

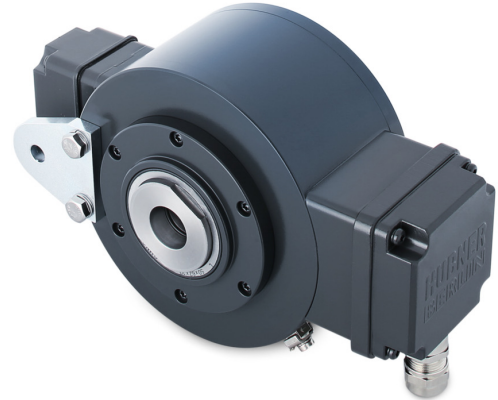
# HOG 16 + DSL

Encoder with integrated programmable, digital speed switch

Through hollow shaft  $\varnothing 20 \dots 50$  mm / 512...2500 pulses per revolution

## Overview

- Freely programmable switch-on and switch-off speed
- Programming via included software (RS485 interface)
- Output stages HTL or TTL
- DSL.R: 3 outputs speed controlled
- DSL.E: 2 outputs speed controlled and 1 control output



## Technical data

### Technical data - electrical ratings

Voltage supply	With DSL.R: 15...30 VDC With DSL.E: 9...30 VDC
Consumption w/o load	$\leq 200$ mA
Sensing method	Optical
Approval	CE

### Technical data - electrical ratings (encoder)

Pulses per revolution	512 ... 2500
Phase shift	$90^\circ \pm 20^\circ$
Duty cycle	40...60 %
Reference signal	Zero pulse, width $90^\circ$
Output frequency	$\leq 120$ kHz
Output signals	K1, K2, K0 + inverted
Output stages	HTL TTL/RS422

### Technical data - electrical ratings (speed switch)

Interface	RS485
Switching accuracy	$\pm 2$ % (or Digit)
Switching outputs	With DSL.R: 3 outputs, speed control With DSL.E: 2 outputs, speed control and 1 control output
Output switching capacity	With DSL.R: 12 VDC; $\leq 40$ mA With DSL.E: 5...230 VAC/VDC; 5...250 mA (EAC: $< 50$ VAC / 75 VDC)
Switching delay time	$\leq 40$ ms

### Technical data - mechanical design

Size (flange)	$\varnothing 158$ mm
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### Technical data - mechanical design

Shaft type	$\varnothing 20 \dots 50$ mm (through hollow shaft)
Admitted shaft load	$\leq 450$ N axial $\leq 600$ N radial
Protection EN 60529	IP 66
Speed (n)	$\leq 6000$ rpm
Range of switching speed (ns)	Pulses = 512: $\pm 16 \dots 6000$ rpm Pulses = 1024: $\pm 8 \dots 6000$ rpm Pulses = 2000: $\pm 5 \dots 3600$ rpm Pulses = 2048: $\pm 4 \dots 3500$ rpm Pulses = 2500: $\pm 3 \dots 2900$ rpm
Operating torque	$\leq 15$ Ncm
Rotor moment of inertia	4.9 kgcm <sup>2</sup>
Material	Housing: aluminium Shaft: stainless steel
Operating temperature	$-20 \dots +85$ °C
Resistance	IEC 60068-2-6 Vibration 15 g, 10-2000 Hz IEC 60068-2-27 Shock 300 g, 6 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.	4 kg 5 kg (with option M)
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Approval	CE

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### Optional

- Relay module DS 93 R (DSL.R version only)
- Redundant sensing (option M)
- Hybrid bearing
- Earthing brushes

# HOG 16 + DSL

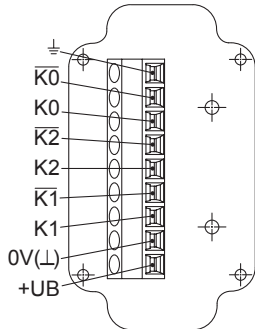
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## Terminal assignment

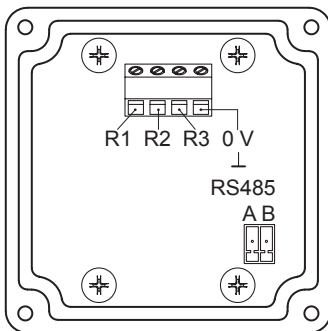
### View A (see dimension)

Connecting terminal box encoder



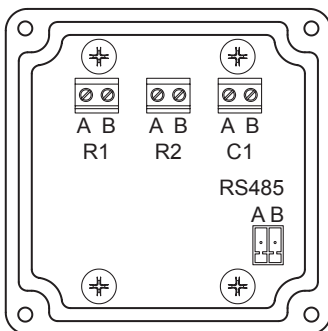
### View B (see dimension)

Connecting terminal speed switch DSL.R



### View B (see dimension)

Connecting terminal speed switch DSL.E



## Terminal significance

### Speed switch DSL.R

R1*	Transistor switching output 1, individually adjustable switching speed, High (12 V), Low (0 V), max. 20 mA
R2*	Transistor switching output 2, individually adjustable switching speed, High (12 V), Low (0 V), max. 20 mA
R3*	Transistor switching output 3, individually adjustable switching speed, High (12 V), Low (0 V), max. 20 mA
GND*	Ground connection
RS485	Interface for PC or Laptop (adapter required). Programming of the DSL via the included software.

\* Connection to relay module, for example DS 93 R (accessory)

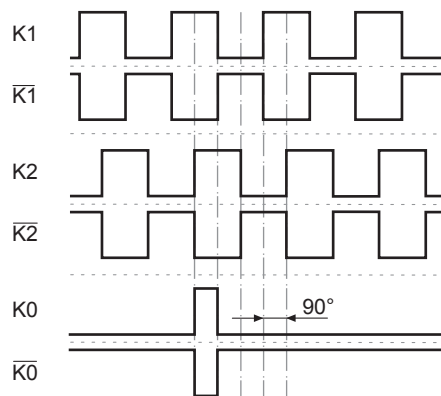
### Speed switch DSL.E

R1 (A+B)	Electronic relay output 1, individually adjustable switching speed, 5...230 V AC/DC
R2 (A+B)	Electronic relay output 2, individually adjustable switching speed, 5...230 V AC/DC
C1 (A+B)	Electronic relay output as a control output, 5...250 mA
RS485	Interface for PC or Laptop (adapter required). Programming of the DSL via the included software.

## Output signals

### HTL/TTL

At positive rotating direction (see dimension)



## Terminal significance

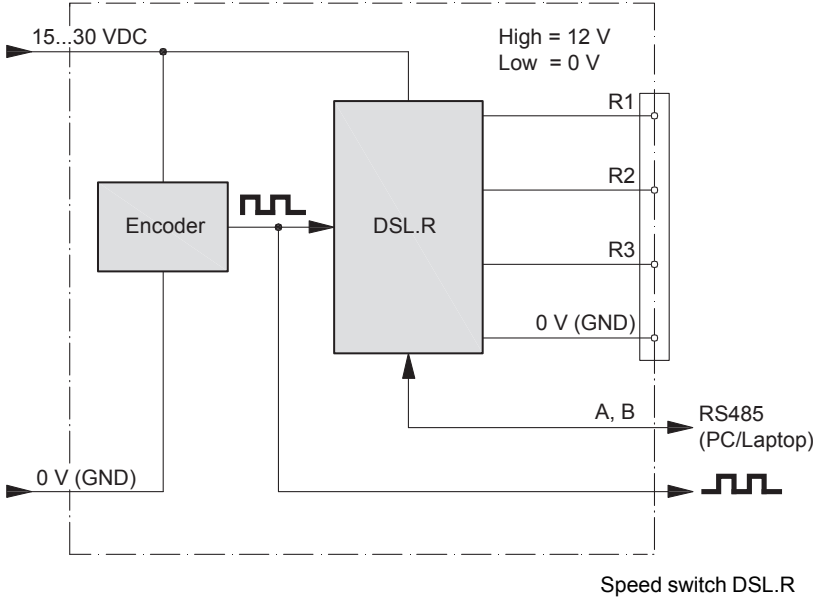
### Encoder incremental

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

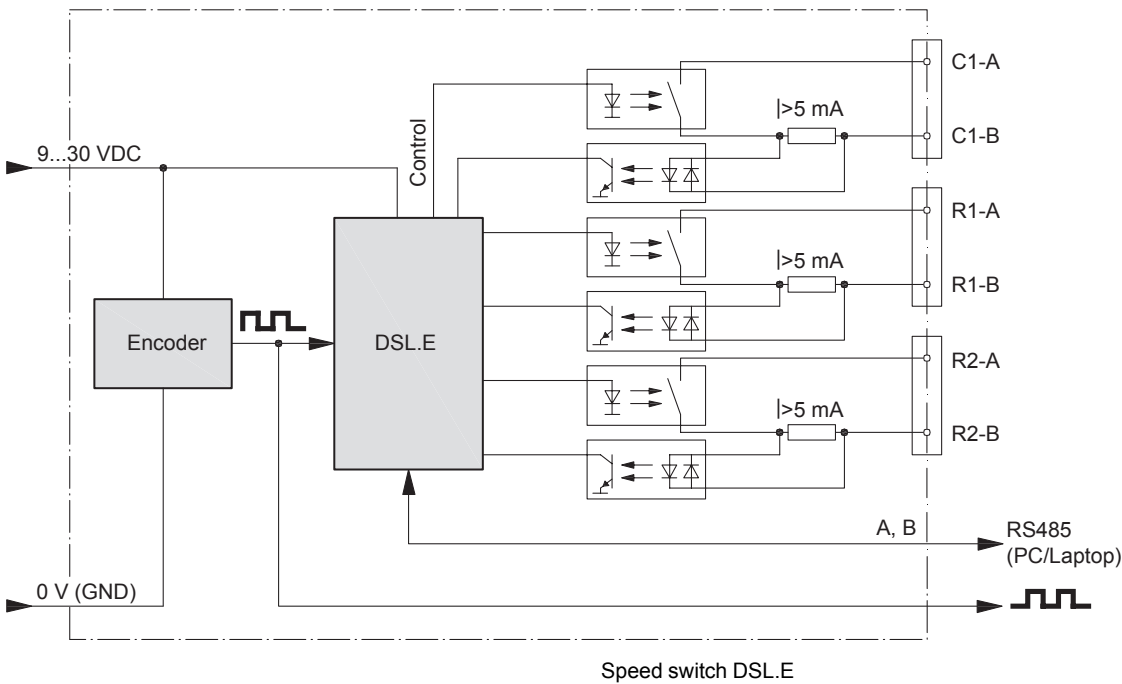
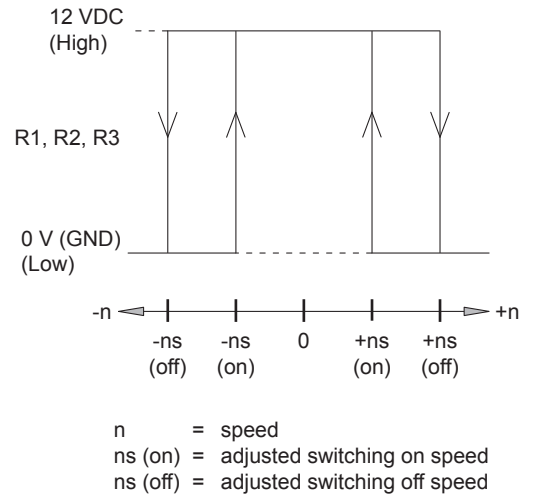
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## Block circuit diagram



## Switching characteristics

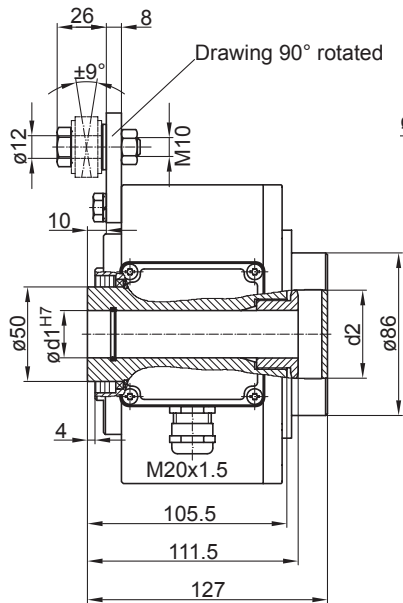


# HOG 16 + DSL

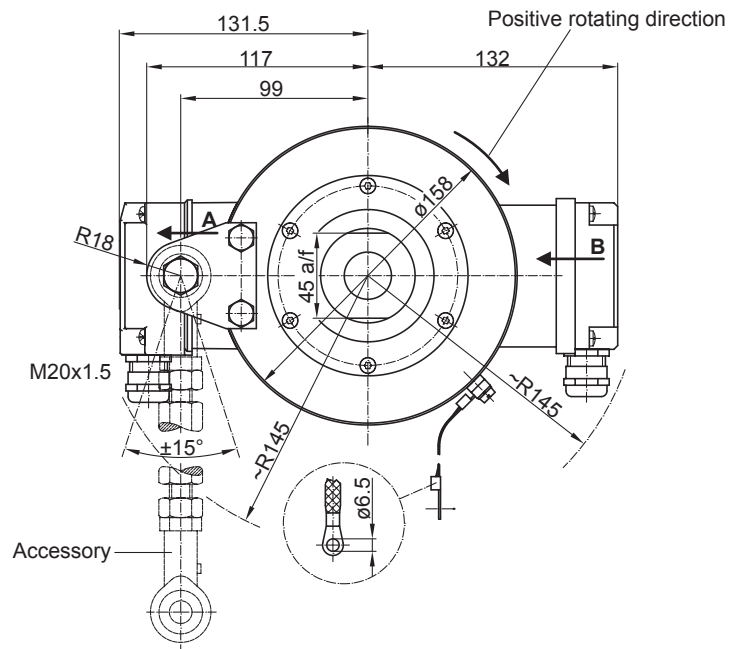
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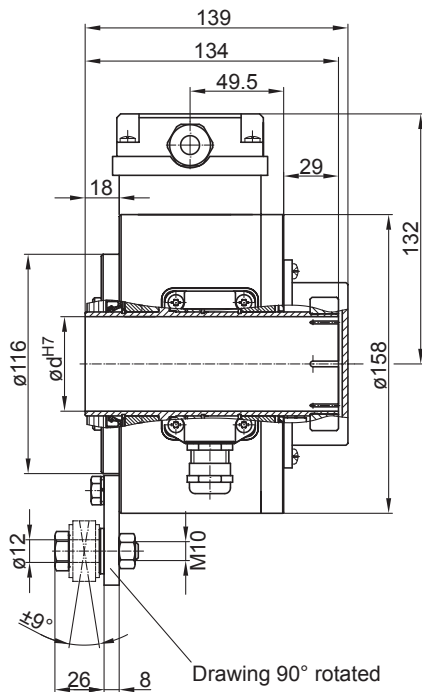
## Dimensions



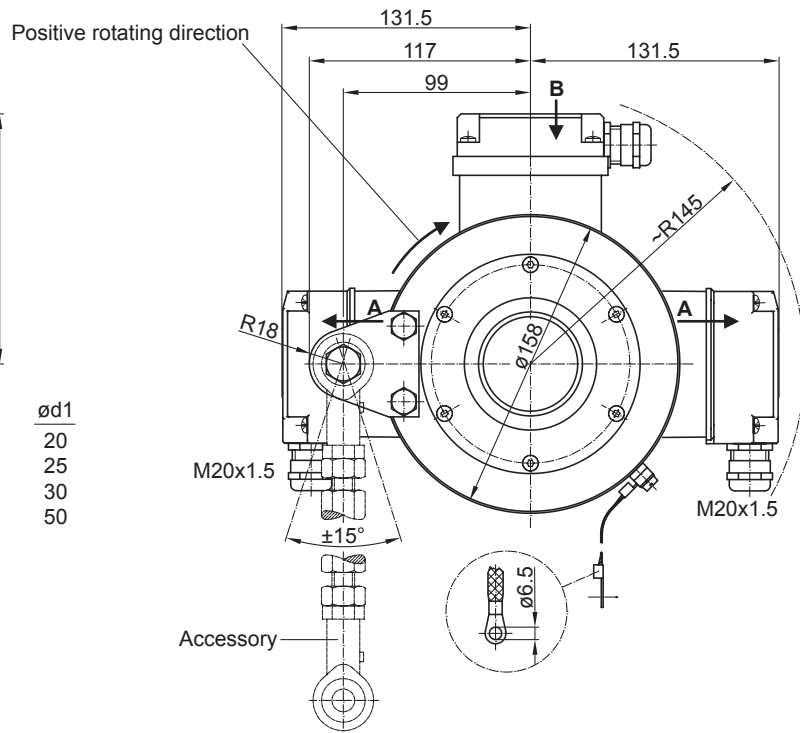
$\varnothing d1$	$d2$
20	36 a/f
25	36 a/f
30	46 a/f



With single sensing and insert nut



$\varnothing d1$
20
25
30
50



With redundant sensing and clamping ring

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## Ordering reference

	HOG16	#	#	DN	####	#	#####	#####
<b>Product</b>	Incremental encoder + Speed switch	HOG16						
<b>Shaft type</b>	Standard ball bearings							
	With hybrid bearings		C					
<b>Redundant sensing</b>	Without redundant sensing							
	With redundant sensing		M					
<b>Output signals</b>	K1, K2, K0			DN				
<b>Pulse number</b>	512				512			
	1024				1024			
	2048				2048			
	2500				2500			
<b>Incremental output</b>	Output circuit HTL with inverted signals						I	
	Output circuit TTL with inverted signals						R	
<b>Shaft diameter</b>	Blind hollow shaft $\varnothing 20$ mm							20H7
	Through hollow shaft $\varnothing 25$ mm							25H7
	Through hollow shaft $\varnothing 30$ mm							30H7
	Through hollow shaft $\varnothing 50$ mm							50H7
<b>Version speed switch</b>	2 outputs, speed control and 1 control output							+ DSL.E
	3 outputs, speed control							+ DSL.R

## Accessories

### Mounting accessories

11054922	Torque arm M12, length 145...170 mm
11054921	Torque arm M12, length 180...205 mm
11072741	Torque arm M12, length 480...540 mm ( $\geq 200$ mm)
11054924	Torque arm M12 insulated, length 145...170 mm
11072723	Torque arm M12 insulated, length 480...540 mm ( $\geq 200$ mm)
11069336	Mounting kit for torque arm size M12 and an earthing strap