

Technical data sheet

Rotary encoder Series Information

Part no.: 90000110

EI30-M 058 CL

Contents

- Technical data
- Part number code



For illustration purposes only

Encoder series	EI 058 CL
Encoder_Basic principle	incremental
Encoder_Operating principle	magnetic
Encoder_Flange diameter	Ø 58 mm
Encoder_Flange type	Clamping flange
Encoder_Solid shaft/Hollow shaft	Hollow shaft
Encoder_Shaft diameter	Ø 10 mm
	Ø 6 mm
	Ø 8 mm
Encoder_Supply voltage	4.75 – 30 VDC
Encoder_Output circuit	HTL (TTL at 5VDC)
	HTL, inv. (TTL/RS422 compatible at 5 VDC)
Encoder_Pulse count	1 – 16384 I/U

Technical data

Encoder EI30 M 058 CL

Resolution

Pulses per revolution PPR	1 PPR up to 16384 PPR
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Mechanical Data

Flange	clamping flange
Flange material	aluminum
Housing material	Stainless steel or die cast aluminum, powder coated (only M16 and M23 plugs)
Flange diameter	Ø 58 mm [Ø 2.283"]
Cam mounting	pitch 69 mm [2.717 inches]

Shaft(s)

Shaft material	stainless steel
Starting torque	approx. 1 Ncm [1.416 in-ozf] at ambient temperature

Shaft	Ø 6 mm [Ø 0.236"] Attention: No option IP = full IP67 version
Shaft length	L: 12 mm [0.472"]
Max. Permissible shaft loading radial	125 N [12.746 kp]
Max. Permissible shaft loading axial	120 N [12.236 kp]

Shaft	Ø 8 mm [Ø 0.315"] Attention: No option IP = full IP67 version
Shaft length	L: 19 mm [0.748"]
Max. Permissible shaft loading radial	125 N [12.746 kp]
Max. Permissible shaft loading axial	120 N [12.236 kp]

Shaft	Ø 9.525 mm [Ø 3/8"] Order No: 4Z Attention: No option IP = full IP67 version
Shaft length	L: 20 mm [0.787"]
Max. Permissible shaft loading radial	220 N [22.433 kp]
Max. Permissible shaft loading axial	120 N [12.236 kp]

Shaft	Ø 10 mm [Ø 0.394"]
Shaft length	L: 20 mm [0.787"]
Max. Permissible shaft loading radial	220 N [22.433 kp]
Max. Permissible shaft loading axial	120 N [12.236 kp]

Bearings

Bearings type	2 precision ball bearings
Nominale service life	1 x 10 ⁹ revs. at 100 % rated shaft load 1 x 10 ¹⁰ revs. at 40 % rated shaft load 1 x 10 ¹¹ revs. at 20 % rated shaft load
Max. operating speed	8000 rpm

Machinery Directive: basic data safety integrity level

MTTF _d	2200 a
Mission time (TM)	25 a
Nominale service life (L10h)	1 x 10 ¹¹ revs. at 20 % rated shaft load and 8000 rpm
Diagnostic coverage (DC)	0 %

Electrical Data

Power supply/Current consumption	4.75 VDC up to 30 VDC: typ. 40 mA
Operating principle	magnetic
Output circuit	HTL (TTL at 5 VDC) HTL, inv. (TTL/RS422 comp. at 5 VDC)
Pulse frequency	HTL up to 16384 ppr: max. 600 kHz TTL up to 16384 ppr: max. 1 MHz
Channels	B N and inverted signals
Load	max. 40 mA / channel
Circuit protection	yes

Accuracy

Phase offset	90° ± max. 7.5 % of the period duration
pulse-/pause-ratio	50 % ± max. 7 %

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

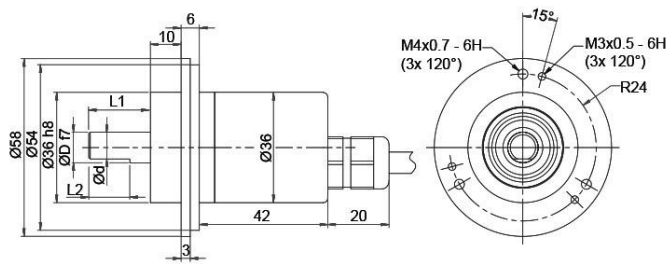
General Data

Weight	approx. 250 g [8.818 oz]
Connections	cable or connector outlet
Protection rating (EN 60529)	Housing: IP65, IP67; shaft sealed: IP65
Operating temperature	Connector: -40 °C up to +85 °C, Cable: -20 °C up to +80 °C (Option LT: -40 °C up to +85 °C). Connector: -40 °F up to +185 °F, Cable: -4 °F up to +176 °F, Option LT: -40 °F up to +185 °F
Storage temperature	Connector: -40 °C up to +85 °C, Cable: -30 °C up to +80 °C (Option LT: -40 °C up to +85 °C) Connector: -40 °F up to +185 °F, cable: -22 °F up to +176 °F, (Option LT: -40 °F up to +185 °F)

Technical data

Encoder EI30 M 058 CL

Cable connection A-C axial with 2 m cable



D = 6	L1 = 12	d = 5.3	L2 = 10
D = 8	L1 = 19	d = 7.5	L2 = 15
D = 9.525 [3/8"]	L1 = 20	d = 8.302 [0.327"]	L2 = 10
D = 10	L1 = 20	d = 9	L2 = 15

All dimensions in mm

Description

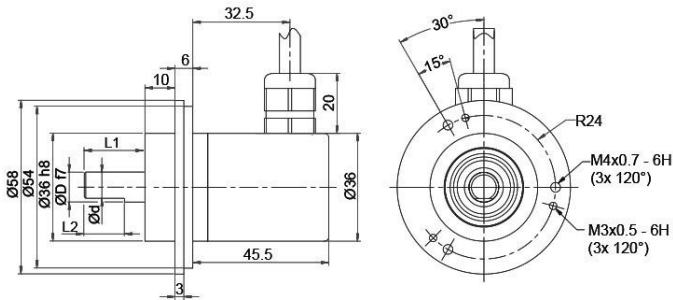
N inv. poss.

A-C axial, shield connected to encoder housing

Assignments

	A-C	A-C
Circuit	D2	D1
GND	WH	WH
(+) Vcc	BN	BN
A	GN	GN
B	YE	YE
N	GY	GY
—	—	—
A inv.	—	RD
B inv.	—	BK, (BU at LT)
N inv.	—	VT
Shield	flex	flex

Cable connection R-C radial with 2 m cable



D = 6	L1 = 12	d = 5.3	L2 = 10
D = 8	L1 = 19	d = 7.5	L2 = 15
D = 9.525 [3/8"]	L1 = 20	d = 8.302 [0.327"]	L2 = 10
D = 10	L1 = 20	d = 9	L2 = 15

All dimensions in mm

	R-IP	R-IP
Circuit	D2	D1
GND	WH	WH
(+) Vcc	BN	BN
A	GN	GN
B	YE	YE
N	GY	GY
–	–	
A inv.	–	RD
B inv.	–	BK

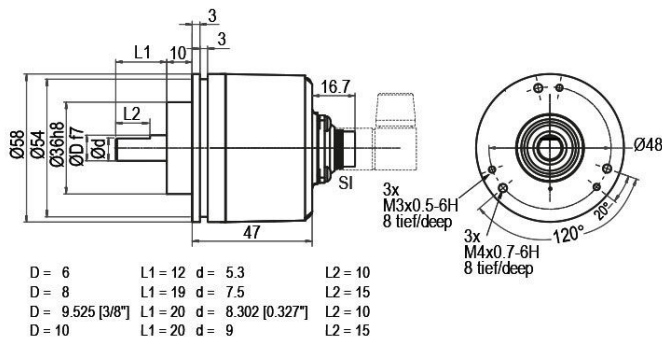
Technical data

Encoder EI30 M 058 CL

Assignments

N inv.	–	VT
Shield	flex	flex

Connector (M16x0.75) A, axial, 5-, 6-, 8-, 12-pin



All dimensions in mm

Description

N inv. poss.

A5	axial, 5-pin, Connector connected to encoder housing	–
A6	axial, 6-pin, Connector connected to encoder housing	–
A8	axial, 8-pin, Connector connected to encoder housing	•
A12	axial, 12-pin, Connector connected to encoder housing	•

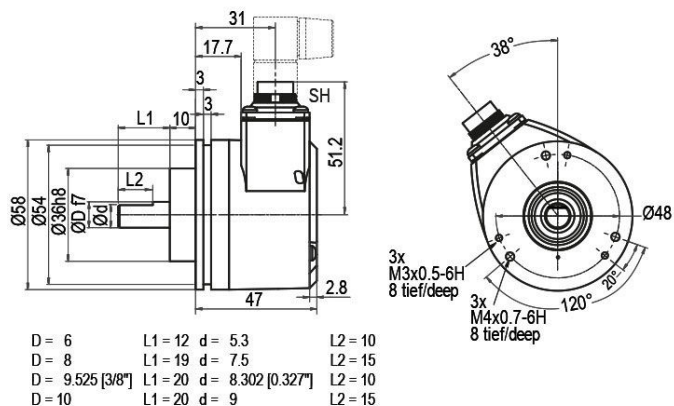
Assignments

	A5 5-pin	A6 6-pin	A8 8-pin	A8 8-pin	A12 12-pin	A12 12-pin
Circuit	D2	D2	D2	D1	D2	D1
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	–	F
B inv.	–	–	–	7	–	A
N inv.	–	–	–	8	–	D
n. c.	–	5	6, 7, 8	–	A, D, F, G, J	G, J
Shield	–	–	–	–	–	–

Technical data

Encoder EI30 M 058 CL

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



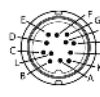
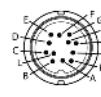
All dimensions in mm

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	•

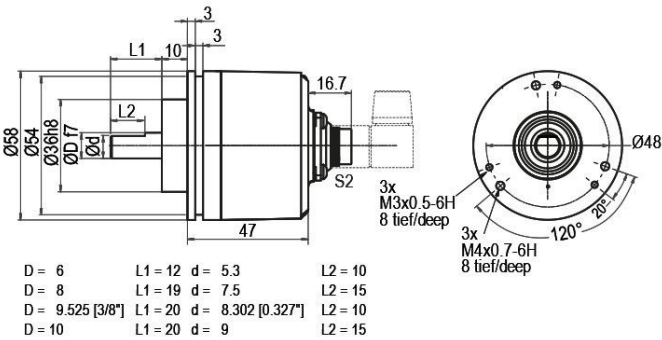
Assignments

	R5	R6	R8	R8	R12	R12
	5-pin	6-pin	8-pin	8-pin	12-pin	12-pin
						
Circuit	D2	D2	D2	D1	D2	D1
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	—	F
B inv.	—	—	—	7	—	A
N inv.	—	—	—	8	—	D
n. c.	—	5	6, 7, 8	—	A, D, F, G, J	G, J
Shield	—	—	—	—	—	—

Technical data

Encoder EI30 M 058 CL

Connector (M16x0.75) A7, axial, 7-pin



All dimensions in mm

Description

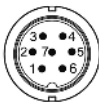
N inv. poss.

A7 axial, 7-pin, Connector connected to encoder housing

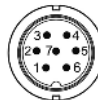
Assignments

A7

7-pin



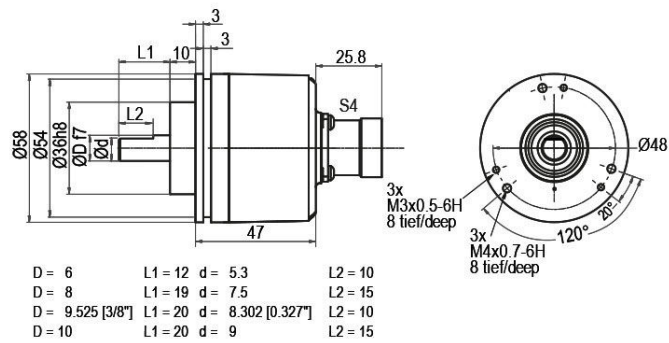
Circuit	D2
GND	1
(+) Vcc	2
A	3
B	4
N	5
–	–
A inv.	–
B inv.	–
N inv.	–
n. c.	6, 7
Shield	–

	R7 7-pin
	
Circuit	D2
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 M 058 CL

Connector (M23) A12M, axial, 12-pin



All dimensions in mm

Description

N inv. poss.

A12M axial, 12-pin, Connector connected to encoder housing

—

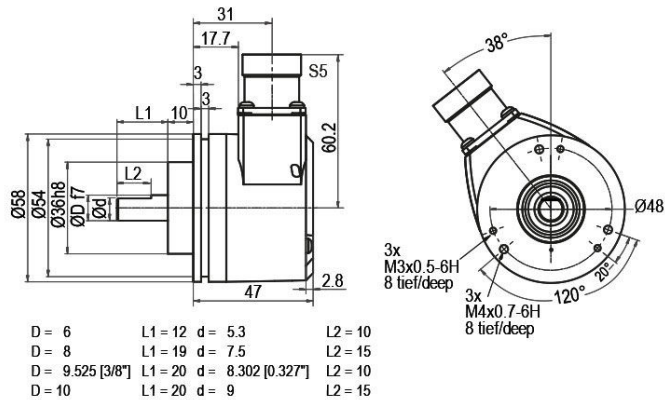
Assignments

	A12M	A12M
	12-pin	12-pin
Circuit	D2	D1
GND	10	10
(+) Vcc	12	12
A	5	5
B	8	8
N	3	3
—	—	—
A inv.	—	6
B inv.	—	1
N inv.	—	4
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11
Shield	—	—

Technical data

Encoder EI30 M 058 CL

Connector (M23) R12M, radial, 12-pin



All dimensions in mm

Description

N inv. poss.

R12M radial, 12-pin, Connector connected to encoder housing

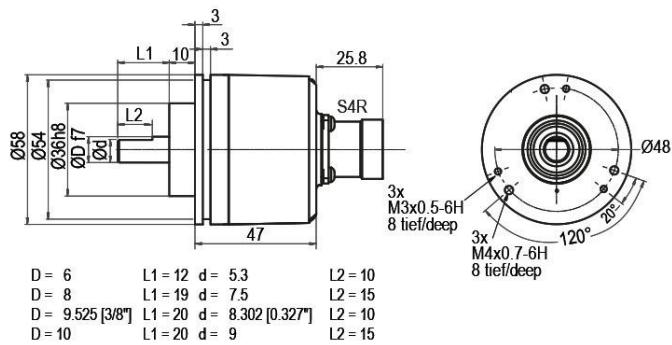
Assignments

	R12M	R12M
	12-pin	12-pin
Circuit	D2	D1
GND	10	10
(+) Vcc	12	12
A	5	5
B	8	8
N	3	3
—	—	—
A inv.	—	6
B inv.	—	1
N inv.	—	4
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11
Shield	—	—

Technical data

Encoder EI30 M 058 CL

Connector (M23) AC12, axial, 12-pin (clockwise)



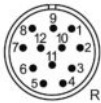
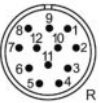
All dimensions in mm

Description N inv. poss.

AC12 axial, 12-pin, Connector connected to encoder housing

Assignments

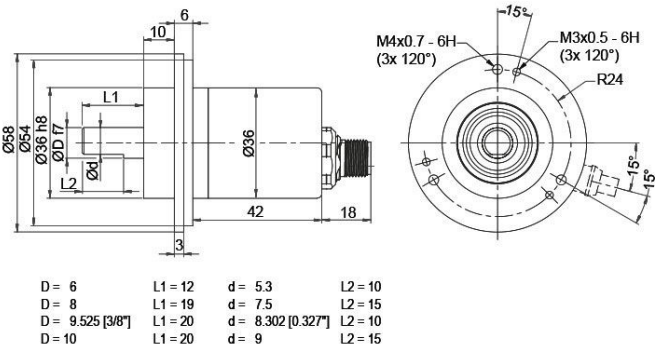
	AC12	AC12
	12-pin	12-pin
Circuit	D2	D1
GND	10	10
(+) Vcc	12	12
A	5	5
B	8	8
N	3	3
—	—	—
A inv.	—	6
B inv.	—	1
N inv.	—	4
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11
Shield	—	—

	RC12 12-pin	RC12 12-pin
		
Circuit	D2	D1
GND	10	10
(+) Vcc	12	12
A	5	5
B	8	8
N	3	3
—	—	—
A inv.	—	6
B inv.	—	1
N inv.	—	4
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11
Shield	—	—

Technical data

Encoder EI30 M 058 CL

Sensor-connector (M12x1) AS axial, 5-, 8-pin



All dimensions in mm

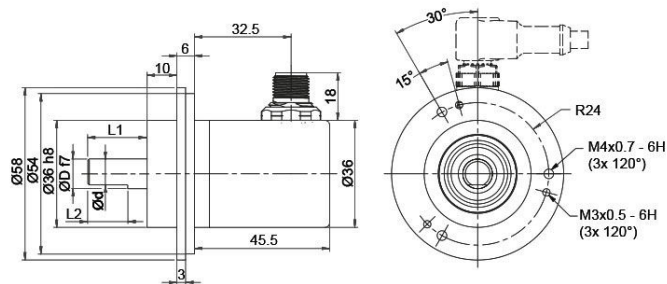
Description		N inv. poss.
AS5	axial, 5-pin, Connector connected to encoder housing	—
AS8	axial, 8-pin, Connector connected to encoder housing	•

	RS5	RS8
	5-pin	8-pin
Circuit	D2	D1
GND	3	1
(+) Vcc	1	2
A	4	3
B	2	4
N	5	5
—	—	—
A inv.	—	6
B inv.	—	7
N inv.	—	8
n. c.	—	—
Shield	—	—

Technical data

Encoder EI30 M 058 CL

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



D = 6	L1 = 12	d = 5.3	L2 = 10
D = 8	L1 = 19	d = 7.5	L2 = 15
D = 9.525 [3/8"]	L1 = 20	d = 8.302 [0.327"]	L2 = 10
D = 10	L1 = 20	d = 9	L2 = 15

All dimensions in mm

Description

N inv. poss.

RS5	radial, 5-pin, Connector connected to encoder housing	—
RS8	radial, 8-pin, Connector connected to encoder housing	•

Assignments

	RS5 5-pin	RS8 8-pin
Circuit	D2	D1
GND	3	1
(+) Vcc	1	2
A	4	3
B	2	4
N	5	5
—	—	—
A inv.	—	6
B inv.	—	7
N inv.	—	8
n. c.	—	—
Shield	—	—

Technical data

Encoder EI30 M 058 CL

Options

Low-friction bearings

Order key

The encoder EI30 M 058 CL is also available as a particularly smooth- running low-friction encoder. The starting torque is thereby changed to ≤ 0.5 Ncm [0.708 in-ozf] and the protection class at the shaft input to IP50.

LB

Shafts sealed to IP67, only with 10 mm [0.394"] shaft

Order key

The encoder EI30 M 058 CL can be supplied in a IP67 version. (full IP67 only connection AS, RS, A-C or R-C version; not cable connection R-IP = IP40).

IP

Max. RPM: 3500 min⁻¹
 Permitted Shaft-Loading: axial 100 N [10.197 kp]; radial 110 N [11.216 kp]
 Starting-torque: approx. 4 Ncm [5.664 in-ozf] at ambient temperature

Low temperature

Order key

The encoder EI30 M 058 CL with the output circuit types D2, D1 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 M 058 CL 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.

PE

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.

Cable length

Order key

The encoder EI30 M 058 CL can be supplied with more than 2 m cable.
 The maximum cable length depends on the supply voltage and the frequency.

XXX = Decimeter

Please extend the standard order code with a three figure number, specifying the cable length in decimetres.
 Example: 5 m cable = 050

Technical data

Encoder EI30 M 058 CL

Example Order No.	Type				
EI30 M 058 CL	EI30 M 058 CL	EI30 M 058 CL			
Shaft					
10	06; 08; 4Z; 10				
Pulses per revolution PPR:					
16384	1-16384 Other PPRs on request				
Channels:					
N	B, N				
Output circuit					
D1	Resolution PPR	Power supply VDC	Output circuit	–	Order key
	1-16384	4.75 - 30	HTL (TTL at 5 VDC)	–	D2
		4.75 - 30	HTL, inv. (TTL/RS422 comp. at 5 VDC)	–	D1

Technical data

Encoder EI30 M 058 CL

Electrical connections

	Description	N inv. poss.	Order key
A-C	Cable: length (2 m standard)		
	radial, shield not connected (IP40)	•	R-IP
	axial, shield connected to encoder housing	•	A-C
	radial, shield connected to encoder housing	•	R-C
	Connector: (shield connected to encoder housing)		
	connector, M16x0.75, 5-pin, axial	–	A5
	connector, M16x0.75, 5-pin, radial	–	R5
	connector, M16x0.75, 6-pin, axial	–	A6
	connector, M16x0.75, 6-pin, radial	–	R6
	connector, M16x0.75, 8-pin, axial	•	A8
	connector, M16x0.75, 8-pin, radial	•	R8
	connector, M16x0.75, 12-pin, axial	•	A12
	connector, M16x0.75, 12-pin, radial	•	R12
	connector, M16x0.75, 7-pin, axial	–	A7
	connector, M16x0.75, 7-pin, radial	–	R7
	connector, M23, 12-pin, axial	•	A12M
	connector, M23, 12-pin, radial	•	R12M
	connector, clockwise pin count, M23, 12-pin, axial	•	AC12
	connector, clockwise pin count, M23, 12-pin, radial	•	RC12
	sensor-connector, M12x1, 5-pin, axial	–	AS5
	sensor-connector, M12x1, 5-pin, radial	–	RS5
	sensor-connector, M12x1, 8-pin, axial	•	AS8
	sensor-connector, M12x1, 8-pin, radial	•	RS8

Options

Description	Order key
Low-friction bearings	LB
Shafts sealed to IP67, only with 10 mm [0.394"] shaft	IP
Low temperature	LT
Pressure equalising membrane	PE
Without option	Empty
Cable length	XXX = Decimeter

Example
Order No.:

EI30 M 058 CL 10 16384 N D1 A-C EI30 M 058 CL

Your enco-
der

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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