

HOG 86 + FSL

Encoder with integrated centrifugal switch

Insulated blind hollow shaft $\varnothing 16$ mm, cone shaft $\varnothing 17$ mm / 500...5000 pulses per revolution

Overview

- Mechanical speed monitoring based on centrifugal force
- Robust, compact housing
- Two-sided bearing system with optimal bearing spacing
- Shaft load up to 450 N
- Shaft insulation up to 2.8 kV
- Terminal boxes, turn by 180°



Technical data

Technical data - electrical ratings

Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Approval	CE

Technical data - electrical ratings (encoder)

Voltage supply	9...30 VDC 5 VDC ± 5 %
Consumption w/o load	≤ 100 mA
Pulses per revolution	500 ... 5000
Phase shift	$90^\circ \pm 20^\circ$
Duty cycle	45...55 % 40...60 % (>3072 pulses)
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-P (power linedriver) TTL/RS422
Sensing method	Optical
Shaft insulation	Suitable up to 2.8 kV
Transmission length	≤ 350 m at 100 kHz (HTL-P) ≤ 550 m at 100 kHz (TTL)

Technical data - electrical ratings (centrifugal switch)

Switching accuracy	± 4 % ($\Delta n = 2$ rpm/s); 20 % ($\Delta n = 1500$ rpm/s)
Switching deviation	≤ 3 % (cw-ccw rotation)
Switching hysteresis	40 % of switching speed
Switching outputs	1 output, speed control
Output switching capacity	≤ 6 A / 230 VAC ≤ 1 A / 125 VDC (EAC: <50 VAC / 75 VDC)

Technical data - electrical ratings (centrifugal switch)

Minimum switching current	50 mA
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Technical data - mechanical design

Size (flange)	$\varnothing 105$ mm
Shaft type	$\varnothing 16$ mm (blind hollow shaft) $\varnothing 17$ mm (cone shaft 1:10)
Admitted shaft load	≤ 350 N axial ≤ 450 N radial
Protection EN 60529	IP 66
Speed (n)	$\leq 1.25 \cdot ns$
Range of switching speed (ns)	850...4500 rpm ($\Delta n = 2$ rpm/s)
Operating torque typ.	6 Ncm
Rotor moment of inertia	200 gcm ²
Material	Housing: aluminium, coated Shaft: stainless steel
Operating temperature	-40...+100 °C -25...+100 °C (>3072 pulses)
Resistance	IEC 60068-2-6 Vibration 5 g, 10-2000 Hz IEC 60068-2-27 Shock 50 g, 11 ms
Corrosion protection	IEC 60068-2-52 Salt mist for ambient conditions C4 according to ISO 12944-2
Connection	2x terminal box 3x terminal box (with option M)
Weight approx.	1.9 kg 2 kg (with option M)

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Optional

- Hybrid bearings for 3 times longer service life
- Function control with EMS (Enhanced Monitoring System)
- Redundant sensing with two terminal boxes

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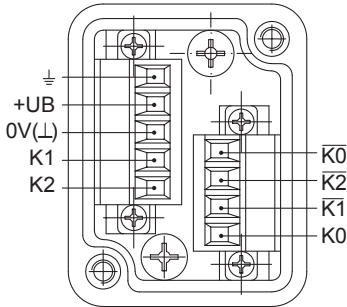
General information

The constructive design of the centrifugal switch is its use as a switch with positive break function. It must not be used as a continuous switch (switching cycles greater than 500 during service life).

Terminal assignment

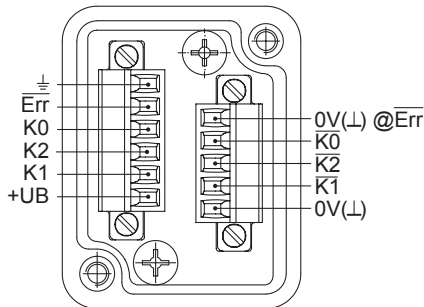
View A (see dimension)

Connecting terminal terminal box encoder



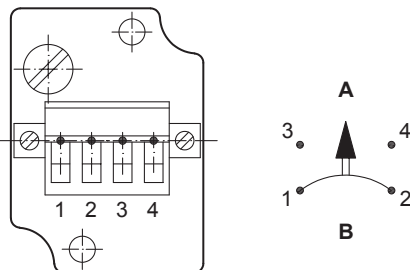
Option EMS: View A (see dimension)

Connecting terminal terminal box encoder



View B (see dimension)

Connecting terminal centrifugal switch



A = make contact, B = break contact

Terminal significance

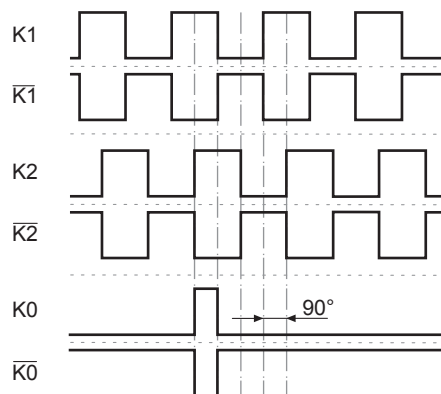
Encoder incremental

+UB	Voltage supply
0V (L)	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)

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)

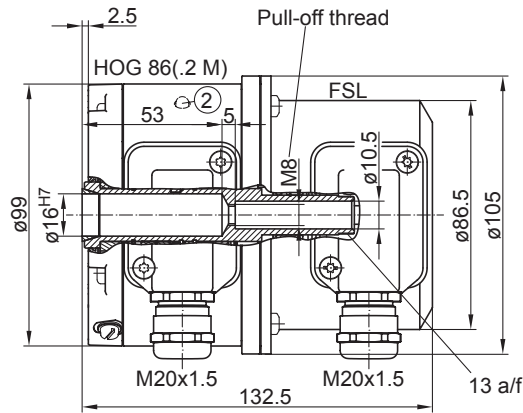
* Only at rotating device

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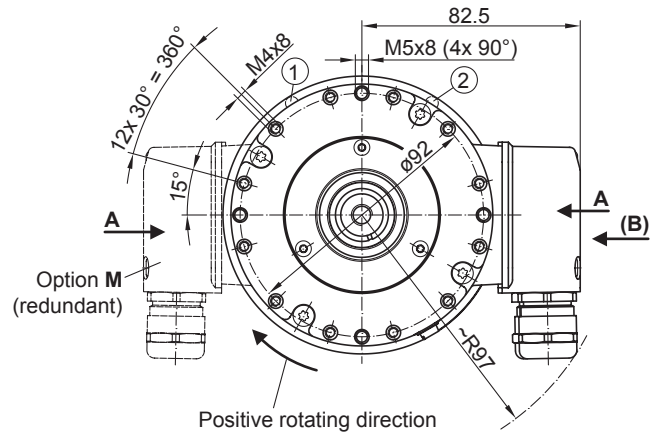
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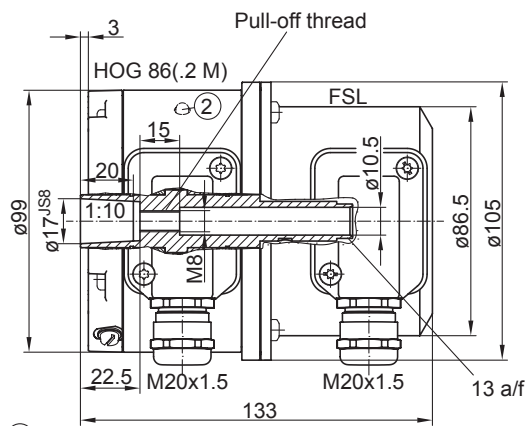
Dimensions



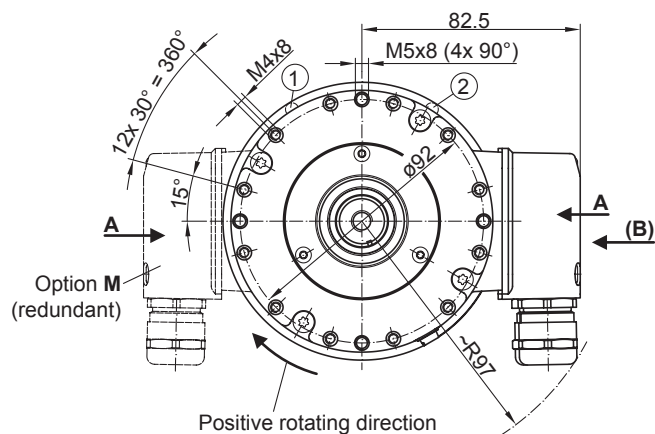
- ① Status LED (option EMS)
- ② Status LED (option **M** (redundant) and EMS)



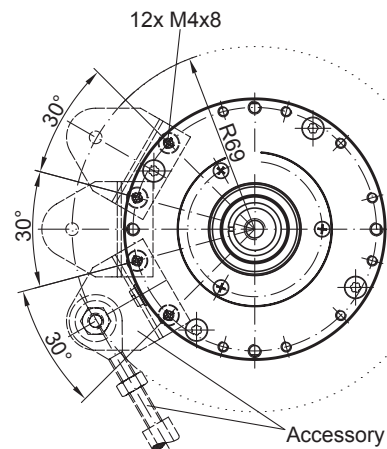
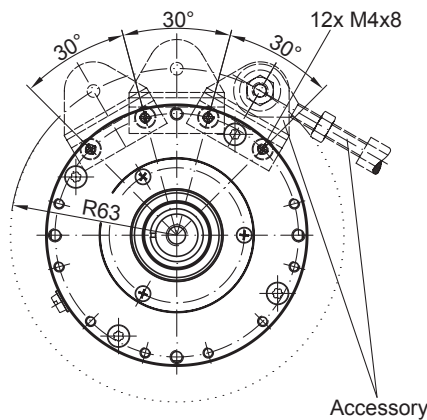
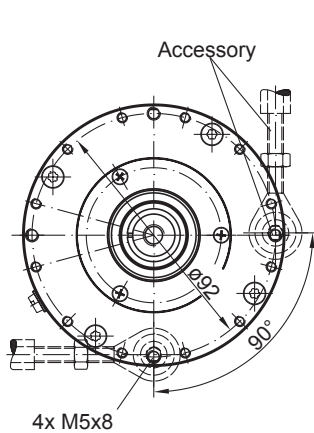
Blind hollow shaft



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



Cone shaft



Mounting possibilities

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Ordering reference

	HOG86	##	#	T	#	#	DN	####	###	+ FSL	#####
Product											
Incremental encoder + Centrifugal switch	HOG86										
EMS - Enhanced Monitoring System											
Without EMS											
With EMS		.2									
Redundant sensing											
Without redundant sensing											
With redundant sensing			M								
Connection											
1x terminal box, radial				T							
Insulation											
Hybrid bearing					H						
PA insulated					P						
Shaft diameter											
$\varnothing 16$ mm, central screw						6					
$\varnothing 17$ mm cone 1:10, central screw						7					
Output signals											
K1, K2, K0							DN				
Pulse number⁽¹⁾											
500								500			
512								512			
1000								1000			
1024								1024			
1250								1250			
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 $\pm 5\%$ / TTL									T		
9...30 VDC / output stage TTL with inverted signals									R		
Version speed switch											
Mechanical centrifugal switch										+ FSL	
Switching speed (ns)											
850...949 rpm ($\Delta n = 2$ rpm/s) ⁽²⁾											6 ...
950...1099 rpm ($\Delta n = 2$ rpm/s) ⁽²⁾											5 ...
1100...1299 rpm ($\Delta n = 2$ rpm/s) ⁽²⁾											4 ...
1300...1799 rpm ($\Delta n = 2$ rpm/s) ⁽²⁾											3 ...
1800...2499 rpm ($\Delta n = 2$ rpm/s) ⁽²⁾											2 ...
2500...4500 rpm ($\Delta n = 2$ rpm/s) ⁽²⁾											1 ...

(1) Other pulse numbers on request.

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

Accessories
Mounting accessories

11077087	Mounting and dismounting set	11004078	Torque arm M6, length 120...130 mm (≥ 71 mm)
11071906	Mounting kit earthing strap	11002915	Torque arm M6, length 425...460 mm (≥ 131 mm)
11043628	Torque arm M6, length 67...70 mm	11054917	Torque arm M6 insulated, length 67...70 mm
		11072795	Torque arm M6 insulated, length 120...130 mm (≥ 71 mm)

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Accessories

Mounting accessories

11082677	Torque arm M6 insulated, length 425...460 mm (≥ 131 mm)
11071850	Support plate mounting kit R63 for torque arm size M6
11082676	Support plate mounting kit R69 for torque arm size M6
11072076	Screw mounting kit for torque arm size M6
11071904	Mounting kit for torque arm size M6