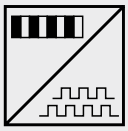
POSIROT®
PMIS4, PMIR7
Incremental magnetic encoder rings

Magnetic rings for rotative applications with POSIROT® position sensor PMIS4

- **All metal housing (sensor head PMIS4)**
- **Protection class IP67**
- **Highest EMC protection**
- **Large guiding distance of ±1 mm**
- **Suitable for harsh environments**
- **Up to 184,320 pulses/360°**
- **For shaft diameters of 27, 35 and 50 mm**
- **Magnet rings with index mark**



Order Code PMIR7
(magnetic ring)

PMIR7 – □ – □

Model name

Magnetic period
20 = 2 mm

Number of poles and inner diameter [in mm]
50 - M - 27
64 - M - 35
90 - M - 50

Order Code PMIS4
(sensor head)

PMIS4 – □ – □ – □ KHZ – □ – □ – □ M – □

Model name

Magnetic period
20 = 2 mm

Scaling factor
See table page 35

Maximum pulse frequency (in kHz, standard 50 kHz)
50 / 20 / 10 (other frequencies on request, max. 480 kHz)

Output
HTL = HTL output with excitation 24 V DC, output 24 V
TTL = TTL output with excitation 5 V DC, output TTL/RS-422
TTL24V = TTL output with excitation 24 V DC, output TTL/10 mA

Signal Z / status signal
Z0 = A/B w/o signal Z
Z1 = A/B with signal Z
Z3 = A/B with signal Z and status signal, only for non-differential (single-ended) outputs

Cable length (in m, standard 2 m)

Connection
S = Open cable end

Order example magnet ring: PMIR7 - 20 - 64 - 35

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

Specifications	Output	Incremental encoder output A/B with differential push-pull output, TTL/24 V-, TTL/RS-422- or HTL-compatible
	Excitation voltage	10 ... 30 V DC or 5 V DC ±5 %
	Excitation current	50 mA to 300 mA, depending on pulse frequency, cable length and load
	Magnetic period of the sensor	2 mm
	Guided spacing between sensor and wheel x_Z	0.1 ... 0.8 mm
	Side tracking tolerance of the sensor	±1 mm
	Linearity (sensor with magnetic wheel PMIR4)	±0.1°
	Repeatability	±1 digit
	Maximum pulse frequency f_P	50, 20, 10 kHz (standard 50 kHz, max. 480 kHz)
	Output signals	A, $\overline{A}$, B, $\overline{B}$, signal Z, $\overline{Z}$, status signal $\overline{ERR}$
	Material of housing	Zinc diecast
	Connection	Cable 8 wire, dia. 5 mm, open cable end. Max. length of the integrated sensor cable: output TTL: 3 m; HTL/TTL24V: 20 m
	Weight (w/o cable and connector)	30 ±5 g
	Protection class (EN 60529)	IP67
	Environmental	
	EMC	DIN EN 61326
	Temperature	-40 ... +85 °C

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

Output signals	Saturation voltage	UH, UL = 0.2 V UH, UL = 0.4 V C_{last} < 10 nF	I_{out} = ±10 mA (UH = UB - U_{out}) I_{out} = ±30 mA
	Short circuit current	ISL, ISH < 800 mA ISL, ISH < 90 mA	(UH, UL = 0 V) (UH, UL = 1.5 V)
	Rise time	t_r, t_f < 200 ns	with cable length 1 m, 10 % … 90 %

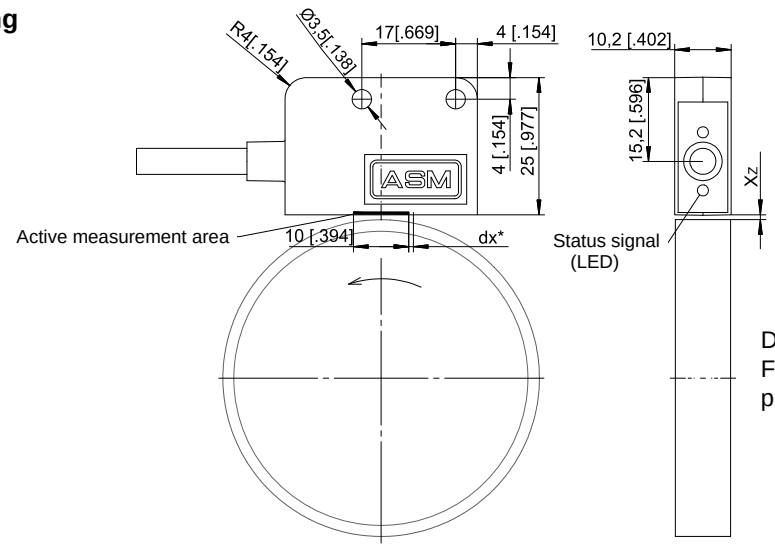
Pulse frequency in dependence on the cable length

Load/cable length	**Load/pulse frequency fp**		
	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 loss of 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 next page), all signal wires must be min. 0.14 mm²!

POSIROT®
PMIS4
Incremental encoder

Outline drawing

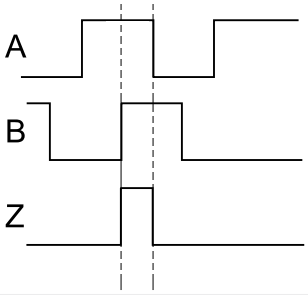


Dimensions informative only.
For guaranteed dimensions
please consult factory.

* = position tolerance of the active measurement area:
dx = ±1 mm

Output signals

Option Z1 (signal Z)

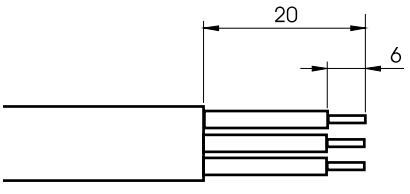


Signal wiring

Signal name				Cable with open end, cable color
Option	**Z0**	**Z1**	**Z3 ***	
Excitation +				White
Excitation GND (0 V)				Brown
	B	B	B	Green
	A	A	A	Yellow
	$\overline{B}$	$\overline{B}$	$\overline{ERR}$	Grey
	$\overline{A}$	$\overline{A}$	–	Pink
	–	Z	Z	Blue
	–	$\overline{Z}$	–	Red
Shield				Black

Z = reference pulse
ERR = status signal, periodical approx. 16 Hz, for side tracking and velocity errors
* = status signal ERR available only with HTL (single ended) output

Connection



Cable output dimensions

POSIROT®
PMIR7
Incremental magnetic encoder rings

Specification	Material	Elastomer bonded hard ferrite
	Base material	Stainless steel
	Signal periods per revolution	From 50 poles/revolution (see table below)
	Magnetic period	2 mm
	Temperature range	-40 ...+85°C
	Linearity with sensor PMIS4	Approx. ± 0.1°

Data valid in connection with the sensor PMIS4.

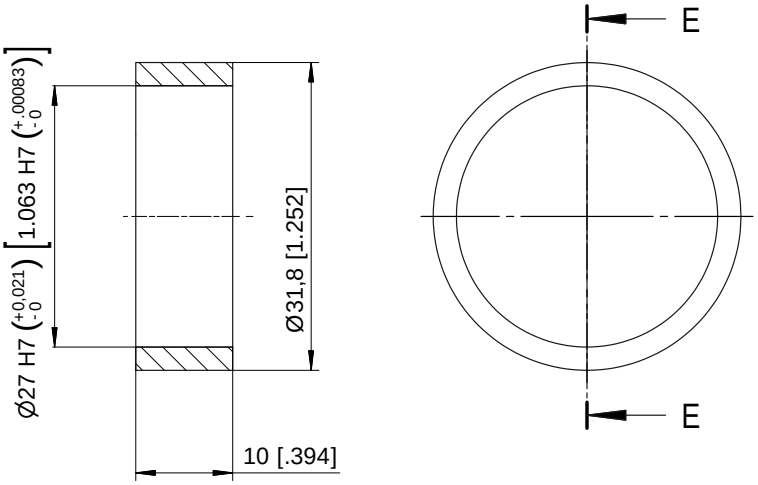
Standard magnetic wheels

Type	Poles	∅	Width	Signal periods/rotation	Inside diameter
PMIR7-20-50-27	50	31.8	10	decade division (refer to the table below)	27H7
PMIR7-20-64-35	64	40.7	10	binary division (refer to the table below)	35H7
PMIR7-20-90-50	90	57.3	10	vernier (refer to the table below)	50H7

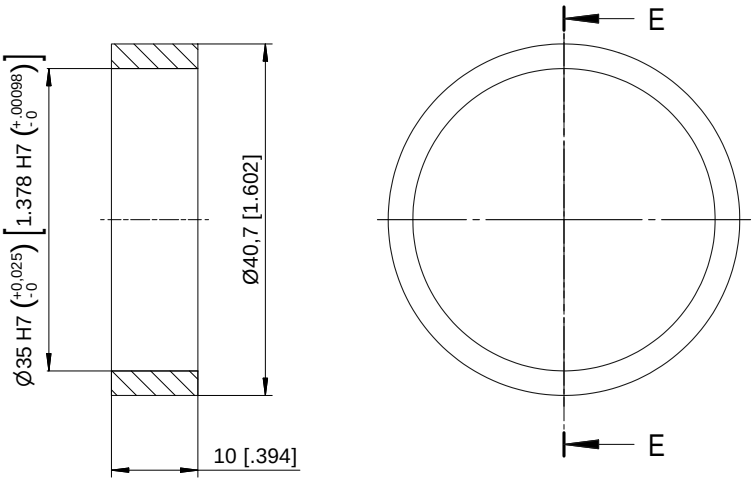
Scaling factor Sensor PMIS4-20- ...	PMIR7-20-50-27		PMIR7-20-64-35		PMIR7-20-90-50	
	Signal periods	R.p.m.)* (at 480 kHz)	Signal periods	R.p.m.)* (at 480 kHz)	Signal periods	R.p.m.)* (at 480 kHz)
1	50	6000	64	6000	90	6000
2	100	6000	128	6000	180	6000
4	200	6000	256	6000	360	6000
8	400	6000	512	6000	720	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.

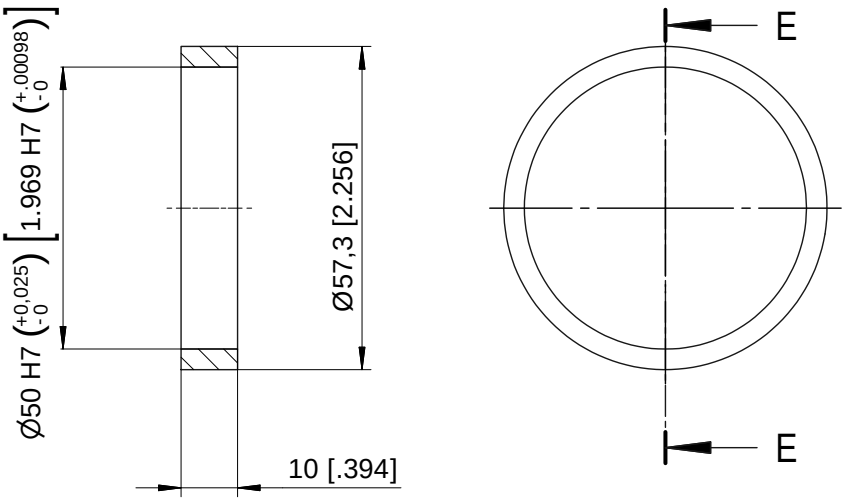
Outline drawing
PMIR7-20-50



Outline drawing
PMIR7-20-64



Outline drawing
PMIR7-20-90



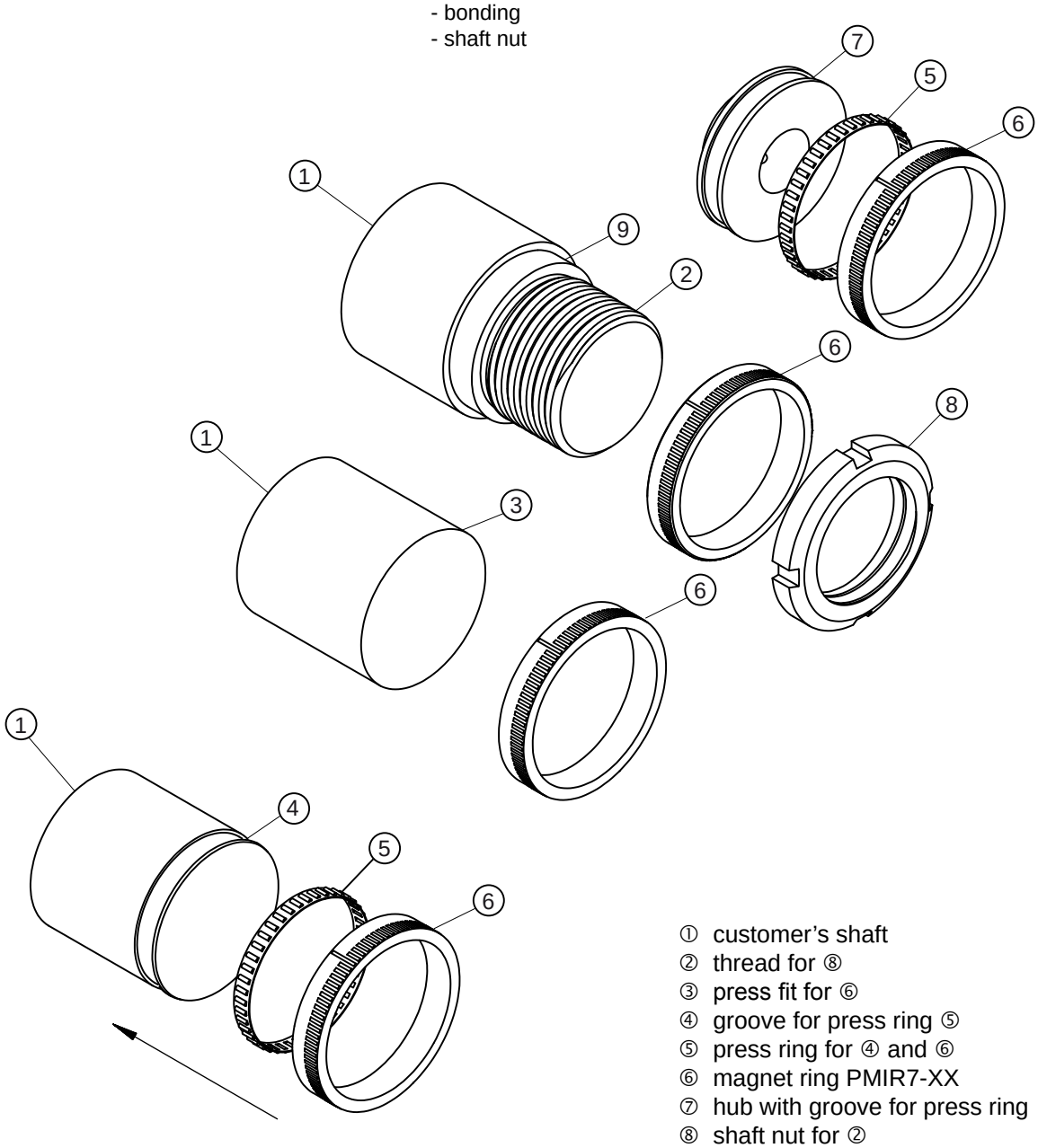
Dimensions in mm [inch]

Dimensions informative only.
For guaranteed dimensions consult factory.

How to mount the PMIR7 magnet rings

The PMIR7 magnet rings can be mounted in several ways on the customer's shaft resp. hub:

- press ring
- press fit
- bonding
- shaft nut



① customer's shaft
② thread for ⑧
③ press fit for ⑥
④ groove for press ring ⑤
⑤ press ring for ④ and ⑥
⑥ magnet ring PMIR7-XX
⑦ hub with groove for press ring
⑧ shaft nut for ②
⑨ force fit for ⑥