











## Catalog of CLA force and torque sensors

SC-002	Micro-force sensor
LC-01 – LC-10	Force sensor
TSF-000 – TSF-05	Micro-torque sensor
TSF-1 – TSF-100	Torque sensor



Denomination	Force sensor SC-002	Force sensor LC-01	Force sensor LC-1	Force sensor LC-5	Force sensor LC-10
Figure					
Measuring range	0 ... ± 20 mN	0 ... ± 0.1 N	0 ... ± 1 N	0 ... ± 5 N	0 ... ± 10 N
Max. linearity error	≤ 1 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.
Max. hysteresis error	≤ 1 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.
Main application	Micro-force sensor, very sensitive with high reactivity. Particularly used in microtechnology and watch industries.	Fine force sensor, sensitive, with high repeatability and strong conception. Without leverage effect on tip which is interchangeable.	Fine force sensor, sensitive, with high repeatability and strong conception. Without leverage effect on tip which is interchangeable.	Sensitive force sensor with high repeatability and strong conception. Without leverage effect on tip which is interchangeable.	Sensitive force sensor with high repeatability and strong conception. Without leverage effect on tip which is interchangeable.
Special application	Measurement of material bending, transmission quality, static and dynamic micro-torque, fastening of micro-assembly, no-load losses, exhaust torque.	Measurement of friction, transmission quality, static and dynamic torque, no-load losses, striking torque, yield of mechanical movement.	Measurement of holding magnetic winding, friction, spring torque, barrel torque, yield and number of barrel turn, running-in, manual winding torque of mechanical movement.	Measurement of spring torque, barrel torque, yield and number of barrel turn, aging test, running-in, energy storage of mechanical movement.	Measurement of spring torque, barrel torque, yield and number of barrel turn, aging test, running-in, energy storage of mechanical movement.
Models	1320-50-001-0 / -1	1320-50-002-0	1320-50-003-0	1320-50-008-0	1320-50-004-0

Denomination	Torque sensor TSF-000	Torque sensor TSF-005	Torque sensor TSF-01	Torque sensor TSF-05	Torque sensor TSF-1
Figure					
Measuring range	0 ... ± 100 µN.m	0 ... ± 500 µN.m	0 ... ± 1 mN.m	0 ... ± 5 mN.m	0 ... ± 10 mN.m
Max. linearity error	≤ 1 % F. S.	≤ 1 % F. S.	≤ 1 % F. S.	≤ 1 % F. S.	≤ 1 % F. S.
Max. hysteresis error	≤ 0.5 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.
Main application	Micro-torque sensor, very sensitive with high repeatability. Used in microtechnology and watch industries.	Micro-torque sensor, very sensitive with high repeatability. Used in microtechnology and watch industries.	Fine torque sensor, very sensitive with high repeatability. Used in microtechnology and watch industries.	Fine torque sensor, very sensitive with high repeatability. Used in microtechnology and watch industries.	Torque sensor, highly sensitive with great repeatability. Used in microtechnology and watch industries.
Special application	Measurement of transmission quality in mechanical movement, static torque, no-load losses.	Measurement of transmission quality in mechanical movement, static torque, no-load losses.	Measurement of friction, transmission quality in mechanical movement, yield of transmission, fastening of micro-assembly.	Measurement of friction, transmission quality in mechanical movement, yield of transmission, fastening of micro-assembly.	Measurement of friction, rod torque, manual winding torque of mechanical movement, energy storage of mechanical movement.
Models	1320-51-001-0	1320-51-002-0	1320-51-003-0	1320-51-004-0	1320-51-005-0

Denomination	Torque sensor TSF-2	Torque sensor TSF-5	Torque sensor TSF-10	Torque sensor TSF-30	Torque sensor TSF-100
Figure					
Measuring range	0 ... ± 20 mN.m	0 ... ± 50 mN.m	0 ... ± 0.1 N.m	0 ... ± 0.3 N.m	0 ... ± 1 N.m
Max. linearity error	≤ 1 % F. S.	≤ 1 % F. S.	≤ 1 % F. S.	≤ 1 % F. S.	≤ 1 % F. S.
Max. hysteresis error	≤ 0.5 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.	≤ 0.5 % F. S.
Main application	Torque sensor, highly sensitive with great repeatability. Used in microtechnology and watch industries.	Torque sensor, highly sensitive with great repeatability. Used in microtechnology and watch industries.	High torque sensor, highly sensitive and repeatable. Used in microtechnology and engineering industries.	High torque sensor, highly sensitive and repeatable. Used in microtechnology and engineering industries.	High torque sensor, highly sensitive and repeatable. Used in microtechnology and engineering industries.
Special application	Measurement of friction, rod torque, energy storage and manual winding torque of mechanical movement, running-in.	Measurement of friction, rod torque, energy storage and manual winding torque of mechanical movement, running-in.	Measurement of friction, barrel torque, weld control, fastening.	Measurement of friction, weld control, fastening of propeller, piping valve control.	Measurement of friction, weld control, fastening of propeller, piping valve control.
Models	1320-51-006-0	1320-51-011-0	1320-51-007-0	1320-51-008-0	1320-51-009-0

## Force sensor SC-002

SC-002 ± 20 mN



Delivery : Ex stock / 4 weeks

Warranty : 12 months

Import CAD : [www.cla.ch](http://www.cla.ch)  
Products -> Sensors -> CAD-SC-002

- ▲ Micro-force
- ▲ Bidirectional
- ▲ High acquisition frequency
- ▲ High performance measuring material
- ▲ Resistant to overloads

### Description

The force sensor SC-002 is bidirectional and resistive type. The measuring system consists of a strain gauge in high-performance material. The measurement tip is constituted by a shaft diameter of 0.5mm with a locating notch for calibration and measurement. The sensor is designed so that its natural frequency is high.

### Applications

The SC-002 sensor is ideal for any type of fine measurement, and can be used to create a leverage effect and accurate torque measurements. It can also be used with a standard 5 VDC power supply and a multimeter.

Some examples :

- ▲ Measurement of material bending
- ▲ Measurement of static micro-torque
- ▲ Measurement of dynamic micro-torque
- ▲ Friction measurement
- ▲ Fastening of micro-assembly

**Technical Data**

Denomination	SC-002
Measuring range	± 20 mN
Maximal linearity error	≤ 1 % F. S.
Maximal hysteresis error	≤ 1 % F. S.
Theoretical resolution	< 5 µN
Nominal sensitivity	12 / 5 mV/V
Orientation	Bidirectional

**Electrical values**

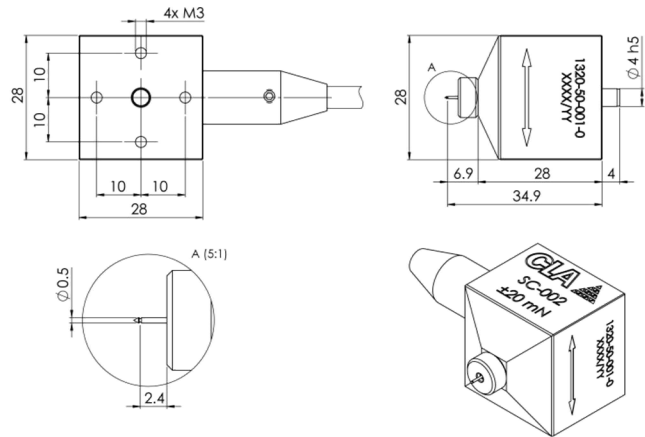
Bridge resistance	Half bridge / Full bridge
Recommended excitation	4 VDC
Maximal excitation	6 VDC
Resonance frequency	450 Hz
Resistance	2200 Ω

**Mechanical values**

Deflection	0.2mm / 20 mN
Overload	150 % F. S.
Breaking	2500 % F. S.
Recommended dynamic performance	80 % F. S.
Material	Aluminium
Connector	M5, 4 plug
Wiring code	1 Brown    Excitation voltage + 3 Blue      Excitation voltage – 4 Black      Signal output + 2 White     PE, Signal output -
Dimensions	28 x 28 x 35.5 mm
Weight	98 g
Protection	White POM plug

**Order number**

SC-002 Half bridge	± 20 mN	1320-50-001-0
SC-002 Full bridge	± 20 mN	1320-50-001-1



**Accessories**

**Calibration certificate** – Provided for each sensor, advised a calibration validation every 12 months.  
Order number : 1320-96-010-0

**VARIOcouple** - Precision laboratory device with mastered rotation axis.  
Order number : 1320-00-001-0

**NEOvario** - Precision laboratory device with mastered rotation axis.  
Order number : 1325-00-001-0

**DIGImes Universel** - Signal converter in 0 - ± 10 VDC type BNC or USB (RS optional), manual adjustment of gain and offset, 5-digits display. For inductive or resistive sensor, half bridge or full bridge.  
Order number : 1320-60-200-0

**Multifunction display** - Signal converter in 0 - ± 10 VDC, with manual adjustment of gain and offset, 5-digit display. For resistive sensor in half bridge.  
Order number : -

**Standard mounting plate** – Effective fixation.  
Order number : 1320-95-004-0

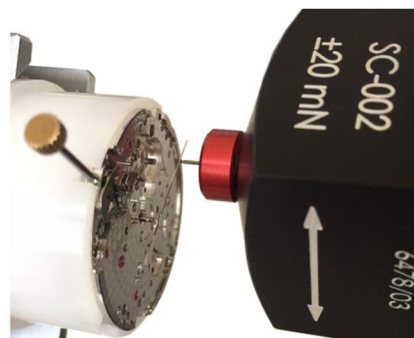
**Quick mounting plate** - Simplified fixation, without tools and pinned.  
Order number : 1320-95-007-0

**Cables** – Shielded, 4 x 0.14<sup>2</sup>, 2 m  
Straight connector    4 wires            9000-01-050-2  
Straight connector    MiniDin 4p            2320-50-010-0

**Application example in watch laboratory**

Winding the spring of a barrel through the hand.

The SC-002 sensor retains the hand while the movement is rotating. The sensor does a torque measurement with a lever arm.



## Force sensor LC-01, LC-1, LC-5, LC-10

LC-01	± 0.1 N
LC-1	± 1 N
LC-5	± 5 N
LC-10	± 10 N

Delivery : Ex stock / 4 weeks

Warranty : 12 months

Import CAD : [www.cla.ch](http://www.cla.ch)  
Products -> Sensors -> CAD-LC



- ▲ Interchangeable tip
- ▲ Bidirectional
- ▲ Fine measure, repeatable
- ▲ High performance measuring material
- ▲ Resistant to overloads

### Description

The range of LC sensors is bidirectional and inductive type. The measuring system consists of a movable core which is integral with the shaft, between two specific springs in high-performance material. The measurement tip is constituted by a shaft diameter of 1 mm and is interchangeable, allowing a personalised tip. The sensor does not vary its measurement according to the pressure zone on the measurement tip.

### Applications

The LC force sensor is ideal for any kind of force measurement, and can be used to create a leverage effect and accurate torque measurements.

Some examples :

- ▲ Friction measurement
- ▲ Energy storage (barrel)
- ▲ Yield of mechanical movement
- ▲ Striking torque
- ▲ Aging test

**Technical Data**

Denomination	LC-01 / LC-1 / LC-5 / LC-10
Measuring range	± 0.1 / ± 1 / ± 5 / ± 10 N
Maximal linearity error	≤ 0.5 % F. S.
Maximal hysteresis error	≤ 0.5 % F. S.
Theoretical resolution	< 10 / < 50 / < 80 / < 100 µN
Nominal sensitivity	12 / 20 / 10 / 10 mV/V
Orientation	Bidirectional

**Electrical values**

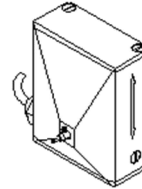
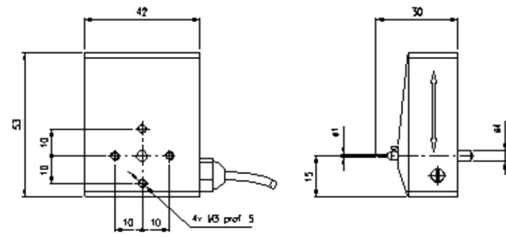
Bridge resistance	Half bridge
Recommended excitation	5 VDC
Maximal excitation	6 VDC
Resonance frequency	100 / 200 / 200 / 200 Hz
Resistance	45 Ω

**Mechanical values**

Deflection	0.17 mm - 0.1 N / 1 N / 5 N / 10 N
Overload	150 % F. S.
Breaking	300 % F. S.
Recommended dynamic performance	80 % F. S.
Material	Aluminium
Connector	M5, 4 plug
Wiring code	1 Brown    Excitation voltage + 3 Blue      Excitation voltage – 4 Black      Signal output + 2 White     PE, Signal output -
Dimensions	30 x 42 x 53 mm
Weight	163 g
Protection	Red aluminium plug

**Order numbers**

LC-01	± 0.1 N	1320-50-002-0
LC-1	± 1 N	1320-50-003-0
LC-5	± 5 N	1320-50-008-0
LC-10	± 10 N	1320-50-004-0



**Accessories**

**Calibration certificate** – Provided for each sensor, advised a calibration validation every 12 months.  
Order number : 1320-96-010-0

**Measurement tip** – Additional universal or personalised tip, adapted.  
Order number : 1320-50-115-x

**VARIOcouple** - Precision laboratory device with mastered rotation axis.  
Order number : 1320-00-001-0

**NEOvario** - Precision laboratory device with mastered rotation axis.  
Order number : 1325-00-001-0

**DIGimes Universel** - Signal converter in 0 - ± 10 VDC type BNC or USB (RS optional), manual adjustment of gain and offset, 5-digits display. For inductive or resistive sensor, half bridge or full bridge.  
Order number : 1320-60-200-0

**Standard mounting plate** – Effective fixation.  
Order number : 1320-95-004-0

**Quick mounting plate** - Simplified fixation, without tools and pinned.  
Order number : 1320-95-007-0

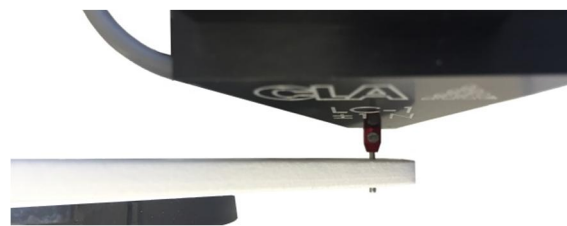
**Adapter cable** - MiniDin 4p - Tuchel Din 4p.  
Order number : 2320-60-021-0

**Cables** – Shielded, 4 x 0.14<sup>ø</sup>, 2 m  
Straight connector    4 wires                    9000-01-050-2  
Straight connector    MiniDin 4p                    2320-50-010-0

**Application example in industry**

Friction measurement on a rotative interrupter

The LC-1 sensor holds the base of the interrupter and the cursor is rotating. The sensor performs a torque measurement with a lever arm.



## Torque sensors TSF-000, TSF-005

TSF-000    ± 100 µN.m

TSF-005    ± 500 µN.m



Delivery :                      Ex stock / 4 weeks

Warranty :                      12 months

Import CAD :                 [www.cla.ch](http://www.cla.ch)  
Products -> Sensors -> CAD-TSF-00x

- ▲ Micro-torque measurement
- ▲ Universal measuring shaft
- ▲ Bidirectional
- ▲ High acquisition frequency
- ▲ Compact dimensions

### Description

The TSF-000 / TSF-005 torque sensor is bidirectional and inductive type with carrier frequency. The measuring system consist of a shaft mounted on flexible pivots which allowing a high-performance torque measurement without friction. A fine angular resolution of 1° full scale gives a high linearity and a practically negligible hysteresis. The 1 mm diameter measurement shaft permits to use personalised tools and adapter ring.

### Applications

The TSF-000 / TSF-005 torque sensor is ideal for any type of fine measurement. Its compact dimension and high resistance to chips make it a sensor easily integrable in an installation.

Some examples :

- ▲ Micro-torque measurement
- ▲ Friction measurement
- ▲ Fastening of micro-assembly
- ▲ Measurement of transmission quality
- ▲ No-load losses

**Technical Data**

Denomination	TSF-000 / TSF-005
Measuring range	$\pm 100 / \pm 500 \mu\text{N.m}$
Maximal linearity error	$\leq 1 \% \text{ F. S.}$
Maximal hysteresis error	$\leq 0.5 \% \text{ F. S.}$
Theoretical resolution	$< 0.1 / < 0.5 \mu\text{N.m}$
Nominal sensitivity	5 / 23 mV/V
Orientation	Bidirectional

**Electrical values**

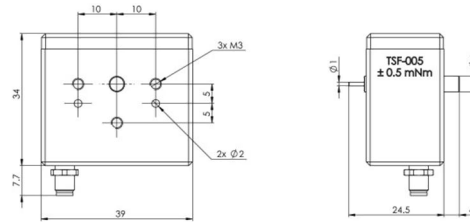
Bridge resistance	Full bridge
Recommended excitation	5 VDC
Maximal excitation	6 VDC
Resonance frequency	500 Hz
Resistance	80 $\Omega$

**Mechanical values**

Deflection	$< 5 \% \text{ F. S.}$
Overload	150 % F. S.
Breaking	300 % F. S.
Recommended dynamic performance	80 % F. S.
Material	Aluminium
Connector	M5, 4 plug
Wiring code	1 Brown    Excitation voltage + 3 Blue      Excitation voltage – 4 Black     Signal output + 2 White    Signal output – Shield      PE
Dimensions	$\varnothing 40 \times 32 \text{ mm}$
Weight	96 g

**Order numbers**

TSF-000	$\pm 100 \mu\text{N.m}$	1320-51-001-0
TSF-005	$\pm 500 \mu\text{N.m}$	1320-51-002-0



**Accessories**

**Calibration certificate** – Provided for each sensor, advised a calibration validation every 12 months.  
Order number : 1320-96-010-0

**VARIOcouple** - Precision laboratory device with mastered rotation axis.  
Order number : 1320-00-001-0

**NEOvario** - Precision laboratory device with mastered rotation axis.  
Order number : 1325-00-001-0

**DIGimes Universel** - Signal converter in 0 -  $\pm 10$  VDC type BNC or USB (RS optional), manual adjustment of gain and offset, 5-digits display. For inductive or resistive sensor, half bridge or full bridge.  
Order number : 1320-60-200-0

**Standard mounting plate** – Effective fixation.  
Order number : 1320-95-004-0

**Quick mounting plate** - Simplified fixation, without tools and pinned.  
Order number : 1320-95-007-0

**Adapter cable** - MiniDin 4p - Tuchel Din 4p.  
Order number : 2320-60-021-0

**Adapter ring** -  $\varnothing 1 - \varnothing 6$   
Order number : 1320-95-400-0

**Adjustable coupling key** – Allows quick coupling, using interchangeable plates.  
Order number : 1303-20-001-0

<b>Cables</b> – Shielded, 4 x 0.14 <sup>ø</sup> , 2 m		
Straight connector	4 wires	9000-01-050-2
Straight connector	MiniDin 4p	2320-50-010-0



## Torque sensor TSF-01, TSF-05, TSF-1

TSF-01	± 1 mN.m
TSF-05	± 5 mN.m
TSF-1	± 10 mN.m



Delivery :	Ex stock / 4 weeks
Warranty :	12 months
Import CAD :	<a href="http://www.cla.ch">www.cla.ch</a> Products -> Sensors -> CAD-TSF-0x

- ▲ Fine torque measurement
- ▲ Universal measuring shaft
- ▲ Bidirectional
- ▲ High acquisition frequency
- ▲ Compact dimensions

### Description

The TSF-01 / TSF-05 / TSF-1 torque sensor is bidirectional and inductive type with carrier frequency. The measuring system consist of a shaft mounted on flexible pivots which allowing a high-performance torque measurement without friction. A fine angular resolution of 1° full scale gives a high linearity and a practically negligible hysteresis. The 1.5 mm diameter measurement shaft permits to use personalised tools and adapter ring.

### Applications

The TSF-01 / TSF-05 / TSF-1 torque sensor is ideal for any type of fine measurement. Its compact dimension and high resistance to chips make it a sensor easily integrable in an installation.

Some examples :

- ▲ Friction measurement
- ▲ Yield of transmission
- ▲ Static torque measurement
- ▲ Fastening of micro-assembly
- ▲ Striking torque

**Technical Data**

Denomination	TSF-01 / TSF-05 / TSF-1
Measuring range	$\pm 1 / \pm 5 / \pm 10$ mN.m
Maximal linearity error	$\leq 1$ % F. S.
Maximal hysteresis error	$\leq 0.5$ % F. S.
Theoretical resolution	$< 1 / < 5 / < 10$ $\mu$ N.m
Nominal sensitivity	25 / 15 / 18 mV/V
Orientation	Bidirectional

**Electrical values**

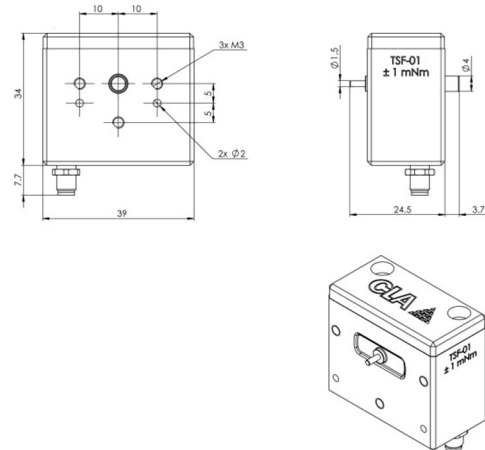
Bridge resistance	Full bridge
Recommended excitation	5 VDC
Maximal excitation	6 VDC
Resonance frequency	500 Hz
Resistance	80 $\Omega$

**Mechanical values**

Deflection	$< 5$ % F. S.
Overload	150 % F. S.
Breaking	300 % F. S.
Recommended dynamic performance	80 % F. S.
Material	Aluminium
Connector	M5, 4 plug
Wiring code	1 Brown    Excitation voltage + 3 Blue      Excitation voltage – 4 Black     Signal output + 2 White     Signal output – Shield      PE
Dimensions	$\varnothing 40 \times 34$ mm
Weight	98 g

**Order numbers**

TSF-01	$\pm 1$ mN.m	1320-51-003-0
TSF-05	$\pm 5$ mN.m	1320-51-004-0
TSF-1	$\pm 10$ mN.m	1320-51-005-0



**Accessories**

**Calibration certificate** – Provided for each sensor, advised a calibration validation every 12 months.  
Order number : 1320-96-010-0

**VARIOcouple** - Precision laboratory device with mastered rotation axis.  
Order number : 1320-00-001-0

**NEOvario** - Precision laboratory device with mastered rotation axis.  
Order number : 1325-00-001-0

**DIGimes Universel** - Signal converter in 0 -  $\pm 10$  VDC type BNC or USB (RS optional), manual adjustment of gain and offset, 5-digits display. For inductive or resistive sensor, half bridge or full bridge.  
Order number : 1320-60-200-0

**Standard mounting plate** – Effective fixation.  
Order number : 1320-95-004-0

**Quick mounting plate** - Simplified fixation, without tools and pinned.  
Order number : 1320-95-007-0

**Adapter ring** -  $\varnothing 1,5 - \varnothing 6$   
Order number : 1320-95-401-0

**Adjustable coupling key** – Allows quick coupling, using interchangeable plates.  
Order number : 1303-20-001-0

**Cables** – Shielded, 4 x 0.14<sup>mm</sup>, 2 m

Straight connector	4 wires	9000-01-050-2
Straight connector	MiniDin 4p	2320-50-010-0

## Torque sensor TSF-2, TSF-5

TSF-2       $\pm 20$  mN.m

TSF-5       $\pm 50$  mN.m



Delivery :                      Ex stock / 4 weeks

Warranty :                      12 months

Import CAD :                [www.cla.ch](http://www.cla.ch)  
Products -> Sensors -> CAD-TSF-x

- ▲ Fine torque measurement
- ▲ Universal measuring shaft
- ▲ Bidirectional
- ▲ High acquisition frequency
- ▲ Compact dimensions

### Description

The TSF-2 / TSF-5 torque sensor is bidirectional and inductive type with carrier frequency. The measuring system consist of a shaft mounted on flexible pivots which allowing a high-performance torque measurement without friction. A fine angular resolution of 1° full scale gives a high linearity and a practically negligible hysteresis. The 3 mm diameter measurement shaft permits to use personalised tools and adapter ring.

### Applications

The TSF-2 / TSF-5 torque sensor is ideal for any type of measurement. Its compact dimension and high resistance to chips make it a sensor easily integrable in an installation.

Some examples :

- ▲ Friction measurement
- ▲ Energy storage (barrel)
- ▲ Yield of mechanical movement
- ▲ Aging test
- ▲ Riveting control

**Technical Data**

Denomination	TSF-2 / TSF-5
Measuring range	$\pm 20 / \pm 50$ mN.m
Maximal linearity error	$\leq 1$ % F. S.
Maximal hysteresis error	$\leq 0.5$ % F. S.
Theoretical resolution	$< 20 / < 50$ $\mu$ N.m
Nominal sensitivity	16 / 20 mV/V
Orientation	Bidirectional

**Electrical values**

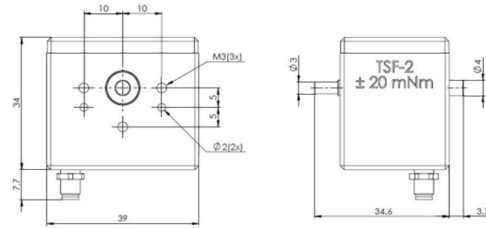
Bridge resistance	Full bridge
Recommended excitation	5 VDC
Maximal excitation	6 VDC
Resonance frequency	500 Hz
Resistance	80 $\Omega$

**Mechanical values**

Deflection	$< 5$ % F. S.
Overload	150 % F. S.
Breaking	300 % F. S.
Recommended dynamic performance	80 % F. S.
Material	Aluminium
Connector	M5, 4 plug
Wiring code	1 Brown    Excitation voltage + 3 Blue      Excitation voltage – 4 Black     Signal output + 2 White     Signal output – Shield      PE
Dimensions	$\varnothing 44 \times 40.5$ mm
Weight	128 g

**Order numbers**

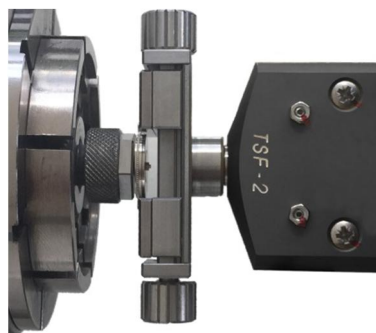
TSF-2	$\pm 20$ mN.m	1320-51-006-0
TSF-5	$\pm 50$ mN.m	1320-51-011-0



**Application example in watch laboratory**

Barrel spring winding measurement

The axis of the barrel is in rotation by its square, the sensor TSF-2 hold the drum by the teeth of the barrel with the adjustable coupling key equipped by the plates with counter-teeth.



**Accessories**

**Calibration certificate** – Provided for each sensor, advised a calibration validation every 12 months.  
Order number : 1320-96-010-0

**VARIOcouple** - Precision laboratory device with mastered rotation axis.  
Order number : 1320-00-001-0

**NEOvario** - Precision laboratory device with mastered rotation axis.  
Order number : 1325-00-001-0

**DIGImes Universel** - Signal converter in 0 -  $\pm 10$  VDC type BNC or USB (RS optional), manual adjustment of gain and offset, 5-digits display. For inductive or resistive sensor, half bridge or full bridge.  
Order number : 1320-60-200-0

**Standard mounting plate** – Effective fixation.  
Order number : 1320-95-004-0

**Quick mounting plate** - Simplified fixation, without tools and pinned.  
Order number : 1320-95-007-0

**Adapter ring** -  $\varnothing 3 - \varnothing 6$   
Order number : 1320-95-402-0

**Adjustable coupling key** – Allows quick coupling, using interchangeable plates.  
Order number : 1303-20-001-0

**Cables** – Shielded, 4 x 0.14<sup>mm</sup>, 2 m  
Straight connector    4 wires                    9000-01-050-2  
Straight connector    MiniDin 4p                    2320-50-010-0

## Torque sensor TSF-10, TSF-30, TSF-100

TSF-10	± 0.1 N.m
TSF-30	± 0.3 N.m
TSF-100	± 1 N.m

Delivery : Ex stock / 4 weeks

Warranty : 12 months

Import CAD : [www.cla.ch](http://www.cla.ch)  
Products -> Sensors -> CAD-TSF-x0



- ▲ Integrated connector
- ▲ Universal measuring shaft
- ▲ Bidirectional
- ▲ High acquisition frequency
- ▲ Compact dimensions

### Description

The TSF-10 / TSF-30 / TSF-100 torque sensor is bidirectional and inductive type with carrier frequency. The measuring system consist of a shaft mounted on flexible pivots which allowing a high-performance torque measurement without friction. A fine angular resolution of 1° full scale gives a high linearity and a practically negligible hysteresis. The 6 mm or 10 mm diameter measurement shaft permit to use personalised tools and adapter ring.

### Applications

The TSF-10 / TSF-30 / TSF-100 torque sensor is ideal for any type of substantial measurement. Its fixing system pinned by the shaft and its high resistance to chips make it a sensor easily integrable in an installation.

Some examples :

- ▲ Control of assembly fastening
- ▲ Friction measurement
- ▲ Piping valve control
- ▲ Aging test
- ▲ Deformation measurement

**Technical Data**

Denomination	TSF-10 / TSF-30 / TSF-100
Measuring range	± 0.1 / ± 0.3 / ± 1 N.m
Maximal linearity error	≤ 1 % F. S.
Maximal hysteresis error	≤ 0.5 % F. S.
Theoretical resolution	< 10 / < 50 / < 100 µN.m
Nominal sensitivity	? / 30 / 45 mV/V
Orientation	Bidirectional

**Electrical values**

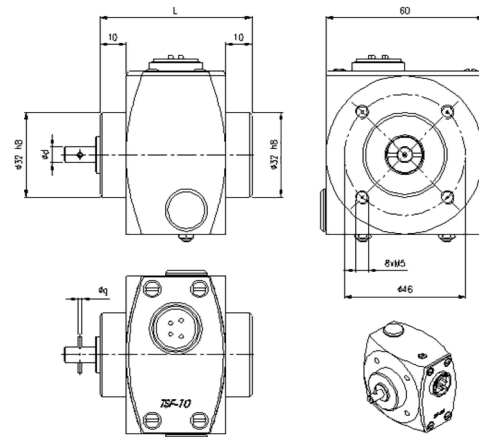
Bridge resistance	Half bridge
Recommended excitation	5 VDC
Maximal excitation	6 VDC
Resonance frequency	500 Hz
Resistance	45 Ω

**Mechanical values**

Deflection	< 5 % F. S.
Overload	150 % F. S.
Breaking	300 % F. S.
Recommended dynamic performance	80 % F. S.
Material	Aluminium
Electrical connection	Shielded cable 4 x 0.25 <sup>ø</sup> , 1.5 m
Connector	Female MiniDin 4 plug
Wiring code	White Excitation voltage + Brown Excitation voltage – Green Signal output + Shield PE, Signal output –
Dimensions	58 / 66 / 77 x 60 x 60 mm
Weight	530 / 580 / 608 g

**Order numbers**

TSF-10	± 0.1 N.m	1320-51-007-0
TSF-30	± 0.3 N.m	1320-51-008-0
TSF-100	± 1 N.m	1320-51-009-0



	Types		
	TSF-10	TSF-30	TSF-100
ød	6 h7	6 h7	10 h10
øg	1.5 h5	1.5 h5	3 h5
L	58	66	77

**Accessories**

**Calibration certificate** – Provided for each sensor, advised a calibration validation every 12 months.  
Order number : 1320-96-010-0

**VARIOcouple** - Precision laboratory device with mastered rotation axis.  
Order number : 1320-00-001-0

**NEOvario** - Precision laboratory device with mastered rotation axis.  
Order number : 1325-00-001-0

**DIGImes Universel** - Signal converter in 0 - ± 10 VDC type BNC or USB (RS optional), manual adjustment of gain and offset, 5-digits display. For inductive or resistive sensor, half bridge or full bridge.  
Order number : 1320-60-200-0

**DIGImes Compact** - Signal converter in 0 - ± 10 VDC, manual adjustment of gain and offset, simplified. For inductive or resistive sensor, half bridge or full bridge.  
Order number : 1320-60-250-0

**Standard mounting plate** – Effective fixation.  
Order number : 1320-95-004-0

**Quick mounting plate** - Simplified fixation, without tools and pinned.  
Order number : 1320-95-007-0

**Adapter cable** - MiniDin 4p - Tuchel Din 4p.  
Order number : 2320-60-021-0

**Adjustable coupling key** – Allows quick coupling, using interchangeable plates.  
Order number : 1303-20-001-0

**Application example in industry**

Measuring a deformation

The TSF-100 sensor, with an adapter ring and a counterpieceprint key, hold the element's axis. This element is in a mastered rotation.



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