

Incremental Rotary Encoder G1B



- Housing diameter: 130 mm
- Hollow shaft: $\varnothing$ 25.4 ... 60 mm
- Line counts: 64 ... 8192
- Output signals: RS422, KS, KI, 1Vpp
- Connector or cable output

Mechanical Data

G1B	Hollow shaft
	Type W
$\varnothing$ Hollow shaft	25.4, 28, 32, 38, 42, 45, 48, 50, 60 mm
Weight	ca. 1100 g
Accuracy (up to line count 2500)	$< \pm \frac{360^\circ}{\text{Line counts} \times 20}$
Mech. permissible speed	max. 3.500 min ⁻¹
Starting torque (25°C)	< 0,5 Nm
Rotor inertia (depends on the specific Version)	1,1 * 10 ⁻³ kgm ² ... 1,6 * 10 ⁻³ kgm ²
Vibration	100 m/s ² ; higher upon request
Shock	1000 m/s ² ; higher upon request
Operating temperature	-25°C ... +85°C; -40°C ... +100°C upon request for KS or KI: RS 422
Protection class	IP 64

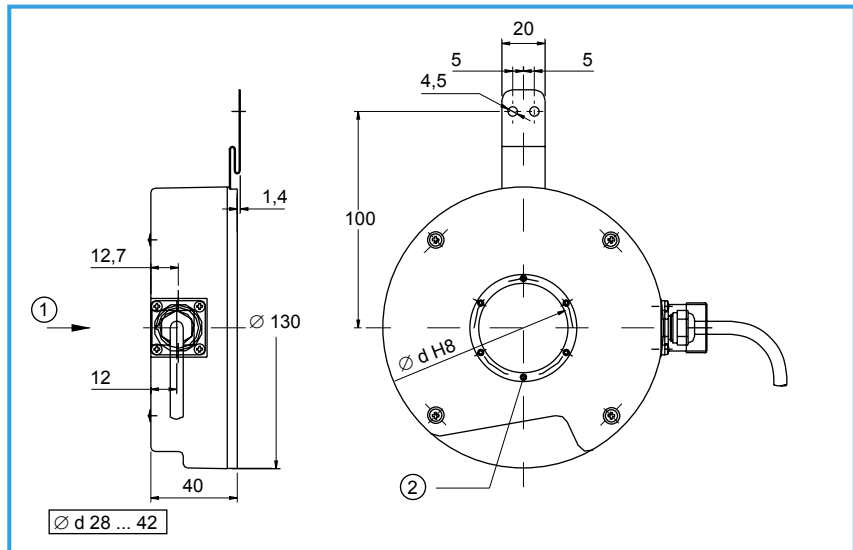
Line counts

64	1024	2048	2500	4096	8192	others upon request
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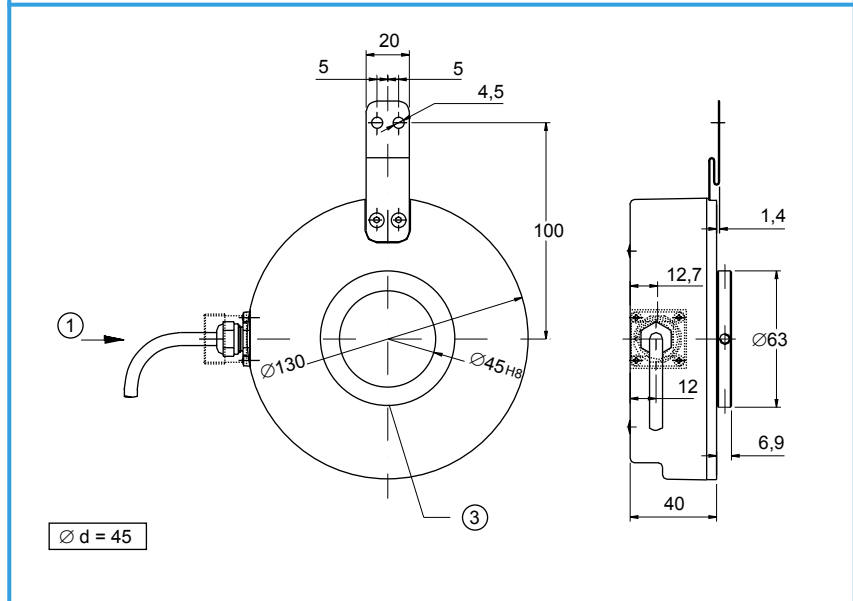
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Dimensions (mm)

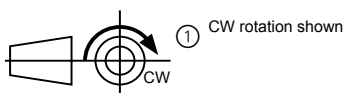
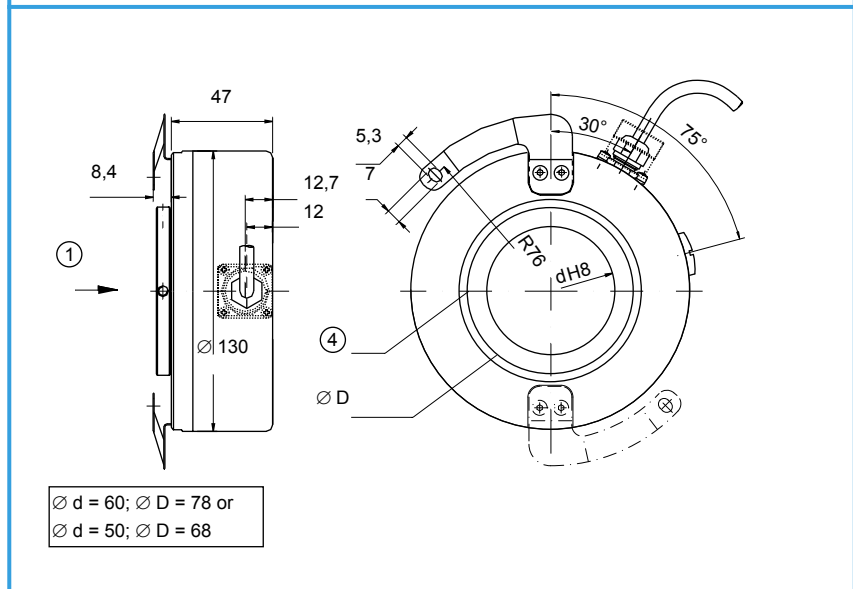
- Standard: IP 64 (with sealing ring)
- connector or cable output radial
- optional: second torque coupling
- axial backlash (shaft): max. $\pm 1,5$ mm
- ② set screw 6 x M3; SW 1,5 included



- Standard: IP 64 (with sealing ring)
- connector or cable output radial
- optional: second torque coupling
- axial backlash (shaft): max. $\pm 1,5$ mm
- ③ set screw 4 x M5; SW 2,5 included



- Standard: IP 64 (with sealing ring)
- connector or cable output radial
- optional: second torque coupling
- axial backlash (shaft): max. $\pm 1,5$ mm
- ④ set screw 4 x M5; SW 2,5 included



Electrical Data

Output signals	Supply voltage	Output voltage	Current requirements	Output load	Output frequency	Cable length	Zero index
LD (RS422)	5 V	5 V	max. 70 mA	± 20 mA	0 .. 300 kHz	max. 100 m	1)
	8 .. 30 V	5 V					1)
KI / KS	8 .. 30 V	8 .. 30 V	max. 70 mA	20 mA	0 .. 160 kHz	max. 50 m	1)
SI	5 V	5 V	max. 70 mA	8 mA (bei 120 Ω)	0 .. 180 kHz	max. 150 m	1)

1) 5 = Z "high" if A + B "high"

Output Signals

Version:

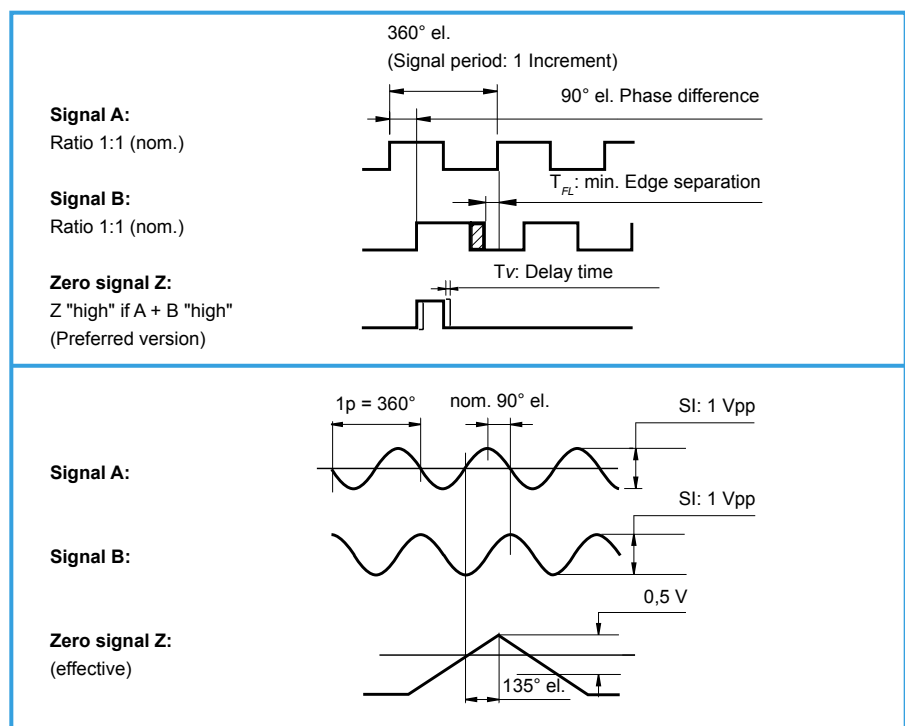
LD = Line driver RS422

KS = Push pull with
short-circuit protection

KI = KS with inverted signals

Version:

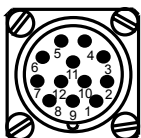
SI = 1 Vpp at 120 Ohm load



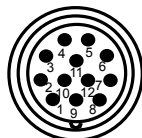
Connector-Terminal and Cable Designation

G1BW	Output circuit			
	KS		LD / KI	
Function / Signal	12-pin	Cable Pur 12 x 0,19	12-pin	Cable Pur 12 x 0,19
Signal A	5	brown	5	brown
Signal $\bar{A}$	-	-	6	green
Signal B	8	grey	8	grey
Signal $\bar{B}$	-	-	1	pink
Signal Z	3	red	3	red
Signal $\bar{Z}$	-	-	4	black
V _{CC}	12	blue	12	blue
V _{CC Sense}	2	violet	2	violet
0 Volts	10	white	10	white
0 Volts _{Sense}	11	yellow	11	yellow
Shield	9	white-blue	9	white-blue

G1BW	Output circuit	
	SI	
Function / Signal	12-pin	Cable Pur 12 x 0,19
Signal A +	5	brown
Signal A -	6	green
Signal B +	8	grey
Signal B -	1	pink
Signal Z +	3	red
Signal Z -	4	black
V _{CC}	12	blue
V _{CC Sense}	2	violet
0 Volts	10	white
0 Volts _{Sense}	11	yellow
Shield	9	white-blue



Square flange receptacle 12-pin:
RC-12P2N122K00



Pin plug 12-pin:
Metal: RC-12P2N1280EF
Plastic: RC-12P1N12K0EF

Mating connector 12-polig:

Socket plug for
square flange receptacle:
RC-12S2N1280EF

**Socket coupling
for pin plug:**

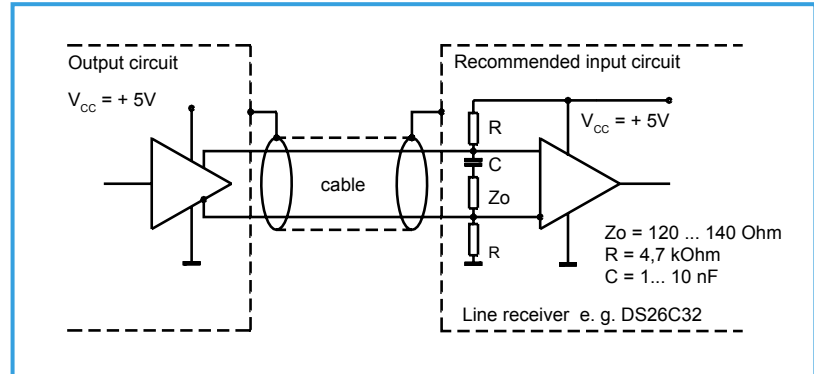
Metal: RC-12S1N1290EF
Plastic: RC-12S1N12M0EF

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Recommended input circuitry of subsequent electronics

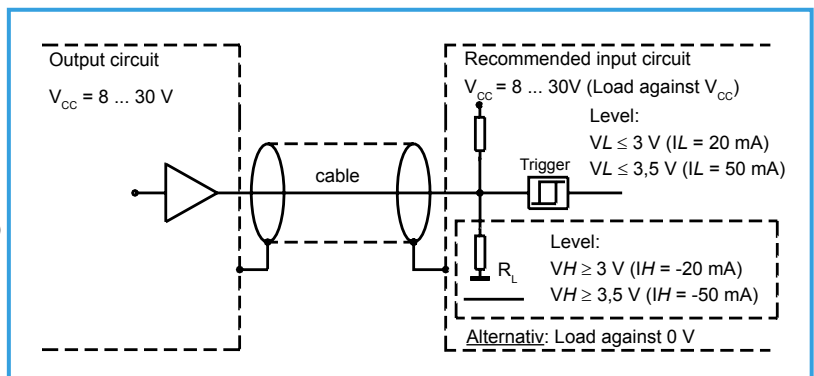
LD: Line driver RS 422 A

Operating voltage:	5 V $\pm$ 5 % or 8 ... 30 V
Current requirement:	max. 70 mA (without load)
Output signals:	A, $\bar{A}$, B, $\bar{B}$, Z, $\bar{Z}$
Max. output frequency:	300 kHz
Min. edge separation:	TFL $\geq$ 0,25 μ s
Level (RS422):	VH $\geq$ 2,5 V (IH = -20 mA) VL $\leq$ 0,5 V (IL = 20 mA)
Max. current load cap.:	I _{max} : $\pm$ 20 mA per output
Delay time:	TV $\leq$ 50 ns
Switching times:	rise / fall times: $\leq$ 100 ns
Cable length:	max. 100 m
Operating temperature:	-25 °C ... +85 °C



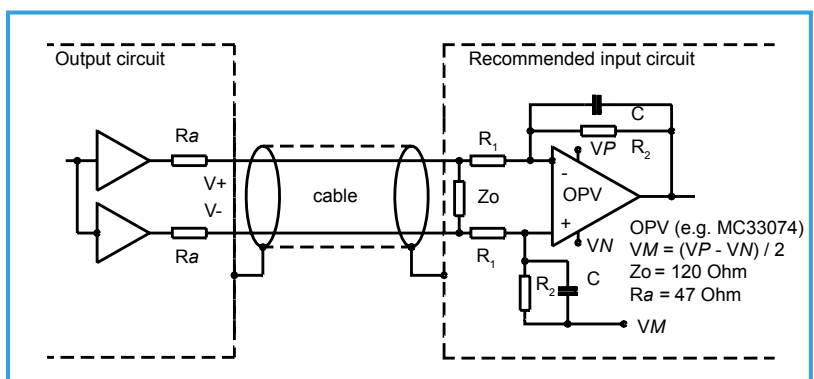
KS, KI: Push pull output with short-circuit protection

Operating voltage:	8 ... 30 V
Current requirement:	max. 70 mA (without load)
Output signals:	A, B, Z
Max. output frequency:	160 kHz
Min. edge separation:	TFL $\geq$ 0,9 μ s
Max. current load cap.:	I _{max} : 20 mA per output
Delay time:	TV $\leq$ 400 ns
Switching times:	rise / fall times: $\leq$ 350 ns (1 m cable and I _{out} = 50 mA)
Cable length:	max. 50 m
Operating temperature:	-25 °C ... +85 °C
Short-circuit protection only at zero speed !	



SI: Voltage interface 1 Vpp

Operating voltage:	5 V $\pm$ 5 %
Current requirement:	max. 70 mA
Output signals:	A+, A-, B+, B-, Z+, Z-
Limit frequency (-3dB):	max. 180 kHz
Signal level at a load of Zo = 120 Ohm:	track signals: A, B $\sim$ 1 V (0,8 ... 1,2 V) index signal (effective signal): Z $\sim$ 0,5 V (0,2 ... 0,85 V)
Cable length:	max. 150 m
Operating temperature:	-25 °C ... +85 °C



Ordering Information	G	1B	X	X	XX	XX	XXXX	-	X X X	-	XX
	G	1B	3	4	5.1	5.2	6	-	7 8 9	-	10
G	Incremental Rotary Encoder										
1B	Model series										
3	Mechanical specification W = Typ W (Through hollow shaft)										
4	Hollow shaft configuration H = 28 mm 7 = 32 mm J = 60 mm G = 38 mm 6 = 45 mm F = 42 mm 5 = 50 mm										
5.1	Output circuit LD = Line driver; RS422 SI = Voltage interface 1 Vpp at 120 Ohm load KS = Push pull with short-circuit protection KI = KS with inverted signals										
5.2	Output channels BI = channel A and B IN = channel B only others upon request										
6	Line counts 64 1024 2048 2500 4096 8192 others upon request										
7	Zero index Z (Reference pulse; north marker) 5 = Z „high“ if A + B „high“ others upon request										
8	Flange F = IP 64										
9	Connector or cable output 1 = Connector radial 4 = Cable radial with connector 3 = Cable radial (1m) 7 = Leads radial others upon request										
10	Supply voltage 05 = 5 Volts 24 = 8 ... 30 Volts										

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