LVDT Load Cells

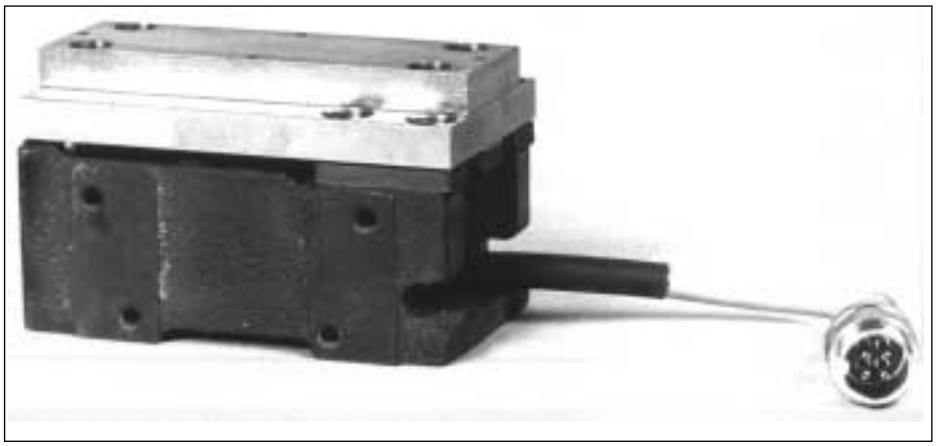
22-2200 LB. Capacity

General Description

The LCS01 Series of load cells uses LVDT type sensor to convert tension into a proportional electrical signal. The LVTD system provides precise, accurate tension measurement while the mechanical design allows for extremely high overloads without damage to the unit.

As web tension increases, the resultant force F also increases. This causes the load plate to rotate minutely around the pivot point 0. This 0 point is a torsion bar which resists the force F. Due to leverage advantage, actual sensing roll movement is quite small. Movement of the core in the LVDT is proportionately larger.

As the core moves within the LVDT coil, the output of the coil varies directly with the core movement, which varies directly with the force F. The output is thus proportional to F.



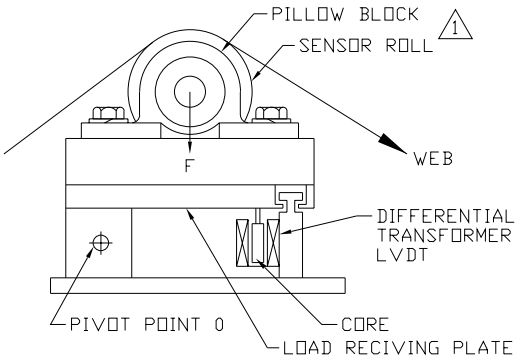
LCS01-0022

The mechanical structure of the torsion bar and the mechanical limit stops on the load plate allow the LCS01 Sensors to survive 100-to-1 overloads without structural failure or variance in calibration.

The LVDT housing also contains a high-frequency oscillator circuit which guarantees excellent linearity. Also a thermal compensating circuit ensures zero thermal drift when used within the stated temperature range.

Standard Features

- Extremely accurate LVDT type sensor
- Mountable at any angle
- Suitable for either symmetrical or asymmetrical web path angles
- Capable of taking extreme overloads without structural damage or loss of calibration
- Simplified mechanical structure
- No calibration or maintenance required



1 PILLOW BLOCK AND SENSOR ROLL NOT INCLUDED

Fig. D.5

Specifications

Part No. LcS01-XXX	-0022	-0044	-0110	-0220	-0660	-1100	-2200
Frame size	MB110	MB11A	MB25A	MB25B	MB33B	MB33A	MB41
Load Range per sensor Lb	22	44	110	220	660	1100	2200
Kg	10	20	50	100	300	500	1000
Tare per sensor Lb	11	22	55	110	230	385	770
Kg	5	10	25	50	105	175	350
Roll movement min/bF	481	236	80.5	38.5	16.3	9.8	0.4
Accuracy	±1%	±1%	±1.5%	±1.5%	±1.75%	±1.75%	±1.75%
Weight Lb. (Kg)	1.8(.8)		7.5(3.4)		35(16)		53(24)
Electrical Data	6 VDC Excitation; 0-400 mV return						
Temperature Range	+14 to 140˚ F (-10 to + 60˚ C)						

Standard Models and Descriptions

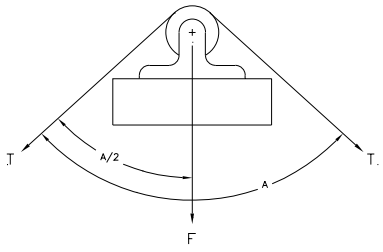
Model Number	Descriptions	Dimensions	Connections
LCS01-0022	22 lb. Load Cell Sensor	Fig. D.6	Fig. D.10 & Fig.D.11
LCS01-0044	44 lb. Load Cell Sensor	Fig. D.6	Fig. D.10 & Fig.D.11
LCS01-00110	110 lb. Load Cell Sensor	Fig. D.7	Fig. D.10 & Fig.D.11
LCS01-00220	220 lb. Load Cell Sensor	Fig. D.7	Fig. D.10 & Fig.D.11
LCS01-00660	660 lb. Load Cell Sensor	Fig. D.8	Fig. D.10 & Fig.D.11
LCS01-1100	1100 lb. Load Cell Sensor	Fig. D.8	Fig. D.10 & Fig.D.11
LCS01-2200	2200 lb. Load Cell Sensor	Fig. D.6	Fig. D.10 & Fig.D.11

Sizing

Two factors affect Sensor Sizing. The sensor must be able to measure the Force (F) created by the Web Tension (T) wrapping the roll at given angle. The sensor must also support the tare weight of the sensing roll and bearings. These two factors are independent of one another and must be calculated separately.

FORCE CONFIGURATION

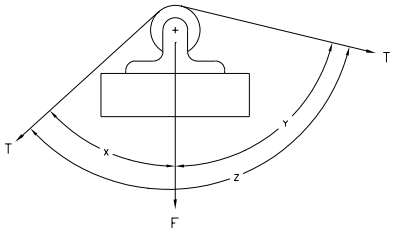
Symmetrical Wrap



F=2T • cos A/2

Load range per sensor (see specifications) is F divided by the number of points supporting the load, i.e. two support points in Bilateral, Unilateral or Cantilevered configuration, or one support point in Narrow Web or

Asymmetrical Wrap



F=(T • cos X) + (T • cosY)

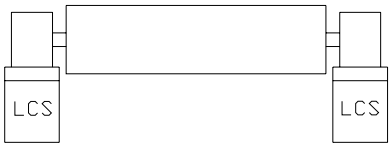
Wire and Filament configuration below. Tare per sensor (see specifications) is calculated the same way. The tare per sensor is the total weight of the sensor roll and the bearings divided by the number of support points.

WARNING!!! Tare capacity can decrease b up to 50% when sensors are mounted vertically or at an angle. Reduce tare per sensor rating in chart on page D5 by 50%.

Sensor Configurations

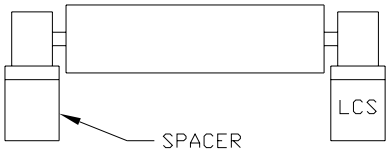
BILATERAL

Standard arrangement used on most machines. Sensing tension on both ends provides maximum sensitivity and eliminates sensing errors due to tension variation from edge to edge.



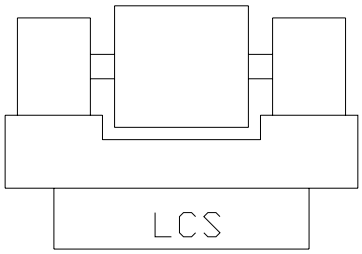
UNILATERAL

More economical sensing method. Not recommended for webs over 14 inches wide or machines where the web is run off center.



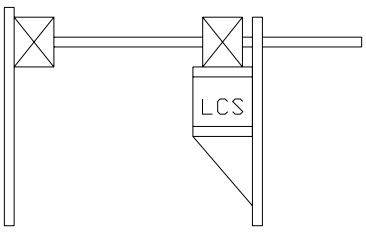
NARROW WEB

Useful on narrow web machines. Should not be used where roll face exceeds six inches.



CANTILEVERED ROLLS

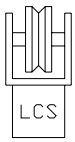
MB Sensor mounted on support bracket to machine frame

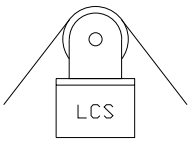


WIRE OR FILAMENT

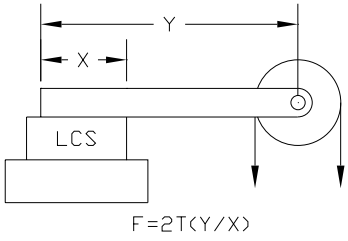
Similar to narrow web style. For tension in excess of two pounds.

For tensions less than two





pounds multiply the force with leverage.



Dimensions

LCS01-0022 and -0044

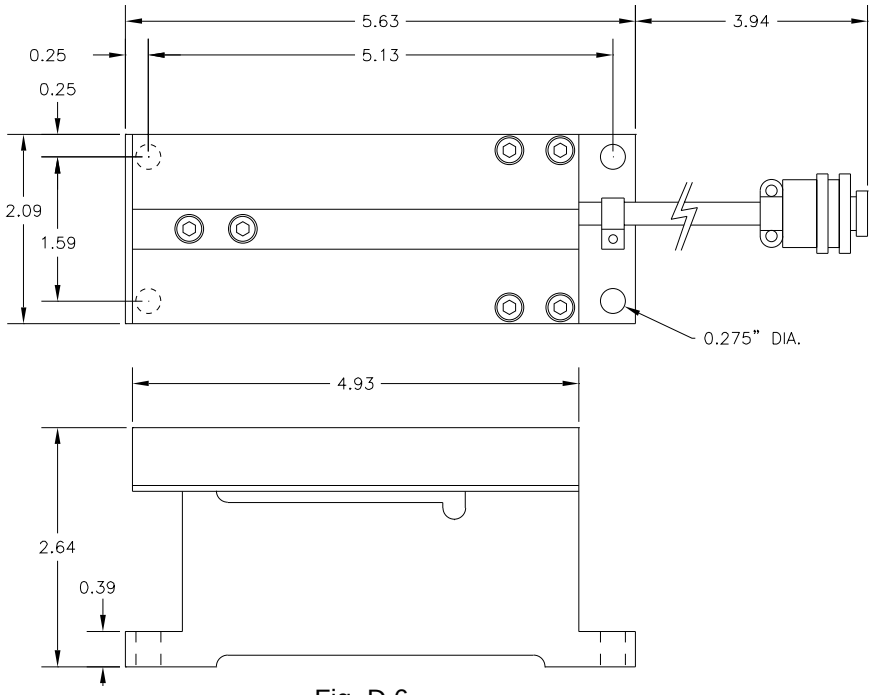


Fig. D.6

LCS01-0110 and -0220

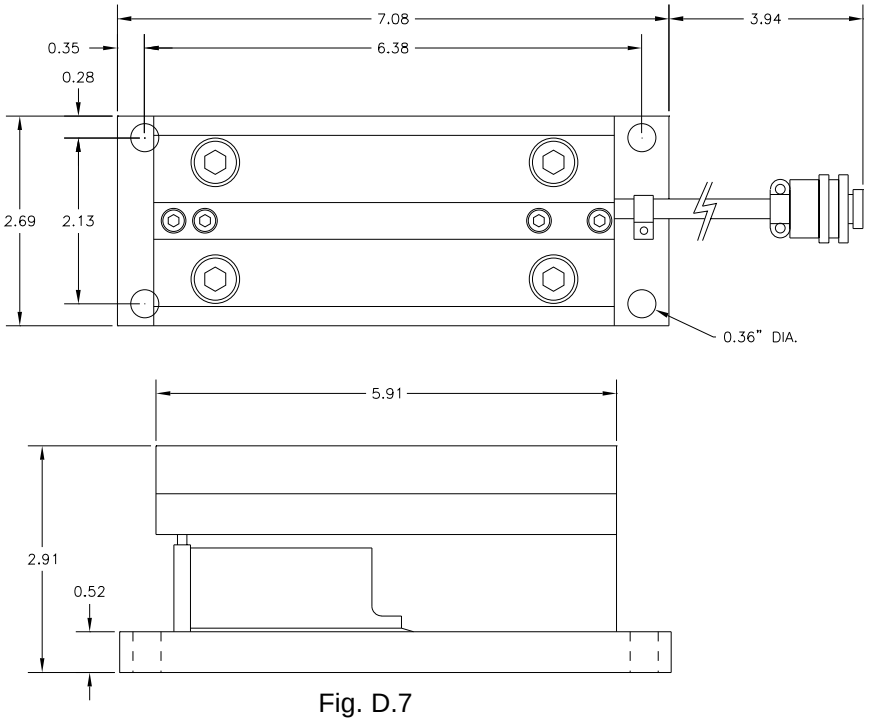


Fig. D.7

Dimensions

LCS01-0660 and -1100

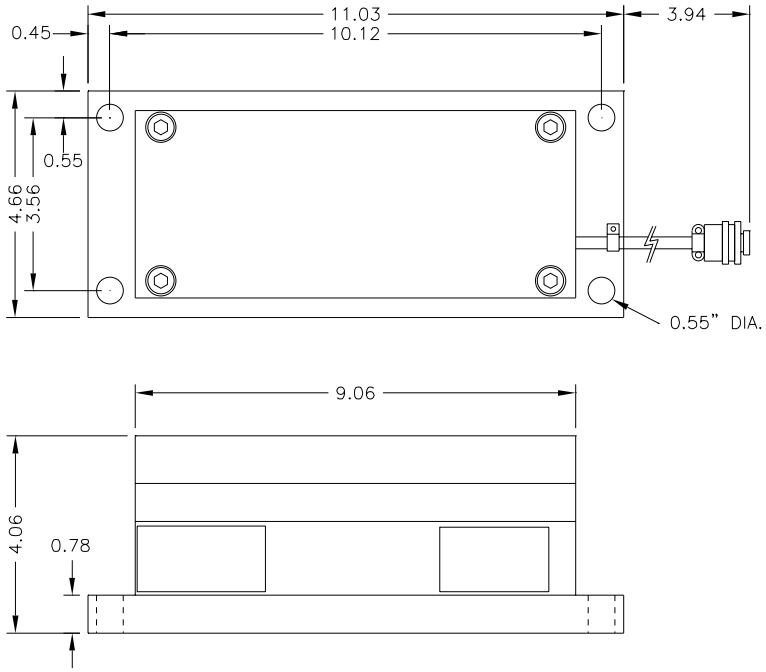


Fig. D.8

LCS01-2200

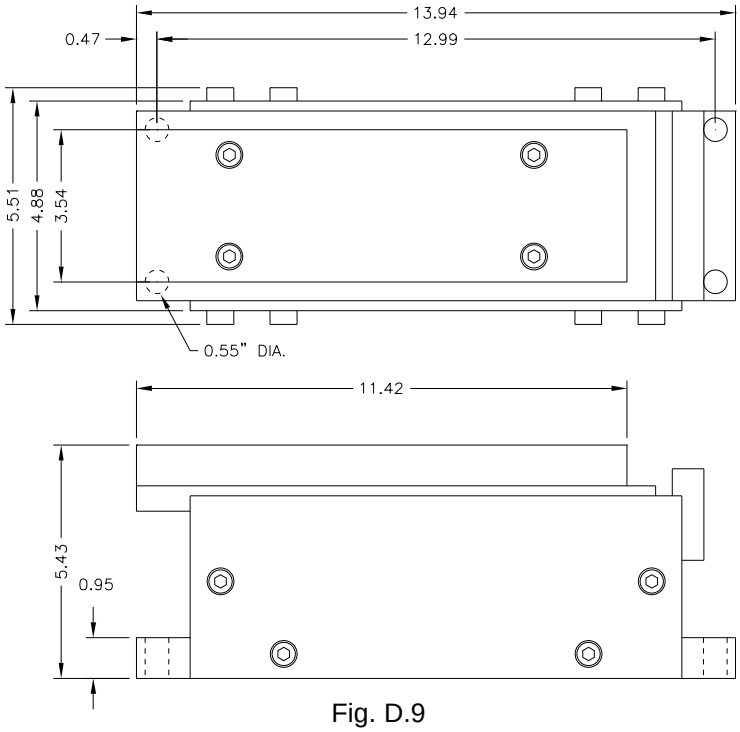
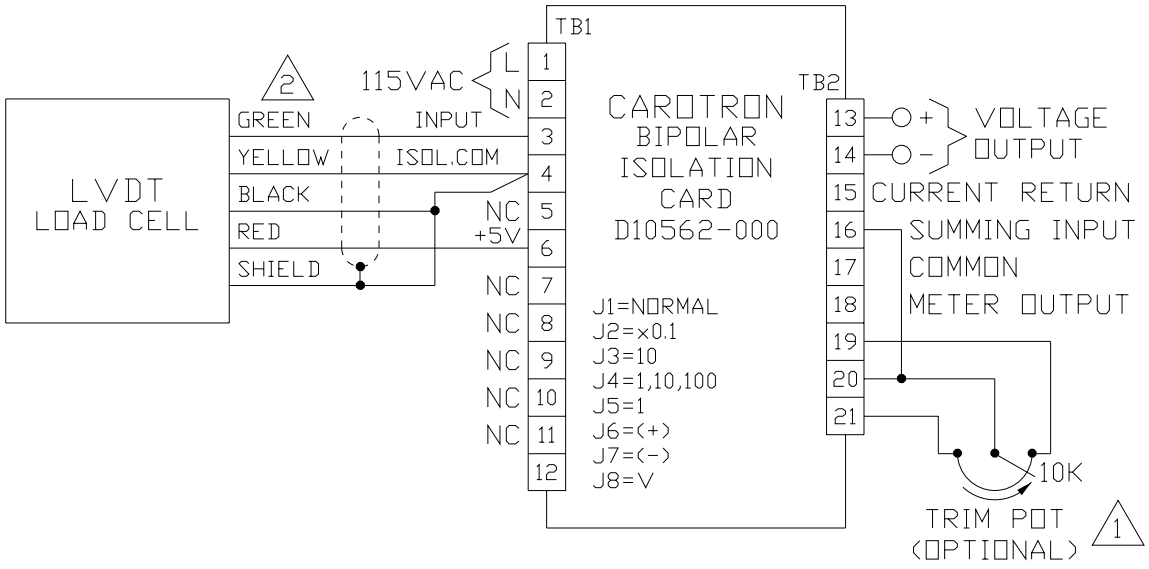


Fig. D.9

Connections

Single Load Cell

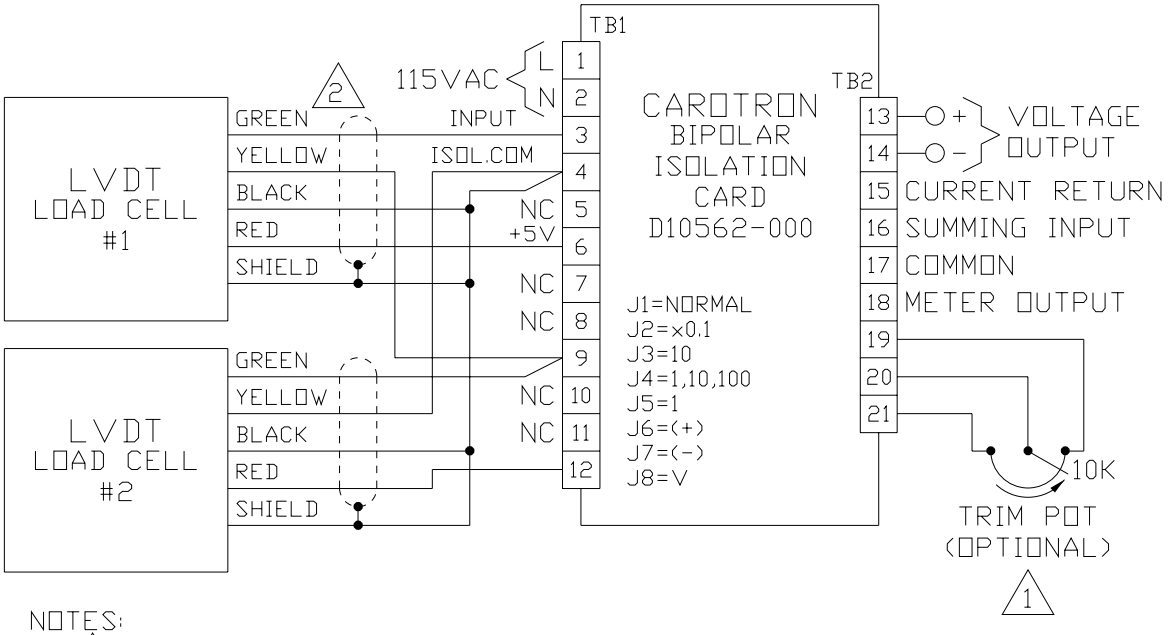


NOTES:

1. JUMPER TB2-19 TO TB2-20 IF TRIM POT IS NOT USED.
2. EXCHANGE CONNECTION OF GREEN ON LOAD CELL WITH YELLOW ON LOAD CELL TO REVERSE OUTPUT POLARITY.

Fig. B.1

Dual Load Cell



NOTES:

1. JUMPER TB2-19 TO TB2-20 IF TRIM POT IS NOT USED.
2. EXCHANGE CONNECTION OF GREEN ON LOAD CELL #1 WITH YELLOW ON LOAD CELL #2 TO REVERSE OUTPUT POLARITY.

Fig. B.2