

TSR-Series

Tension Sensing Roller



IP54

Montalvo TSR-Series Tension Sensing Roller

Montalvo's Tension Sensing Roller (TSR) combines superior tension sensing technology with a high quality roller to produce an all-in-one, convenient, drop-in tension measurement unit. Available in standard sizes, or customizable to fit the needs of virtually any application. The TSR is the perfect solution for retrofit projects, and both OEM's and End Users looking to add high quality, and reliable tension measurement to their process. Quicker lead times, superior performance, leading repeatability, versatility, and competitive pricing make the TSR the ideal solution for your load cell and roller requirements.

Features

- ▶ Drop-In, Easy Installation
- ▶ Superior Tension Sensing Technology
- ▶ Repeatable, Precise Tension Signal
- ▶ Standard Lightweight Aluminum Roller
- ▶ Standard roll lengths from 10" to 24" or 250 mm to 600 mm
- ▶ 3" and 4" Standard Roll Diameters
- ▶ 25lb (125N) to 200lb (1000N) Standard Load Ratings
- ▶ Custom Lengths, Diameters, Load Ratings and Roll Finishes Available



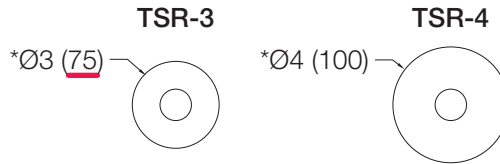
How To Specify

Model and Roll Diameter (standard NOMINAL sizes*)

TSR-3

TSR-4

*Custom diameters available. Use **worksheet**, provide **drawings** or **contact** a Montalvo Applications Specialist.

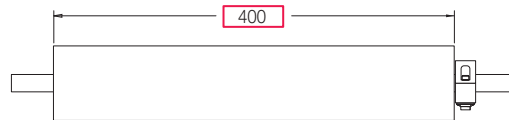


Roll - Face Length (standard NOMINAL sizes*)

TSR-3: 10 (250), 12 (300), 14 (350), 16 (400)

TSR-4: 18 (450), 20 (500), 22 (550), 24 (600)

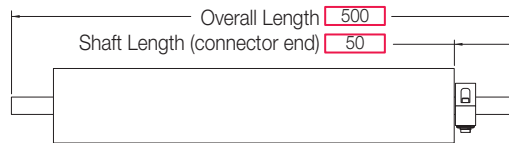
*Custom lengths available. Use **worksheet**, provide **drawings** or **contact** a Montalvo Applications Specialist.



Roll - Overall Length and Shaft Length at Connector End

Specified by customer at time of request.

Please use **worksheet**, provide **drawings**, or **contact** a Montalvo Applications Specialist to provide specifications.

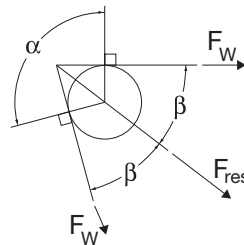


Load Rating

Standard Load Ratings from 25lb (125N) to 200lb (1000N)*.

*Custom Load Ratings Available

Note: It is highly recommended that you consult a Montalvo Applications Specialist to ensure proper load rating.



$$\beta = 90 - 1/2 \times \alpha$$

$$F_{res} = 2 \times F_w \times \cos \beta$$

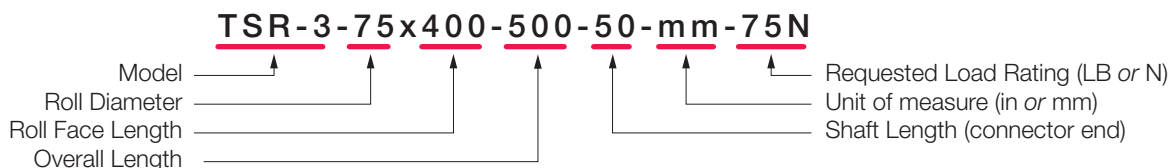
F_{res} resultant force

F_w maximum web force (total web tension)

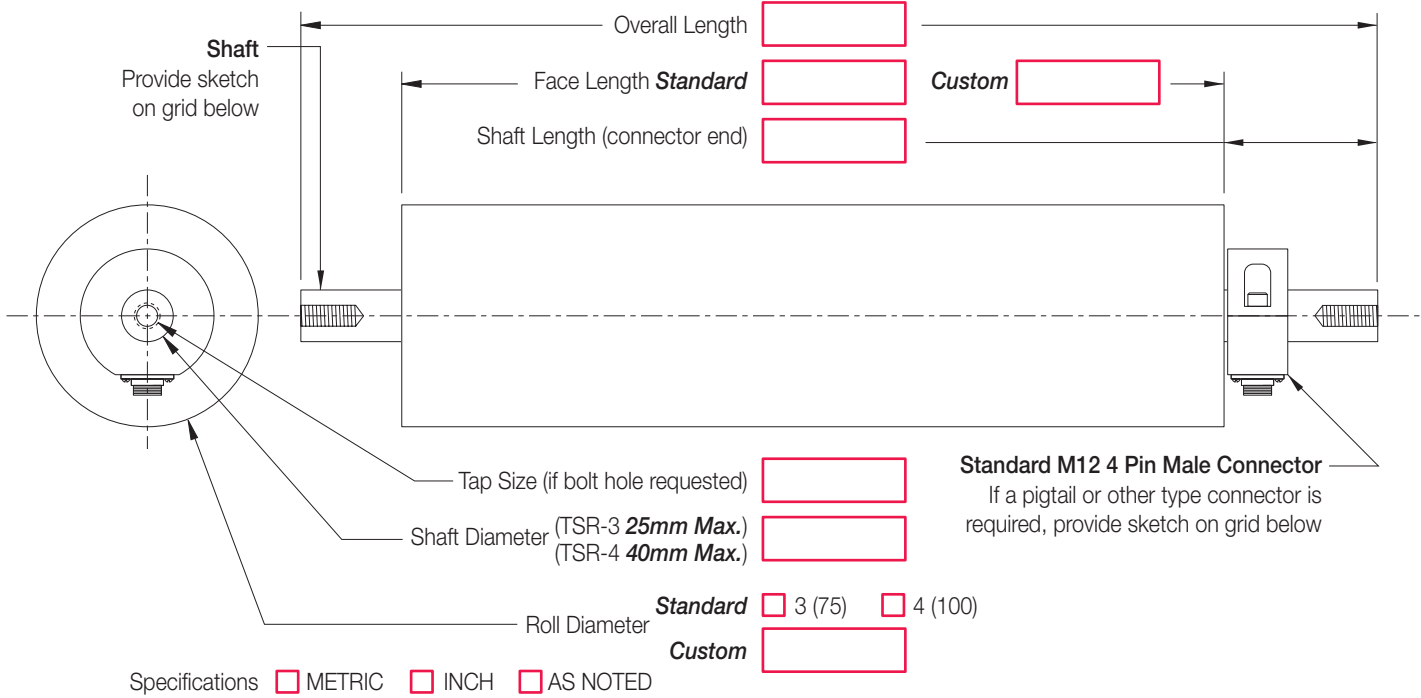
α wrap angle

β angle between resultant force and web

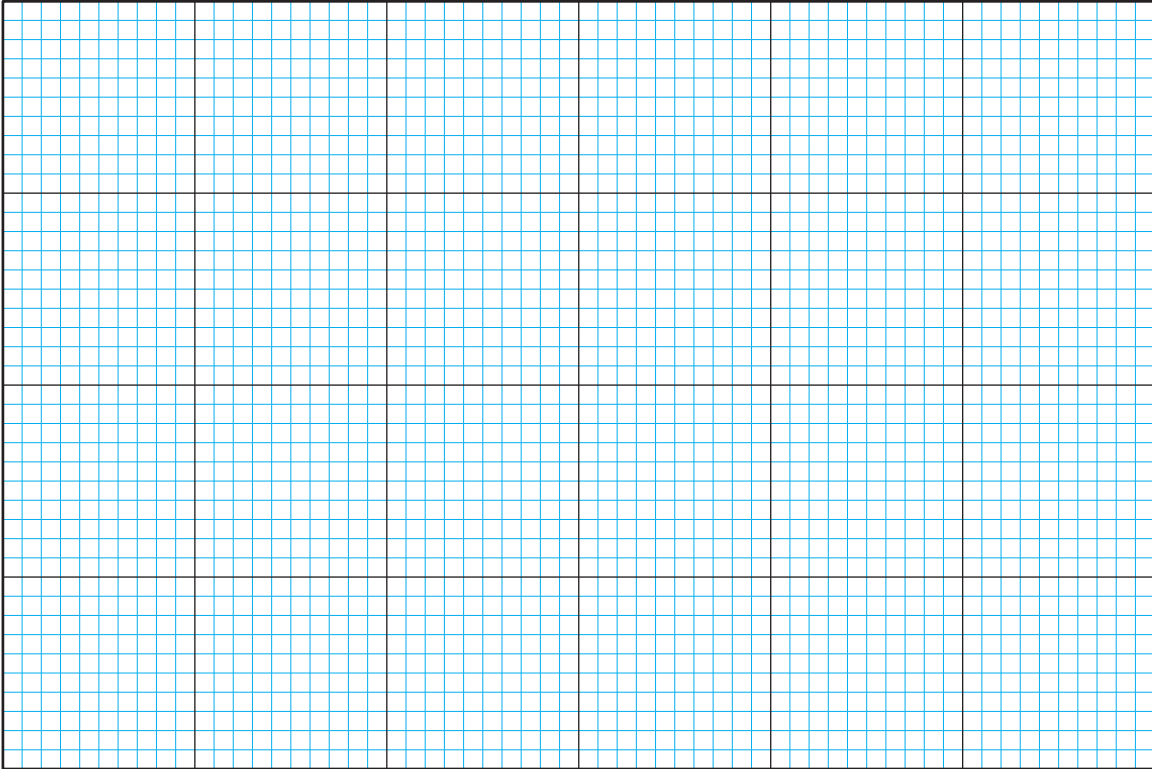
Example



Dimensions



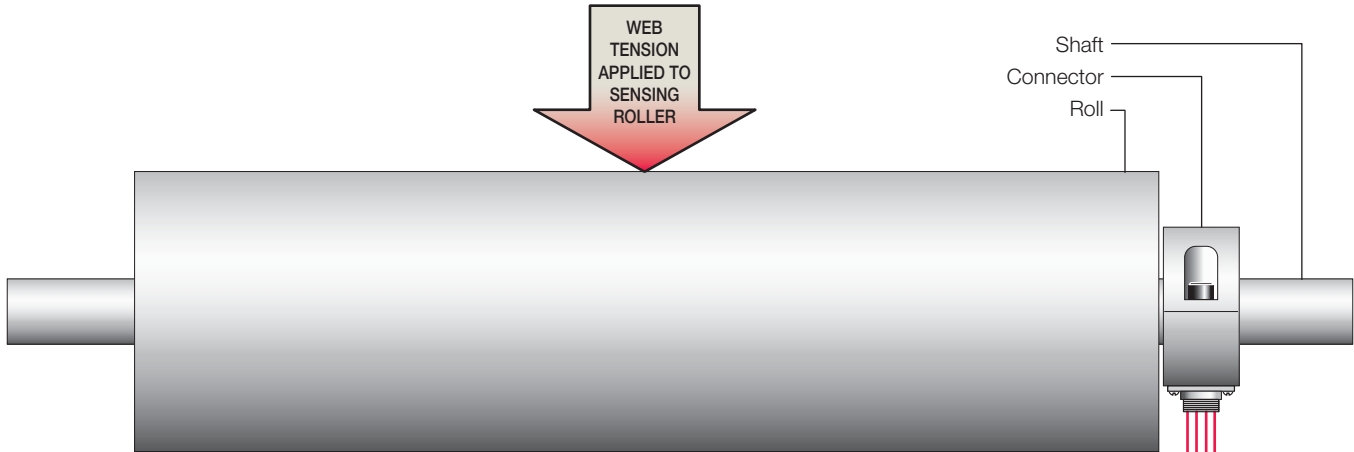
If you have a non-standard application, please use this grid to sketch requirements for the Shaft, Connector and/or Roll.



Scale: = _____ Unit of measure METRIC INCH

How They Work

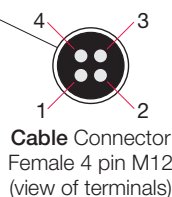
The strain gauges of the Montalvo TSR-Series load cells form a full bridge configuration. The force resulting from the web tension bends the internal (mounted on each end of roll) sensing beams slightly. As a result the resistance of each strain gauge changes, producing an output signal proportional to the web tension.



Montalvo Load Cell Cable (option).
 Connector wired as specified below:

Female 4 pin M12 connector

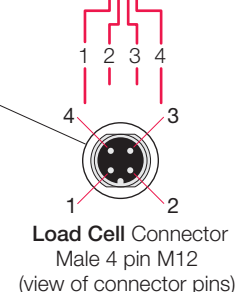
- Pin 1 BROWN or RED..... Excitation
- Pin 2 WHITE Signal
- Pin 3 BLUE or GREEN Signal
- Pin 4 BLACK..... Excitation



Connector can be either fixed to load cell (standard) or on a pigtail wire (option).

Male 4 pin M12 connector

- Pin 1 Excitation
- Pin 2 Signal
- Pin 3 Signal
- Pin 4 Excitation



Specifications

Electrical

Excitation.....	5 VDC
Output - Nominal.....	50 mV/V
Gauge Resistance.....	80 - 130 Ω
Type.....	full bridge semi-conductor
Repeatability.....	$\pm 0.25\%$ full span
Non-Linearity and Hysteresis (combined).....	$\pm 0.50\%$ full span

Connector*

Type.....	Male 4 pin M12
Pin 1.....	Excitation
Pin 2.....	Signal
Pin 3.....	Signal
Pin 4.....	Excitation
Standard Position.....	06 o'clock

* Connector shown above is standard - optional connections available

Loading**

Rated lb (N).....	25 (125), 50 (250), 75 (375), 100 (500), 150 (750), 200 (1000)
Overload.....	300% of rated

** Custom load ratings available

Environmental

Classification.....	IP54
Temperature $^{\circ}\text{F}$ ($^{\circ}\text{C}$) Compensated.....	14 to 131(-10 to 55)
Operating.....	-4 to 185(-20 to 85)
Effect on zero.....	0.015% / $^{\circ}\text{C}$
Effect on span.....	0.015% / $^{\circ}\text{C}$

Mechanical

Material Standard Shaft ¹	stainless steel
Roll ²	6061 aluminum

¹ Optional materials available

² Many roll surface coatings and finishes available

Related Montalvo Products

- Z4 Tension Controller
- S4 Digital Tension Controller
- A4 Digital Load Cell Amplifier
- Tension Indicators
- and... Cables

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