

Operating instructions | EN

AL2200

Magnetic Encoder System MES

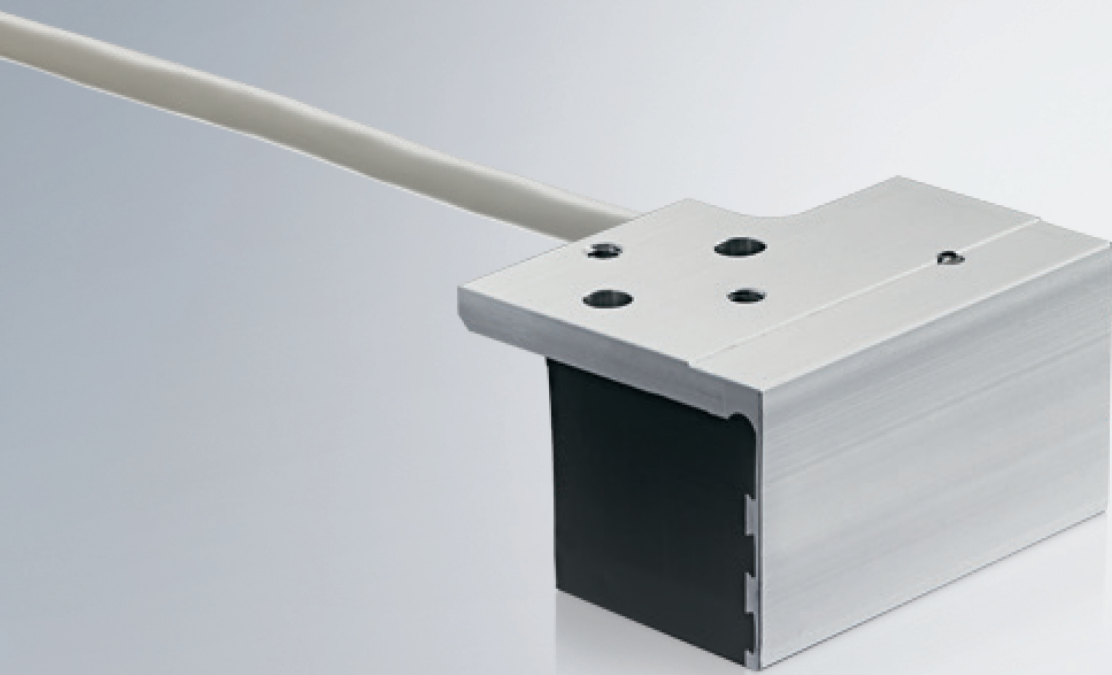


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1 Foreword

1.1 Intended use

The Magnetic Encoder System (MES) serves as feedback for linear motors of the AL2xxx and AL8xxx series. It is to be used exclusively for operation on a servo drive.

Linear feedback systems are required for the commutation and the detection of the velocity and position of brushless linear motors. Such feedback systems consist of a reader head and a graduated rule installed parallel to the travel path. The AL2200 works directly on the magnetic plates of the linear motor, eliminating the need for an additional graduated rule. It detects the magnetic field of the permanent magnets of the magnetic plates and supplies the encoder signals to the servo drive. Since the MES is a semi-absolute feedback system, no wake & shake is required in order to determine the commutation angle at machine start-up. The MES supplies one sine oscillation per logical motor revolution. A logical motor revolution is equivalent to the distance between two homopolar magnets, i.e. between two north poles, for example. The attainable accuracy of ± 0.1 mm is sufficient for simple positioning tasks and depends to a large extent on the mechanical accuracy and position of the magnets along the travel path. Since no graduated rule has to be installed, the MES is an inexpensive feedback solution for linear motors.

2 Product overview

2.1 Scope of supply

Check the completeness of the delivery against your delivery note.

Missing parts or damage should be recorded immediately and reported to the carrier, the insurance and/or Beckhoff Automation GmbH & Co. KG.

The standard scope of supply includes:

Magnetic Encoder System (MES)

2.2 Type key

AL2200 - 000x	Definition
AL2200	AL2200 = Magnetic Encoder System
000	Not defined
x	Connection technology: <ul style="list-style-type: none">• 0 = Without connector plug and 3 m cable• 1 = With connector plug and 0.5 m cable

3 Guidelines and Standards

CAUTION

Danger for persons, the environment or equipment

The Magnetic Encoder System (MES) is **not** a product within the meaning of the EC Machinery Directive. Operation of MES in machines or systems is only permitted once the machine or system manufacturers has provided evidence of CE conformity of the complete machine or system.

4 Properties

The Magnetic Encoder System (MES) consists of a reader head with integrated analog Hall sensors. The Hall sensors evaluate the magnetic field of the magnetic plates and convert the signal into an analog output signal.

Name	Value / property
Signal period	Pole pair distance 24 mm
Output signal	Analog signal 1 V _{pp} , sine-cosine
Termination resistor	R = 120 Ω
Accuracy	< 100 μm The prerequisite is the precise installation of the magnetic plates with an accuracy of ± 20 μm and offset, phase and amplitude compensation.
Repeatability	< 50 μm
Resolution	5 – 10 μm
Power supply	5 V _{DC}
Connection cable	<ul style="list-style-type: none"> • 8-core • with twisted pairs • material PUR • UL-certified • diameter 3.2 mm

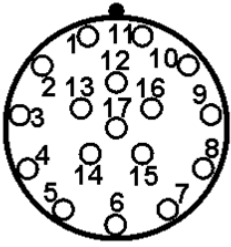
4.1 AL2200-0000

- 3 m connection cable

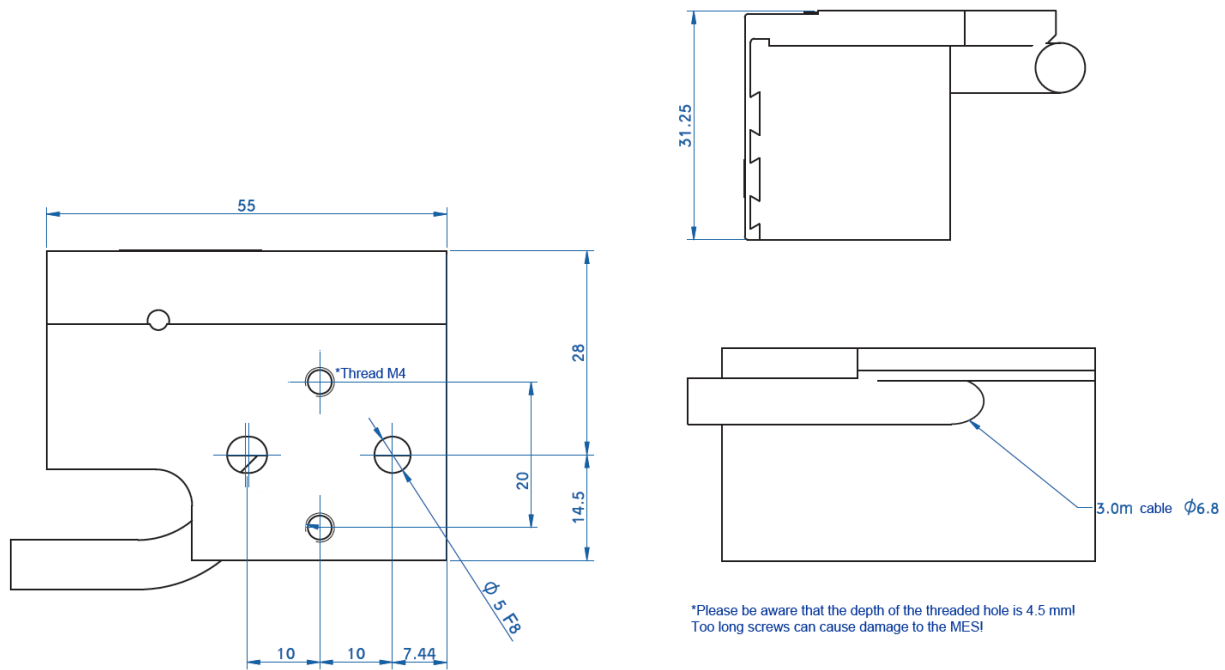
Assignment (color code)	
green	SIN +
yellow	SIN -
blue	COS +
red	COS -
brown	+ 5 V _{DC}
white	GND
pink	+ 5 V sense
gray	GND sense
Shield	PE / GND

4.2 AL2200-0001

- 0.5 m connection cable
- 17-pin M23 connector; corresponds to connector service pack ZS4000-2051
- Compatible motor cable on AX5000: ZK4510-00x0-xxxx

Plug assignment ZS4000-2051		
Plug	Contact	Function
	1	SIN -
	2	GND
	3	COS -
	4	+ 5 VDC
	9	SIN +
	10	GND sense
	11	COS +
	12	+ 5 V sense
	Housing	Shield

5 Dimensions

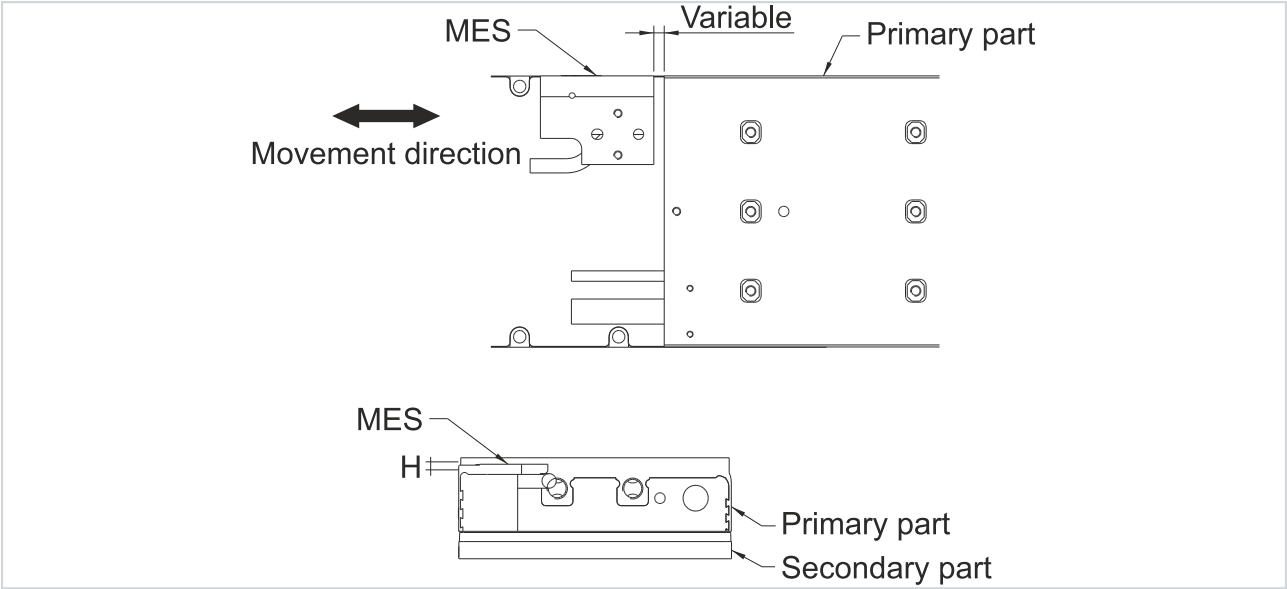


6 Mounting

This chapter provides information on the assembly of the MES system on the linear motors of the AL2000 and AL8000 series.

6.1 AL2000

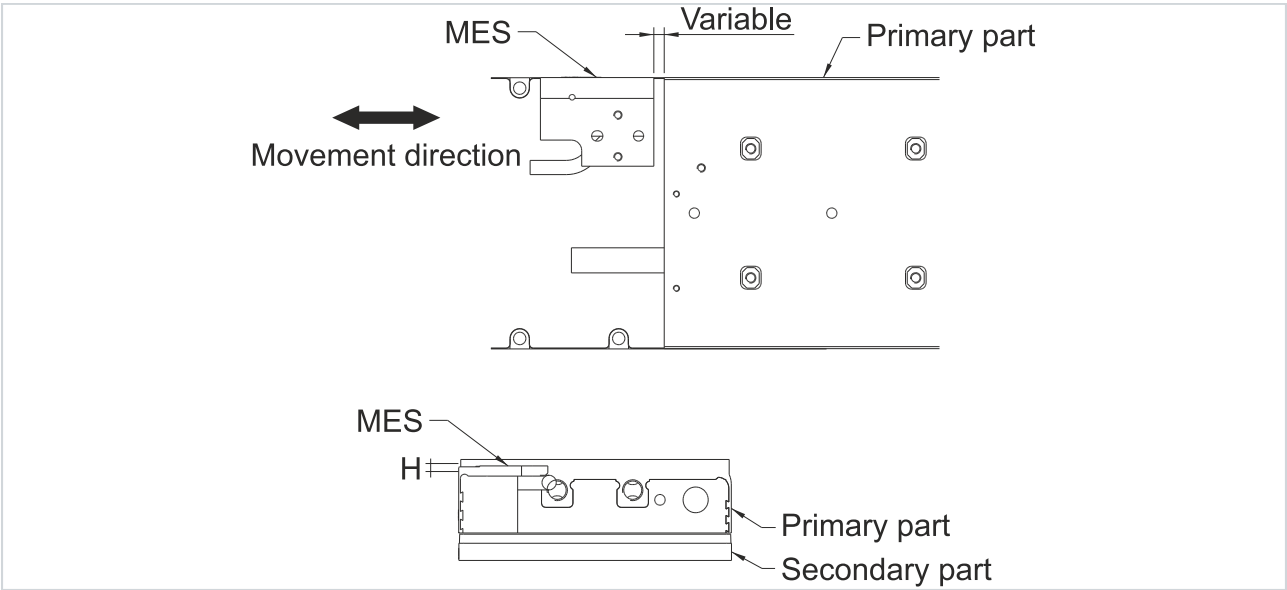
The MES is installed behind or in front of the primary part, so that it moves with the primary part over the secondary part.



	Distance to the top side of the primary part	Rotation with respect to the movement direction	Distance to the outside edge of the primary part	Screws	Locating pins
	H in mm	deg	mm		
AL20xx	0	0.5	+/- 1	M4	Ø 5 F8
AL24xx	0				
AL28xx-0	1				
AL28xx-1	3				

6.2 AL8000

The MES is installed behind or in front of the primary part, so that it moves with the primary part over the secondary part.



	Distance to the top side of the primary part	Rotation with respect to the movement direction	Distance to the outside edge of the primary part	Screws	Locating pins
	H in mm	deg	mm		
AL802x	0	0.5	+/- 1	M4	Ø 5 F8
AL804x	0				
AL806x-0	1				
AL806x-1	3				

7 Support and Service

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