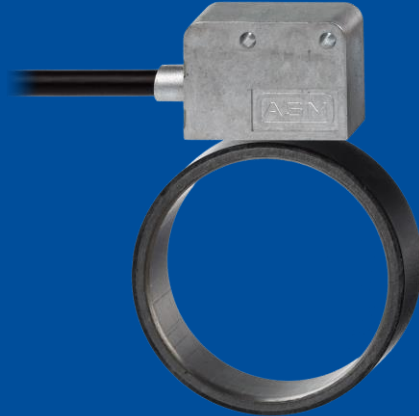




PMIS4, PMIR7, PMIR7N

Incremental Encoder for rotative applications consisting of sensor head PMIS4 and magnetic ring PMIR7/PMIR7N

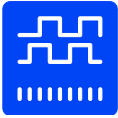


- Protection class IP67
- Measurement range from 0 to 360°
- Shielded metal housing
- Contactless and wear-free
- Up to 184,320 pulses / 360°
- Simple installation and adjustment

Product version



Incremental encoder output



PMIS4 - Sensor head Magnetic Incremental Encoder

Specifications

		Order options	
Magnetic period	2 mm	1	20
Scaling factor	See table of scaling factors	2	see table p. 7
Max. pulse frequency f_p	50 kHz 20 kHz 10 kHz (other frequencies on request, standard 50 kHz, max. 480 kHz)	3	50KHZ 20KHZ 10KHZ
Output	Incremental encoder output A/B with differential push-pull output, HTL, TTL/RS-422T or TL/24 V compatible	4	HTL TTL TTL24V
Signal Z / status signal	A/B without signal Z A/B with signal Z A/B with signal Z and status signal, only for non-differential (single-ended) outputs	5	Z0 Z1 Z3
Excitation voltage	10 ... 30 VDC or 5 VDC $\pm 5\%$		
Excitation current	Max. 300 mA		
Guided spacing between sensor and ring x_z	0.1 ... 0.8 mm		
Side tracking tolerance of the sensor	± 1 mm		
Linearity (sensor with magnetic ring)	0.1°		
Repeatability	± 1 digit		
Output signals	A, \bar{A} , B, \bar{B} / signal Z, \bar{Z} / status signal \bar{ERR}		
Housing material	Zinc die casting		
Cable length	Standard 2 m Max. length of the integrated sensor cable: output TTL: 3 m; HTL/TTL24V: 20 m	6	2M
Connection	Cable 8 wire, dia. 5 mm, open cable end 15 pin D-Sub connector at the cable end as option	7	S P15
Weight	30 g ± 5 g (without cable and connector)		
Protection class (EN 60529)	IP67		
Shock	DIN EN 60068-2-27:2010, 50 g 6 ms, 100 shocks		
Vibration	DIN EN 60068-2-6:2008, 20 g, 10-2000 Hz, 10 cycles		
Temperature	-40 ... +85°C		
EMC	DIN EN 61326-1:2013		

Order code



Order example PMIS4 - 20 - 100 - 50KHZ - HTL - Z0 - 2M - S
Sensor head:

Output signals

NOTICE

The subsequent counting device must be able to process the specified maximum pulse frequency.

Saturation voltage	UH, UL = 0,2 V	$I_{out} = \pm 10 \text{ mA}$	(UH = UB - U _{out})
	UH, UL = 0,4 V	$I_{out} = \pm 30 \text{ mA}$	
	C _{last} < 10 nF		
Short circuit current	ISL, ISH < 800 mA	(UH, UL = 0 V)	
	ISL, ISH < 90 mA	(UH, UL = 1,5 V)	
Rise time	tr, tf < 200 ns	with cable length 1 m, 10 % ... 90 %	

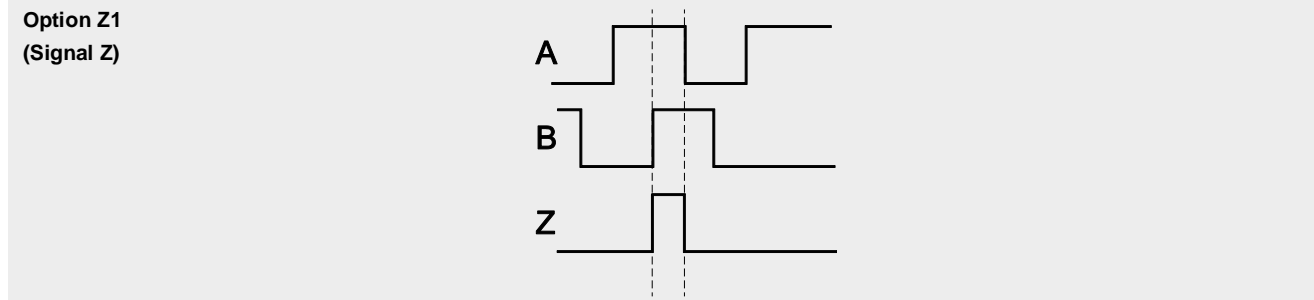
Pulse frequency depending on the cable length

Load / cable length	Load / pulse frequency f _p		
	HTL single ended UB = 24 V	TTL/RS422 differential UB = 5 V *	TTL/24 V UB = 24 V
Max. output current	50 mA	50 mA	10 mA
R _{last} min.	500 Ω	100 Ω	500 Ω
C _{last} max.	10 nF	10 nF	1 nF
200 m	15 kHz	—	—
100 m	25 kHz	100 kHz	—
50 m	50 kHz	200 kHz	50 kHz
10 m	100 kHz	300 kHz	100 kHz

* = consider the voltage drop within the cable; the excitation voltage 5 V ± 5% of the sensor must be guaranteed.

Note: For longer distances (see specification above) you must use min. 0.5 mm² wire for „Excitation +“ and „Excitation GND“ (see signal wiring), all signal wires must be min. 0.14 mm²!

Output signals



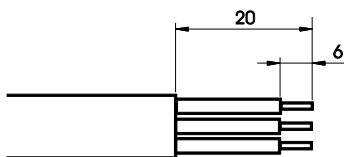
Signal wiring/ connection

Option	Signal name			Cable with open end, cable color	Connector D-Sub, 15 pin
	Z0	Z1	Z3*		
		Excitation +		white	1
		Excitation GND (0V)		brown	2
	B	B	B	green	6
	A	A	A	yellow	4
	\bar{B}	\bar{B}	\overline{ERR}	grey	7
	\bar{A}	\bar{A}	–	pink	5
	–	Z	Z	blue	8
	–	\bar{Z}	–	red	9
		Shield		black	12

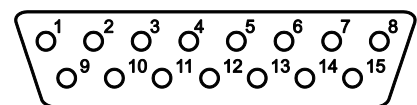
Z = Reference pulse

\overline{ERR} = Status signal, periodical approx. 16 Hz, for side tracking and velocity errors

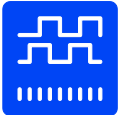
* = Status signal ERR available only with HTL (single ended) output



Cable output dimensions, open end



Connector D-Sub (Pin)
View to connector pins



PMIR7, PMIR7N - Magnetic rings
Magnetic Incremental Encoder

Specifications PMIR7, PMIR7N

Material	Elastomer bonded hard ferrite
Base material	PMIR7: stainless steel PMIR7N: stainless steel (hub: aluminum)
Poles per revolution	50 / 64 / 90 poles/360°
Magnetic period	2 mm
Temperature range	-40 ...+85°C
Linearity with sensor PMIS4	Approx. ± 0.1°

Standard magnetic rings

Type	Poles	Ø	Width	Signal periods/rotation	Inside diameter
PMIR7-20-50-M-27 PMIR7N-20-50-M-20	50	31.8	10	50 to 102 400 (refer to the table p. 7)	27H7 20H7
PMIR7-20-64-M-35 PMIR7N-20-64-M-20	64	40.7	10	64 to 131 072 (refer to the table p. 7)	35H7 20H7
PMIR7-20-90-M-50 PMIR7N-20-90-M-20	90	57.3	10	90 to 184 320 (refer to the table p. 7)	50H7 20H7

PMIR7	PMIR7N
Magnetic ring	Magnetic ring with hub

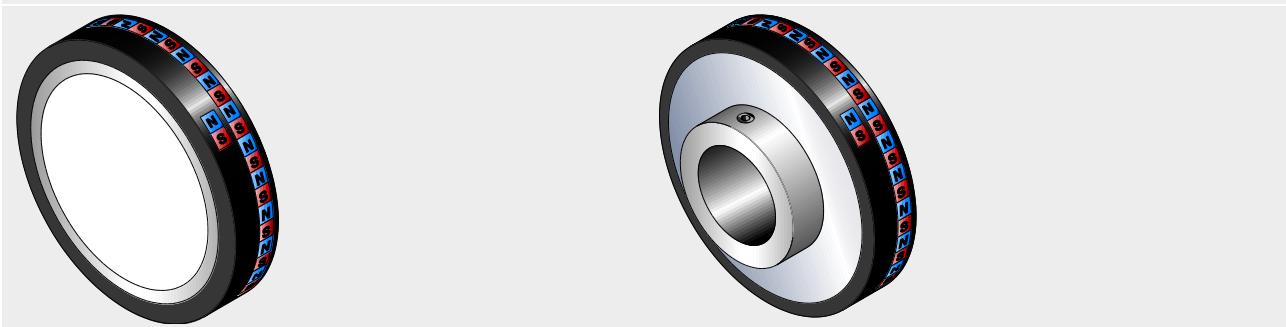


Table of scaling factors

Scaling factor sensor PMIS4-20- ...	PMIR7-20-50-M-27 PMIR7N-20-50-M-20		PMIR7-20-64-M-35 PMIR7N-20-64-M-20		PMIR7-20-90-M-50 PMIR7N-20-90-M-20	
	Signal periods	r.p.m. * (at 480 kHz)	Signal periods	r.p.m. * (at 480 kHz)	Signal period	r.p.m. * (at 480 kHz)
1	50	6000	64	6000	90	6000
2	100	6000	128	6000	180	6000
4	200	6000	256	6000	360	6000
8	400	6000	512	6000	720	6000
10	500	5760	640	4500	900	3200
16	800	6000	1024	6000	1440	6000
20	1000	5760	1280	4500	1800	3200
25	1250	6000	1600	6000	2250	5120
32	1600	6000	2048	6000	2880	6000
40	2000	5760	2560	4500	3600	3200
50	2500	6000	3200	6000	4500	5120
64	3200	6000	4096	5625	5760	4000
80	4000	5760	5120	4500	7200	3200
100	5000	4608	6400	3600	9000	2560
125	6250	3686	8000	2880	11 250	2048
128	6400	3600	8192	2813	11 520	2000
200	10 000	2304	12 800	1800	18 000	1280
250	12 500	1843	16 000	1440	22 500	1024
256	12 800	1800	16 384	1406	23 040	1000
400	20 000	1152	25 600	900	36 000	640
500	25 000	922	32 000	720	45 000	512
512	25 600	900	32 768	703	46 080	500
1024	51 200	450	65 536	352	92 160	250
2048	102 400	225	131 072	176	184 320	125

* Maximum revolution per minute mechanically 6.000 r.p.m.

Magnetic ring PMIR7

Magnetic period	2 mm	1	20
Number of poles and inner diameter [in mm]	50 - M - 27	2	64 - M - 35
	64 - M - 35		
	90 - M - 50		

Order code

PMIR7 – **1** – **2**

Order example magnetic ring PMIR7

PMIR7 – 20 – 64 - M - 35

Magnetic ring PMIR7N

Magnetic period	2 mm	1	20
Number of poles and inner diameter [in mm]	50 - M - 20	2	64 - M - 20
	64 - M - 20		
	90 - M - 20		

Order code

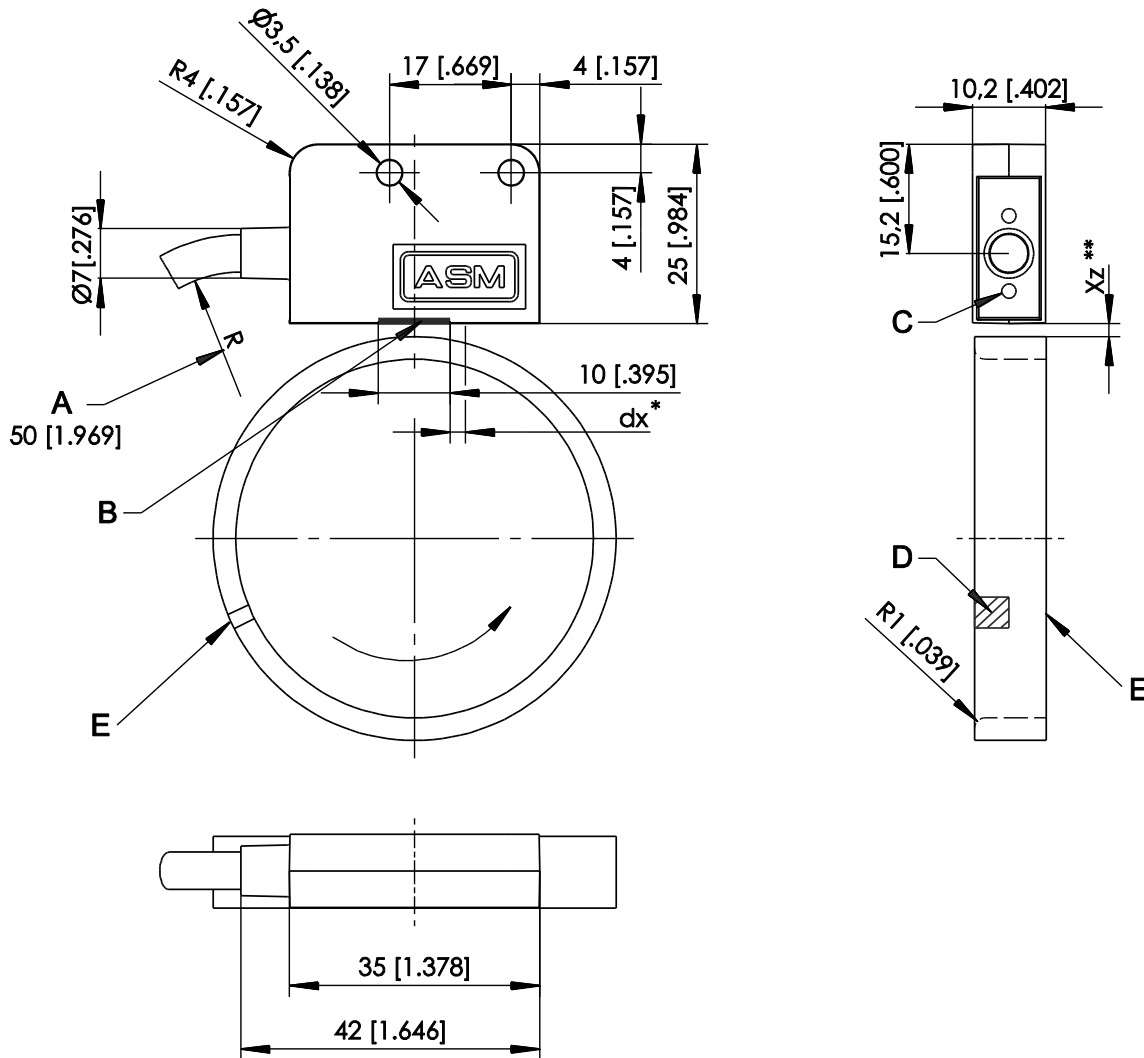
PMIR7N – **1** – **2**

Order example magnetic ring PMIR7N

PMIR7N – 20 – 64 - M - 20

Dimensions

Dimensions PMIS4 and PMIR7



A – Minimum bending radius 50 mm [1.969]

B – Active measurement range

C – Status indicator

D – Reference mark

E – Marking

* Position tolerance of the active measurement range: $dx = \pm 1$ mm

** see "Specifications"

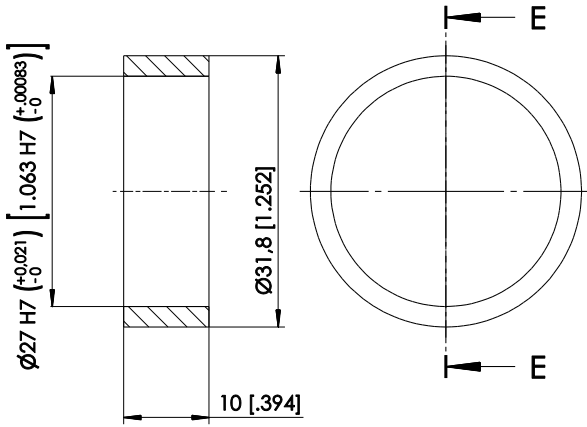
Dimensions in mm [inch]

Dimensions informative only.

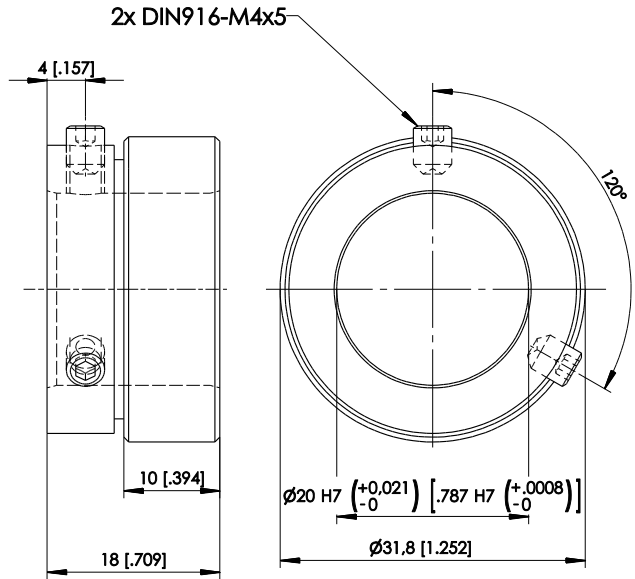
For guaranteed dimensions please consult factory.

Magnetic rings

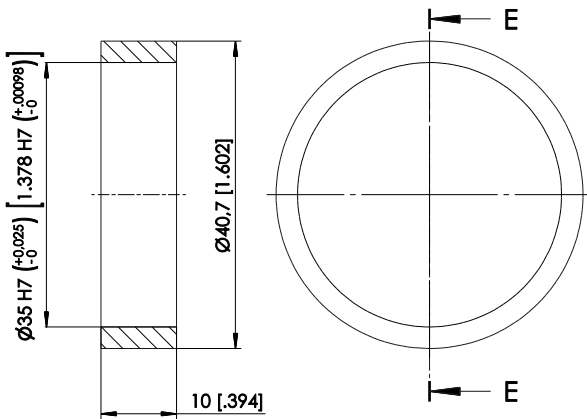
PMIR7-20-50-M-27



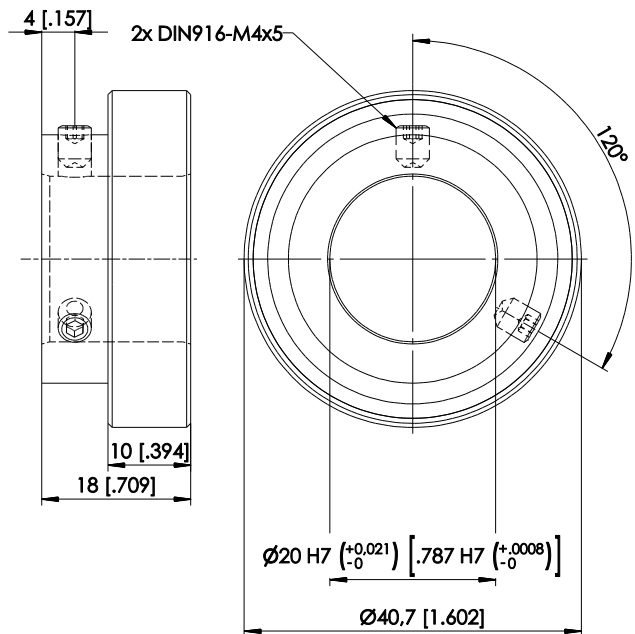
PMIR7N-20-50-M-20



PMIR7-20-64-M-35

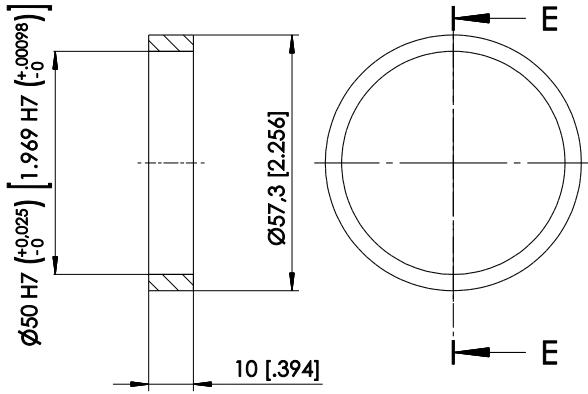


PMIR7N-20-64-M-20

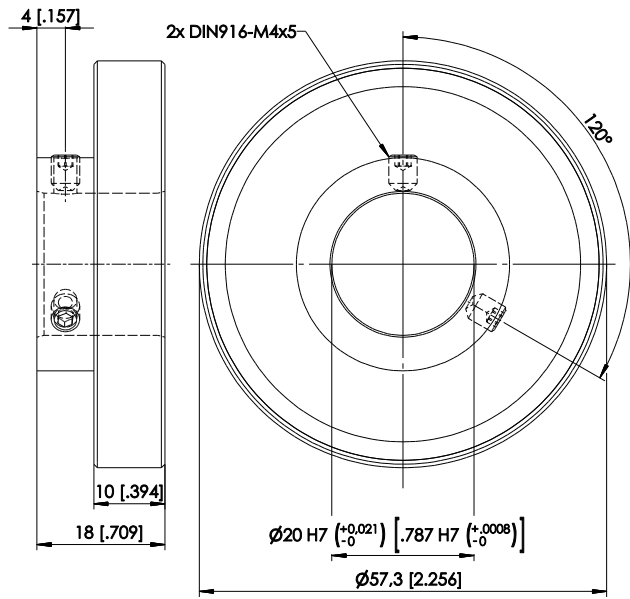


Dimensions in mm [inch].
Dimensions informative only.
For guaranteed dimensions consult factory.

PMIR7-20-90-M-50



PMIR7N-20-90-M-20

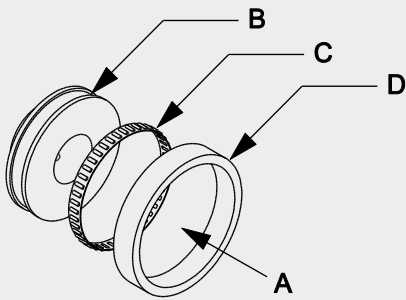


Dimensions in mm [inch].

Dimensions informative only.

For guaranteed dimensions consult factory.

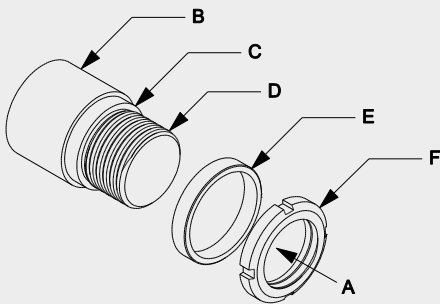
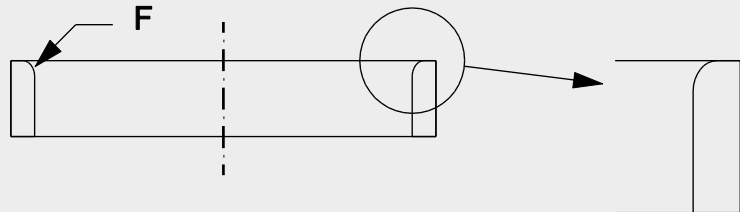
Mounting options for PMIR7 magnetic rings on customer-supplied shaft



Mounting with press ring on hub

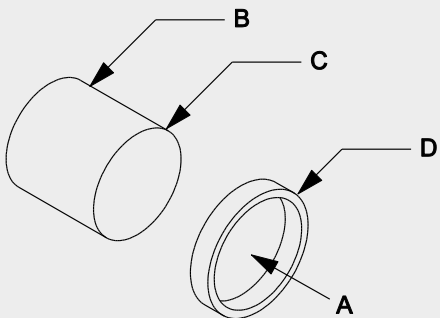
- A – Mounting direction
- B – Hub with groove for press ring
- C – Press ring
- D – Magnetic ring PMIR7

Insert the magnetic ring (F) with the rounding in mounting direction!



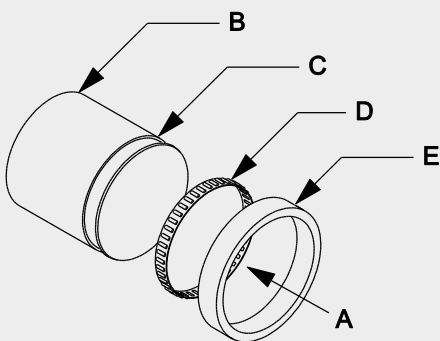
Mounting with shaft nut

- A – Mounting direction
- B – Customer's shaft
- C – Force fit for magnetic ring
- D – Thread for shaft nut
- E – Magnetic ring PMIR7
- F – Shaft nut



Mounting as press fit for shaft

- A – Mounting direction
- B – Customer's shaft
- C – Press fit for magnetic ring
- D – Magnetic ring PMIR7



Mounting with press ring on shaft

- A – Mounting direction
- B – Customer's shaft
- C – Groove for press ring
- D – Press ring
- E – Magnetic ring PMIR7