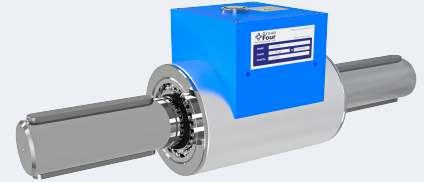


The LXT 981 is a high accuracy, mid range entry into professional torque measurement technology. This sensor is mainly used in automotive testing, motor break testing, starting torque testing, gear box testing and break away torque testing.



FEATURES

- Best price-performance ratio
- Integrated electronic (Plug & Play)
- Contactless measurement system
- Including 5m cable and calibration certificate
- Suitable accessories (Readout unit, couplings)

TECHNICAL DATA

- Nominal torque: up to 1.000 Nm, bidirectional
- Rotational speed: ≤ 10.000 rpm
- Accuracy: ≤ ±0,1 %
- Temperature range: -40 °C to +85 °C
- Protection class: IP50
- Output signal options: 0-10 V/4-20 mA
- Cut-off frequency: 2.500 Hz

LXT 981

LXT 981 round shaft	Unit	Nominal torque bidirectional (+/-) (Nm)	Limiting torque unidirectional (Nm)	Limiting torque bidirectional (+/-) (Nm)	Rotational speed (rpm)
Ø 15 mm	[Nm]	50	65	65	10.000
		100	130	130	
Ø 25 mm		250	325	325	8.000
Ø 40 mm		1.000	1300	1300	5.000

LXT 981 square shaft	Unit	Nominal torque bidirectional (+/-) (Nm)	Limiting torque unidirectional (Nm)	Limiting torque bidirectional (+/-) (Nm)	Rotational speed (rpm)
⅜ inch	[Nm]	50	50	30	10.000
¾ inch		250	250	150	8.000
1 inch		1.000	1.000	600	5.000

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

TECHNICAL CHARACTERISTICS

No.	Model Accuracy class ²	Unit	LXT 981 0,5 Value			
1	Linearity deviation incl. hysteresis		< ±0,2			
2	Rotational Signal Uniformity (RSU)	%ME ³	< ±0,2			
3	Repeatability		< ±0,05			
Output signal in general		Unit	Value			
4	Frequency range, -3dB point, Bessel characteristics	Hz	2.500			
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	62			
12	Output resistance (Current output)	k Ω	≥ 600			
Effect of temperature		Unit	Value			
13	Zero point drift over temperature	%/10 K	< 0,2			
14	Signal drift over temperature within nominal temperature range	%/10 K	< 0,5			
Power supply		Unit	Value			
15	Supply voltage	VDC	11 ... 28			
16	Current consumption (max.)	mA	150			
17	Start-up peak	mA	< 200			
18	Absolute max. supply voltage	VDC	30			
General information		Unit	Value			
19	Protection class according to EN 60529 ⁶	IP	50			
20	Reference temperature	°C	+15 ... +35			
21	Operational temperature range	°C	-40 ... +85			
22	Storage temperature range	°C	-30 ... +85			
Nominal rated torque M (bi-directional)		Nm	50	100	250	1,000
23	Weight	kg	1,4		2,5	6
24	Moment of inertia	kg mm ²	5,9		59,5	626
Load limits ⁷		Unit	Value			
25	Maximum measurable torque	%	110			

² The accuracy class implies that taken separately both the linearity deviation as well as the rotational signal uniformity are either lower than or equal to the value of the accuracy class.

³ %ME: related to a full scale measurement 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.

⁶ Wiring connected.

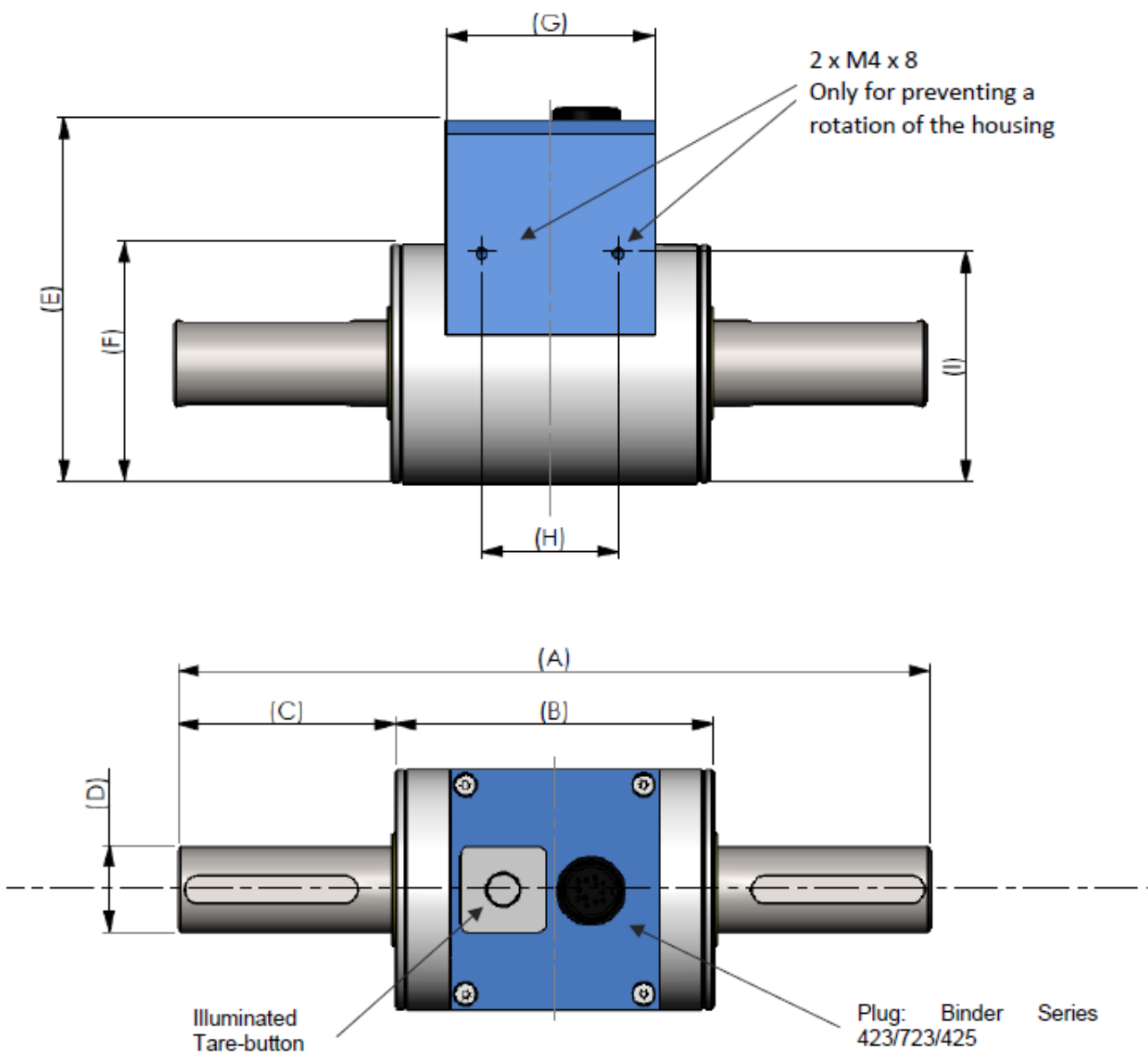
⁷ Based on the non-contact measurement principle the torque sensor is quite insensitive to bending and shearing forces. Self-aligning couplings are recommended in case of dynamic loads.

LOAD CHARACTERISTICS

LXT 981 measuring range	Unit	Axial force (N) ¹	Lateral limit force (N)	Bending limit moment (Nm)
50 and 100	[Nm]	2.300	300	41,7
250 and 500		7.000	800	176
1.000 and 2000		24.000	2.000	700

Each type of irregular stress can only be permitted with its given limit value (bending moment, lateral force or axial force, exceeding the nominal torque) if none of the others can occur. Otherwise the permitted limits must be reduced. If for instance 30 % of the limited bending moment and also 30 % of the limited lateral force are present, only 40 % of the limited axial force are permitted, provided that the nominal torque is not exceeded.

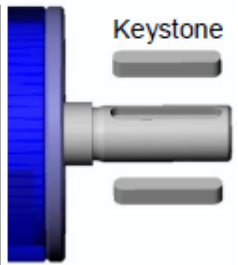
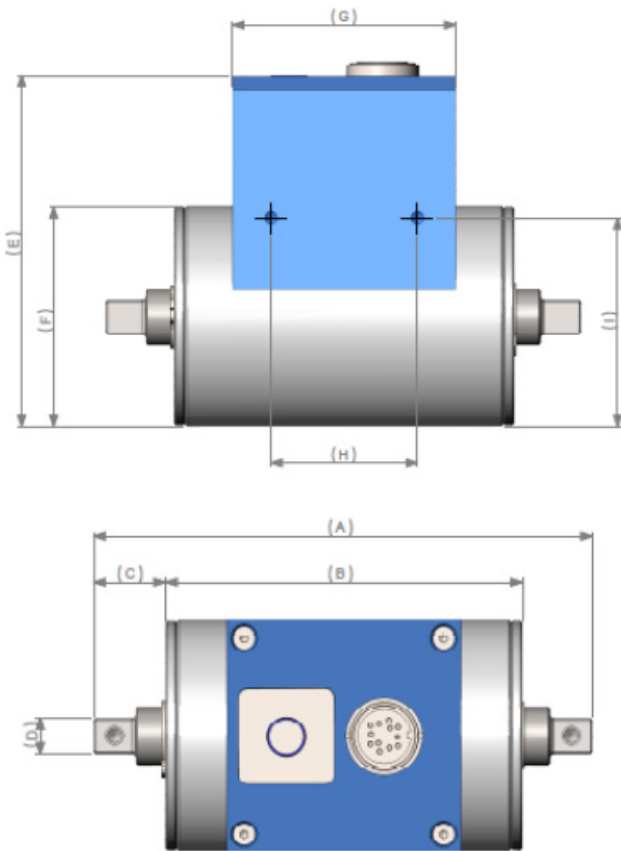
DIMENSIONS



¹ The 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 permitted.

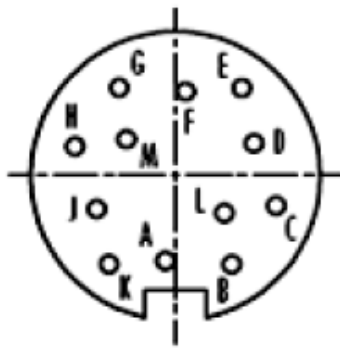
Dimensions (in mm)				
	50 Nm	100 Nm	250 Nm	1.000 Nm
A	160	160	220	350
B	93	93	101	130
C	33,5	33,5	59,5	110
D	15g6	15g6	25g6	40g6
E	96	96	106	126
F	60	60	70	90
G	61	61	61	80
H	40	40	40	60
I	57	57	67	87

Dimensions keyway (mm)				Keystones			Keystone position
Shaft	Width	Depth	Length	Height	Length	Amount	Distance L
∅ 15 mm	5N9	3	25,5	5	25	1	130,5
∅ 25 mm	8N9	4	50,5	7	50	2	165,5
∅ 40 mm	12N9	5	90,5	8	90	2	252,0

Dimensions square shaft (in mm)			
	50 Nm	250 Nm	1.000 Nm
A	130	180	230
B	93	101	130
C	18,5	39,5	50
D	3/8 Zoll	3/4 Zoll	1 Zoll
E	96	106	126
F	60	70	90
G	61	61	80
H	40	40	60
I	57	67	87

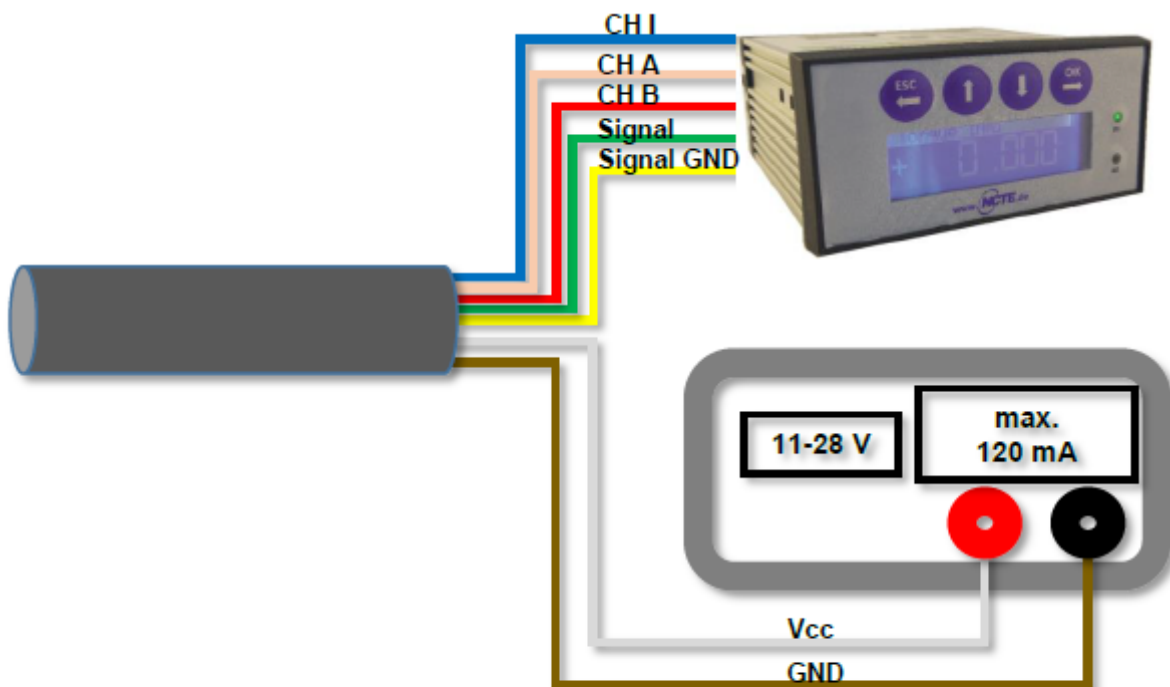
CONNECTION PLAN



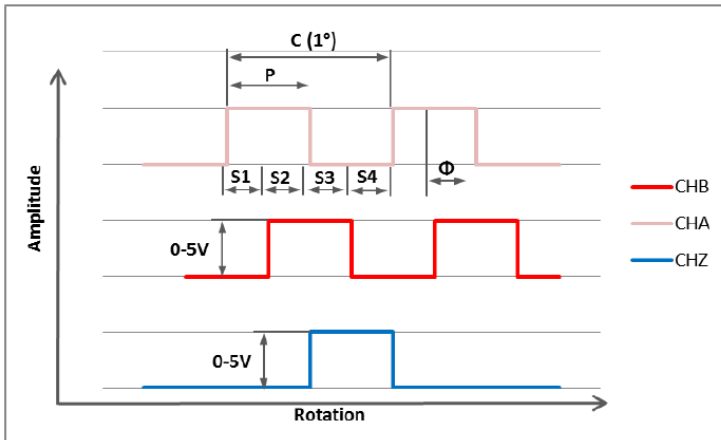
Connector
Power supply and outputs

Type	Binder series 423/723/425 IP67 color coding according to DIN 47100		
Pin	Color	Description	Value
A	White	Supply voltage V_{CC}	11 V ... 28 V
B	Brown	Ground GND	-
C	Green	Analog Out	0 V ... 10 V
D	Yellow	Analog GND	-
E	Grey	Analog Out	4 mA ... 20 mA
F	Pink	Angle Ch A	0 V ... 5 V
G	Blue	Angle Ch I	0 V ... 5 V
H	Red	Angle Ch B	0 V ... 5 V
J	Black	-	-
K	Violet	For internal use only	RX (TTL Pegel)
L	Grey-Pink	For internal use only	RX (TTL Pegel)
M	Red-Blue	Digital GND	-

Connection example:



ANGLE SENSOR



Parameter	Min	Type.	Max.	Units
High Level Output Voltage	2,4	5	-	V
Low Level Output Voltage	0	-	0,4	V
Parameter	Description			
C	One cycle of 360 CPR (degrees)			
P	The duration of high state of the output within one cycle.			
S	The number of electrical degrees between a transition in Channel A and the neighbouring transition in Channel B.			
Φ	The number of electrical degrees between the centre of high state of Channel A and the Centre of high state of Channel B.			

LXT 981 accessories

Readout unit



A **Torque sensor input: Voltage output 0-5 V and 0-10 V**
 Order number: DFI 3000-A
 1 angle encoder input, A/B
 USB interface, Software for Windows included
 SD card slot to use for data logging

S **Torque sensor input: current output 4-20 mA**
 Order number: DFI 3000-S
 1 angle encoder input, A/B
 USB interface, Software for Windows included
 SD card slot to use for data logging

Couplings



Coupling Type	Used for	D2 max.
LXT-60	KB4C/60-67-15-D2	32
LXT-150	KB4C/150-78-15-D2	42
LXT-300	KB4C/300-94-25-D2	60
LXT-500	KB4C/500-100-25-D2	70
LXT-1400	KB4/1400-168-40-D2	80
LXT-300	KB4C/300-94-19-D2	85

ORDER OPTIONS

LXT 981 accuracy, 0,1%						
Measurement range						
50	Nm including 5 m cable and calibration certificate					
100	Nm including 5 m cable and calibration certificate					
250	Nm including 5 m cable and calibration certificate					
1.000	Nm including 5 m cable and calibration certificate					
Angle sensor						
0	Without angle sensor					
1	Angle sensor 360CPR					
Analog output						
A	Voltage output 0-10 V					
S	Current output 4-20 mA					
Shaft ends						
0	Round shaft with keystone					
1	Square shaft (available for 50/250/1.000 Nm)					
Protection class according to EN 60529						
0	IP50					
981	250	0	S	1	0	Example Sensor configuration

Please contact one of our sales representatives for additional information.
sales@group-4.com | 800-419-1444

INSTRUCTION MANUAL

Scope of delivery

The torque sensor set consists of the sensor itself (signal pick-up and signal processing integrated into sensor housing), one connecting cable 5m with a soldered plug, key stones (round shaft) and the calibration certificate.

Installation and removal

Make sure to install the sensor shafts exactly with the proper aligned connecting shafts. The key stone adapter/square endings of the connecting shafts are to be attached force-less to the corresponding ones of the sensor. No external axial force should be on the housing of the sensor from distortion. A maximum cable length of 5m must not to be exceeded. Using a cable or connector other than supplied by Group Four, or a similar cable that is of a different length may affect the overall performance of the sensor.

Do not remove the shaft with torque applied to the sensor.

Offset adjustment

If required the zero point output signal (5 V or 12 mA) can be adjusted by pressing the tare-button. By factory default the sensor is set to 5 V or 12 mA at zero torque.

Interface description

Mechanical connection:

The key stone adapters on both ends of the measurement shaft are intended for torque transmission.

Electrical connector:

On the sensor housing there is a socket for the power supply and the signal output (chapter connection plan).

Operation (in regular case or in optimal case)

Optimal measurement parameters can be achieved if the sensor is applied in accordance to the specification. By compliance with the specification the sensor works generally trouble-free and maintenance-free.

Irregular operation, measures against disturbance

The mechanical overload on the sensor (e. g. exceeding of maximum allowed torque or severe vibrations) may cause damage to the sensor and in consequence the incorrect signal output. In such cases please do not open the sensor. Contact Group Four directly for assistance.

Commissioning

After sensor installation pay attention to the following:

- Switch on the power supply unit and check the supply voltage. Peak voltage must be avoided! Be sure to verify the power supply voltage before connecting the sensor!
- Connect the sensor to the power supply unit by using the delivered cable.
- Connect the sensor output to a high-resistance device such as an A/D converter, oscilloscope, PC measurement board.
- The sensor should be in mechanical unloaded state while connecting it.

Tare function and error indication:

LXT 981 contains a LED button on the housing surface. Pressing the button (min. 3 seconds) will set the signal output to 5V. The illumination of the button serves as a function/malfunction indicator.

Functional indicator:

LED off: missing power supply or sensor is damaged

LED on: Sensor is ready.

Error indicator:

LED flashes: The sensor is not ready.

Flashing of LED can have several possible causes. Various causes are interpreted through a flash code. After each flash code the LED makes a short pause before repeating the code.

2x flashing: Magnet field sensors defective. 4x flashing: Electronics defective.

Shaft coating

The shafts are protected on both sides with a film of anti corrosion wax. We recommend to leave the protection permanent. As far as technologically needed, the coating can be removed with spirit / ethanol.

Handling and transportation

While handling, storage and transportation keep the sensor away from magnetic or electromagnetic fields which may exceed the maximal intensity defined from EMC (chapter technical characteristics) like degaussing machines.

Precautions

- Opening the sensor and individual screws is generally not permitted.
- The shaft locking rings on the shaft ends must not be loosened.
- The fastening nut of the plug (see chapter Dimensions) must not be loosened or tightened.
- Only use voltage supplies that are separate from the mains voltage.
- With regard to the electrical and mechanical load on the sensor, the specifications in accordance with the sensor-specific rating plate and the table in (Chapter: Technical characteristics) must be observed.
- The sensor is not to be used as a support bearing. The existing mounting options are only used to secure the housing against twisting.
- To protect your system, we recommend increasing the torque over several stages.

Service and maintenance

As part of your test and measurement equipment management, we recommend regular inspection of your test and measurement equipment. Please also note the relevant standards and guidelines.

Recommended maintenance

Recalibration - 12 month

Control of wiring, plug and shaft - 12 month

Email: sales@group-4.com