



Absolute encoders AFS/AFM60 SSI

AFS60A-BHPL262144

Model Name > [AFS60A-BHPL262144](#)
Part No. > [AFS60A-BHPL262144](#)

At a glance

- High-resolution absolute encoders with up to 30 bits (AFM60) or up to 18 bits (AFS60)
- Face mount flange, servo flange, blind or through hollow shaft
- SSI, SSI + Incremental or SSI + Sin/Cos interface
- Programmable resolution and offset (dependent on type)
- Connection system: M12, M23 connector or cable outlet
- Enclosure rating: IP 67 (housing), IP 65 (shaft)
- Operating temperature: -30 °C to +100 °C (depends on type)

Your benefits

- Programmability of the encoders means less storage, greater machine availability and easy installation
- Precise positioning due to high resolutions
- Large selection of mechanical interfaces and electrical contacting possibilities: Suitable for all applications
- Suitable for applications with limited space requirements (extremely short installation depth of 30 mm)
- Very good rotation accuracy due to increased bearing distance
- One programming tool and software with automatic encoder detection for AFS60/AFM60/DFS60



Performance

Max. number of steps per revolution:	262,144
Max. number of revolutions:	1
Resolution power:	262,144 x 1
Error limits:	± 0.03 °
Repeatability (Ta not constant):	0.002 °
Measuring step deviation:	± 0.002 °
Measuring step:	0.014 °
Initialization time:	50 ms ¹⁾

¹⁾ Valid positional data can be read once this time has elapsed

Mechanical data

Mechanical interface:	Blind hollow shaft
Shaft diameter:	15 mm
Start up torque:	0.8 Ncm (20 °C)

Operating torque:	0.6 Ncm (20 °C)
Maximum operating speed:	6,000 /min ¹⁾
Moment of inertia of the rotor:	40 gcm ²
Bearing lifetime:	3.0 x 10 ⁹ revolutions
Max. angular acceleration:	500,000 rad/s ²
Permissible movement axial static/dynamic:	± 0.5 mm, ± 0.01 mm
Permissible movement radial static/dynamic:	± 0.3 mm, ± 0.05 mm

¹⁾ Self warming of 3.3 K per 1000 revolutions/min when applying note working temperature range

Electrical data

Power consumption:	0.5 W (without load)
Operating voltage range:	4.5 V DC ... 32 V DC
MTTFd: mean time to dangerous failure:	250 a (EN ISO 13849-1) ¹⁾

¹⁾ 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.

Interfaces

Electrical interface:	Cable, 8-pin, universal, 3 m ¹⁾
Interface signals:	Clock +, Clock -, Data +, Data-
Clock frequency:	2 MHz ²⁾
SET (electronic adjustment):	H-active (L ≡ 0 - 1,5 V, H ≡ 2,0 - Us V)
CW/CCW (counting sequence when turning):	L-active (L ≡ 0 - 1,5 V, H ≡ 2,0 - Us V)

¹⁾ The universal cable outlet is positioned in such a way, that it is possible to lay the cable in a radial or axial direction without kinking it ²⁾

Ambient data

EMC:	(according to EN 61000-6-2 and EN 61000-6-3) ¹⁾
Enclosure rating:	IP 65 (according to IEC 60529), shaft side, IP 67 (according to IEC 60529)
Permissible relative humidity:	90 % (condensation of the optical scanning not permitted)
Working temperature range:	-30 °C ... 100 °C
Storage temperature range:	-40 °C ... 100 °C, without package
Resistance to shocks:	60 g (according to EN 60068-2-27)
Resistance to vibration:	20 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6)

¹⁾

|1| Cable diameter = 5,6 mm
+/- 2 mm Bending radius = 30 mm

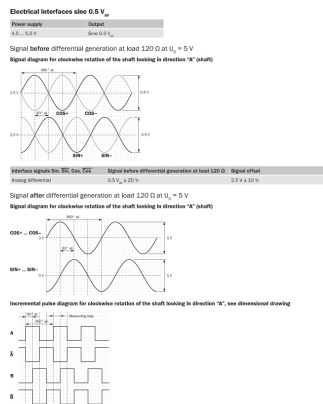


Speed consideration (n)

Steps per revolution

Speed N [min⁻¹]

Interfaces



SSI data format singlets

Bit 1-14: Position Bits

- LSI data format singlet
- SSI data singlet

Bit 15-16: Error Bits

- Error 1: Error message about an error that occurs during the position building procedure it will be indicated by the EXR015.
- Error 2: Error message about an error that occurs during the position building procedure it will be indicated by the EXR016.
- Error 3: Error message about an error that occurs during the position building procedure it will be indicated by the EXR017.
- Error 4: Error message about an error that occurs during the position building procedure it will be indicated by the EXR018.

Example: When the determination of the slave's measuring system. During the determination of the position, an error has occurred since the EXR015 bit is set. The error will be detected during the next data transmission.

The evaluation of the error bits has to be realized in the PLC.

The provided error data has to be used by the PLC completely.

Example:

If the measurement of the absolute encoder at set 27.78.30 is provided by the encoder 11 data bits and 3 error bits.

At set 27.78.30, the position bits are 11 bits, the PLC has to be set up a measurement of 13 bits. Then the error bits have to be read out by the PLC.

SSI data format multibit

Bit 1-14: Position Bits

- LSI data format singlet
- SSI data singlet

Bit 15-16: Error Bits

- Error 1: Error message about an error that occurs during the position building procedure it will be indicated by the EXR015.
- Error 2: Error message about an error that occurs during the position building procedure it will be indicated by the EXR016.
- Error 3: Error message about an error that occurs during the position building procedure it will be indicated by the EXR017.
- Error 4: Error message about an error that occurs during the position building procedure it will be indicated by the EXR018.

Example: When the determination of the slave's measuring system. During the determination of the position, an error has occurred since the EXR015 bit is set. The error will be detected during the next data transmission.

The evaluation of the error bits has to be realized in the PLC.

The provided error data has to be used by the PLC completely. The multibit resolution is fixed at 12 bits.

Example:

If the measurement of the absolute encoder at set 27.78.30 is provided by the encoder 27 data bits and 2 error bits.

At set 27.78.30, the position bits are 27 bits, the PLC has to be set up a measurement of 29 bits. Then the error bits have to be read out by the PLC.

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