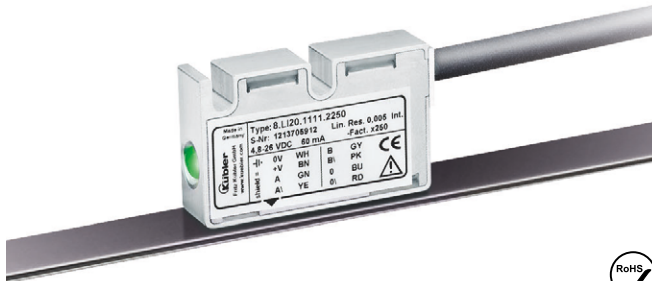


<b>Incremental magnetic measurement system sensor head, magnetic band</b>	<b>Limes LI20 / B1</b>	<b>Resolution min. 10 µm</b>
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The non-contact incremental magnetic linear measurement system Limes LI20 / B1 - made up of the sensor head LI20 and of the 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.

 <b>-20...+80°C</b> Temperature range	 <b>IP</b> High protection level	 Shock / vibration resistant	 Reverse polarity protection
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### 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

- |  |   |   |
|--|---|---|
| <p><b>a Model</b><br/>         1 = IP67, standard<br/>         2 = IP68 / IP69k and humidity tested acc. to EN 60068-3-38, EN 60068-3-78</p> <p><b>b Pulse edge interval</b><br/>         1 = standard</p> | <p><b>c Output circuit / supply voltage</b><br/>         1 = RS422 / 4.8 ... 26 V DC<br/>         2 = Push-pull / 4.8 ... 30 V DC</p> <p><b>d Type of connection</b><br/>         1 = cable, 2 m [6.56'] PUR<br/>         A = cable, special length PUR *)</p> <p>*) Available special lengths <sup>1)</sup> (connection type A):<br/>         3, 5, 8, 10, 15, 20 m [9.84, 16.40, 26.25, 32.80, 49.21, 65.62']<br/>         order code expansion .XXXX = length in dm<br/>         ex.: 8.LI20.111A.2005.0030 (for cable length 3 m)</p> | <p><b>e Reference signal</b><br/>         2 = index periodic</p> <p><b>f Code (resolution)<sup>2)</sup></b><br/>         005 = 100 µm<br/>         020 = 25 µm<br/>         050 = 10 µm</p> |
|--|---|---|

### Order code magnetic band Limes B1



**8.B1.10.010.XXXX**  
Type      a      b

- |   |  |            |            |            |             |            |             |            |  |   |
|---|--|------------|------------|------------|-------------|------------|-------------|------------|--|---|
| <p><b>a Width</b><br/>         10 = 10 mm</p> | <p><b>b Length</b></p> <table border="0"> <tr> <td>0010 = 1 m</td> <td>0060 = 6 m</td> </tr> <tr> <td>0020 = 2 m</td> <td>0100 = 10 m</td> </tr> <tr> <td>0040 = 4 m</td> <td>0200 = 20 m</td> </tr> <tr> <td>0050 = 5 m</td> <td></td> </tr> </table> | 0010 = 1 m | 0060 = 6 m | 0020 = 2 m | 0100 = 10 m | 0040 = 4 m | 0200 = 20 m | 0050 = 5 m |  | <p><i>Optional on request</i><br/>         - other lengths up to 70 m</p> |
| 0010 = 1 m                                    | 0060 = 6 m   |            |            |            |             |            |             |            |  |   |
| 0020 = 2 m                                    | 0100 = 10 m  |            |            |            |             |            |             |            |  |   |
| 0040 = 4 m                                    | 0200 = 20 m  |            |            |            |             |            |             |            |  |   |
| 0050 = 5 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

<b>Incremental magnetic measurement system sensor head, magnetic band</b>	<b>Limes LI20 / B1</b>	<b>Resolution min. 10 µm</b>
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Accessories / Displays	Order no.
<b>Codix 560, preset counter</b> <b>6-digit</b>  <ul style="list-style-type: none"> <li>- Counter, tachometer, time counter and position display in one device</li> <li>- Scalable display</li> <li>- Readable via RS232/485 interface or configurable via MODBUS or CR/LF protocol</li> </ul>	<b>6.560.010.XXX</b>
<b>571T touch, multifunction preset counters</b> <b>8-digit</b>  <ul style="list-style-type: none"> <li>- Measuring function for RPM, speed, speed from elapsed time, machine cycle time, throughput time (reciprocal rotary speed), as well as numerous count functions such as position display</li> <li>- Fast counting input (250 kHz/HTL, 1 MHz/RS422)</li> <li>- 4 switching outputs as limit values (response time &lt; 1 ms)</li> <li>- Scalable analog output (response time &lt; 150 ms), resolution 16 bit</li> <li>- Serial interface RS232 or RS485 for reading in and out the data</li> </ul>	<b>6.571T.01X.XXX</b>

Further Kübler accessories can be found at: [kuebler.com/accessories](http://kuebler.com/accessories)  
 Further Kübler cables and connectors can be found at: [kuebler.com/connection-technology](http://kuebler.com/connection-technology)

## Technical data

Mechanical characteristics sensor head LI20	
<b>Working temperature</b>	-20 °C ... +80 °C [-4 °F ... +176 °F]
<b>Storage temperature</b>	-20 °C ... +80 °C [-4 °F ... +176 °F]
<b>Shock resistance</b>	5000 m/s <sup>2</sup> , 1 ms
<b>Vibration resistance</b>	300 m/s <sup>2</sup> , 10 ... 2000 Hz
<b>Protection</b>	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
<b>Housing</b>	aluminum
<b>Cable</b>	2 m [6.56'] PUR 8 x 0.14 mm <sup>2</sup> [AWG25] shielded, may be used in trailing cable installations
<b>Status LED</b>	green pulse-index red error; speed too high or magnetic fields too weak (at 8.LI20.XXXX.X020 and 8.LI20.XXXX.X050)

Electrical characteristics sensor head LI20		
<b>Output circuit</b>	Push-pull	RS422
<b>Supply voltage</b>	4,8 ... 30 V DC	4,8 ... 26 V DC
<b>Permissible load / channel</b>	±20 mA	120 Ω
<b>Max. cable length</b>	max. 30 m [98.43']	RS422 standard
<b>Power consumption (no load)</b>	typ. 25 mA, max. 60 mA	
<b>Short circuit proof <sup>1)</sup></b>	yes	yes <sup>2)</sup>
<b>Min. pulse edge interval</b>	1 µs (corresponds to 4 µs/cycle see signal figures below)	
<b>Output signal</b>	A, $\bar{A}$ , B, $\bar{B}$ , 0, $\bar{0}$	
<b>Reference signal</b>	index periodical <sup>3)</sup>	

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

Magnetic band Limes B1	
<b>Pole gap</b>	2 mm from pole to pole
<b>Dimensions</b>	width 10 mm thickness 1,97 mm incl. masking tape
<b>Temperature coefficient</b>	16 x 10 <sup>-6</sup> /K
<b>Working temperature</b>	-20 °C ... +80 °C [-4 °F ... +176 °F] <sup>4)</sup>
<b>Mounting</b>	adhesive joint
<b>Measuring</b>	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)
<b>Bending radius</b>	≥ 150 mm (when mounted solely with adhesive tape)
<b>Material metal tape</b>	precision steel strip 1.4310 acc. to EN 10088-3

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

Approvals	
<b>CE compliant in accordance with</b>	
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU

- 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.

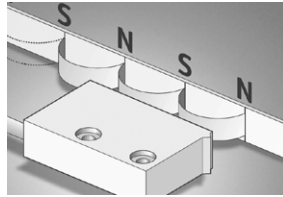
# Linear measuring technology

## Incremental magnetic measurement system sensor head, magnetic band

Limes LI20 / B1

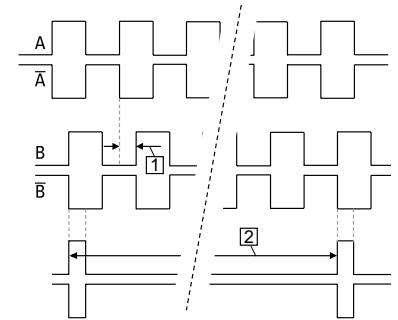
Resolution min. 10 µm

### 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



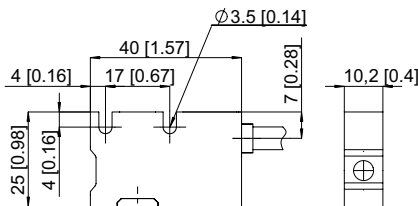
### Terminal assignment

Output circuit	Type of connection	Cable	0 V	+V	A	Ā	B	B̄	0	0̄	⊥
1, 2	1, A	Signal:	0 V	+V	A	Ā	B	B̄	0	0̄	⊥
		Core color:	WH	BN	GN	YE	GY	PK	BU	RD	shield <sup>1)</sup>

### Dimensions

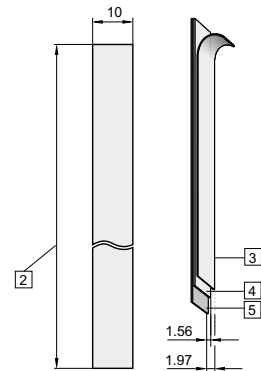
Dimensions in mm [inch]

#### Sensor head Limes LI20



- 1 Active measuring area

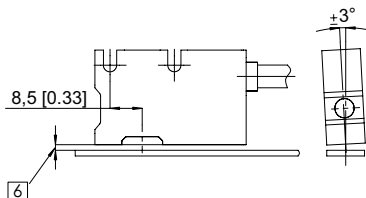
#### Magnetic band Limes B1



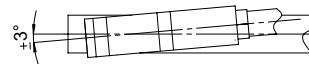
- 2 Length L, max. 70 m
- 3 Masking tape
- 4 Magnetic band
- 5 Carrier band

### Permissible mounting tolerances

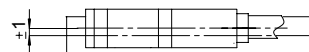
#### Tilting



#### Torsion



#### Offset



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

1) Shield is attached to connector housing