

HOG 10 + ESL 93

Encoder with integrated electronic speed switch

Blind hollow shaft or cone shaft 300...5000 pulses per revolution

Overview

- TTL output driver for cable length up to 550 m
- Electronic speed monitoring
- Circuit breaker with up to three selectable threshold speeds
- Hybrid bearing for extended service life
- Terminal boxes, turn by 180°



Technical data

Technical data - electrical ratings

Shaft insulation	Suitable up to 2.8 kV
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3

Technical data - electrical ratings (encoder)

Voltage supply	9...30 VDC; 5 VDC $\pm 5\%$
Consumption w/o load	≤ 100 mA
Pulses per revolution	300 ... 5000
Phase shift	$90^\circ \pm 20^\circ$
Duty cycle	40...60 %
Reference signal	Zero pulse, width 90°
Output frequency	≤ 120 kHz ≤ 300 kHz (on request)
Output signals	K1, K2, K0 + inverted Error output (option EMS)
Output stages	HTL, TTL/RS422

Technical data - electrical ratings (speed switch)

Voltage supply	12 VDC $\pm 10\%$
Consumption w/o load	≤ 5 mA
Switching accuracy	$\pm 4\%$ (≤ 1500 rpm) $\pm 2\%$ (> 1500 rpm)
Switching hysteresis	$= 30\%$ of switching speed
Switching outputs	3 outputs, speed control
Current each output	40 mA (DC)
Switching delay time	≤ 40 ms

Technical data - mechanical design

Size (flange)	$\varnothing 105$ mm
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Technical data - mechanical design

Shaft type	$\varnothing 16...20$ mm (blind hollow shaft) $\varnothing 17$ mm (cone shaft 1:10)
Admitted shaft load	≤ 450 N axial, ≤ 600 N radial
Protection EN 60529	IP 66
Operating speed	≤ 5000 rpm
Range of switching speed (ns)	3x 200...5000 rpm
Operating torque typ.	6 Ncm
Rotor moment of inertia	680 gcm ²
Material	Housing: aluminium die-cast Shaft: stainless steel
Operating temperature	$-20...+85^\circ\text{C}$
Resistance	IEC 60068-2-6 Vibration 5 g, 10-2000 Hz IEC 60068-2-27 Shock 50 g, 6 ms
Corrosion protection	IEC 60068-2-52 Salt mist for ambient conditions C4 according to ISO 12944-2
Shaft insulation	2.8 kV
Transmission length	≤ 350 m at 100 kHz (HTL-P) ≤ 550 m at 100 kHz (TTL)
Connection	2x terminal box 3x terminal box (with option M)
Weight approx.	2.3 kg 2.5 kg (with option M)
Approval	CE

Optional

- Function control with EMS (Enhanced Monitoring System)
- Redundant sensing with two terminal boxes

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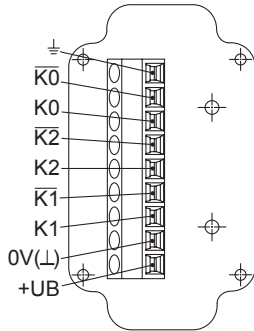
Encoder with integrated electronic speed switch

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Terminal assignment

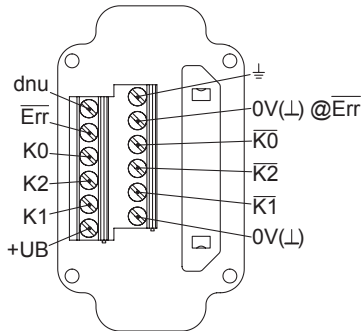
View A (see dimension)

Connecting terminal terminal box encoder



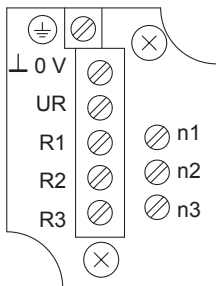
Option EMS: View A (see dimension)

Connecting terminal terminal box encoder



View B (see dimension)

Connecting terminal speed switch ESL 93



Terminal significance

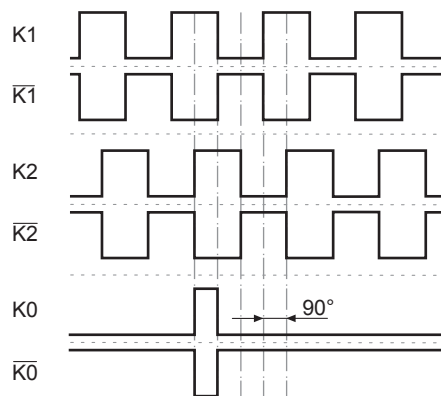
Encoder incremental

+UB	Voltage supply
0V (L)	Ground
⊥	Earth ground (housing)
K1	Output signal channel 1
K1	Output signal channel 1 inverted
K2	Output signal channel 2 (offset by 90° to channel 1)
K2	Output signal channel 2 inverted
K0	Zero pulse (reference signal)
K0	Zero pulse inverted
Err	Error output (option EMS)
dnu	Do not use

Output signals

HTL/TTL

At positive rotating direction (see dimension)



Option EMS: Status LED / error output

Flash light red*	Error of signal sequence, zero pulse or pulses (Error output = HIGH-LOW alternation)
Red	Overload output transistors (Error output = LOW)
Flash light green	Device o.k., rotating (Error output = HIGH)
Green	Device o.k., stopped (Error output = HIGH)
No light	No voltage supply connection or wrong connection (Error output = LOW)

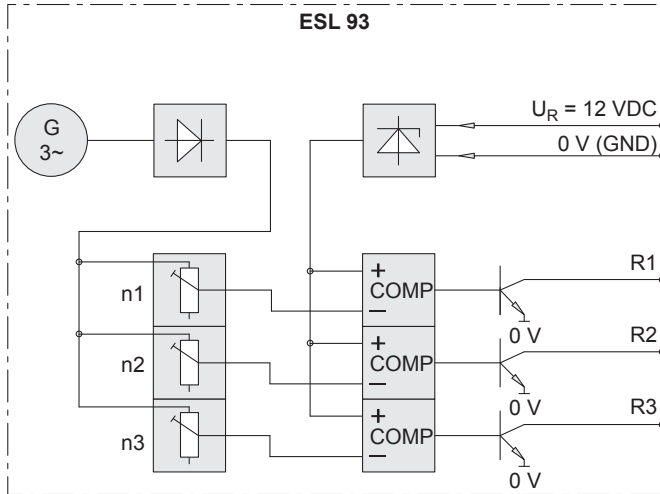
* Only at rotating device

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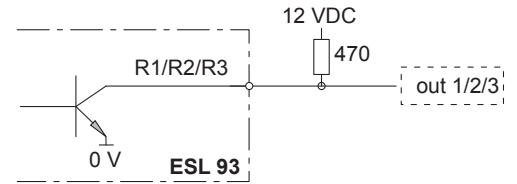
Encoder with integrated electronic speed switch

Blind hollow shaft or cone shaft 300...5000 pulses per revolution

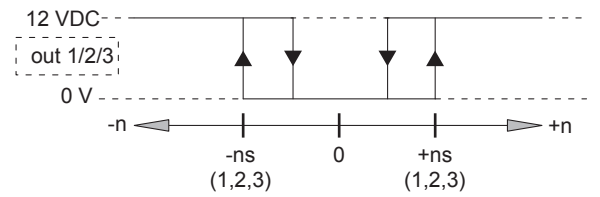
Block circuit diagram



Recommended output circuit



Switching characteristics



n = speed
ns = adjusted switching speed

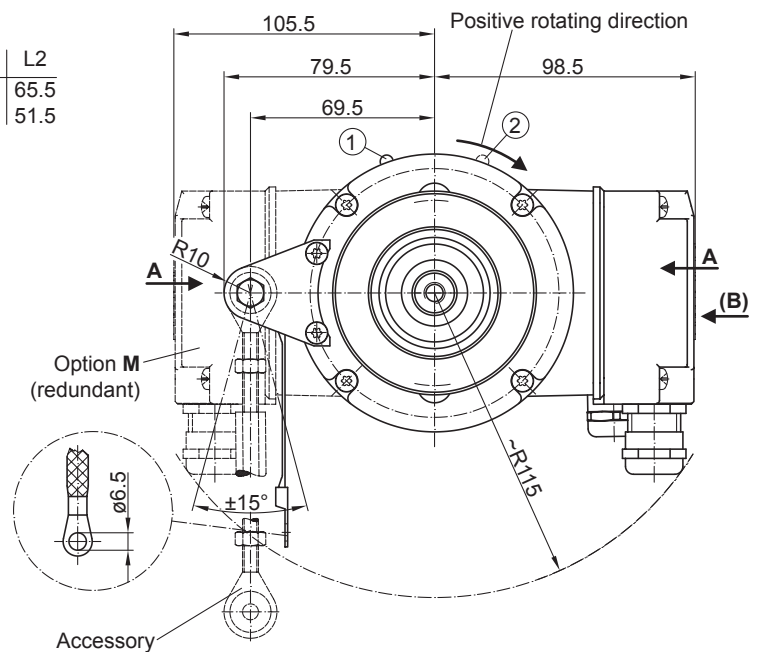
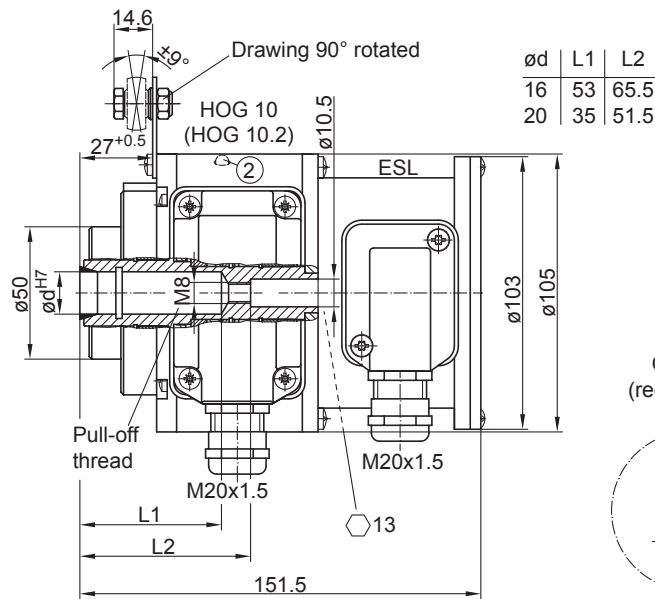
Speed switch ESL 93

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Encoder with integrated electronic speed switch

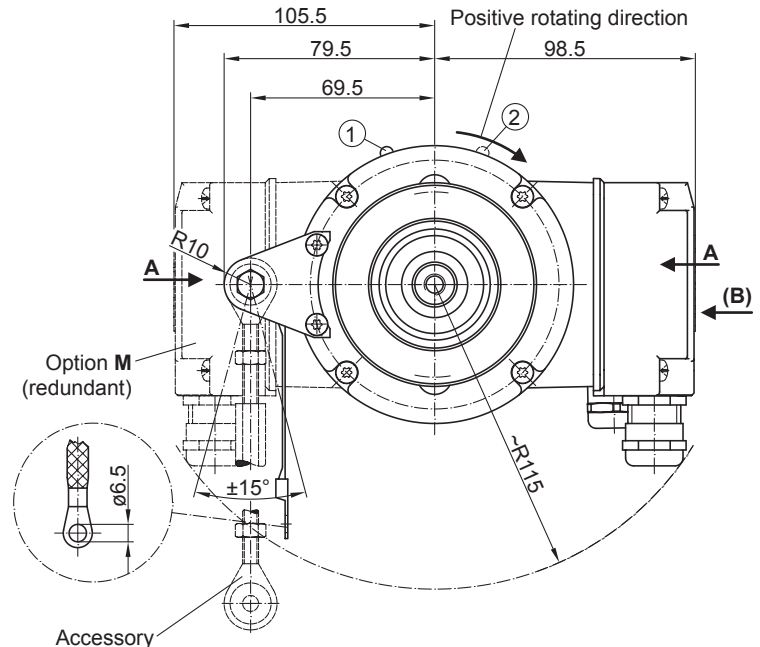
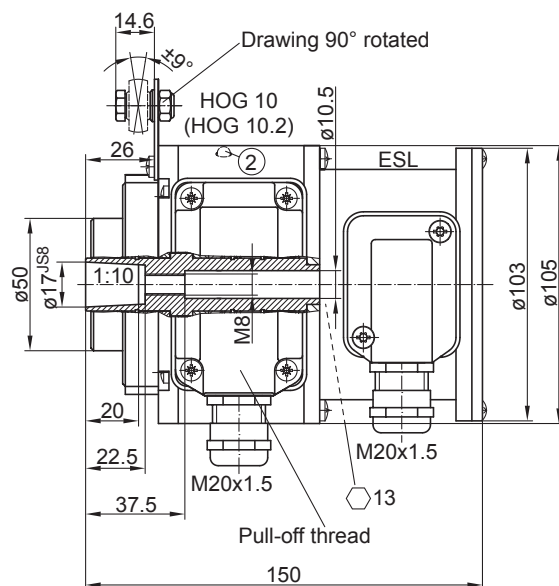
Blind hollow shaft or cone shaft 300...5000 pulses per revolution

Dimensions



- ① Status LED (option EMS)
- ② Status LED (option **M** (redundant) and EMS)

Blind hollow shaft



- ① Status LED (option EMS)
- ② Status LED (option **M** (redundant) and EMS)

Cone shaft

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Ordering reference

	HOG10	##	#	DN	####	###	##	#####	+ ESL93	...	...	...
Product												
Incremental encoder + Speed switch	HOG10											
EMS - Enhanced Monitoring System												
Without EMS												
With EMS		.2										
Redundant sensing												
Without redundant sensing												
With redundant sensing			M									
Output signals												
K1, K2, K0				DN								
Pulse number⁽¹⁾												
300					300							
500					500							
512					512							
1000					1000							
1024					1024							
1200					1200							
2048					2048							
2500					2500							
3072					3072							
4096					4096							
5000					5000							
Voltage supply / output stage												
9...30 VDC / output stage HTL with inverted signals						I						
5 VDC / output stage TTL with inverted signals						TTL						
9...30 VDC / output stage TTL with inverted signals						R						
Sealing system												
Dust protection							LR					
Damp protection							SR					
Shaft diameter												
Blind hollow shaft ø16 mm								16H7				
Blind hollow shaft ø20 mm								20H7				
Cone shaft ø17 mm (1:10)								17K				
Version speed switch												
Electronic speed switch, 3 outputs, speed control									+ ESL93			
Switching speed 1 (ns1)												
200...5000 rpm ⁽²⁾										...		
Switching speed 2 (ns2)												
200...5000 rpm ⁽²⁾												...
Switching speed 3 (ns3)												
200...5000 rpm ⁽²⁾												...

(1) Other pulse numbers on request.

(2) Please specify the exact switching speed in addition to the part number (factory setting).

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Accessories

Mounting accessories

11077197	Mounting kit for torque arm size M6 and earthing strap
11077087	Mounting and dismounting set
11043628	Torque arm M6, length 67...70 mm
11004078	Torque arm M6, length 120...130 mm (≥ 71 mm)
11002915	Torque arm M6, length 425...460 mm (≥ 131 mm)
11054917	Torque arm M6 insulated, length 67...70 mm
11072795	Torque arm M6 insulated, length 120...130 mm (≥ 71 mm)
11082677	Torque arm M6 insulated, length 425...460 mm (≥ 131 mm)

Relay modules

11054943	Relay modul ES 93 R
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