

# Rotary Measuring Technology

## Incremental shaft encoder

### Heavy duty Type ESI 90S



- Designed for heavy duty
- IP 66
- Sealed connector (also unplugged IP 67)
- Highly flexible, chemical resistant PUR-cable (stands up under constant trailing at -20 °C up to 70 °C)
- Temperature and ageing compensation
- Precision graduation at high resolution
- Large temperature range

- Short-circuit proof outputs
- available as explosion proof zone 2 and 22

Applications: steel industry  
forestry, road and wood industry

#### Mechanical characteristics:

Speed:	max. 6000 min <sup>-1</sup>
Rotor moment of inertia:	approx. 15 x 10 <sup>-6</sup> kgm <sup>2</sup>
Starting torque:	< 0.05 Nm
Radial load capacity of shaft*:	140 N
Axial load capacity of shaft*:	70 N
Weight:	approx. 1.2 kg
Protection acc. to EN 60 529:	IP 66
Working temperature:	-20° C ... +85 °C <sup>1)2)</sup>
Operating temperature:	-20° C ... +90 °C <sup>1)2)</sup>
Shaft:	stainless steel
Shock resistance acc. to DIN-IEC 68-2-27	1000 m/s <sup>2</sup> , 6 ms
Vibration resistance acc. to DIN-IEC 68-2-6:	100 m/s <sup>2</sup> , 10...2000 Hz

\* View also diagrams on page 21

1) 80 °C with cable

2) Non-condensing

#### Pulse rates available at short notice:

10, 20, 25, 30, 50, 60, 100, 120, 125, 127, 150, 180, 200, 216, 240, 250, 254, 256, 300, 314, 360, 375, 400, 500, 512, 600, 625, 720, 745, 750, 762, 800, 900, 927, 1000, 1024, 1250, 1270, 1400, 1500, 1800, 2000, 2048, 2250, 2400, 2500, 3000, 3600, 4000, 4096, 5000

Other pulse rates on request

#### Electrical characteristics:

Output circuit:	RS 422 (TTL-compatible)	Push-pull
Supply voltage:	5 V (±5 %) or 10 ... 30 V DC	10 ... 30 V DC
Power consumption (no load) without inverted signal:	-	typ. 55 mA / max. 125 mA
Power consumption (no load) with inverted signals:	typ. 40 mA / max. 90 mA	typ. 80 mA / max. 150 mA
Permissible load/channel:	max. ±20 mA	max. ±30 mA
Pulse frequency:	max. 300 kHz	max. 300 kHz
Signal level high:	min. 2.5 V	min. U <sub>B</sub> -2.5 V
Signal level low:	max. 0.5 V	max. 2.0 V
Rise time t <sub>r</sub>	max. 200 ns	max. 1 μs
Fall time t <sub>f</sub>	max. 200 ns	max. 1 μs
Short circuit proof outputs: <sup>1)</sup>	yes <sup>2)</sup>	yes
Reverse connection protection at U <sub>B</sub> :	5 V: no, 10 ... 30 V: yes	yes

Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3

1) If supply voltage correctly applied

2) Only one channel allowed to be shorted-out:

(If U<sub>B</sub>=5 V, short-circuit to channel, 0 V, or +U<sub>B</sub> is permitted)

(If U<sub>B</sub>=5-30 V, short-circuit to channel or 0 V is permitted)

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#### Terminal assignment

Signal:	0 V	0 V Sensor <sup>2)</sup>	+U <sub>B</sub>	+U <sub>B</sub> Sensor <sup>2)</sup>	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	Shield
12 pin plug: Pin:	10	11	12	2	5	6	8	1	3	4	PH <sup>1)</sup>
Colour:	WH 0.5 mm <sup>2</sup>	WH	BN 0.5 mm <sup>2</sup>	BN	GN	YE	GY	PK	BU	RD	

1) PH = Shield is attached to connector housing

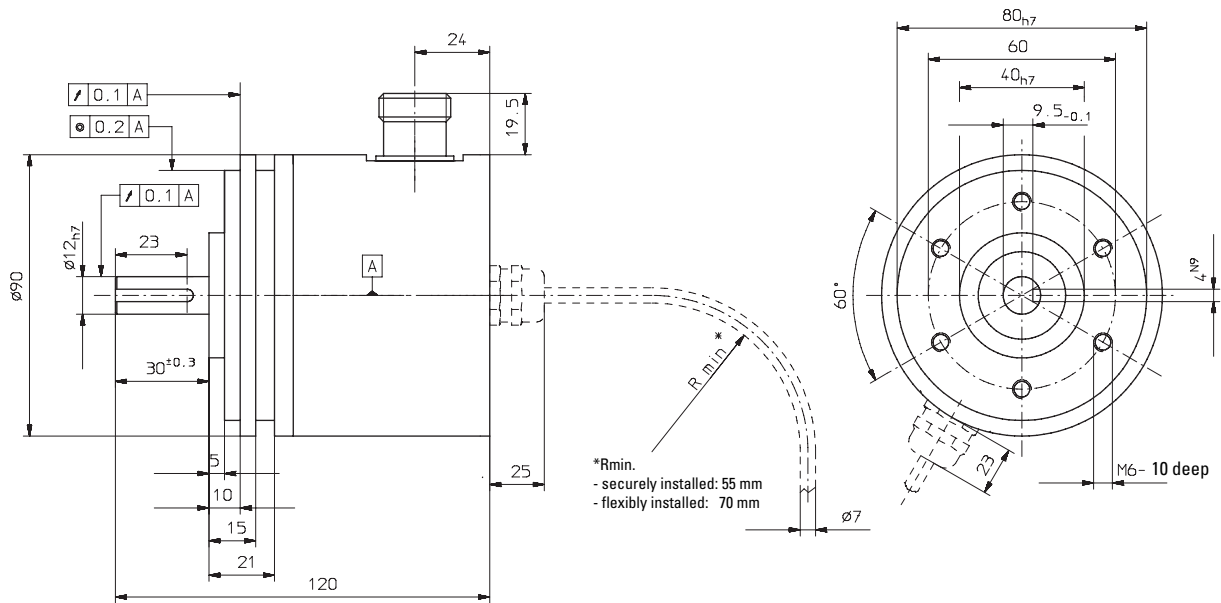
2) Sensor cables are connected to the supply voltage internally if long feeder cables are involved they can be used to adjust or control the voltage at the encoder

- If sensor cables are not in use, they have to be insulated or 0 V Sensor has to be connected to 0 V and U<sub>B</sub>Sensor has to be connected to U<sub>B</sub>

- Using RS 422 outputs and long cable distances, a wave impedance has to be applied at each cable end.

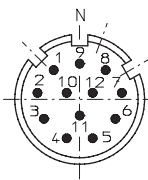
Insulate unused outputs before initial startup.

#### Dimensions



#### Top view of mating side, male contact base:

12 pin plug



#### Mounting advice:

The brackets and shafts of the encoder and drive should not both be rigidly coupled together at the same time! We recommend the use of suitable couplings (see Accessories section).

#### Order code:

ESI 90S.11XX.XXXX

Range		Pulse rate (e.g. 250 pulses=> 0250)
Type of connection and supply voltage		Type of connection
<b>4 = RS 422 (with inverted signal)</b> <b>5 V supply voltage</b> 5 = RS 422 (with inverted signal) 10 ... 30 V supply voltage <b>6 = Push-pull (with inverted signal)</b> <b>10 ... 30 V supply voltage</b> 7 = Push-pull (without inverted signal) 10 ... 30 V supply voltage	Preferred types are indicated in <b>bold</b>	1 = Cable axial (1 m PUR-cable) <b>2 = Cable radial (1 m PUR-cable)</b> 3 = axial 12 pin plug axial without mating connector <b>5 = radial 12 pin plug without mating connector</b>