

# Datasheet



With SSI / Analog sin/cos (1 Vpp) or BiSS C-Interface

## Basic features

- The AHP2L/S safety sensor is multifunctional and a particularly powerful, absolute position measuring system
- Particularly suitable for use in safety-related applications up to Safety Integrity Level 2 (SIL 2) per EN 61800-5-2 / EN 62061 / IEC 61508 and Performance Level d (PL d) per EN ISO 13849-1
- For monitoring linear and rotary movements
- Non-contact and therefore wear-free measurement
- Measuring range up to 48 m, repeatability  $\leq 1 \mu\text{m}$
- Automatic recognition of the sensor and its settings, even after loss of operating voltage and restarting the system
- High reliability due to continuous plausibility check
- Status LED and diagnostic functions for reliable operation and accelerated maintenance
- Space-saving, compact design



## Output/Interface

Bits, number	26 Bit
Clock	RS422 Differential signal
Differential signals	yes
Real-time signals SSI	analog sin/cos additional analog sin/cos (1 Vpp) incremental for functional safety
Error signal	yes
Preset	configurable via hardware PIN or software tool
SSI-Data	1x error bit 1x null bit 24x position
SSI clock frequency max.	1.3 MHz
SSI clock frequency min.	70 kHz
Interface	SSI, analog sin/cos (1 Vpp) BiSS C
Interface coding	Binary
Signal sequence	A before B = rising
Counting direction	rising

## Display/Operation

Function indicator	LED green LED yellow LED red
--------------------	------------------------------------

# Datasheet

## Electrical data

Operating voltage $U_b$	4.75...5.25 VDC / 10...28 VDC
Switch-on delay max.	1000 ms
Hysteresis H max.	2 $\mu$ m
Power consumption	$\leq 1.5$ W (no load)
Periods	2 mm
Voltage-proof up to (GND to housing)	500 VDC
Current consumption max. at 24 VDC	70 mA
Current consumption max. at 5 VDC	220 mA
Overvoltage protection	no

## Electrical connection

Connection	Connector, M12x1 plug, 12-pin
Connection version	axial
Polarity reversal protected	no

## Functional safety

Mission Time	20 a
MTTFd (40 °C)	294 a
PFHd (EN 62061)	4 E-9 1/h
Performance Level	d
SIL (IEC 61508), SIL CL (EN 62061)	2
Safety category (EN ISO 13849-1)	3
Type of the subsystem (EN/IEC 61508-2)	B

## Detection range/measuring range

Resolution	1 $\mu$ m
Interpolation factor	2000
Read distance	0.01...0.8 mm
Non-linearity of sensor head, max.	$\pm 2$ $\mu$ m
Measuring range	48 m
Optimal read distance	0.4 mm
Traverse speed max., absolute interface	5 m/s
Traverse speed max., incremental interface	10 m/s
Repeat accuracy	$\leq 1$ $\mu$ m

## Material

Housing material	Die-cast zinc, nickel plated, Chrome-plated
Housing material, surface protection	nickel plated Chrome-plated

## Mechanical data

Dimension	16 x 18.5 x 80.3 mm
Mounting	Through-hole 4.3 mm
Diameter min.	243 mm
Weight	78 g (without cable)
Pitch max.	$\pm 0.5^\circ$
Pole width	2 mm
Roll max.	$\pm 0.5^\circ$
Lateral offset (Y)	$\pm 0.5$ mm
Tangential offset (X) max.	$\pm 0.5$ mm
Procedure direction	Lengthwise to magnetic scale
Yaw max.	$\pm 0.2^\circ$

# Datasheet

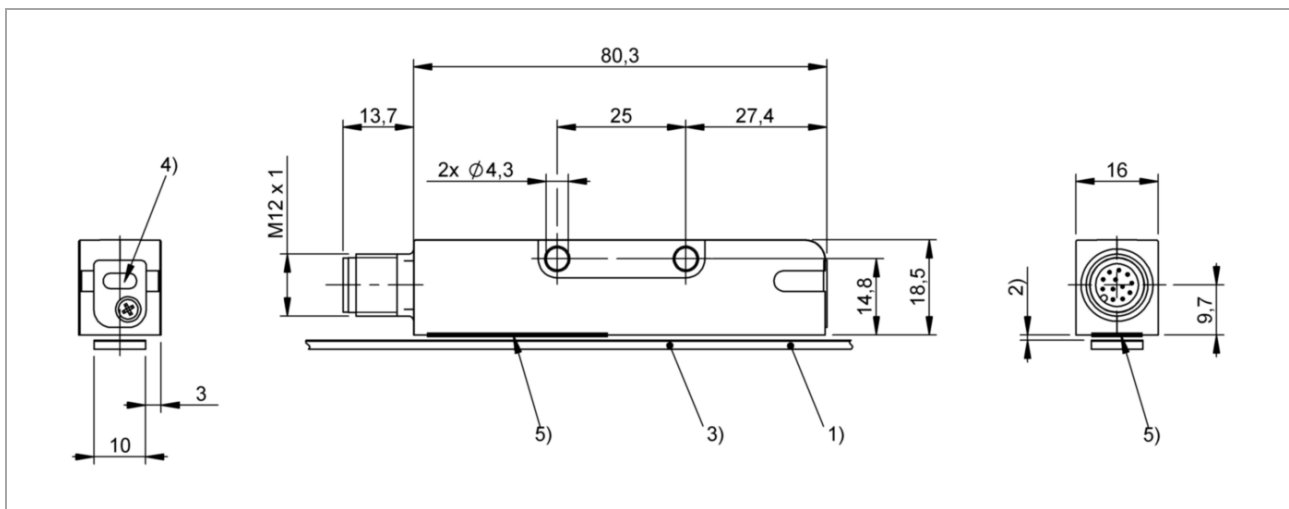
## Environmental conditions

Radiation	(EN 55016-2-3)	Industrial areas
Continuous shock	(EN 60068-2-27)	150 g, 2 ms
Shock	(EN60068-2-27)	100 g, 6 ms
Vibration	(EN 60068-2-6)	20 g, 10...2000 Hz
Noise	(EN600068-2-64)	20 g, 5...2000 Hz
ESD	(EN61000-4-2)	Severity Level 4
RFI	(EN 61000-4-3)	Severity Level 3
Burst	(EN61000-4-4)	Severity Level 3
Surge	(EN 61000-4-5)	Severity Level 2
High-frequency fields	(EN 61000-4-6)	Severity Level 3
Magnetic fields	(EN 61000-4-8)	Severity Level 5
External magnetic fields max., in operation		<1 mT (no effect)
Altitude max.		2000 m (above sea level)
Storage temperature		-25...85 °C
Relative humidity		≤ 90%, non-condensing
IP rating (connector)		IP67
Temperature coefficient, overall system		10.5 ppm/K
Ambient temperature		-20...70 °C

## Approval/Conformity

Approval/Conformity	CE, cURus, EAC, WEEE, TÜV
---------------------	---------------------------

## Dimensions

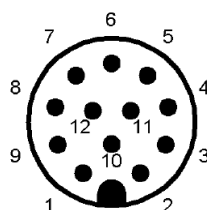


1) not included in scope of delivery, 2) distance to magnetic scale, 3) magnetic scale, 4) LED function indicator, 5) active measurement surface

## Pin assignment

**AHP2L** - Pin assignment Connector M12 (view Pin side); Connection is performed via a 12-wire cable

PIN	Signal
1	+B (+Cos)
2	-B (-Cos)
3	+Clk
4	-Clk
5	-DATA
6	+DATA



PIN	Signal
7	GND
8	VDC
9	-A (-Sin)
10	+A (+Sin)
11	PRESET
12	NC
SCH	Shield

# Datasheet

## Ordering example

**Type**            **AHP2L/S** - **1** - **SSI** - **GS** - **24** - **G** - **0,94** - **CO** - **528**

### Resolution

0,98 = 0,9765625 µm

**1**     = 1 µm

**2**     = 2 µm

**5**     = 5 µm

**10**    = 10 µm

### Interface

**B**     = BiSS-C

**SSI**   = SSI, absolute

### Coding

**GS**   = Gray rising

**GF**   = Gray falling

**BS**   = binary rising

**BF**   = binary falling

### Data format

**24**; 25; 26; 32 Bit

### Incremental real-time signal

**G**     = Analog real-time signal sin/cos (1 Vpp) for functional safety

### Analog real-time signal

**A**     = Analog sin/cos (1Vpp), Period 2 mm

### min. Edge distance

0,11 / 0,26 / 0,42 / **0,94** / 1,8 / 3,5 / 7 / 14 / 21 µs

### Electrical connection

**CO**   = M12 connector (socket) 12-pin)

### Operating voltage

**528**   = 5 VDC, 10-28 VDC

## Accessories

### Magnetic scale M02-A:

1 m length: #15620

24 m (roll): #26224

Magnetic scale can be supplied assembled in any length (up to 48 m in one piece) according to customer's specification.

### Cover tape DB01:

1 m length: #16501

Cover tape can be supplied assembled in any length to customer's specification (up to 48 m in one piece).

### Connector/cable:

5 m cable with M12 connector (socket) 12-pin: #31605

10 m cable with M12 connector (socket) 12-pin: #31610

Without prior notice, the products may be subject to modifications that the Manufacturer reserves to introduce as deemed necessary for their improvement.