

Linear measuring technology

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

Limes LI20 / B1

Resolution min. 10 µm



The non-contact incremental magnetic linear measurement system Limes LI20 / B1 - made up of the sensor head LI20 and of the magnetic band B1 - reaches a resolution up to 10 µm with a maximum distance of 1 mm between the sensor and the band.

For outdoor use with extremely sturdy aluminum housing and stainless-steel cover, wide temperature range as well as a UV-resistant cable. IP68 / IP69k protection, special encapsulation technology and tested resistance to cyclic humidity and damp heat offer the highest levels of reliability, even in exposed outdoor use.



Temperature range



High protection level



Shock / vibration resistant



Reverse polarity protection

Robust

- Sturdy housing with IP67 protection.
Option: special housing for maximum resistance against condensation (IP68 / IP69k, resistance to cyclic humidity acc. to EN 60068-3-38 as well as damp heat acc. to EN 60068-3-78).
- Non-contact measuring system – free from wear.
- Masking tape protecting the magnetic band.

Easy installation

- Simple glued assembly of the magnetic band.
- Large mounting tolerances.
- Requires very little installation space.
- Warning signals via LED if the magnetic field is too weak.

Order code sensor head Limes LI20

8.LI20.X1X1.2XXX
Type a b c d e f

a Model

- 1 = IP67, standard
- 2 = IP68 / IP69k and humidity tested acc. to EN 60068-3-38, EN 60068-3-78

b Pulse edge interval

- 1 = standard

c Output circuit / power supply

- 1 = RS422 / 4.8 ... 26 V DC
- 2 = Push-pull / 4.8 ... 30 V DC

d Type of connection

- 1 = cable, 2 m [6.56'] PUR

e Reference signal

- 2 = index periodic

f Code (resolution)¹⁾

- 005 = 100 µm
- 020 = 25 µm
- 050 = 10 µm

Stock types

- 8.LI20.1111.2005
- 8.LI20.1111.2020
- 8.LI20.1111.2050
- 8.LI20.1121.2005
- 8.LI20.1121.2020
- 8.LI20.1121.2050

Order code magnetic band Limes B1

8.B1.10.010.XXXX
Type a b

a Width

- 10 = 10 mm

b Length

- 0010 = 1 m 0060 = 6 m
- 0020 = 2 m 0100 = 10 m
- 0040 = 4 m 0200 = 20 m
- 0050 = 5 m

Optional on request

- other lengths up to 70 m

Stock types

- 8.B1.10.010.0010

¹⁾ With quadruple evaluation (only connected with magnetic band Limes B1)

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Incremental magnetic measurement system sensor head, magnetic band	Limes LI20 / B1	Resolution min. 10 µm
Accessories / display type 572		Order no.
Position display, 6-digit	with 4 fast switch outputs and serial interface	6.572.0116.D05
	with 4 fast switch outputs, serial interface and scalable analog output	6.572.0116.D95
Position display, 8-digit	with 4 fast switch outputs and serial interface	6.572.0118.D05
	with 4 fast switch outputs, serial interface and scalable analog output	6.572.0118.D95

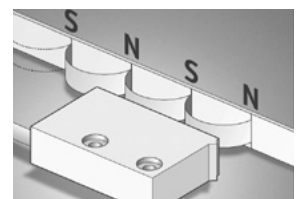
Further accessories can be found in the accessories section or in the accessories area of our website at: www.kuebler.com/accessories.
Additional connectors can be found in the connection technology section or in the connection technology area of our website at: www.kuebler.com/connection_technology.

Technical data

Sensor head Limes LI20	
Output circuit	Push-pull RS422
Power supply	4.8 ... 30 V DC 4.8 ... 26 V DC
Permissible load / channel	±20 mA 120 Ω
Max. cable length	max. 30 m [98.43'] RS422 standard
Power consumption (no load)	typ. 25 mA, max. 60 mA
Short circuit proof ¹⁾	yes yes ²⁾
Min. pulse edge interval	1 µs (corresponds to 4 µs/cycle see signal figures below)
Output signal	A, \bar{A} , B, \bar{B} , 0, $\bar{0}$
Reference signal	index periodical ³⁾
Accuracy	
System accuracy:	typ. +200 µm, max. ± (0.04 + 0.02 x L) mm (L in [m], up to L = 70 m, at T = 20°C [+68°F] and gap sensor head/magnetic band = 0.4 mm)
Repeat accuracy	±1 increment
Resolution and speed ⁴⁾	100 µm (quadruple), max. 25 m/s 25 µm (quadruple), max. 4 m/s 10 µm (quadruple), max. 6.5 m/s
Permissible alignment tolerance (see draft „mounting tolerances“)	
Gap sensor head / magnetic band	0.1 ... 1.0 mm, recommended 0.4 mm
Offset	max. ±1 mm
Tilting	max. 3°
Torsion	max. 3°
General data	
Working temperature	-20°C ... +80°C [-4°F ... +176°F]
Shock resistance	5000 m/s ² , 1 ms
Vibration resistance	300 m/s ² , 10 ... 2000 Hz
Protection	model 1 IP67 acc. to EN 60529 model 2 IP68 / IP69k acc. to EN 60529 and humidity tested acc. to EN 60068-3-38, EN 60068-3-78
Housing	aluminum
Cable	2 m [6.56'] PUR 8 x 0.14 mm ² [AWG25] shielded, may be used in trailing cable installations
Status LED	green pulse-index red error; speed too high or magnetic fields too weak (8.LI20.XXXX.X020 and 8.LI20.XXXX.X050)
CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

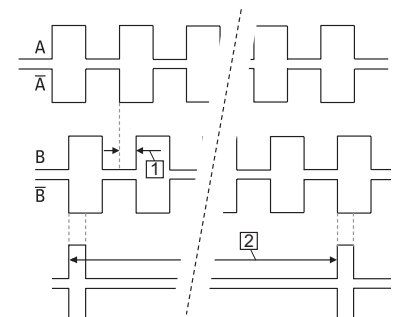
Magnetic band Limes B1	
Pole gap	2 mm from pole to pole
Dimensions	width 10 mm
	thickness 1.97 mm incl. masking tape
Temperature coefficient	16 x 10 ⁻⁶ /K
Working temperature	-20°C ... +80°C [-4°F ... +176°F] -20°C ... +65°C [-4°F ... +144°F] (when mounted solely with adhesive tape)
Storage temperature	-20°C ... +80°C [-4°F ... +176°F]
Mounting	adhesive joint
Measuring	0.1 m (to receive an optimal result of measurement, the magnetic band should be ca. 0.1 m longer than the desired measuring length)
Bending radius	≥ 150 mm (when mounted solely with adhesive tape)
Material metal tape	precision steel strip 1.4404 acc. to EN 10088-3

Function principle



Signal figures

- 1) Pulse edge interval: Pay attention to the instructions in the technical data
- 2) Periodic index signal every 2 mm [0.08"]; the logical assignment A, B and 0-signal can change



- 1) If power supply correctly applied.
- 2) Only one channel allowed to be shorted-out.
If +V = 5 V, short-circuit to channel, 0 V, or +V is permitted.
If +V = 5 ... 30 V, short-circuit to channel or 0 V is permitted.
- 3) At every pole change. The signal is generated by the sensor.
- 4) At the listed rotational speed the min. pulse edge interval is 1 µs, this corresponds to 250 kHz. For the max. rotational speed range a counter with a count input frequency of not less than 250 kHz should be provided.

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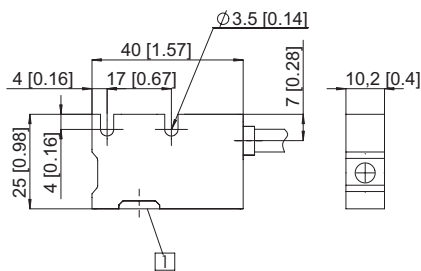
Terminal assignment

Output circuit	Type of connection	Cable									
1, 2	1	Signal:	0 V	+V	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	\perp
		Cable color:	WH	BN	GN	YE	GY	PK	BU	RD	shield ¹⁾

Dimensions

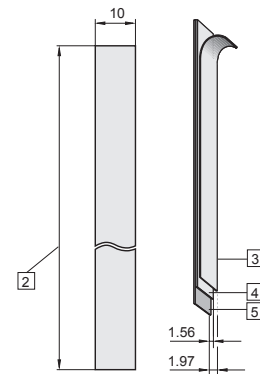
Dimensions in mm [inch]

Sensor head Limes LI20



1 Active measuring area

Magnetic band Limes B1



2 Length L, max. 70 m

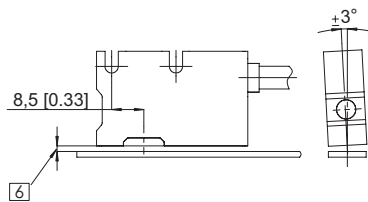
3 Masking tape

4 Magnetic band

5 Carrier band

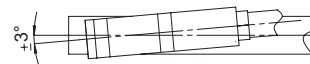
Permissible mounting tolerances

Tilting

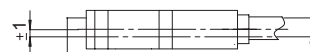


6 Distance sensor head / magnetic band:
0.1 ... 1.0 mm (recommended 0.4 mm)

Torsion



Offset



1) Shield is attached to connector housing