



AFM60A-S4NB018x12

AFS/AFM60 PROFINET

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.

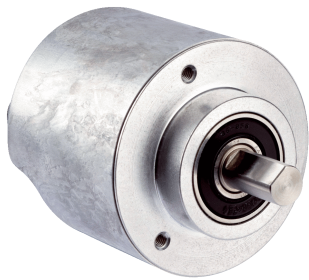


Illustration may differ



Ordering information

Type	Part no.
AFM60A-S4NB018x12	1059039

Other models and accessories → www.sick.com/AFS_AFM60_PROFINET

Detailed technical data

Performance

Max. resolution (number of steps per revolution x number of revolutions)	18 bit x 12 bit (262,144 x 4,096)
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
Parameterising data	Number of steps per revolution, number of revolutions, PRESET, counting direction, sampling rate for speed monitoring, unit for output of the speed value, round axis functionality (multi-turnversion only)
RPI (requested packet interval)	2 ms ... 750 ms
Available diagnostics data	Current, 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 operating voltage
Initialization time	6 s

Electrical data

Connection type	Male connector, 1x, M12, 4-pin, axial Female connector, 2x, M12, 4-pin, axial
Supply voltage	10 ... 30 V DC
MTTFd: mean time to dangerous failure	80 years (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.

Mechanical data

Mechanical design	Solid shaft, face mount flange
Shaft diameter	10 mm
Weight	0.2 kg
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum
Start up torque	0.5 Ncm
Operating torque	0.3 Ncm
Permissible Load capacity of shaft	80 N / radial 40 N / axial
Moment of inertia of the rotor	6.2 gcm ²
Bearing lifetime	3.0 x 10 ⁹ revolutions
Angular acceleration	≤ 500,000 rad/s ²
Operating speed	≤ 9,000 min ⁻¹ ¹⁾

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 ¹⁾
Enclosure rating	IP65, shaft side (according to IEC 60529) IP67, housing side (according to IEC 60529) ²⁾
Permissible relative humidity	90 % (condensation of the optical scanning 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 (according to EN 60068-2-27)
Resistance to vibration	30 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6)

¹⁾ The EMC according to the standards quoted is achieved if screened cables are used.

²⁾ With mating connector inserted.




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
ECl@ss 8.1	27270502
ECl@ss 9.0	27270502
ECl@ss 10.0	27270502
ECl@ss 11.0	27270502
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> Description: 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 Material: Aluminum Items supplied: Including 3 countersunk screws M4 x 8 	BEF-FA-036-060REC	2029162
	<ul style="list-style-type: none"> Description: Flange adapter, adaptation of face mount flange with 36 mm centering hub to 58 mm square mounting plate with shock absorbers, aluminum Material: Aluminum 	BEF-FA-036-060RSA	2029163
	<ul style="list-style-type: none"> Description: 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 Material: Aluminum Items supplied: Including 3 countersunk screws M4 x 10 	BEF-FA-036-063REC	2034225
Other mounting accessories			
	<ul style="list-style-type: none"> Description: Plastic measuring wheel with smooth plastic surface (Hytrell), for 10 mm solid shaft, circumference 200 mm 	BEF-MR-010020	5312988
	<ul style="list-style-type: none"> Description: Measuring wheel with ridged plastic surface (Hytrell) for 10 mm solid shaft, circumference 200 mm 	BEF-MR-010020G	5318678
	<ul style="list-style-type: none"> Description: Plastic measuring wheel with smooth plastic surface (Hytrell) for 10 mm solid shaft, circumference 500 mm 	BEF-MR-010050	5312989
	<ul style="list-style-type: none"> Description: Aluminium measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 200 mm 	BEF-MR006020R	2055222
	<ul style="list-style-type: none"> Description: Measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 300 mm 	BEF-MR006030R	2055634
	<ul style="list-style-type: none"> Description: Aluminium measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 200 mm 	BEF-MR010020R	2055224
	<ul style="list-style-type: none"> Description: Aluminium measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 300 mm 	BEF-MR010030R	2049278
	<ul style="list-style-type: none"> Description: Measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 500 mm 	BEF-MR010050R	2055227
	<ul style="list-style-type: none"> Description: O-ring for measuring wheels (circumference 200 mm) 	BEF-OR-053-040	2064061
	<ul style="list-style-type: none"> Description: O-ring for measuring wheels (circumference 300 mm) Items supplied: 2x O-ring 	BEF-OR-083-050	2064076
Plug connectors and cables			
	<ul style="list-style-type: none"> Connection type head A: Male connector, M12, 4-pin, straight, D-coded Connection type head B: Flying leads Signal type: PROFINET Cable: 2 m, 4-wire, CAT5, CAT5e, PVC Description: PROFINET, shielded, Head A: male connector, M12, 4-pin, straight, D coded Head B: cable Cable: PVC, shielded, 4 x 0.34 mm², Ø 6.5 mm 	STL-1204-G02MZ90	6048247
	<ul style="list-style-type: none"> Connection type head A: Male connector, M12, 4-pin, straight, D-coded Connection type head B: Flying leads Signal type: PROFINET Cable: 5 m, 4-wire, CAT5, CAT5e, PVC Description: PROFINET, shielded, Head A: male connector, M12, 4-pin, straight, D coded Head B: cable Cable: PVC, shielded, 4 x 0.34 mm², Ø 6.5 mm 	STL-1204-G05MZ90	6048248
	<ul style="list-style-type: none"> Connection type head A: Male connector, M12, 4-pin, straight, D-coded Connection type head B: Flying leads Signal type: PROFINET Cable: 10 m, 4-wire, CAT5, CAT5e, PVC Description: PROFINET, shielded, Head A: male connector, M12, 4-pin, straight, D coded Head B: cable Cable: PVC, shielded, 4 x 0.34 mm², Ø 6.5 mm 	STL-1204-G10MZ90	6048249

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 4-pin, angled, D-coded • Connection type head B: Flying leads • Signal type: PROFINET • Cable: 5 m, 4-wire, CAT5, CAT5e, PVC • Description: PROFINET, shielded, Head A: male connector, M12, 4-pin, angled, D coded Head B: cable Cable: PVC, shielded, 4 x 0.34 mm², Ø 6.5 mm 	STL-1204-W05MZ90	6048257
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 4-pin, angled, D-coded • Connection type head B: Flying leads • Signal type: PROFINET • Cable: 25 m, 4-wire, CAT5, CAT5e, PVC • Description: PROFINET, shielded, Head A: male connector, M12, 4-pin, angled, D coded Head B: cable Cable: PVC, shielded, 4 x 0.34 mm², Ø 6.5 mm 	STL-1204-W25MZ90	6048259
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, straight, A-coded • Connection type head B: Flying leads • Authorizations: CE, UL • Signal type: Sensor/actuator cable • Cable: 2 m, 4-wire, PUR, halogen-free • Description: Sensor/actuator cable, unshielded • Application: Zones with oils and lubricants, Drag chain operation 	YF2A14-020UB3XLEAX	2095607
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, straight, A-coded • Connection type head B: Flying leads • Authorizations: CE, UL • Signal type: Sensor/actuator cable • Cable: 5 m, 4-wire, PUR, halogen-free • Description: Sensor/actuator cable, unshielded • Application: Zones with oils and lubricants, Drag chain operation 	YF2A14-050UB3XLEAX	2095608
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, straight, A-coded • Connection type head B: Flying leads • Authorizations: CE, UL • Signal type: Sensor/actuator cable • Cable: 10 m, 4-wire, PUR, halogen-free • Description: Sensor/actuator cable, unshielded • Application: Zones with oils and lubricants, Drag chain operation 	YF2A14-100UB3XLEAX	2095609
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, straight, A-coded • Connection type head B: Flying leads • Authorizations: CE, UL • Signal type: Sensor/actuator cable • Cable: 25 m, 4-wire, PUR, halogen-free • Description: Sensor/actuator cable, unshielded • Application: Zones with oils and lubricants, Drag chain operation 	YF2A14-250UB3XLEAX	2095615
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, angled, A-coded • Connection type head B: Flying leads • Authorizations: CE, UL • Signal type: Sensor/actuator cable • Cable: 2 m, 4-wire, PUR, halogen-free • Description: Sensor/actuator cable, unshielded • Application: Zones with oils and lubricants, Drag chain operation 	YG2A14-020UB3XLEAX	2095766
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, angled, A-coded • Connection type head B: Flying leads • Authorizations: CE, UL • Signal type: Sensor/actuator cable • Cable: 5 m, 4-wire, PUR, halogen-free • Description: Sensor/actuator cable, unshielded • Application: Zones with oils and lubricants, Drag chain operation 	YG2A14-050UB3XLEAX	2095767
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, angled, A-coded • Connection type head B: Flying leads • Authorizations: CE, UL • Signal type: Sensor/actuator cable • Cable: 10 m, 4-wire, PUR, halogen-free • Description: Sensor/actuator cable, unshielded • Application: Zones with oils and lubricants, Drag chain operation 	YG2A14-100UB3XLEAX	2095768

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, angled, A-coded • Connection type head B: Flying leads • Authorizations: CE, UL • Signal type: Sensor/actuator cable • Cable: 25 m, 4-wire, PUR, halogen-free • Description: Sensor/actuator cable, unshielded • Application: Zones with oils and lubricants, Drag chain operation 	YG2A14-250UB3XLEAX	2095771
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 4-pin, angled, D-coded • Connection type head B: Male connector, M12, 4-pin, angled, D-coded • Signal type: PROFINET • Cable: 2 m, 4-wire, CAT5, CAT5e, PUR, halogen-free • Description: PROFINET, shielded, Head A: male connector, M12, 4-pin, angled, D coded Head B: male connector, M12, 4-pin, angled, D coded Cable: PUR, halogen-free, shielded, 4 x 0.34 mm², Ø 6.5 mm 	SSL-1204-W02MZ	6050635
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 4-pin, angled, D-coded • Connection type head B: Male connector, M12, 4-pin, angled, D-coded • Signal type: PROFINET • Cable: 5 m, 4-wire, CAT5, CAT5e, PUR, halogen-free • Description: PROFINET, shielded, Head A: male connector, M12, 4-pin, angled, D coded Head B: male connector, M12, 4-pin, angled, D coded Cable: PUR, halogen-free, shielded, 4 x 0.34 mm², Ø 6.5 mm 	SSL-1204-W05MZ	6050636
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 4-pin, angled, D-coded • Connection type head B: Male connector, M12, 4-pin, angled, D-coded • Signal type: PROFINET, EtherCAT[®] • Cable: 10 m, 4-wire, CAT5, CAT5e, PUR, halogen-free • Description: PROFINET, shielded, Head A: male connector, M12, 4-pin, angled, D coded Head B: male connector, M12, 4-pin, angled, D coded Cable: PUR, halogen-free, shielded, 4 x 0.34 mm², Ø 6.5 mm, EtherCAT[®] 	SSL-1204-W10MZ	6050637
	<ul style="list-style-type: none"> • Connection type head A: Male connector, RJ45, 4-pin, straight • Connection type head B: Male connector, M12, 4-pin, angled, D-coded • Signal type: PROFINET, EtherCAT[®] • Cable: 2 m, 4-wire, CAT5, CAT5e, PVC • Description: PROFINET, shielded, Head A: male connector, RJ45, 4-pin, straight, D coded Head B: male connector, M12, 4-pin, angled Cable: PVC, shielded, 4 x 0.34 mm², Ø 6.5 mm, EtherCAT[®] 	SSL-2J04-F02MZ	6048253
	<ul style="list-style-type: none"> • Connection type head A: Male connector, RJ45, 4-pin, straight • Connection type head B: Male connector, M12, 4-pin, angled, D-coded • Signal type: PROFINET, EtherCAT[®] • Cable: 5 m, 4-wire, CAT5, CAT5e, PVC • Description: PROFINET, shielded, Head A: male connector, RJ45, 4-pin, straight, D coded Head B: male connector, M12, 4-pin, angled Cable: PVC, shielded, 4 x 0.34 mm², Ø 6.5 mm, EtherCAT[®] 	SSL-2J04-F05MZ	6048254
	<ul style="list-style-type: none"> • Connection type head A: Male connector, RJ45, 4-pin, straight • Connection type head B: Male connector, M12, 4-pin, angled, D-coded • Signal type: PROFINET, EtherCAT[®] • Cable: 10 m, 4-wire, CAT5, CAT5e, PVC • Description: PROFINET, shielded, Head A: male connector, RJ45, 4-pin, straight, D coded Head B: male connector, M12, 4-pin, angled Cable: PVC, shielded, 4 x 0.34 mm², Ø 6.5 mm, EtherCAT[®] 	SSL-2J04-F10MZ	6048255
	<ul style="list-style-type: none"> • Connection type head A: Male connector, RJ45, 4-pin, straight • Connection type head B: Male connector, M12, 4-pin, angled, D-coded • Signal type: PROFINET, EtherCAT[®] • Cable: 30 m, 4-wire, CAT5, CAT5e, PVC • Description: PROFINET, shielded, EtherCAT[®] 	SSL-2J04-F30MZ	6059450

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, angled • Connection type head B: - • Authorizations: UL • Description: Unshielded, Head A: female connector, M12, 4-pin, angled, unshielded, for power supply, for cable diameter 3 mm ... 6.5 mm Head B: - • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² 	DOS-1204-W	6007303
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 4-pin, angled, D-coded • Signal type: PROFINET • Cable: CAT5, CAT5e • Description: PROFINET, shielded, Head A: male connector, M12, 4-pin, angled, D coded, shielded, for cable diameter 4 mm ... 8 mm • Connection systems: IDC quick connection • Permitted cross-section: 0.14 mm² ... 0.34 mm² 	STE-1204-WZ	6048262
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, D-coded • Connection type head B: Female connector, RJ45, 8-pin • Signal type: Ethernet • Cable: CAT5, CAT5e • Description: Ethernet, shielded • Note: Cabinet through 	Feedthrough female connector Ethernet RJ45	6048180

SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

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