

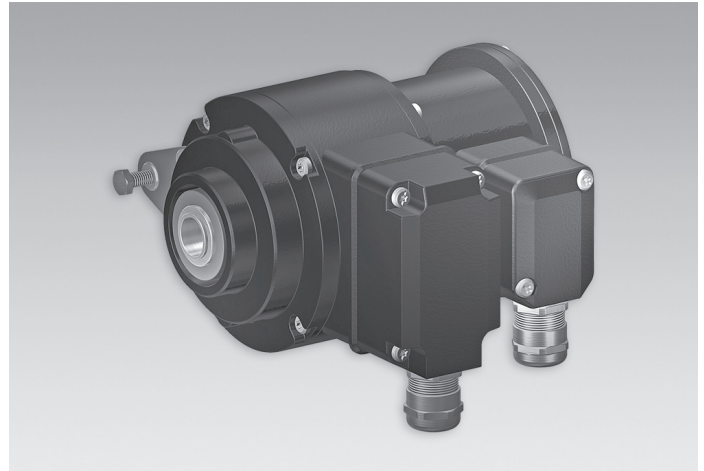
# HOG 10 + ESL 90

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 one selectable threshold speed
- 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<br>≤300 kHz (on request)                  |
| Output signals        | K1, K2, K0 + inverted<br>Error output (option EMS) |
| Output stages         | HTL, TTL/RS422                                     |

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

|                           |  |
|---------------------------|--|
| Switching accuracy        | ± 4 % (≤1500 rpm)<br>± 2 % (>1500 rpm) |
| Switching hysteresis      | = 30 % of switching speed              |
| Switching outputs         | 1 output, speed control                |
| Output switching capacity | ≤6 A / 250 VAC; ≤1 A / 48 VDC          |
| Minimum switching current | 100 mA                                 |
| Switching delay time      | ≤40 ms                                 |

### Technical data - mechanical design

|               |         |
|---------------|---------|
| Size (flange) | ø105 mm |
|---------------|---------|

## Optional

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

### Technical data - mechanical design

|                               |  |
|-------------------------------|--|
| Shaft type                    | ø16...20 mm (blind hollow shaft)<br>ø17 mm (cone shaft 1:10)                       |
| Admitted shaft load           | ≤450 N axial, ≤600 N radial  |
| Protection DIN EN 60529       | IP 66  |
| Operating speed               | ≤6000 rpm  |
| Range of switching speed (ns) | 650...6000 rpm   |
| Operating torque typ.         | 6 Ncm  |
| Rotor moment of inertia       | 680 gcm <sup>2</sup>   |
| Material                      | Housing: aluminium die-cast<br>Shaft: stainless steel                              |
| Operating temperature         | -20...+85 °C   |
| Resistance                    | IEC 60068-2-6<br>Vibration 5 g, 10...2000 Hz<br>IEC 60068-2-27<br>Shock 50 g, 6 ms |
| Corrosion protection          | IEC 60068-2-52 Salt mist<br>for ambient conditions C4 according to<br>ISO 12944-2  |
| Shaft insulation              | 2,8 kV   |
| Transmission length           | ≤350 m at 100 kHz (HTL-P)<br>≤550 m at 100 kHz (TTL)                               |
| Connection                    | 2x terminal box<br>3x terminal box (with option M)                                 |
| Weight approx.                | 2,3 kg<br>2,5 kg (with option M)   |
| Approval                      | CE   |

# HOG 10 + ESL 90

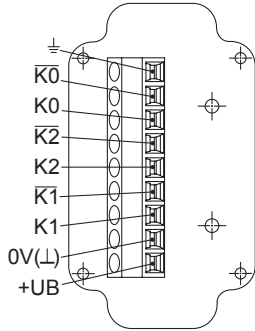
Encoder with integrated electronic speed switch

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

## Terminal assignment

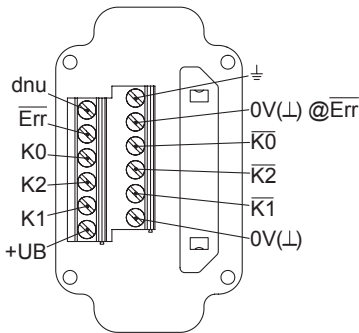
### View A (see dimension)

Connecting terminal terminal box encoder



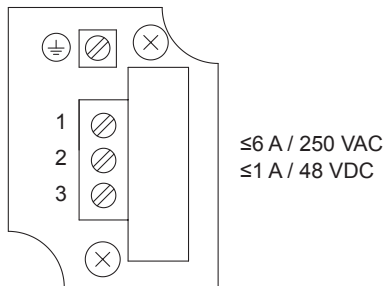
### Option EMS: View A (see dimension)

Connecting terminal terminal box encoder



### View B (see dimension)

Connecting terminal speed switch ESL 90



## Terminal significance

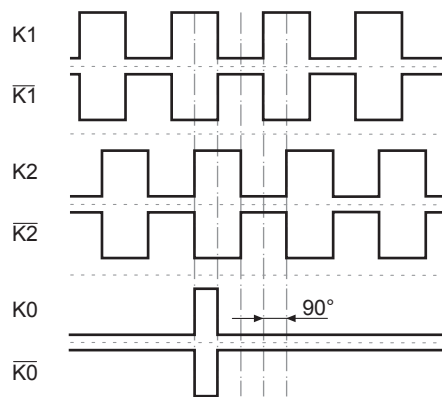
### Encoder incremental

|                 |  |
|-----------------|--|
| +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                                  |
| Err             | Error output (option EMS)                            |
| dnu             | Do not use   |

## Output signals

### HTL/TTL

At positive rotating direction (see dimension)



## Option EMS (Enhanced Monitoring System): Status LED / error output

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

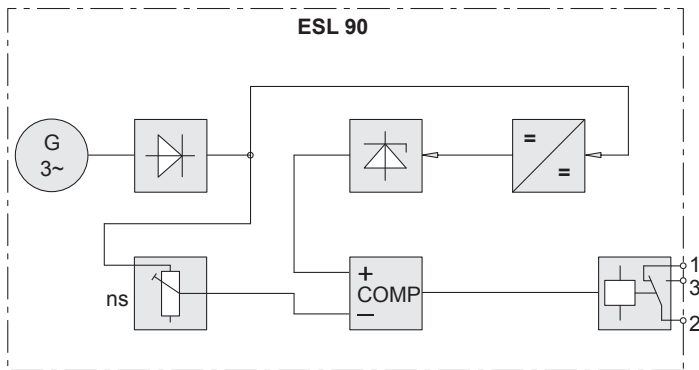
\* Only at rotating device

# HOG 10 + ESL 90

Encoder with integrated electronic speed switch

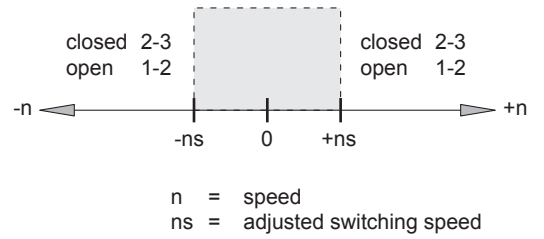
Blind hollow shaft or cone shaft 300...5000 pulses per revolution

## Block circuit diagram



Speed switch ESL 90

## Switching characteristics

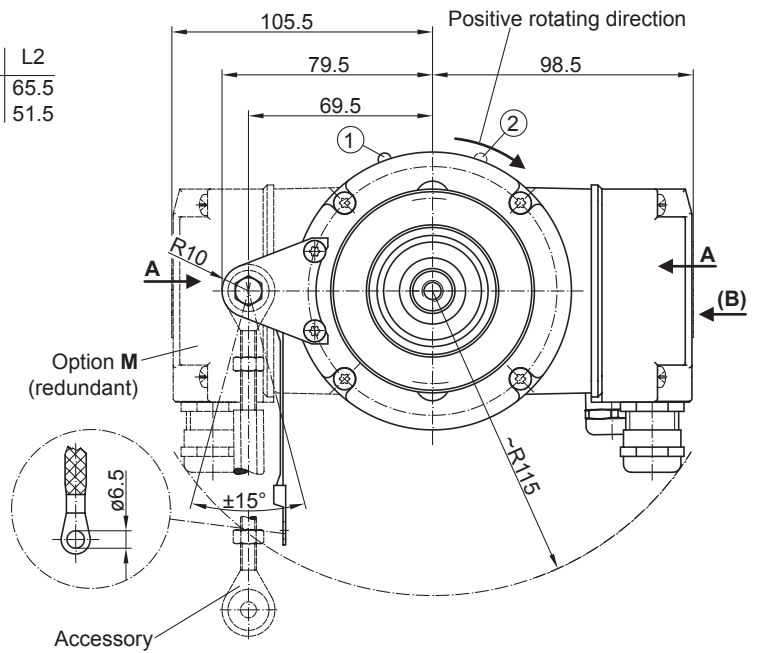
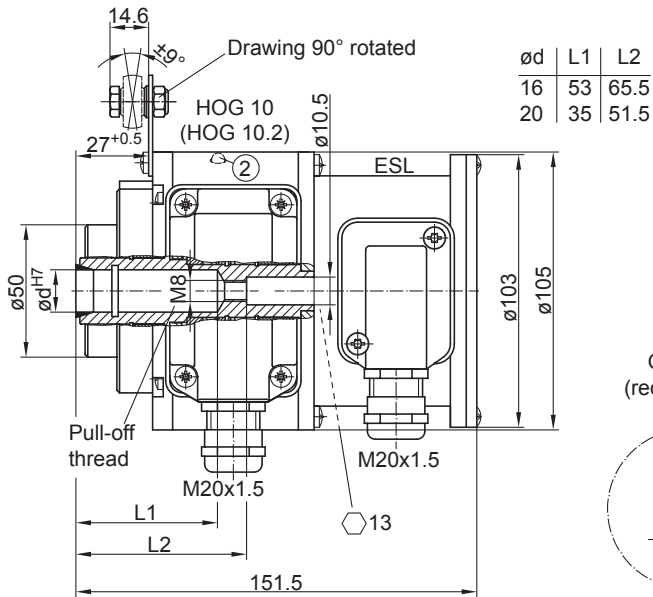


# HOG 10 + ESL 90

Encoder with integrated electronic speed switch

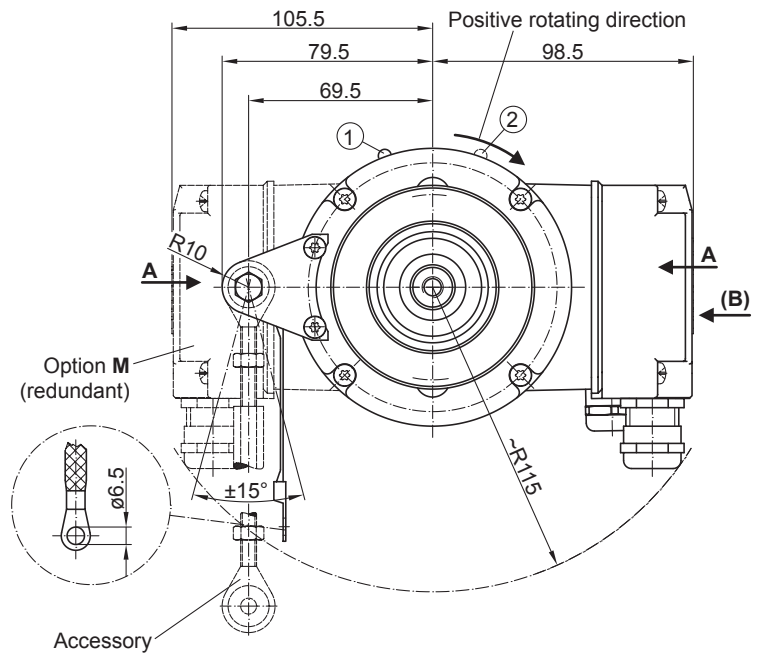
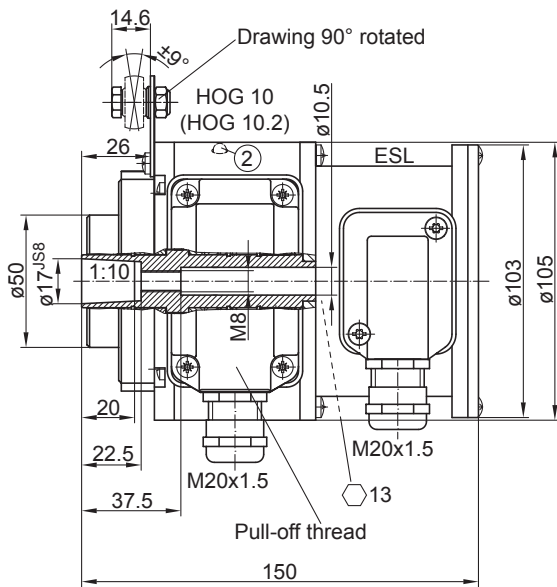
Blind hollow shaft or cone shaft 300...5000 pulses per revolution

## 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

# HOG 10 + ESL 90

Encoder with integrated electronic speed switch

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

**Ordering reference**

|   | HOG10 | ## | # | DN | #### | ### | ## | ##### | +ESL90 | ... |
|---|-------|----|---|----|------|-----|----|-------|--------|-----|
| <b>Product</b>                                      |       |    |   |    |      |     |    |       |        |     |
| Incremental encoder + Speed switch                  | HOG10 |    |   |    |      |     |    |       |        |     |
| <b>EMS - Enhanced Monitoring System</b>             |       |    |   |    |      |     |    |       |        |     |
| Without EMS   |       |    |   |    |      |     |    |       |        |     |
| With EMS  |       | .2 |   |    |      |     |    |       |        |     |
| <b>Redundant sensing</b>                            |       |    |   |    |      |     |    |       |        |     |
| Without redundant sensing                           |       |    |   |    |      |     |    |       |        |     |
| With redundant sensing                              |       |    | M |    |      |     |    |       |        |     |
| <b>Output signals</b>                               |       |    |   |    |      |     |    |       |        |     |
| K1, K2, K0  |       |    |   | DN |      |     |    |       |        |     |
| <b>Pulse number<sup>(1)</sup></b>                   |       |    |   |    |      |     |    |       |        |     |
| 300   |       |    |   |    | 300  |     |    |       |        |     |
| 500   |       |    |   |    | 500  |     |    |       |        |     |
| 512   |       |    |   |    | 512  |     |    |       |        |     |
| 1000  |       |    |   |    | 1000 |     |    |       |        |     |
| 1024  |       |    |   |    | 1024 |     |    |       |        |     |
| 1200  |       |    |   |    | 1200 |     |    |       |        |     |
| 2048  |       |    |   |    | 2048 |     |    |       |        |     |
| 2500  |       |    |   |    | 2500 |     |    |       |        |     |
| 3072  |       |    |   |    | 3072 |     |    |       |        |     |
| 4096  |       |    |   |    | 4096 |     |    |       |        |     |
| 5000  |       |    |   |    | 5000 |     |    |       |        |     |
| <b>Voltage supply / output stage</b>                |       |    |   |    |      |     |    |       |        |     |
| 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   |    |       |        |     |
| <b>Sealing system</b>                               |       |    |   |    |      |     |    |       |        |     |
| Dust protection                                     |       |    |   |    |      |     | LR |       |        |     |
| Damp protection                                     |       |    |   |    |      |     | SR |       |        |     |
| <b>Shaft diameter</b>                               |       |    |   |    |      |     |    |       |        |     |
| Blind hollow shaft ø16 mm                           |       |    |   |    |      |     |    | 16H7  |        |     |
| Blind hollow shaft ø20 mm                           |       |    |   |    |      |     |    | 20H7  |        |     |
| Cone shaft ø17 mm (1:10)                            |       |    |   |    |      |     |    | 17K   |        |     |
| <b>Version speed switch</b>                         |       |    |   |    |      |     |    |       |        |     |
| Electronic speed switch, 1 output, speed control    |       |    |   |    |      |     |    |       | +ESL90 |     |
| <b>Switching speed (ns)</b>                         |       |    |   |    |      |     |    |       |        |     |
| 650...6000 rpm <sup>(2)</sup>                       |       |    |   |    |      |     |    |       |        | ... |

(1) Other pulse numbers on request.

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

## HOG 10 + ESL 90

Encoder with integrated electronic speed switch

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

### 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 ( $\geq 71$ mm)            |
| 11002915 | Torque arm M6, length 425...460 mm ( $\geq 131$ mm)           |
| 11054917 | Torque arm M6 insulated, length 67...70 mm                    |
| 11072795 | Torque arm M6 insulated, length 120...130 mm ( $\geq 71$ mm)  |
| 11082677 | Torque arm M6 insulated, length 425...460 mm ( $\geq 131$ mm) |

#### Connectors and cables

Sensor cable for encoders HEK 8

#### Diagnostic accessories

|          |   |
|----------|---|
| 11075858 | Analyzer for encoders HENQ 1100                   |
| 11075880 | Analyzer for encoders HENQ 1100 with a power pack |