

FT 25-RA

## Miniature distance sensor



## PRODUCT HIGHLIGHTS

- Miniature housing with measurement ranges up to 200 mm for an easy integration and high flexibility
- High linearity and high repeatability for precise control tasks
- Almost surface independent detection on homogeneous object surfaces
- Invertible analogue characteristic
- Window mode e.g. for two-step controls separately adjustable

| Optical data                         |                                                                            |                            | Functions                            |                                           |
|--------------------------------------|----------------------------------------------------------------------------|----------------------------|--------------------------------------|-------------------------------------------|
| Measurement range                    | 20 ... 80 mm <sup>1</sup>                                                  | 30 ... 200 mm <sup>1</sup> | Indicator LED, green                 | Operating voltage indicator               |
| Resolution                           | 0.12 mm (12-bit)                                                           | 0.68 mm (12-bit)           | Indicator LED, yellow                | Switching output indicator                |
| Linearity                            | ± 0.4 mm <sup>2</sup>                                                      | ± 2 mm <sup>2</sup>        | Measurement range adjustment         | Via Teach-in button                       |
| Repeatability                        | < 0.4 mm <sup>2,3</sup>                                                    | < 1 mm <sup>2,3</sup>      | Adjustment possibilities             | Analogue measurement range Q <sub>A</sub> |
| Type of light                        | LED, red, 632 nm                                                           | LED, red, 632 nm           |                                      | Invertible analogue characteristic        |
|                                      |                                                                            |                            |                                      | Switching output Q (window mode)          |
|                                      |                                                                            |                            |                                      | N.O./N.C. via teach-in button             |
|                                      |                                                                            |                            | Default settings                     | See Table                                 |
|                                      |                                                                            |                            |                                      |                                           |
| Electrical data                      |                                                                            |                            | Mechanical data                      |                                           |
| Operating voltage, +U <sub>B</sub>   | 13 ... 30 V DC                                                             |                            | Dimensions                           | 34 × 20 × 12 mm                           |
| No-load current, I <sub>0</sub>      | ≤ 30 mA                                                                    |                            | Enclosure rating                     | IP 67 / IP 69K <sup>4</sup>               |
| Output current, I <sub>e</sub> Q     | ≤ 100 mA                                                                   |                            | Material, housing                    | ABS                                       |
| Protective circuits                  | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection (Q) |                            | Material, front screen               | PMMA                                      |
| Protection Class                     | 2                                                                          |                            | Type of connection                   | See Selection Table                       |
| Power On Delay                       | < 300 ms                                                                   |                            | Ambient temperature: operation       | -20 ... +60 °C <sup>5</sup>               |
| Switching output, Q                  | PNP/NPN (See Selection Table)                                              |                            | Ambient temperature: storage         | -20 ... +80 °C                            |
| Output function                      | N.O./N.C.                                                                  |                            | Weight (metal plug device)           | 10 g                                      |
| Max. capacitive load Q               | 10 nF                                                                      |                            | Resistance to vibrations and impacts | EN 60947-5-2                              |
| Switching frequency, f (ti/tp 1:1) Q | ≤ 1000 Hz                                                                  |                            |                                      |                                           |
| Response time Q                      | 500 µs                                                                     |                            |                                      |                                           |
| Analogue output Q <sub>A</sub>       | 1 ... 10 V / max. 3 mA                                                     |                            |                                      |                                           |
| Response time Q <sub>A</sub>         | 400 µs (FT 25-RA-60)                                                       |                            |                                      |                                           |
|                                      | 3.4 ms (FT 25-RA-170)                                                      |                            |                                      |                                           |
| Warm-up time                         | 10 min.                                                                    |                            |                                      |                                           |
| Temperature drift                    | < 0.1 mm/K (FT 25-RA-60)                                                   |                            |                                      |                                           |
|                                      | < 0.2 mm/K (FT 25-RA-170)                                                  |                            |                                      |                                           |

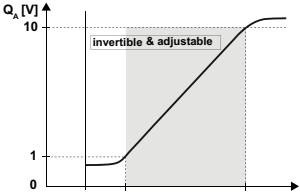
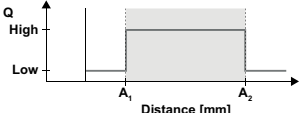
<sup>1</sup> Reference material: 6...90 % reflectivity, <sup>2</sup> Reference material grey, 18 % reflectivity, <sup>3</sup> at constant ambient conditions.

<sup>4</sup> with connected IP 67 / IP 69K plug, <sup>5</sup> UL: -20°C...+50 °C

| Measurement range | Analogue output | Switching output | Type of connection      | Part number          | Article number |
|-------------------|-----------------|------------------|-------------------------|----------------------|----------------|
| 20 ... 80 mm      | 1 ... 10V       | PNP              | Metal plug, M8x1, 4-pin | FT 25-RA-60-PSU-M4M  | 604-41000      |
| 20 ... 80 mm      | 1 ... 10V       | NPN              | Metal plug, M8x1, 4-pin | FT 25-RA-60-NSU-M4M  | 604-41001      |
| 30 ... 200 mm     | 1 ... 10V       | PNP              | Metal plug, M8x1, 4-pin | FT 25-RA-170-PSU-M4M | 604-41002      |
| 30 ... 200 mm     | 1 ... 10V       | NPN              | Metal plug, M8x1, 4-pin | FT 25-RA-170-NSU-M4M | 604-41003      |

| Plug connection (20 ... 80 mm) | Plug connection (30 ... 200 mm) |
|--------------------------------|---------------------------------|
|                                |                                 |

| Connection, 4-pin | Light spot size |
|-------------------|-----------------|
|                   |                 |

| Characteristic output and analogue curves                                           |           | Default settings                       |              |               |
|-------------------------------------------------------------------------------------|-----------|----------------------------------------|--------------|---------------|
|  | 155-01661 |                                        | FT 25-RA-60  | FT 25-RA-170  |
|                                                                                     |           | Analogue output $Q_A$ (1 ... 10 V)     | 20 ... 80 mm | 30 ... 200 mm |
|                                                                                     |           | Switching output $Q$ (A1 ... A2), N.O. | 20 ... 80 mm | 30 ... 200 mm |
|  | 155-01681 |                                        |              |               |

| Accessories       |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |