

# CS1210 Reaction Torque Sensor



- Collar mechanical fittings
- Range from  $\pm 160$  to  $\pm 10,000$  Nm ( $\pm 128$  to  $\pm 8,000$  lbf.ft)
- Stainless Steel or Aluminum
- Gland or Connector Output
- Built In Amplifier per Request



## DESCRIPTION

The **CS1210** Series has been developed to measure torque in static applications. It offers high operating ranges up to 8,000 lbf.ft. The mechanical design and gauge placement minimizes transverse effects. Fitted with metallic strain gauges in a Wheatstone bridge circuit, the **CS1210** is providing excellent temperature stability. For high-level output a model with integrated amplifier is available.

With many years of experience as a designer and manufacturer of sensors, Measurement Specialties, Inc. often works with customers to design or customize sensors for specific uses and testing environments.

To meet your needs we also offer complete turnkey systems. The matched components (sensor, power, amplifier and digital display) are formatted, calibrated and ready for immediate use.

## FEATURES

- For Static Applications
- High Stiffness
- Collar Mechanical Fittings
- High Level Output Model with Integrated Amplifier

## APPLICATIONS

- Process control equipment
- Torque fatigue test benches
- Robotics and effectors
- Bearing torque measurement
- Laboratory and Research

## STANDARD RANGES

<b>F.S. in Nm</b>	160	300	600	1,2k	2,4k	3,5k	4,8k	7k	10k
<b>F.S. in lbf.ft</b>	128	240	480	960	1,92k	2,8k	3,84k	5,6k	8k
<b>Stiffness in Nm/rad</b>	$3.5 \times 10^4$	$6 \times 10^4$	$2 \times 10^5$	$3.5 \times 10^5$	$1 \times 10^6$	$1.4 \times 10^6$	$2.3 \times 10^6$	$3.4 \times 10^6$	$5.7 \times 10^6$
<b>Stiffness in lbf.ft/rad</b>	$2.4 \times 10^3$	$1.4 \times 10^4$	$1.4 \times 10^4$	$2.4 \times 10^4$	$6.9 \times 10^4$	$1 \times 10^5$	$1.6 \times 10^5$	$2.3 \times 10^5$	$3.9 \times 10^5$

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## PERFORMANCE SPECIFICATIONS

All values are typical at temperature 20±1° C

<b>Parameters</b>	
Operating Temperature Range (OTR)	-20 to 80° C (-4 to 176° F)
Compensated Temperature Range (CTR)	0 to 60° C (32 to 140° F)
Zero Shift in CTR	<0.5% F.S./ 50° C [1/100° F]
Sensitivity Shift in CTR	<1% of reading / 50° C [1/100° F]
Range (F.S.)	±160 Nm to ±10 kNm [±128 lbf.ft to ±8 klbf.ft]
<b>Over-Range</b>	
Without Damage	1.5 x F.S.
<b>Accuracy</b>	
Combined Non-Linearity & Hysteresis	±0.25%F.S.

### Electrical Characteristics

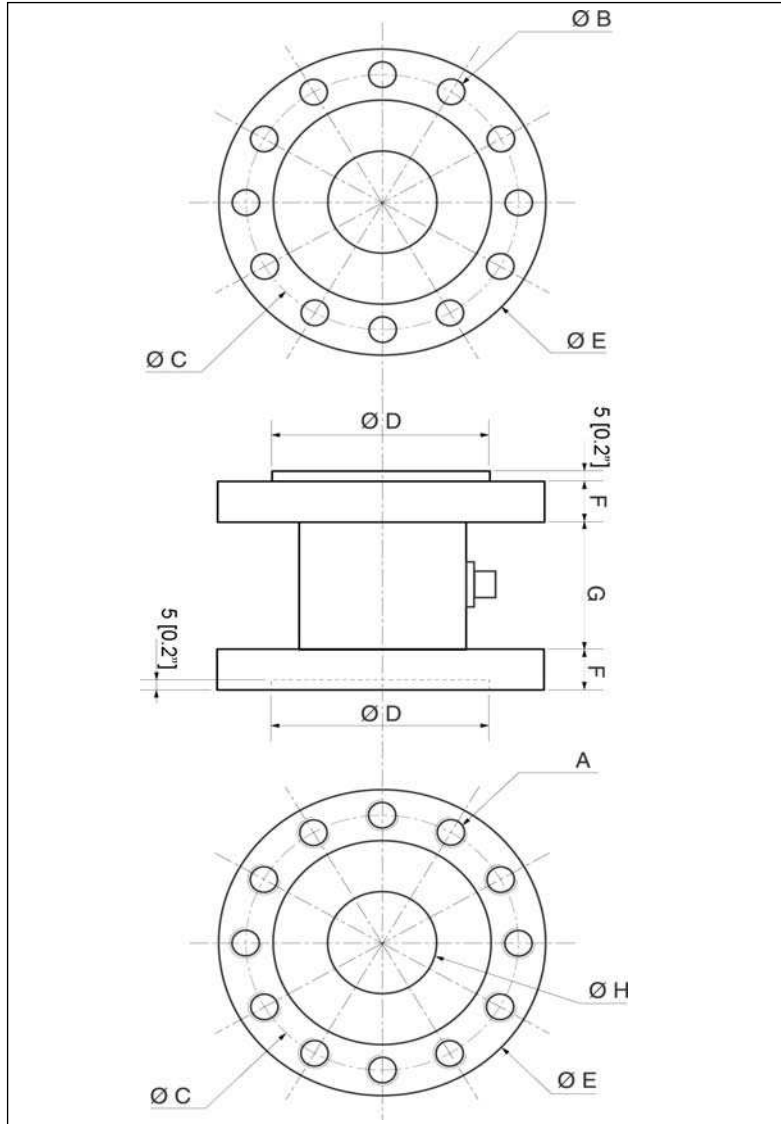
Model	CS1210	CS1210-A1	CS1210-A2
Supply Voltage	10Vdc	10 – 30Vdc	±15Vdc (±12 to ±18Vdc)
F.S. Output <sup>3</sup>	±2mV/V	±2V ±5%	±5V ±5%
Zero Offset <sup>3</sup>	<±5% F.S.	2.5V ±5% F.S.	0V ±5% F.S.
Input Impedance/Consumption	350 to 700Ω	<50mA	<50mA
Output Impedance	350 to 700Ω	1 kΩ <sup>4</sup>	1 kΩ <sup>4</sup>
Insulation under 50Vdc	≥100MΩ	≥100MΩ	≥100MΩ

### Notes

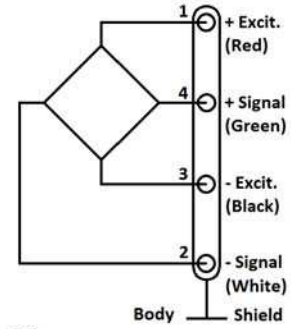
1. Electrical Termination: Connector output including mate
2. Material: Body in stainless steel or aluminum alloy
3. Other signal output on request
4. Output impedance < 100Ω on request
5. CE conformance according to EN 61010-1, EN 50081-1, EN 50082-1

# CS1210 Reaction Torque Sensor

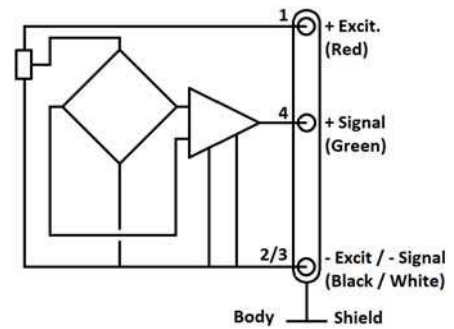
## DIMENSIONS & WIRING SCHEMATIC (IN METRIC AND IMPERIAL)



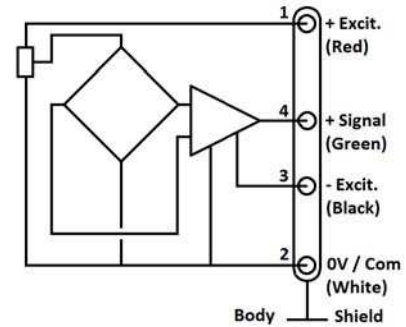
### Wiring Schematic



### Version -A1



### Version -A2



Dimensions in mm [inch]

F.S. in Nm [lbf.ft]	160 - 300 [128 - 240]	600 [480]	1,2k [960]	2,4k [1,92k]	3,5k [2,8k]	4,8k [3,84k]	7k [5,6k]	10k [8k]
A	12 x M10	12 x M10	12 x M10	12 x M12	12 x M16	12 x M18	12 x M20	12 x M24
B	12 x Ø10.3	12 x Ø10.3	12 x Ø10.3	12 x Ø12.3	12 x Ø16.3	12 x Ø18.3	12 x Ø20.5	12 x Ø24.5
C	100 [3.94]	100 [3.94]	100 [3.94]	125 [4.92]	160 [6.30]	180 [7.09]	215 [8.46]	235 [9.25]
D	80 [3.15]	80 [3.15]	80 [3.15]	90 [3.54]	120 [4.72]	140 [5.51]	160 [6.30]	180 [7.09]
E	118 [4.65]	118 [4.65]	118 [4.65]	148 [5.83]	186 [7.32]	218 [8.58]	248 [9.76]	272 [10.71]
F	15 [0.59]	15 [0.59]	15 [0.59]	15 [0.59]	15 [0.59]	15 [0.59]	20 [0.79]	20 [0.79]
G	45 [1.77]	45 [1.77]	45 [1.77]	48 [1.89]	52 [2.05]	55 [2.17]	60 [2.36]	60 [2.36]
H	30 [1.18]	45 [1.77]	45 [1.77]	70 [2.76]	85 [3.35]	100 [3.94]	110 [4.33]	130 [4.33]
Material	Aluminum Alloy			Stainless Steel				

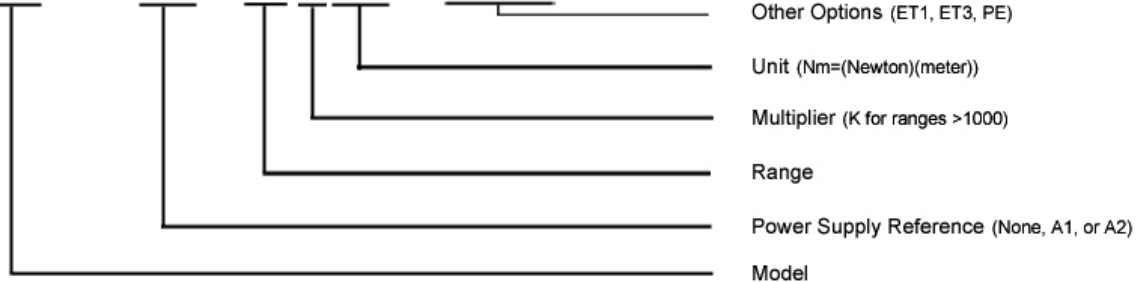
# CS1210 Reaction Torque Sensor

## OPTIONS

<b>A1</b> : Amplified Tension output with unipolar power supply
<b>A2</b> : Amplified Tension output with bipolar power supply
<b>ET1</b> : CTR -20 to 100° C [-4 to 212° F] OTR=CTR
<b>ET3</b> : CTR -40 to 150° C [-40 to 302° F] OTR=CTR ( <b>Note</b> : ET3 not available with A1 and A2 options)
<b>PE</b> : Cable Gland Termination with 2 m [6.6 ft] cable

## ORDERING INFO

CS1210 - A1 - 10KNm - /ET1/PE



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