Magnetic angle sensors

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Cylindrical designs
Rectangular designs

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### cylindrical designs

<table>
<thead>
<tr>
<th>product family</th>
<th>MDRM 18</th>
<th>MDRM 18</th>
<th>MDRM 18</th>
<th>MDRM 18</th>
<th>MDRM 18</th>
<th>MDRM 18</th>
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<tbody>
<tr>
<td>angular range</td>
<td>120° linear</td>
<td>270° linear</td>
<td>270° linear</td>
<td>160° linear</td>
<td>360° linear</td>
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<tr>
<td>resolution</td>
<td>0,09 °</td>
<td>0,09 °</td>
<td>1,41 °</td>
<td>0,09 °</td>
<td>0,09 °</td>
<td>1,41 °</td>
</tr>
<tr>
<td>output signal</td>
<td>4 ... 20 mA</td>
<td>4 ... 20 mA</td>
<td>4 ... 20 mA</td>
<td>0,5 ... 4,5 VDC</td>
<td>0 ... 4,3 VDC</td>
<td>0 ... 5 VDC</td>
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<td>working distance max.</td>
<td>5 mm, with magnet 11052886</td>
<td>5 mm, with magnet 11052886</td>
<td>4 mm, with magnet 11052886</td>
<td>5 mm, with magnet 11052886</td>
<td>5 mm, with magnet 11052886</td>
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<tr>
<td>voltage supply range +Vs</td>
<td>15 ... 30 VDC</td>
<td>15 ... 30 VDC</td>
<td>15 ... 30 VDC</td>
<td>5 VDC</td>
<td>4,7 ... 7,5 VDC</td>
<td>4,75 ... 5,25 VDC</td>
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<tr>
<td>cable PUR 3 x 0,25, 2 m</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
<td>■</td>
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<tr>
<td>flylead connector PUR M12, L=200 mm</td>
<td>■</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>flylead connector PUR M8, L=200 mm</td>
<td>■</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>connector M12</td>
<td>brass nickel plated</td>
<td>brass nickel plated</td>
<td>brass nickel plated</td>
<td>brass nickel plated</td>
<td>brass nickel plated</td>
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<tr>
<td>housing material</td>
<td>brass nickel plated</td>
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### rectangular designs

<table>
<thead>
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<th>MDFM 20</th>
<th>MDFM 20</th>
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<tr>
<td>angular range</td>
<td>270° linear</td>
<td>270° linear</td>
<td>360° linear</td>
<td>360° linear</td>
</tr>
<tr>
<td>resolution</td>
<td>0,09 °</td>
<td>1,41 °</td>
<td>0,09 °</td>
<td>1,41 °</td>
</tr>
<tr>
<td>output signal</td>
<td>4 ... 20 mA</td>
<td>4 ... 20 mA</td>
<td>0 ... 4,3 VDC</td>
<td>0 ... 5 VDC</td>
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<tr>
<td>working distance max.</td>
<td>5 mm, with magnet 11052886</td>
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<td>voltage supply range +Vs</td>
<td>15 ... 30 VDC</td>
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<td>cable PUR 3 x 0,25, 2 m</td>
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<td>flylead connector PUR M8, L=200 mm</td>
<td>■</td>
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<td>housing material</td>
<td>brass nickel plated</td>
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</tr>
</tbody>
</table>

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General information

A magnetic angular sensor identifies the rotation angle of a permanent magnet in respect to the sensor. The integrated electronics will evaluate the value into an analog electric output signal.

![Diagram of magnetic angular sensor](https://via.placeholder.com/150)

Functional principle

The heart of a magnetic angular sensor is the integrated dual differential Hall element which builds an electrical parameter related to the flux direction of an exterior magnetic field. This magnetic field rotating about the element’s center axis generates two sinusoids shifted by 90° which are utilized to detect the rotation angle for output as an absolute value. The integrated electronics evaluates the sinusoids into a linear voltage or current signal. The absolute detection principle ensures output of the correct rotation angle even after power failure.

Example of an output signal provided by a sensor with a sensing angle throughout 360° and voltage output

![Graph of output signal](https://via.placeholder.com/150)
Permanent magnet

When attaching the magnet make sure that its magnetization direction (north / south pole) is aligned in a parallel manner to the sensor’s sensing face. The carrier material to hold the magnet should be non-ferromagnetic (e.g. no steel), otherwise it will hamper the sensing distance.

Working distance

The magnet rotor or the permanent magnet must be attached within the specified working distance to the sensor. Observe the specifications in the data sheet for axial displacement.

Zero signal

For coarse zero signal tuning, align the keyways provided at sensor and magnet rotor (accessory) with each other. Finetuning will be performed electronically by the downstream control. Clockwise rotation of the permanent magnet will generate a rise in the output signal.
Magnetic angle sensors

120°; 4 ... 20 mA

- Angular range 120° linear
- High resolution and system precision
- Contactless, wear-free system

**general data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angular range</td>
<td>120° linear</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.09°</td>
</tr>
<tr>
<td>System accuracy</td>
<td>± 0.25 %</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>± 0.1 % (Full Scale)</td>
</tr>
<tr>
<td>Working distance max.</td>
<td>5 mm, with magnet 11052886</td>
</tr>
<tr>
<td>Axial misalignment max.</td>
<td>0.4 mm</td>
</tr>
</tbody>
</table>

**electrical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response time</td>
<td>&lt; 4 ms</td>
</tr>
<tr>
<td>Voltage supply range +Vs</td>
<td>15 ... 30 VDC</td>
</tr>
<tr>
<td>Current consumption max.</td>
<td>30 mA</td>
</tr>
<tr>
<td>Output signal</td>
<td>4 ... 20 mA</td>
</tr>
<tr>
<td>Load resistance</td>
<td>500 Ohm/15 VDC, 1000 Ohm/30 VDC</td>
</tr>
<tr>
<td>Output circuit</td>
<td>Current output</td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>Yes</td>
</tr>
<tr>
<td>Reverse polarity protection</td>
<td>Yes, V_s to GND</td>
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</table>

**mechanical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Cylindrical threaded</td>
</tr>
<tr>
<td>Housing material</td>
<td>Brass nickel plated</td>
</tr>
<tr>
<td>Dimension</td>
<td>18 mm</td>
</tr>
<tr>
<td>Material (sensing face)</td>
<td>PBTP</td>
</tr>
</tbody>
</table>

**ambient conditions**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>-40 ... +85 °C</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 67</td>
</tr>
</tbody>
</table>

**remarks**

Working distance max. in conjunction with permanent magnet 11052886 (available as an accessory)

**order reference**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Connection Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDRM 18I9524</td>
<td>Cable PUR 3 x 0.25, 2 m</td>
</tr>
<tr>
<td>MDRM 18I9524/KS34P</td>
<td>Flylead connector PUR M12, L=200 mm</td>
</tr>
</tbody>
</table>

**output signal**

Angular range:

- 4 mA: -180°
- 12 mA: 0°
- 20 mA: +180°

**connectors and mating connectors**

- ESG 34SH0200 Connector M12, 3 pin, straight, 2 m
- ESW 33SH0200 Connector M12, 3 pin, angular, 2 m
- Additional cable connectors and field wireable connectors: see accessories

**mounting accessories**

- 11052887 Rotor with permanent magnet MSFN AA01X06
- 11052885 Permanent magnet MMFN AA01X06
- 11016706 Rotor with permanent magnet MSFS AA03X08
- 11052886 Permanent magnet MMFS AA03X08

For details: see accessories section
Magnetic angle sensors

270°; 4 ... 20 mA

- Angular range 270° linear
- High resolution and system precision
- Contactless, wear-free system

**general data**
- angular range: 270° linear
- resolution: 0.09°
- system accuracy: ± 0,25 %
- temperature drift: ± 0,1 % (Full Scale)
- working distance max.: 5 mm, with magnet 11052886
- axial misalignment max.: 0,4 mm

**electrical data**
- response time: < 4 ms
- voltage supply range +Vs: 15 ... 30 VDC
- current consumption max.: 30 mA
- output signal: 4 ... 20 mA
- load resistance: 500 Ohm/15 VDC, 1000 Ohm/30 VDC
- output circuit: current output
- short circuit protection: yes
- reverse polarity protection: yes, Vs to GND

**mechanical data**
- type: cylindrical threaded
- housing material: brass nickel plated
- dimension: 18 mm
- material (sensing face): PBTP

**ambient conditions**
- operating temperature: -40 ... +85 °C
- protection class: IP 67

**output signal**

**dimension drawings**

**connection diagram**

**connectors and mating connectors**
- ESG 34AH0200 Connector M12, 4 pin, straight, 2 m
- ESW 33AH0200 Connector M12, 4 pin, angular, 2 m

**mounting accessories**
- 11052887 Rotor with permanent magnet MSFN AA01X06
- 11052885 Permanent magnet MMFN AA01X06
- 11016706 Rotor with permanent magnet MSFS AA03X08
- 11052886 Permanent magnet MMFS AA03X08

For details: see accessories section
Magnetic angle sensors

270°; 4 ... 20 mA

- Angular range 270° linear
- Contactless, wear-free system

**general data**
- Angular range: 270° linear
- Resolution: 1.41°
- System accuracy: ± 0.6 %
- Temperature drift: ± 0.1 % (Full Scale)
- Working distance max.: 4 mm, with magnet 11052886
- Axial misalignment max.: 0.5 mm

**electrical data**
- Response time: < 2 ms
- Voltage supply range: +Vs 15 ... 30 VDC
- Current consumption max.: 30 mA
- Output signal: 4 ... 20 mA
- Load resistance: 500 Ohm/15 VDC, 1000 Ohm/30 VDC
- Output circuit: Current output
- Short circuit protection: Yes
- Reverse polarity protection: Yes, +Vs to GND

**mechanical data**
- Type: Cylindrical threaded
- Housing material: Brass nickel plated
- Dimension: 18 mm
- Material (sensing face): PBTP

**ambient conditions**
- Operating temperature: -40 ... +85 °C
- Protection class: IP 67

**remarks**
- Working distance max. in conjunction with permanent magnet 11052886 (available as an accessory)

**connection diagram**

**output signal**

- 20 mA
- 12 mA
- 4 mA
- 0 mA

270° angular range

- ESG 34AH0200 Connector M12, 4 pin, straight, 2 m
- ESW 33AH0200 Connector M12, 4 pin, angular, 2 m

**connectors and mating connectors**
- Additional cable connectors and field wireable connectors: see accessories

**mounting accessories**
- 11052887 Rotor with permanent magnet MSFN AA01X06
- 11052885 Permanent magnet MMFN AA01X06
- 11016706 Rotor with permanent magnet MSFS AA03X08
- 11052886 Permanent magnet MMFS AA03X08

For details: see accessories section

---

**order reference** | **connection types**
---|---
MDRM 189524/A270 | Cable PUR 3 x 0.25, 2 m
MDRM 189524/S14A270 | Connector M12
Magnetic angle sensors

160°; 0.5 … 4.5 or 1 … 9 VDC

- Angular range 160° linear
- High resolution and system precision
- Contactless, wear-free system

general data

angular range 160° linear
resolution 0.09°
system accuracy ± 0.25 %
working distance max. 5 mm, with magnet 11052886
axial misalignment max. 0.4 mm

electrical data

response time < 4 ms
load resistance > 1000 Ohm
output circuit voltage output
short circuit protection yes

voltage supply range +Vs = 5 VDC

current consumption max. 10 mA
output signal 0.5 … 4.5 VDC
reverse polarity protection no

voltage supply range +Vs = 12 … 28 VDC

current consumption max. 20 mA
output signal 1 … 9 VDC
reverse polarity protection yes, Vs to GND

mechanical data

type cylindrical threaded
housing material brass nickel plated
dimension 18 mm
material (sensing face) PBTP

ambient conditions

protection class IP 67

remarks

working distance max. in conjunction with permanent magnet 11052886 (available as an accessory)

<table>
<thead>
<tr>
<th>order reference</th>
<th>voltage supply range +Vs</th>
<th>temperature drift</th>
<th>connection types</th>
<th>operating temperature</th>
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<td>MDRM 18U9501</td>
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<td>MDRM 18U9501/KS35P</td>
<td>5 VDC</td>
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<td>fly/lead connector PUR M8, L=200 mm</td>
<td>-40 ... +85 °C</td>
</tr>
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<td>MDRM 18U9524</td>
<td>12 ... 28 VDC</td>
<td>± 0.2 % (Full Scale)</td>
<td>cable PUR 3 x 0.25, 2 m</td>
<td>-25 ... +85 °C</td>
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</tbody>
</table>

dimension drawings

connection diagram

output signal

connectors and mating connectors

ESG 32SH0200 Connector M8, 3 pin, straight, 2 m
ESW 31SH0200 Connector M8, 3 pin, angular, 2 m
additional cable connectors and field wireable connectors: see accessories

mounting accessories

11052887 Rotor with permanent magnet MSFN AA01X06
11052885 Permanent magnet MMFN AA01X06
11016706 Rotor with permanent magnet MSFS AA03X08
11052886 Permanent magnet MMFS AA03X08
for details: see accessories section
Magnetic angle sensors

360°; 0 … 5 VDC

- Angular range 360° linear
- Contactless, wear-free system

**general data**
- Angular range: 360° linear
- Resolution: 1,41°
- System accuracy: ± 0,6 %
- Temperature drift: ± 0,1 % (Full Scale)
- Working distance max.: 4 mm, with magnet 11052886
- Axial misalignment max.: 0,5 mm

**electrical data**
- Response time: < 2 ms
- Voltage supply range: +Vs 4,75 ... 5,25 VDC
- Current consumption max.: 20 mA
- Output signal: 0 ... 5 VDC
- Load resistance: > 1000 Ohm
- Output circuit: Voltage output
- Short circuit protection: No
- Reverse polarity protection: No

**mechanical data**
- Type: Cylindrical threaded
- Housing material: Brass nickel plated
- Dimension: 18 mm
- Material (sensing face): PBTP

**ambient conditions**
- Operating temperature: -40 ... +85 °C
- Protection class: IP 67

**remarks**
Working distance max. in conjunction with permanent magnet 11052886 (available as an accessory)

**order reference**
- MDRM 18U9504/A360: Cable PUR 3 x 0,25, 2 m
- MDRM 18U9504/S14A360: Connector M12

**connection diagram**
- BN (1)
- BK (4)
- BU (3)
- +Vs: Voltage input
- 0 V: Voltage output
- 0 V, 2.5 V, 5 V: Output signal

**output signal**

![Graph showing output signal range from -180° to 0° to -180° with voltage levels 0 V, 2.5 V, and 5 V]

**connectors and mating connectors**
- ESG 34AH0200: Connector M12, 4 pin, straight, 2 m
- ESW 33AH0200: Connector M12, 4 pin, angular, 2 m

**mounting accessories**
- 11052887: Rotor with permanent magnet MSFN AA01X06
- 11052885: Permanent magnet MMFN AA01X06
- 11016706: Rotor with permanent magnet MSFS AA03X08
- 11052886: Permanent magnet MMFS AA03X08

For details: see accessories section
## Magnetic angle sensors

**MDRM 18**

### 360°; 0 ... 4,3 VDC

**Angular range** 360° linear  
**High resolution** and system precision  
**Contactless, wear-free system**

### General data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angular range</td>
<td>360° linear</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.09°</td>
</tr>
<tr>
<td>System accuracy</td>
<td>± 0.25 %</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>± 1 % (Full Scale)</td>
</tr>
<tr>
<td>Working distance max.</td>
<td>5 mm, with magnet 11052886</td>
</tr>
<tr>
<td>Axial misalignment max.</td>
<td>0.4 mm</td>
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### Electrical data

<table>
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<tr>
<th>Parameter</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Response time</td>
<td>&lt; 4 ms</td>
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<tr>
<td>Voltage supply range</td>
<td>+Vs 4.7 ... 7.5 VDC</td>
</tr>
<tr>
<td>Current consumption max.</td>
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<tr>
<td>Output signal</td>
<td>0 ... 4.3 VDC</td>
</tr>
<tr>
<td>Load resistance</td>
<td>&gt; 1000 Ohm</td>
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<tr>
<td>Output circuit</td>
<td>Voltage output</td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>Yes</td>
</tr>
<tr>
<td>Reverse polarity protection</td>
<td>No</td>
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</table>

### Mechanical data

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<thead>
<tr>
<th>Parameter</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Cylindrical threaded</td>
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<tr>
<td>Housing material</td>
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</tr>
<tr>
<td>Dimension</td>
<td>18 mm</td>
</tr>
<tr>
<td>Material (sensing face)</td>
<td>PBTP</td>
</tr>
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</table>

### Ambient conditions

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<th>Specification</th>
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<tr>
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<tr>
<td>Protection class</td>
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### Remarks

Working distance max. in conjunction with permanent magnet 11052886 (available as an accessory)

### Order reference

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<tbody>
<tr>
<td>MDRM 18U9505/C360</td>
<td>Cable PUR 3 x 0.25, 2 m</td>
</tr>
<tr>
<td>MDRM 18U9505/S14C360</td>
<td>Connector M12</td>
</tr>
</tbody>
</table>

### Dimension drawings

![Dimension Drawings](image)

### Connection diagram

![Connection Diagram](image)

### Output signal

![Output Signal](image)

### Connectors and mating connectors

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESG 34AH0200</td>
<td>Connector M12, 4 pin, straight, 2 m</td>
</tr>
<tr>
<td>ESW 33AH0200</td>
<td>Connector M12, 4 pin, angular, 2 m</td>
</tr>
</tbody>
</table>

Additional cable connectors and field wireable connectors: see accessories

### Mounting accessories

<table>
<thead>
<tr>
<th>Accessory Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11052887</td>
<td>Rotor with permanent magnet MSFN AA01X06</td>
</tr>
<tr>
<td>11052885</td>
<td>Permanent magnet MMFN AA01X06</td>
</tr>
<tr>
<td>11016706</td>
<td>Rotor with permanent magnet MSFS AA03X08</td>
</tr>
<tr>
<td>11052886</td>
<td>Permanent magnet MMFS AA03X08</td>
</tr>
</tbody>
</table>

For details: see accessories section
Magnetic angle sensors

MDFM 20

270°; 4 ... 20 mA

- Angular range 270° linear
- High resolution and system precision
- Contactless, wear-free system

**general data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>Angular range</td>
<td>270° linear</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.09°</td>
</tr>
<tr>
<td>System accuracy</td>
<td>± 0.25 %</td>
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<tr>
<td>Temperature drift</td>
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<tr>
<td>Working distance max.</td>
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<tr>
<td>Axial misalignment max.</td>
<td>0.4 mm</td>
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**electrical data**

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<th>Value</th>
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<td>Output circuit</td>
<td>Current output</td>
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<td>Short circuit protection</td>
<td>Yes</td>
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<tr>
<td>Reverse polarity protection</td>
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</table>

**mechanical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Rectangular</td>
</tr>
<tr>
<td>Housing material</td>
<td>Brass nickel plated</td>
</tr>
<tr>
<td>Dimension</td>
<td>20 mm</td>
</tr>
<tr>
<td>Material (sensing face)</td>
<td>PBTP</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40 ... +85 °C</td>
</tr>
<tr>
<td>Protection class</td>
<td>IP 67</td>
</tr>
</tbody>
</table>

**dimensions**

- Angular range 270°; 4 ... 20 mA

**connection diagram**

**output signal**

- 20 mA
- 12 mA
- 4 mA
- 0 mA

**connection types**

- Cable PUR 3 x 0.25, 2 m
- Flylead connector PUR M8, L=200 mm

**connectors and mating connectors**

- ESG 32SH0200 Connector M8, 3 pin, straight, 2 m
- ESW 31SH0200 Connector M8, 3 pin, angular, 2 m

**mounting accessories**

- 11052887 Rotor with permanent magnet MSFN AA01X06
- 11052885 Permanent magnet MMFN AA01X06
- 11016706 Rotor with permanent magnet MSFS AA03X08
- 11052886 Permanent magnet MMFS AA03X08

For details: see accessories section.
Magnetic angle sensors

Magnetic angle sensors

270°; 4 … 20 mA

- Angular range 270° linear
- Contactless, wear-free system

**general data**

- **angular range**: 270° linear
- **resolution**: 1.41°
- **system accuracy**: ± 0.6 %
- **temperature drift**: ± 0.1 % (Full Scale)
- **working distance max.**: 4 mm, with magnet 11052886
- **axial misalignment max.**: 0.5 mm

**electrical data**

- **response time**: < 2 ms
- **voltage supply range +Vs**: 15 ... 30 VDC
- **current consumption max.**: 30 mA
- **output signal**: 4 ... 20 mA
- **load resistance**: 500 Ohm/15 VDC, 1000 Ohm/30 VDC
- **output circuit**: current output
- **short circuit protection**: yes
- **reverse polarity protection**: yes, Vs to GND

**mechanical data**

- **type**: rectangular
- **housing material**: brass nickel plated
- **dimension**: 20 mm
- **material (sensing face)**: PBTP

**ambient conditions**

- **operating temperature**: -40 ... +85 °C
- **protection class**: IP 67

**remarks**

- working distance max. in conjunction with permanent magnet 11052886 (available as an accessory)

**connection diagram**

- **output signal**: 20 mA
- **12 mA**: 0°
- **4 mA**: +180°
- **0 mA**: -180°

**connectors and mating connectors**

- **ESG 32SH0200** Connector M8, 3 pin, straight, 2 m
- **ESW 31SH0200** Connector M8, 3 pin, angular, 2 m

**mounting accessories**

- **11052887** Rotor with permanent magnet MSFN AA01X06
- **11052885** Permanent magnet MMFN AA01X06
- **11016706** Rotor with permanent magnet MSFS AA03X08
- **11052886** Permanent magnet MMFS AA03X08

For details: see accessories section
Magnetic angle sensors MDFM 20

- Angular range 360° linear
- High resolution and system precision
- Contactless, wear-free system

**general data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angular range</td>
<td>360° linear</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.09°</td>
</tr>
<tr>
<td>System accuracy</td>
<td>± 0.25 %</td>
</tr>
<tr>
<td>Temperature drift</td>
<td>± 1 % (Full Scale)</td>
</tr>
<tr>
<td>Working distance max.</td>
<td>5 mm, with magnet 11052886</td>
</tr>
<tr>
<td>Axial misalignment max.</td>
<td>0.4 mm</td>
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</tbody>
</table>

**electrical data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response time</td>
<td>&lt; 4 ms</td>
</tr>
<tr>
<td>Voltage supply range</td>
<td>+Vs 4.7 ... 7.5 VDC</td>
</tr>
<tr>
<td>Current consumption max.</td>
<td>10 mA</td>
</tr>
<tr>
<td>Output signal</td>
<td>0 ... 4.3 VDC</td>
</tr>
<tr>
<td>Load resistance</td>
<td>&gt; 1000 Ohm</td>
</tr>
<tr>
<td>Output circuit</td>
<td>Voltage output</td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>Yes</td>
</tr>
<tr>
<td>Reverse polarity protection</td>
<td>No</td>
</tr>
</tbody>
</table>

**mechanical data**

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<td>PBTP</td>
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**ambient conditions**

<table>
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<th>Value</th>
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<tbody>
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<td>Protection class</td>
<td>IP 67</td>
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**working distance** max. in conjunction with permanent magnet 11052886 (available as an accessory)

**order reference**

<table>
<thead>
<tr>
<th>Order Reference</th>
<th>Connection Types</th>
</tr>
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<tbody>
<tr>
<td>MDFM 20U9405/C360</td>
<td>Cable PUR 3 x 0.25, 2 m</td>
</tr>
<tr>
<td>MDFM 20U9405/KS35PC360</td>
<td>Flylead connector PUR M8, L=200 mm</td>
</tr>
</tbody>
</table>

**connection diagram**

**output signal**

- 4.3 V
- 2.15 V
- 0 V

**connectors and mating connectors**

- ESG 32SH0200 - Connector M8, 3 pin, straight, 2 m
- ESW 31SH0200 - Connector M8, 3 pin, angular, 2 m

**mounting accessories**

- 11052887 - Rotor with permanent magnet MSFN AA01X06
- 11052885 - Permanent magnet MMFN AA01X06
- 11016706 - Rotor with permanent magnet MSFS AA03X08
- 11052886 - Permanent magnet MMFS AA03X08

for details: see accessories section
Magnetic angle sensors

**360°; 0 ... 5 VDC**

- Angular range 360° linear
- Contactless, wear-free system

**general data**
- Angular range: 360° linear
- Resolution: 1.41°
- System accuracy: ± 0.6 %
- Temperature drift: ± 0.1 % (Full Scale)
- Working distance max.: 4 mm, with magnet 11052886
- Axial misalignment max.: 0.5 mm

**electrical data**
- Response time: < 2 ms
- Voltage supply range: +Vs 4.75 ... 5.25 VDC
- Current consumption max.: 20 mA
- Output signal: 0 ... 5 VDC
- Load resistance: > 1000 Ohm
- Output circuit: Voltage output
- Short circuit protection: No
- Reverse polarity protection: No

**mechanical data**
- Type: Rectangular
- Housing material: Brass nickel plated
- Dimension: 20 mm
- Material (sensing face): PBTP

**ambient conditions**
- Operating temperature: -40 ... +85 °C
- Protection class: IP 67

**remarks**
- Working distance max. in conjunction with permanent magnet 11052886 (available as an accessory)

**order reference**
- MDFM 20U9404/A360
- Cable PUR 3 x 0.25, 2 m
- MDFM 20U9404/KS35PA360
- Flylead connector PUR M8, L=200 mm

**dimension drawings**

**connection diagram**

**output signal**

**connectors and mating connectors**
- ESG 32SH0200 Connector M8, 3 pin, straight, 2 m
- ESW 31SH0200 Connector M8, 3 pin, angular, 2 m

**additional cable connectors and field wireable connectors**: see accessories

**mounting accessories**
- 11052887 Rotor with permanent magnet MSFN AA01X06
- 11052885 Permanent magnet MMFN AA01X06
- 11016706 Rotor with permanent magnet MSFS AA03X08
- 11052886 Permanent magnet MMFS AA03X08

For details: see accessories section