



Product description

- The crm+ sensor with one switching output measures the distance to an object within the detection zone contactless. Depending on the adjusted detect distance the switching output is set.
- The ultrasonic transducer surface of the crm+ sensors is laminated with a PEEK film. The transducer itself is sealed against the housing by a PTFE joint ring. This composition ensures a high resistance against many aggressive substances.
- All settings are done with two push-buttons and a three-digit LED-display (TouchControl).
- Three-colour LEDs indicate the switching status.
- The output functions are changeable from NOC to NCC.
- The sensors are adjustable manually

- via TouchControl or via Teach-in procedure.
- Useful additional functions are set in the Add-on-menu.
- Using the LinkControl adapter (optional accessory) all TouchControl and additional sensor parameter settings can be adjusted by a Windows® Software.

IO-Link

The crm+ sensors are IO-Link-capable in accordance with IO-Link specification V1.1 and support Smart Sensor Profile like Digital Measuring Sensor.

The crm+ sensors have a **blind zone** in which distance measurement is not possible. The **operating range** indicates the distance of the sensor that can be applied with normal reflectors with sufficient function reserve. When using good reflectors, such as a calm water surface, the sensor can also be

used up to its **maximum range**. Objects that strongly absorb (e.g. plastic foam) or diffusely reflect sound (e.g. pebble stones) can also reduce the defined operating range.

Safety Notes

- Read the operating manual prior to start-up.
- Connection, installation and adjustment works may only be carried out by expert personnel.
- No safety component in accordance with the EU Machine Directive, use in the area of personal and machine protection not permitted

Proper Use

crm+ ultrasonic sensors are used for non-contact detection of objects.

Synchronisation

If the assembly distance of multiple sensors falls below the values shown in Fig. 1 the integrated synchronisation should be used. Connect Sync/Com-channels (pin 5 at the units repeatable) of all sensors (10 maximum).

	≥0.35 m	≥2.50 m
crm+25...	≥0.35 m	≥2.50 m
crm+35...	≥0.40 m	≥2.50 m
crm+130...	≥1.10 m	≥8.00 m
crm+340...	≥2.00 m	≥18.00 m
crm+600...	≥4.00 m	≥30.00 m

Fig. 1: Assembly distances, indicating synchronisation/multiplex

Multiplex mode

The Add-on-menu allows to assign an individual address »01« to »10« to each sensor connected via the Sync/Com-channel (Pin5). The sensors perform the ultrasonic measurement sequentially from low to high address. Therefore any influence between the sensors is rejected. The address »00« is reserved to synchronisation mode and deactivates the multiplex mode. To use synchronised mode all sensors must be set to address »00«.

Installation

- Mount the sensor at the place of fitting.
- Connect a connection cable to the M12 device plug, see Fig. 2.

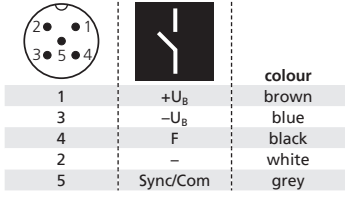


Fig. 2: Pin assignment with view onto sensor plug and colour coding of the microsonic connection cable

Start-up

- Connect the power supply.
- Set the parameters of the sensor manually via TouchControl (see Fig. 3 and Diagram 1)
- or use the Teach-in procedure to adjust the detect points (see Diagram 2).

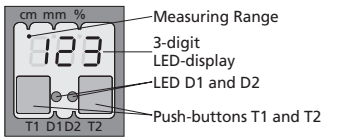


Fig. 3: TouchControl/LED display

Factory setting

- crm+ sensors are delivered factory made with the following settings:
- Switching output on NOC
- Detecting distance at operating range
- Measurement range set to maximum range

Maintenance

crm+ sensors work maintenance free. Small amounts of dirt on the surface do not influence function. Thick layers of dirt and caked-on dirt affect sensor function and therefore must be removed.

Notes

- As a result of the design the assembly of PEEK film and PTFE joint ring is not gas-proof.
- The chemical resistance has to be tested experimentally if necessary.
- crm+ sensors have internal temperature compensation. Because the sensors heat up on their own, the temperature compensation reaches its optimum working point after approx. 30 minutes of operation.
- In the normal operating mode, a yellow LED D2 signals that the switching output is switched through.
- In the normal operating mode, the measured distance value is displayed on the LED-indicator in mm (up to 999 mm) or cm (from 100 cm). Scale switches automatically and is indicated by a point on top of the digits.
- In the Teach-in mode, the hysteresis loops are set back to factory settings.
- If no objects are placed within the detection zone the LED-indicator shows »---«.
- If no push-buttons are pressed for 20 seconds during parameter setting mode the made changes are discarded and the sensor returns to normal operating mode.
- The sensor can be reset to its factory setting, see »Key lock and factory setting«, Diagram 3.
- The latest IODD file and informations about start-up and configuration of crm+ sensors with IO-Link, you will find online at www.microsonic.de/en/crm+.

Show parameters

- In normal operating mode shortly push T1. The LED display shows »PAr.«
- Each time you tap push-button T1 the actual settings of the switching output are shown.

Operating Manual

crm+ Ultrasonic Sensors with one switching output an IO-Link

- crm+25/F/TC/E
- crm+35/F/TC/E
- crm+130/F/TC/E
- crm+340/F/TC/E
- crm+600/F/TC/E



Diagram 1: Set sensor parameters numerically using LED display

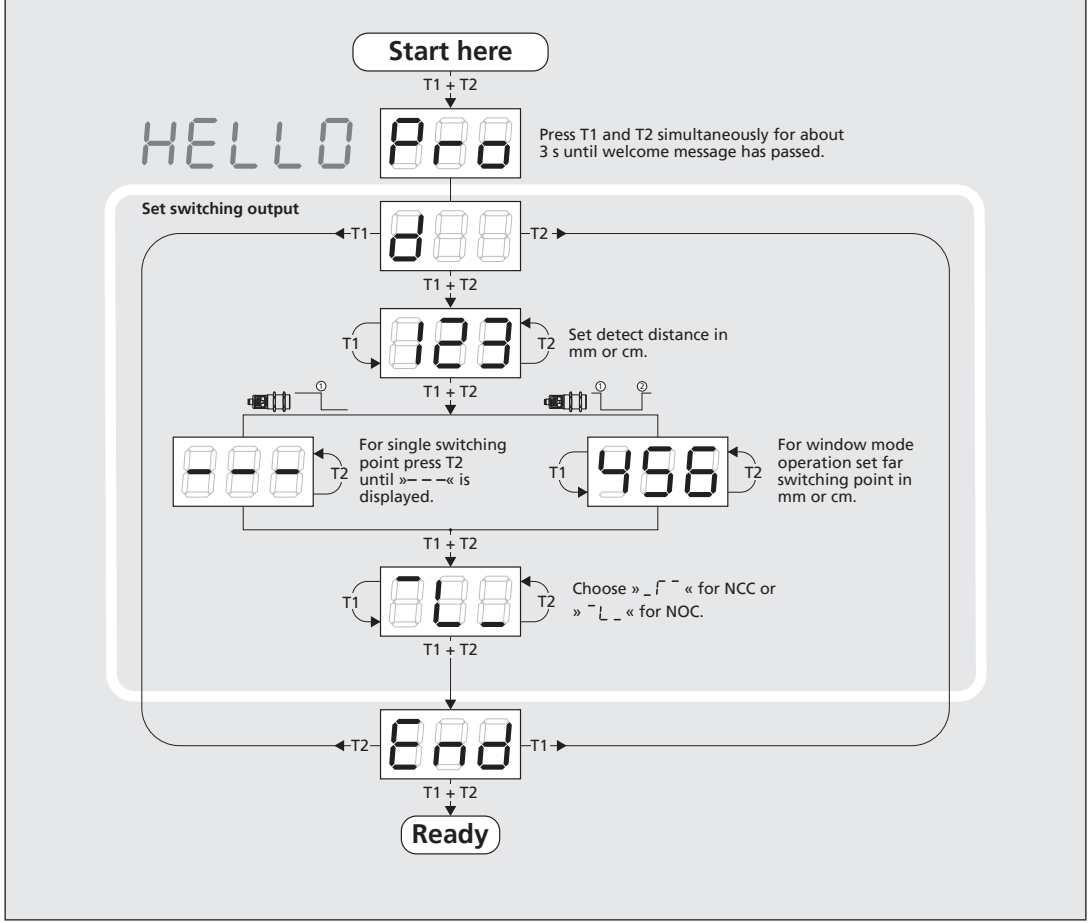


Diagram 2: Set sensor parameters via Teach-in procedure

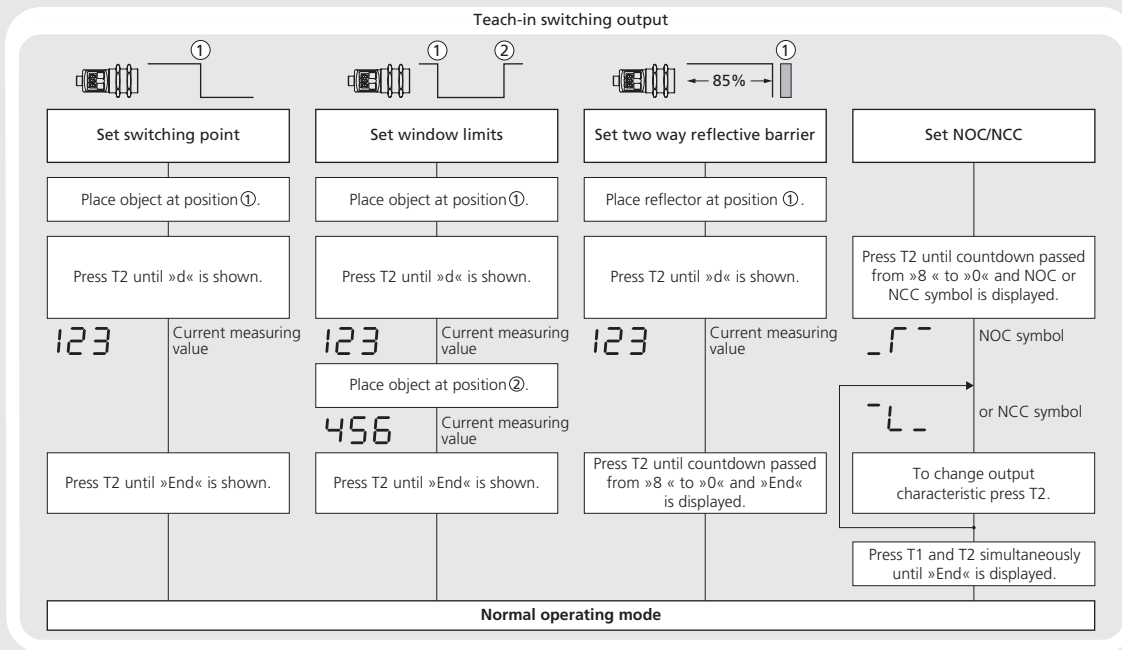


Diagram 3: Key lock and factory setting

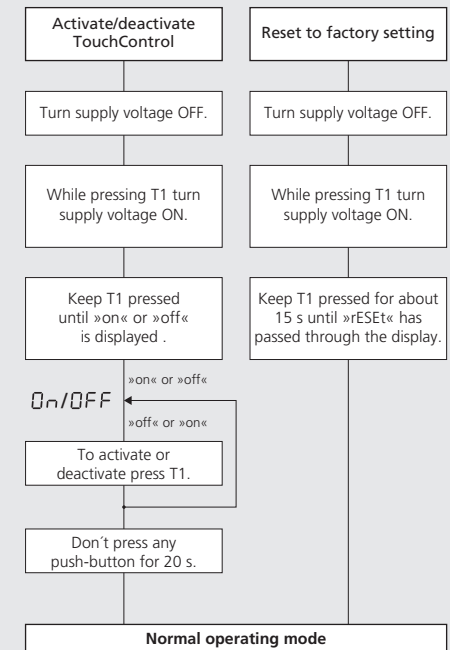
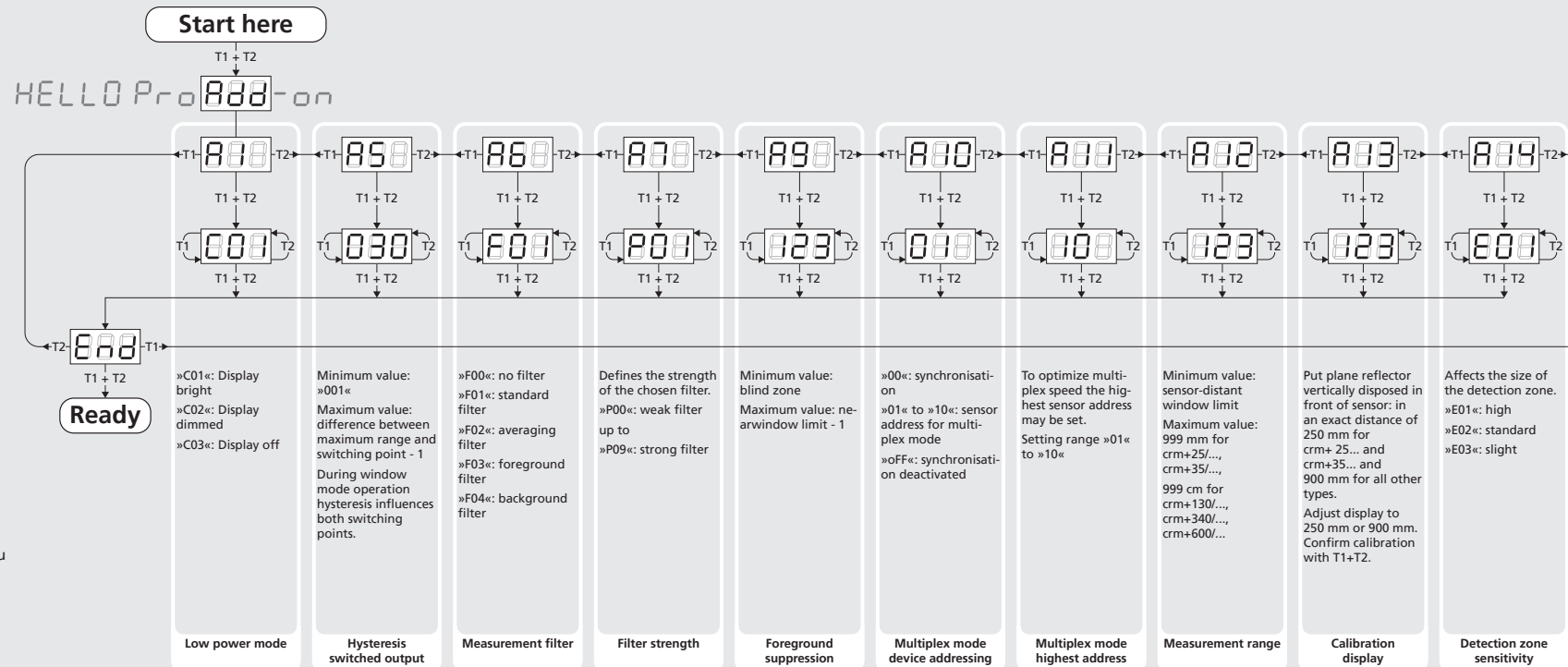
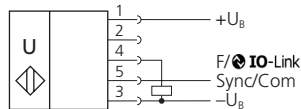


Diagram 4: Useful additional functions in Add-on menu (for experienced users only, settings not required for standard applications)

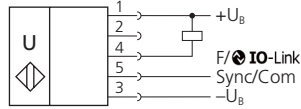


Note
 Changes in the Add-on menu may impair the sensor function.
 A6, A7, A10, A11, A12 have influence on the response time of the sensor.

Technical data

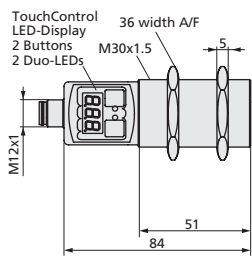


1 Push-Pull output in pnp circuit

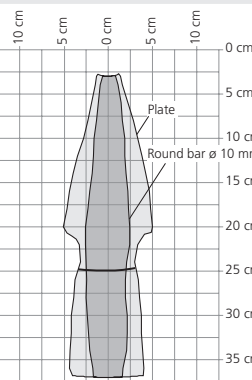


1 Push-Pull output in npn circuit

crm+25...



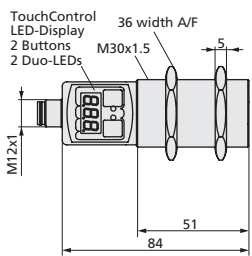
blind zone: 0 to 30 mm
 operating range: 250 mm
 maximum range: 350 mm
 angle of beam spread: see detection zone
 transducer frequency: 320 kHz
 resolution: 0.025 mm



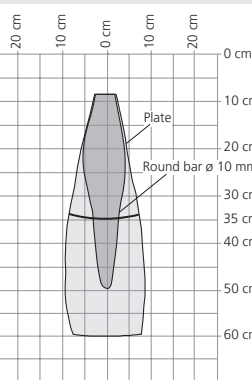
reproducibility: ±0.15 %
 accuracy: ±1 % (Temperature drift internal compensated, may be deactivated³⁾, 0.17%/K without compensation)
 operating voltage U_B : 9 to 30 V DC, short-circuit-proof, Class 2
 voltage ripple: ±10 %
 no-load supply current: ≤ 80 mA
 housing: Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE
 class of protection to EN 60529: IP 67
 norm conformity: EN 60947-5-2
 type of connection: 5-pin initiator plug, PBT
 controls: 2 push-buttons (TouchControl)
 indicators: 3-digit LED display, 2 three-colour LEDs
 programmable: TouchControl, LinkControl, IO-Link
 operating temperature: -25 to +70 °C
 storage temperature: -40 to +85 °C
 weight: 150 g
 switching hysteresis¹⁾: 3 mm
 switching frequency²⁾: 25 Hz
 response time²⁾: 32 ms
 time delay before availability: <300 ms

order No. **crm+25/F/TC/E**
 switching output: Push-Pull, $U_B - 3 V, -U_B + 3 V, I_{max} = 100 mA$
 switchable NOC/NCC, short-circuit-proof

crm+35...



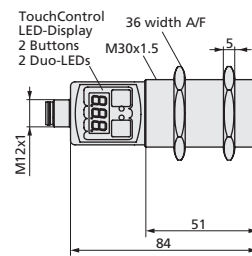
blind zone: 0 to 85 mm
 operating range: 350 mm
 maximum range: 600 mm
 angle of beam spread: see detection zone
 transducer frequency: 360 kHz
 resolution: 0.025 mm



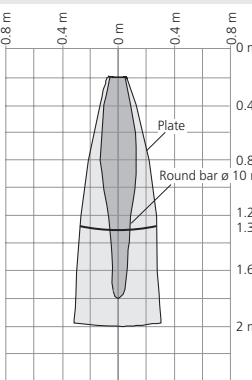
reproducibility: ±0.15 %
 accuracy: ±1 % (Temperature drift internal compensated, may be deactivated³⁾, 0.17%/K without compensation)
 operating voltage U_B : 9 to 30 V DC, short-circuit-proof, Class 2
 voltage ripple: ±10 %
 no-load supply current: ≤ 80 mA
 housing: Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE
 class of protection to EN 60529: IP 67
 norm conformity: EN 60947-5-2
 type of connection: 5-pin initiator plug, PBT
 controls: 2 push-buttons (TouchControl)
 indicators: 3-digit LED display, 2 three-colour LEDs
 programmable: TouchControl, LinkControl, IO-Link
 operating temperature: -25 to +70 °C
 storage temperature: -40 to +85 °C
 weight: 150 g
 switching hysteresis¹⁾: 5 mm
 switching frequency²⁾: 12 Hz
 response time²⁾: 64 ms
 time delay before availability: <300 ms

order No. **crm+35/F/TC/E**
 switching output: Push-Pull, $U_B - 3 V, -U_B + 3 V, I_{max} = 100 mA$
 switchable NOC/NCC, short-circuit-proof

crm+130...



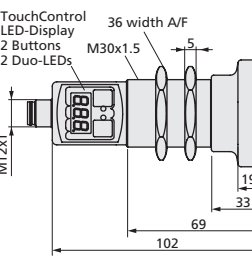
blind zone: 0 to 200 mm
 operating range: 1,300 mm
 maximum range: 2,000 mm
 angle of beam spread: see detection zone
 transducer frequency: 200 kHz
 resolution: 0.18 mm



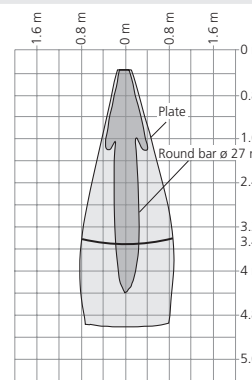
reproducibility: ±0.15 %
 accuracy: ±1 % (Temperature drift internal compensated, may be deactivated³⁾, 0.17%/K without compensation)
 operating voltage U_B : 9 to 30 V DC, short-circuit-proof, Class 2
 voltage ripple: ±10 %
 no-load supply current: ≤ 80 mA
 housing: Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE
 class of protection to EN 60529: IP 67
 norm conformity: EN 60947-5-2
 type of connection: 5-pin initiator plug, PBT
 controls: 2 push-buttons (TouchControl)
 indicators: 3-digit LED display, 2 three-colour LEDs
 programmable: TouchControl, LinkControl, IO-Link
 operating temperature: -25 to +70 °C
 storage temperature: -40 to +85 °C
 weight: 210 g
 switching hysteresis¹⁾: 20 mm
 switching frequency²⁾: 8 Hz
 response time²⁾: 92 ms
 time delay before availability: <300 ms

order No. **crm+130/F/TC/E**
 switching output: Push-Pull, $U_B - 3 V, -U_B + 3 V, I_{max} = 100 mA$
 switchable NOC/NCC, short-circuit-proof

crm+340...



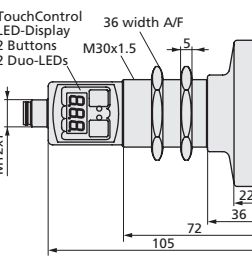
blind zone: 0 to 350 mm
 operating range: 3,400 mm
 maximum range: 5,000 mm
 angle of beam spread: see detection zone
 transducer frequency: 120 kHz
 resolution: 0.18 mm



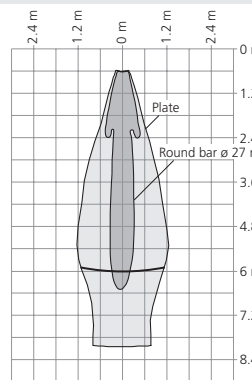
reproducibility: ±0.15 %
 accuracy: ±1 % (Temperature drift internal compensated, may be deactivated³⁾, 0.17%/K without compensation)
 operating voltage U_B : 9 to 30 V DC, short-circuit-proof, Class 2
 voltage ripple: ±10 %
 no-load supply current: ≤ 80 mA
 housing: Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE
 class of protection to EN 60529: IP 67
 norm conformity: EN 60947-5-2
 type of connection: 5-pin initiator plug, PBT
 controls: 2 push-buttons (TouchControl)
 indicators: 3-digit LED display, 2 three-colour LEDs
 programmable: TouchControl, LinkControl, IO-Link
 operating temperature: -25 to +70 °C
 storage temperature: -40 to +85 °C
 weight: 270 g
 switching hysteresis¹⁾: 50 mm
 switching frequency²⁾: 4 Hz
 response time²⁾: 172 ms
 time delay before availability: <380 ms

order No. **crm+340/F/TC/E**
 switching output: Push-Pull, $U_B - 3 V, -U_B + 3 V, I_{max} = 100 mA$
 switchable NOC/NCC, short-circuit-proof

crm+600...



blind zone: 0 to 600 mm
 operating range: 6,000 mm
 maximum range: 8,000 mm
 angle of beam spread: see detection zone
 transducer frequency: 80 kHz
 resolution: 0.18 mm



reproducibility: ±0.15 %
 accuracy: ±1 % (Temperature drift internal compensated, may be deactivated³⁾, 0.17%/K without compensation)
 operating voltage U_B : 9 to 30 V DC, short-circuit-proof, Class 2
 voltage ripple: ±10 %
 no-load supply current: ≤ 80 mA
 housing: Stainless steel 1.4571, plastic parts: PBT, TPU; Ultrasonic transducer: PEEK film, PTFE
 class of protection to EN 60529: IP 67
 norm conformity: EN 60947-5-2
 type of connection: 5-pin initiator plug, PBT
 controls: 2 push-buttons (TouchControl)
 indicators: 3-digit LED display, 2 three-colour LEDs
 programmable: TouchControl, LinkControl, IO-Link
 operating temperature: -25 to +70 °C
 storage temperature: -40 to +85 °C
 weight: 270 g
 switching hysteresis¹⁾: 100 mm
 switching frequency²⁾: 3 Hz
 response time²⁾: 240 ms
 time delay before availability: <450 ms

order No. **crm+600/F/TC/E**
 switching output: Push-Pull, $U_B - 3 V, -U_B + 3 V, I_{max} = 100 mA$
 switchable NOC/NCC, short-circuit-proof

¹⁾ Can be programmed via TouchControl, LinkControl and IO-Link.
²⁾ With TouchControl, LinkControl and IO-Link, the selected filter setting and the maximum range influence the switching frequency and the response time.
³⁾ Can be deactivated via LinkControl.



UL LISTED
 Enclosure Type 1
 For use only in industrial machinery NFPA 79 applications.
 The proximity switches shall be used with a Listed (CYI/7) cable/connector assembly rated minimum 32 Vdc, minimum 290 mA, in the final installation.

