

Rotating Torque Sensors: DR-2112/DR-2112-P and DR-2112-R/DR-2112-R-P (contactless) with Rated Torque from 0.1 ... 20000 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.

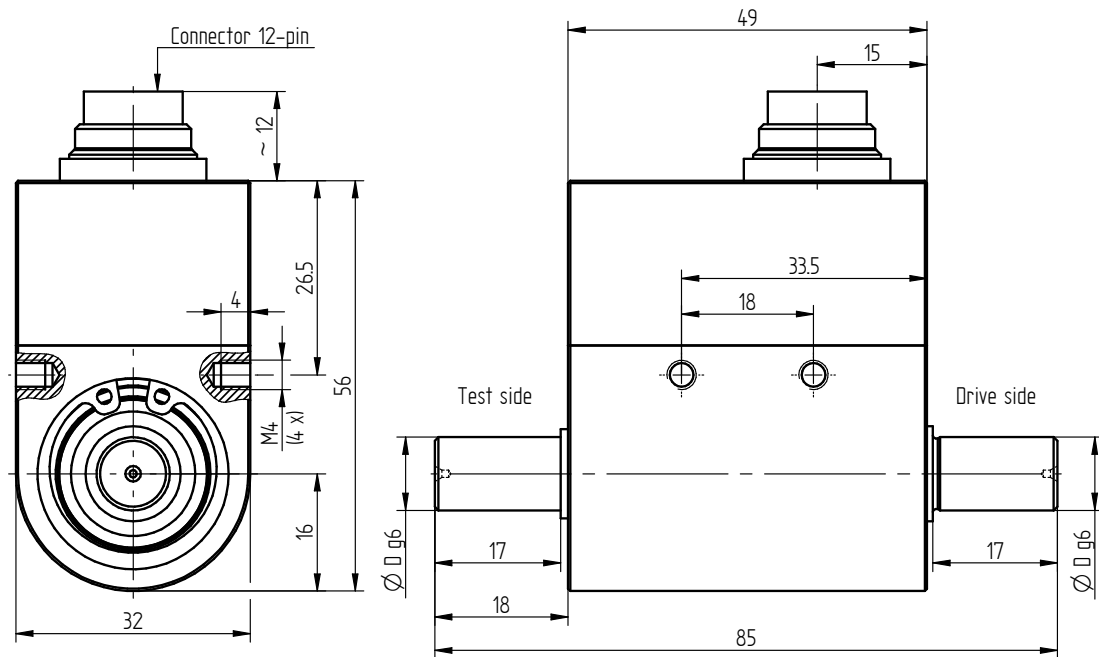
Performance Features

- Torque sensor for e.g. test bench applications
- Accuracy class 0.05 %, optional
- Active output $\pm 5V$ (optional $\pm 10V$)
- Integrated speed/angle measurement, optional
- Speed up to 15000 min^{-1}
- Very short axial length
- High torsional stiffness
- Simple handling and assembly
- Special versions on request

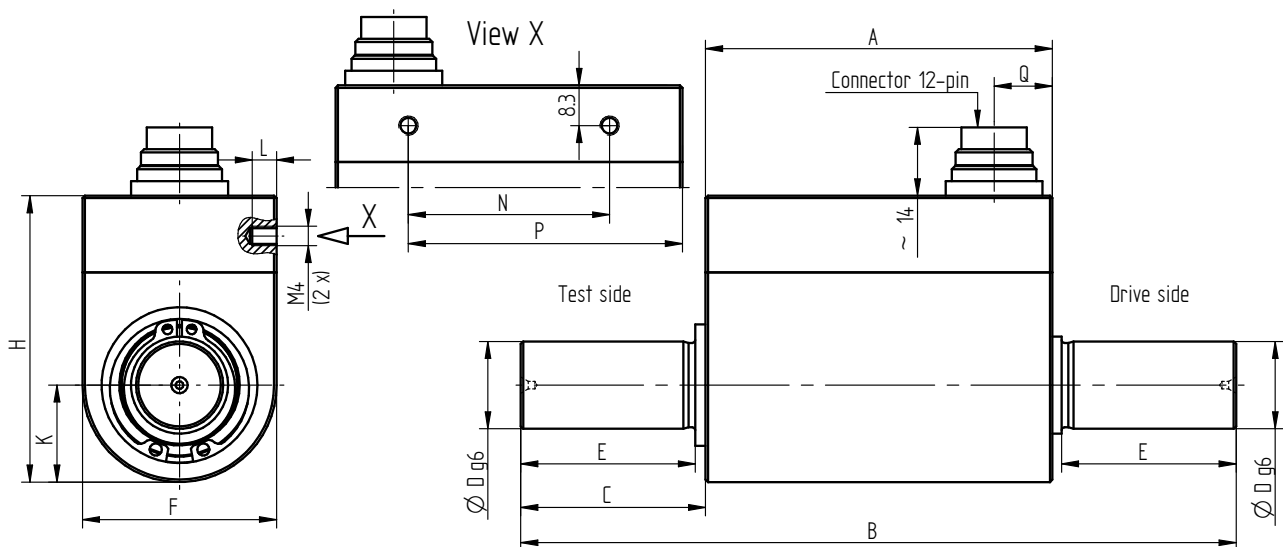
Application

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

Dimensions of DR-2112/DR-2112-P and DR-2112-R/DR-2112-R-P in mm

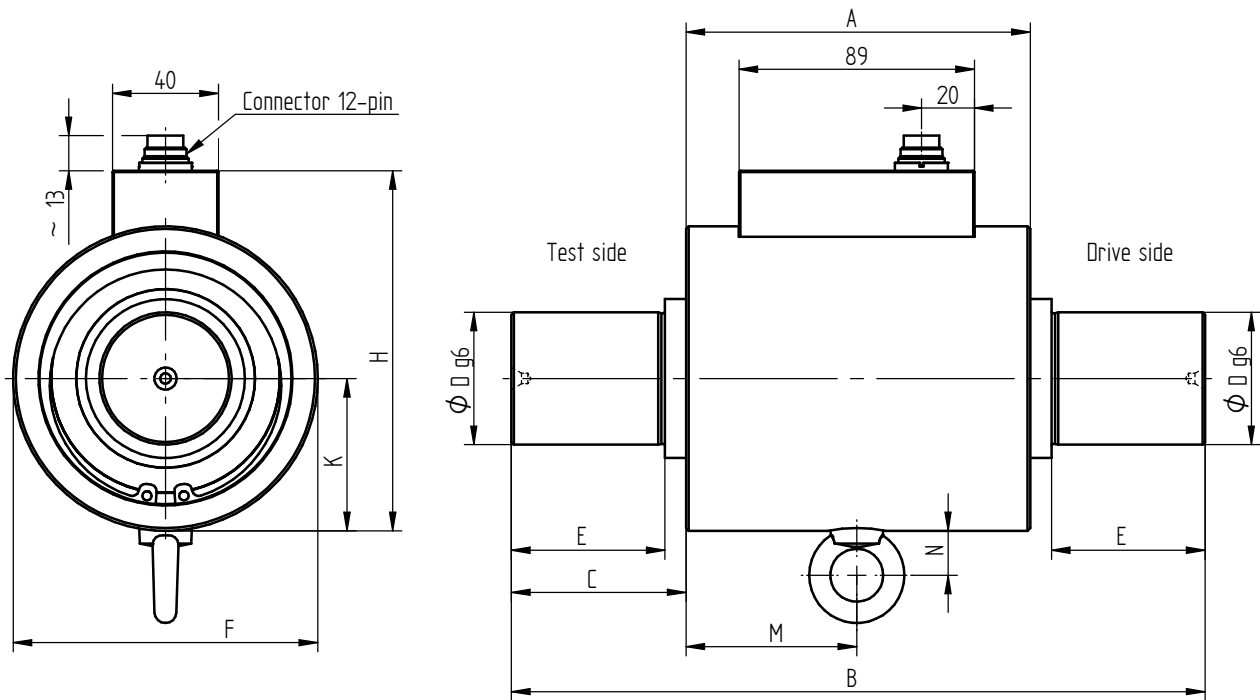


Rated Torque [N·m]	Dimensions [mm]		Weight [kg]
	Ø D		
0.1/0.2/0.5/1/2/5	8		0.2
10	10		0.2



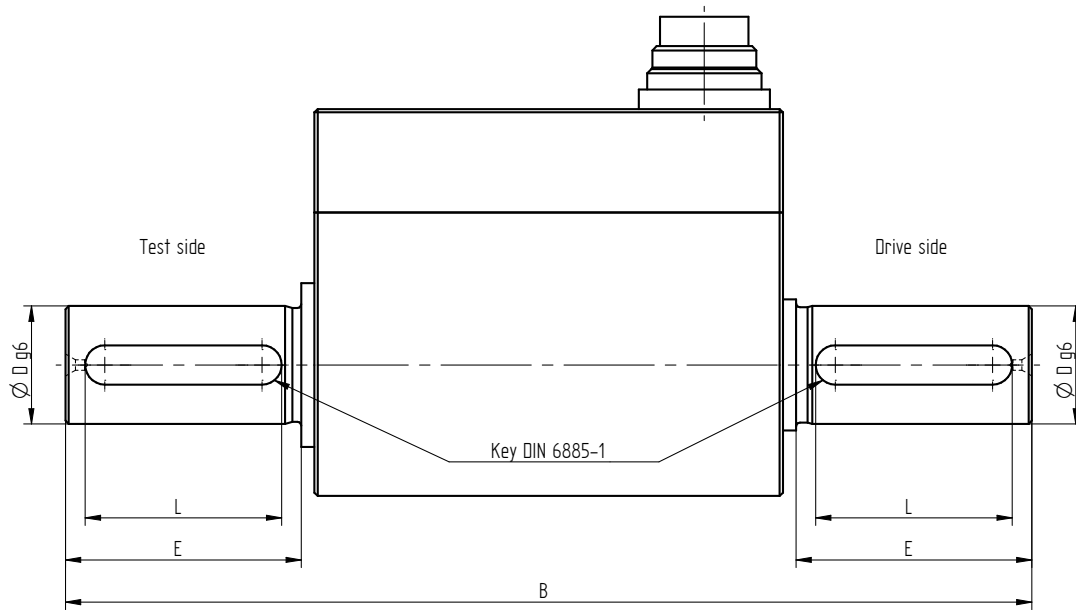
Rated Torque [N·m]	Dimensions [mm]												Weight [kg]
	A	B	C	Ø D	E	F	H	K	L	N	P	Q	
20/30	71.5	111.5	20	18	18	40	59	20	5	41.5	56.5	12	0.5
50/100	71.5	147.5	38	18	36	40	59	20	5	41.5	56.5	12	0.6
200/500	72.5	159.5	43.5	32	38	58	76	29	6	29.5	51.5	15	1.5

Dimensions of DR-2112/DR-2112-P and DR-2112-R/DR-2112-R-P in mm



Rated Torque [N·m]	Dimensions [mm]										Weight [kg]
	A	B	C	Ø D	E	Ø F	H	K	M	N	
1000	130	262	66	50	58	115	136	57.5	64.5	~17	7.2
2000/5000	135	377	121	70	110	139	161	69.5	67.5	~17	15.5
10000/20000	190	470	140	110	120	210	233	105	95	~17	47.5

Dimensions of Version with Feather Keys in mm



Rated Torque [N·m]	Dimensions [mm]				Feather Key ¹	Weight [kg]
	B	Ø D	E	L		
0.1/0.2/0.5/1/2/5	85	8	17	14	2 x 2 x 14	0.2
10	85	10	17	14	3 x 3 x 14	0.2
20/30	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	7.2
2000/5000	377	70	110	100	20 x 12 x 100	15.5
10000 / 20000	570	110	170	160	28 x 16 x 160	47.5

Connection Assignment

12-pin	DR-2112/DR-2112-P and DR-2112-R/DR-2112-R-P	Series 581
Pin A	NC	-
Pin B	Signal angle B (option)	5V TTL
Pin C	Signal (+)	±5V (±10V)
Pin D	Signal (GND)	0V
Pin E	Supply (GND)	0V
Pin F	Supply (+)	12 ... 28VDC
Pin G	Signal angle A (option)	5V TTL
Pin H	NC	-
Pin J	NC	-
Pin K	Control signal	L < 2.0V; H > 3.5V
Pin L	NC	-
Pin M	Shield	-

¹ Calculated load type for feather key: single side light shocks

Technical Data acc. to VDI/VDE/DKD 2639

Torque Sensor		DR-2112/DR-2112-P	DR-2112-R/DR-2112-R-P
Rated torque M_{nom}	N·m	0.1 ... 20000	0.1 ... 1000
Accuracy class	% M_{nom}	0.1 (optional 0.05)	0.2
Relative repeatability error in unchanged mounting position b'	% M_{nom}	±0.02	±0.04
Rated range of supply voltage	VDC	12 ... 28	
Current consumption	mA	≤60	
Output signal	V	±5	
Control signal excitation	V	L <2.0; H >3.5	
Sample rate	kSample/s	10	
Electrical connection		12-pin series 581 ²	
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	±0.3
Temperature effect on characteristic value TK_C	% $M_{nom}/10$ K	±0.1	±0.15
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	

Article-No. DR-2112	Article-No. DR-2112-P ³	Rated Torque [N·m]	Limit Speed [min ⁻¹]	Spring Rate [N·m/rad]	Mass Moment of Inertia [kg·m ²] ⁴		Axial Force Limit [N] ⁵	Lateral Force Limit [N] ⁵
					Drive Side	Test Side		
102570	115285	0.1	15000	1.8E+01	1.9E-06	2.8E-07	42	0.9
101930	115284	0.2	15000	1.8E+01	1.9E-06	2.8E-07	58	1.2
101709	115283	0.5	15000	1.2E+02	1.9E-06	2.8E-07	172	1.9
101597	103655	1	15000	1.2E+02	1.9E-06	2.8E-07	227	2.9
102348	114947	2	15000	3.6E+02	1.9E-06	2.9E-07	348	5.5
101840	106697	5	15000	4.0E+02	1.9E-06	2.9E-07	650	14
102761	106847	10	15000	9.3E+02	2.1E-06	3.8E-07	1000	26
102263	105931	20	15000	4.5E+03	1.2E-05	9.9E-06	1680	43
102111	103289	30	15000	4.5E+03	1.2E-05	9.9E-06	2200	65
102451	105943	50	15000	8.5E+03	1.3E-05	1.2E-05	3100	80
101979	104019	100	12000	8.5E+03	1.3E-05	1.2E-05	4800	160
102177	105885	200	10000	6.7E+04	1.0E-04	9.0E-05	8000	290
102316	108437	500	10000	7.1E+04	1.0E-04	9.0E-05	14000	700
103652	115282	1000	8000	3.1E+05	1.6E-03	1.1E-03	23000	900
103349	110873	2000	5500	7.2E+05	5.3E-03	4.3E-03	33000	1200
103797	112778	5000	5500	8.0E+05	5.4E-03	4.3E-03	57000	2800
105483	114737	10000	5000	3.1E+06	4.0E-02	3.7E-02	90000	4400
105484	115297	20000	5000	3.7E+06	4.0E-02	3.8E-02	130000	8200

² Female cable connector in scope of delivery at first delivery

³ Version '-P' feather key



⁴ Without option speed/angle measurement

⁵ Unsupported shaft (free floating assembly)

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

Article-No. DR-2112-R ⁶	Article-No. DR-2112-R-P ³	Rated Torque [N·m]	Limit Speed [min ⁻¹]	Spring Rate [N·m/rad]	Mass Moment of Inertia [kg·m ²] ⁴		Axial Force Limit [N] ⁵	Lateral Force Limit [N] ⁵
					Drive Side	Test Side		
108678	113453	0.1	15000	1.8E+01	1.9E-06	2.8E-07	42	0.9
108679	115279	0.2	15000	1.8E+01	1.9E-06	2.8E-07	58	1.2
108680	115280	0.5	15000	1.2E+02	1.9E-06	2.8E-07	172	1.9
108681	115281	1	15000	1.2E+02	1.9E-06	2.8E-07	227	2.9
108682	114491	2	15000	3.6E+02	1.9E-06	2.9E-07	348	5.5
108683	113452	5	15000	4.0E+02	1.9E-06	2.9E-07	650	14
108684	109657	10	15000	9.3E+02	2.1E-06	3.8E-07	1000	26
108686	113223	20	15000	4.5E+03	1.2E-05	9.9E-06	1680	43
108687	111395	30	15000	4.5E+03	1.2E-05	9.9E-06	2200	65
108688	110093	50	15000	8.5E+03	1.3E-05	1.2E-05	3100	80
108689	110500	100	12000	8.5E+03	1.3E-05	1.2E-05	4800	160
108690	110149	200	10000	6.7E+04	1.0E-04	9.0E-05	8000	290
108691	109209	500	10000	7.1E+04	1.0E-04	9.0E-05	14000	700
108692	115278	1000	8000	3.1E+05	1.6E-03	1.1E-03	23000	900

Options

Article-No.	Description	
101695	Accuracy class	0.05 % M _{nom}
103562	Output signal	±10V
101560	Speed/angle measurement, 2 x 360 impulses, 90° displaced	5V TTL, CW-turn CH A  CH B 
104097 ⁷	Speed measurement, 1 x 60 impulses	5V TTL
106154	Control signal	50 % M _{nom}
100739	Control signal	80 % 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	

³ Version '-P' feather key

⁴ Without option speed/angle measurement

⁵ Unsupported shaft (free floating assembly)

⁶ Version '-R' accuracy class 0.2 % M_{nom}

⁷ Rated torque ≥10000 N·m

Accessories

Electrical Connection

Article-No.	Description
41382	Female cable connector 12-pin series 581
45598	Female angled connector 12-pin series 682
10270	Connection cable, 3 m, with 12-pin female cable connector series 581 and free strands
10345	Connection cable angled, 3 m, with 12-pin female angled connector series 682 and free strands

Amplifiers

Examples of suitable amplifiers for the torque sensors DR-2112/DR-2112-P and DR-2112-R/DR-2112-R-P:



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