

Incremental encoders

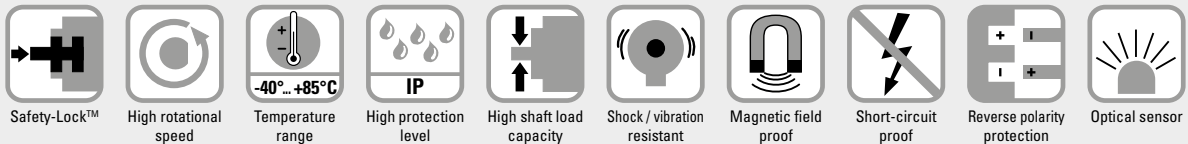
Standard optical	Sendix K80I (large hollow shaft)	Push-pull / RS422 / SinCos
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With reduced size - For large shafts.

The new Sendix encoders are based on state-of-the-art sensor and electronic components as well as a robust metal code disk. The incremental Sendix K80I encoders achieve a resolution of up to 5,000 pulses per revolution with a high level of reliability.

The Sendix K80I encoder for large shafts has the outstanding feature of combining a continuous hollow shaft of 42 mm with a reduced size of 80 mm.

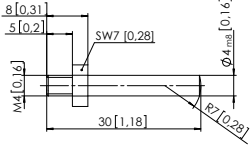


Features and benefits

- **High accuracy and reliability**
State-of-the-art sensor technology with resolutions up to 5.000 ppr.
- **Prepared for the toughest operating conditions and a wide range of external influences**
 - Temperature range from -40 °C bis +85 °C
 - Protection class up to a maximum of IP67
 - Optimized EMC shielding concept
 - Advanced Safety Lock technology
- **Reduced installation space even in large applications**
Hollow shaft up to 42 mm diameter with 80 mm size.
- **Seamless integration into modern, digital networks**
Prepared for use with digital type plate and digital twin for monitoring and maintaining machines and for a wide range of documentation tasks.
Optimizing processes and increasing efficiency.

1) Not suitable for EX2/22.

Incremental encoders

Standard optical	Sendix K80I (large hollow shaft)	Push-pull / RS422 / SinCos
Mounting accessory for hollow shaft encoders		Order no.
Torque pin, ø 4 mm for flange with spring element (mounting type E = 18)	with fixing thread 	8.0010.4700.0000
Tapered shaft mounting kit for K80I with hollow shaft, ø 38 mm [1.50"]	For use in upgrading for tapered shaft mounting. Tapered shafts are used for high-precision direct coupling. An insulation insert is also included in the mounting kit; this reliably protects the encoder from shaft currents. Included in the set: • Insert for cone blind hole, cone 1:10, 17 mm [0.67"] length • Insulation / reduction insert • Allen screw for central fixing	8.0010.4028.0000
Insulation / reduction insert for hollow shaft ø 38 mm [1.50"] Temperature range -40 °C ... +115 °C [-40 °F ... +239 °F]	Insulation inserts prevent currents from passing through the encoder bearings. These currents can occur when using inverter controlled three-phase or AC vector motors and considerably shorten the service life of the encoder bearings. For more details please call our technical hotline (+49 7720 3903 849) or send us an email (info@kuebler.com)	ø D1: 12 mm 8.0010.4091.0000 14 mm 8.0010.4027.0000 15 mm 8.0010.4038.0000 16 mm 8.0010.4019.0000 18 mm 8.0010.4080.0000 20 mm 8.0010.4011.0000 25 mm 8.0010.4012.0000 28 mm 8.0010.4061.0000 30 mm 8.0010.4016.0000 32 mm 8.0010.4015.0000 1/2" (12.7 mm) 8.0010.4013.0000 5/8" (15.875 mm) 8.0010.4070.0000 3/4" (19.05 mm) 8.0010.4090.0000 7/8" (22.225 mm) 8.0010.4018.0000 1" (25.4 mm) 8.0010.4050.0000 1 1/8" (28.575 mm) 8.0010.4014.0000 1 1/4" (31.75 mm) 8.0010.4060.0000
Insulation / reduction insert for hollow shaft ø 42 mm [1.65"]	external diameter 42 mm [1.65"] / internal diameter 38 mm [1.50"] external diameter 42 mm [1.65"] / internal diameter 12 mm [0.47"]	8.0010.4017.0000 8.0010.4029.0000

Incremental encoders

Standard optical		Sendix K80I (large hollow shaft)	Push-pull / RS422 / SinCos
Cables and connectors			Order no.
Preassembled cables	M12 female connector with coupling nut, 5-pin, A coded, straight single ended 2 m [6.56'] PVC cable		05.00.6081.2211.002M
	M12 female connector with coupling nut, 8-pin, A coded, straight single ended 2 m [6.56'] PVC cable		05.00.6041.8211.002M
	M23 female connector with coupling nut, 12-pin, cw single ended 2 m [6.56'] PVC cable		8.0000.6901.0002
Connectors	M12 female connector with coupling nut, 5-pin, A coded, straight (plastic)		05.B-8151-0/9
	M12 female connector with coupling nut, 8-pin, A coded, straight (metal)		05.CMB 8181-0
	M23 female connector with coupling nut, 12-pin, cw		8.0000.5012.0000

Further Kübler accessories can be found at: [kuebler.com/accessories](https://www.kuebler.com/accessories)

Further Kübler cables and connectors can be found at: [kuebler.com/connection-technology](https://www.kuebler.com/connection-technology)

Incremental encoders

Standard optical	Sendix K80I (large hollow shaft)	Push-pull / RS422 / SinCos
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Technical data

Mechanical characteristics

Maximum speed	IP65	5000 min ⁻¹
		2500 min ⁻¹ (continuous)
	IP66/IP67	2400 min ⁻¹
		1200 min ⁻¹ (continuous)
	variants with Ex 2/22 (IP65)	2500 min ⁻¹
Mass moment of inertia		approx. 91.3 ... 158.6 x 10 ⁻⁶ kgm ² (dep. on the hollow shaft version)
Starting torque with seal at 20 °C [68 °F]		< 0.12 Nm
Shaft load capacity	radial	200 N
	axial	100 N
Weight		approx. 0.8 kg [28.22 oz]
Protection acc. to EN 60529	IP65	
	IP66/IP67	
Shock resistance acc. to EN 60068-2-27		2000 m/s ² , 6 ms
Vibration resistance acc. to EN 60068-2-6	5 ... 8.7 Hz	±0.35 mm
	8.7 ... 200 Hz	30 m/s ²
	200 ... 2000 Hz	150 m/s ²

Working temperature range with connector on the housing

-40 °C ... +85 °C [-40 °F ... +185 °F]

Working temperature range with PVC cable

fixed cable installation -30 °C ... +80 °C [-22 °F ... +176 °F]
flexible cable use -5 °C ... +80 °C [+23 °F ... +176 °F]

Working temperature range with PUR cable

fixed cable installation -40 °C ... +80 °C [-40 °F ... +176 °F]
flexible cable use -20 °C ... +80 °C [-4 °F ... +176 °F]

Approvals

UL compliant in accordance with File no. E224618

CE compliant in accordance with
EMC Directive 2014/30/EU
RoHS Directive 2011/65/EU
ATEX Directive 2014/34/EU (for Ex 2/22 variants)

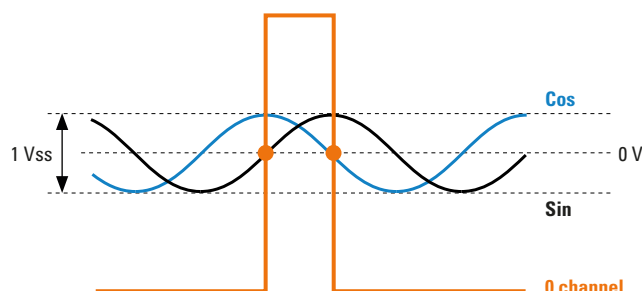
Electrical characteristics

Output circuit	RS422 (TTL compatible)		RS422 (TTL compatible)		Push-pull (HTL/TTL universal, 7272 compatible)	
	Order code  RS		RS		PP	
Supply voltage	5 ... 30 V DC		5 V DC (±5 %)		5 ... 30 V DC	
Power consumption (no load)	typ. 40 mA / max. 90 mA		typ. 40 mA / max. 90 mA		typ. 40 mA / max. 90 mA	
Permissible load / channel	max. +/- 20 mA		max. +/- 20 mA		max. +/- 20 mA	
Pulse frequency	max. 300 kHz		max. 300 kHz		max. 300 kHz ¹⁾	
Signal level	HIGH	min. 2.5 V	min. 2.5 V	min. 2.5 V	min. 2.5 V	min. 2.5 V
	LOW	max. 0.5 V	max. 0.5 V	max. 0.5 V	max. 0.5 V	max. 0.5 V
Rising edge time t_r	max. 200 ns		max. 200 ns		max. 200 ns	
Falling edge time t_f	max. 200 ns		max. 200 ns		max. 200 ns	
Short circuit proof outputs ²⁾	yes ³⁾		yes ³⁾		yes ³⁾	
Reverse polarity protection of the supply voltage	yes		no		yes	

Electrical characteristics SinCos output

Output circuit		SinCos U = 1 Vss	SinCos U = 1 Vss
Supply voltage		5 V DC (±5 %)	5 ... 30 V DC
Power consumption (no load)		typ. 65 mA max. 110 mA	typ. 65 mA max. 110 mA
-3 dB frequency		< 180 kHz	< 180 kHz
Signal level			
channels A/B		1 Vss (±20 %)	1 Vss (±20 %)
channel 0 digital	HIGH	min. 2.5 V	min. 2.5 V
	LOW	max. 0.5 V	max. 0.5 V
Short circuit proof outputs ²⁾		yes	yes
Reverse polarity protection of the supply voltage		no	yes

Signal level channel 0



1) Max. recommended cable length 30 m [98.43'].

2) If supply voltage correctly applied.

3) Only one channel allowed to be shorted-out:
at +V= 5 V DC, short-circuit to channel, 0 V, or +V is permitted.
at +V= 5 ... 30 V DC, short-circuit to channel or 0 V is permitted.

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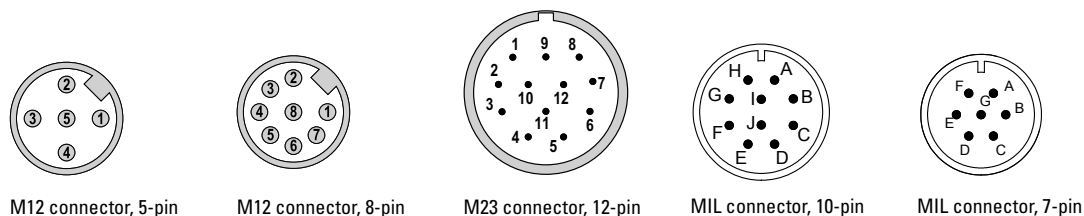
Terminal assignment

Interface	Cable / connector type	Cable (isolate unused cores individually before initial start-up)											
PP, RS, SC	1	Signal:	0 V	+V	0 V _{sens}	+V _{sens}	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
		Core color:	WH	BN	GY/PK	RD/BU	GN	YE	GY	PK	BU	RD	shield
Interface	Cable / connector type	M12 connector, 5-pin											
PP, RS	3	Signal:	0 V	+V	A	B	0	$\perp$					
		Pin:	1	2	3	4	5	PH					
Interface	Cable / connector type	M12 connector, 5-pin (special assignment)											
PP, RS	6	Signal:	0 V	+V	A	B	0	$\perp$					
		Pin:	3	1	4	2	5	PH					
Interface	Cable / connector type	M12 connector, 8-pin											
PP, RS, SC	2	Signal:	0 V	+V	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$		
		Pin:	1	2	3	4	5	6	7	8	PH		
Interface	Cable / connector type	M12 connector, 8-pin (special assignment)											
PP, RS, SC	5	Signal:	0 V	+V	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$		
		Pin:	7	2	1	3	4	5	6	8	PH		
Interface	Cable / connector type	M23 connector, 12-pin											
PP, RS, SC	4	Signal:	0 V	+V	0 V _{sens}	+V _{sens}	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$
		Pin:	10	12	11	2	5	6	8	1	3	4	PH
Interface	Cable / connector type	MIL connector, 10-pin											
PP, RS, SC	E	Signal:	0 V	+V	+V _{sens}	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$	
		Pin:	F	D	E	A	G	B	H	C	I	J	
Interface	Cable / connector type	MIL connector, 10-pin (special assignment)											
PP, RS, SC	J	Signal:	0 V	+V	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	$\perp$		
		Pin:	F	D	A	H	B	I	C	J	G		
Interface	Cable / connector type	MIL connector, 7-pin											
PP, RS	D	Signal:	0 V	+V	+V _{sens}	A	B	0	$\perp$				
		Pin:	F	D	E	A	B	C	PH				
Interface	Cable / connector type	MIL connector, 7-pin (special assignment)											
PP, RS	H	Signal:	0 V	+V	+V _{sens}	A	B	0	$\perp$				
		Pin:	F	D	A	C	B	E	G				

+V : Supply voltage encoder +V DC
 0 V : Supply voltage encoder ground GND (0 V)
 0 V_{sens} / +V_{sens} : Using the sensor outputs of the encoder, the voltage present can be measured and if necessary increased accordingly..

A, $\bar{A}$: Incremental output channel A
 B, $\bar{B}$: Incremental output channel B
 0, $\bar{0}$: Reference signal
 PH $\perp$: Shield is connected to the connector housing

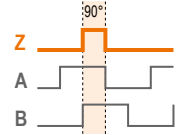
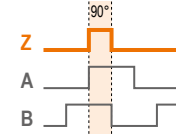
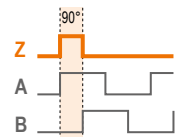
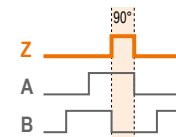
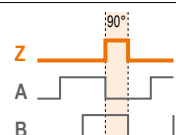
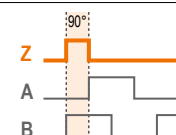
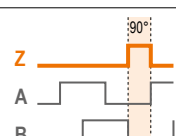
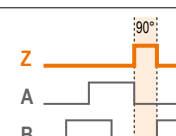
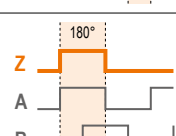
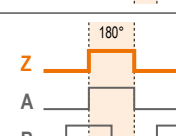
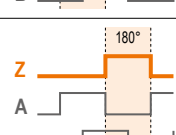
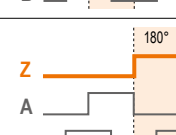
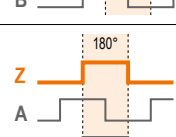
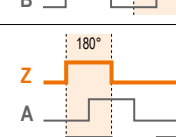
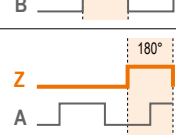
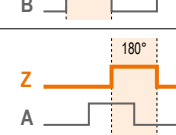
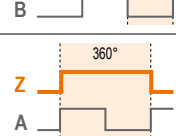
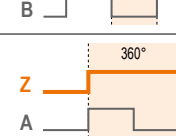
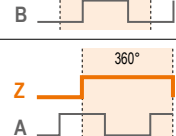
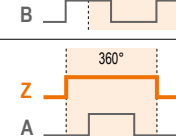
Top view of mating side, male contact base



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Special formats for output signals

A leading B when the shaft is rotated clockwise with the flange side facing you.			B leading A when the shaft is rotated clockwise with the flange side facing you.		
Order code 			Order code 		
Standard No specification in the order code	Z at A / B = 1 / 1 Z is 90° wide		B0	Z at A / B = 1 / 1 Z is 90° wide	
A1	Z at A / B = 1 / 0 Z is 90° wide		B1	Z at A / B = 1 / 0 Z is 90° wide	
A2	Z at A / B = 0 / 1 Z is 90° wide		B2	Z at A / B = 0 / 1 Z is 90° wide	
A3	Z at A / B = 0 / 0 Z is 90° wide		B3	Z at A / B = 0 / 0 Z is 90° wide	
A4	Z at A = 1 Z is 180° wide		B4	Z at A = 1 Z is 180° wide	
A5	Z at A = 0 Z is 180° wide		B5	Z at A = 0 Z is 180° wide	
A6	Z at B = 1 Z is 180° wide		B6	Z at B = 1 Z is 180° wide	
A7	Z at B = 0 Z is 180° wide		B7	Z at B = 0 Z is 180° wide	
A8	Z at A Z is 360° wide		B8	Z at A Z is 360° wide	
A9	Z at B Z is 360° wide		B9	Z at B Z is 360° wide	

Incremental encoders

Standard optical

Sendix K80I (large hollow shaft)

Push-pull / RS422 / SinCos

Dimensions hollow shaft version

Dimensions in mm [inch]

Spring element, long R 48.8 ... 51.2 mm

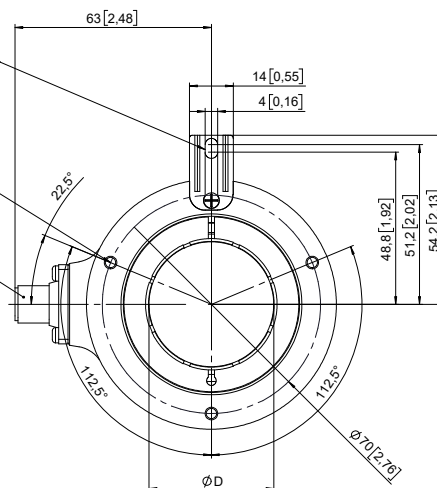
Connection, radial
Connector on the housing
M12 connector, 5- or 8-pin

mounting type **E** = 18
position connection **I** = R
type of connection **I** = C
connector type **K** = 2 or 3

Nut Federelement,
für Drehmomentstift nach DIN 7, Ø4 [0,16]
Spring element for groove,
for DIN 7 dowel pin, Ø4 [0,16]

(3x) M4, 7 [0,28] tief deep

M12-Stecker (8-polig)
M12 connector (8 pins)

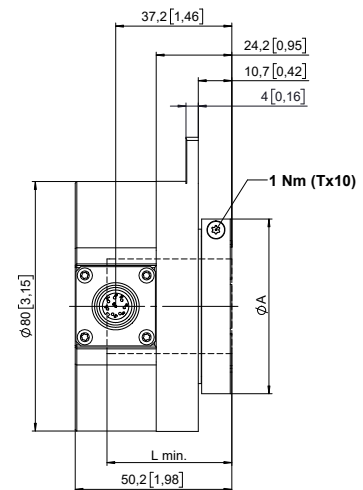


ØD	ØA
28 [1,1]	46 [1,81]
30 [1,18]	
35 [1,38]	51 [2,01]
38 [1,5]	
40 [1,57]	56 [2,2]
42 [1,65]	
1 1/8"	58 [2,28]
1 1/4"	46 [1,81]
	51 [2,01]

Passung für D: H7
fit for D: H7

Empfohlene Passung für Welle auf Kundenseite: g6
Recommended fit for customer shaft: g6

Mindesteinstecktiefe L min.: 41 [1,61]
Minimum insertion depth L min.: 41 [1,61]



D	Fit
28 [1,10]	H7
30 [1,18]	H7
35 [1,38]	H7
38 [1,50]	H7
40 [1,57]	H7
42 [1,65]	H7
1 1/8"	H7
1 1/4"	H7
Recommended fit for shaft on customer side is g6.	

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Standard optical

Sendix K80I (large hollow shaft)

Push-pull / RS422 / SinCos

Dimensions hollow shaft version

Dimensions in mm [inch]

Torque stop, short

R 72.2 ... 77.2 mm

Connection, radial

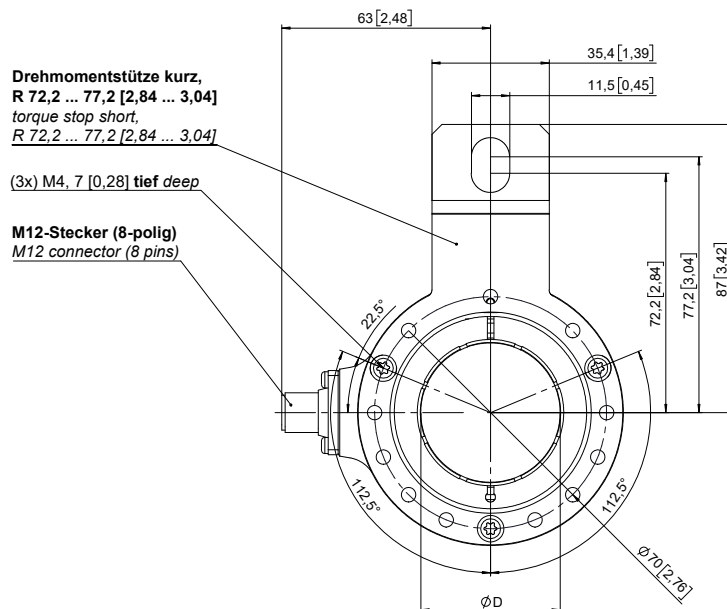
Connector on the housing

M23 connector, 12-pin

mounting type **e** = 48

position connection $\mathbf{h} = \mathbf{R}$

type of connection **i** = C

connector type **k** = 4

ØD	ØA
28 [1,1]	46 [1,81]
30 [1,18]	
35 [1,38]	51 [2,01]
38 [1,5]	56 [2,2]
40 [1,57]	
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1 1/8"	46 [1,81]
1 1/4"	51 [2,01]

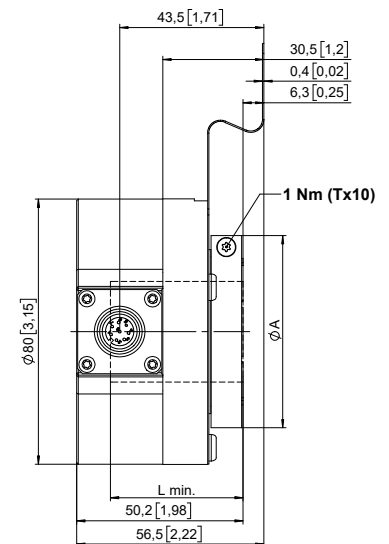
Passung für D: H7

fit for D: H7

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Mindesteinstecktiefe L min.: 41 [1,61]



Incremental encoders

Standard optical

Sendix K80I (large hollow shaft)

Push-pull / RS422 / SinCos

Dimensions hollow shaft version

Dimensions in mm [inch]

Torque stop, long
R 52 ... 103 mm

Connection, radial
Connector on the housing
M23 connector, 12-pin

mounting type **e** = D8

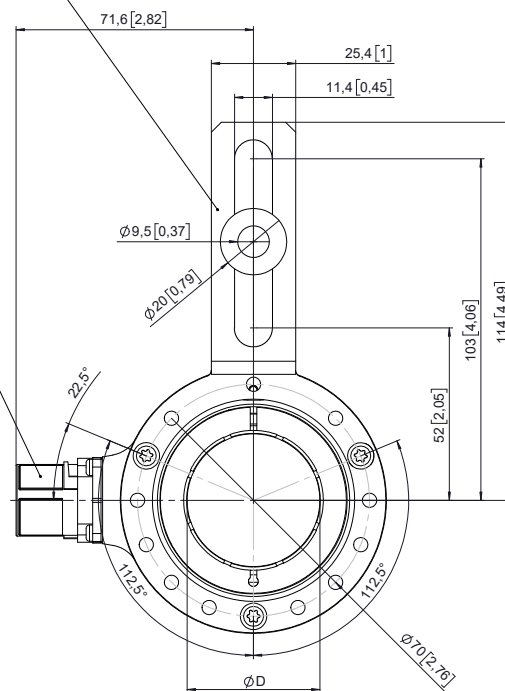
position connection $\mathbf{h} = \mathbf{R}$

type of connection **i** = C

connector type **k** = 4

Drehmomentstütze, lang R 52 ... 103 [R 2,05 ... 4,06]
stator coupling, long R 52 ... 103 [R 2,05 ... 4,06]

M23-Stecker (12-polig)
M23 connector (12 pins)



ØD	ØA
28 [1,1]	46 [1,81]
30 [1,18]	
35 [1,38]	51 [2,01]
38 [1,5]	56 [2,2]
40 [1,57]	
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Passung für D: H7 <i>fit for D: H7</i>	
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Recommended fit for customer shaft: g6

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