



# **Texas Electronics, Inc.**

*The Gold Standard in Weather Instrumentation Since 1957*

---



## **SERIES 525 RAINFALL SENSORS USER'S MANUAL**

---

**TEXAS ELECTRONICS, INC.**

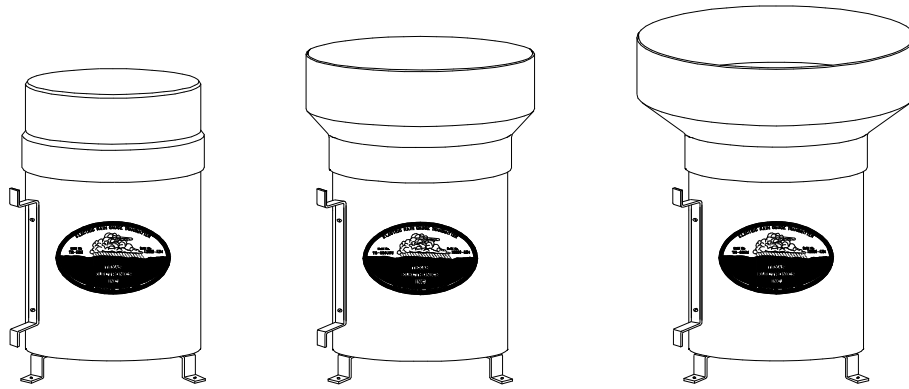
5529 Redfield St. Dallas, TX 75235

P.O. Box 7225 Dallas, TX 75209

Phone (214) 631-2490

Fax (214) 631-4218

Toll Free (800) 424-5651



## **SERIES 525 RAINFALL SENSORS**

### **DESCRIPTION**

The sensor consists of a gold anodized aluminum collector funnel with a knife-edge that diverts the water to a tipping bucket mechanism. The models TR-525I and TR-525USW are calibrated in inches (.01" per tip) and model TR-525M is calibrated in millimeters (.1mm per tip). A magnet is attached to the tipping bucket, which, as the bucket tips, actuates a magnetic switch. Thus, a momentary switch closure takes place with each tip of the bucket. Connecting the sensor to an event counter on an electronic datalogger or display module will allow record keeping of accumulated rainfall. If an analog signal representing rainfall accumulation is required, Texas Electronics, Inc. manufactures a suitable conditioning circuit.

The spent water drains out of the bottom of the housing; hence, the sensor requires no attention or servicing of any sort. It is completely automatic. The aluminum sensor housing is finished with a white baked enamel paint to withstand years of exposure to the environment.

### **SPECIFICATIONS**

Resolution:	0.01" or 0.1 mm
Accuracy:	
English	1.0% at 1"/hr or less
Metric	1.0% at 10 mm/hr or less
Average Switch Closure Time:	135 ms
Maximum Bounce Settling Time:	0.75 ms
Maximum Switch Rating:	30 VDC @ 2 A, 115 VAC @ 1 A
Temperature Limits:	+32°F to +125°F
Humidity Limits:	0 to 100%
Height:	10.125"
Weight:	2.5 pounds
Receiving Orifice Diameter:	6.060" (English) 9.664" (Metric) 8.000" USW (English)
Cable:	25 feet, 2-conductor
Installation:	Consists of attaching the three sensor support legs to a firm platform or securing the side bracket to a stable vertical structure such as the lower end of weather station mast. Sensor cable is then connected to monitoring equipment.
Maintenance:	Occasional cleaning of debris from filter screen may be required.
Warranty:	Three Years

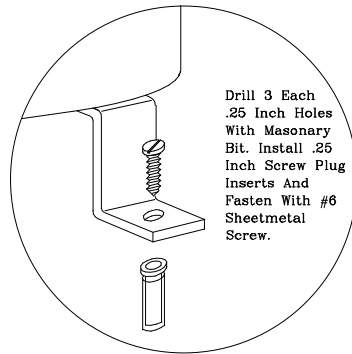
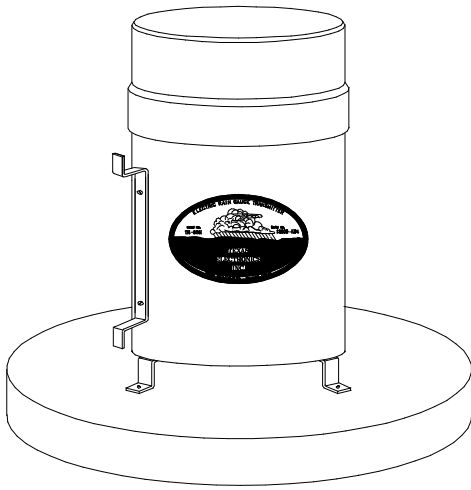
## **ORDERING INFORMATION**

Model #	Description
TR-525I	Rain Gauge, 6.06" collector, English (Please specify for calibration of 0.2 mm/tip)
TR-525USW	Rain Gauge, 8.00" collector, English
TR-525M	Rain Gauge, 25 mm collector, Metric

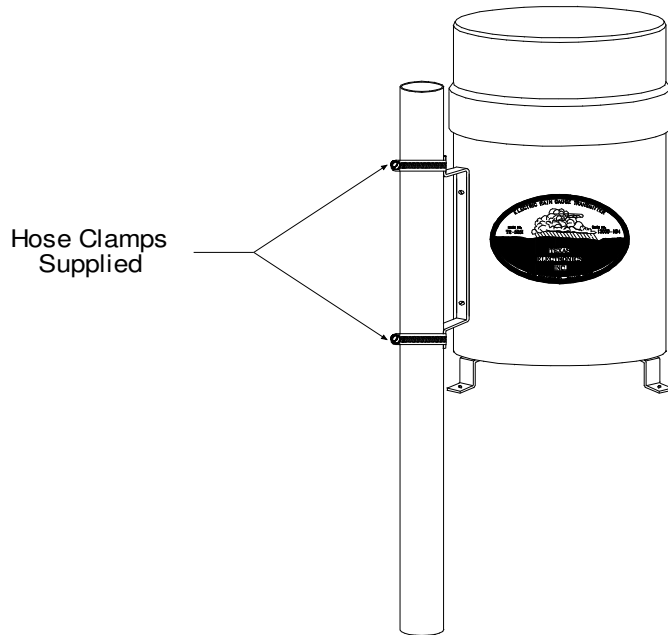
### *Optional Parts / Accessories*

HOBO	Event Datalogger and Software
MB-525	Pole Mounting Base
FC-525	Field Calibration Kit
BB-525	Bird Repellant
HT-525	Heater, 120 VAC
Cable	Additional Cable

# MODEL 525 MOUNTING EXAMPLES



Model 525 Surface Mounted On a Masonry Block



Model 525 Mast Mounted

## **MODEL 525**

### **TIPPING BUCKET RAIN GAUGE TRANSMITTER**

#### **INSTALLATION INSTRUCTIONS**

A clear and unobstructed mounting location is necessary to obtain accurate rainfall readings.

This transmitter has provisions for mounting two ways, surface mounting and mast mounting. Surface mounting is recommended where possible. The transmitter housing **MUST** be mounted in a **LEVEL** position and in a location free from vibration. If mast mounted, make sure that the mast is properly guyed so that vibration in high winds is kept to a minimum.

#### **THE FOLLOWING IS VERY IMPORTANT:**

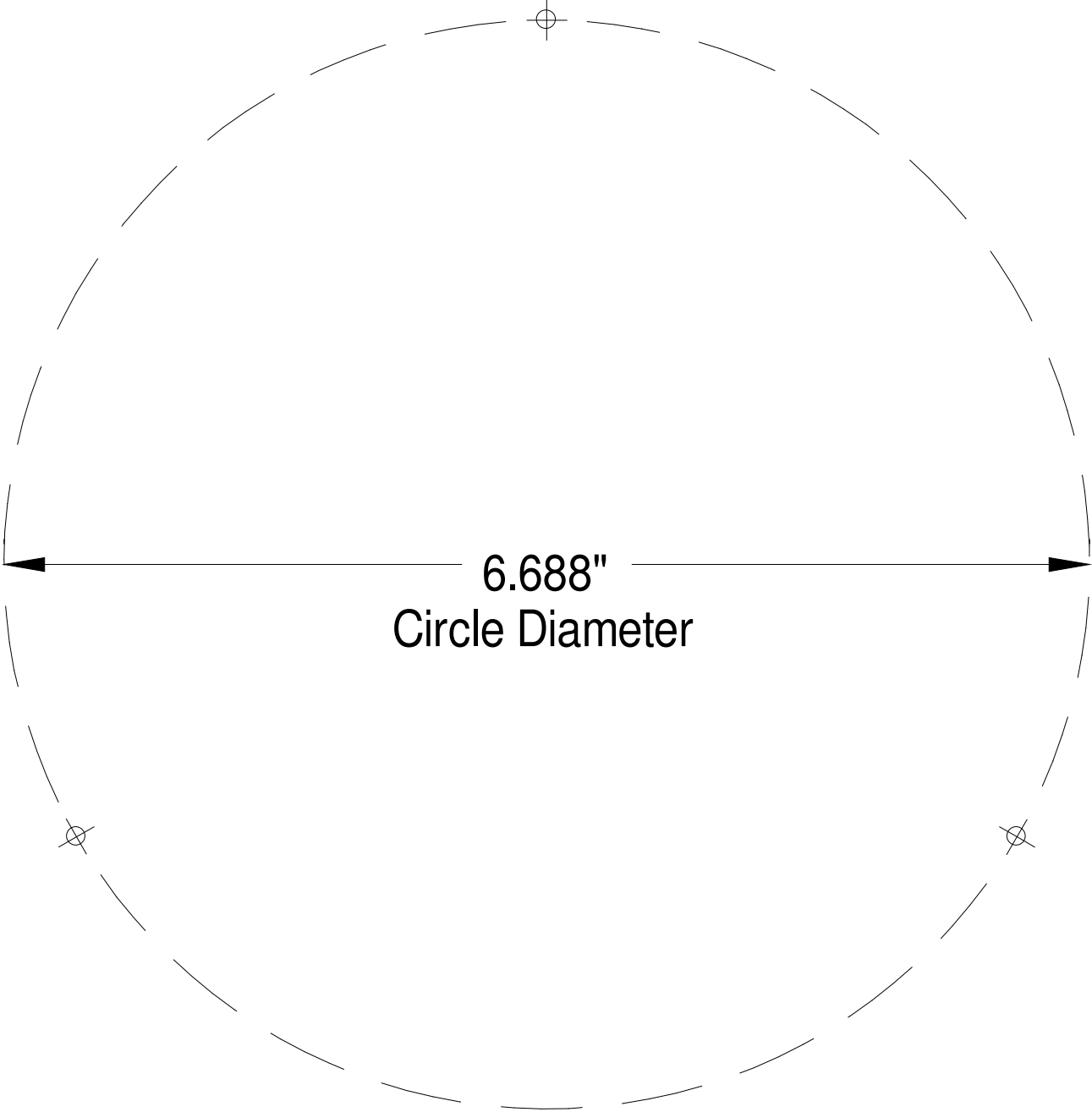
After the final transmitter installation has been made, remove the top gold funnel portion of the transmitter and observe the black tipping bucket. It should **NOT** (repeat **NOT**) be held in a dead center position by the magnetic attraction of the bucket magnet and the hermetically sealed magnetic switch. Press either end of the bucket down against the stop to be sure that it is not centered.

The transmitter to indicator connecting cable may be either shortened or lengthened as required.

The funnel and tipping bucket mechanism should be cleaned periodically. An accumulation of dirt, bugs, etc. on the tipping bucket will adversely affect the calibration.

**REMOVE AND USE THIS TEMPLATE TO BASE MOUNT THE RAINFALL SENSOR**

**MODELS TRP-525I, TRP-525M, TRP-525USW  
MOUNTING TEMPLATE**



## **FIELD CALIBRATION**

TR-525USW

Absolutely accurate calibration can be obtained only with laboratory equipment, but an approximate field check can be easily made. The tipping bucket mechanism is a simple and highly reliable device. The transmitter must be located in a clear area, away from trees, buildings, etc. It must also be mounted level. Accurate readings will not be obtained unless the transmitter is mounted in a level position. The mechanism must be clean. Any accumulation of foreign material, dust, etc. will alter the calibration of this unit. The transmitter must be calibrated with the rate of flow of water through the tipping bucket mechanism under control. At least 36 seconds should be allowed to fill one side of the tipping bucket. This represents a maximum flow rate of one inch of rain per hour. If the flow rate is increased, then the instrument will read low (if properly calibrated). Decreasing the rate of flow will not materially affect the calibration. The reason for this is obvious if the tipping bucket assembly is observed when the weight of this water starts to tip the bucket. Some time is required for the bucket to tip (a few milliseconds). During the first 50% of this time, water flows into the empty bucket. The amount of water flowing during the first 50% of the time is error, the faster the flow rate, the greater the error. Now at flow rates of one inch per hour (100 bucket fillings) or less, the water actually drips into the bucket rather than flowing. Under this condition, the bucket tips between drips, and no error water is added to a full moving bucket.

### *TO CHECK CALIBRATION:*

A field calibration kit is available from Texas Electronics, Inc. Model No. FC-525 is a kit that consists of a holding tank, pre-measured beaker, two orifices, cleaning tools and instructions.

## **FIELD CALIBRATION**

TR-525I & TR-525M

Absolutely accurate calibration can be obtained only with laboratory equipment, but an approximate field check can be easily made. The tipping bucket mechanism is a simple and highly reliable device. The transmitter must be located in a clear area, away from trees, buildings, etc. It must also be mounted level. Accurate readings will not be obtained unless the transmitter is mounted in a level position. The mechanism must be clean. Any accumulation of foreign material, dust, etc. will alter the calibration of this unit. The transmitter must be calibrated with the rate of flow of water through the tipping bucket mechanism under control. At least 36 seconds should be allowed to fill one side of the tipping bucket. This represents a maximum flow rate of one inch of rain per hour. If the flow rate is increased, then the instrument will read low (if properly calibrated). Decreasing the rate of flow will not materially affect the calibration. The reason for this is obvious if the tipping bucket assembly is observed in operation...with water falling into one side of the tipping bucket, there comes a point when the weight of this water starts to tip the bucket. Some time is required for the bucket to tip (a few milliseconds). During the first 50% of this tipping time, water continues to flow into the filled bucket; the last 50% of this tipping time, water flows into the empty bucket. The amount of water flowing during the first 50% of the time is error, the faster the flow rate the greater the error. Now at flow rates of one inch per hour (100 bucket fillings) or less, the water actually drips into the bucket rather than flowing. Under this condition, the bucket tips between drips, and no error water is added to a full moving bucket.

### *TO CHECK CALIBRATION:*

A field calibration kit is available from Texas Electronics, Inc. Model No. FC-525 is a kit that consists of a holding tank, pre-measured beaker, two orifices, cleaning tools and instructions.

## **Warranty**

Texas Electronics, Inc. (hereafter TEI) warrants the equipment manufactured by it to be free from defects in material and workmanship. Upon return, transportation charges prepaid to TEI, within three (3) years of original shipment of sensors and one (1) year of original shipment of electronics, recorders and indicators, TEI will repair or replace, at its option, any equipment which it determines to contain defective material or workmanship, and will return said equipment to purchaser, F.O.B., TEI. Texas Electronics shall not be obligated however to repair or replace equipment which has been repaired by others, abused, improperly installed, altered or otherwise misused or damaged in any way. TEI will not be responsible for any dismantling, re-assembly, or reinstallation charges.

This warranty is in lieu of all other warranties, expressed or implied. TEI shall not be liable for any special, indirect, incidental or consequential damages claimed in connection with any rescission of this agreement by purchaser.

For a list of specific items covered by the extended warranty, see the *Three-Year Warranty Equipment List*.

# Three-Year Warranty Equipment List

Effective February 1, 1992 all of Texas Electronics, Inc. sensors will carry a Three-Year warranty instead of the previous One-Year. The remainder of terms and conditions of the warranty remains unchanged. A specific list of items follows.

## Sensors Covered by Three-Year Warranty

<b>Parameter</b>	<b>Model No.</b>
Wind Direction	TD-105 (Synchro) TD-104D (Potentiometer) TD-110-L2 (Photo-Chopper) TD-106 (Potentiometer)
Wind Speed	TV-110-L2 (Photo-Chopper) TV-110-L3 (Photo-Chopper)  TV-114 (A.C. Generator)
Barometric Pressure	TB-2012
Relative Humidity	TH-2013 TH-2013V
Rainfall	TR-525 TR-6118
Temperature	TT-101 (Outdoor) TT-103R (Surface Mount) TT-103R-W (Water Probe) TT-309I (Indoor)
Solar Radiation	TS-100

## Systems Covered by Three-Year Warranty

<b>Model No.</b>	<b>Description</b>
WSC-5-S	Wind Speed Controller Single Set Point
WSC-5-ST	Wind Speed Controller Single Set Point with Time Delay
WSC-5-D	Wind Speed Controller Dual Set Point
WSC-5-DT	Wind Speed Controller Dual Set Point with Time Delay
WDC-2	Wind Direction Controller