

AFS60A-S4NB262144

AFS/AFM60 Ethernet

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | Part no. |
|-------------------|----------|
| AFS60A-S4NB262144 | 1059050 |

Other models and accessories → www.sick.com/AFS_AFM60_Ethernet

Detailed technical data

Performance

| | |
|---|----------------------|
| Number of steps per revolution (max. resolution) | 262,144 (18 bit) |
| Error limits G | 0.03° ¹⁾ |
| Repeatability standard deviation σ_r | 0.002° ²⁾ |

¹⁾ In accordance with DIN ISO 1319-1, position of the upper and lower error limit depends on the installation situation, specified value refers to a symmetrical position, i.e. deviation in upper and lower direction is the same.

²⁾ In accordance with DIN ISO 55350-13; 68.3% of the measured values are inside the specified area.

Interfaces

| | |
|---|--|
| Communication interface | PROFINET |
| Encoder profile | V4.1 class3 |
| Data transmission rate (baud rate) | 10 Mbit/s, 100 Mbit/s |
| Transmission medium | CAT-5e cable |
| Initialization time | 6 s |
| Cycle time | ≤ 1 ms |
| Parameterising data | Number of steps per revolution PRESET Counting direction Sampling rate for speed calculation Unit for output of the speed value |
| Available diagnostics data | Minimum and maximum temperature Maximum speed Power-on counter Operating hours counter power-on/motion Counter of direction changes/number of movements cw/number of movements ccw Maximum supply voltage |

Electrical data

| | |
|------------------------|---|
| Connection type | Male connector, Female connector, 1x, 2x, M12, M12, 4-pin, 4-pin, axial, axial ^{1) 2)} |
| Supply voltage | 10 ... 30 V |

¹⁾ A-coded.

²⁾ D-coded.

³⁾ This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40°C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

| | |
|--|---|
| Power consumption | ≤ 3 W (without load) |
| Reverse polarity protection | ✓ |
| MTTFd: mean time to dangerous failure | 80 years (EN ISO 13849-1) ³⁾ |

¹⁾ A-coded.

²⁾ D-coded.

³⁾ This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

Mechanical data

| | |
|---------------------------------------|---|
| Mechanical design | Solid shaft, face mount flange |
| Shaft diameter | 10 mm |
| Shaft length | 19 mm |
| Weight | 0.2 kg |
| Shaft material | Stainless steel |
| Flange material | Aluminum |
| Housing material | Aluminum |
| Start up torque | 0.5 Ncm (+20 °C) |
| Operating torque | 0.3 Ncm (+20 °C) |
| Permissible shaft loading | 80 N (radial) 40 N (axial) |
| Operating speed | ≤ 9,000 min ⁻¹ ¹⁾ |
| Moment of inertia of the rotor | 6.2 gcm ² |
| Bearing lifetime | 3 x 10 ⁹ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

Ambient data

| | |
|--------------------------------------|--|
| EMC | According to EN 61000-6-2 and EN 61000-6-3 |
| Enclosure rating | IP65, shaft side (IEC 60529) IP67, housing side (IEC 60529) ¹⁾ |
| Permissible relative humidity | 90 % (Condensation not permitted) |
| Operating temperature range | -40 °C ... +85 °C |
| Storage temperature range | -40 °C ... +100 °C, without package |
| Resistance to shocks | 100 g, 6 ms (EN 60068-2-27) |
| Resistance to vibration | 30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

¹⁾ With mating connector fitted.

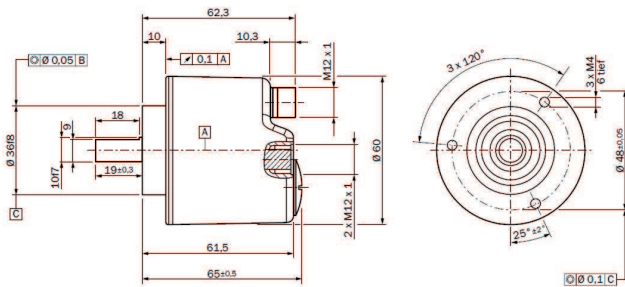
Classifications

| | |
|---------------------|----------|
| eCl@ss 5.0 | 27270502 |
| eCl@ss 5.1.4 | 27270502 |
| eCl@ss 6.0 | 27270590 |
| eCl@ss 6.2 | 27270590 |
| eCl@ss 7.0 | 27270502 |
| eCl@ss 8.0 | 27270502 |

| | |
|-----------------------|----------|
| eCI@ss 8.1 | 27270502 |
| eCI@ss 9.0 | 27270502 |
| eCI@ss 10.0 | 27270502 |
| eCI@ss 11.0 | 27270502 |
| eCI@ss 12.0 | 27270502 |
| ETIM 5.0 | EC001486 |
| ETIM 6.0 | EC001486 |
| ETIM 7.0 | EC001486 |
| ETIM 8.0 | EC001486 |
| UNSPSC 16.0901 | 41112113 |

Dimensional drawing (Dimensions in mm (inch))

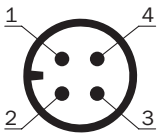
Solid shaft, face mount flange



Diameter x f7 corresponds to the shaft diameter

PIN assignment

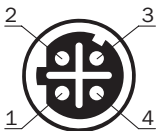
Male connector



Supply voltage

| PIN | Wire color | Signal |
|-----|------------|------------------------------|
| 1 | Brown | U _S 10 V ... 30 V |
| 2 | White | Not assigned |
| 3 | Blue | GND |
| 4 | Black | Not assigned |

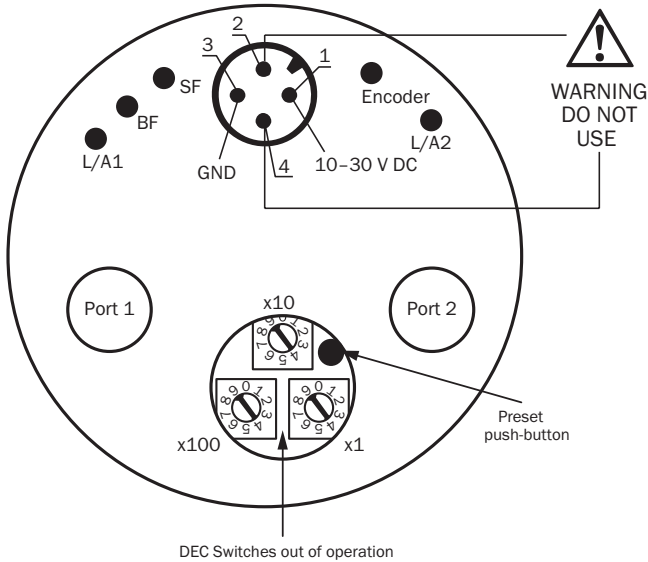
Female connector



Port 1, Port 2

| PIN | Wire color | Signal |
|-----|------------|--------|
| 1 | Yellow | T x D+ |
| 2 | White | R x D+ |
| 3 | Orange | T x D- |
| 4 | Blue | R x D- |








Connection diagram







Recommended accessories

Other models and accessories → www.sick.com/AFS_AFM60_Ethernet

| | Brief description | Type | Part no. |
|----------------|---|-------------------|----------|
| Flanges | | | |
| | Flange adapter, adaptation of face mount flange with 36 mm centering hub to 50 mm servo flange, aluminum, including 3 flat head screws M4 x 10, Aluminum, including 3 countersunk screws M3 x 10 | BEF-FA-036-050 | 2029160 |
| | Flange adapter, adaptation of face mount flange with 36 mm centering hub to 60 mm square mounting plate, aluminum, including 3 flat head screws M4 x 8, Aluminum, including 3 countersunk screws M4 x 8 | BEF-FA-036-060REC | 2029162 |
| | Flange adapter, adaptation of face mount flange with 36 mm centering hub to 58 mm square mounting plate with shock absorbers, aluminum, Aluminum | BEF-FA-036-060RSA | 2029163 |
| | Flange adapter, adaptation of face mount flange with 36 mm centering hub to 63 mm square mounting plate, aluminum, including 3 flat head screws M4 x 10, Aluminum, including 3 countersunk screws M3 x 10 | BEF-FA-036-063REC | 2034225 |

| | Brief description | Type | Part no. |
|---|--|--------------------|----------|
| Other mounting accessories | | | |
|  | Plastic measuring wheel with smooth plastic surface (Hytrell), for 10 mm solid shaft, circumference 200 mm | BEF-MR-010020 | 5312988 |
|  | Measuring wheel with ridged plastic surface (Hytrell) for 10 mm solid shaft, circumference 200 mm | BEF-MR-010020G | 5318678 |
|  | Plastic measuring wheel with smooth plastic surface (Hytrell) for 10 mm solid shaft, circumference 500 mm | BEF-MR-010050 | 5312989 |
|  | Aluminium measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 200 mm | BEF-MR006020R | 2055222 |
| | Measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 300 mm | BEF-MR006030R | 2055634 |
| | Aluminium measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 200 mm | BEF-MR010020R | 2055224 |
| | Aluminium measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 300 mm | BEF-MR010030R | 2049278 |
| | Measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 500 mm | BEF-MR010050R | 2055227 |
| | O-ring for measuring wheels (circumference 200 mm) | BEF-OR-053-040 | 2064061 |
| | O-ring for measuring wheels (circumference 300 mm), 2x O-ring | BEF-OR-083-050 | 2064076 |
| | Plug connectors and cables | | |
|  | Head A: female connector, M12, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 2 m | YF2A14-020UB3XLEAX | 2095607 |
| | Head A: female connector, M12, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 5 m | YF2A14-050UB3XLEAX | 2095608 |
| | Head A: female connector, M12, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 10 m | YF2A14-100UB3XLEAX | 2095609 |
| | Head A: female connector, M12, 4-pin, straight, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 25 m | YF2A14-250UB3XLEAX | 2095615 |
|  | Head A: female connector, M12, 4-pin, angled, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 2 m | YG2A14-020UB3XLEAX | 2095766 |
| | Head A: female connector, M12, 4-pin, angled, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 5 m | YG2A14-050UB3XLEAX | 2095767 |
| | Head A: female connector, M12, 4-pin, angled, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 10 m | YG2A14-100UB3XLEAX | 2095768 |
| | Head A: female connector, M12, 4-pin, angled, A-coded Head B: Flying leads Cable: Sensor/actuator cable, PUR, halogen-free, unshielded, 25 m | YG2A14-250UB3XLEAX | 2095771 |
|  | Head A: male connector, M12, 4-pin, straight, D-coded Head B: Flying leads Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 2 m | YM2D24-020PN1XLEAX | 2106171 |
| | Head A: male connector, M12, 4-pin, straight, D-coded Head B: Flying leads Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 5 m | YM2D24-050PN1XLEAX | 2106172 |

| | Brief description | Type | Part no. |
|---|--|--------------------|----------|
|  | Head A: male connector, M12, 4-pin, straight, D-coded Head B: Flying leads Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 10 m | YM2D24-100PN1XLEAX | 2106173 |
| | Head A: male connector, M12, 4-pin, angled, D-coded Head B: Flying leads Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 5 m | YN2D24-050PN1XLEAX | 2106175 |
| | Head A: male connector, M12, 4-pin, angled, D-coded Head B: Flying leads Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 25 m | YN2D24-250PN1XLEAX | 2106180 |
|  | Head A: male connector, M12, 4-pin, angled, D-coded Head B: male connector, M12, 4-pin, angled, D-coded Cable: PROFINET, PUR, halogen-free, shielded, 5 m | SSL-1204-W05MZ | 6050636 |
|  | Head A: male connector, RJ45, 4-pin, straight Head B: male connector, M12, 4-pin, angled, D-coded Cable: PROFINET, EtherCAT [®] , PVC, shielded, 30 m | SSL-2J04-F30MZ | 6059450 |
| | Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, RJ45, 4-pin, straight Cable: PROFINET, PVC, shielded, 5 m | SSL-2J04-G05MZ60 | 6048245 |
|  | Head A: male connector, M12, 4-pin, angled, D-coded Head B: male connector, RJ45, 8-pin, straight Cable: Ethernet, PUR, halogen-free, shielded, 20 m | SSL-2J04-H20ME | 6063701 |
|  | Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, RJ45, 4-pin, straight Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 2 m | YM2D24-020PN1MRJA4 | 2106182 |
|  | Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, M12, 4-pin, angled, D-coded Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 2 m | YM2D24-020PN1N2D24 | 2106165 |
|  | Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, M12, 4-pin, straight, D-coded Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 5 m | YM2D24-050PN1M2D24 | 2106160 |
|  | Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, M12, 4-pin, angled, D-coded Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 5 m | YM2D24-050PN1N2D24 | 2106166 |
|  | Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, M12, 4-pin, straight, D-coded Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 10 m | YM2D24-100PN1M2D24 | 2106161 |
|  | Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, RJ45, 4-pin, straight Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 10 m | YM2D24-100PN1MRJA4 | 2106185 |
|  | Head A: male connector, M12, 4-pin, straight, D-coded Head B: male connector, M12, 4-pin, angled, D-coded Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 10 m | YM2D24-100PN1N2D24 | 2106167 |
|  | Head A: male connector, M12, 4-pin, angled, D-coded Head B: male connector, RJ45, 4-pin, straight Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 2 m | YN2D24-020PN1MRJA4 | 2106162 |
|  | Head A: male connector, M12, 4-pin, angled, D-coded Head B: male connector, M12, 4-pin, angled, D-coded Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 2 m | YN2D24-020PN1N2D24 | 2106168 |
| | Head A: male connector, M12, 4-pin, angled, D-coded Head B: male connector, RJ45, 4-pin, straight Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 5 m | YN2D24-050PN1MRJA4 | 2106163 |
| | Head A: male connector, M12, 4-pin, angled, D-coded Head B: male connector, RJ45, 4-pin, straight Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 10 m | YN2D24-100PN1MRJA4 | 2106164 |

| | Brief description | Type | Part no. |
|---|--|---|----------|
|  | Head A: male connector, M12, 4-pin, angled, D-coded Head B: male connector, M12, 4-pin, angled, D-coded Cable: Ethernet, PROFINET, PUR, halogen-free, shielded, 10 m | YN2D24-100PN1N2D24 | 2106170 |
|  | Head A: female connector, M12, 4-pin, angled Cable: unshielded | DOS-1204-W | 6007303 |
|  | Head A: male connector, M12, 4-pin, angled, D-coded Cable: PROFINET, shielded | STE-1204-WZ | 6048262 |
|  | Head A: female connector, M12, 4-pin, D-coded Head B: female connector, RJ45, 8-pin Cable: Ethernet, shielded Cabinet through | Feedthrough female connector Ethernet RJ45 | 6048180 |

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