

## Technical data sheet

### Capacitive sensor

Part no.: 50151577

LCS-2Q54P-N10NNC-K020P

#### Contents

- Technical data
- Dimensioned drawings
- Electrical connection
- Circuit diagrams
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For illustration purposes only



## Technical data

### Basic data

|                          |             |
|--------------------------|-------------|
| Series                   | LCS-2       |
| Switching distance $S_n$ | 1 ... 10 mm |

### Characteristic parameters

|      |           |
|------|-----------|
| MTTF | 563 years |
|------|-----------|

### Electrical data

|                    |                              |
|--------------------|------------------------------|
| Protective circuit | Overvoltage protection       |
|                    | 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                     | 20 mA                  |
| Temperature drift, max. (in % of $S_r$ ) | 15 %                   |
| Repeatability, max. (in % of $S_r$ )     | 5 %                    |
| 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, 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   | 0.18 mm <sup>2</sup> |

### Mechanical data

|                       |                        |
|-----------------------|------------------------|
| Design                | Cubic                  |
| Dimension (W x H x L) | 50 mm x 20 mm x 5.5 mm |
| Type of installation  | Non-embedded/non-flush |
| Housing material      | Plastic                |
| Plastic housing       | ABS                    |
| Sensing face material | ABS, ABS               |
| Cover material        | Plastic                |
| Net weight            | 44 g                   |

### Operation and display

|                                     |                                    |
|-------------------------------------|------------------------------------|
| Type of display                     | LED                                |
| Number of LEDs                      | 2 Piece(s)                         |
| Operational controls                | Multiturn potentiometer (12 turns) |
| Function of the operational control | Sensitivity adjustment             |
| Switching distance, adjustable      | Yes                                |

### Environmental data

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

### Certifications

|                      |               |
|----------------------|---------------|
| Degree of protection | IP 65         |
| Protection class     | III           |
| Standards applied    | IEC 60947-5-2 |

### Correction factors

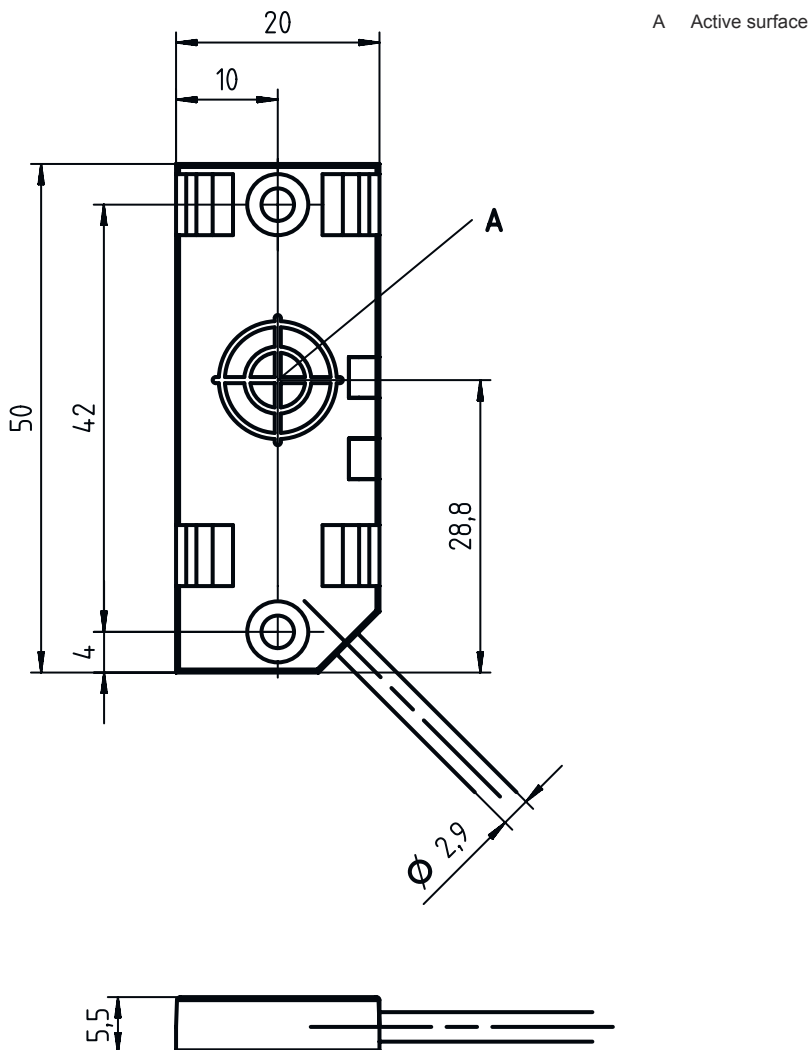
|                            |               |
|----------------------------|---------------|
| Acetone                    | 0.75          |
| Acrylic resin              | 0.1 ... 0.25  |
| Alcohol                    | 0.85          |
| Ammonia                    | 0.7 ... 0.85  |
| Aniline                    | 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 |
| ECLASS 14.0           | 27274201 |
| ECLASS 15.0           | 27274201 |
| ECLASS 16.0           | 27274201 |
| ETIM 5.0              | EC002715 |
| ETIM 6.0              | EC002715 |
| ETIM 7.0              | EC002715 |
| ETIM 8.0              | EC002715 |
| ETIM 9.0              | EC002715 |
| ETIM 10.0             | EC002715 |

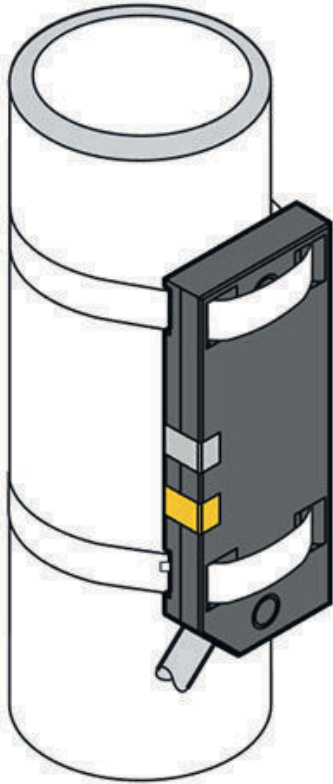
## Dimensioned drawings

All dimensions in millimeters



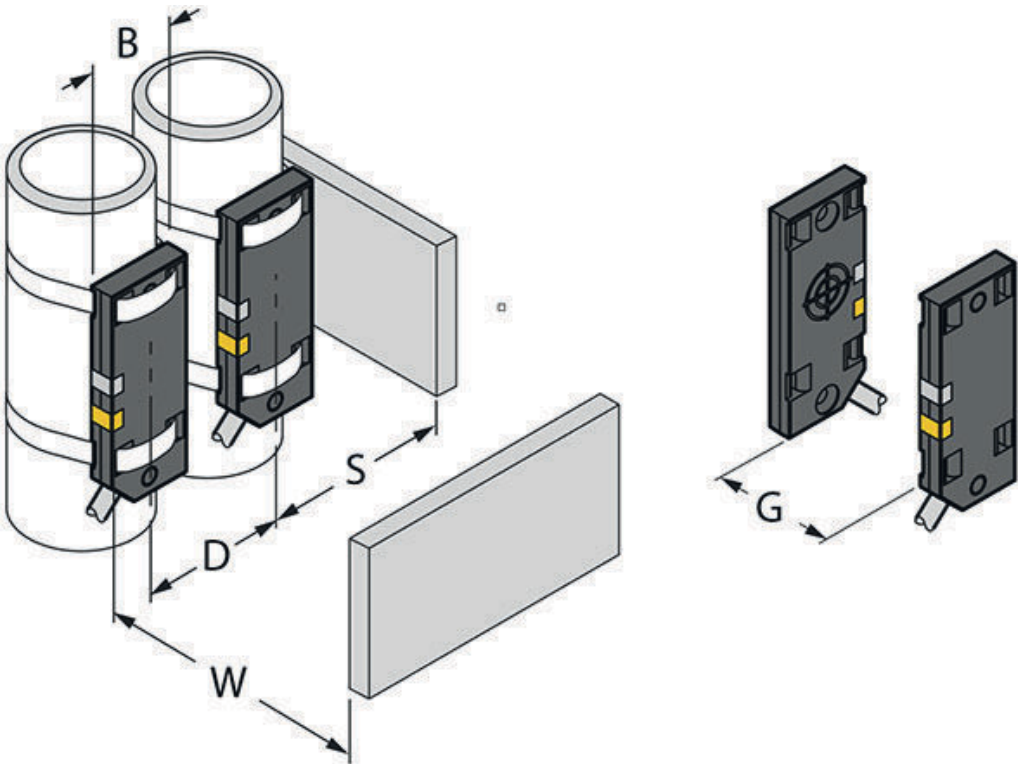
## Dimensioned drawings

### Mounting variants



Dimensioned drawings

Mounting distances



- B

Ø 20 mm, diameter of the active surface
- D

40 mm
- G

60 mm
- S

30 mm
- W

30 mm

Electrical connection

Connection 1

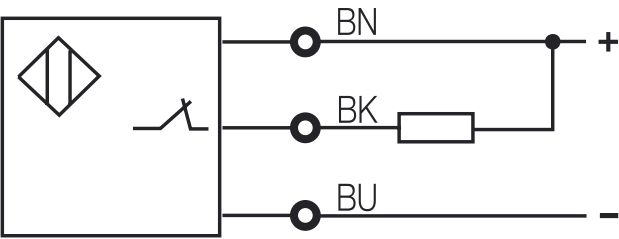
|                      |                |
|----------------------|----------------|
| Function             | Signal OUT     |
|                      | Voltage supply |
| Type of connection   | Cable          |
| Cable length         | 2,000 mm       |
| Sheathing material   | PUR            |
| Number of conductors | 3 -wire        |
| Wire cross section   | 0.18 mm²       |

Conductor color

Conductor assignment

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

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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/flush installation<br>F04: typ. range limit 4.0 mm / embedded/flush installation<br>F05: typ. range limit 5.0 mm / embedded/flush installation<br>F06: typ. range limit 6.0 mm / embedded/flush installation<br>F08: typ. range limit 8.0 mm / embedded/flush installation<br>F10: typ. range limit 10.0 mm / embedded/flush installation<br>F15: typ. range limit 15.0 mm / embedded/flush installation<br>F20: typ. range limit 20.0 mm / embedded/flush installation<br>N06: typ. range limit 6.0 mm / non-embedded/non-flush installation<br>N08: typ. range limit 8.0 mm / non-embedded/non-flush installation<br>N10: Typ. range limit 10.0 mm / non-embedded/non-flush installation<br>N15: typ. range limit 15.0 mm / non-embedded/non-flush installation<br>N25: typ. range limit 25.0 mm / non-embedded/non-flush installation<br>N30: typ. range limit 30.0 mm / non-embedded/non-flush installation |
| E   | <b>Output function</b><br>B: NC and NO contact<br>N: NPN<br>P: PNP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| FF  | <b>Switching</b><br>NC: Normally closed contact<br>NO: normally open contact<br>NP: programmable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| G   | <b>Connection cable</b><br>K: Cable<br>n/a: no cable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

Part number code

|     |                                                                                              |
|-----|----------------------------------------------------------------------------------------------|
| HHH | <b>Cable length</b><br>020: length 2,000 mm<br>003: length 300 mm<br>n/a: no cable           |
| 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!

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

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. |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|