



# Texas Electronics, Inc.

The Gold Standard in Weather Instrumentation Since 1957

## 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. The 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 needed and continuous power is not a problem. 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's or SCADA systems.

(Specifications on next page)

### Features & Benefits

- Superior low starting threshold due to small physical size
- 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 5 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

<u>Model #</u>	<u>Description</u>
TV-4	Wind Speed Sensor, Light Industrial (Specify supply voltages other than 5 VDC)
TV-4AC	Wind Speed Sensor, AC Generator
TV-4A	Wind Speed Sensor, Analog 4-20 mA

*\*Sensor is designed to work with TD-4 wind direction sensor.*

#### Optional Parts / Accessories

Cable Additional Cable

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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 1 MPH = 520 pulses/min. 100 MPH = 52000 pulses/min.	Input Power:	+5.0 VDC @ 5mA (typical) (Other voltages available upon request)
AC Frequency output:	26 mV/MPH (typical) 0.133 Hz/MPH	Input Power:	None (self-generating)
Analog 4-20 mA out:	4 mA = 0 MPH 20 mA = 100 MPH	Input Power:	10-36 VDC
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' (18.3 m) 3 conductor 22 gauge		
Warranty:	3 year		



# Texas Electronics, Inc.

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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 exterior

### Specifications

Operating Range:	0-100 mph
Signal Presentation:	frequency, pulsed output light chopper The 20-slot disc produces the following linear repetition rate:  10 RPM = 1 MPH = 200 pulses/min. 100 RPM = 10 MPH = 2,000 pulses/min. 1000 RPM = 100 MPH = 20,000 pulses/min.
Excitation:	+5.0 VDC @ 5mA (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' (18 m) supplied with sensor
Weight:	1 lb. (0.45 kg) less cable
Bearings:	APEC 3 or better
Mounting Pole:	0.75" I.D. (1.9 cm)
Warranty:	3 year

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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

<u>Model #</u>	<u>Description</u>
TV-110-L320	Wind Speed Sensor, Medium Industrial (Specify supply voltages other than 5VDC)
TV-110-L320A	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

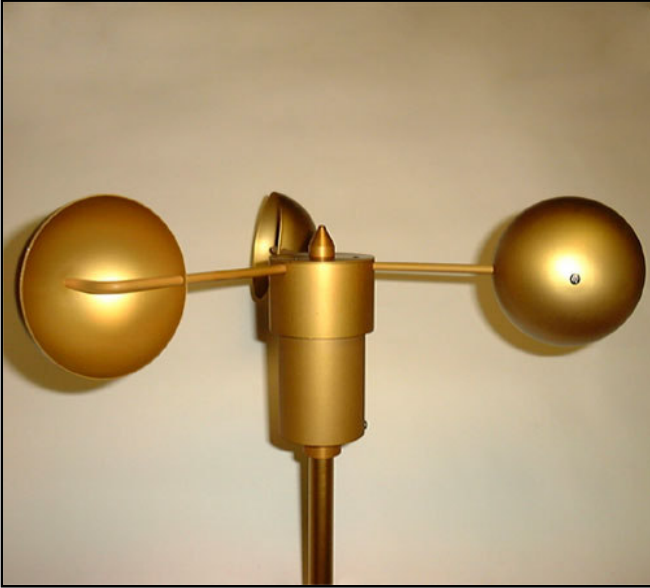


# Texas Electronics, Inc.

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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 general 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
- Lightweight and rugged anodized aluminum exterior

### 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 m) supplied with sensor
Weight:	3.75 lbs. (1.7 kg) with cable
Bearings:	APEC 3 or better
Mounting Pole:	0.75" I.D. (1.9 cm)
Warranty:	3 year

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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 every three to five years.

## Ordering Information

<u>Model #</u>	<u>Description</u>
TV-114	Wind Speed Sensor, Heavy Industrial
TV-114A	Wind Speed Sensor, 4-20mA
<i>* Sensor is designed to work with TD-104-5D wind direction sensor.</i>	

### Optional Parts / Accessories

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



# Texas Electronics, Inc.

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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
- Lightweight and rugged anodized aluminum exterior

### Specifications

Operating Range:	0-360° mechanical
Signal Presentation:	5000 ohm potentiometer, 10000 ohm potentiometer, or Analog 4-20 mA 0-355° electrical range
5000 ohm output:	3 VDC excitation minimum
10000 ohm output:	0-357° electrical range 3 VDC excitation minimum
Analog 4-20 mA output:	0-355° electrical range 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 Base:	Screw attachment, 10-32 machine screw
Cable:	60' (18.3 m) 3 conductor 22 gauge
Warranty:	3 year

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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 to maintain low starting threshold.

## Ordering Information

<u>Model #</u>	<u>Description</u>
TD-4	Wind Direction Sensor, Light Industrial
TD-410	Wind Direction Sensor, Light, 10K
TD-4A	Wind Direction Sensor, Light, 4-20 mA

*\* Sensor is designed to work with TV-4 series wind speed sensors.*

### Optional Parts / Accessories

Cable	Additional Cable
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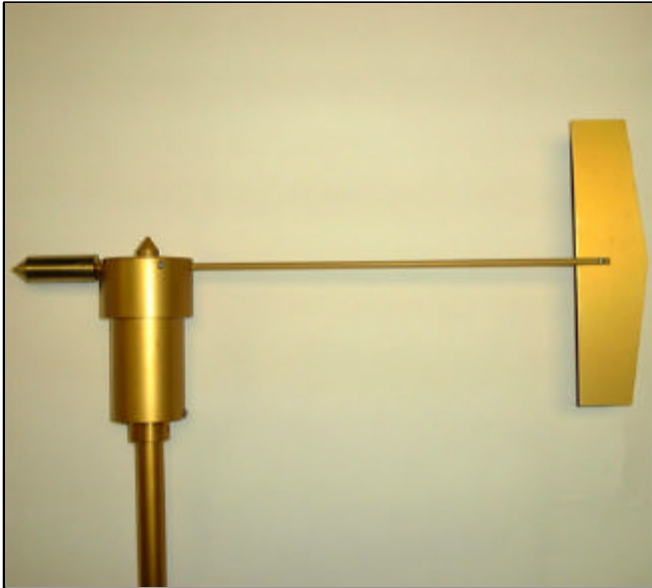


# Texas Electronics, Inc.

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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: 5000 ohm potentiometer

Potentiometer linearity: +/- 0.5%

#### Performance:

Accuracy: +/- 3.0°

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 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: 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" I.D. (1.9 cm)

Cable: 60' (18.3 m) 3 conductor 22 gauge

Warranty: 3 year

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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 to maintain low starting threshold.

## Ordering Information

<u>Model #</u>	<u>Description</u>
TD-106-5D	Wind Direction Sensor, Medium Industrial
TD-106-5DA	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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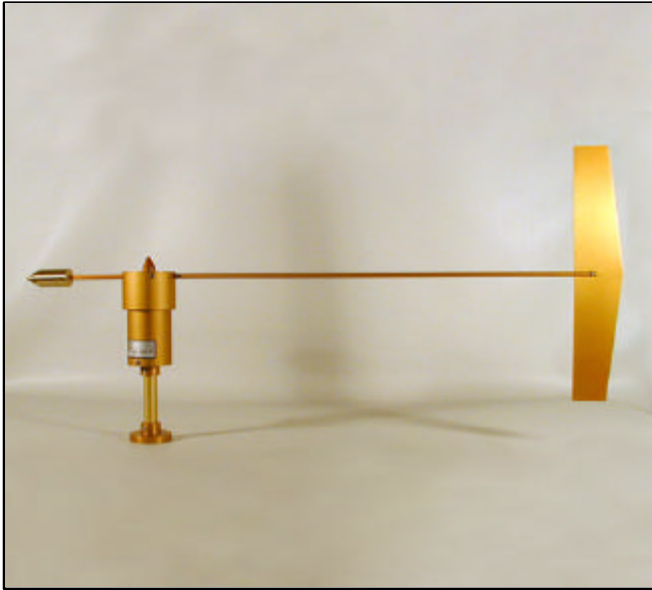


# Texas Electronics, Inc.

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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
- Lightweight and rugged anodized aluminum exterior

### Specifications

Operating Range:	0-360° mechanical, 0-357° electrical
Signal Presentation:	+/- 0.5%
Potentiometer linearity:	+/- 0.5%
Performance:	
Accuracy:	+/- 3.0°
Starting Threshold:	2.5 mph (1.1 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:	1.75 lbs (0.793 kg) less cable
Bearings:	APEC 3 or better
Mounting Pole:	0.75" I.D. (1.9 cm)
Cable:	60' (18.3 m) 3 conductor 22 gauge
Warranty:	3 year

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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 to maintain low starting threshold.

## Ordering Information

<u>Model #</u>	<u>Description</u>
TD-104-5D	Wind Direction Sensor, Heavy Industrial
TD-104-5DA	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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