

Incremental encoders

Heavy Duty shaft, optical	Sendix Heavy Duty H100 (shaft)	Push-pull / RS422 / speed switch
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The Sendix Heavy Duty encoder H100 is an extremely rugged incremental encoder available in 3 versions: encoder with or without speed switch and double encoder.

Thanks to the special HD-Safety-Lock™ construction it is ideally suited for applications in heavy industry, such as steel works and cranes. Resistant materials, wide temperature ranges and a high protection level ensure it remains unaffected by the harshest environmental conditions. Its innovative connection technology enables simple quick installation.



HD-Safety-Lock™	High rotational speed	Temperature range -40°...+100°C	IP66	Shock/vibration resistant	Magnetic field proof	Plug-in cage-clamp connectors	Spring terminal connectors	Reverse polarity protection	Optical sensor	Seawater durable

Suitable for your Heavy Duty application

- HD-Safety-Lock™ bearing construction for an extremely high bearing load capacity of up to 300 N axial and 400 N radial.
- With a temperature range from -40 °C up to +100 °C, IP66 protection and seawater durable material the encoder is resistant to harsh environmental conditions.
- Feather key shaft slot ensures positive fitting to the application.
- Safe overspeed protection by means of mechanical speed switch.

Simple quick installation

- Innovative plug-in spring terminal connectors in the terminal box greatly simplify the cable connection and offer a very high level of safety.
- Various connection possibilities thanks to terminal box being rotatable through 180°.
- Large number of resolution and switching speed options available as standard.

Order code without speed switch

8.H100	.	1	1	1	X	.	XXXX
Type		a	b	c	d		e

a Flange

1 = Euro RE0444

b Shaft (ø x L), with feather key shaft slot

1 = ø 11 x 30 mm [0.43 x 1.18"]

c Version

1 = incremental encoder

d Output circuit / supply voltage

1 = RS422 (with inverted signal) / 5 ... 30 V DC
2 = Push-pull (with inverted signal) / 10 ... 30 V DC

e Pulse rate

1, 5, 10, 12, 36, 100, 200, 250, 256, 360, 400,
500, 512, 600, 800, 1000, 1024, 1200, 2000,
2048, 2500, 3600, 4096, 5000
(e.g. 100 pulse => 0100)

Optional on request

- other pulse rates
- Ex 2/22

Order code with speed switch

8.H100	.	1	1	2	X	.	XXXX	.	XXXX	.	1
Type		a	b	c	d		e		f		g

a Flange

1 = Euro RE0444

b Shaft (ø x L), with feather key shaft slot

1 = ø 11 x 30 mm [0.43 x 1.18"]

c Version

2 = incremental encoder with mech. speed switch

d Output circuit / supply voltage

1 = RS422 (with inverted signal) / 5 ... 30 V DC
2 = Push-pull (with inverted signal) / 10 ... 30 V DC

e Pulse rate

1, 5, 10, 12, 36, 100, 200, 250, 256, 360, 400,
500, 512, 600, 800, 1000, 1024, 1200, 2000,
2048, 2500, 3600, 4096, 5000
(e.g. 100 pulse => 0100)

f Switching speed

750, 1000, 2000, 3000, 4000

g Switching accuracy

1 = standard (±4 % at 100 rad/s²)

Optional on request

- other pulse rates
- other switching speeds
- other switching accuracies
- Ex 2/22

Incremental encoders

Heavy Duty shaft, optical	Sendix Heavy Duty H100 (shaft)	Push-pull / RS422 / speed switch
Order code double encoder	8.H100 . 1 1 3 X . XXXX . XXXX	
	Type	
a Flange 1 = Euro RE0444	i Output circuit / supply voltage 1 = RS422 (with inverted signal) / 5 ... 30 V DC 2 = Push-pull (with inverted signal) / 10 ... 30 V DC	i Pulse rate encoder 2 1, 5, 10, 12, 36, 100, 200, 250, 256, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 2000, 2048, 2500, 3600, 4096, 5000 (e.g. 100 pulse => 0100)
b Shaft ($\varnothing \times L$), with feather key shaft slot 1 = $\varnothing 11 \times 30$ mm [0.43 x 1.18"]	e Pulse rate encoder 1 1, 5, 10, 12, 36, 100, 200, 250, 256, 360, 400, 500, 512, 600, 800, 1000, 1024, 1200, 2000, 2048, 2500, 3600, 4096, 5000 (e.g. 100 pulse => 0100)	<i>Optional on request</i> - other pulse rates - Ex 2/22
c Version 3 = 2 x incremental encoder		

Mounting		Order no.
Coupling	Doppelschlaufenkupplung für Welle 12 mm mit Passfedernut 4 mm	8.0000.1L01.1112
Accessories – connecting cable		Order no.
For encoder	PUR-trailing cable, shielded, halogen free, orange 4 x 2 x 0.25 mm ² [AWG 23] + 2 x 1 mm ² [AWG 17], twisted pair	8.0000.6400.XXXX ¹⁾
For speed switch	TPE-trailing cable, shielded, halogen free, black – 5 x 0.75 mm ² [AWG 18]	8.0000.6600.XXXX ¹⁾

Technical data

Mechanical characteristics	
Maximum speed	6000 min ⁻¹
Starting torque with seal – at 20 °C [68 °F]	~ 2 Ncm
Load capacity of shaft	radial 400 N axial 300 N
Weight	H100 ~ 1.8 kg [63.49 oz] H100 + speed switch ~ 2.7 kg [95.24 oz]
Protection acc. to EN 60529	IP66
Working temperature range (surface of housing)	-40 °C ... +100 °C [-40 °F ... + 212 °F]
Materials	shaft stainless steel housing aluminum die-cast (EN AC-44300), seawater durable coating flange seawater durable aluminum type Al Si Mg Mn (EN AW-6082)
Shock resistance acc. to EN 60068-2-27	3000 m/s ² (1 ms)
Vibration resistance acc. to EN 60068-2-27	without speed switch 100 m/s ² , 10 ... 2000 Hz with speed switch, switching speed > 1000 100 m/s ² , 10 ... 400 Hz with speed switch, switching speed < 1000 50 m/s ² , 10 ... 400 Hz

Electrical characteristics			
Output circuit	RS422 (TTL compatible)	Push-pull (HTL) up to 150 m [492.13'] cable length	
Supply voltage	5 ... 30 V DC	10 ... 30 V DC	
Power consumption (no load) with inverted signal	typ. 40 mA max. 90 mA	typ. 50 mA max. 100 mA	
Permissible load per channel	DC max. +/- 20 mA peak max. +/- 30 mA	max. +/- 30 mA max. +/- 70 mA	
Pulse frequency	max. 300 kHz	max. 300 kHz	
Pulse frequency with 150 m [492.13'] cable length	max. 300 kHz	max. 80 kHz	
Signal level	HIGH min. 2.5 V LOW max. 0.5 V	min. +V - 2.5 V max. 0.5 V	
Rising edge time t_r	max. 200 ns	max. 1 μs	
Falling edge time t_f	max. 200 ns	max. 1 μs	
Short circuit proof outputs ²⁾	yes ³⁾	yes	
Reverse polarity protection of the supply voltage	yes	yes	

Approvals		
CE compliant in accordance with		
EMC Directive	2014/30/EU	
RoHS Directive	2011/65/EU	
ATEX Directive	2014/34/EU (for Ex 2/22 variants)	
UKCA compliant in accordance with		
EMC Regulations	S.I. 2016/1091	
RoHS Regulations	S.I. 2012/3032	
UKEX Regulations	S.I. 2016/1107 (for Ex 2/22 variants)	

1) XXXX = cable length in meters.
2) If supply voltage +V correctly applied.
3) Only one channel allowed to be shorted-out:
At +V short circuit to channel or 0 V is permitted.

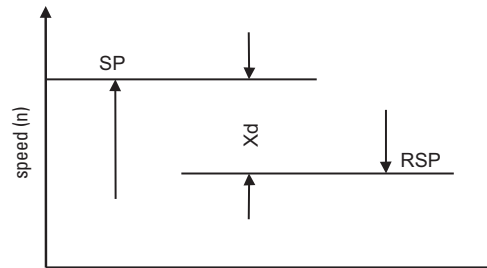
Incremental encoders

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Speed switch	
Switching speed (ns)	750 ... 4000 min ⁻¹
Max. rotational speed (mechanical)	1.25 x ns
Switching accuracy with acceleration $\alpha = 100 \text{ rad/s}^2$ (corresponds $\Delta n = 955 \text{ min}^{-1}/\text{s}$)	$\pm 4 \%$ of ns
Switching difference cw/ccw rotation	$\sim 3 \%$
Switching hysteresis (Xd)	$\sim 40 \%$ up to 80% of ns
Switching capacity	3 A / max. 50 V AC 1 A / max. 75 V DC

(more details see manual)

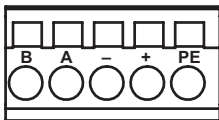
Definition switching hysteresis (Xd)



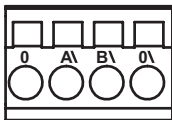
SP = switching point (for switching speed ns)
RSP = reset point
Xd = switching difference (hysteresis)

Terminal assignment terminal connections

Incremental encoders

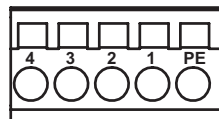


B incremental track B
A incremental track A
- 0 V
+ +V
PE shield



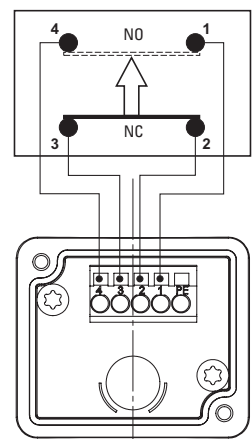
0 incremental track 0
 \bar{A} incremental track \bar{A}
 \bar{B} incremental track \bar{B}
 $\bar{0}$ incremental track $\bar{0}$

Speed switch



4, 1 normally open (NO)
3, 2 normally closed (NC)
PE shield

Jumper



Incremental encoders

**Heavy Duty
shaft, optical**

Sendix Heavy Duty H100 (shaft)

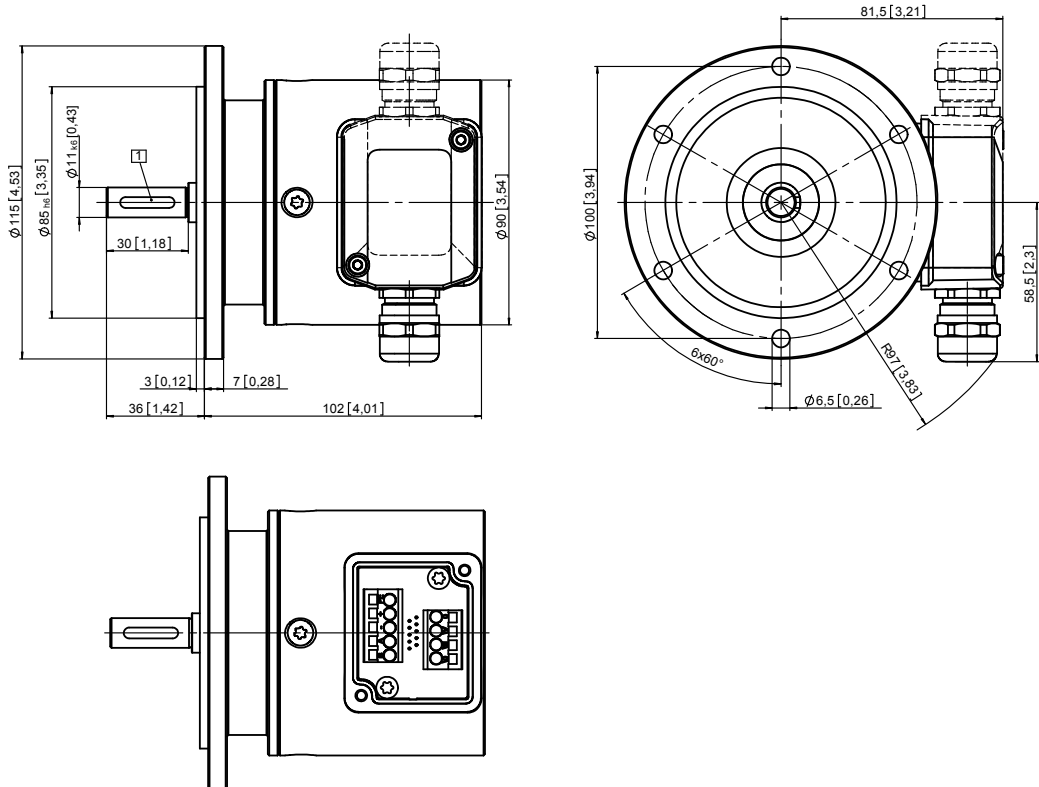
Push-pull / RS422 / speed switch

Dimensions

Dimensions in mm [inch]

Incremental encoder Version 1

- 1 Feather key acc. to ISO 773
4 x 4 x 20 [0.16 x 0.16 x 0.79]



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Dimensions

Dimensions in mm [inch]

Incremental encoder with mechanical speed switch or 2 x incremental encoder (double encoder) Version 2 or 3

- 1 Feather key acc. to ISO 773
4 x 4 x 20 [0.16 x 0.16 x 0.79]

