

Non-contacting two-channel speed sensor type FA11 with brass screw-in thread



| | |
|-------------------------------|---|
| Scanning type | Non-contacting |
| Frequency range | FAH[.]: 0.2 ... 20,000 Hz FAJ[.]: See diagram; 5 Hz...10,000 Hz depending from module and scan distance; under optimal conditions up to 15 kHz |
| Supply voltage | 9 ... 32 VDC |
| Scanning object - distance | FAH[.]: 0.2 ... 3 mm; recommended: 1.0 ± 0.5 mm FAJ[.]: See diagram in the technical documentation |
| Protection class | Housing: IP66/IP68 Connection Type A: IP65; Typ C, E, H, X: IP67 |
| Material | Sensor tube: Brass |
| Length | L1 = 60 ... 200 mm |
| Mounting | Male thread M14x1 M16x1.5 M18x1 M18x1.5 5/8" - 18 UNF (not available for all types) |
| Measuring channels | 1 or 2 measuring channels |
| Output signal and signal type | 1 or 2 square wave signals or 2 square wave signals + 1 status signal or 2 square wave signals + 2 inverted square wave signals |
| Output stage | Push-pull amplifier |
| Option | Additional status signal Galvanically isolated output signals Inverted output signals |



Speed sensors FA11

Application range

Series FA[.]11 speed sensors are mainly used in the following areas: Shipbuilding industry and machinery and equipment. They usually measure the speed of ferromagnetic toothed wheels. Furthermore, they can be used for detecting movements of any ferromagnetic parts, e. g.:

- Toothed wheels with different tooth forms
- Bolt heads
- Holes, openings or grooves
- Impulse bands for plain shafts (accessories)

Specific features

- Robust housing: IP66/68
- Excellent vibration and shock resistance
- High degree of EMC immunity for difficult electrical environment
- Variable lengths, threads and electrical connections
- Detection of very low speed (near zero speed)
- Due to its design and its approvals especially suitable for shipbuilding industry

Measuring principles

Speed sensors of the FA[.]11 series operate according to different measuring principles, depending on the sensor type:

Difference-hall-effect principle (type FAH11)

Two closely spaced Hall elements are located on the sensor chip. The field of a magnet generates a constant voltage in the Hall elements. Ferromagnetic objects with an interrupted surface as they pass the Hall elements cause the Hall voltage to change. When the moving object covers only one Hall element, a differential voltage is generated to provide a measuring signal. The frequency of this measuring signal is proportional to the speed of movement (rotational speed). The difference-Hall principle is direction sensitive.

Inductive-magnetic principle (type FAJ11)

The measuring element consists of a sensing coil and an iron core with an attached permanent magnet. Ferromagnetic objects with an interrupted surface as they pass cause the constant field of the magnet to be changed and induce a voltage in the sensing coil. The frequency of this signal is proportional to the speed of movement (rotational speed). The inductive-magnetic principle is direction independent.

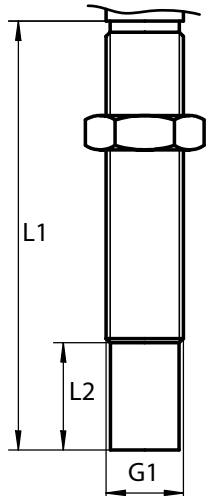
Overview speed sensors FA11 series

| Type | Measuring principle | Signal outputs | Signal form |
|--------|---------------------|---|--------------------------|
| FAH11 | Difference-hall | One square wave signal | Q1 |
| FAJ11 | Induct.-magnetic | One square wave signal | Q1 |
| FAHZ11 | Difference-hall | Two square wave signals, Q2 to Q1 is 90° phase shifted | Q1 Q2 |
| FAHS11 | Difference-hall | Two square wave signals, Q2 to Q1 is 90° phase shifted, one rotation direction signal | Q1 Q2 S |
| FAHD11 | Difference-hall | Two square wave signals, galvanically isolated, Q2 to Q1 is 90° phase shifted | Q1 Q2 |
| FAHQ11 | Difference-hall | Two + two inverted square wave signals, Q1 to Q2 and Q1_N to Q2_N are 90° phase shift | Q1 Q1_N Q2 Q2_N |

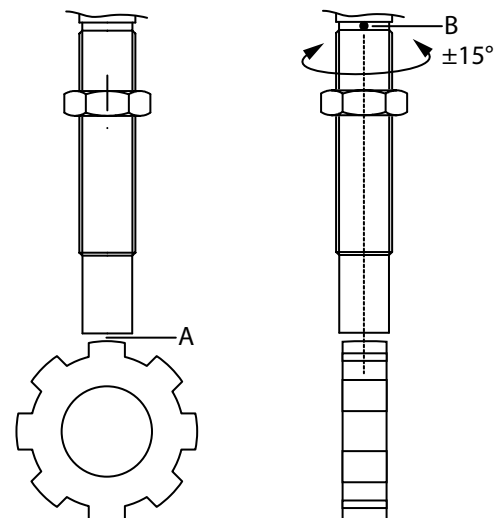
| Approvals | | | | | | |
|-----------|-------|-------|--------|--------|--------|--------|
| | FAH11 | FAJ11 | FAHZ11 | FAHS11 | FAHD11 | FAHQ11 |
| | X | X | X | X | X | X |
| | X | X | X | X | X | X |
| | X | X | X | X | X | X |
| | X | X | X | X | X | X |

Dimensions, connections and drawings

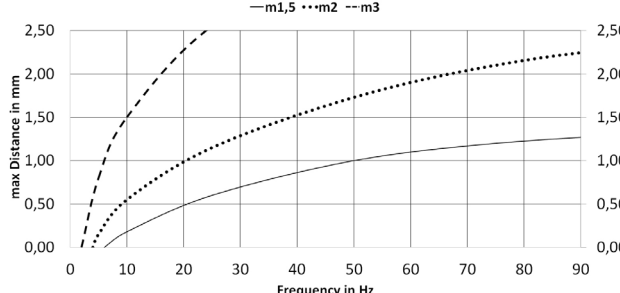
Dimensions and mounting drawing

| | |
|---|---|
|  | <p>Explanation to the illustration Please note the possible combination of L1 and L2 for the nominal length in the type code. L1: 60, 80, 100, 120 mm (up to 200 mm available on request) L2: 5, 20, 40 mm G1: M18x1; M18x1.5; 5/8" – 18 UNF</p> |
|---|---|

Direction-sensitive mounting of sensors with difference-hall principle (FAH[..] series)

| | |
|---|--|
|  | <p>Explanation to the illustration The left figure refers to the "tooth wheel" as scan object. Note that the mounting of sensors with difference-hall principle is direction-sensitive. A: Scan object distance see technical data B: Marker of sensor (red) Marker (B) points in direction of the tooth wheel rotation. The permissible deviation is max. $\pm 15^\circ$.</p> |
|---|--|

Distance and measurable frequency range for sensor with inductive-magnetic principle (FAJ[..] series)

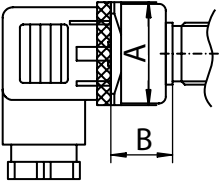
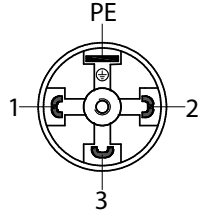
|  <p>Legend: — m1.5 ··· m2 - - - m3</p> <table border="1"> <caption>Approximate data from the graph</caption> <thead> <tr> <th>Frequency (Hz)</th> <th>Max Distance (mm) - m1.5</th> <th>Max Distance (mm) - m2</th> <th>Max Distance (mm) - m3</th> </tr> </thead> <tbody> <tr><td>0</td><td>0.00</td><td>0.00</td><td>0.00</td></tr> <tr><td>10</td><td>0.50</td><td>0.20</td><td>0.10</td></tr> <tr><td>20</td><td>1.50</td><td>0.50</td><td>0.25</td></tr> <tr><td>30</td><td>2.20</td><td>0.80</td><td>0.40</td></tr> <tr><td>40</td><td>2.40</td><td>1.10</td><td>0.55</td></tr> <tr><td>50</td><td>2.45</td><td>1.30</td><td>0.65</td></tr> <tr><td>60</td><td>2.48</td><td>1.45</td><td>0.75</td></tr> <tr><td>70</td><td>2.50</td><td>1.55</td><td>0.80</td></tr> <tr><td>80</td><td>2.50</td><td>1.60</td><td>0.85</td></tr> <tr><td>90</td><td>2.50</td><td>1.65</td><td>0.90</td></tr> </tbody> </table> | Frequency (Hz) | Max Distance (mm) - m1.5 | Max Distance (mm) - m2 | Max Distance (mm) - m3 | 0 | 0.00 | 0.00 | 0.00 | 10 | 0.50 | 0.20 | 0.10 | 20 | 1.50 | 0.50 | 0.25 | 30 | 2.20 | 0.80 | 0.40 | 40 | 2.40 | 1.10 | 0.55 | 50 | 2.45 | 1.30 | 0.65 | 60 | 2.48 | 1.45 | 0.75 | 70 | 2.50 | 1.55 | 0.80 | 80 | 2.50 | 1.60 | 0.85 | 90 | 2.50 | 1.65 | 0.90 | <p>Explanation to the illustration The left figure refers to the tooth wheel as scan object. The detection of the movement of very small tooth wheels (e. g. m1.5) is possible by reducing the distance between sensor and scanning object. The distance in relation to the lower measurable range is mentioned in the above illustration.</p> |
|--|--------------------------|--------------------------|------------------------|------------------------|---|------|------|------|----|------|------|------|----|------|------|------|----|------|------|------|----|------|------|------|----|------|------|------|----|------|------|------|----|------|------|------|----|------|------|------|----|------|------|------|--|
| Frequency (Hz) | Max Distance (mm) - m1.5 | Max Distance (mm) - m2 | Max Distance (mm) - m3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0.00 | 0.00 | 0.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 0.50 | 0.20 | 0.10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 1.50 | 0.50 | 0.25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 | 2.20 | 0.80 | 0.40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 40 | 2.40 | 1.10 | 0.55 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 50 | 2.45 | 1.30 | 0.65 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | 2.48 | 1.45 | 0.75 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | 2.50 | 1.55 | 0.80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 80 | 2.50 | 1.60 | 0.85 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 90 | 2.50 | 1.65 | 0.90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Connectors and pin assignment

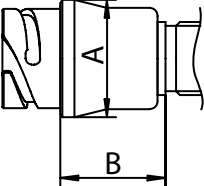
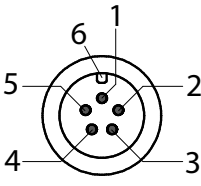
The following table shows an overview about the speed sensors and the available connector types.

| Connection type | FAH11 | FAHZ11 | FAHS11 | FAHD11 | FAJ11 | FAHQ13 |
|-----------------|-------|------------|--------|--------|-------|--------|
| DIN 43650-A | X | - | - | - | X | - |
| MIL 14-5PN | X | - | - | - | X | - |
| EURO M12x1 | X | On request | - | - | X | - |
| DIN 72585 | X | - | - | - | X | - |

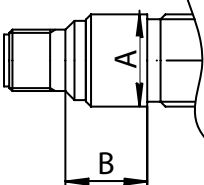
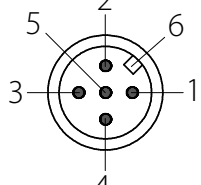
Connecting plug -A DIN43650 A

| | | |
|---|---|---|
|  |  <p>Protection class: IP65</p> | <p>Explanation to the left illustration</p> <p>A: Length 30 mm B: Length 18 mm 1: +U_B 2: -U_B (0V) 3: Signal Q PE: Shield</p> <p>Note: On delivery supplied with female connector.</p> |
|---|---|---|

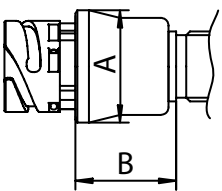
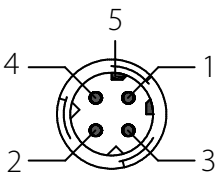
Connecting plug -C MIL 14-5PN

| | | |
|---|---|---|
|  |  <p>Protection class: IP67</p> | <p>Explanation to the left illustration</p> <p>A: Ø 29 mm B: Length 26 mm 1: Shield 2: -U_B (0V) 3: Signal Q 4: Signal Q 5: +U_B 6: Coding nib</p> <p>Note: On delivery without any female connector (accessories set ZL4-1A)</p> |
|---|---|---|

Connecting plug -E Euro M12x1

| | | |
|---|---|---|
|  |  <p>Protection class: IP67</p> | <p>Explanation to the left illustration</p> <p>A: Ø 18 mm B: Length 16 mm 1: +U_B 2: not used 3: -U_B (0V) 4: Signal Q 5: Shield 6: Coding nib</p> <p>Note: On delivery without any female connector (accessories set ZL4-2A)</p> |
|---|---|---|

Connecting plug -H1 DIN72585 Bayonet

| | | |
|---|---|---|
|  |  <p>Protection class: IP67</p> | <p>Explanation to the left illustration</p> <p>A: Ø 29 mm B: Length 26 mm 1: +U_B 2: -U_B (0V) 3: Signal Q 4: Shield 5: Coding nib</p> <p>Note: On delivery without any female connector</p> |
|---|---|---|

List with available female connectors

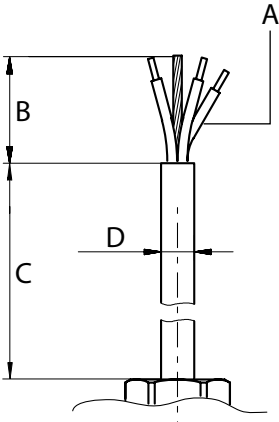
| Connector | Drawing No. | Order No. |
|--|-------------|-----------|
| Female connector DIN 43650-A | ZL-3A | 311046 |
| Female connector according VG95234 | ZL4-1A-E | 314015 |
| Female connector Euro M12x1, shielded, straight with 2.0 m cable | ZL4-2A | 522101 |
| Female connector Euro M12x1, shielded, straight with 5.0 m cable | ZL4-2A | 522102 |
| Female connector Euro M12x1, shielded, straight with 10.0 m cable | ZL4-2A | 522109 |
| Female connector Euro M12x1, shielded, angled 90°, with 2.0 m cable | ZL4-2A | 522439 |
| Female connector Euro M12x1, shielded, angled 90°, with 5.0 m cable | ZL4-2A | 522438 |
| Female connector Euro M12x1, shielded, angled 90°, with 10.0 m cable | ZL4-2A | 522437 |

Connection cables and pin assignment

The following table shows an overview about the speed sensors and the related connection cables.

| Connection type -X | FAH11 | FAHZ11 | FAHS11 | FAHD11 | FAJ11 | FAHQ11 |
|---------------------------|-------|--------|--------|--------|-------|--------|
| Cable with 3 wires | X | - | - | - | X | - |
| Cable with 4 wires | - | X | - | - | - | - |
| Cable with 6 wires | - | - | X | X | - | X |

Connection cable type -X for sensors with 3 connecting wires

| | |
|---|---|
|  | <p>Explanation to the left illustration</p> <p>A) 3 x 0.33 mm² B) 80 ±10 mm C) Length K1 ±5% D) Diameter 4.6 ±0.5 mm Protection class: IP67</p> |
|---|---|

Connection cable type -X for sensors with 4 connecting wires

| | |
|--|--|
| | <p>Explanation to the left illustration</p> <p>A) Wires 4 x 0.33 mm² halogen-free B) Length 80 ±¹⁰ mm C) Length K1 ±^{5%} (K1 see customer drawing) D) Diameter 7 ±^{0.5} mm Protection class: IP67</p> |
|--|--|

Connection cable type -X for sensors with 6 connecting wires

| | |
|--|--|
| | <p>Explanation to the left illustration</p> <p>A) Wires 6 x 0.33 mm² halogen-free B) Length 80 ±¹⁰ mm C) Length K1 ±^{5%} (K1 see customer drawing) D) Diameter 7 ±^{0.5} mm Protection class: IP67</p> |
|--|--|

Connection assignment for type FAH11, FAJ11

Connection assignment for type FAH, FAJ (one channel)

| Color | Explanation |
|--------|-----------------------|
| Brown | U _S + |
| Green | U _S - (0V) |
| White | Signal Q |
| Shield | Ground |

Connection assignment for type FA[..]Z

| Colour | Explanation |
|--------|-----------------------|
| Brown | U _S + |
| Green | U _S - (0V) |
| White | Signal Q1 |
| Yellow | Signal Q2 |
| Shield | Ground |

Connection assignment for type FA[..]S

| Colour | Explanation |
|--------|---|
| Brown | U ₅ + |
| Green | U ₅ - (0V) |
| White | Signal Q1 |
| Yellow | Signal Q2 |
| Grey | Status output for direction of rotation detection |
| Pink | NC |
| Shield | Ground |

Connection assignment for type FA[..]D

| Colour | Explanation |
|--------|----------------------------------|
| Brown | Sensor 1: U _{S1} + |
| Green | Sensor 1: U _{S1} - (0V) |
| White | Sensor 1: Signal Q1 |
| Pink | Sensor 2: U _{S2} + |
| Grey | Sensor 2: U _{S2} - (0V) |
| Yellow | Sensor 2: Signal Q2 |
| Shield | Ground |

Connection assignment for type FA[..]Q

| Colour | Explanation |
|--------|-----------------------|
| Brown | U ₅ + |
| White | Q1 |
| Grey | Q1_N, inverted to Q1 |
| Yellow | Q2 |
| Pink | Q2_N inverted to Q2 |
| Green | U ₅ - (0V) |
| Shield | Ground |

Elementary circuit diagrams

| | |
|---|---|
| <p>Elementary circuit diagram FAH11, FAJ11, FAHZ11</p> | <p>Elementary circuit diagram FAHS11</p> |
| <p>Elementary circuit diagram FAHD11</p> | <p>Elementary circuit diagram FAHQ11</p> |

General technical data

Electrical connection

| | |
|----------------------------|------------------------------------|
| Supply voltage | <i>See specific technical data</i> |
| Nominal voltage | <i>See specific technical data</i> |
| Current consumption | <i>See specific technical data</i> |
| Reverse voltage protection | Yes |
| Over voltage protection | Yes |
| Connection | <i>See specific technical data</i> |
| Recommended cable length | < 100 m |
| Used cable cross section | 0.33 mm ² , shielded |

Electrical output

| | |
|-------------------------------------|------------------------------------|
| Measuring channels | <i>See specific technical data</i> |
| Output signal and signal type | <i>See specific technical data</i> |
| Output stage | Push-pull amplifier |
| Continuous short circuit protection | Yes |
| Galvanic isolation | <i>See specific technical data</i> |
| Output level Low | <i>See specific technical data</i> |
| Output level High | <i>See specific technical data</i> |
| Output current NPN (Sink) | <i>See specific technical data</i> |
| Output current PNP (Load) | <i>See specific technical data</i> |
| Internal resistance Ri | <i>See specific technical data</i> |
| Rise time | ≥ 10 V/μs |

Signal acquisition

| | |
|----------------------------|------------------------------------|
| Measuring principle | Type FAH[.]: Difference-hall |
| | Type FAJ[.]: Inductive magnetic |
| Frequency range | <i>See specific technical data</i> |
| Scanning type | Non-contacting |
| Scanning object - distance | <i>See specific technical data</i> |
| Scanning object | <i>See specific technical data</i> |
| Phase shift | <i>See specific technical data</i> |

| Environmental influences | |
|--------------------------|--|
| Operating temperature | -40 ... +120 °C |
| Storage temperature | Recommended: -25 ... +70 °C; max.: -40 ... +105 °C (max. limit values within 30 days per year @ relative humidity 5...95%) |
| Protection class | <i>See specific technical data</i> |
| Vibration resistance | DIN IEC 60068-T2-6, 10 g @ 5...2000 Hz (Sinus) DIN EN 61373, 30 g @ 20...500 Hz (Random) |
| Shock resistance | DIN IEC 60068-T2-27, 1000 m/s ² @ 6 ms |
| Climatic test | DIN IEC 60068-T2-1/-2/-30 |
| EMI - ESD | IEC 61000-4-2, Lev. 3 |
| EMI - Burst | IEC 61000-4-4, Lev. 3 |
| EMI - Surge | IEC 61000-4-5, Lev. 2 |
| EMI - HF immunity | IEC 61000-4-3, 10 V/m IEC 61000-4-6 (RF - conducted), 10 Veff IEC 60553 (AF - conducted), 3 Veff |
| Emitted interference | CISPR 16-1, CISPR 16-2 EMC2 |
| Insulation voltage | 500 VAC, 50 Hz @ 1 min |

| Mechanical properties | |
|-----------------------|--|
| Material | Sensor tube: Brass Connecting plug: depending on connecting plug type |
| Mounting | Screw-in thread (see type code) |
| Length | L1 = 60 ... 200 mm |
| Installation position | Any |
| Installation mode | <i>See specific technical data</i> |
| Weight | 100 ... 300 g (depending on connection and length) |
| Pressure resistance | 5 bar (measuring area) |

Specific technical data

Technical data on measuring principles

| | Difference-hall principle FAH type | Inductive-magnetic principle FAJ type |
|----------------------------|---|---|
| Scanning object | Ferromagnetic materials, Toothed wheel: Module m1 to m3; tooth face > 7 mm (spur gear DIN867) Hole: Ø ≥ 5 mm, web ≥ 2 mm, depth ≥ 4 mm Groove: ≥ 4 mm, web ≥ 2 mm, depth ≥ 4 mm | Ferromagnetic materials, Toothed wheel: Module ≥ m1.5; tooth face width ≥ 5 mm (spur gear DIN867) Hole: Ø ≥ 5 mm, web ≥ 2 mm, depth ≥ 4 mm Groove: ≥ 4 mm, web ≥ 2 mm, depth ≥ 4 mm |
| Scanning object - distance | 0.2 ... 3 mm; recommended: 1.0 ± 0.5 mm | See diagram in the technical documentation |
| Frequency range | 0.2 ... 20,000 Hz | See diagram; 5 Hz...10,000 Hz depending from module and scan distance; under optimal conditions up to 15 kHz |
| Installation mode | Direction sensitive | Direction independent |

Technical data on electrical connection and signal detection

Sensors with one signal output

| | FAH11 | FAJ11 |
|---------------------------|--|---|
| Supply voltage | 9 ... 32 VDC | |
| Nominal voltage | 24 VDC | |
| Current consumption | < 10 mA (without output current PNP) | < 6 mA (without output current PNP) |
| Connection | DIN 43650A, Mil14-5PN, Euro M12x1, DIN 72585 or cable end (see customer drawing) | |
| Measuring channels | 1 measuring channel | |
| Output level Low | ≤ 0.8 V @ 24 VDC, 10 mA, 24 °C | |
| Output level High | ≥ UB-1.5 V @ 24 VDC, 10 mA, 24 °C | |
| Internal resistance Ri | 45 Ω | |
| Output current NPN (Sink) | max. -50 mA | |
| Output current PNP (Load) | max. 50 mA | |
| Protection class | Housing: IP66/IP68 Connection Type A: IP65; Typ C, E, H, X: IP67 | Housing: IP66/IP68 Connection Type A: IP65; Typ C, E, H, X: IP67 |
| Approvals | CE, ABS, BV, DNV-GL, LR | |

Sensors with two signal outputs

| | FAHZ11 | FAHD11 |
|---------------------------|---|--|
| Supply voltage | 9 ... 32 VDC | 2 x 9 ... 32 VDC |
| Nominal voltage | 15 VDC | 2 x 15 VDC |
| Current consumption | < 20 mA (without output current PNP) | 2 x < 10 mA (without output current PNP) |
| Connection | Cable end, customized connections acc. customer drawing | |
| Measuring channels | 2 measuring channels | 2 galvanically isolated measuring channels |
| Output level Low | Per output: ≤ 0.8 V @ 15 VDC, 10 mA, 24 °C | |
| Output level High | Per output: ≥ UB-1.6 V @ 15 VDC, 10 mA, 24 °C | |
| Internal resistance Ri | 50 Ω | |
| Output current NPN (Sink) | Per output: max. -50 mA | |
| Output current PNP (Load) | Per output: max. 50 mA | |
| Phase shift | 90° ± 10% @ m1.5...m3 90° ± 15% @ m1...m1.25 | |
| Protection class | Housing: IP66/IP68 Connection Type X: IP67 | |
| Approvals | CE, ABS, BV, DNV-GL, LR | |

Sensors with two signal outputs and status signal output

| FAHS11 | |
|---------------------------|--|
| Supply voltage | 9 ... 32 VDC |
| Nominal voltage | 15 VDC |
| Current consumption | < 20 mA (without output current PNP) |
| Connection | Cable end, see customer drawing |
| Measuring channels | 2 measuring channels and status channel for rotation direction detection |
| Output level Low | Per output: $\leq 0.8 \text{ V @ } 24 \text{ VDC, } 10 \text{ mA, } 24 \text{ }^\circ\text{C}$ |
| Output level High | Per output: $\geq U_B - 1.6 \text{ V @ } 24 \text{ VDC, } 10 \text{ mA, } 24 \text{ }^\circ\text{C}$ |
| Internal resistance Ri | 45 Ω |
| Output current NPN (Sink) | Per output: max. -50 mA |
| Output current PNP (Load) | Per output: max. 50 mA |
| Phase shift | $90^\circ \pm 10\% \text{ @ } m1.5...m3 \mid 90^\circ \pm 15\% \text{ @ } m1...m1.25$ |
| Protection class | Housing: IP66/IP68 Connection Type X: IP67 |
| Approvals | CE, ABS, BV, DNV-GL, LR |

Sensors with four output signals

| FAHQ11 | |
|---------------------------|--|
| Supply voltage | 9...32 VDC |
| Nominal voltage | 15 VDC |
| Current consumption | < 20 mA (without output current PNP) |
| Connection | Cable end, see customer drawing |
| Measuring channels | 2 measuring channels |
| Output level Low | Per output: $\leq 0.8 \text{ V @ } 15 \text{ VDC, } 10 \text{ mA, } 24 \text{ }^\circ\text{C}$ |
| Output level High | Per output: $\geq U_B - 1.6 \text{ V @ } 15 \text{ VDC, } 10 \text{ mA, } 24 \text{ }^\circ\text{C}$ |
| Internal resistance Ri | 45 Ω |
| Output current NPN (Sink) | Per output: max. -50 mA |
| Output current PNP (Load) | Per output: max. 50 mA |
| Phase shift | $90^\circ \pm 10\% \text{ @ } m1.5...m3 \mid 90^\circ \pm 15\% \text{ @ } m1...m1.25$ |
| Protection class | Housing: IP66/IP68 Connection: Typ X: IP67 |
| Approvals | CE, ABS, BV, DNV-GL, LR |

Type code

| Type code structure | | | | | | | | | |
|---|----------|----------|------------|-----------|------------|-------------|-------------|-----------|--|
| FA | H | Z | 11- | 02 | 15- | X03- | M10- | S0 | Example: FAHZ11-0215-X03-M10-S0 |
| Measuring principle | | | | | | | | | |
| Measuring principle supplement | | | | | | | | | |
| Construction type & material | | | | | | | | | |
| Nominal length L1 and L2 of the sensor tube | | | | | | | | | |
| Thread type | | | | | | | | | |
| Electrical connection | | | | | | | | | |
| Module version | | | | | | | | | |
| Shield | | | | | | | | | |

| Type code FAJ11[..] | | | | | | | | | |
|---|-------------|---|---|-----------|------------|------------|-----------|-----------|---------------------------------|
| Measuring principle | J | Inductive-magnetic | | | | | | | J |
| Measuring principle supplement | | Without code: 1 channel | | | | | | | J |
| Construction type & material | | 11- | Sensor tube: brass | | | | | | J |
| Nominal length | | 02 | L1 = 60 mm, L2 = 5 mm | | | | | | J |
| | | 03 | L1 = 80 mm, L2 = 5 mm | | | | | | J |
| | | 04 | L1 = 100 mm, L2 = 20 mm | | | | | | |
| | | 05 | L1 = 120 mm, L2 = 40 mm | | | | | | |
| | | Other lengths up to 200 mm available on request | | | | | | | |
| Thread type | | 13- | M14 x 1 | | | | | | |
| | | 22- | M16 x 1.5 | | | | | | |
| | | 15- | M18 x 1 | | | | | | J |
| | | 23- | M18 x 1.5 | | | | | | J |
| | | 88- | 5/8" – 18 UNF | | | | | | |
| Electrical connection | | A- | DIN43650-A pin connector | | | | | | J |
| | | C- | MIL 14-5PN VG95234 pin connector | | | | | | |
| | | E- | Euro M12x1 pin connector | | | | | | J |
| | | H1- | DIN72585 Bajonett | | | | | | |
| | | X03- | Cable end with sheath length 0.5 m | | | | | | |
| | | X05- | Cable end with sheath length 2.0 m | | | | | | J |
| | | X06- | Cable end with sheath length 3.0 m | | | | | | |
| | | X07- | Cable end with sheath length 5.0 m | | | | | | |
| | | X08- | Cable end with sheath length 7.5 m | | | | | | |
| | X09- | Cable end with sheath length 10.0 m | | | | | | | |
| Shield | | | Without code: Shield attached to the sensor housing | | | | | | J |
| | | S0 | Shield not attached to the sensor housing | | | | | | |
| FA | __ | __ | __- | __ | __- | __- | __ | S0 | Example: FAJ11-0323-E-S0 |

Preferred types

Features marked with an indicator letter in the right column in the table are preferred features. If you select a preferred feature for each placeholder (same indicator letter), the device is specified as a preferred type. Preferred types are available quickly from stock. Other types will be delivered according to scheduled appointments.

Special types

If our standard types do not correspond with your expectations, we are pleased to develop a special solution together with you.

| Type code FAH11[...] | | | | | | | | | |
|---|-------------|---|--|----|----|----|----|--|-----|
| Measuring principle | H | Difference-Hall | | | | | | | X,Z |
| Measuring principle supplement | | Without code: 1 output signal | | | | | | | X |
| | Z | 2 output signals, galvanically connected | | | | | | | Z |
| | S | 2 output signals, galvanically connected and status output (e. g. rotation direction detection) | | | | | | | |
| | D | 2 output signals, galvanically isolated | | | | | | | |
| | Q | 4 output signals (2 + 2 inverted) | | | | | | | |
| Construction type & material | | 11- | Sensor tube: brass | | | | | | X,Z |
| Nominal length | | 02 | L1 = 60 mm, L2 = 5 mm | | | | | | X |
| | | 03 | L1 = 80 mm, L2 = 5 mm | | | | | | X,Z |
| | | 04 | L1 = 100 mm, L2 = 20 mm | | | | | | |
| | | 05 | L1 = 120 mm, L2 = 40 mm | | | | | | Z |
| | | | Other lengths up to 200 mm available on request | | | | | | |
| Thread type | | 13- | M14 x 1 (only FAH11) | | | | | | |
| | | 22- | M16 x 1.5 (only FAH11) | | | | | | |
| | | 15- | M18 x 1 | | | | | | X |
| | | 23- | M18 x 1.5 | | | | | | X,Z |
| | | 88- | 5/8" – 18 UNF (only FAH11) | | | | | | |
| Electrical connection | | A- | DIN43650-A pin connector (only FAH11) | | | | | | X |
| | | C- | MIL 14-5PN VG95234 pin connector (only FAH11) | | | | | | |
| | | E- | Euro M12x1 pin connector (only FAH11, on request for FAHZ11) | | | | | | X,Z |
| | | H1- | DIN72585 Bajonett (only FAH11) | | | | | | |
| | | X03- | Cable end with sheath length 0.5 m | | | | | | |
| | | X05- | Cable end with sheath length 2.0 m | | | | | | X |
| | | X06- | Cable end with sheath length 3.0 m | | | | | | |
| | | X07- | Cable end with sheath length 5.0 m | | | | | | |
| | | X08- | Cable end with sheath length 7.5 m | | | | | | |
| | X09- | Cable end with sheath length 10.0 m | | | | | | | |
| Module (for FAHD, FAHZ, FAHQ Series) | | M10- | Module m1 | | | | | | |
| | | M12- | Module m1.25 | | | | | | |
| | | M15- | Module m1.5 | | | | | | |
| | | | Without code: Module m2 | | | | | | Z |
| | M25- | Module m2.5 | | | | | | | |
| | M30- | Module m3 | | | | | | | |
| Shield | | | Without code: Shield attached to the sensor housing | | | | | | X,Z |
| | | S0 | Shield not attached to the sensor housing | | | | | | |
| FA | -- | -- | -- | -- | -- | -- | -- | Example: FAHZ11-0323-X03-M12-S0 | |

Preferred types

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