

# DFV60: Incremental Measuring Wheel Encoders

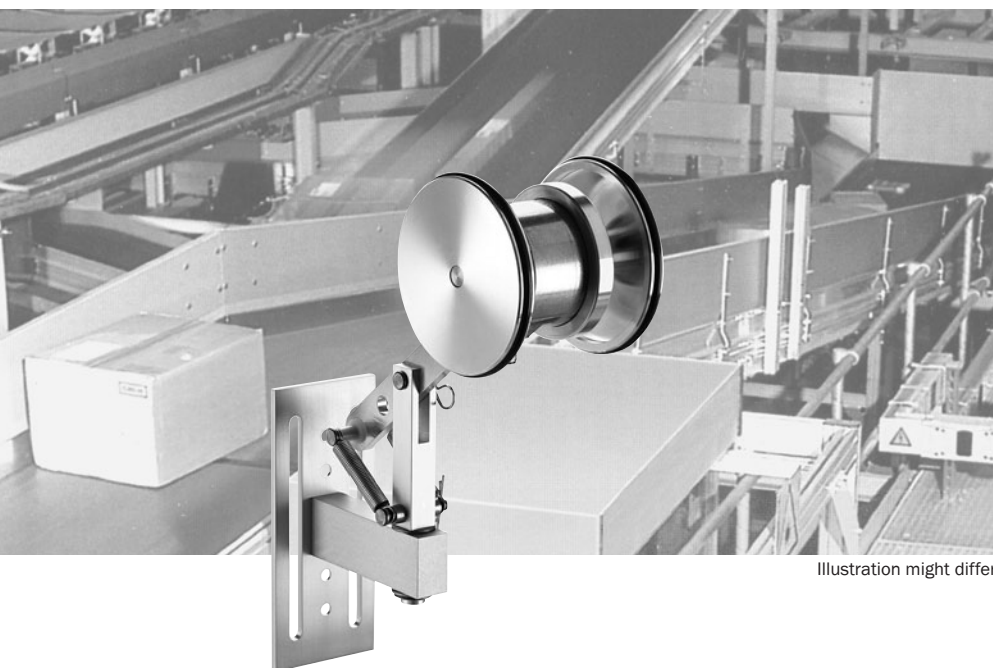


Illustration might differ

Based on the very high pitch of spring and the tractability of the spring arm is the DFV60 usable in applications with harsh environmental conditions.

Specify your own individual Measuring Wheel Encoder.

Product options:

- Electrical Interfaces
  - TTL/RS422
  - HTL/push-pull
  - TTL/HTL programmable
- Measuring wheels, surface
  - O-Ring
- Connector outlet M12
- Cable outlet 1, 5, 3 or 5 m
- Number of lines from 1 up to 65,536 programmable

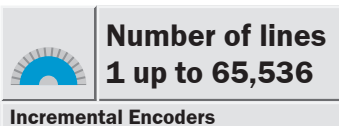
Due to the options available, applications are diverse, in areas such as


- Woodworking machinery
- Steel and shield processing machinery
- Sorting systems
- Conveyor belts
- Printing and paper

The high resolution Measuring Wheel Encoder DFV60 is a very robust and flexible solution for the direct determination of position and speed on the conveyor belt.

With a maximum of 65,536 lines, the DFV60 is unique in its class.

The DFV60 Measuring Wheel Encoder can be fitted direct to the conveyor belt, without the need of any mechanical accessories.

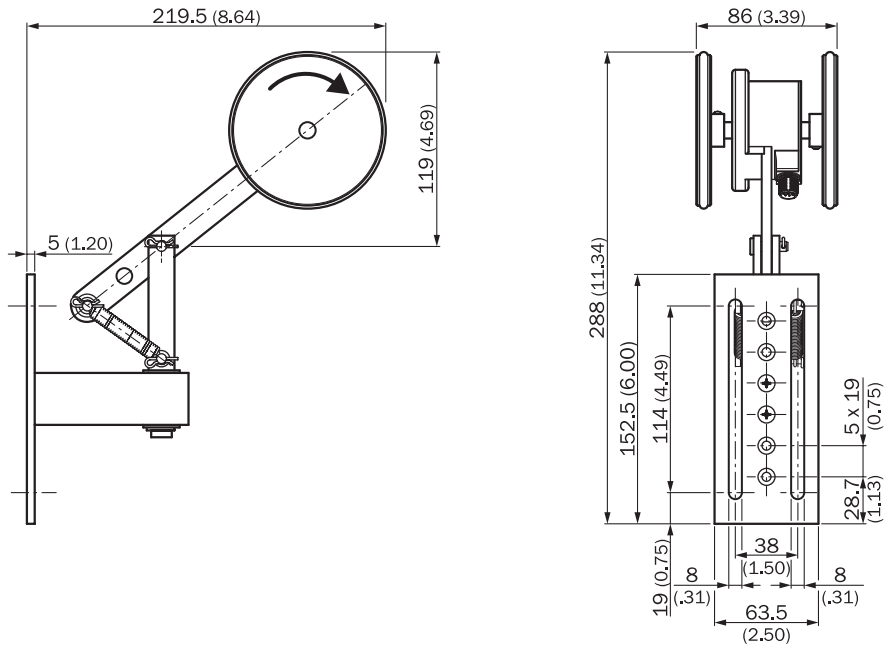


 **Number of lines**  
**1 up to 65,536**

**Incremental Encoders**

- Connector or cable outlet
- Protection class IP 65
- Electrical Interfaces TTL/HTL
- Number of lines, level of output signal and zero pulse width freely programmable

**Dimensional drawing encoder with spring arm**



All dimensions in mm (inch)

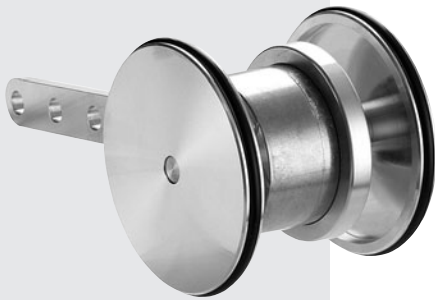
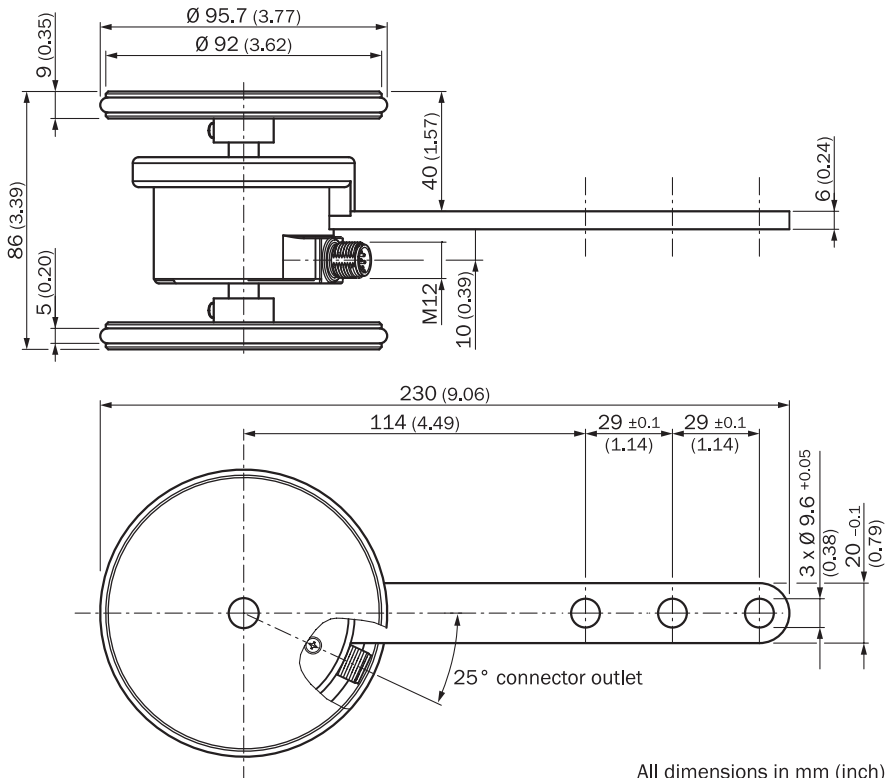


Illustration might differ

**Dimensional drawing encoder**



All dimensions in mm (inch)



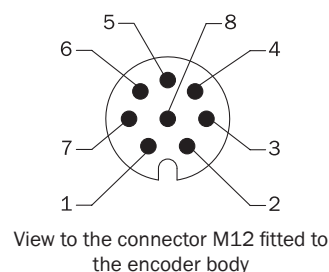
Accessories
Programming Tool (page 4)
Spring arm (page 5)
Connection systems (page 6)
Measuring wheel (page 7)

Technical data to DIN 32878		DFV60	A
<b>Electrical Interface</b>		4.5 to 32 V, TTL/HTL, programmable	
<b>Number of lines per revolution</b>		1 to 65,536	
<b>Mass</b>		0.5 kg	
<b>Reference signal</b>			
	Number	1	
	Position	90° electr., gated with A and B	
<b>Error limits</b>		± 0.03°	
<b>Measuring step deviation</b>			
	Number of lines 1 to 99	± 0.04°	
	Number of lines 100 to 10,000	± 0.008°	
	Number of lines > 10,000	± 0.002°	
<b>Max. output frequency</b>		820 KHz	
<b>Operating speed <sup>1)</sup></b>		3,000 min <sup>-1</sup>	
<b>Bearing lifetime</b>		3 x 10 <sup>9</sup> revolutions	
<b>Working temperature range</b>		-20 to +100 °C	
<b>Storage temperature range</b> (without package)		-40 to +100 °C	
<b>Permissible relative humidity <sup>2)</sup></b>		90 %	
<b>EMC</b> according to EN 61000-6-2 and EN 61000-6-4			
<b>Resistance to shock</b> (according to EN 60068-2-27)		70 g/6 ms	
<b>Resistance to vibration</b> (according to EN 60068-2-6)		30 g/10 to 2,000 Hz	
<b>Protection class</b> according to IEC 60529		IP 65	
<b>Load current</b>			
	4.5 to 32 V, TTL/HTL, programmable	30 mA	
<b>No load operating current</b>			
	4.5 to 32 V, TTL/HTL, programmable	40 mA	
<b>Initialisation time after power on</b>			
	4.5 to 32 V, TTL/HTL, programmable	Max. 30 ms	
<b>Preload spring arm</b>		20 mm	
<b>Spring deflection spring arm</b>		40 mm	

<sup>1)</sup> Self warming 3.3 K/1,000 min<sup>-1</sup> when applying, note working temperature range

<sup>2)</sup> Condensation of the optical scanning not permitted

#### Pin and wire allocation, cable 8-core



PIN, 8-pin, M12 connector	Colour of wires	Signal TTL, HTL	Explanation
1	Brown	$\bar{A}$	Signal line
2	White	A	Signal line
3	Black	$\bar{B}$	Signal line
4	Pink	B	Signal line
5	Yellow	$\bar{Z}$	Signal line
6	Lilac	Z	Signal line
7	Blue	GND	Ground connection of the encoder
8	Red	+U <sub>S</sub>	Supply voltage (potential free to housing)
Screen	Screen	Screen	Screen on the encoder side connected to the housing. On the control side connected to earth.

## Programming Tool

### Programming Tool for DFV60

Type	Part no.
PGT-08-S	1036616

For programming SICK incremental encoders with M12 connectors the following adapter cable is appropriate.

Adapter cable PGT-08-S incremental with cable connector SUB-D 9-pin male and cable connector M13 8-pin female, ready-made with cable 8-core, 4 x 2 x 0.08 mm<sup>2</sup>, with screening, cable length 0.5 m

Type	Part no.
DSL-2D08-G0M5AC3	2046579

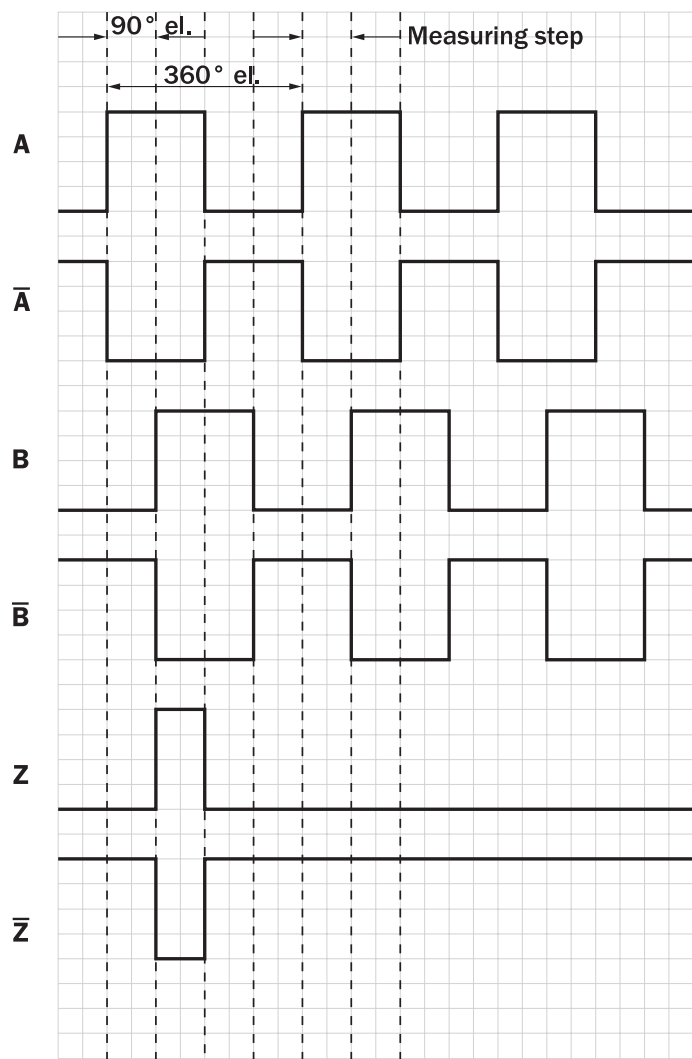


### Caution:

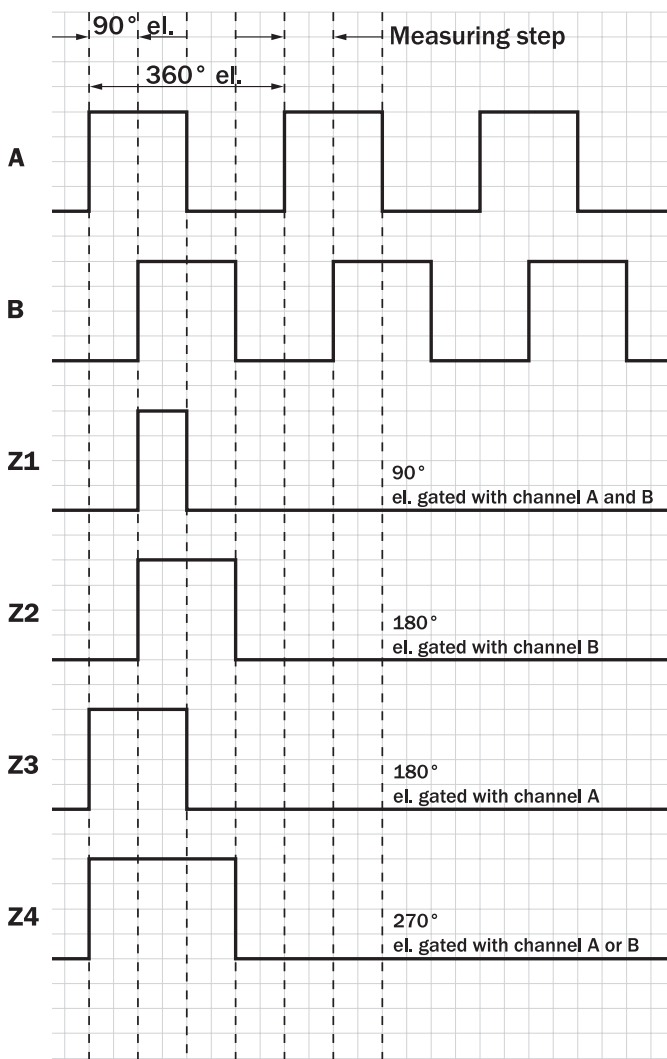
Attempting to programme an incremental encoder with the adapter cables intended for use with the absolute encoders will cause damage to the incremental encoder. Please ensure the correct adapter cable is used!

## Incremental pulse diagram

## Zero pulse width 90°, 180° or 270° programmable



CCW with view on the measuring wheel, see dimensional drawing.



CCW with view on the measuring wheel, see dimensional drawing.

## Order information

Point 1	Point 2	Point 3	Point 4	Point 5	Point 6	Point 7	Point 8	Point 9	Point 10	Point 11	Point 12	Point 13	Point 14	Point 15	Point 16
<b>D</b>	<b>F</b>	<b>V</b>	<b>6</b>	<b>0</b>	<b>A</b>	<b>-</b>	<b>2</b>	<b>2</b>	<b>P</b>		<b>6</b>	<b>5</b>	<b>5</b>	<b>3</b>	<b>6</b>

Type	Mechanical version	Measuring wheels, surface	Electrical interface	Connection type	Number of lines
Advanced = <b>A</b>	2 measuring wheels, Ø 95.7 mm = <b>2</b>	O-Ring NBR70 = <b>2</b>	4.5 to 32 V, TTL/HTL, programmable = <b>P</b>	Male connector M12, 8-pin, radial = <b>C</b> Cable 8-wire, universal 1.5 m = <b>K</b> Cable 8-wire, universal 3 m = <b>L</b> Cable 8-wire, universal 5 m = <b>M</b>	

## DFV60 (preset level of output signal: TTL)

Type	Part no.
DFV60A-22PC65536	1051309
DFV60A-22PK65536	1051331
DFV60A-22PL65536	1051334
DFV60A-22PM65536	1051337

## DFV60 spring arm (please order separately)

Type	Part no.
DFV60 spring arm	2056155



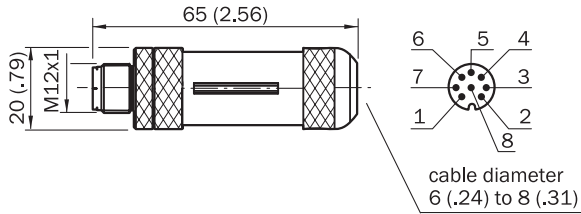
Connection systems

Dimensional drawings and order information

Round screw system M12

Male connector M12, 8-pin, straight, screened, for field assembly

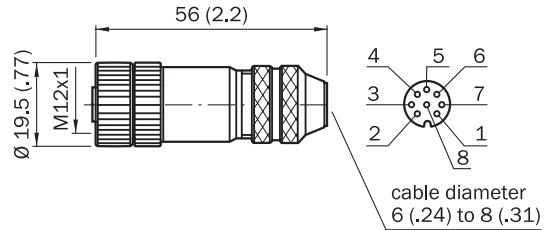
Type	Part no.	Contacts/cable diameter
STE-1208-GA	6028370	8/6 to 8 mm



All dimensions in mm (inch)

Female connector M12, 8-pin, straight, screened, for field assembly

Type	Part no.	Contacts/cable diameter
DOS-1208-GA	6028369	8/6 to 8 mm

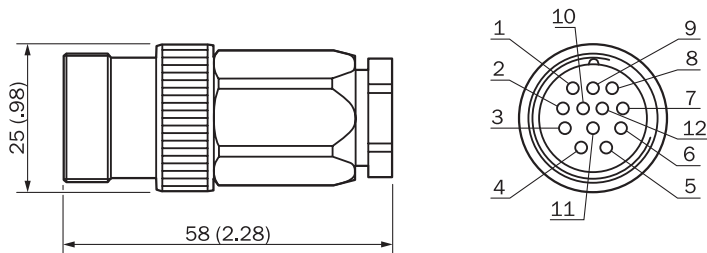


All dimensions in mm (inch)

Round screw system M23, 12-pin

Male connector M23, 12-pin, straight, screened

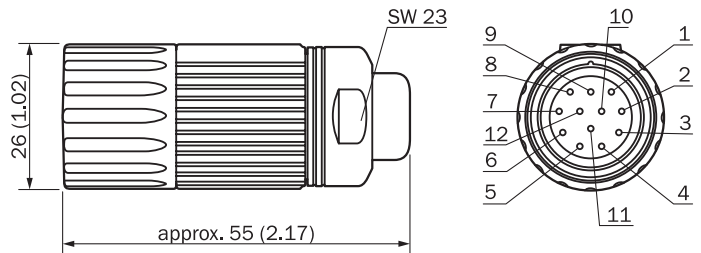
Type	Part no.	Contacts
STE-2312-G	6027537	12



All dimensions in mm (inch)

Female connector M23, 12-pin, straight, screened

Type	Part no.	Contacts
DOS-2312-G	6027538	12

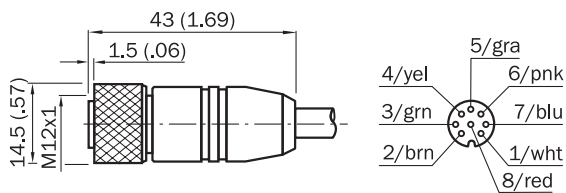


All dimensions in mm (inch)

Part-assembled cables

Female connector M12, 8-pin, straight, pre-wired with cable 8-wire, 4 x 2 x 0.25 mm<sup>2</sup>, screened, suitable for use in a drag chain

Type	Part no.	Contacts	Cable length
DOL-1208-G02MAC1	6032866	8	2.0 m
DOL-1208-G05MAC1	6032867	8	5.0 m
DOL-1208-G10MAC1	6032868	8	10.0 m
DOL-1208-G20MAC1	6032869	8	20.0 m



All dimensions in mm (inch)

**Part-assembled cables**

**Female connector M23, 12-pin, straight, cable 11-core, 4 x 2 x 0.25 + 2 x 0.5 + 1 x 0.14 mm<sup>2</sup> with screening, cable diameter 7.8 mm**

Type	Part no.	Contacts	Cable length
DOL-2312-G02MLA3	2030682	12	2.0 m
DOL-2312-G07MLA3	2030685	12	7.0 m
DOL-2312-G10MLA3	2030688	12	10.0 m
DOL-2312-G15MLA3	2030692	12	15.0 m
DOL-2312-G20MLA3	2030695	12	20.0 m
DOL-2312-G25MLA3	2030699	12	25.0 m
DOL-2312-G30MLA3	2030702	12	30.0 m

**Female connector M23, 12-pin, straight, cable 12-core, 4 x 2 x 0.25 + 2 x 0.5 + 2 x 0.14 mm<sup>2</sup> with screening, suitable for use in a drag chain, cable diameter 7.8 mm**

Type	Part no.	Contacts	Cable length
DOL-2312-G1M5MA3	2029212	12	1.5 m
DOL-2312-G03MMA3	2029213	12	3.0 m
DOL-2312-G05MMA3	2029214	12	5.0 m
DOL-2312-G10MMA3	2029215	12	10.0 m
DOL-2312-G20MMA3	2029216	12	20.0 m
DOL-2312-G30MMA3	2029217	12	30.0 m

**Cables**

**Cable 8-core, per metre, 4 x 2 x 0.15 mm<sup>2</sup>, with screening, cable diameter 5.6 mm, suitable for use in a drag chain**

Type	Part no.	Cores
LTG-2308-MWENC	6027529	8

**Cable 11-core, per metre, 4 x 2 x 0.25 + 2 x 0.5 + 1 x 0.14 mm<sup>2</sup>, with screening, cable diameter 7.5 mm**

Type	Part no.	Cores
LTG-2411-MW	6027530	11

**Cable 12-core, per metre, 4 x 2 x 0.25 + 2 x 0.5 + 2 x 0.14 mm<sup>2</sup>, with screening, suitable for use in a drag chain, cable diameter 7.8 mm**

Type	Part no.	Cores
LTG-2512-MW	6027531	12

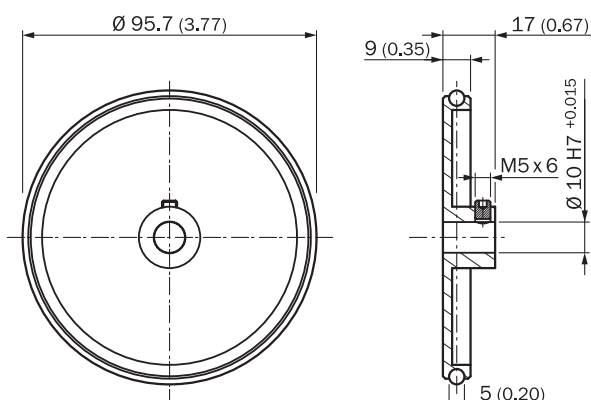
**Cable 12-core, per metre, 4 x 2 x 0.25 + 2 x 0.5 + 2 x 0.14 mm<sup>2</sup>, with screening, suitable for use in a drag chain, UV and salt water resistant, cable diameter 7.8 mm**

Type	Part no.	Cores
LTG-2612-MW	6028516	12

**Measuring wheels**

**Measuring wheel**

Type	Part no.	Circumference	Surface
BEF-MR-010030	2049278	0.3 m	O-Ring NBR70



All dimensions in mm (inch)

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