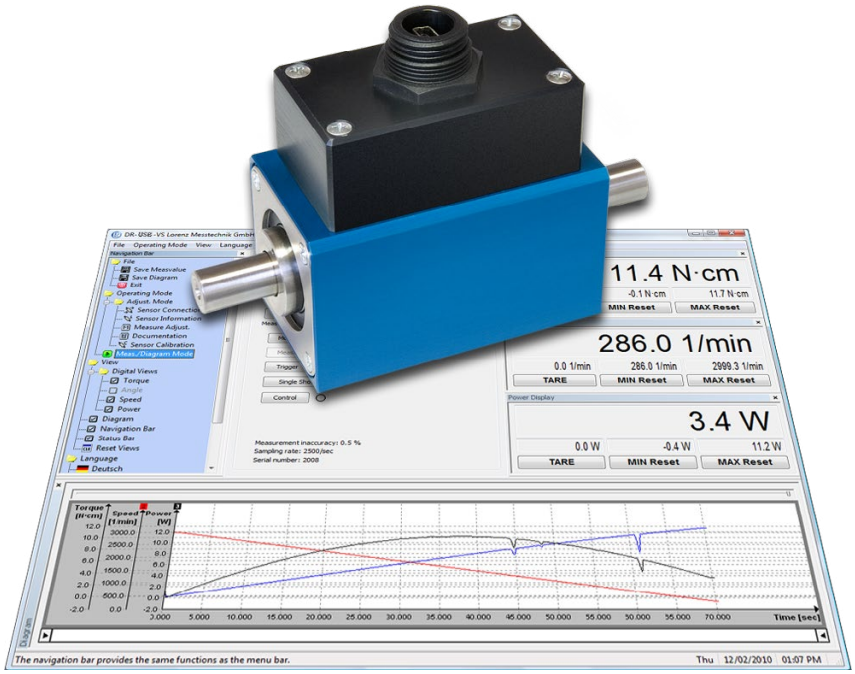
Lorenz® messtechnik gmbh

Data sheet

USB-Torque Sensor DR-3000 / DR-3000-P (contactless) with Rated Torque from 0.1 to 5000 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.

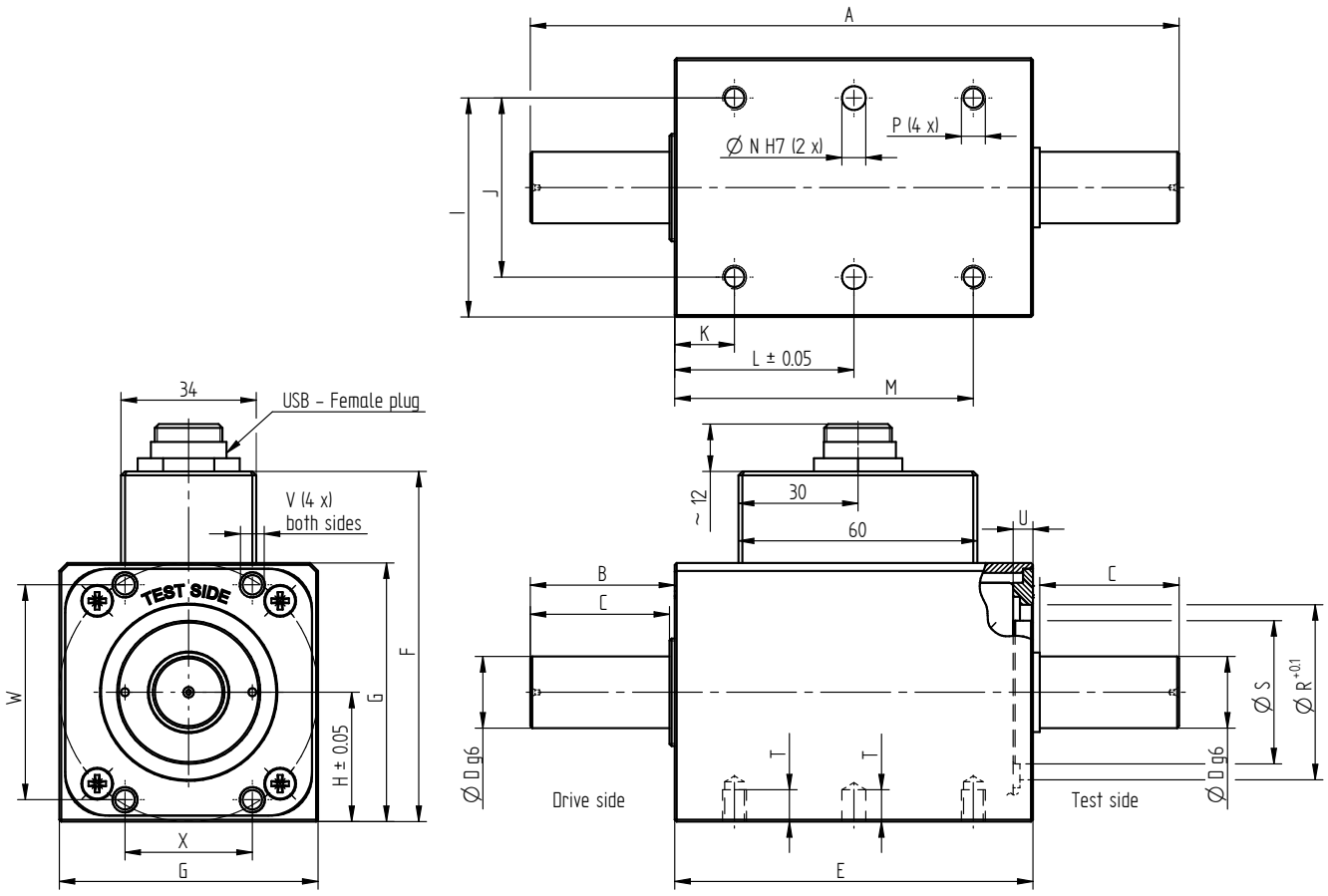
Performance Features

- USB-Torque sensor with configuration and evaluation software
- High accuracy
- Integrated speed/angle measurement
- Up to 2500 measurements/s per measuring channel
- Speed up to 30000 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

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

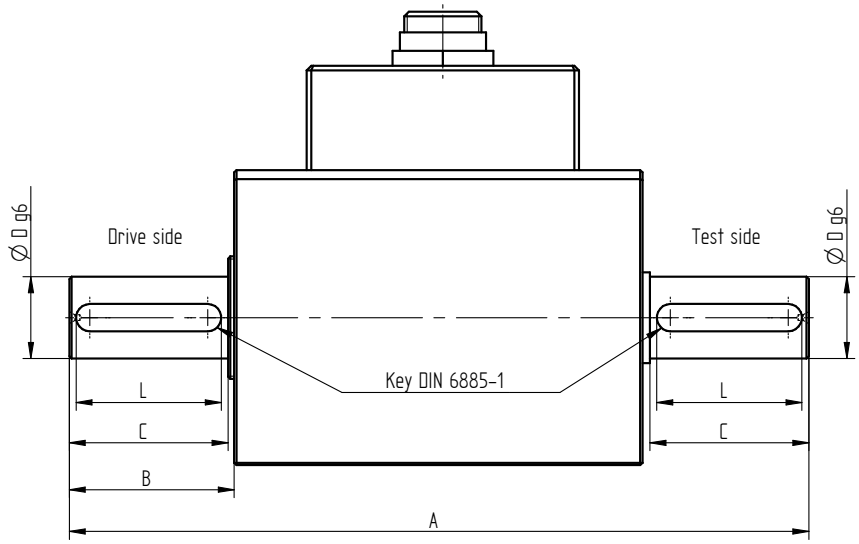
Dimensions in mm



Rated Torque [N·m]	Dimensions [mm]											
	A	B	C	Ø D	E	F	G	H	I	J	K	L
0.1/0.2/0.5/1/2/5	110	19	16.5	8	71	63	40	20	35	30	12	35.5
10	110	19	16.5	10	71	63	40	20	35	30	12	35.5
20/30/50/100	163	36.5	35	18	90	88	65	32.5	55	45	15	45
200/500	234	56.5	55	32	120	118	95	47.5	82.5	70	20	60
1000	234	56.5	55	42	120	118	95	47.5	82.5	70	20	60
2000/5000	372	114	110	70	144	163	140	70	120	100	25	72

Rated Torque [N·m]	Dimensions [mm]											Weight [kg]
	M	Ø N	P	Ø R	Ø S	T	U	V	depth	W	X	
0.1/0.2/0.5/1/2/5	59	4	M4	28	20	8	~ 1,5	M4	7.5	32	18	0.5
10	59	4	M4	28	20	8	~ 1,5	M4	7.5	32	18	0.6
20/30/50/100	75	6	M6	44	36	8	~ 5	M6	12.5	54	32	1.6
200/500	100	8	M8	70	65	14	~ 6	M8	16.5	76	50	4.8
1000	100	8	M8	70	65	14	~ 6	M8	16.5	76	50	5.6
2000/5000	119	12	M12	108	98	20	~ 7	M12	25	112	72	19.0

Dimensions of Version with Feather Key in mm



Rated Torque [N·m]	Dimensions [mm]						Weight [kg]
	A	B	C	Ø D	L	Feather Key[1]	
0.1/0.2/0.5/1/2/5	110	19	16.5	8	14	2 x 2 x 14	0.5
10	110	19	16.5	10	14	3 x 3 x 14	0.6
20/30/50/100	163	36.5	35	18	32	6 x 6 x 32	1.6
200/500	234	56.5	55	32	50	10 x 8 x 50	4.8
1000	234	56.5	55	42	50	12 x 8 x 50	5.6
2000/5000	372	114	110	70	100	20 x 12 x 100	19.0

Technical Data acc. to VDI/VDE/DKD 2639

Article-No. DR-3000	Article-No. DR-3000-P[2]	Rated Torque [N·m]	Limit Speed [min^{-1}]	Spring Rate [N·m/rad]	Mass Moment of Inertia [kg·m²]		Axial Force Limit [N][3]	Lateral Force Limit [N][3]
					Drive Side	Test Side		
114357	115665	0.1	30000	1.8E+01	9.2E-06	2.5E-07	43	1.5
114358	115664	0.2	30000	1.8E+01	9.2E-06	2.5E-07	58	2
111231	115663	0.5	30000	9.4E+01	9.2E-06	2.5E-07	240	3
111177	115662	1	30000	9.4E+01	9.2E-06	2.5E-07	240	3
111232	115661	2	30000	3.7E+02	9.2E-06	2.5E-07	480	7
111233	112617	5	30000	7.7E+02	9.2E-06	2.6E-07	900	16.5
111234	113190	10	30000	8.8E+02	9.3E-06	3.4E-07	1050	21
111235	112618	20	20000	5.1E+03	1.2E-04	6.8E-06	2300	44
111236	112093	30	20000	5.1E+03	1.2E-04	6.8E-06	2300	44
111114	113191	50	20000	9.6E+03	1.2E-04	7.4E-06	5000	142
111237	112619	100	20000	9.6E+03	1.2E-04	7.4E-06	5000	142
111238	112620	200	15000	8.9E+04	5.4E-04	4.4E-04	10000	275
110554	112621	500	15000	1.3E+05	5.4E-04	4.4E-04	13000	400
111240	112622	1000	15000	1.7E+05	6.4E-04	5.3E-04	20000	920
112801	115791	2000	12000	6.3E+05	5.7E-03	5.1E-03	34000	1250
112803	115660	5000	12000	9.6E+05	5.8E-03	5.2E-03	64000	2900

[1] Calculated load type for feather key: single side light shocks
[2] Version „-P“ feather key
[3] Unsupported shaft

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

USB-Torque Sensor DR-3000 / DR-3000-P		
Rated torque **M_{nom}**	N·m	0.1 ... 5000
Accuracy class	% M_{nom}	0.1 (optional 0.05)
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

Options

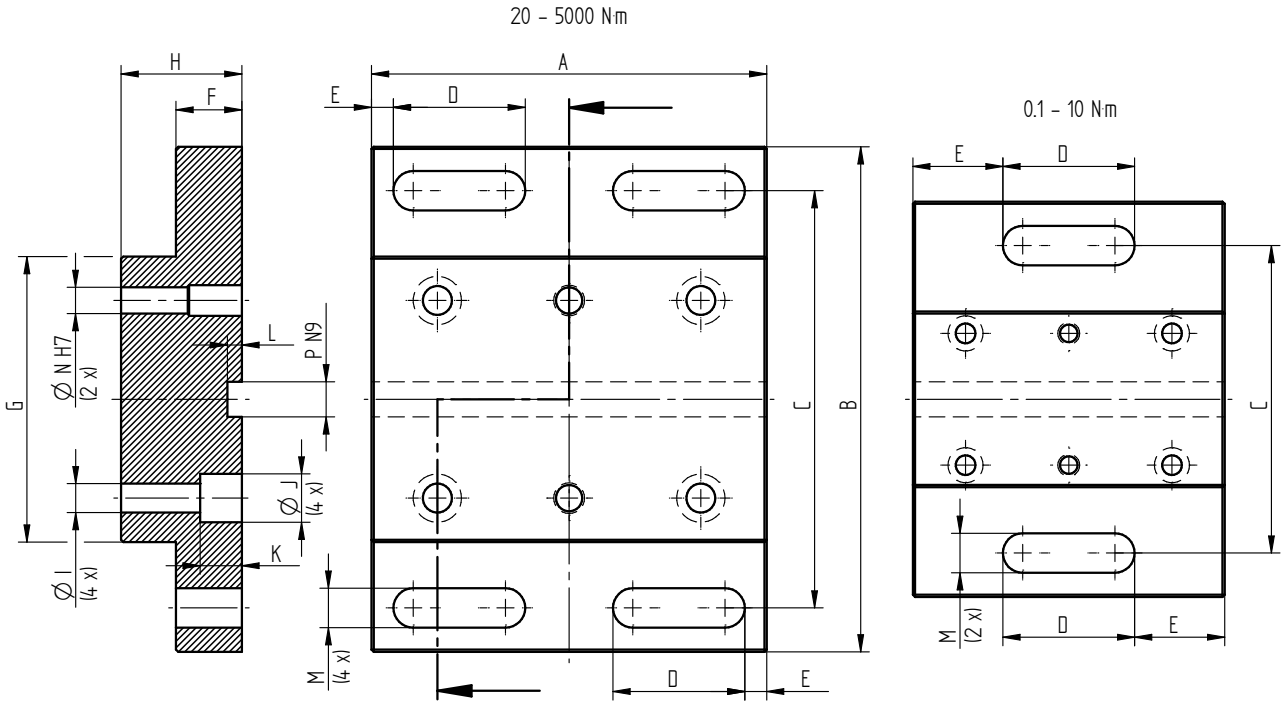
Article-No.	Description	
101695	Accuracy class	0.05 % M_{nom}

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	

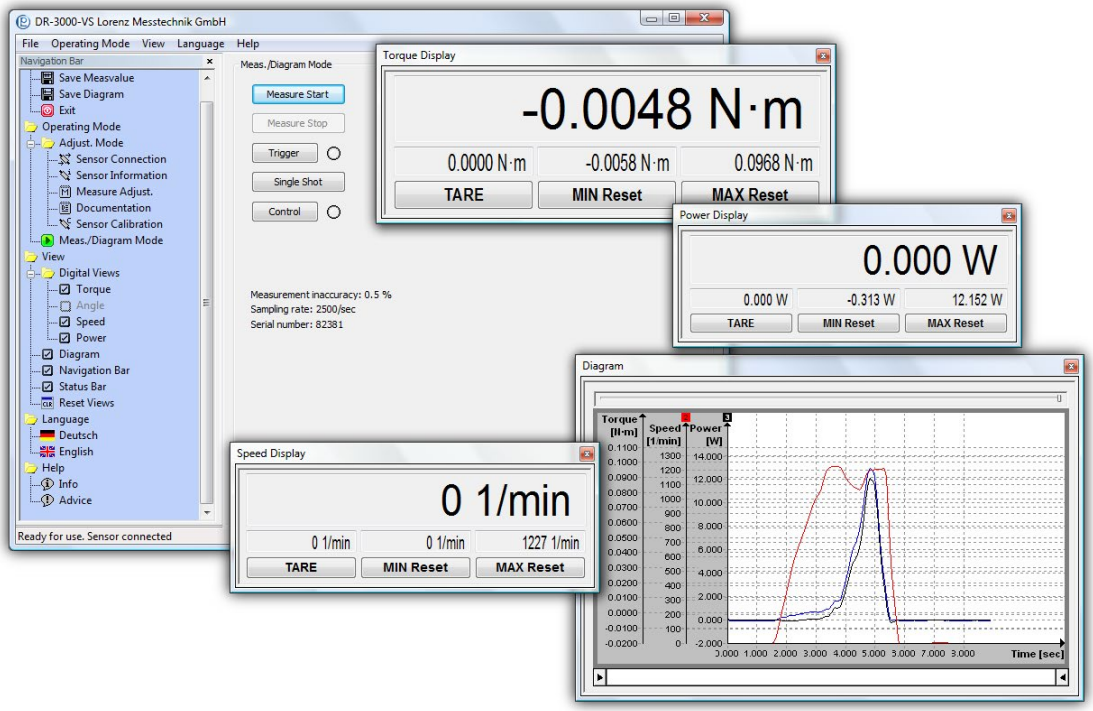
Accessories

Base Plates



Rated Torque [N·m]	Article-No.	Dimensions [mm]															Weight [kg]
		A	B	C	D	E	F	G	H	Ø I	Ø J	K	L	M	Ø N	P	
0.1/0.2/0.5/1/2/5/10	118547	71	90	70	30	20.5	15	40	25	4.5	8	7	3.3	9	4	8	0.3
20/30/50/100	118548	90	115	95	30	5	15	65	27.5	6.6	11	9.5	3.3	9	6	8	0.6
200/500/1000	118549	120	155	125	30	5	20	95	37.5	9	15	10.5	4.1	11	8	10	1.4
2000/5000	118550	144	210	176	36	5	25	140	45	13.5	20	14	4.1	13	12	10	2.9

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[4] 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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