

ATM60-PAH13X13

ATM60

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.

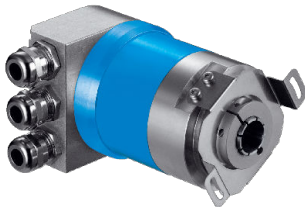


Illustration may differ

Ordering information

Type	Part no.
ATM60-PAH13X13	1030015

Bus adapter not included with delivery

You can find possible successor solutions in, for example, the A3M60, AFM60 and AHM36 product families. Our sales department will be happy to assist you with selecting a suitable successor solution.

Other models and accessories → www.sick.com/ATM60



Detailed technical data

Safety-related parameters

MTTF_D (mean time to dangerous failure)	150 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.

Performance

Number of steps per revolution (max. resolution)	8,192 (13 bit)
Number of revolutions	8,192 (13 bit)
Max. resolution (number of steps per revolution x number of revolutions)	13 bit x 13 bit (8,192 x 8,192)
Measuring step	0.043°
Error limits G	± 0.25° ¹⁾
Repeatability standard deviation σ_r	0.1° 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	PROFIBUS DP
Communication Interface detail	DPV0
Data protocol	Profile for encoders (07hex) – Class 2
Address setting	0 ... 127, DIP switches or protocol
Data transmission rate (baud rate)	9.6 kBaud ... 12 MBaud, automatic detection
Initialization time	1,250 ms ¹⁾
Position forming time	0.25 ms
Status information	LED green (operation), LED red (bus activity)
Bus termination	DIP switch ²⁾

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

²⁾ Should only be connected in the final device.

Set (electronic adjustment)	Via PRESET push button or protocol
------------------------------------	------------------------------------

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

²⁾ Should only be connected in the final device.

Electronics

Connection type	Bus adapter ¹⁾
Supply voltage	10 ... 32 V
Power consumption	≤ 2 W (without load)
Reverse polarity protection	✓

¹⁾ Order bus adapter separately.

Mechanics

Mechanical design	Blind hollow shaft
Shaft diameter	15 mm ¹⁾
Weight	0.59 kg ²⁾
Shaft material	Stainless steel
Flange material	Aluminum
Start up torque	1.2 Ncm (+20 °C), with shaft seal
Operating torque	0.8 Ncm (+20 °C), with shaft seal
Permissible movement static	± 0.3 mm (radial) ± 0.5 mm (axial)
Permissible movement dynamic	± 0.1 mm (radial) ± 0.2 mm (axial)
Operating speed	≤ 3,000 min ⁻¹ ³⁾
Moment of inertia of the rotor	55 gcm ²
Bearing lifetime	3.6 x 10 ⁹ revolutions
Angular acceleration	≤ 500,000 rad/s ²

¹⁾ Collets for 6, 8, 10, 12, 14 mm and 1/4", 3/8" and 1/2" as accessories, separate order item. For 15 mm shaft diameter collet is not needed.

²⁾ Based on encoder with male connector.

³⁾ 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	IP67, with shaft seal (IEC 60529) ¹⁾ IP43, without shaft seal, on encoder flange not sealed (IEC 60529) ¹⁾ IP66, without shaft seal, on encoder flange sealed (IEC 60529) ¹⁾
Permissible relative humidity	98 %
Operating temperature range	-20 °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	20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

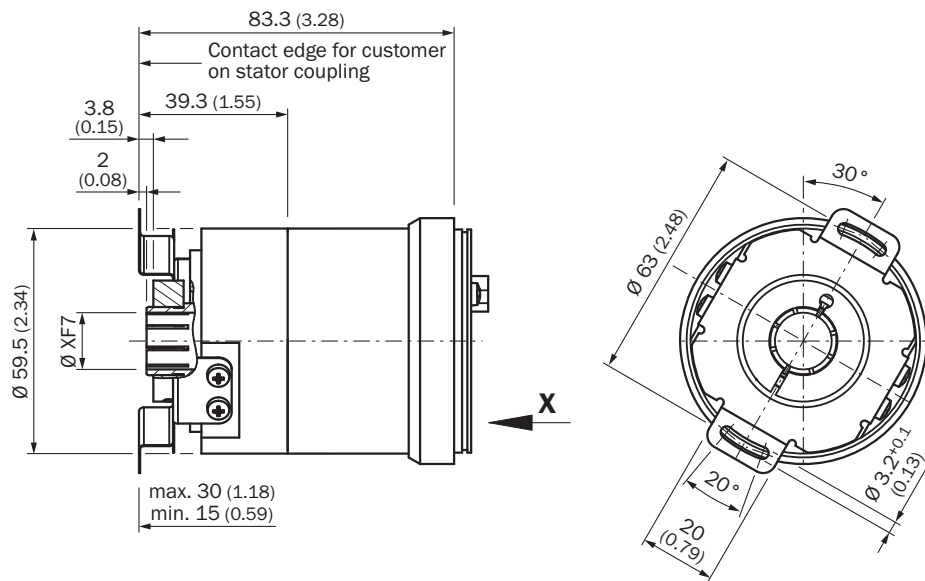
¹⁾ With mating connector fitted.

Classifications

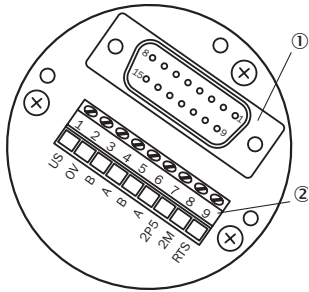
ECLASS 5.0	27270502
-------------------	----------

ECLASS 5.1.4	27270502
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270502
ECLASS 8.0	27270502
ECLASS 8.1	27270502
ECLASS 9.0	27270502
ECLASS 10.0	27270502
ECLASS 11.0	27270502
ECLASS 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))



PIN assignment



- ① Internal plug connector to encoder
② External connection to the bus

Encoders with a PROFIBUS connection adapter have screw connections (metric/PG) for connecting the bus and supply cables. The bus adapter from the complete device is screwed on to connect the cables. The adjacent figure shows the pin assignment within the bus adapter.








Terminal strip	Connector 4-pin	Connector 5-pin	Female connector 5 pin	Signal	Explanation
1	1	-	-	U _S (24 V)	Operating voltage 10 ... 32 V
2	3	-	-	0 V (GND)	Ground (0 V)
3	-	-	4	B	B-cable PROFIBUS DP (out)
4	-	-	2	A	A-cable PROFIBUS DP (out)
5	-	4	-	B	B-cable PROFIBUS DP (out)
6	-	2	-	A	A-cable PROFIBUS DP (out)
7	-	-	1	2P5 1)	+ 5 V (potential free)
8	-	-	3	2M 1)	0 V (potential free)
-	2	1	-	N.C.	-
-	4	3	-	N.C.	-
-	-	5	5	Screen	Housing potential

1)

Use for external bus terminations or to supply the sender/receiver with a optical fiber transmission

Recommended accessories

Other models and accessories → www.sick.com/ATM60

	Brief description	Type	Part no.
Others			
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, straight, A-coded • Description: Unshielded, Head A: female connector, M12, 4-pin, straight, unshielded, for power supply, for cable diameter 4 mm ... 6 mm Head B: - • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² 	DOS-1204-G	6007302
	<ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: PROFIBUS DP • Items supplied: By the meter • Cable: 2-wire, PUR • Description: PROFIBUS DP, shielded 	LTG-2102-MW	6021355
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 5-pin, straight, B-coded • Signal type: PROFIBUS DP • Description: PROFIBUS DP, shielded, Head A: male connector, M12, 5-pin, straight, B coded, shielded, for cable diameter 4 mm ... 9 mm Head B: - • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² 	STE-1205-GQ	6021354
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 5-pin, straight, B-coded • Signal type: PROFIBUS DP • Description: PROFIBUS DP, shielded, Head A: M12 female connector, 5-pin, straight, B-coded, PROFIBUS DP, shielded, for cable diameter 4 mm ... 9 mm Head B: - • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² 	DOS-1205-GQ	6021353
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 5-pin, straight, B-coded • Connection type head B: Flying leads • Signal type: Fieldbus, PROFIBUS DP • Cable: 12 m, 2-wire, PUR, halogen-free • Description: Fieldbus, twisted pair, shieldedPROFIBUS DP • Connection systems: Flying leads • Application: Zones with oils and lubricants 	DOL-1205-G12MQ	6032636
	<ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 4-pin, straight, A-coded • Connection type head B: Flying leads • Signal type: Sensor/actuator cable • Cable: 5 m, 4-wire, PVC • Description: Sensor/actuator cable, unshielded • Application: Zones with chemicals, Uncontaminated zones 	YF2A14-050VB3XLEAX	2096235
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 2-pin, straight, B-coded • Connection type head B: Flying leads • Signal type: Fieldbus, PROFIBUS DP • Cable: 15 m, 2-wire, PUR, halogen-free • Description: Fieldbus, shieldedPROFIBUS DP • Application: Drag chain operation, Zones with oils and lubricants 	YM2B22-150PB1XLEAX	2106276
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 2-pin, straight, B-coded • Connection type head B: Flying leads • Signal type: Fieldbus, PROFIBUS DP • Cable: 5 m, 2-wire, PUR, halogen-free • Description: Fieldbus, shieldedPROFIBUS DP • Application: Drag chain operation, Zones with oils and lubricants 	YM2B22-050PB1XLEAX	2106270
	<ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 2-pin, straight, B-coded • Connection type head B: Flying leads • Signal type: Fieldbus, PROFIBUS DP • Cable: 10 m, 2-wire, PUR, halogen-free • Description: Fieldbus, shieldedPROFIBUS DP • Application: Drag chain operation, Zones with oils and lubricants 	YM2B22-100PB1XLEAX	2106271

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> Connection type head A: Female connector, M12, 2-pin, straight, B-coded Connection type head B: Flying leads Signal type: Fieldbus, PROFIBUS DP Cable: 10 m, 2-wire, PUR, halogen-free Description: Fieldbus, shielded PROFIBUS DP Application: Drag chain operation, Zones with oils and lubricants 	YF2B22-100PB1XLEAX	2106269
	YF2B22-150PB1XLEAX	YF2B22-150PB1XLEAX	2106272
	YF2B22-200PB1XLEAX	YF2B22-200PB1XLEAX	2106273
	<ul style="list-style-type: none"> Connection type head A: Female connector, M12, 2-pin, straight, B-coded Connection type head B: Flying leads Signal type: Fieldbus, PROFIBUS DP Cable: 5 m, 2-wire, PUR, halogen-free Description: Fieldbus, shielded PROFIBUS DP Application: Drag chain operation, Zones with oils and lubricants 	YF2B22-050PB1XLEAX	2121936
	 <ul style="list-style-type: none"> Product segment: Shaft adaptation Product family: Collets Description: Collet for blind hollow shaft, shaft diameter 12 mm, outer diameter 15 mm 	SPZ-012-AD-A	2029179
	 <ul style="list-style-type: none"> Product segment: Shaft adaptation Product family: Collets Description: Collet for blind hollow shaft, shaft diameter 1/2" (12.7 mm), outer diameter 15 mm 	SPZ-1E2-AD-A	2029180
	<ul style="list-style-type: none"> Product segment: Shaft adaptation Product family: Collets Description: Collet for blind hollow shaft, shaft diameter 6 mm, outer diameter 15 mm 	SPZ-006-AD-A	2029174
	<ul style="list-style-type: none"> Product segment: Shaft adaptation Product family: Collets Description: Collet for blind hollow shaft, shaft diameter 1/4" (6.35 mm), outer diameter 15 mm 	SPZ-1E4-AD-A	2029175
	<ul style="list-style-type: none"> Product segment: Shaft adaptation Product family: Collets Description: Collet for blind hollow shaft, shaft diameter 8 mm, outer diameter 15 mm 	SPZ-008-AD-A	2029176
	<ul style="list-style-type: none"> Product segment: Shaft adaptation Product family: Collets Description: Collet for blind hollow shaft, shaft diameter 3/8" (9.525 mm), outer diameter 15 mm 	SPZ-3E8-AD-A	2029177
	<ul style="list-style-type: none"> Product segment: Shaft adaptation Product family: Collets Description: Collet for blind hollow shaft, shaft diameter 10 mm, outer diameter 15 mm 	SPZ-010-AD-A	2029178
	<ul style="list-style-type: none"> Product segment: Shaft adaptation Product family: Collets Description: Collet for blind hollow shaft, shaft diameter 14 mm, outer diameter 15 mm 	SPZ-014-AD-A	2048863

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.”

WORLDWIDE PRESENCE:

Contacts and other locations www.sick.com