

Technisch gegevensblad Informatie over de encoderseries

Art.-nr.: 90000410

EI30-P 115 TM

Inhoud

- Technische gegevens
- Artikelsleutel



Afbeelding kan afwijken

Encoder_serie	EI 115 TM
Encoder_basisprincipe	incrementeel
Encoder_functieprincipe	optisch geïnterpoleerd
Encoder_flensdiameter	Ø 115 mm
Encoder_flenstype	Tachometerflens
Encoder_massieve as/holle as	Massieve as
Encoder_asdiameter	Ø 11 mm
Encoder_voedingsspanning	10 ... 30 V DC
	4,75 ... 5,5 V DC
	5 ... 30V DC
Encoder_uitgangscircuit	1 Vss Sin/Cos
	HTL
	HTL, inv.
	TTL
Encoder_aantal impulsen	TTL, RS422 compatibel, inv.
	10000 I/U
	10240 I/U
	12000 I/U
	12500 I/U
	1440 I/U
	15000 I/U
	16384 I/U
	20000 I/U
	20480 I/U
	25000 I/U
	2880 I/U
	3000 I/U
	3600 I/U
	4000 I/U
	5760 I/U
	6000 I/U
	7200 I/U
	7500 I/U
	8000 I/U
	9182 I/U

Technische gegevens

Encoder EI30 P 115 TM

Resolution

Pulses per revolution PPR	up to 25000 PPR
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Mechanical Data

Flange	tacho flange
Flange material	aluminum
Housing material	die cast aluminum, powder coated
Flange diameter	Ø 115 mm [Ø 4.528"]

Shaft(s)

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

Shaft	Ø 11 mm [Ø 0.433"]
Shaft length	L: 33 mm [1.299"]
Max. Permissible shaft loading radial	200 N [20.394 kp]
Max. Permissible shaft loading axial	120 N [12.236 kp]

Advice	Ø 7 mm [0.2761"] / Ø 8 mm [0.315"] / Ø 12 mm [0.472"] on request
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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 11 x 10 ¹¹ revs. at 20 % rated shaft load
Max. operating speed	8000 rpm

Machinery Directive: basic data safety integrity level

MTTF _d	200 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 5,5 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 ≤ 5000 ppr: max. 200 kHz HTL ≤ 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
Channels	B N and inverted signals

Load	max. 40 mA / channel @ 1 Vpp sin/cos: min. 120 Ohm
Circuit protection	circuit type C4, C6, D4, 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

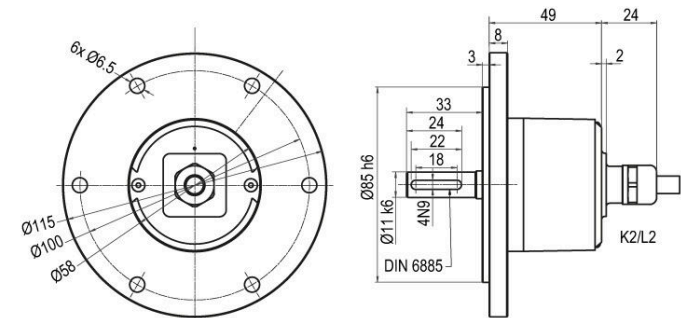
General Data

Weight	approx. 520 g [18.342 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 1 Vpp: -10 °C up to +70 °C [+14 °F up to +158 °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)

Technische gegevens

Encoder EI30 P 115 TM

Cable connection A-N, A-C, axial, with 2 m cable



All dimensions in mm

Description		N inv. poss.
A-N	axial, shield not connected	•
A-C	axial, shield connected to encoder housing	•

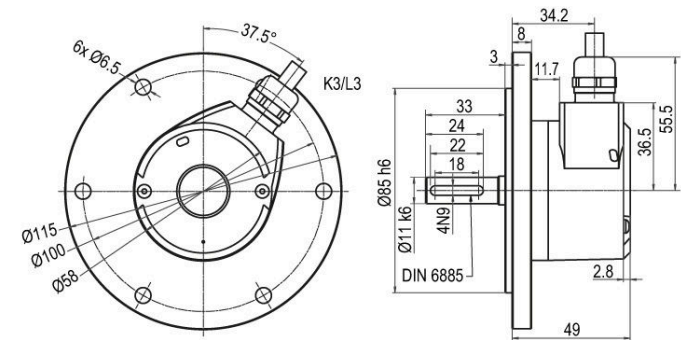
Assignments

	A-N, A-C	A-N, A-C	A-C
Circuit	C3, C4, C5, C6, C7	D3, D4, D5, D6, C1, C2, D7	D8
GND	WH	WH	WH
(+) Vcc	BN	BN	BN
A	GN	GN	GN
B	YE	YE	GY
N	GY	GY	–
–	–	–	–
A inv.	–	RD	YE
B inv.	–	BK, (BU at LT)	PK
N inv.	–	VT	–
Shield	flex	flex	flex

Technische gegevens

Encoder EI30 P 115 TM

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



All dimensions in mm

Description

N inv. poss.

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

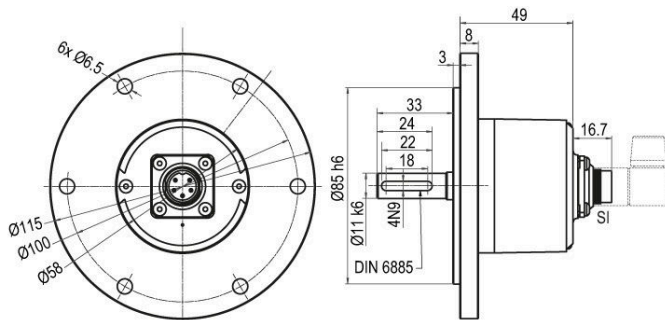
Assignments

	R-N, R-C	R-N, R-C	R-C
Circuit	C3, C4, C5, C6, C7	D3, D4, D5, D6, C1, C2, D7	D8
GND	WH	WH	WH
(+) Vcc	BN	BN	BN
A	GN	GN	GN
B	YE	YE	GY
N	GY	GY	–
–	–	–	–
A inv.	–	RD	YE
B inv.	–	BK, (BU at LT)	PK
N inv.	–	VT	–
Shield	flex	flex	flex

Technische gegevens

Encoder EI30 P 115 TM

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	•

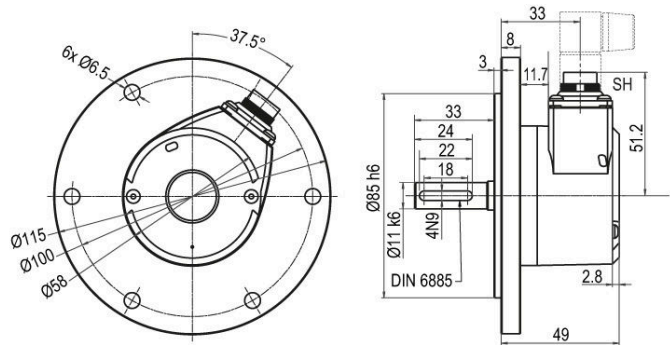
Assignments

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

Technische gegevens

Encoder EI30 P 115 TM

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	•

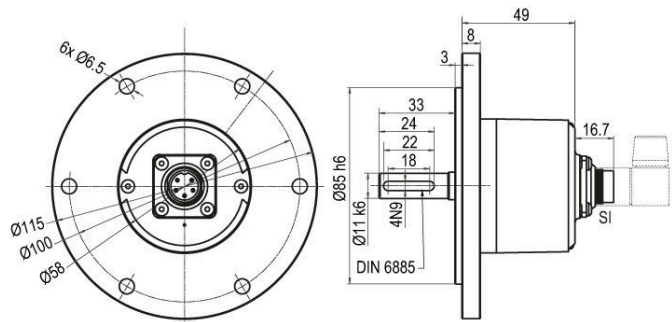
Assignments

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

Technische gegevens

Encoder EI30 P 115 TM

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



All dimensions in mm

Description

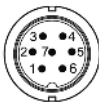
N inv. poss.

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

Assignments

A7

7-pin

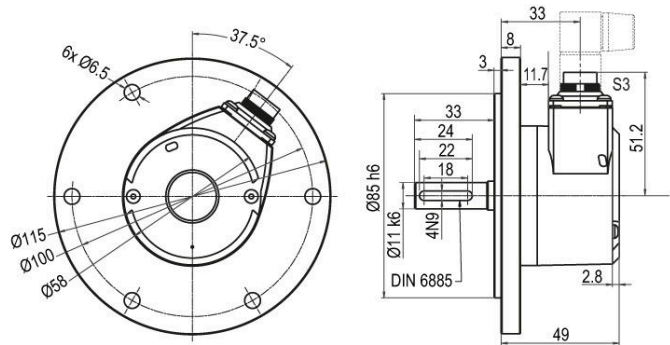


Circuit	C3, C4, C5, C6, C7
GND	1
(+) Vcc	2
A	3
B	4
N	5
–	–
A inv.	–
B inv.	–
N inv.	–
n. c.	6, 7
Shield	–

Technische gegevens

Encoder EI30 P 115 TM

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



All dimensions in mm

Description	N inv. poss.
R7 radial, 7-pin, Connector connected to encoder housing	–

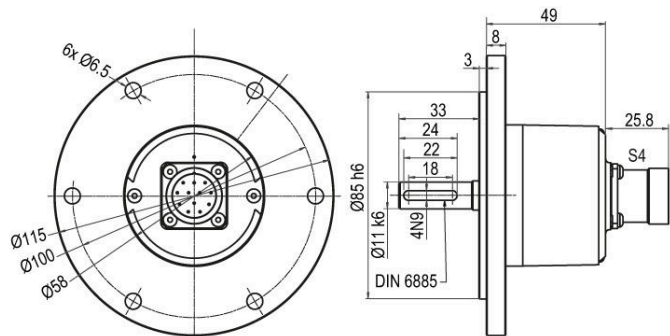
Assignments

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	–

Technische gegevens

Encoder EI30 P 115 TM

Connector (M23) A12M, axial, 12-pin



All dimensions in mm

Description

N inv. poss.

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

–

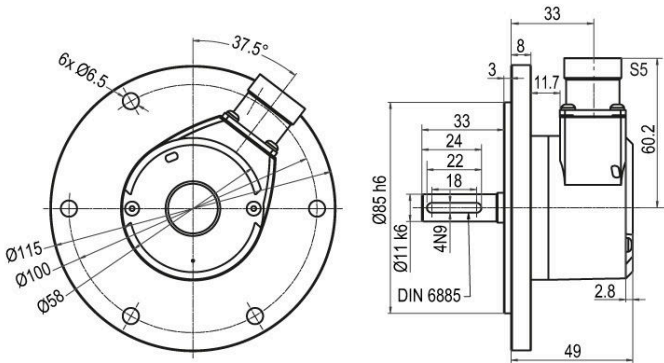
Assignments

	A12M	A12M	A12M
	12-pin	12-pin	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	–
–	–	–	–
A inv.	–	6	6
B inv.	–	1	1
N inv.	–	4	–
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11	2, 3, 4, 7, 9, 11
Shield	–	–	–

Technische gegevens

Encoder EI30 P 115 TM

Connector (M23) R12M, radial, 12-pin



All dimensions in mm

Description

N inv. poss.

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

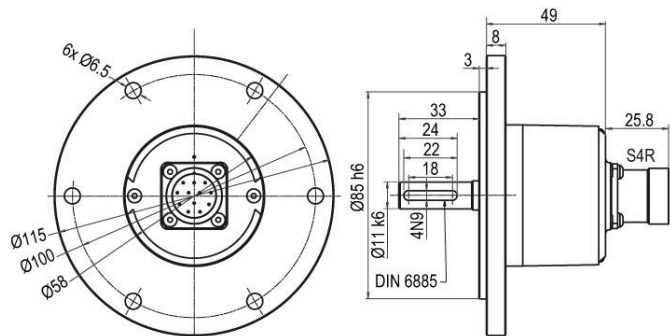
Assignments

	R12M	R12M	R12M
	12-pin	12-pin	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	–
–	–	–	–
A inv.	–	6	6
B inv.	–	1	1
N inv.	–	4	–
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11	2, 3, 4, 7, 9, 11
Shield	–	–	–

Technische gegevens

Encoder EI30 P 115 TM

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



All dimensions in mm

Description N inv. poss.

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

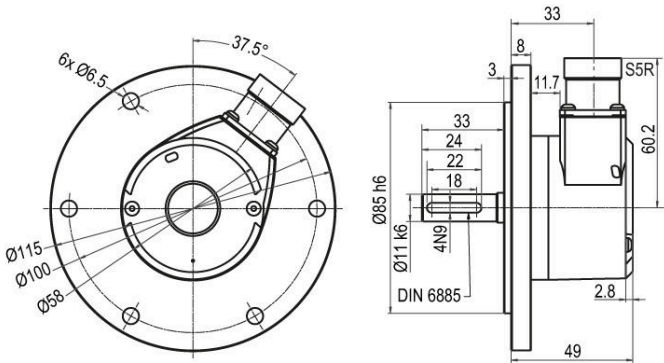
Assignments

	AC12	AC12	AC12
	12-pin	12-pin	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	–
–	–	–	–
A inv.	–	6	6
B inv.	–	1	1
N inv.	–	4	–
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11	2, 3, 4, 7, 9, 11
Shield	–	–	–

Technische gegevens

Encoder EI30 P 115 TM

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



All dimensions in mm

Description

N inv. poss.

RC12 radial, 12-pin, Connector connected to encoder housing

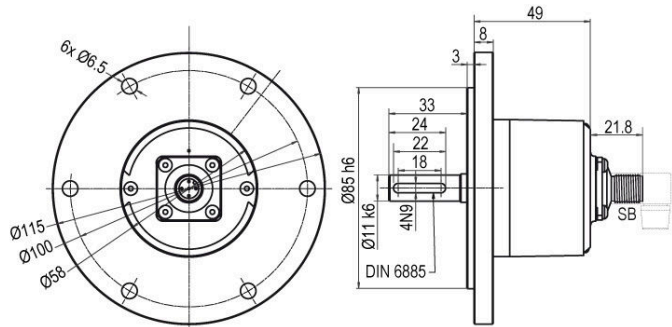
Assignments

	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	–
–	–	–	–
A inv.	–	6	6
B inv.	–	1	1
N inv.	–	4	–
n. c.	1, 2, 4, 6, 7, 9, 11	2, 7, 9, 11	2, 3, 4, 7, 9, 11
Shield	–	–	–

Technische gegevens

Encoder EI30 P 115 TM

Sensor-connector (M12x1) AS, axial, 4-, 5-, 8-, 12-pin



All dimensions in mm

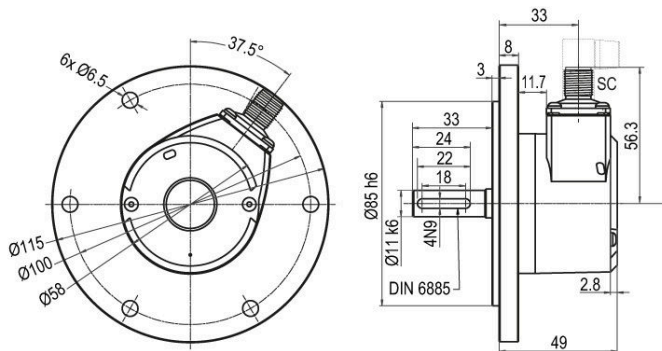
Description	N inv. poss.
AS4 axial, 4-pin, Connector connected to encoder housing	–
AS5 axial, 5-pin, Connector connected to encoder housing	–
AS8 axial, 8-pin, Connector connected to encoder housing	•
AS12 axial, 12-pin, Connector connected to encoder housing	•

	AS4	AS5	AS8	AS8	AS12
	4-pin	5-pin	8-pin	8-pin	12-pin
Circuit	C3, C4, C5, C6, C7	C3, C4, C5, C6, C7	D3, D4, D5, D6, D7, C1, C2	D8	D3, D4, D5, D6, D7, C1, C2
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	–	–	–	–	–

Technische gegevens

Encoder EI30 P 115 TM

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



All dimensions in mm

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	—	—	—	—	—

Technische gegevens

Encoder EI30 P 115 TM

Options

Low-friction bearings

Order key

The encoder EI30 P 115 TM is also available as a particularly smooth- running low-friction encoder. The starting torque is thereby changed to $\leq 0.5 \text{ Ncm}$ [0.708 in-ozf] and the protection class at the shaft input to IP50.

LB

IP67 Shafts sealed to IP67 (not for 1 Vpp Sin/Cos)

The encoder EI30 P 115 TM can be supplied in a full IP67 version.

IP

Max. RPM: 3200 rpm
 Permitted Shaft-Loading, axial: 100 N [10.197 kp]
 Permitted Shaft-Loading, radial: 120 N [12.236 kp]
 Max. PPR: 25000 ppr
 Starting-torque: approx. 5 Ncm [7.081 in-ozf] at ambient temperature

Low temperature

Order key

The encoder EI30 P 115 TM with the output circuit types C1, C2, C3, C4, C5, C6, D3, D4, D5, D6 is also available with the extended temperature range $-40 \text{ }^{\circ}\text{C}$ up to $+85 \text{ }^{\circ}\text{C}$ [$-40 \text{ }^{\circ}\text{F}$ up to $+185 \text{ }^{\circ}\text{F}$] (measured at the flange).

LT

Pressure equalising membrane

Order key

The EI30 P 115 TM 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 P 115 TM 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

Technische gegevens

Encoder EI30 P 115 TM

Example Order No. Type

EI30 P 115 TM	EI30 P 115 TM	EI30 P 115 TM
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Shaft

11	11
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Pulses per revolution PPR:

5000	2, 5, 10, 15, 20, 25, 30, 36, 40, 48, 50, 60, 64, 72, 90, 100, 120, 125, 128, 150, 160, 180, 200, 216, 240, 250, 254, 256, 300, 314, 320, 360, 400, 500, 512, 571, 600, 720, 750, 768, 800, 900, 1000, 1024, 1200, 1250, 1270, 1440, 1500, 1800, 2000, 2048, 2400, 2500, 2880, 3000, 3600, 4000, 4096, 4685, 5000, 5760, 6000, 7200, 7500, 8000, 8192, 10000, 10240, 12000, 12500, 15000, 16384, 20000, 20480, 25000 1 Vpp Sin/Cos only 1024, 2048 Other PPRs on request
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Channels:

N	B, N (SIN: B)
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Output circuit

	Resolution PPR	Power supply VDC	Output circuit	—	Order key
C6	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
		10 - 30	TTL, RS422 comp., inverted	—	C1
		4.75 - 5.5	TTL	—	C3
	(higher frequency) 1200 up to 25000	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

Technische gegevens

Encoder EI30 P 115 TM

Electrical connections

	Description	N inv. poss.	Order key
A-N	Cable: length (2 m standard)		
	axial, shield not connected	•	A-N
	axial, shield connected to encoder housing	•	A-C
	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, 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, clockwise pin count, M23, 12-pin, axial	•	AC12
	connector, M23, 12-pin, radial	•	R12M
	connector, clockwise pin count, M23, 12-pin, radial	•	RC12
	sensor-connector, M12x1, 4-pin, axial	–	AS4
	sensor-connector, M12x1, 4-pin, radial	–	RS4
	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
	sensor-connector, M12x1, 12-pin, axial	•	AS12
	sensor-connector, M12x1, 12-pin, radial	•	RS12

Options

Description	Order key
Low-friction bearings	LB
IP67	IP
Low temperature	LT
Pressure equalising membrane	PE
Without option	Empty
Cable length	XXX = Decimeter

Example Order No.:	EI30 P 115 TM	11	5000	N	C6	A-N	EI30 P 115 TM	Your enco- der
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Artikelsleutel

Artikelaanduiding: **EABB CCCDDEE FFFFFFF GHJJKK LLMNOPPP RR**

A	Type encoder I: incrementeel S: Absolut, Singleturn M: Absolut, Multiturn
BB	Serie 10: Entry 30: Basic 50: Extended 70: Advanced
CCC	Flensdiameter 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	Flenstype BB: holle as met blindgat CC: klemflens (compacte uitvoering) CF: klemflens (voedingsmiddelen en dranken) CH: klemflens (uitvoering voor zware belasting) CL: klemflens HL: holle as (geïsoleerd) HO: holle as HT: holle as (speciale koppelsteun) RC: ronde flens (36/40 klemflens, 58 met 6 mm-as) RE: ronde flens (vergroete boringen) RN: ronde flens SC: statorkoppeling SF: schroefflens (53 klemflens, 58 levensmiddelen en dranken) SI: Servoflens (verhoogde asbelasting en IP-bescherming) SQ: vierkante flens SR: schroefflens (36/40 klemflens, 58 corrosiebestendig) SY: Synchro (incrementaal), Servo (36), Synchro (58) (absoluut) TM: snelheidsmeter (115 met as van 1 mm, 58 met motorfeedback) TS: snelheidsmeter (10 mm-as)
EE	Schacht-/boringsdiameter 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: doorlopende/blinde boring (6 ... 72 mm)
FFFFFF	Signaal/oplossing Axxxx: A Bxxxx: AB Nxxxx: ABN P16384: programmeerbaar xx: Singleturn, 1 ... 16 Bit xx: Multiturn, 0 ... 43 Bit (00 bij Singleturn)
G	Galvanische scheiding (alleen absoluut) 0: zonder 1: met
HH	Spanningsvoorziening (alleen absoluut) 0: 10 ... 32 V DC/met galvanische scheiding 1: 4,75 ... 5,5 V DC 2: 18 ... 30 V DC
J	Werkingsprincipe M: magnetisch O: optisch P: optisch geïnterpoleerd

Artikelsleutel

KK	Interface 01: RS485 07: SSI binair 08: SSI Gray 35: CANopen 38: EtherCAT 48: PROFINET 58: EtherNet/IP
LL	Elektrische aansluiting M08: ronde stekker M8 M12: ronde stekker M12 M16: ronde stekker M16 M23: ronde stekker M23 M12BC: stekker voor buskap
M	Kabeluitgang A: axiaal R: radiaal T: Tangential
NN	Aantal polen xx: aantal polen
O	Afschermingsverbinding (kabel van 2 m) (optioneel) C: aangesloten N: niet aangesloten
PPP	Kabellengte xxx: kabellengte (in dm)

Opmerking



↗ Een lijst met alle beschikbare apparaattypen vindt u op de webpagina van Leuze via www.leuze.com.

