

# Absolute encoders - SSI

End shaft  $\varnothing 12$  mm

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

## BMSH 42, BMMH 42 SSI - MAGRES



BMMH 42 SSI with end shaft

### Features

- Mini encoder single- or multiturn / SSI
- Magnetic sensing
- Resolution: singleturn 12 bit, multiturn 13 bit
- Housing  $\varnothing 42$  mm
- High resistance to shock and vibrations
- Reset input
- End shaft  $\varnothing 12$  mm

### Technical data - electrical ratings

|                             |                                                                           |
|-----------------------------|---------------------------------------------------------------------------|
| Voltage supply              | 5 VDC $\pm 10$ %<br>10...30 VDC                                           |
| Consumption w/o load (typ.) | 100 mA (5 VDC)<br>50 mA (24 VDC)                                          |
| Initializing time (typ.)    | 170 ms after power on                                                     |
| Interface                   | SSI                                                                       |
| Steps per turn              | 4096 / 12 bit                                                             |
| Absolute accuracy           | $\pm 1^\circ$                                                             |
| Sensing method              | Magnetic                                                                  |
| Code                        | Gray or binary                                                            |
| Code sequence               | CW: ascending values with clockwise sense of rotation (looking at flange) |
| Inputs                      | SSI clock<br>Reset input                                                  |
| Output circuit              | SSI data: linedriver RS485                                                |
| Interference immunity       | DIN EN 61000-6-2                                                          |
| Emitted interference        | DIN EN 61000-6-3                                                          |
| Approval                    | UL approval / E217823                                                     |
| <b>BMSH 42</b>              |                                                                           |
| Function                    | Singleturn                                                                |
| <b>BMMH 42</b>              |                                                                           |
| Function                    | Multiturn                                                                 |
| Number of turns             | 8192 / 13 bit                                                             |

### Technical data - mechanical design

|                         |                                                                                          |
|-------------------------|------------------------------------------------------------------------------------------|
| Dimensions (flange)     | $\varnothing 42$ mm                                                                      |
| Shaft                   | $\varnothing 12$ mm end shaft                                                            |
| Protection DIN EN 60529 | IP 65                                                                                    |
| Operating speed         | $\leq 12000$ rpm (mechanical)<br>$\leq 6000$ rpm (electric)                              |
| Operating torque typ.   | 0.0093 Nm                                                                                |
| Materials               | Housing: steel<br>Flange: aluminium                                                      |
| Operating temperature   | -20...+85 °C                                                                             |
| Relative humidity       | 95 %                                                                                     |
| Resistance              | DIN EN 60068-2-6<br>Vibration 30 g, 10-2000 Hz<br>DIN EN 60068-2-27<br>Shock 100 g, 6 ms |
| Connection              | Connector M12, 8-pin<br>Cable                                                            |
| <b>BMSH 42</b>          |                                                                                          |
| Weight approx.          | 120 g                                                                                    |
| <b>BMMH 42</b>          |                                                                                          |
| Weight approx.          | 190 g                                                                                    |

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End shaft ø12 mm

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### Part number

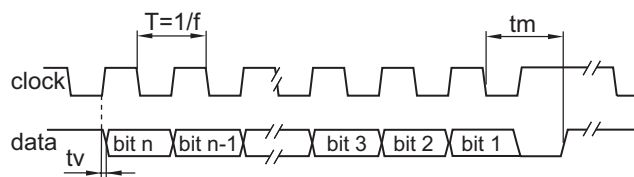
#### Singleturn

|           |  |  |       |     |                                                   |
|-----------|--|--|-------|-----|---------------------------------------------------|
| BMSH 42S1 |  |  | 12/00 |     |                                                   |
|           |  |  |       | 5   | Connection<br>Cable radial                        |
|           |  |  |       | N   | Connector<br>M12, 8-pin,<br>radial                |
|           |  |  |       |     | Shaft                                             |
|           |  |  |       | B2  | End shaft ø12 mm,<br>IP 42, with clamping<br>ring |
|           |  |  |       | P2  | End shaft ø12 mm,<br>IP 65, with clamping<br>ring |
|           |  |  |       |     | 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 42S1 |  |  | 12/13 |     |                                                   |
|           |  |  |       | 5   | Connection<br>Cable radial                        |
|           |  |  |       | N   | Connector<br>M12, 8-pin,<br>radial                |
|           |  |  |       |     | Shaft                                             |
|           |  |  |       | B2  | End shaft ø12 mm,<br>IP 42, with clamping<br>ring |
|           |  |  |       | P2  | End shaft ø12 mm,<br>IP 65, with clamping<br>ring |
|           |  |  |       |     | 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



|                   |                |
|-------------------|----------------|
| Clock frequency f | 100...1000 kHz |
| Scan ratio of T   | 40...60 %      |
| Time lag tv       | 200 ns         |
| Monoflop time tm  | 20 µs + T/2    |

### Accessories

#### Connectors and cables

|          |                                                            |
|----------|------------------------------------------------------------|
| 10146775 | Female connector M12, 8-pin, straight                      |
| 10127844 | Female connector M12, 8-pin, straight, shielded, 2 m       |
| 10129332 | Female connector M12, 8-pin, straight, shielded, 5 m cable |

#### Mounting accessories

|          |                                          |
|----------|------------------------------------------|
| 10110616 | Clamp set                                |
| 10138610 | Set of spring coupling for BMSH, BMMH 42 |

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## BMSH 42, BMMH 42 SSI - MAGRES

### Terminal significance

|                |                                                                                                                                                                                                                                    |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| +Vs            | Encoder supply voltage.                                                                                                                                                                                                            |
| 0 V            | Encoder ground connection relating to +Vs.                                                                                                                                                                                         |
| Data+          | Positive, serial data output of differential linedriver.                                                                                                                                                                           |
| Data-          | Negative, serial data output of differential linedriver.                                                                                                                                                                           |
| Clock+         | Positive SSI clock input.<br>Clock+ together with Clock- forms a current loop. A current of approx. 7 mA towards Clock+ input means logic 1 in positive logic.                                                                     |
| Clock-         | Negative SSI clock input.<br>Clock- together with Clock+ forms a current loop. A current of approx. 7 mA towards Clock- input means logic 0 in positive logic.                                                                     |
| 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. |
| Rot. direction | Ascending position values when looking at the flange and rotating the shaft clockwise.                                                                                                                                             |

### Terminal assignment

#### Cable

for connection reference **-5**

| Core colour | Signals                  | Description        |
|-------------|--------------------------|--------------------|
| brown       | +Vs                      | Supply voltage     |
| white       | 0 V                      | Supply voltage     |
| grey        | Data+                    | Data signal        |
| pink        | Data-                    | Data signal        |
| green       | Clock+                   | Clock signal       |
| yellow      | Clock-                   | Clock signal       |
| blue        | Zero                     | Zero setting input |
| red         | d.u.                     | do not use         |
| Screen      | connected to housing     |                    |
| Cable data  | 8 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         |



### Trigger level

| Control inputs   | Input circuit  |
|------------------|----------------|
| Input level Low  | <0,4 V (>2 ms) |
| Input level High | +Vs or open    |

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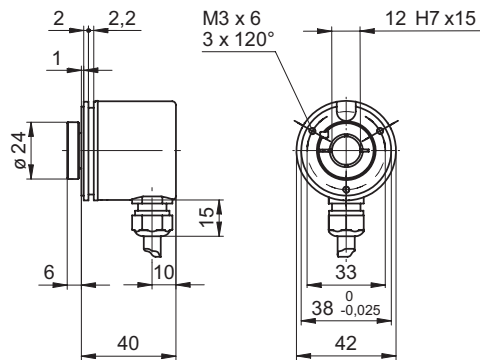
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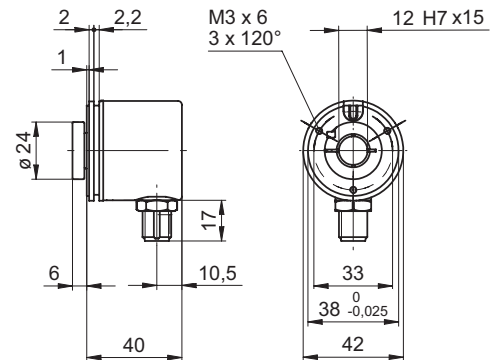
## BMSH 42, BMMH 42 SSI - MAGRES

### Dimensions

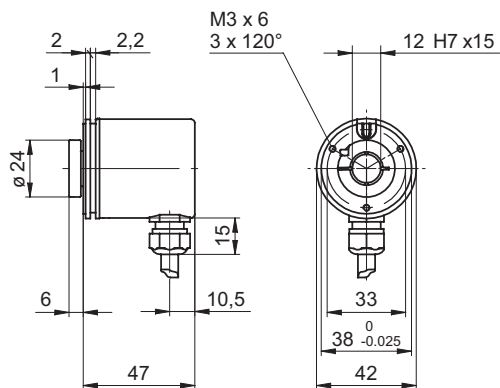
BMSH/BMMH 42 SSI cable axial



BMSH/BMMH 42 SSI cable radial



BMSH/BMMH 42 SSI connector output axial



BMSH/BMMH 42 SSI connector output radial

