

# M7L

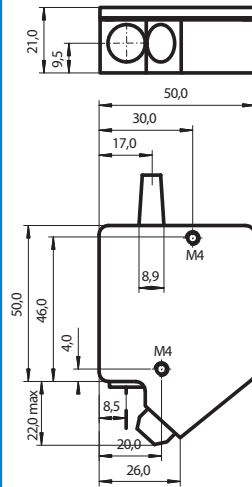
## Laser Distance Sensor

for automated manufacturing

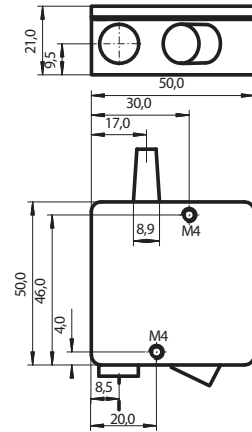


- Analog output / RS 232 interface
- Ranges 0,5 mm up to 400 mm
- Measuring frequency 10 kHz
- Reliable results also with white/black transition
- Compact design due to separate electronic unit

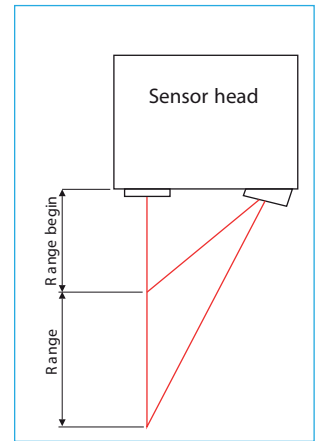
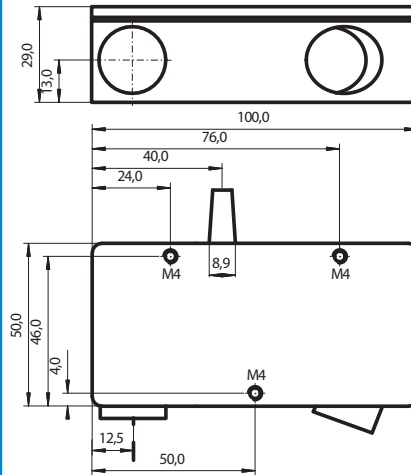
**Type 1**  
weight 250 g, cable length 2m



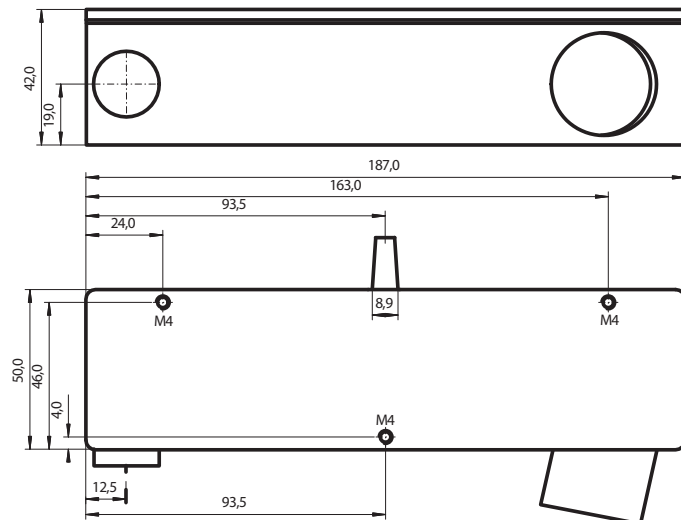
**Type 2**  
weight 240 g, cable length 2m



**Type 3**  
weight 400 g, cable length 2m



**Type 4**  
weight 850 g, cable length 2m



Error and technical modification reserved

DB-M7L\_3-04-E

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## Specifications

| Sensor M7L/              |         | 0.5  | 2   | 4   | 10  | 20  | 50  | 100 | 200 | 400 |
|--------------------------|---------|--|-----|-----|-----|-----|-----|-----|-----|-----|
| Casing type              |         | 1  | 2   | 2   | 2   | 2   | 3   | 3   | 3   | 4   |
| Measuring range          | [mm]    | 0.5  | 2   | 4   | 10  | 20  | 50  | 100 | 200 | 400 |
| Range begin <sup>1</sup> | [mm]    | 23.75  | 23  | 22  | 40  | 55  | 95  | 170 | 240 | 480 |
| Linearity ±              | [µm]    | 1  | 4   | 8   | 20  | 40  | 100 | 200 | 400 | 700 |
| Resolution <sup>2</sup>  | [µm]    | 0.2  | 0.4 | 1   | 5   | 9   | 30  | 60  | 200 | 600 |
| Light spot diameter      | [mm]    | 0.1  | 0.2 | 0.3 | 0.6 | 0.9 | 1.5 | 1.5 | 2   | 4   |
| Laser protection class   |         | Klasse 2 according to DIN EN 60825-1:2001-11                     |     |     |     |     |     |     |     |     |
| Light source             |         | Laser, wave length 670 nm, red visible                           |     |     |     |     |     |     |     |     |
| Sampling rate            |         | 54 kHz   |     |     |     |     |     |     |     |     |
| Distance output          | analog  | 4-20 mA / ±10 V / optional: 0-20 mA, 0-10 V, 0-5 V, ±5 V         |     |     |     |     |     |     |     |     |
|                          | digital | RS 232   |     |     |     |     |     |     |     |     |
| Impedance                |         | approx. 0 Ohm (10 mA max.)                                       |     |     |     |     |     |     |     |     |
| Bandwidth                |         | adjustable: 15 Hz ... 10 kHz (-3 db)                             |     |     |     |     |     |     |     |     |
| Temperature drift        |         | 0.02% of range / K   |     |     |     |     |     |     |     |     |
| Light intensity output   |         | 0-10 V   |     |     |     |     |     |     |     |     |
| MIN                      |         | +24 V / 10 mA when lower than MIN, LED yellow                    |     |     |     |     |     |     |     |     |
| OK                       |         | +24 V / 10 mA when higher than MIN and lower than MAX, LED green |     |     |     |     |     |     |     |     |
| MAX                      |         | +24 V / 10 mA when higher than MAX, LED orange                   |     |     |     |     |     |     |     |     |
| Error output             |         | +24 V / 10 mA, LED red   |     |     |     |     |     |     |     |     |
| Switching hysteresis     |         | approx. 0.5% of range  |     |     |     |     |     |     |     |     |
| Ambient light            |         | 20,000 Lux   |     |     |     |     |     |     |     |     |
| Operation time           |         | 50,000 h for laser diode   |     |     |     |     |     |     |     |     |
| Isolation voltage        |         | 200 VDC, 0 V against casing                                      |     |     |     |     |     |     |     |     |
| Max. vibration           |         | 5 g up to 1 kHz  |     |     |     |     |     |     |     |     |
| Operation temperature    |         | 0° ... +50°C   |     |     |     |     |     |     |     |     |
| Speichertemperatur       |         | -20° ... +70°C   |     |     |     |     |     |     |     |     |
| Humidity                 |         | up to 90% RH, non condensing                                     |     |     |     |     |     |     |     |     |
| Protection class         |         | sensor head: IP 64, electronic unit: IP 40                       |     |     |     |     |     |     |     |     |
| Power supply             |         | +24 VDC / 250 mA (10 ... 30 V)                                   |     |     |     |     |     |     |     |     |

<sup>1</sup> Measured from casing edge

<sup>2</sup> Measurement at 15 Hz, surface colour matt white

### Scope of Delivery

- Sensor with sensor head cable 2m
- Electronic unit
- 25-pol. SUB-D connector, solderable
- Calibration report

### Options

*please state for ordering*

- Special length of sensor head cable
- Sensor head vibration resistant
- Interference filter
- Enhanced laser power

### Accessories

- Protection casing
- Connection cable
- Protection glasses
- Power supply

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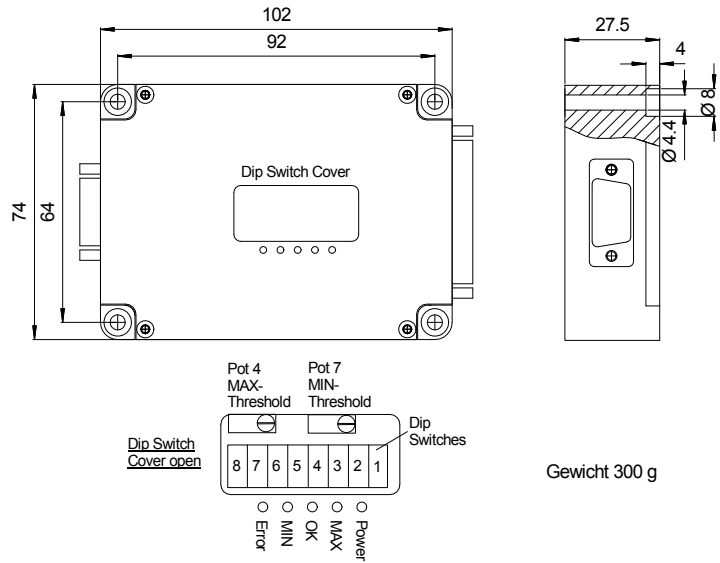
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## Electronic Unit

### Supply and evaluation unit



### Pin Assignment:

| 25 pin SUB-D Pin | Function                                    | Colour |                        |
|------------------|---|--------|------------------------|
| 1                | Distance output $\pm 10$ V <sup>1</sup>     | white  |                        |
| 2                | Error +24 V / 10 mA                         | red    |                        |
| 3                | Multifunction port, 0 V                     |        |                        |
| 5                | Range OK, +24 V / 10 mA                     | pink   |                        |
| 6                | 4 ... 20 mA                                 | blue   |                        |
| 8                | 0 V supply                                  | yellow |                        |
| 14               | Analog GND                                  | brown  |                        |
| 16               | MAX, +24 V / 10 mA                          | violet |                        |
| 17               | Input Sensor 2 (thickness measurement only) |        |                        |
| 19               | MIN, +24 V / 10 mA                          | black  |                        |
| 20               | Light intensity 0 ... 10 V                  | grey   |                        |
| 21               | +24 V supply                                | green  |                        |
| Casing           | EMV   | shield |                        |
|                  | <b>Serial interface / Function</b>          |        | <b>9 pin SUB-D Pin</b> |
| 4                | TXD   | yellow | 2                      |
| 7                | RXD   | brown  | 3                      |
| 8                | GND   | green  | 5                      |
| 18               | RTS   | white  | 7 / 8                  |
|                  | Jumper                                      |        | 1 / 4 / 6              |

### Dip Switch Settings:

| SW1              | Function                         |                                  |         |        |
|------------------|----------------------------------|----------------------------------|---------|--------|
| on               | RS 232 Software Trigger with RXD |                                  |         |        |
| off              | Stop with RTS                    |                                  |         |        |
| SW2              | SW3                              | Function                         |         |        |
| on               | on                               | RS 232 baud rate = 9.6 kBaud     |         |        |
| off              | on                               | RS 232 baud rate = 19.2 kBaud    |         |        |
| on               | off                              | RS 232 baud rate = 38.4 kBaud    |         |        |
| off              | off                              | RS 232 baud rate = 115.2 kBaud   |         |        |
| SW4              | SW5                              | SW6                              | F / kHz | T / ms |
| on               | on                               | on                               | 10      | 0.1    |
| off              | on                               | on                               | 7       | 0.14   |
| on <sup>2</sup>  | off                              | on                               | 4       | 0.25   |
| off              | off                              | on                               | 1       | 1      |
| on               | on                               | off                              | 0.25    | 4      |
| off              | on                               | off                              | 0.1     | 10     |
| on               | off                              | off                              | 0.025   | 40     |
| off              | off                              | off                              | 0.015   | 67     |
| SW7              | SW8                              | Multifunction Port (Pin 3)       |         |        |
| on <sup>2</sup>  | on                               | Laser off (I/O = GND)            |         |        |
| off              | on                               | ---                              |         |        |
| on <sup>3</sup>  | off                              | Trigger output / Sensor = Master |         |        |
| off <sup>3</sup> | off                              | Trigger input / Sensor = Slave   |         |        |

<sup>1</sup> Thickness measuring system: 0 - 10 V at Master

### Cabling thickness measuring system:

Pin 3 (Master) to Pin 3 (Slave)  
Pin 17 (Master) to Pin 1 (Slave)

<sup>2</sup> Default setting

<sup>3</sup> Thickness measurement only