

NEW


DRS61: Incremental encoders, number of lines and zero pulse width freely programmable

DRS60: Incremental Encoders with Zero-Pulse-Teach



Further highlights of this generation of encoders:

- Simple zero-pulse-teach by pressing a button located under a cap on the rear of the encoder
- Excellent price/performance ratio
- Long LED lifetime as a result of automatic light regulation
- Maximum reliability as a result of opto-ASICs with Chip-on-Board technology
- Interchangeable collets for hollow shaft diameters from 6 to 15 mm and 1/4, 3/8, 1/2 inch.

	Number of lines 1 up to 8,192
Incremental Encoder	

CoreTech[®]
by **SICK** | **STEGMANN**

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CoreTech technology permits tailor-made solutions for every application, due to its modular design.

With DRS61 incremental encoders, the number of lines from 1 to 8,192 and the width of the zero pulse can be freely programmed **by the customer**. Therefore, they will be of particular interest to end users, distributors, consulting engineers and system integrators.

DRS60 incremental encoders are available with any desired number of lines between 1 and 8,192.

Whether with face mount flange, servo flange, blind or through hollow shaft with connector or cable outlet, TTL or HTL interface – DRS60/61 encoders will meet virtually any application profile.

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

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

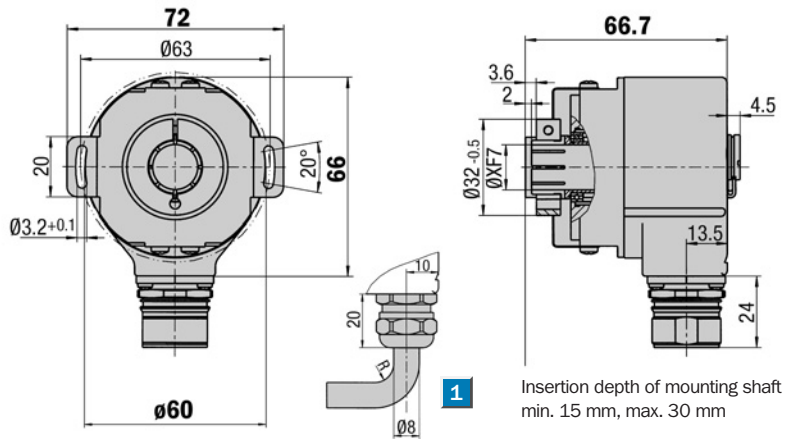
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Number of lines
1 up to 8,192

Incremental Encoder

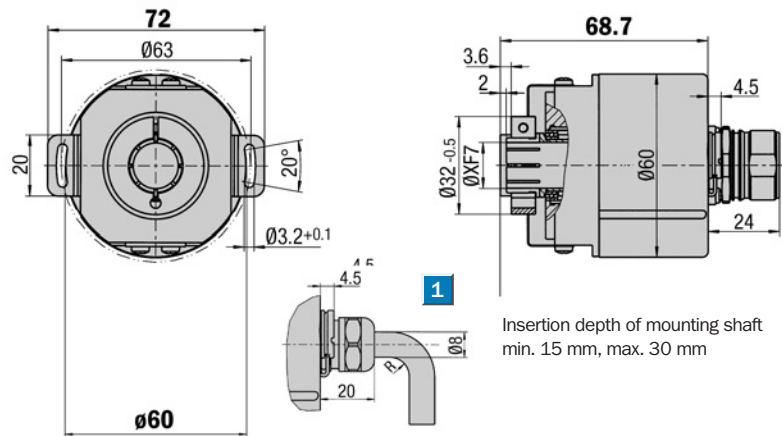
- Connector or cable outlet
- Protection class up to IP 66
- Electrical interfaces
TTL and HTL
- Zero-Pulse-Teach via pressing a button
- DRS61: number of lines and zero pulse width can be freely programmed by the customer

Dimensional drawing blind hollow shaft radial



1 R = bending radius min. 40 mm General tolerances according to DIN ISO 2768-mk

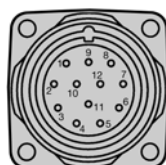
Dimensional drawing blind hollow shaft axial



1 R = bending radius min. 40 mm General tolerances according to DIN ISO 2768-mk

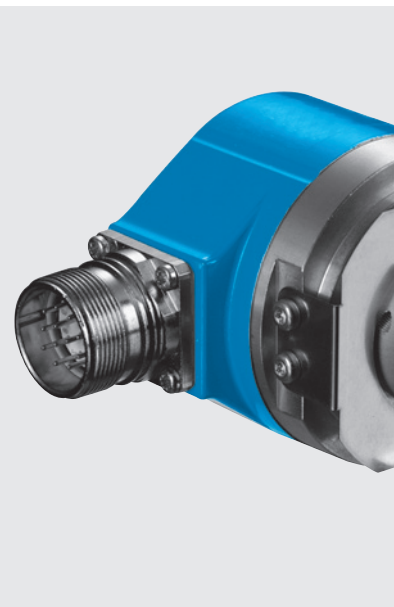
PIN and wire allocation/cable 11 core

PIN	Signal	Wire colour (Cable outlet)	Explanation
1	\bar{B}	black	Signal line
2	Sense +	grey	Connected internally to U_s
3	Z	lilac	Signal line
4	\bar{Z}	yellow	Signal line
5	A	white	Signal line
6	\bar{A}	brown	Signal line
7	N. C.	orange	Not connected
8	B	pink	Signal line
9	Screen		Housing potential
10	GND	blue	Zero volt connected to the encoder
11	Sense -	green	Connected internally to GND
12	U_s	red	Supply voltage ¹⁾



View of the connector M23 fitted to the encoder body

¹⁾ Potential free to housing
 N. C. =
 Not connected



Accessories

Connection systems
Mounting systems
Collets
Programming Tool

Technical Data acc. to DIN 32878		DRS60/DRS61 blind hollow shaft								Flange type	
		blind									
Hollow shaft diameter	6, 8, 10, 12, 15 mm, 1/4", 3/8", 1/2"										
Number of lines per revolution	00001 up to 08192, see order info										
Electrical Interface	TTL/RS 422, 6-channel										
	HTL/push-pull, 6-channel										
Mass ¹⁾	Approx. 0.3 kg										
Moment of inertia of the rotor	See Fig. 1										
Measuring step	90°/number of lines										
Reference signal											
Number	1										
Position ²⁾	90° or 180°										
Error limits											
binary number of lines	0.035°										
non-binary number of lines	0.046°										
Measuring step deviation											
binary number of lines	0.005°										
non-binary number of lines	0.016°										
Max. output frequency											
TTL	820 kHz										
HTL	200 kHz										
Operating torque max.	3,000 min ⁻¹										
Max. angular acceleration	5 x 10 ⁵ rad/s ²										
Operating torque	Typ. 0.4 Ncm										
Start up torque	Typ. 0.6 Ncm										
Permissible movement of the drive element											
radial static/dynamic movement	± 0.3/± 0.1 mm										
axial static/dynamic movement	± 0.5/± 0.2 mm										
Bearing lifetime	3.6 x 10 ⁹ revolutions										
Working temperature range	- 20 ... + 85 °C										
Storage temperature range	- 40 ... + 100 °C										
Permissible relative humidity ³⁾	90 %										
EMC ⁴⁾											
Resistance											
to shocks ⁵⁾	50/11 g/ms										
to vibration ⁶⁾	20/10 ... 2000 g/Hz										
Protection class IEC 60529											
Connector outlet ⁷⁾	IP 65										
Cable outlet	IP 66										
Operating voltage range											
Load current TTL/RS 422, 4.5 ... 5.5 V Max. 20 mA											
TTL/RS 422, 10 ... 32 V Max. 20 mA											
HTL/push-pull, 10 ... 32 V Max. 60 mA											
No-load operating current											
at 10 ... 32 V	Typ. 100 mA										
at 5 V	Typ. 120 mA										
Operation of zero-set ⁸⁾	≥ 100 ms										
Initialisation time after power on	40 ms										

¹⁾ Concerning encoder with connector

²⁾ Electrical, logically linked to A and B

³⁾ Condensation of the optical scanning not permitted

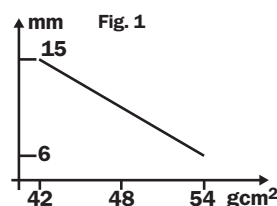
⁴⁾ To DIN EN 61000-6-2 and DIN EN 61000-6-3

⁵⁾ To DIN EN 60068-2-27

⁶⁾ To DIN EN 60068-2-6

⁷⁾ With mating connector fitted

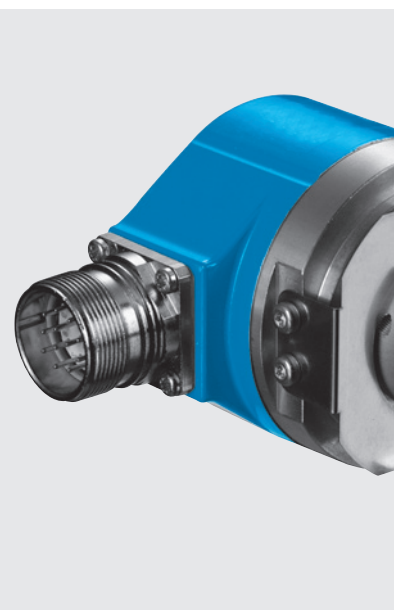
⁸⁾ Only with shaft stationary



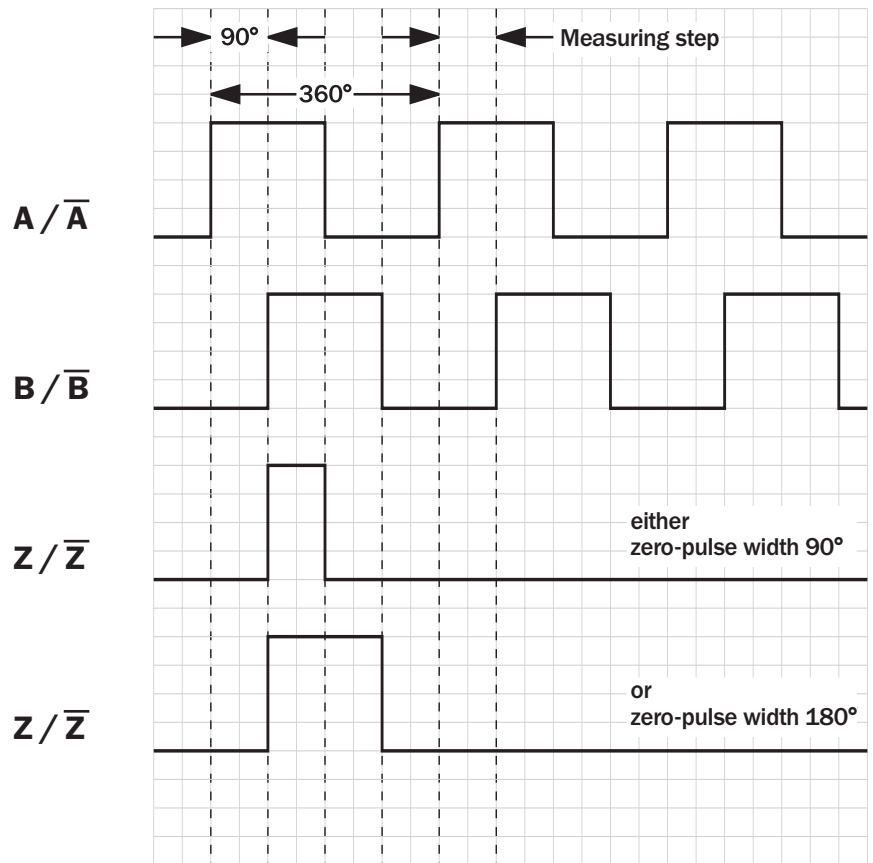
Number of lines
1 up to 8,192

Incremental Encoder

- Connector or cable outlet
- Protection class up to IP 66
- Electrical interfaces
TTL and HTL
- Zero-Pulse-Teach via pressing a button
- DRS61: number of lines and zero pulse width can be freely programmed by the customer



Incremental pulse diagram

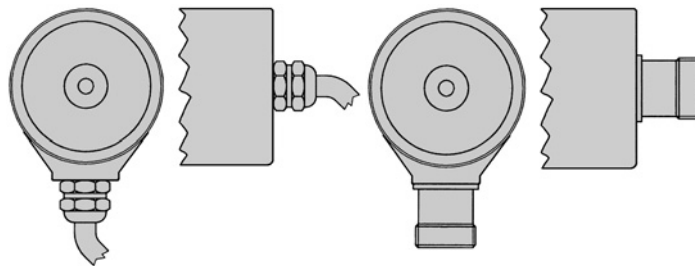


Electrical interface

Supply voltage	4.5 ... 5.5 V	10 ... 32 V	10 ... 32 V
Interfaces/drivers	TTL (RS 422)	TTL (RS 422)	HTL (push-pull)

Connection type

Cable radial	Cable axial	Connector radial	Connector axial
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Accessories

Connection systems
Mounting systems
Collets
Programming Tool



Order information

Incremental Encoder DRS60, blind hollow 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
D	R	S	6	0	-		A						

Electrical interface	
4.5 ... 5.5 V, TTL/RS 422 Zero-pulse width 90°	= A
4.5 ... 5.5 V, TTL/RS 422 Zero-pulse width 180°	= B
10 ... 32 V, TTL/RS 422 Zero-pulse width 90°	= C
10 ... 32 V, TTL/RS 422 Zero-pulse width 180°	= D
10 ... 32 V, HTL/push-pull Zero-pulse width 90°	= E
10 ... 32 V, HTL/push-pull Zero-pulse width 180°	= F

Mechanical interface	
Blind hollow shaft ¹⁾	= A

¹⁾ Collets for 6, 8, 10, 12 mm and 1/4", 3/8" and 1/2" as accessories, separate order item (see below).
For 15 mm shaft diameter, collet is not needed.

Connection type	
Connector M23, 12 pin, radial	= A
Connector M23, 12 pin, axial	= B
Cable 11 core, radial 1.5 m	= K
Cable 11 core, radial 3 m	= L
Cable 11 core, radial 5 m	= M
Cable 11 core, radial 10 m	= N
Cable 11 core, axial 1.5 m	= R
Cable 11 core, axial 3 m	= S
Cable 11 core, axial 5 m	= T
Cable 11 core, axial 10 m	= U

Number of lines	
Each number of lines from 00001 up to 08192 possible.	
Always 5 characters in clear text.	

Order example Incremental Encoder DRS60

4.5 ... 5.5 V, TTL/RS 422 zero-pulse width 90°; blind hollow shaft; 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
D	R	S	6	0	-	A	A	A	0	0	3	6	0



Incremental-Encoder DRS61 blind hollow shaft (number of lines and zero pulse width can be freely programmed by the customer) ¹

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
D	R	S	6	1	-		A		0	8	1	9	2

Electrical interface	
4.5 ... 5.5 V, TTL/RS 422	= A
10 ... 32 V, TTL/RS 422	= C
10 ... 32 V, HTL/push-pull	= E

Mechanical interface	
Blind hollow shaft ¹⁾	= A

¹⁾ Collets for 6, 8, 10, 12 mm and 1/4", 3/8" and 1/2" as accessories, separate order item (see below).
For 15 mm shaft diameter, collet is not needed.

Connection type	
Connector M23, 12 pin, radial	= A
Connector M23, 12 pin, axial	= B
Cable 11 core, radial 1.5 m	= K
Cable 11 core, axial 1.5 m	= R

Number of lines	
Factory-programmed to 8,192.	

Order example Incremental Encoder DRS61

4.5 ... 5.5 Volt, TTL/RS 422; blind hollow shaft; connector M23, 12 pin, radial; number of lines: 8,192 (factory-programmed)

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
D	R	S	6	1	-	A	A	A	0	8	1	9	2

¹ Please order programming tool separately (see accessories page 18)

Blind hollow shaft collets

Type	Part no.	Shaft diameter
SPZ-006-AD-A	2029174	6 mm
SPZ-1E4-AD-A	2029175	1/4"
SPZ-008-AD-A	2029176	8 mm
SPZ-3E8-AD-A	2029177	3/8"
SPZ-010-AD-A	2029178	10 mm
SPZ-012-AD-A	2029179	12 mm
SPZ-1E2-AD-A	2029180	1/2"