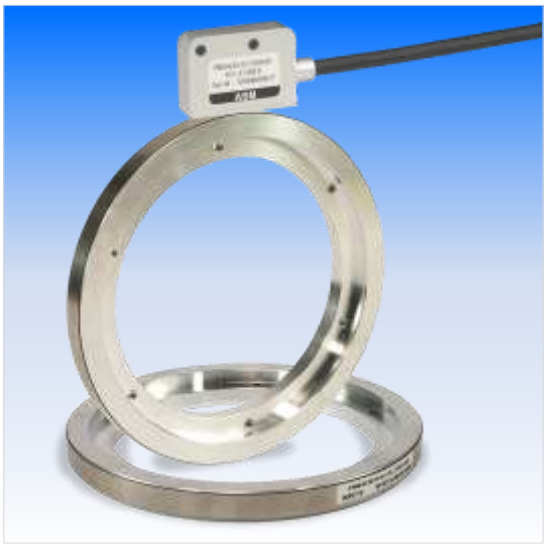
PMIS4, PMIR5

Magnetic incremental encoder



Magnetic wheels for rotative applications

- **All metal housing**
- **Protection class IP67**
- **Excellent protection of the active measurement area**
- **Highest EMC protection**
- **Suitable for harsh environments**
- **Up to 327,680 pulses/360°**

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 VDC oder 5 VDC ±5%
Excitation current	300 mA max.
Magnetic period of the sensor	5 mm
Guided spacing between sensor and wheel x_Z	0.1 ... 2 mm
Side tracking tolerance of the sensor	±1 mm
Linearity (sensor with mag. wheel)	0.1°
Repeatability	±1 Digit
Maximum pulse frequency f_P	50 kHz, 20 kHz, 10 kHz (standard 50 kHz, max. 480 kHz)
Output signals	A, $\overline{A}$, B, $\overline{B}$ / signal Z, $\overline{Z}$ (optional) / status signal $\overline{ERR}$ (optional)
Material of housing	Zinc die casting
Connection	Cable 8 wire, dia. 5 mm, open cable end. 15 pin D-Sub connector at the cable end as option. Max. length of the integrated sensor cable: output TTL: 3 m; HTL/TTL24V: 20 m
Weight	30 g ±5 g (without cable and connector)
Protection class (EN 60529)	IP67
Shock	DIN EN 60068-2-27:1993, 50 g 6 ms, 100 shocks
Vibration	DIN EN 60068-2-6:1995, 20 g, 10-2000 Hz, 10 cycles
EMC	DIN EN 61326-1:2013
Temperature	-40 ...+85°C

Order code sensor head PMIS4

PMIS4	–	1	–	2	–	3	–	4	–	5	–	6	–	7

1 Magnetic period

50 = 5 mm

2 Scaling factor

See table*

3 Maximum pulse frequency (in kHz, standard 50 kHz)

50 / 20 / 10 (other frequencies on request, max. 480 kHz)

4 Output

HTL = HTL output with excitation 24 V DC, output 24 V
TTL = TTL output with excitation 5 V DC, output TTL/RS422
TTL24V = TTL output with excitation 24 V DC, output TTL/10 mA

5 Signal Z / status signal

Z0 = A/B without signal Z
Z1 = A/B with signal Z
Z3 = A/B with signal Z and status signal, only for non-differential outputs (single-ended)

6 Cable length

2M = Standard 2 m

7 Connection

S = open cable end
P15 = D-Sub connector at the cable end,15 pin

Order example sensor head

PMIS4 – 50 – 100 – 50KHZ – HTL – Z0 – 2M – S

***Table "Scaling factor sensor PMIS4-50…" (see page 167)**

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

Output signals

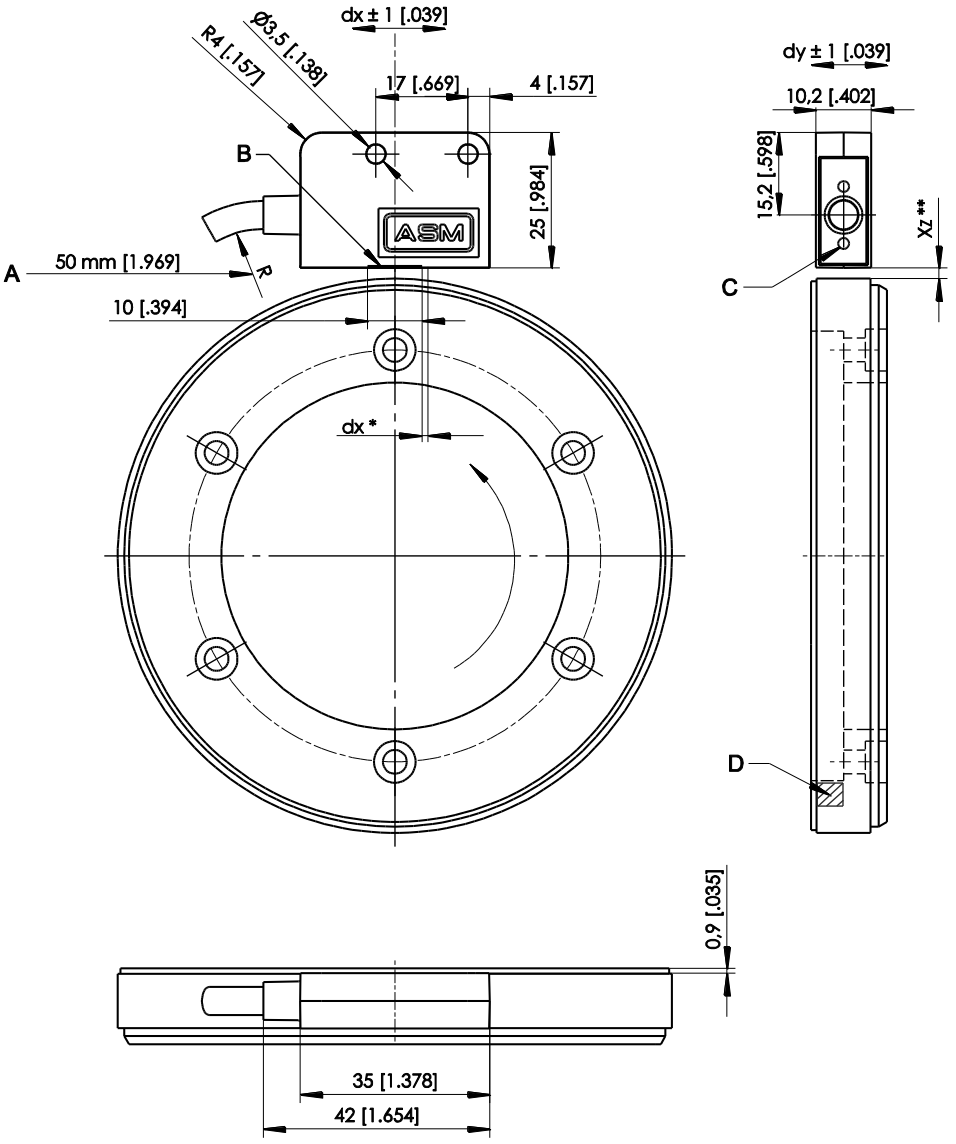
Saturation voltage	UH, UL = 0,2 V UH, UL = 0,4 V C_{last} < 10 nF	I_{out} = ±10 mA (UH = UB - U_{out}) I_{out} = ±30 mA
Short circuit current	ISL, ISH < 800 mA ISL, ISH < 90 mA	(UH, UL = 0 V) (UH, UL = 1,5 V)
Rise time	tr, tf < 200 ns	with cable length 1 m, 10 % … 90 %

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 R_{last} min.	50 mA 500 Ω	50 mA 100 Ω	10 mA 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 mm^2 wire for „Excitation+“ and „Excitation GND“ (see signal wiring), all signal wires must be min. 0.14 mm^2!

Dimensions PMIS4 and PMIR5



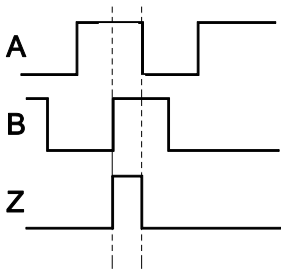
A – Minimum bending radius
B – Active measurement area
C – Status indicator
D – Reference mark

* = position tolerance of the active measurement area: dx = ±1 mm
** = see “Specifications”

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

Output signals

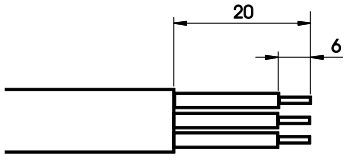
Option Z1
(Signal Z)



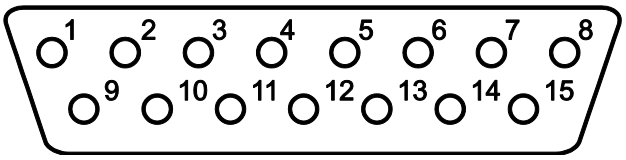
Signal wiring/ connection

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

Z = Reference pulse
$\overline{ERR}$ = tatus 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

PMIR5 - Incremental magnetic rings

Specifications PMIR5

Material	Plastic bonded magnetic scale
Base material	Aluminium, stainless steel
Signal periods per revolution	64 / 96 / 160 poles per revolution
Magnetic period	5 mm
Temperature range	-40 ...+120°C
Linearity with sensor PMIS4	Approx. ± 0.1°

Standard magnetic rings

Type	Poles	Ø	Width	Signal periods/revolution	Inner diameter Ø
PMIR5-50-64-O/M-83	64	102.3	14	Divisions see table below	Ø83 H7
PMIR5-50-96-O/M-133	96	153.2	14	Divisions see table below	Ø133 H7
PMIR5-50-160-O/M-233	160	255.1	14	Divisions see table below	Ø233 H7

Position magnet rings with other number of poles, diameters or magnetic periods on request.

Scaling factor sensor PMIS4-50- ...	PMIR5-50-64-O/M-83		PMIR5-50-96-O/M-133		PMIR5-50-160-O/M-233	
	Signal periods	r.p.m. 1/min * (at 480 kHz)	Signal periods	r.p.m. 1/min * (at 480 kHz)	Signal periods	r.p.m. 1/min (at 480 kHz) *
1	64	3000	96	3000	160	3000
2	128	3000	192	3000	320	3000
4	256	3000	384	3000	640	3000
8	512	3000	768	3000	1280	3000
10	640	3000	960	3000	1600	1800
16	1024	3000	1536	3000	2560	3000
20	1280	3000	1920	3000	3200	1800
25	1600	3000	2400	3000	4000	2880
32	2048	3000	3072	3000	5120	3000
40	2560	3000	3840	3000	6400	1800
50	3200	3000	4800	3000	8000	2880
64	4096	3000	6144	3000	10 240	2250
80	5120	3000	7680	3000	12 800	1800
100	6400	3000	9600	2400	16 000	1440
125	8000	2880	12 000	1920	20 000	1152
128	8192	2813	12 288	1875	20 480	1125
200	12 800	1800	19 200	1200	32 000	720
250	16 000	1440	24 000	960	40 000	576
256	16 384	1406	24 576	938	40 960	563
400	25 600	900	38 400	600	64 000	360
500	32 000	720	48 000	480	80 000	288
512	32 768	703	49 152	469	81 920	281
1024	65 536	352	98 304	234	163 840	141
2048	131 072	176	196 608	117	327 680	70

* Maximum revolution per minute mechanically 3,000 r.p.m.

Order code magnetic ring PMIR5

PMIR5 – [1] – [2] – [3] – [4] – [5]

1 Magnetic period

50 = 5 mm

2 Number of poles

64 / 96 / 160 (other pole numbers on request)

3 Z signal mark

O = without
M = with

4 Inner diameter

83/133/233 (depending on the number of poles, see table)

5 Option

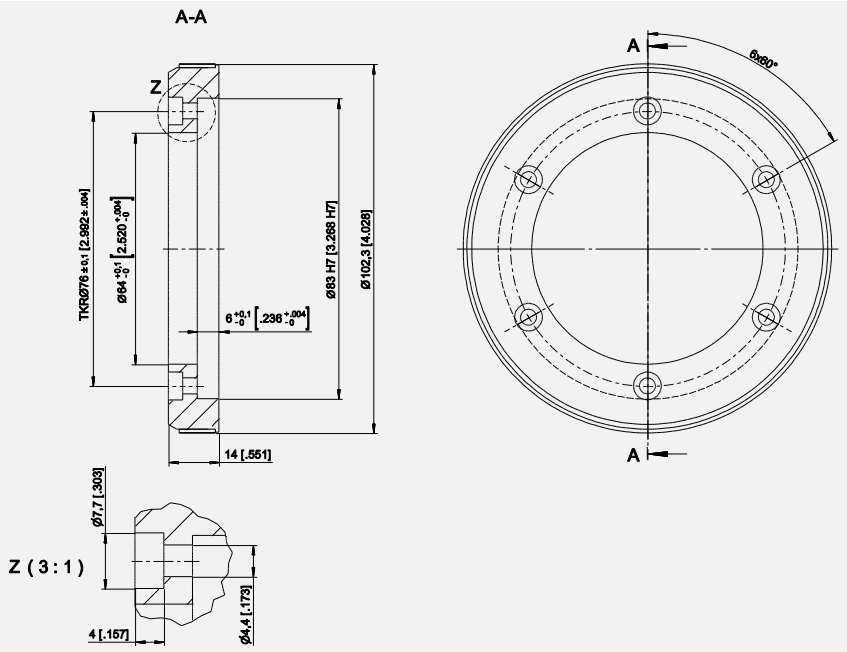
AB = Masking tape

Order example magnetic ring

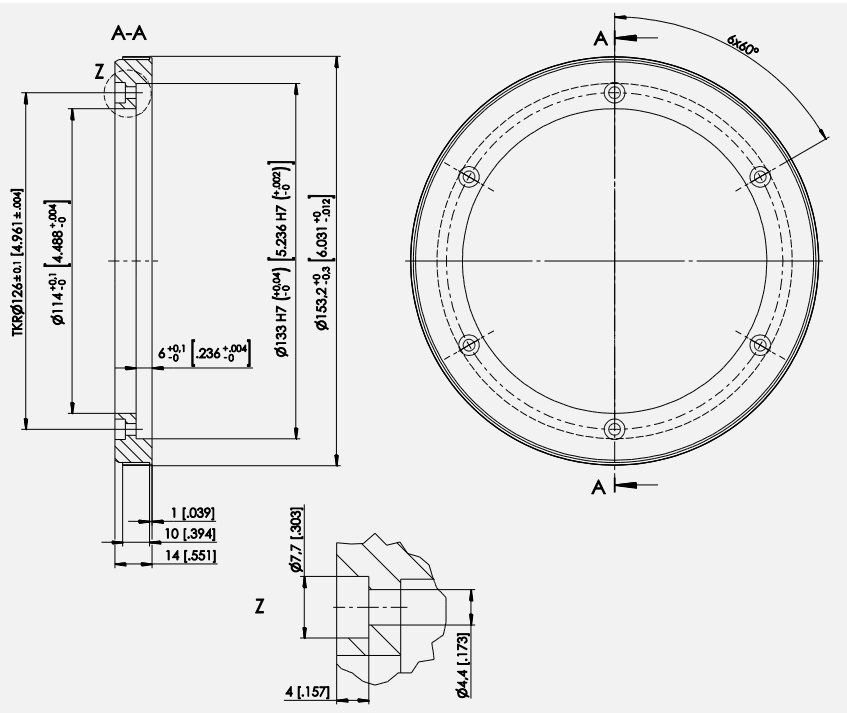
PMIR5 – 50 – 64 – M – 83 – AB

Magnetic rings PMIR5

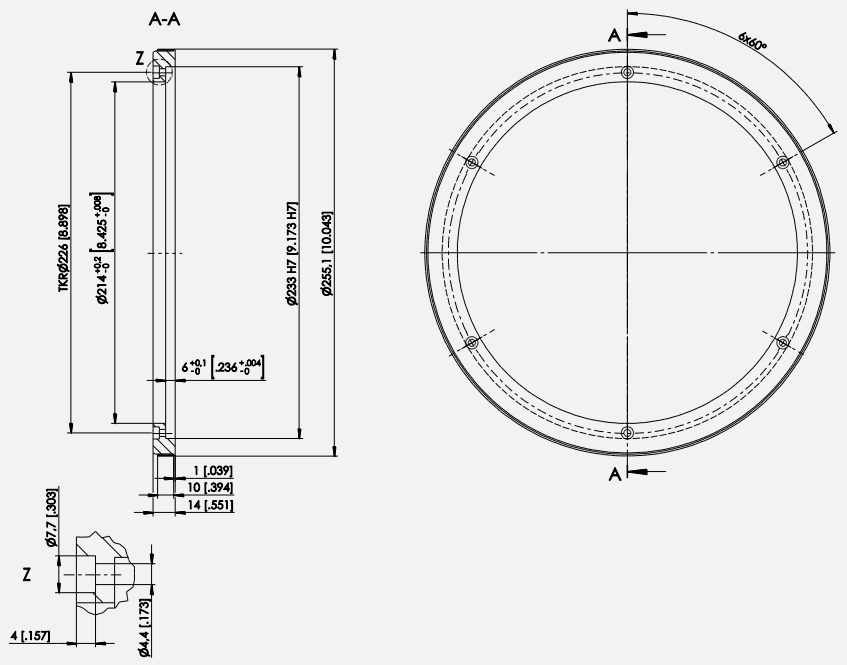
PMIR5-50-64-O/M-83



PMIR5-50-96-O/M-133



PMIR5-50-160-O/M-233



Dimensions in mm [inch].
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