

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 ±5 %
Consumption w/o load	≤100 mA
Pulses per revolution	300 ... 5000
Phase shift	90 ° ±20°
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 ±10 %
Consumption w/o load	≤5 mA
Switching accuracy	± 4 % (≤1500 rpm) ± 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)	ø105 mm
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Technical data - mechanical design

Shaft type	ø16...20 mm (blind hollow shaft) ø17 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 °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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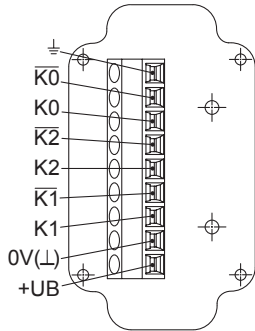
Encoder with integrated electronic speed switch

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

Terminal assignment

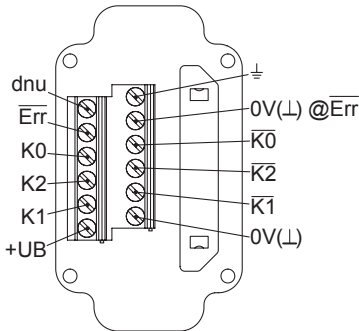
View A (see dimension)

Connecting terminal terminal box encoder



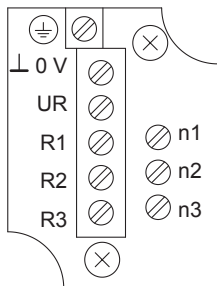
Option EMS: View A (see dimension)

Connecting terminal terminal box encoder



View B (see dimension)

Connecting terminal speed switch ESL 93



Terminal significance

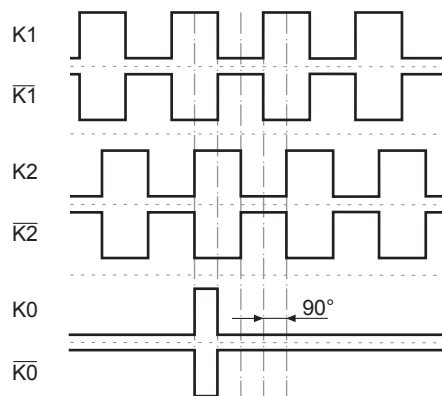
Encoder incremental

+UB	Voltage supply
0V (⊥)	Ground
⊥	Earth ground (housing)
K1	Output signal channel 1
$\overline{K1}$	Output signal channel 1 inverted
K2	Output signal channel 2 (offset by 90° to channel 1)
$\overline{K2}$	Output signal channel 2 inverted
K0	Zero pulse (reference signal)
$\overline{K0}$	Zero pulse inverted
\overline{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)

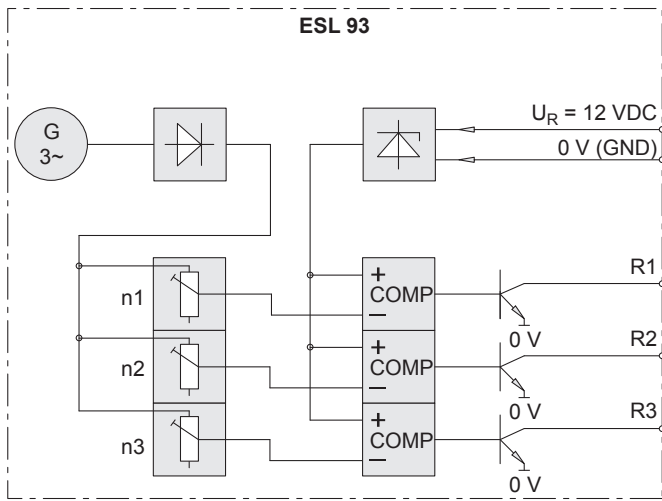
* Only at rotating device

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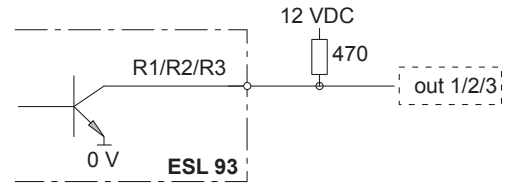
Encoder with integrated electronic speed switch

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

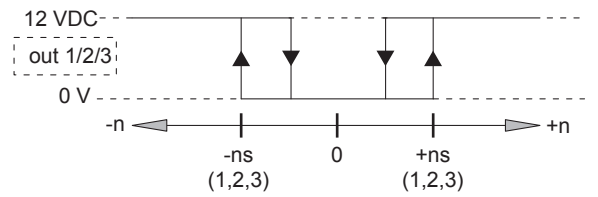
Block circuit diagram



Recommended output circuit



Switching characteristics



n = speed
ns = adjusted switching speed

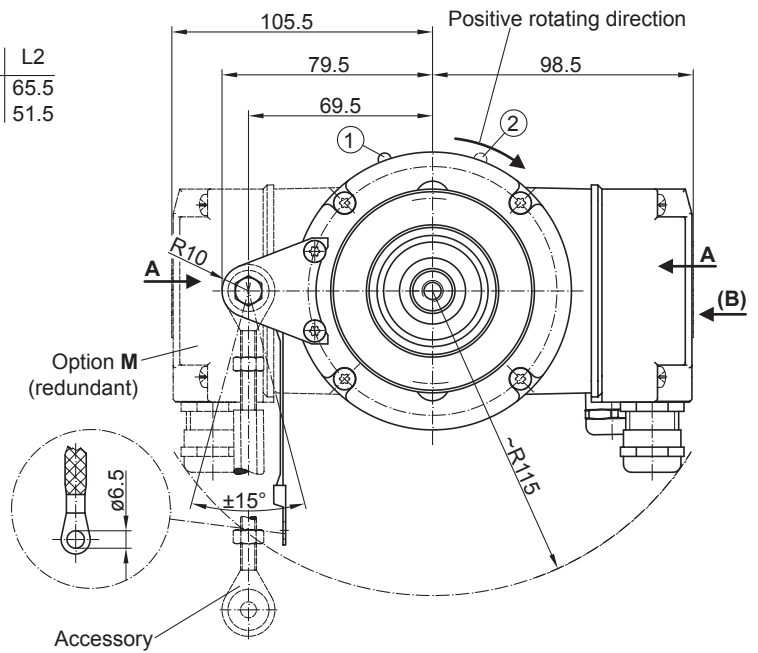
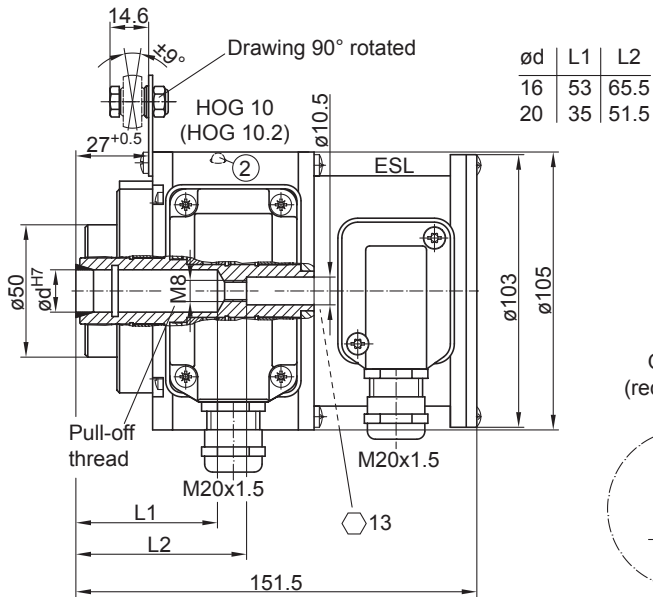
Speed switch ESL 93

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Encoder with integrated electronic speed switch

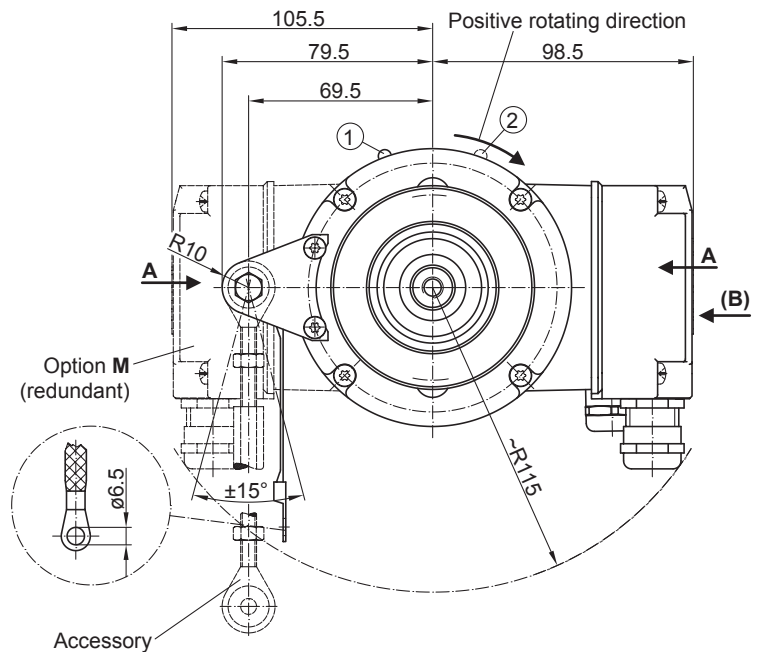
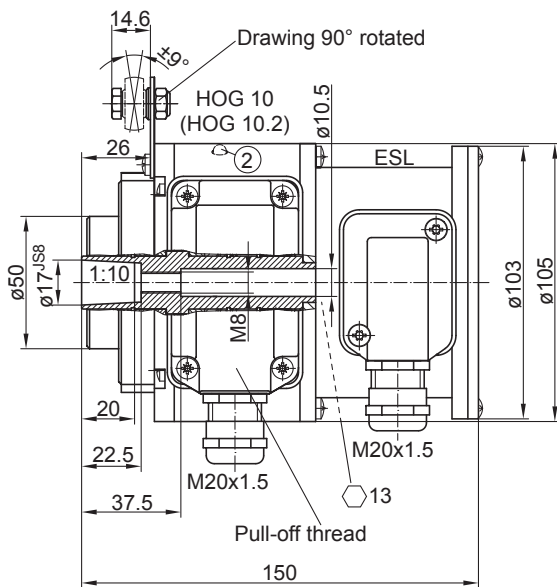
Blind hollow shaft or cone shaft 300...5000 pulses per revolution

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 dismantling 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 moduls

11054943	Relay modul ES 93 R
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