MAGPOWR TS LOAD CELLS

ACCURATE WEB TENSION READOUT WITH MAGPOWR TS-SERIES LOAD CELLS

These rugged load cells are extremely accurate devices used to measure tension in any unwind, rewind or intermediate web processing application. All TS load cells incorporate a dual beam construction design to insure linear output under all conditions. They are designed with mechanical overload stops in both force directions to eliminate sensor damage and the need to recalibrate even after extreme overloads, while also offering the flexibility of a variety of mounting styles and coupling options.

TS Load Cells provide the most consistent control of tension, no matter how the temperature changes throughout the day. In fact, all MAGPOWR TS load cells are designed with foil strain gauges in a full Wheatstone bridge arrangement that provide the lowest temperature drift rating possible. This can mean the difference between a profitable web and a floor of wasted material.

GENERAL SPECIFICATIONS

Gage Resistance
350Ω

Gage Type
Metal foil, full Wheatstone bridge

Excitation Voltage
10VDC nominal

Output Signal
21mVDC nominal per load cell at full load rating

Operating Temperature
-30 ˚ to 80 ˚C

Temp. Effect on Zero
0.02% of rating per ˚C

Combined Non-linearity and hysteresis
0.5% of full scale maximum

Repeatability
0.2% of full scale maximum

Overload Stops
105% to 150% of full load rating

Deflection at full load
0.41mm

Climate Class
3K3 (EN60721)

Cable connector
M12-connector
pin 1, + power; pin 2, + signal; pin 3, - signal; pin 4, - power

KEY FEATURES

- Two sizes with 6 sensing ranges from 2kg to 250kg (5lbs to 500lbs)
- Inch and Metric models for international installations
- Multiple mounting options for maximum flexibility:
  3 coupling styles for use with any type idler roll
  3 mounting styles: Stud Mount, Pillow block, Flange
- Ruggedly constructed for long life and dependability
- Dual beam construction design to insure linear output
- Mechanical overload stops for protection even under severe overloads
- Full Wheatstone bridge design for measurement accuracy

COUPLING OPTIONS

Split coupling models

Load Cells with Split Couplings can be used to measure web tension through dead-shaft or live-shaft idler rolls. With one load cell mounted to each side of the machine frame, the idler roll is supported between the two load cells. The resultant force of the web tension is measured as a load on the roll by the load cells.

In-roll coupling models

The In-Roll Coupling is designed to insert directly into the end of an idler roll. With one load cell mounted to each side of the machine frame, the idler roll is supported between the two load cells. The resultant force of the web tension is measured as a load on the roll by the load cells.
This coupling type eliminates the need for idler rolls with shafts and bearings, thus reducing the overall cost of the tension sensing system.

Wire pulley models

The Wire Pulley is used for single strand applications for any kind of material. When mounted to the side of a machine frame or bracket, a load cell measures tension in the strand as it passes over the nickel plated aluminum load cell pulley.

MOUNTING STYLES

Each TS coupling model can be combined with mounting style Stud mount (S), Pillow block (P) or Flange mount (F).

SELECTION PROCESS

Step 1: Define your desired mounting style: Stud mount (S), Pillow block (P) or Flange mount (F)

Step 2: Define your desired coupling model: Split coupling (C), In-roll coupling (R) or wire pulley (W)

Step 3: Using your known maximum tension, roll weight and angles as shown below, apply the following equation to calculate a “load rating” L.

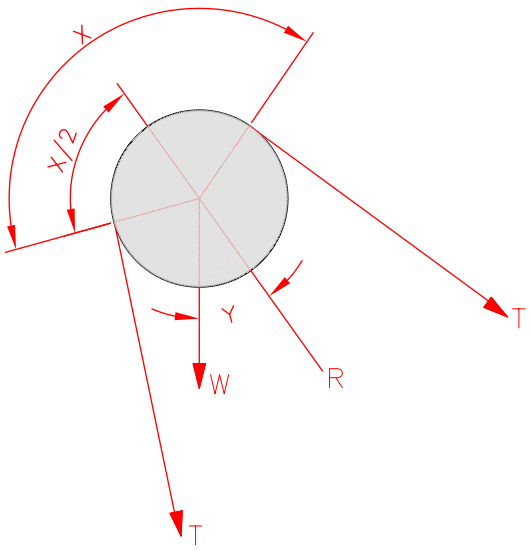
FOR 2 LOAD CELL APPLICATIONS, SPLIT COUPLING AND IN-ROLL COUPLING

$L = 2T*\sin(X/2) + 0{,}5W*\cos(Y)$

FOR 1 LOAD CELL APPLICATIONS, WIRE PULLEY MODELS

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

Step 4: Select the load cell(s) from chart below with the rating greater than that calculated load rating L



L = SENSOR LOAD RATING

T = MAXIMUM TENSION

R = RESULTANT FORCE DUE TO TENSION

W = ROLL WEIGHT

X = WRAP ANGLE

Y = ANGLE BETWEEN RESULTANT FORCE AND WEIGHT FORCE

EXAMPLE:
Installation of a split coupling model for stud mounting TS load cell
Maximum web tension T = 35 kg, angle Y = 30°, wrap angle X = 130°, roll weight W = 10 kg

Use first equation from above for 2 load cell application:

$$L = 2T*\sin(X/2) + 0{,}5W*\cos(Y)$$
$$L = 2(35\,kg)*\sin 65^\circ + 0{,}5*10\,kg*\cos 30^\circ$$
$$L = 70\,kg*(0{,}9063) + 5\,kg*0{,}866$$
$$L = 67{,}8\,kg$$

Select a pair of TS75SC-EC12M load cells with 75 kg rating

SINE/COSINE FUNCTIONS

DEGREES	SINE	COSINE	DEGREES	SINE	COSINE
0	.0000	1.000	50	.7660	.6428
5	.0872	.9962	55	.8192	.5736
10	.1736	.9848	60	.8660	.5000
15	.2588	.9659	65	.9063	.4226
20	.3420	.9397	70	.9397	.3420
25	.4226	.9063	75	.9659	.2588
30	.5000	.8660	80	.9849	.1736
35	.5736	.8192	85	.9962	.0872
40	.6428	.7660	90	1.000	.0000
45	.7071	.7071			

ORDERING INFORMATION

For Split-coupling or In-roll models order two load cells, one for each side of the sensing roll. Wire-pulley models require one load cell per strand. TS load cells are available in both imperial and metric load ratings. Metric models carry an “M” designation after at the end. Metric series load ratings are in kilograms, while imperial series load ratings are in pounds.

Model number code:

TS	______	______	______	EC12 ______
Load cell	rating	mounting style	coupling:	designation:
	Metric in kg (daN)	S: M12 stud	C: split coupling	M: metric
	Imperial in lb	F: flange	R: In-roll	none for imperials
		P: pillow block	W: pulley	

Example: TS75SC-EC12M, metric stud mounting model with split coupling and 75kg load rating.

METRIC MODELS

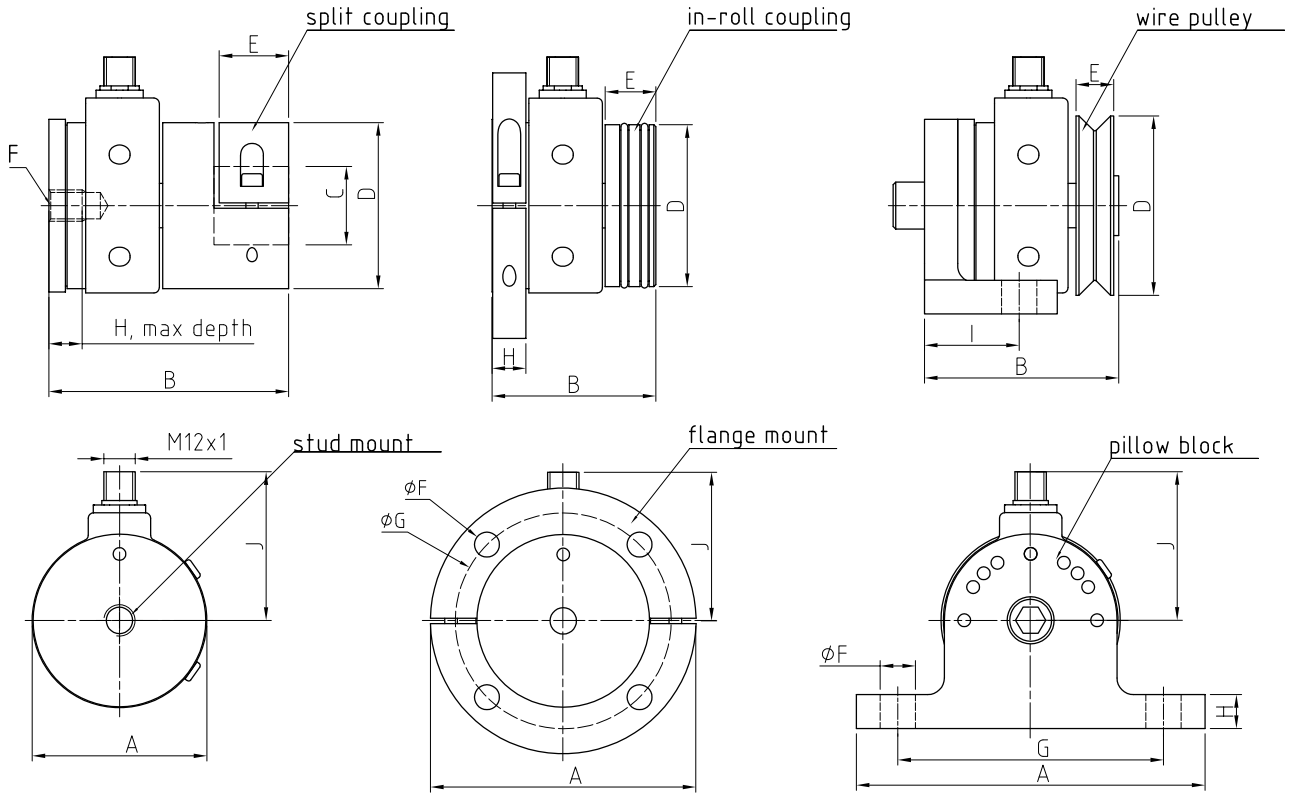
MODEL NUMBER	LOAD RATING
TS2mc-EC12M	2 kg
TS10mc-EC12M	10 kg
TS25mc-EC12M	25 kg
TS75mc-EC12M	75 kg
TS150mc-EC12M	150 kg
TS250mc-EC12M	250 kg

IMPERIAL MODELS

MODEL NUMBER	LOAD RATING
TS5mc-EC12	5 lbs
TS25mc-EC12	25 lbs
TS50mc-EC12	50 lbs
TS150mc-EC12	150 lbs
TS330mc-EC12	330 lbs
TS500mc-EC12	500 lbs

m - mounting styles: S (stud), F (flange), P (pillow)
c - coupling style: C (split coupling), R (In-roll), W (wire pulley)
All combination of coupling and mounting styles are available.

MAGPOWR TS LOAD CELLS



METRIC MODELS

COUPLING	MODEL	LOAD RATING XX	A	B	C	D	E	F	G	H	I	J
Split couplings	TSxxSC-EC12M Stud mount	2kg, 10kg, 25kg	54,0	76,2	30	52,5	18,1	M12		12,7		51,6
		75kg, 150kg, 250kg	66,0	90,4	30	63,5	26,5	M12		12,7		57,2
	TSxxFC-EC12M Flange mount	2kg, 10kg, 25kg	79,4	76,2	30	52,5	18,1	7,9	63,5	12,7		51,6
		75kg, 150kg, 250kg	101,6	90,4	30	63,5	26,5	9,5	82,6	12,7		57,2
	TSxxPC-EC12M Pillow block	2kg, 10kg, 25kg	108,0	90,0	30	52,5	18,1	9,5	82,6	12,7	31,8	51,6
		75kg, 150kg, 250kg	133,4	104,3	30	63,5	26,5	12,7	101,6	12,7	35,0	57,2
Inroll couplings	TSxxSR-EC12M Stud mount	2kg, 10kg, 25kg	54,0	56,6		52,0	13,3	M12		12,7		51,6
		75kg, 150kg, 250kg	66,0	62,7		61,8	19,4	M12		12,7		57,2
	TSxxFR-EC12M Flange mount	2kg, 10kg, 25kg	79,4	52,0		52,0	13,3	7,9	63,5	12,7		51,6
		75kg, 150kg, 250kg	101,6	61,8		61,8	19,4	9,5	82,6	12,7		57,2
	TSxxPR-EC12M Pillow block	2kg, 10kg, 25kg	108,0	69,3		52,0	13,3	9,5	82,6	12,7	31,8	51,6
		75kg, 150kg, 250kg	133,4	75,4		61,8	19,4	12,7	101,6	12,7	35,0	57,2
Wire pulleys	TSxxSW-EC12M Stud mount	2kg, 10kg, 25kg	54,0	57,1		52,0	11,4	M12		12,7		51,6
		75kg, 150kg, 250kg	66,0	61,6		68,6	14,4	M12		12,7		57,2
	TSxxFW-EC12M Flange mount	2kg, 10kg, 25kg	79,4	57,1		52,0	11,4	7,9	63,5	12,7		51,6
		75kg, 150kg, 250kg	101,6	61,6		68,6	14,4	9,5	82,6	12,7		57,2
	TSxxPW-EC12M Pillow block	2kg, 10kg, 25kg	108,0	69,9		52,0	11,4	9,5	82,6	12,7	31,8	51,6
		75kg, 150kg, 250kg	133,4	74,3		68,6	14,4	12,7	101,6	12,7	35,0	57,2

Dimensions in mm

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