

## Reactive Torque Sensor D-2452/D-2452-P with Nominal Torque from 0.005 ... 20000 N·m



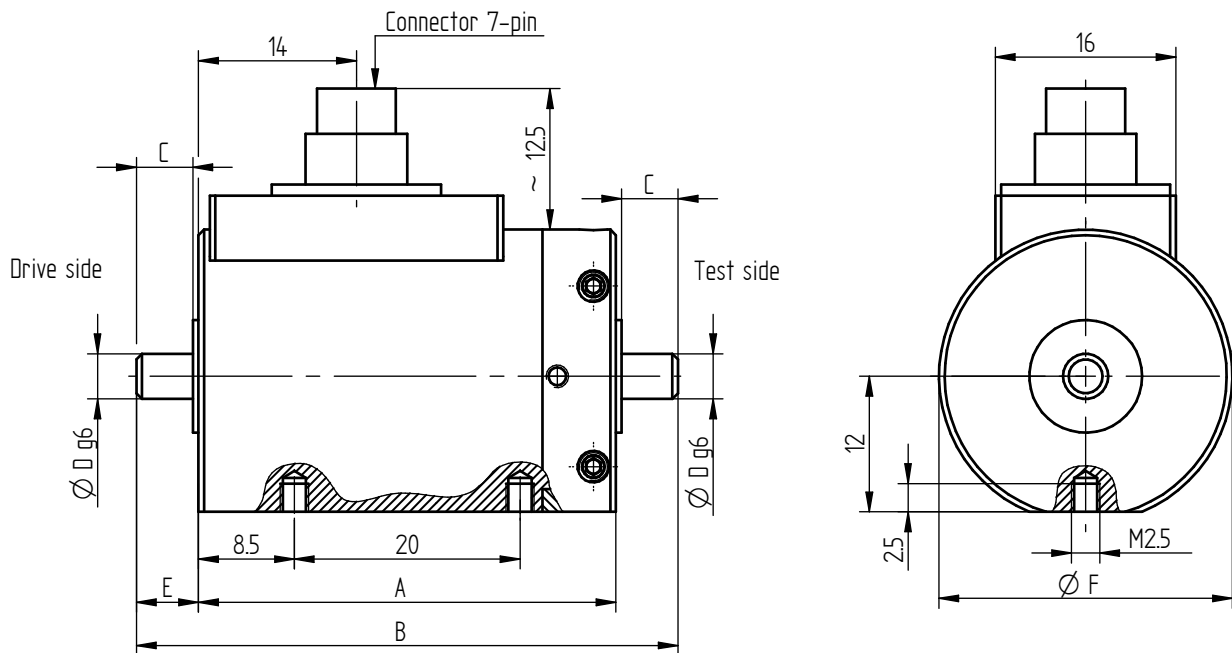
### Performance Features

- Torque sensor for reaction torque measurement
- Sensors with nominal torque to 0.02 N·m with integrated overload protection
- Cylindrical shaft ends on both sides
- Very short axial length
- High torsional stiffness
- Simple handling and assembly
- Special versions on request

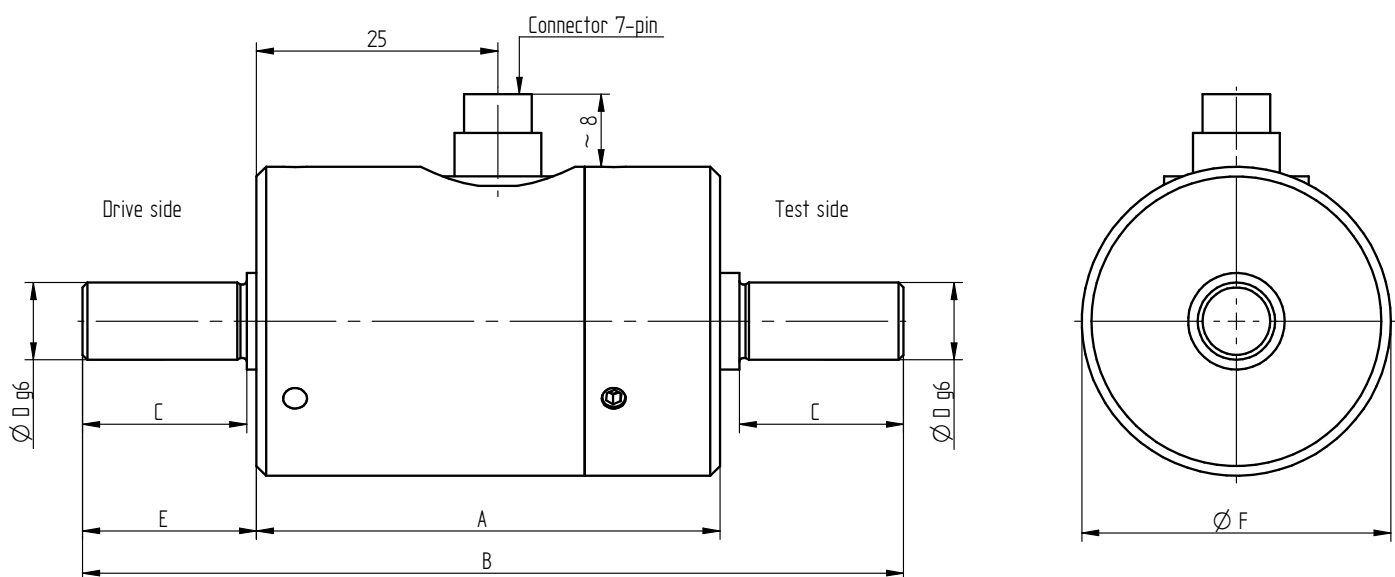
### Application

- Process measuring and control technology
- Fully automated machining centres
- Measuring and control devices
- Tool engineering
- Special mechanical engineering

## Dimensions of D-2452/D-2452-P in mm

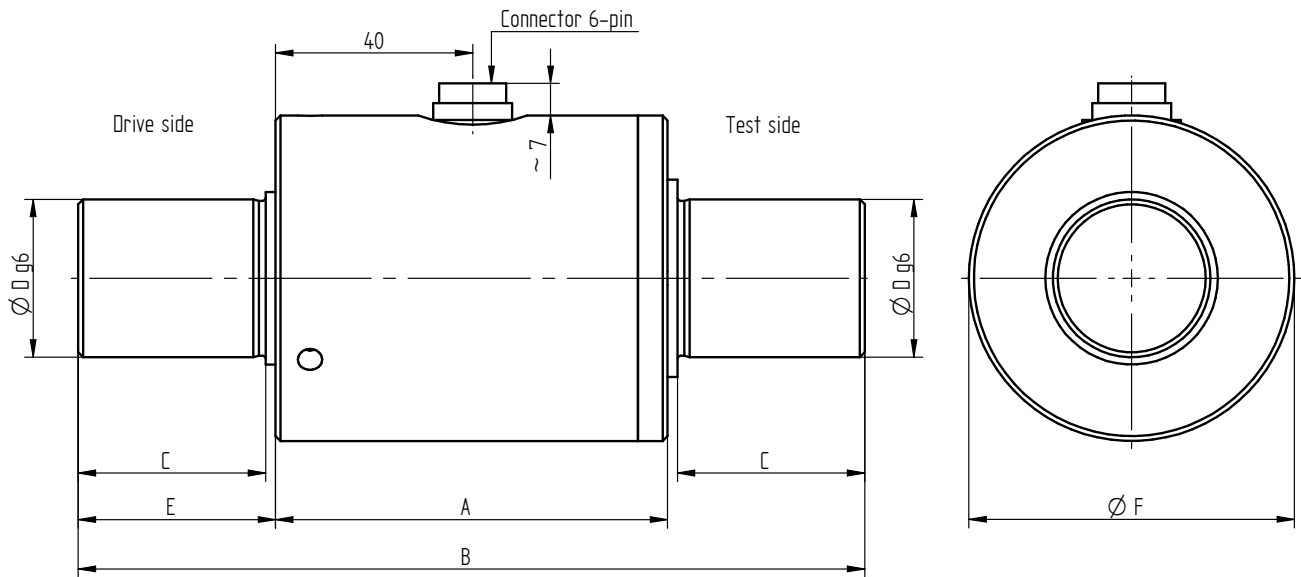


| Nominal Torque [N·m] | Dimensions [mm] |    |   |    |     |    | Weight [kg] |
|----------------------|-----------------|----|---|----|-----|----|-------------|
|                      | A               | B  | C | ØD | E   | ØF |             |
| 0.005/0.01/0.02      | 37              | 48 | 5 | 4  | 5.5 | 26 | 0.1         |

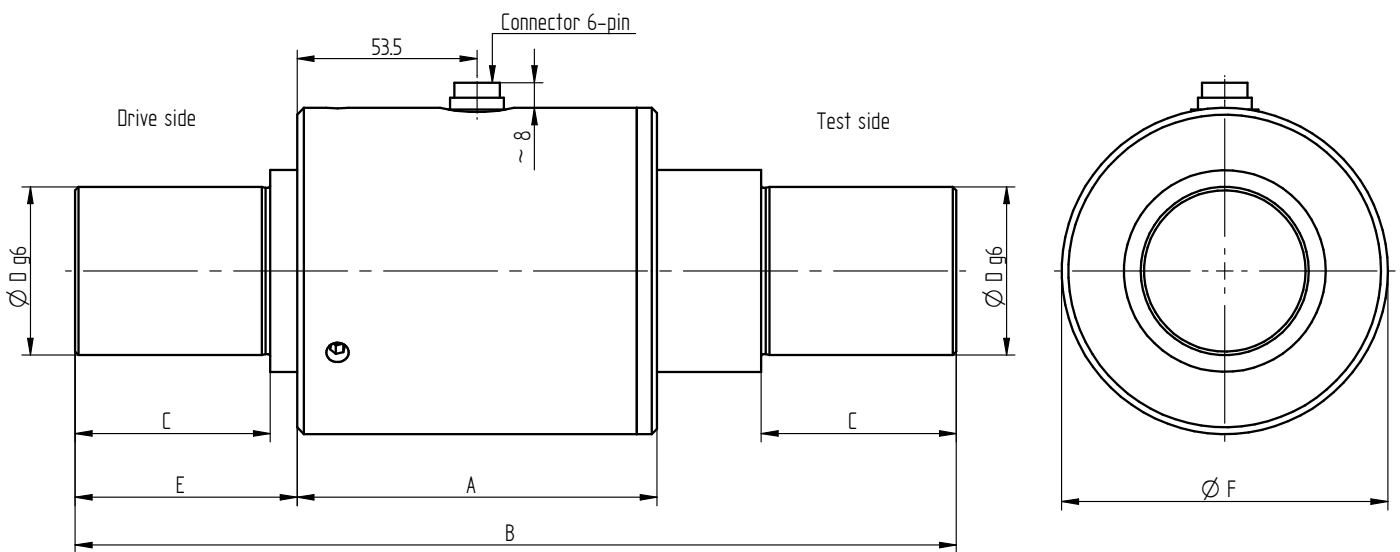


| Nominal Torque [N·m] | Dimensions [mm] |    |    |    |    |    | Weight [kg] |
|----------------------|-----------------|----|----|----|----|----|-------------|
|                      | A               | B  | C  | ØD | E  | ØF |             |
| 0.05                 | 48              | 65 | 7  | 6  | 8  | 32 | 0.1         |
| 0.1/0.2/0.5/1/2/5    | 48              | 85 | 17 | 8  | 18 | 32 | 0.1         |
| 10                   | 48              | 85 | 17 | 10 | 18 | 32 | 0.2         |

## Dimensions of D-2452/D-2452-P in mm

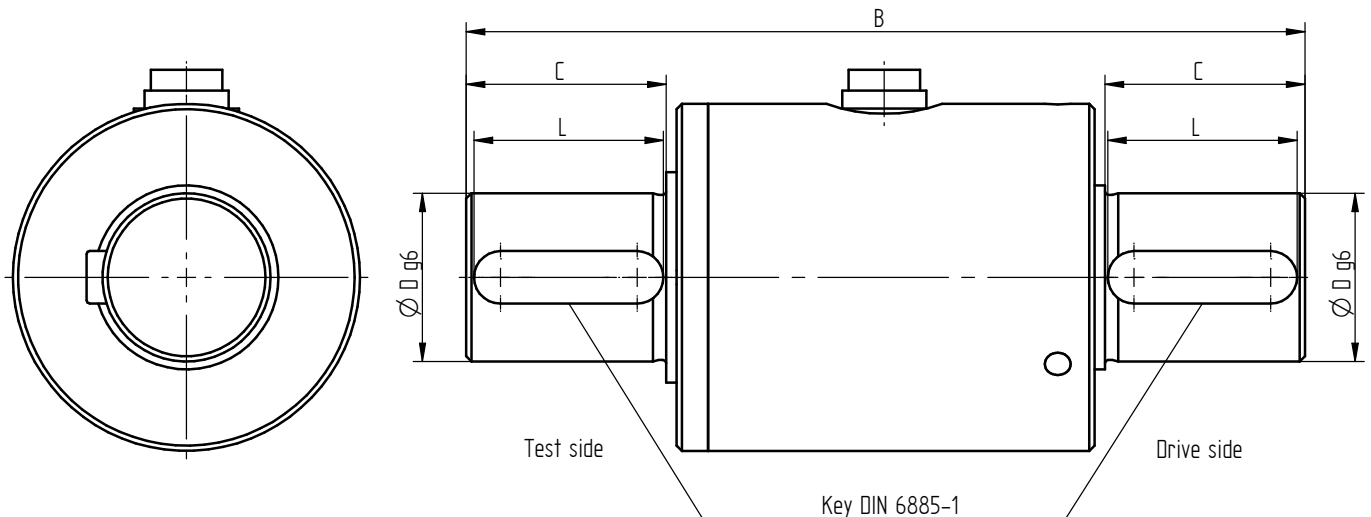


| Nominal Torque [N·m] | Dimensions [mm] |       |    |    |    |    | Weight [kg] |
|----------------------|-----------------|-------|----|----|----|----|-------------|
|                      | A               | B     | C  | ØD | E  | ØF |             |
| 20                   | 73              | 111.5 | 18 | 18 | 19 | 51 | 0.5         |
| 50/100               | 73              | 147.5 | 36 | 18 | 37 | 51 | 0.6         |
| 200/500              | 79.5            | 159.5 | 38 | 32 | 40 | 66 | 1.5         |



| Nominal Torque [N·m] | Dimensions [mm] |     |     |     |     |     | Weight [kg] |
|----------------------|-----------------|-----|-----|-----|-----|-----|-------------|
|                      | A               | B   | C   | ØD  | E   | ØF  |             |
| 1000                 | 107             | 262 | 58  | 50  | 66  | 97  | 7.0         |
| 2000/5000            | 107             | 377 | 110 | 70  | 126 | 112 | 13.5        |
| 10000/20000          | 140             | 470 | 120 | 110 | 160 | 173 | 42.5        |

## Dimensions of Version with Feather Keys in mm



| Nominal Torque [N·m]        | Dimensions [mm] |     |     |     |                          | Weight [kg] |
|-----------------------------|-----------------|-----|-----|-----|--------------------------|-------------|
|                             | B               | ØD  | C   | L   | Feather Key <sup>1</sup> |             |
| 0.1 / 0.2 / 0.5 / 1 / 2 / 5 | 85              | 8   | 17  | 14  | 2 x 2 x 14               | 0.1         |
| 10                          | 85              | 10  | 17  | 14  | 3 x 3 x 14               | 0.2         |
| 20                          | 111.5           | 18  | 18  | 14  | 6 x 6 x 14               | 0.5         |
| 50/100                      | 147.5           | 18  | 36  | 30  | 6 x 6 x 30               | 0.6         |
| 200/500                     | 159.5           | 32  | 38  | 36  | 10 x 8 x 36              | 1.5         |
| 1000                        | 262             | 50  | 58  | 50  | 14 x 9 x 50              | 7.0         |
| 2000/5000                   | 377             | 70  | 110 | 100 | 20 x 12 x 100            | 13.5        |
| 10000/20000                 | 570             | 110 | 170 | 160 | 28 x 16 x 160            | 42.5        |

## Connection Assignment

| 6-pin | D-2452/D-2452-P         | Series 723 |
|-------|-------------------------|------------|
| Pin 1 | Excitation (-)          |            |
| Pin 2 | Excitation (+)          |            |
| Pin 3 | Shield                  |            |
| Pin 4 | Signal (+)              |            |
| Pin 5 | Signal (-)              |            |
| Pin 6 | Control signal (option) |            |

| 7-pin | D-2452/D-2452-P         | Series 712 |
|-------|-------------------------|------------|
| Pin 1 | Excitation (-)          |            |
| Pin 2 | Excitation (+)          |            |
| Pin 3 | Shield                  |            |
| Pin 4 | Signal (+)              |            |
| Pin 5 | Signal (-)              |            |
| Pin 6 | Control signal (option) |            |
| Pin 7 | NC                      |            |

<sup>1</sup> Calculated load type for feather key: single side light shocks

## Technical Data acc. to VDI/VDE/DKD 2639

| Reactive Torque Sensor D-2452/D-2452-P                           |                  |  |
|--|------------------|--|
| Nominal Torque $M_{nom}$   | N·m              | 0.005 ... 20000  |
| Accuracy class   | % $M_{nom}$      | 0.1 (optional 0.05%)   |
| Relative repeatability error in unchanged mounting position $b'$ | %                | ± 0.02   |
| Bridge resistance $R_{Br}$                                       | Ω                | 1000 [≥500 N·m; 2000]  |
| Operating range of excitation voltage                            | VDC              | 2 ... 12   |
| Electrical connection  |                  | 6-pin series 723 <sup>2</sup><br>7-pin series 712 <sup>2</sup> |
| Reference temperature $T_{ref}$                                  | °C               | 23   |
| Rated temperature range  | °C               | -5 ... 45  |
| Operating temperature range                                      | °C               | -15 ... 55   |
| Temperature effect on zero signal $TK_0$                         | % $M_{nom}/10$ K | ±0.2   |
| Temperature effect on characteristic value $TK_C$                | % $M_{nom}/10$ K | ±0.1   |
| Maximum operating torque $M_G$ (static)                          | % $M_{nom}$      | 150  |
| Torque limit $M_{max}$ (static)                                  | % $M_{nom}$      | 200 [≤0.02 N·m; 500]   |
| Breaking torque $M_B$ (static)                                   | % $M_{nom}$      | >300 [≤0.02 N·m; >800]   |
| Permissible oscillation stress when subjected to torque $M_{df}$ | % $M_{nom}$      | 70 (peak-to-peak)  |
| Level of protection  |                  | IP50   |

| Article-No.<br>D-2452 | Article-No.<br>D-2452-P <sup>3</sup> | Nominal<br>Torque<br>[N·m] | Rated Cha-<br>racteristic<br>Value [mV/V]<br>±0.1% | Springrate<br>[N·m/rad] | Mass Moment of Inertia<br>[kg·m <sup>2</sup> ] |           | Axial Force<br>Limit [N] | Lateral<br>Force Limit<br>[N] |
|-----------------------|--------------------------------------|----------------------------|--|-------------------------|--|-----------|--------------------------|-------------------------------|
|                       |                                      |                            |  |                         | Drive Side                                     | Test Side |                          |                               |
| 107772                | -                                    | 0.005                      | 0.3  | 0.46                    | 3.9E-06  | 1.1E-08   | 35                       | 0.9                           |
| 107758                | -                                    | 0.01                       | 0.5  | 0.46                    | 3.9E-06  | 1.1E-08   | 35                       | 0.9                           |
| 107759                | -                                    | 0.02                       | 0.5  | 3.6                     | 3.9E-06  | 1.1E-08   | 35                       | 0.9                           |
| 106099                | -                                    | 0.05                       | 0.5  | 3.7                     | 1.1E-05  | 1.9E-07   | 40                       | 0.9                           |
| 106100                | 115743                               | 0.1                        | 0.5  | 1.8E+01                 | 1.1E-05  | 6.1E-07   | 42                       | 0.9                           |
| 106101                | 115744                               | 0.2                        | 0.8  | 1.8E+01                 | 1.1E-05  | 6.1E-07   | 58                       | 1.2                           |
| 106102                | 111401                               | 0.5                        | 0.8  | 9.7E+01                 | 1.1E-05  | 6.1E-07   | 172                      | 1.9                           |
| 106103                | 115745                               | 1                          | 0.8  | 1.2E+02                 | 1.1E-05  | 6.1E-07   | 227                      | 2.9                           |
| 106104                | 111635                               | 2                          | 0.8  | 3.6E+02                 | 1.1E-05  | 6.3E-07   | 348                      | 5.5                           |
| 106105                | 115746                               | 5                          | 0.8  | 4.1E+02                 | 1.1E-05  | 6.3E-07   | 650                      | 14                            |
| 106106                | 115747                               | 10                         | 0.8  | 9.1E+02                 | 1.1E-05  | 7.4E-07   | 1000                     | 26                            |
| 106108                | 115748                               | 20                         | 0.8  | 4.2E+03                 | 1.0E-04  | 7.0E-06   | 1680                     | 43                            |
| 106110                | 115749                               | 50                         | 0.8  | 6.1E+03                 | 1.1E-04  | 8.6E-06   | 3100                     | 80                            |
| 106111                | 114219                               | 100                        | 0.8  | 8.5E+03                 | 1.1E-04  | 8.8E-06   | 4800                     | 160                           |
| 106112                | 115750                               | 200                        | 0.8  | 6.6E+04                 | 3.6E-04  | 7.9E-05   | 8000                     | 290                           |
| 106113                | 115751                               | 500                        | 0.8  | 7.1E+04                 | 3.6E-04  | 8.0E-05   | 14000                    | 700                           |
| 106114                | 115752                               | 1000                       | 0.8  | 3.1E+05                 | 2.5E-03  | 1.1E-03   | 23000                    | 900                           |
| 106115                | 115753                               | 2000                       | 0.8  | 7.2E+05                 | 6.2E-03  | 4.1E-03   | 33000                    | 1200                          |
| 106116                | 115754                               | 5000                       | 0.8  | 8.0E+05                 | 6.3E-03  | 4.2E-03   | 57000                    | 2800                          |
| 106117                | 115755                               | 10000                      | 1.5  | 3.1E+06                 | 4.9E-02  | 3.0E-02   | 90000                    | 4400                          |
| 106118                | 115756                               | 20000                      | 1.5  | 3.7E+06                 | 4.9E-02  | 3.0E-02   | 130000                   | 8200                          |

<sup>2</sup> Female cable connector in scope of delivery at first delivery

<sup>3</sup> Version „-P“ feather key

## Options

| Article-No. | Description                |                                  |
|-------------|----------------------------|----------------------------------|
| 101695      | Accuracy class             | 0.05 % $M_{nom}$                 |
| 100218      | Control signal             | 100 % $M_{nom}$                  |
| 42828       | Extended temperature range | -30 °C...100 °C                  |
| 42829       | Extended temperature range | -30 °C...120 °C [ $\geq 20$ N·m] |

## Calibrations

| Article-No. | Description   |            |
|-------------|---|------------|
| 400676      | Linearity diagram in accordance to factory standard | 25 % steps |
| 400664      | Linearity diagram in accordance to factory standard | 10% steps  |
| 400961      | Proprietary calibration acc. to VDI/VDE 2646        | 3 steps    |
| 400700      | Proprietary calibration acc. to VDI/VDE 2646        | 5 steps    |
| 400688      | Proprietary calibration acc. to VDI/VDE 2646        | 8 steps    |
|             | DAkkS-Calibration/Standard on request               |            |

## Accessories

### Electrical Connection

| Article-No. | Description  |
|-------------|--|
| 10294       | Female cable connector 7-pin series 712  |
| 10367       | Female angled connector 7-pin series 712   |
| 10316       | Connection cable, 3 m, with 7-pin female cable connector series 712 and free strands         |
| 103348      | Connection cable angled, 3 m, with 7-pin female cable connector series 712 and free strands  |
| 10301       | Female cable connector 6-pin series 581  |
| 10315       | Female angled connector 6-pin series 682   |
| 10266       | Connection cable, 3 m, with 6-pin female cable connector series 581 and free strands         |
| 10387       | Connection cable angled, 3 m, with 6-pin female angled connector series 682 and free strands |

## Amplifiers

Examples of suitable amplifiers for the torque sensor D-2452/D-2452-P:



Further suitable amplifiers you can find on our homepage under <https://www.lorenz-messtechnik.de/english/products/>.