Product Advantages

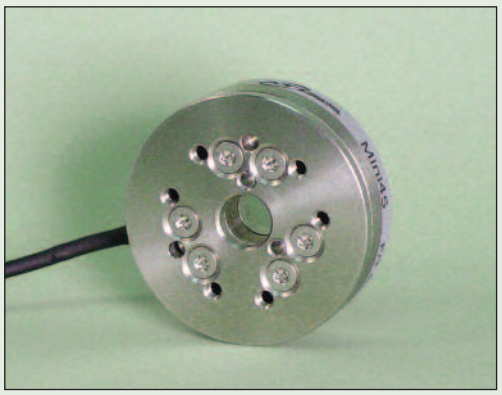
One of the Smallest 6-Axis Sensors in the World: The Mini45 has a compact, low-profile design with a through-hole to allow passage of linkages or cables.

Extremely High Strength:

- EDM wire-cut from high-yield strength stainless steel.
- Maximum allowable single-axis overload values are 5.7 to 25 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.

IP65 and IP68 (4m) Versions Available: The IP65 version of the transducer is available for use in wet environments. The IP68 version is for underwater environments to a maximum depth of 4 meters in fresh water. Contact ATI Industrial Automation for drawings and more information.



The Mini45 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 surgery
- Robotic hand research
- Finger-force research

English Calibrations

SENSING RANGES	Calibrations		
Axes	US-30-40	US-60-80	US-120-160
Fx, Fy (±lbf)	30	60	120
Fz (±lbf)	60	120	240
Tx, Ty (±lbf-in)	40	80	160
Tz (±lbf-in)	40	80	160

RESOLUTION	System Type*					
Axes	CTL	Net/DAQ	CTL	Net/DAQ	CTL	Net/DAQ
Fx, Fy (lbf)	1/40	1/80	1/20	1/40	1/10	1/20
Fz (lbf)	1/40	1/80	1/20	1/40	1/10	1/20
Tx, Ty (lbf-in)	1/44	1/88	1/22	1/44	1/11	1/22
Tz (lbf-in)	1/88	1/176	1/44	1/88	1/22	1/44

Metric Calibrations

SENSING RANGES	Calibrations		
Axes	SI-145-5	SI-290-10	SI-580-20
Fx, Fy (±N)	145	290	580
Fz (±N)	290	580	1160
Tx, Ty (±Nm)	5	10	20
Tz (±Nm)	5	10	20

RESOLUTION	System Type*					
Axes	CTL	Net/DAQ	CTL	Net/DAQ	CTL	Net/DAQ
Fx, Fy (N)	1/8	1/16	1/4	1/8	1/2	1/4
Fz (N)	1/8	1/16	1/4	1/8	1/2	1/4
Tx, Ty (Nm)	1/376	1/752	1/188	1/376	1/94	1/188
Tz (Nm)	1/752	1/1504	1/376	1/752	1/188	1/376

*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	±1100 lbf	±5100 N
Fz	±2300 lbf	±10000 N
Txy	±1000 lbf-in	±110 Nm
Tz	±1200 lbf-in	±140 Nm
Stiffness (Calculated)	**English**	**Metric**
X-axis & Y-axis force (Kx, Ky)	4.2×10^5 lb/in	7.4×10^7 N/m
Z-axis force (Kz)	5.6×10^5 lb/in	9.8×10^7 N/m
X-axis & Y-axis torque (Ktx, Kty)	1.5×10^5 lbf-in/rad	1.7×10^4 Nm/rad
Z-axis torque (Ktz)	3.1×10^5 lbf-in/rad	3.5×10^4 Nm/rad
Resonant Frequency (Measured)		
Fx, Fy, Tz	5600 Hz	
Fz, Tx, Ty	5400 Hz	
Physical Specifications	**English**	**Metric**
Weight*	0.202 lb	0.0917 kg
Diameter (OD,ID)*	1.77 in, 0.373 in	45 mm, 9.5 mm
Height*	0.618 in	15.7 mm

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

"ATI's sales support has been invaluable in helping us select the appropriate sensor and explaining detailed technical issues. I am extremely pleased with the ATI sensor we have chosen. It has enabled us to measure forces exerted by a physician, during a medical procedure, which have never been measured before."

Nathan Delson, PhD
Director, Mechanical Engineering Design Center
University of California, San Diego
Department of Mechanical and Aerospace Engineering

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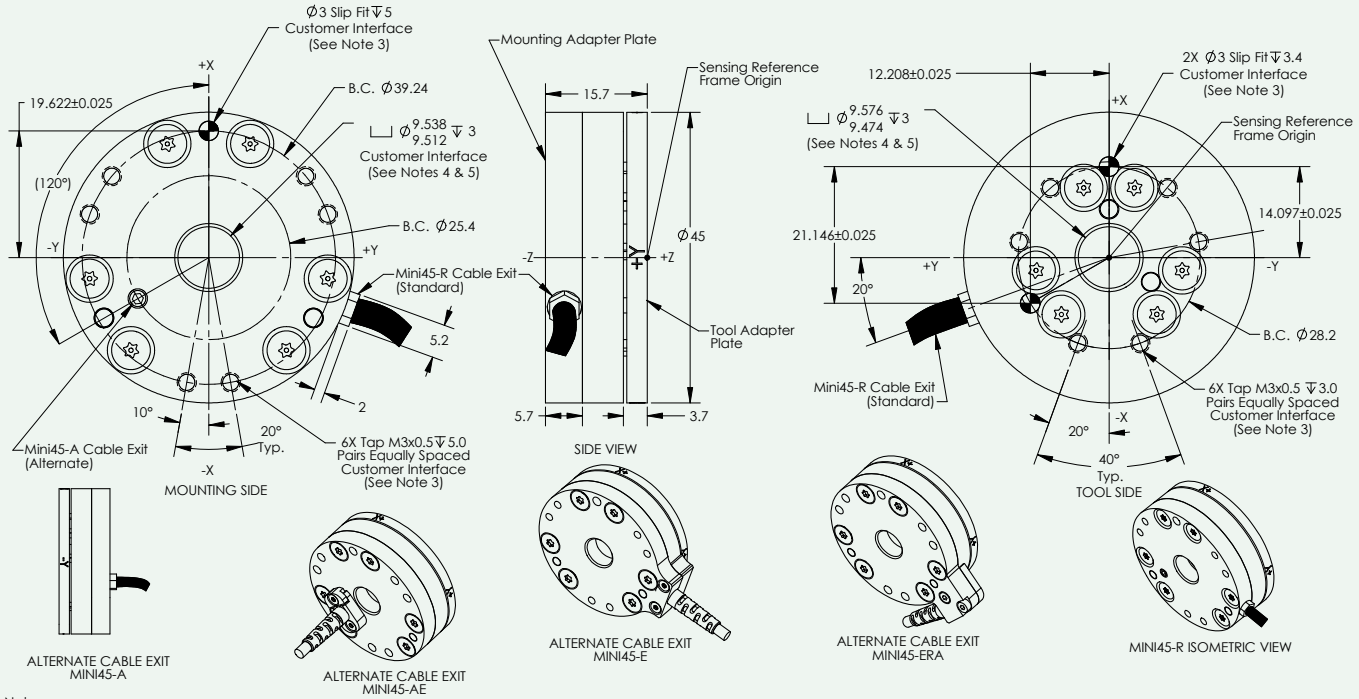

Notes:
1. Mounting and Tool Adapter made of either Aluminum or Stainless Steel (customer specified). Transducer made of hardened Stainless Steel.
2. **WARNING: DO NOT LOOSEN OR REMOVE INTERFACE PLATES OR CABLE FITTING DUE TO POTENTIAL DAMAGE.**
3. **DO NOT EXCEED INTERFACE DEPTH, MAY CAUSE DAMAGE.**
4. Thru hole is 9.4mm. Specified tolerances are for mating to a boss.
5. Do not allow items passing through center hole to touch both the Mounting and Tool Adapter Plates or accuracy will be compromised.
6. Connector (not shown) has 17mm diameter and is 67.5mm long.

Customer Drawing # 9230-05-1094-20