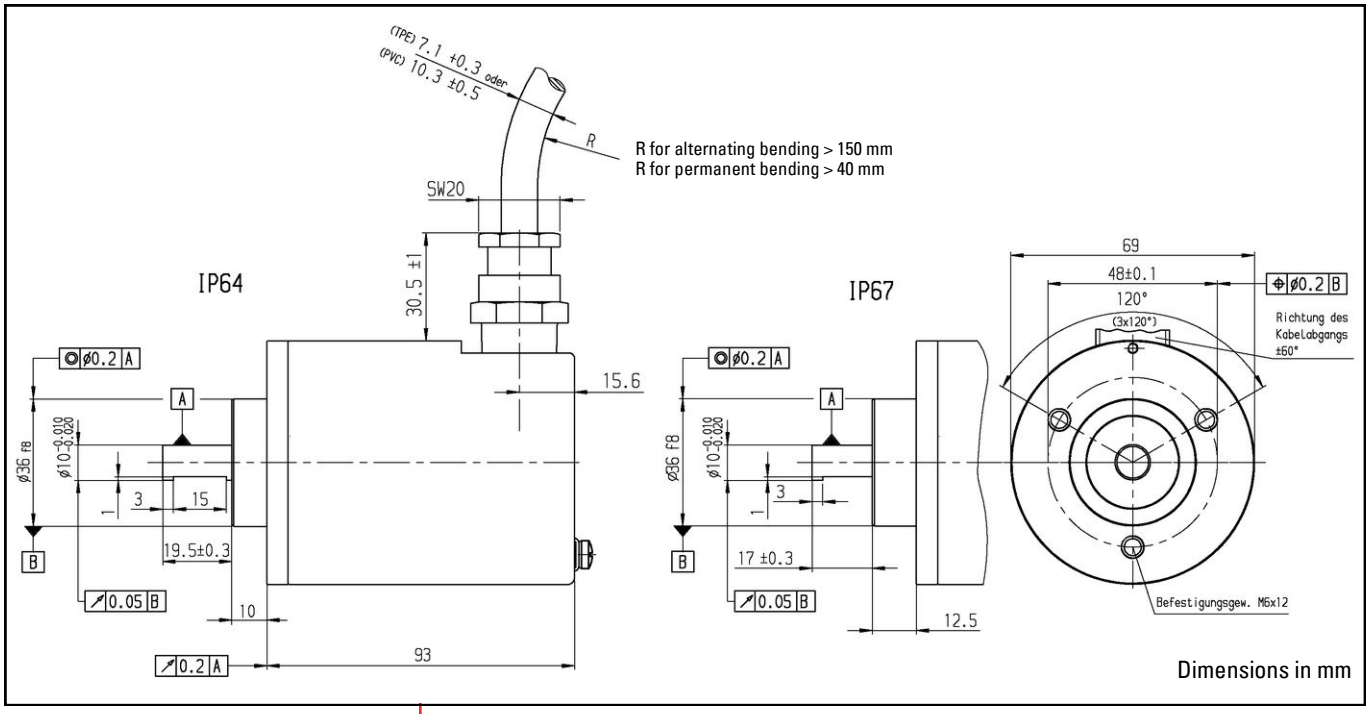
Cable TPE

Cable color	Cable Nr.	Output			
		RS 422 + Sense (T)	**RS 422 + Alarm (R)**	**Push-pull (K)**	**Push-pull complementary (I)**
brown/green	12	DC 5 V	DC 5 / 10 - 30 V	DC 10 - 30 V	DC 10 - 30 V
white/green	11	GND	GND	GND	GND
blue	10	Sense V_{CC}			
white	9	Sense GND			
brown	1	Channel A	Channel A	Channel A	Channel A
green	2	Channel $\overline{A}$	Channel $\overline{A}$		Channel $\overline{A}$
grey	3	Channel B	Channel B	Channel B	Channel B
pink	4	Channel $\overline{B}$	Channel $\overline{B}$		Channel $\overline{B}$
red	5	Channel N	Channel N	Channel N	Channel N
black	6	Channel $\overline{N}$	Channel $\overline{N}$		Channel $\overline{N}$
violet	7		$\overline{Alarm}$	$\overline{Alarm}$	$\overline{Alarm}$
Screen			Cable screen connected to housing		
Screw terminal			for additional connection of an earth conductor		

DIMENSIONED DRAWINGS AXIAL



DIMENSIONED DRAWINGS RADIAL



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ORDERING INFORMATION

Type	Model	Number of pulses	Supply voltage	Flange, Protection, Shaft	Output	Connection [4]
[ ] /	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
RX70 Aluminum **RX71** Stainless Steel	**TI** Incremental	**1 ... 10000**	**A** DC 5 V [1] **E** DC 10 - 30 V [2]	**K.42** Clamping, IP64, 10 mm [3] **K.72** Clamping, IP67, 10 mm	**R** RS 422+Alarm **T** RS 422+Sense **K** Push-pull **I** Push-pull complementary	**E-F0** TPE Cable axial, 5m **F-F0** TPE Cable radial, 5m

[1] DC 5 V: only with output K, T, R available
[2] DC 10 - 30 V: only with output K, I, R available
[3] No dust explosion-proof certification (D) for IP64
[4] If longer cables are required, please see additional ordering information cable length

ORDERING INFORMATION
Selection of cable length

Versions with cable outlet (connection A, B, E or F) are available with various lengths of cable. To order your desired cable length, please add the respective code to the end of your ordering code. Further cable lengths on request.

Code	Cable length
-F0 / without code	5 m
-K0	10 m
-P0	15 m
-U0	20 m
-V0	25 m
-W0	30 m
-X0	40 m
-Y0	50 m

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