



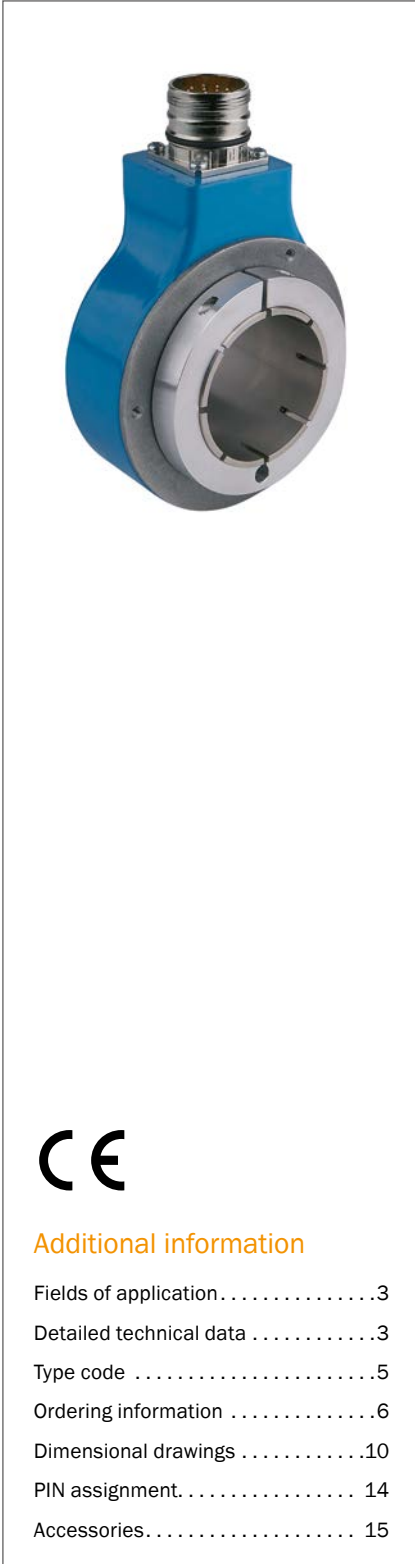
## DGS80

RUGGED INCREMENTAL ENCODER WITH LARGE HOLLOW SHAFT  
DIAMETERS

Incremental encoders

**SICK**  
Sensor Intelligence.

# RUGGED INCREMENTAL ENCODER WITH LARGE HOLLOW SHAFT DIAMETERS



### Additional information

Fields of application . . . . .	3
Detailed technical data . . . . .	3
Type code . . . . .	5
Ordering information . . . . .	6
Dimensional drawings . . . . .	10
PIN assignment . . . . .	14
Accessories . . . . .	15

### Product description

The DGS80 is an incremental encoder with large hollow shaft diameters up to 42 mm. It can be used in numerous industrial automation applications. In combination with the many connection options of the DGS80, its supply voltage range from 5 V to 30 V facilitates integration into most control systems. The quick and easy installation characterizes the incremental encoder: This is made

possible by its compact design, the clamping ring for speedy mounting, the universal torque supports and the large selection of collets that simplify mounting on shafts of different sizes.

### At a glance

- Pulses per revolution: up to 8,192
- Housing diameter: 81 mm, diameter of hollow through shafts: 30 mm or 42 mm
- Protection class: IP65
- Communication interfaces: TTL, HTL
- Connection types: M12, M23 and MS connectors and cable
- Collets available as accessories for adaptation to different sized shafts

### Your benefits

- Large hollow shaft diameters and a wide range of collets eliminate the need for special couplings and allow quick and easy integration into numerous applications
- Easy integration into control systems thanks to large supply voltage range
- Reduced installation time due to easy-to-fit clamping ring and torque arms
- Compact, space-saving design facilitates installation where installation space is limited

→ [www.sick.com/DGS80](http://www.sick.com/DGS80)

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



## Fields of application

- High resolution range makes the encoder suitable for a wide range of industrial applications: e.g. printing, scanning and elevator speed control  
Industrial applications: e.g. AC motor speed measurement, printing, scanning.
- Large hollow shaft diameters and rugged construction for applications in the wood and metal industries
- AC motor applications through wide range of insulated collets

## Detailed technical data

### Performance

<b>Pulses per revolution</b>	0 ... 8,192
<b>Measuring step</b>	90° electric/pulses per revolution
<b>Measuring step deviation</b>	± 15°
<b>Duty cycle</b>	≤ 0.5 ± 15 %

### Interfaces

<b>Communication interface</b>	Incremental
<b>Communication Interface detail</b>	TTL / RS-422 HTL / Push pull (depending on type)
<b>Number of signal channels</b>	6-channel
<b>Initialization time</b>	< 50 ms
<b>Output frequency</b>	≤ 300 kHz
<b>Load current</b>	≤ 40 mA, per channel
<b>Operating current</b>	≤ 50 mA (without load)
<b>Power consumption</b>	≤ 0.85 W

### Mechanical data

<b>Mechanical design</b>	Through hollow shaft
<b>Shaft diameter</b>	30 mm <sup>1)</sup> 42 mm <sup>1)</sup> (depending on type)
<b>Flange type / stator coupling</b>	1-sided stator coupling, slot, screw hole circle radius 50–103 mm <sup>2)</sup>
<b>Weight</b>	650 g
<b>Shaft material</b>	Aluminum
<b>Flange material</b>	Die cast ZAMAC
<b>Housing material</b>	Die cast ZAMAC
<b>Material, cable</b>	PUR
<b>Shaft sealing ring material</b>	FKM70
<b>Material, cable gland</b>	Nickel-plated brass
<b>Start up torque</b>	6 Ncm (+20 °C)
<b>Operating torque</b>	5 Ncm (+20 °C)
<b>Permissible shaft loading radial/axial</b>	100 N / 160 N (depending on type)
<b>Operating speed</b>	≤ 3,600 min <sup>-1</sup>
<b>Moment of inertia of the rotor</b>	408 gcm <sup>2</sup> / 877 gcm <sup>2</sup> (depending on type)
<b>Bearing lifetime</b>	10 <sup>9</sup> revolutions

<sup>1)</sup> Collets (Shaft Reducers) available as accessories to reduce shaft sizes below 30 mm / 42 mm.

<sup>2)</sup> Available as accessory.

## Electrical data

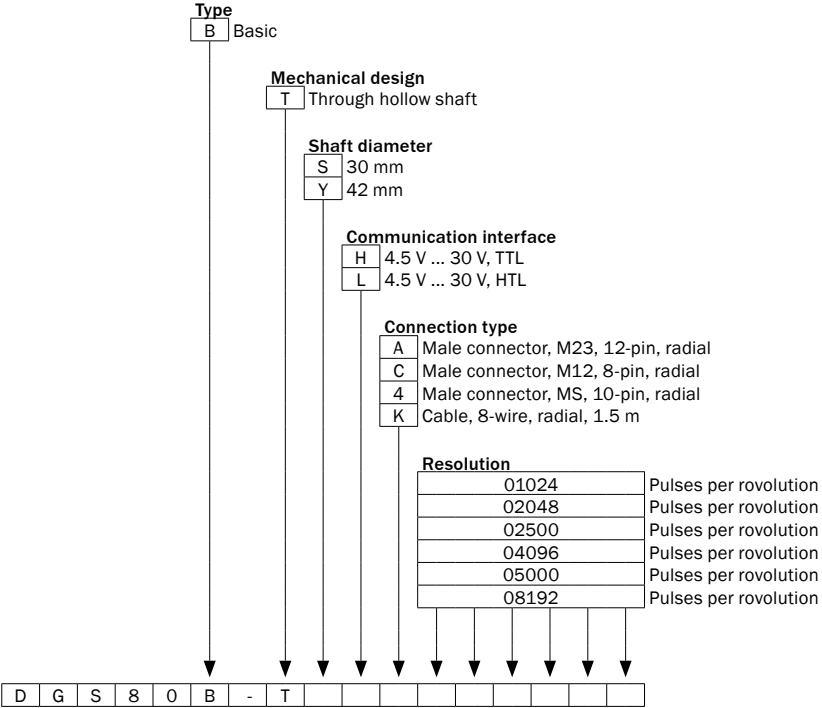
<b>Connection type</b>	Male connector, M23, 12-pin, radial Male connector, M12, 8-pin, radial Male connector, MS, 10-pin, radial Cable, 8-wire, radial, 1.5 m (depending on type)
<b>Supply voltage</b>	4.5 ... 30 V DC
<b>Reference signal, position</b>	90°, electric, logically gated with A and B
<b>Reverse polarity protection</b>	✓
<b>Short-circuit protection of the outputs</b>	✓
<b>MTTFd: mean time to dangerous failure</b>	518 years (EN ISO 13849-1) <sup>1)</sup>

<sup>1)</sup> This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40°C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

## Ambient data

<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-3
<b>Enclosure rating</b>	IP65 (according to IEC 60529)
<b>Permissible relative humidity</b>	98 % (Condensation not permitted)
<b>Operating temperature range</b>	-25 °C ... +85 °C
<b>Storage temperature range</b>	-25 °C ... +85 °C, without package
<b>Resistance to shocks</b>	250 g, 6 ms (according to EN 60068-2-27)
<b>Resistance to vibration</b>	10 g, 5 Hz ... 2,000 Hz (according to EN 60068-2-6)

Type code



Ordering information

- **Mechanical design:** through hollow shaft
- **Communication interface:** Incremental

Shaft diameter	Communication Interface detail	Connection type	Pulses per revolution	Type	Part no.
30 mm <sup>1)</sup>	HTL / Push pull	Cable, 8-wire, radial, 1.5 m	1,024	DGS80B-TSLK01024	1118702
			2,048	DGS80B-TSLK02048	1118703
			2,500	DGS80B-TSLK02500	1118704
			4,096	DGS80B-TSLK04096	1118705
			5,000	DGS80B-TSLK05000	1118706
			8,192	DGS80B-TSLK08192	1118707
		Male connector, M12, 8-pin, radial	1,024	DGS80B-TSLC01024	1118708
			2,048	DGS80B-TSLC02048	1118709
			2,500	DGS80B-TSLC02500	1118710
			4,096	DGS80B-TSLC04096	1118711
			5,000	DGS80B-TSLC05000	1118712
			8,192	DGS80B-TSLC08192	1118713
		Male connector, M23, 12-pin, radial	1,024	DGS80B-TSLA01024	1118696
			2,048	DGS80B-TSLA02048	1118697
			2,500	DGS80B-TSLA02500	1118698
			4,096	DGS80B-TSLA04096	1118699
			5,000	DGS80B-TSLA05000	1118700
			8,192	DGS80B-TSLA08192	1118701
		Male connector, MS, 10-pin, radial	1,024	DGS80B-TSL401024	1118690
			2,048	DGS80B-TSL402048	1118691
			2,500	DGS80B-TSL402500	1118692
			4,096	DGS80B-TSL404096	1118693
			5,000	DGS80B-TSL405000	1118694
			8,192	DGS80B-TSL408192	1118695

<sup>1)</sup> Collets (Shaft Reducers) available as accessories to reduce shaft sizes below 30 mm / 42 mm.

Shaft diameter	Communication Interface detail	Connection type	Pulses per revolution	Type	Part no.
30 mm <sup>1)</sup>	TTL / RS-422	Cable, 8-wire, radial, 1.5 m	1,024	DGS80B-TSHK01024	1118678
			2,048	DGS80B-TSHK02048	1118679
			2,500	DGS80B-TSHK02500	1118680
			4,096	DGS80B-TSHK04096	1118681
			5,000	DGS80B-TSHK05000	1118682
			8,192	DGS80B-TSHK08192	1118683
		Male connector, M12, 8-pin, radial	1,024	DGS80B-TSHC01024	1118684
			2,048	DGS80B-TSHC02048	1118685
			2,500	DGS80B-TSHC02500	1118686
			4,096	DGS80B-TSHC04096	1118687
			5,000	DGS80B-TSHC05000	1118688
			8,192	DGS80B-TSHC08192	1118689
		Male connector, M23, 12-pin, radial	1,024	DGS80B-TSHA01024	1118672
			2,048	DGS80B-TSHA02048	1118673
			2,500	DGS80B-TSHA02500	1118674
			4,096	DGS80B-TSHA04096	1118675
			5,000	DGS80B-TSHA05000	1118676
			8,192	DGS80B-TSHA08192	1118677
		Male connector, MS, 10-pin, radial	1,024	DGS80B-TSH401024	1118666
			2,048	DGS80B-TSH402048	1118667
			2,500	DGS80B-TSH402500	1118668
			4,096	DGS80B-TSH404096	1118669
			5,000	DGS80B-TSH405000	1118670
			8,192	DGS80B-TSH408192	1118671

<sup>1)</sup> Collets (Shaft Reducers) available as accessories to reduce shaft sizes below 30 mm / 42 mm.

Shaft diameter	Communication Interface detail	Connection type	Pulses per revolution	Type	Part no.
42 mm <sup>1)</sup>	HTL / Push pull	Cable, 8-wire, radial, 1.5 m	1,024	DGS80B-TYLK01024	1118750
			2,048	DGS80B-TYLK02048	1118751
			2,500	DGS80B-TYLK02500	1118752
			4,096	DGS80B-TYLK04096	1118753
			5,000	DGS80B-TYLK05000	1118754
			8,192	DGS80B-TYLK08192	1118755
		Male connector, M12, 8-pin, radial	1,024	DGS80B-TYLC01024	1118756
			2,048	DGS80B-TYLC02048	1118757
			2,500	DGS80B-TYLC02500	1118758
			4,096	DGS80B-TYLC04096	1118759
			5,000	DGS80B-TYLC05000	1118760
			8,192	DGS80B-TYLC08192	1118761
		Male connector, M23, 12-pin, radial	1,024	DGS80B-TYLA01024	1118744
			2,048	DGS80B-TYLA02048	1118745
			2,500	DGS80B-TYLA02500	1118746
			4,096	DGS80B-TYLA04096	1118747
			5,000	DGS80B-TYLA05000	1118748
			8,192	DGS80B-TYLA08192	1118749
		Male connector, MS, 10-pin, radial	1,024	DGS80B-TYL401024	1118738
			2,048	DGS80B-TYL402048	1118739
			2,500	DGS80B-TYL402500	1118740
			4,096	DGS80B-TYL404096	1118741
			5,000	DGS80B-TYL405000	1118742
			8,192	DGS80B-TYL408192	1118743

<sup>1)</sup> Collets (Shaft Reducers) available as accessories to reduce shaft sizes below 30 mm / 42 mm.

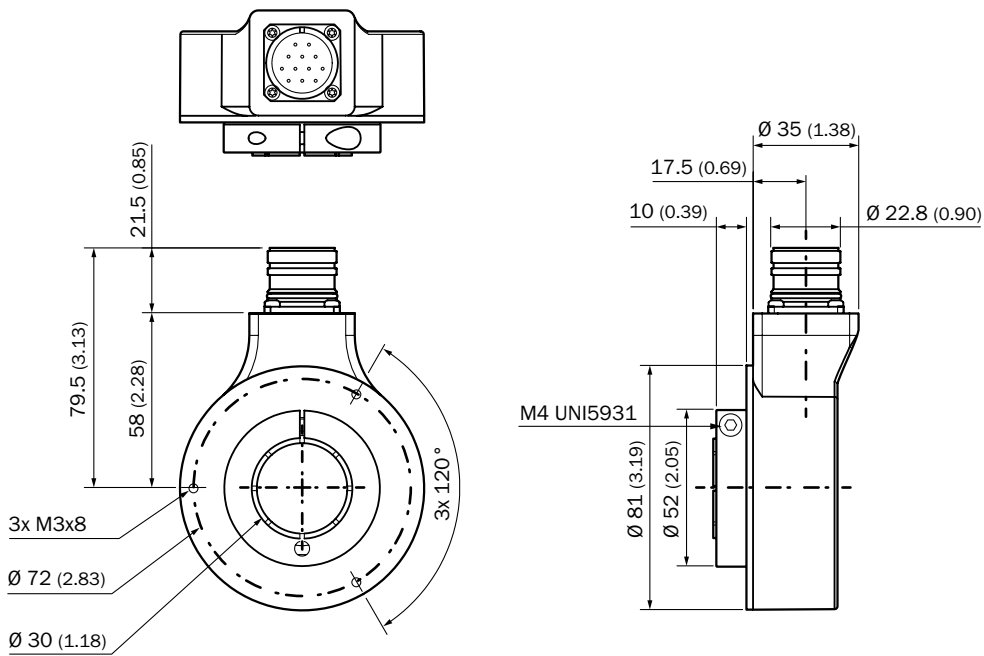


Shaft diameter	Communication Interface detail	Connection type	Pulses per revolution	Type	Part no.
42 mm <sup>1)</sup>	TTL / RS-422	Cable, 8-wire, radial, 1.5 m	1,024	DGS80B-TYHK01024	1118726
			2,048	DGS80B-TYHK02048	1118727
			2,500	DGS80B-TYHK02500	1118728
			4,096	DGS80B-TYHK04096	1118729
			5,000	DGS80B-TYHK05000	1118730
			8,192	DGS80B-TYHK08192	1118731
		Male connector, M12, 8-pin, radial	1,024	DGS80B-TYHC01024	1118732
			2,048	DGS80B-TYHC02048	1118733
			2,500	DGS80B-TYHC02500	1118734
			4,096	DGS80B-TYHC04096	1118735
			5,000	DGS80B-TYHC05000	1118736
			8,192	DGS80B-TYHC08192	1118737
		Male connector, M23, 12-pin, radial	1,024	DGS80B-TYHA01024	1118720
			2,048	DGS80B-TYHA02048	1118721
			2,500	DGS80B-TYHA02500	1118722
			4,096	DGS80B-TYHA04096	1118723
			5,000	DGS80B-TYHA05000	1118724
			8,192	DGS80B-TYHA08192	1118725
		Male connector, MS, 10-pin, radial	1,024	DGS80B-TYH401024	1118714
			2,048	DGS80B-TYH402048	1118715
			2,500	DGS80B-TYH402500	1118716
			4,096	DGS80B-TYH404096	1118717
			5,000	DGS80B-TYH405000	1118718
			8,192	DGS80B-TYH408192	1118719

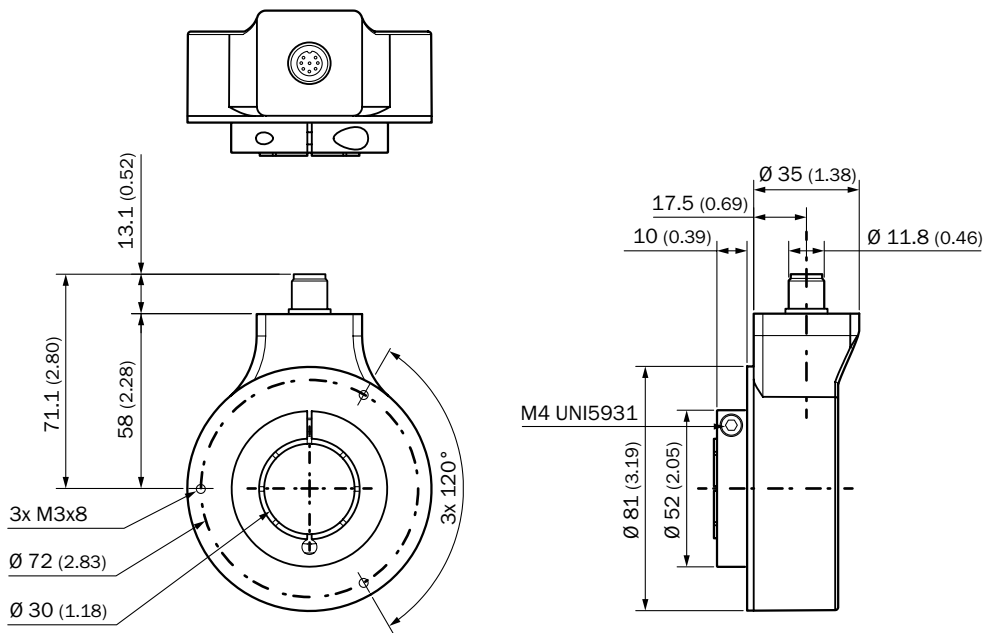
<sup>1)</sup> Collets (Shaft Reducers) available as accessories to reduce shaft sizes below 30 mm / 42 mm.

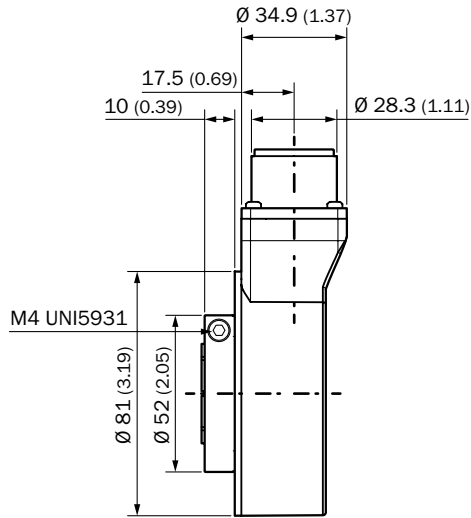
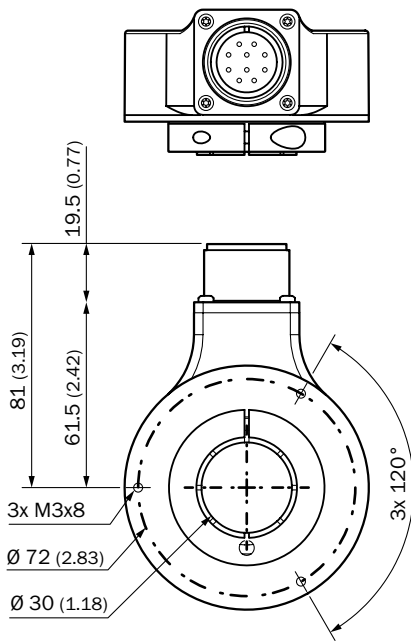
Dimensional drawings (Dimensions in mm (inch))

Bore size 30 mm, male connector M23

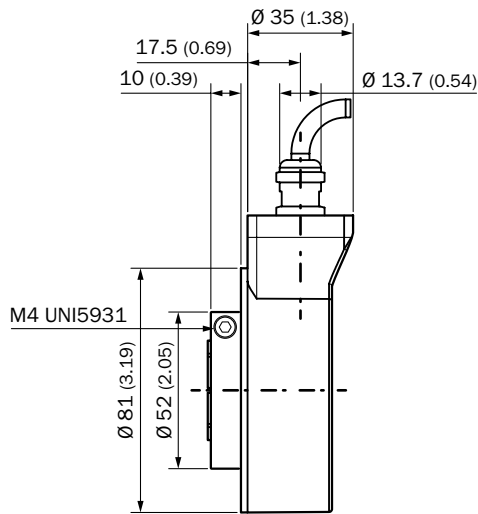
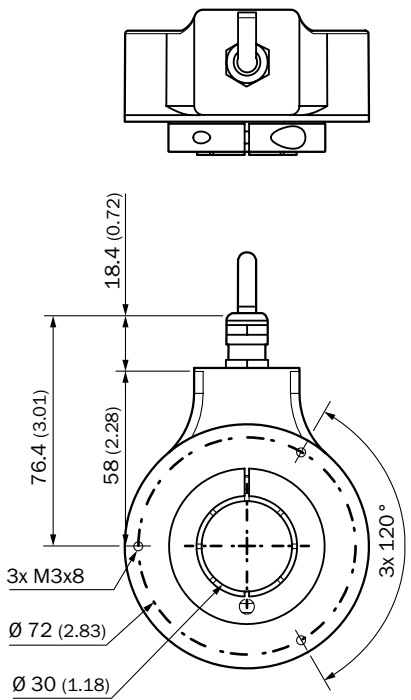


Bore size 30 mm, male connector M12

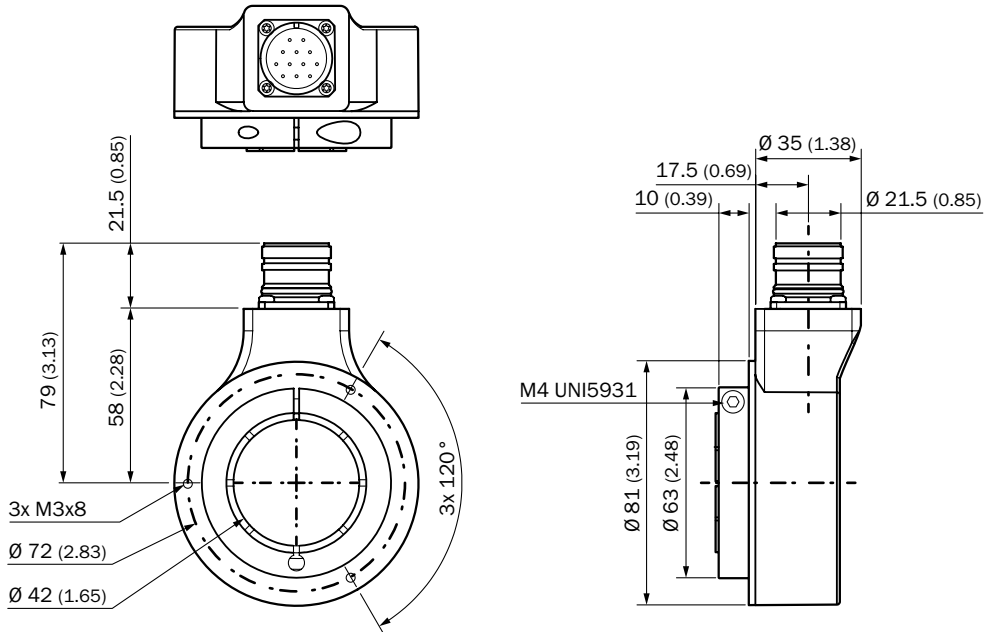




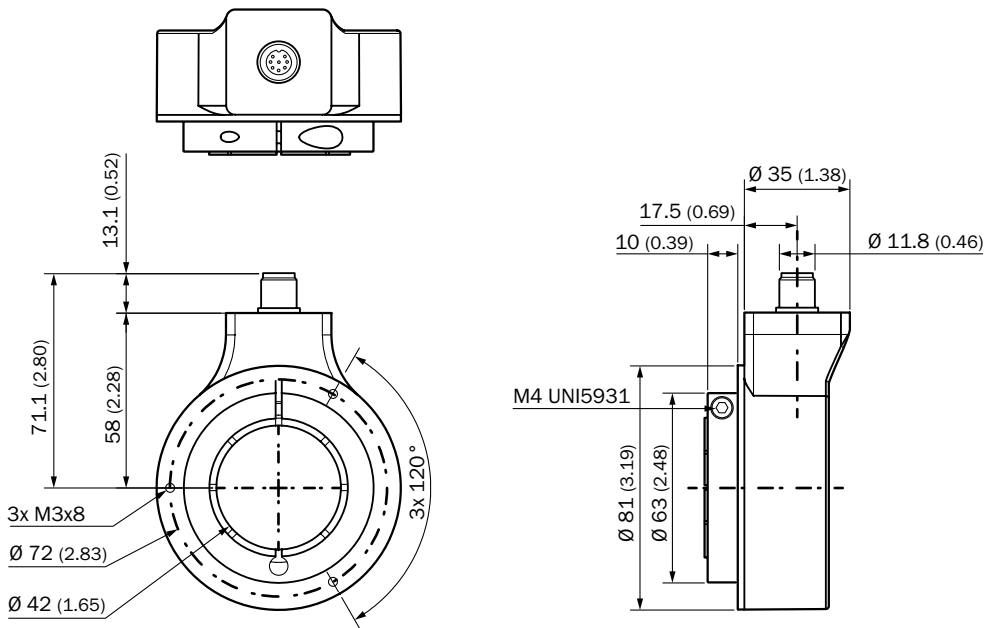
Bore size 30 mm, cable



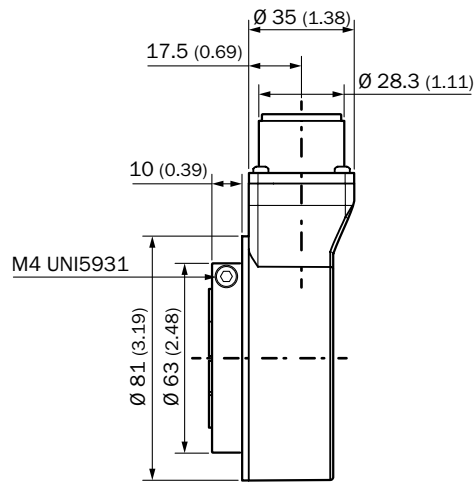
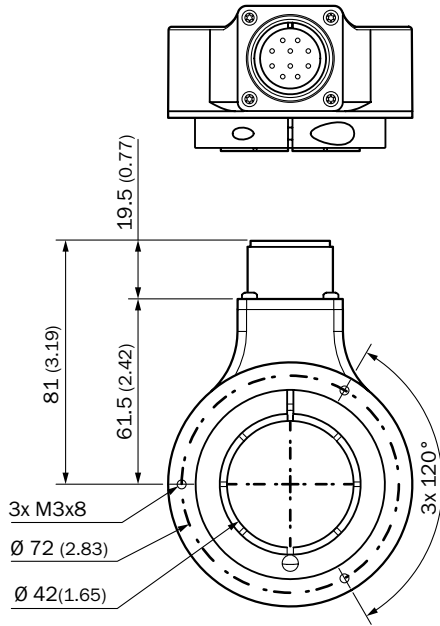
Bore size 42 mm, male connector M23



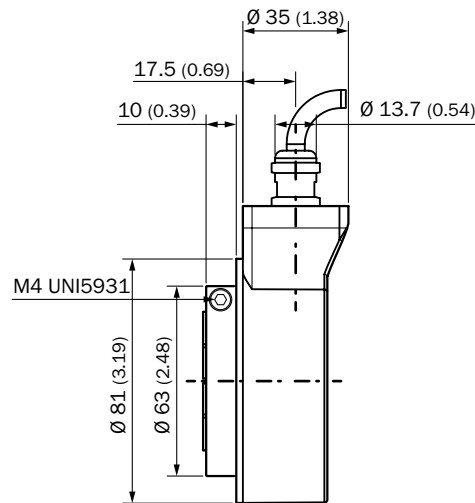
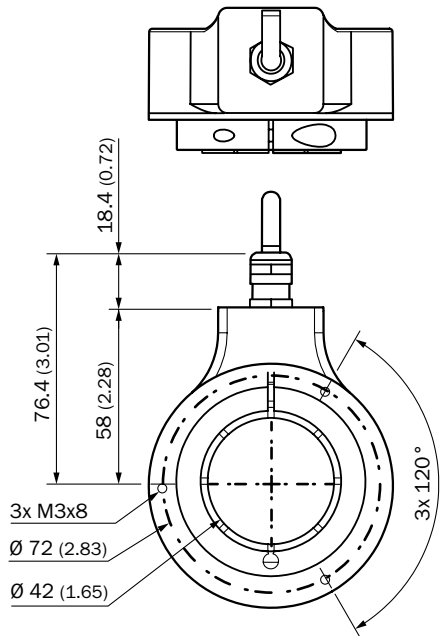
Bore size 42 mm, male connector M12



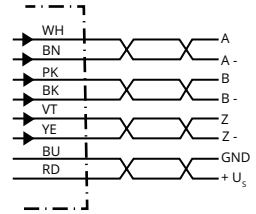
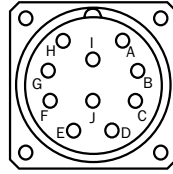
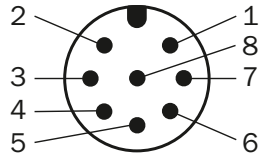
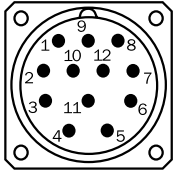
Bore size 42 mm, male connector MS



Bore size 42 mm, cable



PIN assignment



Wire colors (cable connection)	PIN Male connector M12, 8-pin	PIN Male connector M23, 12-pin	PIN Male connector MS, 10-pin	Signal	Explanation
Brown	1	6	H	A-	Signal cable
White	2	5	A	A	Signal cable
Black	3	1	I	B-	Signal cable
Pink	4	8	B	B	Signal cable
Yellow	5	4	J	Z-	Signal cable
Purple	6	3	C	Z	Signal cable
Blue	7	10	F	GND	Ground connection
Red	8	12	D	+U <sub>s</sub>	Supply voltage
-	-	2	E	N.c.	Not connected
-	-	7	-	N.c.	Not connected
-	-	-	G	Housing	Housing
-	-	9	-	N.c.	Not connected
-	-	11	-	N.c.	Not connected
Screen				Screen	Screen connected to housing on encoder side

**Accessories****Mounting systems**

Flanges

Flange plates

Brief description	Type	Part no.
One-sided stator coupling, slot, 115 mm	DGS80-TETHER-A	2122697
One-sided stator coupling, slot, 84 mm	DGS80-TETHER-B	2122698

Shaft adaptation

Collets and clamping rings

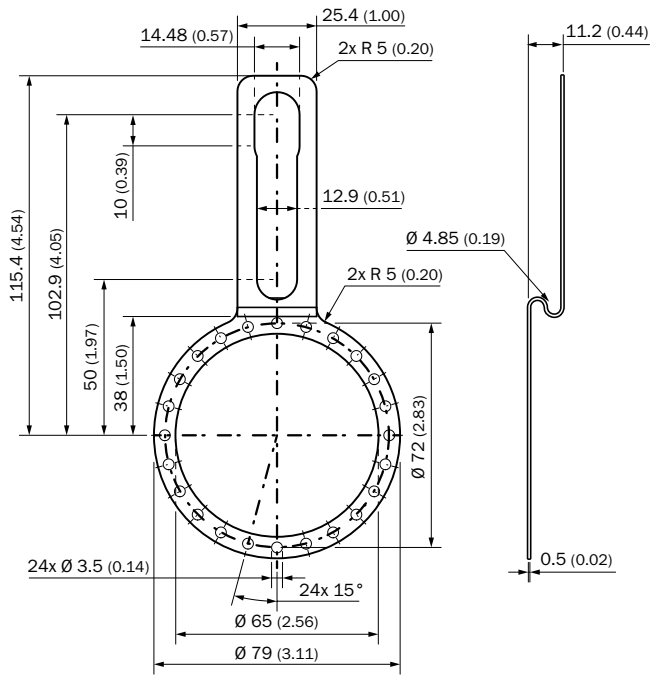
Brief description	Type	Part no.
Collet for through hollow shaft, shaft diameter 16 mm, outer diameter 30 mm	SPZ-030-016-M	2123016
Collet for through hollow shaft, shaft diameter 18 mm, outer diameter 30 mm	SPZ-030-018-M	2123017
Collet for through hollow shaft, shaft diameter 1", outer diameter 30 mm	SPZ-030-01Z-M	2123015
Collet for through hollow shaft, shaft diameter 20 mm, outer diameter 30 mm	SPZ-030-020-M	2123018
Collet for through hollow shaft, shaft diameter 24 mm, outer diameter 30 mm	SPZ-030-024-M	2123019
Collet for through hollow shaft, shaft diameter 25 mm, outer diameter 30 mm	SPZ-030-025-M	2123020
Collet for through hollow shaft, shaft diameter 28 mm, outer diameter 30 mm	SPZ-030-028-M	2123021
Collet for through hollow shaft, shaft diameter 3/4", outer diameter 30 mm	SPZ-030-034Z-M	2123014
Collet for through hollow shaft, shaft diameter 5/8", outer diameter 30 mm	SPZ-030-058Z-M	2123013
Collet for through hollow shaft, shaft diameter 30 mm, outer diameter 42 mm	SPZ-042-030-M	2123008
Collet for through hollow shaft, shaft diameter 32 mm, outer diameter 42 mm	SPZ-042-032-M	2123009
Collet for through hollow shaft, shaft diameter 35 mm, outer diameter 42 mm	SPZ-042-035-M	2123010
Collet for through hollow shaft, shaft diameter 38 mm, outer diameter 42 mm	SPZ-042-038-M	2123011
Collet for through hollow shaft, shaft diameter 40 mm, outer diameter 42 mm	SPZ-042-040-M	2123012

Dimensional drawings → [page 17](#)

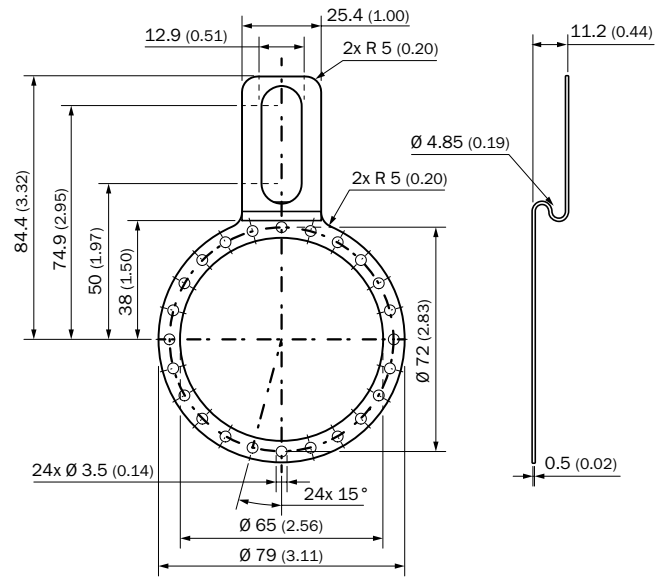
Dimensional drawings for accessories (Dimensions in mm (inch))

Flanges

DGS80-TETHER-A



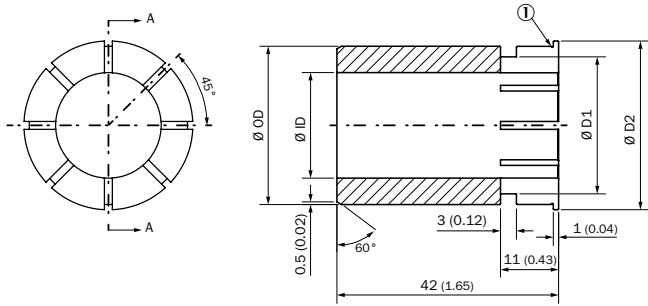
DGS80-TETHER-B





Shaft adaptation

SPZ-030-016-M, SPZ-030-018-M, SPZ-030-01Z-M, SPZ-030-020-M, SPZ-030-024-M, SPZ-030-025-M, SPZ-030-028-M, SPZ-030-034Z-M, SPZ-030-058Z-M, SPZ-042-030-M, SPZ-042-032-M, SPZ-042-035-M, SPZ-042-038-M, SPZ-042-040-M



Type	Part number	ØOD	ØID	ØD1	ØD2
SPZ-030-028-M	2123021	30 mm	28 mm	30 mm	32 mm
SPZ-030-025-M	2123020		25 mm	30 mm	
SPZ-030-024-M	2123019		24 mm	30 mm	
SPZ-030-020-M	2123018		20 mm	26 mm	
SPZ-030-018-M	2123017		18 mm	24 mm	
SPZ-030-016-M	2123016		16 mm	22 mm	
SPZ-030-01Z-M	2123015		1"	30 mm	
SPZ-030-034Z-M	2123014		3/4"	25 mm	
SPZ-030-058Z-M	2123013		5/8"	22 mm	
SPZ-042-040-M	2123012		42 mm	40 mm	
SPZ-042-038-M	2123011	38 mm		42 mm	
SPZ-042-035-M	2123010	35 mm		41 mm	
SPZ-042-032-M	2123009	32 mm		38 mm	
SPZ-042-030-M	2123008	30 mm		36 mm	



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Detailed addresses and further locations → [www.sick.com](https://www.sick.com)