

# Absolute encoders - SSI

Blind hollow shaft up to  $\varnothing 15$  mm

Magnetic single- or multiturn encoders 12 bit ST / 13 bit MT

## BMSH 58, BMMH 58 SSI - MAGRES



BMMH 58 SSI with blind hollow shaft

### Features

- Encoder single- or multiturn / SSI
- Robust magnetic sensing
- Resolution: singleturn 12 bit, multiturn 13 bit
- Designed for harsh environmental conditions
- High resistance to shock and vibrations
- Operating temperature -40...+85 °C
- Blind hollow shaft up to  $\varnothing 15$  mm

### Technical data - electrical ratings

Voltage supply	5 VDC $\pm 10$ % 10...30 VDC
Consumption w/o load	$\leq 150$ mA (5 VDC) $\leq 60$ mA (24 VDC)
Initializing time typ.	170 ms after power on
Interface	SSI
Steps per turn	4096 / 12 bit
Sensing method	Magnetic
Angular accuracy	$\pm 0.5^\circ$
Repeatability	$0.3^\circ$
Code	Gray or binary
Code sequence	CW: ascending values with clockwise sense of rotation; looking at flange
Inputs	SSI clock: Linereceiver RS422 Zero setting input
Output stages	SSI data: Linedriver RS422
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-3
Approval	UL approval / E217823
<b>BMSH 58</b>	
Function	Singleturn
<b>BMMH 58</b>	
Function	Multiturn
Number of turns	8192 / 13 bit

### Technical data - mechanical design

Size (flange)	$\varnothing 58$ mm
Shaft type	$\varnothing 12$ mm (blind hollow shaft) $\varnothing 15$ mm (blind hollow shaft)
Protection DIN EN 60529	IP 65 (without shaft seal), IP 67 (with shaft seal)
Operating speed	$\leq 6000$ rpm
Starting torque	$\leq 2$ Ncm (+20 °C, IP 65) $\leq 2.5$ Ncm (+20 °C, IP 67)
Materials	Housing: steel zinc-coated Flange: aluminium Hollow shaft: stainless steel
Operating temperature	-40...+85 °C (see general informations)
Relative humidity	95 %
Resistance	DIN EN 60068-2-6 Vibration 30 g, 10-2000 Hz DIN EN 60068-2-27 Shock 500 g, 6 ms Shock 200 g, 3 ms (connector M23)
Weight approx.	300 g
Connection	Connector M12, 8-pin Connector M23, 12-pin Cable

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### Part number

#### Singleturn

BMSH 58S1    12/00

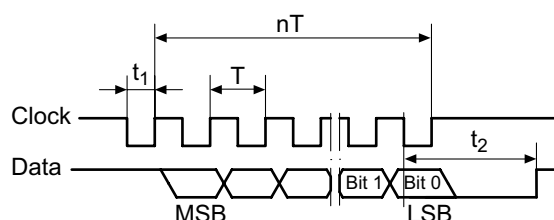
Connection  
 5 Cable radial  
 A Connector M23, radial  
 N Connector M12, radial  
  
Blind hollow shaft  
 2  $\varnothing 12$  mm  
 A  $\varnothing 14$  mm  
 B  $\varnothing 15$  mm  
  
Protection  
 P IP 65  
 Q IP 67  
  
Resolution  
 12/00 12 bit singleturn  
  
Voltage supply / signals  
 05C 5 VDC / SSI  
 24C 10...30 VDC / SSI  
  
Code  
 G Gray code  
 N Binary code

#### Multiturn

BMMH 58S1    12/13

Connection  
 5 Cable radial  
 A Connector M23, radial  
 N Connector M12, radial  
  
Blind hollow shaft  
 2  $\varnothing 12$  mm  
 A  $\varnothing 14$  mm  
 B  $\varnothing 15$  mm  
  
Protection  
 P IP 65  
 Q IP 67  
  
Resolution  
 12/13 12/13 bit single-/multiturn  
  
Voltage supply / signals  
 05C 5 VDC / SSI  
 24C 10...30 VDC / SSI  
  
Code  
 G Gray code  
 N Binary code

### Data transfer



$$T = 1 \dots 10 \mu\text{s} \quad t_1 = 0.5 \dots 5 \mu\text{s}$$

$$t_2 \leq 12 \dots 26 \mu\text{s} \quad f \text{ max. } 1 \text{ MHz}$$

### Trigger level

Control inputs	Input circuit
Input level Low	$< 0.3 \times +V_s$
Input level High	$< 0.7 \times +V_s$

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### Terminal significance

+Vs	Encoder supply voltage.
0 V	Encoder ground connection relating to +Vs.
Data+	Positive data output.
Data-	Negative data output.
Clock+	Positive SSI clock input.
Clock-	Negative SSI clock input.
Zero	Input for setting a zero point anywhere within the encoder resolution. The zero setting operation is triggered by a Low impulse. Connect to +Vs after setting operation for maximum interference immunity. Impulse duration >2 ms.
Note	Include termination resistor R=120 Ohm between Data+ and Data- on control side.

### General informations

Self-heating interrelated to speed, protection, attachment method and ambient conditions as well electronics and supply voltage must be considered for precise thermal dimensioning. Self-heating is supposed to approximate 6 K (IP 65 protection) respectively 12 K (IP 67 protection) per 1000 rpm. Operating the encoder close to the maximum limits requires measuring the real prevailing temperature at the encoder flange.

### Accessories

#### Connectors and cables

10116717	Female connector M23, 12-pin, straight, without cable
10153334	Female connector M23, 12-pin, straight, 2 m cable
10153335	Female connector M23, 12-pin, straight, 5 m cable
10146775	Female connector M12, 8-pin, straight, without cable
11091511	Female connector M12, 8-pin, straight, 20 m cable

#### Mounting accessories

11136718	Set of spring washers for encoders $\varnothing 58$ mm
10110616	Clamp set $\varnothing 15$ mm
10107540	Torque pin
10109520	Torque spring

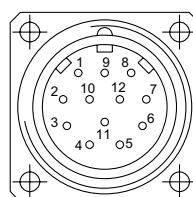
### Terminal assignment

#### Cable / Connector M23 male for connection references -A and -5

Connector	Core colour	Signals	Description
Pin 1	yellow	Clock-	Clock signal
Pin 2	green	Clock+	Clock signal
Pin 3	grey	Data+	Data signal
Pin 4	pink	Data-	Data signal
Pin 5	blue	Zero	Zero setting input
Pin 6	–	n.c.	–
Pin 7	–	n.c.	–
Pin 8	–	n.c.	–
Pin 9	red	d.u.	do not use
Pin 10	–	n.c.	–
Pin 11	brown	+Vs	Supply voltage
Pin 12	white	0 V	Supply voltage

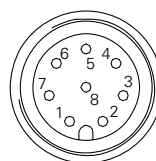
Screen: connected to housing

Cable data: 4 x 2 x 0.14 mm<sup>2</sup>



#### Connector M12 male for connection reference -N

Connector	Signals	Description
Pin 1	0 V	Supply voltage
Pin 2	+Vs	Supply voltage
Pin 3	Clock+	Clock signal
Pin 4	Clock-	Clock signal
Pin 5	Data+	Data signal
Pin 6	Data-	Data signal
Pin 7	Zero	Zero setting input
Pin 8	d.u.	do not use



# Absolute encoders - SSI

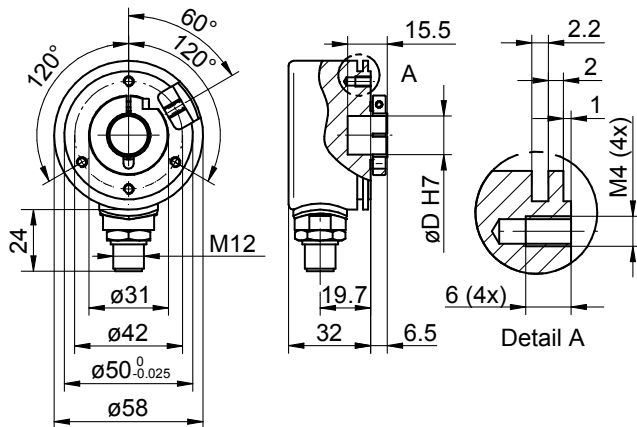
Blind hollow shaft up to  $\varnothing 15$  mm

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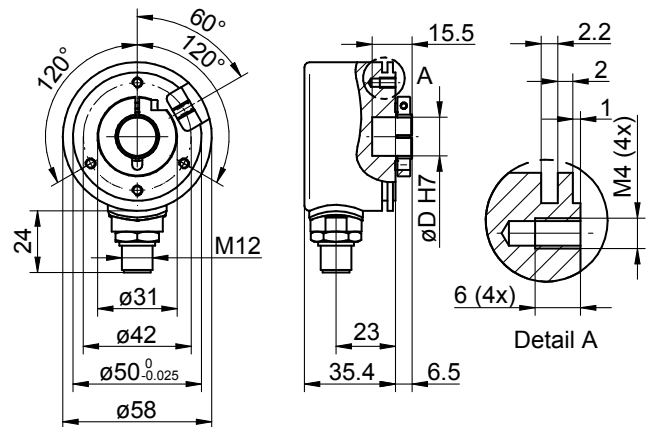
## BMSH 58, BMMH 58 SSI - MAGRES

### Dimensions

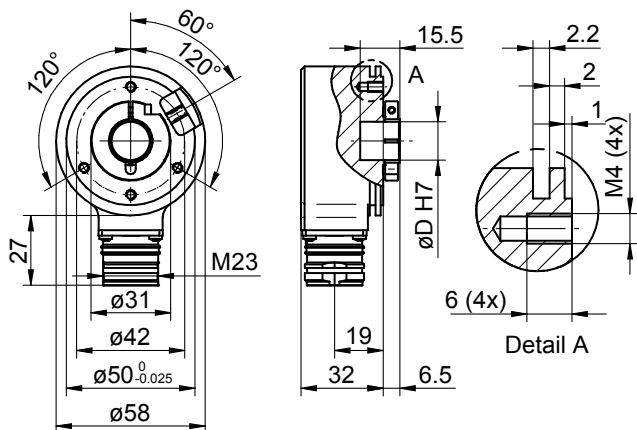
**BMSH/BMMH 58 - connector M12 radial, IP 65**



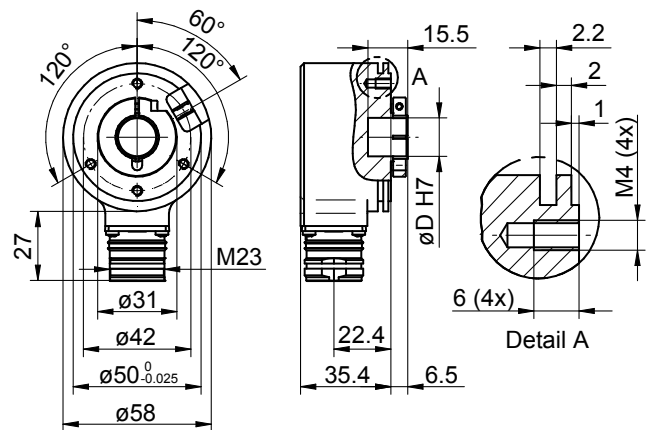
**BMSH/BMMH 58 - connector M12 radial, IP 67**



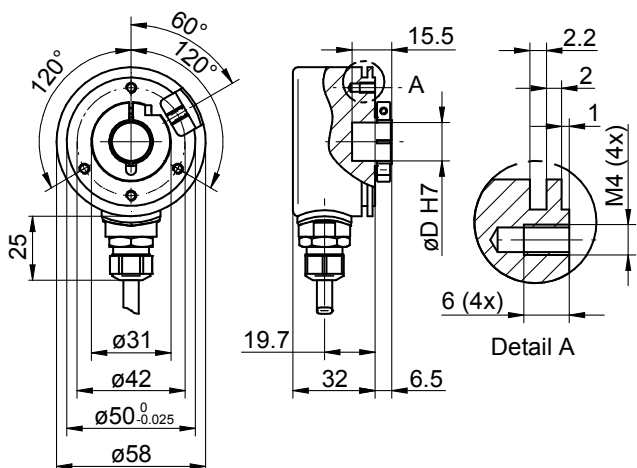
**BMSH/BMMH 58 - connector M23 radial, IP 65**



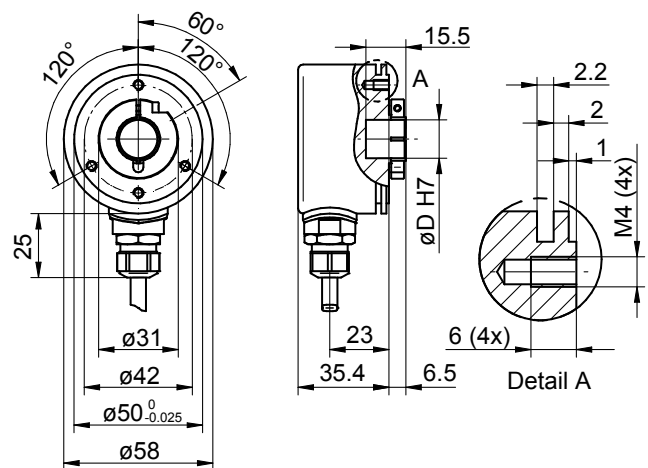
**BMSH/BMMH 58 - connector M23 radial, IP 67**



**BMSH/BMMH 58 - cable radial, IP 65**



**BMSH/BMMH 58 - cable radial, IP 67**



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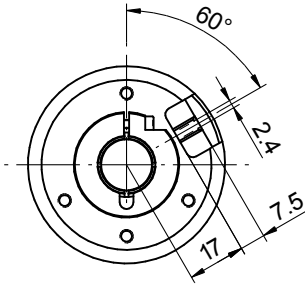
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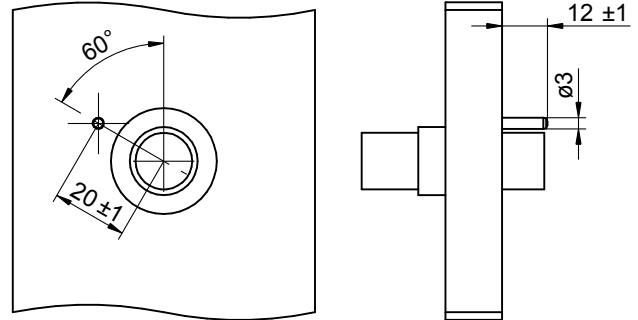
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### Dimensions

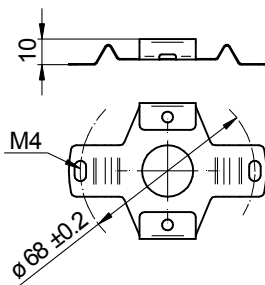
Torque pin support



Bore torque pin



Set of spring washers



Hollow shaft mounting

