



Absolute encoders AFS/AFM60 SSI

AFM60A-BDSA262144



Model Name > [AFM60A-BDSA262144](#)
Part No. > [AFM60A-BDSA262144](#)



Illustration may differ

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:	4,096
Resolution power:	262,144 x 4,096
Resolution:	18 bit x 12 bit
Error limits:	± 0.03 °
Repeatability (Ta not constant):	0.002 °
Measuring step deviation:	± 0.002 °
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:	10 mm
Mass:	0.2 kg

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
Maximum output frequency:	200 kHz
Load resistance min.:	120 Ω
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

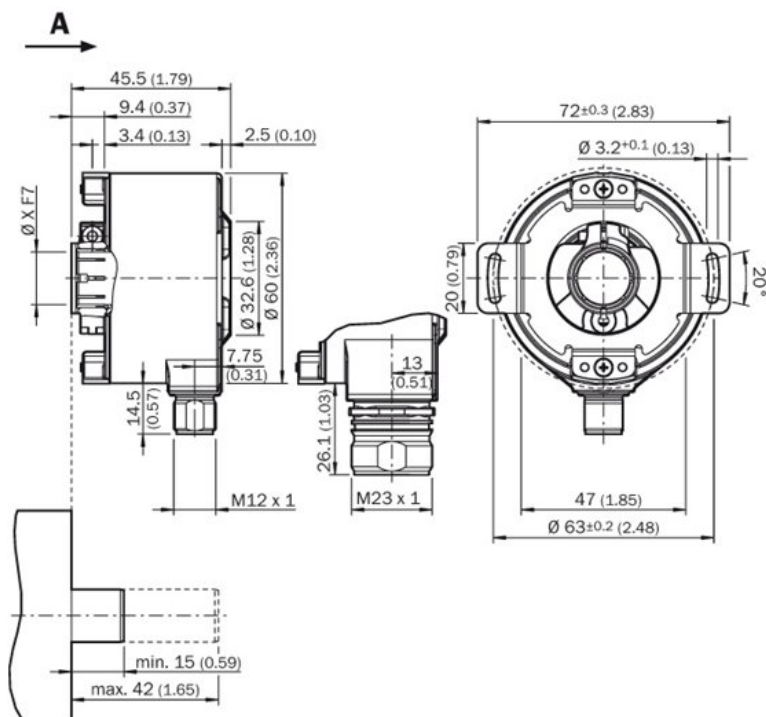
Electrical interface:	Connector M23, 12-pin, radial
Interface signals:	Clock +, Clock -, Data +, Data-, Sin +, Sin -, Cos +, Cos -: analog, differential
Clock frequency:	2 MHz ¹⁾
SET (electronic adjustment):	H-active (L ≡ 0 - 1,5 V, H ≡ 2,0 - Us V)
CW/CCW (counting sequence when turning):	L-active (L ≡ 0 - 1,5 V, H ≡ 2,0 - Us V)
Signal before differential generation:	± 20 %
Signal offset:	2.5 V ± 10 %

¹⁾

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⁾ ²⁾ With mating connector fitted



Pin	Signal	Explanation
1	GND	Ground connection
2	Data+	Interface signals
3	Clock+	Interface signals
4	N.C.	Not connected
5	N.C.	Not connected
6	N.C.	Not connected
7	N.C.	Not connected
8	V ₊	Supply voltage
9	SET	Electronic adjustment
10	Data-	Interface signals
11	Clock-	Interface signals
12	CW/CCW	Counting sequence when turning
	Screen	Screen on the encoder side connected to the housing. On the control side connected to earth.

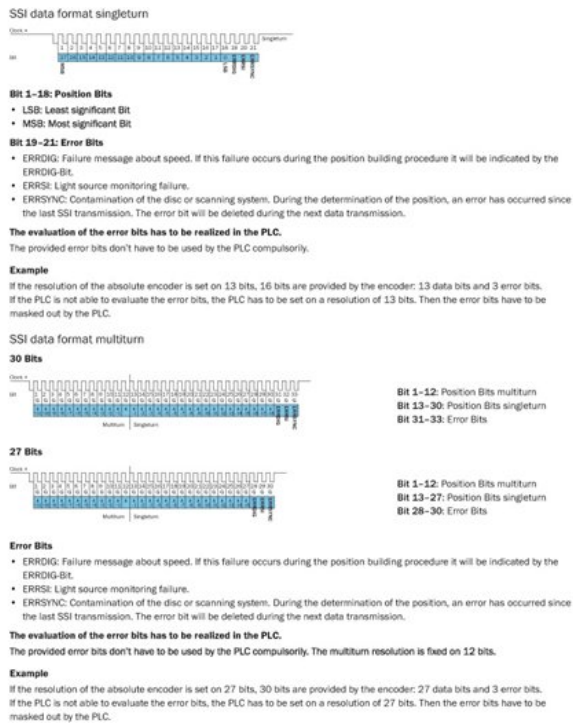
Connector M23, 12 pin and cable outlet, cable 12-core
SSI/Gray + Incremental

Pin	Color wires	Signal	Explanation
1	Red	+V ₊	Supply voltage
2	Blue	GND	Ground connection
3	Yellow	Clock+	Interface signal
4	White	Data+	Interface signal
5	Orange	SET	Electronic adjustment
6	Brown	Data-	Interface signal
7	Violet	Clock-	Interface signal
8	Black	- B	Signal line
9	Orange/black	CW/CCW	Counting sequence when turning
10	Green	A	Signal line
11	Gray	A	Signal line
12	Pink	B	Signal line
	Screen	Screen	Screen on the encoder side connected to the housing. On the control side connected to earth.

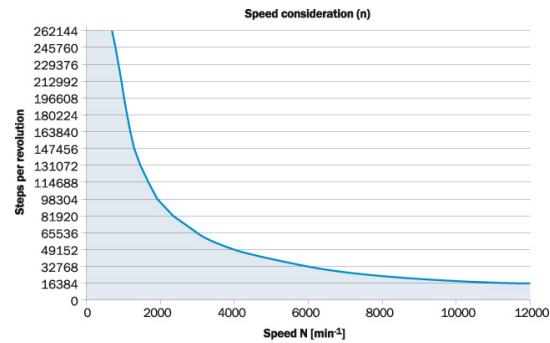
Connector M23, 12 pin and cable outlet, cable 12-core
SSI/Gray + Sin/Cos

Pin	Color wires	Signal	Explanation
1	Red	+V ₊	Supply voltage
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4	White	Data+	Interface signal
5	Orange	SET	Electronic adjustment
6	Brown	Data-	Interface signal
7	Violet	Clock-	Interface signal
8	Black	Sin-	Signal line
9	Orange/black	CW/CCW	Counting sequence when turning
10	Green	Cos-	Signal line
11	Gray	Cos+	Signal line
12	Pink	Sin+	Signal line
	Screen	Screen	Screen on the encoder side connected to the housing. On the control side connected to earth.

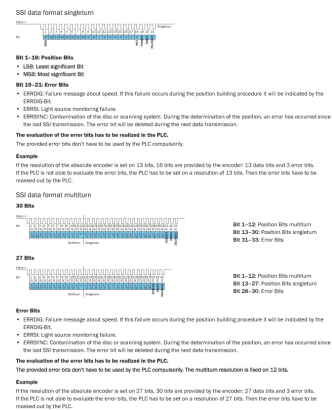
Signalausgänge



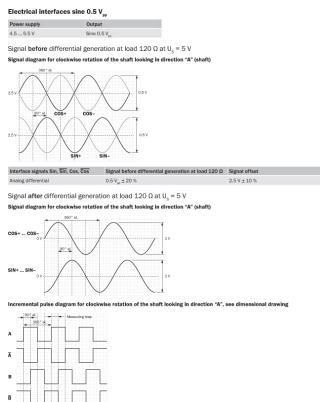
Drehzahlbetrachtung



Signalausgänge



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