



Part no.: 50135720
LCS-1M18P-F05PNP-M12-LT
Capacitive sensor



Figure can vary

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- Technical data
- Dimensioned drawings
- Electrical connection
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- Operation and display
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Part no.: 50135720 – LCS-1M18P-F05PNP-M12-LT – Capacitive sensor

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 | Short circuit protected Polarity reversal protection |
|--------------------|---|

Performance data

| | |
|--|------------------------|
| Supply voltage | 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 | 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, PNP |
| Switching principle | Normally closed contact (NC)/normally open contact (NO), programmable |

Timing

| | |
|---------------------|-------|
| 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) |
|-----------------------|------------|

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Connection 1

| | |
|--------------------|------------------------------|
| Type of connection | Connector |
| Function | Voltage supply Signal OUT |
| 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 (Ø x L) | 18 mm x 87.3 mm |
| Type of installation | Embedded and non-embedded |
| Housing material | Plastic, 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 | Teach button Multiturn potentiometer (12 turns) |
| 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 |

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 |

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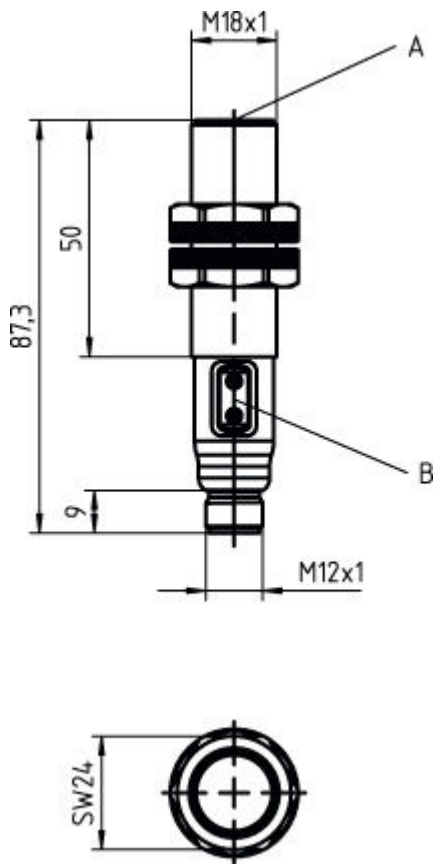
| | |
|----------------------------|---------------|
| Freon R22 and 502 (liquid) | 0.35 |
| Grain | 0.15 ... 0.3 |
| Glass | 0.2 ... 0.55 |
| Glycerin | 0.98 |
| Rubber | 0.15 ... 0.9 |
| Wood, wet | 0.6 ... 0.85 |
| Wood, dry | 0.1 ... 0.4 |
| Carbon dioxide | 0 |
| Air | 0 |
| Marble | 0.5 |
| Flour | 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

| | |
|------------|----------|
| eCl@ss 8.0 | 27270102 |
| eCl@ss 9.0 | 27270102 |
| ETIM 5.0 | EC002715 |

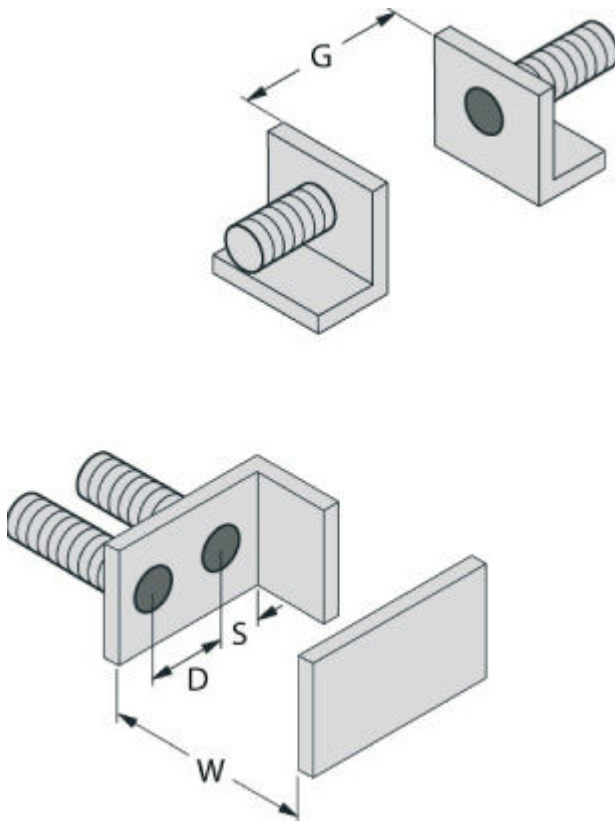
Dimensioned drawings

All dimensions in millimeters



A Active surface
B Teach buttons

Mounting distances

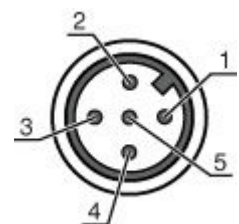


| | |
|---|-------|
| D | 36 mm |
| G | 30 mm |
| S | 27 mm |
| W | 15 mm |

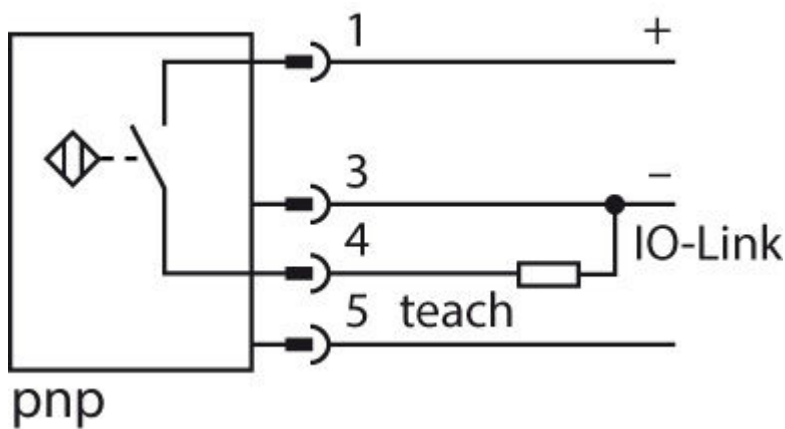
Electrical connection

| Connection 1 | |
|--------------------|------------------------------|
| Type of connection | Connector |
| Function | Voltage supply Signal OUT |
| 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

LEDs

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

Part number code

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





| | |
|-----|--|
| LCS | Operating principle: LCS: capacitive sensor |
| A | Series: 1: 1 series "Extended" 2: 2 series "Advanced" |
| BBB | Design: M12: series with M12 x 1 external thread M18: series with M18 x 1 external thread M30: series with M30 x 1.5 external thread Q40: series in cubic design, length 40 mm Q54: series in cubic design, length 54 mm |
| C | Housing material: B: brass M: metal P: plastic/PBT T: PTFE |
| DDD | Measurement range / type of installation: F03: typ. range limit 3.0 mm / embedded installation F04: typ. range limit 4.0 mm / embedded installation F05: typ. range limit 5.0 mm / embedded installation F06: typ. range limit 6.0 mm / embedded installation F08: typ. range limit 8.0 mm / embedded installation F10: typ. range limit 10.0 mm / embedded installation F15: typ. range limit 15.0 mm / embedded installation F20: typ. range limit 20.0 mm / embedded installation N06: typ. range limit 6.0 mm / non-embedded installation N08: typ. range limit 8.0 mm / non-embedded installation N15: typ. range limit 15.0 mm / non-embedded installation N25: typ. range limit 25.0 mm / non-embedded installation N30: typ. range limit 30.0 mm / non-embedded installation |
| E | Output function: B: NC and NO contact N: NPN P: PNP |

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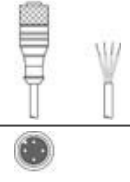
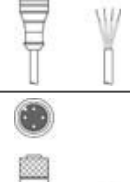
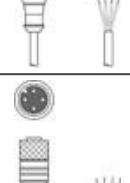
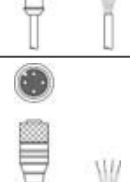
| | |
|-----|---|
| FF | Switching: NC: normally closed contact NO: normally open contact NP: programmable |
| G | Connection cable: K: cable n/a: no cable |
| HHH | Cable length: 020: length 2,000 mm 003: length 300 mm n/a: no cable |
| I | Cable material: P: PUR T: PTFE V: PVC |
| JJJ | Electrical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

Accessories

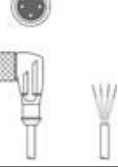
Connection technology - Connection cables

| | Part no. | Designation | Article | Description |
|---|----------|----------------------------|------------------|---|
|  | 50112960 | K-D M12A-4P-10m- FAB | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: FAB |
|  | 50104570 | K-D M12A-4P-2m- FAB | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: FAB |
|  | 50104572 | K-D M12A-4P-5m- FAB | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: FAB |
|  | 50112961 | K-D M12W-4P-10m- FAB | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: FAB |
|  | 50104571 | K-D M12W-4P-2m- FAB | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: FAB |



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| | Part no. | Designation | Article | Description |
|---|----------|---------------------------|------------------|---|
|  | 50104573 | K-D M12W-4P-5m- FAB | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: FAB |
|  | 50130654 | KD U-M12-4A- P1-020 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PUR |
|  | 50130672 | KD U-M12-4A- P1-020-DP | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connector, LED: Yes, 1 Piece(s) Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PUR |
|  | 50130657 | KD U-M12-4A- P1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PUR |
|  | 50130675 | KD U-M12-4A- P1-050-DP | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connector, LED: Yes, 1 Piece(s) Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PUR |
|  | 50130658 | KD U-M12-4A- P1-100 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: PUR |
|  | 50130676 | KD U-M12-4A- P1-100-DP | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connector, LED: Yes, 1 Piece(s) Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: PUR |
|  | 50130648 | KD U-M12-4A- V1-020 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PVC |
|  | 50130652 | KD U-M12-4A- V1-050 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PVC |
|  | 50130653 | KD U-M12-4A- V1-100 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: PVC |


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| | Part no. | Designation | Article | Description |
|---|----------|-----------------------|------------------|--|
|  | 50132431 | KD U-M12-4A-V1-200 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 20,000 mm Sheathing material: PVC |
|  | 50132430 | KD U-M12-4A-V1-300 | Connection cable | Connection 1: Connector, M12, Axial, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 30,000 mm Sheathing material: PVC |
|  | 50130692 | KD U-M12-4W-P1-020 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PUR |
|  | 50130718 | KD U-M12-4W-P1-020-DP | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connector, LED: Yes, 1 Piece(s) Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PUR |
|  | 50130694 | KD U-M12-4W-P1-050 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PUR |
|  | 50130720 | KD U-M12-4W-P1-050-DP | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connector, LED: Yes, 1 Piece(s) Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PUR |
|  | 50130695 | KD U-M12-4W-P1-100 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: PUR |
|  | 50130721 | KD U-M12-4W-P1-100-DP | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connector, LED: Yes, 1 Piece(s) Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: PUR |
|  | 50130688 | KD U-M12-4W-V1-020 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 2,000 mm Sheathing material: PVC |
|  | 50130690 | KD U-M12-4W-V1-050 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 5,000 mm Sheathing material: PVC |


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| | Part no. | Designation | Article | Description |
|---|----------|--------------------|------------------|---|
|  | 50130691 | KD U-M12-4W-V1-100 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 10,000 mm Sheathing material: PVC |
|  | 50132641 | KD U-M12-4W-V1-200 | Connection cable | Connection 1: Connector, M12, Angled, Female, A-coded, 4 -pin Connection 2: Open end Shielded: No Cable length: 20,000 mm Sheathing material: PVC |




Mounting technology - Mounting brackets

| | Part no. | Designation | Article | Description |
|---|----------|-------------|------------------|--|
|  | 50113548 | BT D18M.5 | Mounting bracket | Diameter, inner: 18 mm Design of mounting device: Angle, L-shape Fastening, at system: Through-hole mounting Mounting bracket, at device: Screw type Type of mounting device: Rigid Material: Stainless steel |

Mounting technology - Rod mounts

| | Part no. | Designation | Article | Description |
|---|----------|--------------|-----------------|--|
|  | 50117490 | BTU D18M-D12 | Mounting system | Design of mounting device: Mounting system Fastening, at system: Through-hole mounting Mounting bracket, at device: Screw type Type of mounting device: Clampable, Adjustable, Turning, 360° Material: Metal |

Mounting technology - Other

| | Part no. | Designation | Article | Description |
|---|----------|-------------|---------|---|
|  | 50132729 | AC D18M-CS | Clamp | Contains: 2x M24 mounting nut Diameter, inner: 18 mm Design of mounting device: Mounting clamp Fastening, at system: Screw type, Through-hole mounting Mounting bracket, at device: insertable, Clampable with limit stop Type of mounting device: Clampable, With limit stop Material: Metal |
|  | 50111501 | MC 018K | Clamp | Diameter, inner: 18 mm Design of mounting device: Mounting clamp Fastening, at system: Through-hole mounting Mounting bracket, at device: Clampable Type of mounting device: Rigid Material: Plastic |
|  | 50111502 | MC 018K-LS | Clamp | Diameter, inner: 18 mm Design of mounting device: Mounting clamp Fastening, at system: Through-hole mounting Mounting bracket, at device: Clampable with limit stop Type of mounting device: Rigid Material: Plastic |

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 present¹: Press button 1 for 2 to 9 s
- Switching point medium not present¹: 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

Teach via manual bridging

- Switching point medium present¹: Apply U_B for 2 to 9 s
- Switching point medium not present¹: Apply GND for 2 to 9 s
- Change NC contact/NO contact: Apply U_B 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.

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