

Datasheet

General features

- Linear magnetic sensor, with direct reading of the absolute position.
- Resolutions up to 1 μm .
- Measuring length up to 30.000 mm.
- FANUC α i serial interface.
- Contactless reading.
- Status indication through LED RGBW.
- Extremely easy and fast mounting of the sensor and application of the magnetic scale, with wide alignment tolerances.
- Small size, to allow installation in narrow spaces.
- Axial or radial robust sealed cable output.
- Cable suitable for continuous movements.
- To be used with magnetic scale MBA2.



FANUC

Technical characteristics

Pole pitch	2+2 mm
Serial interface	FANUC α i
Resolution absolute position	500 - 100 - 50 - 10 - 5 - 1 μm
Accuracy grade	$\pm 10 \mu\text{m}$ ¹⁾
Interpolation error (SDE)	$\pm 1.5 \mu\text{m}$ ²⁾
Unidirectional repeatability	$\pm 0.5 \mu\text{m}$ ²⁾
Hysteresis	2 μm ²⁾
Measuring length ML	up to 30.000 mm
Max. traversing speed	600 m/min
Vibration resistance (EN 60068-2-6)	200 m/s ² [55 ... 2.000 Hz]
Protection class (EN 60529)	IP67
Operating temperature	-20 °C ... +75 °C
Storage temperature	-40 °C ... +80 °C
Relative humidity	100%
Power supply	5 VDC $\pm 5\%$
Current consumption	200 mA _{MAX} (with R = 120 Ω) with 5 VDC
Electrical connections	see related table
Electrical protections	inversion of power supply polarity and short circuits on output ports
Weight	80 g

¹⁾ The declared accuracy grade of $\pm X \mu\text{m}$ is referred to a measuring length of 1 m.

²⁾ The error declared is subject to the respect of the alignment tolerances.

Datasheet

Mechanical characteristics

- Magnetic sensor with zinc die-cast housing (standard).
- Possibility to fix the magnetic sensor with M4 screws or with through M3 screws.
- Wide alignment tolerances.
- Robust sealed cable output.

Electrical characteristics

- Reading through positioning sensor based on magneto resistance, with AMR effect (Magnetic Anisotropy).
- Electrical protection against inversion of power supply polarity and short circuits on output ports.
- Serial interface FANUC α i.

Wiring and Pin Assignment (assignment according to DIN 47100)

6-wire connecting cable

Absolute magnetic sensor AMS2/2-FAN is supplied with a 6-wire shielded cable $\varnothing = 6.2$ mm, PUR external sheath with low friction coefficient, resistant to oil and suitable for continuous movements.

Conductors section:

- power supply: 0.35 mm²
- signals: 0.25 mm²

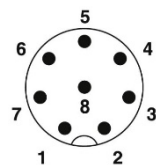


The cable's bending radius should not be lower than 70 mm.

Cable length 1 m with M12 connector. With cable extension, the maximum length can be extended to 30 m.

Connector M12 plug straight, 8-pin, type CZ4

PIN	Signal	Colour
1	0V	1)
2	+V	brown
3	Data	pink
4	Data/	grey
5	0V	white
6	CK/	yellow
7	CK	green
8	+V	2)
9	--	--
10	--	--
11	--	--
12	Shield	3)



Connector type **CZ4**:
M12 plug straight, 8-pin,
view on plug side.

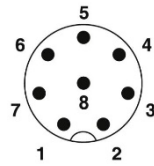
- 1) 0V = pin 1 shorted to pin 5, and vice versa
- 2) +V = pin 2 shorted to pin 8, and vice versa
- 3) Shield = connected to plug housing

Wiring and Pin Assignment: M12 plug straight, 8-pin (according to DIN 47100)

Datasheet

Connector M12 plug straight, 8-pin, type C08

PIN	Signal	Colour
1	0V	1)
2	+V	2)
3	CK	green
4	CK/	yellow
5	Data/	grey
6	Data	pink
7	0V	white
8	+V	brown
9	--	--
10	--	--
11	--	--
12	Shield	3)



Connector type **C08**:
M12 plug straight, 8-pin,
view on plug side.

- 1) 0V = pin 1 shorted to pin 7, and vice versa
 2) +V = pin 2 shorted to pin 8, and vice versa
 3) Shield = connected to plug housing

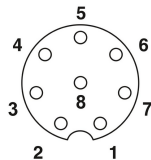
Wiring and Pin Assignment: M12 plug straight, 8-pin (according to DIN 47100)

Extension cable

Extension cable type **VLK-8** with M12 **socket**, 8-pin, straight, opposite open cable end.

- Conductors section: 8 x 0.25 mm² for power supply and signals, PUR/PVC external sheath

PIN	Signal	Colour
1	0V	1)
2	+V	2)
3	CK	green
4	CK/	yellow
5	Data/	grey
6	Data	pink
7	0V	blue
8	+V	red
9	--	--
10	--	--
11	--	--
12	Shield	3)



Connector type **C08**:
M12 socket straight, 8-pin,
view on socket side.

- 1) 0V = pin 1 shorted to pin 7, and vice versa
 2) +V = pin 2 shorted to pin 8, and vice versa
 3) Shield = connected to plug housing

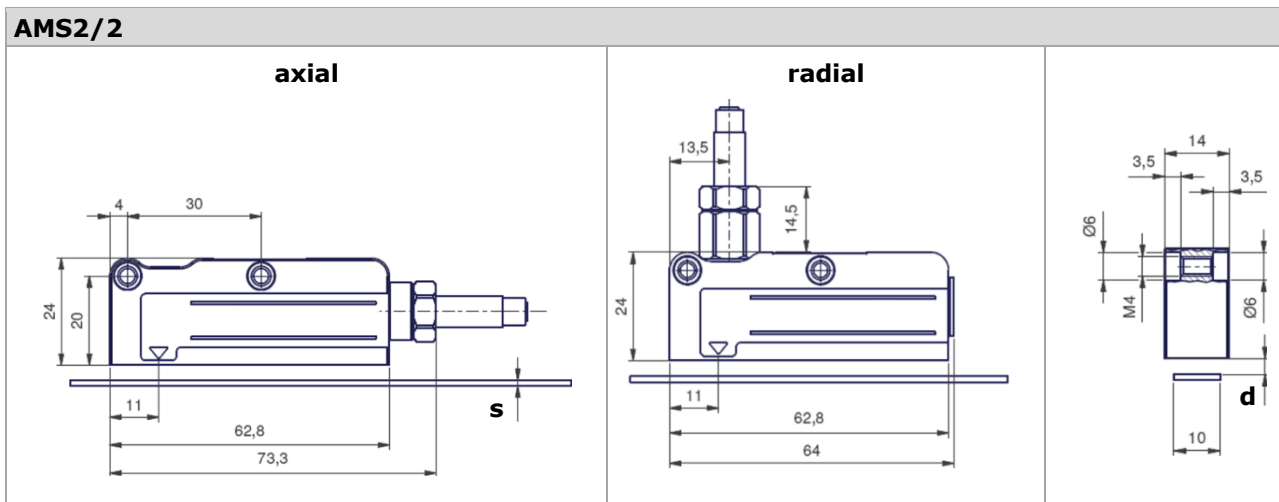
Wiring and Pin Assignment: M12 socket straight, 8-pin (according to DIN 47100)



Connection extension cable type VLK-8 only in combination with M12 plug, 8-pin type C08.

Datasheet

Dimensions



All dimensions in mm

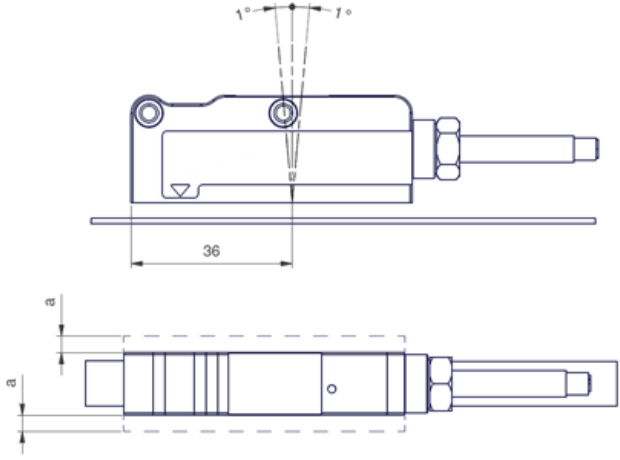
s (mm) = thickness magnetic scale		
MBA2¹⁾	thickness without double-sided adhesive tape	1.3
	thickness with double-sided adhesive tape	1.5
MBA2 + DB01²⁾	thickness with double-sided adhesive tape and cover tape DB01	1.7

d (mm) = distance to be maintained between sensor and surface		
MBA2¹⁾	distance to be maintained between sensor and surface of the magnetic scale (without cover tape)	0.4 ... 1.0
MBA2+ DB01²⁾	distance to be maintained between sensor and surface of the cover tape	max. 0.7

- ¹⁾ Absolute magnetic scale MBA2, composed by a magnetized plastoferrite tape, with pole pitch 2+2 mm. The plastoferrite is supported by a stainless steel tape, already provided with an adhesive tape.
- ²⁾ Non-magnetic stainless steel cover tape DB01 on which a double-sided adhesive tape is pre-mounted for a quick sticking and an easy fixing on the magnetic scale.

Datasheet

Alignment tolerances

AMS2/2 + MBA2	a (mm) = alignment tolerance
	a = 0.5_{MAX}

NOTICE

- Respect the maximum distance between the sensor and the magnetic band.

NOTICE

- Avoid the direct contact with magnetized objects or tools that could damage the surface.
- **Do not touch** the contacts of the cable's connector to avoid electrostatic discharges (ESD) on the device.

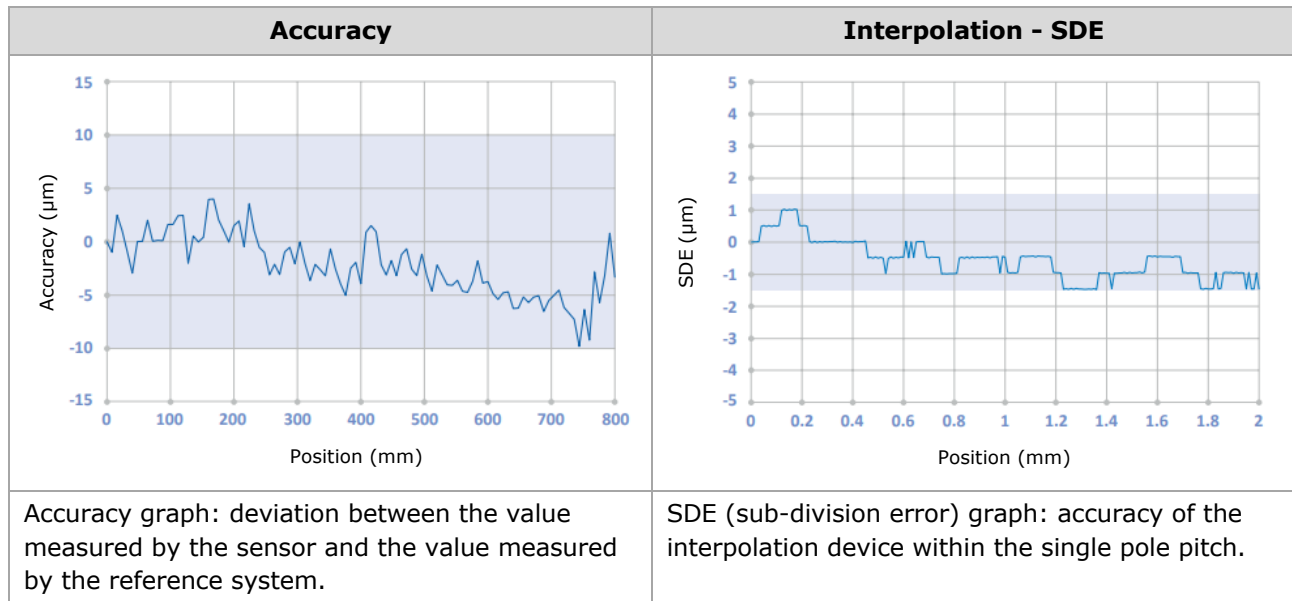
Datasheet



The following graphs show tests carried out in a metrological room under controlled climatic conditions: $T = 20\text{ °C} \pm 0.1\text{ °C}$ and $R.H. = 45\% \dots 55\%$.

The reference system for the comparison of position measurements is interferometric with 1 nm resolution and equipped with an environmental compensation device. The sensor is installed according to the recommended mechanical configuration at a distance of 0.5 mm from the magnetic scale.

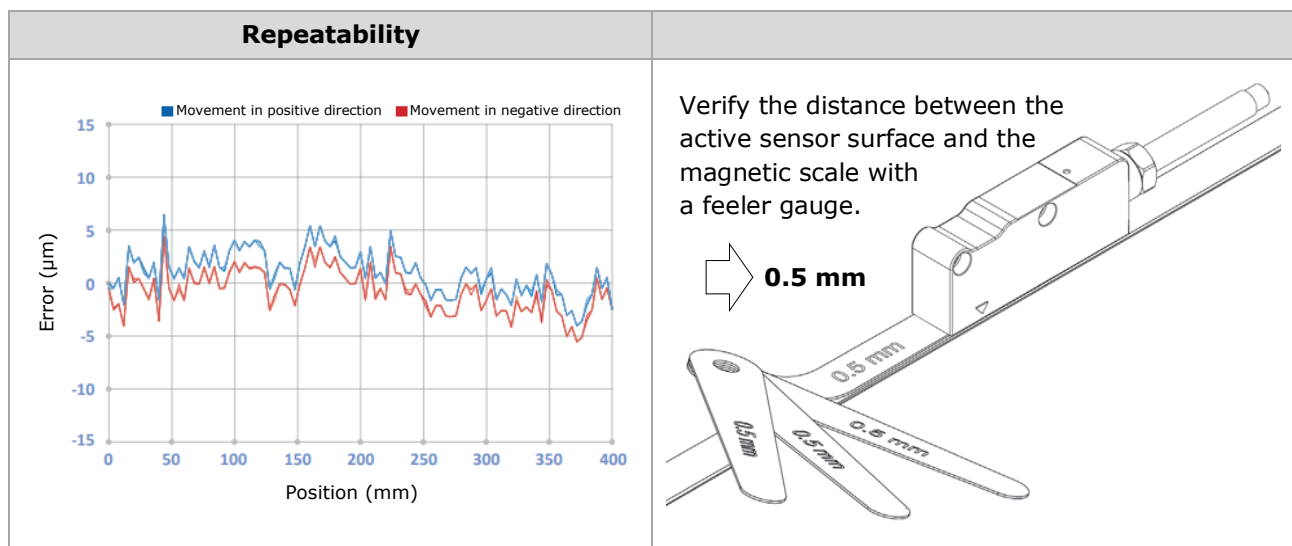
Accuracy and Interpolation



Repeatability

Repeatability graph obtained by carrying out the measurements several times in both directions of advancement.

- Unidirectional repeatability: measurement error detected without inverting the movement direction of the sensor.
- Hysteresis: difference in the measure due to the inversion of the sensor movement direction.



Datasheet

Ordering example Magnetic sensor

Type **AMS2/2-FAN** - **Z** - **1** - **A** - **V** - **F1** - **M01/S** - **SC**

Pole pitch [mm]

2 = 2+2

Housing

Z = Zinc die-casting (standard)

A = Aluminium (optional, on request)

Resolution [μm]

500; 100; 50; 10; 5; **1**

Cable output

A = axial

R = radial

Power supply

V = 5 VDC

Output signals

F1 = FANUC α i

Cable length/type

M01 = 1 m (standard)

S = PUR cable

Connector/wiring

SC = without connector, open cable end

CZ4 = connector M12 straight, 8-pin

CO8 = connector M12 plug straight, 8-pin (only in combination with extension cable type VLK-8)



Accessories

Please order the magnetic scale, the corresponding cover tape and extension cable separately. For ordering information, please refer to the corresponding data sheet.

You can configure the enclosure according to your requirements from the technical information and enter it into the ordering code.

Variants that cannot be configured from the ordering example are available on request as a special version.

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