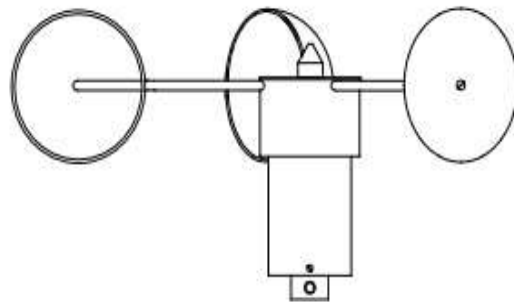




“Relied on Worldwide in the Most Extreme Conditions”



TV-114
TV-114-A
Wind Speed Sensor
User’s Manual



Model 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.

SPECIFICATIONS

	<u>TV-114</u>	<u>TV-114-A</u>
Operating Range:	0-100 mph	0-100 mph
Signal Presentation:	AC frequency	4-20 Ma
	10 rpm = 1.0 mph = 1.33 Hz	4 mA = 0 mph
	1000 rpm = 100.0 mph = 133.33 Hz	20 mA = 100 mph
Excitation:	None (self-generating)	10-36 VDC
Performance:		
Accuracy:	+/- 2.0 mph (0.90 m/s over entire range m/s)	+/- 2.0 mph (0.90 m/s over entire range m/s)
Distance Constant:	> 21.7' (6.6 m)	>21.7' (6.6 m)
Starting Threshold:	2.0 mph (0.90 m/s)	2.0 mph (0.90 m/s)
Environmental:		
Operational Envelope:	0-135 mph (0 to 60 m/s)	0-135 mph (0 to 60 m/s)
Temperature:	-40 to 160° F (-40 to 70° C)	-40 to 160° F (-40 to 70° C)
Relative Humidity:	0-100%	0-100%
Physical:		
Height:	7.5" (19.0 cm)	7.5" (19.0 cm)
Cup Diameter:	4" (10 cm)	4" (10 cm)
Cup Wheel Diameter:	18" (46 cm)	18" (46 cm)
Finish:	Gold Anodized Aluminum	Gold Anodized Aluminum
Cable:	60', 18 Gauge 2 conductor	60', 18 Gauge 2 conductor
Weight:	3.75 lbs. (1.7 kg) with cable	3.75 lbs. (1.7 kg) w/ cable
Bearings:	APEC 3 or better	APEC 3 or better
Mounting Pole:	0.75" O.D. (1.9 cm)	0.75" O.D (1.9 cm)
Warranty:	3 years	3 years

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

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. Other possible routine maintenance involves replacing the bearing housing assembly every three to five years to maintain low starting threshold.

ORDERING INFORMATION

Model # Description

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

* Sensor is designed to work with TD-104-5D wind direction sensor.
Optional Parts / Accessories

T-8011M Synchronous motor for calibration

TV-114 WIND SENSOR

G-114 GENERATOR

The chart below shows the maximum output obtainable from this generator, under a no load condition. This signal may be scaled down to fit many customer requirements.

R.P.M. VS. OUTPUT

RPM	MPH	KNOTS	G-114 AC Generator	
			AC VOLTS	DC VOLTS
0	0	0.000	0.00	0.0
50	5	4.345	0.22	0.35
100	10	8.684	0.45	0.78
200	20	17.36	0.95	1.65
300	30	26.052	1.43	2.38
400	40	34.736	1.92	3.12
500	50	43.420	2.38	3.83
600	60	52.104	2.86	4.60
700	70	60.788	3.32	5.35
800	80	69.472	3.79	6.11
900	90	78.156	4.25	6.90
1000	100	86.840	4.70	7.65

M.P.H. VS. FREQUENCY

MPH	FREQ.	MPH	FREQ.
5	6.66 Hz	55	73.315 Hz
10	13.33 Hz	60	80 Hz
15	20 Hz	65	86.645
20	26.66 Hz	70	93.31
25	33.325 Hz	75	100 Hz
30	40 Hz	80	106.64 Hz
35	46.655 Hz	85	113.305 Hz
40	53.32 Hz	90	120 Hz
45	60 Hz	95	126.635 Hz
50	66.65 Hz	100	133.33 Hz

NOTES:

1. Calibration may be checked by rotating the anemometer head at a known RPM. The above table shows the value that should be displayed on the indicator.
2. The AC Volts column shows the output directly out of the transmitter.
3. The DC Volts column shows the open circuit voltage out of the AC to DC adaptor.

PROPER EXPOSURE OF METEOROLOGICAL INSTRUMENTS

The following generally recognized guidelines depict ideal sensor mounting locations. These guidelines are only suggestions to aid the user in selecting optimum representative sampling locations for a particular sensor.

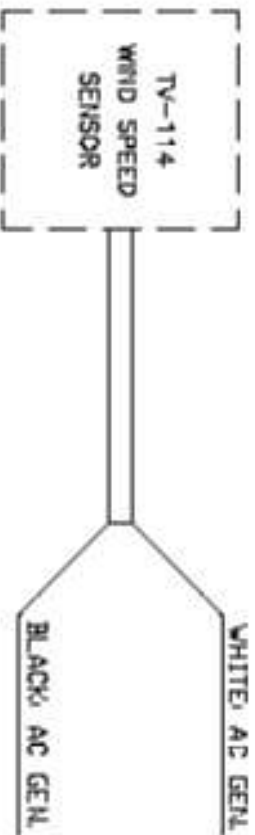
Reference was made to US Weather Bureau Installation criteria in preparing this data (See Reference 1).

WIND EQUIPMENT:

So far as available sites permit, wind sensors should be placed above the ground on a freely-exposed tower (20 feet or higher) and over terrain that is relatively level and free from obstructions to wind flow. When a compromise must be made, sensing units should be exposed at least 12 feet above any obstruction within 100 feet and at least as high as any obstruction within 100 to 200 feet of the wind equipment. Support towers or masts should not be of such bulk or shape as to create an appreciable obstruction to wind flow. Avoid sites where local obstructions may create up-or-down drafts, eddy currents or jet-flow effects. When sensors are roof-mounted, they should be installed at least 10 feet (or more) from the roof surface, depending upon the particular installation site. Turbulence and other local effects can be reduced somewhat by mounting sensors on the upwind end of the building (the end of the building exposed to the most common local prevailing winds). Horizontal-mount booms that extend from existing towers should be fabricated so that sensors will extend a distance of 5 to 10 feet from the tower assembly (dependent on tower thickness).

Wind direction sensors are oriented upon installation in reference to either true north or magnetic north. True north is obtained by applying a local magnetic variation correction factor to a magnetic north compass indication (magnetic variation for a particular locality is obtainable from the nearest Weather Bureau Branch Office). Indicator readings for a true north sensor orientation will then be in terms of true geographic compass points. All U.S. Weather Bureau surface wind data used for observational network reporting purposes and general public use is given in reference to this true north format. Indicator readings for a magnetic north sensor orientation will be in terms of actual readings as would be obtained from directly viewing a magnetic compass instrument. Wind direction data at Federal Aviation Agency and other aircraft reporting facilities (for direct control tower-to-pilot utilization) is always made in reference to this magnetic north format.

WIRING DIAGRAM



TYPICAL RANGE
0-100 MPH

OUTPUT
1000 RPM = 100 MPH = 133.33HZ

Texas Electronics, Inc.

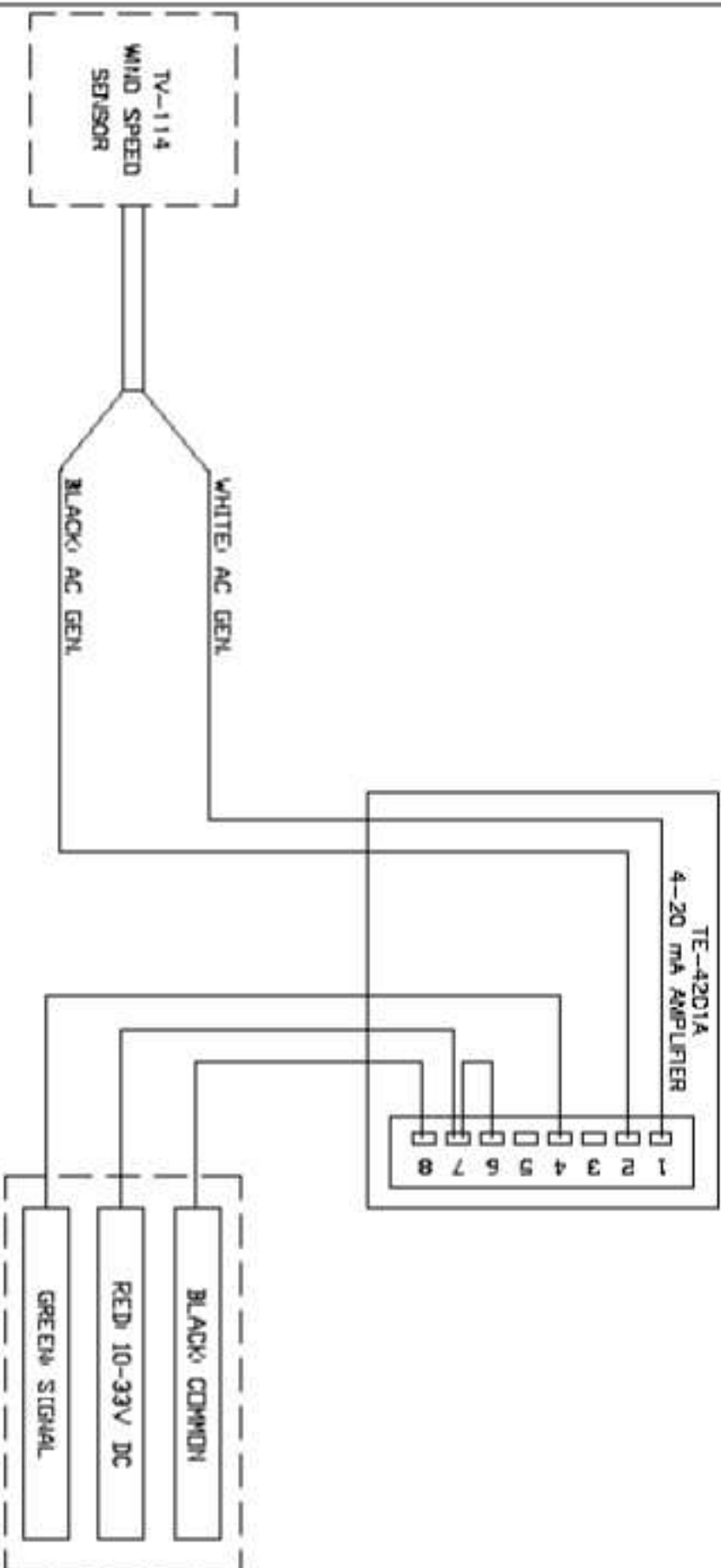
The Gold Standard in Weather Instrumentation Since 1967



TITLE: TV-114 WIND SPEED SENSOR
WIRING DIAGRAM


SIZE	FIGURE NO.	DWG. NO.	REV.
A		3030	A
SHEET		SHEET 1-1	

WIRING DIAGRAM

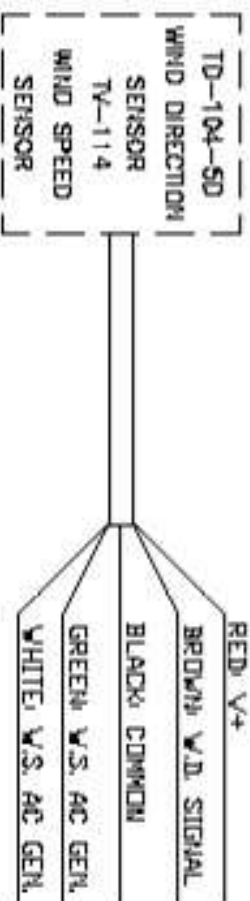


TYPICAL RANGE
0-100 MPH

OUTPUT
4 to 20 mA

Texas Electronics, Inc.			
<small>The Gold Standard In Weather Instrumentation Since 1967</small>			
			
TITLE		TV-114A WIND SPEED SENSOR	
SIZE	FORM NO.	DRG. NO.	REV.
A		3029	A
SCALE			SHEET 1-1

WIRING DIAGRAM




TYPICAL RANGE

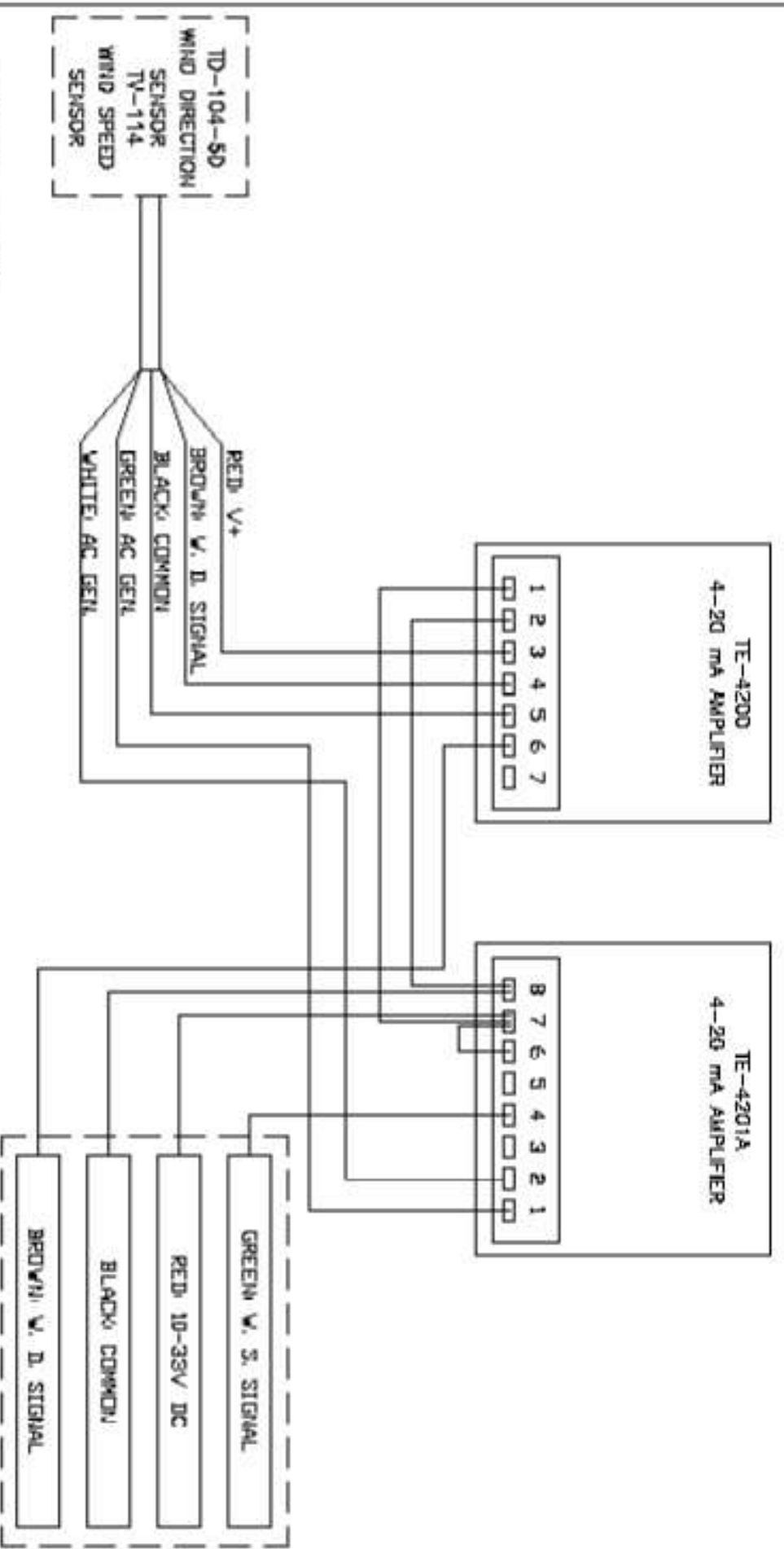
WIND DIRECTION: 0-360° Mech., 0-357° Elect.
 WIND SPEED: 0-100 MPH

OUTPUT

WIND DIRECTION: 10K OHM POTENTIOMETER
 WIND SPEED: 1000 RPM = 100 MPH = 133.33HZ

Texas Electronics, Inc.			
The Gold Standard in Weather Instrumentation Since 1957			
			
TITLE TD-104-5D WIND DIRECTION & TV-114 WIND SPEED WIRING DIAGRAM			
REV	DATE	BY	APP'D
A	3026		
DRAWN FROM ID. A		SHEET 1-1	


WIRING DIAGRAM



TYPICAL RANGE
 WIND SPEED: 0-100 MPH
 WIND DIRECTION: 0-357° ELECTRICAL, 0-360° MECH.

OUTPUT
 4 to 20 mA

Texas Electronics, Inc.
 The Gold Standard in Weather Instrumentation Since 1967



TITLE TD-104-50A WIND DIRECTION & TV-114A WIND SPEED			
SIZE A	FIG. NO.	DWG. NO.	REV.
A		3025	A
SCALE		SHEET 1-1	

Warranty

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

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