METEOROLOGICAL INSTRUMENTS

INSTRUCTIONS

WIND MONITOR
MODEL 05103-SDI

CE

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PN: 05103-SDI-90
REV: A122325

MODEL 05103-SDI
WIND MONITOR

WIND SPEED SPECIFICATION SUMMARY

Range	0 to 100 m/s (224 mph)
Sensor	18 cm diameter 4-blade helicoid propeller molded of polypropylene
Pitch	29.4 cm air passage per revolution
Distance Constant	2.7 m (8.9 ft.) for 63% recovery
Threshold Sensitivity	1.1 m/s (2.4 mph)
Transducer	Centrally mounted stationary coil with a rotating magnet on the propeller shaft. Frequency is digitally measured

WIND DIRECTION (AZIMUTH) SPECIFICATION SUMMARY

Range	360° mechanical, 355° electrical (5° open)
Sensor	Balanced vane, 38 cm (15 in) turning radius.
Damping Ratio	0.3
Delay Distance	1.3 m (4.3 ft) for 50% recovery
Threshold Sensitivity	1.1 m/s (2.5 mph) at 10° displacement
Transducer	Precision conductive plastic potentiometer, 10K ohm resistance (±20%), 0.25% linearity
Life Expectancy	50 million revolutions
Transducer Excitation	Regulated DC voltage provided internally
Output	Digital SDI-12 representation of azimuth angle

GENERAL

Power Requirement	6 - 16 VDC (12 VDC typ.)	
	Active:	1.0 mA @ 12 VDC
	Sleep:	0.3 mA @ 12 VDC
Dimensions:	Overall Height:	39cm
	Overall Length:	55cm
	Mounting:	34mm (Ø 1.34 in) (std. 1 inch pipe)
Weight:	Sensor Weight:	1.0 kg (2.2 lb)
	Shipping weight:	2.3 kg (5.0 lb)
SDI-12 Output:	Compliant with SDI-12 Version 1.3	
Operating Temperature:	-40 to +50°C (-40 to +140°F)	

INTRODUCTION

The R.M. Young Model 05103-SDI Wind Monitor measures horizontal wind speed and direction and provides a digital SDI-12 output. This sensor combines the proven mechanical design of the standard Model 05103 Wind Monitor with a microcontroller-based SDI-12 interface for accurate, low-power digital communication.

Originally developed for ocean data buoy use, the Wind Monitor is rugged and corrosion resistant yet accurate and lightweight. The main housing, nose cone, propeller, and other internal parts are injection-molded UV-stabilized plastic.

Model 05103-SDI features an oversized propeller shaft and ceramic bearings with non-contact seals to minimize contamination and moisture ingress. Both the propeller and vertical shafts utilize corrosion-resistant ceramic bearings, providing extended service life and reliable performance in the most demanding environments.

Wind speed is sensed by a 4-blade helicoid propeller that rotates a magnet past a stationary coil. The microcontroller measures the induced frequency and converts it to wind speed. Wind direction is sensed by a precision 10 kΩ conductive plastic potentiometer. The SDI-12 interface provides digital measurement, configuration, and averaging options via simple ASCII commands.

The instrument mounts on standard one-inch pipe (outside diameter 34 mm). An orientation ring allows the instrument to be removed and reinstalled without loss of wind direction reference. Both the mounting post assembly and the orientation ring are secured to the mounting pipe by stainless steel band clamps. Electrical connection is made in a junction box at the base.

INITIAL CHECKOUT

When the Wind Monitor is unpacked, it should be checked carefully for any signs of shipping damage.

Remove the plastic nut on the propeller shaft. Install the propeller so the serial number faces forward (into the wind). Engage the propeller into the molded ribs on the shaft hub. The vane and propeller should rotate freely 360° without friction. Check vane balance by holding the instrument base so the vane surface is horizontal. It should have near neutral torque without any particular tendency to rotate.

The instrument is factory calibrated and fully tested before shipment. Verify operation by connecting to an SDI-12 data logger or compatible interface and sending the address query command.

Address Querry Command: ?!
Response: 0 <CR><LF> (default address)

INSTALLATION

Proper placement of the instrument is very important. Eddies from trees, buildings, or other structures can greatly influence wind speed and wind direction observations. To get meaningful data for most applications locate the instrument well above or upwind from obstructions. As a general rule, the air flow around a structure is disturbed to twice the height of the structure upwind, six times the height downwind, and up to twice the height of the structure above ground. For some applications it may not be practical or necessary to meet these requirements.

FAILURE TO PROPERLY GROUND THE WIND MONITOR MAY RESULT IN ERRONEOUS SIGNALS OR TRANSDUCER DAMAGE.

Grounding the Wind Monitor is vitally important. Without proper grounding, static electrical charge can build up during certain atmospheric conditions and discharge through the transducers. This discharge can cause erroneous signals or transducer failure. To direct the discharge away from the transducers, the mounting post assembly is made with a special antistatic plastic. It is very important that the mounting post be connected to a good earth ground. There are two ways this may be accomplished. First, the Wind Monitor may be mounted on a metal pipe which is connected to earth ground. The mounting pipe should not be painted where the Wind Monitor is mounted. Towers or masts set in concrete should be connected to one or more grounding rods. If it is difficult to ground the mounting post in this manner, the following method should be used. Inside the junction box the terminal labeled EARTH GND is internally connected to the antistatic mounting post. This terminal should be connected to an earth ground (Refer to wiring diagram).

Initial installation is most easily done with two people: one to adjust the instrument position and the other to observe the indicating device. After initial installation, the instrument can be removed and returned to its mounting without realigning the vane since the orientation ring preserves the wind direction reference. Install the Wind Monitor following these steps:

1. MOUNT WIND MONITOR
   a) Place orientation ring on mounting post. Do Not tighten band clamp yet.
   b) Place Wind Monitor on mounting post. Do Not tighten band clamp yet.
2. Align Vane
   a) Connect the instrument to a data logger using the wiring diagram provided at the back of this manual. Power the instrument and use the data logger to send a measurement command (e.g., 0M!) to verify communication and confirm that wind direction data is being received.
   b) Choose a known wind direction reference point on the horizon.
   c) Sighting down the instrument centerline, point the nose cone toward the chosen reference point on the horizon.
   d) While holding the vane in position, trigger a measurement (OM!) and observe the reported wind direction. Repeat measurement cycles until the reported wind direction matches the known reference.
   e) Tighten the mounting post band clamp.
   f) Engage the orientation ring indexing pin in the notch at the instrument base.
   g) Tighten the orientation ring band clamp.

OPERATION

Model 05103-SDI uses the SDI-12 (v1.3) serial communication protocol to initiate wind measurements and set sensor operation parameters. The default sensor address is 0 (zero) and can be changed to any valid single-character value if needed. Additional details about the SDI-12 protocol may be found at www.sdi-12.org.

After initial power-up with 12 VDC, the sensor is in a low-power standby state with a quiescent current of 0.3 mA.

A valid and properly addressed SDI-12 command wakes the sensor to initiate a wind measurement set/check operating parameters. After command processing has finished, the sensor returns to the low-power standby state.

SDI-12 'M' or 'C' commands initiate a wind measurement. The sensor response message indicates the maximum time needed before the measurement is ready, and that two data values will be available. The maximum time depends on the user configuration (sample count and sample interval).

If an 'M' command initiates a measurement, the sensor sends a Service Request when the wind measurement is ready to be retrieved. When the polling device receives the Service Request it then sends a 'D' command to request measurement results from the sensor. With 'C' commands, no Service Request is sent, and the polling device must wait the full delay time before sending the 'D' command to request the measurement.

Measurement Commands

Name	Command	Response	Notes
Instantaneous Measurement (Polar)	aM!	attt2<CR><LF>	Collects 4 Samples at 250 ms.
	aMC!		
	aC!	attt02<CR><LF>	
	aCC!		
	aD0!	a+www.w+ddd<CR><LF>	
		a+www.w+ddd<CRC><CR><LF>	
Instantaneous Measurement (Cartesian)	aM1!	attt2<CR><LF>	
	aMC1!		
	aC1!	attt02<CR><LF>	
	aCC1!		
	aD0!	a±uu.u±vv.v<CR><LF>	
		a±uu.u±vv.v<CRC><CR><LF>	
Average Measurement (Polar)	aM2!	attt2<CR><LF>	Measurements reflect the user defined sample interval and sample count.
	aMC2!		
	aC2!	attt02<CR><LF>	
	aCC2!		
	aD0!	a+www.w+ddd<CR><LF>	
		a+www.w+ddd<CRC><CR><LF>	
Average Measurement (Cartesian)	aM3!	attt2<CR><LF>	
	aMC3!		
	aC3!	attt02<CR><LF>	
	aCC3!		
	aD0!	a±uu.u±vv.v<CR><LF>	
		a±uu.u±vv.v<CRC><CR><LF>	
3-Second Gust Measurement (WMO) (Polar)	aM4!	attt2<CR><LF>	Sample count set to 600 and sample interval to 1 second (10 min sample period).
	aMC4!		
	aC4!	attt02<CR><LF>	
	aCC4!		
	aD0!	a+www.w+ddd<CR><LF>	
		a+www.w+ddd<CRC><CR><LF>	
3-Second Gust Measurement (user defined settings) (Polar)	aM5!	attt2<CR><LF>	Measurements reflect the user defined sample interval and sample count.
	aMC5!		
	aC5!	attt02<CR><LF>	
	aCC5!		
	aD0!	a+www.w+ddd<CR><LF>	
		a+www.w+ddd<CRC><CR><LF>	

Non-Measurement Commands

Name	Command	Response
Address Query	?!	a<CR><LF>
Acknowledge Active	a!	a<CR><LF>
Change Address	aAb! a = Sensor address b = New sensor address	b<CR><LF>
Send Identification	aI!	a13RMYOUNG 05103 1.0SN=0000012345<CR><LF>

Extended Commands

The SDI-12 command set may be customized with Extended Commands to accommodate manufacturer settings and other functions. Extended commands and responses are listed below. Extended Commands return "astatus" when completed. A successful command returns aS<CR><LF> and a failed command returns aF<CR><LF>. Note that only the aXP!, aXV!, and aXI! commands send a response message.

Name	Command
Wind Speed Units	**aXUn!** (n = wind speed units code) 0 = m/s (default) 1 = knots 2 = mph 3 = kph
Propeller Pitch	**aXSPn!** (n = pitch code) 0 = 05103 (294 mm/rev) (default) 1 = 05108 (500 mm/rev) 2 = 05305 (307 mm/rev)
Wind Speed Multiplier	**aXMn!** (n = multiplier) n = 0.5000 - 1.5000 (default: 1.000)
Wind Direction Offset	**aXOn!** (n = offset) n = 0.0 - 360.0 (default: 0.0)
Sample Interval	**aXSIs!** (s = time in ms) s = 100 ms - 1000 ms (default: 200 ms) Sets the time between individual wind speed samples (ms) during averaging.
Number of Samples	**aXNSn!** (n = number of samples) n = 1 - 720 (default: 50) Sets the number of samples during averaging.
Parameter Report	**aXP!** (returns current configuration) *aU=msSP=05103M=1.0000O=0.0SI=200NS=050<CR><LF>* a = Sensor Address U = Wind Speed Units SP = Propeller Pitch M = Wind Speed Multiplier O = Wind Direction Offset SI = Sample Interval NS = Number of Samples
Reset to Factory Default	**aXFD!**
Input Voltage (v)	**aXV!** a+xx.xx<CR><LF>
Current Draw (mA)	**aXI!** a0011<CR><LF> **aD0!** a+x.xxx<CR><LF>

CALIBRATION

Periodic calibration checks are desirable and may be necessary where the instrument is used in programs that require auditing of sensor performance. Recalibration may also be necessary after some maintenance operations.

An accurate wind direction calibration requires a Vane Angle Fixture (YOUNG Model 18112 or equivalent). Details are listed under "POTENTIOMETER REPLACEMENT – STEP 7. ALIGN VANE." The sensor nose cone must be removed if any adjustment is required.

Wind speed calibration is determined by the propeller pitch and the output characteristics of the transducer. Calibration formulas showing wind speed versus propeller RPM are listed below. Standard accuracy is ±0.3 m/s (±0.6 mph). For greater accuracy, the device must be individually calibrated in comparison with a wind speed standard. Contact the factory or your YOUNG supplier to schedule a NIST (National Institute of Standards & Technology) traceable wind tunnel calibration in our facility.

To check wind calibration using a signal from the instrument, temporarily remove the propeller and connect an Anemometer Drive to the propeller shaft. Apply the appropriate calibration formula to the calibrating motor RPM and check for proper SDI-12 data response.

For example, with the propeller shaft turning at 3600 rpm, the reported wind speed should be approximately 17.6 meters per second

(3600 rpm × 0.00490 m/s per rpm = 17.6 m/s).

Use the aM! command (see SDI-12 Data Commands section) to request wind data and confirm the reported wind speed value corresponds to the calculated value.

Details on checking bearing torque, which affects wind speed and direction threshold, appear in the following section.

Calibration Formulas

Model 05103-SDI Wind Monitor w/ 08234 Propeller

WIND SPEED vs PROPELLER RPM

m/s	=	0.00490 x rpm
knots	=	0.00952 x rpm
mph	=	0.01096 x rpm
km/h	=	0.01764 x rpm

MAINTENANCE

Given proper care, the SDI-12 Wind Monitor should provide years of service. The only components likely to need replacement due to normal wear are the precision ball bearings and the wind direction potentiometer. Only a qualified instrument technician should perform the replacement. If service facilities are not available, return the instrument to the company. Refer to the drawings to become familiar with part names and locations. The asterisk * which appears in the following outlines is a reminder that maximum torque on all set screws is 80 oz-in

POTENTIOMETER REPLACEMENT

The potentiometer has a life expectancy of fifty million revolutions. As it becomes worn, the element may begin to produce noisy signals or become nonlinear. When signal noise or non-linearity becomes unacceptable, replace the potentiometer. Refer to exploded view drawing and proceed as follows:

1. REMOVE MAIN HOUSING
   a) Unscrew nose cone from main housing. Set O-ring aside for later use.
   b) Gently push main housing latch.
   c) While pushing latch, lift main housing up and remove it from vertical shaft bearing rotor.
2. UNSOLDER TRANSDUCER WIRE
   a) Remove junction box cover, exposing circuit board.
   b) Remove screws holding circuit board.
   c) Unsolder three potentiometer wires (white, green, black), two wind speed coil wires (red, black) and earth ground wire (red) from board.
3. REMOVE POTENTIOMETER
   a) Loosen set screw on potentiometer coupling and remove it from potentiometer adjust thumbwheel.
   b) Loosen set screw on potentiometer adjust thumbwheel and remove it from potentiometer shaft.
   c) Loosen two set screws at base of transducer assembly and remove assembly from vertical shaft.
   d) Unscrew potentiometer housing from potentiometer mounting & coil assembly.
   e) Push potentiometer out of potentiometer mounting & coil assembly by applying firm but gentle pressure on potentiometer shaft. Make sure that the shaft o-ring comes out with the potentiometer. If not, then gently push it out from the top of the coil assembly.
4. INSTALL NEW POTENTIOMETER
   a) Push new potentiometer into potentiometer mounting & coil assembly making sure o-ring is on shaft.
   b) Feed potentiometer and coil wires through hole in bottom of potentiometer housing.
   c) Screw potentiometer housing onto potentiometer mounting & coil assembly.
   d) Gently pull transducer wires through bottom of potentiometer housing to take up any slack. Apply a small amount of silicone sealant around hole.
   e) Install transducer assembly on vertical shaft allowing 0.5 mm (0.020") clearance from vertical bearing. Tighten set screws* at bottom of transducer assembly.
   f) Place potentiometer adjust thumbwheel on potentiometer shaft and tighten set screw*.
   g) Place potentiometer coupling on potentiometer adjust thumbwheel. *Do Not tighten set screw yet*.
5. RECONNECT TRANSDUCER WIRES
   a) Using needle-nose pliers or a paper clip bent to form a small hook, gently pull transducer wires through hole in junction box.
   b) Solder wires to circuit board according to wiring diagram. Observe color code.
   c) Secure circuit board in junction box using two screws removed in step 2b. Do not overtighten.
6. REPLACE MAIN HOUSING
   a) Place main housing over vertical shaft bearing rotor. Be careful to align indexing key and channel in these two assemblies.
   b) Place main housing over vertical shaft bearing rotor until potentiometer coupling is near top of main housing.
   c) Turn potentiometer adjust thumbwheel until potentiometer coupling is oriented to engage ridge in top of main housing. Set screw on potentiometer coupling should be facing the front opening.
   d) With potentiometer coupling properly oriented, continue pushing main housing onto vertical shaft bearing rotor until main housing latch locks into position with a “click”.
7. ALIGN VANE
   a) Connect the SDI-12 data/power lead to the data logger per the wiring diagram. The data logger provides power and SDI-12 communications.
   b) Install sensor on vane angle fixture (Young Model 18112 or equivalent) with junction box at 180° or South position, align vane to a known angular reference.
   c) From the data logger, issue an SDI-12 measurement command and record the reported wind direction (0M!). If the reported measurement is within tolerance, proceed to step (d). If the reported measurement is out of tolerance, reach through the front of the main housing and turn the potentiometer adjust thumbwheel. After each adjustment, issue the 0M! measurement command again and verify the reading. Repeat adjustment → aM! → verify until the measurement is within tolerance.
   d) Once the received measurement is correct and within tolerance, tighten set screw* on potentiometer coupling.
8. REPLACE NOSE CONE
   a) Screw nose cone into main housing until o-ring seal is seated. Be certain threads are properly engaged to avoid cross-threading.

*Max set screw torque 80 oz-in

FLANGE BEARING REPLACEMENT

If anemometer bearings become noisy or wind speed threshold increases above an acceptable level, bearings may need replacement. Check anemometer bearing condition using a Model 18310 Propeller Torque Disc. If needed, bearings are replaced as follows.

1. REMOVE OLD BEARINGS
   a) Unscrew nose cone. Set o-ring aside for later use.
   b) Loosen set screw on magnet shaft collar and remove magnet.
   c) Slide propeller shaft out of nose cone assembly.
   d) Remove both front and rear bearings from nose cone assembly. Insert edge of a pocket knife under bearing flange and lift it out.
2. INSTALL NEW BEARINGS
   a) Insert new front and rear bearings into nose cone.
   b) Carefully slide propeller shaft thru bearings.
   c) Place magnet on propeller shaft allowing 0.5 mm (0.020") clearance from rear bearing.
   d) Tighten set screw* on magnet shaft collar.
   e) Screw nose cone into main housing until o-ring seal is seated. Be certain threads are properly engaged to avoid cross-threading.

VERTICAL SHAFT BEARING REPLACEMENT

Vertical shaft bearings are much larger than the anemometer bearings. Ordinarily, these bearings require replacement less frequently than anemometer bearings. Check bearing condition using a Model 18331 Vane Torque Gauge.

Since this procedure is similar to POTENTIOMETER REPLACEMENT, only the major steps are listed here.

1. REMOVE MAIN HOUSING
2. UNSOLDER TRANSDUCER WIRES AND REMOVE TRANSDUCER ASSEMBLY
   Loosen set screws at base of transducer assembly and remove entire assembly from vertical shaft.
3. REMOVE VERTICAL SHAFT BEARING ROTOR by sliding it upward off vertical shaft.
4. REMOVE OLD VERTICAL BEARINGS AND INSTALL NEW BEARINGS. When inserting new bearings, be careful not to apply pressure to bearing shields.
5. REPLACE VERTICAL SHAFT BEARING ROTOR.
6. REPLACE TRANSDUCER & RECONNECT WIRES
7. REPLACE MAIN HOUSING
8. ALIGN VANE
9. REPLACE NOSE CONE

EMC COMPLIANCE

To be determined. Testing is required.

WARRANTY

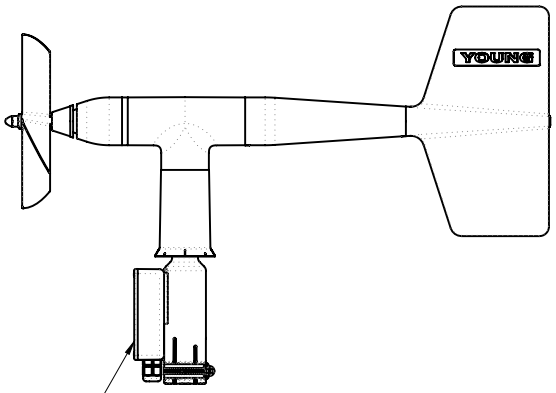
This product is warranted to be free of defects in materials and construction for a period of 12 months from date of initial purchase. Liability is limited to repair or replacement of defective item. A copy of the warranty policy may be obtained from R. M. Young Company.

CE COMPLIANCE

To be determined. Testing is required.

CABLE & WIRING DIAGRAM

MODEL 05103-SDI WIND MONITOR



WS COIL WIRES
(26 AWG)
Red / Wht & Blk / Wht

STATIONARY WIND SPEED TRANSDUCER COIL:

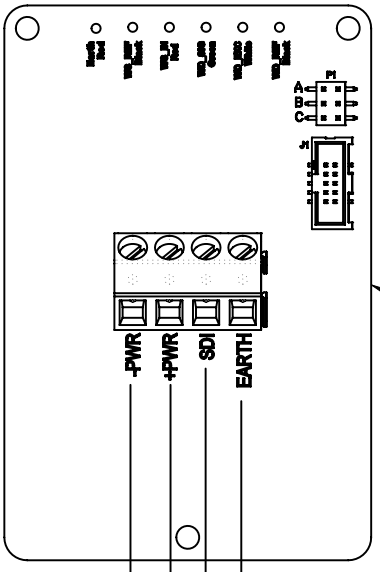
ROTATING MAGNET ON PROPELLER SHAFT INDUCES AC SIGNAL WITH FREQUENCY DIRECTLY PROPORTIONAL TO WIND SPEED. THREE CYCLES OF OUTPUT REPRESENTS ONE PROPELLER REVOLUTION.

WIND DIRECTION POTENTIOMETER WITH ANTISTATIC DRAIN PAD:

10K OHMS, 0.25% LINEARITY, 355° FUNCTION ANGLE, 1 WATT @ 40°C, DERATED TO 0 WATTS @ 125° C

WD POT WIRES
(26 AWG)
Wht, Grn, Blk, & Red

RED
BLK \ WHT
RED \ WHT
GRN
WHT
BLK



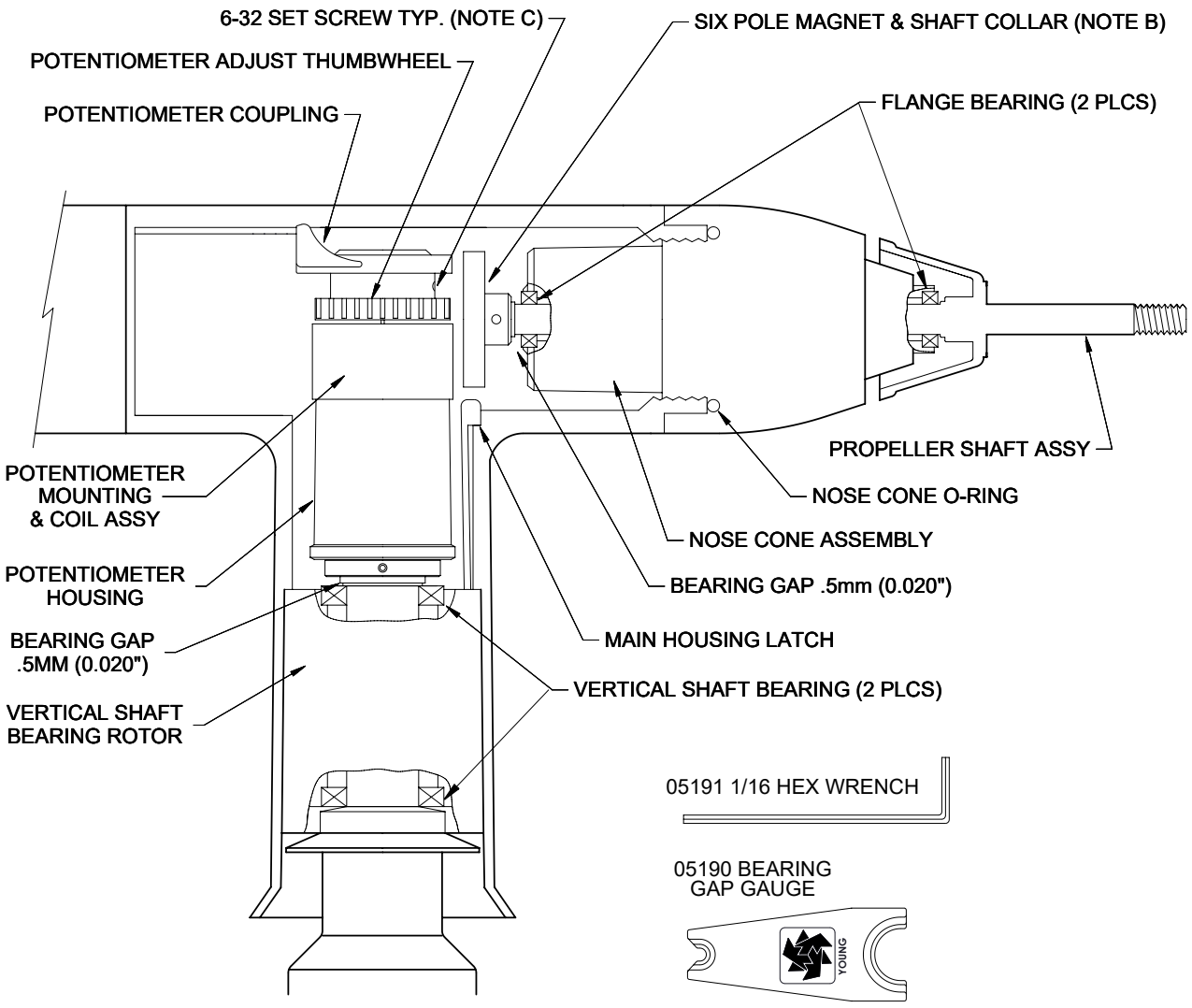
05178AS JUNCTION BOX CIRCUIT BOARD

NOTE: THE EARTH GROUND TERMINAL MUST BE CONNECTED TO EARTH GROUND TO PROVIDE A STATIC DISCHARGE PATH.

MULTI-CONDUCTOR CABLE (RMY 18723)

(GREEN) EARTH GROUND
(WHITE) TO SDI DATA RECORDER
(RED) 6-16V (+)
(BLACK) SENSOR POWER (-)
SHIELD — SHIELD (⏚)

BEARING REPLACEMENT & POTENTIOMETER ADJUSTMENT



NOTES:

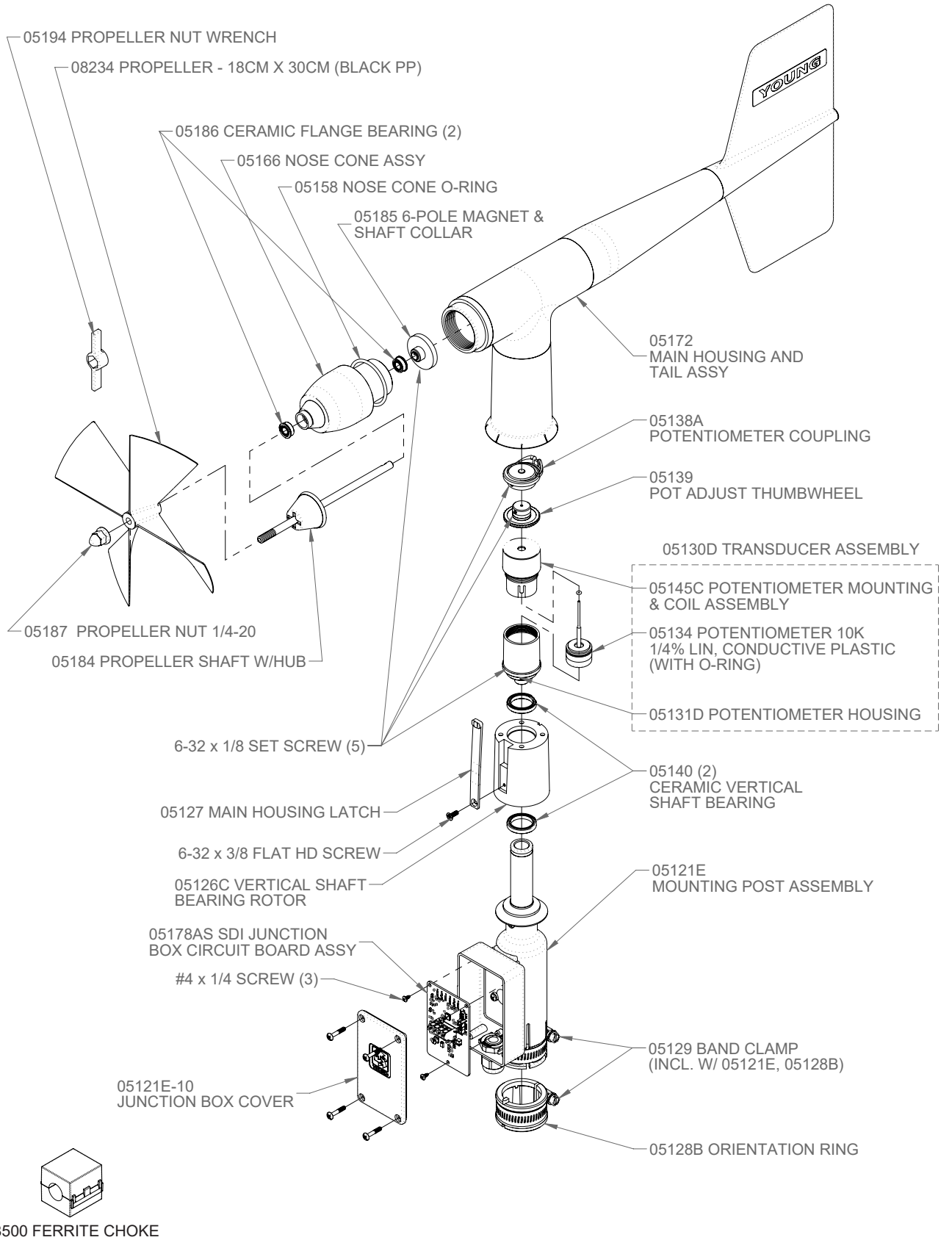
A. TO REMOVE HOUSING - UNTHREAD NOSE CONE ASSEMBLY, REMOVE HOUSING SCREWS, PUSH MAIN HOUSING LATCH, LIFT UPWARD.

B. TO REPLACE ANEMOMETER FLANGE BEARINGS - UNTHREAD NOSE CONE, REMOVE SIX POLE MAGNET, SLIDE PROPELLER SHAFT AND HUB ASSEMBLY FORWARD, REMOVE FLANGE BEARINGS. AFTER BEARING REPLACEMENT, SET BEARING GAP TO 0.5mm (0.020")

C. TO ADJUST POTENTIOMETER OUTPUT SIGNAL - REMOVE NOSE CONE, LOOSEN SET SCREW IN POTENTIOMETER COUPLING, ADJUST OUTPUT SIGNAL BY MEANS OF POTENTIOMETER ADJUSTMENT THUMBWHEEL, RE-TIGHTEN SET SCREW.

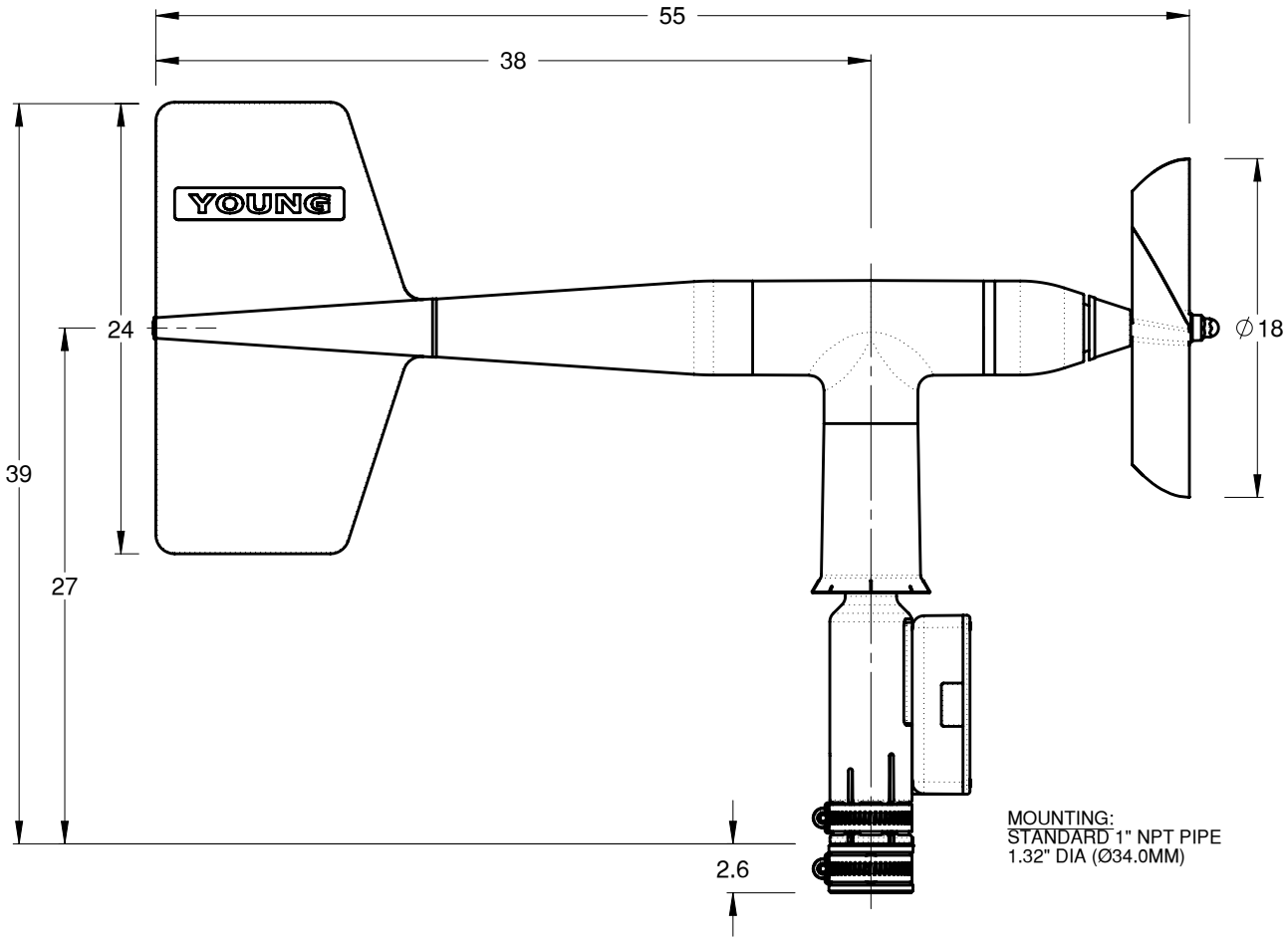
GENERAL ASSEMBLY & REPLACEMENT PARTS

MODEL 05103-sdi WIND MONITOR



OVERALL DIMENSIONS

MODEL 05103-sdi WIND MONITOR



NOT TO SCALE

ALL DIMENSIONS IN CENTIMETERS
UNLESS OTHERWISE SPECIFIED

Calibration Accessories

YOUNG

Model 18802 Anemometer Drive provides a convenient and accurate way to rotate an anemometer shaft at a known rate. The motor may be set to rotate clockwise or counter-clockwise at any rate between 200 and 15,000 RPM in 100 RPM increments. The LCD display is referenced to an accurate and stable quartz timebase. For completely portable operation, the unit can be operated on internal batteries. For extended operation, an AC wall adapter is included.

Model 18811 Anemometer Drive is identical to Model 18802 except the drive motor incorporates a gear reducer for operation in the range of 20 to 990 RPM in 10 RPM increments. The lower range is recommended for cup anemometer calibration.

Model 18112 Vane Angle Bench Stand is used for benchtop wind direction calibration of the Wind Monitor family of sensors. The mounting post engages the direction orientation notch on the Wind Monitor. An easy to read pointer indicates 0 to 360 degrees with $^1/_2$ degree resolution.

Model 18212 Vane Angle Fixture - Tower Mount similar to the Model 18112, the tower mount feature allows use on the tower as well as the bench top. The fixture is temporarily placed on the tower between the Wind Monitor and its tower mounting. Index keys and notches are engaged to preserve direction reference.

Model 18310 Propeller Torque Disc checks anemometer bearing torque with 0.1 gm/cm resolution. The disc temporarily replaces the propeller for torque measurement or simple yet accurate pass/fail checks. Charts included with the unit relate torque to propeller threshold with limits for acceptable bearing performance.

Model 18312 Cup-Wheel Torque Disc checks cup anemometer bearing torque.

Model 18331 Vane Torque Gauge checks vane bearing torque of the Wind Monitor family sensors. Slip the fixture over the main housing and make simple yet accurate vane torque measurements. Charts relating vane torque to vane threshold provide limits for acceptable bearing performance.

Model 18301 Vane Alignment Rod helps align the vane of a wind sensor to a known direction reference during installation. The base of the device has an index key that engages the direction orientation notch in the sensor allowing the sensor to be removed without losing wind direction reference.

Ordering Information

	MODEL
ANEMOMETER DRIVE *200 to 15,000 RPM*	**18802**
ANEMOMETER DRIVE *20 TO 990 RPM*	**18811**
230V / 50-60 HZ INPUT POWER	***ADD SUFFIX "H"***
VANE ANGLE BENCH STAND	**18112**
VANE ANGLE FIXTURE - TOWER MOUNT	**18212**
PROPELLER TORQUE DISC	**18310**
CUP-WHEEL TORQUE DISC	**18312**
VANE TORQUE GAUGE	**18331**
VANE ALIGNMENT ROD	**18301**

Specifications

MODEL 18802 **ANEMOMETER DRIVE** **(Replaces 18801)**

Range:
200 to 15,000 RPM in 100 RPM increments

Rotation:
Clockwise or Counter-Clockwise

Display Resolution:
1 RPM

Quartz Timebase Reference:
0.1 RPM

Power Requirement:
2x9 V (alkaline or lithium) batteries
115 VAC wall adapter included
(230 VAC – add suffix H)

MODEL 18811 **ANEMOMETER DRIVE** **(Replaces 18810)**

Range:
20 to 990 RPM in 10 RPM increments

Display Resolution:
0.1 RPM

MODEL 18112, 18212 **VANE ANGLE CALIBRATION DEVICES**

Range:
0 to 360 degrees

Resolution:
0.5 degree

MODEL 18310, 18312 **TORQUE DISC DEVICES**

Range:
0 to 5.4 gm-cm

Resolution:
0.1 gm-cm

MODEL 18331 **VANE TORQUE GAUGE**

Range:
0 to 50 gm-cm

Resolution:
5 gm-cm

Specifications subject to change without notice.

YOUNG

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E-mail: met.sales@youngusa.com
Web Site: www.youngusa.com