

## Technical data sheet

### Capacitive sensor

Part no.: 50135721

LCS-1M18P-F05NNP-M12-LT

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- Circuit diagrams
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For illustration purposes only



## Technical data

### Basic data

|  |              |
|--|--------------|
| Series   | LCS-1        |
| Switching distance $S_n$ (embedded installation)       | 1 ... 5 mm   |
| Switching distance $S_n$ (non-embedded installation)   | 1 ... 7.5 mm |
| Assured switching distance (embedded installation)     | 3.6 mm       |
| Assured switching distance (non-embedded installation) | 5.4 mm       |

### Electrical data

|                    |   |
|--------------------|---|
| Protective circuit | Polarity reversal protection<br>Short circuit protected |
|--------------------|---|

### Performance data

|  |                        |
|--|------------------------|
| Supply voltage $U_B$                     | 10 ... 30 V, DC        |
| Residual ripple                          | 0 ... 10 %, From $U_B$ |
| Open-circuit current                     | 15 mA                  |
| Temperature drift, max. (in % of $S_n$ ) | 20 %                   |
| Repeatability, max. (in % of $S_n$ )     | 2 %                    |
| Rated operating current                  | 200 mA                 |

### Outputs

|                                     |            |
|-------------------------------------|------------|
| Number of digital switching outputs | 1 Piece(s) |
|-------------------------------------|------------|

### Switching outputs

|              |                          |
|--------------|--------------------------|
| Type         | Digital switching output |
| Voltage type | DC                       |

### Switching output 1

|                     |   |
|---------------------|---|
| Assignment          | Connection 1, pin 4   |
| Switching element   | Transistor, NPN   |
| Switching principle | Normally closed contact (NC)/normally open contact (NO), programmable |

### Time behavior

|                     |       |
|---------------------|-------|
| Switching frequency | 10 Hz |
|---------------------|-------|

### Interface

|      |         |
|------|---------|
| Type | IO-Link |
|------|---------|

### IO-Link

|               |      |
|---------------|------|
| COM mode      | COM2 |
| Frame type    | 2.2  |
| Specification | 1.1  |

### Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 1 Piece(s) |
|-----------------------|------------|

### Connection 1

|                    |                              |
|--------------------|------------------------------|
| Function           | Signal OUT<br>Voltage supply |
| Type of connection | Connector                    |
| Thread size        | M12                          |
| Type               | Male                         |
| Material           | Plastic                      |
| No. of pins        | 5 -pin                       |
| Encoding           | A-coded                      |

### Mechanical data

|                                |                            |
|--------------------------------|----------------------------|
| Design                         | Cylindrical                |
| Thread size                    | M18 x 1 mm                 |
| Dimension ( $\varnothing$ x L) | 18 mm x 87.3 mm            |
| Type of installation           | Embedded                   |
| Housing material               | Plastic                    |
| Plastic housing                | Polyamide (PA 12)          |
| Sensing face material          | Plastic, Polyamide (PA 12) |
| Cover material                 | Plastic, Polyamide (PA 12) |
| Net weight                     | 40 g                       |

### Operation and display

|                                     |  |
|-------------------------------------|--|
| Type of display                     | LED  |
| Number of LEDs                      | 1 Piece(s)   |
| Operational controls                | Multiturn potentiometer (12 turns)<br>Teach button |
| Function of the operational control | Sensitivity adjustment                             |
| Switching distance, adjustable      | Yes  |

### Environmental data

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -25 ... 70 °C |
|--------------------------------|---------------|

### Certifications

|                      |               |
|----------------------|---------------|
| Degree of protection | IP 67         |
| Protection class     | III           |
| Certifications       | c UL US       |
| Standards applied    | IEC 60947-5-2 |

## Technical data

### Correction factors

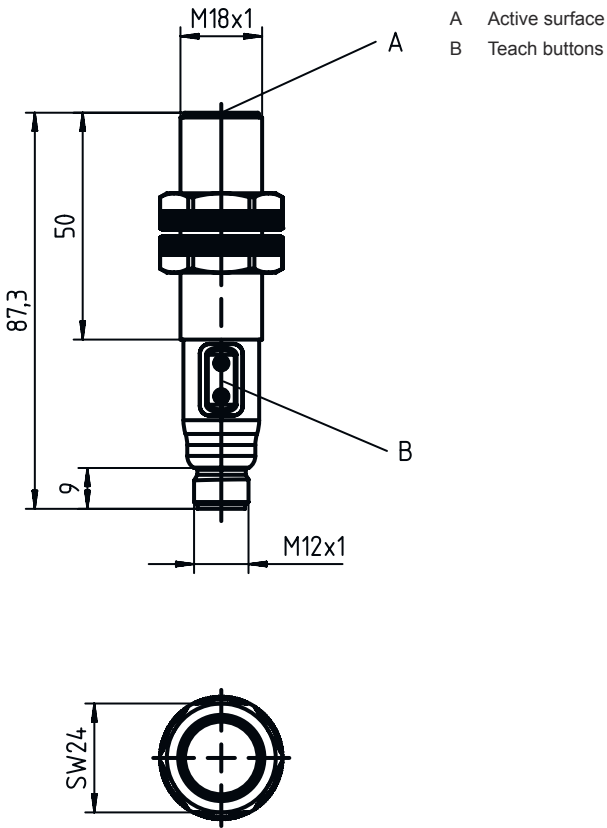
|                            |               |
|----------------------------|---------------|
| Acetone                    | 0.75          |
| Acrylic resin              | 0.1 ... 0.25  |
| Alcohol                    | 0.85          |
| Ammonia                    | 0.7 ... 0.85  |
| Aniline                    | 0.4           |
| Gasoline                   | 0.1           |
| Celluloid                  | 0.15          |
| Liquid chlorine            | 0.1           |
| Ebonite                    | 0.15          |
| Epoxy resin                | 0.15 ... 0.35 |
| Crude oil                  | 0.05          |
| Ethanol                    | 0.85          |
| Ethylene glycol            | 0.93          |
| Freon R22 and 502 (liquid) | 0.35          |
| Grain                      | 0.15 ... 0.3  |
| Glass                      | 0.2 ... 0.55  |
| Glycerin                   | 0.98          |
| Rubber                     | 0.15 ... 0.9  |
| Wood, wet                  | 0.6 ... 0.85  |
| Wood, dry                  | 0.1 ... 0.4   |
| Carbon dioxide             | 0             |
| Air                        | 0             |
| Marble                     | 0.5           |
| Flour                      | 0.05          |
| Melamine resin             | 0.25 ... 0.55 |
| Milk powder                | 0.2           |
| Nylon                      | 0.2 ... 0.3   |
| Oil-containing paper       | 0.25          |
| Paper                      | 0.1           |
| Polyamide                  | 0.3           |
| Polyester resin            | 0.15 ... 0.5  |
| Pressboard                 | 0.1 ... 0.3   |
| PTFE                       | 0.1           |
| Quartz glass               | 0.2           |
| Salt                       | 0.35          |
| Sand                       | 0.15 ... 0.3  |
| Water                      | 1             |
| Cement dust                | 0.25          |
| Sugar                      | 0.15          |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27270102 |
| ECLASS 8.0            | 27270102 |
| ECLASS 9.0            | 27270102 |
| ECLASS 10.0           | 27270102 |
| ECLASS 11.0           | 27270102 |
| ECLASS 12.0           | 27274201 |
| ECLASS 13.0           | 27274201 |
| ECLASS 14.0           | 27274201 |
| ETIM 5.0              | EC002715 |
| ETIM 6.0              | EC002715 |
| ETIM 7.0              | EC002715 |
| ETIM 8.0              | EC002715 |
| ETIM 9.0              | EC002715 |

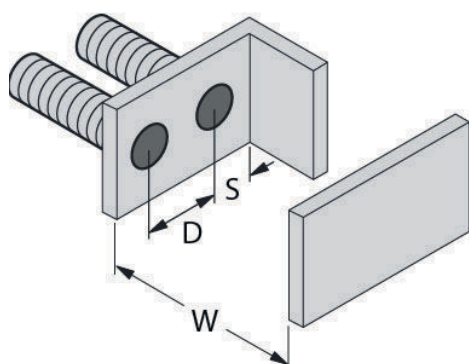
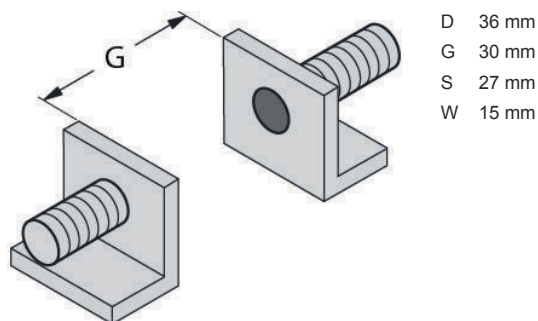
## Dimensioned drawings

All dimensions in millimeters



# Dimensioned drawings

## Mounting distances

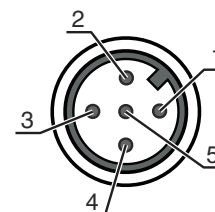


## Electrical connection

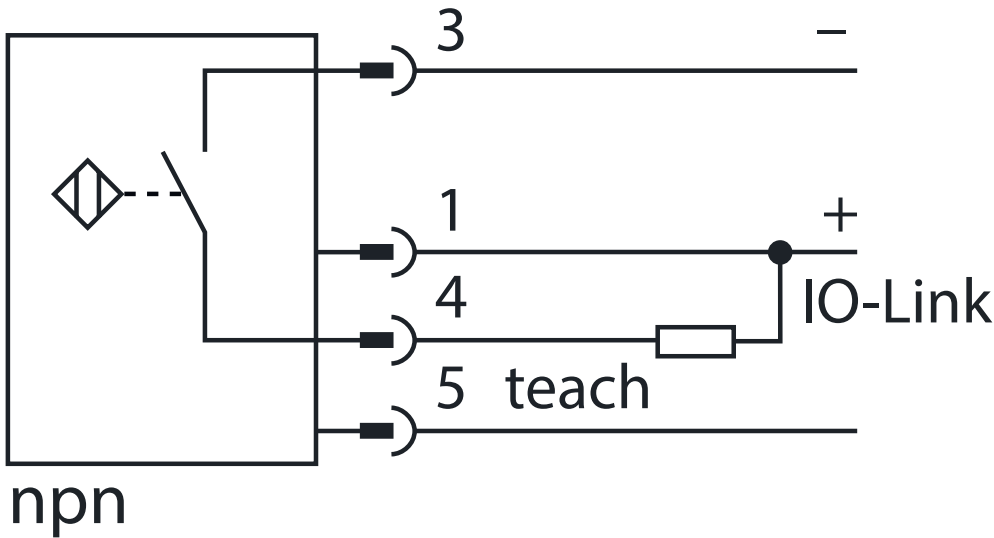
### Connection 1

|                    |                |
|--------------------|----------------|
| Function           | Signal OUT     |
|                    | Voltage supply |
| Type of connection | Connector      |
| Thread size        | M12            |
| Type               | Male           |
| Material           | Plastic        |
| No. of pins        | 5 -pin         |
| Encoding           | A-coded        |

| Pin | Pin assignment | Conductor color |
|-----|----------------|-----------------|
| 1   | +10...30 V DC  | Brown           |
| 2   | n.c.           | White           |
| 3   | GND            | Blue            |
| 4   | IO-Link        | Black           |
| 5   | Teach-in       | Gray            |



## Circuit diagrams



## Operation and display

| LED | Display                  | Meaning                          |
|-----|--------------------------|----------------------------------|
| 1   | Yellow, continuous light | Switching output/switching state |

## Part number code

Part designation: LCS-ABBBC-DDDEFF-GHHHIJJJ KK

|     |   |
|-----|---|
| LCS | <b>Operating principle</b><br>LCS: capacitive sensor  |
| A   | <b>Series</b><br>1: series 1 "Extended"<br>2: series 2 "Advanced"   |
| BBB | <b>Design</b><br>M12: series with M12 x 1 external thread<br>M18: series with M18 x 1 external thread<br>M30: series with M30 x 1.5 external thread<br>Q40: series in cubic design, length 40 mm<br>Q54: series in cubic design, length 54 mm   |
| C   | <b>Housing material</b><br>B: Brass<br>M: metal<br>P: plastic/PBT<br>T: PTFE  |
| DDD | <b>Measurement range / type of installation</b><br>F03: typ. range limit 3.0 mm / embedded installation<br>F04: typ. range limit 4.0 mm / embedded installation<br>F05: typ. range limit 5.0 mm / embedded installation<br>F06: typ. range limit 6.0 mm / embedded installation<br>F08: typ. range limit 8.0 mm / embedded installation<br>F10: typ. range limit 10.0 mm / embedded installation<br>F15: typ. range limit 15.0 mm / embedded installation<br>F20: typ. range limit 20.0 mm / embedded installation<br>N06: typ. range limit 6.0 mm / non-embedded installation<br>N08: typ. range limit 8.0 mm / non-embedded installation<br>N15: typ. range limit 15.0 mm / non-embedded installation<br>N25: typ. range limit 25.0 mm / non-embedded installation<br>N30: typ. range limit 30.0 mm / non-embedded installation |

## Part number code

|            |  |
|------------|--|
| <b>E</b>   | <b>Output function</b><br>B: NC and NO contact<br>N: NPN<br>P: PNP                               |
| <b>FF</b>  | <b>Switching</b><br>NC: Normally closed contact<br>NO: normally open contact<br>NP: programmable |
| <b>G</b>   | <b>Connection cable</b><br>K: Cable<br>n/a: no cable   |
| <b>HHH</b> | <b>Cable length</b><br>020: length 2,000 mm<br>003: length 300 mm<br>n/a: no cable               |
| <b>I</b>   | <b>Cable material</b><br>P: PUR<br>T: PTFE<br>V: PVC   |
| <b>JJJ</b> | <b>Electrical connection</b><br>M08: M8 connector, 3-pin<br>M12: M12 connector, 4-pin (plug)     |
| <b>KK</b>  | <b>Special equipment</b><br>L: IO-Link interface<br>T: teach-in<br>n/a: no special equipment     |

### Note



A list with all available device types can be found on the Leuze website at [www.leuze.com](http://www.leuze.com).

## Notes



### Observe intended use!



- ⌘ This product is not a safety sensor and is not intended as personnel protection.
- ⌘ The product may only be put into operation by competent persons.
- ⌘ Only use the product in accordance with its intended use.

### Teach via IO-Link



All operating modes are teachable via FDT/IODD

### Teach via teach buttons



- ⌘ Switching point medium present<sup>1</sup>: Press button 1 for 2 to 9 s
- ⌘ Switching point medium not present<sup>1</sup>: Press button 2 for 2 to 9 s
- ⌘ Change NC contact/NO contact: Press button 1 for more than 10 s
- ⌘ Reset: Press button 2 for more than 10 s

## Notes

| Teach via manual bridging |   |
|---------------------------|---|
|                           | ↪ Switching point medium present <sup>1</sup> : Apply U <sub>B</sub> for 2 to 9 s |
|                           | ↪ Switching point medium not present <sup>1</sup> : Apply GND for 2 to 9 s        |
|                           | ↪ Change NC contact/NO contact: Apply U <sub>B</sub> for more than 10 s           |
|                           | ↪ Reset: Apply GND for more than 10 s   |

| NOTE |  |
|------|--|
|      | ↪ The specified minimum distances have been checked with a standard switching distance. If the sensitivity of the sensor is changed using a potentiometer, this data sheet information is no longer valid. |

## Further information

- Manual teach function: Manual bridging possible via pin 5. To do this, U<sub>B</sub> or GND must be applied via a 5-wire cable.
- <sup>1</sup> If the switching point is to be set centrally between "Medium present" and "Medium not present", both media statuses must be taught in consecutively.

## Accessories

### Connection technology - Connection unit

|  | Part no. | Designation           | Article        | Description   |
|--|----------|-----------------------|----------------|---|
|  | 50144900 | MD 798i-11-82/L5-2222 | IO-Link master | Type: IO-Link master<br>Current consumption, max.: 11,000 mA<br>Switching outputs for each sensor connection: 1 Piece(s)<br>Switching output: Transistor, PNP<br>Interface: IO-Link, Automatic protocol detection, EtherNet IP, Modbus TCP, PROFINET<br>Connections: 12 Piece(s)<br>Sensor connections: 8 Piece(s)<br>Connections for voltage supply: 2 Piece(s)<br>Interface connections: 2 Piece(s)<br>Degree of protection: IP 67, IP 65, IP 69K |

### Connection technology - Connection cables

|  | Part no. | Designation        | Article          | Description   |
|--|----------|--------------------|------------------|---|
|  | 50130654 | KD U-M12-4A-P1-020 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 2.000 mm<br>Sheathing material: PUR |
|  | 50130657 | KD U-M12-4A-P1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin<br>Connector, LED: No<br>Connection 2: Open end<br>Shielded: No<br>Cable length: 5.000 mm<br>Sheathing material: PUR |



## Accessories

### Note



A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page.