

## Technical data sheet

### Capacitive sensor

Part no.: 50135695

LCS-1M12M-F04NNC-K020P

#### Contents

- Technical data
- Dimensioned drawings
- Electrical connection
- Circuit diagrams
- Operation and display
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Figure can vary



## Technical data

### Basic data

|                            |            |
|----------------------------|------------|
| Series                     | LCS-1      |
| Switching distance $S_n$   | 1 ... 4 mm |
| Assured switching distance | 4 mm       |

### Characteristic parameters

|      |           |
|------|-----------|
| MTTF | 343 years |
|------|-----------|

### Electrical data

|                    |                              |
|--------------------|------------------------------|
| Protective circuit | Polarity reversal protection |
|                    | 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 $S_r$ ) | 20 %                   |
| Repeatability, max. (in % of $S_r$ )     | 2 %                    |
| Rated operating current                  | 100 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, conductor 2 |
| Switching element   | Transistor, NPN           |
| Switching principle | NC (normally closed)      |

### Time behavior

|                     |        |
|---------------------|--------|
| Switching frequency | 100 Hz |
|---------------------|--------|

### Connection

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

#### Connection 1

|                      |                      |
|----------------------|----------------------|
| Function             | Signal OUT           |
|                      | Voltage supply       |
| Type of connection   | Cable                |
| Cable length         | 2,000 mm             |
| Sheathing material   | PUR                  |
| Number of conductors | 3 -wire              |
| Wire cross section   | 0.14 mm <sup>2</sup> |

### Mechanical data

|                         |                             |
|-------------------------|-----------------------------|
| Design                  | Cylindrical                 |
| Thread size             | M12 x 1 mm                  |
| Dimension (Ø x L)       | 12 mm x 61 mm               |
| Type of installation    | Embedded                    |
| Housing material        | Metal                       |
|                         | Stainless steel             |
| Stainless steel housing | V2A                         |
| Sensing face material   | Plastic, Polybutylene (PBT) |
| Cover material          | Plastic, Polybutylene (PBT) |
| Net weight              | 59 g                        |

### Operation and display

|                                     |                                    |
|-------------------------------------|------------------------------------|
| Type of display                     | LED                                |
| Number of LEDs                      | 2 Piece(s)                         |
| Operational controls                | Multiturn potentiometer (20 turns) |
| Function of the operational control | Sensitivity adjustment             |
| Switching distance, adjustable      | Yes                                |

### Environmental data

|                                |               |
|--------------------------------|---------------|
| Ambient temperature, operation | -25 ... 85 °C |
|--------------------------------|---------------|

### Certifications

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

### Correction factors

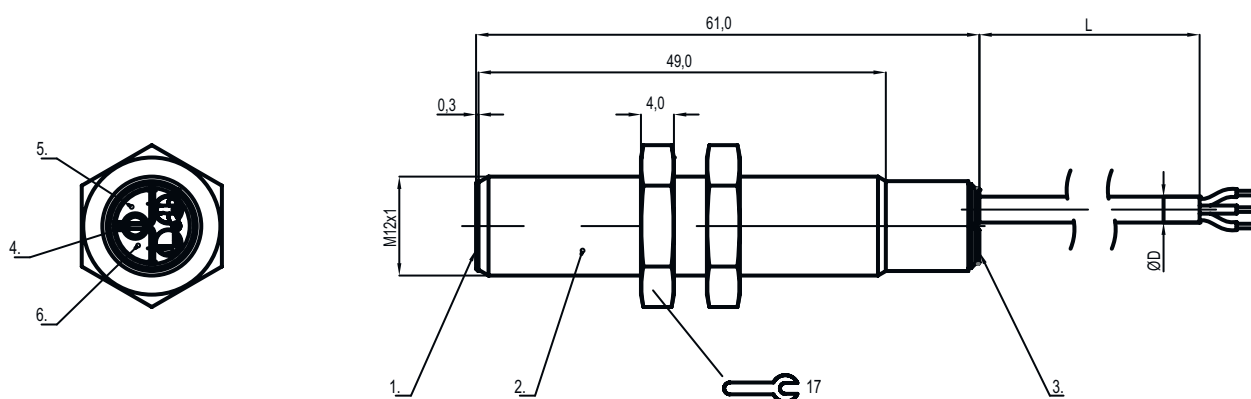
|                            |               |
|----------------------------|---------------|
| Acetone                    | 0.75          |
| Acrylic resin              | 0.1 ... 0.25  |
| Alcohol                    | 0.85          |
| Ammonia                    | 0.7 ... 0.85  |
| Aniline                    | 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          |

## Technical data

|                       |          |
|-----------------------|----------|
| 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 |
| ETIM 5.0              | EC002715 |
| ETIM 6.0              | EC002715 |
| ETIM 7.0              | EC002715 |
| ETIM 8.0              | EC002715 |

## Dimensioned drawings

All dimensions in millimeters



- |                  |  |
|------------------|--|
| 1 Active surface | 4 Potentiometer                        |
| 2 Housing        | 5 Green LED, operating voltage display |
| 3 Cover          | 6 Yellow LED, function indicator       |

## Electrical connection

### Connection 1

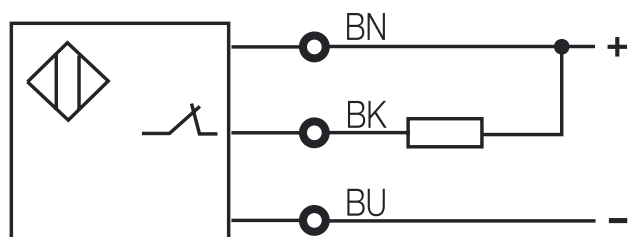
|                      |                      |
|----------------------|----------------------|
| Function             | Signal OUT           |
|                      | Voltage supply       |
| Type of connection   | Cable                |
| Cable length         | 2,000 mm             |
| Sheathing material   | PUR                  |
| Number of conductors | 3 -wire              |
| Wire cross section   | 0.14 mm <sup>2</sup> |

### Conductor color

### Conductor assignment

|       |              |
|-------|--------------|
| Brown | 10 - 30 V DC |
| Black | OUT          |
| Blue  | GND          |

## Circuit diagrams



## Operation and display

| LED | Display                  | Meaning                          |
|-----|--------------------------|----------------------------------|
| 1   | Green, continuous light  | Ready                            |
| 2   | Yellow, continuous light | Switching output/switching state |

## Part number code

Part designation: **LCS-ABBBC-DDDEFF-GHHHIJJ KK**

|            |   |
|------------|---|
| <b>LCS</b> | <b>Operating principle</b><br>LCS: capacitive sensor  |
| <b>A</b>   | <b>Series</b><br>1: series 1 "Extended"<br>2: series 2 "Advanced"   |
| <b>BBB</b> | <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   |
| <b>C</b>   | <b>Housing material</b><br>B: Brass<br>M: metal<br>P: plastic/PBT<br>T: PTFE  |
| <b>DDD</b> | <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 |
| <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  |

## Part number code

|     |  |
|-----|--|
| I   | <b>Cable material</b><br>P: PUR<br>T: PTFE<br>V: PVC   |
| JJJ | <b>Electrical connection</b><br>M08: M8 connector, 3-pin<br>M12: M12 connector, 4-pin (plug) |
| KK  | <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 <a href="http://www.leuze.com">www.leuze.com</a> . |
|--|--|

## Notes

### ⚠ Observe intended use!

|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>⌘ This product is not a safety sensor and is not intended as personnel protection.</li> <li>⌘ The product may only be put into operation by competent persons.</li> <li>⌘ Only use the product in accordance with its intended use.</li> </ul> |
|--|---|

## Accessories

### Mounting technology - Other

|  | Part no. | Designation | Article | Description   |
|--|----------|-------------|---------|---|
|  | 50111499 | MC 012K     | Clamp   | Diameter, inner: 12 mm<br>Design of mounting device: Mounting clamp<br>Fastening, at system: Through-hole mounting<br>Mounting bracket, at device: Clampable<br>Type of mounting device: Rigid<br>Material: Plastic |

### Note

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