

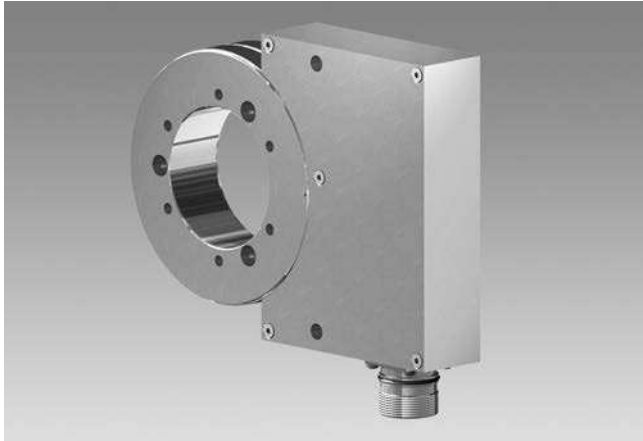
Encoders without bearings - absolute

Absolute encoder, sensor head with integrated FPGA signal processing

Magnetic sensing, through hollow shaft max. $\varnothing 80$ mm, singleturn 8...17 Bit

Additional 1...131072 pulses or 1...8192 sinewave cycles per turn

MHAP 100 - HDmag



MHAP 100 - Version for axial screw mounting

Features

- Absolute encoder with magnetic sensing and without bearings
- Sensor head with integrated FPGA signal processing
- Absolute resolution max. 17 bit singleturn
- Additional incremental output
- Robust and wearless
- Electronics is fully encapsulated
- High protection standard
- Large tolerances: axial ± 1 mm, radial max. 0.5 mm
- Simple mounting, easy adaptation
- Several mounting possibilities

Technical data - electrical ratings

Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Approval	CE

Technical data - electrical ratings (SSI)

Voltage supply	4.5...30 VDC
Interface	SSI
Function	Singleturn
Steps per turn	≤ 131072 / 17 bit
Sensing method	Magnetic
Code	Gray or binary
Code sequence	CW default
Additional output signals	Square-wave TTL (RS422) Square-wave universal HTL/ TTL SinCos

Technical data - electrical ratings (square-wave)

Voltage supply	4.5...30 VDC
Consumption w/o load	≤ 300 mA
Pulses per revolution	1...131072
Phase shift	$90^\circ \pm 10^\circ$
Scan ratio	40...60 %
Sensing method	Magnetic
Output frequency	≤ 2 MHz
Output signals	A+, A-, B+, B-
Output stages	HTL TTL/RS422

Technical data - electrical ratings (SinCos)

Voltage supply	4.5...30 VDC
Consumption w/o load	≤ 300 mA
Sinewave cycles per turn	1...8192
Phase shift	$90^\circ \pm 5^\circ$
Sensing method	Magnetic
Output signals	A+, A-, B+, B-
Output stages	SinCos 1 Vpp
Difference of SinCos amplitude	≤ 20 mV
Harmonics typ.	-40 dB
DC offset	≤ 20 mV
Bandwidth	400 kHz (-3 dB)

Technical data - mechanical design

Sensor head	FPGA signal processing
Size (flange)	$\varnothing 101.3$ mm
Axial tolerance	± 1 mm (wheel/head)
Radial tolerance	0.1...0.5 mm (wheel/head)
Shaft type	$\varnothing 16...80$ mm (through hollow shaft)
Protection DIN EN 60529	IP 67 (head), IP 68 (wheel)
Operating temperature	-20...+85 °C
Operating speed	≤ 8000 rpm
Resistance	IEC 60068-2-6 Vibration 30 g, 55-2000 Hz IEC 60068-2-27 Shock 300 g, 2 ms
Accuracy of magnetic measure	± 400 "
Connection	Flange connector M23, 17-pin

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Part number

MHAP 100 B5

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Pulse number/sinewave cycles - see table

Voltage supply / signals

- P 4,5...30 VDC / SinCos
- R 4,5...30 VDC / square-wave (TTL)
- U 5...30 VDC / square-wave (5 VDC = TTL / 10...30 VDC = HTL universal)
- Z Without additional output signals

Parity bit

- O Odd
- E Even
- N None

Resolution Singleturn (bit)

8, 9, 10, 11, 12, 13, 14, 15, 16, 17

Code

- B Binary code
- G Gray code

Mounting type / hollow shaft (\varnothing mm)

Screw mounting

G38, G45, G50, G55, G60, G65, G70, G75, G80

Clamping set mounting

Z16, Z20, Z22, Z25, Z28, Z32, Z35, Z38, Z40, Z42, Z45, Z48, Z50, Z55, Z60, Z63, Z65

Shrink fit mounting

H38, H45, H50, H55, H60, H65, H70, H75, H80

Clamping ring mounting

K25, K30, K32, K38, K40, K45, K48, K50, K55, K56, K60, K65, K70, K75

Pulse number/sinewave cycles

1	16	256	4096	65536
2	32	512	8192	131072
4	64	1024	16384	
8	128	2048	32768	

Maximum sinewave cycles 8192 for SinCos output.

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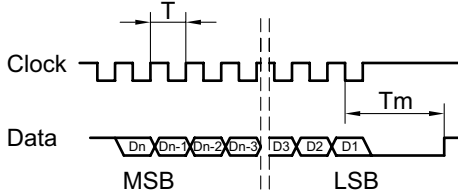
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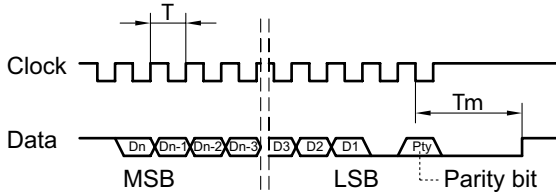
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Data transfer

Without parity bit



With parity bit



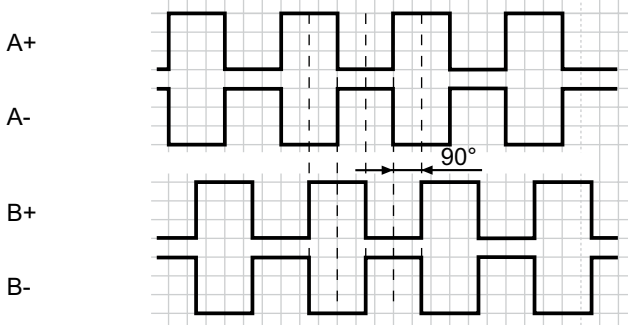
$$T = 0.5 \dots 10 \mu\text{s}$$

$$T_m = 15 \mu\text{s}$$

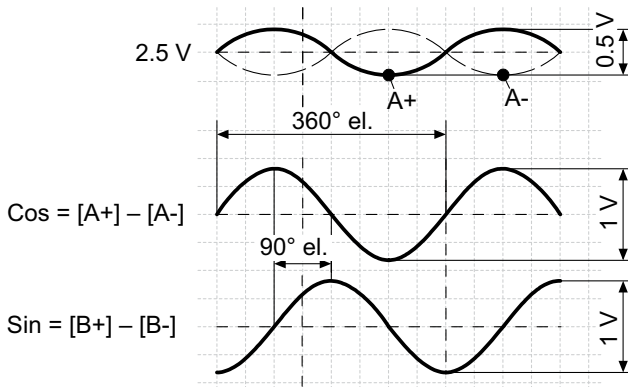
$$\text{Taktfrequenz} \leq 2 \text{ MHz}$$

Output signals

Version with additional square-wave signals
HTL oder TTL at positive rotating direction



Version with additional SinCos signals
at positive rotating direction



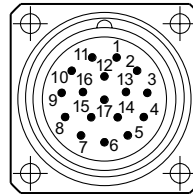
Terminal assignment

View A

Flange connector M23, 17-pin, male, CW

Pin	Assignment
1	Do not use
2	Do not use
3	Do not use
4	Do not use
5	Do not use
6	Do not use
7	+UB
8	SSI Clock+
9	SSI Clock-
10	⊥
11	Internal shield
12	B+ *
13	B- *
14	SSI Data+
15	A+ *
16	A- *
17	SSI Data-

* Do not use in version without incremental output



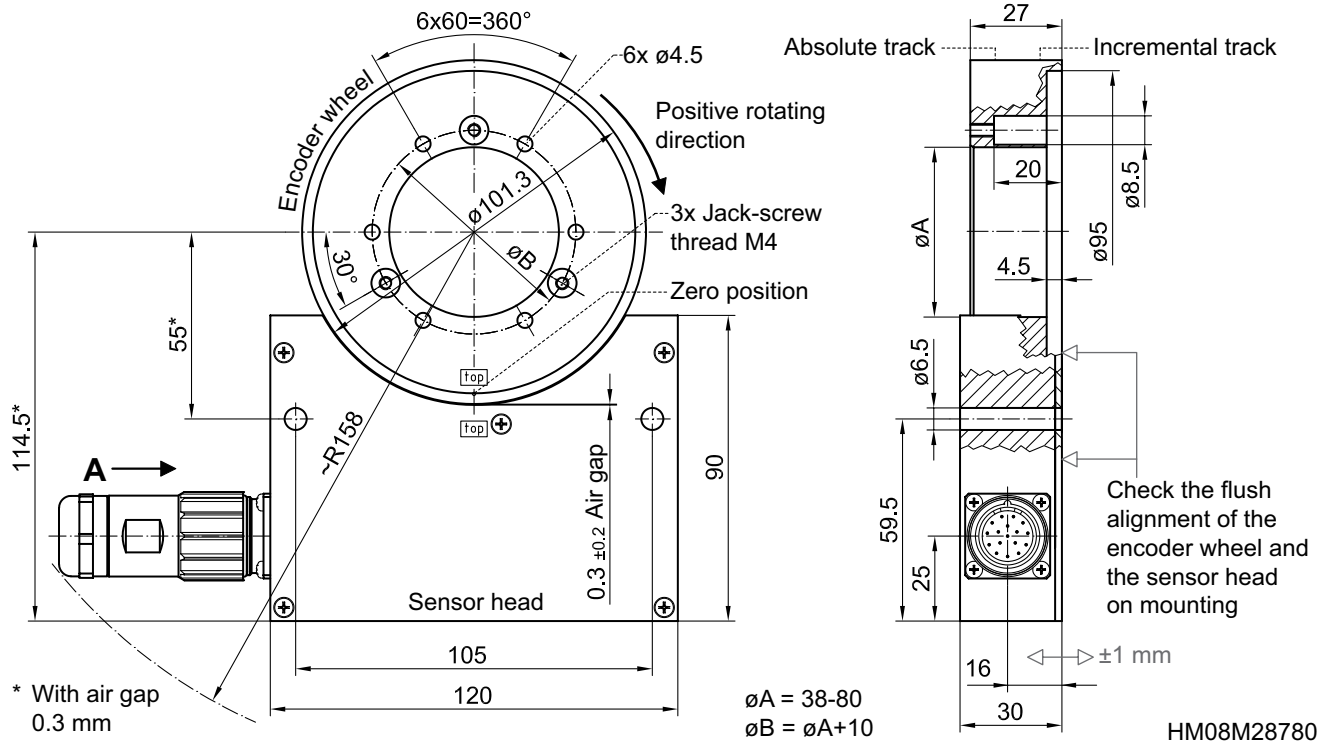
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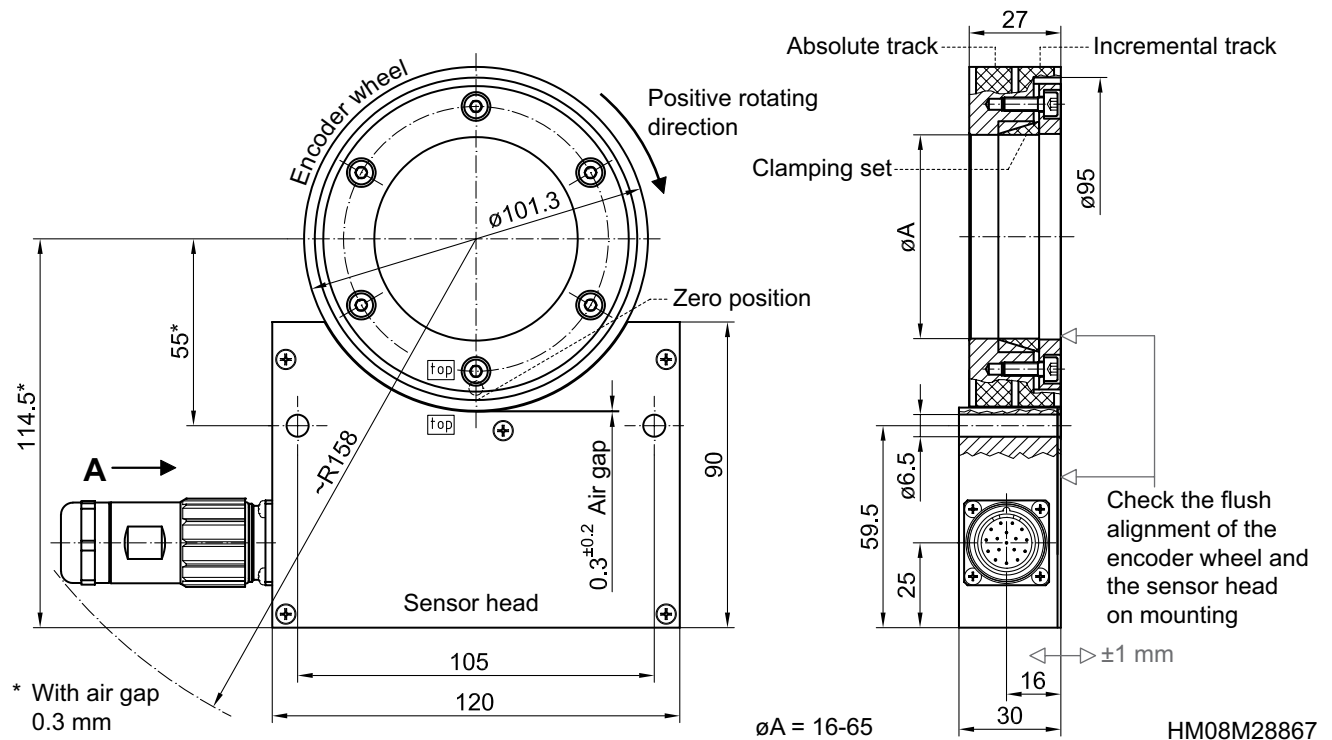
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Dimensions

Version for axial screw mounting



Version for clamping set mounting



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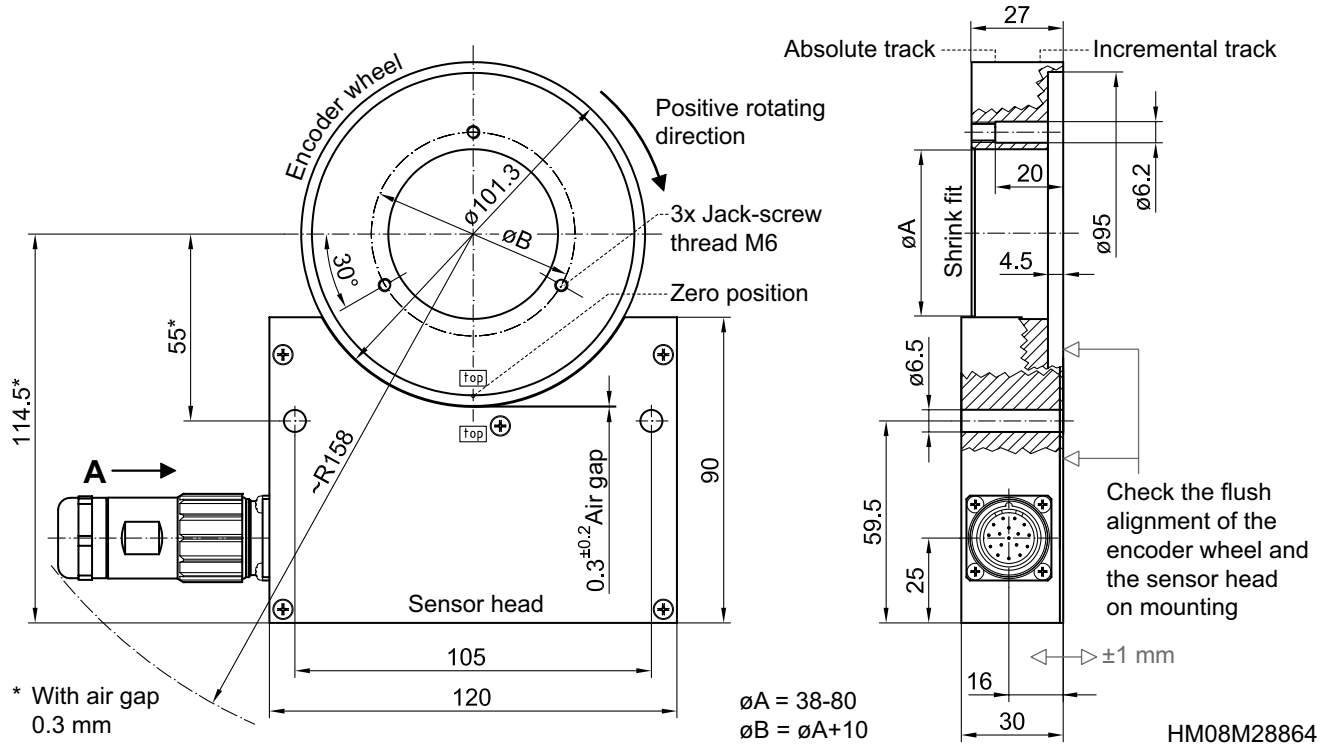
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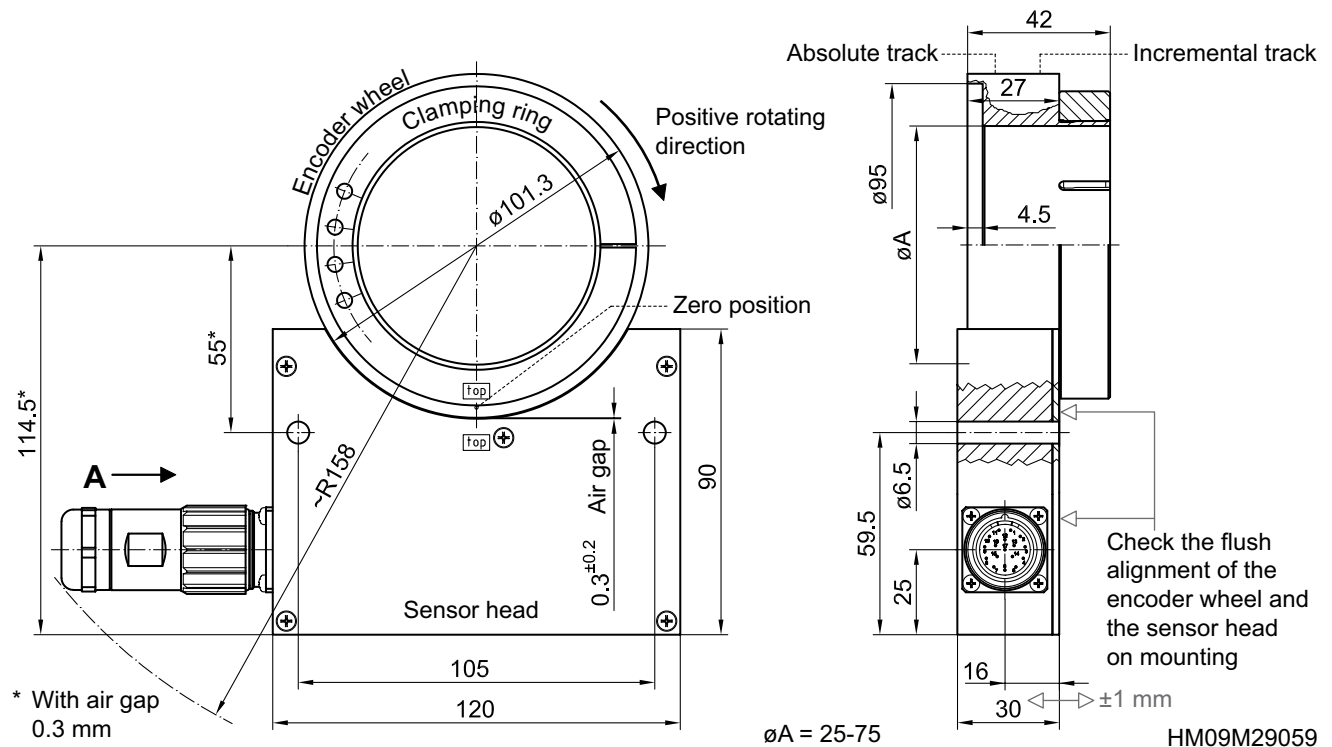
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Dimensions

Version for shrink fit mounting



Version for clamping ring mounting



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