

MSG FORCE SENSORS

AEROSPACE INCEPTORS

Sensata Microfused Strain Gauge (MSG) force sensors provide accurate and cost-effective force measurements for aerospace inceptors and side sticks. The force sensors utilize our proprietary MSG sense elements which have provided robust, highly characterized performance for safety-critical applications for nearly 30 years. Sensata MSG force sensors for aerospace inceptors provide multiple output measurements of both x-axis and y-axis in a single unit, saving space, reducing complexity, and overall cost. Our solution also provides low cross-talk, resistance to humidity with lower drift, longer life, and lower cost of ownership. Our engineers are ready to tailor our design to meet your most stringent force-sensing requirements for mission-critical flight control applications.



Features

- High performance MSG sense elements
- Available with quad redundant outputs
- Construction reduces EMC related issues
- Proprietary ASIC technology for highly accurate, temperature compensated performance with diagnostic capability
- Lightning and ESD protected
- RTCA DO-160 and MIL-STD-810 tested

Applications

- Active Inceptors
- Active Side Sticks

SPECIFICATIONS

Performance

Accuracy (Best Fit Straight Line)^(a)	+/-0.25% FS @ 25 °C
Accuracy (Total Error Band)^(b)	+/-4.0% FS @ -20 °C to +85 °C
Operating Endurance	Application specific
Operating Ambient Temperature	-40 °C to +100 °C
Operating Media Temperature	-40 °C to +125 °C
Storage Temperature	-40 °C to +125 °C

Electrical

Supply Voltage / Output	8-32VDC for 4-20mA output 5±0.25VDC for 0.5-4.5VDC output 8-32VDC for 0-5VDC output 12-32VDC for 0-10VDC output 8-32VDC for 1-5VDC output 8-32VDC for 0.5-4.5VDC output
Output Load	≥ 4.7 kΩ for voltage output ≤ (Vsup-8)/20mA for current supply
Output Response Time	<2ms
Overvoltage Protection	36 VDC
Reverse Voltage Protection	Yes
Short Circuit Protection	Yes
Insulation Resistance	>100 MΩ at 500V
EMC	IEC 61326-1 and EN 61326-2-3
Dielectric	500VAC
Enhanced Radiate Immunity	100V/m (80-200MHz) 200V/m (200-2700MHz)
Enhanced ESD	+/-8KV Contact; +/-15KV Air

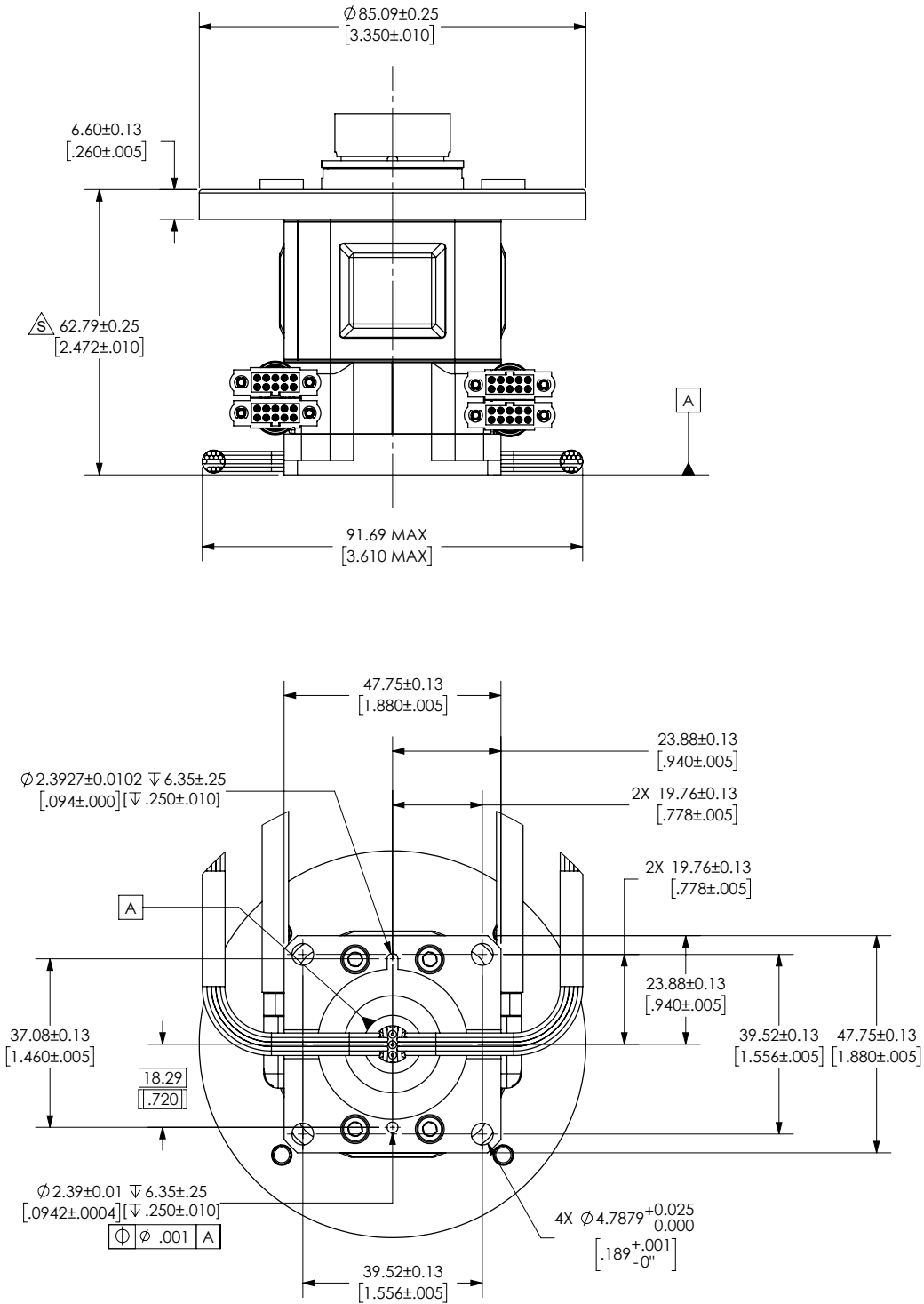
Physical

Max Operating Load	±200 lbf in pitch and roll ±65lbf coaxial to the Grip Axis
Ultimate Load	±375lbf pitch and roll ±100lbf coaxial to the Grip Axis
Random Vibration	RTCA/DO-160G, Section 8, Category R
Mechanical Shock	RTCA/DO-160G, Section 7, Category B
Drop (any axis)	NA



DIMENSIONS

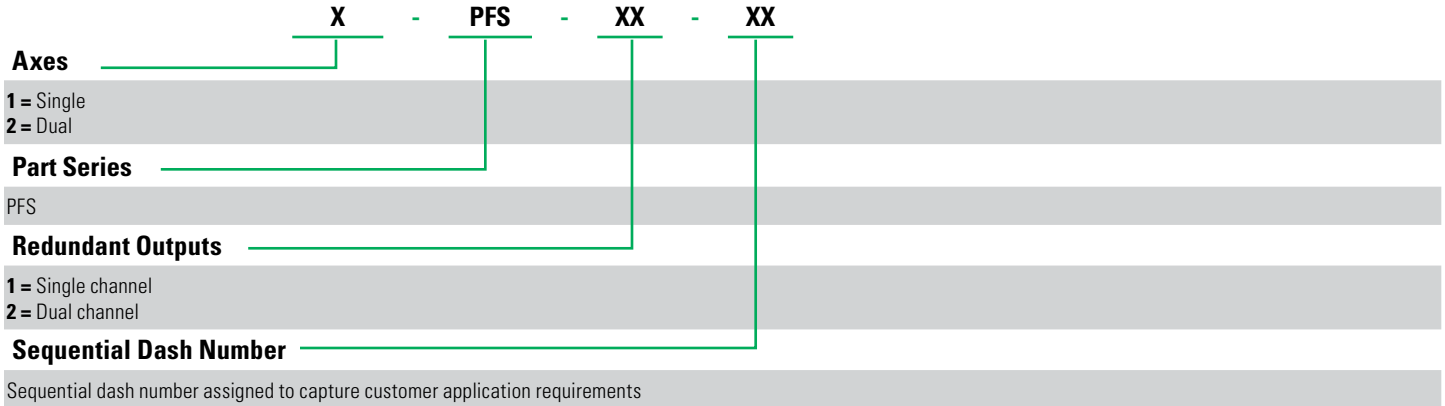
Tolerance, unless otherwise noted:
All dimensions are in millimeters [inches]





ORDERING OPTIONS

Example : 2PFS4-01



GENERAL NOTES

- (a) Best fit straight line accuracy includes errors from non-linearity, non-repeatability, and hysteresis
- (b) Total error band accuracy includes errors from non-linearity, non-repeatability, hysteresis, zero offset, full span offset, and thermal effects
- (c) Best fit straight line accuracy includes errors from non-linearity, non-repeatability, and hysteresis



WARNINGS



RISK OF MATERIAL DAMAGE AND HOT ENCLOSURE

- The product's side panels may be hot, allow the product to cool before touching
- Follow proper mounting instructions including torque values
- Do not allow liquids or foreign objects to enter this product

Failure to follow these instructions can result in serious injury, or equipment damage.



HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power before installing or working with this equipment
- Verify all connections and replace all covers before turning on power

Failure to follow these instructions will result in death or serious injury.

Sensata Technologies, Inc. ("Sensata") data sheets are solely intended to assist designers ("Buyers") who are developing systems that incorporate Sensata products (also referred to herein as "components"). Buyer understands and agrees that Buyer remains responsible for using its independent analysis, valuation, and judgment in designing Buyer's systems and products. Sensata data sheets have been created using standard laboratory conditions and engineering practices. Sensata has not conducted any testing other than that specifically described in the published documentation for a particular data sheet. Sensata may make corrections, enhancements, improvements, and other changes to its data sheets or components without notice.

Buyers are authorized to use Sensata data sheets with the Sensata component(s) identified in each particular data sheet. HOWEVER, NO OTHER LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OTHERWISE TO ANY OTHER SENSATA INTELLECTUAL PROPERTY RIGHT, AND NO LICENSE TO ANY THIRD PARTY TECHNOLOGY OR INTELLECTUAL PROPERTY RIGHT, IS GRANTED HEREIN. SENSATA DATA SHEETS ARE PROVIDED "AS IS". SENSATA MAKES NO WARRANTIES OR REPRESENTATIONS WITH REGARD TO THE DATA SHEETS OR USE OF THE DATA SHEETS, EXPRESS, IMPLIED, OR STATUTORY, INCLUDING ACCURACY OR COMPLETENESS. SENSATA DISCLAIMS ANY WARRANTY OF TITLE AND ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUIET ENJOYMENT, QUIET POSSESSION, AND NON-INFRINGEMENT OF ANY THIRD PARTY INTELLECTUAL PROPERTY RIGHTS WITH REGARD TO SENSATA DATA SHEETS OR USE THEREOF.

All products are sold subject to Sensata's terms and conditions of sale supplied at www.sensata.com SENSATA ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR THE DESIGN OF BUYERS' PRODUCTS. BUYER ACKNOWLEDGES AND AGREES THAT IT IS SOLELY RESPONSIBLE FOR COMPLIANCE WITH ALL LEGAL, REGULATORY, AND SAFETY-RELATED REQUIREMENTS CONCERNING ITS PRODUCTS, AND ANY USE OF SENSATA COMPONENTS IN ITS APPLICATIONS, NOTWITHSTANDING ANY APPLICATIONS-RELATED INFORMATION OR SUPPORT THAT MAY BE PROVIDED BY SENSATA.

Mailing Address: Sensata Technologies, Inc., 529 Pleasant Street, Attleboro, MA 02703, USA

CONTACT US

Americas

Tel: +1 (508) 236-3800, ask for AEROSPACE product marketing
E-mail: support@sensata.com
and include "MSG Force Sensor" in the e-mail subject