

Data sheet

1 Key Facts

Technical	Distinctive features
<ul style="list-style-type: none"> Nominal torque: up to 10000 Nm, bidirectional Customer-specific calibration on request (>10000Nm) Speed: ≤ 2500 rpm Accuracy: ≤ ±0.5 % Operating temperature: -30 °C to +85 °C Protection class: IP50, IP65 Output signal options: 0-10 V / 4-20 mA / CAN-Bus / USB Cut-off frequency: 2500 Hz 	<ul style="list-style-type: none"> Made in Germany Short delivery time (< two weeks) Excellent price / performance ratio Integrated electronic (Plug & Play) Completely contactless measuring system Delivery including 5 m cable and calibration certificate

2 Torque ranges

Model line Series 5000	Nominal torque bidirectional (+/-) [Nm]	RPM [U/min]
Standard	10000	2500
Customised	Calibration >10000 Nm on request	On request

Note: In case of overload, the sensor leads to a measurement offset. In such case, the sensor needs to be recalibrated at NCTE AG. The sensor should be operated only within the specified nominal torque range.

3 Load characteristics

Model line Series 5000	Axial force [N] ¹	Limit transverse force [N]	Limit bending moment [Nm]
Standard	20000	300	41.7
Customer-specific	20000	800	176

Any irregular stress (bending moment, transverse or axial force, exceeding the nominal torque) up to the specified static load limit is only permissible as long as none of the other stresses can occur. Otherwise the limit values must be reduced. If 30 % of the limit bending moment and 30 % of the limit transverse force are present in each case, only 40 % of the axial force is permissible, whereby the nominal torque must not be exceeded.

4 Technical characteristics

No.	Accuracy class ²		0.5	
	Description	Unit	Value	
1	Linearity deviation incl. hysteresis	%ME ³	< ±0.5	
2	Rotational Signal Uniformity (RSU)		< ±0.5	
3	Repeatability		< ±0.1	
Output signal general		Unit	Value	
4	Frequency range, -3dB point, Bessel characteristics	Hz	2500	
5	Analog signal	V mA	0 ... 10	4 ... 20
6	Signal at torque = Zero ⁴	V mA	5	12
7	Signal at positive nominal torque ⁵	V mA	9	20
8	Signal at negative nominal torque ⁵	V mA	1	4
9	Calibration parameter (normed) ⁵	V/Nm mA/Nm	4 V/ Measurement range	8 mA/ Measurement range
10	Error output	V mA	0/10	<4/20<
11	Output resistance (Voltage output)	Ω	50	
12	Output resistance (Current output)	k Ω	≥ 600	
Effect of temperature		Unit	Value	
13	Zero point drift over temperature	%/10 K	< 0.5	
14	Signal drift over temperature within nominal temperature range	%/10 K	< 0.5	

¹ Specified values only apply to direct axial force on the shaft. If the axial force acts on the circlip, only 50 % of the force is permissible.

² The accuracy class means that the linearity deviation as well as the circulation modulation, individually, are each less than or equal to the value specified as the accuracy class. The accuracy class must not be confused with a classification according to DIN 51309 or EA-10/14.

³ % ME: Related to the measuring range.

⁴ Zero point can be set to 5 V using a tare button.

⁵ The exact sensor-specific values can be found in the calibration certificate supplied.

Power supply		Unit	Value	
15	Supply voltage	VDC	9 ... 28	
16	Current consumption (max.)	mA	40	
17	Start-up peak	mA	< 100	
18	Absolute max. supply voltage	VDC	30	
General information		Unit	Value	
19	Protection class according to EN 60529 ⁶	IP	50/65	
20	Reference temperature	°C	+15 ... +35	
21	Operational temperature range	°C	-40 ... +85	
22	Storage temperature range	°C	-30 ... +85	
Nominal torque (bi-directional)		Nm	10000	Customer-specific
23	Weight	kg	15.9	-
24	Moment of inertia	kg mm ²	80270	-
Load limits⁷		Unit	Value	
25	Maximum measurable torque	%	10000	15000

5 EMV Emission data

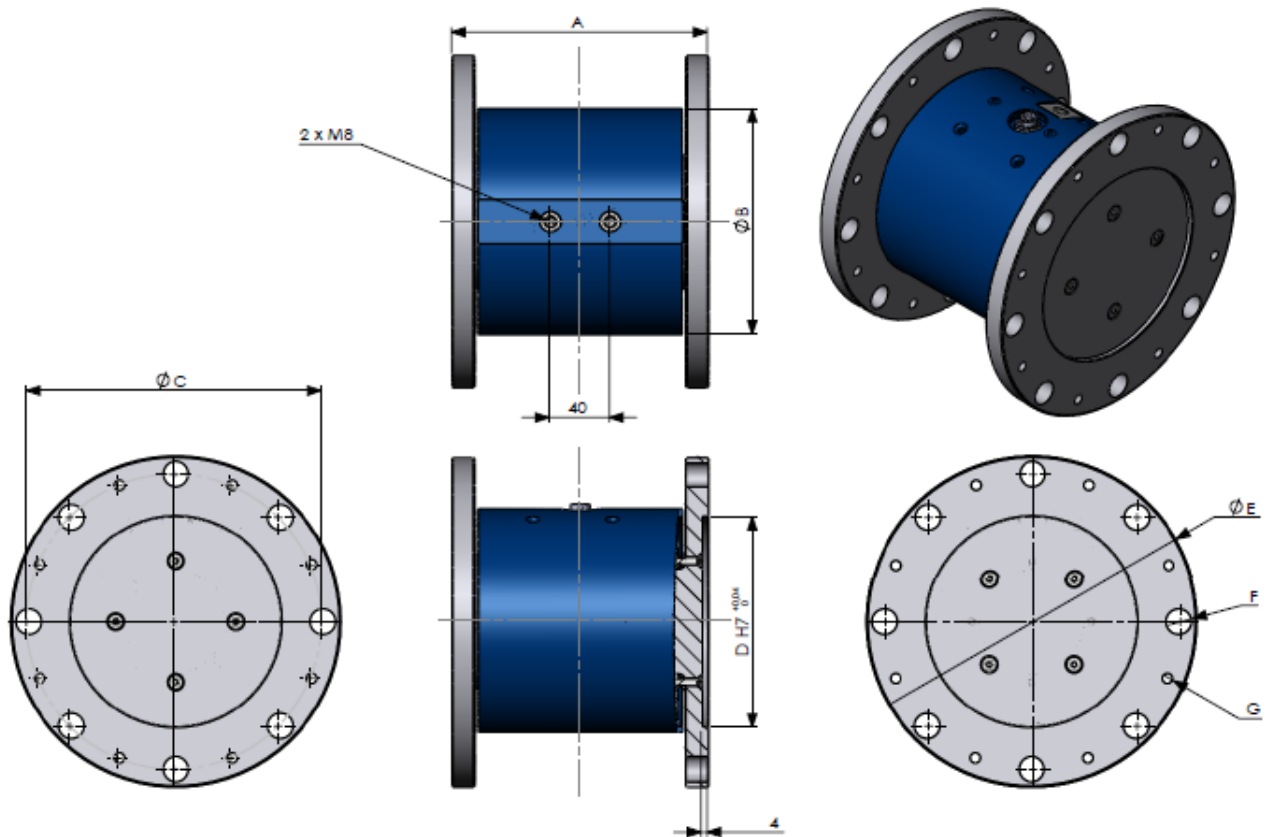
EMV immunity and emitted interference (DIN EN IEC 61000-6-2 / DIN EN IEC 61000-6-4 / DIN EN 61326-1)

Examination	Test specification	Admission	Evaluation criteria
Discharge of static electricity (ESD)	IEC 61000-4-2	± 6 kV Contact discharge	A passed
Electromagnetic HF-field	IEC 61000-4-3	80 - 1000 MHz; 10 V/m; 80% AM	A passed
Rapid transients	IEC 61000-4-4	± 2 kV	A passed
High frequency, asymmetrical	IEC 61000-4-6	0.15 - 80 MHz; 10V; 80% AM	A passed
Examination	Test specification	Admission	Evaluation criteria
Interference voltage 0.15 - 30 MHz	CISPR 11:2009 + A1:2010	Class B	Limit values observed
Radio interference field strength 30 - 1000 MHz	CISPR 11:2009 + A1:2010	Class B	Limit values observed

⁶ Wiring connected.

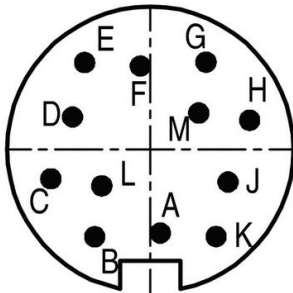
⁷ Based on the non-contact measurement principle the torque sensor is quite insensitive to bending and shearing forces. Self-aligning couplings are recommended in case of dynamic loads.

6 Dimensions



Dimensions [mm]	
Value	10000 Nm
A	170
B	150
C	196
D	140
E	220
F	17
G	-
tightening torque	8 x M16, 12.9, 145 Nm

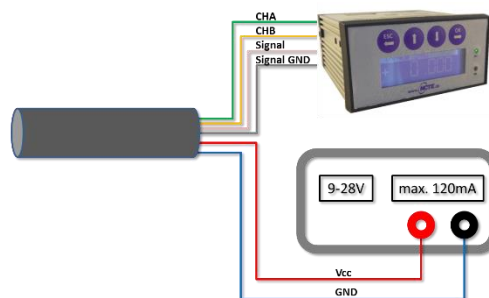
7 Wiring diagram



Connector
Power supply and
outputs

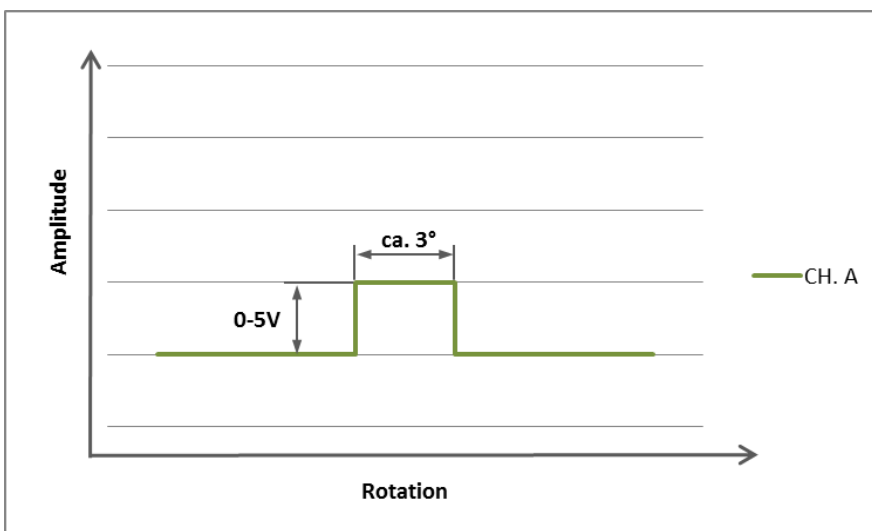
Type	Binder Plug Series 423/723/425 IP67 (Colour coding acc. to DIN 47100)		
Pin	Colour	Description	Value
A	White	CAN / USB	H/D-
B	Brown	CAN / USB	L/D+
C	Green	Angle channel	0V ... 5V
D	Yellow	Angle channel	0V ... 5V
E	Grey	Analog GND	-
F	Pink	Output signal analogue voltage / current	0V ... 10V 4 ... 20 mA
G	Blue	Supply voltage GND	-
H	Red	Supply voltage V _{CC}	9 ... 28 V
J	Black	USB GND	-
K	Purple	-	-
L	Grey-Pink	USB	+5 V
M	Red-Blue	-	-

8 Sensor wiring



9 Speed sensor

Magnetic (Hall effect) speed sensor with 60 CPR.



Parameter	Min.	Typ.	Max.	Unit
Operating frequency	0	-	8000	Hz
Analogue signal bandwidth	20	40	-	kHz
Upper level Output signal	2.4	5	-	V
Lower level Output signal	-	0	0.4	V


10 Order options

Series 5000 accuracy 0.5 %	
Measuring range [kNm]	
10	including 5m cable and calibration certificate
customer	including 5m cable and calibration certificate
Angle sensor	
0	Without angle sensor
2	Angle sensor 60 CPR
Analog output	
A	Voltage output 0-10V
S	Current output 4-20mA
Output digital (optional)	
U	USB inkl. NCTE Software and 2.8m cable
C	CAN-Bus (only with speed sensor)
Protection class according to EN 60529	
0	IP50
1	IP65
5000	10 2 A U 0 Example Sensor configuration

We would be pleased to provide you with further information about serial products in a personal contact under

Phone: +49 (0)89 66 56 19 30 or by e-mail: sales@ncte.de.

11 Accessories

Readout unit	
	
A	Order number 400010-ATS001 (Art. No.: 400010005)
B	Order number: 400010-ATS002 (Art. No.: 400010006)
Sensor input: Voltage output 0-5 V and 0-10 V	
1 x angle encoder input, A/B USB interface, Software Windows included SD card slot to use for data logging	
Sensor input: current output 4-20 mA	
1 x angle encoder input, A/B USB interface, Software for windows included SD card slot to use for data logging	

You can obtain further or additional accessories and special requests in a personal discussion with your contact person for series products by calling +49 (0)89 66 56 19 30 or by e-mail: sales@ncte.de.

Your experts for magnetostrictive sensors

