Product Advantages

One of the Smallest 6-Axis Sensors in the World: The Nano43 fits into restricted spaces of research applications and allows linkages and cables to pass through its center hole.

Extremely High Strength:

- EDM wire-cut from high-yield strength stainless steel.
- Maximum allowable single-axis overload values are 6.4 to 28 times rated capacities.

High Signal-to-Noise Ratio: Silicon strain gages provide a signal 75 times stronger than conventional foil gages. This signal is amplified, resulting in near-zero noise distortion.

The Nano43 F/T transducer
The transducer is made of hardened stainless steel with integral interface plates made from high-strength aircraft aluminum.

Typical Applications

- Telerobotics
- Robotic hand research
- Robotic surgery
- Finger-force research

English Calibrations

SENSING RANGES	Calibrations		
Axes	US-2-1	US-4-2	US-8-4
Fx, Fy (±lbf)	2	4	8
Fz (±lbf)	2	4	8
Tx, Ty (±lbf-in)	1	2	4
Tz (±lbf-in)	1	2	4

RESOLUTION	System Type*					
Axes	CTL	Net/DAQ	CTL	Net/DAQ	CTL	Net/DAQ
Fx, Fy (lbf)	1/1160	1/2320	1/580	1/1160	1/290	1/580
Fz (lbf)	1/1160	1/2320	1/580	1/1160	1/290	1/580
Tx, Ty (lbf-in)	1/2320	1/4640	1/1160	1/2320	1/580	1/1160
Tz (lbf-in)	1/2320	1/4640	1/1160	1/2320	1/580	1/1160

Metric Calibrations

SENSING RANGES	Calibrations		
Axes	SI-9-0.125	SI-18-0.25	SI-36-0.5
Fx, Fy (±N)	9	18	36
Fz (±N)	9	18	36
Tx, Ty (±Nmm)	125	250	500
Tz (±Nmm)	125	250	500

RESOLUTION	System Type*					
Axes	CTL	Net/DAQ	CTL	Net/DAQ	CTL	Net/DAQ
Fx, Fy (N)	1/256	1/512	1/128	1/256	1/64	1/128
Fz (N)	1/256	1/512	1/128	1/256	1/64	1/128
Tx, Ty (Nmm)	1/20	1/40	1/10	1/20	1/5	1/10
Tz (Nmm)	1/20	1/40	1/10	1/20	1/5	1/10

*CTL: Controller F/T System; Net: Net F/T System; DAQ: 16-bit DAQ F/T System. The resolution is typical for most applications and can be improved with filtering. Resolutions quoted are the effective resolution after dropping four counts of noise (Net/DAQ) or eight counts of noise (CTL). All sensors calibrated by ATI.
Applied loads must be within range in each of the six axes for the F/T sensor to measure correctly (refer to the transducer manual for complex loading information).

Single-Axis Overload	English	Metric
Fxy	±68 lbf	±300 N
Fz	±86 lbf	±380 N
Txy	±29 lbf-in	±3.2 Nm
Tz	±41 lbf-in	±4.6 Nm
Stiffness (Calculated)	**English**	**Metric**
X-axis & Y-axis force (Kx, Ky)	$2.9x10^4$ lb/in	$5.2x10^6$ N/m
Z-axis force (Kz)	$2.9x10^4$ lb/in	$5.2x10^6$ N/m
X-axis & Y-axis torque (Ktx, Kty)	$6.8x10^3$ lbf-in/rad	$7.7x10^2$ Nm/rad
Z-axis torque (Ktz)	$1.0x10^4$ lbf-in/rad	$1.1x10^3$ Nm/rad
Resonant Frequency (Measured)		
Fx, Fy, Tz	2800 Hz	
Fz, Tx, Ty	2300 Hz	
Physical Specifications	**English**	**Metric**
Weight*	0.0854 lb	0.0387 kg
Diameter (OD,ID)*	1.69 in, 0.78 in	43 mm, 19.9 mm
Height*	0.454 in	11.5 mm

*Specifications are for non-IP rated models. Diameter excludes any connector or cable features.

"For high-resolution miniature 6 DOF force sensors, we've found ATI's products to be the best commercially available."

Peter Berkelman, PhD
Center for Computer-Integrated Surgical Systems and Technology
Johns Hopkins University

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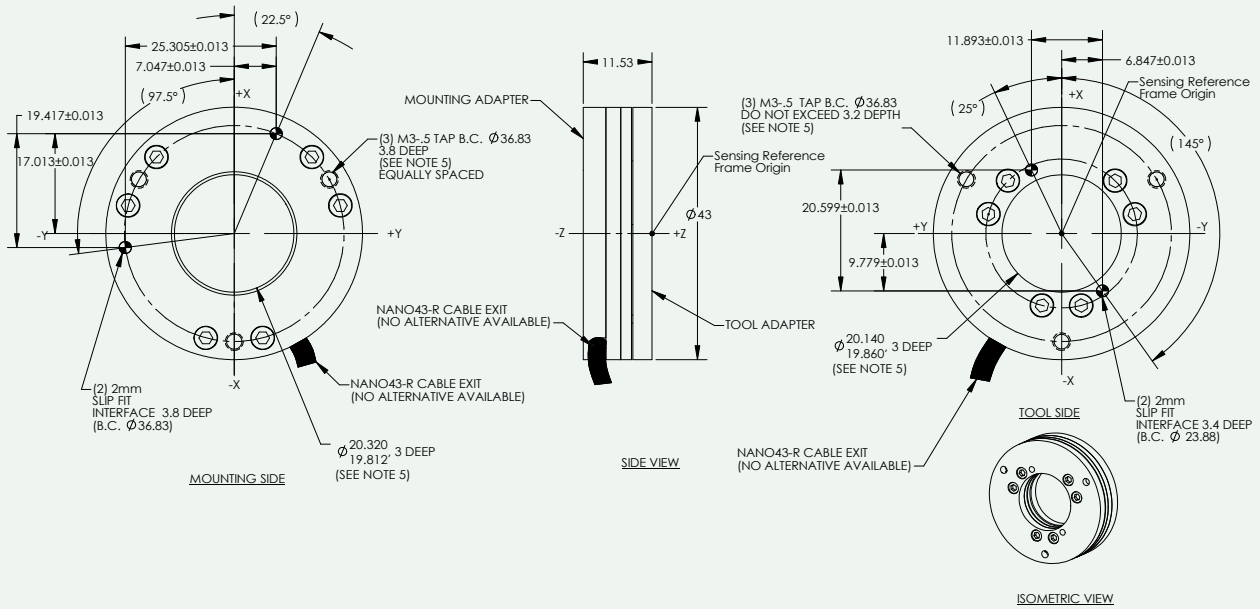

NOTES:
1. MOUNTING AND TOOL ADAPTER MADE OF EITHER ALUMINUM, OR SST (CUSTOMER SPECIFIED). TRANSDUCER MADE OF HARDENED STAINLESS STEEL.
2. USE M3 TAPPED HOLES AND CENTER HOLE ON TOOL AND MOUNTING ADAPTER FOR INTERFACING.
3. CONNECTOR (NOT SHOWN) HAS 17MM DIAMETER AND IS 67.5MM LONG.
4. **WARNING: DO NOT LOOSEN OR REMOVE INTERFACE PLATES DUE TO POTENTIAL DAMAGE**
5. **DO NOT EXCEED INTERFACE DEPTH MAY CAUSE DAMAGE**

Customer Drawing # 9230-05-1110-05