

Technical data sheet

Rotary encoder Series Information

Part no.: 90000460

EI30-P 100 HO

Contents

- Technical data
- Part number code



For illustration purposes only

Encoder series	EI 100 HO
Encoder_Basic principle	incremental
Encoder_Operating principle	optically interpolated
Encoder_Flange diameter	Ø 100 mm
Encoder_Flange type	Hollow shaft
Encoder_Solid shaft/Hollow shaft	Hollow shaft
Encoder_Shaft diameter	Ø 25 mm
	Ø 28 mm
	Ø 30 mm
	Ø 32 mm
	Ø 38 mm
	Ø 40 mm
	Ø 42 mm
	Ø 45 mm
Encoder_Supply voltage	10 ... 30V DC
	4.75 ... 5.5 V DC
	5 – 30V DC
Encoder_Output circuit	1 Vss Sin/Cos
	HTL
	HTL, inv.
	TTL
	TTL, RS422 compatible, inv.
Encoder_Pulse count	10240 I/U
	16384 I/U
	20480 I/U
	4096 I/U
	8192 I/U

Technical data

Encoder EI30 P 100 HO

Resolution

Pulses per revolution PPR	up to 20480 PPR
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Mechanical Data

Flange	hollow shaft (through-bored)
Flange material	aluminum
Housing material	aluminum, powder coated
Torque supports	incl. 1 torque support
- 1. Spring plate compensation	axial: ± 0.8 mm [0.0315"], radial: ± 0.2 mm [0.0079"]
Flange diameter	$\varnothing$ 100 mm [$\varnothing$ 3.543"]

Shaft(s)

Shaft material	stainless steel
Starting torque	approx. 1.5 Ncm [2.124 in-ozf] at ambient temperature
Fixing	2 x M4, DIN 913; Starting torque: 2,5 Nm

Shaft	$\varnothing$ 25 mm [$\varnothing$ 0.984"]
Shaft length	L: 42 mm [1.654"]
Insertion depth min.	52 mm [2.047"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]

Shaft	$\varnothing$ 28 mm [$\varnothing$ 1.102"]
Shaft length	L: 42 mm [1.654"]
Insertion depth min.	52 mm [2.047"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]

Shaft	$\varnothing$ 30 mm [$\varnothing$ 1.181"]
Shaft length	L: 42 mm [1.654"]
Insertion depth min.	52 mm [2.047"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]

Shaft	$\varnothing$ 32 mm [$\varnothing$ 1.26"]
Shaft length	L: 42 mm [1.654"]
Insertion depth min.	52 mm [2.047"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	100 N [10.197 kp]

Shaft	$\varnothing$ 38 mm [$\varnothing$ 1.496"]
Shaft length	L: 42 mm [1.654"]
Insertion depth min.	52 mm [2.047"]
Max. Permissible shaft loading radial	200 N [20.394 kp]

Max. Permissible shaft loading axial	100 N [10.197 kp]
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Shaft	$\varnothing$ 40 mm [$\varnothing$ 1.575"]
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Shaft length	L: 42 mm [1.654"]
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Insertion depth min.	52 mm [2.047"]
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Max. Permissible shaft loading radial	200 N [20.394 kp]
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Max. Permissible shaft loading axial	100 N [10.197 kp]
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Shaft	$\varnothing$ 42 mm [$\varnothing$ 1.654"]
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Shaft length	L: 42 mm [1.654"]
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Insertion depth min.	52 mm [2.047"]
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Max. Permissible shaft loading radial	200 N [20.394 kp]
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Max. Permissible shaft loading axial	100 N [10.197 kp]
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Shaft	$\varnothing$ 45 mm [$\varnothing$ 1.772"]
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Shaft length	L: 42 mm [1.654"]
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Insertion depth min.	52 mm [2.047"]
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Max. Permissible shaft loading radial	200 N [20.394 kp]
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Max. Permissible shaft loading axial	100 N [10.197 kp]
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Bearings

Bearings type	2 precision ball bearings
Nominale service life	3 x 10 ¹⁰ revs. at 100 % rated shaft load 1 x 10 ¹¹ revs. at 40 % rated shaft load 1 x 10 ¹² revs. at 20 % rated shaft load
Max. operating speed	3500 rpm

Machinery Directive: basic data safety integrity level

MTTF _d	200 a
Mission time (TM)	25 a
Nominale service life (L10h)	1 x 10 ¹² revs. at 20 % rated shaft load and 3500 rpm
Diagnostic coverage (DC)	0 %

Electrical Data

Power supply/Current consumption	4.75 VDC up to 30 VDC: typ. 70 mA (100 mA only C3, D3)
Power supply/Current consumption	5 VDC up to 30 VDC: typ. 70 mA
Power supply/Current consumption	10 VDC up to 30 VDC: typ. 70 mA (100 mA only C2, C4, D4)
Operating principle	optical
Output circuit	TTL TTL, RS422 compatible, inv. HTL HTL, inv. 1 Vpp sin/cos
Pulse frequency	TTL $\leq$ 5000 ppr: max. 200 kHz HTL $\leq$ 5000 ppr: max. 200 kHz TTL more than 1200 ppr: max. 2 MHz HTL more than 1200 ppr: max. 600 kHz 1 Vpp sin/cos: max. 100 kHz

Technical data

Encoder EI30 P 100 HO

Electrical Data

Channels	B N and inverted signals
Load	max. 40 mA / channel @ 1 Vpp sin/cos: min. 120 Ohm
Circuit protection	circuit type C6 and D6 only

Accuracy

Phase offset	90° ± max. 7.5 % of the period duration
pulse-/pause-ratio	≤5000 ppr: 50 % ± max. 7 % Output circuits C2, C3, C4, D3, D4: 50 % ± max. 10 %

Environmental data

ESD (DIN EN 61000-4-2):	8 kV
Burst (DIN EN 61000-4-4):	2 kV
includes EMC:	DIN EN 61000-6-2 DIN EN 61000-6-3
Vibration: (DIN EN 60068-2-6)	50 m/s ² (10 Hz up to 2000 Hz)
Shock: (DIN EN 60068-2-27)	1000 m/s ² (6 ms)
Electrical Safety:	according DIN VDE 0160

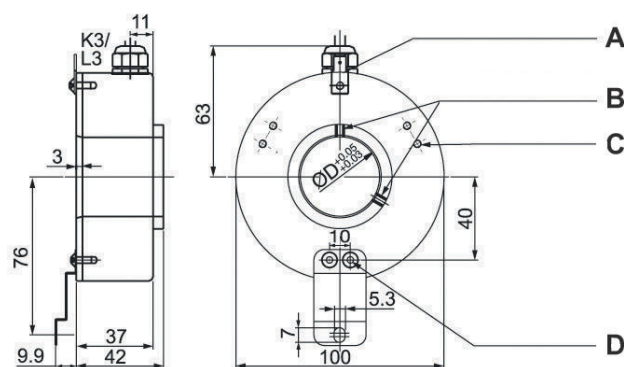
Duty information

Customs tariff number:	90318020
Country of origin:	Germany

General Data

Weight	approx. 720 g [25.397 oz]
Connections	cable or connector, radial
Protection rating (EN 60529)	IP54
Operating temperature	-20 °C up to +80 °C [-4 °F up to +176 °F] 1 Vpp: -10 °C up to +70 °C [+14 °F up to +158 °F]
Storage temperature	-30 °C up to +80 °C [-22 °F up to 176 °F]

Cable connection R-N, R-C radial with 2 m cable



All dimensions in mm

- A Plug-in connector for functional ground connection
(flat pin 6.3 x 0.8 according to DIN 46244)
- B 2x threaded pin M4
- C 6x M4x0.7-6H - 6 deep
- D Spring plate as torque support

Description

N inv. poss.

R-N	radial, shield not connected	•
R-C	radial, shield connected to encoder housing	•

Assignments

	R-N, R-C	R-N, R-C	R-C
Circuit	C3, C4, C5, C6, C7	C1, C2, D3, D4, D5, D6, D7	D8
GND	WH	WH	WH
(+) Vcc	BN	BN	BN
A	GN	GN	GN

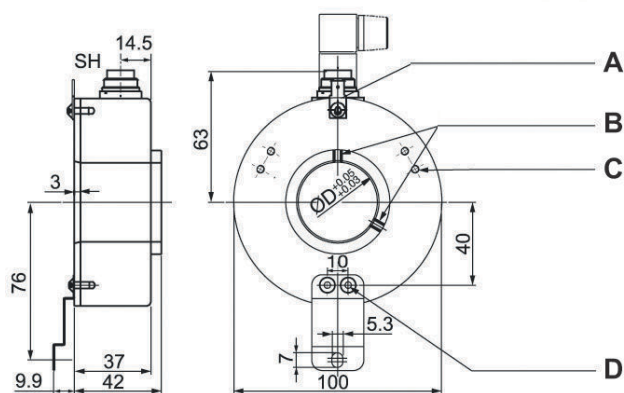
Technical data

Encoder EI30 P 100 HO

Assignments

B	YE	YE	GY
N	GY	GY	BK
	–	–	–
A inv.	–	RD	YE
B inv.	–	BK, (BU at LT)	PK
N inv.	–	VT	–
Shield	flex	flex	flex

Connector (M16x0.75) R, radial, 5-, 6-, 8-, 12-pin



All dimensions in mm

- A Plug-in connector for functional ground connection (flat pin 6.3 x 0.8 according to DIN 46244)
- B 2x threaded pin M4
- C 6x M4x0.7-6H - 6 deep
- D Spring plate as torque support

Description

N inv. poss.

R5	radial, 5-pin, Connector connected to encoder housing	–
R6	radial, 6-pin, Connector connected to encoder housing	–
R8	radial, 8-pin, Connector connected to encoder housing	•
R12	radial, 12-pin, Connector connected to encoder housing	•

Assignments

	R5 5-pin	R6 6-pin	R8 8-pin	R8 8-pin	R12 12-pin	R12 12-pin
Circuit	C3, C4, C5, C6, C7	C3, C4, C5, C6, C7	C1, C2, D3, D4, D5, D6, D7	D8	C1, C2, D3, D4, D5, D6, D7	D8
GND	1	6	1	1	K, L	K, L
(+) Vcc	2	1	2	2	M, B	M, B
A	3	2	3	3	E	E
B	4	4	4	4	H	H
N	5	3	5	5	C	C
–	–	–	–	–	–	–
A inv.	–	–	6	6	F	F
B inv.	–	–	7	7	A	A

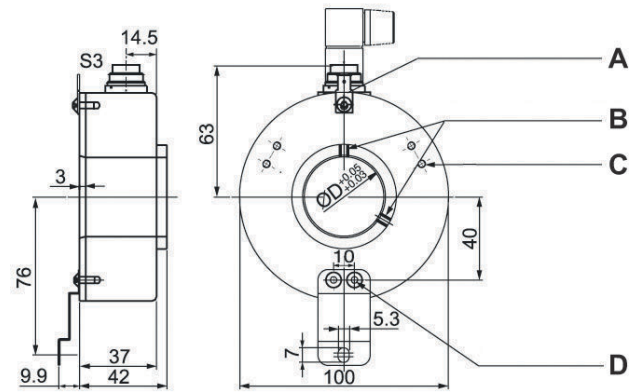
Technical data

Encoder EI30 P 100 HO

Assignments

N inv.	-	-	8	8	D	D
n. c.	-	5	-	-	G, J	G, J
Shield	-	-	-	-	-	-

Connector (M16x0.75) R7, radial, 7-pin



All dimensions in mm

- A Plug-in connexctor for functional ground connection (flat pin 6.3 x 0.8 according to DIN 46244)
- B 2x threaded pin M4
- C 6x M4x0.7-6H - 6 deep
- D Spring plate as torque support

Description

N inv. poss.

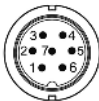
R7 radial, 7-pin, Connector connected to encoder housing

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Assignments

R7

7-pin

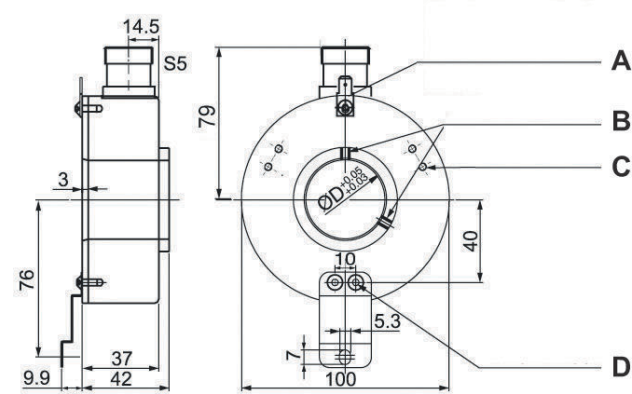


Circuit	C3, C4, C5, C6, C7
GND	1
(+) Vcc	2
A	3
B	4
N	5
-	-
A inv.	-
B inv.	-
N inv.	-
n. c.	6, 7
Shield	-

Technical data

Encoder EI30 P 100 HO

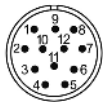
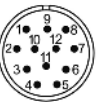
Connector (M23) R12M, radial, 12-pin



All dimensions in mm

- A Plug-in connexctor for functional ground connection (flat pin 6.3 x 0.8 according to DIN 46244)
- B 2x threaded pin M4
- C 6x M4x0.7-6H - 6 deep
- D Spring plate as torque support

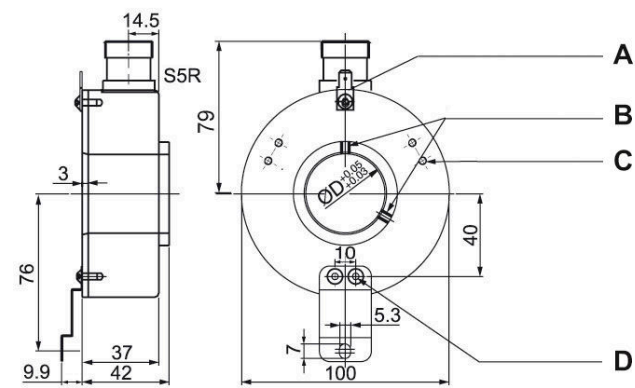
Description	N inv. poss.
R12M radial, 12-pin, Connector connected to encoder housing	•

	R12M 12-pin	R12M 12-pin	R12M 12-pin
			
Circuit	C3, C4, C5, C6, C7	C1, C2, D3, D4, D5, D6, D7	D8
GND	10	10	10
(+) Vcc	12	12	12
A	5	5	5
B	8	8	8
N	3	3	3
–	–	–	–
A inv.	–	6	6
B inv.	–	1	1
N inv.	–	4	4
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11	2, 7, 9, 11
Shield	–	–	–

Technical data

Encoder EI30 P 100 HO

Connector (M23) RC12, radial, 12-pin (clockwise)



All dimensions in mm

- A Plug-in connexctor for functional ground connection (flat pin 6.3 x 0.8 according to DIN 46244)
- B 2x threaded pin M4
- C 6x M4x0.7-6H - 6 deep
- D Spring plate as torque support

Description	N inv. poss.
RC12 radial, 12-pin, Connector connected to encoder housing	•

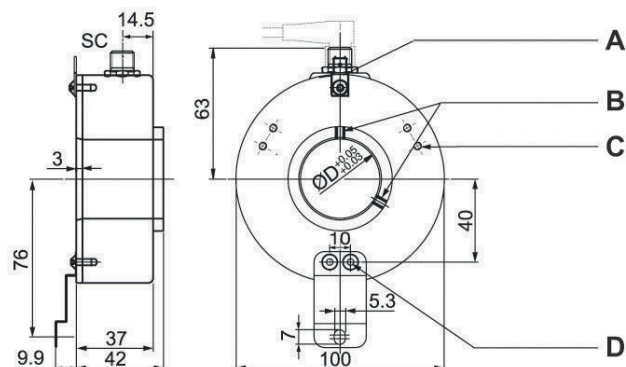
	RC12 12-pin	RC12 12-pin	RC12 12-pin
Circuit	C3, C4, C5, C6, C7	C1, C2, D3, D4, D5, D6, D7	D8
GND	10	10	10
(+) Vcc	12	12	12
A	5	5	5
B	8	8	8
N	3	3	3
—	—	—	—
A inv.	—	6	6
B inv.	—	1	1
N inv.	—	4	4
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11	2, 7, 9, 11
Shield	—	—	—

Hier waren die falschen Bilder drin: es fehlte unten rechts das R

Technical data

Encoder EI30 P 100 HO

Sensor-connector (M12x1) RS, radial, 4-, 5-, 8-, 12-pin



All dimensions in mm

- A Plug-in connector for functional ground connection (flat pin 6.3 x 0.8 according to DIN 46244)
- B 2x threaded pin M4
- C 6x M4x0.7-6H - 6 deep
- D Spring plate as torque support

Description

N inv. poss.

RS4	radial, 4-pin, Connector connected to encoder housing	—
RS5	radial, 5-pin, Connector connected to encoder housing	—
RS8	radial, 8-pin, Connector connected to encoder housing	•
RS12	radial, 12-pin, Connector connected to encoder housing	•

Assignments

	RS4 4-pin	RS5 5-pin	RS8 8-pin	RS8 8-pin	RS12 12-pin
Circuit	C3, C4, C5, C6, C7	C3, C4, C5, C6, C7	C1, C2, D3, D4, D5, D6, D7	D8	C1, C2, D3, D4, D5, D6, D7
GND	3	3	1	1	3
(+) Vcc	1	1	2	2	1
A	2	4	3	3	4
B	4	2	4	5	6
N	—	5	5	—	8
—	—	—	—	—	—
A inv.	—	—	6	4	9
B inv.	—	—	7	6	7
N inv.	—	—	8	—	10
n. c.	—	—	—	7, 8	2, 5, 11, 12
Shield	—	—	—	—	—

Technical data

Encoder EI30 P 100 HO

Options

Low temperature	Order key
The encoder EI30 P 100 HO with the output circuit types C4, C6, D4, D6, C3, C5, D3, D5, C1, C2 is also available with the extended temperature range -40 °C up to +85 °C [-40 °F up to +185 °F] (measured at the flange).	LT
Pressure equalising membrane	Order key
The EI30 P 100 HO shaft encoder is also optionally available with a pressure equalising membrane. This prevents water from penetrating into the encoder housing in the case of high air humidity. The IP67 protection level, temperature range and salt spray resistance are maintained. Resistant to chemicals and solvents in accordance with DIN EN ISO 2812-1. Max. RPM: 1500 rpm Permitted Shaft-Loading, axial: 100 N [10.197 kp] Permitted Shaft-Loading, radial: 120 N [12.236 kp] Max. PPR: 20480 ppr Starting-torque: approx. 5 Ncm [7.081 in-ozf] at ambient temperature	PE
Cable length	Order key
The encoder EI30 P 100 HO can be supplied with more than 2 m cable. The maximum cable length depends on the supply voltage and the frequency. Please extend the standard order code with a three figure number, specifying the cable length in decimetres. Example: 5 m cable = 050	XXX = Decimeter

Technical data

Encoder EI30 P 100 HO

Example Order No.	Type				
EI30 P 100 HO	EI30 P 100 HO				
	EI30 P 100 HO				
Shaft					
25	25; 28; 30; 32; 38; 40; 42; 45				
Pulses per revolution PPR:					
1024	512, 1024, 2048, 2500, 3600, 4096, 4500, 5000, 8192, 10240, 16384, 20480 1 Vpp Sin/Cos only 1024, 2048 Other PPRs on request				
Channels:					
N	B, N				
Output circuit					
C6	Resolution PPR	Power supply VDC	Output circuit	—	Order key
	up to 2500	5 - 30	HTL (TTL at 5 VDC)	—	C7
		5 - 30	HTL, inv. (TTL/RS422 comp. at 5 VDC)	—	D7
	up to 5000	4.75 - 5.5	TTL	—	C5
		4.75 - 5.5	TTL, RS422 comp., inverted	—	D5
		10 - 30	HTL	—	C6
		10 - 30	HTL inverted	—	D6
	(higher frequency) 1200 up to 25000	10 - 30	TTL, RS422 comp., inverted	—	C1
		4.75 - 5.5	TTL	—	C3
		4.75 - 5.5	TTL, RS422 comp., inverted	—	D3
		10 - 30	HTL	—	C4
		10 - 30	HTL inverted	—	D4
		10 - 30	TTL, RS422 comp., inverted	—	C2
	1024, 2048	4.75 - 5.5	1 Vpp sin/cos	—	D8

Technical data

Encoder EI30 P 100 HO

Electrical connections

Description		N inv. poss.	Order key
R-N	Cable: length (2 m standard)		
	radial, shield not connected	•	R-N
	radial, shield connected to encoder housing	•	R-C
	Connector: (shield connected to encoder housing)		
	connector, M16x0.75, 5-pin, radial	–	R5
	connector, M16x0.75, 6-pin, radial	–	R6
	connector, M16x0.75, 8-pin, radial	•	R8
	connector, M16x0.75, 12-pin, radial	•	R12
	connector, M16x0.75, 7-pin, radial	–	R7
	connector, M23, 12-pin, radial	•	R12M
	connector, clockwise pin count, M23, 12-pin, radial	•	RC12
	sensor-connector, M12x1, 4-pin, radial	–	RS4
	sensor-connector, M12x1, 5-pin, radial	–	RS5
	sensor-connector, M12x1, 8-pin, radial	•	RS8
	sensor-connector, M12x1, 12-pin, radial	•	RS12

Options

Description		Order key
Low temperature		LT
IP55		PE
Without option		Empty
Cable length		XXX = Decimeter

Example Order No.:	EI30 P 100 HO	25	1024	N	C6	R-N	EI30 P 100 HO	Your encoder
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Part number code

Part designation: **EABB CCCDDEE FFFFFFF GHJJKK LLMNOPPP RR**

A	Rotary encoder type I: Incremental S: Absolute, singleturn M: Absolute, multiturn
BB	Series 10: Entry 30: Basic 50: Extended 70: Advanced
CCC	Flange diameter 024: 24 mm 036: 36 mm 058: 58 mm 063: 63 mm 067: 67 mm 070: 70 mm 080: 80 mm 100: 100 mm 115: 115 mm
DD	Flange type BB: Hollow shaft with blind hole CC: Clamping flange (compact design) CF: Clamping flange (food and beverages) CH: Clamping flange (heavy-duty version) CL: Clamping flange HI: Hollow shaft (insulated) HO: Hollow shaft HT: Hollow shaft (special torque support) RC: Round flange (36/40 clamping flange, 58 with 6 mm shaft) RE: Round flange (expanded boreholes) RN: Round flange SC: Stator coupling SF: Screw flange (53 clamping flange, 58 food and beverages) SI: Servo flange (increased shaft load and IP protection) SQ: Square flange SR: Screw flange (36/40 clamping flange, 58 corrosion-resistant) SY: Synchro (incremental), Servo (36), Synchro (58) (absolute) TM: Speedometer (115 with 1 mm shaft, 58 motor feedback) TS: Speedometer (10 mm shaft)
EE	Shaft / bore hole diameter 06: 6 mm 07: 7 mm 08: 8 mm 08: 8 mm 10: 10 mm 11: 11 mm 12: 12 mm 14: 14 mm 15: 15 mm 06-72: Hollow bore / blind holes (6 – 72 mm)
FFFFFF	Signal / resolution Axxxx: A Bxxxx: AB Nxxxx: ABN P16384: Programmable xx: Singleturn, 1 – 16 bit xx: Multiturn, 0 – 43 bit (00 for singleturn)
G	Galvanic isolation (absolute only) 0: without 1: with
HH	Voltage supply (absolute only) 0: 10 – 32 V DC/with galvanic isolation 1: 4.75 – 5.5 V DC 2: 18 – 30 V DC
J	Operating principle M: magnetic O: optical P: optically interpolated

Part number code

KK	Interface 01: RS485 07: SSI binary 08: SSI Gray 35: CANopen 38: EtherCAT 48: PROFINET 58: EtherNet/IP
LL	Electrical connection M08: M8 connector M12: M12 connector M16: M16 connector M23: M23 connector M12BC: Bus cover connector
M	Cable outlet A: Axial R: Radial T: Tangential
NN	No. of pins xx: Number of pins
O	Shield connection (2 cable) (optional) C: connected N: not connected
PPP	Cable length xxx: Cable length (in dm)

Note

	A list with all available device types can be found on the Leuze website at www.leuze.com.
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