Texas Electronics

"Relied on Worldwide in the Most Extreme Conditions"

Product Catalog
2022

Texas Electronics, Inc.
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Rain Gauge Tipping Bucket

TR-4 Rainfall Sensor

Description

The Texas Electronics, Inc. TR-4 low-cost rainfall sensor is a remote tipping bucket style rain gauge that measures liquid precipitation. The Rain Gauge is a freestanding receptacle for measuring precipitation. Through an opening at the top of the device, rain is collected and then funneled to a mechanical device, called a tipping bucket. As water is collected, the tipping bucket fills to the point that it tips over, causing a momentary closure of a switch to incrementally measure rainfall accumulation. This action empties the bucket in preparation for additional measurement. Water discharged by the tipping bucket passes out of the rain gauge with no need for emptying. The TR-4 was designed to meet the need for a rugged and reliable rain gauge tipping bucket without the high accuracy of a research grade sensor, or the associated cost.

Features & Benefits

- Interfaces with virtually all data acquisition systems
- Knife-edge collector optimizes rainfall catch
- Exceptional splash-out protection reduces wind errors
- Easy installation and maintenance
- Rugged aluminum exterior
- Anodized aluminum collector for weather resistance

Specifications

Resolution:	0.01" English
Accuracy:	0-1 in. (25 mm) per hour; +/-2%
Collector diameter:	3.90" (100 mm) with knife-edge
Funnel depth:	3" (76 mm)
Splash out protection:	>1.5" (38 mm)
Operating Temp:	32 to 125° F (0 to 50° C)
Storage Temp:	-40 to 160° F (-40 to 70° C)
Humidity Limits:	0 to 100%
Weight:	2 lbs. (0.9 kg) 4 lbs. (1.8 kg) shipping
Height:	6" (152 mm)
Cable:	10', 22 gauge 2 conductor
Switch:	Momentary potted reed switch
Switch rating:	30 VDC @ 2 A, 115 VAC @ 1 A
Switch Closure Time:	135 ms
Bounce Settling Time:	0.75 ms
Pivot:	Ground bronze pivots with hardened stainless steel shaft
Bucket:	Black ABS injection molded
Level:	Integral Bubble Level
Warranty:	3 years

Installation & Maintenance

Installation consists of attaching the three sensor support legs to a firm platform (such as our MB-525 Mounting Base). Pole mounting on the mast of a weather station is available by securing to the included side bracket.

Maintenance consists of routine cleaning of debris from the filter screen, and occasional calibration verification with our FC500 Field Calibration Kit.

Ordering Information

Model #: TR-4
Description: Rain Gauge, 3.90" collector, English

Optional Parts / Accessories
FC500 Field Calibration Kit
HOBO Datalogger and Software
BB-525 Bird Repellant
Cable Additional Cable

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Rain Gauge Tipping Bucket

TR-525I Series Rainfall Sensor

Description

The Texas Electronics, Inc. TR-525I Rainfall Sensor with 6" diameter funnel is a remote tipping bucket style rain gauge that measures liquid precipitation. The Rain Gauge is a freestanding receptacle for measuring precipitation. Through an opening at the top of the device, rain is collected and then funneled to a mechanical device, called a tipping bucket. As water is collected, the tipping bucket fills to the point that it tips over, causing a momentary closure of a switch to incrementally measure rainfall accumulation. This action empties the bucket in preparation for additional measurement. Water discharged by the tipping bucket passes out of the rain gauge with no need for emptying. The TR-525I is a rugged and reliable rain gauge that delivers high accuracy at a low cost.

Features & Benefits

- Interfaces with virtually all data acquisition systems
- Knife-edge collector optimizes rainfall catch
- Exceptional splash-out protection improves accuracy in high winds
- Easy installation and maintenance
- Over 30 years in production
- Lightweight aluminum exterior
- Powder coated aluminum collector for weather resistance and better water shedding
- Integrated bubble level
- 2 thumb screws to hold collector secure

Specifications

Resolution:	0.01" English, 0.2 mm (optional)
Accuracy:	0-2 in. (50 mm) per hour; +\-1%
Range:	27" (700 mm) per hour
Collector diameter:	6.06" (163 mm)
Funnel depth:	>6.5" (165 mm)
Splash out protection:	>2" (50 mm)
Operating Temp:	32 to 158° F (0 to 50° C)
Storage Temp:	-40 to 185° F (-40 to 70° C)
Humidity Limits:	0 to 100%
Weight:	1.6 lbs.
Height:	10.25"
Cable:	10', 24 gauge 2 conductor
Switch:	Momentary potted reed switch
Switch rating:	30 VDC @ 2 A, 115 VAC @ 1 A
Switch Closure Time:	135 ms
Bounce Settling Time:	0.75 ms
Pivot:	Ground bronze pivots with hardened stainless steel shaft
Bucket:	Black PP injection molded
Level:	Integral Bubble Level
Warranty:	3 years

Description

Installation consists of attaching the three sensor support legs to a firm platform (such as our MB-525 Mounting Base). Pole mounting on the mast of a weather station is available by securing to the included side bracket.

Maintenance consists of routine cleaning of debris from the filter screen, and occasional calibration verification with our FC500 Field Calibration Kit.

Ordering Information

Model #: TR-525I
Description: Rain Gauge, 6.06" collector
(Please specify for calibration of 0.2 mm/tip)

Optional Parts / Accessories

HOBO Pendant Datalogger
MB-525 Pole Mounting Base
FC-500 Field Calibration Kit
BB-525 Bird Repellant
HT-525 Heater, 120 VAC

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Rain Gauge Tipping Bucket

TR-525M Rainfall Sensor

Description

The Texas Electronics, Inc. TR-525M Rainfall Sensor is a remote tipping bucket style rain gauge that measures the amount of liquid precipitation.
The TR-525M rain gauge is a freestanding receptacle for measuring precipitation. It contains an open top, which allows rainfall to fall into the upper portion, which is called the collector. Collected water is funneled to a mechanical device (tipping bucket), which incrementally measures the rainfall accumulation and causes a momentary closure of a switch. As water is collected, the tipping bucket fills to the point where it tips over. This action empties the bucket in preparation for additional measurement. Water discharged by the tipping bucket passes out of the rain gauge with no need for emptying.
The TR-525M was designed to meet the need for a rugged and reliable metric rain gauge tipping bucket with high accuracy and low cost.

Features & Benefits

- Interfaces with virtually all data acquisition systems
- Knife-edge collector optimizes rainfall catch
- Exceptional splash-out protection improves accuracy in high winds
- Easy installation and maintenance
- Rugged aluminum exterior
- Anodized aluminum collector for weather resistance
- Integrated bubble level

Specifications

Resolution:	0.1 mm Metric
Accuracy:	50 mm per hour; +/-1%
Range:	27" (700 mm) per hour
Collector diameter:	9.66" (245 mm) with knife-edge
Funnel depth:	7.2" (183 mm)
Splash out protection:	>2" (50 mm)
Operating Temp:	32 to 158° F (0 to 50° C)
Storage Temp:	-40 to 185° F (-40 to 70° C)
Humidity Limits:	0 to 100%
Weight:	2 lbs.
Height:	12" (305 mm)
Cable:	10', 24 gauge 2 conductor
Switch:	Momentary potted reed switch
Switch rating:	30 VDC @ 2 A, 115 VAC @ 1 A
Switch Closure Time:	135 ms
Bounce Settling Time:	0.75 ms
Pivot:	Ground bronze pivots with hardened stainless steel shaft
Bucket:	Black PP injection molded
Level:	Integral Bubble Level
Warranty:	3 years

Installation & Maintenance

Installation consists of attaching the three sensor support legs to a firm platform (such as our MB-525 Mounting Base). Pole mounting on the mast of a weather station is available by securing to the included side bracket.

Maintenance consists of routine cleaning of debris from the filter screen, and occasional calibration verification with our FC500 Field Calibration Kit.

Ordering Information

Model #: TR-525M
Description: Rain Gauge, Metric

Optional Parts / Accessories

HOBO Pendant Datalogger
MB-525 Pole Mounting Base
FC-500 Field Calibration Kit
BB-525 Bird Repellant
HT-525 Heater, 120 VAC

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Rain Gauge Tipping Bucket

TR-525U (USW) Series Rainfall Sensor

Description

The Texas Electronics, Inc. TR-525U (USW) Rainfall Sensor with 8" diameter funnel is a remote tipping bucket style rain gauge that measures liquid precipitation. The Rain Gauge is a freestanding receptacle for measuring precipitation. Through an opening at the top of the device, rain is collected and then funneled to a mechanical device, called a tipping bucket. As water is collected, the tipping bucket fills to the point that it tips over, causing a momentary closure of a switch to incrementally measure rainfall accumulation. This action empties the bucket in preparation for additional measurement. Water discharged by the tipping bucket passes out of the rain gauge with no need for emptying. The TR-525U (USW) was specifically designed to meet the National Weather Service's requirements for rainfall measurement.

Features & Benefits

- Meets government requirements for an 8" collector
- Interfaces with virtually all data acquisition systems
- Knife-edge collector optimizes rainfall catch
- Exceptional splash-out protection improves accuracy in high winds
- Easy installation and maintenance
- Over 30 years in production
- Lightweight aluminum exterior
- Anodized aluminum collector for weather resistance
- Integrated bubble level

Specifications

Resolution:	0.01" or 0.2 mm
Accuracy:	0-2 in. (50 mm) per hour; +\-1%
Range:	27" (700 mm) per hour
Collector diameter:	8.00" (203 mm) with knife-edge
Funnel depth:	6.4" (163 mm)
Splash out protection:	>2" (50 mm)
Operating Temp:	32 to 158° F (0 to 50° C)
Storage Temp:	-40 to 185° F (-40 to 70° C)
Humidity Limits:	0 to 100%
Weight:	1.8 lbs.
Height:	11.125"
Cable:	10', 24 gauge 2 conductor
Switch:	Momentary potted reed switch
Switch rating:	30 VDC @ 2 A, 115 VAC @ 1 A
Switch Closure Time:	135 ms
Bounce Settling Time:	0.75 ms
Pivot:	Ground bronze pivots with hardened stainless steel shaft
Bucket:	Black PP injection molded
Level:	Integral Bubble Level
Warranty:	3 years

Installation & Maintenance

Installation consists of attaching the three sensor support legs to a firm platform (such as our MB-525 Mounting Base). Pole mounting on the mast of a weather station is available by securing to the included side bracket.

Maintenance consists of routine cleaning of debris from the filter screen, and occasional calibration verification with our FC500 Field Calibration Kit.

Ordering Information

Model #: TR-525U (USW)
Description: Rain Gauge, 8.00" collector
(Please specify for calibration of 0.2 mm/tip)

Optional Parts / Accessories

HOBO	Pendent Datalogger
MB-525	Pole Mounting Base
FC-500	Field Calibration Kit
BB-525	Bird Repellant
HT-525	Heater, 120 VAC

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Rain Gauge Tipping Bucket

TR-525-W2 Series Rainfall Sensor

Description

The Texas Electronics, Inc. TR-525-W2 Rainfall Sensor with a WMO standard 200mm diameter funnel is a remote tipping bucket style rain gauge that measures liquid precipitation. The Rain Gauge is a freestanding receptacle for measuring precipitation. Through an opening at the top of the device, rain is collected and then funneled to a mechanical device, called a tipping bucket. As water is collected, the tipping bucket fills to the point that it tips over, causing a momentary closure of a switch to incrementally measure rainfall accumulation. This action empties the bucket in preparation for additional measurement. Water discharged by the tipping bucket passes out of the rain gauge with no need for emptying. The TR-525-W2 was specifically designed to meet the National Weather Service & World Meteorological Organization requirements for rainfall measurement.

Features & Benefits

- Meets WMO requirements for a 200mm collector
- Interfaces with virtually all data acquisition systems
- Knife-edge collector optimizes rainfall catch
- Exceptional splash-out protection improves accuracy in high winds
- Easy installation and maintenance
- Over 30 years in production
- Lightweight aluminum exterior
- Aluminum collector for weather resistance
- Integrated bubble level

Specifications

Resolution:	0.1mm, 0.2mm, 0.5mm
	1.0mm (additional fee), 0.01"
Accuracy:	0-2 in. (50 mm) per hour; +/-1%
Range:	700 mm per hour (27")
Collector diameter:	200 mm with knife-edge
Funnel depth:	163 mm (6.4")
Splash out protection:	50 mm (2")
Operating Temp:	32 to 158° F (0 to 50° C)
Storage Temp:	-40 to 185° F (-40 to 70° C)
Humidity Limits:	0 to 100%
Weight:	1.8 lbs
Height:	11.125"
Cable:	10', 24 gauge 2 conductor
Switch:	Momentary potted reed switch
Switch rating:	30 VDC @ 2 A, 115 VAC @ 1 A
Switch Closure Time:	135 ms
Bounce Settling Time:	0.75 ms
Pivot:	Ground bronze pivots with hardened
	stainless steel shaft
Bucket:	Black PP injection molded
Level:	Integral Bubble Level
Warranty:	3 years

Installation & Maintenance

Installation consists of attaching the three sensor support legs to a firm platform (such as our MB-525 Mounting Base). Pole mounting on the mast of a weather station is available by securing to the included side bracket.

Maintenance consists of routine cleaning of debris from the filter screen, and occasional calibration verification with our FC-500 Field Calibration Kit.

Ordering Information

Model #: TR-525-W2
Description: Rain Gauge, 200mm collector
(Please specify calibration)

Optional Parts / Accessories

Pendant Datalogger
MB-525 Pole Mounting Base
FC-500 Field Calibration Kit
BB-525 Bird Repellant
HT-525 Heater, 120 VAC

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Rain Gauge Tipping Bucket

TR-525-W2-S Series Rainfall Sensor

Description

The Texas Electronics, Inc. TR-525-W2-S Rainfall Sensor with a WMO standard 200mm diameter funnel is a remote tipping bucket style rain gauge that measures liquid precipitation. It utilizes a unique siphoning mechanism that allows an extended range of accuracy. This system allows control of the "flow rate" of accumulated precipitation. This metering geometry assures higher levels in both accuracy and repeatability during periods of extremely heavy rainfall. The Rain Gauge is a freestanding receptacle for measuring precipitation.. The TR-525-W2-S was specifically designed to meet the National Weather Service & World Meteorological Organization requirements for rainfall measurement.

Features & Benefits

- Unique siphoning technique allows for wide accuracy
- Meets WMO requirements for a 200mm collector
- Interfaces with virtually all data acquisition systems
- Knife-edge collector optimizes rainfall catch
- Exceptional splash-out protection improves accuracy in high winds
- Easy installation and maintenance
- Over 30 years in production
- Lightweight aluminum exterior
- Aluminum collector for weather resistance
- Integrated bubble level

Specifications

Resolution:	0.1mm, 0.2mm, 0.5mm 1.0mm (additional fee), 0.01"
Accuracy:	0-10 in. (254 mm) per hour; +/-2% 10-20 in. (508 mm) per hour; +/-3%
Siphon starting threshold:	<0.01" (<0.254 mm)
Range:	700 mm per hour (27")
Collector diameter:	200 mm with knife-edge
Funnel depth:	163 mm (6.4")
Splash out protection:	50 mm (2")
Operating Temp:	32 to 140° F (0 to 60° C)
Storage Temp:	-40 to 185° F (-40 to 70° C)
Humidity Limits:	0 to 100%
Weight:	1.8 lbs
Height:	11.125"
Cable:	10', 24 gauge 2 conductor
Switch:	Momentary potted reed switch
Switch rating:	30 VDC @ 2 A, 115 VAC @ 1 A
Switch Closure Time:	135 ms
Bounce Settling Time:	0.75 ms
Pivot:	Ground bronze pivots with hardened stainless steel shaft
Bucket:	Black PP injection molded
Level:	Integral Bubble Level
Warranty:	3 years

Installation & Maintenance

Installation consists of attaching the three sensor support legs to a firm platform (such as our MB-525 Mounting Base). Pole mounting on the mast of a weather station is available by securing to the included side bracket.

Maintenance consists of routine cleaning of debris from the filter screen, and occasional calibration verification with our FC-500 Field Calibration Kit.

Ordering Information

Model #: TR-525-W2-S
Description: Rain Gauge, 200mm collector
(Please specify calibration)

Optional Parts / Accessories

Pendant Datalogger
MB-525 Pole Mounting Base
FC-500 Field Calibration Kit
BB-525 Bird Repellant
HT-525 Heater, 120 VAC

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Complete Weather Station

CWS-1

Description

The CWS-1 Complete Weather Station is a packaged weather system designed to fit applications where precise weather data is required. The system utilizes the highest quality sensors and rugged mounting hardware to ensure reliable data transfer.

Features & Benefits

- High quality, research grade sensors
- Rugged, corrosion resistant enamel coating
- Pre-drilled and tapped assembly
- Utilizes weather resistant connectors for all sensors
- Quick and easy assembly

Specifications

Mechanical

Mast	
Material:	Aluminum Tubing
Size:	3" x 3"
Height:	7'
Finish:	Powder-coat
Wiring:	Quick-release wiring harness
Crossarm	(w/ rain base & wind base)
Material:	Aluminum Tubing
Size:	1" H x 3" W
Length:	4'
Finish:	Powder-coat
Wiring:	Quick-release wiring harness
Base	(w/ mast assembly)
Material:	Aluminum sheet
Size:	12" L x 12" W
Thickness:	0.25"
Mounting:	0.75" holes @ 8.75" between center
Finish:	Powder-coat
Lightning Rod	(Optional item)
Material:	Aluminum rod
Size:	0.25" diameter
Length:	3'
Finish:	Powder-coat
Solar Base	(Optional item)
Material:	Aluminum tubing
Size:	0.5" diameter
Length:	12"
Finish:	Powder-coat
Junction Box	(Standard - Included with mast)

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Specifications Cont'd

Type:	Fiberglass
Size:	6" W x 8 H x 4" D
Protection:	Nema 4X
Interface:	Cable glands
Connections:	Terminal Strip
4-20 mA Junction Box	(Optional item)
Type:	Fiberglass
Size:	6" W x 8" H x 4" D
Protection:	Nema 4X
Interface:	Cable glands
Connections:	Terminal Strip
Electrical	
Power:	10-30 VDC
Current:	<250 mA typical (<500 mA for
	4-20 mA outputs)
	Check Sensors for exact current
	Consumption
Warranty:	3 years

Installation & Maintenance

The CWS-1 Weather Station is designed to easily assemble with standardized parts. All components are pre-drilled and tapped for simple field assembly with common hand tools and the included corrosion resistant fasteners. The station is designed to be bolted on a user provided cement slab utilizing the 12" square base. (Pattern available upon request.) Placement of a weather station is critical to ensure correct and dependable data. Consult your local regulatory agency for required placement. Or contact us for typical installation requirements. The CWS-1 Weather Station is intended to be maintenance free. However, you should consult each sensor data sheet to see its required maintenance.

Ordering Information

Model #	Description
CWS-1	Complete Weather Station Package

Standard package includes the following:

Mast	(w/ base & junction box)
Crossarm	(w/ rain base & wind base)
TV-4	Wind Speed Sensor
TD-4	Wind Direction Sensor
TR-525I	Rain Gauge, 6"
TTH-1315	Temperature & Humidity Sensor

Optional Parts / Accessories

**These parts can be added to the standard package above*

Model #	Description
CWS-003	Lightning Rod
CWS-004	Solar Radiation Base
SP-Lite	Solar Radiation Sensor

Custom Packages

**For a custom system, all pieces need to be ordered individually.*

Model #	Description
CWS-001	Mast (w/ base & junction box)
CWS-002	Crossarm (w/ rain base & wind base)
CWS-003	Lightning Rod
CWS-004	Solar Radiation Base
TV-4*	Wind Speed Sensor (Please specify exact model)
TD-4*	Wind Direction Sensor (Please specify exact model)
TR-525*	Rain Gauge/Tipping Bucket (Please specify exact model)
TTH-1315	Temperature & Humidity Sensor
SP-LITE	Solar Radiation Sensor

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Wind Speed Indicating System

Model 2-200

Description

The Model 2-200 Wind Speed Indicating System is an extremely accurate, low cost wind measuring system. This system consists of a Model TV-114 anemometer and a dial indicator. No external power source is required, as the system generates its own power. This feature makes the Model 2-200 ideal for mobile applications where access to a power source is limited or non-existent. The TV-114 Wind Speed Sensor is a rugged sensor consisting of a lightweight. 3-cup anemometer mechanically coupled to a brush-less precision AC generator located within a gold-anodized aluminum housing. The exterior of the sensor helps prevent corrosion even in extreme conditions of heat, cold and saltwater environments. The sensor is designed to be as sensitive as possible to light winds, yet strong enough to withstand hurricane force winds. The indicator utilizes a 0-1 mA DC meter movement contained in a cast aluminum housing with universal mounting brackets. The brackets simplify meter mounting in marine or mobile installations as they allow for top, back, or bottom mounting. The indicator can be ordered for any one of two ranges as follows: 0-100 MPH and 0-50 m/s

Features & Benefits

- Self-generating system requires no external power source
- Provides for safe operation of wind-affected equipment
- Rugged instruments can withstand extreme conditions
- Extremely accurate readings at economical price
- Mounts easily in a variety of configurations
- Available in a variety of ranges
- Over 30 years in production

Specifications

Indicator Size:	4.5"Wx3.5"Hx2"deep
	(11.43 cm x 8.89 cm x 5.08 cm)
Weight (complete system):	
	8 lbs. (3.62 kg) with standard 60' cable)
Cable:	60', 18 Gauge 2 conductor
Power:	serf-generating, no power source necessary
Operating Temperature:	-20° to 125°F (-29° to 50°C)
Storage Temperature:	-40° to 160°F (-40° to 70°C)
Humidity Limits:	0 to 100%
Finish:	Sensor - Gold anodized aluminum
	Indicator - black numerals on white dial
	Indicator Box - powder-coat black box; clear
	alodine aluminum mounting bracket
Warranty:	3 Years

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Installation & Maintenance

Before attaching the anemometer or wind speed sensor in place, the three anemometer cup/cup arm assemblies must be attached to the rotor head of the sensor. The cup arms are inserted all the way into the holes in the side of the rotor top plate with the flat side facing up, and they are secured with allen screws inserted through the top of the rotor plate. Screws and allen wrenches are shipped in a small plastic packet accompanying the cup/cup arm assemblies. The sensor head is equipped with a 12" straight tube through which cable is run to connect to the indicator. This tube is the mounting feature and can be attached with the supplied hose clamps to the top of a crane boom, or in other appropriate location where wind speed must be monitored. The sensor should be located in such a way as to avoid any obstruction within at least 100 feet if possible, and up or down currents, eddy currents or jet flow effects are also to be avoided. After the anemometer is fastened in place, the cable must be properly secured to the point where it will be attached to the indicator box. The indicator is then firmly bolted inside crane cab or wherever it is needed in order to keep equipment operator informed of the current wind speed. If necessary, the cable may be cut down in length, or more cable can be added with negligible effect on the anemometer's calibration. Additional cable length may be specified when ordering, and cable can be obtained from Texas Electronics if needed. If changing cable length by more than several hundred feet, contact the factory to determine the severity of the effect on calibration. Rotating elements are carefully balanced to eliminate any possible vibration and assure sensitivity to the lightest wind. In some applications users may wish to occasionally verify and document sensor accuracy with a synchronous test motor. Under average climate conditions, AC generator and/or bearings replacement is recommended at 3 to 5-year intervals.

Wind Speed Sensor (Model TV-114)

A three-cup anemometer directly connected to a precision alternating current brushless generator measures wind speed. The anemometer and generator shaft rotate in sealed ball bearings.

Starting Threshold:	2.2 to 3.0 MPH (1.1 to 1.3m/s_
Distance Constant:	21.7 ft. (6.6m)
Accuracy:	+/- 2.0 MPH (0.9 m/s)
Excitation Requirement:	None, self-generating
Operational Envelope:	0 to 120 MPH (0 to 53.7 m/s)
Cup Wheel Diameter:	18" (45.7 cm)
Overall Height:	7.5" (19.1 cm)
Turning Radius:	9.0" (22.9 cm)

Ordering Information

Model#	Description
2-200	Wind Speed Indicating System (Please specify if other than 0-100 MPH)

Optional Parts/Accessories

Cable	Additional Cable

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Wind Speed Activated Control System

WSC-5

Features & Benefits

- Enhances safety in numerous industrial operations
- Single and Double set points available
- System includes Controller and Wind Speed Sensor
- Easy installation and maintenance
- Over 30 years in production
- Weatherproof enclosure for superior outdoor protection
- Offers wide variety of settings

Description

The Texas Electronics WSC-5 Wind Speed Activated Control System is designed for switching on and/or off, various types of equipment according to wind speed parameters. Designed to withstand harsh environments the WSC-5 is a truly commercial/research grade instrument that is ideally suited for safety applications such as cranes and other types of high reach and load bearing equipment where strong winds can be a factor. The WSC-5 also offers complete, user-defined capability in controlling alarms, fountains, beacons, deodorizers, air samplers, etc., when wind speed exceeds or falls below a certain selectable value. The control output function (either switch-on or switch-off or both) can be set for activation at any desired speed value from 0-100 MPH (alternate ranges available). Single and dual set points are available depending on the requirements of the user. An adjustable time delay is used to minimize premature on-off cycling of the controlled equipment when wind speed is fluctuating around the selected set point. Time delays are programmable with time periods ranging from 1 to 1023 seconds. Two modes of operation are provided; Automatic and Latching. In the Automatic mode, the relay(s) is energized at wind speeds exceeding the set point(s), but automatically de-energized when wind speed falls below the set point(s). In the Latching mode, the relay(s) energizes when the wind speed set point(s) is exceeded and remains energized until manually reset. The WSC-5 Indicator/Control components are housed in a Nema-style enclosure for maximum environmental protection. Conduit connectors are mounted on the cabinet base for entry of respective cables. A terminal strip is provided within the enclosure for making the appropriate cable connections. A clear Lexan window in the door allows viewing of the control panel without opening the door. Two standard WSC-5 systems are available, depending upon the requirements of the user. Both systems operate on a scale of 0-100 MPH unless special scale range (optional price) is requested. Wind Speed is measured by a 3-cup anemometer, which is remotely located from the wind speed control/indicator assembly. The rotating cup assembly is mechanically coupled to a precision low-torque alternating current generator. The absence of brushes and contacts in this generator provides long life and low sensor starting threshold. The life of the generator is essentially equal to the life of its bearings. Bearings are incorporated on both the anemometer and generator shafts, which require no additional lubrication. All exposed sensor parts are constructed of gold-anodized aluminum to resist adverse environmental conditions. Sixty feet of 18 gauge insulated two-conductor cable provides transmission from sensor to controller module, although additional length may be specified.

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SPECIFICATIONS:

Indicator Range:	0-100 MPH
Indication/Actuation Accuracy:	2% of full scale
Set Point Adjustability	Adjustable over full scale
Dual Set Point Units:	Adjustable to within 0 MPH of each other
Time Delay Relays:	Switch Settable Time Delays
	from 0.1 sec to 1,023 sec.
	+/- 2% setting Accuracy
	+/- 0.1% Repeat Accuracy
	SPDT or DPDT
	10 A Output Contacts
Operator Controls:	1) on-off switch
	2) set point adjustment knob(s)
	3) time delay set point knob(s)
	4) latch & auto switch
Control Console Size:	12"W x 15.5"H x 7.5"Deep
Enclosure type:	
Covers:	NEMA 3,3R, 4,4X AND12
Mounting:	Wall Type
Finish:	Gray fiberglass throughout with Lexan
	viewing window
Power Consumption:	Approximately 3 Watts
Cable:	60', 18 Gauge 2 conductor
Warranty:	3 years

Wind Speed Sensor (Model TV-114)

A three-cup anemometer directly connected to a precision alternating current brushless generator measures wind speed. The anemometer and generator shaft rotate in sealed ball bearings.

Starting Threshold:	2.2 to 3.0 MPH (1.1 to 1.3 m/s_
Distance Constant:	21.7 ft. (6.6m)
Accuracy:	+/- 2.0 MPD (0.9m/s)
Excitation Requirement:	None, self-generating
	0 to 120 MPH (0 to 53.7 m/s)
Operational Envelope:	18" (45.7 cm)
Cup Wheel Diameter:	7.5" (19.1 cm)
Overall Height:	9.0" (22.9 cm)

Installation & Maintenance

Console and wind speed sensor may be mounted at any desired location. The speed sensor should be mounted so that it will measure a true representative sample of wind speed affecting the equipment being monitored. It should be mounted high enough to clear all obstructions in a vertical position. A 12" straight mounting tube is provided with the sensor and may be clamped to any convenient vertical mast, as desired. The indicator/controller unit may be mounted either indoors or outdoors as required. Field maintenance should include occasional cleaning of the cup assembly and inspection of the internal mechanism to make sure it is free of insects and debris. In some applications users may need to occasionally verify and document sensor accuracy with a synchronous test motor. Bearing and AC generator replacement may be performed every three to five years.

Ordering Information

Model #:

WSC-5-SDOR	Wind Speed Controller, Single Set Point
WSC-5-DDOR	Wind Speed Controller, Dual Set Point

Optional Parts / Accessories

WSC-Alarm1	Indoor Alarm & Strobe
WSC-Alarm2	Outdoor Alarm & Strobe
Cable	Additional Cable

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Wind Velocity Anemometer

TV-4 Wind Speed Sensor

Description

The Texas Electronics, Inc. TV-4 Wind Speed Sensor is a mechanical style anemometer that measures the horizontal velocity of wind. This unit combines small physical size with superior bearings to meet the EPA's Prevention of Significant Deterioration (PSD) starting threshold requirements.
The TV-4 wind speed sensor is a freestanding device for measuring air velocity. Thee sensor consists of a lightweight 3-cup anemometer, which electromechanically converts wind speed into a measurable electronic signal. The output signal can be presented in 3 optional forms: a pulsed DC signal, an AC frequency, or a conditioned analog signal. Each output has a specific application. The pulsed DC signal is used where high-accuracy is required and continuous power is not an issue. The AC frequency output is used in situations where power consumption is critical. And finally, the conditioned analog signal is used to easily and quickly communicate with virtually all digital control systems such as PLC or SCADA systems.

Features & Benefits

- Superior low starting threshold
- Long life hybrid single wiper potentiometer
- No plastic parts for extremely long life
- Precision stainless steel bearings for stability and repeatability
- Crossarm included with purchase of matching wind speed sensor
- Easy installation and maintenance
- Over 25 years in production
- Lightweight and rugged anodized aluminum exterior

Installation & Maintenance

Installation consists of threading the 10-32 mounting base into our crossarm or any other suitable beam. If a crossarm is used, the entire unit can be bolted to a mast or attached via U-bolts. The sensor is dynamically calibrated at the factory and due to the nature of its operation should not require field calibration. Field maintenance should include occasional cleaning of the cup assembly and inspection of the internal mechanism to make sure it is free from insects and debris. In some applications users may need to occasionally verify and document sensor accuracy with a synchronous test motor. Other possible routine maintenance is to replace the bearing housing assembly every three to five years to maintain low starting threshold

Ordering Information

Model#	Description
TV-4	Wind Speed Sensor, Light Industrial
TV-4-A	Wind Speed Sensor, Analog 4-20 mA

** Sensor is designed to work with TD-4 Wind Direction Sensor*

Optional Parts/Accessories

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Specifications

Operating Range:	0-100 MPH		
Signal Presentation:	Pulsed DC output - light chopper		
	AC Frequency, or Analog, 4-20 mA		
	(please specify)		
Pulsed DC output::	20-slot disc	Input Power:	+5.0 VDC @ 5 mA (typical)
	1 MPH = 520 pulses/ min.		(other voltages available upon request)
	100 MPH = 52000 pulses/min.		
AC Frequency output:	26 mA/MPH (typical)	Input Power:	None (self-generating)
	0.133 Hz/MPH		
Analog 4-20 mA output:	4 mA = 0 MPH	Input Power:	10-36 VDC
	20 mA = 100 MPH		
Performance:			
Accuracy:	+/- 2.0 MPH (0.89 m/s)		
Distance Constant:	>21.7' (6.6 m)		
Starting Threshold:	0.6 MPH (0.27 m/s)		
Environmental:			
Operational Envelope:	0-135 MPH (0 to 60 m/s)		
Temperature:	-40 to 160°F (-40 to 70°C)		
Relative Humidity:	0-100%		
Physical:			
Cup Wheel Diameter:	6.0" (15.3 cm)		
Overall Height:	4.75" (12.1 cm)		
Turning Radius:	3.0" (7.6 cm)		
Cup Diameter:	2.0" (5.1 cm)		
Bearings:	APEC 3 or better		
Mounting Base:	Screw attachment, 10-32 machine screw		
Weight:	0.5 lbs (0.23 kg) less cable		
Cable:	60', 22 Gauge 3 conductor		
Warranty:	3 years		

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Wind Velocity Anemometer

TV-110-L320 Wind Speed Sensor

Description

The Texas Electronics, Inc. TV-110-L320 Wind Speed Sensor is a mechanical style anemometer that measures the horizontal velocity of wind. This unit is designed to meet or exceed all the EPA's Prevention of Significant Deterioration (PSD) requirements. The TV-110-L320 wind speed sensor is a freestanding device for measuring air velocity. The sensor consists of a lightweight 3-cup anemometer, which is mechanically coupled to 20-slot disc located within the sensor housing. A light beam, produced by an infrared light emitting diode (LED), passes through the slotted disc and falls upon a light-detecting transistor. The transistor switches on and off 20 times for each revolution of the cup assembly. Therefore a pulsed output is produced which is proportional to wind speed.

Features & Benefits

- Superior low starting threshold
- No plastic parts for extremely long life
- Precision stainless steel bearings for stability and repeatability
- Crossarm included with purchase of matching wind direction sensor
- Easy installation and maintenance
- Over 25 years in production
- Lightweight and rugged anodized aluminum

Specifications

Operating Range	0-100 MPH
Signal Presentation:	Frequency, pulsed output light chopper
	The 20-slot disc produces the following
	liner repetition rate:
	0 RPM = 1 MPH = 200 pulses/min.
	100 RPM = 10 MPH = 2,000
	1,000 RPM = 100 MPH = 20,000 pulses/min.
Excitation:	+5.0 VDC @ 5 mA (typical)
	(other voltages available upon request)
Performance:	
Accuracy:	+/- 1.0 MPH (0.45 m/s) over entire range
	+/- 0.6 MPH (0.25 m/s) at less than 11.2 MPH
	(5.0 m/s)
Distance Constant:	>16.5' (5.0 m)
Starting Threshold:	1.1 MPH (0.5 m/s)
Environmental:	
Operational Envelope:	0-135 MPH (0 to 60 m/s)
Temperature:	-40 to 160°F (-40 to 70°C)
Relative Humidity:	0-100%
Physical:	
Height:	6.5" (16.5 cm)
Cup Diameter:	3.25" (8.25 cm)
Cup Wheel Diameter:	12.5" (32 cm)
Finish:	Gold Anodized Aluminum
Cable:	60', 22 Gauge 3 conductor
Bearings:	APEC 3 or better
Mounting Pole:	0.75" O.D. (1.9 cm)
Warranty:	3 years

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Installation & Maintenance

Installation consists of attaching the unit to a mast via the supplied mounting pole. If a crossarm is used, the entire unit can be bolted to a mast or attached via U-bolts.
The sensor is dynamically calibrated at the factory and due to the nature of its operation should not require field calibration. Field maintenance should include occasional cleaning of the cup assembly and inspection of the internal mechanism to make sure it is free from insects and debris. In some applications users may need to occasionally verify and document sensor accuracy with a synchronous test motor. Possible bearing and photo detector replacement every three to five years to maintain low starting threshold.

Ordering Information

Model #:

TV-110-L320	Wind Speed Sensor, Medium Industrial (Specify supply voltages other than 5VDC)
TV-110-L320-A	Wind Speed Sensor, 4-20 mA

** Sensor is designed to work with TD-106-5D Wind Direction Sensor*

Optional Parts / Accessories

T-8011M	Synchronous motor for calibration
Cable	Additional Cable

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Wind Velocity Anemometer

TV-114 Wind Speed Sensor

Description

The Texas Electronics, Inc. TV-114 Wind Speed Sensor is a mechanical style anemometer that measures the horizontal velocity of wind. The sensor is intended for long-term, maintenance-free operation.

The TV-114 wind speed sensor is a freestanding device for measuring air velocity. The sensor consists of a lightweight 3-cup anemometer, which is mechanically coupled to an AC generator. As the cup mechanism rotates the AC generator produces an AC sine wave where the amplitude and frequency are proportional to wind speed.

Features & Benefits

- Non-contacting brushless AC generator for long-term maintenance free operation
- No plastic parts for extremely long life
- Precision stainless steel bearings for stability and repeatability
- Crossarm included with purchase of matching wind direction sensor
- Easy installation and maintenance
- Over 25 years in production

Specifications

Operating Range	0-100 MPH
Signal Presentation:	AC frequency
	10 RPM = 1.0 MPH = 1.33 Hz
	1000 RPM = 100.0 MPH = 133.33 Hz
Excitation:	None (self-generating)
Performance:	
Accuracy:	+/- 2.0 MPH (0.90 m/s) over entire range m/s)
Distance Constant:	>21.7' (6.6 m)
Starting Threshold:	2.0 MPH (0.90 m/s)
Environmental:	
Operational Envelope:	0-135 MPH (0 to 60 m/s)
Temperature:	-40 to 160°F (-40 to 70°C)
Relative Humidity:	0-100%
Physical:	
Height:	7.5" (19.0 cm)
Cup Diameter:	4" (10 cm)
Cup Wheel Diameter:	18" (46 cm)
Finish:	Gold Anodized Aluminum
Cable:	60', 18 Gauge 2 conductor
Bearings:	APEC 3 or better
Mounting Pole:	0.75" O.D. (1.9 cm)
Warranty:	3 years

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Installation & Maintenance

Installation consists of attaching the unit to a mast via the supplied mounting pole. If a crossarm is used, the entire unit can be bolted to a mast or attached via U-bolts. The sensor is dynamically calibrated at the factory and due to the nature of its operation should not require field calibration. Field maintenance should include occasional cleaning of the cup assembly and inspection of the internal mechanism to make sure it is free from insects and debris. In some applications users may need to occasionally verify and document sensor accuracy with a synchronous test motor. Possible bearing and AC generator replacement is recommended every three to five years.

Ordering Information

Model#	Description
TV-114	Wind Speed Sensor, Heavy Industrial
TV-114-A	Wind Speed Sensor, 4-20mA

**Sensor is designed to work with TF-104-5D Wind Direction Sensor*

Optional Parts/Accessories

CA-1	Crossarm, pre-wired
T-8011M	Synchronous motor for calibration
Cable	Additional Cable

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Wind Direction Vane

TD-4 Wind Direction Sensor

Description

The Texas Electronics, Inc. TD-4 Wind Direction Sensor is a mechanical style wind meter that measures the horizontal wind azimuth. This unit combines small physical size with superior bearings to meet the EPA's Prevention of Significant Deterioration (PSD) starting threshold requirements. The TD-4 wind direction sensor is a freestanding device for measuring the direction of wind. The sensor consists of a vane and counterweight assembly, which is mechanically coupled to a potentiometer (variable resistor). As the vane rotates in the wind, the potentiometer changes resistance proportionally to the direction of wind.

Features & Benefits

- Superior low starting threshold
- Long life hybrid dual wiper potentiometer
- No plastic parts for extremely long life
- Precision stainless steel bearings for stability and repeatability
- Crossarm included with purchase of matching wind speed sensor
- Easy installation and maintenance
- Over 25 years in production

Specifications

Operating Range	0-360° mechanical
Signal Presentation:	10000 ohm potentiometer
	0-357° electrical range
	3 VDC excitation minimum
Analog 4-20 mA output:	0-355° electrical
	10-30 VDC
Performance:	
Accuracy:	+/- 3.0°
Starting Threshold:	0.6 MPH (0.27 m/s)
Resolution:	1°
Potentiometer Linearity:	+/- 1.0%
Environmental:	
Operational Envelope:	0-135 MPH (0 to 60 m/s)
Temperature:	-40 to 160°F (-40 to 70°C)
Relative Humidity:	0-100%
Physical:	
Vane Overall Length:	8.5" (21.6 cm)
Overall Height:	6.75" (17.2 cm)
Turning Radius:	13" (33 cm)
Weight:	0.5 lbs. (0.23 kg) less cable
Bearings:	APEC 3 or better
Mounting Pole:	Screw attachment, 10-32 machine screw
Cable:	60', 22 Gauge 3 conductor
Warranty:	3 years

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Installation & Maintenance

Installation consists of threading the 10-32 mounting base into our crossarm or any other suitable beam. If a crossarm is used, the entire unit can be bolted to a mast or attached via U-bolts.

The sensor is dynamically calibrated at the factory and due to the nature of its operation should not require field calibration. Calibration is a matter of proper orientation during installation. A magnetic compass is recommended for proper orientation. Field maintenance should include occasional cleaning of the vane assembly and inspection of the internal mechanism to make sure it is free from insects and debris. In some applications users may need to occasionally verify and document sensor accuracy with a calibration dial/vane. Possible bearing and potentiometer replacement every three to five years is recommended to maintain low starting threshold.

Ordering Information

Model#	Description
TD-4	Wind Direction Sensor, Light Industrial
TD-4-A	Wind Direction Sensor, Light 4-20 mA

** Sensor is designed to work with TV-4 Wind Speed Sensor*

Optional Parts/Accessories

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TDV-4 Wind Speed & Direction Sensor

Description

The Texas Electronics, Inc. TDV-4 Wind Speed & Direction Sensor is a mechanical style wind meter that measures both the horizontal wind azimuth and velocity of wind. This unit combines small physical size with superior bearings to meet the EPA's Prevention of Significant Deterioration (PSD) starting threshold requirements. The direction sensor consists of a vane and counterweight assembly, which is mechanically coupled to a potentiometer (variable resistor) and the velocity sensor consists of a lightweight 3-cup anemometer, which electromechanically converts wind speed into a measurable electronic signal. The output signal can be presented in 2 optional forms: a pulsed DC signal or a conditioned analog signal. As the vane rotates in the wind, the potentiometer changes resistance proportionally to the direction of wind.

Installation & Maintenance

The sensor is dynamically calibrated at the factory and due to the nature of its operation should not require field calibration. Calibration is a matter of proper orientation during installation. A magnetic compass is recommended for proper orientation. Field maintenance should include occasional cleaning of the vane assembly and inspection of the internal mechanism to make sure it is free from insects and debris. In some applications users may need to occasionally verify and document sensor accuracy with a calibration dial/vane. Possible bearing and potentiometer replacement every three to five years is recommended to maintain low starting threshold.

Features & Benefits

- Superior low starting threshold
- Long life potentiometer
- Metal construction for extremely long life
- Precision stainless steel bearings for stability and repeatability
- Cross arm included with purchase
- Easy installation and maintenance
- Components over 25 years in production
- Lightweight and rugged anodized aluminum exterior

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Wind Speed Specifications

Wind Speed Operating Range	0-100 MPH
Signal	Pulsed DC output - light chopper OR analog, 4-20 mA (please specify)
Pulsed DC out	20-slot disc
	Input Power: +5.0 VDC @ 5 mA (typical) 1 MPH = 520 pulses/ min. 100 MPH = 52000 pulses/min. (other voltages available upon request)
Analog 4-20 mA output:	4 mA = 0 MPH
	Input Power: 10-36 VDC 20 mA = 100 MPH
Performance:	
Accuracy:	+/- 2.0 MPH (0.89 m/s)
Distance Constant:	21.7' (6.6 m)
Starting Threshold:	0.6 MPH (0.27 m/s)

Overall Specifications

Environmental:	
Operational Envelope:	0-135 MPH (0 to 60 m/s)
Speed Specifications	
	Operating Range 0-100 MPH
Product Specifications	
Temperature:	-40 to 160°F (-40 to 70°C)
Relative Humidity:	0-100%
Physical:	
Overall Length:	18" (45.72 cm)
Overall Height:	12" (30.48 cm)
Turning Radius:	6" (15.24 cm)
Bearings:	APEC 3 or better
Cable:	60', 22 Gauge 4 conductor
Warranty:	3 years

Direction Specifications

Direction Operating Range	0-360° mechanical
Signal Presentation	10000 ohm potentiometer
	0-357° electrical range
	3 VDC excitation minimum
Analog 4-20 mA output:	0-355° electrical
	10-30 VDC
Performance:	
Accuracy:	+/- 3.0°
Starting Threshold:	0.6MPH (0.27m/s)
Resolution:	1°
Potentiometer Linearity:	+/- 1.0%

Ordering Information

Model#	Description
TDV-4	Wind Speed & Direction Sensor
TDV-4-A	Wind Speed & Direction Sensor, 4-20 mA

Optional Parts/Accessories

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Wind Direction Vane

TD-106-5D Wind Direction Sensor

Description

The Texas Electronics, Inc. TD-106-5D Wind Direction Sensor is a mechanical style wind meter that measures the horizontal wind azimuth. This unit combines small physical size with superior bearings to meet the EPA's Prevention of Significant Deterioration (PSD) requirements.
The TD-106-5D Wind Direction Sensor is a freestanding device for measuring the direction of wind. The sensor consists of a vane and counterweight assembly, which is mechanically coupled to a potentiometer (variable resistor). As the vane rotates in the wind, the potentiometer changes resistance proportionally to the direction of wind.

Features & Benefits

- Superior low starting threshold
- Long life hybrid single wiper potentiometer
- No plastic parts for extremely long life
- Precision stainless steel bearings for stability and repeatability
- Crossarm included with purchase of matching wind speed sensor
- Easy installation and maintenance
- Over 25 years in production
- Lightweight and rugged anodized aluminum exterior

Specifications

Operating Range	0-360° mechanical, 0-357° electrical
Signal Presentation:	10000 ohm potentiometer
	0-357° electrical
	3 VDC excitation minimum
Performance:	
Accuracy:	+/- 3.0°
Potentiometer Linearity:	+/- 0.5%
Starting Threshold:	1.1 MPH (0.5 m/s)
Damping Ratio:	0.4 to 0.6
Damped Wavelength:	11.5' (3.5 m)
Delay Distance:	2.6' (0.8 m0
Resolution:	1°
Environmental:	
Operational Envelope:	0-135 MPH (0 to 60 m/s)
Temperature:	-40 to 160°F (-40 to 70°C)
Relative Humidity:	0-100%
Physical:	
Vane Overall Length:	18.8" (48 cm)
Overall Height:	8.75" (22 cm)
Weight:	1.3 lbs. (0.6 kg) less cable
Bearings:	APEC 3 or better
Mounting Pole:	0.75" O.D. (1.9 cm)
Cable:	60', 22 Gauge 3 conductor
Warranty:	3 years

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Installation & Maintenance

Installation consists of attaching the unit to a mast via the supplied mounting pole. If a crossarm is used, the entire unit can be bolted to a mast or attached via U-bolts.
The sensor is dynamically calibrated at the factory and due to the nature of its operation should not require field calibration. Calibration is a matter of proper orientation during installation. A magnetic compass is recommended for proper orientation. Field maintenance should include occasional cleaning of the vane assembly and inspection of the internal mechanism to make sure it is free from insects and debris. In some applications users may need to occasionally verify and document sensor accuracy with a calibration dial/vane. Possible bearing and potentiometer replacement every three to five years is recommended to maintain low starting threshold

Ordering Information

Model#	Description
TD-106-5D	Wind Direction Sensor, Heavy Industrial
TD-106-5D-A	Wind Direction Sensor, 4-20 mA

** Sensor is designed to work with TV-110-L320 Wind Speed Sensor*

Optional Parts/Accessories

Cable	Additional Cable

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Wind Direction Vane

TD-104-5D Wind Direction Sensor

Description

The Texas Electronics, Inc. TD-104-5D Wind Direction Sensor is a mechanical style wind meter that measures the horizontal wind azimuth. The sensor is intended for general long-term maintenance free operation.
The TD-104-5D wind direction sensor is a freestanding device for measuring the direction of wind. The sensor consists of a vane and counterweight assembly, which is mechanically coupled to a potentiometer (variable resistor). As the vane rotates in the wind, the potentiometer changes resistance proportionally to the direction of wind.

Features & Benefits

- Superior low starting threshold
- Long life hybrid single wiper potentiometer
- No plastic parts for extremely long life
- Precision stainless steel bearings for stability and repeatability
- Crossarm included with purchase of matching wind speed sensor
- Easy installation and maintenance
- Over 25 years in production

Specifications

Operating Range	0-360° mechanical
Signal Presentation:	10000 ohm potentiometer
	0-357° electrical
	3 VDC excitation minimum
Performance:	
Accuracy:	+/- 3.0°
Potentiometer Linearity:	2.5 MPH (1.1 m/s)
Starting Threshold:	+/- 0.5% m/s)
Damping Ratio:	30.36
Damped Wavelength:	19.7’ (6.0 m)
Delay Distance:	4.8’ (1.15 m)
Resolution:	1°
Environmental:	
Operational Envelope:	0-135 MPH (0 to 60 m/s)
Temperature:	-40 to 160°F (-40 to 70°C)
Relative Humidity:	0-100%
Physical:	
Vane Overall Length:	33.8” (85.9 cm)
Overall Height:	13.0” (33 cm)
Turning Radius:	25.5” (65 cm)
Weight:	1.3 lbs. (0.6 kg) less cable
Bearings:	APEC 3 or better
Mounting Pole:	0.75” O.D. (1.9 cm)
Cable:	60’, 22 Gauge 3 conductor
Warranty:	3 years

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Installation & Maintenance

Installation consists of attaching the unit to a mast via the supplied mounting pole. If a crossarm is used, the entire unit can be bolted to a mast or attached via U-bolts.
The sensor is dynamically calibrated at the factory and due to the nature of its operation should not require field calibration. Calibration is a matter of proper orientation during installation. A magnetic compass is recommended for proper orientation. Field maintenance should include occasional cleaning of the vane assembly and inspection of the internal mechanism to make sure it is free from insects and debris. In some applications users may need to occasionally verify and document sensor accuracy with a calibration dial/vane. Possible bearing and potentiometer replacement every three to five years is recommended to maintain low starting threshold.

Ordering Information

Model#	Description
TD-104-5D	Wind Direction Sensor, Heavy Industrial
TD-104-5D-A	Wind Direction Sensor, 4-20 mA

** Sensor is designed to work with TV-114 Wind Speed Sensor*

Optional Parts/Accessories

Cable	Additional Cable

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Ambient Air Temperature

TT-101-QR Temperature Sensor

Description

The Texas Electronics, Inc. TT-101QR Air Temperature Sensor with the proper signal processor provides a DC signal proportional to ambient temperature. A highly sensitive linear thermistor-resistor network is utilized as the sensing element. Sensors feature direct interchangeability with one another without system recalibration. (See "Calibration/Cleaning Frequency" to the right.) Air temperature variations create a resistance bridge imbalance, the subsequent output signal varying linearly with temperature. A naturally aspirated sensor shelter is provided which permits temperature measurement substantially free of solar radiation. Exposed shelter components are constructed of aluminum with a white powder coat finish for maximum environmental protection. The signal conditioner output voltage may be interfaced with various types of recorders, indicators, dataloggers, etc. as required by the user. Two or more sensors may be mounted on a tower to obtain vertical temperature profile studies for the measurement of inversion conditions. This differential air temperature may be displayed or programmed, in the same formats as the single sensor. The TT-101QR now features a quick-release mounting bracket for easy installation and maintenance.

Features & Benefits

- Available in four different temperature ranges
- Signal conditioner output can be interfaced with indicators or dataloggers
- Quick-release mounting bracket provides ease in installation and maintenance
- Sensing element utilizes a highly sensitive linear thermistor-resistor network
- Optional Yellow Springs sensing element available
- Over 25 years in production
- Lightweight and rugged white powder coat finished aluminum exterior

Installation & Maintenance

The radiation shield with sensing element can be pole or mast mounted. Whenever possible, sensors should be installed at a height of 4 ft. (1.2 meters) or greater over earth or sod at least 100 ft. (30.48 meters) away from any concrete or other hard-surfaced area and not closer to any other object than four times the height of the object above the instrument shelter or remote sensors. Avoid roof installations if possible. If it is necessary to roof-mount shelters and sensors, they should not be closer than 30 ft. (9.14 meters) to any large, vertical reflecting surface (walls, etc.), exhaust fans, or cooling towers. Electronic remote sensors, when roof-mounted, should be installed least 9 ft. (2.74 meters) or greater above the roof surface. To minimize radiation effects from the roof, they can also be mounted on a horizontal boom so they extend from the side of the building roof or tower assembly.

Installation:

The system is delivered consisting of two principle parts: (1) the radiation shield containing the sensor with 60 feet (18.28 meters) of cable attached; and (2) an electronics package. The radiation shield may be installed with provided clamps in whatever area that it is desired to sense the temperature. The electronic package may be installed within 60 ft. (18.28 meters) of the sensor. Longer cable is available upon request.

Calibration / Cleaning Frequency:

The temperature system should not require calibration, however, the system may be checked for accuracy each six months, if desired. In the event that it is required, field calibration (zeroing and spanning) can be readily accomplished by substituting fixed standard resistor values for the sensor output. No cleaning program should be required with normal use.

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Specifications

Ranges Available:	-40° to +120°F
	-60° to + 40°C
	-40° to +50°C
	+60° to +220°F
Response (Nominal):	Time to reach 90% of DT 0.8 sec./F
Signal:	Signal output in many forms, depending on signal processor
Accuracy:	+/- 1° within the range of -30° to +110°F (34.4° to +43.3°C)
	+/- 3° from -30° to -40°F (34.4° to -40°C)
	+/- 3° from +110° to + 120°F (43.3° to +48.8°C)
Environmental Limits:	
Temperature:	-55° to +180°F (operating range: -40° to +120°F)
Humidity:	0-100%
Dimensions:	6.75" H x 7.25" W (17.1 cm x 18.4 cm)
Cable:	60', 18 Gauge 2 conductor
Warranty:	3 years

°F	°C	Resistance	°F	°C	Resistance
Null	Null	34,274	+40°	+4.44°	5,942
-40°	-40°	33,336	+50°	+10°	5,051
-30°	-34.44°	24,904	+60°	+15.55°	4,282
-20°	-28.88°	18,985	+70°	+21.11°	3,642
-10°	-23.33°	14,824	+80° span	+26.66°	3,087
0° Null	-17.77°	12,002	+90°	+32.22°	2,602
+10°	-12.22°	9,844	+100° span	+37.77°	2,186
+20°	-6.66°	8,252	+110°	+43.33°	1,839
+30°	-1.11°	7,002	+120°	+48.88°	1,543

ORDERING INFORMATION

Model #: TT-101-QR
Description: Temperature Sensor

Optional Parts / Accessories:
Cable Additional Cable

Model #: TT-101-QR-A
Description: Temperature Sensor 4-20 Ma

Optional Parts / Accessories:
Cable Additional Cable

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Ambient Air Temperature & Humidity

TTH-1315 Temperature Humidity Sensor

Description

The Texas Electronics, Inc. Model TTH-1315 Sensor utilizes a Vaisala HMP60 Humidity Temperature Probe with interchangeable sensing elements that do not require calibration. The unit is encased in a corrosive-resistant spun aluminum radiation shield that allows for wind aspiration and protection from the sun's UV rays. The shield is finished in white powder-coat to provide for virtual cosmetic invisibility while reflecting much of the radiant heat from surrounding objects and the sun. Overcurrent protection is provided in a NEMA 4X enclosure that is mounted to the angled mounting bracket on the sensor. Tranzorbs are utilized to protect the sensor and signal conditioning units in an overcurrent situation. With DC voltage applied to the sensor, the unit will return signal voltages that are linear to the range of the instrument. Signal conditioning is applied to ensure proper voltages are returned and can be amplified or modified to a current output to connect to any analog signal processing unit.

Specifications

Sensor	Viasala INTERCAP HMP60
Sensor Protection:	Stainless steel sintered filter
Measuring Range:	0 to 100% Relative Humidity
	40° to +140°F (-40° to +60°C)
Analog Output Signals:	0 to 1 V
Analog Signal Resolution:	0.02% RH & 0.1°F
Operating Limits:	Same as measuring range
Accuracy:	+/- 1.5% RH and +/- 0.5°F / 0.3°C
Repeatability:	Better than 0.5% RH and 0.1°C / 32.18°F
Protection Grade:	IP65
Supply Voltage:	5 to 28 VDC
Current Consumption:	1 mA average, max. peak 5 mA
Minimum Excitation Time:	4s
EMC Compatibility (CE):	EN 61326-1
Material:	Powder-coat, White Aluminum
Dimensions:	12" Height
Diameter:	7¼"
Warranty:	3 years

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Features & Benefits

- Combines temperature and humidity in one sensing unit
- Vaisala HMP60 has interchangeable sensing elements requiring no calibration
- Stacked plate construction of shelter provides natural ventilation
- Quick-release mounting bracket allows for easy installation and maintenance
- Aluminum radiation shield is lightweight and extremely durable
- White powder coat finish reflects most radiant heat from sun and surrounding objects

Installation & Maintenance

The radiation shield with sensing element can be pole or mast mounted. Whenever possible, sensors should be installed at a height of 4 ft. (1.2 meters) or greater over earth or sod at least 100 ft. (30.48 meters) away from any concrete or other hard-surfaced area and not closer to any other object than four times the height of the object above the instrument shelter or remote sensors. Avoid roof installations if possible. If it is necessary to roof-mount shelters and sensors, they should not be closer than 30 ft. (9.14 meters) to any large, vertical reflecting surface (walls, etc.), exhaust fans, or cooling towers. Electronic remote sensors, when roof-mounted, should be installed at least 9 ft. (2.74 meters) or greater above the roof surface. To minimize radiation effects from the roof, they can also be mounted on a horizontal boom so they extend from the side of the building roof or tower assembly.

ORDERING INFORMATION

Model #:

TTH-1315	Temperature & Humidity Sensor
TTH-1315-A	Temperature & Humidity Sensor, 4-20 mA

Optional Parts / Accessories

Radiation Shield Assembly
Vaisala HMP60 Humidity & Temperature Probe

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Solar Radiation Sensor

SP-LITE Solar Radiation Sensor

Features & Benefits

- SP-Lite is an all-weather instrument
- Designed for continuous outdoor use
- Complies with "Cosine Response"
- Full 180-degree field of view for complete hemispheric measurement
- Contained in lightweight and rugged white powder coat finished aluminum mounting bracket

Description

The Texas Electronics, Inc. SP-Lite Solar Radiation Sensor utilizes a Kipp & Zonen Silicon pyranometer mounted in a white powder-coat finished aluminum bracket that provides a stable upward-facing installation. It measures the solar energy that is received from the entire hemisphere (180 degrees field of view). The output is expressed in Watts per square meter. The pyranometer is designed for continuous outdoor use. Its calibration is valid for natural sunlight only, but not artificial light. In its most frequent application, the pyranometer is used for measuring the solar radiation emitting on the horizontal surface. The sensor consists of a photodiode, housing, mounting bracket with cable junction box attached, and cable. A resistance shunts the photodiode, generating a voltage output. The photodiode and the material on top of it determine most electrical specifications. It is encapsulated in the housing in such a way that it has a field of view of 180 degrees and that its angular characteristics fulfill the "Cosine Response". The nominal output resistance of the pyranometer is 50 Watts. This implies that the input impedance of the readout equipment should be at least 5000 Ohms in order to make an error of less than 0.1%. Cable can be extended without problems to a length of 328 ft. (100 meters), provided that cable resistance is less than 0.1% of the input impedance of the readout equipment. The electrical sensitivity of the photodiode changes with the temperature. A nominal value for this is 0.2% change per degree Celsius. Calibration is performed at 20°C (68°F).

Installation & Maintenance

Installation:

The site for an upward-facing pyranometer should be free from any significant obstructions above the plane of the sensing element and should be readily accessible. Ideally, the instrument should be located so that (1) a shadow will not be cast on it at any time (e.g. by radio masts, etc.); (2) it is not close to light-colored walls or other objects likely to reflect sunlight onto it; and (3) it is not exposed to artificial radiation sources. A flat roof provides the best location, or a rigid stand with a horizontal upper surface some distance from building structures or other obstructions. The stand should be sufficiently rigid that the horizontal position of the receiving surface does not change, especially during high winds. Precautions should be taken to avoid subjecting the instrument to severe shocks or vibration.

Calibration / Cleaning Frequency:

Recalibration is recommended every two years, preferably by letting a higher standard run parallel during two sunny days and comparing daily totals.

The sensor should be kept clean, using water or alcohol.

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Specifications

Electrical:	
Impendence (nominal):	50 Ohms
Response time:	<1 sec.
Sensitivity (nominal):	100 uV/W/m²
Expected signal range under	
atmospheric conditions:	0 to 0.2V
Stability:	< +/- 2% per year
Non-linerity:	<1% up to 1000 W/m²
Temperature dependence	
of sensitivity:	+/- 0.15% / °C
Spectral range:	0.4 to 1.1 nm
Detector type:	SILICON photo diode
Directional:	Cosine corrected between 80° angle of
	Incidence, error:within +/- 10% Cosine errors
	averaged over opposite azimuth error (at 60°
	Angle of incidence):within +/- 10%
Mechanical:	
Material of housing:	Anodized aluminum contained in white
	Powder-coat finished aluminum mounting bracket
Dimensions:	Height from surface to top of level
Width:	Pyranometer - 6.25" (15.87 cm)
Environmental:	Working temperature range -
	-22 to +158°F (-30° to +70°C)
Cable:	60', 24 Gauge 2 conductor
Warranty:	3 years

Ordering Information

Model#	Description
SP-Lite	Solar Radiation Sensor
SP-Lite	Solar Radiation Sensor, 4-20 mA

Optional Parts/Accessories

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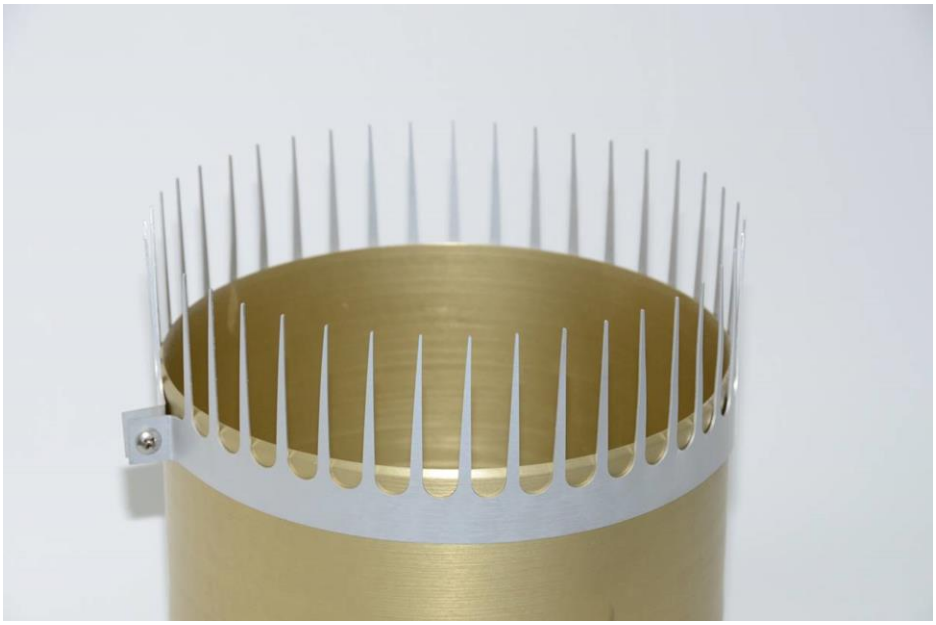
Bird Spikes user manual (6", 8", 9.66", 200mm)



Installation

1. Wrap the Bird Spike strip around the collector funnel of the rain gauge.

2. Attach the ends of the strip together with the enclosed screw and nut.

3. Bend the spikes outward for full coverage if desired.

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Field Calibration Device

FC-500

Description

The Field Calibration Device is designed to be a field verification of accuracy for all Texas Electronics, Inc. rain gauges. This unit is not intended to substitute a dynamic laboratory calibration; however it is a great indicator of accuracy. The manual device comes complete with everything necessary to verify the accuracy and functionality of the rain gauge.

Features & Benefits

- Quickly and accurately verifies calibration
- Works with all TR-525 rain gauge series
- Low cost verification
- Easy-to-use
- Eliminates unnecessary downtime
- Unlimited number of field calibrations

Contents

3 rods, container, black bag, nozzle, cleaning pin for nozzle, instructions

Calibration

There are typical two different types of calibration for a tipping bucket. The first, most common yet least accurate is a static calibration. The second and most accurate is a dynamic calibration. (Note: This kit allows for a dynamic calibration of a rain gauge in the field.) Static calibration is when a specific volume of water is place into a tipping mechanism. The mechanism is then adjusted until it tips. This process is sometimes continued until both sides of the tipping mechanism tip at the specified volume of water. Dynamic calibration utilizes a similar technique but also tests over time. A specific volume of water is poured into the tipping mechanism over a specific period of time. The main difference in this calibration is that calibrating over time allows for compensation of error cause by spillage. When a tipping bucket fills to the point of tipping there is a brief time when additional water is allowed into the gauge. This additional water is called spillage or overage and typically causes tipping buckets to read low at high rainfall rates. Hence a quality rain gauge will be calibrated over a range of rainfall rates or flow rates to minimize this error. Note that ALL standard tipping buckets have spillage issues. This explains the need for a siphon rain gauge, such as our TR-525-S-U, to regulate the flow into the tipping mechanism and therefore minimize the spillage over a much broader range of rainfall.

Tip Volume

Our ideal, factory calibrated tip volumes for our rain gauges are as follows:

TR-4		.01 inch calibration	243 tips +-6
TR-525I01	(525i,RG3)	.01 inch cal.	100 tips +-2
TR-525I20	(525i metric, RG3M)	.20mm cal.	124 tips +-3
TR-525U01	(525USW)	.01 inch cal.	59 tips +-2
TR-525U20	(525 metric)	.20mm cal.	74 tips +-2
TR-525M10		.10mm cal.	100 tips +-2
TR-525U01S	(525USW inch Siphon)	.01 inch cal.	62 tips +-2
TR-525W2		.20mm cal.	75 tips +-2

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Rain Gauge Heater

HT-525

Description

A rain gauge heater, HT-525, is available where snow or freezing weather may occur. The rain gauge heater is an accessory to our line of TR-525 series rain gauge and consists of two low-power heating elements that prevent disruption in readings during freezing times. The heaters are thermostatically controlled with an additional thermal overload. The heaters are ideally balance to keep the gauge clear at all times yet minimize the amount of evaporation. (Note: Rain Gauge NOT included)

Features & Benefits

- Keep your rain gauge operational during snow or freeze
- Upgrade ANY TR-525 series rain gauge
- Low power heater reduce evaporation
- Easy installation
- Thermostat control with thermal overload
- Dual heaters standard

Specifications

Power:	120 VAC
Current:	1.65 A
Starting Temperature:	45°F (72°C)
Minimum Temperature::	-65°F (-54°C)
Warranty:	3 years

Installation & Maintenance

(Note: Installation of the heater within the rain gauge is not necessary if both the heater and rain gauge are purchased at the same time.)

Installation of the heater assembly into the rain gauge simply consists of mounting the power junction box on the exterior of the rain gauge and installing the heaters within the gauge using its self-adhesive coating. Detailed installation instructions are included along with all the required hardware.

Connect AC power to the heater within the weather resistant enclosure. Make sure to adhere to all local electrical codes. If you are uncertain about wiring utilize a local electrical contractor.

Maintenance consists of removing the debris screen during times of potential snow or freezing rain to prevent ice bridging over the collector.

Ordering Information

Model #: TR-525I	Description
HT-525	Heater for TR-525 Series Rain Gauge

Optional Parts / Accessories

TR-525	Rain Gauge/Tip Bucket (Please Specify Exact Model)

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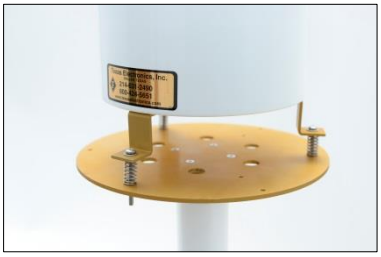
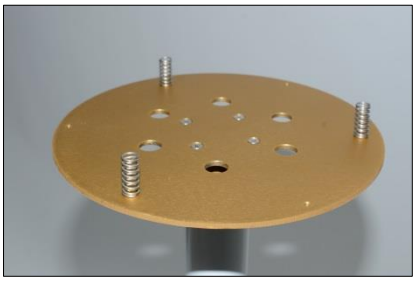
Pole Mounting Base

MB-525





Description

The MB-525 Pole Mounting Base is designed to be an aid in quick and easy installation in any of our rain gauges. The base has three adjustable springs to allow quick adjustment and accurate leveling of the rain gauge.

(Note: Rain Gauge NOT included)

Features & Benefits

- Quick and accurate adjustment
- Works with any Texas Electronics series rain gauge
- Low-cost verification
- Easy installation
- Utilizes a standard pipe flange
- Secure mounting

Pole Mounting Base Kit Contents

Base plate with 1.25" NPT or 1.00" pipe flange
Adjustment screws and springs

*Note: The 1.25" pipe is NOT included

Installation & Maintenance

Installation of rain gauge with the MB-525 pole mounting base consists of mounting a 1.00" or 1.25" pipe with a NPT thread vertically into the ground. Typical installations suggest the top of the rain gauge be 36" (91.4 cm) above the ground. Below is a chart that gives the height of each TR- rain gauge (Note: the MB-525 adds approximately 1" (2.54 cm) to the overall height.) and the suggest height of the pipe above ground. All distances are approximate.

Model#	Height	Height with MB-525	Suggested Pipe Height
TR-525I	10" (25.4 cm)	11" (27.9 cm)	25" (63.5 cm)
TR525USW	11" (27.9 cm)	12" (30.5 cm)	24" (70 cm)
TR-525M	12" (30.5 cm)	13" (33 cm)	23" (58.4 cm)
TR-525W2	11" (27.9 cm)	12" (30.5 cm)	24" (70 cm)

Once the pipe is installed simply screw the base onto the pipe. Then install the rain gauge onto the base as shown in the manual and the installation is complete.

Maintenance of the base consists of periodically verifying and adjusting the level of the rain gauge if necessary. No other maintenance is required.

Ordering information

Model # MB-525 Pole Mounting Base for all Texas Electronics rain gauges.

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Power Free Snow Melt Adapter Instruction Manual

Description

Texas Electronics snow melt adapter provides a way to record frozen precipitation such as snowfall without a power source. The antifreeze mixture melts incoming precipitation and feeds the mixture into the tipping assembly. The environmentally friendly mixture is then fed out the bottom of the rain gauge where it can be recaptured.

Installation & Maintenance

The device requires an existing TR525I (6") tipping bucket rain gauge. The gauge can be any calibration.

1. The rain collector pan should be attached in-between the base of the rain gauge and the rain gauge legs with the included screws.

2. The gauge's pole mounting base should be attached to the pole with the included U-bolts.

3. The rain gauge should be affixed to the base. Make sure to keep the rain gauge level using the included leveling screws and springs.

4. The snow melt adapter can now be attached to the gauge. The snow melt adapter replaces a traditional collector. Care should be taken to align the thumb screws on the snow melt adapter with the slots on the rain gauge. After the adapter is lined up the adapter should be attached to the pole with the included hose clamps.

5. The gauge can now be filled with the antifreeze mix and topped with mineral oil.

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Maintenance

The snow melt adapter requires periodic maintenance to function properly. The device is intended for winter use and is should be replaced with a regular collector during summer month. Maintenance schedule will vary for different climates. The specs listed in "temperature specs" are useful to help determine when the antifreeze needs to be replaced.

Antifreeze Specs

The Antifreeze mix used is a 1:1 mix of propelyene glycol and ethanol. This has mix has been shown to not only be environmentally friendly but also to function effectively in similar devices. Texas Electronics does not recommend substitute anti freeze mixture such as those used in cars. The devices relies on the antifreeze mixture having a specific gravity below 1 to effectively melt the snow and ethelyene glycol does not have the correct properties. To prevent evaporation a generous layer (4-6oz) of light mineral oil should be used to cover the top of the antifreeze mixture. Please also note that the antifreeze mixture may have a slight delay in recording precipitation amounts.

Temperature Specs

As rain falls the antifreeze mixture becomes gradually diluted. To start out the mixture has a ratio of 1:0 antifreeze to water. As a total of 5 inches of rain fall the mixture becomes 1:1, As a total of 6.8 inches of rain fall the mixture becomes 1:2. As a total of 7.7 inches of rain fall the mixture becomes 1:3. The solution becomes slushy at approximately -35C for 1:1, approximately -20C for 1:2, and approximately -10C for 1:3. This information along with the environment that the gauges is used in can be used to create a maintenance schedule.

Ordering Information

Model#	Description
Power Free Snow Melt Adapter	

Optional Parts/Accessories

TR-515I	Tipping Bucket Rain Gauge

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Rain Gauge LCD Counter

BC-200

Compact remote enclosed water-proof counter used to collect data when performing a tipping bucket rain gauge field calibration.

The counter is connected to the switch contact inside a tipping bucket rain gauge as its being calibrated in the field and the tipping bucket count is saved into a historical file.

- Internal 15+ year battery
- Waterproof enclosure
- Reflective LCD Display with 8 Large (8mm) digits
- Front panel reset button
- Waterproof front reset button

Operating Instructions

- Disconnect the rain gauge from the data logger or other measuring device
- Connect the two wires from the LCD counter to the rain gauge
- Each tip of the rain gauge bucket will increment one count
- Push the red button to reset count

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2022 Price List

Rainfall

TR-525W2	Rain Gauge/Tipping Bucket 200mm Collector, 10'cable	$472.94
TR-525U	Rain Gauge/Tipping Bucket 8" Collector, 10' cable	$472.94
TR-525M	Rain Gauge/Tipping Bucket 9.66" Collector, 10' cable	$485.18
TR-525I	Rain Gauge/Tipping Bucket 6" Collector, 10' cable	$430.65
TR-4	Rain Gauge/Tipping Bucket 4" Collector, 10' cable.	$334.95
*	Siphon Option	+$192.52
*	Dual Reed Switch	+$64.54

Rainfall Accessories

CBL-22G.	Additional Cable (rain sensors provided with 10'cable)	$0.62/ft.
MB-525	Mounting Base	$162.47
FC-500	Field Calibration Kit	$399.50
BB-525	Bird Spikes	$37.84-$43.40
HT-525	Heater for 525 series 120 VAC power required	$353.87
Cable	Datalogger Optical Download Cable	$137.99
Pendent	RG3 Pendent Datalogger	$116.84

Wind

		Raw Signal	Analog 4-20mA
*Heavy Industrial**			
TV-114	Wind Speed	$629.84	$941.43
TD-104-5D	Wind Direction	$688.82	$963.68
*Medium Industrial**			
TV-110-L320	Wind Speed	$455.14	$724.43
TD-106-5D	Wind Direction	$584.22	$819.26
*Light Industrial**			
TV-4	Wind Speed	$390.59	$658.78
TD-4	Wind Direction	$390.59	$658.78
TDV-4	Wind Speed/Direction	$723.32	$1122.82

*Wind sensors include a crossarm when purchased as a set. Wind sensors include 60' cable

Other Weather Sensors

		Raw Signal	Analog 4-20mA
TT-101-QR	Air Temperature w/ Radiation Shield	$371.68	$642.09
TTH-1315	Air Temp/Humidity w/ Radiation Shield	$653.21	$1192.92
SP-Lite	Solar Radiation	$832.37	$1108.35

Controllers

WSC-5-SDOR	Wind Speed Controller Single set point	$2036.42
WSC-5-DDOR	Wind Speed Controller Dual set point	$3125.86

Displays/Indicators

2-200	Wind Speed Analog Self-generating	$988.17

Packaged Weather Station

CWS-1	Complete Weather Station	Call

Custom systems which can include Wind Speed, Wind Direction, Temperature, Humidity, and Rainfall sensors. Mast, crossarm, and lightning rod also available.

Sensor/System Accessories

600-00170	7' Mast Cable Assembly	$217
CWS-001	Mast for Weather Station	$903.59
CWS-002	Crossarm for Weather Station	$555.29
CWS-003	Lightning Rod	$167.99

All shop labor for custom parts is $90.00 per hour.

Contact Information:

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