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Load Cells Force/Torque Sensors™

Transducer Techniques®

INTRODUCTION

***Transducer Techniques, Inc**., established in 1979 designs and manufactures a complete line of load cells, torque sensors, special purpose transducers and related instrumentation. All transducer sensing elements incorporate bonded foil strain gages wired in a full wheatstone bridge configuration.*

Only strain gages of the highest quality are installed and configured by technicians who have undergone our extensive training program targeting craftsmanship and attention to detail. To the end user, this means a quality product.

TECHNICAL SUPPORT

Transducer Techniques maintains an experienced and highly trained applications engineering staff. Our engineers are available from 7:30 a.m. to 4:30 p.m. Monday through Friday, and are as close as your telephone. We urge you to call and discuss your requirements, and give us the opportunity to properly apply our sensors.

(800) 344-3965

(909) 719-3965 • Fax (909) 719-3900

E-mail: tti@ttloadcells.com

URL: http://www.ttloadcells.com

TABLE OF CONTENTS

LOAD CELLS / FORCE SENSORS

CLP SERIES Page **18-19**
UNIVERSAL / LOAD PIN
CAPACITY RANGES:
750 THROUGH 200,000 LBS.

LPO SERIES Page **23**
UNIVERSAL / LOW PROFILE
CAPACITY RANGES:
500, 1,000, 2,000, 3,000,
5,000, 10,000, 20,000 LBS.

SWO SERIES Page **24**
UNIVERSAL
CAPACITY RANGES:
1,000, 2,000, 3,000, 5,000,
10,000, 20,000, 30,000, 50,000 LBS.

HSW SERIES Page **25**
UNIVERSAL
CAPACITY RANGES:
1,000, 2,000, 3,000, 5,000,
10,000, 20,000, 30,000, 50,000 LBS.

LPU SERIES Page **26**
UNIVERSAL
CAPACITY RANGES:
100, 250, 500, 1,000, 2,000, 3,000,
4,000, 5,000, 7,500,10,000, 15,000,
20,000, 30,000, 50,000 LBS.

SBO SERIES Page **27**
UNIVERSAL
CAPACITY RANGES:
50, 100, 200, 300, 500, 750,
1,000, 2,000, 3,000, 5,000 LBS.

BEAM LOAD CELLS

TBS SERIES Page **28-29**
FULL BRIDGE
THIN BEAM SENSOR
CAPACITY RANGES:
.25, .50, 1, 2, 5, 10, 20, 40 LBS.

EBB SERIES Page **30**
ECONOMICAL
BENDING BEAM SENSORS
CAPACITY RANGES:
1, 2, 5, 10 Kg.

LSP SERIES Page **31**
LOW CAPACITY
SINGLE POINT LOAD CELL
CAPACITY RANGES:
.3, .5, 1, 2, 5, 10 Kg.

ESP SERIES Page **32**
ECONOMICAL
SINGLE POINT LOAD CELL
CAPACITY RANGES:
6, 10, 15, 20, 25, 30, 35 Kg.

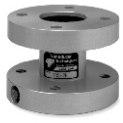
SPL SERIES Page **33**
ECONOMICAL
SINGLE POINT LOAD CELL
CAPACITY RANGES:
65, 100, 150, 200, 300, 500 Kg.

SBL SERIES Page **34**
HEAVY DUTY
SHEAR BEAM LOAD CELL
CAPACITY RANGES:
500, 1,000, 2,000, 2500, 3,000,
4000, 5,000, 10,000, 15,000,
20,000 LBS.

TORQUE SENSORS Reaction

RTS SERIES Page **35**
REACTION TORQUE SENSOR
CAPACITY RANGES:
5, 10, 25, 50, 100, 200,
500, 1,000 OUNCE INCHES

TRT SERIES Page **36**
REACTION TORQUE SENSOR
CAPACITY RANGES:
25, 50, 100, 200, 500, INCH LBS.



TRS SERIES Page **37**
REACTION TORQUE SENSOR
CAPACITY RANGES:
500, 1,000, 2,000, 5,000, 10,000,
20,000, 50,000, 100,000 INCH LBS.

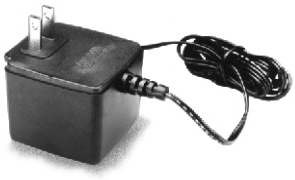
SWS SERIES Page **38**
REACTION TORQUE SENSOR
CAPACITY RANGES:
10, 20, 50, 100, 250,
600, 1,000 FT. LBS.

TABLE OF CONTENTS

DIGITAL / COMPACT / PEAK CAPTURE HAND-HELD FORCE GAUGE

MODEL HFG-45

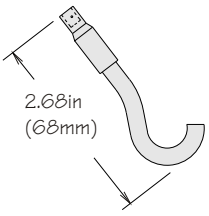
The HFG-45 is a pocket sized hand held high quality digital force gauge. Overall, this force gauge is the most useful force measuring instrument your company can have, for either hand held applications via strap, or hard mounted via four threaded holes on the back. Choose engineering units of lb, oz, kg, N, or kN for loads up to 45 pounds with full scale accuracy of .5% in either tension or compression. The HFG-45 can be used for continuous or peak capture measurements. Standard accessories include a test hook, extension rod, and compression plate shown below. Four replaceable AA batteries are supplied, and an optional AC power supply is available.

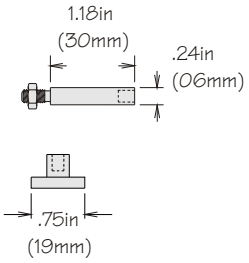


Optional
AC Power Adaptor *is available as* ***APD-HFG*** *from our accessories section*

ACCESSORIES INCLUDED:

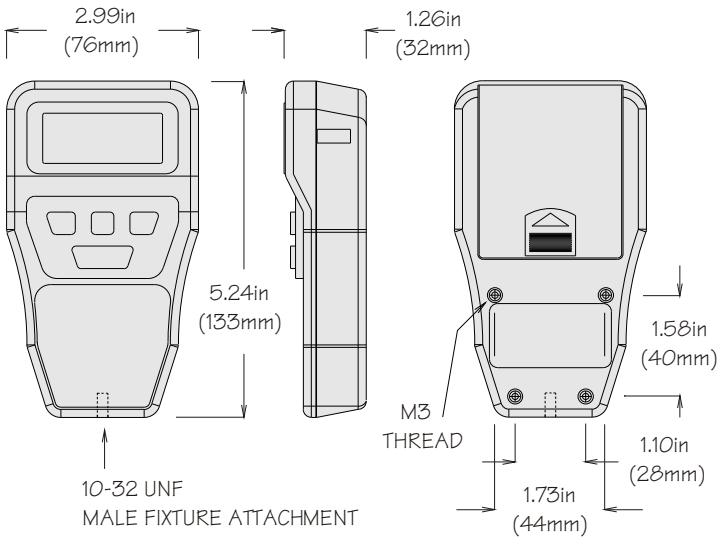
Test Hook
Extension Rod
Compression Plate





SPECIFICATIONS

Capacity:	200 N/20kgf/45lbf
Resolution:	1 part in 2000 (0.1N/0.01kgf/0.02lbf)
Units:	Imperial, SI and metric conversions
Force Capture Rate:	10 Hz
Accuracy:	±0.5% of full scale ±1 L.S.D.
Power Supply:	4 x 1.5V AA batteries or adapter 9 VDC 50 mA
Battery Saving Mode:	Instrument switches off after 5 minutes of inactivity(with an override for continuous measurement applications)
Peak Capture:	Peak capture and normal measurement for tension and compression
Compensated Temp. Range:	60°F to 160°F
Safe Temp. Range:	65°F to 200°F
Gauge Housing:	High impact composite materials
Weight:	250g (8.83 oz.)



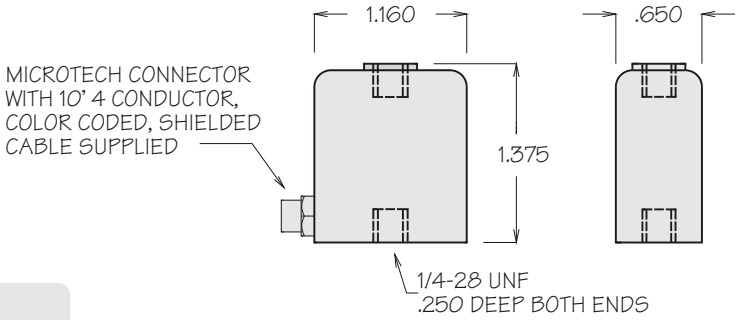
ULTRA PRECISION MINI LOAD CELL
UNIVERSAL / TENSION OR COMPRESSION

MDB SERIES

CAPACITY RANGES:
2.5, 5, 10, 25, 50, 75, 100 LBS.

The MDB Series was designed to help fill the growing need for a greater selection of high accuracy load cells for use in space limited applications. The anodized aluminum MDB's are compliant in tension and compression, therefore, a good choice for in line through zero applications, as well as single direction tension or compression. Applications may include load feedback for process control, low capacity tensile testing machines, robotics, or designed into your product. Give us a call; we would be pleased to discuss your application requirements.

DIMENSIONS MDB-2.5 THRU 1OO



SPECIFICATIONS

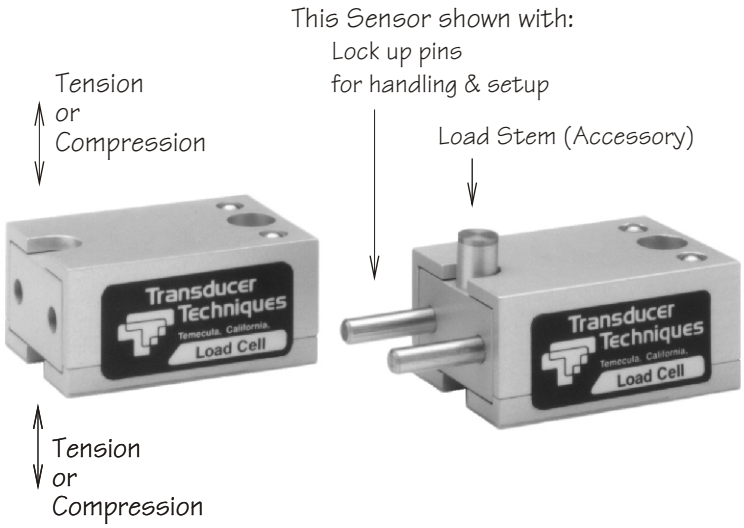
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.05% of R.O.
Hysteresis:	0.05% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Weight:	1 oz. all ranges

MODEL	CAPACITY LBS.	NATURAL RINGING FREQUENCY HZ	DEFLECTION INCHES
MDB-2.5	2.5	575	.004
MDB-5	5	765	.004
MDB-10	10	1,400	.004
MDB-25	25	2,700	.006
MDB-50	50	3,100	.008
MDB-75	75	3,150	.010
MDB-100	100	3,300	.012

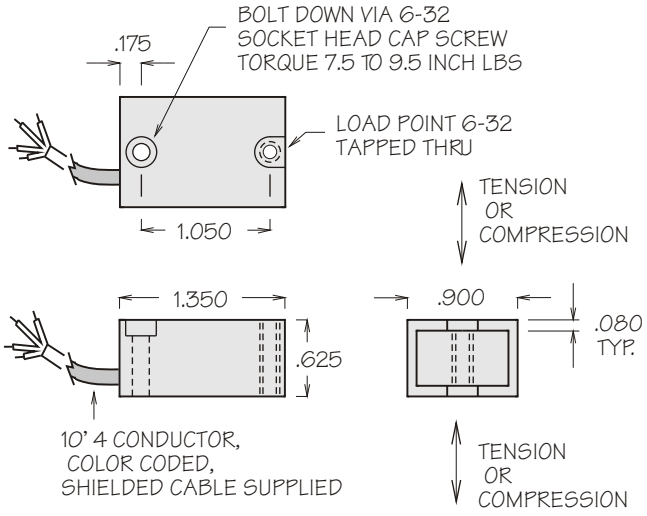
PRECISION GRAM SENSOR
UNIVERSAL / TENSION OR COMPRESSION

GS0 SERIES

CAPACITY RANGES:
10, 25, 30, 50, 100, 150,
250, 500, 1,000 GRAMS



The GS0 Series can be utilized in tension or compression or both with excellent compliance. The force sensing end of the anodized aluminum GS0 Series is tapped 6-32 thru for attachment possibilities for almost any application. Bonded foil strain gages at the sensing element provide for excellent stability over the suggested temperature range and ensure long term reliability. Call for application assistance.



SPECIFICATIONS

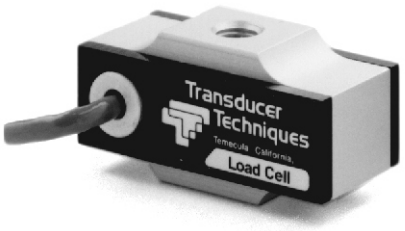
Rated Output (R.O.):	1 mV/V nominal
Nonlinearity:	0.05% of R.O.
Hysteresis:	0.05% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Deflection Inches:	0.004 @ R.O.
Weight:	1 oz. all ranges

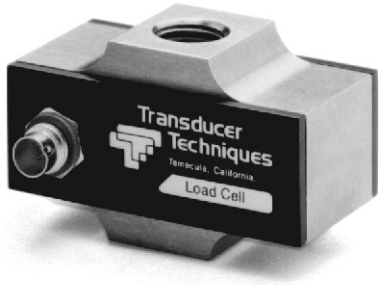
MODEL	CAPACITY GRAMS	NATURAL RINGING FREQUENCY HZ	DEFLECTION INCHES
GS0-10	10	260	.004
GS0-25	25	475	.004
GS0-30	30	360	.004
GS0-50	50	440	.004
GS0-100	100	610	.004
GS0-150	150	700	.004
GS0-250	250	1000	.004
GS0-500	500	1450	.004
GS0-1K	1,000	2000	.004

MINI LOW PROFILE LOAD CELL
UNIVERSAL / TENSION OR COMPRESSION

MLP SERIES

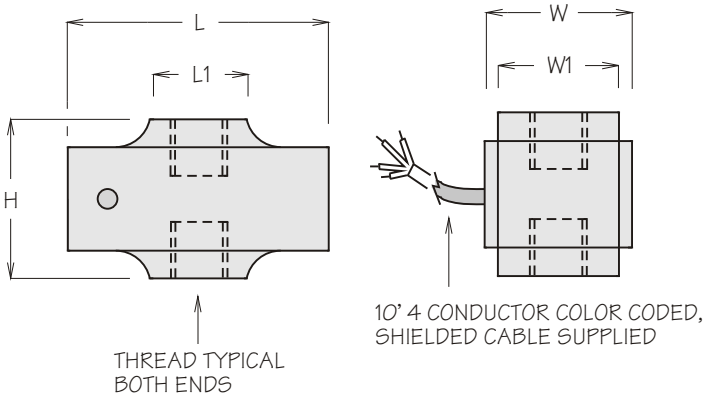
CAPACITY RANGES:
10, 25, 50, 75, 100, 150,
200, 300, 500, 750, 1,000 LBS.





The model MLP Series load cells were designed with economy as first priority. They are a scaled down version of our successful LP0 Series. MLP-10 through MLP-300 are anodized aluminum and the MLP-500 through MLP-1K are made from 17-4ph heat treated stainless steel. The unique low profile design of the MLP Series provides excellent stability for in line applications for tension and/or compression, while saving space at the same time.

Options
-CO *Mini Gold Pin Connector System, male and female with 10' 4 cond. color coded shielded cable*
-DB *Dual Bridge*



SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.1% of R.O.
Hysteresis:	0.1% of R.O.
Nonrepeatability:	0.05% of R.O.
Creep in 20 Min.:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

		DIMENSIONS (INCHES)							NATURAL RINGING		
MODEL	CAPACITY LBS.	L	L1	W	W1	H	THREAD	THREAD DEPTH	FREQUENCY HZ	DEFLECTION INCHES	WT. OZS.
MLP-10	10	1.504	.600	.54	.375	.75	10-32	.200	2,175	.003	.5
MLP-25	25	1.521	.600	.66	.500	.75	1/4-28	.230	2,200	.003	.7
MLP-50	50	1.584	.625	.66	.500	.75	1/4-28	.230	2,500	.003	.7
MLP-75	75	1.640	.650	.66	.500	.75	1/4-28	.230	2,800	.003	.8
MLP-100	100	1.664	.660	.66	.500	.75	1/4-28	.230	4,500	.003	.8
MLP-150	150	1.642	.575	.93	.750	1.00	3/8-24	.375	4,500	.003	1.3
MLP-200	200	1.688	.580	.93	.750	1.00	3/8-24	.375	5,200	.003	1.4
MLP-300	300	1.748	.600	.93	.750	1.00	3/8-24	.375	5,200	.003	3.0
MLP-500	500	1.658	.580	.93	.750	1.00	3/8-24	.375	5,200	.003	3.0
MLP-750	750	1.734	.585	.93	.750	1.00	3/8-24	.375	5,200	.003	3.0
MLP-1K	1,000	1.784	.615	.93	.750	1.00	3/8-24	.375	5,200	.003	3.0

ECONOMICAL TENSION LOAD CELL FOR ACCURATE IN-LINE FORCE MEASUREMENT

TLL SERIES

CAPACITY RANGES: 5K, 10K, 20K, 30K, 50K LBS.

Our TLL Series load cells are offered as an economical method for accurately measuring in line tension forces. Best results are obtained when loaded through spherical rod end bearings or similar "universal" mechanical linkage. Ranges 500 through 3,000 lbs. are anodized aluminum, and ranges 5,000 through 50,000 lbs. are manufactured from heat treated 17-4ph stainless steel. The TLL Series sensing areas and cable exit are moisture protected for semi-controlled environments.

CAPACITY RANGES: 500, 1,000, 2,000, 3,000 LBS.

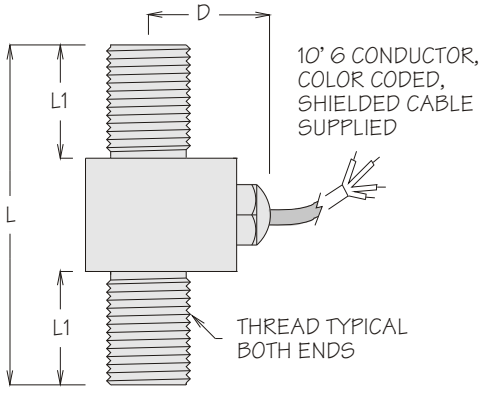
***Options** available with TLL-5K thru TLL-50K only*
***-PTB -** Connector twist lock (PT02A-10-6P)*

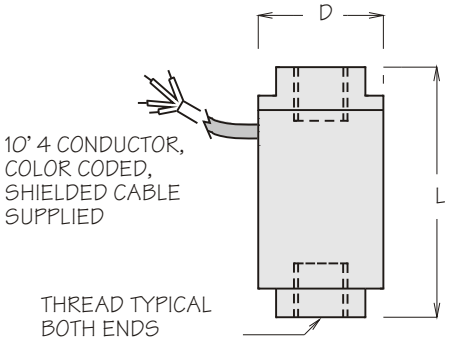
SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal	Temp Effect on Output:	0.005% of Load/°F
Nonlinearity:	0.25% of R.O.	Temp. Effect on Zero:	0.005% of R.O./°F
Hysteresis:	0.25% of R.O.	Terminal Resistance:	350 ohms nominal
Nonrepeatability:	0.1% of R.O.	Excitation Voltage:	10 VDC
Zero Balance:	1.0% of R.O.	Safe Overload:	150% of R.O.
Compensated Temp. Range:	60° to 160°F	**DEFLECTION**	
Safe Temp. Range:	-65° to 200°F	TLL-500 thru TLL-3K:	0.003 inches
		TLL-5K thru TLL-50K:	0.005 inches

DIMENSIONS (INCHES)

MODEL	CAPACITY LBS.	L	L1	D	THREAD	WT. OZS.
TLL-5K	5,000	3.50	1.125	1.500	3/4-16 UNF	8
TLL-10K	10,000	3.50	1.125	1.500	3/4-16 UNF	8
TLL-20K	20,000	3.75	1.250	1.600	1-14 UNS	14
TLL-30K	30,000	4.25	1.500	1.700	1 1/4-12 UNF	24
TLL-50K	50,000	5.00	1.875	1.825	1 1/2-12 UNF	40





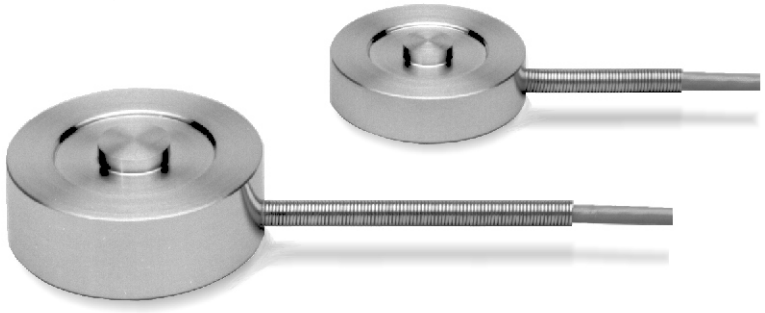
DIMENSIONS (INCHES)

MODEL	CAPACITY LBS.	DIA.	L	THREAD	THREAD DEPTH	WT. OZS.
TLL-500	500	.750	1.500	1/4-28 UNF	.250	.5
TLL-1K	1,000	.875	1.750	3/8-24 UNF	.375	.6
TLL-2K	2,000	.875	1.750	3/8-24 UNF	.375	.7
TLL-3K	3,000	1.25	2.000	1/2-20 UNF	.500	1.0

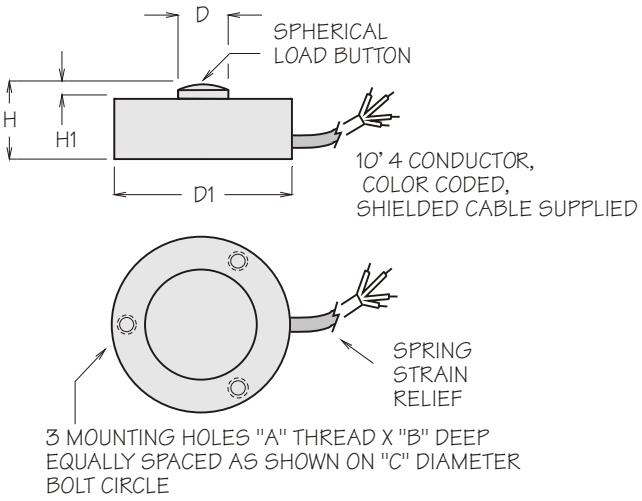
LOW PROFILE COMPRESSION ONLY LOAD BUTTON

LB0 SERIES

CAPACITY RANGES:
100, 250, 500, 750, 1,000, 2,000, 3,000, 5,000, 10,000, 15,000, 20,000, 30,000, 50,000 LBS.



The LB0 Series (Load Button) load cells are offered for compression only applications where space is limited. Matching surface must be flat and at least the diameter of (D1). The loading diameter (D2) is slightly convex for accurate load distribution. Threaded mounting holes are provided on the bottom surface for fastening down from beneath. These sensors are manufactured from heat treated 17-4ph stainless steel and sealed for use in most industrial environments.



SPECIFICATIONS

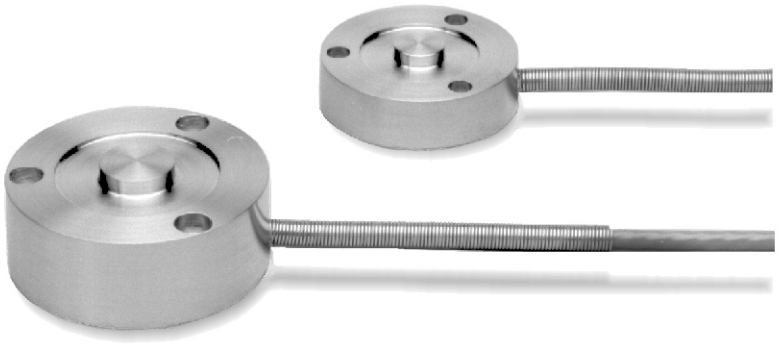
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.25% of R.O.
Hysteresis:	0.25% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

		DIMENSIONS (INCHES)											
MODEL	CAPACITY LBS.	D DIA.	D1 DIA.	H	H1	BUTTON RADIUS	A THREAD UNC	B THREAD DEPTH	C BOLT CIRCLE	NATURAL RINGING FREQUENCY HZ	DEFLECTION INCHES	WT. OZS.
LB0-100A	100	.21	1.000	.40	.05	2.0	4-40	.22	.750	25,000	.001	1.0
LB0-100	100	.32	1.240	.40	.07	2.0	6-32	.22	1.000	25,000	.001	1.2
LB0-250	250	.32	1.240	.40	.07	2.0	6-32	.25	1.000	25,000	.001	1.2
LB0-500	500	.32	1.240	.40	.07	2.0	6-32	.25	1.000	28,000	.001	1.2
LB0-750	750	.32	1.240	.40	.07	2.0	6-32	.25	1.000	28,000	.001	1.2
LB0-1K	1,000	.32	1.240	.40	.07	2.0	6-32	.25	1.000	32,000	.001	1.3
LB0-2K	2,000	.32	1.240	.40	.07	2.0	6-32	.25	1.000	32,000	.001	1.3
LB0-3K	3,000	.45	1.490	.62	.08	4.0	6-32	.25	1.250	28,000	.002	3.0
LB0-5K	5,000	.45	1.490	.62	.08	4.0	6-32	.25	1.250	22,000	.002	3.0
LB0-10K	10,000	.45	1.490	.62	.08	4.0	6-32	.25	1.250	24,000	.002	3.0
LB0-15K	15,000	.60	1.990	1.00	.12	6.0	6-32	.25	1.625	20,000	.002	8.0
LB0-20K	20,000	.60	1.990	1.00	.12	6.0	6-32	.25	1.625	20,000	.002	9.0
LB0-30K	30,000	.60	1.990	1.00	.12	6.0	6-32	.25	1.625	15,500	.002	9.0
LB0-50K	50,000	.80	2.990	1.50	.18	6.0	6-32	.25	2.375	10,000	.003	33.0

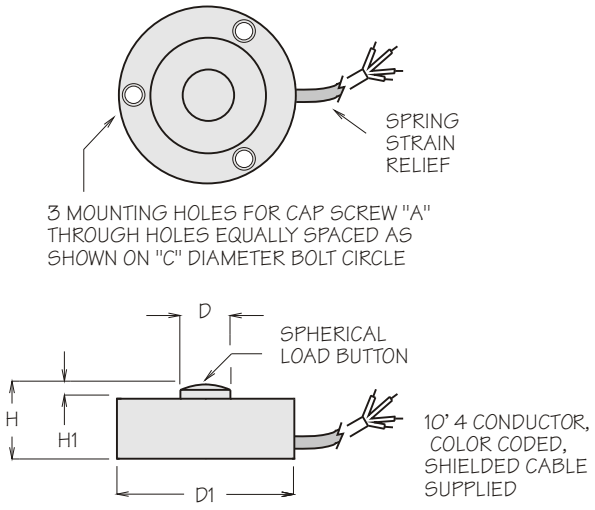
LOW PROFILE COMPRESSION ONLY LOAD BUTTON

LBC SERIES

CAPACITY RANGES:
100, 250, 500, 750, 1,000, 2,000, 3,000, 5,000, 10,000, 15,000, 20,000, 30,000, 50,000 LBS.



The LBC Series (Load Button) load cells are offered for compression only applications where space is limited. The matching surface must be flat and at least the diameter of (D1). The loading diameter (D2) is slightly convex for accurate load distribution. Counter bored mounting holes are provided for fastening down from the top. These sensors are manufactured from heat treated 17-4ph stainless steel and sealed for use in most industrial environments.



SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.25% of R.O.
Hysteresis:	0.25% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

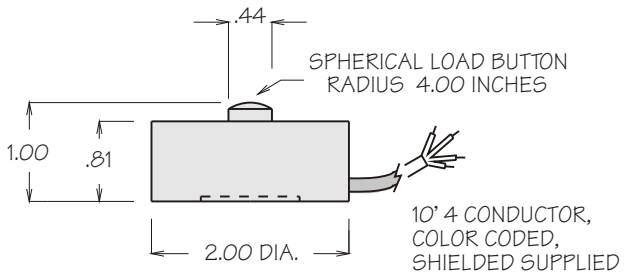
		DIMENSIONS (INCHES)							NATURAL RINGING		
MODEL	CAPACITY LBS.	D DIA.	D1 DIA.	H	H1	BUTTON RADIUS	A CAP SCREW	C BOLT CIRCLE	FREQUENCY HZ	DEFLECTION INCHES	WT. OZS.
LBC-100A	100	.21	1.000	.40	.05	2.0	#1	.750	25,000	.001	1.0
LBC-100	100	.32	1.240	.40	.07	2.0	#2	1.000	25,000	.001	1.2
LBC-250	250	.32	1.240	.40	.07	2.0	#2	1.000	25,000	.001	1.2
LBC-500	500	.32	1.240	.40	.07	2.0	#2	1.000	28,000	.001	1.2
LBC-750	750	.32	1.240	.40	.07	2.0	#2	1.000	28,000	.001	1.2
LBC-1K	1,000	.32	1.240	.40	.07	2.0	#2	1.000	32,000	.001	1.3
LBC-2K	2,000	.32	1.240	.40	.07	2.0	#2	1.000	32,000	.001	1.3
LBC-3K	3,000	.45	1.490	.62	.08	4.0	#4	1.250	28,000	.002	3.0
LBC-5K	5,000	.45	1.490	.62	.08	4.0	#4	1.250	22,000	.002	3.0
LBC-10K	10,000	.45	1.490	.62	.08	4.0	#4	1.250	24,000	.002	3.0
LBC-15K	15,000	.60	1.990	1.00	.12	6.0	#6	1.625	20,000	.002	8.0
LBC-20K	20,000	.60	1.990	1.00	.12	6.0	#6	1.625	20,000	.002	9.0
LBC-30K	30,000	.60	1.990	1.00	.12	6.0	#6	1.625	15,500	.002	9.0
LBC-50K	50,000	.80	2.990	1.50	.18	6.0	#6	2.375	10,000	.003	33.0

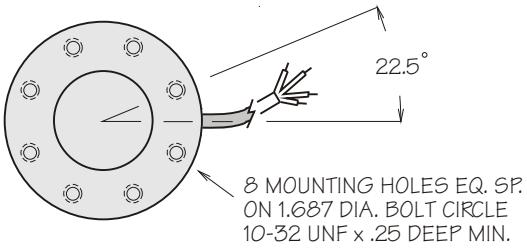
LOW PROFILE COMPRESSION ONLY LOAD BUTTON WITH MOUNTING PROVIDED

LBM SERIES

CAPACITY RANGES:
50, 100, 200, 500,
1,000, 2,000, 2,500,
5,000, 8,000, 10,000 LBS.

The LBM Series (Load Button) load cells are offered for compression only applications where space is limited. This load button is a direct replacement for many of the same type and bolt patterns currently used in the industry. The matching surface must be flat and at least 2 inches in diameter. The loading diameter is slightly convex for accurate load distribution. Eight threaded mounting holes are provided on the bottom surface for fastening down from beneath. These sensors are manufactured from heat treated 17-4ph stainless steel, and the sensing element incorporates bonded foil strain gages of the highest quality. They are sealed for protection against most industrial environments.





SPECIFICATIONS

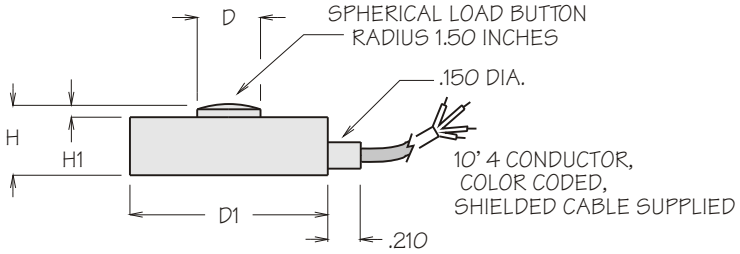
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.15% of R.O.
Hysteresis:	0.1% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Deflection Inches:	0.002 @ R.O.

SUBMINIATURE COMPRESSION ONLY LOAD BUTTON

SLB SERIES

CAPACITY RANGES:
25, 50, 100, 250,
500, 750, 1,000 LBS.

The SLB Series Subminiature load cells (Load Buttons) are offered for compression only applications where space is limited. The matching surface must be flat for ultimate accuracy. The loading diameter is slightly convex for accurate load distribution. These sensors are manufactured from heat treated 17-4ph stainless steel, and the sensing element incorporates bonded foil strain gages of the highest quality. They are sealed for protection against most industrial environments.



SPECIFICATIONS

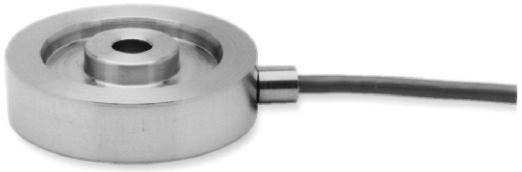
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.25% of R.O.
Hysteresis:	0.25% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
	5 VDC on SLB-25 & SLB-50
Safe Overload:	150% of R.O.
Deflection Inches:	0.002 @ R.O.

		DIMENSIONS (INCHES)			
MODEL	CAPACITY LBS.	D	D1	H	H1
SLB-25	25	.090	.375	.250	.050
SLB-50	50	.090	.375	.250	.050
SLB-100	100	.125	.500	.250	.050
SLB-250	250	.125	.500	.250	.050
SLB-500	500	.200	.750	.250	.050
SLB-750	750	.200	.750	.250	.050
SLB-1K	1,000	.200	.750	.250	.050

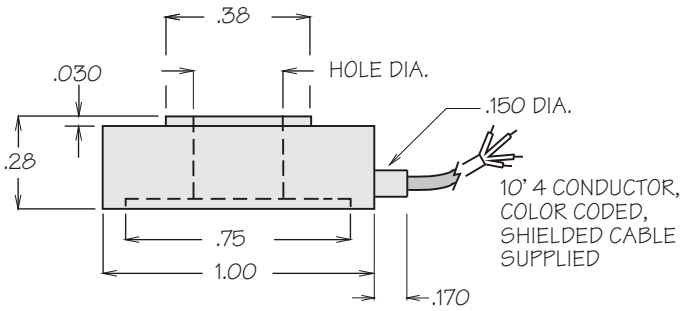
THRU-HOLE LOAD CELL COMPRESSION ONLY

THA SERIES

CAPACITY RANGES:
50, 100, 250, 500 LBS.



Our THA Series thru-hole load cells offer an outside diameter of 1.00 inches and up to two different thru-hole diameter options per capacity range. These load cells are manufactured from heat treated 17-4 ph stainless steel. The sensing element incorporates bonded foil strain gages of the highest quality and are sealed for protection against most industrial environments.



SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.25% of R.O.
Hysteresis:	0.25% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Deflection Inches:	0.002 @ R.O.

MODEL	CAPACITY	AVAILABLE INSIDE HOLE DIAMETERS
THA-50	50 LBS.	-P, -Q
THA-100	100 LBS.	-P, -Q
THA-250	250 LBS.	-P, -Q
THA-500	500 LBS.	-P, -Q

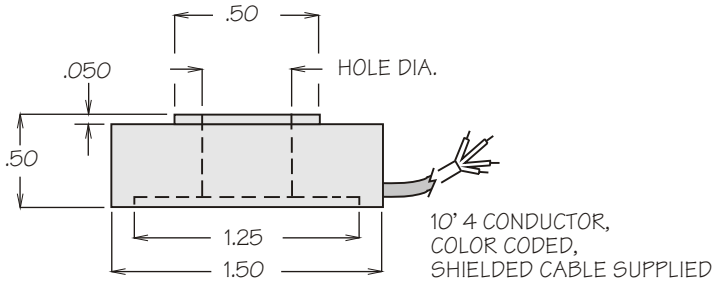
INSIDE HOLE DIAMETER DIMENSIONS	-P	-Q
NOMINAL HOLE DIA.	1/8”	3/16”
ACTUAL HOLE DIA.	.128	.193

THRU-HOLE LOAD CELL COMPRESSION ONLY

THB SERIES

CAPACITY RANGES:
100, 250, 500, 1,000, 2,000 LBS.

Our THB Series thru-hole load cells offer an outside diameter of 1.50 inches and up to four different thru-hole diameter options per capacity range. These load cells are manufactured from heat treated 17-4 ph stainless steel. The sensing element incorporates bonded foil strain gages of the highest quality and are sealed for protection against most industrial environments.



SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.25% of R.O.
Hysteresis:	0.25% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Deflection Inches:	0.002 @ R.O.

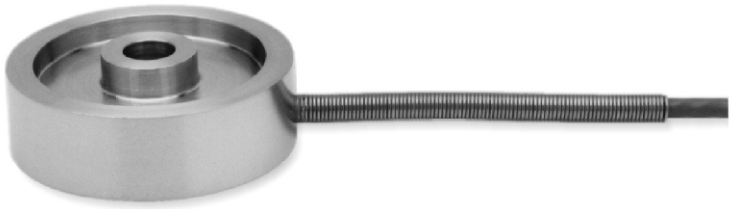
MODEL	CAPACITY	AVAILABLE INSIDE HOLE DIAMETERS
THB-100	100 LBS.	-P, -Q, -R, -S
THB-250	250 LBS.	-P, -Q, -R, -S
THB-500	500 LBS.	-P, -Q, -R, -S
THB-1K	1,000 LBS.	-P, -Q, -R, -S
THB-2K	2,000 LBS.	-P, -Q, -R, -S

INSIDE HOLE DIAMETER DIMENSIONS	-P	-Q	-R	-S
NOMINAL HOLE DIA.	1/8"	3/16"	1/4"	3/8"
ACTUAL HOLE DIA.	.128	.193	.266	.391

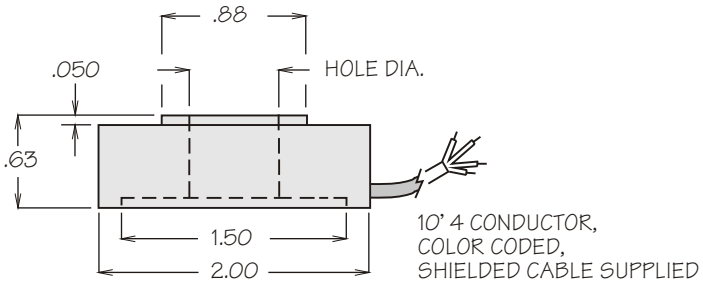
THRU-HOLE LOAD CELL COMPRESSION ONLY

THC SERIES

CAPACITY RANGES:
250, 500, 1,000, 2,000,
3,000, 5,000, 7,500, 10,000 LBS.



Our THC Series thru-hole load cells offer an outside diameter of 2.00 inches and up to six different thru-hole diameter options per capacity range. These load cells are manufactured from heat treated 17-4 ph stainless steel. The sensing element incorporates bonded foil strain gages of the highest quality and are sealed for protection against most industrial environments.



SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.25% of R.O.
Hysteresis:	0.25% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Deflection Inches:	0.002 @ R.O.

MODEL	CAPACITY	AVAILABLE INSIDE HOLE DIAMETERS
THC-250	250 LBS.	-P, -Q, -R, -S, -T, -V
THC-500	500 LBS.	-P, -Q, -R, -S, -T, -V
THC-1K	1,000 LBS.	-P, -Q, -R, -S, -T, -V
THC-2K	2,000 LBS.	-P, -Q, -R, -S, -T, -V
THC-3K	3,000 LBS.	-P, -Q, -R, -S, -T, -V
THC-5K	5,000 LBS.	-P, -Q, -R, -S, -T, -V
THC-7.5K	7,500 LBS.	-P, -Q, -R, -S, -T, -V
THC-10K	10,000 LBS.	-P, -Q, -R, -S, -T, -V

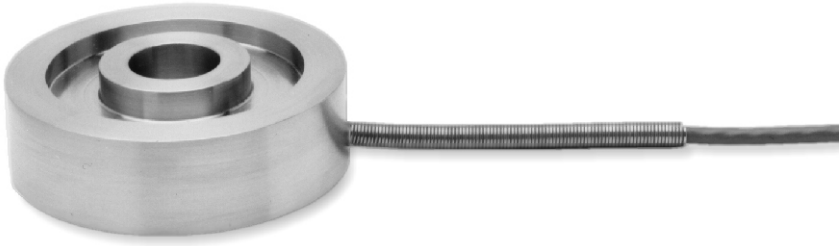
INSIDE HOLE DIAMETER DIMENSIONS

	-P	-Q	-R	-S	-T	-V
NOMINAL HOLE DIA.	1/8”	3/16”	1/4”	3/8”	1/2”	5/8”
ACTUAL HOLE DIA.	.128	.193	.266	.391	.532	.656

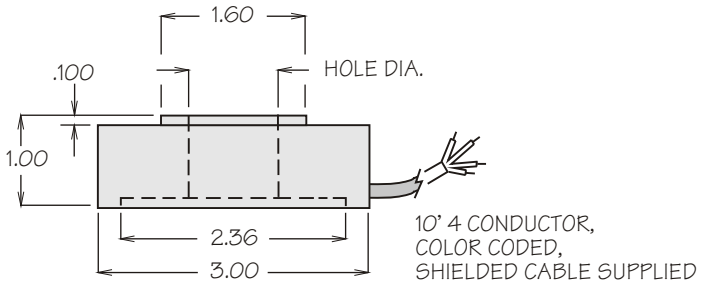
THRU-HOLE LOAD CELL COMPRESSION ONLY

THD SERIES

CAPACITY RANGES:
2,000, 3,000, 5,000, 7,500, 10,000, 15,000, 20,000, 30,000, 50,000 LBS.



Our THD Series thru-hole load cells offer an outside diameter of 3.00 inches and up to nine different thru-hole diameter options per capacity range. These load cells are manufactured from heat treated 17-4 ph stainless steel. The sensing element incorporates bonded foil strain gages of the highest quality and are sealed for protection against most industrial environments.



SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.25% of R.O.
Nonlinearity Hole Diameters Y, Z:	0.5% of R.O.
Hysteresis:	0.25% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

MODEL	CAPACITY
THD-2K	2,000 LBS.
THD-3K	3,000 LBS.
THD-5K	5,000 LBS.
THD-7.5K	7,500 LBS.
THD-10K	10,000 LBS.
THD-15K	15,000 LBS.
THD-20K	20,000 LBS.
THD-30K	30,000 LBS.
THD-50K	50,000 LBS.

ALL MODELS AVAILABLE WITH
-P THROUGH -Z
INSIDE HOLE DIAMETERS

INSIDE HOLE DIAMETER DIMENSIONS

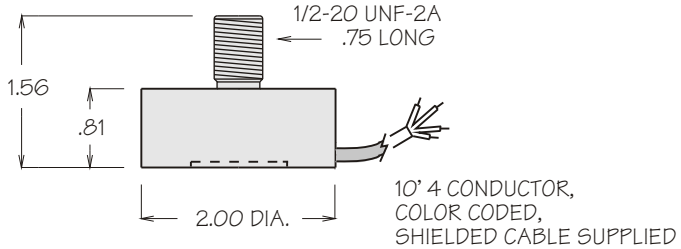
	-P	-Q	-R	-S	-T	-V	-W	-Y	-Z
NOMINAL HOLE DIA.	1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"
ACTUAL HOLE DIA.	.128	.193	.266	.391	.532	.656	.781	1.032	1.281

SURFACE STUD MOUNT LOAD CELL
UNIVERSAL / TENSION OR COMPRESSION

SSM SERIES

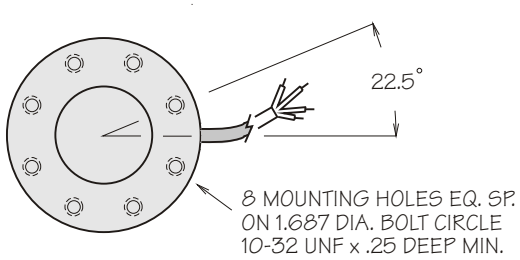
CAPACITY RANGES:
50, 100, 200, 500,
1,000, 2,000, 2,500,
5,000, 8,000, 10,000 LBS.

The SSM Series Surface Stud Mount load cells were designed to be surface mounted with the load applied through the mounting stud for tension or compression applications. The matching surface must be flat and at least 2 inches in diameter. Eight threaded mounting holes are provided on the bottom surface for fastening down from beneath. These sensors are manufactured from heat treated 17-4ph stainless steel, and the sensing element incorporates bonded foil strain gages of the highest quality. They are sealed for protection against most industrial environments.



SPECIFICATIONS

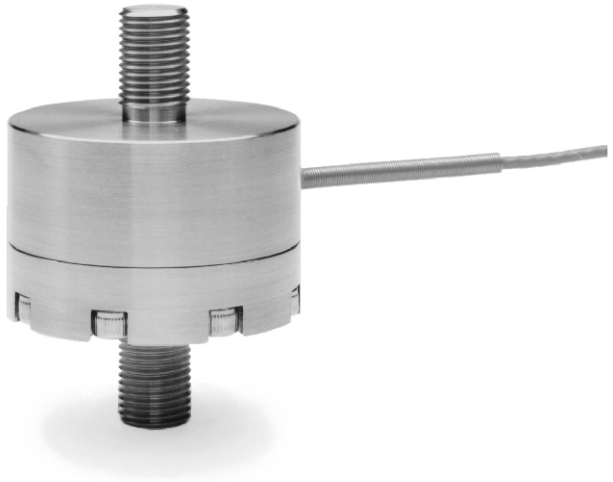
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.15% of R.O.
Hysteresis:	0.15% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Deflection Inches:	0.002 @ R.O.



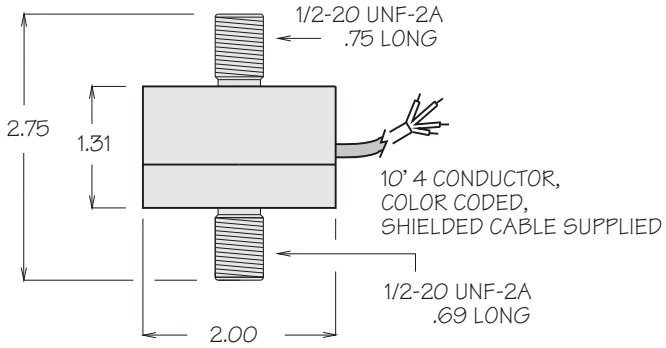
DUAL STUD MOUNT LOAD CELL
UNIVERSAL / TENSION OR COMPRESSION

DSM SERIES

CAPACITY RANGES:
50, 100, 200, 500,
1,000, 2,000, 2,500,
5,000, 8,000, 10,000 LBS.



The DSM Series Dual Stud Mount load cells are supplied with a stud at each end for easy in line mounting in ranges from 50 lbs. through 10,000 lbs. These load cells are highly accurate and are manufactured from heat treated 17-4ph stainless steel. The sensing element incorporates bonded foil strain gages of the highest quality, and are sealed for protection against most industrial environments.



SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.15% of R.O.
Hysteresis:	0.15% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Deflection Inches:	0.002 @ R.O.

PRECISION FATIGUE RESISTANT LOAD CELL
UNIVERSAL / TENSION OR COMPRESSION

SWP SERIES

CAPACITY RANGES:
1,000, 2,000, 3,000,
5,000, 10,000, 20,000,
50,000 LBS.

Our SWP Series low profile load cells are an excellent choice for applications that require ultra stiffness and resistance to extraneous bending and side load forces. For tension and/or compression applications, the load cell is bolted down to a flat surface and center loaded, utilizing the thru tapped hole. Load buttons or load bearing compression only applications are offered in our accessories section. For in line tension applications, we recommend our tension base (-TB option) for hardness, flatness, stiffness, and alignment. The SWP Series load cell and the -TB (tension base) are manufactured from heat treated 17-4ph stainless steel. The same high quality full bridge strain gage installation is utilized in all our force and torque measuring products.

Options

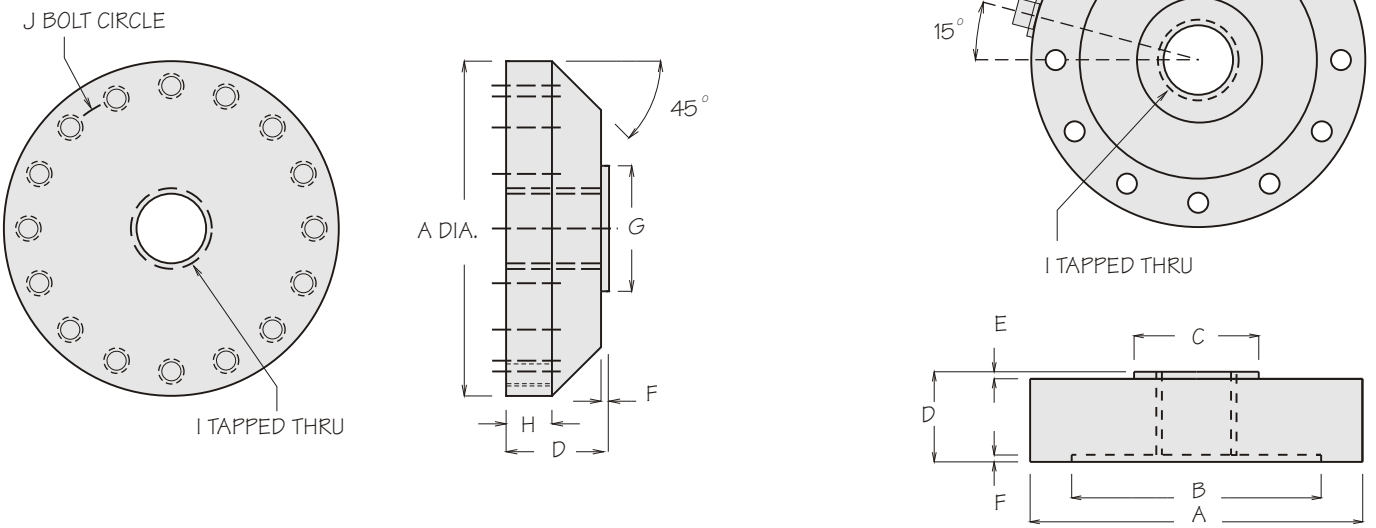
TB0-SWP135 *Tension Base (1K - 3K)*
TB1-SWP1020 *Tension Base (5K - 20K)*
TB2-SWP-50K *Tension Base (50K)*

Shown fastened to
OPTION -TB1
Tension Base

SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.05% of R.O.
Hysteresis:	0.05% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	700 ohms nominal
Excitation Voltage:	10-20 VDC
Safe Overload:	150% of R.O.
Deflection:	0.001 inches @ R.O.
Fatigue Life One Direction:	100 x 10^6
Fatigue Life Bidirectional:	50 x 10^6

MODEL	NATURAL RINGING FREQUENCY Hz
SWP-1K	4,000
SWP-2K	5,700
SWP-3K	7,300
SWP-5K	8,700
SWP-5K	6,500
SWP-10K	7,400
SWP-20K	8,500
SWP-50K	10,000



DIMENSIONS (INCHES)

MODEL	CAPACITY LBS.	A DIA.	B DIA.	C DIA.	D	E	F	G DIA.	H	I THREAD	J	K	L
SWP-1K	1,000	4.125	2.775	1.650	1.375	.125	.050	1.250	.500	5/8-18 UNF	3.500	.281	8
SWP-2K	2,000	4.125	2.775	1.650	1.375	.125	.050	1.250	.500	5/8-18 UNF	3.500	.281	8
SWP-3K	3,000	4.125	2.775	1.650	1.375	.125	.050	1.250	.500	5/8-18 UNF	3.500	.281	8
SWP-5K-4	5,000	4.125	2.775	1.650	1.375	.125	.050	1.250	.500	5/8-18 UNF	3.500	.281	8
SWP-5K	5,000	6.000	4.260	2.500	1.750	.125	.050	2.250	.810	1 1/4-12 UNF	5.125	.406	12
SWP-10K	10,000	6.000	4.260	2.500	1.750	.125	.050	2.250	.810	1 1/4-12 UNF	5.125	.406	12
SWP-20K	20,000	6.000	4.260	2.500	1.750	.125	.050	2.250	.810	1 1/4-12 UNF	5.125	.406	12
SWP-50K	50,000	8.000	5.000	3.140	2.000	.125	.050	3.140	.810	1 3/4-12 UNF	6.500	.531	16

ACCURATE / HIGH RELIABILITY IN HARSH MARINE & INDUSTRIAL ENVIRONMENTS LOAD PIN

CLP SERIES

Our CLP Series load pins are used most often where pins or large bolts would normally be carrying the load. Typical applications would include replacement for shackle pins, clevis pins, and pulley shafts. These load pins are made from heat treated 17-4ph stainless steel and incorporate a stainless steel molded connector system for use in harsh industrial environments. The mating connector, sold seperately, is available in three different cable lengths.

CAPACITY RANGES:
750, 1,500, 3,000, 6,000, 12,500, 18,000, 30,000 LBS.

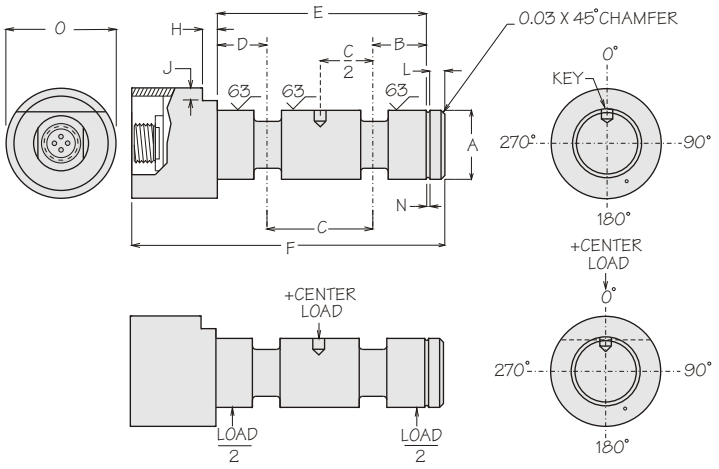
CAPACITY RANGES:
50,000, 75,000, 100,000, 125,000, 160,000, 200,000 LBS.

TYPICAL APPLICATIONS

Crane Load Monitor	Sprocket Axle
Front End Loaders	Crane Cargo Hook
Tow Bar Connection	Connecting Rod
Railroad Couplings	Forklifts
Conveyor Belt Rollers	Mooring Line Tension
Clevis Joints	Tow Line Tension

SPECIFICATIONS

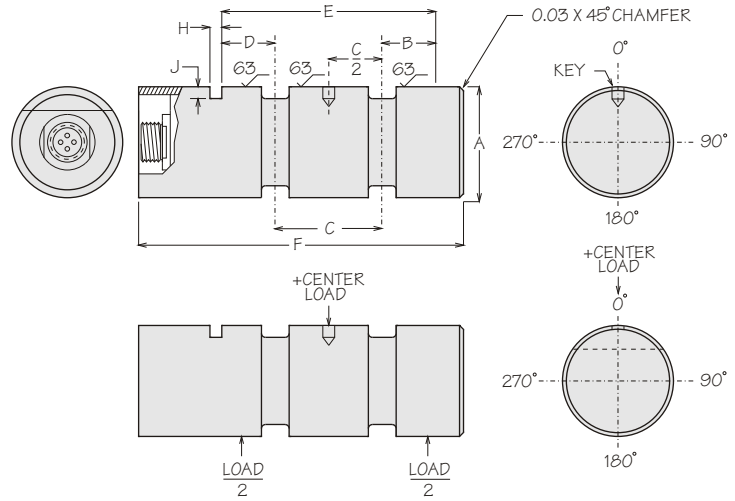
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.50% of R.O.
Hysteresis:	0.50% of R.O.
Nonrepeatability:	0.15% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.008% of Load/°F
Temp. Effect on Zero:	0.003% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.



Anti-Rotation & Retaining Device

In pins with a diameter less than 2 inches, the Keeper Plate used at dimension H & J (provides and maintains proper angular alignment of Load Pin in regard to load direction) will retain in one direction only, requiring a Retaining Ring.

MODEL	CAPACITY LBS.	DIMENSIONS (INCHES) A DIA.	B	C	D	E	F	H	J	KEY DIA.	L	SNAP RING GROOVE DIA.	N	O DIA.
CLP-750	750	.375	.41	.56	.41	1.38	3.69	.20	.25	N/A	.31	.352	.029	2.00
CLP-1.5K	1,500	.375	.41	.56	.41	1.38	3.69	.20	.25	N/A	.31	.352	.029	2.00
CLP-3K	3,000	.500	.50	.75	.50	1.75	4.00	.20	.25	N/A	.25	.468	.039	2.00
CLP-6K	6,000	.750	.59	1.00	.59	2.18	4.50	.20	.25	.156	.31	.704	.046	2.00
CLP-12.5K	12,500	1.000	.63	1.00	.63	2.26	4.75	.20	.25	.219	.50	.940	.046	2.00
CLP-18K	18,000	1.250	.81	1.38	.81	3.00	5.63	.27	.25	.219	.63	1.176	.056	2.00
CLP-30K	30,000	1.500	.94	1.63	.94	3.51	6.13	.27	.25	.281	.63	1.406	.056	2.00
		+.000 -.002												



Anti-Rotation & Retaining Device

In pins with a diameter 2 inches and over, the Keeper Plate used at dimension H & J (provides and maintains proper angular alignment of Load Pin in regard to load direction) alone will perform as a complete Retainer.

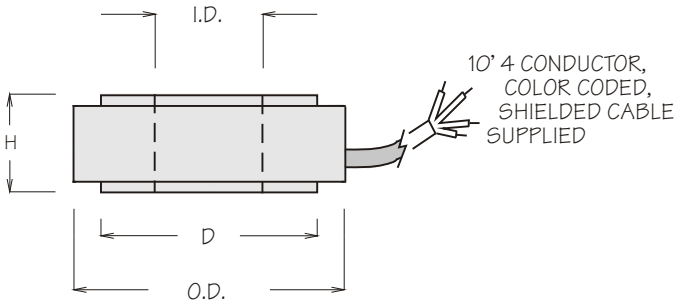
MODEL	CAPACITY LBS.	DIMENSIONS (INCHES) A DIA.	B	C	D	E	F	H	J	KEY DIA.
CLP-50K	50,000	2.000	1.00	2.00	1.00	4.00	6.63	.266	.38	.281
CLP-75K	75,000	2.500	1.25	2.50	1.25	5.00	7.63	.266	.50	.281
CLP-100K	100,000	2.750	1.47	2.69	1.47	5.63	8.38	.406	.50	.406
CLP-125K	125,000	3.000	1.44	3.00	1.44	5.88	8.75	.406	.63	.406
CLP-160K	160,000	3.500	1.75	3.50	1.75	7.00	10.00	.531	.63	.531
CLP-200K	200,000	4.000	2.25	4.00	2.25	8.50	11.75	.531	.75	.531
		+.000 -.002								

COMPRESSION ONLY / THRU HOLE LOAD WASHER

LW0 SERIES

CAPACITY RANGES:
2,400 THROUGH 300,000 LBS.

The LW0 Series are washer shaped, strain gage based load cells that have been most commonly used in fastener testing and thru hole load applications. Our stocked ranges from 2,400 through 300,000 lbs. compression are made from 17-4ph heat treated stainless steel and are matched to bolt diameters and their specific load characteristics. Modifications of diameters, thicknesses, or load range to a specific diameter for OEM applications are welcomed. The sensing element incorporates bonded foil strain gages of the highest quality and are sealed for protection against most industrial environments.



SPECIFICATIONS

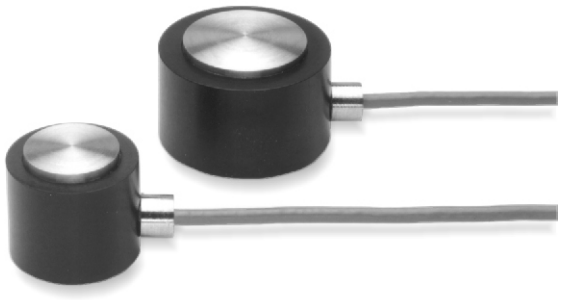
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	2.0% of R.O.
Hysteresis:	2.0% of R.O.
Nonrepeatability:	1.0% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Deflection Inches:	0.001 @ R.O.

		DIMENSIONS (INCHES)			
MODEL	CAPACITY LBS.	O.D. DIA.	I.D. DIA.	D	H
LW0-2	2,400	.85	.192	.345	.350
LW0-4	4,000	.85	.262	.400	.350
LW0-7	7,000	.85	.326	.520	.350
LW0-10	10,000	.85	.396	.620	.350
LW0-14	14,000	1.00	.454	.725	.350
LW0-20	20,000	1.00	.517	.850	.350
LW0-25	25,000	1.25	.580	.960	.350
LW0-30	30,000	1.25	.644	1.040	.350
LW0-45	45,000	1.50	.770	1.200	.375
LW0-60	60,000	1.75	.897	1.490	.500
LW0-80	80,000	2.00	1.024	1.710	.500
LW0-80A	80,000	2.00	1.150	1.790	.500
LW0-125	125,000	2.37	1.279	2.140	.625
LW0-190	190,000	3.00	1.533	2.640	.875
LW0-260	260,000	3.50	1.787	3.000	1.250
LW0-300	300,000	3.75	2.041	3.300	1.370

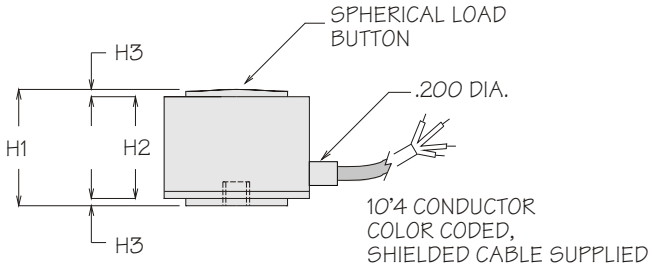
MINI LOAD COLUMN LOAD CELL COMPRESSION ONLY

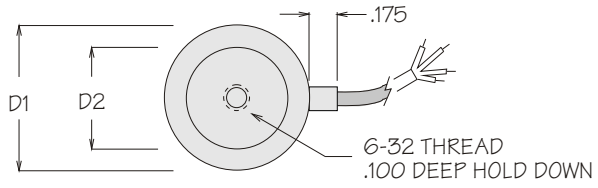
MLC SERIES

CAPACITY RANGES:
2,000, 3,000, 5,000, 7,500,
10,000, 15,000, 20,000,
30,000 LBS.



The MLC Series is our miniature high capacity compression only load cell/force sensor, featuring low profile compact size for a wide range of portable and dedicated applications up to 30,000 lbs. The load diameter is slightly convex for accurate load distribution. Low deflection through design results in ultra fast frequency response. The MLC's are designed to be mounted in a shallow machined flat pocket or smooth flat surface, either free or fastened via a bottom 6-32 tapped hole. These load cells are manufactured from heat treated 17-4 ph stainless steel. The sensing element incorporates bonded foil strain gages of the highest quality and are sealed for protection against most industrial environments.





SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.25% of R.O.
Hysteresis:	0.25% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Deflection Inches :	0.002 @ R.O.

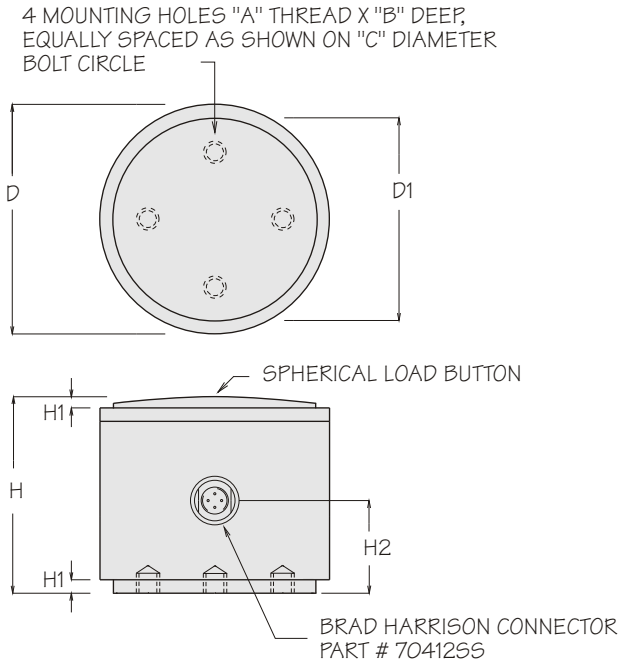
		DIMENSIONS (INCHES)					
MODEL	CAPACITY LBS.	D1	D2	H1	H2	H3	BUTTON RADIUS
MLC-2K	2,000	.625	.450	.600	.480	.06	2.0
MLC-3K	3,000	.625	.450	.600	.480	.06	2.0
MLC-5K	5,000	.625	.450	.600	.480	.06	2.0
MLC-7.5K	7,500	.875	.625	.625	.505	.06	2.0
MLC-10K	10,000	.875	.625	.625	.505	.06	2.0
MLC-15K	15,000	1.250	.875	1.000	.880	.06	4.0
MLC-20K	20,000	1.250	.875	1.000	.880	.06	4.0
MLC-30K	30,000	1.250	.875	1.000	.880	.06	4.0

LOW PROFILE COMPRESSION ONLY LOAD COLUMN

CLC SERIES

CAPACITY RANGES:
50,000, 100,000, 200,000,
300,000, 400,000 LBS.

Our CLC Series is our high capacity compression only load cell, featuring low profile compact size for a wide range of portable and dedicated applications. The loading diameter (D1) is slightly convex for accurate load distribution. Low deflection through design results in ultra fast frequency response. All ranges are made from 17-4ph heat treated stainless steel and incorporate a stainless steel molded connector system designed to resist washdown and splash. The mating connector, sold seperately, is available in three different cable lengths.



SPECIFICATIONS

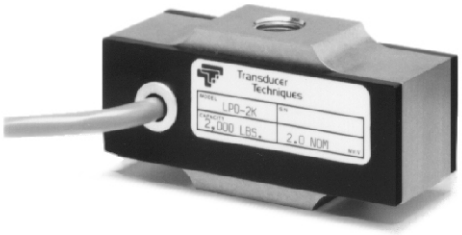
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.25% of R.O.
Hysteresis:	0.25% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

		DIMENSIONS (INCHES)									NATURAL RINGING FREQUENCY		
MODEL	CAPACITY LBS.	D	D1	H	H1	H2	BUTTON RADIUS	A	B	C	HZ	DEFLECTION	WT. LBS.
CLC-50K	50,000	2.750	2.060	2.250	.250	1.000	20.0	1/4-28	.250	1.500	32,000	.001	5
CLC-100K	100,000	2.750	2.060	2.250	.250	1.000	20.0	1/4-28	.250	1.500	32,000	.001	6
CLC-200K	200,000	3.500	2.810	4.000	.250	1.875	24.0	3/8-24	.375	2.000	32,000	.001	8
CLC-300K	300,000	4.250	3.560	4.500	.250	2.125	24.0	3/8-24	.375	2.500	32,000	.001	9
CLC-400K	400,000	4.500	3.810	5.000	.250	2.375	24.0	3/8-24	.375	2.500	32,000	.001	10

ULTRA LOW PROFILE LOAD CELL
UNIVERSAL / TENSION OR COMPRESSION

LP0 SERIES

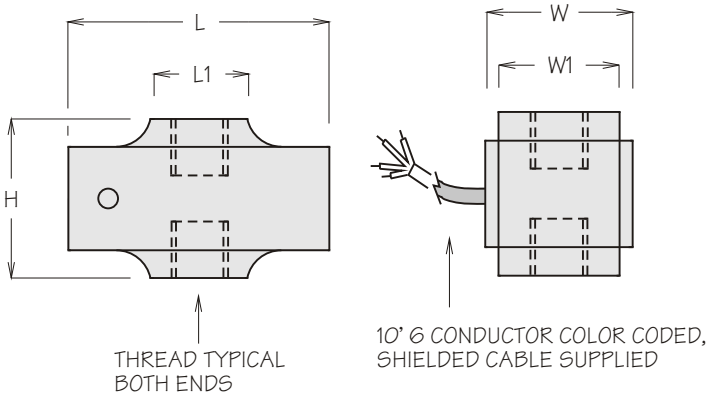
CAPACITY RANGES:
500, 1,000, 2,000, 3,000, 5,000,
10,000, 20,000 LBS.



The LP0 Series is the ultimate in low profile. This tension and compression load cell is manufactured from 17-4ph heat treated stainless steel and offers great stability, along with all the inherent advantages of strain gage devices such as accuracy, reliability, and infinite resolution. Good tension and compression compliance make the LP0's a good choice for thru zero applications. The LP0 Series is offered in single, dual, and triple bridge configurations.

Options

-PTB *Connector twist lock (PT02A-10-6P)*
-DB *Dual Bridge*
-TB *Triple Bridge*



SPECIFICATIONS

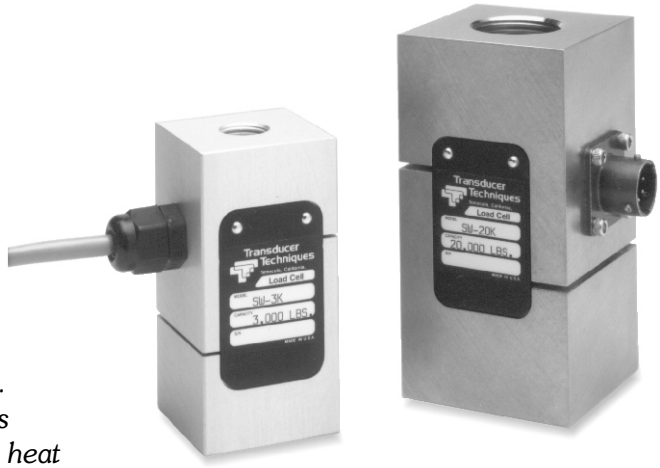
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.1% of R.O.
Hysteresis:	0.1% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

		DIMENSIONS (INCHES)							NATURAL RINGING		
MODEL	CAPACITY LBS.	L	L1	W	W1	H	THREAD	THREAD DEPTH	FREQUENCY HZ	DEFLECTION	WT. OZS.
LP0-500	500	3.000	1.250	1.000	.700	1.500	1/2-20 UNF	.500	2,100	.003	12
LP0-1K	1,000	3.125	1.250	1.000	.700	1.625	1/2-20 UNF	.500	2,850	.003	14
LP0-2K	2,000	3.312	1.250	1.250	.950	1.625	1/2-20 UNF	.500	3.150	.003	17
LP0-3K	3,000	4.000	1.790	1.500	1.200	1.750	1/2-20 UNF	.500	4,500	.005	34
LP0-5K	5,000	4.125	1.790	1.875	1.625	2.000	3/4-16 UNF	.700	6,250	.005	43
LP0-10K	10,000	4.125	1.938	2.250	1.750	2.000	3/4-16 UNF	.700	10,000	.005	50
LP0-20K	20,000	4.562	1.938	3.000	2.700	3.000	1-14 UNS	1.000	10,000	.005	90

A COMPACT ACCURATE LOAD CELL
UNIVERSAL / TENSION OR COMPRESSION

SW0 SERIES

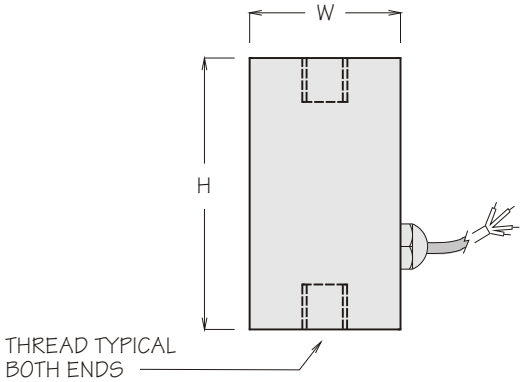
CAPACITY RANGES:
1,000, 2,000, 3,000, 5,000,
10,000, 20,000, 30,000, 50,000 LBS.



We designed the SW0 Series as an economical solution for applications that require force measurement or load feedback in both tension and compression with good output (millivolt) compliance. When applied as an in line load link or base mounted, the SW0 Series offers good side load rejection. Ranges from 1,000 lbs. through 3,000 lbs. are anodized aluminum and ranges 5,000 lbs. through 50,000 lbs. are made from 17-4ph heat treated stainless steel. The sensing element incorporates bonded foil strain gages of the highest quality and are sealed for protection against most industrial environments.

MODELS
SW0-1K AND SW0-2K
SW0-3K THRU SW0-10K
SW0-20K THRU SW0-50K

CABLE SUPPLIED
10' 4 CONDUCTOR
10' 6 CONDUCTOR
CONNECTOR (PT02A-10-6P)



SPECIFICATIONS

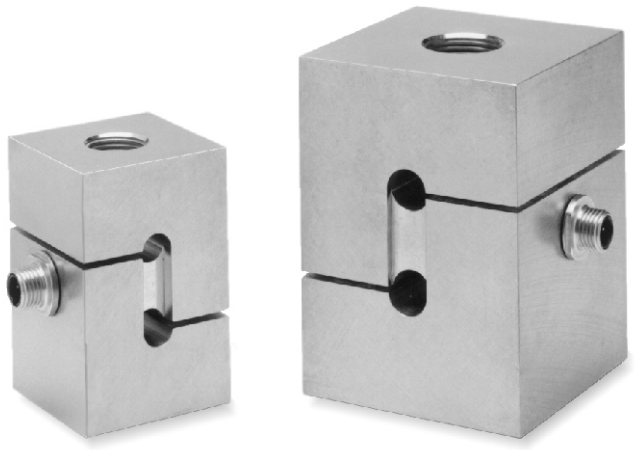
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.1% of R.O.
Hysteresis:	0.1% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

		DIMENSIONS (INCHES)				NATURAL RINGING		
MODEL	CAPACITY LBS.	H	W SQ.	THREAD	THREAD DEPTH	FREQUENCY HZ	DEFLECTION	WT. LBS.
SW0-1K	1,000	2.25	1.230	3/8-24 UNF	.400	3,500	.003	.3
SW0-2K	2,000	2.25	1.230	3/8-24 UNF	.400	5,000	.003	.3
SW0-3K	3,000	3.00	1.480	1/2-20 UNF	.500	5,000	.003	.6
SW0-5K	5,000	3.00	1.425	3/4-16 UNF	.750	5,000	.003	1.9
SW0-10K	10,000	3.00	1.925	3/4-16 UNF	.750	6,500	.003	1.9
SW0-20K	20,000	3.85	1.925	1-14 UNS	.970	6,500	.006	4.3
SW0-30K	30,000	4.75	2.925	1 1/4-12 UNF	1.250	8,000	.006	10.0
SW0-50K	50,000	5.50	2.925	1 1/2-12 UNF	1.500	9,500	.006	12.0

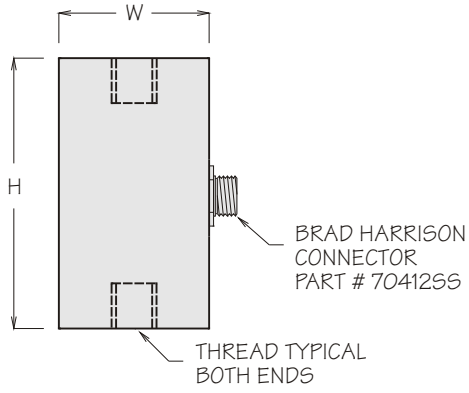
HERMETICALLY SEALED LOAD CELL UNIVERSAL\TENSION OR COMPRESSION

HSW SERIES

CAPACITY RANGES:
1,000, 2,000, 3,000, 5,000,
10,000, 20,000, 30,000, 50,000 LBS.



The HSW Series is hermetically sealed for use in harsh industrial environments. All ranges are made from 17-4ph heat treated stainless steel and incorporate a stainless steel molded connector system designed to resist wash down and most chemicals. The mating connector, sold separately, is available in three different cable lengths. As with our SW0 Series, the HSW Series offers high accuracy, low deflection, fast frequency response, and a good output (millivolt) compliance between tension and compression.



SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.1% of R.O.
Hysteresis:	0.1% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

MODEL	CAPACITY LBS.	DIMENSIONS (INCHES) H	W SQ.	THREAD	THREAD DEPTH	NATURAL RINGING FREQUENCY HZ	DEFLECTION	WT. LBS.
HSW-1K	1,000	2.500	1.425	3/8-24 UNF	.400	3,500	.003	1.9
HSW-2K	2,000	2.500	1.425	3/8-24 UNF	.400	5,000	.003	1.9
HSW-3K	3,000	2.500	1.425	1/2-20 UNF	.500	5,000	.003	1.9
HSW-5K	5,000	3.000	1.925	3/4-16 UNF	.750	5,000	.003	2.2
HSW-10K	10,000	3.000	1.925	3/4-16 UNF	.750	6,500	.003	2.2
HSW-20K	20,000	4.000	2.900	1-14 UNS	1.000	6,500	.006	8
HSW-30K	30,000	5.250	2.900	1 1/4-12 UNF	1.250	8,000	.006	10
HSW-50K	50,000	6.250	2.900	1 1/2-12 UNF	1.500	9,500	.006	12

LOW PROFILE UNIVERSAL TENSION OR COMPRESSION

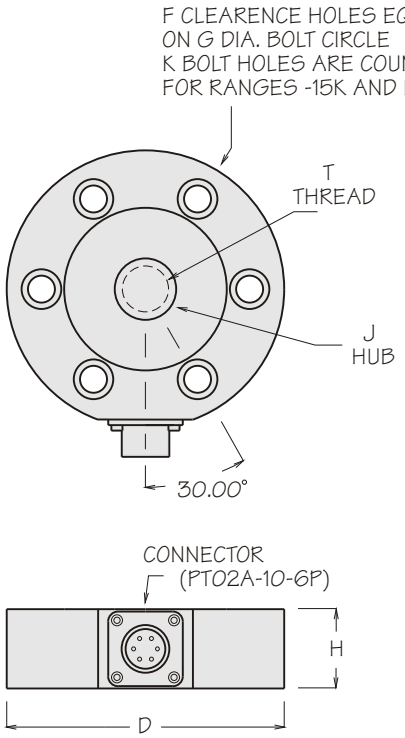
LPU SERIES

CAPACITY RANGES:
100, 250, 500, 1,000, 2,000, 3,000, 4,000, 5,000, 7,500, 10,000, 15,000, 20,000, 30,000, 50,000 LBS.

Our LPU Series are low profile, universal tension or compression "pancake" type load cells. They are available in 14 ranges from 100 lbs. through 50,000 lbs. Hold down bolt holes are provided through the outer diameter and a threaded hole provided through the center for pushing or pulling from either end. The ALB load buttons located in our accessories section, are ideal for compression applications. The LPU Series are made from 17-4ph heat treated stainless steel. The sensing element incorporates bonded foil strain gages of the highest quality and are sealed for protection against most industrial environments.

SPECIFICATIONS

Rated Output (R.O.):	3 mV/V nominal
Nonlinearity:	0.1% of R.O.
Hysteresis:	0.1% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.001% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.



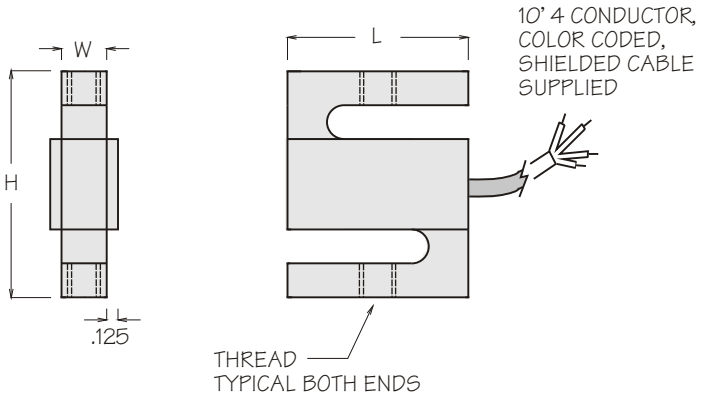
MODEL	CAPACITY LBS.	DIMENSIONS (INCHES) D	H	F	G	K	J	T
LPU-100	100	3.0	1.0	6	2.25	.28	.625	3/8-24 UNF
LPU-250	250	3.0	1.0	6	2.25	.28	.625	3/8-24 UNF
LPU-500	500	3.0	1.0	6	2.25	.28	.625	3/8-24 UNF
LPU-1K	1,000	3.0	1.0	6	2.25	.28	.625	3/8-24 UNF
LPU-2K	2,000	3.5	1.0	6	2.63	.34	.775	1/2-20 UNF
LPU-3K	3,000	3.5	1.0	6	2.63	.34	.775	1/2-20 UNF
LPU-4K	4,000	3.5	1.0	6	2.63	.34	.775	1/2-20 UNF
LPU-5K	5,000	3.5	1.0	6	2.63	.34	.775	1/2-20 UNF
LPU-7.5K	7,500	5.5	1.8	8	4.50	.41	1.450	1-14 UNS
LPU-10K	10,000	5.5	1.8	8	4.50	.41	1.450	1-14 UNS
LPU-15K	15,000	5.5	1.8	8	4.50	.41	1.450	1-14 UNS
LPU-20K	20,000	6.0	1.8	8	4.88	.53	2.125	1 1/2-12 UNF
LPU-30K	30,000	6.0	1.8	8	4.88	.53	2.125	1 1/2-12 UNF
LPU-50K	50,000	6.0	1.8	8	4.88	.53	2.125	1 1/2-12 UNF

PRECISION LOAD CELL
UNIVERSAL / TENSION OR COMPRESSION

SB0 SERIES

CAPACITY RANGES:
50, 100, 200, 300, 500, 750,
1,000, 2,000, 3,000, 5,000 LBS.

SB0 Series load cells are offered for tension or compression applications for precision weight and force measurements. Applications might include conveyor scales, check weighers, and counting scales. SB0 Series 50 through 1,000 lbs. are anodized aluminum and 2,000 through 5,000 lbs. ranges are made from 17-4ph heat treated stainless steel. The sensing element incorporates bonded foil strain gages of the highest quality and are sealed for protection against most industrial environments.



MODEL	CAPACITY LBS.	DIMENSIONS (INCHES) L	W	H	THREAD
SB0-50	50	2.0	.5	2.5	3/8-24
SB0-100	100	2.0	.5	2.5	3/8-24
SB0-200	200	2.0	.5	2.5	3/8-24
SB0-300	300	2.0	.5	2.5	3/8-24
SB0-500	500	2.0	1.0	3.0	1/2-20
SB0-750	750	2.0	1.0	3.0	1/2-20
SB0-1K	1,000	2.0	1.0	3.0	1/2-20
SB0-2K	2,000	2.0	1.0	3.0	1/2-20
SB0-3K	3,000	2.0	1.0	3.0	1/2-20
SB0-5K	5,000	2.5	1.5	3.5	5/8-18

SPECIFICATIONS

Rated Output (R.O.):	3.0 mV/V nominal
Nonlinearity:	0.05% of R.O.
Hysteresis:	0.03% of R.O.
Nonrepeatability:	0.02% of R.O.
Creep in 20 Min.:	0.03% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	15° to 115°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.08% of Load/100°F
Temp. Effect on Zero:	0.08% of R.O./100°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

FULL BRIDGE THIN BEAM SENSORS

TBS SERIES

CAPACITY RANGES:
.25, .50, 1, 2, 5,
10, 20, 40 LBS.

The TBS Series thin beam sensors are exceptionally suited for small load measurements. They are designed to measure many different parameters found in medical instrumentation, home appliances, process control, robotics, automotive and many other high volume applicatons. A specially developed integrated strain gage includes all balancing, compensating and conductive elements and is laminated to the beam to provide excellent stability and reliability.

Rated Output (R.O.):	2mV/V ±20%
Combined Error:	0.25% full scale
Zero Balance:	±0.3 mV/V
Compensated Temp. Range:	20° to 120°F
Temperature Effects:	Zero Balance 0.02% of FS/°F;Output 0.02%/°F
Resistance:	(Input and output) 1200 ohms ±300 ohms
Insulation Resistance:	1000@ 50 VDC
Excitation Voltage:	10 VDC
Seal:	Urethane coated
Safe Overload:	150% FS
Full Scale Deflection:	0.010 to 0.0500
Lead Wire:	9" shielded PVC four conductor 30 AWG
Material:	301 SS(berryllium copper 1/4 and 1/2 lb. units
Deflection Inches:	.025

Figure 1

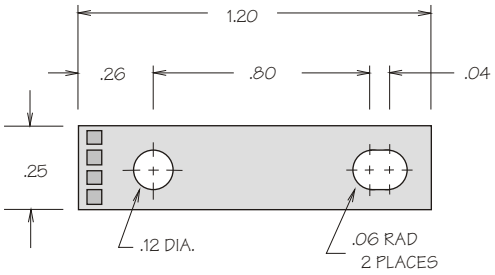
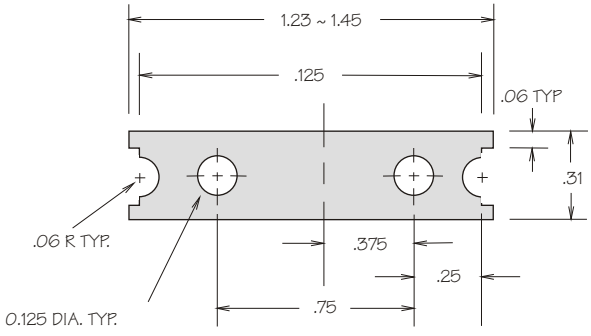
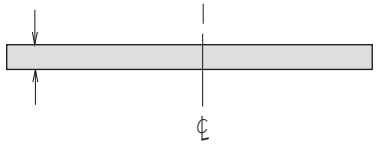


Figure 2



t for Figure 1 & 2



WIRING CODE

+EXC.	RED
-EXC.	BLACK
+SIG.	GREEN
-SIG.	WHITE

ACCESSORIES

MODEL	MOUNTING
TBS-MK-1	for TBS-.25 - TBS-5
TBS-MK-2	for TBS-10 - TBS-40

MODEL	CAPACITY LBS.	t DIMENSION	DRAWING FIGURES
TBS-.25	.25	0.006	Fig. 1
TBS-.50	.50	0.009	Fig. 1
TBS-1	1	0.011	Fig. 1
TBS-2	2	0.015	Fig. 1
TBS-5	5	0.022	Fig. 1
TBS-10	10	0.031	Fig. 2
TBS-20	20	0.044	Fig. 2
TBS-40	40	0.063	Fig. 2

INSTALLATION CONSIDERATIONS FOR THIN BEAM SENSORS

Careful design considerations must be taken into account when mounting the TBS-MK-1 and the TBS-MK-2 Series thin beam sensors. The sensor's performance is dependent upon the mechanical interface. All thin beam load cells require mounting clamps to create a double bend during loading as shown in figure 1. This illustration is exaggerated to show the clamp's effectiveness in producing opposing moments that create the double bend. An electrical output is generated as the double bend causes tension and compression on the sensor strain gage.

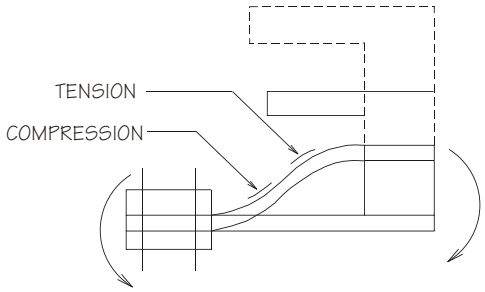
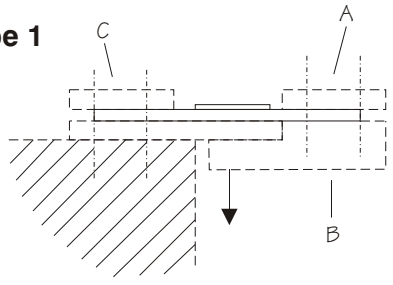


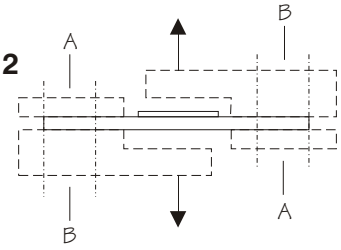
Figure 1

Two typical mounting arrangements are shown below. For high accuracy applications, reinforcement plates should be slightly harder than the beam material, and the interfacing corners should be sharp. Due to low loads and sensor construction associated with the TBS-.25 thru TBS-2, inline loading (Type 2) is not recommended.

Type 1

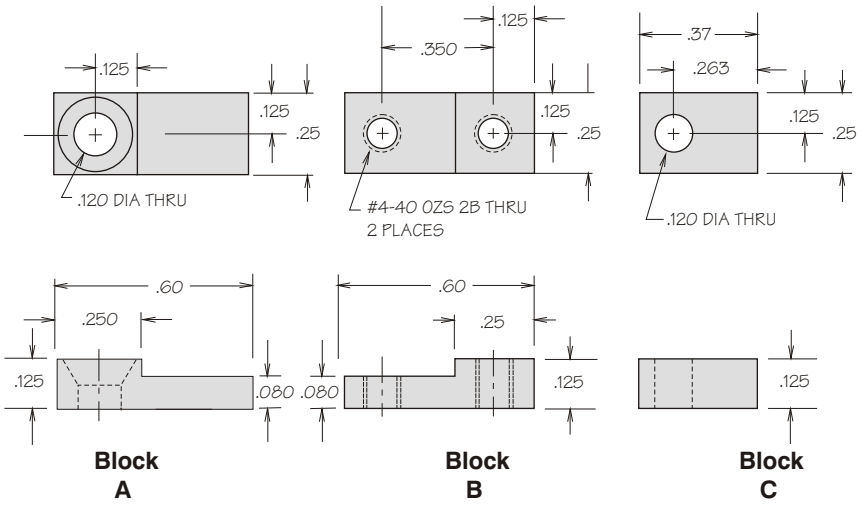


Type 2



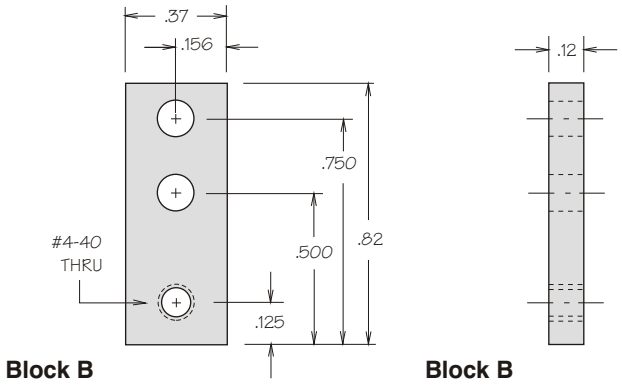
TBS-MK-1 Mounting Kit

Mounting Kit TBS-MK-1 for thin beam sensors TBS-.25, thru. TBS-5. Type 1 Mounting only. Kit includes: Mounting blocks A, B, C.

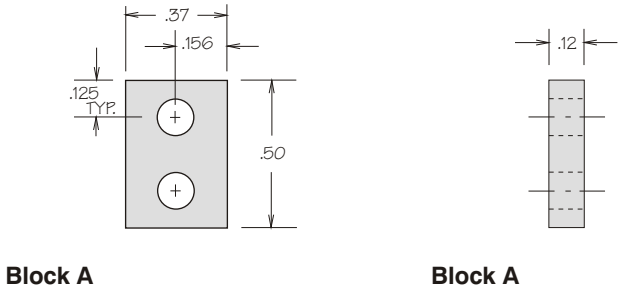


TBS-MK-2 Mounting Kit

Mounting Kit TBS-MK-2 for thin beam sensors TBS-10 thru TBS-40. Kit includes 4 mounting blocks, 2 of each lock A & B.



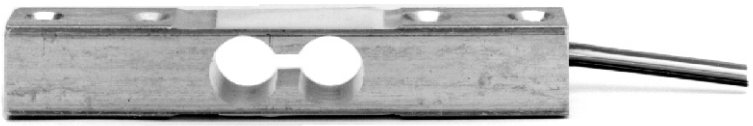
DIMENSIONS IN INCHES



ECONOMICAL BENDING BEAM LOAD CELL

EBB SERIES

CAPACITY RANGES:
1, 2, 5,10 Kg.

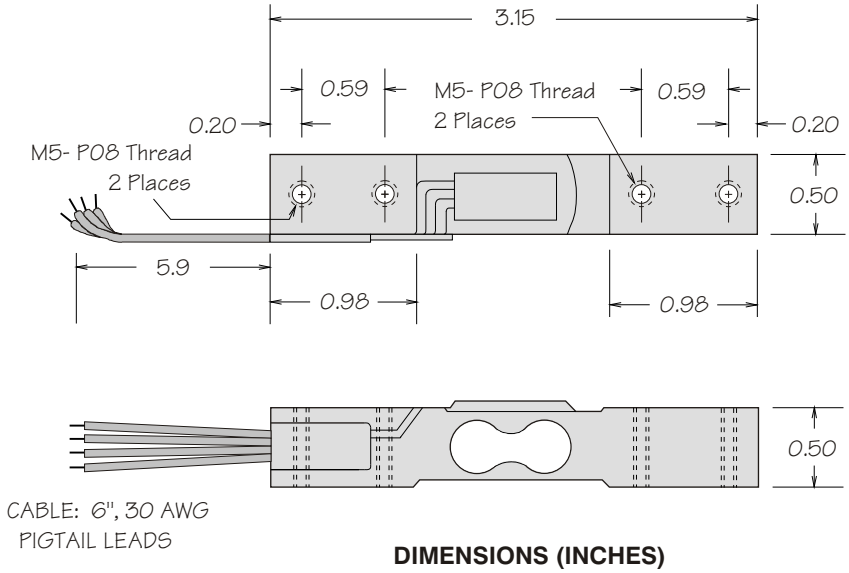


The EBB Series is a economical low capacity bending beam load cell suitable for use in a variety of industrial and OEM force measurement and weighing applications. It is made of an aluminum alloy and comes in 1, 2, 5 and 10 kilogram ranges.

SPECIFICATIONS

Rated Output (R.O.):	0.5 mV/V ± 10%
Nonlinearity:	0.1% of R.O.
Hysteresis:	0.1% of R.O.
Zero Balance:	±1 mV/V
Compensated Temp. Range:	14°F to 104°F
Safe Temp. Range:	14°F to 140°F
Temp. Effect on Output:	.01% of Load/°F
Temp. Effect on Zero:	.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	5 VDC (8 VDC max.)
Safe Overload:	200% of R.O.
Cable:	6", 30 AWG pigtail leads

MODEL	CAPACITY Kg.	CAPACITY LBS.
EBB-1	1	2.2
EBB-2	2	4.4
EBB-5	5	11
EBB-10	10	22



DIMENSIONS (INCHES)

Wiring Color Code
+Exc. Red -Exc. Black
+Sig. Green -Sig. White

LOW CAPACITY SINGLE POINT LOAD CELLS

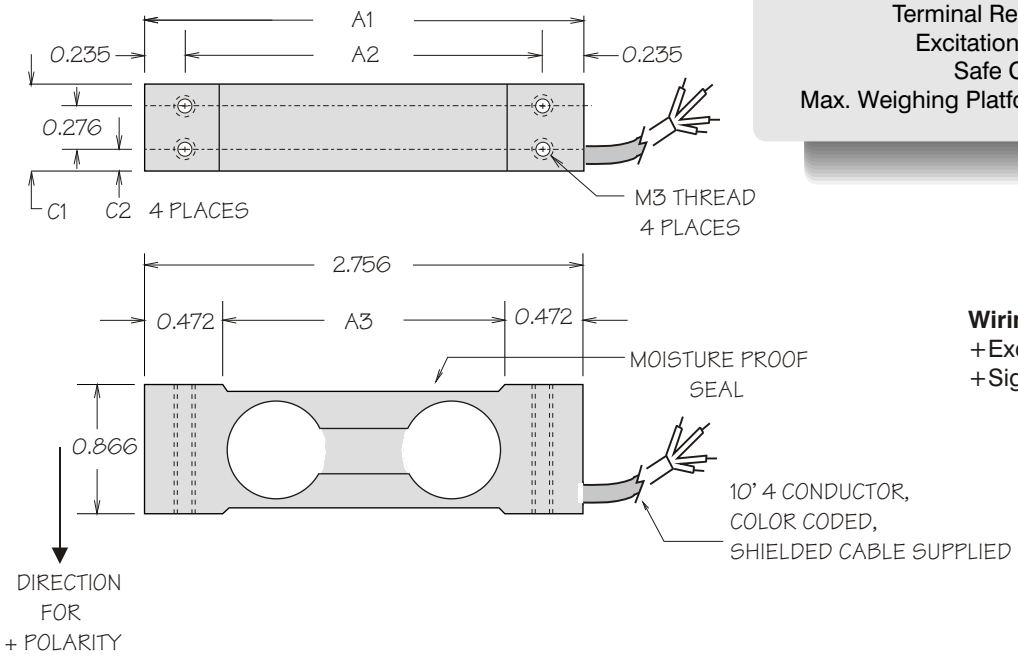
LSP SERIES

CAPACITY RANGES:
1, 2, 5, 10 Kg.

The LSP Series is a low capacity, low cost, high accurate single point load cell. It is ideal for OEM applications such as electronic scales and weighing machines. The single point design is highly resistant to eccentric loading allowing direct mounting to the scale base and weighing platform. The LSP Series features a moisture proof sealant.

SPECIFICATIONS

Rated Output (R.O.) Range 1Kg.:	1.0 mV/V nominal
Rated Output (R.O.) Ranges 2, 5, and 10Kg.:	1.5 mV/V nominal
Nonlinearity:	0.02% of R.O.
Hysteresis:	0.02% of R.O.
Nonrepeatability:	0.02% of R.O.
Zero Balance:	±5% R.O.
Compensated Temp. Range:	14°F to 104°F
Safe Temp. Range:	14°F to 140°F
Temp Effect on Output:	0.0022 of Load/°F
Temp Effect on Zero:	0.0022% R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC (15 VDC max.)
Safe Overload:	150% of R.O.
Max. Weighing Platform Size:	7.87" x 7.87"



Wiring Color Code
+Exc. Red -Exc. Black
+Sig. Green -Sig. White

DIMENSIONS (INCHES)

MODEL	CAPACITY Kg.	CAPACITY LBS.	RATED OUTPUT	A1	A2	A3	C1	C2
LSP-1	1	2.2	1.0	2.760	2.284	1.800	0.590	0.160
LSP-2	2	4.4	1.5	2.760	2.284	1.800	0.590	0.160
LSP-5	5	11	1.5	2.760	2.284	1.800	0.590	0.160
LSP-10	10	22	1.5	2.760	2.284	1.800	0.590	0.160

ECONOMICAL SINGLE POINT LOAD CELL

ESP SERIES

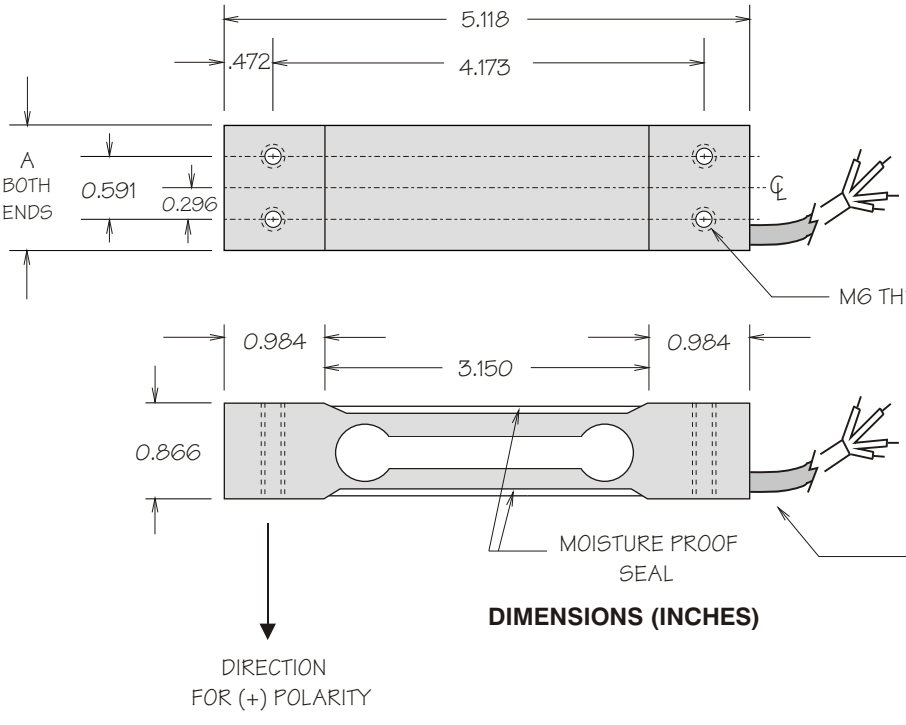
CAPACITY RANGES:
6, 10, 15, 20, 25, 30, 35 Kg.

The ESP Series is a economical, high accurate single point load cell. It is ideal for OEM applications such as electronic scales and weighing machines. The single point design is highly resistant to eccentric loading allowing direct mounting to the scale base and weighing platform. The ESP Series features a moisture proof sealant.

MODEL	CAPACITY Kg.	CAPACITY LBS.
ESP-6	6	13
ESP-10	10	22
ESP-15	15	33
ESP-20	20	44
ESP-25	25	55
ESP-30	30	66
ESP-35	35	77

SPECIFICATIONS

Rated Output (R.O.):	2.0mV/V ±10%
Nonlinearity:	0.02% of R.O.
Hysteresis:	0.02% of R.O.
Nonrepeatability:	0.02% of R.O
Zero Balance:	±1% of R.O.
Compensated Temp. Range:	14°F to 104°F
Safe Temp Range:	14°F to 140°F
Temp. Effect on Output:	0.002% of Load/°F
Temp. Effect on Zero:	0.002% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC (20 VDC max.)
Safe Overload:	150% R.O.
Max. Weighing Platform Size:	11.8” x 11.8”



CAPACITY Kg.	A	WEIGHT OZS.
6-20	1.181	7.1
25-35	1.575	9.2

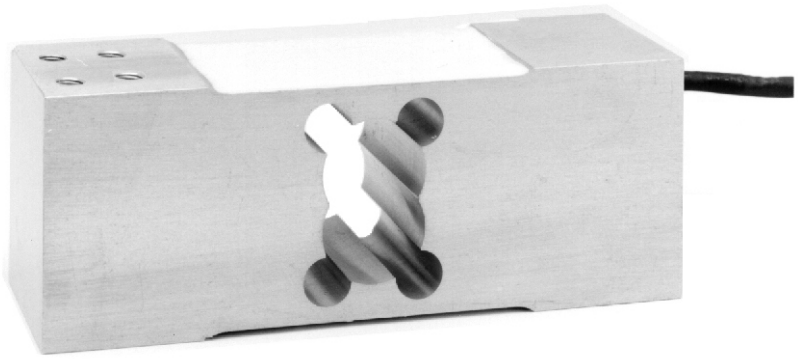
Wiring Color Code
+Exc. Red -Exc. Black
+Sig. Green -Sig. White

DIMENSIONS (INCHES)

MEDIUM CAPACITY SINGLE POINT LOAD CELLS

SPL SERIES

CAPACITY RANGES:
65, 100, 150, 200,
300, 500 Kg.

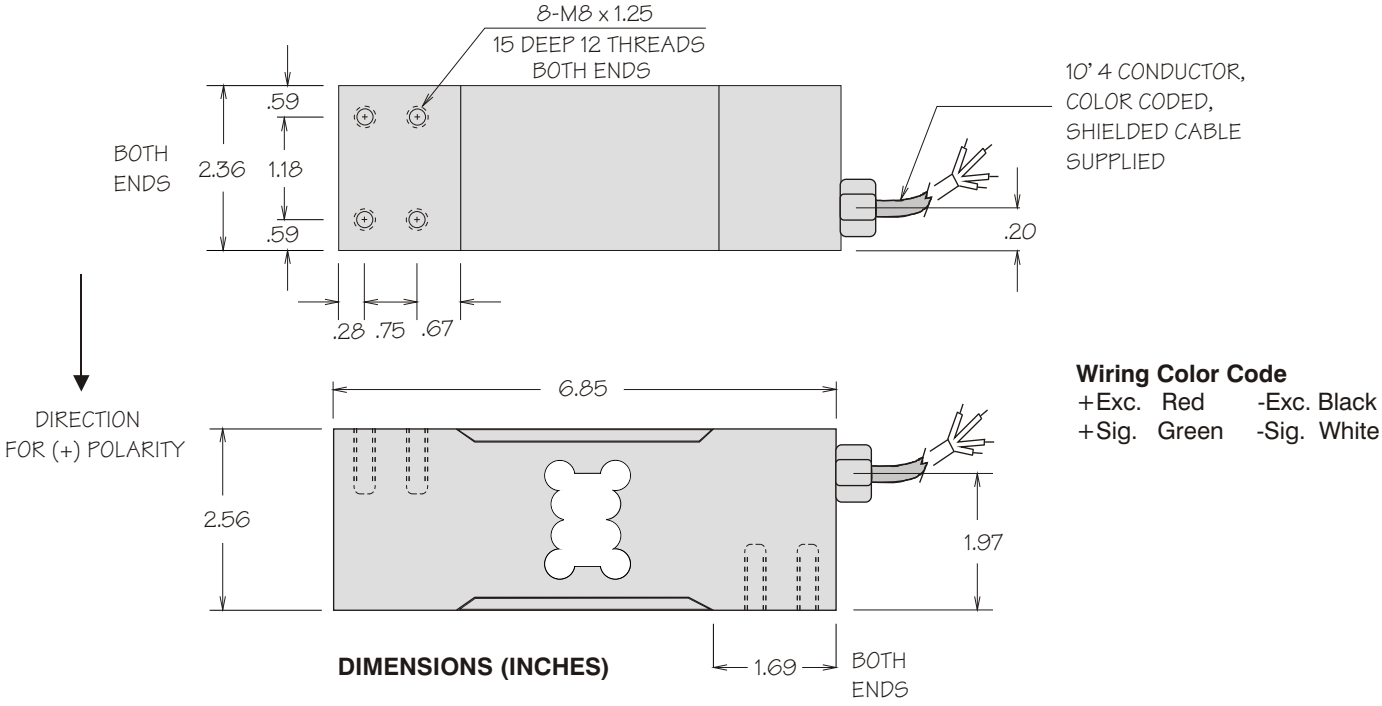


The SPL Series single point load cell simplifies scale designs, packaging machinery and other industrial weighing equipment. Their single point design eliminates the need for multiple load cells and summing boxes, and thus, simplifies the design and reduces the cost. All SPL Series load cells employ 100% aluminum construction and features a moisture proof sealant which also makes them suitable for damp environments.

MODEL	CAPACITY Kg.	CAPACITY LBS.
SPL-65	65	143
SPL-100	100	220
SPL-150	150	330
SPL-200	200	440
SPL-300	300	660
SPL-500	500	1100

SPECIFICATIONS

Rated Output (R.O.):	1.6mV/V ±10%
Nonlinearity:	0.02% of R.O.
Hysteresis:	0.02% of R.O.
Nonrepeatability:	0.02% of R.O
Zero Balance:	±5% R.O.
Compensated Temp. Range:	14°F to 104°F
Safe Temp Range:	14°F to 140°F
Temp. Effect on Output:	0.002% of Load/°F
Temp. Effect on Zero:	0.004% of R.O./°F
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.
Terminal Resistance	
Input Resistance:	400 ohm ±30 ohm
Output Resistance:	350 ohm ±3 ohm
Max. Weighing Platform Size:	35” x 35”



DIMENSIONS (INCHES)

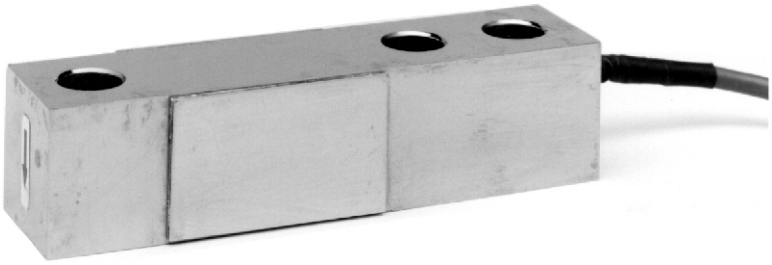
Wiring Color Code

+Exc.	Red	-Exc.	Black
+Sig.	Green	-Sig.	White

HEAVY DUTY SHEAR BEAM LOAD CELLS

SBL SERIES

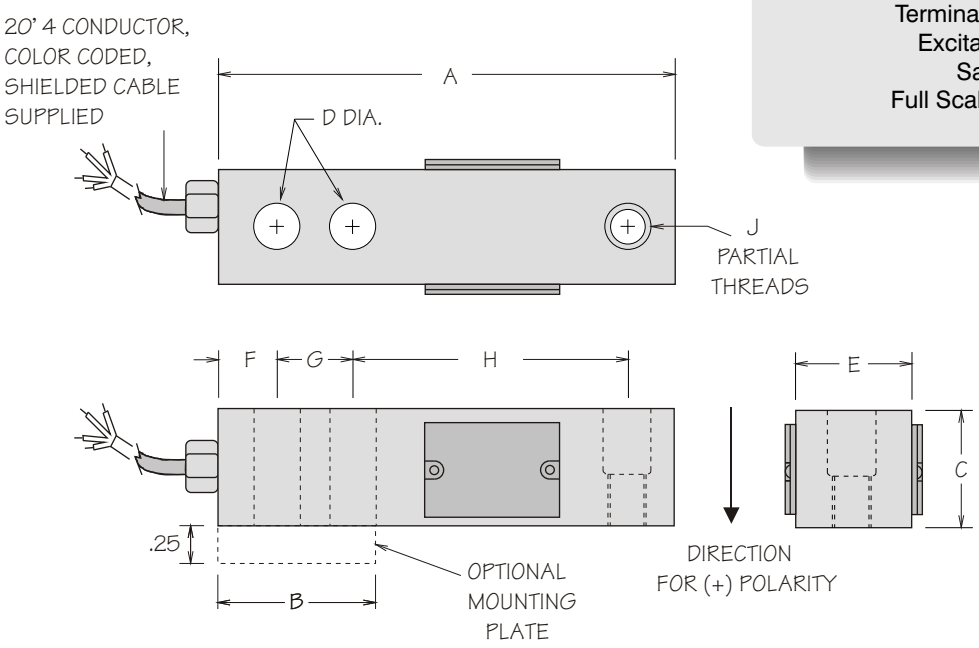
CAPACITY RANGES:
500, 1,000, 2,000 2,500, 3,000, 4,000, 5,000, 10,000, 15,000, 20,000 LBS.



The SBL Series heavy duty shear beam load cells are ideal for process weighing and for use in low profile industrial scales. These economical load cells are easy to install and durable in the field. Environmental protection is afforded through water resistant potting, a compression sealed and strain relieved cable entry, and corrosion resistant nickel plated steel.

SPECIFICATIONS

Rated Output (R.O.):	3.0mV/V ±1%
Nonlinearity:	0.03% of R.O.
Hysteresis:	0.02% of R.O.
Nonrepeatability:	0.02% of R.O
Zero Balance:	±1% of R.O.
Compensated Temp. Range:	14°F to 122°F
Safe Temp Range:	14°F to 176°F
Temp. Effect on Output:	0.002% of Load/°F
Temp. Effect on Zero:	0.002% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC (20 VDC max.)
Safe Overload:	150% of R.O.
Full Scale Deflection:	0.015" to 0.025"



Wiring Color Code
+Exc. Red -Exc. Black
+Sig. Green -Sig. White

MODEL	CAPACITY LBS.
SBL-500	500
SBL-1K	1,000
SBL-2K	2,000
SBL-2.5K	2,500
SBL-3K	3,000
SBL-4K	4,000
SBL-5K	5,000
SBL-10K	10,000
SBL-15K	15,000
SBL-20K	20,000

DIMENSIONS (INCHES)

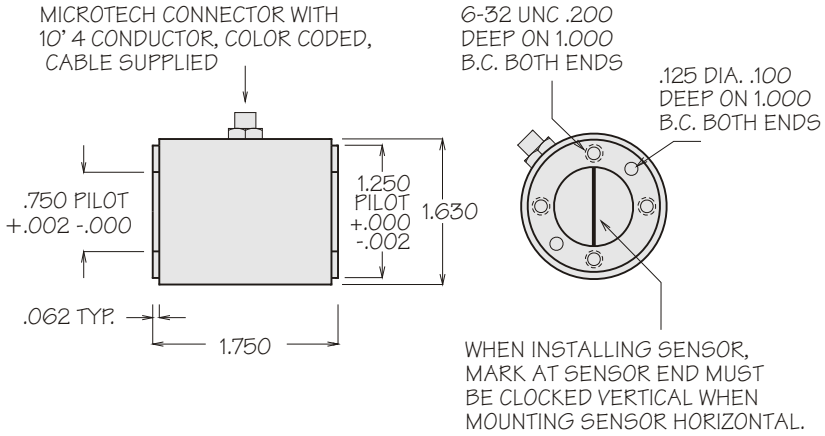
CAPACITY	A	B	C	D	E	F	G	H	J
500-4K	5.12	1.87	1.25	.53	1.25	.62	1.0	3.00	1/2-20
5K-10K	6.75	2.64	1.50	.78	1.50	.75	1.5	3.75	3/4-16
15K-20K	8.75	3.52	2.00	1.03	2.00	1.00	2.0	4.75	1-14

LOW CAPACITY (OUNCE INCHES) REACTION TORQUE SENSOR

RTS SERIES

CAPACITY RANGES:
5, 10, 25, 50, 100, 200,
500, 1,000 OUNCE INCHES

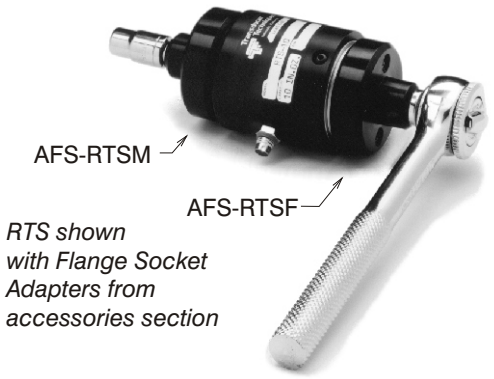
The RTS Series torque sensors were designed to fill the need for accurate torque measurements below 62.5 in.lbs. without giving up stiffness or sensitivity to forces from other directions. They are manufactured from sensor quality aluminum and anodized for long-term durability. Bonded foil strain gages and materials of the highest quality are installed assuring high reliability. The four bolt hole pattern with the use of our O.D. or I.D. pilots on either end allows simple adaptation to any application.



SPECIFICATIONS

Rated Output (R.O.):	1.5 mV/V nominal
Nonlinearity:	0.1% of R.O.
Hysteresis:	0.1% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

MODEL	CAPACITY OZ.IN.	CAPACITY LBS.IN.	TORSIONAL STIFFNESS OZ.IN./RAD.	MAX. OVERHUNG MOMENT WxS OZ.IN.	MAX. SHEAR W OZ.	MAX. THRUST P OZ.
RTS-5	5	.312	725	60	40	280
RTS-10	10	.625	725	60	40	280
RTS-25	25	1.562	1,875	60	60	385
RTS-50	50	3.125	3,650	100	100	560
RTS-100	100	6.250	7,250	150	150	768
RTS-200	200	12.500	14,525	200	200	1,360
RTS-500	500	31.250	36,125	250	250	2,400
RTS-1K	1,000	62.500	72,350	480	480	3,600



RTS shown with Flange Socket Adapters from accessories section

LOW CAPACITY (INCH LBS.) GENERAL PURPOSE REACTION TORQUE SENSOR

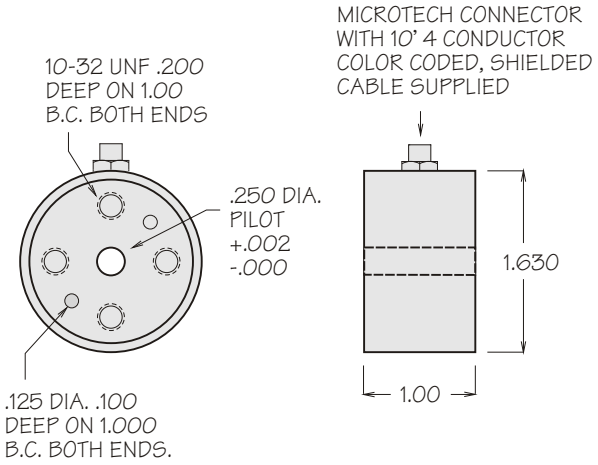
TRT SERIES

CAPACITY RANGES:
25, 50, 100, 200, 500 INCH LBS.

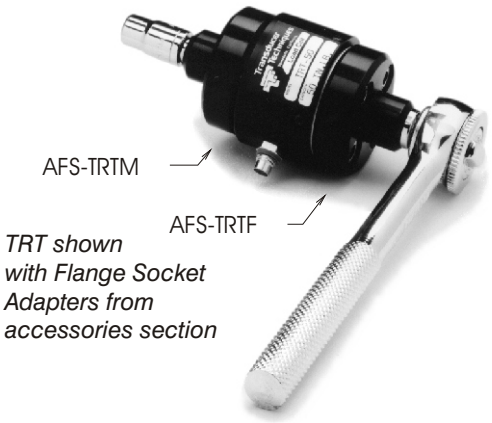
The TRT Series reaction torque sensors offer long term reliability due to non moving parts and state of the art bonded foil strain gages. Whenever possible, the best approach for precision torque measurements is via reaction torque sensing, eliminating high maintenance and high cost of slip rings, bearings and brushes.

SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.1% of R.O.
Hysteresis:	0.1% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.



MODEL	CAPACITY INCH LBS.	TORSIONAL STIFFNESS INCH LBS./RAD.	MAX. OVERHUNG MOMENT WxS INCH LBS.	MAX. SHEAR W LBS.	MAX. THRUST P LBS.
TRT-25	25	5,125	50	20	425
TRT-50	50	5,125	50	20	425
TRT-100	100	10,125	100	40	800
TRT-200	200	20,375	200	80	1,400
TRT-500	500	75,875	300	200	2,600



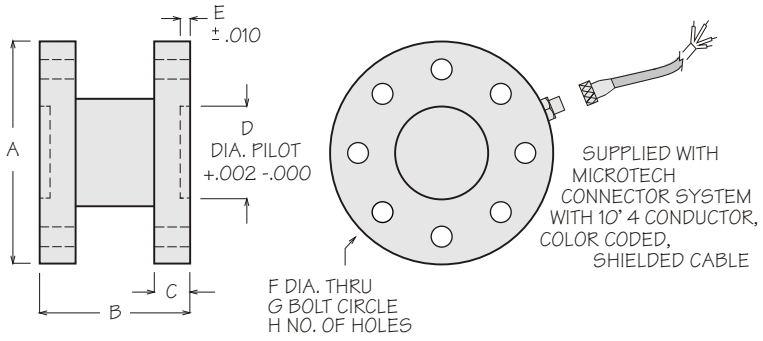
TRT shown with Flange Socket Adapters from accessories section

GENERAL PURPOSE FLANGED REACTION TORQUE SENSOR

TRS SERIES

CAPACITY RANGES:
500, 1,000, 2,000, 5,000, 10,000,
20,000, 50,000, 100,000 INCH LBS.

The TRS Series reaction torque sensors offer long term reliability due to non moving parts and state of the art bonded foil strain gages. The anodized aluminum TRS Series is also available as a two axis sensor, torque and thrust, on special request. Whenever possible, the best approach for precision torque measurements is via reaction torque sensing, eliminating high maintenance and high cost of slip rings, bearings, and brushes.



SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.1% of R.O.
Hysteresis:	0.1% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.005% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

		DIMENSIONS (INCHES)								
MODEL	CAPACITY INCH LBS.	A DIA.	B	C	D	E	F	G	H	WT. LBS.
TRS-500	500	3.00	2.00	.50	1.25	.125	.28	2.25	4	.7
TRS-1K	1,000	3.00	2.00	.50	1.25	.125	.28	2.25	4	.7
TRS-2K	2,000	3.00	2.00	.50	1.25	.125	.28	2.25	4	.7
TRS-5K	5,000	4.00	2.50	.50	1.50	.125	.28	3.25	8	1.2
TRS-10K	10,000	4.50	2.50	.75	1.50	.125	.28	3.75	8	2.2
TRS-20K	20,000	4.50	3.00	.75	2.00	.125	.34	3.75	8	2.2
TRS-50K	50,000	6.75	3.50	1.00	3.00	.125	.41	5.75	8	7.2
TRS-100K	100,000	6.75	3.50	1.00	3.00	.125	.41	5.75	8	7.2

Options

TH *Thrust Bridge*
(Consult our applications engineers For torque thrust load combinations.)

GOD *Strain Gages installed on Outside Diameter for thru hole applications*

MODEL	TORSIONAL STIFFNESS INCH LBS./RAD.	MAX. OVERHUNG MOMENT WxS INCH LBS.	MAX. SHEAR W LBS.	MAX. THRUST P LBS.
TRS-500	190K	500	750	1,500
TRS-1K	190K	500	750	1,500
TRS-2K	380K	1,000	1,500	2,000
TRS-5K	930K	2,000	2,000	3,000
TRS-10K	2,700K	5,000	4,000	6,000
TRS-20K	5,800K	10,000	6,500	10,000
TRS-50K	8,000K	24,000	12,000	18,000
TRS-100K	20,000K	50,000	20,000	30,000

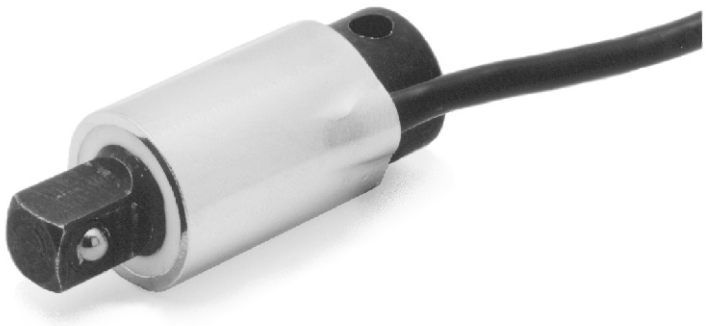
LOAD CARRYING CAPACITY:

W = Weight of test device
S = Distance to center of gravity of test unit
P = Thrust
W x S = Overhung moment
Do not exceed moment (W x S) or shear (W), whichever value is attained first.

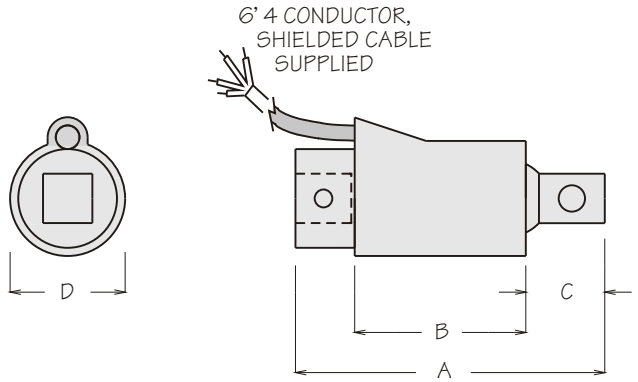
SOCKET WRENCH TORQUE SENSOR REACTION TYPE

SWS SERIES

CAPACITY RANGES:
10, 20, 50, 100, 250,
600, 1,000 FT. LBS.



Our SWS Series reaction type socket wrench torque sensors are available in ranges from 10 ft-lbs. through 1000 ft-lbs. and provide accurate measurements of bolt or nut wrenching torques. These sensors are bi-directional so both tightening and break-away torques can be measured. These low cost sensors deliver high accuracy and outstanding frequency response. Calibration of mechanical torque wrenches may be performed with this sensor. The sensing element incorporates bonded foil strain gages of the highest quality.



SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.2% of R.O.
Hysteresis:	0.2% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.

			DIMENSIONS (INCHES)			
MODEL	CAPACITY FT. LBS.	DRIVE SIZE	A	B	C	D
SWS-10	10	1/4	2.063	1.312	.375	.625
SWS-20	20	1/4	2.063	1.312	.375	.625
SWS-50	50	3/8	2.312	1.312	.500	.875
SWS-100	100	3/8	2.350	1.312	.500	.875
SWS-250	250	1/2	2.625	1.500	.688	1.125
SWS-600	600	3/4	3.938	2.000	1.063	1.625
SWS-1K	1,000	1.0	4.375	1.875	1.125	2.500

GENERAL PURPOSE REACTION TYPE SHAFT TORQUE SENSOR

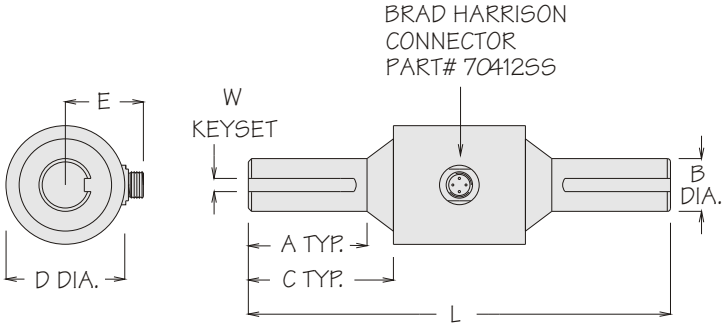
STS SERIES

CAPACITY RANGES:
600, 1,200, 2,000, 3,000,
6,000, 12,000 IN. LBS.

The STS Series is our general purpose reaction type shaft torque sensor. They are often installed between devices such as motors, switches, shafts or axles, and their mounting plate to provide bi-directional torque output. They are available in six capacity ranges from 600 inch lbs. through 12,000 inch lbs., and are made from 17-4ph heat treated stainless steel. The sensing element incorporates bonded foil strain gages of the highest quality and are sealed for protection against most industrial environments.

SPECIFICATIONS

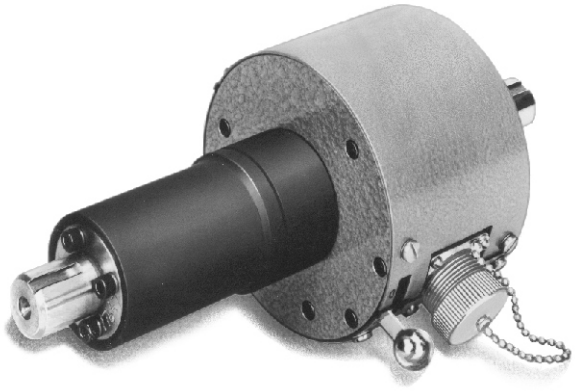
Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.2% of R.O.
Hysteresis:	0.10% of R.O.
Nonrepeatability:	0.05% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.01% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.



MODEL	CAPACITY IN. LBS.	DIMENSIONS (INCHES) A	B	C	D	E	L	W
STS-600	600	2.25	1.00	2.75	2.25	1.55	8.00	1/4
STS-1.2K	1,200	2.25	1.00	2.75	2.25	1.55	8.00	1/4
STS-2K	2,000	2.25	1.00	2.75	2.25	1.55	8.00	1/4
STS-3K	3,000	3.00	1.50	3.75	3.50	1.95	11.0	3/8
STS-6K	6,000	3.00	1.50	3.75	3.50	1.95	11.0	3/8
STS-12K	12,000	3.00	1.50	3.75	3.50	1.95	11.0	3/8

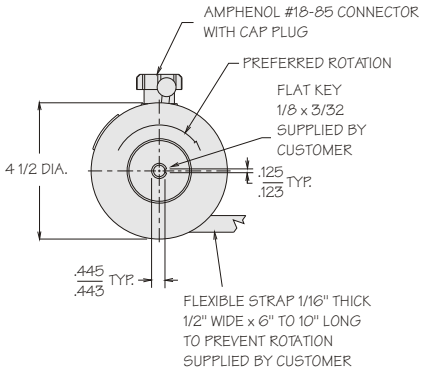
RST SERIES

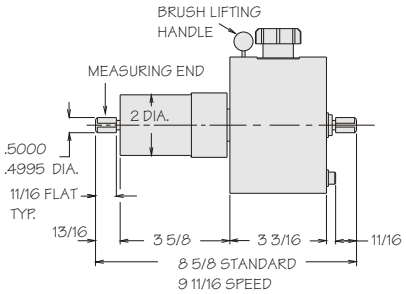
The RST- Series is our low range rotating torque sensors that are available in eleven full scale ranges of 10 through 30K inch pounds. The sensing element incorporates bonded foil strain gages of the highest quality along with coined silver slip ring and silver brushes for data transmission. The WR2, Flexural Natural Frequency, and Torsional Stiffness values as stated in the Dynamic Characteristics box below, are approximate and the tabulated data pertains to the torque pickup only, and does not include the effects of couplings or other rotating masses that would be part of a dynamic system.



RST-A

CAPACITY RANGES:
10, 20, 50 INCH LBS.





MODEL	CAPACITY IN. LBS	MAX. SPEED RPM	WR² LBS. IN.²	FLEXURAL NATURAL FREQUENCY RPM	TORSIONAL STIFFNESS IN. LBS./RADIAN	WT. LBS.
RST-A10	10	3,600	.634	15,500	300	3
RST-A20	20	3,600	.636	17,500	900	3
RST-A50	50	3,600	.643	23,000	2,300	3

SPECIFICATIONS

PERFORMANCE

Output at Full Scale:	1.5 mv/V
Calibration Accuracy:	0.25% FS, CW or CCW
Nonlinearity:	0.25% of FS
Repeatability:	0.25% of FS
Hysteresis:	0.25% of FS

TEMPERATURE

Safe Temp. Range:	-50 to 140°F
Compensated Temp. Range:	72°F to 150°F ±3°F
Temp. Effect on Zero:	0.0025% FS per °F

ELECTRICAL

Excitation:	10 VDC
Zero Balance @ 72 ± 3°F:	2.5% F.S.
Terminal Resistance:	350 ohms nominal

INSULATION RESISTANCE

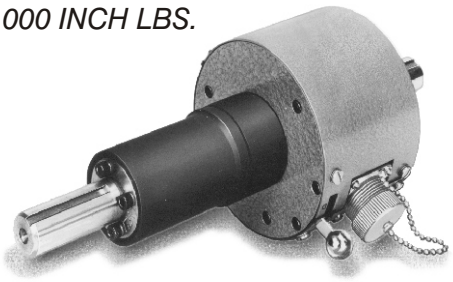
Bridge to Ground:	2,000 megohms
Shield to Ground:	1,000 megohms

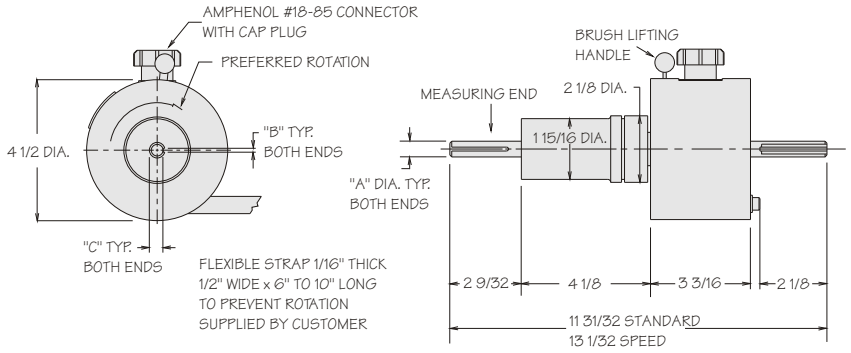
OVERLOAD RATINGS

Safe:	120%
Electrical Failure:	300%

RST-B

CAPACITY RANGES:
100, 200, 500,
1,000 INCH LBS.

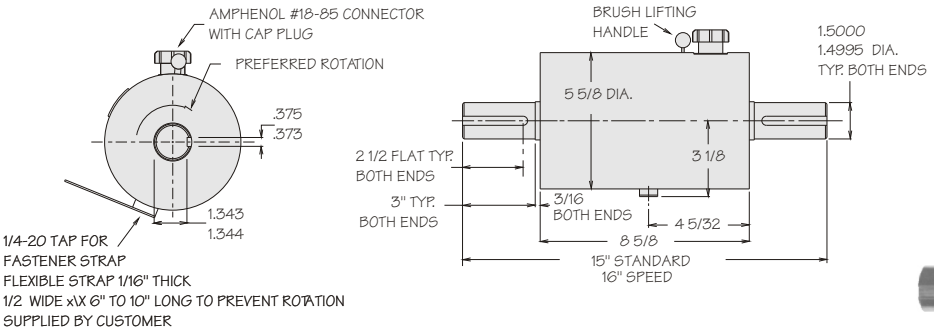




MODEL	CAPACITY IN. LBS.	MAX. SPEED (RPM)	WR² LBS. IN.²	FLEXURAL NATURAL FREQUENCY RPM	TORSIONAL STIFFNESS IN. LBS./RADIAN	WT. LBS.	DIMENSIONS (INCHES) A	B	C	D
RST-B100	100	7,000	1.26	46,600	14,800	5.5	.5000 .4995	.125 .123	.445 .443	$\frac{1}{8}$ x $\frac{3}{32}$
RST-B200	200	7,000	1.26	46,600	14,800	5.5				
RST-B500	500	7,000	1.32	81,800	79,700	6	.8753 .8749	.1875 .1855	.802 .800	$\frac{3}{16}$ x $\frac{1}{8}$
RST-B1K	1,000	7,000	1.56	86,600	72,600	6				

RST-C

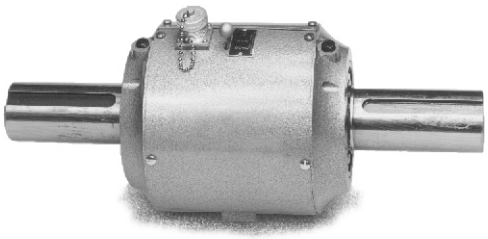
CAPACITY RANGES:
2,000, 5,000 INCH LBS.

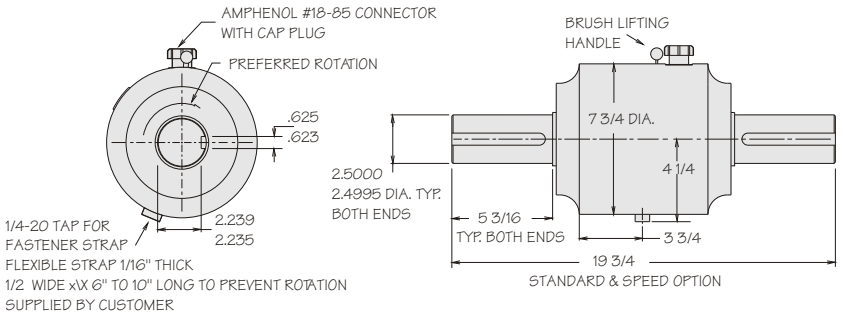


MODEL	CAPACITY IN. LBS.	MAX. SPEED RPM	WR² LBS. IN.²	FLEXURAL NATURAL FREQUENCY RPM	TORSIONAL STIFFNESS IN. LBS./RADIAN	WT. LBS.
RST-C2K	2,000	5,000	2.69	29,200	99,300	17
RST-C5K	5,000	5,000	2.78	31,800	238,000	17.5

RST-D

CAPACITY RANGES:
12,000, 30,000 INCH LBS.





MODEL	CAPACITY IN. LBS.	MAX. SPEED RPM	WR² LBS. IN.²	FLEXURAL NATURAL FREQUENCY RPM	TORSIONAL STIFFNESS IN. LBS./RADIAN	WT. LBS.
RST-D12K	12,000	5,000	22.6	27,400	905,000	39
RST-D30K	30,000	5,000	23.5	41,600	1,680,000	42

SOCKET WRENCH TORQUE SENSOR ROTATING TYPE

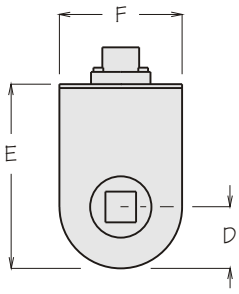
RSS SERIES

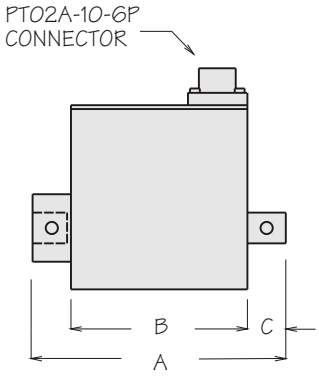
CAPACITY RANGES:
10, 20, 50, 100, 250,
600, 1,000 FT. LBS.

Our RSS Series rotating socket wrench torque sensors are available in ranges from 10 ft-lbs. through 1000 ft-lbs. and provide accurate measurements of bolt or nut wrenching torques. These sensors are bi-directional so both tightening and break-away torques can be measured. Unlimited rotation of the ball bearing supported sensor shaft allows monitoring of the total fastening cycle. The sensing element incorporates bonded foil strain gages of the highest quality, along with coined silver slip rings and two silver graphite brushes per ring for data transmission. The silver graphite brush assemblies are field replaceable.

SPECIFICATIONS

Rated Output (R.O.):	2 mV/V nominal
Nonlinearity:	0.25% of R.O.
Hysteresis:	0.25% of R.O.
Nonrepeatability:	0.1% of R.O.
Zero Balance:	1.0% of R.O.
Compensated Temp. Range:	60° to 160°F
Safe Temp. Range:	-65° to 200°F
Temp. Effect on Output:	0.005% of Load/°F
Temp. Effect on Zero:	0.001% of R.O./°F
Terminal Resistance:	350 ohms nominal
Excitation Voltage:	10 VDC
Safe Overload:	150% of R.O.



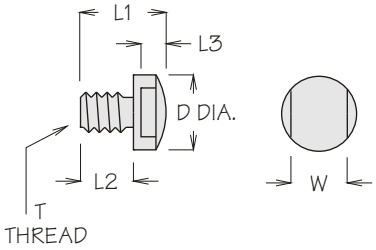


MODEL	CAPACITY FT.LBS.	DRIVE SIZE	MAX. SPEED RPM	DIMENSIONS (INCHES) A	B	C	D	E	F
RSS-10	10	1/4	500	4.125	2.875	.750	1.00	3.00	2.00
RSS-20	20	1/4	500	4.125	2.875	.750	1.00	3.00	2.00
RSS-50	50	3/8	500	4.125	2.875	.750	1.00	3.00	2.00
RSS-100	100	3/8	500	4.125	2.875	.750	1.00	3.00	2.00
RSS-250	250	1/2	500	4.125	2.875	.750	1.00	3.00	2.00
RSS-600	600	3/4	500	7.50	4.750	1.562	2.00	4.125	3.50
RSS-1000	1000	1.0	500	7.50	4.750	1.562	2.00	4.50	4.00

ACCESSORIES

Load Buttons

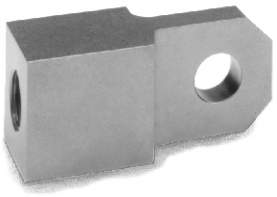
17-4 ph stainless steel heat treated

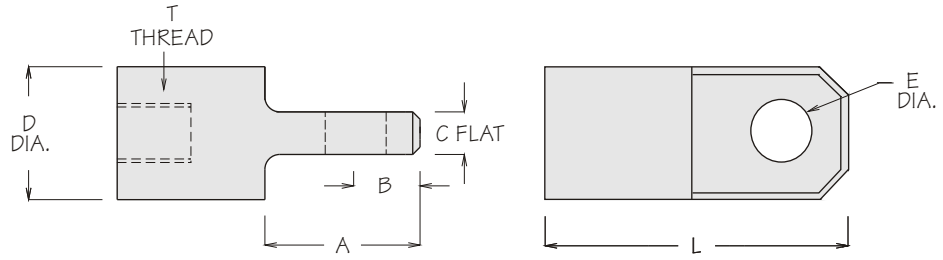


ORDER CODE	T THREAD	DIMENSIONS (INCHES) L1	L2	L3	D	W	BUTTON RADIUS
ALB-03	10-32 UNF	.400	.200	.150	.375	.250	2.0
ALB-04	1/4-28 UNF	.470	.220	.250	.500	.375	4.0
ALB-06	3/8-24 UNF	.625	.312	.312	.750	.625	6.0
ALB-08	1/2-20 UNF	.812	.437	.375	.750	.625	6.0
ALB-10	5/8-18 UNF	.937	.500	.437	1.000	.750	10.0
ALB-12	3/4-16 UNF	1.125	.625	.437	1.125	.875	12.0
ALB-16	1-14 UNS	1.437	.875	.562	1.500	1.250	24.0
ALB-20	1 1/4-12 UNF	1.750	1.125	.625	2.000	1.750	36.0
ALB-24	1 1/2-12 UNF	2.125	1.375	.750	2.250	2.000	36.0

Male Clevis

17-4 ph stainless steel heat treated

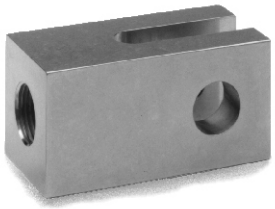


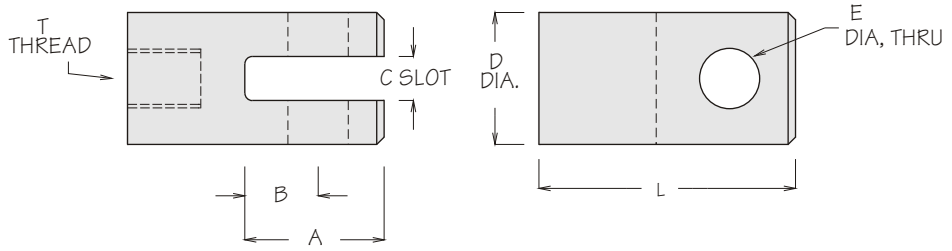


ORDER CODE	A	B	DIMENSIONS (INCHES) C FLATS	D SQ.	E DIA.	L	T THREAD	APPROX. WT. LBS.	SAFE STATIC LOAD RATING LBS.
AMC-08	1.312	.562	.360	1.125	.515	2.562	1/2-20 UNF	1	5,000
AMC-12	1.750	.750	.490	1.500	.640	3.375	3/4-16 UNF	2	10,000
AMC-16	2.312	1.000	.760	2.250	.890	4.870	1-14 UNS	2	25,000
AMC-20	3.030	1.312	.870	2.625	1.140	5.685	1 1/4-12 UNF	8	37,500
AMC-24	3.750	1.625	.995	3.000	1.265	6.500	1 1/2-12 UNF	10	50,000

Female Clevis

17-4 ph stainless steel heat treated



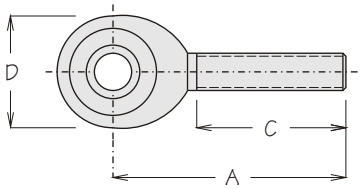


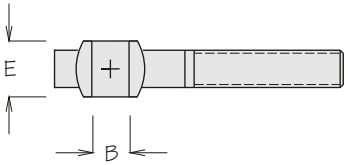
ORDER CODE	A	B	DIMENSIONS (INCHES) C SLOTS	D SQ.	E DIA.	L	T THREAD	APPROX. WT. LBS.	SAFE STATIC LOAD RATING LBS.
AFC-08	1.187	.625	.380	1.125	.515	2.187	1/2-20 UNF	5	5,000
AFC-12	1.625	.875	.510	1.500	.640	3.000	3/4-16 UNF	6	10,000
AFC-16	2.187	1.187	.780	2.250	.890	3.937	1-14 UNS	7	25,000
AFC-20	2.812	1.500	.900	2.625	1.140	4.937	1 1/4-12 UNF	12	37,500
AFC-24	3.437	1.812	1.030	3.000	1.265	5.937	1 1/2-12 UNF	20	50,000

ACCESSORIES

Rod End Bearings

Spherical self aligning

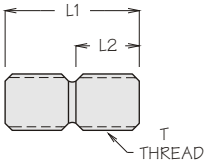




ORDER CODE	DIMENSIONS (INCHES) A	B DIA.	C	D DIA.	E FLATS	T THREAD	SAFE STATIC LOAD RATING LBS.
ARE-03	1.250	.190	.750	.625	.312	10-32 UNF	1,900
ARE-04	1.562	.250	1.000	.750	.375	1/4-28 UNF	3,500
ARE-06	1.938	.375	1.250	1.000	.500	3/8-24 UNF	6,000
ARE-08	2.438	.500	1.500	1.312	.625	1/2-20 UNF	10,000
ARE-10	2.625	.625	1.625	1.500	.750	5/8-18 UNF	16,000
ARE-12	2.875	.750	1.750	1.750	.875	3/4-16 UNF	18,000
ARE-16	4.125	1.000	2.125	2.750	1.375	1-14 UNS	50,000
ARE-20	4.125	1.250	2.125	2.750	1.093	1 1/4-12 UNF	53,000
ARE-24	5.375	1.500	3.000	3.500	1.312	1 1/2-12 UNF	90,000

Clevis Studs

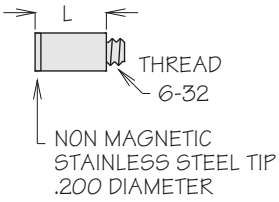
17-4 ph stainless steel heat treated



ORDER CODE	DIMENSIONS (INCHES) L1	L2	T THREAD
ACS-08	1.19	.562	1/2-20 UNF
ACS-12	1.75	.812	3/4-16 UNF
ACS-16	2.25	1.062	1-14 UNS
ACS-20	2.75	1.312	1 1/4-12 UNF
ACS-24	3.25	1.562	1 1/2-12 UNF

Load Stems

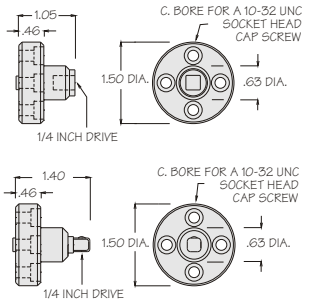
(Used with GS Series Gram Sensors)



ORDER CODE	L1
ALS-04	.250
ALS-06	.375
ALS-08	.500

Socket Wrench Adapters for TRT Series Torque Sensors

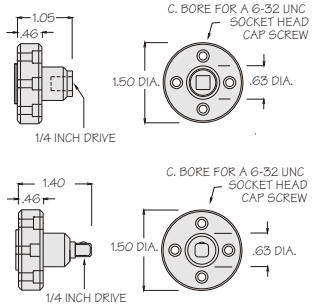
AFS-TRTF **AFS-TRTM**



TRT Series Torque Sensor

Socket Wrench Adapters for RTS Series Torque Sensors

AFS-RTSF **AFS-RTSM**



RTS Series Torque Sensor

ACCESSORIES

Mating Connectors and Connector/Cable Assemblies

AD2-5

AD9

AMP-T

AMI-4

AMM-46SS
AMM-412SS
AMM-420SS
AMM-450SS

AMP-T4
AMP-T6

ORDER CODE	CONNECTOR OR ASSEMBLY DESCRIPTION	CABLE LENGTH FT.	USED WITH
AMP-T	MATING CONNECTOR (PT06A-10-6S)		SERIES LPU, SW, SWP & OPTON-PTB
AMP-T4	MATING ASSEMBLY (PT06A-10-6S) 4 COND.	10	SERIES LPU, SW, SWP & OPTION-PTB
AMP-T6	MATING ASSEMBLY (PT06A-10-6S) 6 COND.	10	SERIES LPU, SW, SWP & OPTION-PTB
AMI-4	MATING ASSEMBLY (MICROTECH) 4 COND.	10	ALL SENSOR WITH MICROTECH SYSTEM
AD9	MATING (9 PIN “D” SERIES)		TI-3000 SENSOR INPUTS
AD2-5	MATING (25 PIN “D” SERIES)		SYS 1, SYS 5 & TI-3000 ANALOG OUTPUT
AMM-46SS	MATING ASSMEBLY/MOLDED 4 COND. SS	6	SERIES HSW, CLP & CLC
AMM-412SS	MATING ASSEMBLY/MOLDED 4 COND. SS	12	SERIES HSW, CLP & CLC
AMM-420SS	MATING ASSEMBLY/MOLDED 4 COND. SS	20	SERIES HSW, CLP & CLC
AMM-450SS	MATING ASSEMBLY/MOLDED 4 COND. SS	50	SERIES HSW, CLP & CLC

Shunt Calibration Resistors

ORDER CODE	RESISTOR VALUE ohms	OUTPUT PRODUCED WHEN PLACED ACROSS CORNER OF 350 ohm BRIDGE
ARC-4	43,575	2 mV/V
ARC-2	87,325	1 mV/V
ARC-1	174,825	.5 mV/V

Power Adaptors

ORDER CODE	USED WITH MODEL
APD-HFG	HFG-45
APD-12 VDC	TM0-1

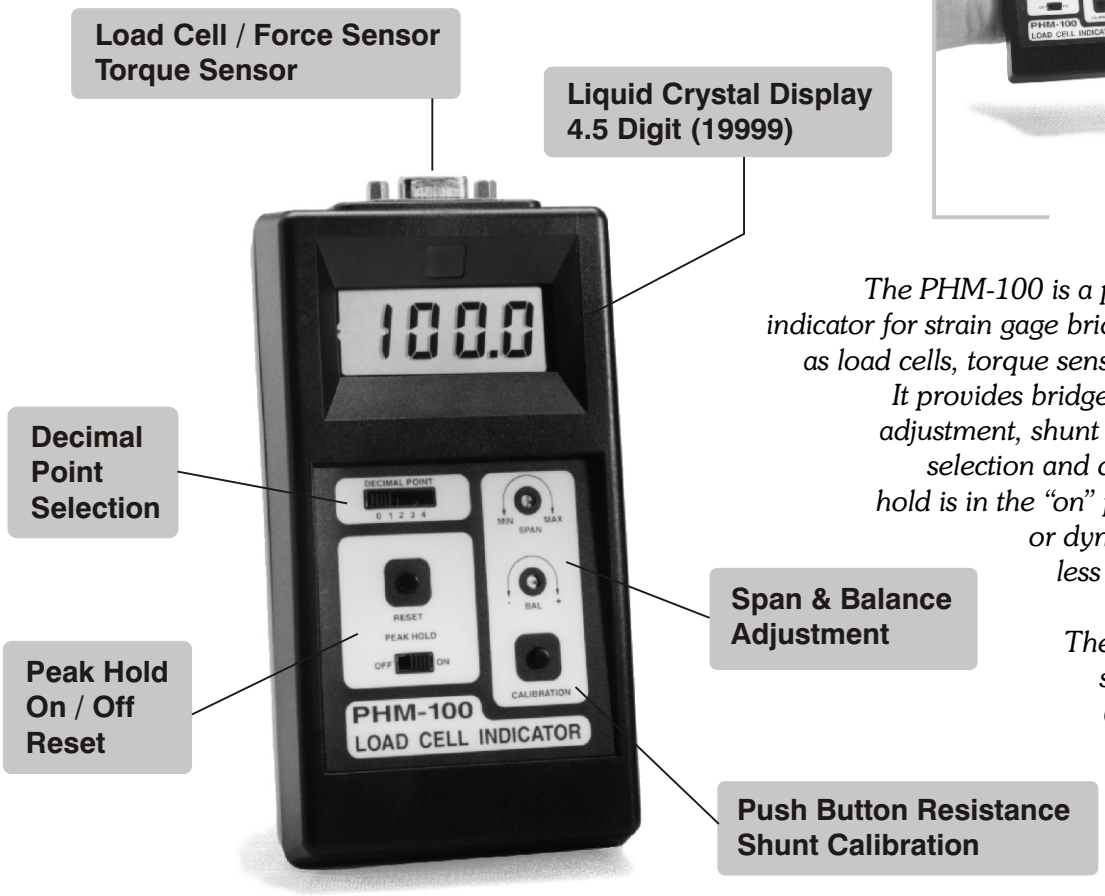
Enclosure For TM0-1

4.5L x 3.5W x 2.25D
with adjustment access

ATM-1

PORTABLE / HAND-HELD TRANSDUCER INDICATOR

MODEL PHM-100



The PHM-100 is a portable hand-held digital indicator for strain gage bridge type transducers such as load cells, torque sensors and pressure sensors. It provides bridge excitation, balance, span adjustment, shunt calibration, decimal point selection and digital display. When peak hold is in the "on" position, the highest static or dynamic signal is captured at less than one millisecond and displayed until reset. The PHM-100 operates on a standard 9 volt battery for 60 hours and is equipped with a low battery indicator.

SPECIFICATIONS

SIGNAL CONDITIONER

Type:	Full external bridge
Sensor Resistance:	350 to 1000 ohm
Balance Range:	20% of FS
Shunt Calibration:	Push button, single point, shunt resitance of 87.325 Kohm

BRIDGE AMPLIFIER

Type:	Bipolar differential
Input Sensitivity:	HIGH: 2mV for 19999 counts min. LOW: 20mV for 19999 counts min. (via Gain switch)
Display Scaling:	0 to 19999 counts

BRIDGE EXCITATION

Type:	Constant voltage
Output:	1.21 VDC
Output Current:	15 mA, short circuit protection

PEAK CAPTURE

Type:	Analog
Response Time:	Less than 1 ms
Zero Reset:	.05% of full display count
Droop Rate:	.15% / minute max (appox. 28 counts at FS)
Capture Sense:	Bidirectional (via polarity switch)

GENERAL

Nonlinearity:	1 count FS
Accuracy:	± .1% of FS
Scale Factor Tempco:	7ppm /°C max
Noise:	2 counts max
Balance Stability:	.2% for 8 hours
Gain Stability:	.02% for 8 hours
Operating Temp:	0° to 50°C
Size:	5.7 x 3.1 x 1.5 inches
Weight:	.6 lbs. approx.
Connector:	9 pin D sub male
Power:	9 VDC battery for 60 hours low battery annunciator

STAND ALONE / BENCH TOP AMPLIFIER / CONDITIONER MODULE

MODEL TM0-2

Analog Output
0- ±10 VDC

Bench Top V.O.M.
Millivolt Meter
X-Y Plotter
Chart Recorder
A/D - Computer

Load Cell/
Force Sensor
Torque Sensor

MODEL TM0-2A

Current Output
4-20 mA

The TMO-2 and TM0-2A Transducer Modules are complete differential amplifier/signal conditioners with self contained power. Both units provide excitation, balance and span adjustment via precision 10 turn pots, and shunt calibration necessary to couple a user supplied bridge type transducer to an indicating instrument. Full scale output is specified at plus or minus 10 VDC for TM0-2, and 4-20 mA for TM0-2A. The TMO-2 provides a floating shunt calibration circuit which applies calibration at the transducer, thereby eliminating errors due to line losses. The excitation supply incorporates a Wagner Ground to greatly improve Common Mode Rejection. The factory set band-width of the module is narrow to improve stability for applications such as weighing scales. The removal of a single capacitor will increase the frequency response DC to 10K Hz for dynamic data applications.

SPECIFICATIONS

SIGNAL CONDITIONER

Type:	Full external bridge
Sensor Resistance:	120 to 1000 ohm
Balance Range (350 OHM):	3% of bridge resistance
Shunt Calibration:	Single point momentary
Calibration Value:	1 mV/V resistor provided

BRIDGE AMPLIFIER

Type:	Bipolar differential
Gain Range:	67 to 737
Input Sensitivity:	1 mV/V to 10 mV/V
Input Impedance:	10 Megohm minimum
Output Voltage:	0 to ±10 Volts (2 mV/V specs)
Output Current:	0 to ±10 mA
Output Impedance:	75 ohm
CMR:	110 db minimum, DC to 60 Hz
Noise and Ripple:	Less than 3 mVP-P
Nonlinearity:	.01% maximum
Accuracy:	± .05% of FS

FILTER

Type:	Low pass, 6 db, octave
Frequency:	16 Hz standard (160 and 1600 Hz available)

EXCITATION SUPPLY

Type:	Constant voltage
Output:	8 VDC ±.25V
Output Current:	0 to 120 mA
Current Limit:	Factory set at 65 mA
Load Regulation:	.1% maximum for 100% load change

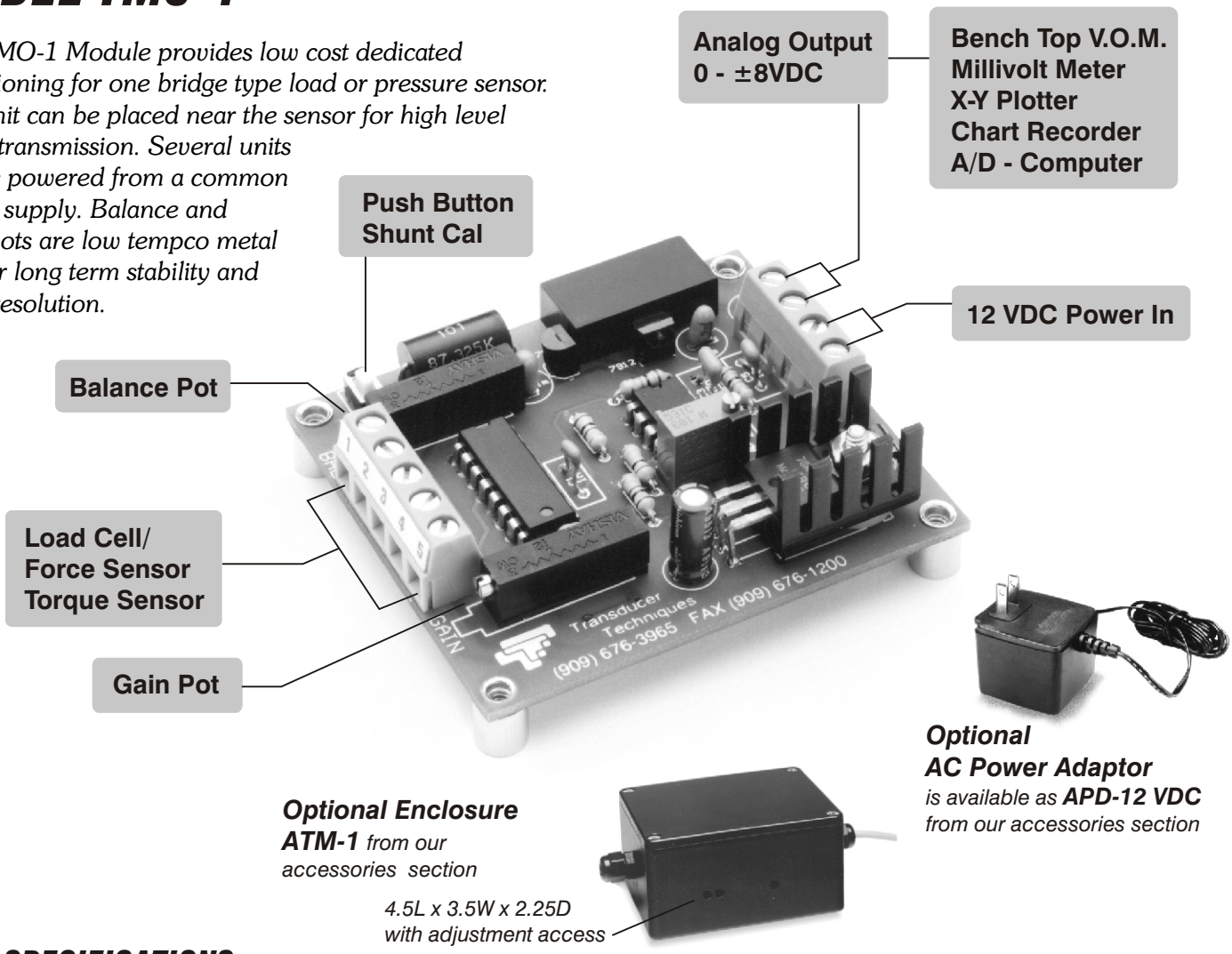
GENERAL

Balance Stability:	.2% for 8 hours
Gain Stability:	.01% for 8 hours
Tempco:	.02% full scale/°C
Isolation:	1000 Megohm, output to AC
Operating Temp:	0 to 50°C
Size:	3 x 3.75 x 6.25 inches
Weight:	Less than 2 lbs. approx.
Fuse:	250 mA internal
Power:	115 VAC ±10% 60 Hz 3 Watts

LOW COST 12 VDC POWERED AMPLIFIER / CONDITIONER MODULE

MODEL TMO-1

The TMO-1 Module provides low cost dedicated conditioning for one bridge type load or pressure sensor. The unit can be placed near the sensor for high level signal transmission. Several units can be powered from a common power supply. Balance and span pots are low tempco metal film for long term stability and good resolution.



SPECIFICATIONS

AMPLIFIER SECTION

Type:	Bipolar, differential
Gain Range:	75 to 1000
Input Sensitivity:	1 mV/V minimum for 8 VDC output
Output Voltage:	0 to ±8 VDC (linear to 9.5)
Output Current:	0 to 10 mA
Nonlinearity:	.01% maximum
Accuracy:	±.05% of FS
Stability:	±.1% for 24 hours
Tempco:	.01% full scale/°C
Noise and Ripple:	Less than 5 mV P-P at gain=1000
Filter Type:	2 Pole Butterworth
Frequency Response:	DC to 220 Hz (2.2, 22, 2200 Hz available, no charge)

BRIDGE SECTION

Excitation Voltage:	8 VDC ±.25 V 5 VDC optional
Sensor Resistance:	120 ohm minimum 1000 ohm maximum
Balance Range:	±30% of output (350 ohm bridge)

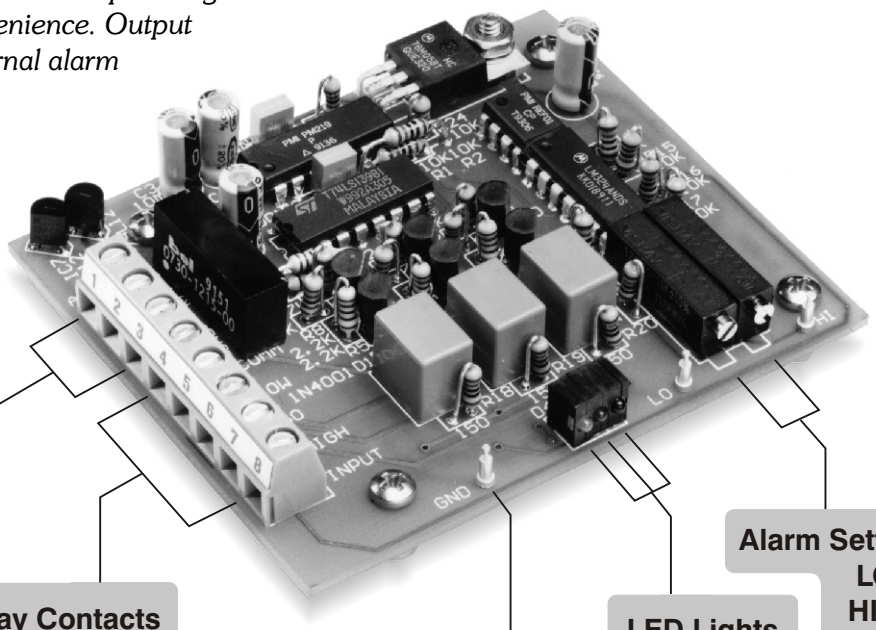
GENERAL

Weight:	Approx. 2 ozs.
Size:	2.25"L x 2.50"W x .80"H inches tall
Mounting:	Corner standoffs, 4-40 thread
Input/Output:	Via screw terminals
Operating Temp:	0 to 70 °C
Power Required:	12 VDC ± .5V at 65 mA 24 VDC optional
Mounting Footprint:	1.950 x 2.220

DUAL SET POINT (WINDOW) ALARM BOARD

MODEL DSP-1

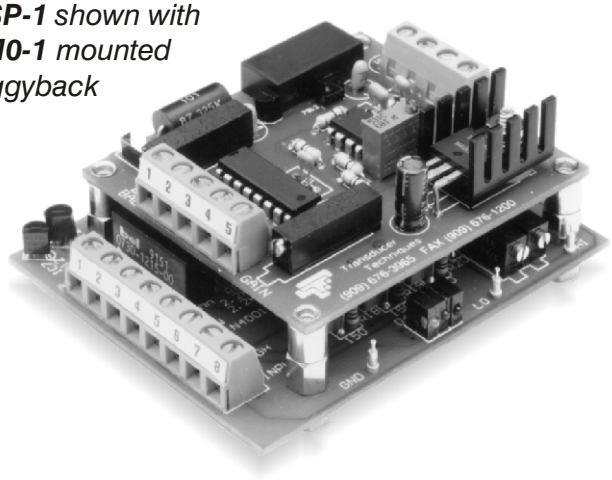
The DSP-1 is designed to monitor critical sensor data from a sensor amplifier/conditioner device such as the TMO-1 or TMO-2. The window is normally associated with signals such as below normal (yellow), go range or acceptable (green), and above acceptable (red). Status is provided by output relays as well as LED's. The window is set by high and low potentiometers with set values measurable at high and low test pins. A ground test pin is provided for measurement convenience. Output relays can be used to drive larger external alarm devices or to halt the process or activity that is causing the unacceptable level. TMO-1 signal amplifier/conditioner can be mounted to the DSP-1 via four standoffs (provided) to create a single unit powered by the same power supply.



Optional
AC Power Adaptor
is available as ***APD-12 VDC***
from our accessories section

SPECIFICATIONS

Alarm Setting:	2-(High and Low)
Status Levels:	3-(Low, Go and High)
Alarm Range:	0 to 10 VDC
Alarm Response:	Less than 15 ms
Alarm Setting:	Via external voltmeter
Power:	12 VDC /100 mA max
Relay Rating:	2 A @ 100 VAC or 24 VDC, contact resistance 50 Mohm
Dimensions:	3"L x 2.6"W x 0.6"H



DSP-1 *shown with* ***TM0-1*** *mounted piggyback*

INTELLIGENT PANEL MOUNT METER AMPLIFIER / CONDITIONER

MODEL DPM-2

The voltage-to-frequency microprocessor makes Transducer Techniques 4-digit panel mount meters the ideal solution for meeting the measurement, display and control requirements of noisy indutrial applications, OEMs and system designers. Model DPM-2 accepts any full bridge transducer. Balance and span can be selected via the front keypad, thus allowing the display to read directly in engineering units. Front panel max and tare functions are ideal for industrial weighing applications. Isolated adjustable 9-11 VDC excitation with remote sense and 90 mA drive eliminates the need for external power supplies. Rear screw terminal connectors are included.

FEATURES

- Front panel tare function
- Automatic storage of max reading
- .5 Inch high intensity display
- Security lockout code
- Plug-in screw terminals

PLUG-IN OPTIONS

- **OPTION C**
  Dual setpoint controller
  5 Amp, 125 VAC From C relays
- **OPTION H**
  Isolated linearized analog outputs
  0 to 10 VDC or 4-20 mA
- **OPTION T**
  Isolated digital communications
  RS 232 serial data output

SPECIFICATIONS

DISPLAY	
Type:	4 LED, 6 -segment, 13.0mm (.50")
Color:	Blue-Green
Range:	-9999 to +9999
A to D CONVERSION	
Rate:	4/s at 60 Hz operation
Output Update Rate:	2/s at 60 Hz operation
Display Update Rate:	2/s at 60 Hz operation
ACCURACY at 25°C	
Load Cell Meter:	0.01% FS +/- 1 Ct.
Span Tempco:	0.008% of reading/°C
Zero Tempco:	0.1 Cts./°C
Reference Junction:	0.03 degree/degree
NOISE REJECTION	
CMV from DC to 60 Hz:	2500 V peak, input to power line with AC power supply
CMR from DC to 60 Hz:	80 dB Typical
NMR to 50/60Hz line:	60 dB Typical
ENVIRONMENTAL	
Operating Temperature:	0°C to 45°C
Storage Temperature:	-40°C to +85°C
Relative Humidity:	80% at 40°C, noncondensing
OPERATING POWER	
Voltage:	115 VAC or 230 VAC ±10%
EXCITATION POWER SUPPLIES	
Outputs:	Adjustment range +9 VDC to + 11 VDC , 90 mA
PANEL CUTOUT	
Height:	1.78
Length:	3.63

HIGH SPEED MICRO PROCESSOR DIGITAL PANEL MOUNT METER

MODEL DPM-3

The DPM-3 digital panel meter is a low cost solution to a wide range of load/force and torque monitoring applications. By simple front panel push button setup the DPM-3 can be scaled to a full five digits from 0 to 99,999 to read directly in engineering units such as grams, ounces, pounds, inch pounds, etc. The DPM-3 samples 60 readings per second (50 for 50 Hz operation) for fast control response, true peak reading capability, and an analog output (optional) that accurately tracks the signal input. The meter has an adaptive digital filter that can automatically select the best time constant for minimum noise yet respond rapidly to an actual change in signal level. The peak value can be displayed by a push of a button on the front panel. Auto tare allows the meter to be set to zero for any input signal level. The DPM-3 provides an isolated 5, 10, or 24 VDC output for bridge transducer/sensors.

New *Windows based software for data logging available upon request.*

FEATURES

- 60 Conversions per second for:
  - Fast control response
  - True peak reading
  - Analog outputs (optional) that track the input
- Scalable to 5 digits
  - Engineering units to +/-.99,999
  - Setup by front panel push buttons
- Worldwide input power:
  - 85 to 264 VAC and 90 to 370 VDC
- Isolated 5, 10, or 24 VDC output
  - Provides transmitter excitation
- Peak hold and auto tare
- Automatic, adaptive digital filtering
- Plug-in screw terminals

PLUG-IN OPTIONS

- **OPTION C**
  Dual setpoint controller
  10 Amp, 240 VAC Form C relays
- **OPTION H**
  Isolated linearized analog outputs
  0 to 10 VDC or 0 to 20 (4/20) mA
- **OPTION T**
  Isolated digital communications
  RS-232 for interface and meter setup
  RS-485 to interface with multiple meters
  Baud rates from 300 to 19,200
- **OPTION V**
  Isolated low voltage power supply
  9 to 37 VDC and 8 to 28 VAC inputs
  Isolated 5, 10, or 24 VDC output

SPECIFICATIONS

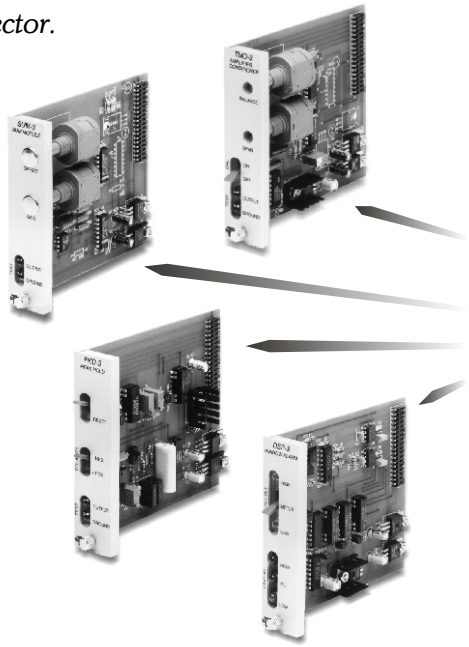
DISPLAY	
Type:	5 LED, 7 -segment, 14.2mm (.56")
Color:	Red
Range:	-99999 to +99999 and
	-99990 to +99990
A to D CONVERSION	
Technique (Pat. Pend):	Concurrent Slope™
Rate:	60/s at 60 Hz operation
	50/s at 50 Hz operation
Output Update Rate:	56/s at 60 Hz
	47/s at 50 Hz
Display Update Rate:	3.5/s at 60 Hz
	3.5/s at 50 Hz
ACCURACY at 25°C	
Load Cell Meter:	0.01% FS +/- 1 Ct.
Span Tempco:	0.003% of reading/°C
Zero Tempco:	0.1 Cts./°C
Reference Junction:	0.03 degree/degree
NOISE REJECTION	
CMV from DC to 60 Hz:	Safety-related to 250 VAC
	4.2 kVp per High Voltage Test
CMR from DC to 60 Hz:	130 dB
NMR to 50/60Hz line:	90 dB with minimum filtering
ENVIRONMENTAL	
Operating Temperature:	0°C to 55°C
Storage Temperature:	-40°C to 85°C
Relative Humidity:	95% at 40°C, noncondensing
OPERATING POWER	
Voltage (std):	85 to 264 Vac, 90 to 370 VDC
Voltage (opt):	8 to 28 Vac, 9 to 37 VDC
EXCITATION POWER SUPPLIES	
Outputs:	5 VDC, 5%, 200 mA max.
	10 VDC, 5%, 120 mA max.
	24 VDC, 5%, 50 mA max.
PANEL CUTOUT	
Height:	1.77
Length:	3.62

VERSATILE 5-CHANNEL INDUSTRIAL AMPLIFIER / CONDITIONER

MODEL TI0-3000

The TI0-3000 System was originally designed to perform precision summing on 2, 3, or 4 load cell signals for weighing applications. Development has progressed into accessory modules with considerable versatility for user defined configurations in a compact economical five (5) slot system with built-in meter and channel selector.

Shown with window cover removed



AVAILABLE PLUG-INS

TM0-3 *Amplifier / Conditioner module for strain gage type sensors*
SUM-3 *Precision Summer for weighing*
PKD-3 *Peak Hold with polarity and reset*
DSP-3 *Window Alarm with dual set points*

OPTIONS

TM0-3A *4-20 milliamp output*
SUM-3A *4-20 milliamp output*

INPUTS

Weight / Force
Pressure
Strain
Deflection

OPTIONAL OUTPUTS

Analog Data
Current Loops
Peak Capture
(.5 ms Response Time)
Control (Alarms)
Quick Look Display

CHASSIS SPECIFICATIONS

Plug-In Capacity:	5
Meter:	3½ or 4½ digit
Sensor Input:	9 pin D connector
Data / Control Output:	25 pin D connector
Size (Inches):	12 wide x 7.5 high x 8 deep
Weight:	15 lbs. approx.
Power:	115 VAC 60 Hz
Fuse:	250 mA

AVAILABLE CONFIGURATIONS

Function	*Capacity*					
TM0-3 *(Amp / Cond)*	5	4	3	3	2	2
SUM-3 *(Sum)*	0	1	1	1	1	0
PKD-3 *(Peak)*	0	0	1	0	0	0
DSP-3 *(Alarms)*	0	0	0	1	2	0

TMO-3 AMPLIFIER/CONDITIONER

Description

The TMO-3 Module provides sensor excitation, zero balance control, gain adjustment and calibration resistor, necessary to condition one (1) strain gage type sensor signal for display on built-in meter, off board recording or processing. The nominal output range of the module is 0 to ±10 VDC. The TM0-3 module derives its power from the TIO-3000 motherboard. On-board regulators supply amplifier bias and bridge excitation. Each module contains a two-pole filter as the final element.

Options

1. *A 4 to 20 mA current loop output is available as Option "A".*
2. *The standard 16 Hz filter was picked for meter stability. The bandwidth of the TM0-3 can be much higher if desired.*

MODULE SPECIFICATIONS

Amplifier Type:	Biopolar differential
Gain Adjustment:	75 to 1000
Input Impedance:	50 megaohm minimum
Output Voltage:	0 to ± 10 volts, less with sum
CMR:	100 dB min., DC to 15 Hz
Noise and Ripple:	Less than 10 mV P-P @ G = 1000
Nonlinearity:	.05% of full scale
Compliance:	.1% of full scale
Frequency Response:	DC to 16 Hz
Bridge Resistance:	120 to 1000 ohm
Bal Range (350 ohm):	25% of output, minimum
Shunt Calibration:	Single point, local
Sensor Wiring:	6 wire shielded
Excitation Type:	Constant 8 VDC up to 100 mA
Load Regulation:	.1% max for 100% load change

PKD-3 PEAK HOLD MODULE

Description

The PKD-3 Module provides very fast response to variations in data level and captures the highest peak that occurs in a given monitor window. Unlike microprocessor controlled meters that convert in digital readings at three samples per second and then save the highest reading, the PKD-3 tracks continually and holds in analog form until reset. The module has polarity select and reset control which can be operated from the front edge of the module or remotely by switching TTL control lines to ground.

A typical application for the PKD-3 is with a TMO-3 and a torque transducer used with an automatic nut runner. When the runner stalls, peak torque is saved. If backoff torque is needed for system evaluation, the module can be reset to zero and the polarity changed, both by computer.

MODULE SPECIFICATIONS

Input Range:	0 to ± 5 VDC
Output Range:	0 to ± 5 VDC
Response Time:	Less than .5 ms
Reset Time:	50 ms minimum
Droop:	Less than 2 mV/minute
Power:	From TI0-3000 motherboard

DSP-3 WINDOW ALARM

Description

The DSP-3 is designed as a watchdog module to monitor critical sensor data from a TMO-3 or SUM-3 Module. The window is normally associated with signals such as: below normal (yellow), go range or acceptable (green), and above acceptable (red). Front edge LED's provide this status, as do output relays. The window is set by a high and low potentiometer, with set values displayed on the TIO-3000 meter, usually in a engineering unit like the sensor channel it is tracking. Output relays can be used to drive larger external alarm devices or to switch off the process or activity that is causing the unacceptable level.

Options

1. *1 ms responses*

MODULE SPECIFICATIONS

Alarm Settings:	2 (high and low)
Status Levels:	3 (low, go and high)
Alarm Range:	0 to 5.0 VDC
Alarm Response:	Less than 15 ms
Alarm Settings:	Via TI0-3000 meter
Power:	Via TI0-3000 motherboard
Relay Type:	Plugable fast acting reed
Relay Rating:	10 watts .5 amp maximum
Life:	100 million cycle

SUM-3 PRECISION SUMMING MODULE

Description

The SUM-3 Module is designed for precise weighing application by accepting the output signals from 2, 3, or 4 TMO-3 conditioning modules and performing the algebraic sum of those signals. Unlike resistor summers, the active element summing junction does not require sensor signals of matching output. The TIO-3000 approach provides a cal resistor to scale amplifiers (TMO-3's) to engineering units. With data now standardized during setup, precision summing is accomplished.

Advantages

1. *Load cells are less expensive if calibrated, not standardized.*
2. *A damaged sensor can be replaced and the system rescaled to the new sensor/cal resistor.*
3. *Load cells of two different capacities can be summed.*
4. *Load cells may be dispersed at uneven locations to weigh an odd shaped tank or structure.*

Options

1. *A 4 to 20 mA current loop output is available as Option "A".*

MODULE SPECIFICATIONS

Summing Accuracy:	± .1% of inputs
Input Range (4 Inputs):	± 2.5% VDC
Output Range:	± 10 VDC
Stability:	.05% for 24 hours
Tempco:	.01% per °C
Power:	From TI0-3000 motherboard

POWER SUPPLY MODULES

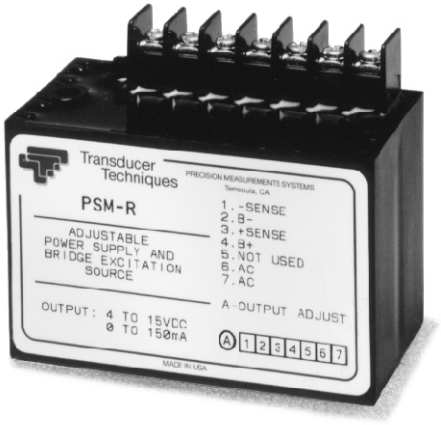
MODEL PSM-F10

The PSM-F10 is a chassis mountable power supply package. They are ideal for use with dedicated microprocessor systems, instrument design and test equipment. The PSM-F10 can also be used as a supplemental bench or laboratory power supply. The special "clamp" type barrier strip secures the wire without twisting. Note the protected recessed barrier strip facing the top of the case. This allows connections to be made in tight areas while protecting the barrier strip from physical damage. Nothing else offers this combination of ruggedness, flexibility and convenience.

SPECIFICATIONS

Input:	115 VAC ±10% 50 to 60 Hz
Output Voltage:	10 VDC fixed
Output Current:	400 mA max.
Line and Load Regulation:	0.05% max.
Noise and Ripple:	1 mV RMS
Operating Temperature:	0 to 70°C
Temperature Effect:	50 ppm/°C
Storage Temperature:	-25 to 85°C
Line Isolation:	1200-1500 VRMS
Dimensions:	4.00" x 2.70" x 1.40"

MODEL PSM-R



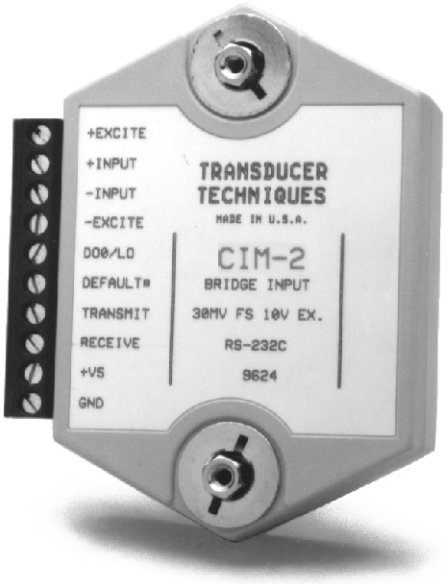
The PSM-R is a self contained AC power bridge excitation supply. This device consists of a low interwinding capacitance AC transformer and a high stability adjustable linear regulator designed specifically for driving transducer bridges. DC excitation is adjustable from 4 to 15 volts output and is capable of supplying 0 to 150 mA in output current. It features remote sensing to eliminate line drop errors and very low noise. It can also be used as a high quality voltage source or reference in many applications. AC input requirements are 105 to 125 VAC at 60 Hz.

SPECIFICATIONS

Input:	115 VAC ±10% 50 to 60 Hz
Output Voltage:	Adjustable 4 to 15 VDC
Output Current:	150 mA max.
Line and Load Regulation:	0.005%
Noise and Ripple:	0.5 mV RMS
Operating Temperature:	0 to 70°C
Temperature Effect:	50 ppm/°C
Storage Temperature:	-25 to 85°C
Line Isolation:	1100 VRMS
Dimensions:	3.75" X 2.00" X 2.87"

COMPUTER INTERFACE MODULE
RS 232 OR RS 485
MODEL CIM-2

Our model CIM-2 allows direct connection of any strain gage bridge transducer to your computer via a RS 232 or RS 485 link. As many as 124 modules may be connected to a single communications port with the ability to address each module or sequential scanning of modules. Scaling may be selected to read out in any desired engineering units with limit setting capability provided. All functions are field programmable.



SPECIFICATIONS

GENERAL	
Channels:	1
Temperature:	-25° to 70°C
Material:	ABS Plastic
Power Required:	10 to 30 VDC
Inputs Accepted:	0 to 30mV or 0 to 100mV
Calibration Method:	Computer Keyboard
Accuracy:	±0.05%

TRANSDUCER	
Excitation:	5 or 10 VDC
COMPUTER SCREEN DISPLAY	
Display:	6 Digits
Conversions:	8 Per Second
PHYSICAL	
Dimensions:	3.6" x 2.45" x 0.85"

TRANSDUCER SIMULATOR

MODEL TSM-3MV

The TSM-3MV was designed for use in testing, troubleshooting, and calibrating digital weigh indicators and systems. It is perfect for bench testing setpoint systems. It has Vernier range of 106% of selected step.

SPECIFICATIONS

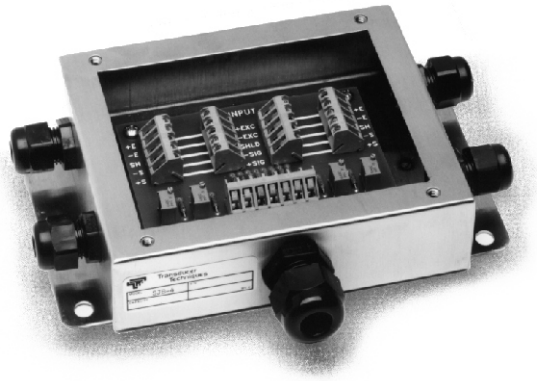
Variable Range:	0-3 mV/V in 15 ea. (.2 mV/V steps)
Impedance:	350 ohms ±0.05%
Nonlinearity:	Less than .05%
Temp. Coefficient:	±5ppm/°C
Dimensions:	3.125" x 6.00" x 2.750”

SUMMING JUNCTION BOX

MODEL SJB-4

Our SJB-4 is a load cell summing card housed in a NEMA 4X enclosure, measuring 6 x 7.5 inches overall. It has four 5-position terminal strips for load cell input and one 7-position terminal strip with internally jumped sense terminals for output to the instrument. The board will sum 2 to 4 load cells and can be daisy-chained to sum up to 8 load cells using 2 summing cards and enclosures. Trimming of signal output is accomplished with four 25-turn trim pots. The housing can be mounted with four .28 inch diameter mounting holes provided, with a spacing of 3.37 x 6.25 inches on center.

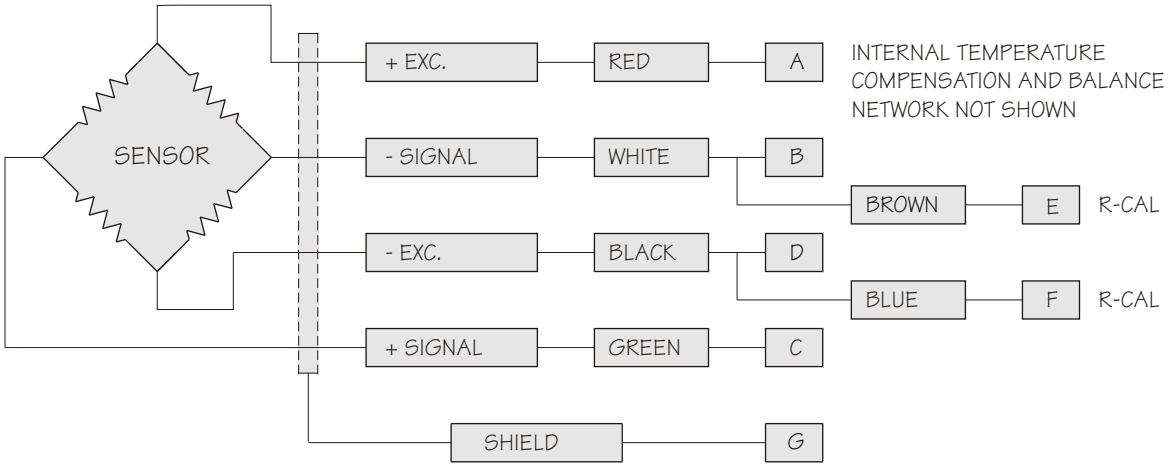
***SJB-4** Shown with cover and seal removed*



SPECIFICATIONS

Case:	NEMA 4X
Feedthroughs:	Compression type for wire up to 0.25 diameter
Span:	±3% adjustment

WIRING / COLOR CODE



CALIBRATION

Our load cells and torque sensors are supplied with at least a one direction calibration certificate traceable to the NIST. Dead weights and transfer standards and all measurement equipment used to calibrate our products are certified on a regular schedule.

Calibration Procedure

Four load points are recorded from zero to full scale increasing and decreasing with the errors documented as linearity and hysteresis as percent of full scale. This procedure is repeated and the difference between runs documented as repeatability error as percent of full scale. Finally, with the load cell or torque sensor at zero (NO LOAD) position, a precision wire wound resistor is placed across (-) power lead (black) and (-) signal lead (white) producing a millivolt output. Our calibration certificate will reflect this resistor value and millivolt output along with calculated percent of full scale and engineering units to be used later for system calibration.

System Calibration

Our load cell and torque sensor related instrumentation (with or without display) utilize the resistance (R-CAL) method of calibration transfer. The precision resistor value stated on our calibration certificate and explained above is supplied with our instrumentation as a internal or external (R-CAL) resistor. A push button or momentary switch shunts the load cell bridge, and the span pot is quickly and accurately adjusted to the engineering units equivalent stated on the calibration certificate.

ORDERING INFORMATION

Example

MLP - 10 - T - DB

- **MLP** — **MODEL**
- **10** — **FULL SCALE RANGE**
- **T** — **CALIBRATION DIRECTION DESIRED:** (T) TENSION CALIBRATION (C) COMPRESSION CALIBRATION
- **DB** — **OPTIONS**

INSTRUMENTATION MODEL NUMBERS, INSTRUMENT OPTIONS AND ACCESSORIES SHOULD BE ORDERED AS SEPARATE LINE ITEMS.
Order (TC) BIDIRECTIONAL CALIBRATION AS SEPARATE LINE ITEM

TERMS & CONDITIONS OF SALE & SHIPMENT

Terms

1. Payment terms are net thirty (30) days from the invoice date with prior credit approval.
2. All prices are F.O.B. Transducer Techniques, plant unless otherwise specified and are firm for sixty (60)days from the date of quotation.
3. Title to merchandise passes to the Purchaser upon Company delivery to a carrier at Transducer Techniques, plant, 43178 Business Park Drive, Temecula, CA 92590.
4. Normal shipment method is UPS. Purchaser can specify any other shipping method. Shipping cost normally will be prepaid and added as a separate item on the invoice.
5. If the financial condition of the Purchaser is not satisfactory to Company, the Company may cancel the order or require full or partial payment in advance.

Prices

Prices published in catalogs, bulletins, or price lists are not offers to sell and are subject to change without notice. General price information should be specifically confirmed.

Product Modification & Substitutions

The Company reserves the right to change or modify, at any time or without notice, any product, or to discontinue the manufacture of any product.

Delivery Schedules

The Company reserves the right to make partial shipments of equipment as fabrication is completed. Partial shipments will be invoiced at standard terms. Delivery information is approximate and refers to time of delivery to carrier and is made in good faith. Delivery schedules are not guaranteed and the Company will not accept any liability for any penalty or damages, liquidated or otherwise, for delayed shipments or installations.

Cancellation

In the event of cancellation, Purchaser shall pay to the Company promptly upon receipt of invoice from the Company:

(a) The full contract price for all products which shall have been completed prior to the Company's receipt of notice of cancellation.
(b) All costs actually incurred by the Company in connection with the uncompleted portion of the order.
(c) Cancellation charges incurred by the Company on account of its purchasing commitments made under the order.

Claims

The Company's liability under this warranty or any other warranty, whether expressed or implied in law or fact, shall be limited to the repair or replacement of defective material and workmanship; and in no event shall the Company be liable for consequential or indirect damages.

Modifying or Conflicting Terms

Acceptance of this offer is expressly conditional on Purchaser's acceptance of all Company's terms. Neither modification of, nor addition to, the foregoing terms of sale and shipment, oral or written, nor any conflicting terms or conditions incorporated in Purchaser's order, are a part of the contract unless specifically agreed to by the Company in writing and signed by an officer of the Company.

Patent Infringement

The Company makes no representations as to whether goods being sold are free of the rightful claim of any third person by way of infringement of similar claims and disclaims any warranty against infringement or similar claims with respect to the goods.

Confidential

Selected software and hardware, drawings, diagrams, manuals, specifications and other material furnished by the Company relating to the use and service of articles furnished hereunder, including any information, may be identified as proprietary to the Company. Such software and hardware, diagrams, manuals, drawings, specifications and other materials, have been developed at great expense and are considered to be trade secrets of the Company. Buyer may not reproduce in any way without the expressed written permission of the Company, such diagrams, drawing, manuals, specifications and other materials, except as needed to operate and maintain the equipment supplied by the Company. All documents and /or material aforementioned relative to the articles, supplied directly by the Company(except information as may be established to be in the public domain, or disclosed pursuant to judicial or Government action) shall be received in confidence.

Authority of the Company's Agents

No agent, employee or representative of the Company has the authority to bind the Company to any affirmation, representation or warranty concerning the goods sold under this contract, and unless an affirmation, representation or warranty made by an agent, employee or representative is specifically included within this bargain , it shall not in any way be enforceable by the Purchaser.

Return Policy

Items requested to be returned for credit are subject to: Transducer Techniques approval along with the authorization number; Restocking charge of 20% , a one direction calibration charge plus any rework. Return transportation to be prepaid.

WARRANTY / REPAIR POLICY

Limited Warranty on Products

Any of our products which, under normal operating conditions, proves defective in material or in workmanship within one (1) year from the date of shipment by Transducer Techniques, will be repaired or replaced free of charge provided that you obtain a return material authorization from Transducer Techniques and send the defective product, transportation charges prepaid with notice of the defect, and establish that the product has been properly installed, maintained, and operated within the limits of rated and normal usage. Replacement product will be shipped F.O.B. our plant. The terms of this warranty do not extend to any product or part thereof which, under normal usage, has an inherently shorter useful life than one year. The replacement warranty detailed here is the Buyer's exclusive remedy, and will satisfy all obligations of Transducer Techniques, whether based on contract, negligence, or otherwise. Transducer Techniques is not responsible for any incidental or consequential loss or damage which might result from a failure of any Transducer Techniques, product. This express warranty is made in lieu of any and all other warranties, expressed or implied, including implied warranty of merchantability or fitness for particular purpose. Any unauthorized disassembly or attempt to repair voids this warranty.

Obtaining Service Under Warranty

Advance authorization is required prior to the return to Transducer Techniques. Before returning the item(s) either write to the Repair Department c/o Transducer Techniques, 43178 Business Park Drive, Temecula, CA 92590, or call (909)676-3965 with: 1) a part number; 2) a serial number for the defective product; 3) a technical description of the defect; 4) a no-charge purchase order number (so products can be returned to you correctly); and, 5) ship to and bill to addresses. Shipment to Transducer Techniques shall be at Buyer's expense and repaired, or replacement items will be shipped F.O.B. our plant in Temecula, CA. Non-verified problems or defects may be subject to a $75 evaluation charge. Please return the original calibration data with the unit.

Obtaining Non-Warranty Service

Advance authorization is required prior to the return to Transducer Techniques. Before returning the items, either write to the Repair Department c/o Transducer Techniques, 43178 Business Park Drive, Temecula, CA 92590, or call (909)676-3965 with: 1) a model number; 2) a serial number for the defective product; 3) a technical description of the malfunction; 4) a purchase order number to cover Transducer Techniques, repair cost; and, 5) ship to and bill to addresses. After the product is evaluated by Transducer Techniques, we will contact you to provide the estimated repair costs before proceeding. The minimum evaluation charge is $75. Shipment to Transducer Techniques shall be at Buyer's expense and repaired items will be shipped to you F.O.B. our plant in Temecula, CA. Please return the original calibration data with the unit.

Repair Warranty

All repairs of Transducer Techniques, products are warranted for a period of 90 days from the date of shipment. This warranty applies only to those items which were found defective and repaired; it does not apply to products in which no defect was found and returned as is, or merely recalibrated. Out of warranty products may not be capable of being returned to the exact original specifications or dimensions.

FOR TECHNICAL SUPPORT, CALL

(800) 344-3965

E-mail: tti@ttloadcells.com

URL: http://www.ttloadcells.com

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