

1- or 2-channel speed sensor

▶ GEL 2474

with increased sensing distance



General information

- ▶ 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
- ▶ Increased sensing distance (air gap up to 3 mm, depending on module of target wheel)

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

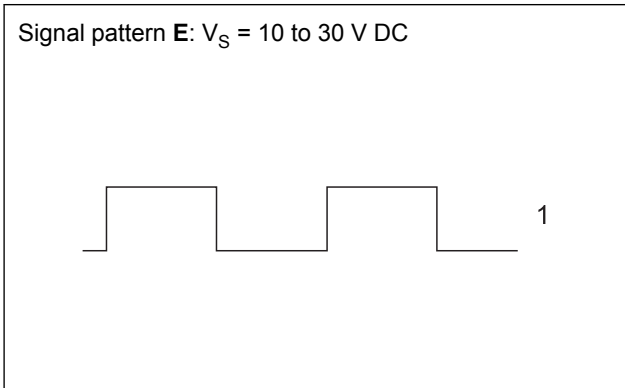
Signal pattern	E-	EI	EM	V-
Electrical data				
Supply voltage V_S (reverse polarity protected)	10 to 30 VDC	10 to 20 VDC		10 to 30 VDC
Current consumption I_S (without load)	≤ 30 mA	–	< 12 mA	≤ 45 mA
Output signal (short-circuit proof)	Square-wave			
Output level high ⁽¹⁾	$V_S - 1.0$ V	typ. 14 mA	$V_S - 1.8$ V	$V_S - 1.5$ V
Output level low ⁽¹⁾	≤ 1 V	typ. 7 mA	≤ 1.5 V ⁽²⁾	≤ 1.5 V
Max. output current per channel	≤ 20 mA	≤ 16 mA	≤ 10 mA	≤ 20 mA
Input frequency target wheel	0 Hz to 25 kHz		1 Hz to 8 kHz	1 Hz to 25 kHz
Duty cycle (depends on measuring scale and air gap)	50% \pm 5%		50% \pm 10%	50% \pm 5%
Phase shift	–			typ. 90°
Slew rate (with 2 m cable)	≥ 10 V/ μ s	≥ 6 V/ μ s ($R_L = 560 \Omega$)	≥ 4 V/ μ s	≥ 10 V/ μ s
EMC	Rail vehicles: EN 50121-3-2 Industry applications: EN 61000-6-1 to 4			
Insulation strength (DIN EN 60439-1)	500 V			
Mechanical data				
Module m of target wheel:	1.0 to 3.5 (DP: 25.4 to 7.3)		2.0 (DP: 12.7)	
Permissible air gap (for module m) m = 1.00 m = 1.50 m = 2.00 m = 2.50 m = 3.50	0.2 to 1.4 mm 0.2 to 1.8 mm 0.2 to 2.2 mm 0.2 to 2.8 mm 0.2 to 3.0 mm		0.3 to 1.5 mm	0.2 to 2.2 mm
Width of target wheel	≥ 10 mm (smaller ones on request)			
Form of the target wheel	Involute gear as per DIN 867, rectangular gear 1:1 or slotted disk (on request)			
Material of target wheel	Ferromagnetic steel			
Operating and ambient temperature	-40 °C to +120 °C		-40 °C to +85 °C	-40 °C to +120 °C
Storage temperature	-40 °C to +120 °C			
Protection class	IP 68			
Vibration and shock resistance	EN 61373 Cat. 3			
Type testing	EN 50155			
Sensor housing material	Stainless steel			
Weight (with 2 m cable)	650 g			
Electrical connection				
Cable	Cable non halogen and screened (specifications on request), cable outlet straight			
Cable length	≤ 100 m			
Cable diameter	8.2 mm	8.3 mm	6.3 mm	8.2 mm
Cable cross section	6 x 1.0 mm ²	4 x 1.0 mm ²	3 x 0.5 mm ²	6 x 1.0 mm ²
Bending radius static / dynamic	24 / 41 mm	25 / 42 mm	19 / 32 mm	24 / 41 mm

(1) Output signal level depends on output current and temperature.

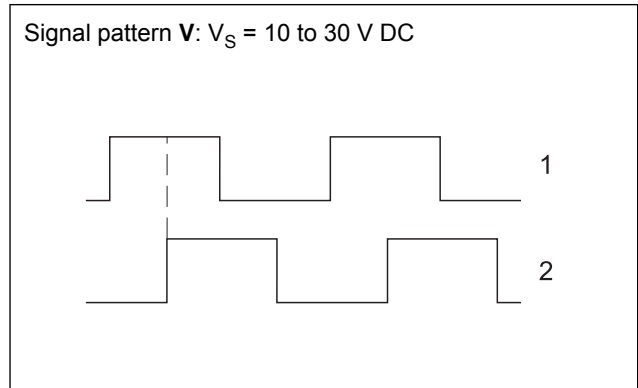
(2) 7 V \pm 0.3 V at frequencies < 1 Hz \pm 0.3 Hz

Signal pattern, Electrical connection

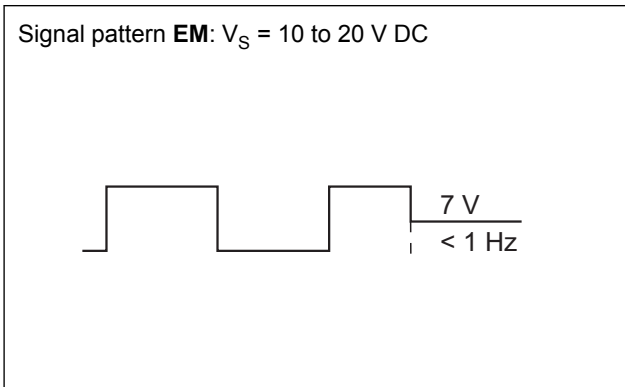
Voltage output (1 channel)



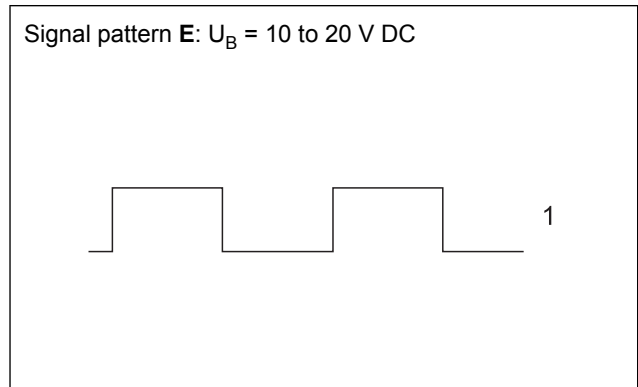
Voltage output (2 channels)



Voltage output with standstill voltage (1 channel)



Current output (1 channel)



Key

1, 2 = channel 1, channel 2

V_S = supply voltage

Electrical connection

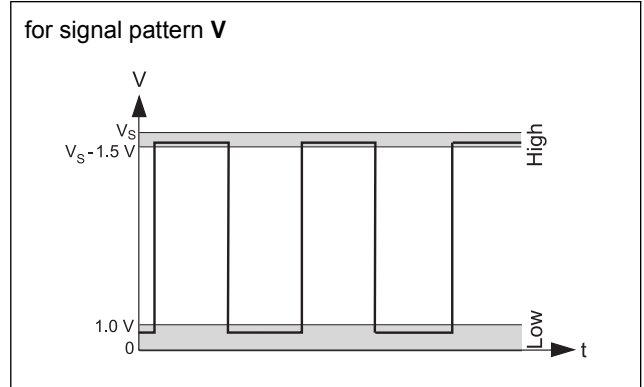
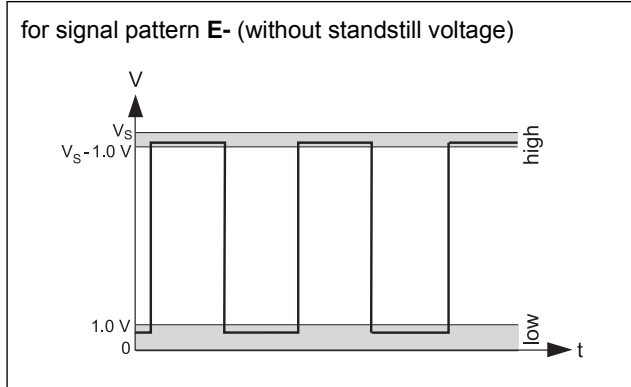
Signal	Voltage output		Standstill voltage	Current output
	E	V	EM	EI
Channel 1	yellow	yellow		blue
Channel 2		white	white	
GND (0 V)	blue	blue	black	
+ V_S	red	red	red	red
Cable/screen	1 / 1	1 / 1	1 / 1	1 / 1

for signal pattern **E** - / **V** -: $V_S = 10$ to 30 V DC

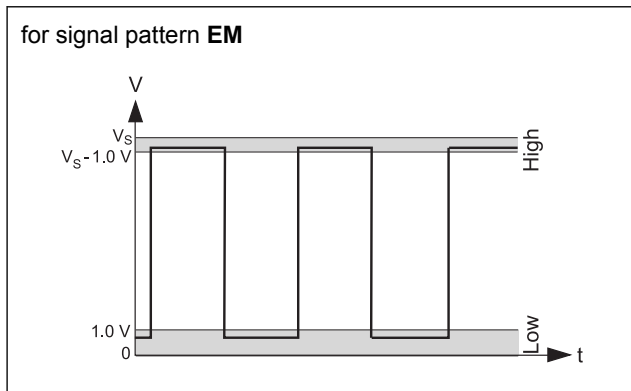
for signal pattern **EI** / **EM**: $V_S = 10$ to 20 V DC

Signal level

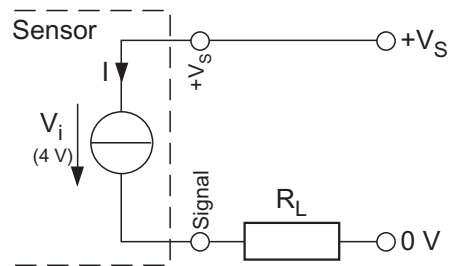
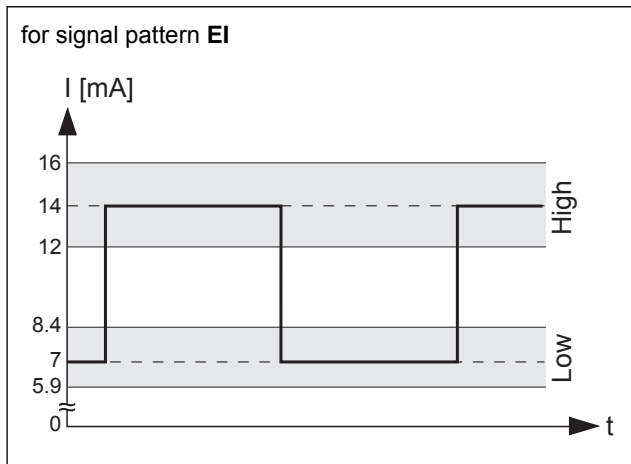
Voltage output



Voltage output with standstill voltage



Current output



When using the current output, the resistor to be connected must not exceed a specific value:

$$R_{B,max} = (V_S - 4 \text{ V}) / I_{max}$$

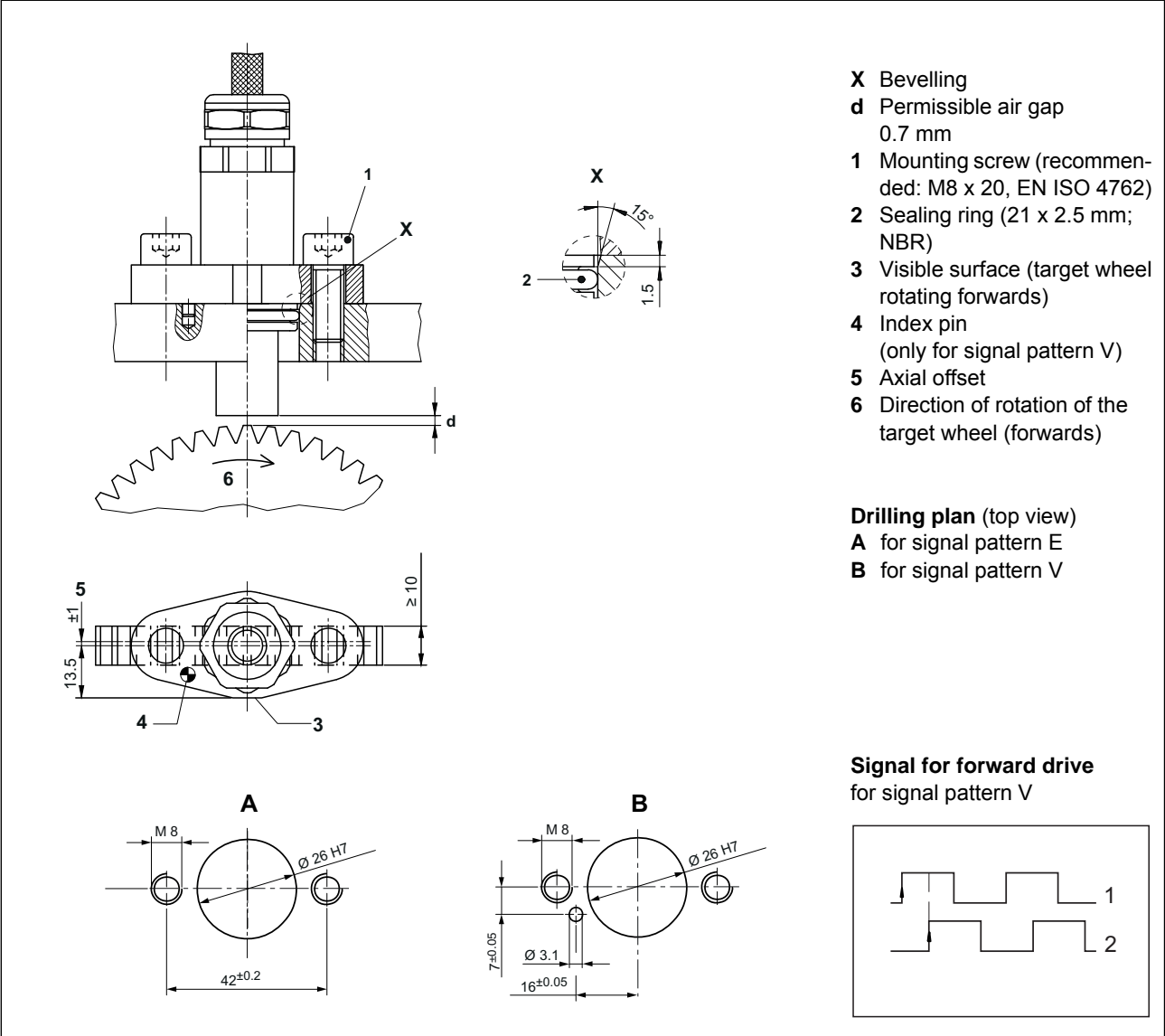
with $V_S = 10$ to 20 V DC and $I_{max} = 16 \text{ mA}$

Example for $V_S = 15 \text{ V}$:

$$R_{B,max} = 11 \text{ V} / 16 \text{ mA} = 690 \Omega$$

Assembly drawing

Assembly drawing



- X** Beveling
- d** Permissible air gap
0.7 mm
- 1** Mounting screw (recommended: M8 x 20, EN ISO 4762)
- 2** Sealing ring (21 x 2.5 mm; NBR)
- 3** Visible surface (target wheel rotating forwards)
- 4** Index pin (only for signal pattern V)
- 5** Axial offset
- 6** Direction of rotation of the target wheel (forwards)

Drilling plan (top view)
A for signal pattern E
B for signal pattern V

Signal for forward drive
for signal pattern V

Please observe the EMC-reference in the operating instructions!

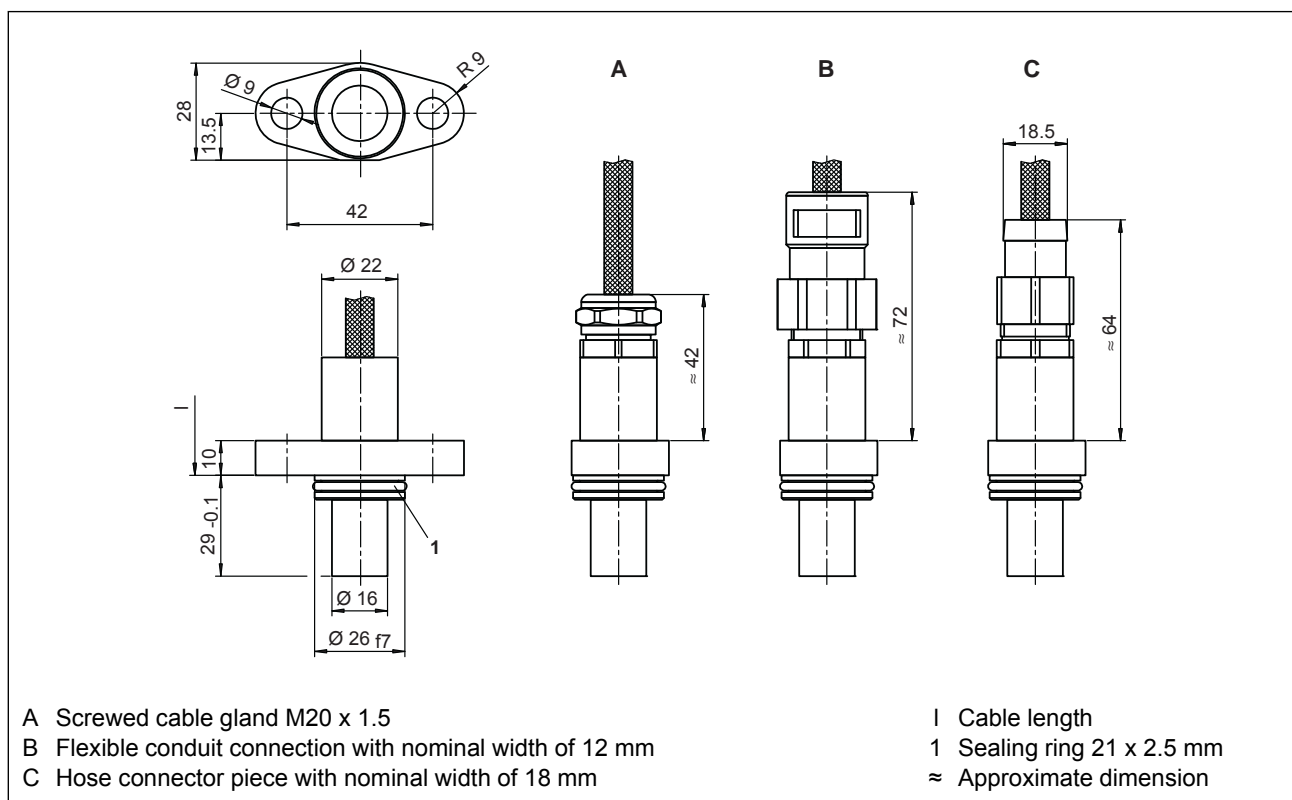
Type code, Dimensions

Type code GEL 2474

Signal pattern	
E	1-channel square-wave signal
V	2-channel square-wave signals shifted by 90° (only in connection with voltage signal output)
Signal output	
-	Voltage
I	Current (only for signal pattern E)
M	7 V standstill voltage (only for signal pattern E)
Cable screening	
L	Connected to sensor housing
P	Not connected to sensor housing
Cable outlet	
K	Screwed cable gland
W	Flexible tube fitting
G	Rubber tube adapter
Cable length L	
xxx	Centimetres
Special assembly	
N	None
S	Customized (upon request)
2474	

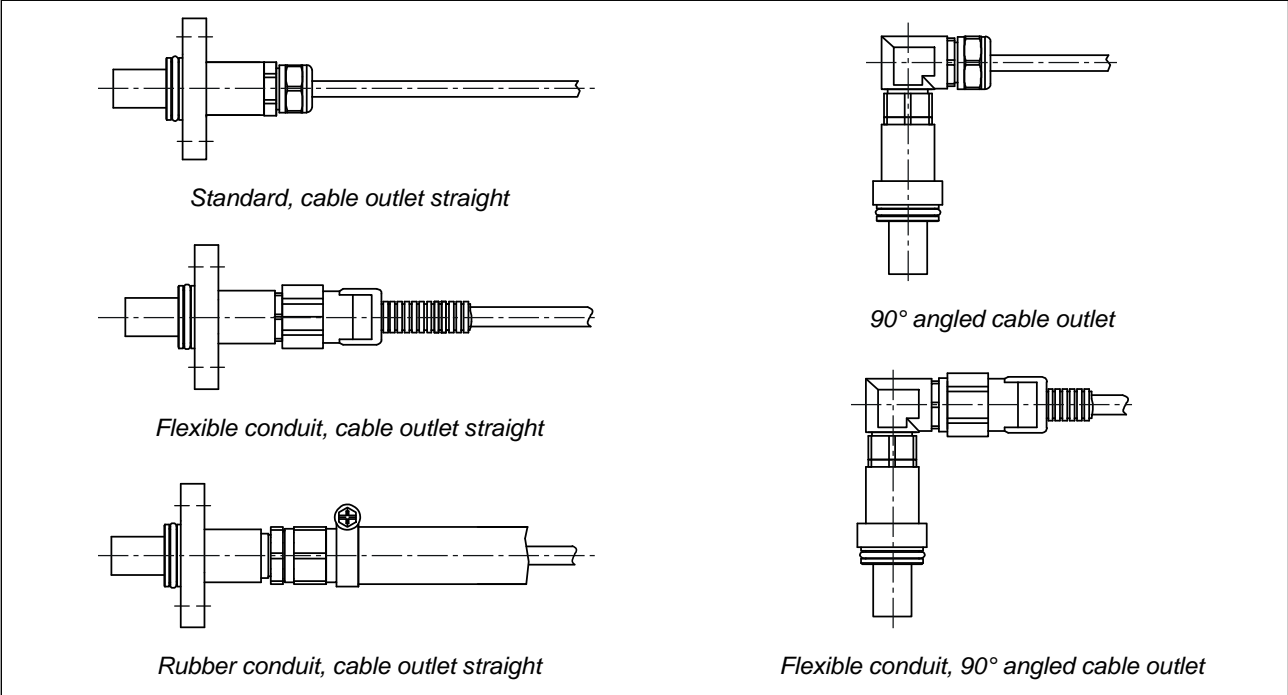
Notes: For a special customized version a Y-No. will be created. A special version 2474Yxxx is manufactured according to a drawing or application description and could differ from the technical standard specification.

Dimensions GEL 2474

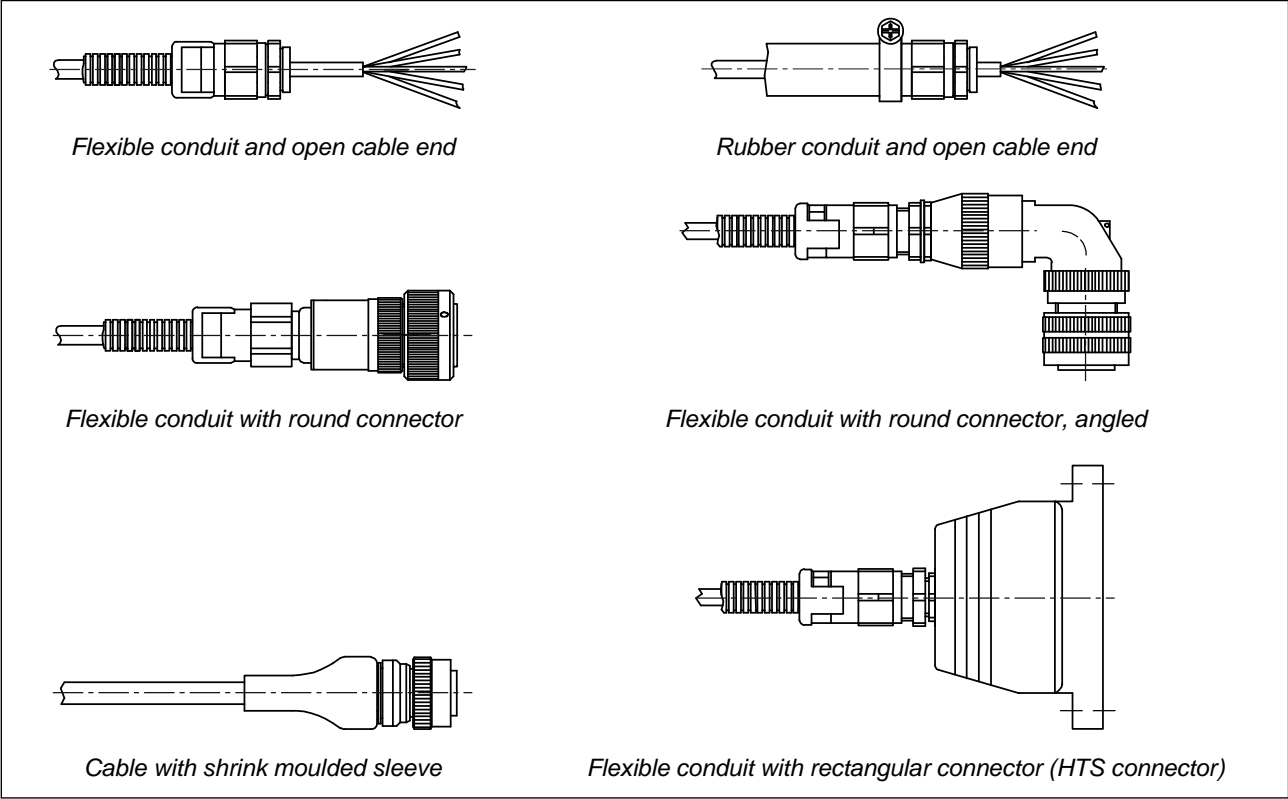


Example for customized cable connections

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



Lenord, Bauer & Co. GmbH
Dohlenstraße 32
46145 Oberhausen, Deutschland
Phone: +49 208 9963-0
Fax: +49 208 676292
Internet: www.lenord.de
E-Mail: info@lenord.de

Subject to technical modifications and typographical errors.
The latest version can be downloaded at www.lenord.de .

