

Torque Sensor, rotating Series 86-2112

This sensor has a contactless and digital signal transmission from rotor to stator, which means no signal falsification and maintenance-free



86-2112

86-2112-xxxx 86-2112R-xxxx

Nominal torque from 0.1 N·m ... 20000 N·m
Accuracy class optional 0.05%
Active output ± 5 V (opt. ± 10 V)
Speed up to 15.000 min⁻¹
Integrated speed/angle measurement optional
Very short axial length
High torsional stiffness
Reliable and durable
Simple handling and assembly
Special versions on request

86-2412-xxxx 86-2412R-xxxx

Nominal torque from 0.1 N·m ... 20000 N·m
Accuracy class optional 0.05%
Digital output RS485
Speed up to 15.000 min⁻¹
Integrated speed/angle measurement optional
Very short axial length
High torsional stiffness
Reliable and durable
Simple handling and assembly
Special versions on request
Auto identification of: measuring range, serial number, date of calibration

Technical Data

Model 86-2112, 86-2412

Order code	Article No. 86-2112	Nominal Torque [Nm]	Limit Speed [min ⁻¹]	Springrate [N·m/rad]	Mass moment of inertia		Limit Thrust Load [N] ²	Limit Shear Force [N] ³
					[kg·m ²] ¹			
					Drive side	Test side		
86-2112-4100	102570	0,1	15000	1,80E+01	1,90E-06	2,80E-07	42	0,9
86-2112-4200	101930	0,2	15000	1,80E+01	1,90E-06	2,80E-07	58	1,2
86-2112-4500	101709	0,5	15000	1,20E+02	1,90E-06	2,80E-07	172	1,9
86-2112-5001	101597	1	15000	1,20E+02	1,90E-06	2,80E-07	227	2,9
86-2112-5002	102348	2	15000	3,60E+02	1,90E-06	2,90E-07	348	5,5
86-2112-5005	101840	5	15000	4,00E+02	1,90E-06	2,90E-07	650	14
86-2112-5010	102761	10	15000	9,30E+02	2,10E-06	3,80E-07	1000	26
86-2112-5020	102263	20	15000	4,50E+03	1,20E-05	9,90E-06	16680	43
86-2112-5030	102111	30	15000	4,50E+03	1,20E-05	9,90E-06	2200	65
86-2112-5050	102451	50	15000	8,50E+03	1,30E-05	1,20E-05	3100	80
86-2112-5100	101979	100	12000	8,50E+03	1,30E-05	1,20E-05	4800	160
86-2112-5200	102177	200	10000	6,70E+04	1,00E-04	9,00E-05	8000	290
86-2112-5500	102316	500	10000	7,10E+04	1,00E-04	9,00E-05	14000	700
86-2112-6001	103652	1000	8000	3,10E+05	1,60E-03	1,10E-03	23000	900
86-2112-6002	103349	2000	5500	7,20E+05	5,30E-03	4,30E-03	33000	1200
86-2112-6005	103797	5000	5500	8,00E+05	5,40E-03	4,30E-03	57000	2800
86-2112-6010	105483	10000	5000	3,10E+06	4,00E-02	3,70E-02	90000	4400
86-2112-6020	105484	20000	5000	3,70E+06	4,00E-02	3,80E-02	130000	8200

Model 86-2112R, 86-2412R

Order code	Article No. 86-2112R	Nominal Torque [Nm]	Limit Speed [min ⁻¹]	Springrate [N·m/rad]	Mass moment of inertia		Limit Thrust Load [N] ²	Limit Shear Force [N] ³
					[kg·m ²] ¹			
					Drive side	Test side		
86-2112R-4100	108678	0,1	15000	1,80E+01	1,90E-06	2,80E-07	42	0,9
86-2112R-4200	108679	0,2	15000	1,80E+01	1,90E-06	2,80E-07	58	1,2
86-2112R-4500	108680	0,5	15000	1,20E+02	1,90E-06	2,80E-07	172	1,9
86-2112R-5001	108681	1	15000	1,20E+02	1,90E-06	2,80E-07	227	2,9
86-2112R-5002	108682	2	15000	3,60E+02	1,90E-06	2,90E-07	348	5,5
86-2112R-5005	108683	5	15000	4,00E+02	1,90E-06	2,90E-07	650	14
86-2112R-5010	108684	10	15000	9,30E+02	2,10E-06	3,80E-07	1000	26
86-2112R-5020	108686	20	15000	4,50E+03	1,20E-05	9,90E-06	1680	43
86-2112R-5050	108688	50	15000	8,50E+03	1,30E-05	1,20E-05	2200	80
86-2112R-5100	108689	100	12000	8,50E+03	1,30E-05	1,20E-05	3100	160
86-2112R-5200	108690	200	10000	6,70E+04	1,00E-04	9,00E-05	4800	290
86-2112R-5500	108691	500	10000	7,10E+04	1,00E-04	9,00E-05	8000	700
86-2112R-6001	108692	1000	8000	3,10E+05	1,60E-03	1,10E-03	14000	900

[1] Without option speed/angle measurement

[2] Unsupported shaft

[3] Unsupported shaft

Technical Data

	86-2112 (86-2112R)	86-2412 (86-2412R)
Accuracy class	0,1 (0,2) % f. s.	0,1 (0,2) % f. s.
Repeatability (DIN 1319)	±0,02 (±0,04) %	±0,02 (±0,04) %
Excitation voltage	12 ... 28 VDC	12...28 VDC
Current consumption	max. 60 mA	max. 60 mA
Output signal	±5 V	±25000 digits per Software
Control signal excitation	L <2,0; H >3,5 V	
Sample rate	10 kSample	5 kSample
Reference temperature	23 °C	23 °C
Nominal temperature range	5 ... 45 °C	5 ... 45 °C
Service temperature range	0 ... 60 °C	0 ... 60 °C
Storage temperature range	-10 ... 70 °C	-10 ... 70 °C
Temp. coeff. of sensitivity	±0,01 (±0,015) % f. s.	±0,01 (±0,015) % f. s.
Temp. coeff. of zero signal	±0,02 (±0,03) % f. s.	±0,02 (±0,03) % f. s.
Service torque (static)	150 % f. s.	150 % f. s.
Limit torque (static)	200 % f. s.	200 % f. s.
Ultimate torque (static)	>300 % f. s.	>300 % f. s.
Bandwidth (DIN 50100)	70 (<i>peak - peak</i>) %	70 (<i>peak - peak</i>) %
Level of protection (DIN EN 60529)	IP50	IP50
Electrical connection	12-pin series 581 ^[4]	12-pin series 581 ^[4]

Pin Connection Model 86-2112, 86-2112R

12pin

Pin A	NC	-
Pin B	Opt. angle B	5 V TTL
Pin C	Signal (+)	±5 V (±10V)
Pin D	Signal (GND)	0 V
Pin E	Excitation (GND)	0 V
Pin F	Excitation (+)	12 ... 28 VDC
Pin G	Opt. angle A	5 V TTL
Pin H	NC	-
Pin J	NC	-
Pin K	Control signal	L <2,0 V; H >3,5 V
Pin L	NC	-
Pin M	Shield	

Pin Connection Model 86-2412, 86-2412R

12pin

Pin A	NC	-
Pin B	Opt. angle B	5 V TTL
Pin C	NC	-
Pin D	NC	-
Pin E	Excitation (GND)	0 V
Pin F	Excitation (+)	12 ... 28 VDC
Pin G	Opt. angle A	5 V TTL
Pin H	NC	-
Pin J	RS485	RS485 (B)
Pin K	NC	-
Pin L	RS485	RS485 (A)
Pin M	Shield	

Option/Accessories

Article No.	Description
101695	Accuracy class 0,05 % f. s.
103562	Output signal ±10 V
101560	Speed/angle measurement, 2 x 360 impulses, 90° displaced, 5 V TTL
104097 ^[5]	Speed measurement, 1 x 60 impulses, 5 V TTL
41382	Female cable connector 12-pin series 581
45598	Female angled connector 12-pin series 682
10270	Connection cable, 3 m, 12-pin series 581, free soldered ends
10345	Connection cable angled, 3 m, 12-pin series 682, free soldered ends
on request	Feather key groove according DIN 6885

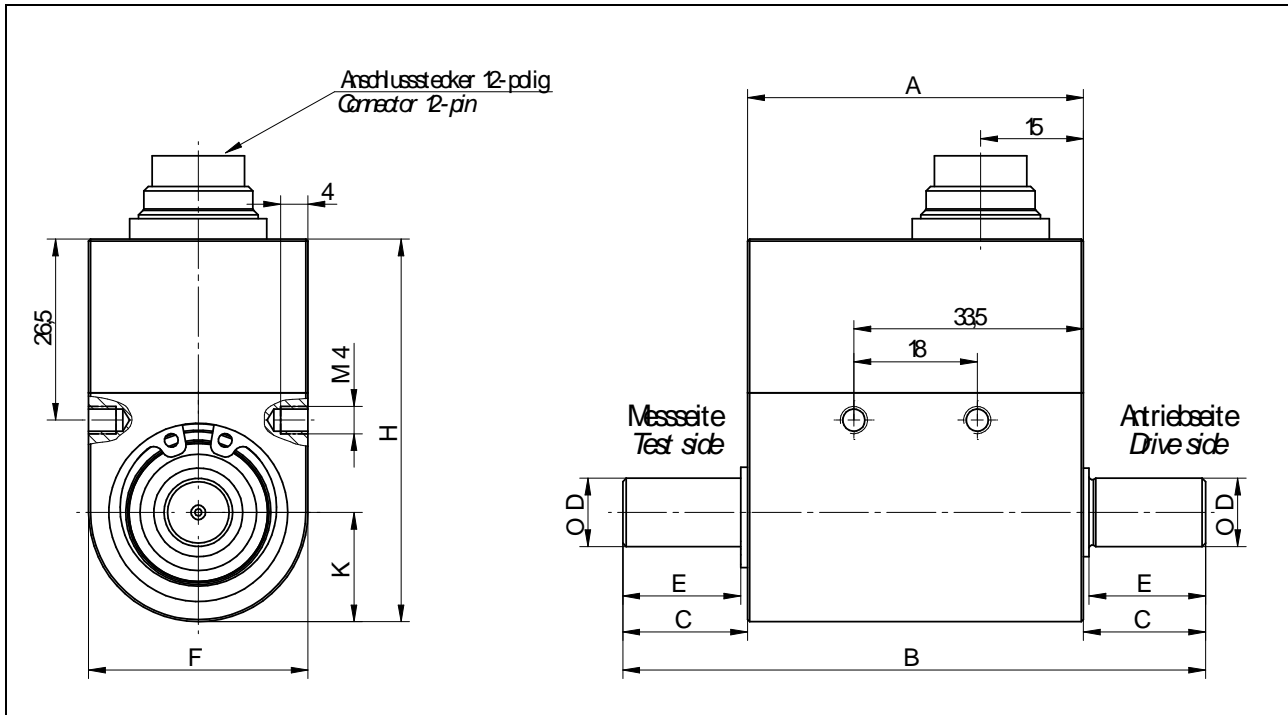
Option Calibrations

Article No.	Description	Steps	Norm
400676	Linearity diagram	25%	Factory standard
400664	Linearity diagram	10%	
400961	Proprietary calibration	3	VDI/VDE 2646
400700	Proprietary calibration	5	
400688	Proprietary calibration	8	
	DAkKS-Calibration		on request

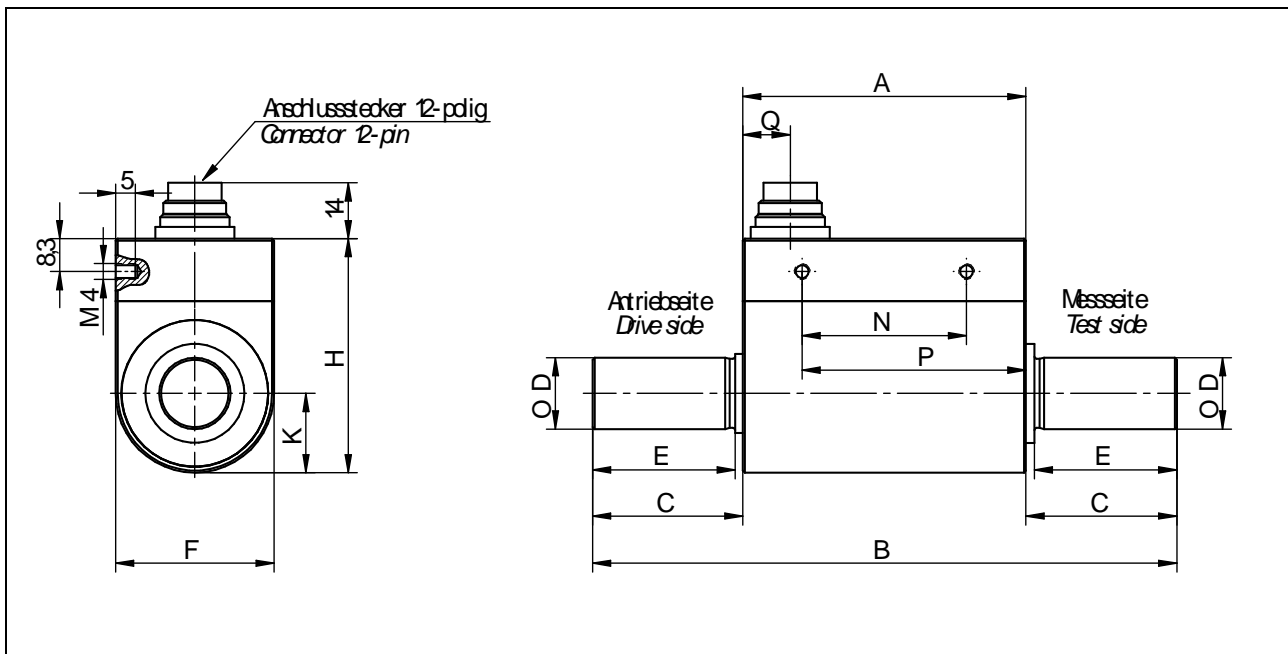
[4]female cable connector in scope of delivery at first delivery

[5]Nominal torque ≥2000 N·m

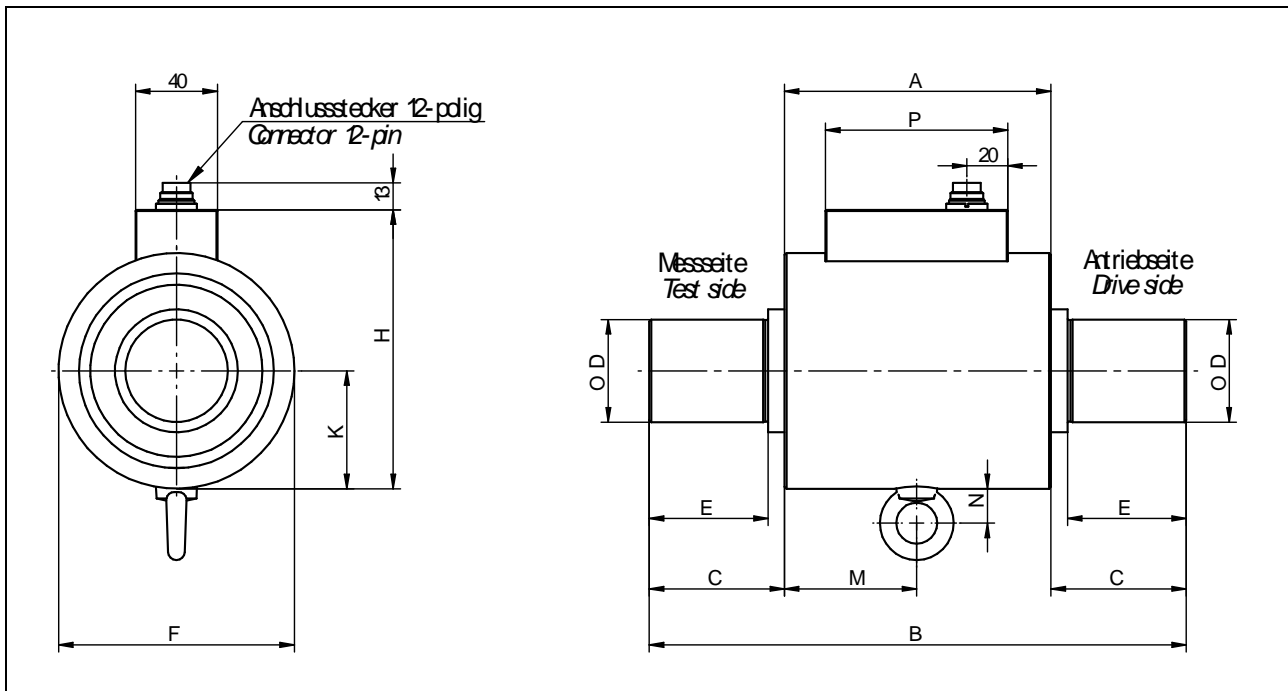
Mechanical Dimensions



Measuring range [N·m]	Dimensions [mm]							
	A	B	C	D	E	F	H	K
0,1 / 0,2 / 0,5 / 1 / 2 / 5	49	85	18	8 g6	17	32	56	16
10	49	85	18	10 g6	17	32	56	16



Measuring range [N·m]	Dimensions [mm]											
	A	B	C	ØD	E	F	H	K	M	N	P	Q
20 / 30	71,5	111,5	20	18 g6	18	40	59	20	5	41,5	56,5	12
50 / 100	71,5	147,5	38	18 g6	36	40	59	20	5	41,5	56,5	12
200 / 500	72,5	159,5	43,5	32 g6	38	58	76	29	6	29,5	51,5	15



Measuring range [N·m]	Dimensions [mm]										
	A	B	C	ØD	E	F	H	K	M	N	P
1000	130	262	66	50 g6	58	115	136	57,5	65,5	18	89
2000 / 5000	135	377	121	70 g6	110	139	161	69,5	67,5	18	89
10000 / 20000	190	470	140	110 g6	120	210	233	109	95	18	89

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