SIT 105/110/120 Series Torque Transducer 50Nm to 5000Nm





Apollo Park, Ironstone Lane, Wroxton, Banbury, Oxon, OX15 6AY, UK Tel: +44 (0)1869 238400 Fax: +44 (0)1869 238401 Email: info@sensors.co.uk Web: www.sensors.co.uk



SIT 105/110/120 Strain Gauge In-Line Torque Transducer

The SIT 105/110/120 strain gauge reaction transducers are designed for operation in any industrial environment.

Models are available in sizes ranging from 50Nm to 5000Nm, offering outputs from mV/V outputs, to ratiometric voltage outputs, to digital data connection via RS232 or USB

An option of a bench mount housing is available for torque wrench test and calibration.



Technology

The SIT 105/110/120 torque transducers use modern wire foil strain gauge technology with the latest high performance stainless steel shafts

Software

TorqView is an easy to use advanced torque monitoring software, available to assist data recording and instrumentation displays that interface with Windows based PCs.

Features include: 3 types of display, text files compatible with Matlab and Excel and Real time chart plotting. See TorqView datasheet for more details.

LabView VIs are available for users to design their own process control applications. DLLs are also available for users to write their own custom software.



SIT 105 transducers offers:

• Calibrated 1mV/V output

SIT 110 transducers offers:

 Scaled ratiometric voltage output, 2.5V zero, 4.5V CW FSD 0.5V ACW FSD

SIT 120 Transducers offers:

- Ratiometric voltage output as above
- RS232 output for connection to PC

SIT 120 Extension Module also offers:

- USB digital output
- User scalable voltage or current outputs, ±1V to ± 10V, 4-20mA bipolar and unipolar

SIT 105/110/120 Series Strain Gauge Torque Transducers - Data Specification

Parameter	Condition	Data			Units	
SIT105/110/120 Static	c torque measuren	nent system	1 1 1 11			
Measurement method	Natad	DC Strain Gauge bridge with calibration and temperature compensation				
l'orque range	Note 1		50, 100, 200, 500, 50, 50, 100, 200, 500, 500, 500, 500, 500, 500, 5	1000, 2000, 5000, 10000 1000, 2000, 5000, 10000		Ibf.ft
Drive size		1/2 (up to 200Nm)	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			
Temperature					(7.0070 20001411)	
Measurement method		Static torque	measurement system	based on Strain Gauge t	echnology	
Temperature accuracy		•	,	±0.5	57	٥C
Ref. Temp., T _{RT}				20		٥C
Operating range, ΔT_0			-1	0 to 50		٥C
Storage range, ΔTs			-2	0 to 60		٥C
Temperature drift (FS)	Uncompensated		Cons	ult Factory		%FS/ºC
	Compensated		Cons	ult Factory		%FS/ºC
SIT105/110/120						
Linearity				0.05		%FS
Hysteresis				0.05		%FS
Resolution		0.005			%FS	
Frequency response		Up to 5KHz (digital output), Up to 8KHz (Analog output)			Hz	
Accuracy	20ºC, SM	±0.6 @ 5KHz			%FS	
	(See Note 2)	±0.1 @ 310Hz				
		±0.06 @ 155Hz				
			±0.02	5 @ 40Hz		
Averaging	(See Note 3)		From	n 1 to 128		N
Analog output						
Output voltage			SIT10	05 = mV/V		Vdc
		SIT SIT	F110 = 0.5v (ACW FS)) – 2.5v (zero) – 4.5v (CV	VFS)	
		SITI20 = As Abov	/e, (<u>+</u> 1V to <u>+</u> 10V & 4-	20mA Output available vi	a SITI20 Extension	
Lood impodence		module (OPTN-X))			KO	
Digital output (STT120	Corios Tronsdusor			SK		K\$2
	PS-232 (standard) LISB (via SIT120 Extension Module (OPTN-V)					
Sampling rate	See Liser	4 5Keps (min) -5 5Keps (max)			kene	
Sampling rate	Guide for details	4.5K5p5 (mm) =5.5K5p5 (max)			кэрэ	
Power supply						
Nominal voltage, Vs			1	0 to 18		V
Current consumption, I_{S}		80 (max)			mA	
Power consumption, Ws		1.2 (max)			W	
Allowed residual ripple		20			mVp-p	
of excitation voltage, V _{rip}						l
Electromagnetic compa	tibility					
EMC compatibility			EN 55011 &	EN 61326-1 (JG)		1

. Note 1. Other sizes are possible. Consult factory for details. Note 2. SM – Static Mode. Dynamic values will depend upon user application and has to be adjusted accordingly. Note 3. Digital averaging can be configured by user to optimise accuracy/frequency response for specific user applications. Digital averaging default setting is N=32. For details see User Manual.

SIT 105/110/120 Series Strain Gauge Torque Transducers

Dimensions (50 – 200Nm)



Parameter	Data			
Mechanical Properti	es			
Torque (Max)	50	100	200	Nm
Shaft Code	CA	СВ	CC	
Drive Size	1/2			
Max measurable load	120 (of rated torque)			%
limit				
Static safe load	200 (of rated torque)			%
breaking				
Transducer weight,		TBC		Kg
approx				

Sensor Technology Ltd reserves the right to change specification and dimensions without notice.

.

SIT 105/110/120 Series Strain Gauge Torque Transducers

Dimensions (201 – 500Nm)



Parameter	Data	Units
Mechanical Properti	es	
Torque (Max)	500	Nm
Shaft Code	DA	
Drive Size	3/4	Inch
Max measurable load	120 (of rated torque)	%
limit		
Static safe load	200 (of rated torque)	%
breaking		
Transducer weight,	1.3	Kg
approx		

SIT 105/110/120 Series Strain Gauge Torque Transducers

Dimensions (1001 – 5000Nm)



Parameter	Da	ita	Units
Mechanical Properti	es		
Torque (Max)	2000	5000	Nm
Shaft Code	FA	FB	
Drive Size	1	/2	Inch
Max measurable load limit	120 (of rat	ed torque)	%
Static safe load breaking	200 (of rat	ed torque)	%
Transducer weight, approx	4	.5	Kg

SIT 105/110/120 Series Strain Gauge Torque Transducers - Standard Range

	SIT 105	SIT 110	SIT 120	Option Code	Remarks
Standard features					
M / F Square ends	•	•	•		
mV / V Output	•	•	•		
Ratiometric voltage output 2.5V ± 2.5V FSD		•	•		
Internal temperature reading / correction		•	•		
RS232			•		
Optional Features					
Round Shaft ends (with keyways)	\$	\$	\$	K	
Plain shaft ends (no keyways)	\$	\$	\$	Р	
Bench mount housing	\$	\$	\$	Y	
SIT120 extension module			\$	Х	USB output ±1V to ±10V output. 0-20 mA or 4-20mA output. User adjustable (includes lead to transducer)

SIT 105/110/120 Series Strain Gauge Torque Transducers - Connector and Lead Options

	SIT 105	SIT 110	SIT 120	Remarks
Leads				
ACC - 11	\$	\$	\$	Open ended for user to self wire
ACC – 12	\$	\$	\$	With 15 way 'D' connector for easier system integration

SIT 105/110/120 Series Strain Gauge Torque Transducers – Additional related products

	Code	Remarks/Purpose
Transducer Display ETD	ETD	Display readout
WSG Wireless Strain Gauge Transmitter	WSG-STM	
with optional outputs and displays including:	WSG-STD	
- Wireless Strain Gauge Cabin Display	WSG-CD	See WSG Datasheet
 Wireless Strain Gauge Handheld Receiver Display 	WSG-HR	
 Wireless Strain Gauge Computer Receiver Interface 	WSG-RI	
AC Mains Adapter Power Supply	PSU 1	For providing 12Vdc
Transducer Signal Breakout Unit (Not compatible when using WSG)	SBU 1	
TorqView	TORQVIEW	Torque Monitoring Software

Glossary of terms and definitions used in this datasheet

- **Accuracy** The degree of conformity of a measured or calculated quantity, which will show the same or similar results. Accuracy of the overall TorqSense system is limited by the combined error of several factors such as linearity, hysteresis, temperature drifts and other parameters affecting measurements. If errors in the system are known or can be estimated, an overall error or uncertainty of measurement can be calculated.
- **Digital averaging** The application of algorithms to reduce white noise. In any electronic system, electronic white noise is mixed with the signal and this noise usually limits the accuracy. To reduce the influence of white noise and increase the accuracy of the system different averaging algorithms can be applied. In the TorqSense system a flying digital averaging technique is applied to reduce the white noise commensurate with the level of accuracy required. However, as any averaging algorithm works as a low pass filter, the more averaging that is applied the lower the frequency response. Therefore, each Torqsense system should be optimised to the customer's requirements by choosing the right combination of accuracy/frequency response. Please see relevant part of the Datasheet and User Manual.

SIT 120 Mulit Function Interface box



Features

The SIT Multi Function Interface Box is used as an optional accessory to the SIT 120 and takes the 2.5V zero \pm 1.5V analog Voltage from the transducer head and provides additional user configurable analog outputs via Transducer Control software (provided).

Power supply	Data	Unit
Voltage	9 - 18	VDC
Ripple	< 50	mV
Current	TBC	mA
Physical		
Enclosure	Height 30 x Width 108.5 x Length 80.5	mm
Temperature Range	-10 to +50	٥C
Temperature Stability	TBC	%/°C
Digital		
RS232	115	kbps
RS232 Sampling Rate	4200	Samples / Sec
USB	USB 2.0 full speed (12Mbps)	Mbps
USB Sampling Rate	Up to 6000	Samples / Sec
Analog Output		
FSD Voltage Output	User configurable ± 10	VDC

	± 10	VDC
	± 5	
	± 1	
Min Load Impedance	1	ΚΩ
Current Output	User configurable	
	0-20	mA
	4-20	
Max Loop resistance	500	Ω
Electromagnetic Compatibility		
EMC Compatibility	EN 61326:2006	