burster

THE MEASUREMENT **SOLUTION**

YOUR INDIVIDUAL PRODUCT INFORMATION

THE MEASUREMENT **SOLUTION**

HIGH-TECH FROM A STRONG SOURCE

burster specializes in the development, production and sale of measuring and test devices, sensors and measurement systems as well as calibration services. Since 1961, burster has set standards for precision, quality and flexibility. This has made the German medium-sized enterprise one of the world's foremost suppliers of sensor signal processing and process monitoring systems.

Globally, burster is in contact with more than 140,000 people in industry and R&D. We are partners for mechanical and plant engineering and automation, the automotive industry and its suppliers, electrical and electronic engineering, the chemicals industry, e-mobility as well as many other sectors and future or niche markets such as medical engineering, biotechnology and robotics.

SENSORS

TORQUE SENSORS

NON-ROTATING APPLICATIONS

TYP **8625**

Precision torque sensor

- Principle: Non-rotating
- Measuring range: 0.01 N·m ... 200 N·m
- Measurement accuracy: ≤ 0.05 % F.S.

TYP **8630**

Precision torque sensor

- Principle: Non-rotating
- Measuring range: 2 N·m ... 200 N·m
- Measurement accuracy: ≤ 0.1 % F.S.

TYP **8631**

Precision torque sensor

- Principle: Non-rotating
- Measuring range: 5 N·m ... 200 N·m
- Measurement accuracy: ≤ 0.1 % F.S.

TYP **8627**

Torque sensor

- Principle: Non-rotating
- Measuring range: 500 Nm ... 5000 Nm
- Measurement accuracy: ≤ 0.1 % F.S.
- Signal output: 0.5 mV/V; 1 mV/V ...

ROTATING APPLICATIONS

TYP **8661**

Precision torque sensor

- Principle: Rotating
- Measuring range: ±0.02 N·m ... ±1000 N·m
- Measurement accuracy: ≤ ±0.05 %
- Output signal: ±10 V (optional ±5 V or USB)

TYP **8656**

Precision torque sensor

- Principle: Rotating
- Measuring range: 1 N·m ... 100 N·m
- Measurement accuracy: 0.2 % F.S.

TYP **8655**

Torque sensor

- Principle: Square, rotating, contactless
- Measuring range: 1 N·m ... 160 N·m
- Measurement accuracy: 0.25 % F.S.

TYP **86403;86413;86423**

Torque sensors

- Principle: Rotating
- Measuring range: 1 Nm ... 1000 Nm
- Measurement accuracy: ≤ ±0.1 % F.S.
- Signal output: 0.5 mV/V; 1 mV/V ...

MULTI-COMPONENT SENSORS

TYP **8565**

Load cell and torque sensor – X/Y/Z

- Flexibly configurable 3 forces / 3 torques (Fx / Fy / Fz - Mx / My / Mz) Robot flange according to DIN ISO 9049-1

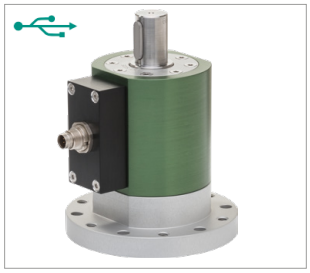
Delivery: ex stock | Warranty: 24 months

High-Precision Torque Sensor
for non-rotating applications

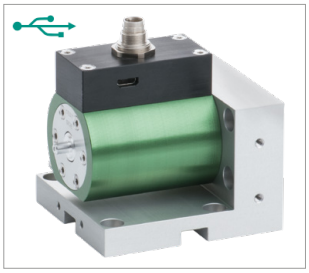
MODEL **8625**

burster TEDS

NEW
immune to side loads
thanks to support bearings



8625 with flange



8625 with bracket

Highlights

- Measurement ranges of 0 ... 0.01 N·m to 0 ... 200 N·m
- Linearity error as low as from ≤ 0.05 % F.S.
- Standardized output signal
- Tare function, filter and average values configurable

Options

- Output signal ±10 V / USB
- burster TEDS
- Bracket or flange adapter offers choice of mounting options
- Immune to side loads thanks to built-in support bearings
- Dual-range model

Applications

- Test setups for precision mechanics
- Measuring the frictional torque ob bearings
- Measuring the torques applied to vehicle control elements and knobs
- Reference sensor in calibration systems

Product description

This high precision torque sensor is designed for both static and dynamic measurements on non-rotating applications. It is particularly suitable for torque measurements on, for instance, extremely small electrical actuating drives and micro-mechanical actuator elements, or for measuring reaction torques e.g. on micro-motors.

The high accuracy of measurement also makes this sensor ideal for use as a reference in many fields of industrial manufacture as well as laboratory research and development projects. Not containing any rotating parts, it requires no maintenance if properly used.

The strain-gage based sensor's modular design allows precise configuration for the desired application. With the integrated amplifier option, the sensor directly supplies a voltage signal of 0 ... ±10 V that is proportional to the torque. The sensor can be configured via the micro-USB interface, providing access to, for example, a filter frequency setting, averaging, and a tare function. Measurements via USB in addition to the voltage output are available with the USB measurement option. The sensor comes with the DigiVision software for performing measurements and data archiving, with drivers additionally available e.g. for LabVIEW. Integration into custom software is possible via DLL

The burster TEDS option (electronic data sheet, memory chip with sensor-specific data) allows rapid configuration of compatible evaluation units (instrumentation amplifier, indicator, ...).

Technical Data

8625	–	4010-VXXXXX	4020-VXXXXX	4050-VXXXXX	4100-VXXXXX	4200-VXXXXX	4500-VXXXXX	5001-VXXXXX
Measuring range calibrated in N·m from 0 ...		±0.01 N·m	±0.02 N·m	±0.05 N·m	±0.1 N·m	±0.2 N·m	±0.5 N·m	±1 N·m
Accuracy								
Relative non-linearity		0.15 % F.S.	0.1 % F.S.		0.05 % F.S.			
Relative hysteresis		0.15 % F.S.	0.1 % F.S.					
Tolerance of sensitivity		0.2 % F.S.	0.1 % F.S.					
Maximum limit axial load	[N]	50						
Maximum limit radial load	[N]	1				1.5	2	3
Spring constant	[N·m/rad]	5	8	10	18	41	115	261
Mass moment of inertia measuring side	[10^{-6} kg*m^2]	0.022	0.026	0.059	0.749	0.812	0.886	1.15
Electrical values without amplifier								
Sensitivity		0.25 mV/V		0.5 mV/V				
Bridge resistance (full bridge)		1000 Ω						
Excitation voltage		5 V (max. 10 V)						
Environmental conditions without amplifier								
Range of operating and nominal temperature		-20 °C ... +80 °C						
Sensitivity of temperature effects		on the zero point 0.020 % F.S./K on the sensitivity 0.015 % F.S./K			0.015 % F.S./K 0.010 % F.S./K			
Electrical values with amplifier/USB								
Rated supply voltage range		5 ... 30 V DC (or 5 V via USB)						
DC power consumption		approx. 1 W						
Output voltage at ± rated torque		±10 V						
Output resistance		< 500 Ω						
Insulation resistance		zero (binding capability)						
-3 dB cut-off frequency		5000 Hz						
Ripple		<50 mV_{ss}						
Control signal		10.00 V DC						
Environmental conditions with amplifier/USB								
Range of operating and nominal temperature		0 °C ... +60 °C						
Sensitivity of temperature effects		on the zero point 0.020 % F.S./K on the sensitivity 0.015 % F.S./K			0.015 % F.S./K 0.010 % F.S./K			
Mechanical values								
Dynamic overload safe		recommended 70 % of nominal torque						
Max. operation torque		150 % of nominal torque (≥ 0.2 N·m)						
Breakaway torque		300 % of nominal torque						
Alternating load		70 % of nominal torque						
Other								
Material		Housing: made of anodized aluminium Shaft: high-strength aluminium 3.1354			Shaft: steel shell 1.4542			
Protection class		acc. EN 60529, IP40						
Weight	[g]	150			180			190
Geometry								
L	[mm]	59		65	85			
LJ	[mm]	48						
H	[mm]	47						
H1	[mm]	32						
∅ J	[mm]	40						
D	[mm]	4g6		6g6	8h6			
LK	[mm]	20						
A/B	[mm]	5.5		8	18			
G	[mm]	M4						
Installation								
Installation instructions		Do not exceed the permitted axial and radial forces during fitting and operation. Please refer to our operating instructions for detailed information (www.burster.com). Do not use the housing as a means of absorbing torque.						

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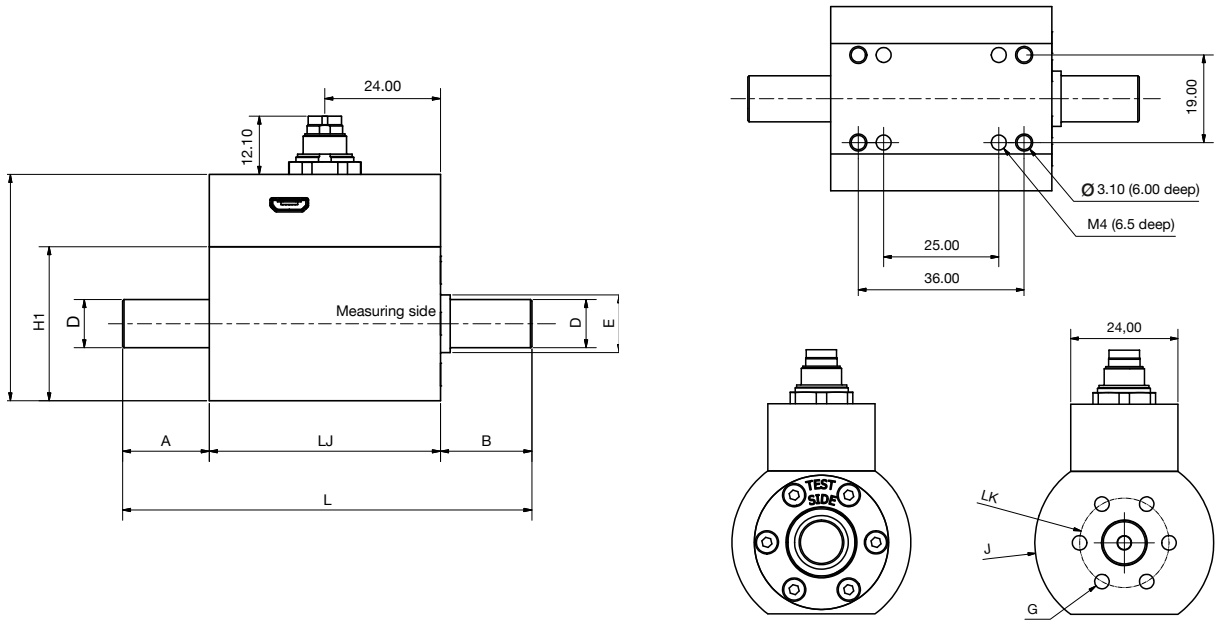
Technical Data

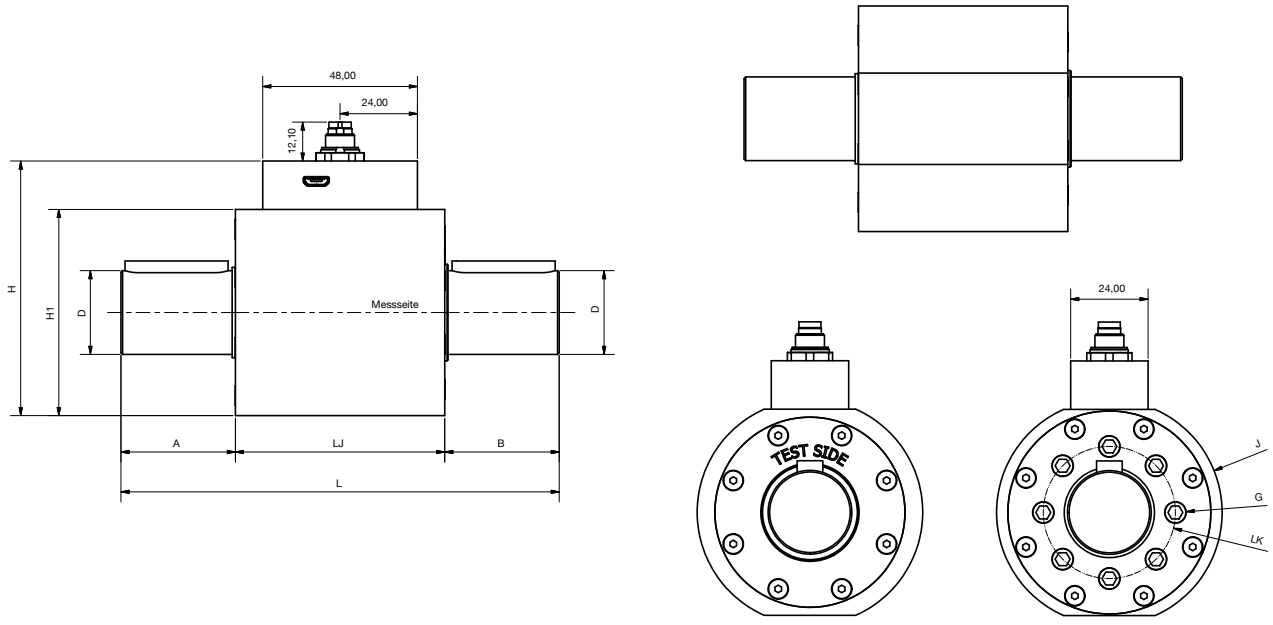
8625	–	5002-VXXXXX	5005-VXXXXX	5010-VXXXXX	5020-VXXXXX	5050-VXXXXX	5100-VXXXXX	5200-VXXXXX
Measuring range calibrated in N·m from 0 ...		±2 N·m	±5 N·m	±10 N·m	±20 N·m	±50 N·m	±100 N·m	±200 N·m
Accuracy								
Relative non-linearity		0,05 % F.S.						
Relative hysteresis		0,1 % F.S.						
Tolerance of sensitivity		0,1 % F.S.						
Maximum limit axial load	[N]	50	200		1500	3000	4000	8000
Maximum limit radial load	[N]	6	15	30	40	80	150	275
Spring constant	[N·m/rad]	304	1242	2604	5500	13000	28000	61000
Mass moment of inertia measuring side	[10^{-6} kg*m^2]	1.17	1.44	2.2	22	24	123	139
Electrical values without amplifier								
Sensitivity		1 mV/V						
Bridge resistance (full bridge)		1000 Ω						
Excitation voltage		5 V (max. 10 V)						
Environmental conditions without amplifier								
Range of operating and nominal temperature		-20 °C ... +80 °C						
Sensitivity of temperature effects		on the zero point 0.015 % F.S./K on the sensitivity 0.01 % F.S./K						
Electrical values with amplifier/USB								
Rated supply voltage range		5 ... 30 V DC (or 5 V via USB)						
DC power consumption		approx. 1 W						
Output voltage at ± rated torque		±10 V						
Output resistance		< 500 Ω						
Insulation resistance		zero (binding capability)						
-3 dB cut-off frequency		5000 Hz						
Ripple		<50 mV_{ss}						
Control signal		10.00 V DC						
Environmental conditions with amplifier/USB								
Range of operating and nominal temperature		0 °C ... +60 °C						
Sensitivity of temperature effects		on the zero point 0.015 % F.S./K on the sensitivity 0.010 % F.S./K						
Mechanical values								
Dynamic overload safe		70 % of nominal torque						
Max. operation torque		150 % of nominal torque						
Breakaway torque		300 % of nominal torque						
Alternating load		70 % of nominal torque						
Other								
Material		Housing: made of anodized aluminium; Shaft steel shell 1.4542						
Protection class		acc. EN 60529, IP40						
Weight	[g]	190			480	495	1100	1140
Geometry								
L	[mm]	85			103		136	
LJ	[mm]	48			55		65	
H	[mm]	47			63		79	
H1	[mm]	32			48		64	
∅ J	[mm]	40			55		70	
D	[mm]	8h6		10h6	15g6		26g6	
LK	[mm]	20			26		41	
A / B	[mm]	18			24		35,5	
G	[mm]	M4			M6		M8	
Installation								
Installation instructions		Do not exceed the permitted axial and radial forces during fitting and operation. Please refer to our operating instructions for detailed information (www.burster.com). Do not use the housing as a means of absorbing torque.						

Dimensional drawing - **measuring ranges 0.01 Nm ... 10 Nm**



Holes on the sensor underside only up to 10 N.m. For detailed dimensions, including with fitted flange or bracket, you can find sensor CAD data on our website www.burster.com.

Dimensional drawing - **measuring ranges 20 Nm ... 200 Nm**



Electrical values

7-pin miniature connector, additionally micro-USB interface for configuration/measurement (Option, USB connection cable included)

Wiring Code depends on the options selected		
Pin	Assignment without electronic	Assignment with electronic
1	Bridge supply -	Supply GND
2	Bridge supply +	Supply +5 ... 30 V
3	Shield	Shield
4	Signal +	Output signal ±10 V
5	Signal -	Output signal GND
6	TEDS I/0 (option) / NC	Control signal
7	TEDS GND (option) / NC	Switching between ranges (option)

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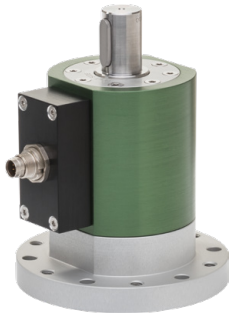
Accessories

Flange-mounted model



The flange adapter allows easy integration of the sensor in existing equipment with a flange connection. When ordered with the sensor, the flange adapter comes prefitted; please refer to order code.

Alternatively it can be ordered separately as an accessory.

Please refer to the accessories data sheet 8600-Z00X

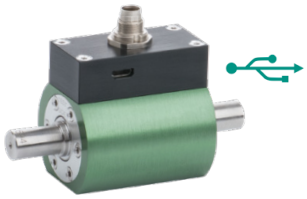
Bracket-mounted model

The bracket provides a quick-to-fit and stable fixture for the sensor. When ordered with the sensor, the bracket comes pre-fitted; please refer to order code

Alternatively it can be ordered separately as an accessory.

Please refer to the accessories data sheet 8600-Z00X

Integrated amplifier with USB interface



This sensor model comes with a USB port in addition to the 0 ... ± 10 V output.
Two versions are available:

- ±10 V output signal, USB used solely for configuration
- ±10 V output signal, USB used for both configuration and measurement

When a USB-based measurement is launched, the analog output signal is disabled because it is not possible to use both forms of output simultaneously.

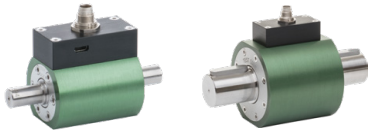
With both versions, the measurement signal can be tared, averaged or filtered. These functions can be set up and/or activated via USB and the free version of DigiVision.

Metal-bellows couplings

Metal-bellows couplings provide optimum misalignment correction. We recommend torsionally rigid metalbellows couplings. These couplings feature extremely high torsional stiffness under applied torque and extremely low restoring forces. From measuring range 20 N·m the metal-bellows couplings model 8695 can be used with keyways.

Please refer to the accessories data sheet 8695.

Dual range

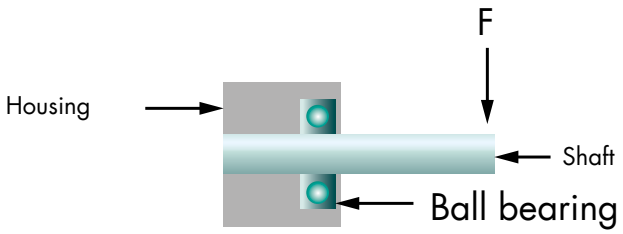


With integrated amplifier and from the 2 Nm measuring range and up, the dual-range option can be selected. The following subdivisions are available:

Graduation:	1:2	1:4	1:5
	Upper scale value of second range		
2 Nm	1 Nm	0,5 Nm	-
5 Nm	-	-	1 Nm
10 Nm	5 Nm	-	2 Nm
20 Nm	10 Nm	5 Nm	-
50 Nm	-	-	10 Nm
100 Nm	50 Nm	-	20 Nm
200 Nm	100 Nm	50 Nm	-

The second, smaller measuring range can be activated via USB or by applying the operating voltage to pin 7.

Support bearing at the test end



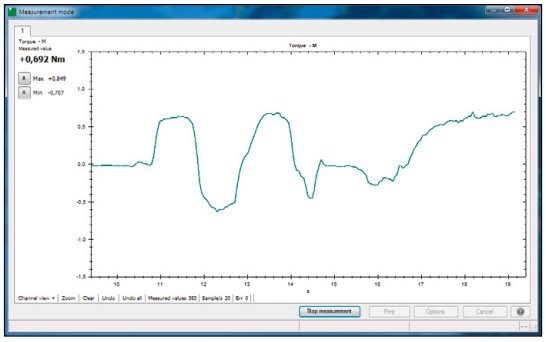
The support bearing option significantly increases the sensor's side load immunity. Especially in manually operated applications, correct application of the torque without parasitic loads usually cannot be guaranteed.

The support bearing largely separates these forces from the measuring element, making measurement results much more reproducible.

DigiVision configuration and analysis software

Features

- Can be used to actuate tare function, with value stored in sensor
- Configuration options for averaging and filters; value stored in sensor
- Intuitive user interface
- Automatic sensor identification
- Sensor calibration data readout



DigiVision Light PC software		
freely available on our website		DigiVision configuration and analysis software max. 200 measured value/s for one sensor
DigiVision Standard PC software		
Model 8625-P100		DigiVison configuration and analysis software up to 16 channels
PC-Software DigiVision Professional		
Model 8625-P200		DigiVision configuration and analysis software with additional configurable maths channel; up to 32 channels

USB measurement option

- Numerical & graphical display and measurement of the physical torque value
- Practical start and stop trigger functions
- 4 limits can be configured for each measurement channel
- MIN/MAX value acquisition
- Automatic scaling
- Measurement reports can be saved as Excel or PDF file
- Archive viewer for displaying sets of curves
- X Multichannel measurements, even with different sensors (e.g. 9206, 8631, 8661) available with standard version

Accessories

Order code		
9900-V594		Mating connection 7 pin
9900-V596		Mating connection 90°-angle
99594-000A-0150030		Connecting cable, length 3 m, other end free
99596-000A-0150030		Connecting cable, length 3 m, plug with 90°-angle, other end free
99141-594A-0150030		Connecting cable for burster desktop instruments with 12 pin socket, length 3 m
99209-586C-0510030		For model 9235, model 7281 and model 9311
9900-K358		Micro USB cable, length 1.8 m
8625-P100		DigiVision Standard configuration and analysis software; up to 16 channels
8625-P200		DigiVision Professional with additional configurable maths channel; up to 32 channels
		DigiVision Light configuration and analysis software, max. 200 measured value/s for one sensor (freely available on our website)
8600-Z00X		Flange-mounted or bracket-mounted, see accessories data sheet 8600-Z00X

Calibration

Manufacturer Calibration Certificate (WKS)		
		Special calibration for clockwise or/and counter clockwise direction torque, in 20 % steps of range up and down.
DAkkS Calibration Certificate		
		DAkkS calibration certificate per DIN 51309, clockwise and/or anticlockwise torque, with eight steps spaced across the measurement range, increasing and decreasing.

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Order Code

Measuring Range	Code			
0 ... ±0.01 N·m	4	0	1	0
0 ... ±0.02 N·m	4	0	2	0
0 ... ±0.05 N·m	4	0	5	0
0 ... ±0.1 N·m	4	1	0	0
0 ... ±0.2 N·m	4	2	0	0
0 ... ±0.5 N·m	4	5	0	0
0 ... ±1 N·m	5	0	0	1
0 ... ±2 N·m	5	0	0	2
0 ... ±5 N·m	5	0	0	5
0 ... ±10 N·m	5	0	1	0
0 ... ±20 N·m	5	0	2	0
0 ... ±50 N·m	5	0	5	0
0 ... ±100 N·m	5	1	0	0
0 ... ±200 N·m	5	2	0	0

											Standard				
											0	0	0	0	0
8	**6**	**2**	**5**	**–**					**–**	**V**					**0**

Standard sensor

- Standard sensor, one measuring range — 0
- Dual-range version, graduation 1:10 from measuring range 5 N·m — 2
- Dual-range version, graduation 1:5 from measuring range 2 N·m — 3
- Dual-range version, graduation 1:4 from measuring range 2 N·m — 4

- Without additional support bearings on the measuring side — 0
- With additional support bearings on the measuring side — 1

Output signals

- Output voltage 10 V incl. configuration USB — 0
- Output voltage 10 V incl. USB configuring and measuring USB — 1
- Output signal standardized, mV/V — 3
- Output signal, mV/V with TEDS — 4

Versions

- Both round shaft ends — 0
- Flange-mounted — 4
- Incl. Bracket-mounted — 7

Delivery: ex stock | Warranty: 24 months

High Precision Torque Sensor
for non-rotating applications

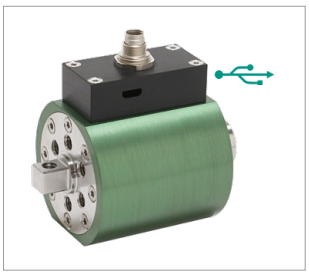
MODEL **8630**

NEW

burster TEDS

Model 8630 Flange-mounted

Model 8630 Bracked-mounted



Model 8630 with USB interface

Highlights

- Measuring ranges from 0 ... 2 N·m up to 0 ... 200 N·m
- Linearity error ≤ 0,1 % F.S.
- Internal square and external square
- Standardized output signal
- Tare function, filter and average values configurable
- Insensitive to side loads thanks to built-in support bearing

Options

- Output signal ±10 V / USB
- burster TEDS
- Bracket or flange adapter offers choice of mounting options
- Dual-range model

Applications

- Testing screw-fastening tools
- Logging data for specified release torques
- Measuring the tightening torque of screw connections
- Acquisition of breakage moments on screw caps

Product description

This high-precision torque sensor can be used to perform both static and dynamic measurements on non-rotating parts. The internal and external square drive design make this sensor especially easy to fit in existing or new screw-fitting applications.

Quality assurance and monitoring of screw-fastening tools are just two applications that can take full advantage of sensor features such as USB port, built-in amplifier and side-load absorbing bearings.

With no rotating parts, this sensor needs no maintenance when used correctly.

Available accessories include mounting brackets and flange adapters, which enable quick, easy and practical integration of the sensor into existing or newly developed setups and test benches.

The strain-gauge based sensor's modular design allows precise configuration for the desired application.

With the integrated amplifier option, the sensor directly supplies a voltage signal of 0 ... ± 10 V that is proportional to the torque. The sensor can be configured via the micro-USB interface, providing access to, for example, a filter frequency setting, averaging, and a tare function. Measurements via USB in addition to the voltage output are available with the USB measurement option. The sensor comes with the DigiVision software for performing measurements and data archiving, with drivers additionally available e.g. for LabVIEW. Integration into custom software is possible via DLL. Examples can be found on our website www.burster.com

The burster TEDS option (electronic data sheet, memory chip with sensor-specific data) allows rapid configuration of compatible evaluation units (instrumentation amplifier, indicator, ...).

Technical Data

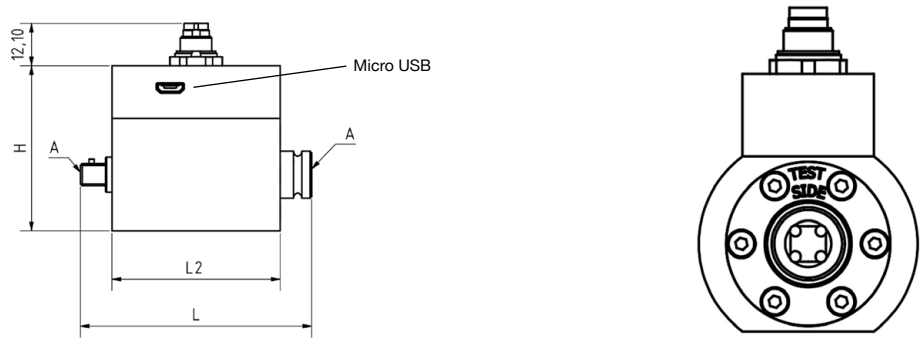
8630	–	5002-VXXXXX	5005-VXXXXX	5010-VXXXXX	5020-VXXXXX	5050-VXXXXX	5100-VXXXXX	5200-VXXXXX
Measuring range calibrated in N·m from 0 ...		±2	±5	±10	±20	±50	±100	±200
		Higher measuring ranges on request.						
Accuracy								
Relative non-linearity		0.1 % F.S.						
Relative hysteresis		0.1 % F.S.						
Tolerance of sensitivity		0.1 % F.S.						
Maximum axial load	[N]	800	1000	1500	5000		7000	
Maximum radial load	[N]	300			550		750	
Spring constant	[N·m/rad]	280	1070	2500	5880	14700	29400	68900
Mass moment of inertia measuring side	[10^{-6} kg*m^2]	0,57	0,73	0,9	12,15	13,7	44,7	51,66
Electrical values without amplifier / USB								
Bridge resistance (full bridge)		1000 Ω						
Excitation voltage		5 V						
Max. excitation voltage		10 V						
Environmental conditions without amplifier / USB								
Range of operating and nominal temperature		-20 °C ... +80 °C						
Sensitivity of temperature effects		at zero 0.015 % F.S./K on final value 0.010 % F.S./K						
Electrical values with amplifier/USB								
Rated supply voltage range		5 ... 30 V DC (or 5 V via USB)						
DC power consumption		approx. 1 W						
Output voltage at ± rated torque		±10 V						
Output resistance		< 500 Ω						
Insulation resistance		zero (binding capability)						
-3 dB cut-off frequency		5000 Hz						
Ripple		< 50 mV_{ss}						
Calibration signal		10.00 V DC						
Environmental conditions with amplifier/USB								
Range of operating and nominal temperature		-20 °C ... +60 °C						
Sensitivity of temperature effects		at zero 0.015 % F.S./K on final value 0.010 % F.S./K						
Mechanical values								
Dynanic overload safe		up to 70 % from nominal value						
Max. operation torque ≥0,2 N·m		150 % of nominal torque						
Breakaway torque		300 % of nominal torque						
Alternating load		70 % of nominal torque						
Other		5002	5005	5010	5020	5050	5100	5200
Material:		Housing: made of anodized aluminium Shaft: steel shell 1.4542						
Protection class		acc. EN 60529, IP40						
Weight	[g]	139			219		354	

3055-008630EN-5699-071527

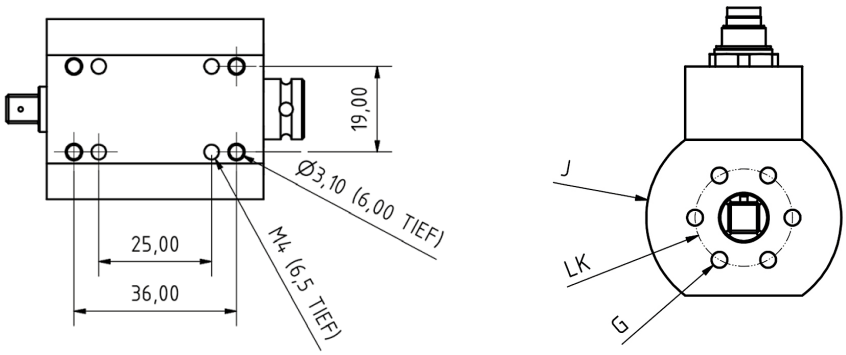
Geometrie

8630	–	5002-VXXXXX	5005-VXXXXX	5010-VXXXXX	5020-VXXXXX	5050-VXXXXX	5100-VXXXXX	5200-VXXXXX
L	[mm]	66			80		100	
L2	[mm]	48			55		65	
H	[mm]	47			63		79	
Ø J	[mm]	40			55		70	
LK	[mm]	20			25		41	
A	[mm]	6.3 (1/4")			10 (3/8")		12.5 (1/2")	
G	[mm]	M4			M6		M8	
Mounting								
Mounting instructions		Do not exceed the permitted axial and radial forces during fitting and operation (see technical data). Please refer to our operating instructions for detailed information www.burster.com. Do not use the housing as a means of absorbing torque.						

Dimensional drawing 1 **Model 8630**



Dimensional drawing 2 **Model 8630**



Holes on the sensor underside only up to 10 N.m. For detailed dimensions, including with fitted flange or bracket, you can find sensor CAD data on our website www.burster.com.

Electrical values

7-pin miniature connector, additionally micro-USB interface for configuration/measurement (Option, USB connection cable included)

Wiring Code depends on the options selected		
Pin	Assignment without electronic	Assignment with electronic
1	Bridge supply -	Supply GND
2	Bridge supply +	Supply +5 ... 30 V
3	Shield	Shield
4	Signal +	Output signal ±10 V
5	Signal -	Output signal GND
6	TEDS I/0 (option) / NC	Control signal
7	TEDS GND (option) / NC	Switching between ranges (option)

Flange-mounted model

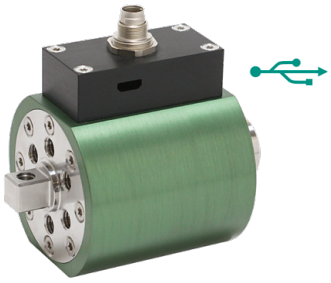
The flange adapter allows easy integration of the sensor in existing equipment with a flange connection. When ordered with the sensor, the flange adapter comes pre-fitted; please refer to order code.
Alternatively it can be ordered separately as an accessory.
Please refer to the accessories data sheet 8600-Z00X.

Bracket-mounted model

The bracket provides a quick-to-fit and stable fixture for the sensor. When ordered with the sensor, the bracket comes pre-fitted; please refer to order code.

Alternatively it can be ordered separately as an accessory.
Please refer to the accessories data sheet 8600-Z001.

Torque sensor with built-in USB port (option)



This sensor model comes with a USB port in addition to the 0 ... ± 10 V output. Two versions are available:

- ± 10 V output signal, USB used solely for configuration
- ± 10 V output signal, USB used for both configuration and measurement

When a USB-based measurement is launched, the analog output signal is disabled because it is not possible to use both forms of output simultaneously.

With both versions, the measurement signal can be tared, averaged or filtered. These functions can be set up and/or activated via USB and the free version of DigiVision.

Dual-range version

With integrated amplifier, the dual-range option can be selected. The following subdivisions are available:

Graduation:	1:2	1:4	1:5
	Upper scale value of second range		
2 N·m	1 Nm	0.5 Nm	-
5 N·m	-	-	1 Nm
10 N·m	5 Nm	-	2 Nm
20 N·m	10 Nm	5 Nm	-
50 N·m	-	-	10 Nm
100 N·m	50 Nm	-	20 Nm
200 N·m	100 Nm	50 Nm	-

The second, smaller measuring range can be activated via USB or by applying the operating voltage to pin 7.

DigiVision configuration and analysis software

Features

- Can be used to actuate tare function, with value stored in sensor
- Configuration options for averaging and filters; value stored in sensor
- Intuitive user interface
- Automatic sensor identification
- Sensor calibration data readout

DigiVision Light PC software

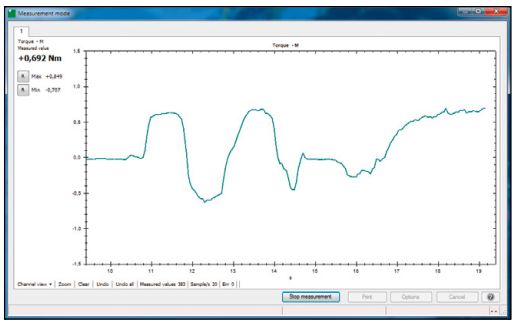
DigiVision configuration and analysis software max. 200 measured value/s for one sensor (freely available on our website)

DigiVision Standard PC software

DigiVison configuration and analysis software up to 16 channels — Model 8630-P100

PC-Software DigiVision Professional

DigiVision configuration and analysis software including maths functions; up to 32 — Model 8630-P200



USB measurement option

- Numerical & graphical display and measurement of the physical torque value
- Practical start and stop trigger functions
- 4 limits can be configured for each measurement channel
- MIN/MAX value acquisition
- Automatic scaling
- Measurement reports can be saved as Excel or PDF file
- Archive viewer for displaying sets of curves
- X Multichannel measurements, even with different sensors (e.g. 9206, 8631, 8661) available with standard version

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Accessories

Order code		
9900-V594		Mating connection 7 pin
9900-V596		Mating connection 90°-angle
99594-000A-0150030		Connecting cable, length 3 m, other end free
99596-000A-0150030		Connecting cable, length 3 m, plug with 90°-angle, other end free
99141-594A-0150030		Connecting cable for burster desktop instruments with 12 pin socket, length 3 m
99209-586C-0510030		Connecting cable for model 9235, model 7281 and model 9311, length 3 m
9900-K358		Micro USB cable, length 1.8 m
8630-Z003		Adapter internal square - internal square 1/4"
8630-Z004		Adapter internal square - internal square 3/8"
8630-Z005		Adapter internal square - internal square 1/2"
8630-Z006		Adapter external square - external square 1/4"
8630-Z007		Adapter external square - external square 3/8"
8630-Z008		Adapter external square - external square 1/2"
8630-P100		DigiVision Standard configuration and analysis software; up to 16 channels
8630-P200		DigiVision Professional with additional configurable maths channel; up to 32 channels
		DigiVision Light configuration and analysis software, max. 200 measured value/s for one sensor (freely available on our website)
8600-Z00X		Flange-mounted or Bracket-mounted, see accessories data sheet 8600-Z00X

Calibration

Manufacturer Calibration Certificate (WKS)		
		Special calibration for clockwise or/and counter clockwise direction torque, in 20 % steps of range up and down.
DAkkS Calibration Certificate		
		DAkkS calibration certificate per DIN 51309, clockwise and/or anticlockwise torque, with eight steps spaced across the measurement range, increasing and decreasing.

Order Code

Measuring Range	Code			
0 ... ±2 N·m	5	0	0	2
0 ... ±5 N·m	5	0	0	5
0 ... ±10 N·m	5	0	1	0
0 ... ±20 N·m	5	0	2	0
0 ... ±50 N·m	5	0	5	0
0 ... ±100 N·m	5	1	0	0
0 ... ±200 N·m	5	2	0	0

											Standard				
											0	0	0	1	0
8	**6**	**3**	**0**	**–**	**X**	**X**	**X**	**X**	**-**	**V**		**0**			**0**

Standard sensor	
■ Standard sensor, one measuring range	0
■ Dual-range version, graduation 1:5 from measuring range 5 N·m	2
■ Dual-range version, graduation 1:4	3
■ Dual-range version, graduation 1:2	4

Output signals	
■ Output voltage 10 V incl. configuration USB	0
■ Output voltage 10 V incl. USB configuring and measuring USB	1
■ Output signal standardized, mV/V	3
■ Output signal, mV/V with TEDS	4

Versions	
■ Internal square/External square	1
■ Internal square/Flange-mounted	5
■ Internal square/incl. Bracket-mounted	6

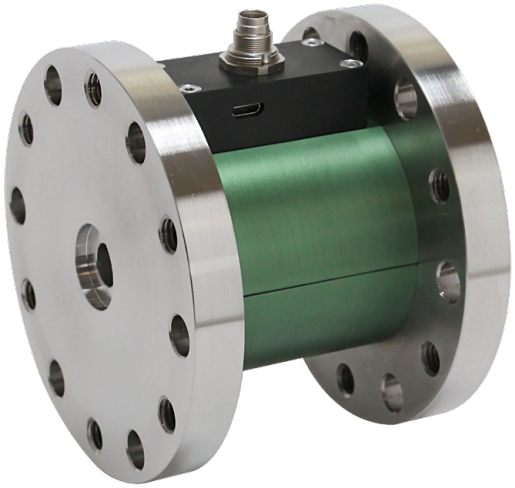
Delivery: ex stock | Warranty: 24 months

High Precision Torque Sensor

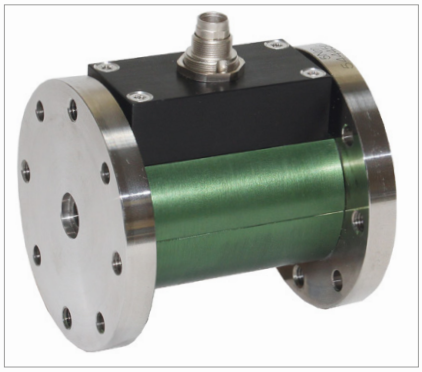
for non-rotating applications

MODEL **8631**

NEW



burster TEDS



Highlights

- Measuring ranges from 0 ... 5 N·m up to 0 ... 200 N·m
- Linearity error ≤ 0,1 % F.S.
- Standardized output signal
- Tare function, filter and average values configurable
- Extremely high, reliable axial load

Options

- Output signal ±10 V / USB
- burster TEDS
- Dual-range model

Applications

- Test setups for precision mechanics
- Measuring reaction torques for motors
- Measuring car-seat adjustment torques
- Measuring operating torques for door release mechanisms

Product description

This high-precision torque sensor is designed for both static and dynamic measurements on non-rotating parts. The through-hole can be used to feed parts such as cables or Bowden cables through the sensor.

The mounting flanges contain threaded holes and through-holes so that the sensor can be fitted at either end. With no rotating parts, this sensor needs no maintenance when used correctly.

The modular design of this strain-gage sensor allows precise configuration for the desired application.

With the integrated amplifier option, the sensor directly supplies a voltage signal of 0 ... ± 10 V that is proportional to the torque. The sensor can be configured via the micro-USB interface, providing access to, for example, a filter frequency setting, averaging, and a tare function. With the USB option, in addition to the voltage output, the measurement function is available via USB as well. The sensor comes with the DigiVision software for performing measurements and data archiving, with drivers additionally available e.g. for LabVIEW. Integration into custom software is possible via DLL. Examples can be found on our website www.burster.com

The burster TEDS option (electronic data sheet, memory chip with sensor-specific data) allows rapid configuration of compatible evaluation units (instrumentation amplifier, indicator, ...).

Technical Data

8631	–	5005-VXXXXX	5010-VXXXXX	5020-VXXXXX	5050-VXXXXX	5100-VXXXXX	5200-VXXXXX
Measuring range calibrated in N·m from 0 ...		±5	±10	±20	±50	±100	±200
		Higher measuring ranges on request.					
Accuracy							
Relative non-linearity		0.1 % F.S.					
Relative hysteresis		0.1 % F.S.					
Maximum limit axial load	[N]	500	750	1000	2000	4000	6000
Maximum limit radial load	[N]	50	75	100	200	400	600
Spring constant	[N·m/rad]	650	1500	5500	15000	30000	135000
Mass moment of inertia measuring side	[10^{-6} kg*m^2]	37	38	165	170	465	480
Electrical values without amplifier / USB							
Sensitivity		1 mV/V					
Tolerance of sensitivity		0.1 % F.S.					
Bridge resistance (full bridge)		1000 Ω					
Excitation voltage		5 V (max. 10 V)					
Environmental conditions without amplifier / USB							
Range of operating and nominal temperature		-20 °C ... +80 °C					
Sensitivity of temperature effects		on the zero point 0.015 % F.S./K on the sensitivity 0.010 % F.S./K					
Electrical values with amplifier / USB							
Rated supply voltage range		5 ... 30 V DC (or 5 V via USB)					
DC power consumption		ca. 1 W					
Output voltage at ± rated torque		±10 V					
Output resistance		< 500 Ω					
Insulation resistance		zero (binding capability)					
-3 dB cut-off frequency		5000 Hz					
Ripple		< 50 mV					
Calibration signal		10.00 V DC					
Environmental conditions with amplifier / USB							
Range of operating and nominal temperature		0 °C ... +60 °C					
Sensitivity of temperature effects:		on the zero point 0.015 % F.S./K on the sensitivity 0.010 % F.S./K					
Mechanical values							
Dynamic overload safe		up to 70 % from nominal value					
Max. operation torque		150 % of nominal torque					
Breakaway torque		300 % of nominal torque					
Alternating load		70 % of nominal torque					
Other		5005	5010	5020	5050	5100	5200
Material:		Housing: made of anodized aluminium Shaft: steel shell 1.4542					
Protection class		acc. EN 60529, IP40					
Weight	[g]	400		930	950	1700	1750

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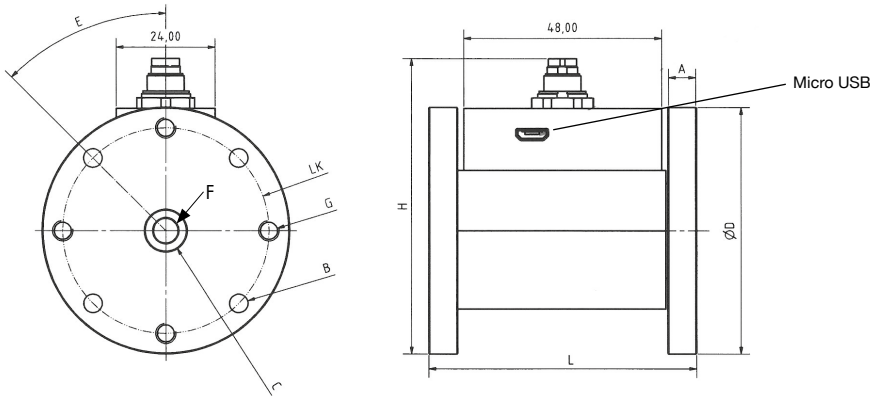
Geometrie

8631	–	5005-VXXXXX	5010-VXXXXX	5020-VXXXXX	5050-VXXXXX	5100-VXXXXX	5200-VXXXXX
L	[mm]	65		70		80	
D	[mm]	60		80		100	
A	[mm]	7		10		12	
H	[mm]	72		86		105	
LK	[mm]	50		70		85	
Ø B	[mm]	4.5 (4 x 90°)		5.5 (6 x 60°)		9.0 (6 x 60°)	
G	[mm]	4 x M5		6 x M5		6 x M8	
E	[mm]	45°		30°			
F	[mm]	6		12			
C	[mm]	10 H7		20 H7			
Mounting							
Mounting instructions		Do not exceed the permitted axial and radial forces during fitting and operation (see technical data). Please refer to our operating instructions for detailed information www.burster.com.					

Dimensional drawing **Model 8631**



For detailed dimensions, you can find CAD data for the sensor on our website www.burster.com.

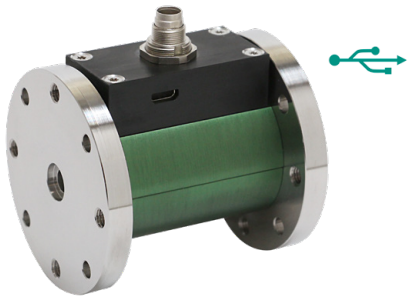
Electrical values

7-pin miniature connector, additionally micro-USB interface for configuration/measurement (Option, USB connection cable included)

Wiring Code depends on the options selected

Pin	Assignment without electronic	Assignment with electronic
1	Bridge supply -	Supply GND
2	Bridge supply +	Supply +5 ... 30 V
3	Shield	Shield
4	Signal +	Output signal ±10 V
5	Signal -	Output signal GND
6	TEDS I/0 (option) / NC	Control signal
7	TEDS GND (option) / NC	Switching between ranges (option)

Integrated ampifier with USB interface



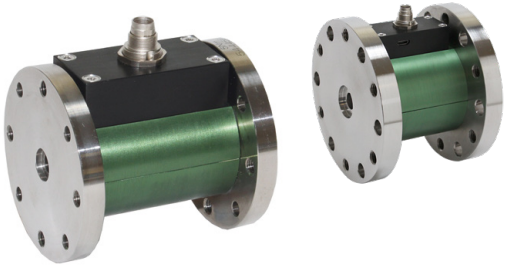
This sensor model comes with a USB port in addition to the 0 ... ± 10 V output. Two versions are available:

- ± 10 V output signal, USB used solely for configuration
- ± 10 V output signal, USB used for both configuration and measurement

When a USB-based measurement is launched, the analog output signal is disabled because it is not possible to use both forms of output simultaneously.

With both versions, the measurement signal can be tared, averaged or filtered. These functions can be set up and/or activated via USB and the free version of DigiVision.

Dual-range version



With integrated amplifier, the dual-range option can be selected. The following subdivisions are available:

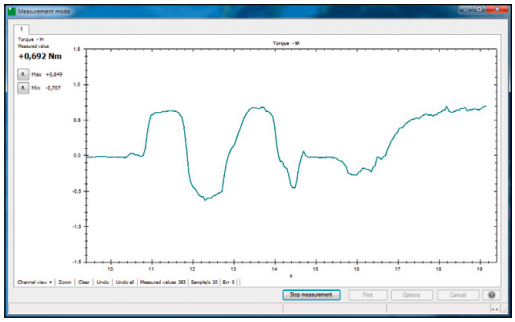
Graduation:	1:2	1:4	1:5
	Upper scale value of second range		
5 N·m	-	-	1 Nm
10 N·m	5 Nm	-	2 Nm
20 N·m	10 Nm	5 Nm	-
50 N·m	-	-	10 Nm
100 N·m	50 Nm	-	20 Nm
200 N·m	100 Nm	50 Nm	-

The second, smaller measuring range can be activated via USB or by applying the operating voltage to pin 7.

DigiVision configuration and analysis software

Features

- Can be used to actuate tare function, with value stored in sensor
- Configuration options for averaging and filters; value stored in sensor
- Intuitive user interface
- Automatic sensor identification
- Sensor calibration data readout



DigiVision Light PC software

DigiVision configuration and analysis software max. 200 measured value/s for one sensor (freely available on our website)

DigiVision Standard PC software

DigiVison configuration and analysis software up to 16 channels — Model 8630-P100

PC-Software DigiVision Professional

DigiVision configuration and analysis software including maths functions; up to 32 — Model 8630-P200

USB measurement option

- Numerical & graphical display and measurement of the physical torque value
- Practical start and stop trigger functions
- 4 limits can be configured for each measurement channel
- MIN/MAX value acquisition
- Automatic scaling
- Measurement reports can be saved as Excel or PDF file
- Archive viewer for displaying sets of curves
- X Multichannel measurements, even with different sensors (e.g. 9206, 8631, 8661) available with standard version

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Accessories

Order code		
9900-V594		Mating connection 7 pin
9900-V596		Mating connection 90°-angle
99594-000A-0150030		Connecting cable, length 3 m, other end free
99596-000A-0150030		Connecting cable, length 3 m, plug with 90°-angle, other end free
99141-594A-0150030		Connecting cable for burster desktop instruments with 12 pin socket, length 3 m
99209-586C-0510030		Connecting cable for model 9235, model 7281 and model 9311, length 3 m
9900-K358		Micro USB cable, length 1.8 m
8631-P100		DigiVision Standard configuration and analysis software; up to 16 channels
8631-P200		DigiVision Professional with additional configurable maths channel; up to 32 channels
		DigiVision Light configuration and analysis software, max. 200 measured value/s for one sensor (freely available on our website)

Calibration

Manufacturer Calibration Certificate (WKS)		
		Special calibration for clockwise or/and counter clockwise direction torque, in 20 % steps of range up and down.
DAkkS Calibration Certificate		
		DAkkS calibration certificate per DIN 51309, clockwise and/or anticlockwise torque, with eight steps spaced across the measurement range, increasing and decreasing.

Order Code

Measuring Range	Code			
0 ... ±5 N·m	5	0	0	5
0 ... ±10 N·m	5	0	1	0
0 ... ±20 N·m	5	0	2	0
0 ... ±50 N·m	5	0	5	0
0 ... ±100 N·m	5	1	0	0
0 ... ±200 N·m	5	2	0	0

											Standard				
											0	0	0	3	0
8	6	3	1	–	X	X	X	X	-	V		0		3	0

Standard sensor	
■ Standard sensor, one measuring range	0
■ Dual-range version, graduation 1:5	2
■ Dual-range version, graduation 1:4	3
■ Dual-range version, graduation 1:2	4

Output signals	
■ Output voltage 10 V incl. configuration USB	0
■ Output voltage 10 V incl. USB configuring and measuring USB	1
■ Output signal standardized, mV/V	3
■ Output signal, mV/V with TEDS	4

Torque Sensor

For static and dynamic applications, non-rotary

Model 8627

Code:	8627 EN
Delivery:	4 weeks
Warranty:	24 months

- **Measurement range from 0 ... 500 Nm to 0 ... 5000 Nm**
- **Linearity error 0.1 % F.S.**
- **Reliable and durable**
- **Simple handling and assembly**
- **Output signal standardized**
- **Optional linearity error 0.05 % F.S.**
- **Optional with burster TEDS**

8627 EN

Application

This torque sensor is qualified for static and dynamic measurements on non-rotary applications.

Further the measurement of reaction torques on rotating machine parts is possible. Especially torque sensors with flanges are preferred. They are mounted between motor and stator, e.g. in agitator drives. This enables a maintenance-free torque measurement.
For individual measuring tasks the design of our torque sensors can be adapted to the customer's installation conditions.

Description

The design is optimized regarding overall length, weight and volume, so that axial forces up to relatively high limit values and bending moments of up to 20 % of the measuring range have only a small effect to the influence of the measuring element. Four metal film strain gauges are mounted on the measuring element and connected to form a full bridge. When applying AC or DC voltage on the bridge, the mechanical value torque is converted into electrical voltage. The necessary amplifier either delivers a norm signal (0 … 10 V, 0/4 … 20 mA) or – with indicator module – a torque signal truly corresponding to the measured variable.

The sensor output signal is standardized, so that an exchange of the sensor (spare part) does not require any new adjustment of the measuring chain.

The burster TEDS option (electronic data sheet, memory chip with sensor-specific data) allows rapid configuration of compatible evaluation units (instrumentation amplifier, indicator, ...).

burster praezisionsmesstechnik gmbh & co kg Germany
Talstr. 1-5 · Gernsbach 76593 · Phone +49-7224-6450
www.burster.com
info@burster.com

Technical Data

Order Code	Measuring Range	Dimensions [mm]								Bore Holes		P
		øA	øB	øD	F	G	L	øT	øQ	Number	Pitch	
8627-5500	0 ... ± 500 Nm	20H7	18	100	15	M10	80	82	60	8	45°	39.5
8627-6001	0 ... ± 1000 Nm	20H7	18	100	15	M10	80	82	60	8	45°	39.5
8627-6002	0 ... ± 2000 Nm	75H7	20	130	20	M12	100	100	80	12	30°	45
8627-6005	0 ... ± 5000 Nm	75H7	20	130	20	M12	100	100	80	12	30°	45

Higher measuring ranges upon request.

Electrical values

Resistor bridge (full bridge): foil strain gauge 350 Ω, nominal*
* Deviation from the indicated values are possible.

Excitation voltage: 2 ... 12 V
recommended 10 V

Nominal value: standard, 1 mV/V

Environmental conditions

Operating temperature range: - 15 °C ... + 55 °C

Rated temperature range: - 5 °C ... + 45 °C

Temperature effect:
on zero signal: ± 0.02 % F.S./K
on characteristic value: ± 0.01 % F.S./K

Mechanical values

Relative linearity error: ± 0.1 % F.S.

Relative reversibility error: ± 0,1 % F.S.

Relative repeatability error: ± 0,1 % F.S.

Max. operating torque (static): 150 % of nominal value

Torque limit (static): 200 % of nominal value

Breaking moment (static): > 300 % of nominal value

Dynamic load: recommended ≤ 70 % of nominal value

Rated torsion angle: < 0.1°

Material: steel, 1.2826 res. 1.2738

Degree of protection: acc. EN 60529 IP50

Pins assignment:

	Pin
excitation -	1
excitation +	2
shield	3
signal +	4
signal GND	5
NC	6

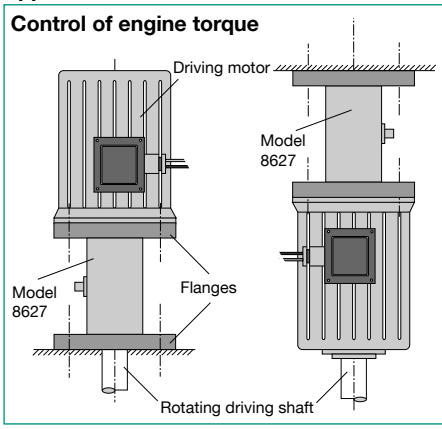
Mechanical connection: both ends with flag

Electrical connection: 6 pins plug connection

Mating: 6 pole model 9953
(included is scope of delivery)

Application

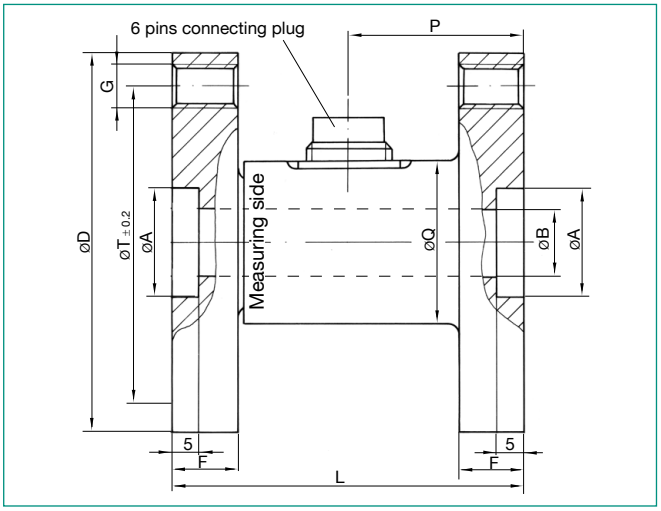
Control of engine torque



Model 8627, with its two flanges on both ends, enables the user to seize reaction torques without any problems and maintenance-free.

The arrangement showed on the left is especially suitable for the measurement of torque on agitators.

Dimension drawing model 8627



The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.
Download via www.burster.com or directly at www.traceparts.com. For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

Order Information

Torque sensor, non-rotary, both ends with flags, burster TEDS, measurement ±500 Nm **Model 8627-5500**

Accessories

Mating connector, 6 pole cable coupling **Model 9953**

Mating connector, 6 pole, 90°- phase shift **Model 9900-V589**

Connection cable with one end free, length 3 m, with connector model 9953 **Model 99553-000A-0110030**

Connection cable, length 3 m
- for burster desktop instruments with 12 pin connectors **Model 99141-553A-0150030**
- for model 9235, model 9311 and model 7281 **Model 99209-553A-0110030**

Amplifier, process indicators, digital displays **see section 9 of the catalog.**

Manufacturer Calibration Certificate (WKS)

Special calibration for clockwise or/and counter clockwise direction torque, in 20 % steps of range up and down.

burster praezisionsmesstechnik gmbh & co kg Germany
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www.burster.com
info@burster.com

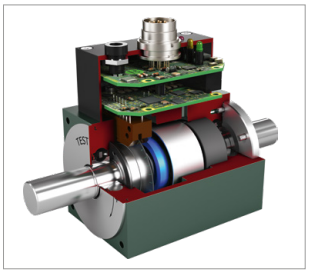
Delivery: ex stock | Warranty: 24 months

High-Precision Torque Sensor
rotating, contactless

MODEL **8661**

With mounting block

With mounting block and couplings



In the cross-section

With couplings

Highlights
- Measurement ranges of 0 ... 0.02 N·m to 0 ... 1000 N·m
- Very low linearity error ≤ ±0.05 % F.S.
- Output signal 0 ... ±10 V
- Refresh rate 2000 measurements/s

Options
- Speed and angle measurement up to 2000 increments
- Dual range in different graduations
- Shaft end with keyway
- USB port including software

Applications
- Research & development
- Machinery and plant engineering
- Electric motor test
- Suitable for use in all types of test bench

Product description
The non-contact torque sensor type 8661 works according to the strain gage principle. Thanks to the inductive and optical transmission of the signals, the sensor is maintenance-free, the signals are digitized directly on the shaft and made available by the evaluation electronics as a voltage signal or via USB. Thanks to the high-quality bearing, depending on the measuring range, up to 25,000 rpm is possible. The bidirectional voltage output from -10 V ... +10 V allows the direction of rotation to be identified very easily.

To record the speed and angle of rotation, the sensor can optionally be equipped with different number of increments, up to 2000. This speed / angle signal is available as a TTL output signal.

The free DigiVision Light software is available in connection with USB, alternatively drivers for LabVIEW and DASYLab are ready for download.

Connection cables in various lengths, metal bellows couplings and mounting blocks are available for integration in customer-specific systems.

Technical Data

8661	–	4020	4050	4100	4200	4500	5001	5002
Measuring range calibrated in N·m from 0 ...		±0.02 N·m	±0.05 N·m	±0.1 N·m	±0.2 N·m	±0.5 N·m	±1 N·m	±2 N·m
Accuracy								
Relative non-linearity		0.1 % F.S.		0.05 % F.S.				
Relative non-linearity dual range sensor		-				0.1 % F.S.		
Relative hysteresis		< 0.1 % F.S. / dual range sensor < 0.2 % F.S.						
Tolerance of sensitivity		±0.1 % F.S. / dual range sensor ±0.2 % F.S.						
Electrical values								
Rated supply voltage range		10 ... 30 V DC (or 5 V via USB)						
DC power consumption		approx. 2 W						
Output voltage at ± rated torque		±10 V						
Output resistance		1 kΩ						
Insulation resistance		> 5 MΩ						
Refresh rate		2000/sek.						
Ripple		< 50 mV_{ss}						
Control signal		10.00 V DC						
Environmental conditions								
Range of operating and nominal temperature		0 °C ... +60 °C						
Sensitivity of temperature effects		on the zero point 0.015 % F.S./K / 2. measuring range dual range sensor 0.03 % F.S./K on the sensitivity 0.010 % F.S./K / 2. measuring range dual range sensor 0.02 % F.S./K						
Mechanical values								
Dynamic overload safe		recommended 70 % of nominal torque						
Max. operation torque		200 % of nominal torque / dual range sensor 150 %						
Breakaway torque		300 % of nominal torque						
Alternating load		70 % of nominal torque						
Maximum limit axial load	[N]	50						
Maximum limit radial load	[N]	3				4	7	13
Spring constant	[N·m/rad]	10		20	50	100	100	180
Mass moment of inertia measuring side	[10^{-6} kg*m^2]	0.048			0.05	0.06	0.062	0.077
Mass moment of inertia drive side	[10^{-6} kg*m^2]	2.2						
Max. rotary speed	[min^{-1}]	25000						
Other								
Material		Housing: made of anodized aluminium; Shaft: high-strength aluminium 3.1354; shaft ends stainless steel 1.4542		Housing: made of anodized aluminium Shaft: stainless steel 1.4542				
Protection class		acc. EN 60529, IP40						
Weight	[g]	300						
Installation								
Installation instructions		Do not exceed the permitted axial and radial forces during fitting and operation. Please refer to our operating instructions for detailed information www.burster.com. Suitable couplings should be used to avoid strain resulting from parallel or angular offset between the shafts.						

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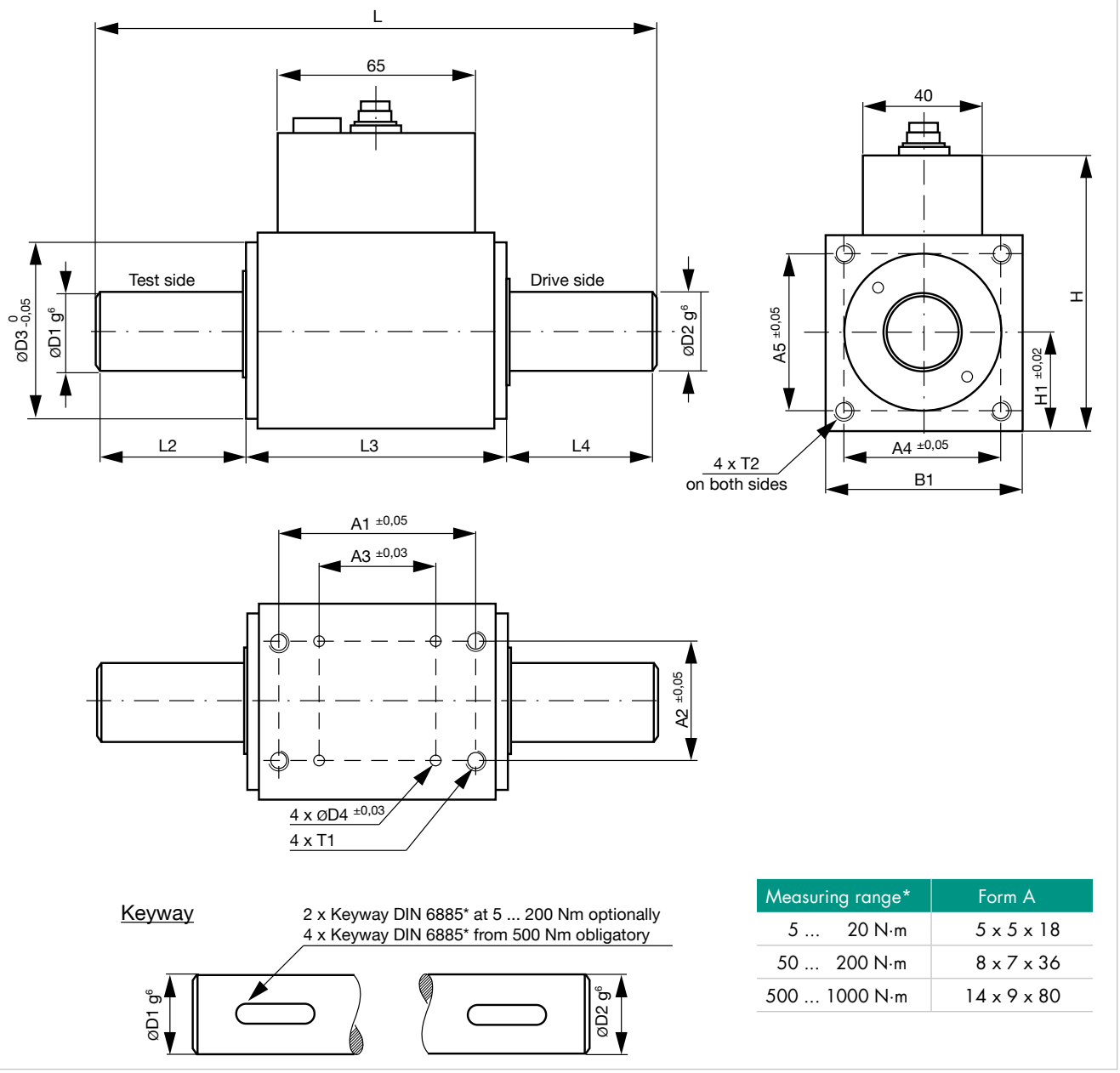
Technical Data

8661	–	5005	5010	5020	5050	5100	5200	5500	6001
Measuring range calibrated in N·m from 0 …		±5 N·m	±10 N·m	±20 N·m	±50 N·m	±100 N·m	±200 N·m	±500 N·m	±1000 N·m
Accuracy									
Relative non-linearity		0.05 % F.S.							
Relative non-linearity dual range sensor		0,1 % F.S.							
Relative hysteresis		< 0.1 % F.S. / dual range sensor < 0.2 % F.S.							
Tolerance of sensitivity		±0.1 % F.S. / dual range sensor ±0.2 % F.S.							
Electrical values									
Rated supply voltage range		10 … 30 V DC (or 5 V via USB)							
DC power consumption		approx. 2 W							
Output voltage at ± rated torque		±10 V							
Output resistance		1 kΩ							
Insulation resistance		> 5 MΩ							
Refresh rate		2000/sek.							
Ripple		< 50 mV_{ss}							
Control signal		10.00 V DC							
Environmental conditions									
Range of operating and nominal temperature		0 °C … +60 °C							
Sensitivity of temperature effects		on the zero point 0.015 % F.S./K / 2. measuring range dual range sensor 0.03 % F.S./K on the sensitivity 0.010 % F.S./K / 2. measuring range dual range sensor 0.02 % F.S./K							
Mechanical values									
Dynamic overload safe		recommended 70 % of nominal torque							
Max. operation torque		200 % of nominal torque / dual range sensor 150 %							
Breakaway torque		300 % of nominal torque							
Alternating load		70 % of nominal torque							
Maximum limit axial load	[N]	200			300			500	
Maximum limit radial load	[N]	15	30	60	125	215		250	500
Spring constant	[N·m/rad]	800	1700	3000	14000	25000	40000	150000	220000
Mass moment of inertia measuring side	[10^{-6} kg*m^2]	2.2	2.35	2.6	33.3	33.7	35.0	600	600
Mass moment of inertia drive side	[10^{-6} kg*m^2]	14.3		14.6	85.7	85.9	85.5	1200	
Max. rotary speed	[min^{-1}]	15000						7000	
Other									
Material		Housing: made of anodized aluminium; Shaft: stainless steel 1.4542							
Protection class		acc. EN 60529, IP40							
Weight	[g]	900			1500			6000	
Installation									
Installation instructions		Do not exceed the permitted axial and radial forces during fitting and operation. Please refer to our operating instructions for detailed information www.burster.com. Suitable couplings should be used to avoid strain resulting from parallel or angular offset between the shafts.							

Dimensional drawing



Measuring range*	Form A
5 ... 20 N·m	5 x 5 x 18
50 ... 200 N·m	8 x 7 x 36
500 ... 1000 N·m	14 x 9 x 80

For detailed dimensions you can find sensor CAD data on our website www.burster.com.

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8661	–	4020	4050	4100	4200	4500	5001	5002
Measuring range from 0 ...		±0.02 N·m	±0.05 N·m	±0.1 N·m	±0.2 N·m	±0.5 N·m	±1 N·m	±2 N·m
Geometry								
A1	[mm]	45						
A2	[mm]	31						
A3	[mm]	30						
A4	[mm]	26						
A5	[mm]	24						
B1	[mm]	40						
D1	[mm]	5g6						6g6
D2	[mm]	8g6						
D4 Ø / deep	[mm]	Ø 3.1 / 5						
H	[mm]	60						
H1	[mm]	15						
L	[mm]	87						94
L2	[mm]	10						14
L3	[mm]	66						
L4	[mm]	11						14
T1 / deep	[mm]	M4 / 8						
T2 / deep	[mm]	M3 / 5,5						

8661	–	5005	5010	5020	5050	5100	5200	5500	6001
Measuring range from 0 ...		±5 N·m	±10 N·m	±20 N·m	±50 N·m	±100 N·m	±200 N·m	±500 N·m	±1000 N·m
Geometry									
A1	[mm]	57						50	
A2	[mm]	44						90	
A3	[mm]	41						30	
A4	[mm]	45.3			54.4			88.4	
A5	[mm]	45.3			54.4			88.4	
B1	[mm]	55			64			107	
D1	[mm]	15g6			26g6			45g6	
D2	[mm]	15g6			26g6			45g6	
D4 Ø / deep	[mm]	Ø 3.1 / 5						Ø 4.1 / 10	
H	[mm]	85			94			137	
H1	[mm]	27.5			32			53.5	
L	[mm]	143			168			285	
L2	[mm]	30			45			95	
L3	[mm]	83			78			95	
L4	[mm]	30			45			95	
T1 / deep	[mm]	M5 / 9			M5 / 8			M8 / 20	
T2 / deep	[mm]	M4 / 6						M6 / 10	

Electrical values

12-pin connector or USB (Option, USB connection cable included)

Wiring Code depends on the options selected		
Pin	Assignment	Cable colour (99540-000F-052XXXX)
A	NC	
B	Angular exit B	violet
C	Moment output +	yellow
D	Moment output -	green
E	Supply -	blue
F	Supply +	red
G	Angular exit A	pink
H	NC	
J	Ground angle output, measuring range switchover	black
K	Control signal	White
L	Measuring range switchover	brown
M	NC	

Accessories

Mounting block model 8661-Z00X

If the sensor needs to be replaced, the locating pin speeds up replacement, avoiding the need for laborious realignment. This can be useful especially when the sensor is only used occasionally in the load path. The mounting block has a central hole and special design allowing a range of options for reliable cable attachment. Two clips ensure the sensor is fixed securely.

For further information please see accessories data sheet 8661-Z00X

Metal bellow couplings

For optimum compensation of misalignment we recommend torsionally free metal bellow couplings. They are characterized by their excellent torsional stiffness during torque load and their low restoring forces. The couplings are optionally with keyways available.

For further information please see accessories data sheet 869X.

Options

USB interface

This sensor version has a USB connection instead of the ±10 V output. The sensor is powered via USB, no further connections required.

In addition to torque, the speed or rotation angle measured values are optionally available. The calculated mechanical performance in is also displayed in DigiVision.

Free drivers are available for integration into LabVIEW and DASYLab, also a DLL for integration into your own programs.

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Dual range

The sensor with two measuring ranges corresponds to its dimensions of the standard version, but has two separately calibrated measuring ranges. The measuring ranges are switched within <50 ms, even during measurement operation, by applying the operating voltage to pin L or via USB. The following graduations are available:

Graduation:	1:10	1:4	1:5
	Upper scale value of second range		
0.5 N·m	-	-	0.1 N·m
1 N·m	-	-	0.2 N·m
2 N·m	0.2 N·m	0.5 N·m	-
5 N·m	0.5 N·m	-	1 N·m
10 N·m	1 N·m	-	2 N·m
20 N·m	2 N·m	5 N·m	-

Graduation:	1:10	1:4	1:5
	Upper scale value of second range		
50 N·m	5 N·m	-	10 N·m
100 N·m	10 N·m	-	20 N·m
200 N·m	20 N·m	50 N·m	-
500 N·m	50 N·m	-	100 N·m
1000 N·m	100 N·m	-	200 N·m

The second, smaller measuring range can be activated via USB or by applying the operating voltage to pin L.

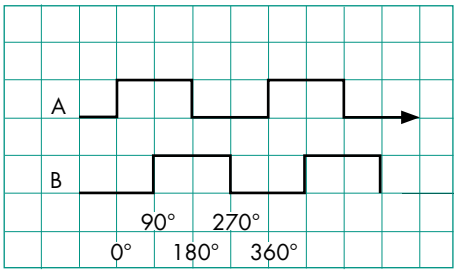
Torque sensor with integrated rotational speed / angular displacement measurement

8661 torque sensors are optionally available with integrated rotational speed and angular displacement measurement. Two pulse channels with TTL level – channel A and channel B – are always available. For clockwise rotation (looking at the test side), channel A leads channel B with a phase shift of 90°. Only one pulse channel is needed for speed measurement.

For angular displacement measurement (or direction detection), both channels need to be evaluated. To achieve the maximum angular resolution, four-edge decoding must be used to read both the rising and falling edges. For instance an angular resolution of up to 0.045° can then be achieved with an encoder disk having 2000 increments.

Maximum speed:

Encoder disk with 2000 increments: ≤ 3000 min^{-1}
Encoder disk with 1024 increments: ≤ 6000 min^{-1}
Encoder disk with 400 increments: ≤ 15000 min^{-1}
Encoder disk with 240 increments: ≤ 25000 min^{-1}



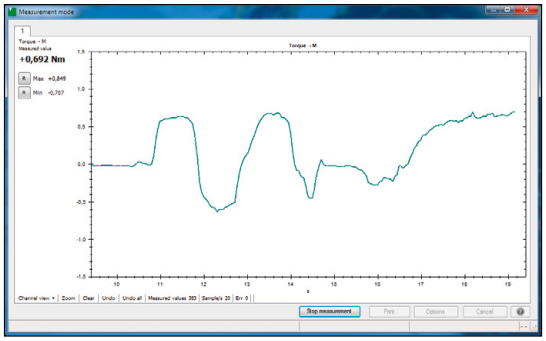
Increments	from 0 ... 0,02 N·m to 0 ... 2 N·m	from 0 ... 5 N·m to 0 ... 200 N·m	from 0 ... 500 N·m to 0 ... 1000 N·m
2000	-	yes	-
1024	yes	yes	yes
400	yes	yes	-
240	yes	-	-

The measuring accuracy of the rotational speed and angular displacement measurement is directly related to the speed and the encoder disk used. With the USB option, another influencing factor is the setting of the averaging, which should be adapted to the speed range used.

DigiVision configuration and analysis software

Features

- Tare function
- Configuration options for averaging and filters; value stored in sensor
- Intuitive user interface
- Automatic sensor identification
- Sensor calibration data readout



DigiVision Light PC software		
freely available on our website		DigiVision configuration and analysis software max. 200 measured value/s for one sensor
DigiVision Standard PC software		
Model 8661-P100		DigiVison configuration and analysis software up to 16 channels, no limit to the refreh rate
PC-Software DigiVision Professional		
Model 8661-P200		DigiVision configuration and analysis software with additional configurable maths channel; up to 32 channels

- Numerical & graphical display and measurement of the physical torque value
- Practical start and stop trigger functions
- 4 limits can be configured for each measurement channel
- MIN/MAX value acquisition
- Automatic scaling
- Measurement reports can be saved as Excel or PDF file
- Archive viewer for displaying sets of curves
- X Multichannel measurements, even with different sensors (e.g. 9206, 8631, 8625) available with standard version

Accessories

Order code		
9940		Mating connection 12 pin (scope of delivery)
9900-V539		Mating connection 90°-angle
99540-000F-0520030		Connecting cable, length 3 m, other end free
99539-000F-0520030		Connecting cable, length 3 m, plug with 90°-angle, other end free
99209-540G-0160030		Connecting cable for model 7281 and model 9311, length 3 m, with external supply
99163-540A-0520030		Connecting cable, length 3 m, 8661 to DIGIFORCE® 9307combined cannel D (option channel)
99209-215A-0090004		Adapter cable to DIGIFORCE® 9307 standard channel A/B and C (usable only in connection with type 99163-540A-052xxxx)
		DigiVision Light configuration and analysis software, max. 200 measured value/s for one sensor (freely available on our website)
8661-Z010		USB cable connector type A, type BMini, length 2 m, black
8661-P100		DigiVision Standard configuration and analysis software; up to 16 channels
8661-P200		DigiVision Professional with additional configurable maths channel; up to 32 channels
8600-Z00X		Mounting block, see accessories data sheet 8661-Z00X
8600-Z010		Power pack for external supply

Calibration

Manufacturer Calibration Certificate (WKS)		
		Special calibration for clockwise or/and counter clockwise direction torque, in 20 % steps of range up and down.
Calibration Certificate with accreditation symbol		
		Calibration certificate with accreditation symbol per DIN 51309, clockwise or/and anticlockwise torque, with eight steps spaced across the measurement range, increasing and decreasing.

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Order code

Measuring Range	Code			
0 ... ±0.02 N·m	4	0	2	0
0 ... ±0.05 N·m	4	0	5	0
0 ... ±0.1 N·m	4	1	0	0
0 ... ±0.2 N·m	4	2	0	0
0 ... ±0.5 N·m	4	5	0	0
0 ... ±1 N·m	5	0	0	1
0 ... ±2 N·m	5	0	0	2
0 ... ±5 N·m	5	0	0	5
0 ... ±10 N·m	5	0	1	0
0 ... ±20 N·m	5	0	2	0
0 ... ±50 N·m	5	0	5	0
0 ... ±100 N·m	5	1	0	0
0 ... ±200 N·m	5	2	0	0
0 ... ±500 N·m	5	5	0	0
0 ... ±1000 N·m	6	0	0	1
	⋮	⋮	⋮	⋮

											Standard			
											0	0	0	0
8	**6**	**6**	**1**	**–**					**–**	**V**				

Standard sensor	
■ Standard sensor, one measuring range	0
■ Dual-range version, graduation 1:10 available ≥ 2 N·m	1
■ Dual-range version, graduation 1:5 available ≥ 0.5 N·m	2
■ Dual-range version, graduation 1:4 available ≥ 2 N·m	3

■ Without speed/angle measurement	0
■ Speed/angle measurement 400 increments	1
■ Speed/angle measurement 1024 increments	2
■ Speed/angle measurement 240 increments	3
■ Speed/angle measurement 2000 increments	4

Output signals	
■ Output voltage 0 ... ±10 V	0
■ USB interface	1
■ Output voltage 0 ... ±5 V	2

Versions	
■ Round shaft ends	0
■ Shaft ends with keyway	2

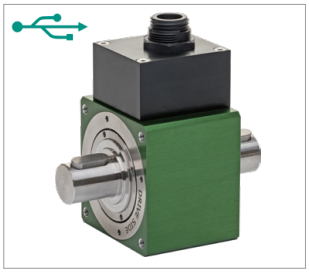
Delivery: ex stock | Warranty: 24 months

Precision Torque Sensor
rotating, contactless

MODEL **8656**

Highlight:
Very short design

Small measuring range



Large measuring range

Highlights
- Measurement ranges of 0 ... 1 N·m to 0 ... 100 N·m
- Very short design
- Output signal 0 ... ±10 V

Options
- Speed and angle measurement with resolution of up to 400 increments
- USB port including software

Applications
- End-of-line test benches
- Research & development
- Machinery and plant engineering
- Electric motor test
- Suitable for use in all types of test bench

Product description
The very short torque sensor model 8656 is contactless constructed. The torque is recorded by the torsion of the shaft using the strain gauge principle. Thanks to the inductive and optical transmission of the signals, the sensor is maintenance-free, the signals are digitized directly on the shaft and made available by the evaluation electronics as a voltage signal or via USB. Thanks to the high-quality, up to 10,000 rpm is possible. The direction of rotation can be seen from the potential of the output voltage, clockwise rotation corresponds to positive output voltage, counterclockwise rotation the voltage level is negative.

The shaft is equipped with keyways in every measuring range, matching keys are included. If a key connection is not required, the key can be omitted. The torque is matched with suitable couplings, we recommend model 8690, safely transmitted.

To record the speed and angle of rotation, the sensor can optionally be equipped with an incremental disc with 400 increments. This speed / angle signal is available as a TTL output signal.

The free DigiVision software is available in connection with USB, alternatively drivers for LabVIEW and DASYLab are ready for download.

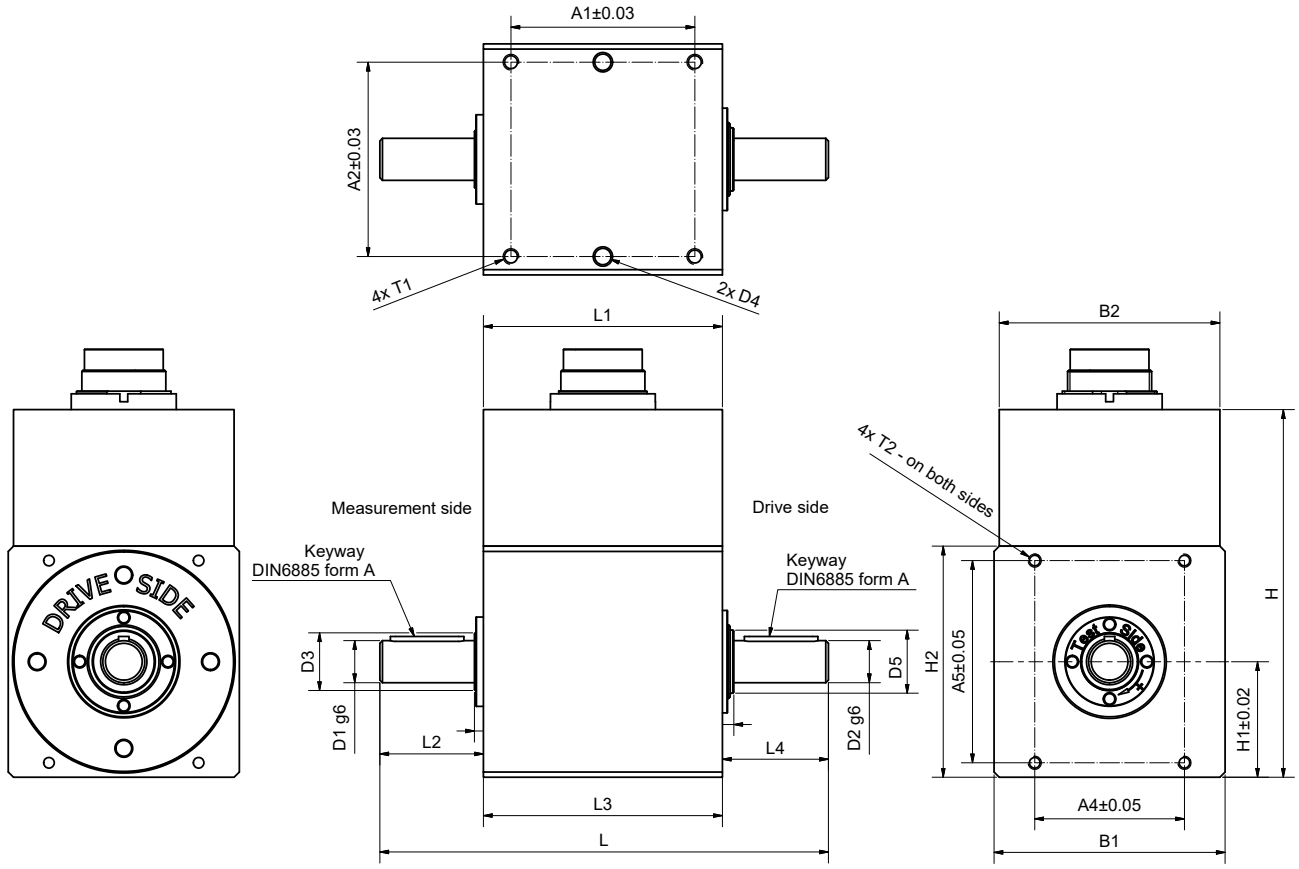
Connection cables in various lengths, metal bellows couplings and mounting brackets are available for integration in customer-specific systems.

Technical Data

8656	–	5001	5002	5005	5010	5020	5050	5100
Measuring range calibrated in N·m from 0 ...		±1 N·m	±2 N·m	±5 N·m	±10 N·m	±20 N·m	±50 N·m	±100 N·m
Accuracy								
Relative non-linearity		0.2 % F.S.						
Relative hysteresis		0.15 % F.S.						
Tolerance of sensitivity		0.25 % F.S.						
Electrical values								
Rated supply voltage range		10 ... 30 V DC (or 5 V via USB)						
DC power consumption		approx. 2 W						
Output voltage at ± rated torque		±10 V						
Output resistance		330 Ω						
Insulation resistance		> 5 MΩ						
Update rate		400/sec.						
Ripple		< 50 mV_{ss}						
Control signal		10.00 V DC						
Environmental conditions								
Range of operating and nominal temperature		0 °C ... +60 °C						
Sensitivity of temperature effects		on the zero point 0.015 % F.S./K on the sensitivity 0.015 % F.S./K						
Mechanical values								
Dynamic overload safe		recommended 70 % of nominal torque						
Max. operation torque		150 % of nominal torque						
Breakaway torque		300 % of nominal torque						
Alternating load		70 % of nominal torque						
Maximum limit axial load	[N]	70				150		165
Maximum limit radial load	[N]	5	10	13	20	25	30	50
Spring constant	[N·m/rad]	330		1000		7500		18000
Mass moment of inertia measuring side	[10^{-6} kg*m^2]	4				8		22
Mass moment of inertia drive side	[10^{-6} kg*m^2]	1				8.5		25
Max. rotary speed	[min^{-1}]	10000						
Other								
Material		Housing: made of anodized aluminium; Shaft: steel shell 1.4542						
Protection class		acc. EN 60529, IP40						
Weight	[g]	310				485		710
Installation								
Installation instructions		Do not exceed the permitted axial and radial forces during fitting and operation. Please refer to our operating instructions for detailed information www.burster.com. Suitable couplings should be used to avoid strain resulting from parallel or angular offset between the shafts.						

3057-008625EN-5699-081528

Dimensional drawing



Keyway:

Measuring range*	Form A
1 ... 10 N·m	2 x 2 x 14
20 ... 50 N·m	5 x 5 x 16
100 N·m	6 x 6 x 18

For detailed dimensions you can find sensor CAD data on our website www.burster.com.

8656	–	5001	5002	5005	5010	5020	5050	5100
Measuring range from 0 ...		±1 N·m	±2 N·m	±5 N·m	±10 N·m	±20 N·m	±50 N·m	±100 N·m
Geometry								
A1	[mm]	35						33.5
A2	[mm]	37				36		41
A4	[mm]	28.5				44		50
A5	[mm]	38.5				41		48
B1	[mm]	44				50		59
B2	[mm]	42						
D1 / D2	[mm]	8g6				15g6		18g6
D3	[mm]	11				16		24
D4 Ø / deep	[mm]	Ø 3.1 / 6						
H1	[mm]	22				25		29.5
H2	[mm]	44				50		59
L	[mm]	85.4				90.1		95.5
L2	[mm]	19.7				21.5		24
L3	[mm]	45.5				47.5		
L4	[mm]	20.2				21.1		24
T1 / deep	[mm]	M3 / 7				M4 / 7		
T2 / deep	[mm]	M2.5 / 8				M3 / 8		M4 /8

Electrical values

12-pin connector or mini USB with screw connection for configuration / measurement (option, USB connection cable included)

Wiring Code depends on the options selected		
Pin	Assignment	Cable colour (99540-000F-052XXXX)
A	NC	
B	Angular exit B	violet
C	Moment output +	yellow
D	Moment output -	green
E	Supply -	blue
F	Supply +	red
G	Angular exit A	pink
H	NC	
J	Ground angle output	black
K	Control signal	White
L	-	-
M	NC	

Accessories

Mounting block model 8600-Z02X

The mounting block has a central hole and special design allowing a range of options for reliable cable attachment. Two clips ensure the sensor is fixed securely.

For further information please see accessories data sheet 8600-Z02X

Metal bellow couplings

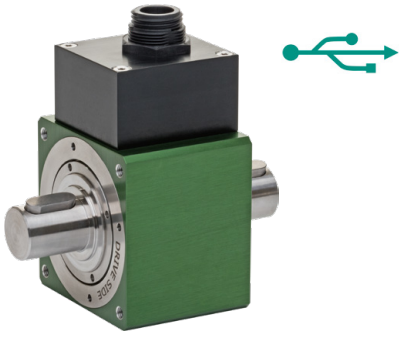
Couplings are necessary for correct installation. We recommend torsionally free metal bellows couplings to achieve an optimum compensation of misalignment.

The couplings are characterized by their excellent torsional stiffness during torque load and their low restoring forces. The couplings are optionally available with feather keys.

For further information please see accessories data sheet 8690.

Options

Integrated amplifier with USB interface



This sensor version has an USB connection instead of the ±10 V output. The sensor is powered via USB, no further connections required.

In addition to torque, the speed or rotation angle measured values are optionally available at the output. The mechanical performance calculated in the sensor is also displayed via the DigiVision software.

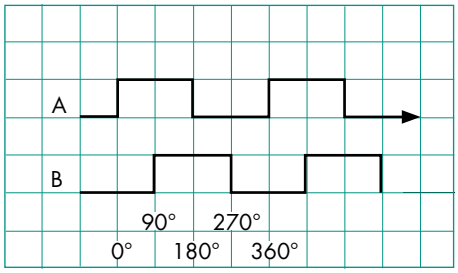
Free drivers are available for integration into LabVIEW and DASYlab, also a DLL for integration into your own programs.

3057-008625EN-5699-081528

Torque sensor with integrated rotational speed / angular displacement measurement

8656 torque sensors are optionally available with integrated rotational speed and angular displacement measurement. Two pulse channels with TTL level – channel A and channel B – are always available. For clockwise rotation (looking at the test side), channel A leads channel B with a phase shift of 90°. Only one pulse channel is needed for speed measurement.

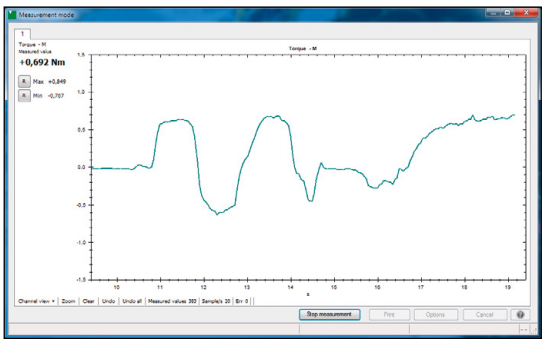
For angular displacement measurement (or direction detection), both channels need to be evaluated. To achieve the maximum angular resolution, four-edge decoding must be used to read both the rising and falling edges, so an angular resolution of 0.255 ° is possible.



DigiVision configuration and analysis software

Features

- Can be used to actuate tare function
- Configuration options for averaging and filters
- Intuitive user interface
- Automatic sensor identification
- Sensor calibration data readout



DigiVision Light PC software		
freely available on our website		DigiVision configuration and analysis software max. 200 measured value/s for one sensor
DigiVision Standard PC software		
Model 8656-P100		DigiVison configuration and analysis software up to 16 channels
PC-Software DigiVision Professional		
Model 8656-P200		DigiVision configuration and analysis software with additional configurable maths channel; up to 32 channels

USB measurement option

- Numerical & graphical display and measurement of the physical torque value
- Practical start and stop trigger functions
- 4 limits can be configured for each measurement channel
- MIN/MAX value acquisition
- Automatic scaling
- Measurement reports can be saved as Excel or PDF file
- Archive viewer for displaying sets of curves
- X Multichannel measurements, even with different sensors (e.g. 9206, 8631, 8625, 8661) available with standard version

Accessories

Order code		
9940		Mating connection 12 pin (scope of delivery)
9900-V539		Mating connection 90°-angle
99540-000F-0520030		Connecting cable, length 3 m, other end free
99539-000F-0520030		Connecting cable, length 3 m, plug with 90°-angle, other end free
99209-540G-0160030		Connecting cable for model 7281 and model 9311, length 3 m, with external supply
99163-540A-0150030		Connecting cable, length 3 m, 8656 to DIGIFORCE® 9307combined cannel D (option channel)
99209-215A-0090004		Adapter cable to DIGIFORCE® 9307 standard channel A/B and C (usable only in connection with type 99163-540A-015xxxx)
		DigiVision Light configuration and analysis software, max. 200 measured value/s for one sensor (freely available on our website)
9900-K349		USB cable, length 2 m (included with the USB version)
8656-P100		DigiVision Standard configuration and analysis software; up to 16 channels
8656-P200		DigiVision Professional with additional configurable maths channel; up to 32 channels
8600-Z02X		Mounting block, see accessories data sheet 8656-Z02X

Calibration

Manufacturer Calibration Certificate (WKS)		
		Special calibration for clockwise or/and counter clockwise direction torque, in 20 % steps of range up and down.
DAkkS Calibration Certificate		
		DAkkS calibration certificate per DIN 51309, clockwise or/and counter clockwise torque, with eight steps spaced across the measurement range, increasing and decreasing.

3057-008625EN-5699-081528

Order Code

Measuring Range	Code
0 ... ±1 N·m	5 0 0 1
0 ... ±2 N·m	5 0 0 2
0 ... ±5 N·m	5 0 0 5
0 ... ±10 N·m	5 0 1 0
0 ... ±20 N·m	5 0 2 0
0 ... ±50 N·m	5 0 5 0
0 ... ±100 N·m	5 1 0 0

												Standard				
												0	0	0	2	0
8	**6**	**5**	**6**	**-**					**-**	**V**	**0**			**2**	**0**

■ Without angle/speed measurement	0
■ Speed/angle measurement 400 increments	1

Output signals	
■ Output voltage 0 ... ±10 V	0
■ USB interface	1

■ Rounded shaft ends with keyway	2

Delivery: ex stock | Warranty: 24 months

Torque Sensor

Square, rotating, contactless

MODEL **8655**

Highlights

- Measurement ranges of 0 ... 1 N·m to 0 ... 160 N·m
- Internal square and external square
- Very short design
- Output signal 0 ... ±10 V

Options

- Speed and angle measurement with resolution of up to 400 increments
- USB port including software

Applications

- Monitoring and regulation of screwing processes
- Quality monitoring of tools and machines
- Machinery and plant engineering

Small measuring range

Large measuring range

Product description

The compact torque sensor model 8655 with standard square is contactless constructed. The torque is recorded by the torsion of the shaft using the strain gage principle. Thanks to the inductive and optical transmission of the signals, the sensor is maintenance-free, the signals are digitized directly on the shaft and made available by the evaluation electronics as a voltage signal or via USB. The direction of rotation can be seen from the potential of the output voltage, clockwise rotation corresponds to positive output voltage, counterclockwise rotation the voltage level is negative.

The standard square enables simple integration into existing systems or devices, additional components such as couplings are not require.

To record the speed and angle of rotation, the sensor can optionally be equipped with an incremental disc with 400 increments. This speed / angle signal is available as a TTL output signal.

The free DigiVision software is available in connection with USB, alternatively drivers for LabVIEW and DASYLab are ready for download.

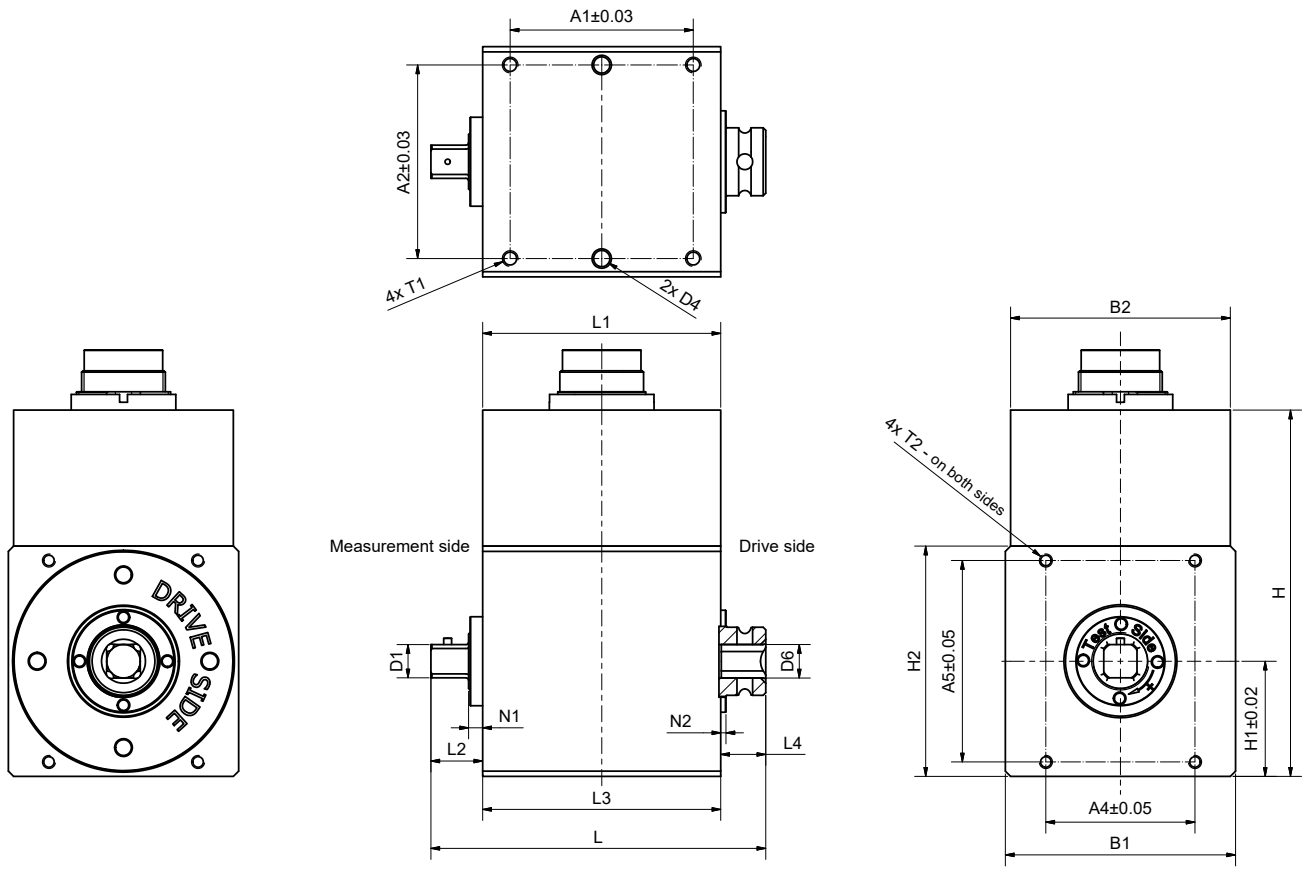
Connection cables in various lengths, metal bellows couplings and mounting brackets are available for integration in customer-specific systems.

Technical Data

8655	–	5001	5002	5005	5012	5025	5050	5063	5100	5160
Measuring range calibrated in N·m from 0 ...		±1 N·m	±2 N·m	±5 N·m	±12 N·m	±25 N·m	±50 N·m	±63 N·m	±100 N·m	±160 N·m
Accuracy										
Relative non-linearity		0.25 % F.S.								
Relative hysteresis		0.2 % F.S.								
Tolerance of sensitivity		0.25 % F.S.								
Electrical values										
Rated supply voltage range		10 ... 30 V DC (or 5 V via USB)								
DC power consumption		approx. 2 W								
Output voltage at ± rated torque		±10 V								
Output resistance		1 kΩ								
Insulation resistance		> 5 MΩ								
Update rate		400/sec.								
Ripple		< 50 mV_{ss}								
Control signal		10.00 V DC								
Environmental conditions										
Range of operating and nominal temperature		0 °C ... +60 °C								
Sensitivity of temperature effects		on the zero point 0.015 % F.S./K on the sensitivity 0.015 % F.S./K								
Mechanical values										
Dynamic overload safe		recommended 70 % of nominal torque								
Max. operation torque		120 % of nominal torque								
Breakaway torque		300 % of nominal torque								
Alternating load		70 % of nominal torque								
Maximum limit axial load	[N]	70				150			165	
Maximum limit radial load	[N]	5	10	13	20	25	30		50	65
Spring constant	[N·m/rad]	300		1000		5000			16000	
Mass moment of inertia measuring side	[10^{-6} kg*m^2]	3.50				7.10			21.50	
Mass moment of inertia drive side	[10^{-6} kg*m^2]	1.0			1.05	8.50			34.00	
Max. rotary speed	[min^{-1}]	3000								
Other										
Material		Housing: made of anodized aluminium; stainless steel shaft 1.4542								
Protection class		acc. EN 60529, IP40								
Weight	[g]	310				450			750	
Installation										
Installation instructions		Do not exceed the permitted axial and radial forces during fitting and operation. Please refer to our operating instructions for detailed information www.burster.com.								

3086-008655EN-5699-091529

Dimensional drawing



For detailed dimensions you can find sensor CAD data on our website www.burster.com.

8655	–	5001	5002	5005	5012	5025	5050	5063	5100	5160
Measuring range from 0 ...		±1 N·m	±2 N·m	±5 N·m	±12 N·m	±25 N·m	±50 N·m	±63 N·m	±100 N·m	±160 N·m
Geometry										
A1	[mm]	35							33.5	
A2	[mm]	37				36			41	
A4	[mm]	28.5				44			50	
A5	[mm]	38.5				41			48	
B1	[mm]	44				50			59	
B2	[mm]	42								
D1	[mm]	¼" external square DIN 3121 form E				⅜" external square DIN 3121 form E			½" external square DIN 3121 form E	
D6 / deep	[mm]	¼" internal square DIN 3121 form H, 8 mm				⅜" internal square DIN 3121 form H, 12.2 mm			½" internal square DIN 3121 form H, 16.5 mm	
D4 Ø / deep	[mm]	Ø 3.1 / 6								
H1	[mm]	22				25			29.5	
H2	[mm]	44				50			59	
L	[mm]	64				71.10			89.4	
L2	[mm]	9.9				13.5			17.90	
L3	[mm]	45.5				47.5				
L4	[mm]	8.6				10.1			24	
T1 / deep	[mm]	M3 / 7				M4 / 7				
T2 / deep	[mm]	M2.5 / 8				M3 / 8			M4 /8	

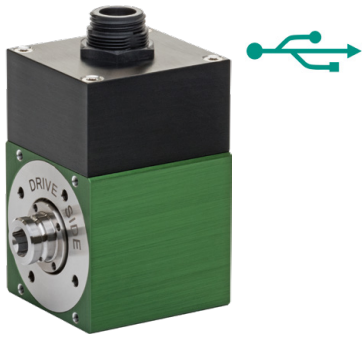
Electrical values

12-pin connector or USB connection for configuration / measurement (option, USB connection cable included)

Wiring Code depends on the options selected		
Pin	Assignment	Cable colour (99540-000F-052XXXX)
A	NC	
B	Angular exit B	violet
C	Moment output +	yellow
D	Moment output -	green
E	Supply -	blue
F	Supply +	red
G	Angular exit A	pink
H	NC	
J	Ground angle output	black
K	Control signal	white
L	NC	brown
M	NC	

Options

Integrated amplifier with USB interface

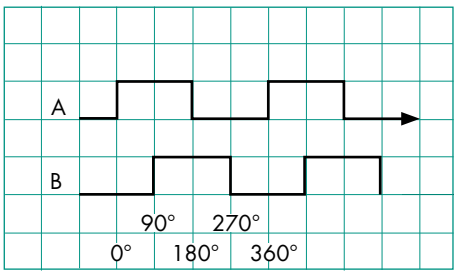


This sensor version has an USB connection instead of the ±10 V output. The sensor is powered via USB, no further connections required.

In addition to torque, the speed or rotation angle measured values are optionally available at the output. The mechanical performance calculated in the sensor can also be displayed using the DigiVision software.

Free drivers are available for integration into LabVIEW and DASYLab, also a DLL for integration into your own programs.

Torque sensor with integrated rotational speed / angular displacement measurement



8655 torque sensors are optionally available with integrated rotational speed and angular displacement measurement. Two pulse channels with TTL level – channel A and channel B – are always available. For clockwise rotation (looking at the test side), channel A leads channel B with a phase shift of 90°. Only one pulse channel is needed for speed measurement.

For angular displacement measurement (or direction detection), both channels need to be evaluated. To achieve the maximum angular resolution, four-edge decoding must be used to read both the rising and falling edges, so an angular resolution of 0.255 ° is possible.

3086-008655EN-5699-091529

Accessories

Mounting block model 8600-Z02X

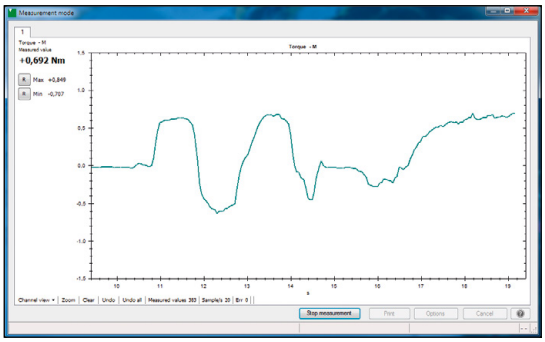
The mounting block has a central hole and special design allowing a range of options for reliable cable attachment. Two clips ensure the sensor is fixed securely.

For further information please see accessories data sheet 8600-Z02X

DigiVision configuration and analysis software

Features

- Can be used to actuate tare function
- Configuration options for averaging and filters
- Intuitive user interface
- Automatic sensor identification
- Sensor calibration data readout



DigiVision Light PC software		
freely available on our website		DigiVision configuration and analysis software max. 200 measured value/s for one sensor
DigiVision Standard PC software		
Model 8655-P100		DigiVison configuration and analysis software up to 16 channels
PC-Software DigiVision Professional		
Model 8655-P200		DigiVision configuration and analysis software with additional configurable maths channel; up to 32 channels

USB measurement option

- Numerical & graphical display and measurement of the physical torque value
- Practical start and stop trigger functions
- 4 limits can be configured for each measurement channel
- MIN/MAX value acquisition
- Automatic scaling
- Measurement reports can be saved as Excel or PDF file
- Archive viewer for displaying sets of curves
- X Multichannel measurements, even with different sensors (e.g. 9206, 8631, 8625, 8661) available with standard version

Accessories

Order code		
9940		Mating connection 12 pin (scope of delivery)
9900-V539		Mating connection 90°-angle
99540-000F-0520030		Connecting cable, length 3 m, other end free
99539-000F-0520030		Connecting cable, length 3 m, plug with 90°-angle, other end free
99209-540G-0160030		Connecting cable for model 7281 and model 9311, length 3 m, with external supply
99163-540A-0150030		Connecting cable, length 3 m, 8655 to DIGIFORCE® 9307combined cannel D (option channel)
99209-215A-0090004		Adapter cable to DIGIFORCE® 9307 standard channel A/B and C (usable only in connection with type 99163-540A-015xxxx)
		DigiVision Light configuration and analysis software, max. 200 measured value/s for one sensor (freely available on our website)
9900-K349		USB cable, length 2 m (included with the USB version)
8655-P100		DigiVision Standard configuration and analysis software; up to 16 channels
8655-P200		DigiVision Professional with additional configurable maths channel; up to 32 channels
8600-Z02X		Mounting block, see accessories data sheet 8600-Z02X

Calibration

Manufacturer Calibration Certificate (WKS)		
		Special calibration for clockwise or/and counter clockwise direction torque, in 20 % steps of range up and down.
DAkkS Calibration Certificate		
		DAkkS calibration certificate per DIN 51309, clockwise or/and counter clockwise torque, with eight steps spaced across the measurement range, increasing and decreasing.

3086-008655EN-5699-091529

Order Code

Measuring Range	Code			
0 ... ±1 N·m	5	0	0	1
0 ... ±2 N·m	5	0	0	2
0 ... ±5 N·m	5	0	0	5
0 ... ±12 N·m	5	0	1	2
0 ... ±25 N·m	5	0	2	5
0 ... ±50 N·m	5	0	5	0
0 ... ±63 N·m	5	0	6	3
0 ... ±100 N·m	5	1	0	0
0 ... ±160 N·m	5	1	6	0
	⋮	⋮	⋮	⋮

											Standard				
											0	0	0	1	0
8	**6**	**5**	**5**	**–**					**–**	**V**	**0**			**1**	**0**

■ Without angle/speed measurement	0
■ Speed/angle measurement 400 increments	1

Output signals	
■ Output voltage 0 ... ±10 V	0
■ USB interface	1

■ Internal square and external square acc. DIN 3121	1

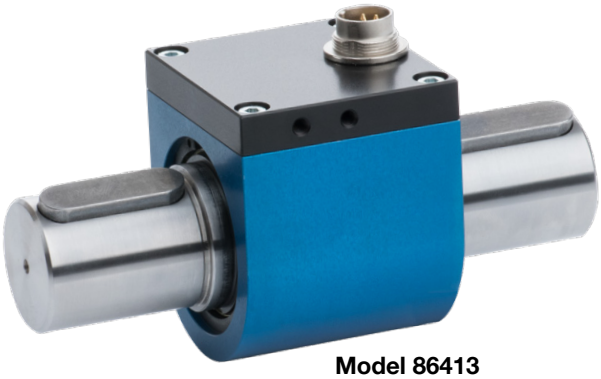
Torque Sensor

Rotating, contact ring transfer

Model 86403 with square end
Model 86413 with round shaft ends
Model 86423 with hexagonal shaft end

Code:	86403 EN
Delivery:	4 weeks
Warranty:	24 months

Model 86403



Model 86413

Model 86423

- **Measuring ranges between 0 ... ± 1 Nm and 0 ... 1000 Nm**
- **Excellent reproducibility**
- **Standardized output signal makes exchange easy**
- **Optionally available with factory calibration certificate**
- **Designed for clockwise and counterclockwise torque**
- **Optionally available with integrated angle measurement**
- **Rotation speed up to 3000 min^{-1} (short-term)**

86403 EN

Application

Precise, reliable measurements of both static and dynamic torques in either direction can be made with this range of sensors.
This opens a wide range of possible applications to the user. These torque sensors are standard equipment in a wide range of industrial automation, quality control and automotive components industry applications, as well as in laboratories.

Typical applications:

Screwing technology
- ► Checking and adjusting bolting tools such as torque limiting wrenches, screwdrivers
- ► Testing bolted connections

Measuring the drag torque of motors and pumps
- ► Frictional torques of gears, bearings and seals
- ► Testing torsion springs
- ► Adjusting equipment in the automobile industry (sunroof, power windows etc.)

Description

Strain gauges are mounted on the torsion shaft of the sensor element, itself made of steel, connected to form a full bridge. The electrical power excitation for the wire strain gauge full bridge and the transmission of the measured signal is provided through a high-quality slip-ring system between the stator and the rotor.
For a clockwise torque, the measurement signal is positive, and it is negative for a counterclockwise torque.
The sensor for the optionally available angle measurement for the square shaft versions is fitted with an additional pulse-generating disk.
With the aid of a second encoder track, displaced by 90°, allows the subsequent evaluation units to perform 4-fold edge evaluation. This allows significantly improved resolution to be achieved. The offset track makes it possible to detect the direction of the rotation.
The characteristic parameters for the sensors are standardized in order to reduce the effort required to check a connected amplifier or to exchange the sensor.

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www.burster.com
info@burster.com

Technical Data

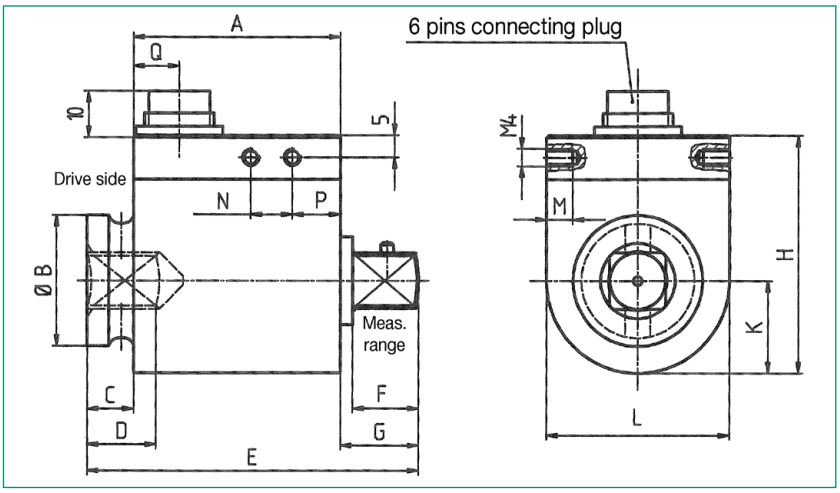
Model 86403

Toque sensor, rotating, standard square ends according to DIN 3121

Order Code	Measurement Range	Sensitivity [mV/V]	Square Ends	Spring Constant [Nm/rad]	Max. Lateral Force [N]	Torque of Inertia Drive End J in [kg m²]	Mass [kg]	Dimensions [mm] A	B	C	D	E	F	G	H	L	K	M	N	P	Q
86403-5001	0 ... ± 1 Nm	0.5	1/4"	$1.9 \cdot 10^2$	4	$2.9 \cdot 10^{-7}$	0.14	45.5	13	8.6	8	64	7.2	9.9	39	24	12	5	9	8.6	12.2
86403-5002	0 ... ± 2 Nm	0.5	1/4"	$4.3 \cdot 10^2$	5	$2.9 \cdot 10^{-7}$	0.14	45.5	13	8.6	8	64	7.2	9.9	39	24	12	5	9	8.6	12.2
86403-5005	0 ... ± 5 Nm	2	1/4"	$2.7 \cdot 10^2$	7	$2.9 \cdot 10^{-7}$	0.14	45.5	13	8.6	8	64	7.2	9.9	39	24	12	5	9	8.6	12.2
86403-5012	0 ... ± 12 Nm	2	1/4"	$6.6 \cdot 10^2$	7.5	$3.0 \cdot 10^{-7}$	0.14	45.5	13	8.6	8	64	7.2	9.9	39	24	12	5	9	8.6	12.2
86403-5025	0 ... ± 25 Nm	2	3/8"	$2.3 \cdot 10^3$	12	$1.2 \cdot 10^{-5}$	0.32	47.5	22	10.1	12.2	71	10.4	13.5	54	42	21	6	9.5	11	10.5
86403-5063	0 ... ± 63 Nm	2	3/8"	$5.7 \cdot 10^3$	28	$1.2 \cdot 10^{-5}$	0.32	47.5	22	10.1	12.2	71	10.4	13.5	54	42	21	6	9.5	11	10.5
86403-5160	0 ... ± 160 Nm	2	1/2"	$1.4 \cdot 10^4$	65	$1.7 \cdot 10^{-5}$	0.35	47.5	29.7	10.7	15.9	76	15.1	17.9	54	42	21	6	9.5	11	10.5
86403-5500	0 ... ± 500 Nm	2	3/4"	$5.9 \cdot 10^4$	200	$1.1 \cdot 10^{-4}$	0.80	55	44	19.1	24.9	100	22.6	25.9	68	60	30	-	-	-	10.5
86403-6001	0 ... ± 1000 Nm	2	1"	$1.1 \cdot 10^5$	240	$2.6 \cdot 10^{-4}$	1.40	55	54	33.1	29.6	132	27.4	43.9	68	60	30	-	-	-	10.5

Higher ranges on request

Dimensional drawing
Model 86403

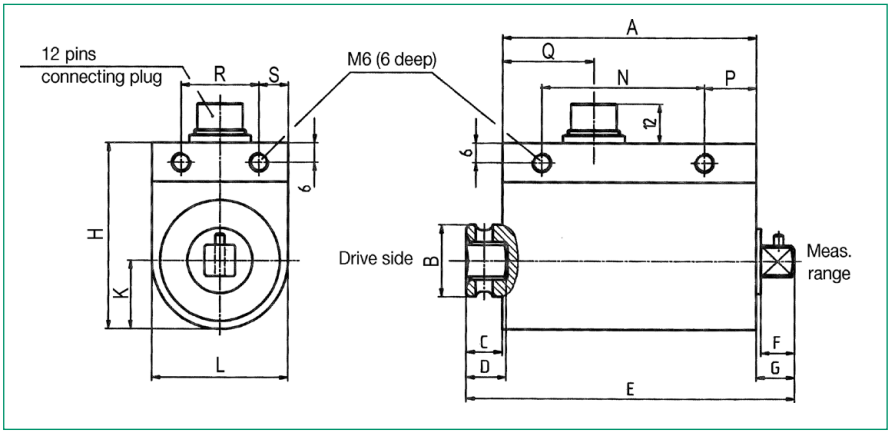


Model 86403-...-V501

Torque sensor, rotating, standard square ends, with angle measurement

Order Code	Measurement Range	Sensitivity [mV/V]	Square Ends	Spring Constant [Nm/rad]	Max. Lateral Force [N]	Torque of Inertia Drive End J in [kg m²]	Mass [kg]	Dimensions [mm] A	B	C	D	E	F	G	H	L	K	M	N	P	Q	R	S
86403-5001-V501	0... ± 1 Nm	0.5	1/4"	$1.4 \cdot 10^2$	4	$3.2 \cdot 10^{-6}$	0.5	65	13	9	8	84	7.2	10	48.5	34	17	4	9	10.5	30.5	10	12
86403-5002-V501	0... ± 2 Nm	0.5	1/4"	$4.5 \cdot 10^2$	5	$3.3 \cdot 10^{-6}$	0.5	65	13	9	8	84	7.2	10	48.5	34	17	4	9	10.5	30.5	10	12
86403-5005-V501	0... ± 5 Nm	2	1/4"	$3.0 \cdot 10^2$	7	$3.3 \cdot 10^{-6}$	0.5	65	13	9	8	84	7.2	10	48.5	34	17	4	9	10.5	30.5	10	12
86403-5012-V501	0... ± 12 Nm	2	1/4"	$6.7 \cdot 10^2$	7.5	$3.3 \cdot 10^{-6}$	0.5	65	13	9	8	84	7.2	10	48.5	34	17	4	9	10.5	30.5	10	12
86403-5025-V501	0... ± 25 Nm	2	3/8"	$2.4 \cdot 10^3$	12	$1.2 \cdot 10^{-5}$	0.5	78	22	11	12.2	100.8	10.4	11.8	57	42	21	6	50	16	28	24	9
86403-5063-V501	0... ± 63 Nm	2	3/8"	$6.8 \cdot 10^3$	28	$1.2 \cdot 10^{-5}$	0.5	78	22	11	12.2	100.8	10.4	11.8	57	42	21	6	50	16	28	24	9
86403-5160-V501	0... ± 160 Nm	2	1/2"	$1.2 \cdot 10^4$	65	$1.7 \cdot 10^{-5}$	0.6	78	29.8	12	16.9	106	15.1	16	57	42	21	6	50	16	28	24	9
86403-5500-V501	0... ± 500 Nm	2	3/4"	$3.9 \cdot 10^4$	200	$9.2 \cdot 10^{-5}$	1.3	92	44	18	24.9	135	22.6	25	70	56	28	10	66	13	43	24	16
86403-6001-V501	0... ± 1000 Nm	2	1"	$8.9 \cdot 10^4$	240	$3.6 \cdot 10^{-4}$	1.5	92	54	53.1	29.9	177	27.3	31.9	70	56	28	10	66	13	43	24	16

Dimensional drawing
Model 86403-...V501



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2399-086403EN-5672-081524

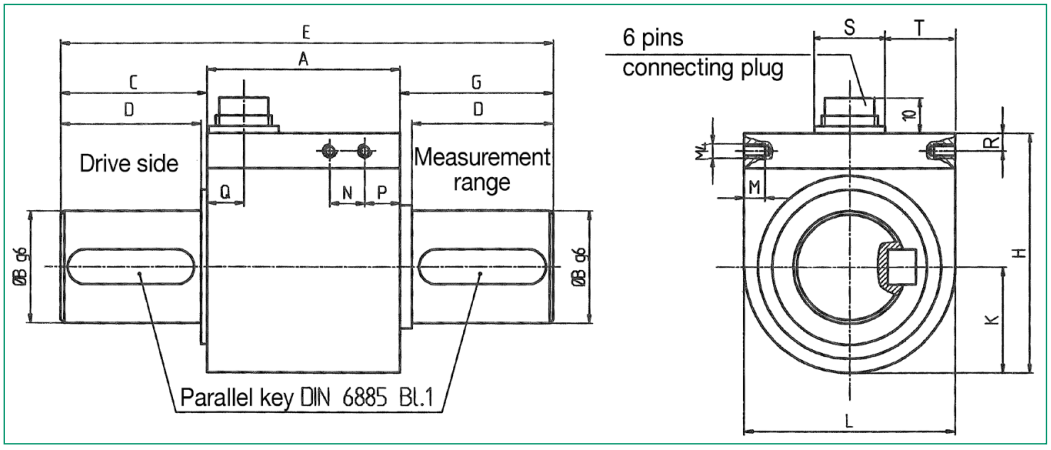
Technical Data

Model 86413

Torque sensor, rotating, round shaft ends with parallel key

Order Code	Measurement Range	Sensitivity [mV/V]	Spring Constant [Nm/rad]	Max. Lateral Force [N]	Torque of Inertia Drive End J in [kg m²]	Mass [kg]	Dimensions [mm] A	B	C	D	E	G	H	L	K	M	N	P	Q	R
86413-5001	0 ... ± 1 Nm	0.5	$1.9 \cdot 10^2$	4	$1.34 \cdot 10^{-6}$	0.16	45.5	8	19.7	18	85	19.7	39	24	12	5	9	27.9	33.3	5
86413-5002	0 ... ± 2 Nm	0.5	$1.9 \cdot 10^2$	5	$1.34 \cdot 10^{-6}$	0.16	45.5	8	19.7	18	85	19.7	39	24	12	5	9	27.9	33.3	5
86413-5005	0 ... ± 5 Nm	2	$2.43 \cdot 10^2$	7	$1.34 \cdot 10^{-6}$	0.16	45.5	8	19.7	18	85	19.7	39	24	12	5	9	27.9	33.3	5
86413-5010	0 ... ± 10 Nm	2	$4.56 \cdot 10^2$	7.5	$1.35 \cdot 10^{-6}$	0.16	45.5	8	19.7	18	85	19.7	39	24	12	5	9	27.9	33.3	5
86413-5020	0 ... ± 20 Nm	2	$1.77 \cdot 10^3$	12	$1.16 \cdot 10^{-5}$	0.35	47.5	15	21.1	20	90	21.5	54	42	21	6	9.5	11	10.5	5
86413-5050	0 ... ± 50 Nm	2	$4.82 \cdot 10^3$	28	$1.17 \cdot 10^{-5}$	0.38	47.5	15	21.1	20	90	21.5	54	42	21	6	9.5	11	10.5	5
86413-5100	0 ... ± 100 Nm	2	$9.85 \cdot 10^3$	65	$1.25 \cdot 10^{-5}$	0.42	47.5	18	24	22	95	23.6	54	42	21	6	9.5	11	10.5	5
86413-5200	0 ... ± 200 Nm	2	$2.80 \cdot 10^4$	80	$9.15 \cdot 10^{-5}$	0.90	55	32	41.6	40	140	43.4	68	60	30	-	-	-	10.5	5
86413-5500	0 ... ± 500 Nm	2	$6.33 \cdot 10^4$	200	$9.42 \cdot 10^{-5}$	0.90	55	32	41.6	40	140	43.4	68	60	30	-	-	-	10.5	5

Dimensional drawing Models 86413 and 86413-...V501



Model 86413-...V501

Torque sensor, rotating, round shaft with keyways and internal angle measurement

Order Code	Measurement Range	Sensitivity [mV/V]	Spring Constant [Nm/rad]	Max. Lateral Force [N]	Torque of Inertia Drive End J in [kg m²]	Mass [kg]	Dimensions [mm] A	B	C/G	D	E	H	L	K	M	N	P	Q	R	S	T
86413-5001-V501	0 ... ± 1 Nm	0.5	$2.3 \cdot 10^2$	4	$3.3 \cdot 10^{-6}$	0.5	65	10	17.5	15.5	100	48.5	34	17	4	9	10.5	30.5	6.5	20	7
86413-5002-V501	0 ... ± 2 Nm	0.5	$2.3 \cdot 10^2$	5	$3.3 \cdot 10^{-6}$	0.5	65	10	17.5	15.5	100	48.5	34	17	4	9	10.5	30.5	6.5	20	7
86413-5005-V501	0 ... ± 5 Nm	2	$2.9 \cdot 10^2$	7	$3.3 \cdot 10^{-6}$	0.5	65	10	17.5	15.5	100	48.5	34	17	4	9	10.5	30.5	6.5	20	7
86413-5010-V501	0 ... ± 10 Nm	2	$5.6 \cdot 10^2$	7.5	$1.1 \cdot 10^{-5}$	0.5	65	10	17.5	15.5	100	48.5	34	17	4	9	10.5	30.5	6.5	20	7
86413-5020-V501	0 ... ± 20 Nm	2	$1.6 \cdot 10^3$	12	$1.1 \cdot 10^{-5}$	0.6	78	15	21	20	120	57	42	21	6	50	16	28	6	20	11
86413-5050-V501	0 ... ± 50 Nm	2	$4.1 \cdot 10^3$	28	$1.1 \cdot 10^{-5}$	0.6	78	15	21	20	120	57	42	21	6	50	16	28	6	20	11
86413-5100-V501	0 ... ± 100 Nm	2	$7.9 \cdot 10^3$	65	$1.3 \cdot 10^{-5}$	0.6	78	18	25	24	128	57	42	21	6	50	16	28	6	20	11
86413-5200-V501	0 ... ± 200 Nm	2	$2.8 \cdot 10^4$	80	$1.0 \cdot 10^{-4}$	1.3	92	32	44	40	180	70	56	28	10	66	13	43	6	20	18
86413-5500-V501	0 ... ± 500 Nm	2	$5.3 \cdot 10^4$	200	$1.0 \cdot 10^{-4}$	1.3	92	32	44	40	180	70	56	28	10	66	13	43	6	20	18

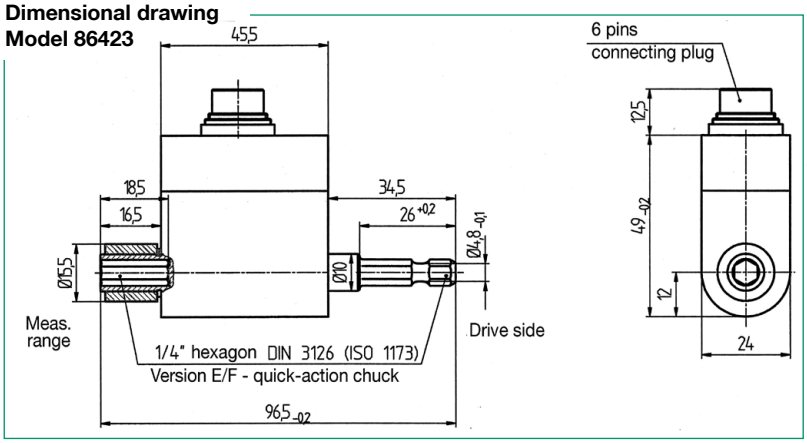
Model 86423

Torque sensor, rotating, standard hexagonal shaft ends 1/4" DIN 3126 Form E/F

Order Code	Measurement Range	Sensitivity [mV/V]	Mass [kg]
86423-5001	0 ... ± 1 Nm	0.5	0.2
86423-5002	0 ... ± 2 Nm	1	0.2
86423-5005	0 ... ± 5 Nm	1	0.2
86423-5010	0 ... ± 10 Nm	2	0.2
86423-5020	0 ... ± 20 Nm	2	0.2

The CAD drawing (3D/2D) for this sensor can be imported online directly into your CAD system.
Download via www.burster.com or directly at www.traceparts.com. For further information about the burster traceparts cooperation refer to data sheet 80-CAD-EN.

Dimensional drawing Model 86423



- Drive end --- hexagon head
- Measurement side --- hexagon socket
- Quick-action chuck

Note: The max. allowed static lateral force is smaller than 10 % of the lower value of the measurement range.

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General Technical Data for all Sensors

Electrical values

Torque sensor

Bridge resistance (full bridge): 350 Ω

Excitation voltage: 2 ... 12 V DC

Characteristic: standardized 0.5 mV/V, 1mV/V or 2 mV/V (refer to tables)

Tolerance of characteristic: ± 0.1 %

Test (option):
If the full bridge is connected to the positive strain gauge excitation voltage, it generates an electrical signal equivalent to 100 % of the nominal signal.

Angle displacement sensor (refer to options)

Excitation voltage: 5 V DC

Angle displacement measurement: 360 pulses/rotation
2 TTL outputs with two encoders, angle displacement 90° for detection of direction.

Environmental conditions

Range of operation temperature: ±10 °C ... + 60 °C

Range of nominal temperature: ± 5 °C ... + 50 °C

Influence of temperature in range of nominal temperature:

to zero signal	±0.01 % F.S./K
to characteristic	±0.003 % F.S./K

Mechanical values

Measurement error, consisting of non-linearity and hysteresis: ≤ ± 0.1 % F.S.

Relative spread in unchanged mounting position: ≤ ± 0.05 % F.S.

Range of rotation:
an exceedance of the max. rotary speed, up to 1.5 x max. rotary speed, is possible only for short time

max. rotary speed for

ranges from von	≤0 ... 12 Nm		2000¹/min
ranges from	0 ... 25 Nm	to 0 ... 160 Nm	1500¹/min
ranges from	0 ... 500 Nm	to 0 ... 1000 Nm	1000¹/min
ranges from	0 ...2000 Nm	to 0... 5000 Nm	500¹/min

Max. operation torque: 120 % of nominal torque

Dynamic torques (peak-peak): max. 70 % of nominal torque

Limit torque (static): 130 % of nominal torque

Breakaway torque (static): 250 % of nominal torque

Angle displacement at nominal torque: < 0.5 °

Material: high strength heat-treated steel, similar to 1.2826 or 12738

Protection class: acc. to EN 60529 IP50

Dimensions: refer to table and dimensional drawing

Maintenance/cleaning (contact ring abrasion, recommended change of the brushes): after approx. 5 x 10^7 rotations

Mechanical connection:

model 86403	Internal and external square acc. to DIN 3121, used for connection to assembling tools for bolt and nuts.
model 86413	Version with keyways on both shaft ends (2 x 180 °) acc. to DIN 6885 page 1
model 86423	Hexagon head and socket 1/4", acc. to DIN 3126 (ISO 1173) version E/F quick-action chuck

Electrical connection:

Sensors without measurement of angle displacement

6 pin plug-in connection Mating connector model 9953

Wiring:

1	excitation	negative	
2	excitation	positive	
3	shield (not connected in the sensor)		
4	output	positive	for clockwise torques
5	output signal	negative	for clockwise torques
6	100 % check		

Sensors with measurement of angle displacement

12 pin plug-in connection Mating connector model 9940

Wiring:

A	excitation	negative for torque	(0 V DC)
B	excitation	positive for torque	(2 ... 12 V DC)
C	output signal	positive for clockwise torque	
D	output signal	negative for clockwise torque	
E	excitation	negative for angle displ.	(0 V DC)
F	excitation	positive for angle displ.	(+ 5 V DC)
G	angle output 1	(TTL pulses)	
H	angle output 2	(TTL pulses)	
J	angle output		(0 V DC)
K	check, shunt calibration (option)		
L	NC		
M	shield		

Order Information

1. Torque sensor, rotating, square end
   measurement range 0 ... 1 Nm **Model 86403-5001**
2. Torque sensor, rotating, square end, with meas. of angle displ.
   measurement range 0 ... 63 Nm **Model 86403-5063-V501**

Accessories

for sensors without measurement of angle displacement

Mating connector 6 pin, in scope of delivery **Model 9953**

Mating connector 6 pin, 90° outlet **Model 9900-V589**

Connection cable, one end open, length 3 m **Model 99553-000A-0110030**

Connection cable to burster desktop devices with 12 pin panel jack, length 3 m **Model 99141-553A-0150030**

Connection cable to 9235 and 9310 length 3 m **Model 99209-553A-0110030**

Cable adapter to 9163-V3XXXX length 0.2 m **Model 99209-609A-0090002**

for sensors with measurement of angle displacement

Mating connector 12 pin, in scope of delivery **Model 9940**

Mating connector 12 pin, 90° outlet **Model 9900-V539**

Connection cable, one end open, length 3 m **Model 99540-000K-0270030**

Connection cable to model 9307, length 3 m **Model 99163-540C-0270030**

Strain gauge simulator **Model 9405**
The sensor will be replaced by the strain gauge simulator for checking amplifiers or indicators.

Supply units, amplifiers and process control units like modular amplifiers models 9243, 9206, 9163 or 9307
refer to section 9 of the catalog.

Options

Higher measurement ranges on request.

Manufacturers Calibration Certificate (WKS)

Calibration of a torque sensor with or without amplifier / indicator (measurement chain) in clockwise or / and counter clockwise direction in increments of 20 % of the measurement range.

Mounting Instructions

The sensors, particularly those with small measuring ranges, must be mounted carefully. It is important that the drive and measuring ends are not reversed during assembly. The slip-ring rotation transmitter is located on the drive side. If fitted incorrectly (measuring side and drive side swapped), its friction, which is unavoidable, will be included in the measurement.
The correct position of the measuring side is indicated on the corresponding dimensional drawing. The measuring shaft should always be cleaned prior to assembly and should be supported during fitting, to ensure that no foreign objects are sticking to it. It is recommended that the sensor is electrically connected and that the output signal is watched at the time of fitting. Vibrations originating in the equipment should be kept away from the sensor. The sensor should only be mounted on the coupling after the parts have been accurately aligned. This should be done without free play or lateral forces. It is recommended that the cable connection points upwards, so that abrasion dust cannot fall onto the brush connections.

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info@burster.com

2399-086403EN-5672-081524

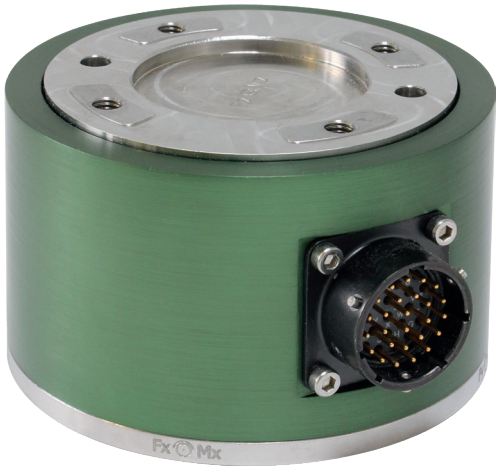
Warranty: 24 months

Load Cell and Torque Sensor – X/Y/Z

Configurable up to 3x force / 3x torque

MODEL 8565 NEW

Preliminary data sheet

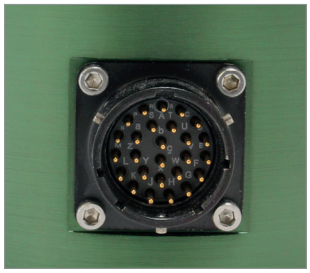


Highlights

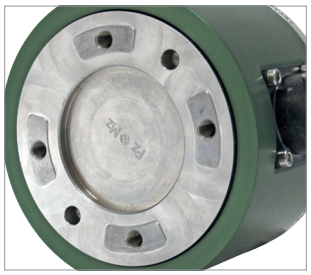
- 6-axis sensor
- Measuring range Fx: 1 kN / Fy: 1 kN / Fz: 2 kN
  Mx: 50 Nm / My: 50 Nm / Mz: 50 Nm
- Other measuring ranges available on request
- Non-linearity < 0.1 % F.S.
- Excellent price/performance ratio
- Customer-specific axis configuration

Applications

- Robot-assisted applications
- Pick & place
- Tactile sensing in manufacturing
- Collision detection
- Force-controlled machining



Strain gage output



Robot flange in accordance with DIN ISO 9049-1

Direction of action

Product description

In robotics and automation engineering, the requirements for precise, tactile handling are constantly increasing. The robust 8565 multi-axis sensor with its low crosstalk enables you to monitor and evaluate your process at any time, regardless of the sensor's orientation.

With just one sensor, you can obtain accurate three-dimensional load information. Its six independent outputs let you selectively evaluate the direction of action of the loads (axial force [Fz] / lateral forces [Fx/Fy] / torque [Mz] / bending moment [Mx/My]).

Thanks to its compact design and adaptation via the standardized robot flange in accordance with DIN ISO 9049-1, the sensor can be integrated into many applications quickly and easily.

When the slightest deviations are detected in your fast-moving and complex production processes, you can intervene immediately to make adjustments. This helps to prevent faulty parts and reduce manufacturing costs.

Technical data

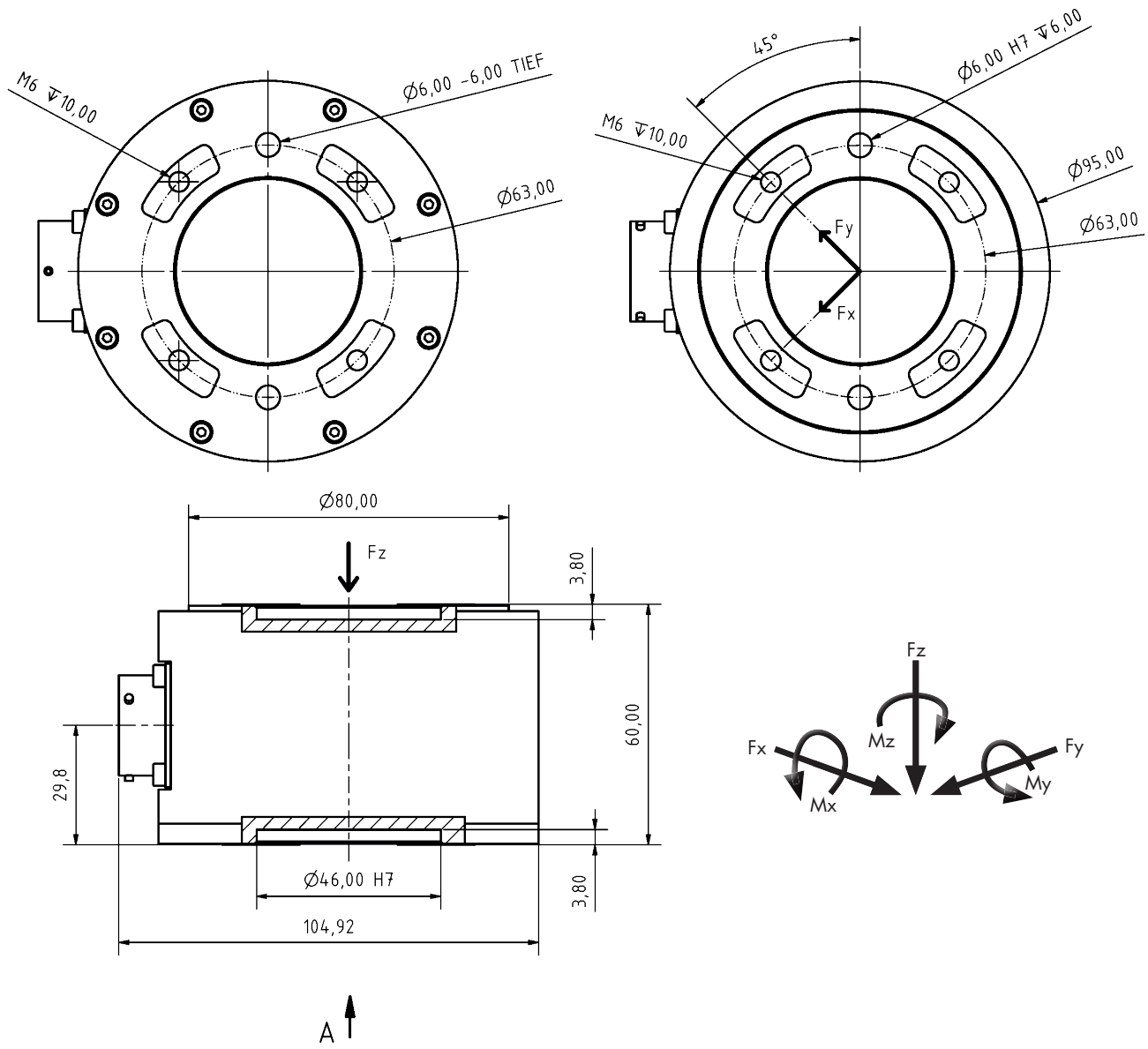
8565	–	60025050
Measuring range Fx calibrated in N from 0 ...		Fx = 0 ... ±1 kN (0 ... ±224.8 lbs)
Measuring range Fy calibrated in N from 0 ...		Fy = 0 ... ±1 kN (0 ... ±224.8 lbs)
Measuring range Fz calibrated in N from 0 ...		Fz = 0 ... ±2 kN (0 ... ±449.6 lbs)
Measuring range Mx calibrated in Nm from 0 ...		Mx = 0 ... ±50 Nm (0 ... ±442.51 lbs in)
Measuring range My calibrated in Nm from 0 ...		My = 0 ... ±50 Nm (0 ... ±442.51 lbs in)
Measuring range Mz calibrated in Nm from 0 ...		Mz = 0 ... ±50 Nm (0 ... ±442.51 lbs in)
Accuracy		
Relative non-linearity *		< ±0.1 % F.S.
Relative hysteresis		0.2 % F.S.
Characteristic curve deviation*		< ±0.15 % F.S.
Crosstalk		< 5 % from Fz to other axes (other crosstalk significantly less)
Temperature effect on zero output		≤ ±0.02 % F.S./K
Temperature effect on nominal sensitivity		≤ ±0.02 % F.S./K
Electrical values		
Sensitivity (nominal) Fx:		1.2 mV/V
Sensitivity (nominal) Fy:		1.2 mV/V
Sensitivity (nominal) Fz:		0.4 mV/V
Sensitivity (nominal) Mx:		1 mV/V
Sensitivity (nominal) My:		1 mV/V
Sensitivity (nominal) Mz:		0.9 mV/V
Measurement direction		Positive output signal for compressive load / torque in the direction of the marked X, Y or Z axis
Bridge resistance		350 Ω / 700 Ω nominal (deviations are possible)
Excitation voltage		5 V DC (max. 10 V DC)
Environmental conditions		
Nominal temperature range		+15 °C ... +70 °C
Operating temperature range		-10 °C ... +80 °C
Mechanical values		
Deflection full scale		Fx and Fy < 0.04 mm / Fz < 0.015 mm
Max. operational force (Dynamic load limit 250)		$Lmax = 100 * \frac{\sqrt{Fx^2+Fy^2}}{Fx\ nom.} + 50 * \frac{\lvert Fz\rvert}{Fz\ nom.} + 70 * \frac{\sqrt{Mx^2+My^2}}{Mx\ nom.} + 100 * \frac{\lvert Mz\rvert}{Mz\ nom.} \leq 250$ Please note: The sensor's coordinate origin is in the geometric center of the sensor. When calculating the maximum operational force, the additional bending moments due to leverage effects must be taken into account for the acting lateral forces. Example: Force-controlled grinding process with simultaneous dynamic loads of up to: Fx = 500 N / Fy = 500 N / Fz = 1.5 kN / Mx = 20 N / My = 20 N / Mz = 40 N $\mathbf{Lmax = 100 * \frac{\sqrt{500N^2 + 500N^2}}{1000N} + 50 * \frac{1500N}{2000N} + 70 * \frac{\sqrt{20Nm^2 + 20Nm^2}}{50Nm} + 100 * \frac{40Nm}{50Nm}} = 227.80$
Dynamic performance		recommended: 50 %
Material		high-strength aluminum
Protection class (EN 60529)		IP40
Other		
Natural frequency		> 1800 Hz
Mass	[g]	800

* The data in the area 20 % - 100 %

4368-008565EN-5699-031526

Geometry		
		see dimensional drawing
Installation		
Intended mounting screws		4 x M6
Tightening torque mounting screws		10 Nm
Mounting screws		strength 8.8 or higher
Weight		800 g

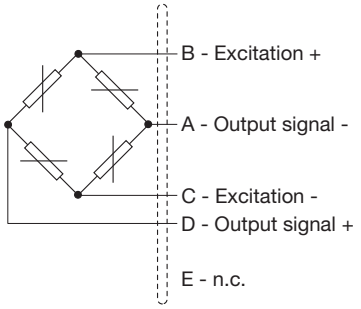
Dimensional drawing



Electrical termination

Output signal

burster load cells are based on a strain-gage Wheatstone bridge. This measurement principle means that the output voltage mV/V is highly dependent on the sensor supply voltage. Our website contains details of suitable instrumentation amplifiers, indicator and display devices and process instruments.



Connector pin assignment				
Measurement channel		**Assignment**		**Pin**
Fx		Us+	Excitation (+)	A
		Us-	Excitation (-)	B
		Um+	Measurement signal (+)	C
		Um-	Measurement signal (-)	D
Fy		Us+	Excitation (+)	E
		Us-	Excitation (-)	F
		Um+	Measurement signal (+)	G
		Um-	Measurement signal (-)	H
Fz		Us+	Excitation (+)	J
		Us-	Excitation (-)	K
		Um+	Measurement signal (+)	L
		Um-	Measurement signal (-)	M
Mx		Us+	Excitation (+)	N
		Us-	Excitation (-)	P
		Um+	Measurement signal (+)	R
		Um-	Measurement signal (-)	S
My		Us+	Excitation (+)	T
		Us-	Excitation (-)	U
		Um+	Measurement signal (+)	V
		Um-	Measurement signal (-)	W
Mz		Us+	Excitation (+)	X
		Us-	Excitation (-)	Y
		Um+	Measurement signal (+)	Z
		Um-	Measurement signal (-)	a
		N.C.		b
		N.C.		c

Electrical connection		
9900-V724		Souriau 26-pin connector, series 851 cable installation

Accessories

Connector, cables and devices

Order code		
Connector		
9900-V724		Connector socket 26 pin (included with device)
Cables		
99724-000A-0090030		Connecting cable, 3m, 3x strain gage (Fx/Fy/Fz)
99724-000B-0090030		Connecting cable, 3m, 3x strain gage (Mx/My/Mz)
99724-000F-0090030		Connecting cable, 3m, 6x strain gage
99209-724A-0090030		Connecting cable to USB interface 9206-V3xxxx, 3x force, length 3 m, suitable for drag chains
99209-724B-0090030		Connecting cable to USB interface 9206-V3xxxx, 3x torque, length 3 m, suitable for drag chains
99209-724F-0090030		Connecting cable to USB interface 9206-V3xxxx, 3x force / 3x torque, length 3 m, suitable for drag chains
Devices		
9250-VXXXXXX		Universal instrumentation amplifier
9251-VXXXX		Fieldbus controller for the 9250 instrumentation amplifier series
9236-V...		In-line instrumentation amplifier for strain gage sensors
9206-V...		USB sensor interface for strain gage sensors

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Order Code

Measuring range	Code								Measuring range
	Fz				Mz				
Fz = 0 ... ±2 kN Fy = 0 ... ±1 kN Fx = 0 ... ±1 kN Mz = 0 ... ±50 Nm My = 0 ... ±50 Nm Mx = 0 ... ±50 Nm	6	0	0	2	5	0	5	0	Fz = 0 ... ±449.6 lbs Fy = 0 ... ±224.8 lbs Fx = 0 ... ±224.8 lbs Mz = 0 ... ±442.5 lbs in My = 0 ... ±442.5 lbs in Mx = 0 ... ±442.5 lbs in

8	5	6	5	–									–			0	0

■ Force: ~~Fz~~ / ~~Fy~~ / ~~Fx~~	0
■ Force: ~~Fz~~ / ~~Fy~~ / **Fx**	1
■ Force: ~~Fz~~ / **Fy** / ~~Fx~~	2
■ Force: ~~Fz~~ / **Fy** / **Fx**	3
■ Force: **Fz** / ~~Fy~~ / ~~Fx~~	4
■ Force: **Fz** / ~~Fy~~ / **Fx**	5
■ Force: **Fz** / **Fy** / ~~Fx~~	6
■ Force: **Fz** / **Fy** / **Fx**	7

■ Torque: ~~Mz~~ / ~~My~~ / ~~Mx~~	0
■ Torque: ~~Mz~~ / ~~My~~ / **Mx**	1
■ Torque: ~~Mz~~ / **My** / ~~Mx~~	2
■ Torque: ~~Mz~~ / **My** / **Mx**	3
■ Torque: **Mz** / ~~My~~ / ~~Mx~~	4
■ Torque: **Mz** / ~~My~~ / **Mx**	5
■ Torque: **Mz** / **My** / ~~Mx~~	6
■ Torque: **Mz** / **My** / **Mx**	7

Example order

Ordering example			
1x		Sensor with application 3x force / 3x torque	Type 8565-6002-5050-7700
1x		Connecting cable, open cable end, length 3 m, suitable for drag chains	Type 99209-724F-0090030
6x		Single-channel in-line instrumentation amplifier for strain gage sensors	Type 9236-V000
6x		Calibrate a measuring chain	92ABG

Note

■ **Brochure**
Our brochure **"Load cells – for production automation, R&D and quality assurance"** is available for download on our website or can be requested. It contains numerous applications, detailed product specifications and overviews.

■ **Product videos**
You can find our **installation videos** at: **www.youtube.com/bursterVideo**

■ **CAD data**
Download via **www.burster.de** or directly from **www.traceparts.de**

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As manufacturers of complete measurement solutions and sensor signal processing systems, we aim to offer a comprehensive service to our customers.

Our services. Your advantage. From the start. At every stage.

Our services for you:

Accredited calibration

DAkkS ISO 17025 accredited laboratory for maximum reliability, accuracy, smallest measurement uncertainties and international recognition. Important component of test equipment management under IATF 16949.

FACTORY CALIBRATION CERTIFICATE (WKS)

Compliance with requirements of the automotive, medical technology and aerospace industries for monitoring test and measurement equipment.

TEST AND CALIBRATION CERTIFICATE

For cost-effective, fast and traceable calibration.

SENSOR-AMPLIFIER CALIBRATION

Configuration of measurement systems.

THINK GLOBAL – ACT LOCAL

Service competence at your site, supported by experts at burster HQ.

PHONE SERVICE / VIDEO CALL

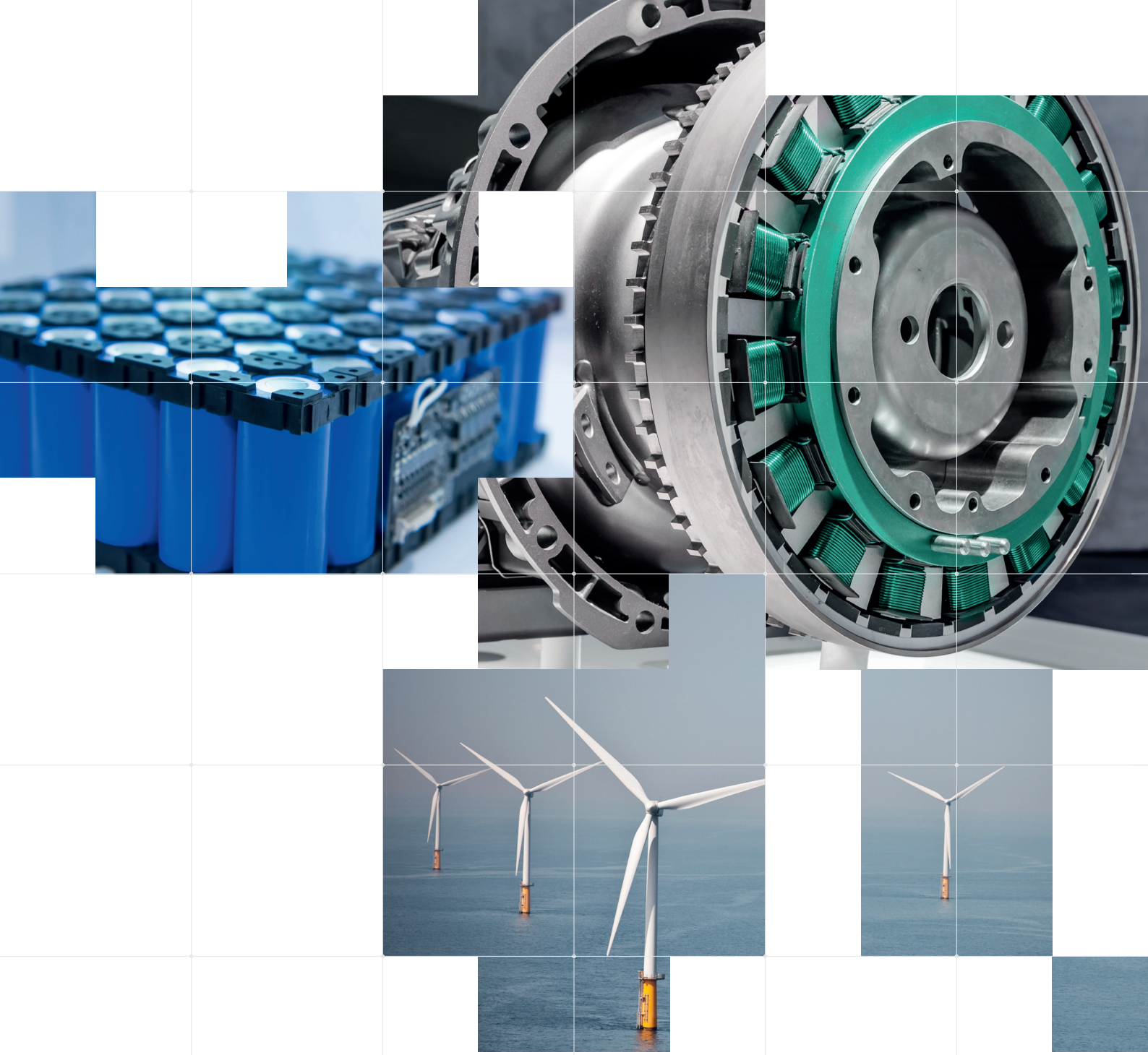
Our service team is always happy to help you.

DOWNLOAD SERVICE

All documents available online 24/7.

VIDEO TUTORIALS

You can find lots of helpful tutorials on our YouTube channel.



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