

Linear measuring technology

**Absolute magnetic measurement system
sensor head, magnetic band**

Limes LA50 / BA5

**Measuring length max. 20 m
Resolution min. 10 µm**



The non-contact absolute magnetic linear measurement system Limes LA50 / BA5 - made up of the sensor head LA50 and of the magnetic band BA5 - reaches a resolution up to 10 µm with a maximum distance of 1.5 mm between the sensor and the band.



DC 10 ... 30 V	 20 m	 1,5 mm	 4 m/s	 0,01 mm	 IP40	 Reverse polarity protection	 Shock / vibration resistant	 -10°...+70°C	 Magnetic sensor
Power supply	Max. measuring length	Max. distance to measuring tape	Max. speed	High resolution	Protection	Reverse polarity protection	Shock / vibration resistant	Temperature range	Magnetic sensor

Robust and versatile

- Resolution 0.01 mm / measuring lengths max. 20 m.
- Rugged die-cast zinc housing.
- Positions changes are also detected when de-energized no referencing movement required – no wear.
- Automatic distance detection in case of too high distance between the sensor and the magnetic band.
- Masking tape protecting the magnetic band.
- Address, baud rate, bus termination can be modified via microswitches.
- Interfaces: SSI, CANopen.

Easy installation

- Simple glued assembly of the magnetic band.
- Large mounting tolerances.
- Requires very little installation space.
- LED warning signals in case of too weak magnetic field.

Order code sensor head Limes LA50

8.LA50 . 12X1
Type a b c d

- | | | |
|---|---|---|
| a Model
1 = IP40, standard | c Output circuit / power supply
1 = SSI 25 bit / 10 ... 30 V DC
3 = CANopen / 10 ... 30 V DC | d Type of connection
1 = cable, 1.5 m PUR |
| b baud rate
2 = standard (CANopen, 250 k) | | |

Order code magnetic band Limes BA5

8.BA5 . 20 . 010 . XXXX
Type a b

- | | |
|------------------------------|--|
| a Width
20 = 20 mm | b Length (measuring range = length - 0.1 m)
0010 = 1 m 0060 = 6 m
0020 = 2 m 0100 = 10 m
0040 = 4 m 0200 = 20 m
0050 = 5 m |
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Accessories		Order no.
SSI display type 570T Position display, 8-digit	with 2 relay outputs and serial interface DC power supply	6.570T.010.300
	with 4 fast switch outputs and serial interface AC/DC power supply	6.570T.012.E01
	with 4 fast switch outputs, serial interface and scalable analog output AC/DC power supply	6.570T.012.E02
	with 4 fast switch outputs and RS485 interface AC/DC power supply	6.570T.012.E03

Further accessories can be found in the accessories section or in the accessories area of our website at: www.kuebler.com/accessories.
 Additional connectors can be found in the connection technology section or in the connection technology area of our website at: www.kuebler.com/connection_technology.

Technical data

Mechanical characteristics	
Weight	ca. 0.19 kg [6.70 oz]
Working temperature	-10°C ... +70°C [+14°F ... +158°F] (non condensing)
Storage temperature	-25°C ... +85°C [-13°F ... +185°F]
Protection acc. to EN 60529	IP40
Housing	zinc die-cast
Max. traverse speed permanent absolute positions reading	4 m/s
Shock resistance acc. to EN 60068-2-27	5000 m/s ² , 1 ms
Vibration resistance acc. to EN 60068-2-6	300 m/s ² , 10 ... 2000 Hz
Distance sensor head / magnetic band	0.1 ... 1.5 mm incl. masking tape (recommended 0.5 mm)
Measuring length	max. 20 m
Type of connection (standard)	cable, 1.5 m PUR, open cable ends

Electrical characteristics	
Power supply	10 ... 30 V DC ±10%
Residual ripple	< 10 %
Current consumption	max. 150 mA
Reverse polarity protection	yes
Short circuit proof	yes
CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

Accuracy	
Measuring principle	absolute
System accuracy at 20°C [+68°F]	max. ± (150 + 20 x L) µm L = measuring length in meters
Repeat accuracy	±1 increment
Resolution	0.01 mm
LED, red	lights up when distance too large

SSI interface	
Output driver	RS485 transceiver type
Permissible load / channel	max. ±20 mA
Signal level	HIGH typ. 3.8 V LOW at I _{Load} = 20 mA typ. 1.3 V
Clock rate	25 bit (24 + 1 failurebit for distance)
Code	binary / gray (default) switchable
SSI clock rate	80 kHz ... 0.4 MHz
Monoflop time	≤ 40 µs
Data refresh rate	≤ 250 µs

CANopen interface	
Interface	CAN High-Speed acc. to ISO 11898, Basic and Full CAN, CAN specification 2.0 B
Protocol	CANopen
Baud rate	125 ... 1000 kbit/s adjustable with a rotary switch
Termination	yes/no with a rotary switch
Node address	1 ... 15 configurable (default 1)
LSS protocol	CIA LSS protocol DS305 global command support for node address and baud rate selective commands via attributes of the identity object

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Magnetic band Limes BA5	
Pole gap	basic pole pitch 5 mm
Dimensions	width 20 mm
	thickness 1.8 mm incl. masking tape
Relative linear expansion	$\Delta L = L \times \alpha \times \Delta \delta$ L = measuring length in meters $\alpha = 16 \times 10^{-6} 1/K$ temperature coefficient $\Delta \delta$ = relative temperature change based on 20°C [+68°F] in °K

Working temperature	-20°C ... +80°C [-4°F ... +176°F] ¹⁾
Mounting	adhesive joint
Additional length	100 mm in order to obtain an optimal measuring result, the magnetic band should be about 0.1 m longer than the required measuring length
Min. bending radius for storage	≥ 150 mm
Material metal tape	precision steel strip 1.4404 acc. to EN 10088-3

Terminal assignment

Output circuit	Type of connection	Cable										
1 (SSI)	1	Signal:	0 V	+V	D+	D-	C+	C-	-	-	-	⊥
		Core color:	WH	BN	YE	OR	GN	VT	GY	BK	shield ²⁾	

Output circuit	Type of connection	Cable										
3 (CANopen)	1	Signal:	0 V	+V	CAN_H	CAN_L	-	-	-	-	-	⊥
		Core color:	WH	BN	YE	OR	GN	VT	GY	BK	shield ²⁾	

- +V: Encoder power supply +V DC
- 0 V: Encoder power supply ground GND (0V)
- C+, C-: Clock signal
- D+, D-: Data signal

1) Magnetic band (ends) attached by screwing, clamping or equivalent.
 2) Connect shielding only machine side

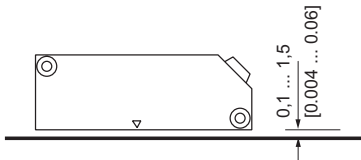
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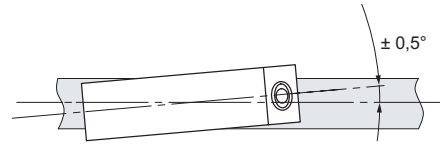
Permissible mounting tolerances

Dimensions in mm [inch]

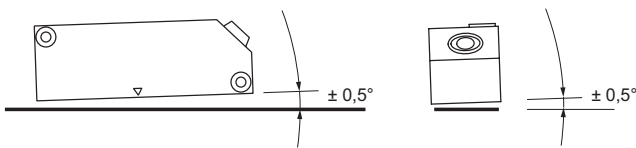
Distance sensor head / magnetic band (incl. masking tape)



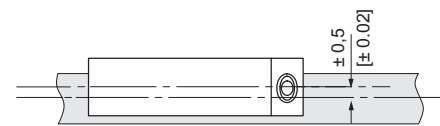
Torsion



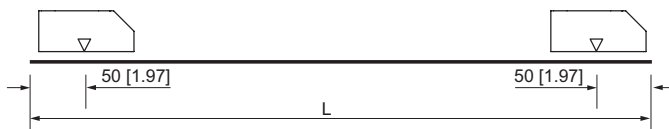
Tilting



Offset



Measuring range



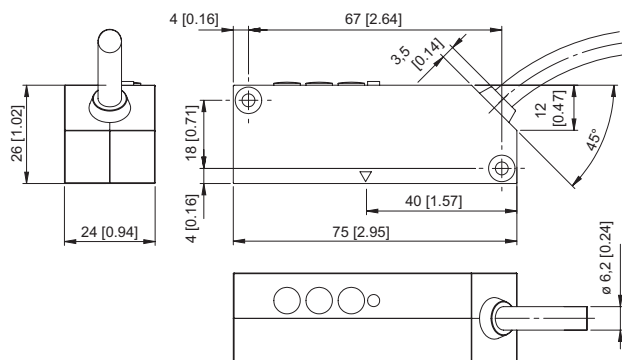
Observe mounting direction



Dimensions

Dimensions in mm [inch]

Sensor head Limes LA50



Magnetic band Limes BA5

- 1 Length L, max. 20 m
- 2 Masking tape
- 3 Magnetic band

