Made in Germany

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Technical Information

# GEL 247

# Incremental Bearingless rotary Encoders

## 1-/2-Channel Hall-Effect Speed Sensor with Voltage or Current Output and Standstill Voltage

D-51T-247 | Status 2026-07-07

LENORD +BAUER

Finding solutions.
Founding trust.

Motion sensors and integrated drive technology

# General Information

- Maintenance- and wear-free Speed Sensor based on magnetic sensing
- Detection of measuring elements (e.g., target wheels made of ferromagnetic materials)
- Reliable detection of high rotational speeds down to creeping movements (0 Hz…25 kHz)
- Highly reliable rotation direction detection and standstill detection at power-up.
- Robust and compact stainless steel housing for use in harsh and confined applications

## Features

- Incremental, differential-measuring 1-/2-channel Speed Sensor based on the Hall effect
- Highest signal quality for reliable evaluation in control systems
- Maximum compatibility thanks to voltage or current output as well as standstill voltage
- High EMC immunity for interference-free signal transmission in demanding industrial environments
- Configuration flexibility thanks to freely selectable cable exit, cable protection, and connector options
- Compliant with a wide range of standards and requirements for a variety of applications:
*see „Technical Data - Environmental Testing“, page 11*

## Advantages

- Optimized lifecycle cost
- Maintenance-free and wear-resistant
- Wide range of configuration options
- Compact and robust construction type
- Easy to install
- Easy integration
- Cable break monitoring
- Galvanically isolated measurement systems
- Well-suited for safety applications
- High signal quality

Do you have specific requirements regarding the flange shape, tube length, number of channels, cable protection, cable outlet, connector assembly, or the EMC design? Please contact us. Our experts can create the optimal solution for your application from an extensive modular system and will be happy to advise you on the most cost-effective custom adaptation.

support@lenord.de or +49(0)208 9963-215



Side or straight cable outlet

# Applications

## Industry & Automation

**Printing & Packaging Machines:**
- Synchronization of Conveyor Belts
- Register control in printing

## Automotive & Commercial Vehicles

**Vehicle Drivetrains:**
- RPM measurement on crankshafts and camshafts for engine control units
- Rotor position detection in electric motors (BLDC, PMSM)
- Input/output speed in the transmission for shift strategy

**Vehicle Dynamics Systems:**
- Wheel speed sensors for ABS/ESP
- Torque distribution in all-wheel-drive systems

**Commercial Vehicles & Agricultural Machinery:**
- Speed monitoring on PTOs, hydraulic pumps
- Harvesting Machinery: Conveyor screws, threshing drums

## Rail Technology & Transportation

**Rail vehicles:**
- Wheel speed sensors for slip control and brake control
- Drive control for electric locomotives and railcars

**Conveyor and cable cars:**
- Speed monitoring on idler pulleys
- Synchronization of drives in multi-motor systems

## Marine applications

**Drive:**
- Speed measurement on marine engines, turbochargers, gearboxes, and generators

**Auxiliary units:**
- Input/output speed measurement for slip monitoring

## Energy & Utilities

**Wind turbines:**
- Rotor speed for power control
- Pitch adjustment (blade angle control)

**Hydroelectric Power Plants / Turbines:**
- Speed control for synchronization with grid frequency

**Generators & emergency power systems:**
- Speed measurement for frequency monitoring and load management

## Building Services & Infrastructure

**Elevators & escalators:**
- Cabin speed and position
- Safety Systems (Emergency Stop in Case of Overspeed)

**Building equipment:**
- Pump and fan speeds in large HVAC systems

## Logistics & Conveyor Technology

**Conveyor belts:**
- Speed control in distribution centers

**Automated Storage Systems:**
- Positioning of Storage and Retrieval Machines

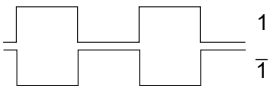
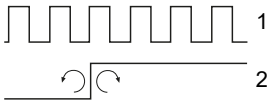
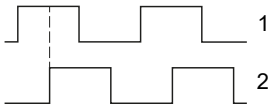
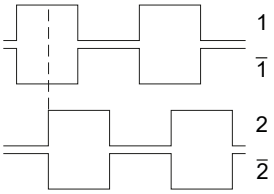
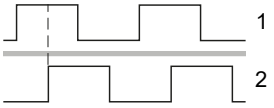
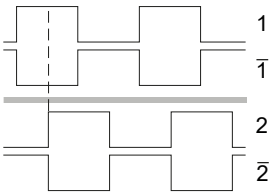
**Crane Systems:**
- Hoist and Traverse Control

# Technical Data: Voltage Output

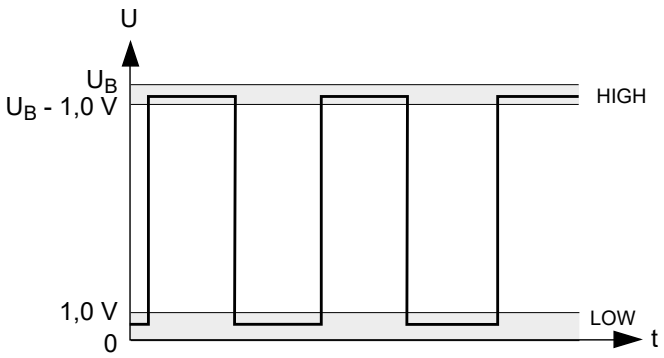
| Signal Pattern | E- | F- | S- | V- | X- | D- | H- |
|---|---|---|---|---|---|---|---|
| **Electrical Data** | | | | | | | |
| Supply voltage $U_B$ (reverse-polarity protected) | 10 ... 30 V DC | | | | | | |
| Current consumption $I_B$ (no load) | ≤ 15 mA | | ≤ 25 mA | | | | |
| Output signal (short-circuit-proof) | Square-wave signals | | | | | | |
| Output signal level (High) (1) | ≥ $U_B$ - 1.0 V | | | | | | |
| Output signal level (Low) (1) | ≤ 1.0 V | | | | | | |
| Output current per channel | ≤ 20 mA | | | | | | |
| Frequency range | 0 ... 25 kHz | | | | | | |
| Duty cycle | 50% ± 20% (2) | | | | | | |
| phase offset | – | | | typ. 90° | | | |
| **Mechanical Data** | | | | | | | |
| Sensor tube material | Stainless steel | | | | | | |
| Flange material | Stainless steel | | | | | | |
| Sensor weight (including 2 m cable) | 500 g | | | | | | |
| **Cable** | | | | | | | |
| Connection | Cable exit: straight or side-mounted; connector as specified | | | | | | |
| Cable length | ≤ 100 m | | | | | | |
| Note on shielding | Cable shield directly attached to the sensor or optionally capacitively attached | | | | | | |
| **Environmental testing** | | | | | | | |
| The Speed Sensor complies with a wide range of standards and requirements for a variety of applications: *see „Technical Data - Environmental Testing“, page 11* | | | | | | | |
| **Requirements for the target wheel** | | | | | | | |
| Material | ferromagnetic steel | | | | | | |
| Tooth Profile | Involute gearing per DIN 867<br>Rectangular teeth, typically 1:1 (other ratios available upon request) | | | | | | |
| Width | ≥ 10 mm (smaller widths available upon request) | | | | | | |
| Module m | 1.00 / 1.25 / 1.50 / 1.75 / 2.00 / 2.25 / 2.50 / 2.75 / 3.00 / 3.25 / 3.50 | | | | | | |
| Air gap | *see „Air Gap Table“, page 18* | | | | | | |

(1) Depends on output current and temperature
(2) Applies to operation at the rated air gap and with gear teeth in accordance with DIN 867

# Voltage Output - Signal Pattern

| Signal Pattern | | | |
|---|---|---|---|
| **Output Signals** | | **Supply Voltage** | **Pulse Diagram** |
| **E-** | 1 channel | 10 ... 30 V DC |  |
| **F-** | 1 channel with inverted signals | 10 ... 30 V DC |  |
| **S-** | 1 channel with directional signal<br>↻ forward<br>↺ reverse | 10 ... 30 V DC |  |
| **V-** | 2 channels, 90° phase offset | 10 ... 30 V DC |  |
| **X-** | 2 channels, 90° phase offset, with inverted channels | 10 ... 30 V DC |  |
| **D-** | 2 channels, electrically isolated, 90° phase offset | 10 ... 30 V DC |  |
| **H-** | 2 channels, electrically isolated, 90° phase offset, with inverted channels | 10 ... 30 V DC |  |

**Output signal level – voltage output**



# Voltage Output - Connection

| **Standard cable** | | | |
|---|---|---|---|
| Signal Pattern | **E**, **S**, **V** | **F-** and **X-** | **D-** and **H-** |
| Cables | halogen-free and shielded (specifications available upon request) | | |
| Cable diameter | 5.4 ± 0.2 mm | 6.5 ± 0.3 mm | 8.0 ± 0.3 mm |
| Cable cross-section | 4 × 0.5 mm² | 6 × 0.5 mm² | 12 × 0.34 mm² |
| Minimum bend radius | 16 mm (static)<br>27 mm (dynamic) | 20 mm (static)<br>33 mm (dynamic) | 24 mm (static)<br>40 mm (dynamic) |

## Pin Assignment

Follow the EMC instructions in the accompanying documents.

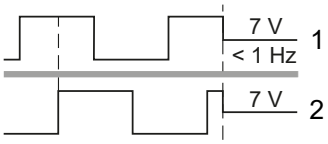
| **Flying lead** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Signal | **E-** | **F-** | **S-** | **V-** | **X-** | **D-** | | **H-** | |
| Channel 1 | YE | YE | YE | YE | YE | YE | | YE | |
| Channel 2 | | | WH | WH | WH | | WH | | WH |
| Channel 1 inverted | | BK | | | BK | | | BK | |
| Channel 2 inverted | | | | | BN | | | | BN |
| GND (0 V) | BU | BU | BU | BU | BU | BU | GY | BU | GY |
| $+U_B$ | RD | RD | RD | RD | RD | RD | PK | RD | PK |
| Cables / Shields | 1 / 1 | 1 / 1 | 1 / 1 | 1 / 1 | 1 / 1 | 1 / 1 | | 1 / 1 | |
| Cable shield directly attached to the sensor or capacitively attached.<br>Wire color codes: **BK** black, **BN** brown, **BU** blue, **GY** gray, **GN** green, **PK** pink, **RD** red, **WH** white, **YE** yellow | | | | | | | | | |

# Technical Data: Voltage Output with Standstill Voltage

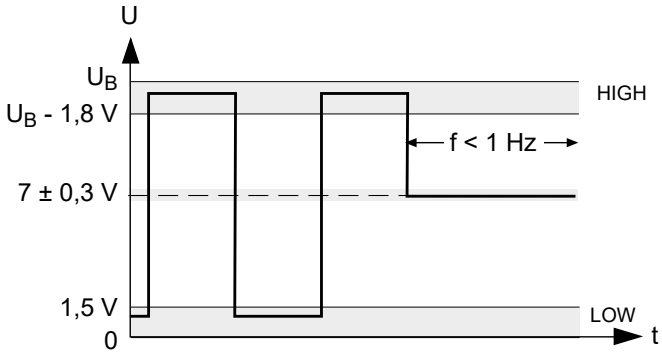
| Signal Pattern | **EM** | **DM** |
|---|---|---|
| **Electrical Data** | | |
| Supply voltage $U_B$ (reverse polarity protected) | 10 ... 30 V DC | |
| Current consumption $I_B$ (no load) | ≤ 15 mA | ≤ 25 mA |
| Output signal (short-circuit-proof) | Square-wave signals | |
| Output signal level (High) (1) | ≥ $U_B$ - 1.8 V | |
| Output signal level (Low) (1) | ≤ 1.5 V | |
| Output current per channel | ≤ 10 mA | |
| Frequency range | 0 ... 20 kHz | |
| Duty cycle | 50% ± 20% (2) | |
| phase offset | - | typ. 90° |
| **Mechanical Data** | | |
| Sensor tube material | Stainless steel | |
| Flange material | Stainless steel | |
| Sensor weight (including 2 m cable) | 500 g | |
| **Cable** | | |
| Cable | halogen-free and shielded (3) | |
| Cable diameter | 5.4 ± 0.2 mm | 8.0 ± 0.3 mm |
| Cable cross-section | 4 x 0.5 mm² | 12 x 0.34 mm² |
| Minimum bending radius (static/dynamic) | 16 mm / 27 mm | 24 mm / 40 mm |
| Note on shielding | Cable shield directly attached to the sensor or optionally capacitively attached | |
| **Environmental testing** | | |
| The Speed Sensor complies with a wide range of standards and requirements for a variety of applications:<br>*see „Technical Data - Environmental Testing“, page 11* | | |
| **Requirements for the target wheel** | | |
| Material | Ferromagnetic steel | |
| Tooth Profile | Involute gearing per DIN 867<br>Rectangular teeth, typically 1:1 (other ratios available upon request) | |
| Width | ≥ 10 mm (smaller widths available upon request) | |
| Module m | 1.00 / 1.25 / 1.50 / 1.75 / 2.00 / 2.25 / 2.50 / 2.75 / 3.00 / 3.25 / 3.50 | |
| Air gap | *see „Air Gap Table“, page 18* | |

(1) Depends on output current and temperature
(2) Applies to operation at the rated air gap and with gear teeth per DIN 867
(3) Specifications available upon request

# Output with Standstill Voltage - Output Signals and Connectors

| Signal Patterns with Standstill Voltage (DM, EM) | | | |
|---|---|---|---|
| **Output Signals** | | **Supply Voltage** | **Pulse Diagram** |
| **EM** | 1 channel with standstill voltage | 10 ... 30 V DC |  |
| **DM** | 2 galvanically isolated channels, 90° phase offset, with standstill voltage | 10 ... 30 V DC |  |

**Output signal level – voltage output (DM, EM)**




## Pin Assignment – Voltage Output (DM, EM)

Observe the EMC notes in the accompanying documents.

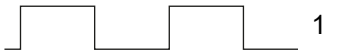
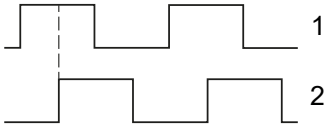
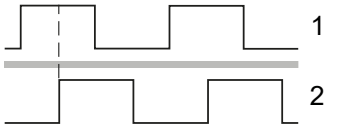
| Signal | EM | DM | |
|---|---|---|---|
| Channel 1 | YE | YE | |
| Channel 2 | | | WH |
| GND (0 V) | BU | BU | GY |
| $+U_B$ | RD | RD | PK |
| Cables / Shields | 1 / 1 | 1 / 1 | |
| Cable shield directly attached to the sensor or optionally capacitively attached<br>Wire color codes: **BK** black, **BN** brown, **BU** blue, **GY** gray, **GN** green, **PK** pink, **RD** red, **WH** white, **YE** yellow | | | |

# Technical Data: Current Output

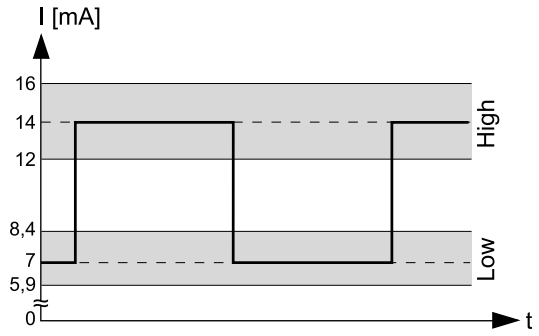
| Signal Pattern | EI | DI | VI |
|---|---|---|---|
| **Electrical Data** | | | |
| Supply voltage $U_B$ (reverse-polarity protected) | 10 ... 30 V DC | | |
| Output signal (short-circuit-proof) | Square-wave signals | | |
| Output signal level (High) (1) | typ. 14 mA | | |
| Output signal level (Low) (1) | typ. 7 mA | | |
| Output current per channel | ≤ 16 mA | | |
| Frequency range | 0 ... 25 kHz | | |
| Duty cycle | 50% ± 20% (2) | | |
| phase offset | - | typ. 90° | |
| **Mechanical Data** | | | |
| Sensor tube material | Stainless steel | | |
| Flange material | Stainless steel | | |
| Sensor weight (including 2 m cable) | 500 g | | |
| **Cable** | | | |
| Cable | halogen-free and shielded (3) | | |
| Cable diameter | 5.4 ± 0.2 mm | | |
| Cable cross-section | 4 x 0.5 mm² | | |
| Minimum bending radius (static/dynamic) | 16 mm / 27 mm | | |
| Note on shielding | Cable shield directly attached to the sensor or optionally capacitively attached | | |
| **Environmental testing** | | | |
| The Speed Sensor complies with a wide range of standards and requirements for a variety of applications:<br>*see „Technical Data - Environmental Testing“, page 11* | | | |
| **Requirements for the target wheel** | | | |
| Material | Ferromagnetic steel | | |
| Tooth Profile | Involute gearing per DIN 867<br>Rectangular teeth, typically 1:1 (other ratios available upon request) | | |
| Width | ≥ 10 mm (smaller widths available upon request) | | |
| Module m | 1.00 / 1.25 / 1.50 / 1.75 / 2.00 / 2.25 / 2.50 / 2.75 / 3.00 / 3.25 / 3.50 | | |
| Air gap | *see „Air Gap Table“, page 18* | | |

(1) Depends on output current and temperature
(2) Applies to operation at the rated air gap and with gear teeth per DIN 867
(3) Specifications available upon request

# Current Output - Output Signals and Connectors

| Signal Patterns (EI, VI, DI) | | | |
|---|---|---|---|
| **Output Signals** | | **Supply Voltage** | **Pulse Diagram** |
| **EI** | 1 channel | 10 ... 30 V DC |  |
| **VI** | 2 channels, 90° phase offset | 10 ... 30 V DC |  |
| **DI** | 2 channels, electrically isolated, 90° phase offset | 10 ... 30 V DC |  |

**Output signal level (EI, VI, DI)**

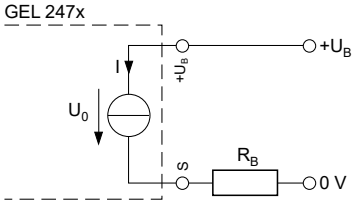



## Pin Assignment (EI, VI, DI)

Observe the EMC notes in the accompanying documents.

| Signal | EI | VI | DI | |
|---|---|---|---|---|
| Channel 1 | BU | SU | BU | |
| Channel 2 | | GN | | GN |
| $+U_B$ | RD | RD | RD | YE |
| Cables / Shields | | 1 / 1 | 1 / 1 | |

Cable shield directly attached to the sensor or optionally capacitively attached
Wire color codes: **BK** black, **BN** brown, **BU** blue, **GY** gray, **GN** green, **PK** pink, **RD** red, **WH** white, **YE** yellow




$U_B$ Supply voltage
S Signal
$I_{max}$ Maximum output current

**Measurement resistance**
The measurement resistor $R_B$ to be connected must fall within the following limits:
$R_{B,min}$ = 240 Ω
$R_{B,max} = (U_B – 5\ V) / I_{max}$

**Example**

with $U_B$ = 15 V and $I_{max}$ = 16 mA:
$R_{B,max}$ = 15 V - 5 V / 16 mA = 10 V / 16 mA
= 625 Ω

# Technical Data - Environmental Testing

Lenord+Bauer's Speed Sensors are designed for a wide range of applications. During design and manufacturing, we consistently ensure the reliability and compatibility of the Speed Sensors with a wide variety of standards, and these are continuously tested.

Through the ongoing development and optimization of sensors for a wide range of applications, Lenord+Bauer has extensive experience in this field.

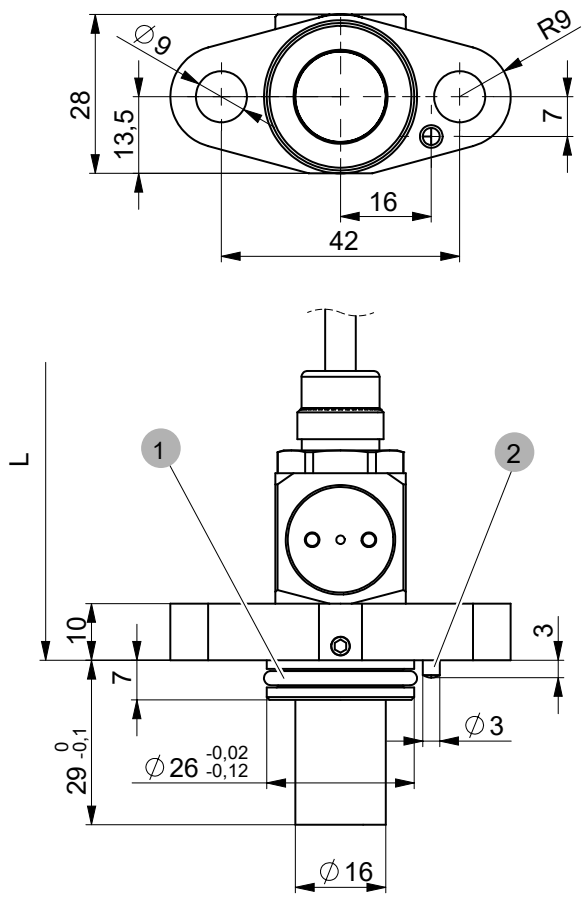
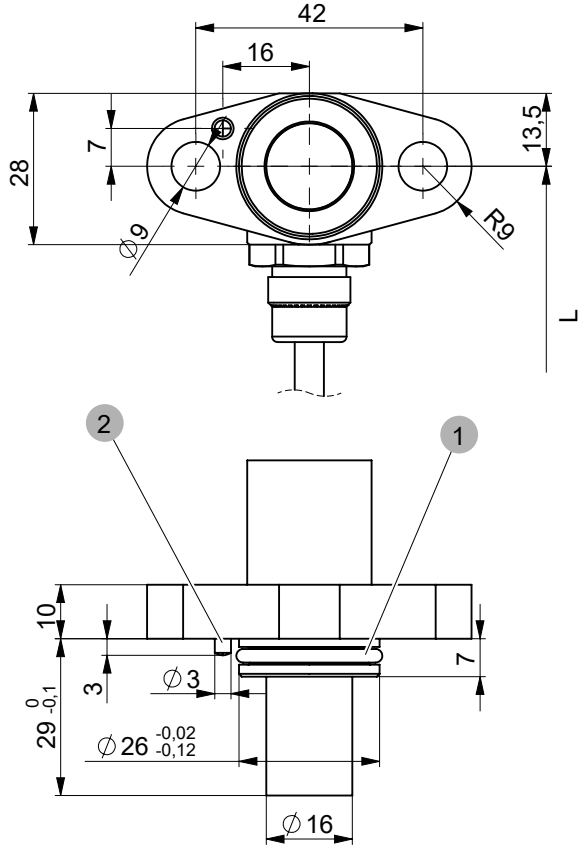
Only the minimum standards for all sensors are listed below.

If you have additional requirements regarding standards and approvals, please feel free to contact us.

| | Rail Vehicle Industry | Maritime Applications | Industrial applications |
|---|---|---|---|
| Operating and working temperature | -40 °C … +120°C /<br>-40 °C … +85°C (for Signal Patterns with standstill voltage) | | |
| Storage temperature | -40 °C … +120 °C | | |
| General Industry Standard | DIN EN 50155:2022-06 | DNV-CG-0339 | Depending on the application |
| Dielectric strength | 500 V AC / 750 V DC<br>DIN EN 50155:2022-06 | DNV-CG-0339 | 500 V AC |
| Electromagnetic compatibility | DIN EN 50121-3-2:2017-11 | DNV-CG-0339 | IEC 61000-6-2:2016<br>IEC 61000-6-4:2016 |
| Vibration Resistance | DIN EN 61373:2011-04<br>Cat. 3 | DNV-CG-0339 | IEC 60068-2-64:2008<br>IEC 60068-2-6:2008 |
| Shock resistance | DIN EN 61373-2011-04<br>Cat. 3 | DNV-CG-0339 | IEC 60068-2-27:2008 |
| Fire protection | DIN EN 45545-2:2023-12<br>NFPA 130 upon request | IMO 2010 FTP | Upon request |
| Degree of protection on the measurement side (1) | IP68 | | |
| MTTF value | > 2,000,000 h at 55 °C | | |

(1) The degree of protection on the cable outlet side depends on the cable gland or cable protection

# Mechanical Properties

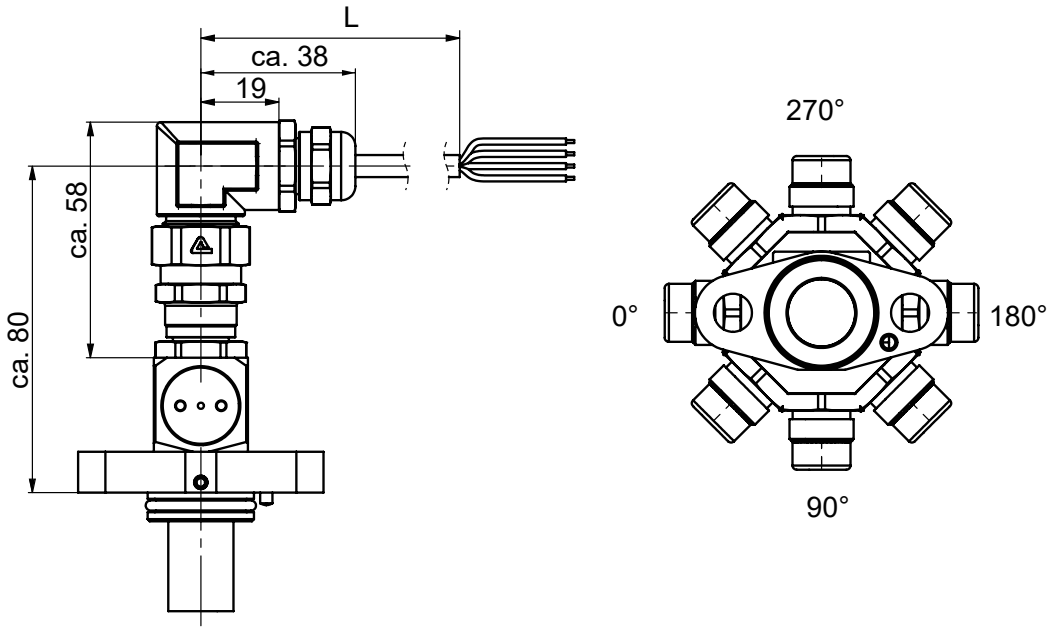
| Cable Outlet | |
|---|---|
| All dimensions in mm; general tolerance per DIN ISO 2768 mK | |
| **Straight cable outlet**<br>Option **S** | **Side cable outlet**<br>Option **L** |
| Additionally, the straight cable outlet can be connected at an angle:<br>*„**Straight Cable Exit with Angle**“, page 13* | Additionally, the side cable outlet can be connected using an angle:<br>*„**Side cable outlet with angle**“, page 13* |
|  |  |

| | |
|---|---|
| 1 | Sealing ring: O-ring 21 x 2.5 mm; NBR |
| 2 | Index pin |
| L | Cable length L is determined by the Type Code<br>(Tolerance depends on the assembled cable length) |

## Straight Cable Exit with Angle

Straight cable outlet with angle – When option **S** is selected for the cable outlet (see Type Code)

The selection can be made in 45° increments: 000°; 045°; 090°; 135°; 180°; 225°; 270°; 315° (tolerance ± 10°) (see Type Code).

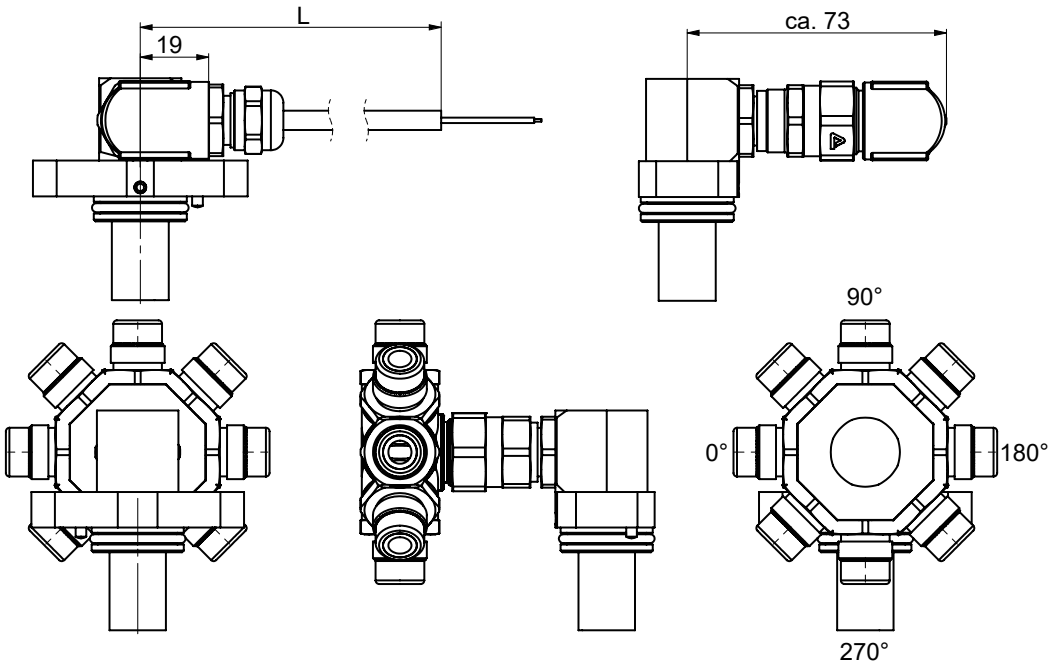



Cable length **L** is determined by the Type Code
(tolerance depends on the assembled cable length)

## Side cable outlet with angle

Side cable outlet with angle – When selecting option **L** for the cable outlet (see Type Code)

The selection can be made in 45° increments: 000°; 045°; 090°; 135°; 180°; 225°; 270°; 315° (tolerance ± 10°) (see Type Code).



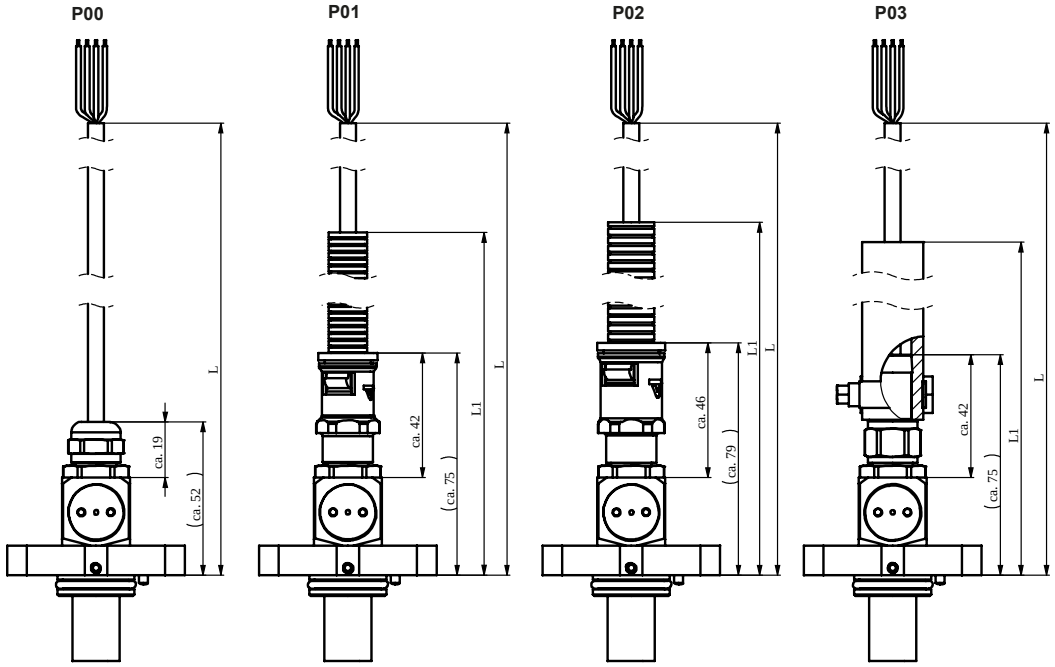

Cable length **L** is determined by the Type Code
(tolerance depends on the assembled cable length)

| Cable Protection at the Cable Exit | |
|---|---|
| Depending on requirements, the Speed Sensor can be equipped with various types of cable protection at the cable outlet. | |
| ▪ Dimensional drawings for straight cable outlet: *„**Straight cable outlet**“, page 14*<br>▪ Dimensional drawings for side cable outlet: *„**Side Cable Exit**“, page 15* | |
| Selection **P00** | Without cable protection |
| Option **P01** | Corrugated tube NW10 |
| Option **P02** | Corrugated tube NW12 |
| Option **P03** | Hydraulic hose DN12 |

| Technical Data for Cable Protection | | | |
|---|---|---|---|
| **Option** | **P01** | **P02** | **P03** |
| Type | Corrugated tube NW10 | Corrugated tube NW12 | Hydraulic hose DN12 |
| Material (Specifications available upon request) | Polyamide, halogen-free | Polyamide, halogen-free | Rubber compound |
| Outer diameter | 13.0 mm | 15.8 mm | 19.5 ± 0.5 mm |
| Minimum bending radius | 25 mm (static)<br>60 mm (dynamic) | 35 mm (static)<br>80 mm (dynamic) | 70 mm |

**Straight cable outlet**

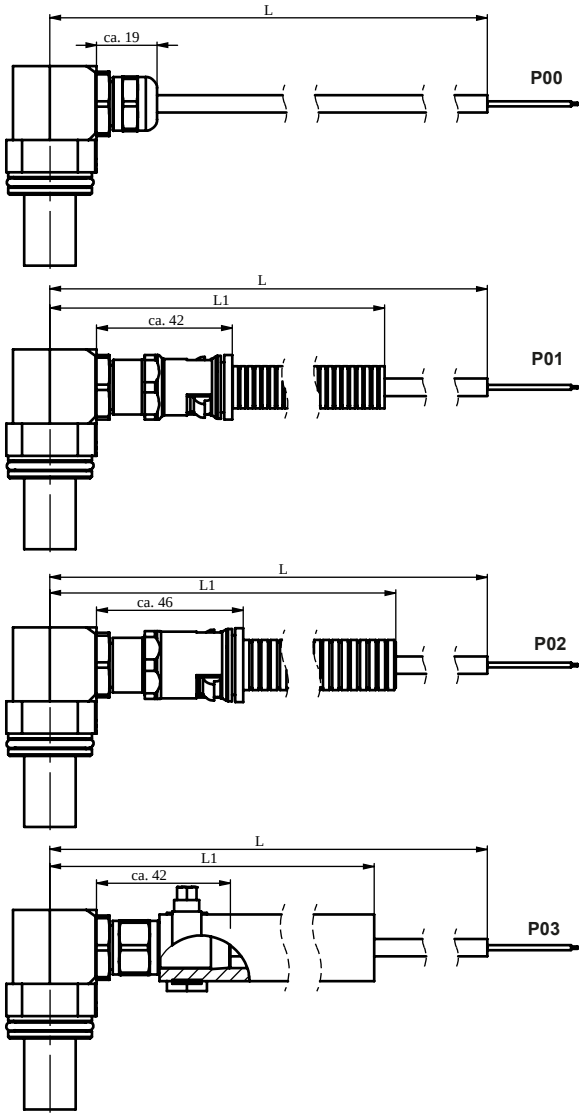
Cable protection for straight cable outlet—when option **S** is selected for the cable outlet (see Type Code)




| | |
|---|---|
| **P00** | Without cable protection |
| **P01** | Corrugated tube NW10 |
| **P02** | Corrugated tube NW12 |
| **P03** | Hydraulic hose DN12 |
| **L** | Cable length **L** is determined by the Type Code<br>(Tolerance depends on the assembled cable length) |
| L1 | Protective hose length L1; depending on the cable connection and assembly, the protective hose length L1 corresponds to the cable length L minus 100 mm |

## Side Cable Exit

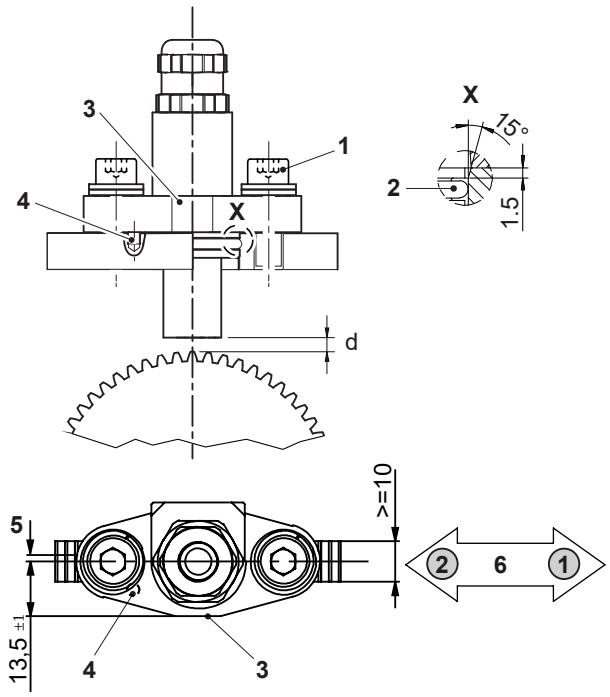
Cable protection for side cable outlet—when option **L** is selected for the cable outlet (see Type Code)




| | |
|---|---|
| **P00** | Without cable protection |
| **P01** | Corrugated tube NW10 |
| **P02** | Corrugated tube NW12 |
| **P03** | Hydraulic hose DN12 |
| **L** | Cable length **L** is determined by the Type Code<br>(Tolerance depends on the assembled cable length) |
| L1 | Protective hose length L1; depending on the cable connection and assembly, the protective hose length L1 corresponds to the cable length L minus 100 mm |

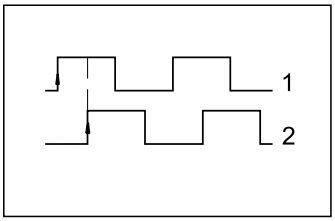
# Installation Drawing

All dimensions in mm, general tolerance DIN ISO 2768 mK

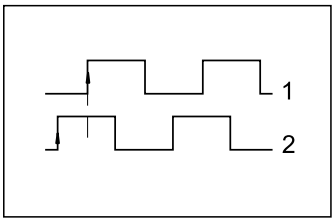



X Entry chamfer
d Air gap (see air gap table)
1 Hex socket screw (recommended: M8 x 20, EN ISO 4762)
2 Sealing ring: O-ring 21 x 2.5 mm; NBR
3 Reference surface
4 Index pin
5 Axial offset
6 Direction of rotation of the Target wheel

**Signal for direction of rotation 1**




**Signal for direction of rotation 2**




Other mounting orientations (such as rotated by 45°) are available upon request.

The reference surface (3) or the index pin (4) are used to determine the direction of rotation.

**Index pin**

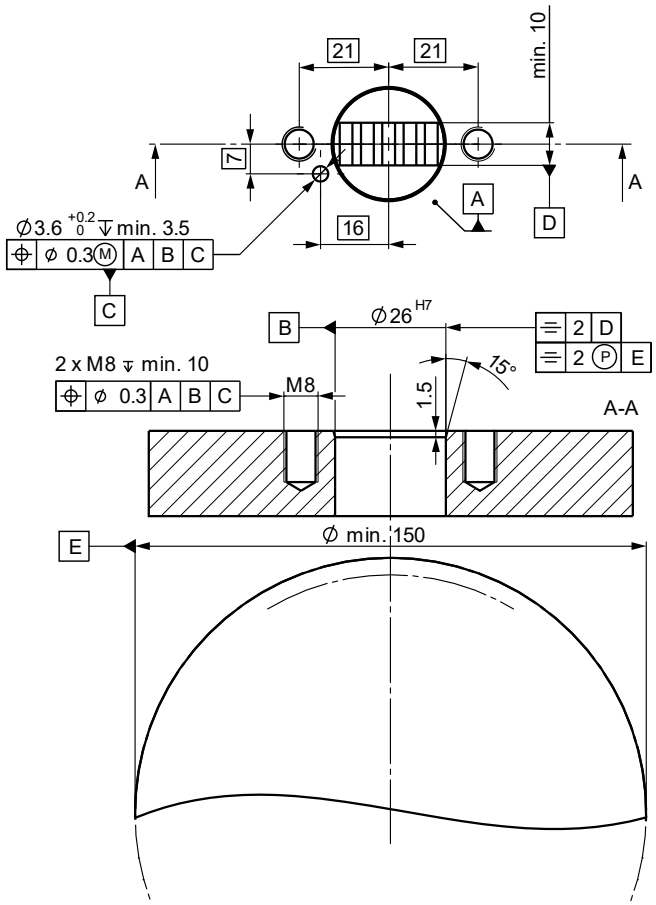
- If the Target wheel rotates from the index pin toward the center of the sensor, this is rotation direction **rotation direction 1**.
- If the Target wheel rotates from the center of the sensor toward the index pin, this is **rotation direction 2**.

**Reference surface**

- If the Target wheel rotates clockwise when viewed from the reference surface, this is **rotation direction 1**.
- If the Target wheel rotates counterclockwise when viewed from the reference surface, this is **rotation direction 2**.

# Drilling Pattern

All dimensions in mm; general tolerance per DIN ISO 2768 mK



# Air Gap Table

| Module | Permissible Air Gap | Nominal Air Gap | Max. Permissible Vertical Runout |
|---|---|---|---|
| 1.00 | 0.2 … 0.8 mm | 0.5 mm | ± 0.3 mm |
| 1.25 | | | |
| 1.50 | 0.2 … 1.3 mm | 0.7 mm | |
| 1.75 | | | |
| 2.00 | 0.2 … 1.5 mm | 0.7 mm | |
| 2.25 | | | |
| 2.50 | | | |
| 2.75 | | | |
| 3.00 | | | |
| 3.25 | | | |
| 3.50 | | | |

# Type Code GEL 247

| 247- | Product Type | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Application** | | | | | | | | |
| | **RA** | Rail Vehicle Industry | | | | | | | |
| | **MA** | Maritime Applications | | | | | | | |
| | **IA** | Industrial Applications | | | | | | | |
| | | **Signal Pattern** | | | | | | | |
| | | **E-** | 1-Channel Square-Wave Signal | | | | | | |
| | | **F-** | 1-Channel Square-Wave Signal with Inverted Signal | | | | | | |
| | | **S-** | 1-channel square-wave signal with direction signal | | | | | | |
| | | **V-** | 2-channel square-wave signals with a 90° phase offset | | | | | | |
| | | **X-** | 2-channel square-wave signals with a 90° phase offset and their inverse signals | | | | | | |
| | | **D-** | 2-channel square-wave signals with a 90° phase offset, electrically isolated | | | | | | |
| | | **H-** | 2-channel square-wave signals with a 90° phase offset and their inverted signals, electrically isolated | | | | | | |
| | | **EI** | 1-channel square-wave signal; current output 7 ... 14 mA | | | | | | |
| | | **DI** | 2-channel square-wave signals with a 90° phase offset, electrically isolated; current output 7 ... 14 mA | | | | | | |
| | | **VI** | 2-channel square-wave signals with 90° phase offset; current output 7 ... 14 mA | | | | | | |
| | | **EM** | 1-channel square-wave signal; with standstill voltage of 7 V | | | | | | |
| | | **DM** | 2-channel square-wave signals with 90° phase offset, electrically isolated; with standstill voltage of 7 V | | | | | | |
| | | | **Shield contact** | | | | | | |
| | | | **SD** | directly attached | | | | | |
| | | | **SC** | capacitively attached | | | | | |
| | | | | **Module** | | **Module** | | | |
| | | | | **M01** | m = 1.00, steel, involute | **M12** | m = 1.00, steel, rectangular | | |
| | | | | **M02** | m = 1.25, steel, involute | **M13** | m = 1.25, steel, rectangular | | |
| | | | | **M03** | m = 1.50, steel, involute | **M14** | m = 1.50, steel, rectangular | | |
| | | | | **M04** | m = 1.75, steel, involute | **M15** | m = 1.75, steel, rectangular | | |
| | | | | **M05** | m = 2.00, steel, involute | **M16** | m = 2.00, steel, rectangular | | |
| | | | | **M06** | m = 2.25, steel, involute | **M17** | m = 2.25, steel, rectangular | | |
| | | | | **M07** | m = 2.50, steel, involute | **M18** | m = 2.50, steel, rectangular | | |
| | | | | **M08** | m = 2.75, steel, involute | **M19** | m = 2.75, steel, rectangular | | |
| | | | | **M09** | m = 3.00, steel, involute | **M20** | m = 3.00, steel, rectangular | | |
| | | | | **M10** | m = 3.25, steel, involute | **M21** | m = 3.25, steel, rectangular | | |
| | | | | **M11** | m = 3.50, steel, involute | **M22** | m = 3.50, steel, rectangular | | |
| | | | | | **Cable outlet** | | | | |
| | | | | | **S** | Straight cable outlet | | | |
| | | | | | **L** | Side cable outlet | | | |
| | | | | | | **angle** | | | |
| | | | | | | **0** | without angle | | |
| | | | | | | **1** | With angle, 0 degrees | **5** | with angle, 180 degrees |
| | | | | | | **2** | with angle, 45 degrees | **6** | with angle, 225 degrees |
| | | | | | | **3** | with angle, 90 degrees | **7** | with angle, 270 degrees |
| | | | | | | **4** | with angle, 135 degrees | **8** | with angle, 315 degrees |
| | | | | | | | **Cable protection** | | |
| | | | | | | | **P00** | None | |
| | | | | | | | **P01** | Corrugated tube NW10 | |
| | | | | | | | **P02** | Corrugated tube NW12 | |
| | | | | | | | **P03** | Hydraulic hose DN12 | |
| | | | | | | | | **Cable length L** | |
| | | | | | | | | **L1** | 1000 mm |
| | | | | | | | | **LX** | X=2: 2000 mm, X=3: 3000 mm ... X=7: 7000 mm |
| | | | | | | | | **L8** | 8000 mm |
| ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | ▼ | |
| 247- | __ | __ | __ | ___ | _ | _ | ___ | __ | ◄ **Product code** |

## Accessories

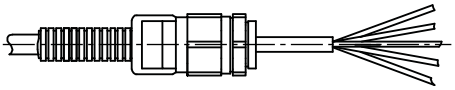
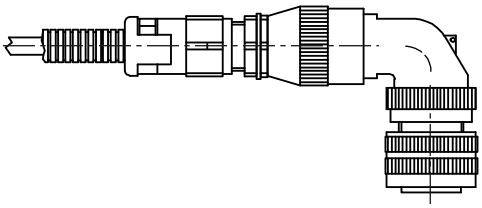
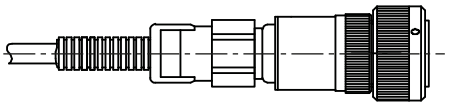
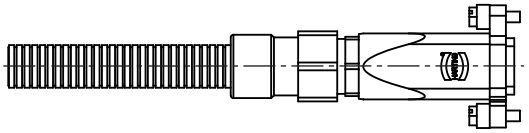
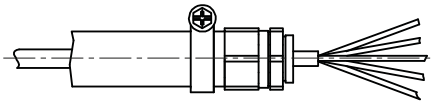
| | |
|---|---|
| ZB247XM8 | 2 M8 x 20 screws (EN ISO 4762) with washer and spring washer |

A Y-number is assigned for customer-specific designs. Custom designs are manufactured according to drawings or application descriptions and may differ from the standard technical specifications.

# Examples of Preferred Types

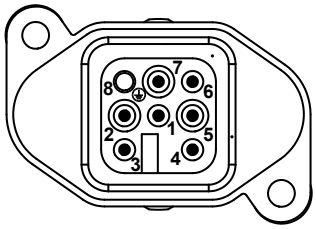
## We can assemble the following for you upon request:

In addition to the extensive selection of cable exits and cable protection options (see Type Code), various configurations are also available for the cable end.

| Examples of cable ends, preferred models | |
|---|---|
| <br>Corrugated tube with open cable end | <br>Corrugated tube with round connector, angled |
| <br>Corrugated tube with round connector | <br>Corrugated tube with Harting HAN HPR connector |
| <br>Rubber tubing and flying lead | |

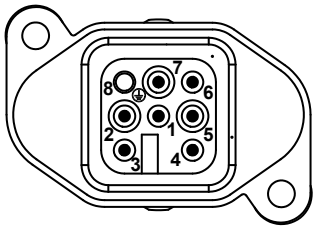
If you decide to have us assemble our Speed Sensors with cable protection and connectors, we recommend using the preferred types shown here. The necessary materials have been field-tested in large quantities and are always in stock. This allows us to achieve the fastest delivery times thanks to optimal material availability and the lowest retail prices due to large purchasing volumes. If you need assistance defining your desired product, please contact our sales team atsupport@lenord.deor +49(0)208 9963-215.

**Pin Assignment for Harting HAN HPR Connectors for D and H Signals, Preferred Type**




| Pin Assignment | | |
|---|---|---|
| Pin | Function | Color |
| 1 | $U_B$ = 10 ... 30 V DC | red |
| 2 | 0 V GND | blue |
| 3 | Track 1 | yellow |
| 4 | n. c. | n/c |
| 5 | $U_B$ = 10 ... 30 V DC | brown |
| 6 | 0 V GND | black |
| 7 | Track 2 | white |
| 8 | Shield | purple |

**Pin assignment for Harting HAN HPR connector for V and X signals, preferred type**




| Pin assignment | | |
|---|---|---|
| Pin | Function | Color |
| 1 | $U_B$ = 10 ... 30 V DC | red |
| 2 | 0 V GND | blue |
| 3 | Track 1 | yellow |
| 4 | Track 2 | white |
| 5 | Track 1 inverted | black |
| 6 | Track 2 inverted | brown |
| 7 | Shield | purple |
| 8 | n. c. | n. c. |

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