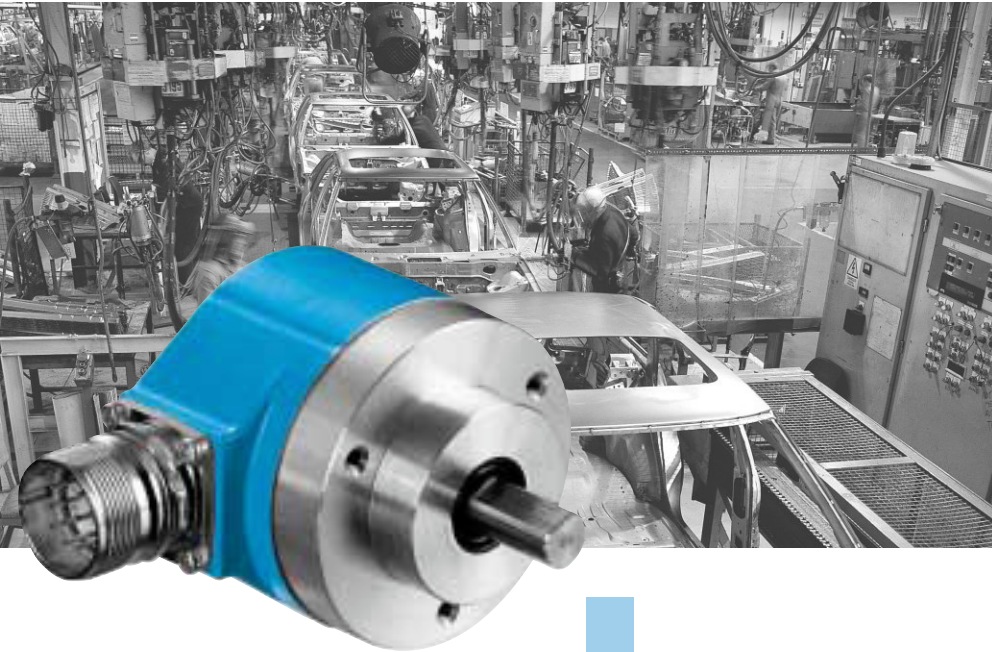


# DGS 60, DGS 65 and DGS 66: Incremental Encoders for rough environmental conditions



Select your individual encoder -  
Possible product variants:  
6 and 10 mm solid shafts with  
servo flange or face mount flange,  
through or blind hollow shafts with  
connector or cable outlet, TTL or  
HTL interface.

Thanks to this wide variety of  
products, there are numerous  
possible uses, for example in:

- machine tools
- textile machines
- woodworking machines
- packaging machines

	<p><b>Number of lines</b> <b>100 to 10.000</b></p>
<p><b>Incremental Encoder</b></p>	

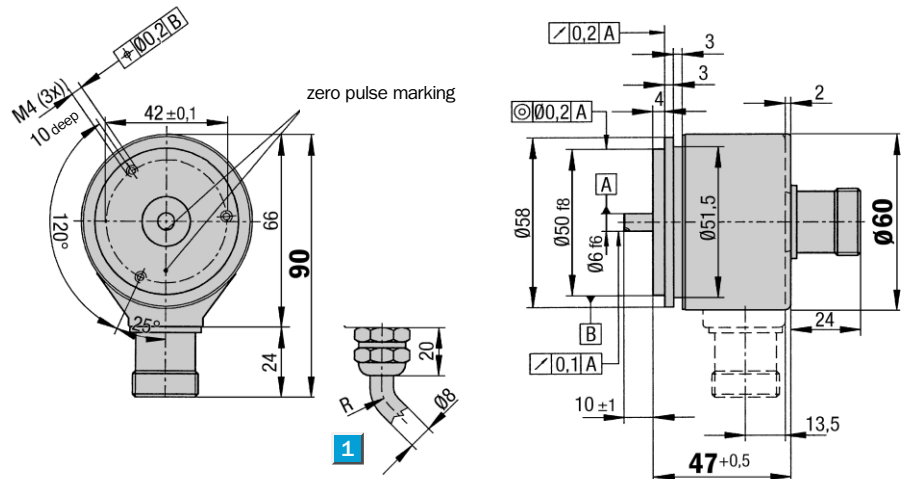
Incremental encoders in the  
DGS 60, DGS 65 and DGS 66  
series are in use world-wide  
under the toughest environmental  
conditions.  
The rugged construction - up to  
IP 67 degree protection - and the  
individual adaptation of the  
design to the requirements of  
the user are the outstanding  
features of this series.  
Resolutions up to 10.000 lines  
are available.

**Number of lines**  
**100 to 10.000**

Incremental Encoder

- Servo-/ and face mount flange
- Connector-/and cable outlet
- Protection class up to IP 67
- Electrical Interfaces  
TTL and HTL

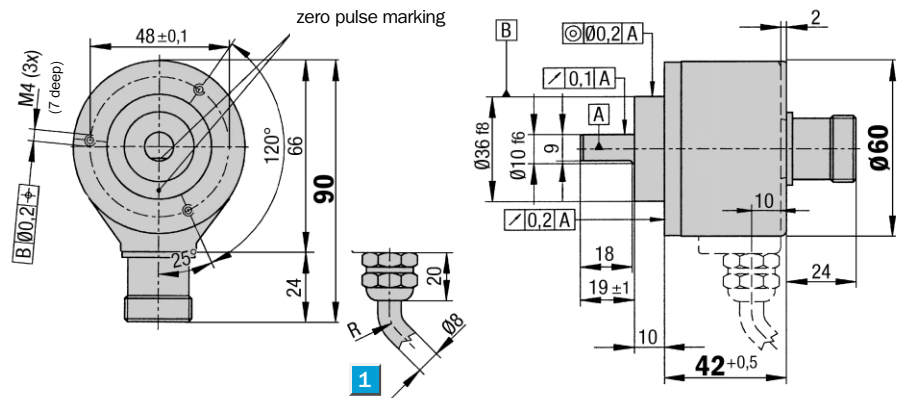
## Dimensional drawing servo flange



1 R = bending radius min. 40 mm

General tolerances according to DIN ISO 2768-mk

## Dimensional drawing face mount flange

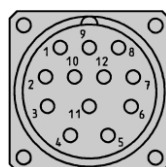


1 R = bending radius min. 40 mm

General tolerances according to DIN ISO 2768-mk

## PIN- and cable core allocation

PIN	Signal HTL	Signal TTL	Core colour (cable outlet)	Explanation
1	N.C.	$\bar{B}$	black	Signal line
2	N.C.	Sense +	grey	Connected internally to Us
3	Z	Z	lilac	Signal line
4	N.C.	$\bar{Z}$	yellow	Signal line
5	A	A	white	Signal line
6	N.C.	$\bar{A}$	brown	Signal line
7	N.C.	N.C.	orange	N.C.
8	B	B	pink	Signal line
9	Screen	Screen		Housing potential
10	GND	GND	blue	Ground connection
11	N.C.	Sense -	green	Connected internally to ground
12	Us	Us	red	Power supply <sup>1)</sup>



View of the connector M 23 fitted to the encoder body

<sup>1)</sup> Potential free to housing

N.C. = Not Connected



### Accessories

- Connection systems
- Mounting systems

Technical Data		DGS 60	Flange type							
			servo	face m.						
<b>Solid shaft</b>	10 mm									
	6 mm									
<b>Number of lines (Z) per revolution</b>	00100 to 10.000 see order info									
<b>Attention: number of lines &gt; 5000</b>	only with TTL 4...6V									
<b>Electrical Interface</b>	TTL / RS 422, 6-channel									
	HTL / push-pull, 3-channel (A, B, Z)									
<b>Mass <sup>1)</sup></b>	approx. 0.3 kg									
<b>Moment of inertia of the rotor</b>										
Servo flange	13 gcm <sup>2</sup>									
Face mount flange	25 gcm <sup>2</sup>									
<b>Measuring step</b>	90° / number of lines									
<b>Reference signal</b>										
Number	1									
Position	90° electr. & logically interlocked with A+B									
<b>Error limits</b>										
100 ≤ Z < 1250	45 / Z + 0.054°									
1250 < Z ≤ 10000	45 / Z + 0.039°									
<b>Measuring step deviation</b>	45 / Z Grad									
<b>Max. output frequency</b>										
TTL	300 kHz (600 at > 5000 lines)									
HTL	200 kHz									
<b>Max. operating speed <sup>2)</sup></b>										
with shaft seal	6.000 min <sup>-1</sup>									
without shaft seal	10000 min <sup>-1</sup>									
<b>Max. angular acceleration</b>	5 x 10 <sup>5</sup> rad/s <sup>2</sup>									
<b>Operating torque</b>										
with shaft seal	1 Ncm									
without shaft seal	0.1 Ncm									
<b>Start up torque</b>										
with shaft seal	1.5 Ncm									
without shaft seal	0.2 Ncm									
<b>Permissible shaft loading</b>										
Servo flange Radial / Axial	20 N / 10 N									
Face mount flange Radial / Axial	40 N / 20 N									
<b>Bearing lifetime</b>	3.6 x 10 <sup>10</sup> revolutions									
<b>Working temperature range</b>	- 20° ... + 85° C									
<b>Storage temperature range</b>	- 30° ... + 85° C									
<b>Permissible relative humidity <sup>3)</sup></b>	90 %									
<b>EMC <sup>4)</sup></b>										
<b>Resistance</b>										
to shocks <sup>5)</sup>	30 / 11 g/ms									
to vibration <sup>6)</sup>	20 / 10 ... 150 g/Hz									
<b>Protection class acc. IEC 60529 <sup>7)</sup></b>										
Housing side	IP 67									
Flange side	IP 65									
<b>Operating voltage range</b>										
load current TTL / RS 422, 4...6V	max. 20 mA									
TTL / RS 422, 10...30V	max. 20 mA									
HTL / push-pull	max. 60 mA									
<b>Operating voltage range at no load</b>										
at 24 V	100 mA									
at 5 V	120 mA									

<sup>1)</sup> for an encoder with connector outlet

<sup>3)</sup> condensation not permitted


<sup>5)</sup> acc. to DIN IEC 68 part 2-27

<sup>2)</sup> At speeds > 6000 rpm the shaft seal must be removed

<sup>4)</sup> acc. DIN EN 61000-6-4 and DIN EN 61000-6-1

<sup>6)</sup> acc. to DIN IEC 68 part 2-6

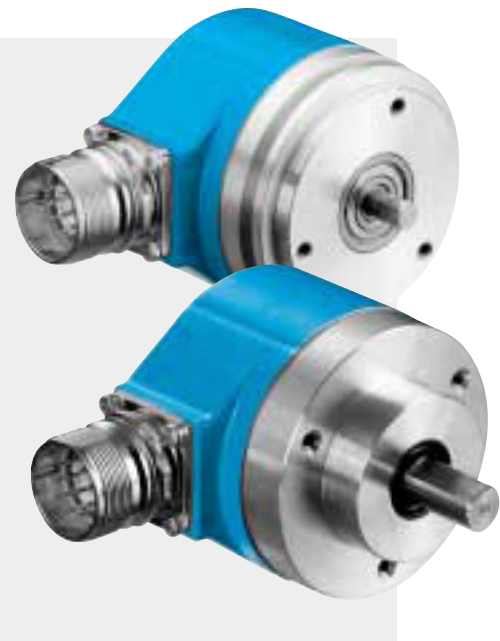
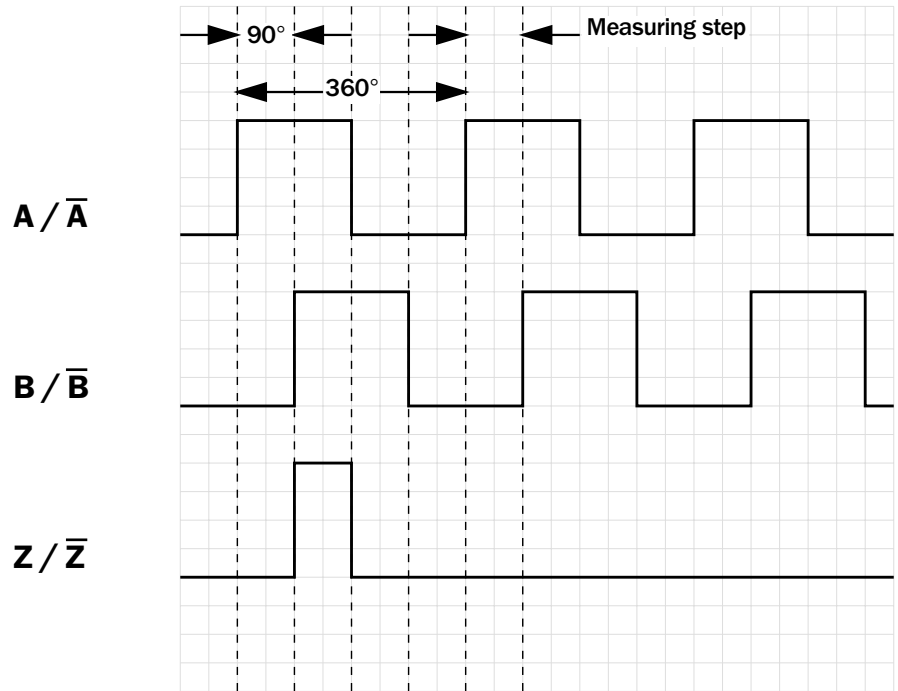
<sup>7)</sup> with mating connector fitted

 **Number of lines**  
**100 to 10.000**

Incremental Encoder

- Servo-/ and face mount flange
- Connector-/and cable outlet
- Protection class up to IP 67
- Electrical Interfaces  
TTL and HTL

## Incremental pulse diagram

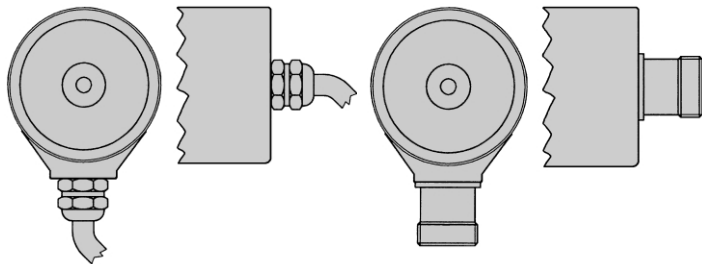


## Electrical interfaces

Supply voltage	4...6 V	10...30 V	10...30 V
Interfaces/drivers	TTL (RS 422)	TTL (RS 422)	HTL (push-pull)

## Connection type

- Cable radial   
  Cable axial   
  Connector radial   
  Connector axial



<b>Accessories</b>
Connection systems
Mounting systems

**Order information**

**Incremental Encoder DGS 60, solid shaft**

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
<b>D</b>	<b>G</b>	<b>S</b>	<b>6</b>	<b>0</b>	<b>-</b>								

<b>Electrical interface</b>	<b>Mechanical Interface</b>	<b>Connection type</b>	<b>Number of lines</b>
4...6 V, TTL (RS 422) = <b>A</b>	Servo flange, shaft 6 mm = <b>1</b>	Connector M23, 12 pin., radial = <b>A</b>	Always 5 characters in clear text <b>1</b>
10...30 V, TTL (RS 422) = <b>C</b>	Face mount flange, shaft 10 mm = <b>4</b>	Connector M23, 12 pin., axial = <b>B</b>	
10...30 V, HTL (push-pull) = <b>G</b>		Cable 11 core, radial 1.5 m = <b>K</b>	
		Cable 11 core, radial 3 m = <b>L</b>	
		Cable 11 core, radial 5 m = <b>M</b>	
		Cable 11 core, axial 1.5 m = <b>R</b>	
		Cable 11 core, axial 3 m = <b>S</b>	
		Cable 11 core, axial 5 m = <b>T</b>	

**1 Number of lines (Z) per revolution**

00100	00250	00500	00720	01024	02000	04000	07200 <sup>1)</sup>
00125	00256	00512	00750	01200	02048	04096	08000 <sup>1)</sup>
00150	00300	00570	00800	01250	02500	04500	08192 <sup>1)</sup>
00160	00314	00600	00900	01500	03000	05000	09000 <sup>1)</sup>
00180	00360	00625	01000	01800	03600	06000 <sup>1)</sup>	10000 <sup>1)</sup>
00200	00400	00700					

<sup>1)</sup> only possible with interface 4...6 V, TTL (RS 422) = A

**Order example: Incremental Encoder DGS 60**

**4...6 V, TTL; servo flange; connector M23, 12 pin, radial; number of lines: 360**

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
<b>D</b>	<b>G</b>	<b>S</b>	<b>6</b>	<b>0</b>	<b>-</b>	<b>A</b>	<b>1</b>	<b>A</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>6</b>	<b>0</b>

**Please enter your individual encoder here**

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
<b>D</b>	<b>G</b>	<b>S</b>	<b>6</b>	<b>0</b>	<b>-</b>								

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
<b>D</b>	<b>G</b>	<b>S</b>	<b>6</b>	<b>0</b>	<b>-</b>								

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
<b>D</b>	<b>G</b>	<b>S</b>	<b>6</b>	<b>0</b>	<b>-</b>								