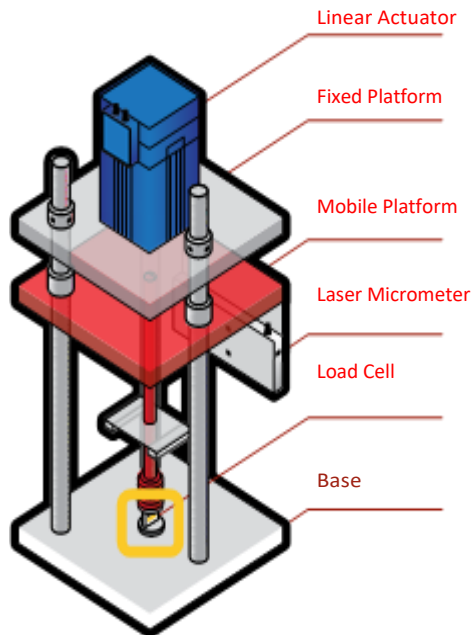




**GUIDE FOR LOAD CELLS, PRESSURE SENSORS AND TORQUES
BY LOGICBUS**



LOAD CELLS



Load Sensors for all Industrie

FUTEK's standard, custom, and OEM series provides diverse solutions for aerospace, medical, automotive, and manufacturing industries, just to name a few. These load sensors offer solutions for applications requiring both tension and compression measurements and an impressive capacity range of grams to thousands of pounds..

• Popular Designs

- S-Beam/Z-Beam
- Rod End
- Load Button
- In Line
- Load Column/Canister
- Through Hole/Donut/Washer
- Pancake/Universal
- Side Mount

FUTEK also offers a number of customized solutions:

- Cryogenic
- Submersible
- Fatigue-Rated
- Non-Magnetic
- Miniature Design
- Dual Bridge
- Space/Flight Qualified
- High Temperature



Automation



Sensors



Industrial
Computers



Data
Acquisition



Test & Measurement
Equipment



North
America



Central and South
America

Miniature load sensors



• S-Beam Jr. in miniature (LSB200)

The S-Beam Jr. model is a miniature load cell capable of measuring compression and tension forces from 100 g to 100 lb. (444 Newtons). The miniature size of the LSB200 and its exceptional functionality for protection against overload make this model a highly adaptable solution for various applications in the sector. The following are other functions that demonstrate the versatility of S-Beam Jr. :

- Original equipment manufacturer
- Submersible
- Empty operation
- Non-magnetic
- Radiation tolerant
- High temperature

FUTEK has an extensive selection of miniature load cells to measure tension and compression forces. These load cells support from 10 g to 20,000 pounds of force, making them ideal for applications that require high precision and resistance.



MINIATURE THREADED IN LINE
LOAD CELL



MINIATURE S-BEAM JR. WITH MALE
THREADS
LRM200



SUBMERSIBLE MINIATURE S-BEAM
JR.
LSB210



SUBMINIATURE LOAD BUTTON
LLB130



SUBMINIATURE LOAD BUTTON
LLB250











MINIATURE THREADED IN LINE
LOAD CELL
LCM200



MINIATURE THREADED IN LINE
LOAD CELL
LCM300



LOAD CELL OF PASSING HOLE
LTH300

MODEL #	CAPACITIES	DESCRIPTION	SPECIFICATIONS
 LAU200	100, 300 lb. (445, 1334 N)	Pedal Force Sensor <ul style="list-style-type: none"> • Ideal for Automotive Applications involving accelerator or clutch testing • Ideal for Aerospace Applications involving pedal force testing • Low Profile Height • Removable Mounting Plate • #29 AWG, 4 conductor, spiral shielded Teflon cable 12 in [0.3 m] long with 4 pin LEMO • receptacle (PHG.OB.304.CLLD) 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -60 to 200° F Excitation (max): 20 VDC Bridge Resistance: 700 Ω nom. Deflection: 0.002-0.005" nom. Safe Overload: 150% of RO
 LAU220	300, 500 lb. (1334, 2224 N)	Pedal Force Sensor <ul style="list-style-type: none"> • Ideal for Automotive Applications involving brake testing • Ideal for Aerospace Applications involving pedal force testing • Spike resistant and highly resistant to off-axis loading • Low Profile Height • Removable Mounting Plate • Light weight • #24 AWG, 4 conductor, braided shielded PVC • cable 15 ft [4.5 m] long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.25% of RO Hysteresis: ± 0.25% of RO Operating Temperature: -60 to 200° F Excitation (max): 20 VDC Bridge Resistance: 700 Ω nom. Deflection: 0.003 - 0.005 nom. Safe Overload: 150% of RO
 LMD300	50 lb. (222 N)	Pinch Force Sensor Used to measure pinch force in medical rehabilitation, lab testing and window pinch force measurement <ul style="list-style-type: none"> • Ideal for automotive or medical applications • Slim design • #28 AWG, 4 conductor, spiral shielded PVC cable, 10 ft [3 m] long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% of RO Operating Temperature: 0 to 160° F Excitation (max): 18 VDC Bridge Resistance: 1000 Ω nom. Deflection: 0.005" nom. Safe Overload: 200% of RO
 LMD500	300 lb. (1334 N)	Hand exerciser <ul style="list-style-type: none"> • Aluminum construction in one piece • Indicated for rehabilitation therapy and as an instrument to test manual strength 	Nominal output: 3 mV / V nom. Non-linearity: ± 0.25% nominal output Hysteresis: ± 0.25% nominal output Operating temperature: -60 to 200° F Excitation (max.): 18 VDC Bridge resistance: 350 Ω nom. Deflection: 0.002" nom. Wiring code: CC4
 LCA300	2K, 3K, 5K lb. (9K, 13K, 22K N)	Miniature Column Load Cell <ul style="list-style-type: none"> • Fast response time • Superior natural frequency up to 43 kHz • Low deflection • Small profile for tight spaces • #29 AWG, 4 conductor, spiral shielded Teflon cable 10 ft [3 m] long 	Rated Output: 1.3 - 2 mV/V nom. Nonlinearity: ± 1% of RO Hysteresis: ± 1% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.001" nom. Safe Overload: 150% of RO
 LCA305	10K lb. 44K N	Miniature Column Load Cell <ul style="list-style-type: none"> • Fast response time • Superior natural frequency up to 50 kHz • Low deflection • Small profile for tight spaces • #29 AWG, 4 conductor, spiral shielded Teflon cable 10 ft [3 m] long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 1% of RO Hysteresis: ± 1% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.001" nom. Safe Overload: 150% of RO
 LCA310	15K, 30K lb. (67K, 133K N)	Miniature Column Load Cell <ul style="list-style-type: none"> • Fast response time • Superior natural frequency up to 24 kHz • Low deflection • Small profile for tight spaces • #29 AWG, 4 conductor, spiral shielded Teflon cable 10 ft [3 m] long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 1% of RO Hysteresis: ± 1% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.003 - 0.004" nom. Safe Overload: 150% of RO
 LCB200	1K, 2K, 3K lb. (4K, 9K, 13K N)	In Line Rod End Load Cell <ul style="list-style-type: none"> • Incredibly fast • Low deflection, light weight • For use in both tension and compression • Can easily thread in line into a threaded rod or actuator • #28 AWG, 4 conductor, shielded PVC cable 10 ft [3 m] long 	Rated Output: 1 - 3 mV/V nom. Nonlinearity: ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature: -45 to 200° F Excitation (max): 18 VDC Bridge Resistance: 1000 Ω nom. Deflection: 0.0005 - 0.0015" nom. Safe Overload: 150% of RO



Automation



Sensors



Industrial Computers



Data Acquisition











Test & Measurement Equipment











North America



Central and South America

MODEL #	CAPACITIES	DESCRIPTION	SPECIFICATIONS
 LCB400	1K, 3K, 10K lb. (4K, 13K, 44K N)	Rod End Load Cell <ul style="list-style-type: none"> • Light weight • Low deflection, light weight • For use in both tension and compression • Can easily thread in line into a threaded rod or actuator • 6 Pin BENDIX Receptacle (PT02E) 	Rated Output:..... 2 mV/V nom. Nonlinearity:..... ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature:..... -60 to 200° F Excitation (max): 18 VDC Bridge Resistance:..... 350 Ω nom. Deflection:..... 0.0016 - 0.0031" nom. Safe Overload:150% of RO
 LCB450	5K, 20K lb. (22K, 89K N)	Fatigue Rated Rod End Load Cell <ul style="list-style-type: none"> • Light weight • Low deflection, light weight • For use in both tension and compression • Can easily thread in line into a threaded rod or actuator • 6 Pin BENDIX Receptacle (PT02E) 	Rated Output:..... 2 mV/V nom. Nonlinearity:..... ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature:..... -60 to 200° F Excitation (max): 18 VDC Bridge Resistance:..... 350 Ω nom. Deflection:..... 0.0014 - 0.0032" nom. Safe Overload:300% of RO
 LCB500	100, 200, 500, 1K, 2K, 3K, 5K lb. (445, 890, 2224, 4K, 9K, 13K, 22K N)	Rod End Load Cell <ul style="list-style-type: none"> • One piece construction • Low deflection • For use in both tension and compression • Low profile • 6 Pin BENDIX Receptacle (PT02E) 	Rated Output:..... 0.75 - 1.5 mV/V nom. Nonlinearity: ± 0.25% of RO Hysteresis: ± 0.25% of RO Operating Temperature: 0 to 200° F Excitation (max): 18 VDC Bridge Resistance: 700 Ω nom. Deflection:..... 0.0019 - 0.0020" nom. Safe Overload:150% of RO
 LCF300	25, 50, 100, 250, 500 lb. (111, 222, 445, 1112, 2224 N)	Universal Pancake Load Cell <ul style="list-style-type: none"> • For use in both tension and compression • Monolithic multibeam construction • Utilizes metal foil strain gauge technology • Highly resistant to off-axis loading • LEMO Receptacle (EGG.0B.304.CLL) • 6 Pin BENDIX Receptacle (Optional) 	Rated Output: 1 - 2 mV/V nom. Nonlinearity: ± 0.25% of RO Hysteresis: ± 0.25% of RO Operating Temperature:..... -60 to 200° F Excitation (max): 20 VDC Bridge Resistance:..... 700 Ω nom. Deflection:..... 0.0012 - 0.0018" nom. Safe Overload:150% of RO
 LCF400	250, 500, 1K, 2.5, 5K lb. (1112, 2224, 4K, 11K, 22K N)	Universal Pancake Load Cell <ul style="list-style-type: none"> • Highly resistant to off-axis loading • One-piece construction • Utilizes metal foil strain gauge technology • 17-4 PH stainless-steel construction • For use in both tension and compression • 6 Pin BENDIX Receptacle (PT02E-10-6P) 	Rated Output:..... 3 mV/V nom., 250 lb 1.5 mV/V Nonlinearity:..... ± 0.1% of RO Hysteresis: ± 0.1% of RO Operating Temperature:..... -65 to 200° F Excitation (max): 18 VDC Bridge Resistance:..... 700 Ω nom. Deflection:..... 0.001 - 0.004" nom. Safe Overload:150% of RO
 LCF450	500, 1K, 2K, 5K, 10K lb. (2224, 4K, 9K, 22K, 44K N)	Universal Pancake Load Cell <ul style="list-style-type: none"> • Low profile design • For use in both tension and compression • Utilizes metal foil strain gauge technology • Highly resistant to off-axis loading • 6 Pin BENDIX Receptacle (PT02E) Optional <ul style="list-style-type: none"> • Fatigue rate (LCF451) • TEDS IEEE1451.4 	Rated Output:..... 2 mV/V nom. Nonlinearity:..... ± 0.1% of RO* Hysteresis: ± 0.2% of RO* Operating Temperature:..... -60 to 200° F Excitation (max): 20 VDC Bridge Resistance:..... 700 Ω nom. Deflection: 0.001 - 0.004" nom. Safe Overload:150% of RO
 LCF455	500, 1K, 2K, 5K, 10K lb. (2224, 4K, 9K, 22K, 44K N)	Tension Base Pancake Load Cell <ul style="list-style-type: none"> • Low profile design • For use in both tension and compression • Utilizes metal foil strain gauge technology • Highly resistant to off-axis loading • 6 Pin BENDIX Receptacle (PT02E) • Fatigue rated version available (LCF456) 	Rated Output:..... 2 mV/V nom. Nonlinearity:..... ± 0.1% of RO* Hysteresis: ± 0.2% of RO* Operating Temperature:..... -60 to 200° F Excitation (max): 20 VDC Bridge Resistance:..... 700 Ω nom. Deflection:..... 0.001 - 0.004" nom. Safe Overload:150% of RO
 LCF500	25K, 50K lb. (111K, 222K N)	Universal Pancake Load Cell <ul style="list-style-type: none"> • Low profile design • For use in compression • Utilizes metal foil strain gauge technology • Highly resistant to off-axis loading • 6 Pin BENDIX Receptacle (PT02E-10-6P) Optional <ul style="list-style-type: none"> • Dual bridge and dual range • TEDS IEEE1451.4 	Rated Output:..... 4 mV/V nom. Nonlinearity:..... ± 0.1% of RO* Hysteresis: ± 0.2% of RO* Operating Temperature:..... -60 to 200° F Excitation (max): 20 VDC Bridge Resistance:..... 350 Ω nom. Deflection:..... 0.002 - 0.003" nom. Safe Overload:150% of RO

MODEL #	CAPACITIES	DESCRIPTION	SPECIFICATIONS
 LCF505	25K, 50K lb. (111K, 222K N)	Tension Base Pancake Load Cell <ul style="list-style-type: none"> • Low profile design with tension base • For use in both tension and compression • Highly resistant to off-axis loading • 6 Pin BENDIX Receptacle (PT02E-10-6P) 	Rated Output: 4 mV/V nom. Nonlinearity: ± 0.1% of RO* Hysteresis: ± 0.2% of RO* Operating Temperature: -60 to 200° F Excitation (max): 20 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.002" - 0.003" nom. Safe Overload: 150% of RO
 LCF506	12.5K; 25K lb. (55,6K; 111,2K N)	Fatigue Rated Pancake Load Cell <ul style="list-style-type: none"> • Low profile design with tension base • For use in both tension and compression • Highly resistant to off-axis loading • 6 Pin BENDIX Receptacle (PT02E-10-6P) 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.1% of RO* Hysteresis: ± 0.2% of RO* Operating Temperature: -60 to 200° F Excitation (max): 20 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.0010 - 0.0015" nom. Safe Overload: 300% of RO
 LCM100	1000 g, 5, 10, 25 lb. (9,8; 22,24; 44,48; 111,2 N)	Miniature Threaded In Line Load Cell <ul style="list-style-type: none"> • High speed, low deflection • Minimal mounting clearance • Outer diameter of 0.38" [9.5 mm] • 17-4 PH stainless-steel construction • For use in both tension and compression • #34 Awg 4 conductor braided shielded cable, 5 ft [1.5 m] Long 	Rated Output: 1 - 2 mV/V nom. Nonlinearity ± 0.5 % Hysteresis ± 0.5% Bridge Resistance: 350 Ω nom. Operating Temperature: -60° to 200° F Excitation (max): 7 VDC Deflection: 0.0001 - 0.0002" nom. Safe Overload: 150% of RO
 LCM200	250, 500, 1K lb. (1112, 2224, 4K N)	Miniature Threaded In Line Load Cell <ul style="list-style-type: none"> • Minimal mounting clearance • 17-4 stainless-steel construction • For use in both tension and compression • #29 AWG, 4 conductor, spiral shielded Teflon cable 10 ft [3 m] long 	Rated Output: 1 - 2 mV/V nom. Nonlinearity: ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature: -60 to 285° F Excitation (max): 15 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.001" nom. Safe Overload: 150% of RO
 LCM300	50, 100, 250, 500, 1K lb. (222, 445, 1112, 2224, 4K N)	Miniature Threaded In Line Load Cell <ul style="list-style-type: none"> • Minimal mounting clearance • 17-4 PH stainless-steel construction • For use in both tension and compression • #28 AWG, 4 conductor braided-shielded PVC cable 10 ft (3 m) long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature: -45 to 200° F Excitation (max): 15 VDC Bridge Resistance: 740 Ω nom. Deflection: 0.001" nom. Safe Overload: 150% of RO
 LCM325	2K, 3K lb. (9K, 13K N)	Miniature Threaded In Line Load Cell <ul style="list-style-type: none"> • Miniature size • Fast response and low deflection • Robust cable strain relief • For use in both tension and compression • #28 AWG, 4 conductor, braided shielded PVC cable, 10 ft [3 m] long 	Rated Output: 1.3 to 2 mV/V nom. Nonlinearity: ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature: -45 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.001" nom. Safe Overload: 150% of RO
 LCM350	4K, 5K lb. (18K, 22K N)	Miniature Threaded In Line Load Cell <ul style="list-style-type: none"> • Miniature size • Fast response and low deflection • Robust cable strain relief • #28 AWG, 4 conductor, braided shielded PVC cable, 10 ft [3 m] long • For use in both tension and compression 	Rated Output: 1.6 - 2 mV/V nom. Nonlinearity: ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature: -45 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.002" nom. Safe Overload: 150% of RO
 LCM375	7,5K; 10K lb. (33K, 44K N)	Miniature Threaded In Line Load Cell <ul style="list-style-type: none"> • Miniature size • Fast response and low deflection • Robust cable strain relief • #28 AWG, 4 conductor, braided shielded PVC cable, 10 ft [3 m] long • For use in both tension and compression 	Rated Output: 1.5 - 2 mV/V nom. Nonlinearity: ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature: -45 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.002" nom. Safe Overload: 150% of RO



Automation



Sensors



Industrial Computers



Data Acquisition



Test & Measurement Equipment



North America



Central and South America

MODEL #	CAPACITIES	DESCRIPTION	SPECIFICATIONS
 <p>LCM525</p>	20K lb. (89K N)	<p>Threaded In Line Load Cell</p> <ul style="list-style-type: none"> • Fast response and low deflection • Miniature size • Notable Nonlinearity • Robust cable strain relief • #28 AWG, 4 conductor, braided shielded PVC cable, 10 ft [3 m] long • For use in both tension and compression 	<p>Rated Output: 2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -45 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.004" nom. Safe Overload: 150% of RO</p>
 <p>LCM550</p>	50K lb. (222K N)	<p>Threaded In Line Load Cell</p> <ul style="list-style-type: none"> • Miniature Size • Fast response and low deflection • Notable Nonlinearity • Robust cable strain relief • #24 AWG, 4 conductor, braided shielded PVC cable, 10 ft [3 m] long • For use in both tension and compression 	<p>Rated Output: 2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -45 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.005" nom. Safe Overload: 150% of RO</p>
 <p>LLB130</p>	1000 g, 5, 10, 25, 50 lb. 9,80; (22,2; 44,5; 111; 222 N)	<p>Subminiature Load Button</p> <ul style="list-style-type: none"> • Fully internally temperature compensated (no external conditioning circuitry) • Subminiature / light weight • Low deflection / fast response • 17-4ph S.S. • #34 AWG, 4 conductor Teflon, stainless-steel braided shielded cable 5 ft [1.5 m] long 	<p>Rated Output..... 1 - 2 mV/V nom. Nonlinearity ± 0.5% of RO Hysteresis ± 0.5% of RO Operating Temperature..... -60 to 200° F Excitation (max) 7 VDC Deflection..... 0.0005" nom. Bridge Resistance..... 350 Ω nom. Safe Overload..... 150% of RO</p>
 <p>LLB250</p>	100, 250 lb. (445, 1112 N)	<p>Miniature Load Button</p> <ul style="list-style-type: none"> • Ultra fast response • Low deflection • Impressive repeatability • 17-4 PH stainless-steel construction • Fully welded construction • #34 awg 4 conductor braided shielded cable, 5 ft [1.5 m] long 	<p>Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature: -60 to 200° F Excitation (max): 7 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.0005" nom.</p>
 <p>LLB300</p>	25, 50, 100, 250, 500, 1K lb. (111, 222, 445, 1112, 2224, 4K N)	<p>Miniature Load Button</p> <ul style="list-style-type: none"> • Ultra fast response • Robust strain relief • #29 AWG, 4 conductor, spiral shielded Teflon cable 10-ft [3 m] long • Low deflection • 17-4 stainless-steel construction • For use in compression 	<p>Rated Output: 1 - 2.5 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -60 to 250° F Excitation (max): 18 VDC Bridge Resistance: 700 Ω nom. Deflection: 0.0003 - 0.001" nom. Safe Overload..... 150% of RO</p>
 <p>LLB350</p>	25, 50 lb. (111, 222 N)	<p>Miniature Load Button with Threaded/ Tapped Holes</p> <ul style="list-style-type: none"> • Ultra low deflection • Robust strain relief • #29 AWG, 4 conductor, spiral shielded Teflon cable 10-R [3 m] long • 17-4 PH stainless-steel construction • For use in compression • Utilizes metal foil strain gauge technology 	<p>Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% of RO* Hysteresis: ± 0.5% of RO* Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.0005 - 0.0007" nom. Safe Overload..... 150% of RO</p>
 <p>LLB400</p>	100, 250, 500, 1K, 2K, 2.5K lb. (445, 1112, 2224, 4K, 9K, 11K N)	<p>Load Button with Threaded/Tapped Holes</p> <ul style="list-style-type: none"> • Ultra low deflection • Robust strain relief • #26 AWG, 4 conductor, braided shielded Teflon cable 10 ft [3 m] long • 17-4 PH stainless-steel construction • For use in compression • Utilizes metal foil strain gauge technology 	<p>Rated Output: 2 or 2.5 mV/V nom. Nonlinearity: ± 0.15% 100-250 lb; 0.25% 500 - 1k lb; 0.35% 2k lb; 0.50% 2.5k lb of RO* Hysteresis: ± 0.15% 100-250 lb; 0.25% 500 - 1k lb; 0.35% 2k lb; 0.50% 2.5k lb of RO* Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 740 Ω nom. Deflection: 0.001" nom. Safe Overload..... 150% of RO</p>
 <p>LLB450</p>	5K, 10K lb. (22K, 44K N)	<p>High Capacity Load Button with Threaded/ Tapped Holes</p> <ul style="list-style-type: none"> • Ultra low deflection • Robust strain relief • #24 AWG, 4 conductor, braided shielded Teflon cable 10 ft [3 m] long • 17-4 PH stainless-steel construction • For use in compression 	<p>Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% of RO* Hysteresis: ± 0.5% of RO* Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 700 Ω nom. Deflection: 0.002" nom.</p>

MODEL #	CAPACITIES	DESCRIPTION	SPECIFICATIONS
 LLB500	15K, 20K, 30K lb. (67K, 89K, 133K N)	High Capacity Load Button with Threaded/ Tapped Holes <ul style="list-style-type: none"> • Ultra low deflection • Robust strain relief • #24 AWG, 4 conductor, braided shielded Teflon cable 10 ft [3 m] long • 17-4 PH stainless-steel construction • For use in compression 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% of RO* Hysteresis: ± 0.5% of RO* Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 700 Ω nom. Deflection: 0.0027 - 0.0037" nom. Safe Overload: 150% of RO
 LLB550	50K lb. (222K N)	High Capacity Load Button with Threaded/ Tapped Holes <ul style="list-style-type: none"> • Ultra low deflection • Robust strain relief • #24 AWG, 4 conductor, braided shielded Teflon cable 10 ft [3 m] long • 17-4 PH stainless-steel construction • For use in compression • Includes bottom mounting provisions 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% of RO* Hysteresis: ± 0.5% of RO* Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 700 Ω nom. Deflection: 0.0042" nom. Safe Overload: 150% of RO
 LTH300	50, 100, 250, 500, 1K lb. (222, 445, 1112, 2224, 4K N)	Donut/Through Hole Load Cell <ul style="list-style-type: none"> • Fast response time • Robust strain relief • Compatible in load washer applications • Offered in a variety of capacities and inner diameters • #29 AWG, 4 conductor, spiral shielded Teflon cable, 10 ft [3 m] long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% of RO* Hysteresis: ± 0.5% of RO* Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 700 Ω nom. Deflection: 0.001" nom. Safe Overload: 150% of RO
 LTH350	100, 500, 2K, 5K lb. (445, 2224, 9K, 22K N)	Donut/Through Hole Load Cell <ul style="list-style-type: none"> • Fast response time • Robust strain relief • Compatible in load washer applications • Offered in a variety of capacities and inner diameters • #24 AWG, 4 conductor, braided shielded Teflon cable, 10 ft [3 m] long 	Rated Output: 1.5 to 2 mV/V nom. Nonlinearity: ± 0.5% of RO* Hysteresis: ± 0.5% of RO* Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 700 Ω nom. Deflection: 0.002" nom. Safe Overload: 150% of RO
 LTH400	10K lb. (44K N)	Donut/Through Hole Load Cell <ul style="list-style-type: none"> • Fast response time • Robust strain relief • Compatible in load washer applications • Offered in a variety of capacities and inner diameters • #24 AWG, 4 conductor, braided shielded Te on cable, 10 ft [3 m] long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% of RO* Hysteresis: ± 0.5% of RO* Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 700 Ω nom. Deflection: 0.002" nom. Safe Overload: 150% of RO
 LTH500	2K, 3K, 5K, 7.5K, 10K, 15K, 20K, 30K, 50K lb. (9K, 13K, 22K, 33K, 44K, 67K, 89K, 133K, 222K N)	Donut/Through Hole Load Cell <ul style="list-style-type: none"> • Fast response time • Robust strain relief • Compatible in load washer applications • Offered in a variety of capacities and inner diameters • #24 AWG, 4 conductor, braided shielded Te on cable, 10 ft [3 m] long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% of RO* Hysteresis: ± 0.5% of RO* Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 700 Ω nom. Deflection: 0.002" nom. Safe Overload: 150% of RO
 LRF350	200, 300, 500, 1K lb. (890, 1334, 2K, 4K N)	Low Profile Load Cell <ul style="list-style-type: none"> • Light weight • High accuracy • Low profile • For use in both tension and compression • Easy to integrate on flat loading surfaces • 4 Pin LEMO Receptacle 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.1% of RO Hysteresis: ± 0.1% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.002 - 0.006" nom. Safe Overload: 150% of RO
 LRF400	0.25; 0.50; 1; 2.2; 5; 10; 25; 50; 100 lb. (1.1; 2.2; 4.5; 9.8; 22.2; 44.5; 111; 222; 445 N)	Low Profile Load Cell <ul style="list-style-type: none"> • High accuracy • Overload protection • For use in both tension and compression • 4 Pin LEMO Receptacle • Integrated connector, detachable cable available 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.05% of RO, 10g ± 0.1% Hysteresis: ± 0.05% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 1000 Ω nom. Deflection: 0.0014 - 0.0049" nom. Safe Overload: 50 - 250 lb



Automation



Sensors



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Test & Measurement Equipment






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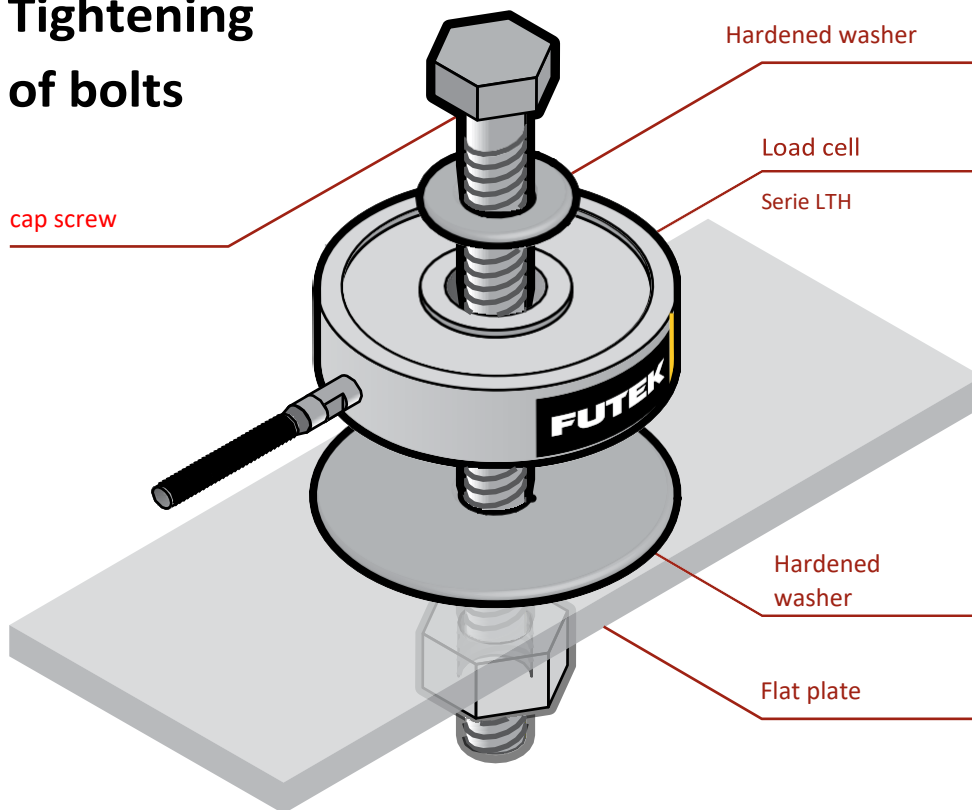


Central and South America

MODEL #	CAPACITIES	DESCRIPTION	SPECIFICATIONS
 LRM200	3,5 oz.; 8,8 oz.; 1, 2, 5, 10, 25, 50, 100 lb. (100 g, 250 g, 4, 9, 22, 44, 111, 222, 445 N)	Miniature S-Beam Jr. Load Cell with Male Threads • Miniature size • Notable nonlinearity • Available in both Aluminum or Stainless Steel • Built In Overload Protection • #29 AWG, 4 conductor, spiral shielded silicone cable, 5 ft [1.5 m] long	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.1% of RO Hysteresis: ± 0.1% of RO Operating Temperature: -60 to 200° F Excitation (max): 10 VDC Bridge Resistance: 350 - 1000 Ω nom. Deflection: 0.004 - 0.008" nom. Safe Overload: 200% - 1000% of ROI
 LSB200	0,35 oz.; 0,71 oz.; 1,76 oz.; 3,5 oz.; 8,8 oz.; 1, 2, 5, 10, 25, 50, 100 lb. (10 g, 20 g, 50 g, 100 g, 250 g; 4, 9, 22, 44, 111, 222, 445 N)	Miniature S-Beam Jr. Load Cell • Up to 10 times the overload protection • Overload is available in Tension and Compression • Light weight • Notable nonlinearity • Loads up to 100 lb (445 N) • Miniature size • #29 AWG, 4 conductor, spiral shielded silicone cable, 5 ft [1.5 m] long	Rated Output: 0.5 - 2 mV/V nom. Nonlinearity ± 0.1% of RO* Hysteresis ± 0.1% of RO* Operating Temperature: -60 to 200° F Excitation (max) 10 VDC Bridge Resistance 350 - 1000 Ω nom. Deflection 0.004 - 0.010" nom. Safe Overload: 200% - 1000% of RO
 LSB210	100 g, 250 g, 1, 2, 5, 10, 25, 50, 100 lb. (1; 2,5; 4,5; 8,9; 22,2; 44,5; 111; 222; 445 N)	Submersible Miniature S-Beam Jr. Load Cell • Up to 10 times the overload protection • For in line use in both tension and compression • Light weight • Miniature size • IP68 • #29 AWG, 4 conductor, spiral shielded silicone cable, 5 ft [1.5 m] long	Rated Output: 1 - 2 mV/V nom. Nonlinearity: ± 0.2 - 3% of RO Hysteresis: ± 0.2 - 5% of RO Operating Temperature: 0 to 160° F Excitation (max): 10 VDC Bridge Resistance: 350 - 1000 Ω nom. Deflection: 0.005" nom. Safe Overload: 200% - 1000% of RO
 LSB302	25, 50, 100, 300 lb. (111, 222, 445, 1334 N)	S-Beam Load Cell • Up to 10 times the overload protection • For in line use in both tension and compression • Notable nonlinearity • Connector or robust cable strain relief • #28 AWG, 6 conductor, polyurethane cable, 5 ft [1.5 m] long. 4-Pin LEMO® connector receptacle standard	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.05% of RO Hysteresis: ± 0.05% of RO Operating Temperature: -40 - 176°F or -60 - 200°F Excitation (max): 20 VDC Bridge Resistance: 1000 Ω nom. Deflection: 0.004 - 0.01" nom. Safe Overload: 500% - 1000% of RO
 LSB352	500, 1K lb. (2K, 4K N)	S-Beam Load Cell • Up to 5 times overload protection • For in line use in both tension and compression • Notable nonlinearity • Robust cable strain relief • #28 AWG, 6 conductor, braided shielded	Salida nominal: 3 mV/V nom. No linealidad: ± 0.05 % de salida nominal* Histéresis: ± 0.05 % de salida nominal* Temperatura de funcionamiento: -40 a 200 °F Excitación (máx.): 18 VCC Resistencia del puente: 350 Ω nom. Deflexión: 0,01" nom. Código del cableado: WC4
 LSB400	5K, 10K lb. (22K, 44K N)	S-Beam Load Cell • For in line use in both tension and compression • Notable nonlinearity • Connector or robust cable strain relief • #28 AWG, 6 conductor, polyurethane cable, 5 ft [1.5 m] long. LEMO® connector receptacle standard	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.05% of RO Hysteresis: ± 0.05% of RO Operating Temperature: -60 to 200° F Excitation (max): 20 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.011 - 0.020" nom. Safe Overload: 500% of RO
 FFP350	1 lb. (4 N)	Flat Plate Force Sensor • Full active bridge (300 series stainless steel) • As thin as 0.08" (2mm) • Can be utilized to measure force, pressure, and displacement • 29 AWG Teflon® wire, 6" long • 300 Series S.S.	Rated Output: 1.5 mV/V nom. Nonlinearity: ± 0.25% of RO Hysteresis: ± 0.25% of RO Operating Temperature: -60 to 200° F Excitation (max): 10 VDC Bridge Resistance: 350 Ω nom. Deflection: Contact Factory

MODEL #	CAPACITIES	DESCRIPTION	SPECIFICATIONS
 LSM200	10 lb. (44 N)	Foldable backward bar (original equipment manufacturer) <ul style="list-style-type: none"> • Integrated protection against overloads • Side mounting • Exposed elements • Aluminum 2024 • Flexible 2 "Molex® cable with 4 Type A conductors (1 mm pitch) 	Nominal output: 2.3 mV / V nom. Non-linearity: ± 0.2% nominal output Hysteresis: ± 0.2% nominal output Operating temperature: - 60 to 200 ° F Excitation (max.): 18 VCC Bridge resistance: 1000 Ω nom. Deflection: 0.01 "nom .
 LSM250	0,25; 0,5; 1 lb. (1, 2, 4 N)	OEM Load Cell <ul style="list-style-type: none"> • Intended for high volume applications • Easily integrates into OEM applications • Side mounting OEM load cell • Built-in overload protection • Light-weight design • #29 AWG, 4 conductor, spiral teflon cable, 6 in [152.4 mm] long • Can integrate with analog VDC, mA, digital SPI, I2C, RS-232, UART output, and more 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.05% of RO Hysteresis: ± 0.05% of RO Operating Temperature: -60 to 200° F Excitation (max.): 18 VDC Bridge Resistance: 1000 Ω nom. Deflection: 0.004" nom. Safe Overload: 50 lb
 LSM300	2.2; 5; 10; 25; 50; 100; 200; 500 lb. (9,8; 22; 44; 111; 222; 445; 890; 2224 N)	OEM Load Cell <ul style="list-style-type: none"> • Intended for high volume applications • Easily integrates into OEM applications • Built-in overload protection • Exceptional nonlinearity and nonrepeatability • Can integrate with analog VDC, mA, digital SPI, I2C, RS-232, UART output, and more • #29 AWG, 4 conductor, spiral teflon cable, 6 in [152.4 mm] long • RoHS compliant 	Rated Output..... 2 mV/V nom. Nonlinearity ± 0.02% to ± 0.06% of RO Hysteresis ± 0.02% to ± 0.06% of RO Operating Temperature..... -60 to 200° F Excitation (max)..... 18 VDC Bridge Resistance..... 1000 Ω nom. Deflection..... 0.0055 - 0.0080" nom. Safe Overload..... 250 - 400% of RO

Tightening of bolts



SUMMARY OF APPLICATION

The through-hole load cells (donut type) from FUTEK are the most suitable for directly measuring the tightening torque of the load. In the through hole series (LTH) you will find various capacities and diameter sizes perfect for bolt tightening applications.

PRODUCTS IN WHICH IT IS USED

Thru-hole charging cell / donut type (LTH series) complemented with instrumentation solutions (USB solutions, IPM650 digital display, IHH500 handheld device or amplifier).



Automation



Sensors



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Data Acquisition



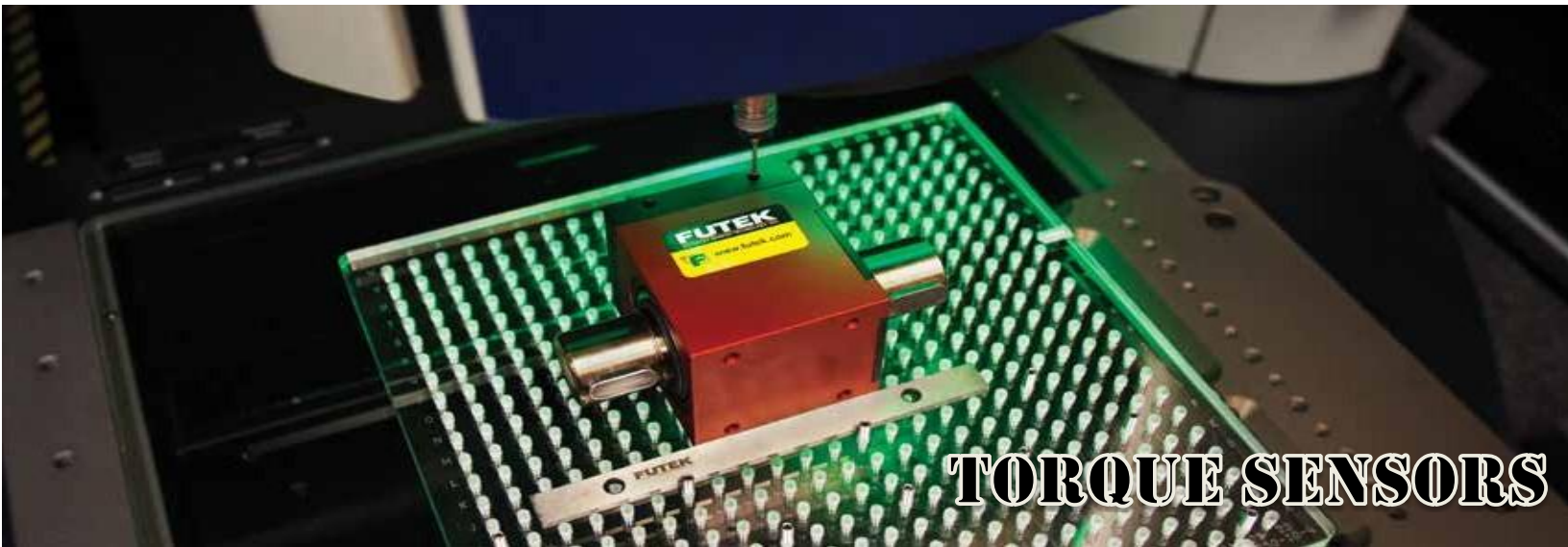
Test & Measurement Equipment



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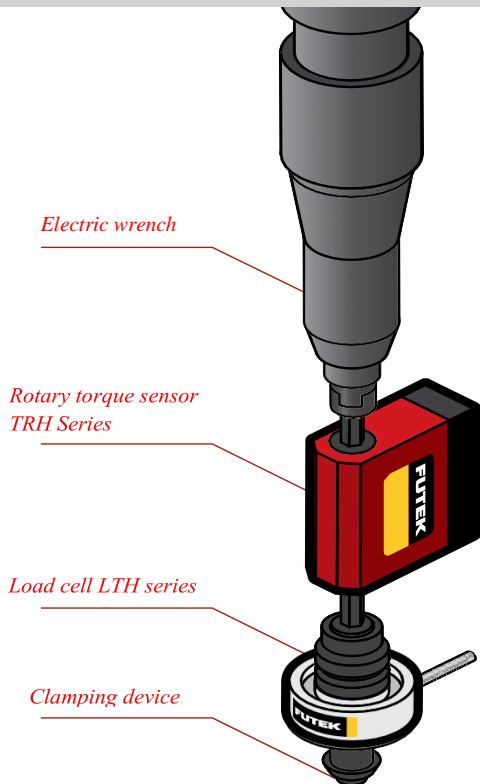
Central and South America



TORQUE SENSORS



Among FUTEK's extensive list of products is an impressive array of strain gauge Reaction and Rotary Torque Sensors. FUTEK's Reaction Torque Sensors are designed for static torsional measurements, while our Rotary Torque Sensors generate dynamic measurements. Both sensors' families produce an electrical output signal that can be streamed through USB Solutions or read on any of our digital displays or amplifiers.



Reaction Torque Sensors

Typically, reaction torque sensors are used for non-moving, in-line, and auditing measurement applications. Knowing this, we designed this torque series for versatility with multiple mounting options, different capacities, and various shaft dimensions.

- Static Measurements
- OEM Capabilities
- Proprietary Strain Gauge Technology
- Easy Integration with Instrumentation

Rotary Torque Sensors

With model options including Drive, Hex, and Shaft-to-Shaft, engineers and operators will find an appropriate sensor to meet their specifications. These rotary torque sensors are well-suited for aerospace, automotive, and robotic applications.

- Multiple outputs - mV/V, VDC, or USB
- Up to 12,000 RPM
- Capacity Range up to 1,000 Nm
- Encoder Options



MODEL #	CAPACITIES	DIMENSIONS	SPECIFICATIONS
 TAT200	50, 100 pulg.-oz. (353, 706 Nmm)	Miniature Screw Driver Reaction Torque Sensor <ul style="list-style-type: none"> • Designed for Torque auditing • Red anodized aluminum housing • Slim design • High accuracy • #28 AWG, 4 conductor, braided shielded PVC cable 10 ft [3 m] long 	Rated Output: 1 - 2 mV/V nom Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temp: 0 to 160° F Excitation (max): 18 VDC Bridge Res: 1000 Ω nom. Safe Overload: 150% of RO
 TDD400	5, 10, 20, 50, 160, 400, 1K pulg.-oz.; 100, 200, 500 pulg.-lb. (0,04; 0,08; 0,15; 0,37; 1,2; 3,0; 7,5; 12; 24; 60; Nm)	Square-Drive Reaction Torque Sensor <ul style="list-style-type: none"> • Easily integrates into OEM applications • Designed for Torque auditing • Aluminum construction • Built-in overload protection on lower ranges • 4 Pin LEMO® Receptacle (EGG. OB. 304 CLL) 	Rated Output: 1 - 2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω - 700 Ω nom. Safe Overload: 150% of RO
 TDF400	5, 10, 20, 50, 160, 400, 1K pulg.-oz.; 100, 200, 500 pulg.-lb. (0,04; 0,08; 0,15; 0,37; 1,2; 3,0; 7,5; 12; 24; 60; Nm)	Flange Reaction Torque Sensor <ul style="list-style-type: none"> • Easily integrates into OEM applications • Designed for Torque auditing • Aluminum construction • Built-in overload protection on lower ranges • 4 Pin LEMO® Receptacle (EGG.OB.304.CLL) 	Rated Output: 1 - 2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω - 700 Ω nom. Safe Overload: 150 - 300% of RO
 TDF600	1,2K; 2,4K; 6K pulg.-lb. (150, 300, 700 Nm)	Flange-to-Square Reaction Torque Sensor <ul style="list-style-type: none"> • Easily integrates into OEM applications • Designed for Torque auditing • Stainless-steel construction • 1/2" square drive (1200, 2400 in-lb), 3/4" square drive (6000 in-lb) • 6 Pin BENDIX Receptacle (PT02E-10-6P) 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.1% of RO Hysteresis: ± 0.1% of RO Operating Temperature: -60 to 200° F Excitation (max): 20 VDC Bridge Resistance: 700 Ω nom. Safe Overload: 150% of RO
 TDF650	12K pulg.-lb. (1,4K Nm)	Flange-to-Square Reaction Torque Sensor <ul style="list-style-type: none"> • Easily integrates into OEM applications • Designed for Torque auditing • Stainless-steel construction • 1" square drive • 6 Pin BENDIX Receptacle (PT02E-10-6P) 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.1% of RO Hysteresis: ± 0.1% of RO Operating Temperature: -60 to 200° F Excitation (max): 20 VDC Bridge Resistance: 700 Ω nom. Safe Overload: 150% of RO
 TFF325	20, 50 pulg.-oz.; 12, 50, 100 pulg.-lb. (141, 353 Nmm; 1,5; 6, 12 Nm)	OEM Flange-to-Flange Reaction Torque Sensor <ul style="list-style-type: none"> • Easily integrates into OEM applications • Intended for high volume applications • Aluminum construction • 0.5 inch through holes • Designed for torque auditing • #29 AWG, 4 conductor, spiral Teflon cable 6 in [152.4 mm] long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 1000 Ω nom. Safe Overload: 150% of RO
 TFF350	1,3K pulg.-lb. (150 Nm)	OEM Flange-to-Flange Reaction Torque Sensor <ul style="list-style-type: none"> • Easily integrates into OEM applications • Intended for high volume applications • Aluminum construction • 0.58 inch through holes • Designed for torque auditing • #29 AWG, 4 conductor, spiral Teflon cable 6 in [152.4 mm] long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 700 Ω nom. Safe Overload: 150% of RO
 TFF400	5, 10, 20, 50, 160, 400, 1K pulg.-oz., 100, 200, 500 pulg.-lb. (0,04; 0,08; 0,15; 0,37; 1,2; 3,0; 7,5; 12; 24; 60 Nm)	Flange-to-Flange Reaction Torque Sensor <ul style="list-style-type: none"> • Easily integrates into OEM applications • Designed for torque auditing • Aluminum construction • Built-in overload protection on lower ranges • 4 Pin LEMO® Receptacle (EGG. OB. 304 CLL) • Optional mounting plates available 	Rated Output: 1 - 2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω - 700 Ω nom. Safe Overload: 150 - 300% of RO



Automation



Sensors



Industrial Computers



Data Acquisition



Test & Measurement Equipment






North America

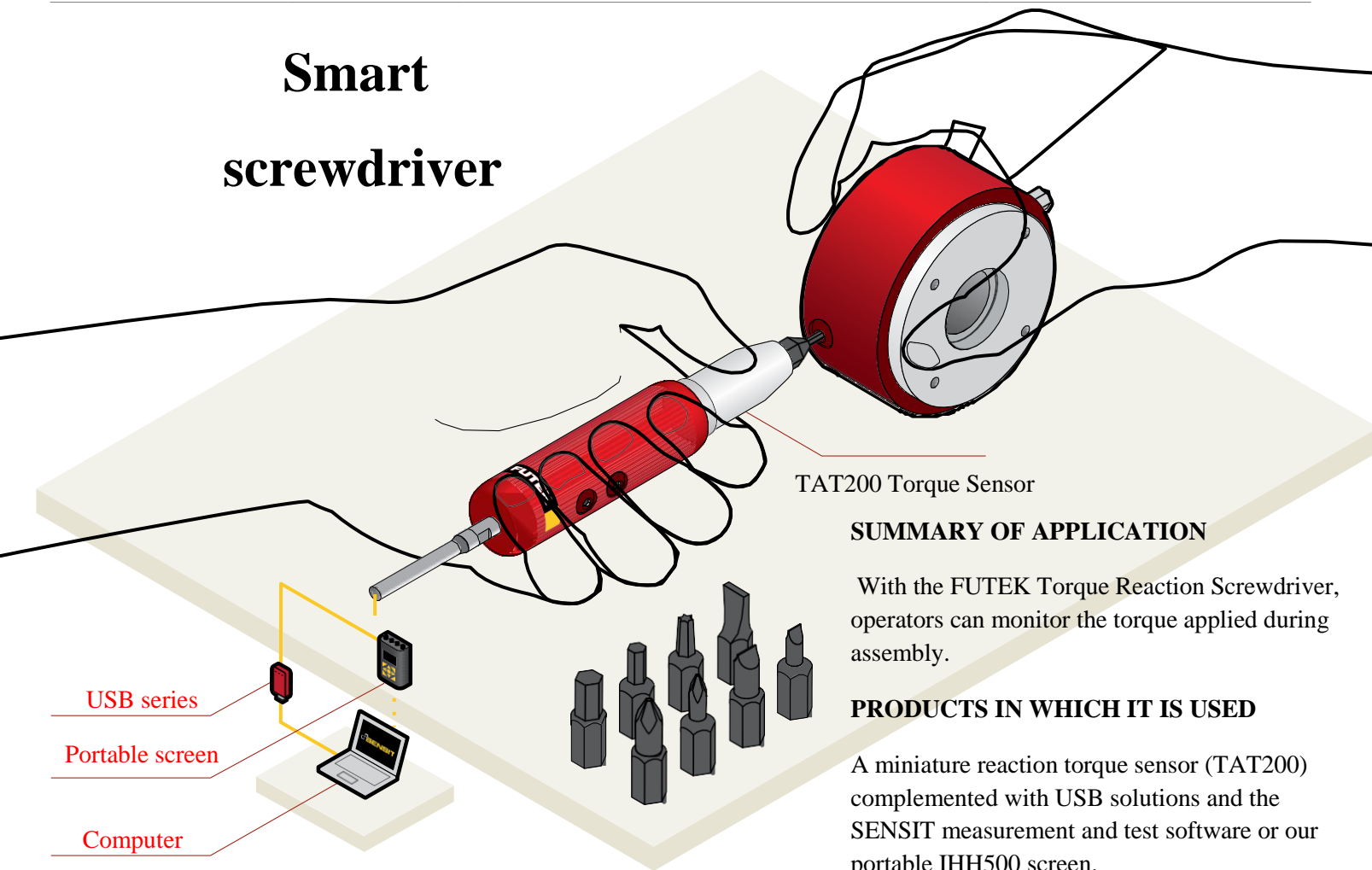


Central and South America

MODEL #	CAPACITIES	DESCRIPTION	SPECIFICATIONS
 TFF425	5, 10, 20, 50, 160, 400, 1K pulg.-oz., 100, 200, 500 pulg.-lb. (0,04; 0,08; 0,15; 0,37; 1,2; 3,0; 7,5; 12; 24; 60 Nm)	Flange-to-Flange Reaction Torque Sensor <ul style="list-style-type: none"> • Easily integrates into OEM applications • Designed for Torque auditing • Aluminum construction • Built-in overload protection • 4 Pin LEMO® Receptacle (EGG. OB. 304 CLL) 	Rated Output: 1 -2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω - 700 Ω nom. Safe Overload: 150 - 300% of RO
 TFF500	100 pulg.-lb. (11,3 Nm)	Flange-to-Flange Reaction Torque Sensor <ul style="list-style-type: none"> • Low profile with large inner diameter • Integrated TEDS streamlines the setup of a sensor with an instrument by allowing you to bypass complicated calibration steps • Fits a Prime Planetary Gearhead with P/N 017PLX • Accepts NEMA 17 mounting pattern • DB9 Male connector 	Rated Output: 1 mV/V nom. Nonlinearity: ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature: 0 to 160° F Excitation (max): 18 VDC Bridge Resistance: Contact Factory Safe Overload: 150% of RO
 TFF600	2K, 10K pulg.-lb. (113, 225, 565, 1130 Nm)	Flange-to-Flange Reaction Torque Sensor <ul style="list-style-type: none"> • Easily integrates into OEM applications • Designed for Torque auditing • Aluminum & stainless-steel construction • 6 Pin BENDIX Receptacle (PT02E-10-6P) 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Safe Overload: 150% of RO
 TSS400	5, 10, 20, 50, 160, 400, 1K pulg.-oz., 100, 200, 500 pulg.-lb. (0,04; 0,08; 0,15; 0,37; 1,2; 3,0; 7,5; 12; 24; 60 Nm)	Shaft-to-Shaft Reaction Torque Sensor <ul style="list-style-type: none"> • Easily integrates into OEM applications • Designed for Torque auditing • Aluminum construction • Built-in overload protection • Note: not a rotary torque sensor • 4 Pin LEMO® Receptacle (EGG. OB. 304 CLL) 	Rated Output: 1-2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.2% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω - 700 Ω nom. Safe Overload: 150% of RO
 TRH300	18, 53, 106, 177 pulg.-lb. (2, 6, 12, 20 Nm)	Slip-Ring Hex-Drive Rotary Torque Sensor <ul style="list-style-type: none"> • 1/4" Hex Drive in CW/CCW • Utilizes strain gauge technology • Compact size • Can operate up to 3000 RPM • Slip ring assembly • 6 Pin Binder Series #581 (09-0323-99-06) 	Rated Output: 2 mV/V nom. (1 mV/V 2Nm) Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.1% of RO Operating Temperature: 14 to 194° F Excitation (VDC or VAC): 5 to 11 Bridge Resistance: 350 Ω nom. Rotational Speed (max): 3k RPM Safe Overload: 150% of RO
 TRH605	4,5; 9; 18; 53; 106; 159 pulg.-lb. (0,5; 1; 2; 6; 12; 18 Nm)	Rotary Torque Sensor with Encoder <ul style="list-style-type: none"> • Square Drive in CW/CCW • Utilizes strain gauge technology • Angle speed feedback included • Compact size • Can operate up to 7000 RPM 	Rated Output: ±5 VDC Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.1% of RO Operating Temperature: -13 to 176° F Excitation (VDC): 11 to 26 Bridge Resistance: Contact Factory Rotational Speed (max): 7k RPM Encoder Excitation Voltage: 5 VDC Safe Overload: 150% of RO
 TRS300	89, 177, 443, 885, 1770, 4425, 9K pulg.-lb. (10, 20, 50, 100, 200, 500, 1K Nm)	Slip-Ring Shaft-to-Shaft Rotary Torque Sensor <ul style="list-style-type: none"> • Shaft to Shaft Drive in CW/CCW • Configures with external mating electronics • Slip ring-based torque sensor • Compact size • Designed for lower duty cycles • Can operate up to 3000 RPM • 6 Pin Binder Series #581 (09-0323-99-06) 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.1% of RO Operating Temperature: 14 to 194° F Excitation (VDC or VAC): 5 to 12 Bridge Resistance: 350 Ω nom. Rotational Speed (max): 3k RPM Safe Overload: 150% of RO
 TRD605	106, 159, 443, 885, 1416, 2213, 4425, 9K pulg.-lb. (12, 18, 50, 100, 160, 250, 500, 1K Nm)	Rotary Torque Sensor with Encoder <ul style="list-style-type: none"> • 1/4" Hex Drive in CW/CCW • Utilizes strain gauge technology • Angle speed feedback included • Compact size • Can operate up to 7000 RPM • 12 Pin Binder Series #581 (09-0331-90-12) 	Rated Output: ±5 VDC Nonlinearity: ± 0.2% of RO Hysteresis: ± 0.1% of RO Operating Temperature: -13 to 176° F Excitation (VDC): 11 to 26 Rotational Speed (max): 7k RPM Encoder Excitation Voltage: 5 VDC Safe Overload: 150% of RO

Nº de modelo	Capacidades	Descripción	Especificaciones
 TRS600	9, 18, 44, 89, 177, 443, 885 pulg.-lb. (1, 2, 5, 10, 20, 50, 100 Nm)	Non-Contact Rotary Torque Sensor <ul style="list-style-type: none"> • Shaft to Shaft Drive in CW/CCW • Utilizes strain gauge technology • Compact size • Can operate up to 12000 RPM (9-89 in-lb) • 12 Pin Binder Series #581 (09-0331-90-12) 	Rated Output:±5 VDC Hysteresis:± 0.1% of RO Operating Temperature: -13 to 176° F Excitation (VDC):11 to 26 Rotational Speed (max): 9k - 12k RPM Bridge Resistance:Contact Factory Safe Overload:150% of RO
 TRS605	9, 18, 44, 89, 177, 443, 885, 1770, 4425, 9K pulg.-lb. (1, 2, 5, 10, 20, 50, 100, 200, 500, 1K Nm)	Non-Contact Shaft-to-Shaft Rotary Torque Sensor with Encoder <ul style="list-style-type: none"> • Shaft to Shaft Drive in CW/CCW • Utilizes strain gauge technology • Angle speed feedback • Compact size • Can operate up to 7000 RPM • 12 Pin Binder Series #581 (09-0331-90-12) 	Rated Output:±5 VDC Nonlinearity:± 0.2% of RO Hysteresis:± 0.1% of RO Operating Temperature: -13 to 176° F Excitation (VDC):11 to 26 Rotational Speed (max): 7k RPM Encoder Excitation Voltage:5 VDC Safe Overload:150% of RO
 TRS705	9, 18, 44, 89, 177, 443, 885, 1770, 4425, 9K pulg.-lb. (1, 2, 5, 10, 20, 50, 100, 200, 500, 1K Nm)	Non-Contact Shaft-to-Shaft Rotary Torque Sensor with Encoder <ul style="list-style-type: none"> • Utilizes strain gauge technology • Angle speed feedback included • Compact size • Can operate up to 7000 RPM • 12 Pin Binder Series #581 (09-0331-90-12) • 100 - 1000 Nm mounting frame is detachable 	Rated Output:±5 VDC Nonlinearity:± 0.2% of RO Hysteresis:± 0.1% of RO Operating Temperature: -13 to 176° F Excitation (VDC):11 to 26 Rotational Speed (max): 7k RPM Encoder Excitation Voltage:5 VDC Safe Overload:150% of RO

Smart screwdriver







PRESSURE SENSORS



FUTEK offers high quality pressure sensors for various industries, such as aerospace, automotive, and general manufacturing. Utilizing strain gauge technology, these pressure sensors measure either gauge pressure or absolute pressure.

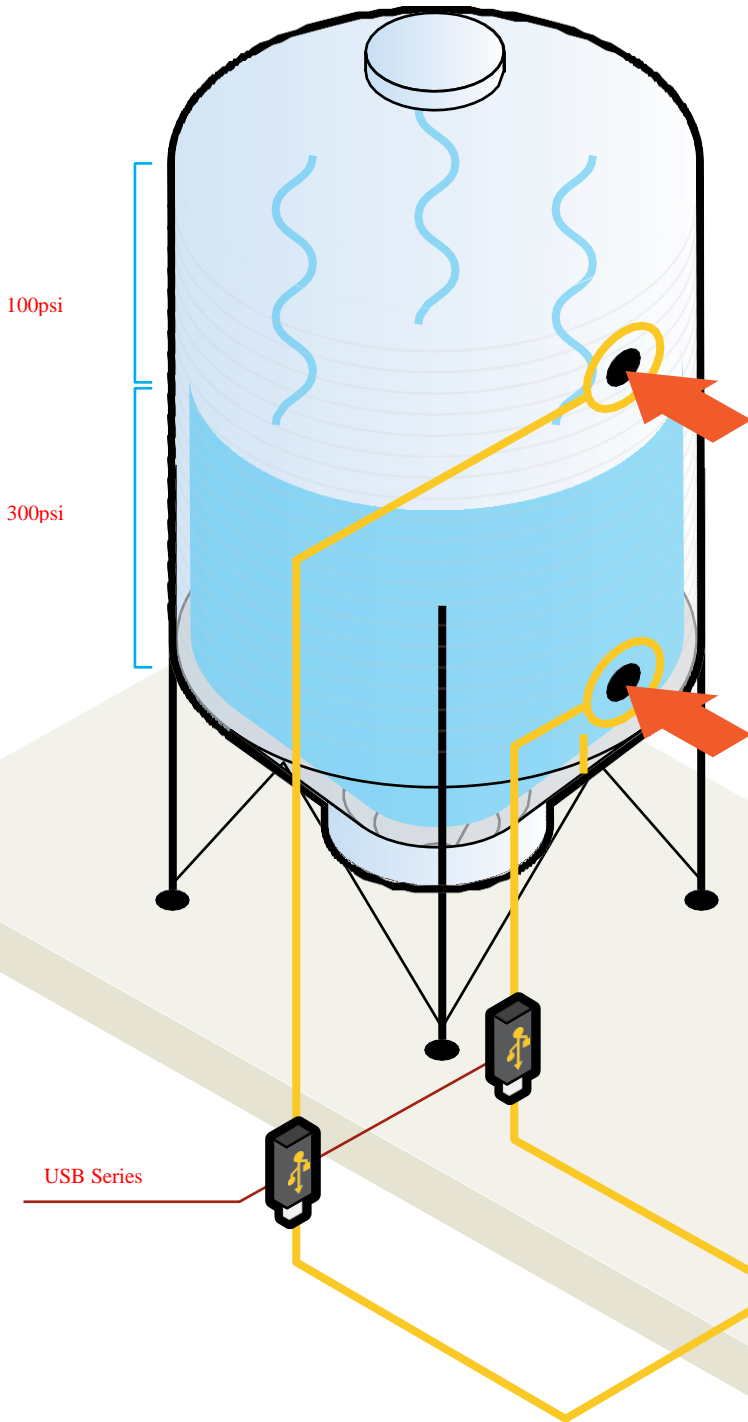
The Complete Pressure Sensor Suite

FUTEK’s pressure sensors have many notable capabilities, such as stainless steel wetted parts, flush diaphragm options, miniature models, OEM designs, high frequency response, and multiple output options. The full line of pressure sensors is compatible with FUTEK’s instrumentation suite of digital displays, amplifiers, and USB modules.

MODEL #	CAPACITIES	DESCRIPTION	SPECIFICATIONS
 PFP350	300, 1K, 5K, 10K psi (21, 69, 345, 690 bar) OEM	Female Port Pressure Sensor <ul style="list-style-type: none"> • 17-4 stainless steel • Unamplified output mV range • Pressure port: 1/4 NPT std. • 28 AWG, 6 conductor shielded Polyurethane cable, 3 ft standard. Quick disconnect Lemo® receptacle optional • Weight: 5.5 oz (156 g) 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.5% RO Hysteresis: ± 0.5% RO Operating Temperature: -60 to 250° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Safe Overload: 150% RO
 PFT510	225, 750, 3K, 7.5K, 10K psi (15, 50, 200, 500, 700 bar)	Flush Mount Pressure Sensor <ul style="list-style-type: none"> • Miniature size • Incredibly fast • Flush mount • Un-amplified out mV range • Mechanical engagement: M10 x 1 (optional 3/8-24) • 17-4 PH stainless-steel (Wetted/Body) • #29 AWG, 4 conductor, spiral shielded silicone cable, 5 ft [1.5 m] long 	Rated Output: 1 - 2 mV/V nom. Nonlinearity: 0.4% of RO BFSL Hysteresis: 0.2% of RO BFSL Operating Temperature: -40 to 194° F Excitation Voltage (max): 10 VDC Bridge Resistance: 350 Ω nom. Safe Overload: 150% of RO



Differential pressure measurement

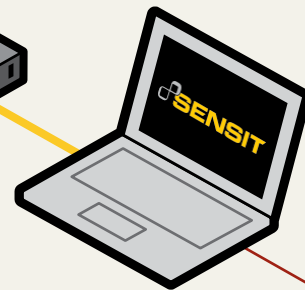
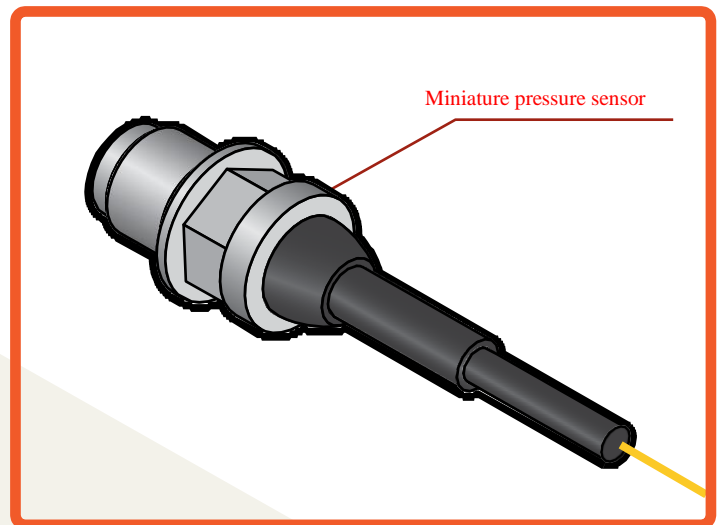


SUMMARY OF THE APPLICATION

Engineers and operators can use pressure sensors to monitor the fluid and gas ratio within a pressurized reservoir.

PRODUCTS IN WHICH IT IS USED

Two miniature pressure sensors complemented with USB solutions and SENSIT measurement and test software.

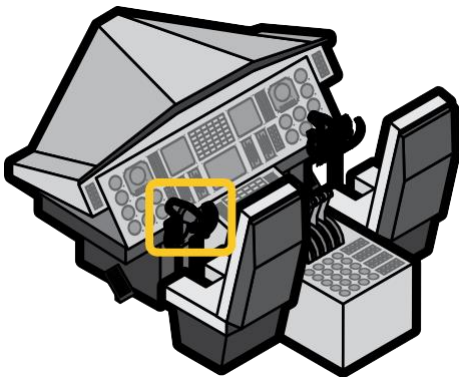




MULTI-AXIS SENSORS



Multi-axis sensors can accurately measure up to six components (three forces and three moments) of load/torque. For example, independent strain gauge bridges are used to measure three directions of force: longitude, latitude, and vertical, as well as the moments of each force direction



MBA500










A careful structural analysis of the monolithic flexure has been done to isolate the forces and moments, which results in a reduction of cross-talk sensitivities.

FUTEK's multi-axis sensor series measures different configurations of load, bi-axial torque, tension, tri-axial load, and multi-axis low profile thrust and moment. Commonly used in robotic and automotive applications, multi-axis sensors offer simultaneous feedback from a single sensor component. These sensors are not limited to ambient operating environments, but are able to be modified for more extreme conditions, such as submersion, non-magnetic, and cryogenic temperatures. FUTEK also strives to integrate electronics (amplifiers or USB Solutions) within several multi-axis sensors.

Capacities

- Encapsulated strain gages
- Low interference
- mV / V output
- High strength metals
- Capacity range: 10 - 25,000 lb.



MODEL #	CAPACITIES	DESCRIPTION	SPECIFICATIONS
 MAU300	200 lb. 890 N	Stick Shift Load Cell <ul style="list-style-type: none"> Measures Fx and Fy loads Anodized aluminum Ideal for automotive gearshift actuation force measurement applications Intended for manual use/human testing Ideal for aerospace control stick pull/push force auditing #28 AWG, 4 conductor braided shielded PVC cable 10 ft [3 m] long 	Rated Output: 2 mV/V nom. Nonlinearity: ± 0.25% of RO Hysteresis: ± 0.25% of RO Operating Temperature: -40 to 160° F Excitation (max): 20 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.009" nom. Safe Overload: 150% of RO
 MBA400	50, 200 lb. (222, 890 N)	Biaxial Load Cell <ul style="list-style-type: none"> Measure Fx and Fy loads Measures Fx and Fy loads Ideal for high speed planar force measurements for automation systems Ideal for embedded automotive and aircraft control stick force measurement 4 Pin LEMO receptacle EGG.0B.304.CLL Stainless Steel Construction 	Rated Output: 2 to 3 mV/V nom. Nonlinearity: ± 0.1% of RO Operating Temperature: - 60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Deflection: 0.0078 to 0.0110" nom. Safe Overload: 150% of RO
 MBA500	Fz: 50, 100, 200, 500 lb. Mz: 50, 100, 200, 500 in.-lb. (222, 445, 890, 2224 N; 222, 445, 500 Nm)	Torque and Thrust Biaxial Sensor <ul style="list-style-type: none"> Ideal for auditing the torque of aircraft control columns Ideal for propeller efficiency characterization Measures CW/CCW and tension and compression #28 AWG, 4 conductor, braided shielded PVC cable, 10 ft [3 m] long 	Rated Output: 2 to 3 mV/V nom. Nonlinearity: ± 0.25% of RO Hysteresis: ± 0.25% of RO Operating Temperature: -45 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Safe Overload: 125 to 150% of RO
 MTA400	Fx, Fy: 250 lb.; Fz: 500 lb. (Fx, Fy: 1K N; Fz: 2K N)	Triaxial Load Cell <ul style="list-style-type: none"> Ideal for wind tunnel lift, drag, and side force measurement Low mechanical crosstalk Ideal for flight control force auditing and measurement of Robotic Actuator and Reaction Forces 10 Pin LEMO® receptacle EGG.1B.310.CLL 	Rated Output (Fx, Fy, Fz): 1.5 mV/V nom. Rated Output (Fz): 0.75 mV/V nom. Nonlinearity: ± 0.25% of RO Hysteresis: ± 0.25% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350, 700 Ω nom. Safe Overload: 150% of RO
 MTA500	Mx, My: 400, 800, 1K, 2K pulg.-lb. Fz: 1K, 2K, 5K, 10K, 250K lb. (Mx, My: 45,2; 90,4; 113; 226 Nm) Fz: 4K, 9K, 22K, 44K, 1112K Nm)	Low Profile Thrust and Moment Load Cell <ul style="list-style-type: none"> Used for quantification of test stand misalignment Used for measurement of wind tunnel model aerodynamics Can Measure Force via Moment Arms (3) 6 Pin BENDIX receptacle (PT02E-10-6P) 	Rated Output (Mx, My, Fz): 0.75 to 2 mV/V nom. Nonlinearity (Mx, My): ± 0.5% of RO Nonlinearity (Fz): ± 0.5% of RO Crosstalk: 2.0% of RO Operating Temperature: -60 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 to 700 Ω nom. Safe Overload: 150% of RO
 MTA505	Mx, My: 2K, 10K pulg.-lb. Fz: 10K, 25K lb. (Mx, My: 226, 1130 N-M Fz: 44K, 111K N)	Low Profile Thrust and Moment Load Cell <ul style="list-style-type: none"> Measures Mx, My, Fz Used for quantification of test stand misalignment Used for measurement of wind tunnel model aerodynamics Can Measure Force via Moment Arms Tension base included (3) 6 Pin BENDIX receptacle (PT02E-10-6P) 	Rated Output (Mx, My): 0.5 to 2 mV/V nom. Rated Output (Fz): 2.5 to 4 mV/V nom. Nonlinearity (Mx, My): ± 0.5% of RO Nonlinearity (Fz): ± 0.2% of RO Crosstalk: 2.0% of RO Operating Temperature: -65 to 200° F Excitation (max): 18 VDC Bridge Resistance: 350 Ω nom. Safe Overload: 150% of RO
 MTA600	Fx, Fy: 2.5K lb. Fz: 5K lb. (Fx, Fy: 11K N) (Fz: 22K N)	Triaxial Load Cell <ul style="list-style-type: none"> Can support simultaneous force measurements on the X, Y, Z axes Used for wind tunnel model applications Used for triaxial dynamometer applications for motion studies DB15 Female 	Rated Output (Fx, Fy): 1.5 mV/V nom. Rated Output (Fz): 0.75 mV/V nom. Nonlinearity: ± 0.5% of RO Hysteresis: ± 0.5% of RO Operating Temperature: 0 to 160° F Excitation (max): 18 VDC Bridge Resistance (Fx, Fy): 350 Ω nom. Bridge Resistance (Fz): 700 Ω nom. Safe Overload: 150% of RO



Automation



Sensors



Industrial Computers



Data Acquisition



Test & Measurement Equipment



North America



Central and South America



INSTRUMENTS



FUTEK not only produces load, torque, pressure, and multi-axis sensors, but also an entire suite of instruments and software. From digital displays and amplifiers to USB Solutions, our engineering team designed and developed this line of instrumentation for versatility and efficiency. FUTEK's instruments integrate with our own SENSIT™ Test and Measurement Software, which was designed in-house at our headquarters.

Our Electrical Engineering Team is continuously working towards exploring new methods of data retrieval. From introducing a new differential amplifier to designing embedded transmitters and controllers, we are committed to offering efficient and smart instruments to our customers that are high performing and miniature in size.




Highlighted Display & Amplifier Capabilities:

- USB Link
- Analog Voltage / Current Output / Differential Output
- Strain Gauge / Amplified Sensor Output
- High Accuracy / Resolution
- Universal Unit Conversion
- Peak / Valley / Tare / Gross / Reset
- Embedded transmitters and Controllers

Highlighted USB Solution Capabilities:

- High Resolution
- High Accuracy
- Programmable Gain Digital Amplifier
- Selectable Sampling Rate
- ASCII Stream Output
- USB 2.0 Communication



MODEL #	DESCRIPTION	INPUT	OUTPUT	SPECIFICATIONS
 <p>IAA100</p>	<p>Voltage Analog Amplifier</p> <ul style="list-style-type: none"> • CE Approval • RoHS Compliant • Internal Span and Offset Potentiometers • Selectable reverse polarity • Bipolar output/ differential input • Voltage only Signal Conditioner • Compatible with any full bridge strain gauge sensor 	<p>$\pm 0,3 \text{ a } \pm 10 \text{ mV/V}$</p>	<p>$\pm 5 \text{ VDC}$, $\pm 10 \text{ VDC}$ and 0-5-10 VDC (with offset shift switch)</p>	<ul style="list-style-type: none"> • Power input: 12.5 to 26 VDC • Selectable excitation: 5 VDC and 10 VDC • Selectable shunt resistor (256 selections) with on board or remote trigger • Built-in DIN clip • Bandwidth: 1 kHz (standard), 10 kHz and 25 kHz (available) • Nonlinearity: $\pm 0.01\%$ of FSR
 <p>IAA200</p>	<p>Current Analog Amplifier</p> <ul style="list-style-type: none"> • CE Approval • RoHS Compliant • Internal Span and Offset Potentiometers • Selectable reverse polarity • Bipolar output/differential input • Current only Signal Conditioner • Compatible with any full bridge strain gauge sensor 	<p>$\pm 0,3 \text{ a } \pm 10 \text{ mV/V}$</p>	<ul style="list-style-type: none"> • 4-20 mA (unipolar) • 4-12-20 mA (bipolar) offset shift switch available 	<ul style="list-style-type: none"> • Power input: 12.5 to 26 VDC • Selectable excitation: 5 VDC and 10 VDC • Selectable shunt resistor (256 selections) with on board or remote trigger • Built-in DIN clip • Bandwidth: 1 kHz (standard), 10 kHz and 25 kHz (available) • Nonlinearity: $\pm 0.01\%$ of FSR
 <p>IHH500</p>	<p>Digital Hand Held Display</p> <ul style="list-style-type: none"> • CE Approval • RoHS Compliant • Two Individual Relay Outputs 	<ul style="list-style-type: none"> • Up to $\pm 500 \text{ mV/V}$ (Strain Gauge Input) • Up to $\pm 12 \text{ VDC}$ (Amplified Input) • Up to 30 mA (Amplified Input) • Leading and Lagging TTL input for Encoders (Elite Version Only) 	<ul style="list-style-type: none"> • USB 2.0 • ASCII Streaming Output • Analog Voltage Output: 0-5 VDC or $\pm 5 \text{ VDC}$ • Analog Current Output: 0-20 mA, 4-20 mA, 0-25 mA and 5-25 mA • Power Output 24 VDC/1W; 5 VDC/0.25W • 5.000 VDC Bridge Excitation 	<p>Multi-Purpose Display</p> <ul style="list-style-type: none"> • Compatible with any full bridge strain gauge sensor and most amplified output sensor (VDC, mA) • 21k Point Data logging • Excitation Output 5 VDC for strain gauge only • 16x4 Character LCD/6 Digit Display • Bridge Resistance Measurement • Shunt calibration • Universal Unit Conversion • 14 Sensor Profile Storage • Internal Resolution: 24 bits • Noise-free Resolution (mV/V): Up to 18.2 bits • Nonlinearity: $\pm 0.005\%$ of FSR
 <p>IPM650</p>	<p>Panel Mount Display</p> <ul style="list-style-type: none"> • CE Approval • RoHS Compliant • Two Individual Relay Outputs 	<ul style="list-style-type: none"> • Hasta $\pm 500 \text{ mV/V}$ (galga extensiométrica) • Hasta $\pm 12 \text{ VCC}$ (salida amplificada) • Hasta 30 VCC (salida amplificada) 	<ul style="list-style-type: none"> • USB 2.0 • Salida de transmisión ASCII • 0-5 VCC o $\pm 5 \text{ VCC}$ • 0-2 0mA, 4-20 mA, 0-25 mA y 5-25 mA • Potencia eléctrica 24 VCC/1 W; 5 VCC/0,2 5W • 5,000 V 	<ul style="list-style-type: none"> • Multi-Purpose Display • Compatible with any full bridge strain gauge sensor and most amplified output sensor (VDC, mA) • 21k Point Data logging • Excitation Output 5 VDC for strain gauge only • 16x4 Character LCD/6 Digit Display • Bridge Resistance Measurement • Shunt calibration • Universal Unit Conversion • 14 Sensor Profile Storage • Internal Resolution: 24 bits • Noise-free Resolution (mV/V): Up to 18.2 bits • Nonlinearity: $\pm 0.005\%$ of FSR
 <p>USB220</p>	<p>High Resolution USB Solution</p> <ul style="list-style-type: none"> • Sampling Rate: Up to 4,800 samples per second (SPS) • Bandwidth: Up to 1,200 Hz (SPS/4) • Internal Resolution: 24 bits • Noise-free Resolution (mV/V): Up to 18.1 bits • Bridge Excitation: 4.6 VDC • Nonlinearity: $\pm 0.005\%$ of FSR 	<ul style="list-style-type: none"> • Range: Up to $\pm 400 \text{ mV/V}$ • Max. Bridge Resistance: 5000 Ω • Min. Bridge Resistance: 50 Ω 	<ul style="list-style-type: none"> • USB 2.0 Communication Link • ASCII Streaming Output 	<ul style="list-style-type: none"> • USB Bus-Powered (5V) • Integrated Shunt Cal • Input/Output Short Circuit Protection • CE Approval • RoHS Compliant



Automation



Sensors



Industrial Computers



Data Acquisition





Test & Measurement Equipment



North America



Central and South America

MODEL #	DESCRIPTION	INPUT	OUTPUT	SPECIFICATIONS
 <p>USB320</p>	<p>Amplified Input USB Solution</p> <ul style="list-style-type: none"> • Sampling Rate: Up to 4,800 samples per second (SPS) • Bandwidth: Up to 1,200 Hz (SPS/4) • Internal Resolution: 24 bits • Noise-free Resolution (mV/v): Up to 21 bits • Power Output: 12 VDC, 1 Watt • Nonlinearity: $\pm 0.005\%$ of FSR 	<ul style="list-style-type: none"> • Entrada amplificada: ± 10 VCC (FSH03631) 0-20 mA (FSH0364) 	<ul style="list-style-type: none"> • Enlace de comunicación USB 2.0 • ASCII 	<ul style="list-style-type: none"> • Alimentación por bus USB (5 V) • Protección de cortocircuito de entrada/salida • Aprobado por CE • Compatible con RoHS • No linealidad: $\pm 0.005\%$ de FSR • Precisión: $\pm 0.005\%$ de FSR
 <p>USB520</p>	<p>mV/V, Amplified and Encoder Input USB Solution</p> <ul style="list-style-type: none"> • Sampling Rate: Up to 4,800 samples per second (SPS) • Bandwidth: Up to 1,200 Hz (SPS/4) • Internal Resolution: 24 bits • Noise-free Resolution (mV/V): Up to 18.2 bits • Bridge Excitation: 4.6 VDC • Power Output: 5-24 VDC, 1 Watt • Nonlinearity: $\pm 0.005\%$ of FSR 	<ul style="list-style-type: none"> • Range: Up to ± 400 mV/V • Amplified Input: ± 10 VDC, 0-20 mA • Max. Bridge Resistance: 5000 Ω • Min. Bridge Resistance: 50 Ω 	<ul style="list-style-type: none"> • USB 2.0 Communication Link • ASCII Streaming Output 	<ul style="list-style-type: none"> • USB Bus-Powered (5V) • Input/Output Short Circuit Protection • Quadrature Encoder Input • CE Approval • RoHS Compliant