

# 2-channel speed sensor

## ▶ GEL 247

Compact sensor for harsh applications

SENSORLINE

▶ **LENORD+BAUER**

**Technical information**

**Version 01.11**



### General

- ▶ Speed sensor based on magnetic measurement principle
- ▶ Maintenance- and wear-free operation due to non-contact measurement of rotation
- ▶ Safe detection of very slow rotation from 0 Hz without pulse loss and for high-speed rotation up to 25 kHz
- ▶ Suitable for ferromagnetic target wheels
- ▶ Two channels shifted by 90° provide the direction of rotation
- ▶ Robust and compact stainless steel housing suitable for harsh fittings conditions
- ▶ Simple flange mounting
- ▶ Customized cable fittings

### Features

- ▶ Module target wheel 1.00 to 3.50
- ▶ Measuring range 0 Hz to 25 kHz
- ▶ Temperature range -40 to +120 °C
- ▶ Protection class IP 68
- ▶ Type test according to EN 50155

### Advantages

- ▶ Low lifecycle costs for end customer due to high reliability
- ▶ Place-saving sensor in a compact design

### Fields of application

- ▶ Rail vehicles
  - Traction control
  - Anti-slip
  - Anti-skid
  - Motor speed
- ▶ Automation
  - Measurement of speed and positions at gears, motors and roller

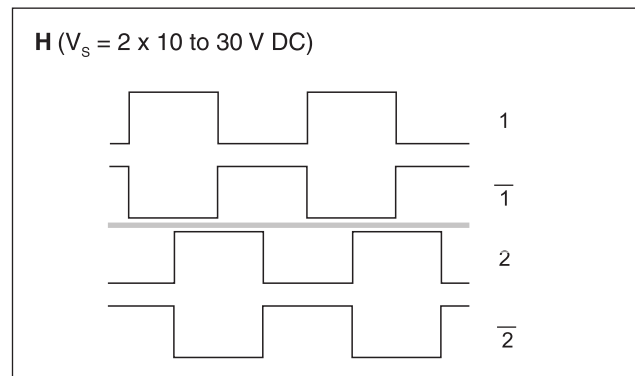
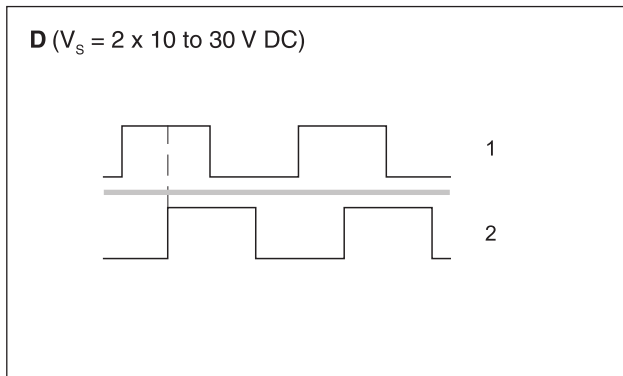
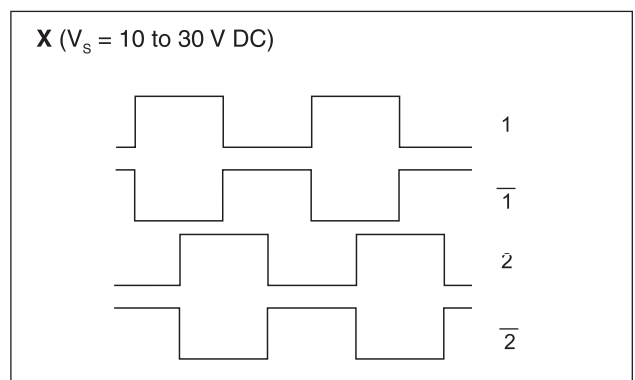
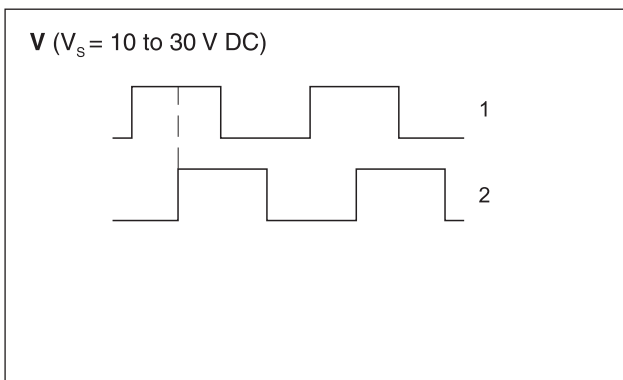
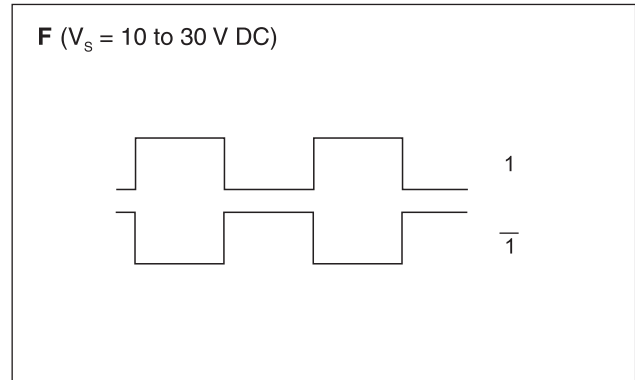
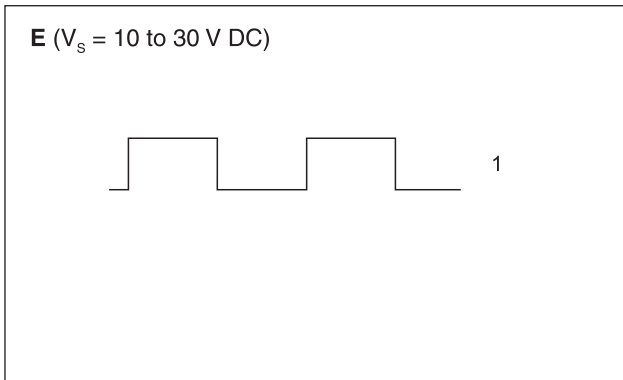


# Technical data

Signal pattern	E	F	V	X	D	H
<b>Electrical data</b>						
Supply voltage $V_S$ (reverse polarity protected)	10 to 30 V DC					
Current consumption $I_S$ (without load)	$\leq 15$ mA		$\leq 25$ mA			
Output signal (short circuit-proof)	square-wave signals					
Output signal level high <sup>(1)</sup>	$\geq V_S - 1.0$ V					
Output signal level low <sup>(1)</sup>	$\leq 350$ mV					
Output current per channel	$\leq 20$ mA					
Input frequency (target wheel)	0 Hz to 25 kHz					
Output frequency	0 Hz to 25 kHz					
Duty (depends on measuring scale and air gap)	50% $\pm$ 25%					
Phase shift	-		Typ. 90°			
Slew rate (2 m cable)	$\geq 10$ V/ $\mu$ s					
Electromagnetic compatibility	Rail vehicles (EN 50121-3-2) Industrial applications (EN 61000-6-1 to 4)					
Insulation	500 V AC (EN 60439-1)					
<b>Mechanical data</b>						
Module m of target wheel	1.00 / 1.25 / 1.50 / 1.75 / 2.00 / 2.25 / 2.50 / 3.00 / 3.50					
Permissible air gap (for module m) m: 1.00 to 1.25 [D.P.: 25.4 to 20.3] m: 1.50 to 3.5 [D.P.: 16.93 to 7.26]	Typ. 0.7 mm (0.1 to 0.8 mm) Typ. 0.7 mm (0.1 to 1.3 mm)					
Width of target wheel	$\geq 10$ mm (smaller ones on request)					
Form of target wheel	Involute gear as per DIN 867 (other on request)					
Material of target wheel	Ferromagnetic steel					
Operating and ambient temperature	-40 °C to +120 °C					
Storage temperature	-40 °C to +120 °C					
Protection class	IP 68					
Vibration resistance	EN 61373 cat. 3					
Shock resistance	EN 61373 cat. 3					
Type test	EN 50155					
Housing material of sensor	Stainless steel					
Weight of sensor (2 m cable)	Approx. 250 g					
<b>Electrical connection</b>						
Cable	Cable halogen free and screened (specification on request), cable outlet straight or lateral					
Cable length	$\leq 100$ m					
Cable diameter	8.2 mm			8.0 mm		
Cable cross section	6 x 1 mm <sup>2</sup>			12 x 0.34 mm <sup>2</sup>		
Cable type	LK1069			LK1076		
Bending radius static / dynamic	24 mm / 41 mm					

<sup>(1)</sup> valid with maximum output current of 20 mA

## Signal pattern



### Explanations:

1, 2 = channel 1, channel 2

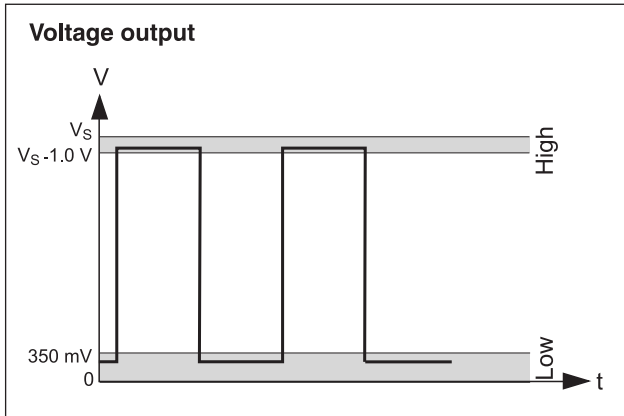
$\bar{1}, \bar{2}$  = invers channel 1, invers channel 2

— = galvanically isolated

$V_s$  = supply voltage

# Signal level, Electrical connection Dimensions

## Signal level



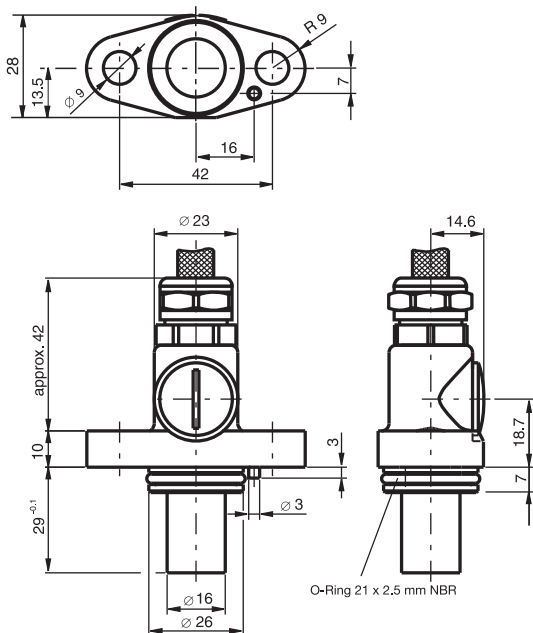
## Electrical connection

### Electrical connection

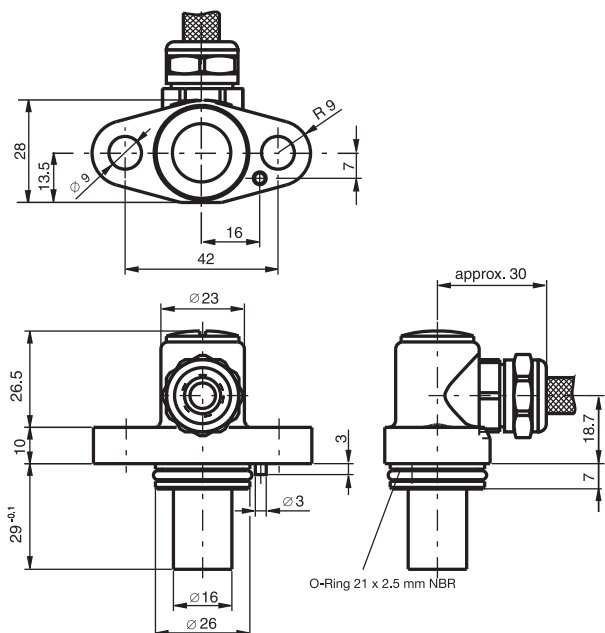
Signal pattern	E	F	V	X	D		H	
Channel 1	yellow	yellow	yellow	yellow	yellow		yellow	
Channel 2			white	white		white		white
Channel $\bar{1}$		black		black			black	
Channel $\bar{2}$				brown				brown
GND (0 V)	blue	blue	blue	blue	blue	grey	blue	grey
+ $V_S$ (10 to 30 V DC)	red	red	red	red	red	pink	red	pink
Cable / screens	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1		1 / 1	

## Dimensions

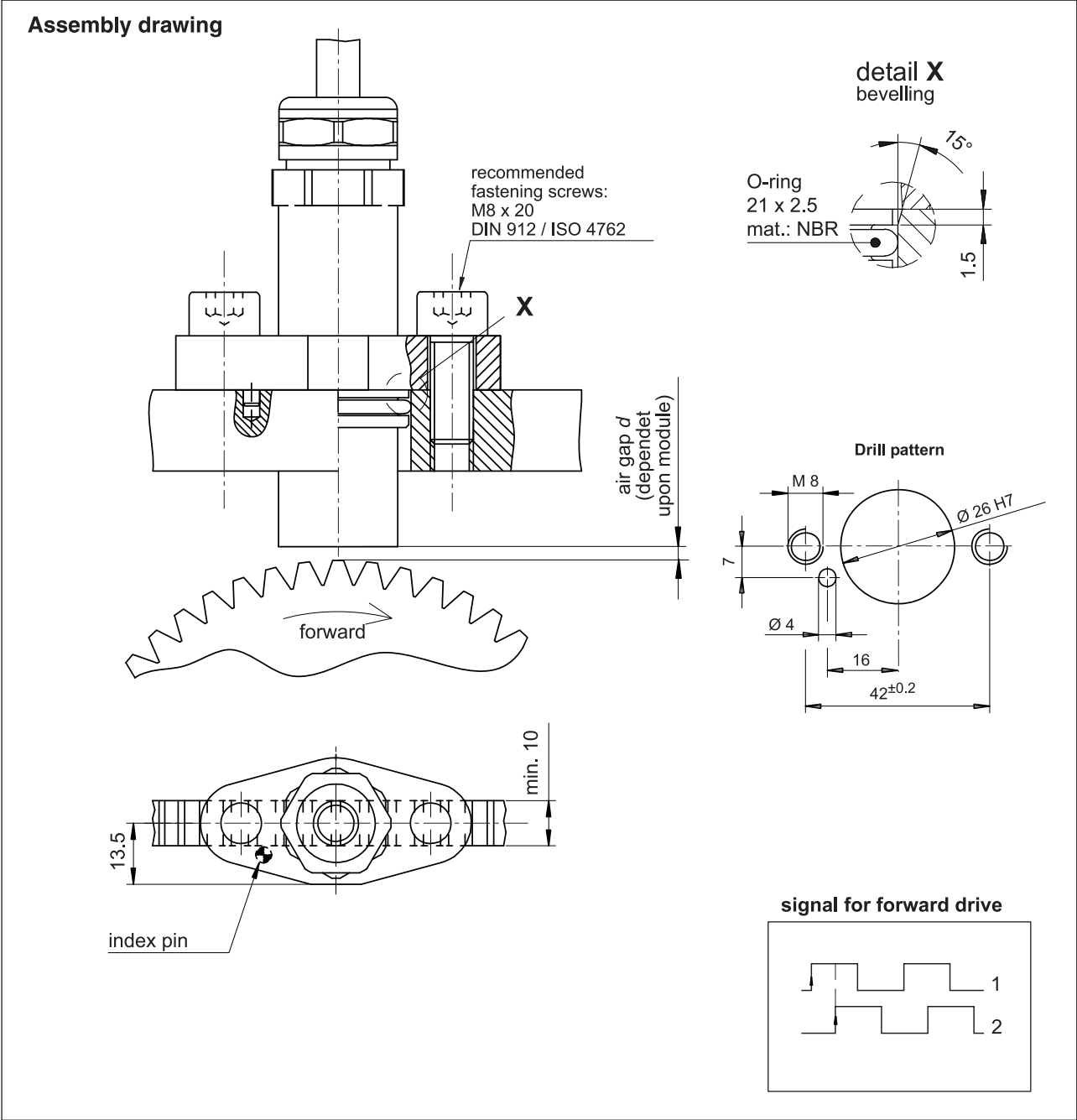
### Dimension GEL 247 (cable outlet straight)



### Dimension GEL 247 (cable outlet lateral)



# Assembly drawing



Please observe the EMC-reference in the operating instructions!

# Type code

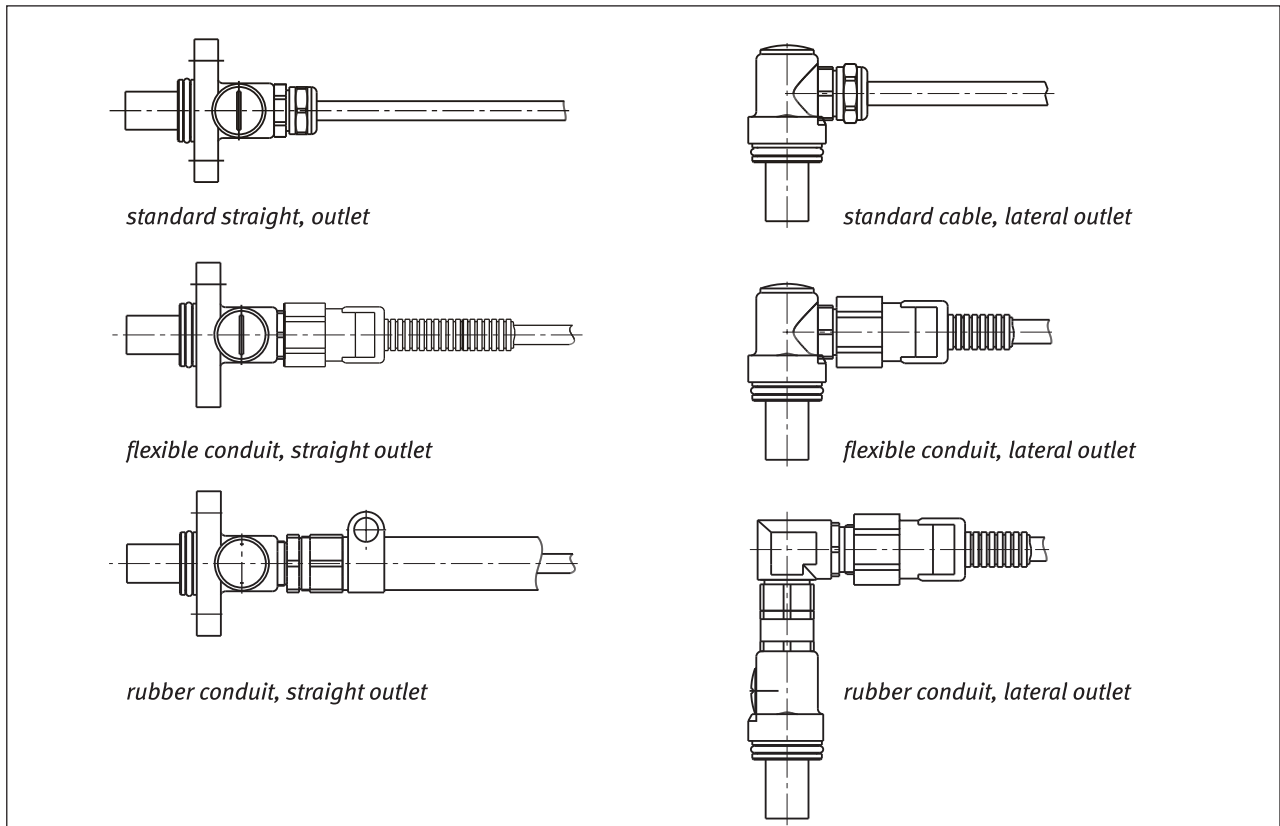
## Type code GEL 247

		<b>Signal pattern</b>	
		E 1-channel square-wave signals	
		F 1-channel square-wave signals and their inversed signals	
		V 2-channel square-wave signals shifted by 90°	
		X 2-channel square-wave signals shifted by 90° and their inversed signals	
		D 2-channel square-wave signals shifted by 90°, galvanically isolated	
		H 2-channel square-wave signals shifted by 90° and their inversed signals, galvanically isolated	
		1 -	
		<b>Cable outlet</b>	
		F Straight, cable length 2 m	
		G Lateral, cable length 2 m	
		S Straight, customised design	
		T Lateral, customised design	
		<b>Module m</b>	
		M100 m = 1.00	
		M125 m = 1.25	
		M150 m = 1.50	
		M175 m = 1.75	
		M200 m = 2.00	
		M225 m = 2.25	
		M250 m = 2.50	
		M300 m = 3.00	
		M350 m = 3.50	
		<b>Temperature range</b>	
		0 - 40 ... + 120 °C	
247	-	-	-

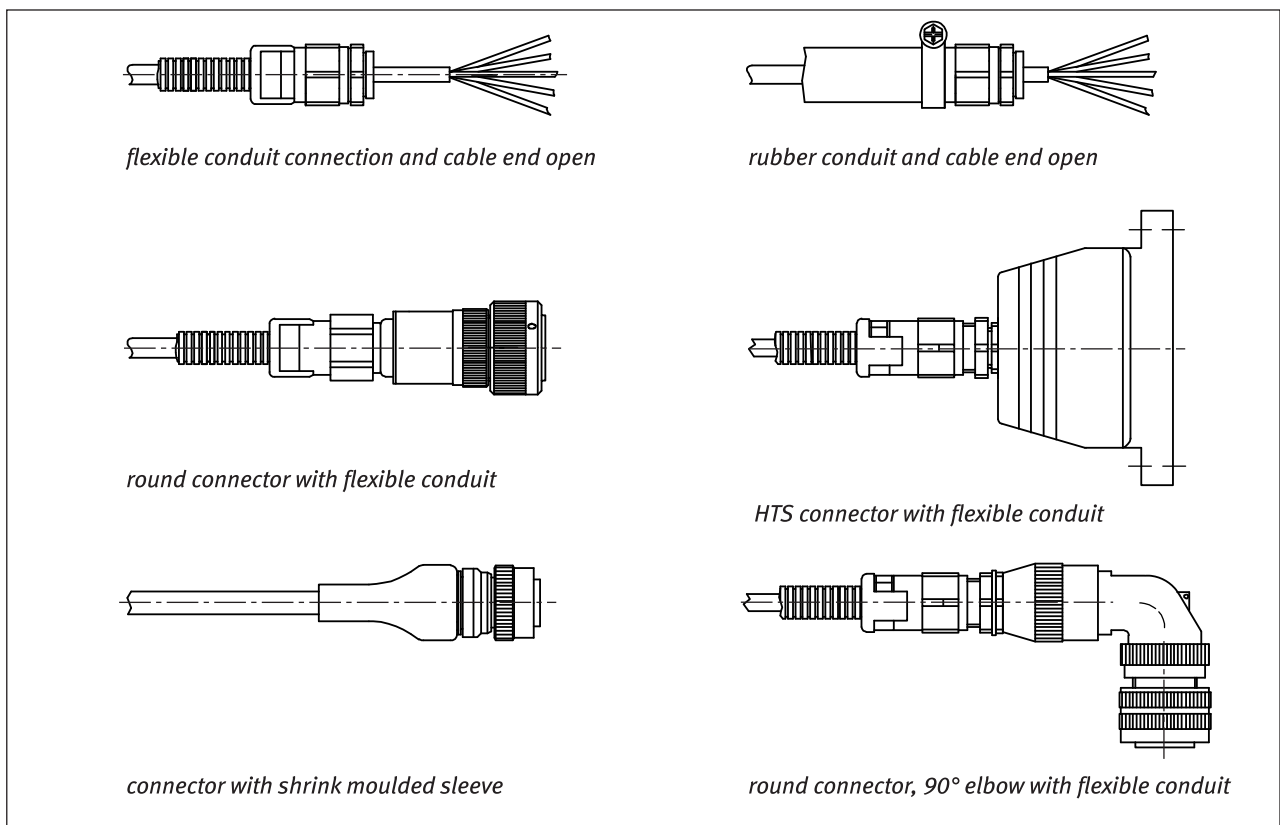
**Notes:** For a special customized version a Y-No. will be created. A special version 247Yxxx is manufactured according to a drawing or application description and could differ from the technical standard specification.

# Examples of customized cable connections:

## Encoder end



## Cable end



We have agencies in:

Austria  
Belgium  
Canada  
China  
Czech Republic  
Denmark  
Finland  
France  
Germany  
Great Britain  
Israel  
Italy  
Korea  
Malaysia  
Netherlands  
Norway  
Portugal  
Sweden  
Switzerland  
Spain  
Turkey  
USA



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Subject to technical modifications and typographical errors.  
The latest version can be downloaded at [www.lenord.de](http://www.lenord.de) .

