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## INSTRUCTION MANUAL MODEL TS WEB TENSION SENSORS

**(PLEASE NOTE: DO NOT HAMMER ON THE SENSORS OR TAMPER WITH THE INTERNAL COMPONENTS)**

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### DESCRIPTION

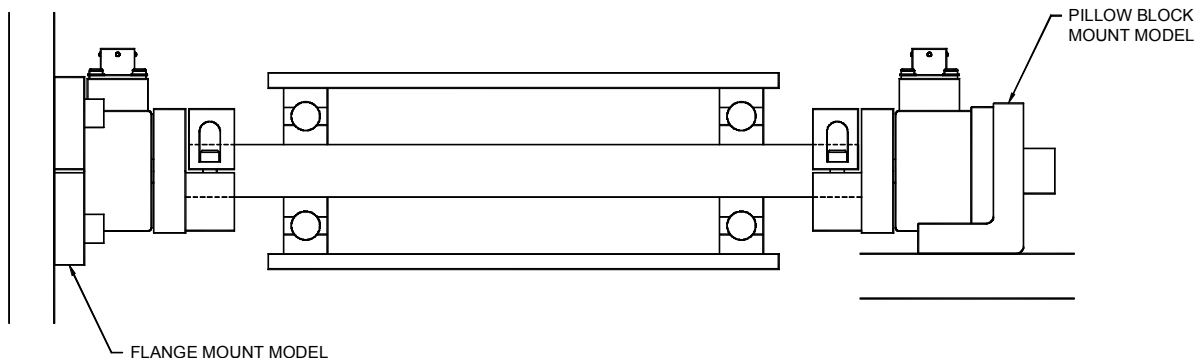
The MAGPOWR TS line of web tension sensors are extremely accurate devices used to measure tension in any unwind, rewind, or intermediate web processing application. The unique low profile design minimizes space requirements inside the machine frames, thus maximizing the potential for web width. The TS model sensors also offer the flexibility of a variety of mounting styles and coupling options.

They are ruggedly constructed with mechanical overload stops in both force directions to eliminate sensor damage and the need to recalibrate even after extreme overloads. A full Wheatstone bridge arrangement of four foil strain gages is used in each sensor for the most accurate means of measuring web tension. In addition, all sensors incorporate a dual beam construction design to insure linear output under all loading conditions.

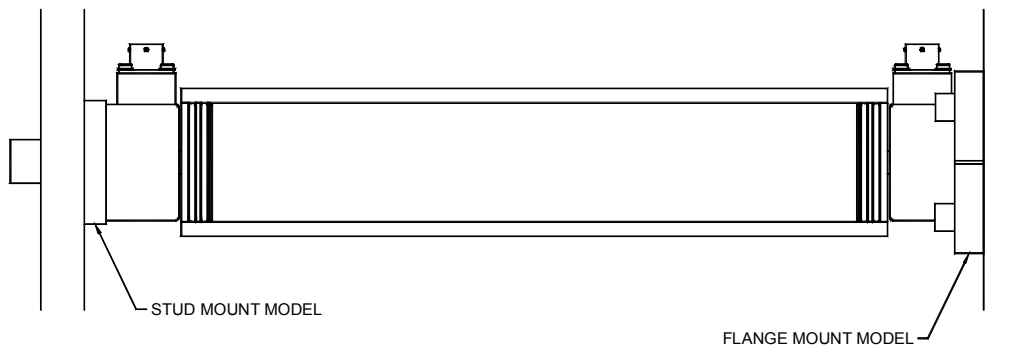
The TS style tension sensors may be mounted to the machine side frame in one of several ways. They can be mounted on a vertical surface using the Stud mount model, or the Flange mount model, or to a horizontal surface using the Pillow Block model.

### COUPLING TYPE

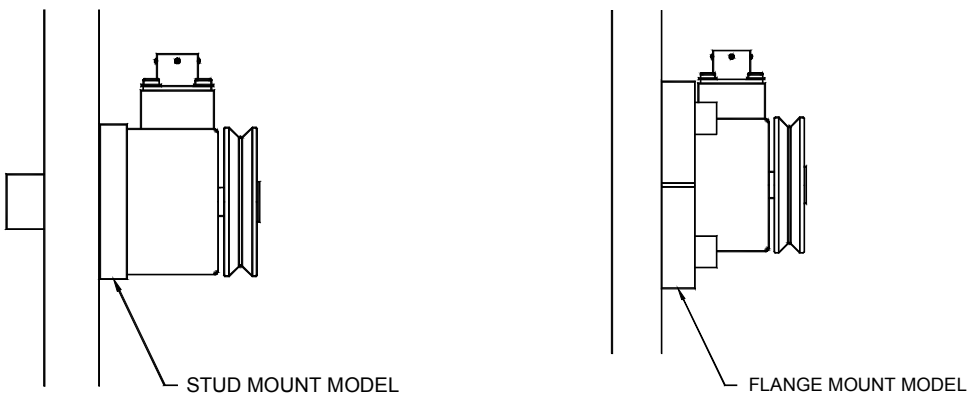
The Split Coupling configuration supports the customer's dead or live shaft on each side of the machine. Sensors with split couplings are available with all three mounting types.



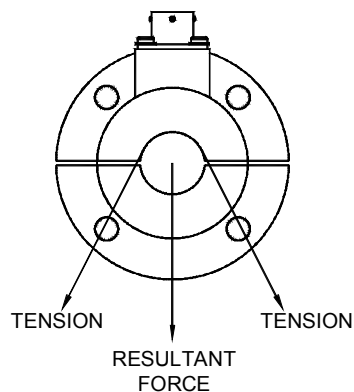
The In-Roll configuration supports the customer's roll assembly (hollow tube) on each side of the machine. Sensors with in-roll couplings are available with all three mounting types.



The Wire Pulley configuration supports the single strand or wire, and measures tension in the wire or strand as it passes over the pulley. Sensors with wire pulleys are available with all three mounting types.



Select a clean flat surface where the wrap angle of the web does not change. Position the vertical centerline of the sensor so that it bisects the wrap angle of the web. For the single stud mount, fasten to the machine frame with a bolt making sure that the bolt penetration does not exceed dimension "L" as shown in the outline dimension table. A small hole is provided in the rear of the sensor to accept a pin to aid in alignment. For the flange mounted version, fasten to the machine frame with 4 bolts. For the pillow block style, mount the pillow block adapter with two bolts. A series of holes are provided in the pillow block adapter to allow alignment of the sensor with the resultant force. The force direction arrow should bisect the wrap angle of the web, and point in the same direction as the resultant force, as shown below.



NOTE: If the orientation of the sensor requires the force direction arrow to be pointed opposite the resultant tension force direction, then the black (-S) and the white (+S) sensor leads to the MAGPOWR readout or control terminal block must be reversed.

NOTE: The sensor coupling or in-roll coupling can accommodate shaft misalignment of .001 in/in.

EXAMPLE: For 60 inches between machine side frames, the sensors must be aligned within .060 inches.

## SHAFT AND ROLL ASSEMBLY INSTALLATION (SUPPLIED BY CUSTOMER)

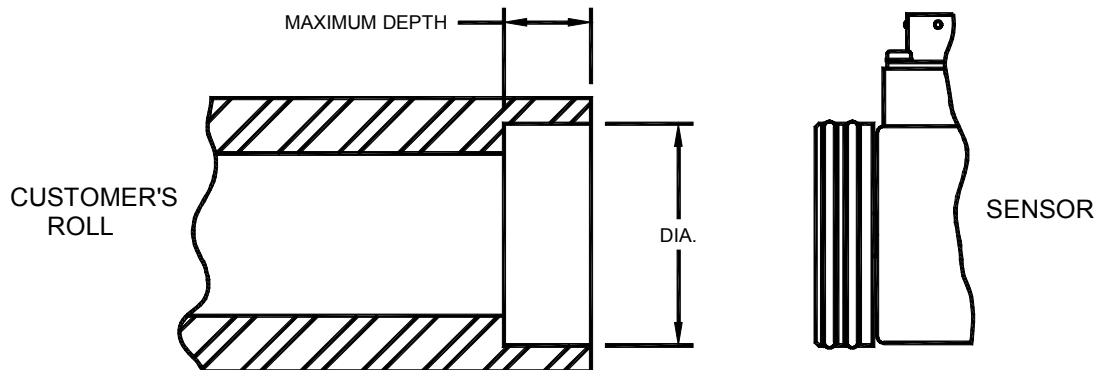
### Split Coupling Models

Split coupling sensors can be used for both live and dead shaft applications. All split coupling sensors are shipped with the coupling locked in place for use with a dead shaft. For live shaft applications remove the anti-rotation screw located behind the removable part of the split coupling.

Remove the coupling screws and top half of the couplings. Gently lower the shaft / roller assembly into the couplings. The couplings have some misalignment capability to facilitate shaft mounting. Replace one coupling top half and screws. Tighten screws securely. Push this coupling toward the machine frame, and hold it in position while securing the coupling on the other end of the shaft. This will divide the thermal expansion capability between the two sensors. Connect the sensors to the readout or control with shielded cables. (MAGPOWR Part Number SC-15)

### In-Roll Coupling Models

Insert one sensor into each end of a machined tube, and install between machine frames accordingly.



52.0<sup>+0.05</sup><sub>-.00</sub> mm diameter; 0.53 in. (13.5 mm) maximum depth for 5 lb, 50 lb, 2 kg, & 25 kg sensors

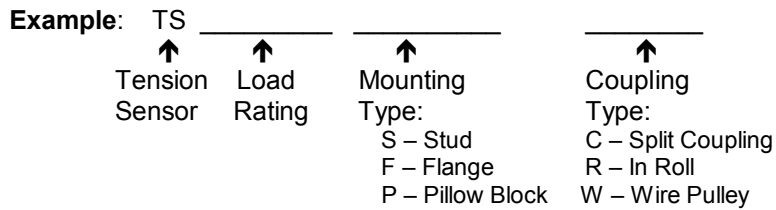
62.0<sup>+0.05</sup><sub>-.00</sub> mm diameter; 0.76 in. (19.3 mm) maximum depth for 150 lb, 500 lb, 75 kg, & 250 kg sensors

## MAINTENANCE

No maintenance is required for the model TS sensors, other than periodic lubrication of the bearing on the live shaft, (rotating coupling) and in-roll applications.

A grease fitting is located on the top of the coupling, for the split coupling models, and under the o-ring on in-roll coupling models. The grease fitting accepts a needle type grease gun. The bearing should be lubricated with 1.0 gram Chevron SRI 2 or equal.

## MODEL NUMBER DESIGNATION



## STANDARD TS SENSOR MODELS

Mounting Type and Rating	Split Coupling Models	In-Roll Coupling Models	Wire Pulley Models
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Stud Mount 5 lb Sensor	TS 5 SC	TS 5 SR	TS 5 SW
Stud Mount 50 lb Sensor	TS 50 SC	TS 50 SR	TS 50 SW
Stud Mount 150 lb Sensor	TS 150 SC	TS 150 SR	TS 150 SW
Stud Mount 500 lb Sensor	TS 500 SC	TS 500 SR	TS 500 SW

Flange Mount 5 lb Sensor	TS 5 FC	TS 5 FR	TS 5 FW
Flange Mount 50 lb Sensor	TS 50 FC	TS 50 FR	TS 50 FW
Flange Mount 150 lb Sensor	TS 150 FC	TS 150 FR	TS 150 FW
Flange Mount 500 lb Sensor	TS 500 FC	TS 500 FR	TS 500 FW

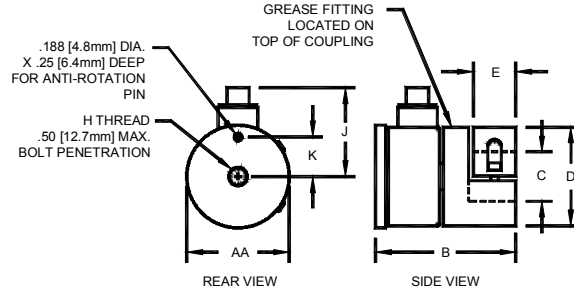
Pillow Block Mount 5 lb Sensor	TS 5 PC	TS 5 PR	TS 5 PW
Pillow Block Mount 50 lb Sensor	TS 50 PC	TS 50 PR	TS 50 PW
Pillow Block Mount 150 lb Sensor	TS 150 PC	TS 150 PR	TS 150 PW
Pillow Block Mount 500 lb Sensor	TS 500 PC	TS 500 PR	TS 500 PW

Metric Stud Mount 2 Kg Sensor	TS 2 SCM	TS 2 SRM	TS 2 SWM
Metric Stud Mount 25 Kg Sensor	TS 25 SCM	TS 25 SRM	TS 25 SWM
Metric Stud Mount 75 Kg Sensor	TS 75 SCM	TS 75 SRM	TS 75 SWM
Metric Stud Mount 250 Kg Sensor	TS 250 SCM	TS 250 SRM	TS 250 SWM

## SPLIT COUPLING SENSOR DIMENSIONS

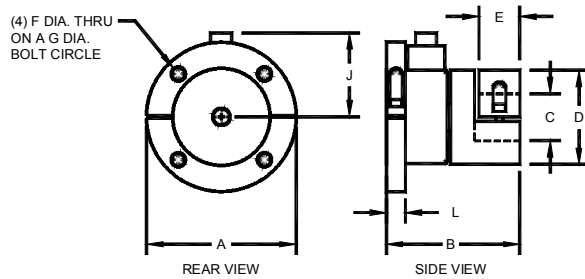
### Stud Mount Models

TS5SC, TS50SC, TS150SC, TS500SC  
TS2SCM, TS25SCM, TS75SCM, TS250SCM



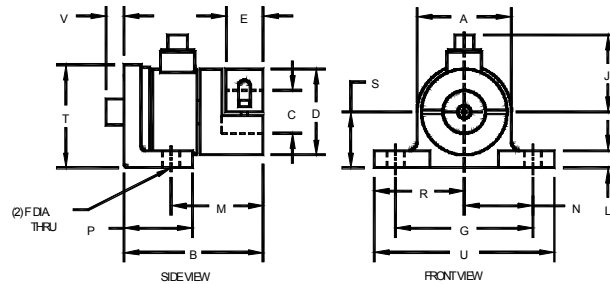
### Flange Mount Models

TS5FC, TS50FC, TS150FC, TS500FC



### Pillow Block Models

TS5PC, TS50PC, TS150PC, TS500PC



### Split Coupling Models

MODEL	A	AA	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V
TS5SC		2.13	3.0	.875	2.07	0.75			1/2-13	2.1	0.88									
TS50SC		2.13	3.0	.875	2.07	0.75			1/2-13	2.1	0.88									
TS150SC		2.60	3.56	1.25	2.50	1.08			1/2-13	2.3	1.0									
TS500SC		2.60	3.56	1.25	2.50	1.08			1/2-13	2.3	1.0									
TS5FC	3.13		3.0	.875	2.07	0.75	.31	2.50		2.1		.5								
TS50FC	3.13		3.0	.875	2.07	0.75	.31	2.50		2.1		.5								
TS150FC	4.0		3.56	1.25	2.50	1.08	.38	3.25		2.3		.5								
TS500FC	4.0		3.56	1.25	2.50	1.08	.38	3.25		2.3		.5								
TS5PC	2.3		3.5	.875	2.07	0.75	.38	3.25		2.1		.5	2.25	1.63	1.8	2.1	1.38	2.5	4.3	.5
TS50PC	2.3		3.5	.875	2.07	0.75	.38	3.25		2.1		.5	2.25	1.63	1.8	2.1	1.38	2.5	4.3	.5
TS150PC	2.8		4.06	1.25	2.50	1.08	.50	4.00		2.3		.5	2.68	2.00	2.0	2.6	1.63	3.0	5.3	.5
TS500PC	2.8		4.06	1.25	2.50	1.08	.50	4.00		2.3		.5	2.68	2.00	2.0	2.6	1.63	3.0	5.3	.5

Units are in inches

### Metric Stud Mount Models

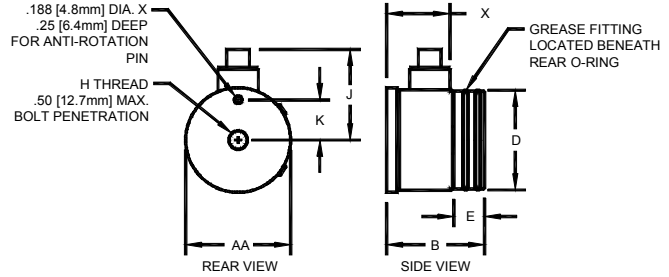
MODEL	A	AA	B	C	D	E	F	G	H	J	K
TS2SCM		54	76.2	30.0	52.5	19.1			M12	51.6	22.2
TS25SCM		54	76.2	30.0	52.5	19.1			M12	51.6	22.2
TS75SCM		66	90.4	30.0	63.5	27.5			M12	57.2	25.4
TS250SCM		66	90.4	30.0	63.5	27.5			M12	57.2	25.4

Units are in millimeters

## IN-ROLL SENSOR DIMENSIONS

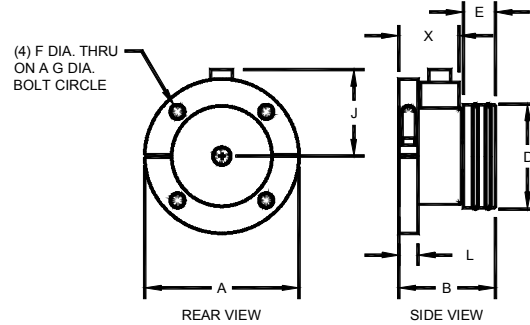
### Stud Mount Models

TS5SR, TS50SR, TS150SR, TS500SR  
TS2SCM, TS25SRM, TS75SRM, TS250SRM



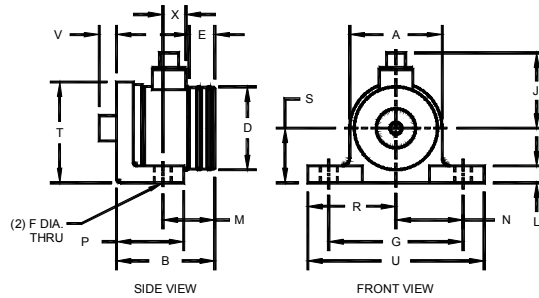
### Flange Mount Models

TS5FR, TS50FR, TS150FR, TS500FR



### Pillow Block Models

TS5PR, TS50PR, TS150PR, TS500PR



### In-Roll Coupling Models

MODEL	A	AA	B	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	X
TS5SR		2.13	2.19	52mm	.53			1/2-13	2.1	0.88										1.57
TS50SR		2.13	2.19	52mm	.53			1/2-13	2.1	0.88										1.57
TS150SR		2.60	2.43	62mm	.76			1/2-13	2.3	1.0										1.57
TS500SR		2.60	2.43	62mm	.76			1/2-13	2.3	1.0										1.57
TS5FR	3.13		2.19	52mm	.53	.31	2.50		2.1		.5									1.57
TS50FR	3.13		2.19	52mm	.53	.31	2.50		2.1		.5									1.57
TS150FR	4.0		2.43	62mm	.76	.38	3.25		2.3		.5									1.57
TS500FR	4.0		2.43	62mm	.76	.38	3.25		2.3		.5									1.57
TS5PR	2.3		2.69	52mm	.53	.38	3.25		2.1		.5	1.44	1.63	1.8	2.1	1.38	2.5	4.3	.5	.82
TS50PR	2.3		2.69	52mm	.53	.38	3.25		2.1		.5	1.44	1.63	1.8	2.1	1.38	2.5	4.3	.5	.82
TS150PR	2.8		2.93	62mm	.76	.50	4.00		2.3		.5	1.55	2.00	2.0	2.6	1.63	3.0	5.3	.5	.69
TS500PR	2.8		2.93	62mm	.76	.50	4.00		2.3		.5	1.55	2.00	2.0	2.6	1.63	3.0	5.3	.5	.69

Units are in inches

### Metric Stud Mount Models

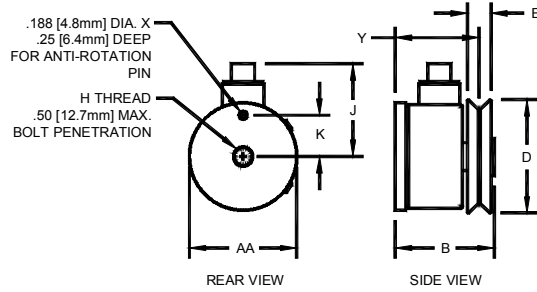
MODEL	A	AA	B	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	X
TS2SRM		54	55.6	52mm	13.3			M12	51.6	22.2										39.8
TS25SRM		54	55.6	52mm	13.3			M12	51.6	22.2										39.8
TS75SRM		66	61.7	62mm	19.4			M12	57.2	25.4										39.8
TS250SRM		66	61.7	62mm	19.4			M12	57.2	25.4										39.8

Units are in millimeters

## WIRE PULLEY SENSOR DIMENSIONS

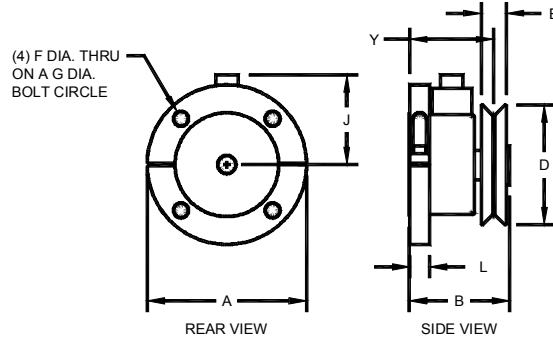
### Stud Mount Models

TS5SW, TS50SW, TS50SW, TS150SW, TS500SW  
TS2SWM, TS25SWM, TS75SWM, TS250SWM



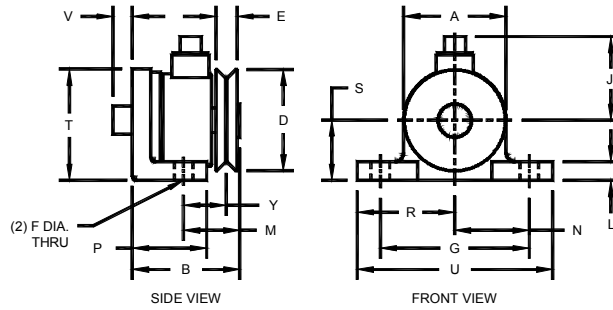
### Flange Mount Models

TS5FW, TS50FW, TS150FW, TS500FW



### Pillow Block Models

TS5PW, TS50PW, TS150PW, TS500PW



### Wire Pulley Models

MODEL	A	AA	B	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	Y
TS5SW		2.13	2.19	2.05	.45			1/2-13	2.1	0.88										1.93
TS50SW		2.13	2.19	2.05	.45			1/2-13	2.1	0.88										1.93
TS150SW		2.60	2.39	2.73	.57			1/2-13	2.3	1.0										2.03
TS500SW		2.60	2.39	2.73	.57			1/2-13	2.3	1.0										2.03
TS5FW	3.13		2.19	2.05	.45	.31	2.50		2.1		.5									1.93
TS50FW	3.13		2.19	2.05	.45	.31	2.50		2.1		.5									1.93
TS150FW	4.0		2.39	2.73	.57	.38	3.25		2.3		.5									2.03
TS500FW	4.0		2.39	2.73	.57	.38	3.25		2.3		.5									2.03
TS5PW	2.3		2.69	2.05	.45	.38	3.25		2.1		.5	1.44	1.63	1.8	2.1	1.38	2.5	4.3	.5	1.18
TS50PW	2.3		2.69	2.05	.45	.38	3.25		2.1		.5	1.44	1.63	1.8	2.1	1.38	2.5	4.3	.5	1.18
TS150PW	2.8		2.89	2.73	.57	.50	4.00		2.3		.5	1.51	2.00	2.0	2.6	1.63	3.0	5.3	.5	1.15
TS500PW	2.8		2.89	2.73	.57	.50	4.00		2.3		.5	1.51	2.00	2.0	2.6	1.63	3.0	5.3	.5	1.15

Units are in inches

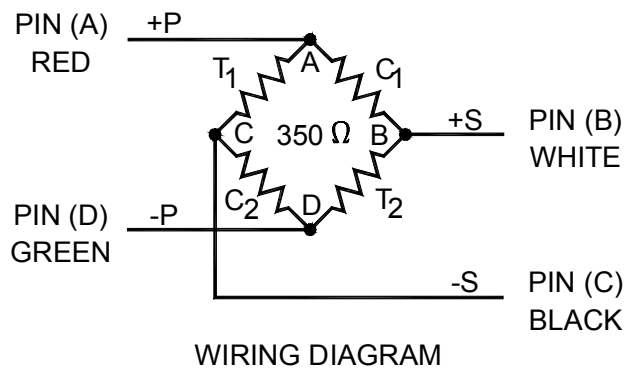
### Metric Stud Mount Models

MODEL	A	AA	B	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U	Y
TS2SWM		54	55.6	52.0	11.4			M12	51.6	22.2									49.1
TS25SWM		54	55.6	52.0	11.4			M12	51.6	22.2									49.1
TS75SWM		66	60.7	69.4	14.4			M12	57.2	25.4									51.5
TS250SWM		66	60.7	69.4	14.4			M12	57.2	25.4									51.5

Units are in millimeters

## SPECIFICATIONS

Gage Resistance	350 ohms
Excitation Voltage	10 vdc nominal
Output Signal	21 mvdc nominal per sensor at Full Load Rating
Operating Temperature	-30° C to 90° C
Combined Non-Linearity and Hysteresis	0.5% of Full Scale Maximum
Repeatability	0.2% of Full Scale Maximum
Deflection at Full Load	.016 in. (.41mm) maximum
Temperature Effect on Zero	.02% of Rating per ° C
Mating Cable Assembly	MAGPOWR Part No. SC-15
Mating Connector	MAGPOWR Part No. 12A36-1 (Pin A, +Power; Pin B, +Signal; Pin C, -Signal; Pin D, -Power)
Climate Class	3K3 (EN60721)



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