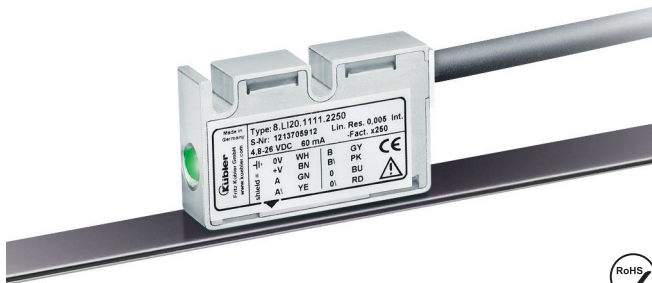


Linear measuring technology

Incremental magnetic measurement system sensor head, magnetic band	Limes LI20 / B1	Resolution min. 10 µm
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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.



-20...+80°C
Temperature range



IP
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.X1XX.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 / supply voltage

- 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
- A = cable, special length PUR *)

*) Available special lengths ¹⁾ (connection type A):
3, 5, 8, 10, 15, 20 m [9.84, 16.40, 26.25, 32.80, 49.21, 65.62']
order code expansion .XXXX = length in dm
ex.: 8.LI20.111A.2005.0030 (for cable length 3 m)

e Reference signal

- 2 = index periodic

f Code (resolution)²⁾

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

Order code magnetic band Limes B1

8.B1.10.010.XXXX
Type a b

a Width

- 10 = 10 mm

b Length

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

Optional on request

- other lengths up to 70 m

1) Cable lengths >10 m only possible with supply voltage >10 V.

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

Linear measuring technology

Incremental magnetic measurement system sensor head, magnetic band	Limes LI20 / B1	Resolution min. 10 µm
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Accessories / display type 572		Order no.
Position display, 8-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

Mechanical characteristics sensor head LI20		
Working temperature	-20 °C ... +80 °C [-4 °F ... +176 °F]	
Storage 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 error; speed too high or magnetic fields too weak (at 8.LI20.XXXX.X020 and 8.LI20.XXXX.X050)
	red	

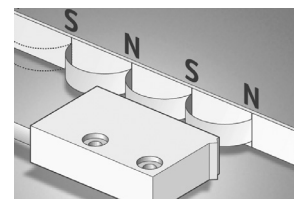
Electrical characteristics sensor head LI20		
Output circuit	Push-pull	RS422
Supply voltage	4,8 ... 30 V DC	4,8 ... 26 V DC
Permissible load / channel	±20 mA	120 Ω
Max. cable length	max. 30 m [98.43']	RS422 standard
Power consumption (no load)	typ. 25 mA, max. 60 mA	
Short circuit proof ¹⁾	yes	yes ²⁾
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⁾	
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] ⁴⁾
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 1.4310 acc. to EN 10088-3

Accuracy	
Magnetic band	± (0,025 + 0,02 x L) mm – L in [m], up to L _{max} = 70 m
Sensor head	± 0,01 mm interpolation error accuracy: at T = 20 °C and gap sensor head/magnetic band 0,4 mm
Repeat accuracy	±1 increment
Resolution and speed ⁵⁾	100 µm (quadruple), max. 25 m/s 25 µm (quadruple), max. 4 m/s 10 µm (quadruple), max. 6,5 m/s

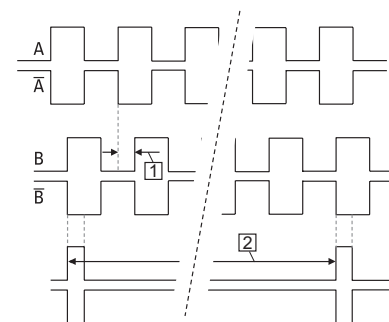
Permissible alignment tolerance (see draft „mounting tolerances“)	
Gap sensor head / magnetic band	0,1 ... 1,0 mm (recommended 0,4 mm)
Offset	max. ±1 mm
Tilting	max. 3°
Torsion	max. 3°

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 supply voltage 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) Magnetic band (ends) attached by screwing, clamping or equivalent.
- 5) 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.

Linear measuring technology

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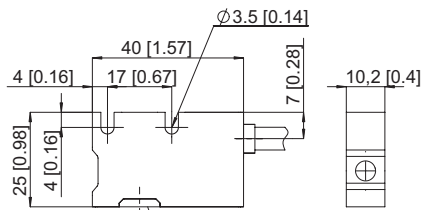
Terminal assignment

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

Dimensions

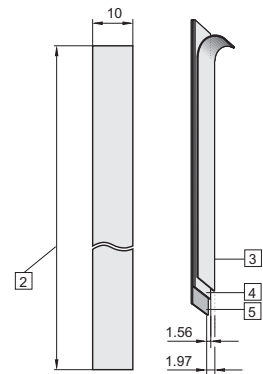
Dimensions in mm [inch]

Sensor head Limes LI20



1 Active measuring area

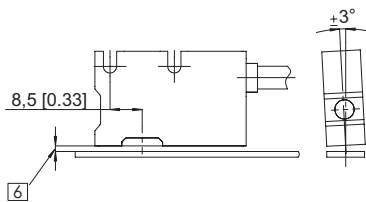
Magnetic band Limes B1



- 2 Length L, max. 70 m
- 3 Masking tape
- 4 Magnetic band
- 5 Carrier band

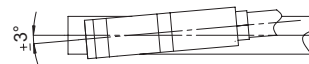
Permissible mounting tolerances

Tilting

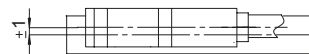


6 Distance sensor head / magnetic band:
0.1 ... 1.0 mm (recommended 0.4 mm)

Torsion



Offset



1) Shield is attached to connector housing