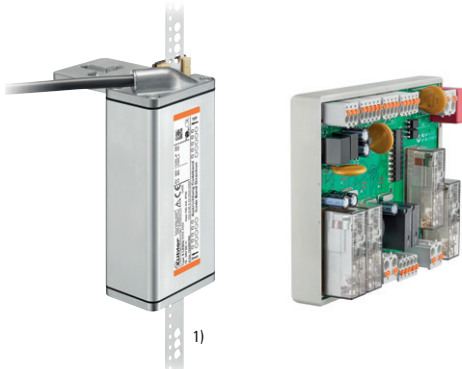


# Linear measuring technology

|                             |              |  |
|-----------------------------|--------------|--|
| <b>Shaft copying system</b> | <b>PSU02</b> | <b>Safe System, SIL3</b><br><b>Measuring range up to 392 m</b> |
|-----------------------------|--------------|--|



The PSU02 is combined with the Ants LES02 sensor to realize elevator and safety functions in compliance with EN 81-20/-21/-50. The Ants LES02 measures the absolute car position 100% slip-free. The PSU02 evaluates the safe position feedback and triggers by means of safety relays, jointly with the elevator control, the required safety functions. Therefore, the safe system, besides installation and maintenance time, allows above all saving costs.



|                      |            |                   |         |        |                             |                             |                   |
|----------------------|------------|-------------------|---------|--------|-----------------------------|-----------------------------|-------------------|
|                      |            |                   |         |        |                             |                             |                   |
| Wide measuring range | Resolution | Easy installation | Compact | Robust | Shock / vibration resistant | Reverse polarity protection | Temperature range |

## Characteristics

- Safe position values and evaluation.
- SIL3-certified by TÜV.
- Integrated UCM function.
- Extremely robust and compact.
- Stainless steel coded band.
- Simple assembly.
- Contactless measuring principle.

## Benefits

- Realization of elevator and safety functions in compliance with EN 81-20/-21/-50.
- Replaces existing components such as limit switches, inspection limit switches, magnetic sensors and door zone magnets.
- Reduces installation and maintenance time.
- Accurate car positioning.
- 100% slip-free thanks to absolute position measurement directly on the elevator car.
- Suitable for tight installation spaces.
- Highest availability.

|  |   |   |
|--|---|---|
| <b>Order code</b><br><b>PSU02</b>                                    | <b>8.PSU02</b>  | <b>. 1 1 2 1 . 22 11</b>                                      |
|  | Type  | a b c d   |
| <b>a</b> Type of mounting<br>1 = top-hat rail mounting               | <b>c</b> Interface / power supply<br>2 = CANopen / 24 V | <b>d</b> Interface profile<br>22 = CANopen Lift, DS417 V2.2.8 |
| <b>b</b> Sensor<br>1 = Can be combined with Ants LES02 <sup>1)</sup> |   |   |

|  |   |  |
|--|---|--|
| <b>Order code</b><br><b>Sensor</b>   | <b>8.LES02</b>  | <b>. X 1 1 X . XX 11</b>                                   |
|  | Type  | a b c d  |
| <b>a</b> Type of mounting<br>1 = with mounting plate<br>2 = without mounting plate <sup>1)</sup> | <b>c</b> Type of connection<br>1 = cable, 3 m [9.84'], open cable end<br>A = cable, special lengths, shielded, open cable end *)                        | <b>d</b> Interface profile<br>11 = CAN proprietary, V1.0.0 |
| <b>b</b> Interface / power supply<br>1 = CAN / 10 ... 30 V                                       | <b>*)</b> Special lengths on request: 5 m, 7 m, 10 m<br>order code expansion .XXXX = length in dm<br>ex.: 8.LES02.111A.1111.0050 (for cable length 5 m) |  |

1) The sensor Ants LES02 is not a component of the PSU02 and must be ordered separately.  
Each of these two components is SIL3-certified.

2) T-slot mounting.

# Linear measuring technology

|                             |              |  |
|-----------------------------|--------------|--|
| <b>Shaft copying system</b> | <b>PSU02</b> | <b>Safe System, SIL3</b><br><b>Measuring range up to 392 m</b> |
|-----------------------------|--------------|--|

|  |   |  |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
|--|---|--|--|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|--------------|--|-------------|-------------|--------------|--|-------------|-------------|--|--|-------------|-------------|--------------------|--|
| <b>Order code</b><br><b>Coded band, absolute</b>                                       | <b>8.LEX.BA . XXXX</b><br>Type <b>a</b>   |  |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| <b>a</b> <i>Measuring lengths</i><br>XXXX = lengths in meters<br>(max. length = 392 m) | <table border="0"> <tr> <td><i>Standard lengths</i></td> <td></td> <td></td> <td></td> </tr> <tr> <td>0010 = 10 m</td> <td>0040 = 40 m</td> <td>0090 = 90 m</td> <td></td> </tr> <tr> <td>0015 = 15 m</td> <td>0050 = 50 m</td> <td>0100 = 100 m</td> <td></td> </tr> <tr> <td>0020 = 20 m</td> <td>0060 = 60 m</td> <td>0392 = 392 m</td> <td></td> </tr> <tr> <td>0025 = 25 m</td> <td>0070 = 70 m</td> <td>Intermediate lengths &lt; 100 m as from 5 pieces,</td> <td></td> </tr> <tr> <td>0030 = 30 m</td> <td>0080 = 80 m</td> <td>&gt; 100 m on request</td> <td></td> </tr> </table> | <i>Standard lengths</i>                        |  |             |             | 0010 = 10 m | 0040 = 40 m | 0090 = 90 m |              | 0015 = 15 m | 0050 = 50 m | 0100 = 100 m |  | 0020 = 20 m | 0060 = 60 m | 0392 = 392 m |  | 0025 = 25 m | 0070 = 70 m | Intermediate lengths < 100 m as from 5 pieces, |  | 0030 = 30 m | 0080 = 80 m | > 100 m on request |  |
| <i>Standard lengths</i>  |   |  |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| 0010 = 10 m  | 0040 = 40 m   | 0090 = 90 m                                    |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| 0015 = 15 m  | 0050 = 50 m   | 0100 = 100 m                                   |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| 0020 = 20 m  | 0060 = 60 m   | 0392 = 392 m                                   |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| 0025 = 25 m  | 0070 = 70 m   | Intermediate lengths < 100 m as from 5 pieces, |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| 0030 = 30 m  | 0080 = 80 m   | > 100 m on request                             |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
|  | <table border="0"> <tr> <td><i>Stock types</i></td> <td></td> </tr> <tr> <td>0010 = 10 m</td> <td>0030 = 30 m</td> </tr> <tr> <td>0015 = 15 m</td> <td>0040 = 40 m</td> </tr> <tr> <td>0020 = 20 m</td> <td>0392 = 392 m</td> </tr> <tr> <td>0025 = 25 m</td> <td></td> </tr> </table>  | <i>Stock types</i>                             |  | 0010 = 10 m | 0030 = 30 m | 0015 = 15 m | 0040 = 40 m | 0020 = 20 m | 0392 = 392 m | 0025 = 25 m |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| <i>Stock types</i>   |   |  |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| 0010 = 10 m  | 0030 = 30 m   |  |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| 0015 = 15 m  | 0040 = 40 m   |  |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| 0020 = 20 m  | 0392 = 392 m  |  |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |
| 0025 = 25 m  |   |  |  |             |             |             |             |             |              |             |             |              |  |             |             |              |  |             |             |  |  |             |             |                    |  |

|                    |                  |
|--------------------|------------------|
| <b>Accessories</b> | <b>Order no.</b> |
|--------------------|------------------|

|                            |                      |
|----------------------------|----------------------|
| <b>Mounting kit LES.MK</b> | <b>8.LES.MK.0001</b> |
|----------------------------|----------------------|

**EMC shield terminal**

For an EMC-compliant installation of the sensor cable, top-hat rail mounting

Clamp: spring steel, galvanized

Foot: spring steel

Shield diameter 3.0 ... 12.0 mm

**8.0000.4G06.0312**

## Technical data

| Mechanical characteristics evaluation unit PSU02 |                                       |
|--|---------------------------------------|
| <b>Max. number of floors</b>                     | 200                                   |
| <b>Connection</b>                                | picoMAX® eCOM 3.5                     |
| <b>Switch-off time / System reaction time</b>    | < 25 ms (incl. relay switching time)  |
| <b>Housing (material)</b>                        | plastic                               |
| <b>Dimensions</b> L x W x H                      | 70 x 95 x 30 mm [2.76 x 3.74 x 1.18"] |

| Electrical characteristics evaluation unit PSU02            |                                |
|---|--------------------------------|
| <b>Power supply</b>   | 24 VDC ±10 %, low voltage PELV |
| <b>Power</b>  | < 10 W                         |
| <b>Internal interface</b><br>(between Ants LES02 and PSU02) | CAN proprietary, V1.0.0        |
| <b>External interface</b><br>(between PSU02 and control)    | CANopen Lift, DS417 V2.2.8     |

| Environmental conditions evaluation unit PSU02 |   |
|--|---|
| <b>Protection</b> acc. to EN 60529             | IP00 (min. IP20 when mounted in cabinet)        |
| <b>Humidity</b>                                | < 90 % (non condensing)                         |
| <b>Working temperature</b>                     | -5°C ... +55°C [+23°F ... +131°F]               |
| <b>Storage temperature</b>                     | -10°C ... +70°C [+14°F ... +158°F]              |
| <b>Air pressure (operating altitude)</b>       | 800 ... 1013 hPA (up to 2000 m above sea level) |

| Mechanical characteristics sensor Ants LES02 |   |
|--|---|
| <b>Code</b>                                  | absolute, 16 bit  |
| <b>Max. measuring length</b>                 | 392 m   |
| <b>Speed</b>                                 | certified 8 m/s <sup>1)</sup><br>functional 12 m/s <sup>2)</sup>      |
| <b>Resolution</b>                            | certified 1 mm<br>functional 0.5 mm                                   |
| <b>Accuracy</b>                              | ±1 mm   |
| <b>Type of connection</b>                    | cable 3 m with open end<br>further lengths up to max. 10 m on request |
| <b>Weight</b>                                | 550 g   |
| <b>Housing (material)</b>                    | Aluminium   |
| <b>Dimensions</b> L x W x H                  | 126 x 55 x 37 mm  |

| Electrical characteristics sensor Ants LES02 |                         |
|--|-------------------------|
| <b>Power supply</b>                          | 10 ... 30 V DC          |
| <b>Reverse polarity protection</b>           | yes                     |
| <b>Power consumption</b>                     | max. 100 mA             |
| <b>Interfaces</b>                            | CAN proprietary, V1.0.0 |

| Environmental conditions sensor Ants LES02 |  |
|--|--|
| <b>Protection</b> acc. to EN 60529         | IP54                                     |
| <b>Humidity</b>                            | < 90 % (non condensing)                  |
| <b>Working temperature</b>                 | -10°C ... +70°C [+14°F ... +158°F]       |
| <b>Storage temperature</b>                 | -15°C ... +80°C [+5°F ... +176°F]        |
| <b>Air pressure (operating altitude)</b>   | 800 ... 1013 hPA (up to 2000 m above NN) |

1) Reference is the nominal speed of the elevator facility.  
2) The sensor switches to error mode for speeds > 12 m/s.

# Linear measuring technology

|                             |              |  |
|-----------------------------|--------------|--|
| <b>Shaft copying system</b> | <b>PSU02</b> | <b>Safe System, SIL3</b><br><b>Measuring range up to 392 m</b> |
|-----------------------------|--------------|--|

| Technical data coded band LEX.BA |   |
|----------------------------------|---|
| <b>Material</b>                  | V2A spring-loaded stainless steel, chamfered edges  |
| <b>Dimensions</b>                | 16 x 0.4 mm [0.63 x 0.016"]                         |
| <b>Max. length</b>               | 392 m   |
| <b>Weight</b>                    | 50 g / m [1.76 oz/m]                                |
| <b>Thermal expansion</b>         | 16 x 10 <sup>-6</sup> / K<br>between 20°C ... 100°C |

| Technical data mounting kit LES.MK |                   |
|------------------------------------|-------------------|
| <b>Dimensions</b>                  | see manual R60205 |
| <b>Material</b>                    | see manual R60205 |

| Standards / Directives / Certificates |                          |                                   |
|---------------------------------------|--------------------------|-----------------------------------|
| <b>Standards</b>                      | elevator standard        | EN 81-20/-21/-50                  |
|                                       | EMC emission             | EN 12015                          |
|                                       | EMC immunity             | EN 12016                          |
|                                       | vibration resistance     | EN 60068-2-6 / EN 81-50, 5.6.3.1  |
|                                       | shock resistance         | EN 60068-2-27 / EN 81-50, 5.6.3.1 |
|                                       | environmental conditions | EN 60068-2-14 / EN 81-50, 5.6.3.2 |
| <b>Directives</b>                     | EMC directive            | 2014/30/EU                        |
|                                       | elevator directives      | 2014/33/EU                        |
|                                       | RoHs directive           | 2011/65/EU                        |
| <b>CE compliant</b>                   | yes                      |                                   |

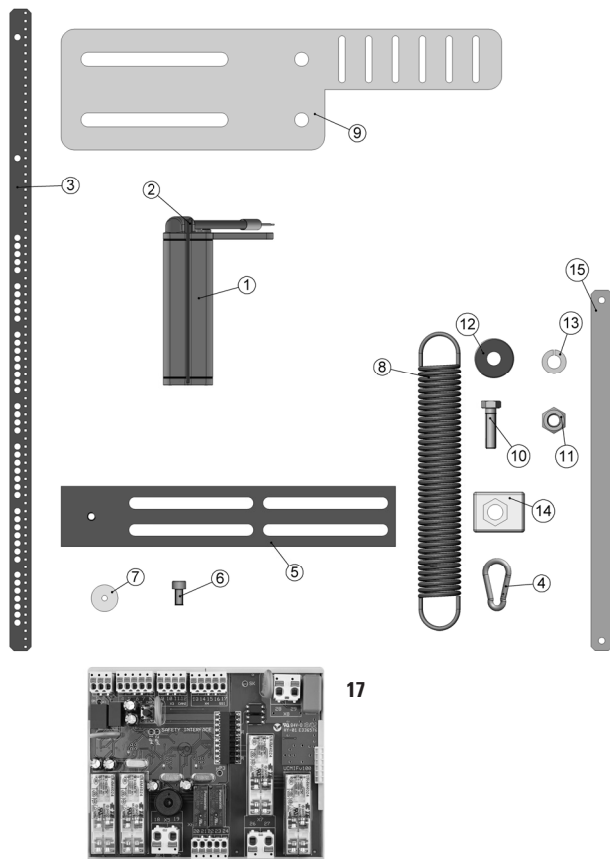
| Safety characteristics                    |                                    |
|---|------------------------------------|
| <b>Classification</b>                     | SIL3                               |
| <b>PFH<sub>d</sub> value</b>              | < 10 <sup>-8</sup> h <sup>-1</sup> |
| <b>Mission time / Proof test interval</b> | 20 years                           |

### Terminal assignment Ants LES02

| Interface | Type of connection | Cable       |      |         |    |     |
|-----------|--------------------|-------------|------|---------|----|-----|
|           |                    | 1<br>CAN    | 1, A | Signal: | +V | 0 V |
|           |                    | Core color: | BN   | WH      | GN | YE  |

- +V: Power supply +V DC
- 0 V: Power supply ground GND (0 V)

### Scope of delivery PSU02 with Ants LES02, LEX.BA and LES.MK



The following components included in the SIL3 certification are required for proper operation.

#### Ants LES02 (8.LES02.xxxx.xxxx)

- 1 1 x sensor
- 2 2 x sliding plates, mounted

#### Coded band LEX.BA (8.LEX.BA.xxxx)

- 3 1 x stainless steel coded band

#### Mounting kit LES.MK (8.LES.MK.0001)

- 4 3 x stainless steel snap hooks
- 5 1 x sensor cabin fastening plate
- 6 1 x sensor fastening screw with Polyfleck coating
- 7 1 x washer
- 8 1 x spring
- 9 2 x rail fastening plates
- 10 8 x M10x30 hexagon head screws
- 11 8 x M10 hexagon nuts
- 12 8 x M10 large diameter washers
- 13 8 x M10 retaining rings
- 14 8 x clamping plates
- 15 1 x securing band

#### Evaluation unit PSU02

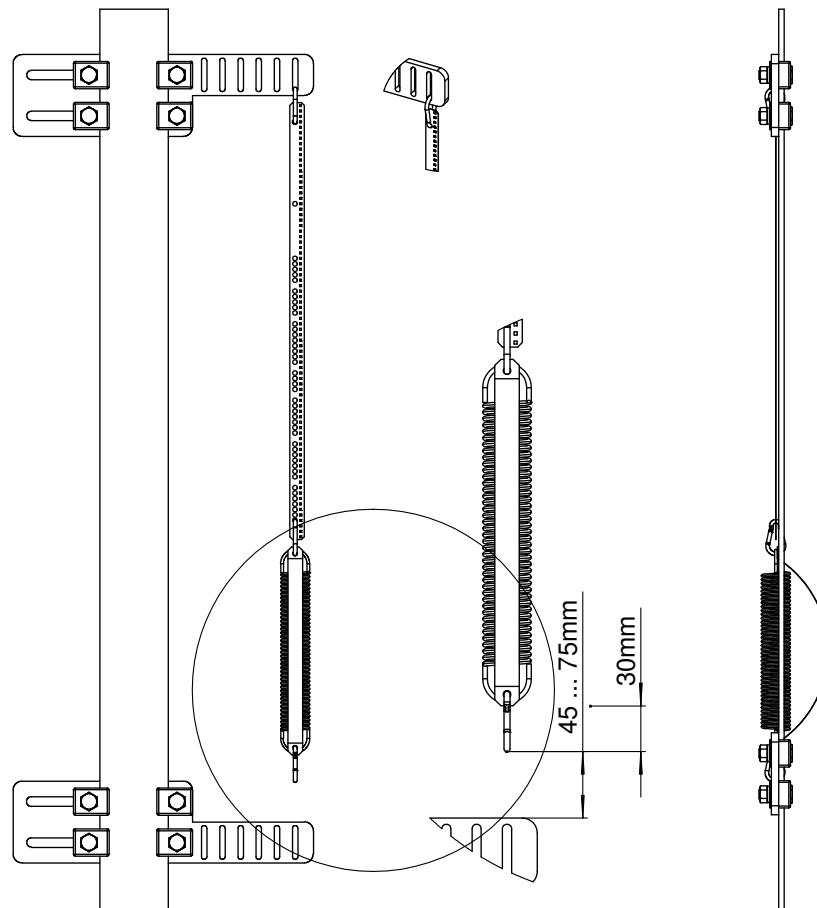
- 17 1 x evaluation unit

|                             |              |  |
|-----------------------------|--------------|--|
| <b>Shaft copying system</b> | <b>PSU02</b> | <b>Safe System, SIL3</b><br><b>Measuring range up to 392 m</b> |
|-----------------------------|--------------|--|

## Technology in detail

### Coded band fastening

Ants LES02 stands out in particular for its ease of installation. This saves time and costs.

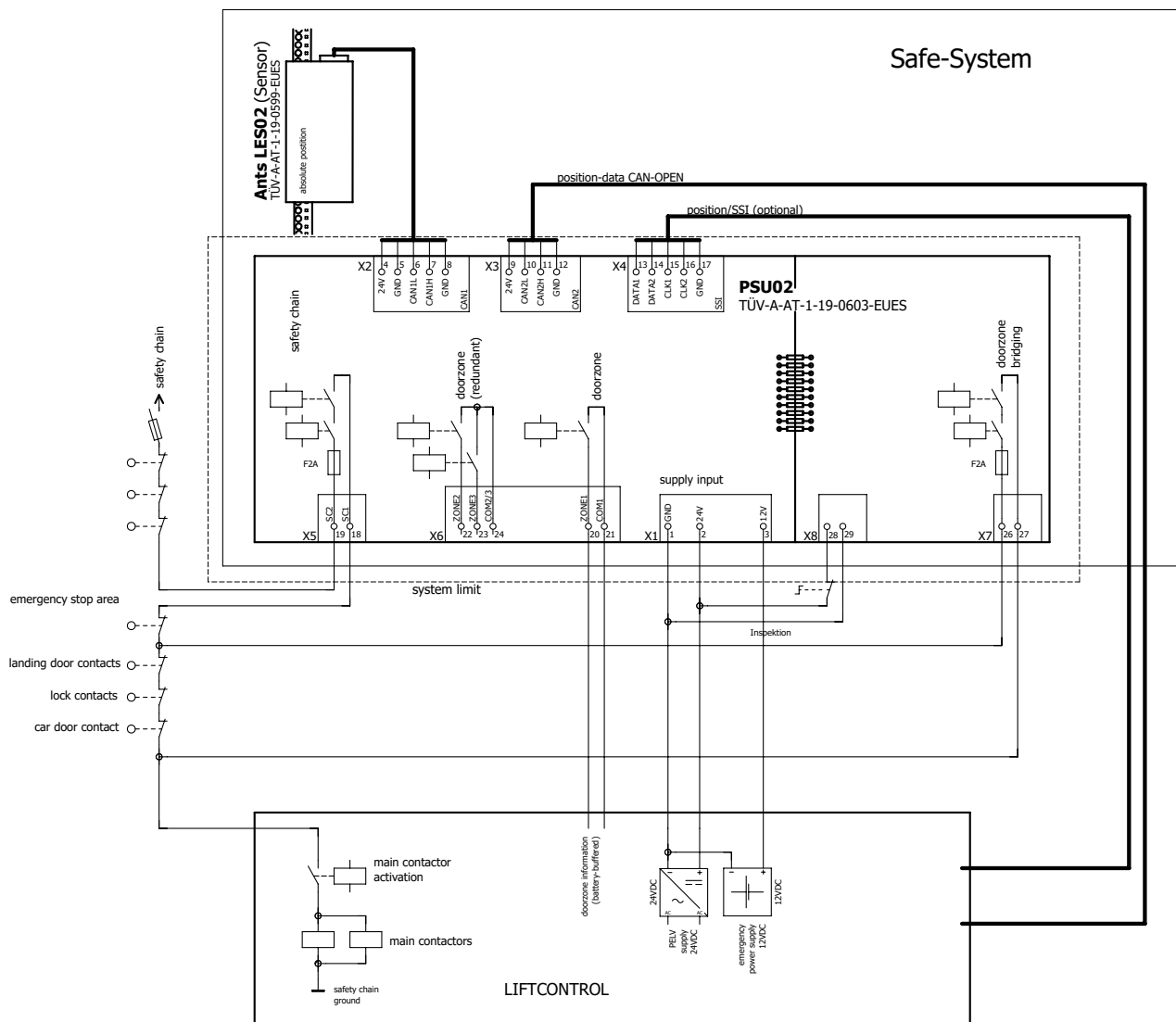


# Linear measuring technology

|                             |              |  |
|-----------------------------|--------------|--|
| <b>Shaft copying system</b> | <b>PSU02</b> | <b>Safe System, SIL3</b><br><b>Measuring range up to 392 m</b> |
|-----------------------------|--------------|--|

| Realizable elevator and safety functions |   |  |
|--|---|--|
| No.                                      |   |  |
| 1  | <b>Emergency limit switch</b>   | 5.12.2.3.1 b) 1                                    |
| 2  | <b>Unintended movement (UCM)</b>  | 5.6.7.7 2  |
| 3  | <b>Delay control (pre-tripping)</b>   | EN 81-20 : 5.12.1.3 3                              |
| 4  | <b>Overspeed teach-in (1.0 m/s)</b>   | No standard note 3                                 |
| 5  | <b>Inspection limit switch for reduced shaft head and pit</b>                                 | EN 81-21 : 5.5.3.4, 5.7.3.4 2                      |
| 6  | <b>Overspeed inspection (0.6 m/s)</b>   | No standard note 2                                 |
| 7  | <b>Overspeed (pre-tripping +15%)</b>  | No standard note Functional                        |
| 8  | <b>Door bypass</b>  | EN 81-20 : 5.12.1.4 a), b), c), 2), d) 2           |
| 9  | <b>Two independent redundant signals for the door zones to drive an additional UCM device</b> | EN 81-20 : 5.11.2.5<br>EN 81-50 : 5.6.3.1.1 No SIL |

## Wiring diagram Safe-System

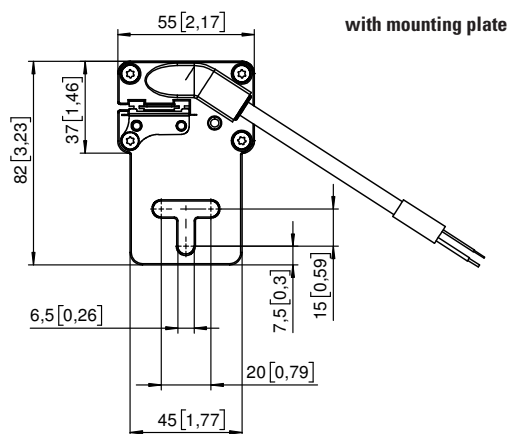
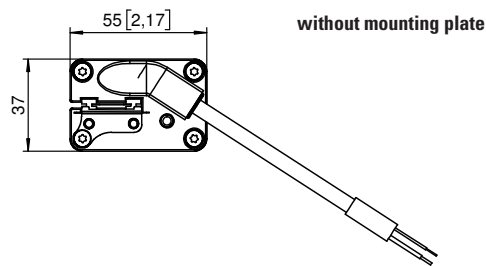
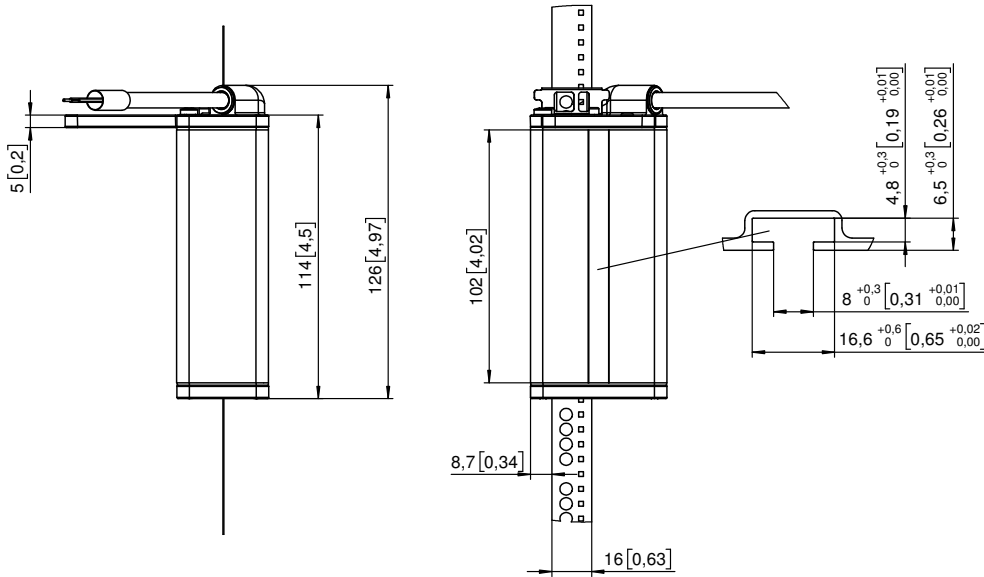


|                             |              |  |
|-----------------------------|--------------|--|
| <b>Shaft copying system</b> | <b>PSU02</b> | <b>Safe System, SIL3</b><br><b>Measuring range up to 392 m</b> |
|-----------------------------|--------------|--|

## Dimensions

Dimensions in mm [inch]

### Sensor Ants LES02



# Linear measuring technology

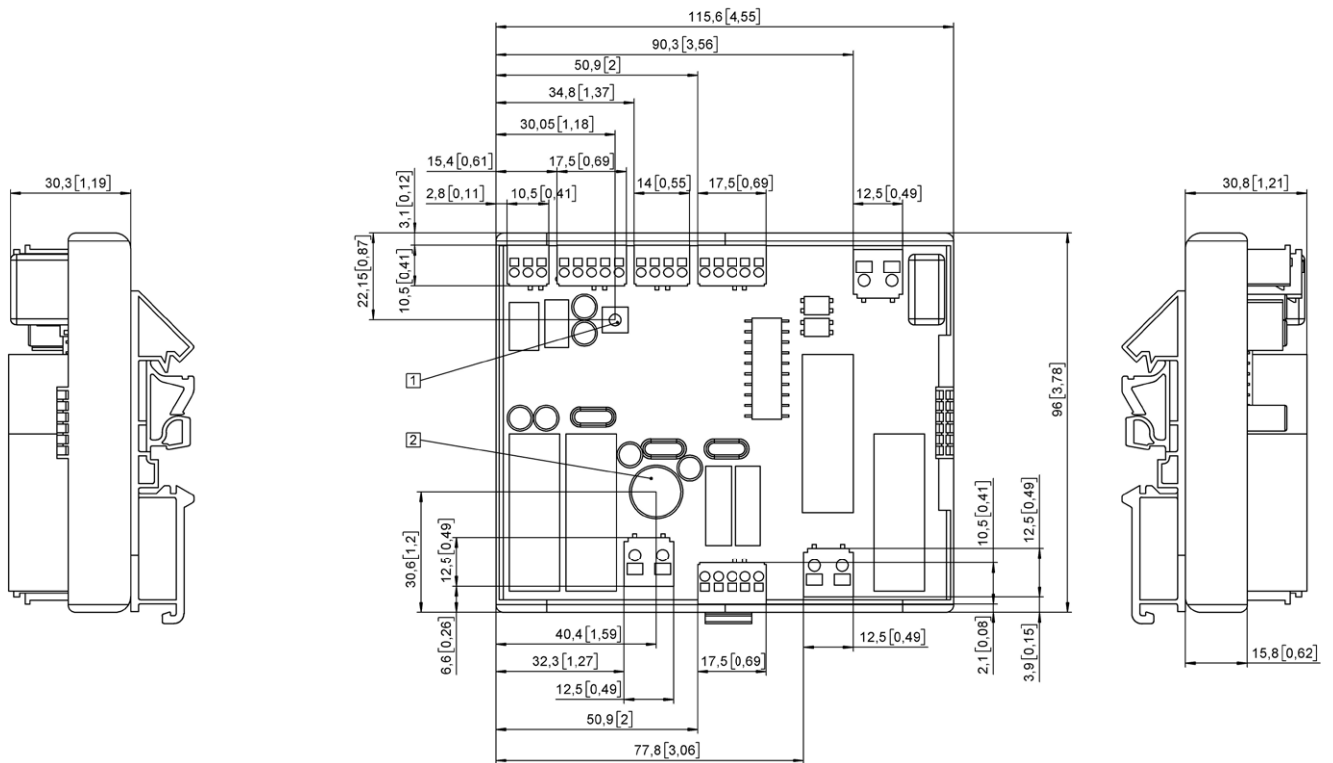
|                             |              |  |
|-----------------------------|--------------|--|
| <b>Shaft copying system</b> | <b>PSU02</b> | <b>Safe System, SIL3</b><br><b>Measuring range up to 392 m</b> |
|-----------------------------|--------------|--|

## Dimensions

Dimensions in mm [inch]

### Evaluation unit PSU02

(Installation on all DIN EN top hat rails)



- 1 Pushbutton
- 2 Signal generator