



Absolute encoders AFS/AFM60 SSI, Rotary

AFS60B-S4AK004096

Model Name > **AFS60B-S4AK004096**
Part No. > **1059496**



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:	4,096
Max. number of revolutions:	1
Resolution power:	4,096 x 1
Resolution:	12 bit
Error limits:	± 0.05 °
Repeatability (Ta not constant):	0.002 °
Measuring step deviation:	± 0.01 °
Measuring step:	0.01 °
Initialization time:	50 ms ¹⁾

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

Mechanical data

Mechanical interface:	Solid shaft with flat, Face mount flange
Shaft diameter:	10 mm

Start up torque:	0.5 Ncm (20 °C)
Operating torque:	0.3 Ncm (20 °C)
Permissible Load capacity of shaft:	40 N (axial), 80 N (radial)
Maximum operating speed:	9,000 /min ¹⁾
Moment of inertia of the rotor:	6.2 gcm ²
Bearing lifetime:	3.0 x 10 ⁹ revolutions
Max. angular acceleration:	500,000 rad/s ²

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, 1.5 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)

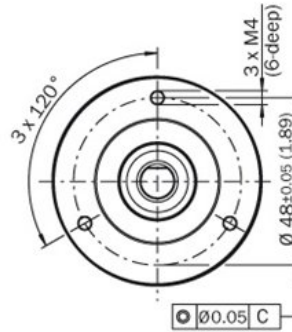
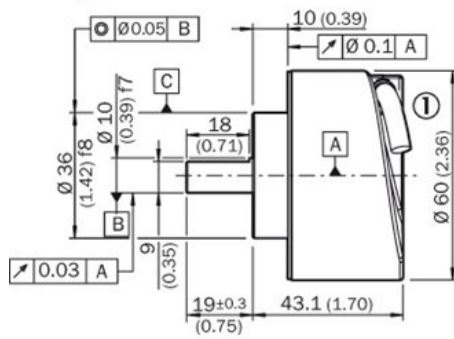
¹⁾ The universal cable outlet is positioned in such a way, that it is possible to lay the cable in a radial or axial direction without kinking it²⁾

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:	70 g (according to EN 60068-2-27)
Resistance to vibration:	30 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6)

¹⁾

A



Signalausgänge

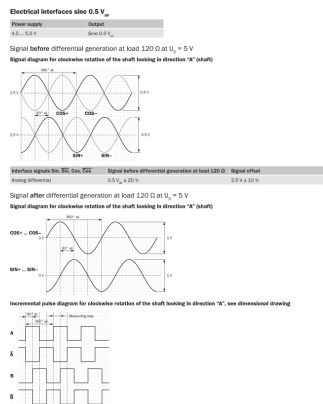
Schematic representation of the structure of the 21 exons of the human CYP17 gene. The gene is shown as a horizontal line with 21 numbered boxes representing exons. Exons 1 through 10 are labeled 'Exon 1' through 'Exon 10' above them. Exons 11 through 21 are labeled 'Exon 11' through 'Exon 21' below them. The gene is flanked by 'Promoter' on the left and '3'UTR' on the right.

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The graph illustrates the relationship between the speed of the motor (N in min^{-1}) and the number of steps per revolution. The y-axis represents 'Steps per revolution' with values ranging from 16,384 to 262,144. The x-axis represents 'Speed N [min^{-1}]' with values from 0 to 12,000. The curve shows that as the speed increases, the number of steps per revolution decreases, following a non-linear relationship.

Interfaces



SSI data format signatures

SSI Data Rate	Error Bit Position
100 Mbit/s	16
200 Mbit/s	32
400 Mbit/s	64
800 Mbit/s	128
1600 Mbit/s	256
3200 Mbit/s	512
6400 Mbit/s	1024
12800 Mbit/s	2048
25600 Mbit/s	4096
51200 Mbit/s	8192
102400 Mbit/s	16384
204800 Mbit/s	32768
409600 Mbit/s	65536
819200 Mbit/s	131072
1638400 Mbit/s	262144
3276800 Mbit/s	524288
6553600 Mbit/s	1048576
13107200 Mbit/s	2097152
26214400 Mbit/s	4194304
52428800 Mbit/s	8388608
104857600 Mbit/s	16777216
209715200 Mbit/s	33554432
419430400 Mbit/s	67108864
838860800 Mbit/s	134217728
1677721600 Mbit/s	268435456
3355443200 Mbit/s	536870912
6710886400 Mbit/s	1073741824
13421772800 Mbit/s	2147483648
26843545600 Mbit/s	4294967296
53687091200 Mbit/s	8589934592
107374182400 Mbit/s	17179869184
214748364800 Mbit/s	34359738368
429496729600 Mbit/s	68719476736
858993459200 Mbit/s	137438953472
1717986918400 Mbit/s	274877906944
3435973836800 Mbit/s	549755813888
6871947673600 Mbit/s	1099511627776
13743895347200 Mbit/s	2199023255552
27487790694400 Mbit/s	4398046511104
54975581388800 Mbit/s	8796093022208
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219902325555200 Mbit/s	35184372088832
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879609302220800 Mbit/s	140737488355328
1759218604441600 Mbit/s	281474976710656
3518437208883200 Mbit/s	562949953421312
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1801439850948198400 Mbit/s	288230376151711744
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14411518807585587200 Mbit/s	2305843009213693952
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115292150460684697600 Mbit/s	18446744073709551616
230584300921369395200 Mbit/s	36893488147419103232
461168601842738790400 Mbit/s	73786976294838206464
922337203685477580800 Mbit/s	147573952589676412928
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14757395258967641292800 Mbit/s	2361183241434822606848
29514790517935282585600 Mbit/s	4722366482869645213696
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472236648286964521369600 Mbit/s	75557863725914323419136
944473296573929042739200 Mbit/s	151115727451828646838272
1888946593147858085478400 Mbit/s	302231454903657293676544
3777893186295716170956800 Mbit/s	604462909807314587353088
7555786372591432341913600 Mbit/s	1208925819614629174706176
15111572745182864683827200 Mbit/s	2417851639229258349412352
30223145490365729367654400 Mbit/s	4835703278458516698824704
60446290980731458735308800 Mbit/s	967140655691703339764

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