Encoders without bearings - absolute
Sensor head with split wheel and magnetic tape for shaft ø90...300 mm
Singleturn resolution up to 20 bit

MQR 350A - *HDmag flex*

MQR 350A

Features

– "Quasi-absolute" (see dimension) encoder SSI without bearings
– Split wheel design for easiest mounting on installed shafts
– Very large axial tolerances ±8 mm
– Resolution: singleturn ≤20 Bit, speed ≤18 Bit
– Zero position and counting direction inputs
– Status indication via system OK output and LED

Optional

– Additional incremental output
– Parity bit

Technical data - electrical ratings

Voltage supply	4.75...30 VDC
Consumption w/o load	≤300 mA (24 VDC)
Output signals	SSI data (Linedriver RS485)
Position resolution	0...20 bit singleturn
Speed resolution	≤18 bit (±20...±2000 rpm)
Code	Gray or binary
Code sequence	Positiv at CW
Input signals	SSI clock, set zero, counting direction
Additional outputs	HTL, TTL/RS422 or SinCos
Status indicator	Color-LED, system OK output
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-3
Approvals	CE, UL approval / E217823

Technical data - electrical ratings (square-wave)

Pulses per revolution	1024...4096
Phase shift	90° ±2°
Duty cycle	45...55 %
Output frequency	≤500 kHz (HTL), ≤2 MHz (TTL)
Output signals	A+, A-, B+, B-
Output stages	HTL, TTL/RS422

Technical data - electrical ratings (SinCos)

Sinewave cycles per revolution	1024...4096
Phase shift	90° ±2°
Output frequency	≤500 kHz
Output signals	A+, A-, B+, B-
Output stages	SinCos 1 Vpp

Technical data - mechanical design

Shaft type	ø90...300 mm (through hollow shaft)
Dimensions (sensor head)	165 x 25 x 93 mm
Outer diameter adapter wheel	350 mm
Over all depth adapter wheel	40 mm
Axial tolerance	±8 mm (belt to head)
Radial tolerance	1...3 mm (belt to head)
Shaft diameter tolerance	-0.4...0 mm
Protection DIN EN 60529	IP 67
Operating speed	≤2000 rpm
Materials	Housing sensing head: aluminium alloy Adapter wheel: stainless steel (1.4104) Magnetic belt: stainless steel (1.4104)
Operating temperature	-40...+85 °C
Resistance	IEC 60068-2-6 Vibration 30 g, 10-2000 Hz IEC 60068-2-27 Shock 300 g, 6 ms
Weight approx.	880 g (head), 13 kg (wheel with belt, bore size ø90 mm), 12.5 kg (wheel with belt, bore size ø150 mm), 7 kg (wheel with belt, bore size ø299 mm)
Connection	Flange connector M23, 17-pin

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Part number

MQR350A- [....] . [N] . [ ] [ ] [ ] . [A] [ ]

Parity bit
	None
/4802	Even
/4803	Odd

Operating temperature
| A | -40...+85 °C |

Additional output
0	No additional output
G	4096 pulses TTL, HTL (Vin=Vout), 4 channel
H	4096 pulses TTL/RS422, 4 channel
J	4096 sinewave cycles SinCos (1 Vpp), 4 channel
7	2048 pulses TTL, HTL (Vin=Vout), 4 channel
8	2048 pulses TTL/RS422, 4 channel
9	2048 sinewave cycles SinCos (1 Vpp), 4 channel
4	1024 pulses TTL, HTL (Vin=Vout), 4 channel
5	1024 pulses TTL/RS422, 4 channel
6	1024 sinewave cycles SinCos (1 Vpp), 4 channel

Resolution speed
00	No speed signal
SE	12 bit, ±20 rpm
SF	12 bit, ±40 rpm
SG	12 bit, ±500 rpm
SH	12 bit, ±2000 rpm
SI	14 bit, ±20 rpm
SK	14 bit, ±40 rpm
SL	14 bit, ±500 rpm
SM	14 bit, ±2000 rpm
S2	16 bit, ±40 rpm
S3	16 bit, ±500 rpm
S4	16 bit, ±2000 rpm
S7	18 bit, ±500 rpm
S8	18 bit, ±2000 rpm

Resolution singleturn
00	No position signal
13	13 bit
16	16 bit
20	20 bit

Voltage supply / interface
| UG | 4,75…30 VDC, SSI Gray |
| UB | 4.75…30 VDC, SSI binary |

Connection
| N | Flange connector M23, tangential, 17-pin, male, CW |

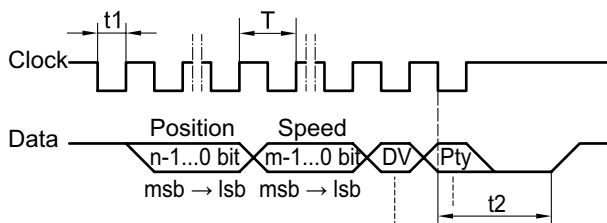**Shaft diameter (mm)**
| .... | 0090...0300 |

Other versions on request.

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Data transfer

Data valid bit
With position output:
1 = Position output is valid and no error,
0 = Position output is not valid
Without position output:
1 = no error, 0 = error

Parity bit
Only for version with parity

Clock frequency	100 kHz...2 MHz
Period (T)	0,5…10 µs
Time lag (t1)	0,25…5 µs
Monoflop time (t2)	13 µs (internal)
Master wait time (t2)	15 µs (master)
n, m	Number of bits

Data valid bit and the optional parity bit are excepted from Gray code.

For continous clocking, the SSI word is transmitted only once followed by zero values (no ring register operation).

The filter cut-off frequency f_{filter} applies exclusively to the speed word and is set at the factory depending to the speed range and shaft diameter.
The filter cut-off frequency is calculated as follows:

$$f_{filter} = \left\{ 20\ Hz \leq \frac{n_{max}\ [rpm]}{60} \cdot \frac{\pi \cdot d\ [mm]}{20} \leq 500\ Hz \right\}$$

Further filter cut-off frequency settings on request.

Terminal assignment

View A
Flange connector M23, 17-pin, male, CW

Pin	Assignment
1	System OK-
2	DIR direction of rotation (Adoption with HIGH)
3	Do not use
4	System OK+
5	Zero (Adoption at rising edge)
6	Do not use
7	+UB
8	SSI Clock+
9	SSI Clock-
10	0 V
11	Internal shield
12	B+ / Sin+ *
13	B- / Sin- *
14	SSI Data+
15	A+ / Cos+ *
16	A- / Cos- *
17	SSI Data-

* Do not use in version without incremental output
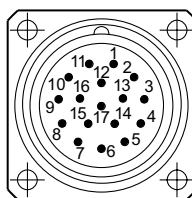
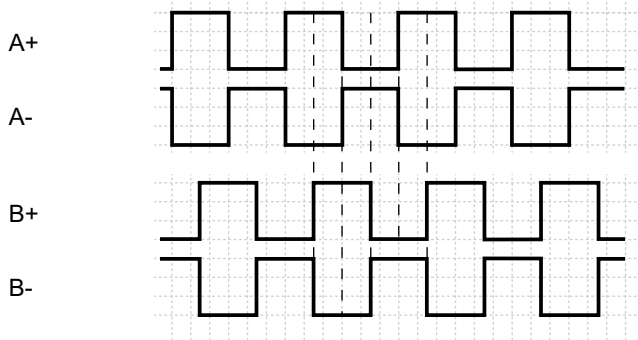www.baumer.com/motion

Baumer

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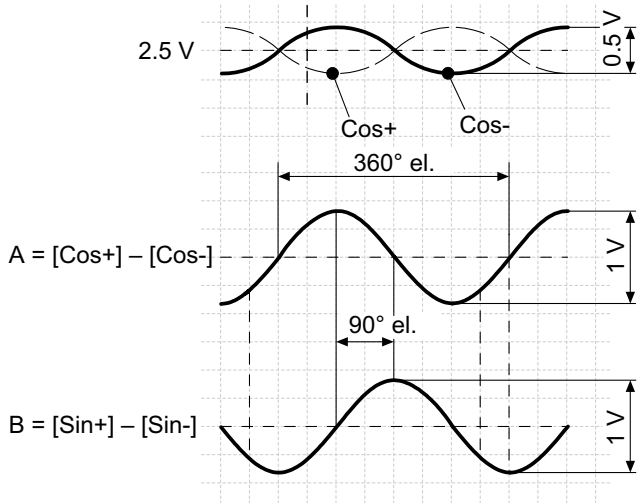**MQR 350A -** *HDmag flex*

Output signals

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

A+

A-

B+

B-

Version with additional SinCos signals
at positive rotating direction

2.5 V

0.5 V

Cos+   Cos-

360° el.

A = [Cos+] – [Cos-]

90° el.

1 V

B = [Sin+] – [Sin-]

1 V

Accessories

Connectors and cables

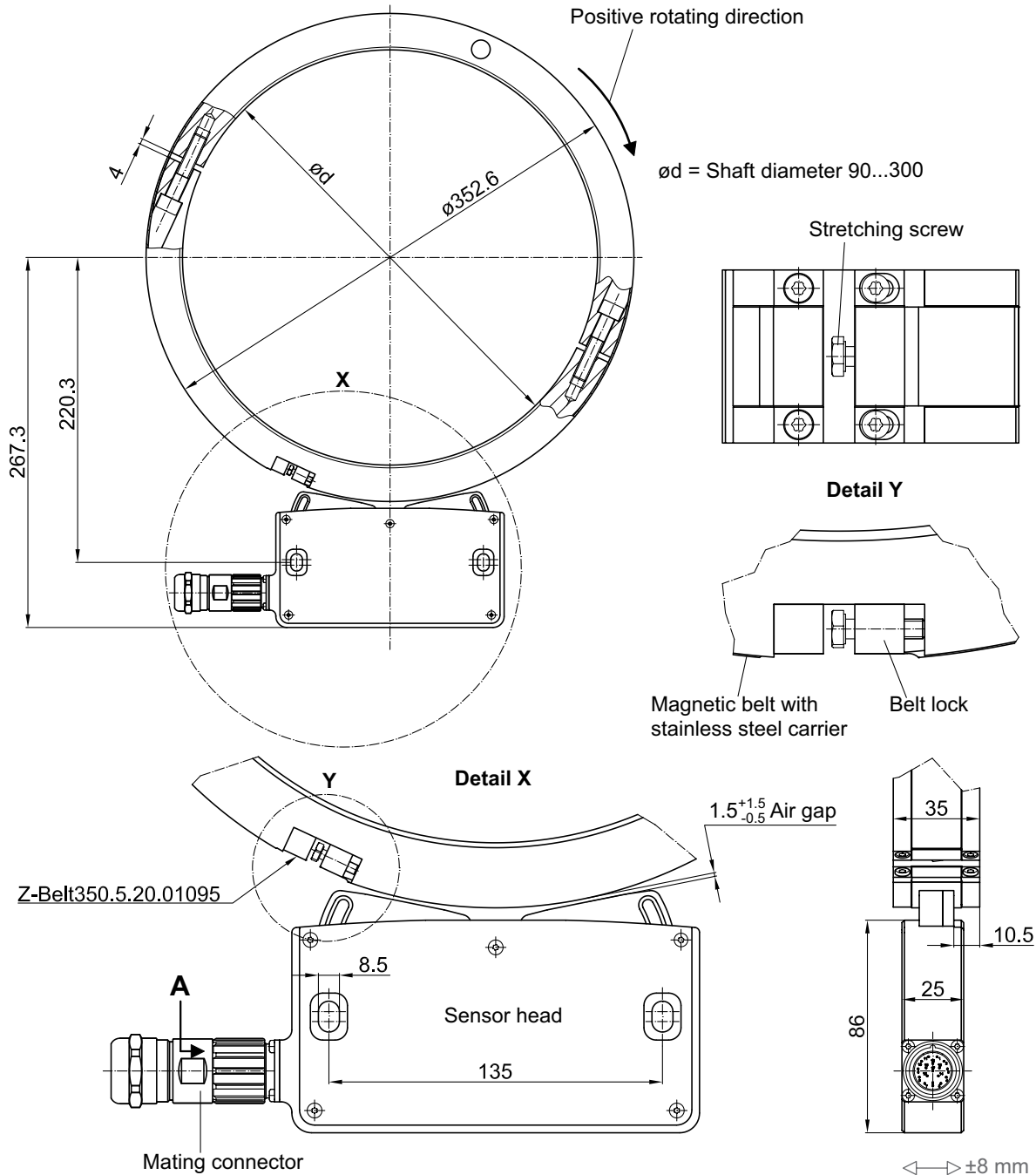|	
11068551	Mating connector M23, solder version, 17-pin, CCW

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Positive rotating direction

ød = Shaft diameter 90...300

Stretching screw

Detail Y

Magnetic belt with stainless steel carrier

Belt lock

Detail X

$1.5^{+1.5}_{-0.5}$ Air gap

Z-Belt350.5.20.01095

A

8.5

Sensor head

135

Mating connector

35

10.5

25

86

$\triangleleft\!\!-\!\!\triangleright$ ±8 mm

Initialization of a validate absolute position

The MQR350A is a "quasi-absolute" encoder.

"Quasi-absolute" means that it is an incremental encoder that provides a valid absolute position only after initialization.

Therefore the belt lock must pass the sensor head twice in the same direction. The zero position will then be set to the middle of the belt lock and the encoder delivers valid absolute position data.

5/7/2019