MODEL 024A
MET-ONE WIND DIRECTION SENSOR

REVISION: 10/91

WARRANTY AND ASSISTANCE

The **024A MET-ONE WIND DIRECTION SENSOR** is warranted by CAMPBELL SCIENTIFIC, INC. to be free from defects in materials and workmanship under normal use and service for twelve (12) months from date of shipment unless specified otherwise. Batteries have no warranty. CAMPBELL SCIENTIFIC, INC.'s obligation under this warranty is limited to repairing or replacing (at CAMPBELL SCIENTIFIC, INC.'s option) defective products. The customer shall assume all costs of removing, reinstalling, and shipping defective products to CAMPBELL SCIENTIFIC, INC. CAMPBELL SCIENTIFIC, INC. will return such products by surface carrier prepaid. This warranty shall not apply to any CAMPBELL SCIENTIFIC, INC. products which have been subjected to modification, misuse, neglect, accidents of nature, or shipping damage. This warranty is in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose. CAMPBELL SCIENTIFIC, INC. is not liable for special, indirect, incidental, or consequential damages.

Products may not be returned without prior authorization. To obtain a Returned Materials Authorization (RMA), contact CAMPBELL SCIENTIFIC, INC., phone (435) 753-2342. After an applications engineer determines the nature of the problem, an RMA number will be issued. Please write this number clearly on the outside of the shipping container. CAMPBELL SCIENTIFIC's shipping address is:

CAMPBELL SCIENTIFIC, INC.
RMA#_____
815 West 1800 North
Logan, Utah 84321-1784

CAMPBELL SCIENTIFIC, INC. does not accept collect calls.

Non-warranty products returned for repair should be accompanied by a purchase order to cover the repair.

CAMPBELL SCIENTIFIC, INC.

815 W. 1800 N.
Logan, UT 84321-1784
USA
Phone (435) 753-2342
FAX (435) 750-9540
www.campbellsci.com

Campbell Scientific Canada Corp.
11564 -149th Street
Edmonton, Alberta T5M 1W7
CANADA
Phone (780) 454-2505
FAX (780) 454-2655

Campbell Scientific Ltd.
Campbell Park
80 Hathern Road
Shepshed, Loughborough
LE12 9GX, U.K.
Phone +44 (0) 1509 601141
FAX +44 (0) 1509 601091

024A MET-ONE WIND DIRECTION SENSOR
TABLE OF CONTENTS

LIST OF FIGURES

TABLE

024A MET-ONE WIND DIRECTION SENSOR

1. FUNCTION

The Met-One 024A Wind Vane measures wind direction from 0 to 360 degrees with a 5 degree accuracy specification. The 024A utilizes a potentiometer to vary the sensor resistance in relation to wind direction.

This manual is written for implementation with Campbell Scientific's CR10, 21X, and CR7 Dataloggers.

2. SPECIFICATIONS

Range	0-360 degrees
Threshold	0.447 m/s (1.0 mph)
Accuracy	±5 degrees
Temperature Range	-50 C to +70 C
Delay Distance	Less than 1.5 m (5 ft.)
Damping Ratio:	
Standard	0.25
Optional	0.4
Potentiometer Specifications:	
Sand, Dust, and Fungus	MIL-E-5272
Salt Spray	MIL-E-12934
Resistance	0-10,000 Ohms
Weight	680 g (1.5 lb.)

3. SENSOR INSTALLATION

Remove the Allen hex screw in the lower part of the sensor housing and insert the 024A in the mounting bushing (see Figure 1). Tighten the screw in the bushing onto the sensor housing.

Insert the sensor with the attached mounting bushing in the larger diameter connector on the end of the 019 Crossarm. Be sure that the shoulder screw is in place. Orient the sensor so that the counter weight is pointing south and tighten the two set screws. Accurate orientation requires a compass to align the counter weight in a due south direction.

> **NOTE:** The compass is oriented to magnetic north rather than true north. Be sure to check the declination angle at the installation site.

Connect the cable assembly to the sensor receptacle.

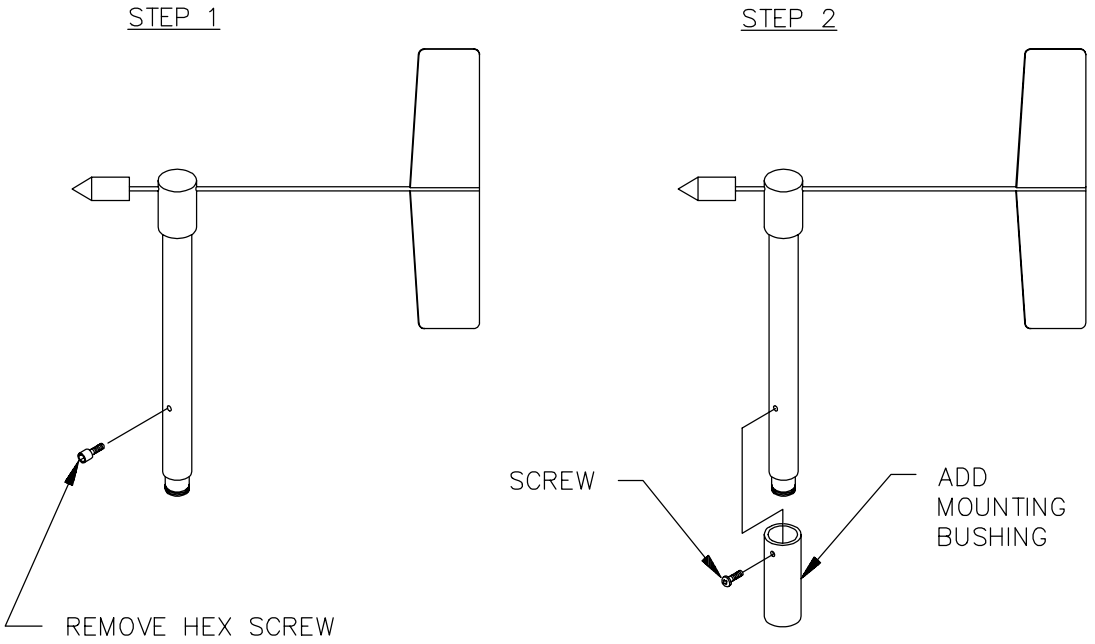

FIGURE 1. Bushing Installation on 024A Sensor

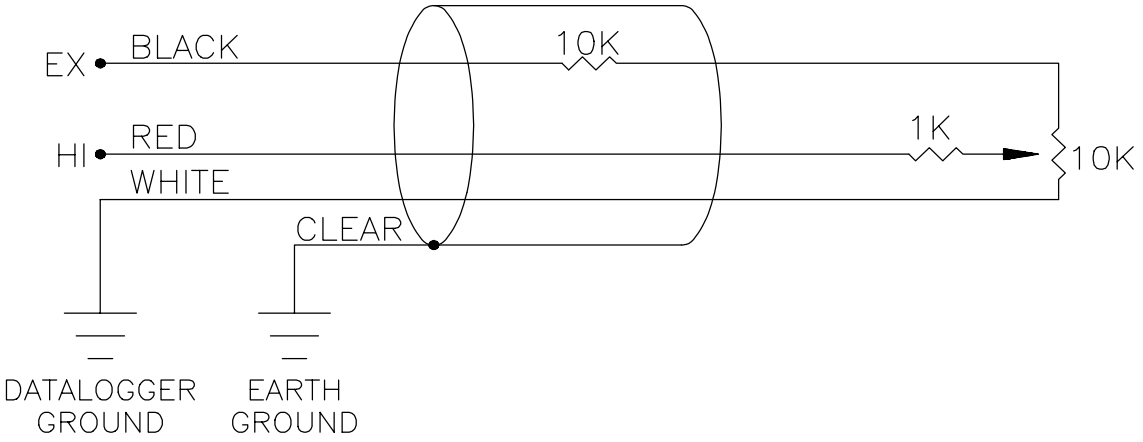

FIGURE 2. Schematic of 024A Wind Direction Sensor

4. PHYSICAL CONNECTIONS

The black (EX) lead connects to any excitation port. The red (HI) lead connects to any single-ended analog input channel. The white (ground) lead connects to Ground (G) on the 21X or CR7, or Analog Ground (AG) on the CR10. The clear lead is the shield which connects to a ground terminal (G) on the 21X and CR7, or power ground (G) on the CR10. A schematic of the 024A is shown in Figure 2. A cable diagram is shown in Figure 3.

5. DATALOGGER INSTRUCTION

Instruction 4, Excite-Delay-Measure, is used to measure the 024A. In general, a delay of 2, for 0.02 seconds, is sufficient when lead lengths are less than 100 feet. The excitation voltage applied (Parameter 6) and the measurement range (Parameter 2) depend on the datalogger utilized, as shown below.

	CR10	21X, CR7
Excitation	500 mV	1000 mV
Mea. Range	(250 mV, fast)	(500 mV, fast)

Initially the multiplier will be 1.0; see the section "Calibration and Orientation" for determining the proper multiplier. The offset will always be 0.0.

6. CALIBRATION AND ORIENTATION

Conversion of the voltage output into wind direction is done by entering the proper multiplier. A multiplier of 1.0 is used while determining the proper multiplier. The proper multiplier is calculated by dividing 360 by the full scale input voltage. The full scale input voltage is the maximum voltage output from the wind vane. This is found by entering the *6 Mode and monitoring the input location of wind direction while slowly rotating the vane. The shoulder screw must first be removed. The maximum value observed is the full scale input voltage.

> **NOTE:** If the reading is -99999, exceeds 500 on the 21X or CR7, or exceeds 250 on the CR10, then reduce the millivolts of excitation by 5 mV.

	CR10, 21X, CR7
Multiplier	360/FSIV*
Offset	0.0

*FSIV = Full scale input voltage

Enter the calculated multiplier in program Instruction 4.

Orientation of the 024A Wind Direction Sensor should be complete if the 024A counter weight was aligned due south. Enter the *6 Mode and monitor the input location of wind direction. At due north the reading should be 0 degrees, and at due south the reading should be 180 degrees.

If the orientation of the counter weight was done properly, and the readings are not correct, an alternate orientation procedure must be done. Loosen the two screws on the 019 Crossarm connector. While pointing the counter weight north, rotate the 024A shaft until the display reads 0 degrees. Accurate orientation will require a compass. At this point tighten the two screws on the 019 Crossarm connector.

7. GENERAL MAINTENANCE SCHEDULE

7.1 6 - 12 MONTH PERIODIC SERVICE *

Inspect sensor for physical damage and verify that the vane assembly rotates freely. To verify parts and locations, refer to the parts diagram (Figure 4) and the parts list (Table 1).

7.2 24 - 36 MONTH SERVICE *

A complete factory overhaul of the sensor, including the replacement of the potentiometer, is recommended.

MET ONE INSTRUMENTS INC.
481 California Ave.
Grants Pass, OR 97526
Tel. (503) 471-7111
FAX (503) 471-7116

* Schedule is based on average to adverse environments.

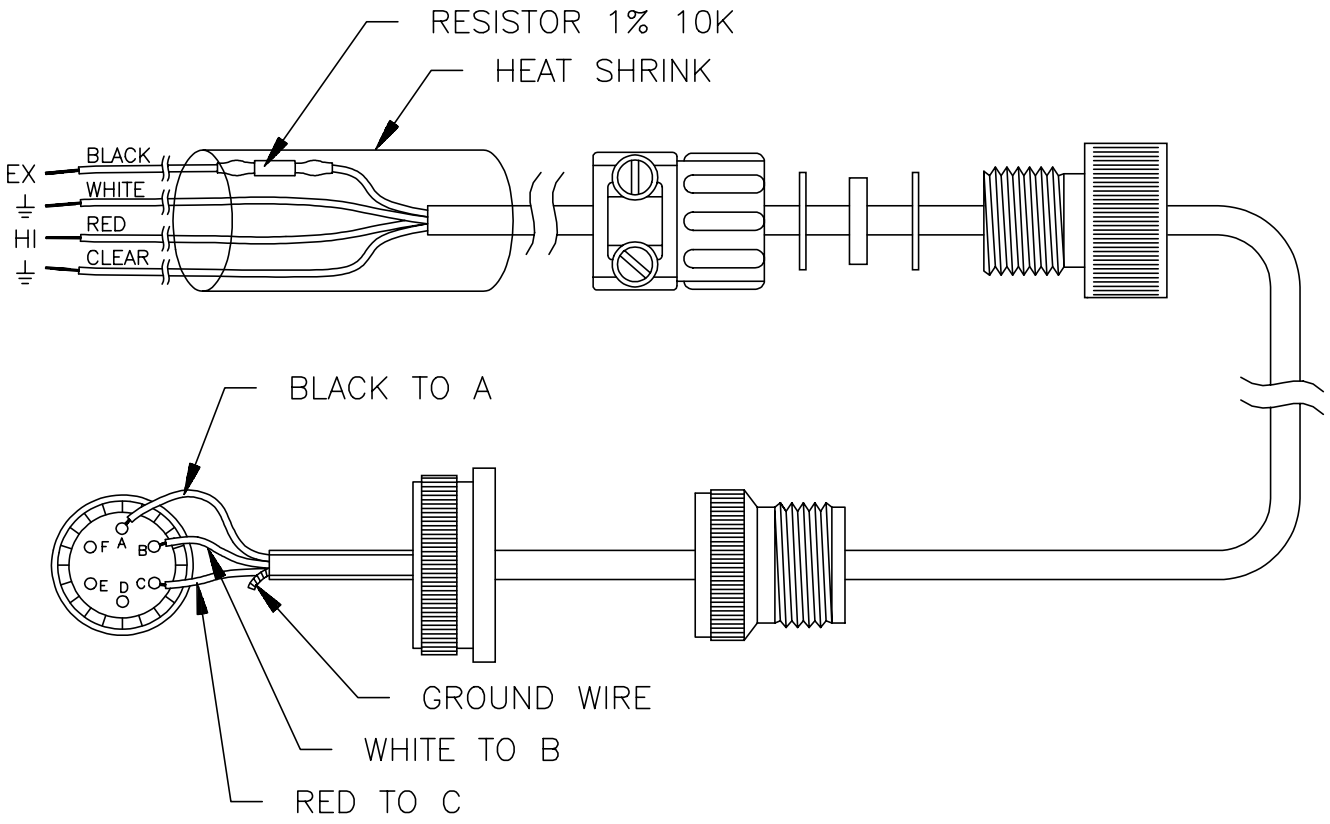

FIGURE 3. Cable Diagram

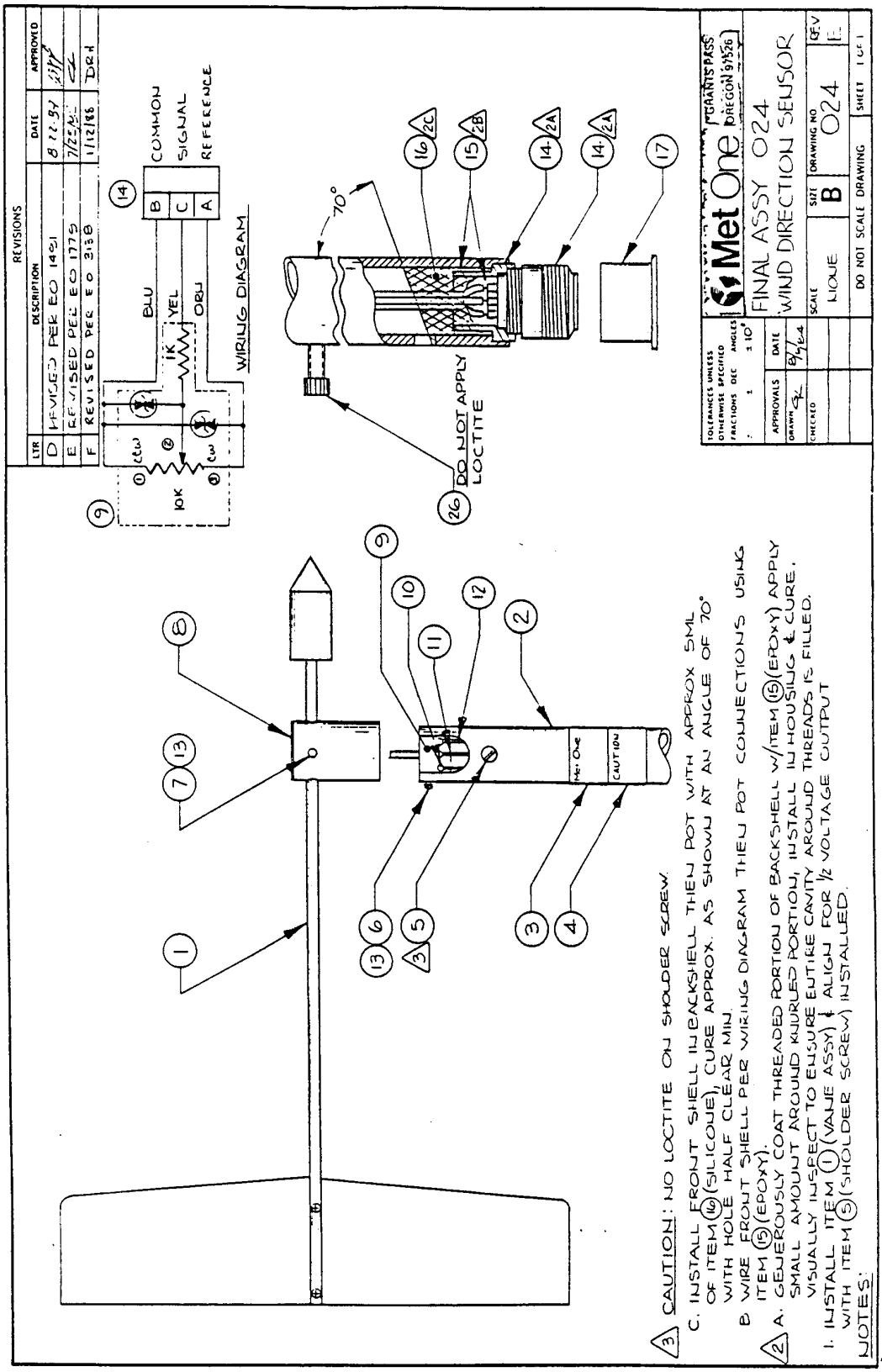

FIGURE 4. Parts Diagram

TABLE 1. Met-One Parts List Reproduced by Campbell Scientific, Inc.

Item	Part No.	Description	Qty./Assy.
1	102105	Vane Assembly	1
2	101685-1	Wind Dir. Support	1
3	101049-2	Label, Wind Dir.	1
4	101789	Label, Caution	1
5	860015	Screw, Shoulder	1
6	601100	Screw, Pan Hd Ph, 2-56x3/16	3
7	601680	Scrw, Set A/H, 8-32x3/8	2
8	101687	Label, Met-One	1
9	102017	Assy, Potentiometer	1
10	980495	Wire, 22Ga, Yel	1
11	980450	Wire, 22Ga, Blu	1
12	980475	Wire, 22Ga, Orn	1
13	995425	Loctite 222	A/R
14	500280	Connector, 6 Pin	1
15	995100	Adhesive, Epoxy	A/R
16	995060	Adhesive, Silicone	5ml
17	510020	Cap	1
18			
19			
20			
21	101806	Assembly, Cable	Ref
22	101699	Assy Instructions	Ref
23	101706	014 & 024 Installation	Ref
24	101697	Wir. Diagram	Ref
25			
26	601850	Scrw, Cap A/H SS 10-32x5/8	1