




The MAGPOWR TLC series of load cells are extremely accurate devices used to measure web tension in any unwind, rewind or intermediate web processing application.

The TLC line of load cells deliver precise web tension measurement with low temperature drift due to a full Wheatstone bridge construction on each load cell. The load cells allow for force measurement and 10 times overload protection in both force directions.

With a low profile design, space between the machine frames dedicated to the load cell is minimized. The load cells can also be mounted on the outside of the machine frames, eliminating any space required for the load cells.

The TLC is flange mounted to any vertical machine surface or on top of horizontal surfaces utilizing the optional pillow block bracket.

GENERAL SPECIFICATIONS

Product Name

TLCA and TLCB Load Cell Series

Gage Resistance

350 ohms nominal

Excitation Voltage

10 VDC maximum

Output Signal

1.5 mV/V, 15 mVDC maximum per sensor at full load rating

Operating Temperature

-20°C to 80°C (-4°F to 176 °F)

Combined non-linearity and hysteresis

0.5% of full scale maximum

Temperature effect on zero

0.02% of rating per °C

Repeatability

0.2% of full scale maximum

Load Ratings

TLCA: 50, 100, 250, 500 Newtons (11, 23, 56, 112 pounds)

TLCB: 500, 1000, 2000, 3000 Newtons (112, 225, 450, 675 pounds)

Construction

Nickel plated steel (beam)
Nickel plated aluminum (covers)

Overload Stops Engagement

105% to 150% of full load rating

Overload Protection

10X full load rating

Deflection at Full Load

Size A: 0.17 mm (0.007 inch)
Size B: 0.15 mm (0.006 inch)

Mating Cable

LCC series with straight connector
LCCRA series with 90 degree connector

Climate Class

3K3 (EN60721)

Certifications

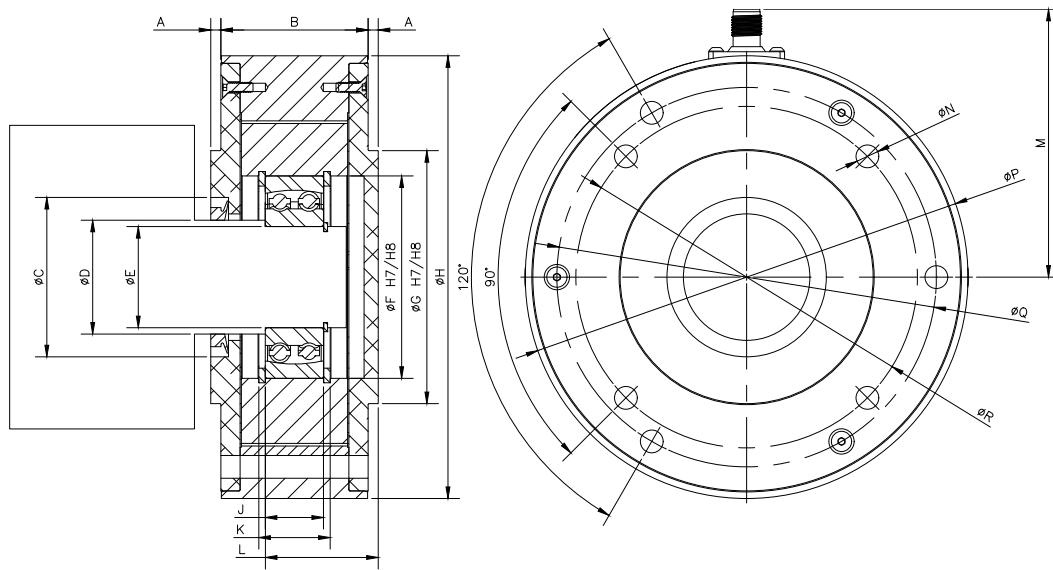
IP67
CE
RoHS
UL (when used with IS-2)

KEY FEATURES

- Used in live shaft applications
- Standard in metric models
- Flange and pillow block mounting
- Four load ratings from 50 to 500 newtons (11 to 112 pounds) in size A, four load ratings from 500 to 3000 newtons (112 to 675 pounds) in size B
- Ruggedly constructed for long life and dependability
- Mechanical overload stops for 10x protection under severe overloads
- Full Wheatstone bridge design for measurement accuracy and low temperature drift
- Can be mounted on the inside of machine frames or hidden on the backside of the machine frames
- Size A can be mounted using three bolts on a 90 mm bolt circle or four bolts on a 75 mm bolt circle
- Size B can be mounted using three bolts on a 150 mm bolt circle or four bolts on a 135 mm bolt circle



DIMENSIONS



Dimensions shown in mm (inches)

| | A | B | C | D | E | F | G | H |
|---------------|------------|-------------|-------------|--------------|------------|------------|------------|------------|
| TLCAXXXEC12M | 2.5[0.098] | 32.2[1.268] | 36[1.417] | 22[0.866] | 17[0.669] | 40[1.575] | 60[2.362] | 105[4.134] |
| | J | K | L | N | M | P | Q | R |
| TLCAXXXEC12M | 12[0.472] | 15.7[0.618] | 24.65[0.97] | 71.3[2.807] | 6.5[0.256] | 105[4.134] | 90[3.543] | 75[2.953] |
| TLCBXXXXEC12M | 23[0.906] | 28.3[1.114] | 44.6[1.756] | 105.9[4.169] | 9[0.354] | 175[6.89] | 150[5.906] | 135[5.315] |

MODEL NUMBER KEY

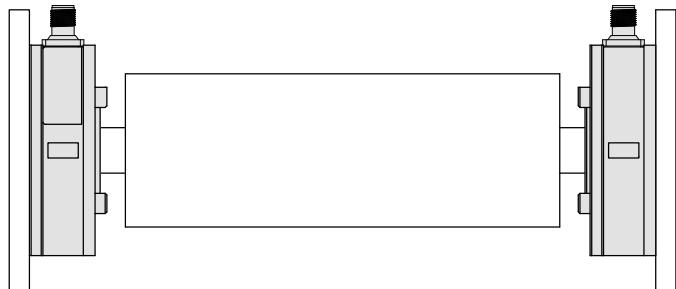
| TL | C | XXXX | EC12 | M |
|--------------------|------|-----------------------------|------------|--------|
| LOAD CELL MODEL | SIZE | LOAD RATING (IN NEWTONS) | CONNNECTOR | METRIC |

AVAILABLE MODELS

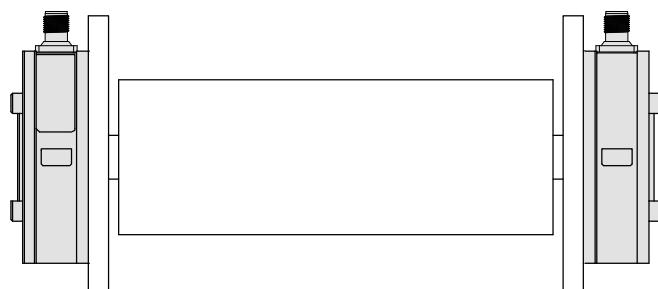
| MODEL NUMBER | LOAD RATING | | |
|-----------------|-------------|---------|--------|
| TLCA-50-EC12M | 50N | 11 lbf | 5 Kg |
| TLCA-100-EC12M | 100N | 23 lbf | 10 Kg |
| TLCA-250-EC12M | 250N | 56 lbf | 26 Kg |
| TLCA-500-EC12M | 500N | 113 lbf | 51 Kg |
| TLCB-500-EC12M | 500N | 113 lbf | 51 Kg |
| TLCB-1000-EC12M | 1000N | 225 lbf | 102 Kg |
| TLCB-2000-EC12M | 2000N | 450 lbf | 204 Kg |
| TLCB-3000-EC12M | 3000N | 675 lbf | 306 Kg |

TYPICAL INSTALLATION

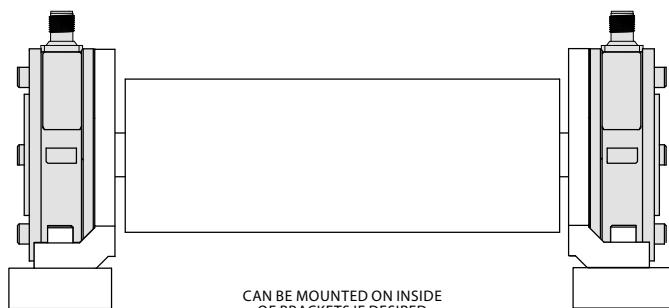
FLANGE MOUNT (INSIDE OF VERTICLE FRAMES)



FLANGE MOUNT (OUTSIDE OF VERTICAL FRAMES)



PILLOW BLOCK (ON TOP OF HORIZONTAL FRAMES)



To size and select the tension sensors, the total load on the sensing roll must be calculated. This load consists of the tension components plus the roll weight components in the sensing plane. Using the known maximum tension, roll weight and angles as shown, apply the equation below to calculate the actual load.

$$\text{LOAD} = 2T (\sin X/2) +/- (W (\cos Y))$$

This is the total load, but since tension transients are generally quite large, the "T" should be multiplied by 2, and since there are two sensors supporting this load, the total load is divided by 2. The final equation for load rating required for each sensor is then:

$$L = (4T (\sin (X/2)) +/- (W (\cos Y))) \div 2$$

Note: Use $+ W (\cos Y)$ if the resultant force is in the direction opposite the connector on the load cell and $- W (\cos Y)$ if pulling towards the connector.

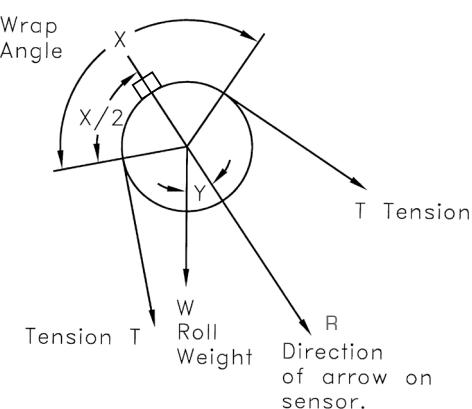
After calculating L, select 2 sensors, each with a load rating greater than L.

For example, if the roll weight is 10 pounds, the maximum tension is 25 pounds, the angle Y is 60 degrees, the wrap angle is 90 degrees and the resultant force is away from the connector the resulting TLC sensor is:

$$L = (4(25)(\sin(90/2)) + (10 \cos 60)) \div 2$$

$$L = 37.85 \text{ pounds (168.4 Newtons)}$$

Use (2) TLCA-250-EC12M Load Cells



T= web tension

X= web wrap angle

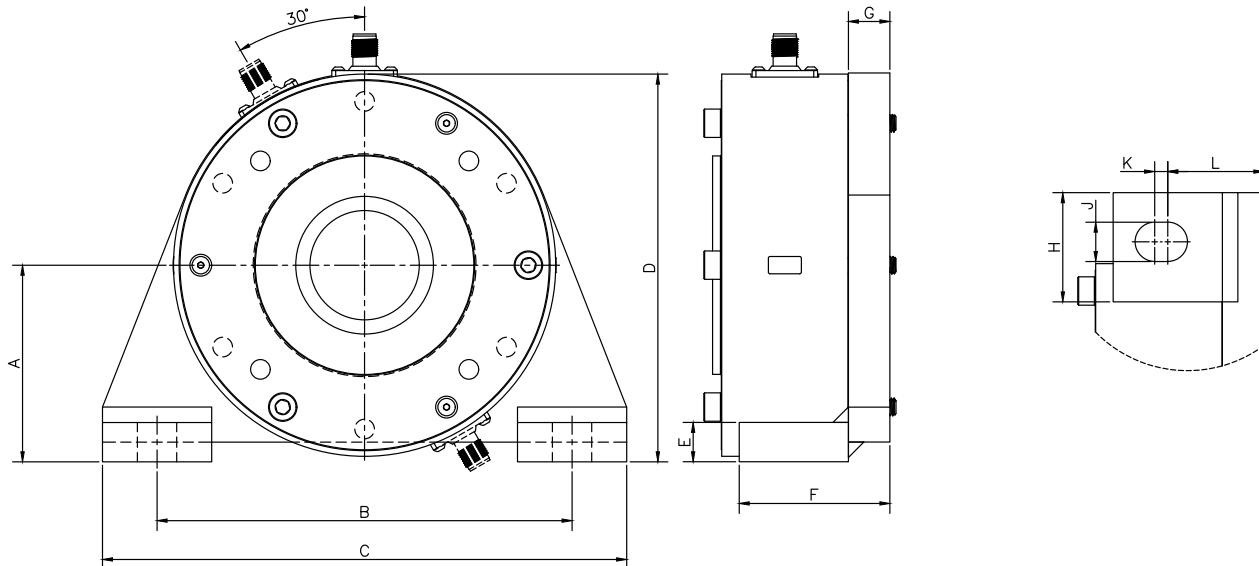
R= resultant force direction from web tension that bisects the wrap angle

Y= angle between wrap angle midpoint (R) and the roll weight

Note: connector should always be aligned with (R)

L= calculated minimum force rating for each load cell

MOUNTED ON PILLOW BLOCK BRACKETS



Dimensions shown in mm (inches)

| | A | B | C | D | E | F |
|---------------|------------|-------------|-------------|-------------|------------|------------|
| TLCAXXXEC12M | 56 [2.205] | 115 [4.528] | 140 [5.512] | 109 [4.291] | 13 [0.512] | 40 [1.575] |
| G | H | J | K | L | | |
| TLCAXXXEC12M | 10 [0.394] | 25 [0.984] | 9 [0.354] | 3 [0.118] | 24 [0.945] | |
| TLCBXXXXEC12M | 19 [0.748] | 50 [1.969] | 18 [0.709] | 6 [0.236] | 44 [1.732] | |

OPTIONAL EQUIPMENT

SIZE A

- Self-aligning bearings to use in load cells, 17 mm bore, part number 30A23-4, (one per load cell needed)
- TLCA-PBK, pillow block bracket (one per load cell needed)

SIZE B

- Self-aligning bearings to use in load cells, 40 mm bore, part number 30A23-7, (one per load cell needed)
- TLCB-PBK, pillow block bracket (one per load cell needed)

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