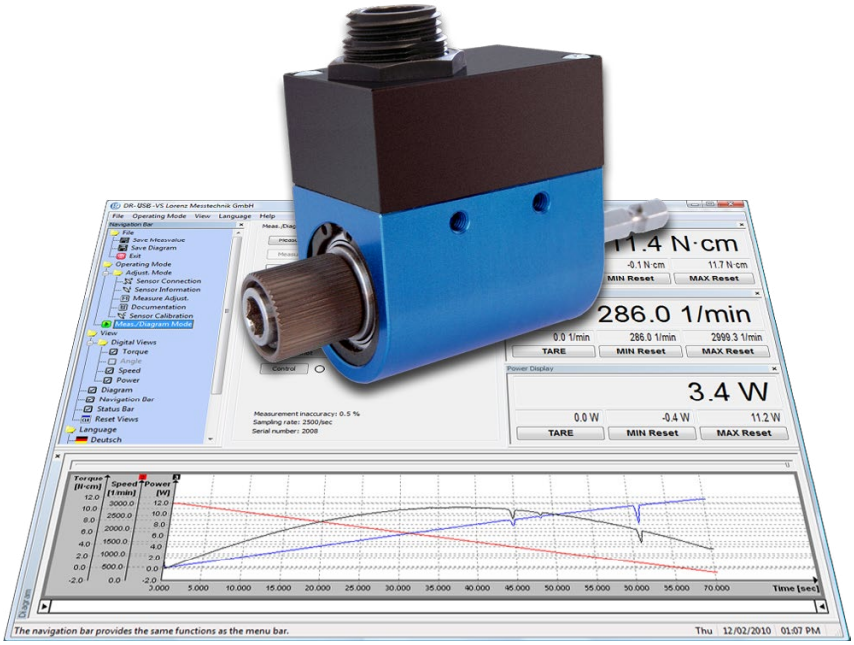
Lorenz® messtechnik gmbh

Data sheet

# USB-Torque Sensor DR-3003 (contactless) with Rated Torque from 0.1 ... 20 N·m




*This sensor has a contactless and digital signal transmission from rotor to stator without signal falsification of the measurement data. It is therefore highly accurate and maintenance-free.*

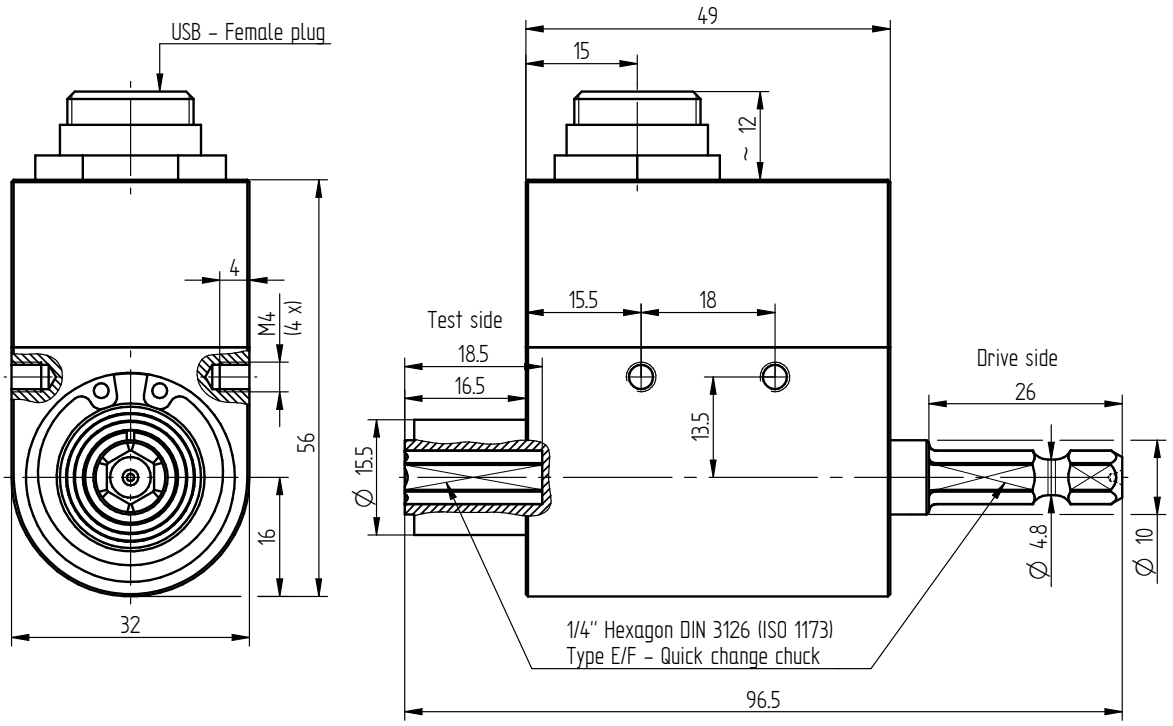
## Performance Features

- USB-Torque sensor for screw driving systems with configuration and evaluation software
- High accuracy
- Integrated speed/angle measurement
- Up to 2500 measurements/s per measuring channel
- Speed up to 4000 $min^{-1}$
- Very short axial length
- Feed-in from USB without external power supply
- Calibration parameter lodged in sensor
- Performance calculation via software
- Simple handling and assembly
- Special versions on request

## Application

- Assembly technology
- Process measuring and control technology
- Automotive industry
- Measuring and control devices
- Tool engineering
- Special mechanical engineering

## Dimensions of DR-3003 in mm




| Rated Torque [N·m] | Hexagon Drive | Weight [kg] |
|---|---|---|
| 0.1/0.2/0.5/1/2/5/10/15/20 | 1/4“ | 0.2 |

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

| USB-Torque Sensor DR-3003 | | |
|---|---|---|
| Rated torque **$M_{nom}$** | N·m | 0.1 ... 20 |
| Accuracy class | % $M_{nom}$ | 0.1 |
| Speed resolution | $min^{-1}$ | 1 |
| Speed accuracy | | 1 % full scale ±1 digit |
| Angle of rotation resolution | degree | 0.25 |
| Relative repeatability error in unchanged mounting position **b'** | % $M_{nom}$ | ±0.02 |
| Feed-in from USB | VDC | 4 ... 6 |
| Current consumption | mA | ≤250 |
| Output signal torque | digits | ±25000 |
| Output signal speed/angle of rotation | digits | ±32511 |
| Control signal excitation | | per software |
| Sample rate | kSample/s | 2.5 |
| Electrical connection | | Mini-USB-B-Socket IP68, incl. 3 m connection cable to PC |
| Reference temperature **$T_{ref}$** | °C | 23 |
| Rated temperature range | °C | 5 ... 45 |
| Operating temperature range | °C | 0 ... 60 |
| Storage temperature range | °C | -10 ... 70 |
| 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 |
| Breaking torque **$M_B$** (static) | % $M_{nom}$ | >300 |
| Permissible oscillation stress when subjected to torque **$M_{df}$** | % $M_{nom}$ | 70 (peak-to-peak) |
| Level of protection | | IP50 |

## Technical Data acc. to VDI/VDE/DKD 2639 (continued)

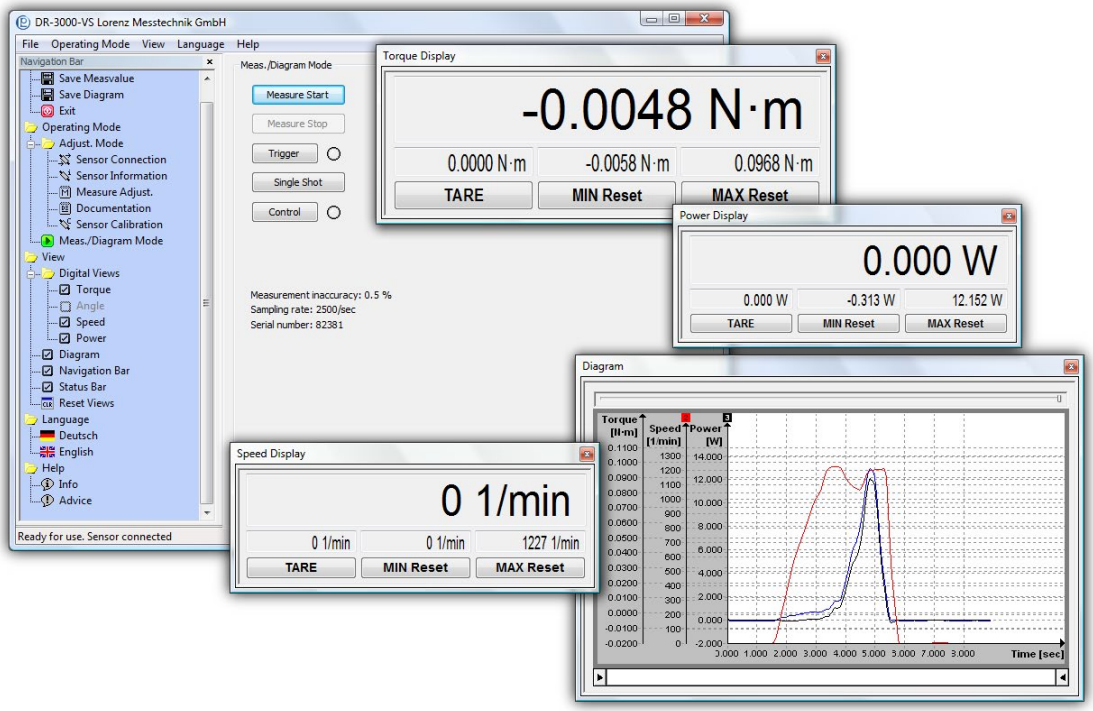
| Article-No. | Rated Torque [N·m] | Limit Speed [min$^{-1}$] | Springrate [N·m/rad] | Mass Moment of Inertia [kg·m²] | | Axial Force Limit [N][1] | Lateral Force Limit [N][1] |
|---|---|---|---|---|---|---|---|
| | | | | Drive Side | Test Side | | |
| 112831 | 0.1 | 3000 | 18 | 2.6E-06 | 3.9E-07 | 43 | 1.2 |
| 112832 | 0.2 | 3000 | 18 | 2.6E-06 | 3.9E-07 | 58 | 1.6 |
| 112833 | 0.5 | 3000 | 112 | 2.6E-06 | 3.9E-07 | 185 | 1.6 |
| 112834 | 1 | 4000 | 112 | 2.6E-06 | 3.9E-07 | 260 | 2.6 |
| 112828 | 2 | 4000 | 285 | 2.6E-06 | 3.9E-07 | 480 | 6.6 |
| 112835 | 5 | 4000 | 457 | 2.6E-06 | 4.0E-07 | 865 | 17 |
| 112836 | 10 | 4000 | 516 | 2.6E-06 | 4.2E-07 | 1150 | 24 |
| 112837 | 15 | 4000 | 516 | 2.6E-06 | 4.2E-07 | 1150 | 24 |
| 112838 | 20 | 4000 | 516 | 2.6E-06 | 4.2E-07 | 1150 | 24 |

## 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 |
| 401023 | Proprietary calibration for the angle of rotation acc. to VDI/VDE 2648-1 | |
| | DAkkS-Calibration / Standard on request | |

[1] Unsupported shaft

## Configuration and Evaluation Software DR-USB-VS




The configuration and evaluation software serves for easy evaluation and graphical visualisation of torque/speed/power or torque/angle of rotation on PC.
The software allows direct read in of measured data into a text file in CSV-format through the USB-port of a PC. This enables further analyses with a commercially available spreadsheet program at any time.

| Technical data | |
|---|---|
| Type | DR-USB-VS |
| Interface | USB |
| Protocol | Lorenz Standard Protocol |
| System Requirements | Windows® 7 - 10 32/64 Bit[2] Dual-Core from 1.8 GHz (with diagram) |

| Highlights at a glance | |
|---|---|
| Conversion in physical values | ✓ |
| Simultaneous storage of up to 3 physical values | ✓ |
| Simultaneous measuring | 1 Sensor |
| Automatic scaling of y-axis | ✓ |
| Graphical visualisation of a physical value | ✓ |
| Automatic or manual storage in a CSV and BMP file | ✓ |
| Mathematical computation of the mechanical power | ✓ |
| Calibration function | ✓ |
| Resettable minimum value memory for each measured value | ✓ |
| Resettable maximum value memory for each measured value | ✓ |
| Variable average determination | ✓ |
| Tare for each measured value | ✓ |

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