TECHNICAL BULLETIN
ACCESSORY INFORMATION

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Operation & Maintenance Instructions For Digital Manometer Sentry System Used For All Labgard Class II, Type A/B3 Biological Safety Cabinets

Digital Manometer Sentry System

Operation & Maintenance Instructions
For All
Labgard, Class II, Type A/B3 Biological Safety Cabinets

Table of Contents

Drawings

Digital Manometer Sentry System

Manufactured By:
NuAire, Inc, Plymouth, Minnesota USA 55447

1.0 Introduction

The Digital Manometer Sentry System is an all electronic version of NuAire's successful Labgard Sentry System. The all electronic improvement to the Sentry System features:

1. Solid State Pressure Transducer
2. Bright Red LED 3 1/2 Digit Display
3. Accuracy of ±0.5% of Reading or ± Count
4. Independent Low/Hi Limit Alarms
5. Digital Display of Setpoints
6. Simplified Calibration Procedures

This all new system is designed to provide an additional measure of safety in the Biological Safety Cabinet by informing the operator when cabinet airflow drops below the critical level per NSF Standard #49, (that level at which air velocities within the cabinet may be low enough to permit contaminants to escape and enter the cabinet and room, respectively, due to normal disruptions of the air barrier). If this happens, the Sentry System will sound an alarm, flash a warning light, and take its own corrective action by switching the motor and blower speed to maximum, returning the system performance of the cabinet to safe levels within the performance envelope. Working within the cabinet can then be completed before the cabinet is shut down for maintenance. The Sentry System activates when the cabinets airflow drops below safe levels as a result of:

1. Dirty HEPA Filters
2. Failure of Blower Control (Triac) System
3. Low Voltage Power Supplied to Cabinet (Brown-Out)
4. Failure of the Sentry System Itself

2.0 Theory of Operation (See Block Program - Drawing ACD-02624)

The total airflow sensor continuously samples air velocity in the main airflow duct supplying pressurized air to the exhaust and supply HEPA filters of the Biological Safety Cabinet. The sensor provides an air differential pressure signal to the pressure transducer, which electronically converts the air pressure signal to an analog signal directly proportional to the strength of the air pressure.

The 220/50Hz Biological Safety Cabinets only measure static pressure to the pressure transducer resulting in a lower analog signal, but operation remains the same.

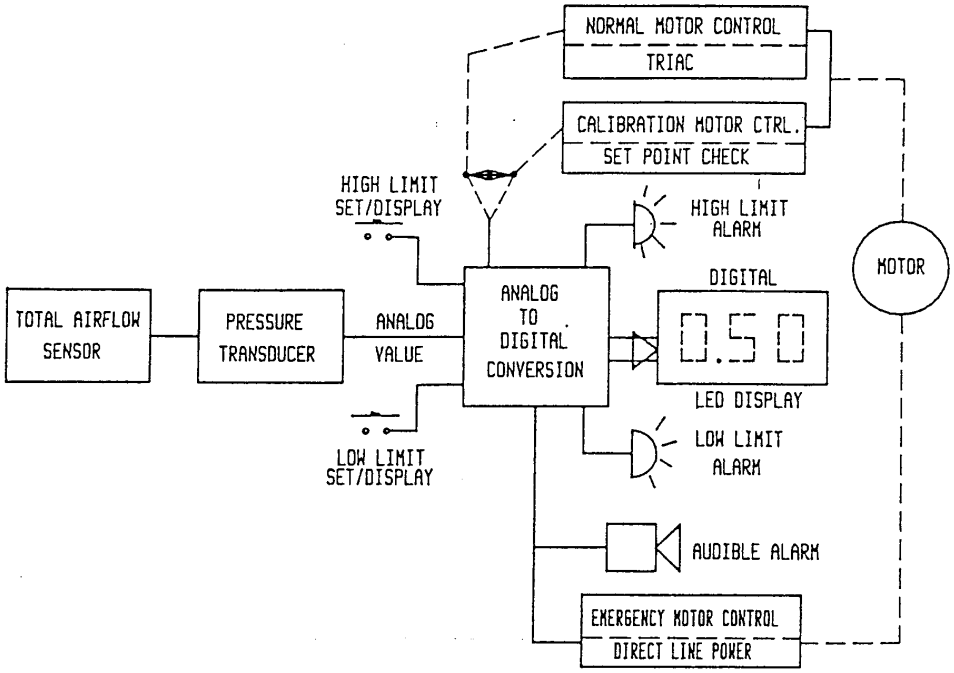
The analog signal is compared to the *setpoint* corresponding to an unacceptable level of system performance. If air velocity remains above the *setpoint* for normal operation, the motor/blower speed will be controlled by the cabinet's solid state control system. When the cabinet's system performance drops below the *setpoint*, the error and alarm circuitry will automatically switch to the Emergency Motor Control System and apply direct line current to the motor, simultaneously lighting a red LED alarm light on the Sentry control panel and sounding an audible alarm.

Direct line current will increase blower speed and corresponding airflow to higher than existing values which are within the performance envelope of the cabinet. The work in process in the cabinet can be concluded with safety to both the operator and the product without duress and maintenance can be performed at the earliest convenient time.

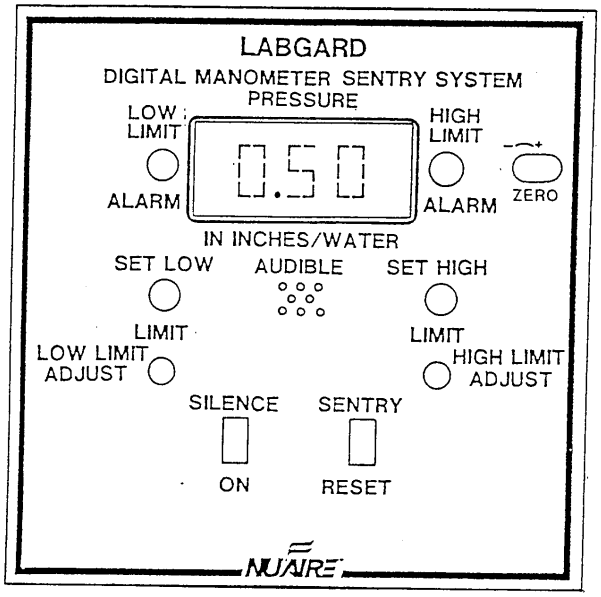
The motor/blower system performance is constantly displayed on a bring red 3 /12 digit LED display and can be calibrated or inspected at any time. By depressing the "set low limit" push button, one can visually inspect the lower *setpoint* (i.e. the air barrier inflow velocity (nominally 75 LFPM) which causes Sentry System activation) and compare this to the actual performance of the motor/blower being displayed on the 3 1/2 digit LED display. In this manner, the real system performance can be checked at any time.

The cabinets normal air barrier inflow velocity is a minimum of 100 LFPM per NSF Standard #49 for a Type B3 cabinet (i.e. vented to the outside), which all of NuAire's cabinets conform to. For Type A cabinets, the minimum inflow velocity is 75 LFPM; therefore, NuAire has chosen the lower *setpoint* to be 75 LFPM for activation of the Sentry System. This lower *setpoint* can be increased if desired.

It should also be pointed out that all of NuAire's Biological Safety Cabinets have been biologically challenged per the procedures in NSF Standard #49 at 75 LFPM to insure that, even under the minimum inflow velocity, personnel protection is maintained.



BLOCK DIAGRAM - DIGITAL MANOMETER SENTRY SYSTEM ACD-02624



3.0 Controls & Indicators

The following is a discussion of the controls and indicators available to the operator as well as the maintenance technician (see also Drawing ACD-02625).

3.1 Digital Display

System performance is constantly displayed on the bright red 3 1/2 digit LED display. Although the display itself will display pressure (or vacuum) from -19.99 to +19.99 inches water gauge, the range of values constituting acceptable performance are from 0.8 to 1.8 inches water gauge, depending upon the size of the cabinet. The display will indicate negative pressure by lighting a minus sign in front of the number.

3.2 Low Limit Alarm

The Low Limit Alarm is a bright red LED that lights when the system performance is less than or equal to the lower limit *setpoint*.

3.3 High Limit Alarm

The High Limit Alarm is a bright red LED that lights when the system performance is greater than or equal to the upper limit *setpoint*. The high limit alarm, although available, is not used.

3.4 Set Low (High) Limit

The Set Low (High) Limit is a momentary push button switch that when depressed, displays the lower (upper) *setpoint* on the digital display. The high limit alarm, although available is not used; and should be set well above the "clean HEPA filter" System Performance Value on the digital display.

3.5 Low (High) Limit Adjust

Both adjustments are potentiometers with 10 turns of rotation on the slotted shaft. The adjustments will permit settings from -19.99 to +19.99 inches water gauge, however, the low limit adjustment will be factory set to an equivalent system performance value of 75 LFPM through the work access opening (usually between 0 and 0.5 inches water gauge). The upper limit adjustment should be set well above the System Performance Value with clean HEPA filters, (usually above 2.0 inches water gauge). The Low (High) Limit *setpoints* are adjusted while depressing the Set Low (High) Limit push buttons.

3.6 Silence/On

This two-position slide switch will silence the audible alarm when in the *silence* position. The audible alarm will sound if the system performance value is less than or equal to the lower *setpoint*. The audible alarm will sound if the system performance value is less than or equal to the lower *setpoint*. The audible alarm emits a 1000 cycle tone at 78 dbA.

3.7 Sentry/Reset

The Sentry/Reset switch is a double pole, double throw slide switch that is designed to either arm the Digital Manometer Sentry System upon initial power application or reset the Sentry System after a detection of a system performance anomaly or failure. The switch must be moved to Reset and then back to Sentry. **If the switch is left on the Reset position, the alarm circuitry is disabled**

3.8 Fuse

Located in the primary circuit of the power supply transformer is a 250 Volt, 1/8 Amp fuse protecting the +5 Volt circuitry of the Sentry System. The fuse is readily accessible on the Printed Wiring Board behind the Display Printed Wiring Board. If the digital display ever disappears while the cabinet is in operation, the fuse should be checked first.

3.9 Calibration Switch

The Calibration Switch is located within the Control Center on the Sentry Relay Module. The Calibration mode bypasses the normal Control system Airflow Control Potentiometer, and substitutes one that simulates a failure, in order to check the Sentry System Activation *setpoint*.

3.10 Zero Adjust

The Zero Adjustment is a potentiometer with 10 turns of rotation on the slotted shaft. The adjustment is used to periodically zero the display for accurate measurement.

4.0 Warranty

NuAire, Inc. warrants that it will repair F.O.B. its factory or furnish without charge F.O.B. its factory, a similarly part to replace any material in its equipment within 36 months after the date of sale if proved to the satisfaction of the company to have been defective at the time is was sold, provided that all parts claimed defective shall be returned, properly identified to the company at its factory, charges prepaid.

Factory installed equipment or accessories are warranted only to the extent guaranteed by the original manufacturer, and this warranty shall not apply to any portion of the equipment modified by the user. Claims under this warranty should be directed to NuAire, Inc. setting forth in detail, the nature of the defect, the date of the initial installation and the serial and model number of the equipment.

This warranty shall not apply to any NuAire product or part thereof which has been subject to misuse, abuse, accident, shipping damage, improper installation or service, or damage by fire, flood or acts of God. If the serial number of this product is altered, removed or defaced as to be illegible, the warranty shall be null and void in its entirety.

The warranty is for the sole benefit of the original purchaser and is not assignable or transferable.

5.0 Operation

5.1 Start-Up

The Sentry System is activated immediately (i.e. in the alarm state) when the blower switch is initially turned on. This feature serves to test your Sentry System every time you start up the Biological Safety Cabinet. It requires approximately three seconds for air velocities within the cabinet to reach safe operating level. The audible alarm may be deactivated during initial power application.

5.2 Arming the System

The Digital Manometer Sentry System requires a positive operator action to arm the system. This procedure insures that:

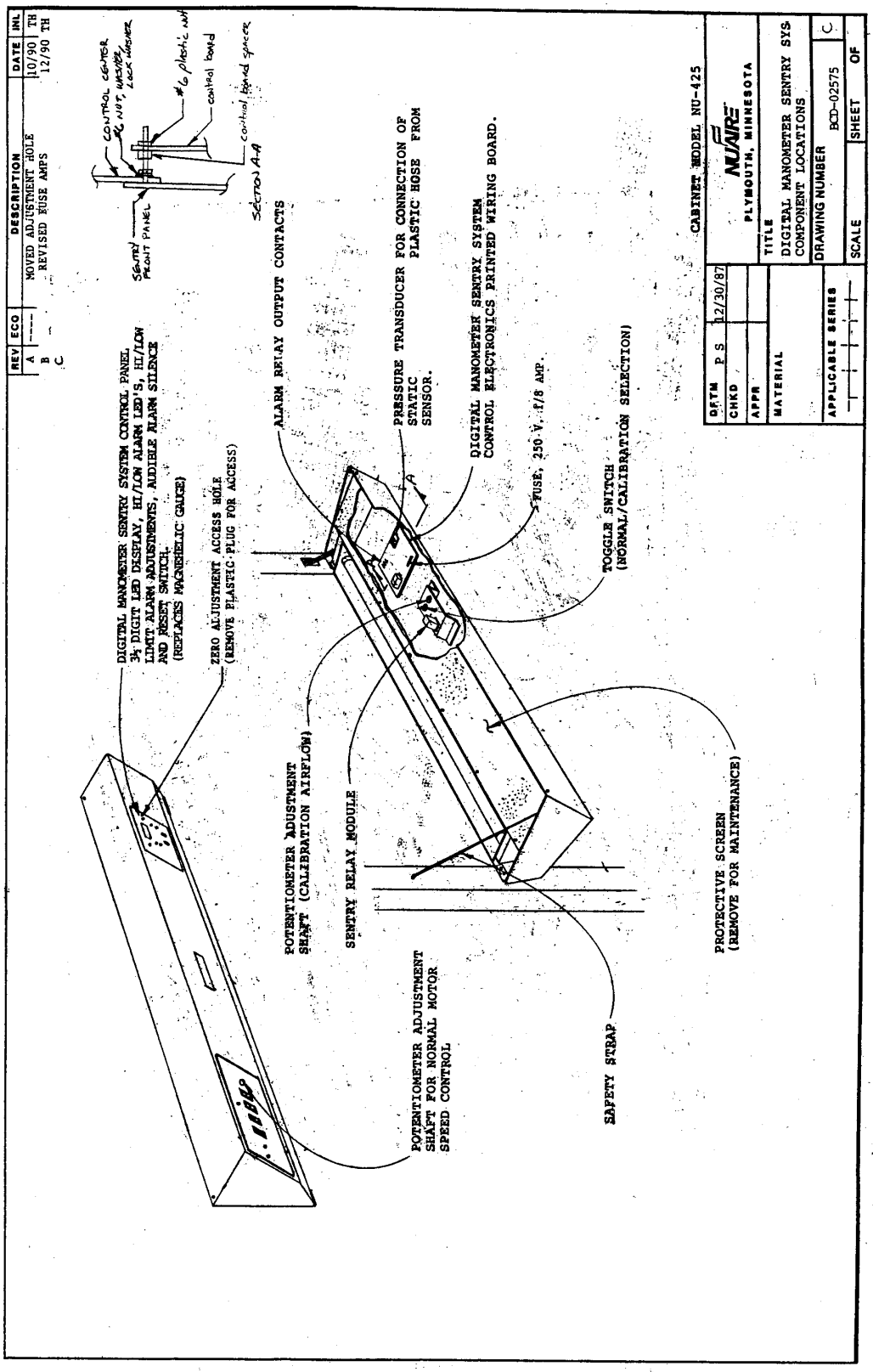
1. The Sentry System as well as the cabinet is working properly

2. Assures the operator that the Digital Manometer Sentry System is monitoring cabinet performance for his/her safety. The Digital Manometer Sentry System is armed by depressing the Sentry Reset Slide Switch after waiting approximately three seconds after power is applied to the motor/blower. The alarm indicator should extinguish and the audible alarm should deactivate. If the audible switch was on *silence* during power application, the switch should now be placed in the ON position, allowing the audible alarm to be activated if a system performance failure occurs.

5.3 Normal Operation

With the Sentry System once armed, it will be activated when it detects system performance levels that are below the *safe level* as established by NSF Standard #49. The sensitivity setting is adjustable (by a trained technician). Normally factory set level is approximately 75 FPM air barrier inflow velocity.

Once the Digital Manometer Sentry System has detected a system performance failure, the Sentry will attempt to compensate for low airflow by applying full line voltage (maximum blower speed) to the motor and blower. Once in alarm, work within the cabinet can be completed as soon as convenient and the cabinet shut down for maintenance.


REV | ECO | DESCRIPTION | DATE | INL
A | ---- | MOVED ADJUSTMENT HOLE | 10/90 | TH
B | | REVISED FUSE AMPS | 12/90 | TH
C
CONTROL CABINET
#6 PLASTIC WASHER
CONTROL BOARD
CONTROL BOARD SPACER
SECTION A-A
SECURITY FRONT PANEL
DIGITAL MANOMETER SENTRY SYSTEM CONTROL PANEL
3½ DIGIT LED DISPLAY, HI/LOW ALARM LED'S, HI/LOW LIMIT ALARM ADJUSTMENTS, AUDIBLE ALARM SILENCE AND RESET SWITCH.
(REPLACES MAGNEHELIC GAUGE)
ZERO ADJUSTMENT ACCESS HOLE
(REMOVE PLASTIC PLUG FOR ACCESS)
ALARM RELAY OUTPUT CONTACTS
PRESSURE TRANSDUCER FOR CONNECTION OF PLASTIC HOSE FROM STATIC SENSOR.
DIGITAL MANOMETER SENTRY SYSTEM CONTROL ELECTRONICS PRINTED WIRING BOARD.
FUSE, 250 V, 1/8 AMP.
TOGGLE SWITCH (NORMAL/CALIBRATION SELECTION)
POTENTIOMETER ADJUSTMENT SHAFT (CALIBRATION AIRFLOW)
SENTRY RELAY MODULE
POTENTIOMETER ADJUSTMENT SHAFT FOR NORMAL MOTOR SPEED CONTROL
SAFETY STRAP
PROTECTIVE SCREEN (REMOVE FOR MAINTENANCE)
CABINET MODEL NU-425
DSTN P S 12/30/87
CHKD
APPR
MATERIAL
APPLICABLE SERIES
NUAIRE
PLYMOUTH, MINNESOTA
TITLE
DIGITAL MANOMETER SENTRY SYS COMPONENT LOCATIONS
DRAWING NUMBER BCD-02575 C
SCALE SHEET OF

6.0 Calibration Procedure

Calibration of the Sentry System should be done only by a qualified technician, employing the following calibrated equipment:

1. Thermoanemometer, 0-200 LFPM Scale
2. Small Flatblade Screwdriver

The following is a summary of the steps involved in calibration to be discussed in detail.

Step 1 Establish Normal (Factory Standard) Air Velocities

Step 2 Zero Adjust Digital Manometer

Step 3 Setup For Measurement of Air Barrier Velocity

Step 4 Activate the Calibration System

Step 5 Establish Low Limit Setpoint

Step 6 Adjust Low Limit Setpoint

Step 7 Return Cabinet To Normal Control

6.1 Establish Normal (Factory Standard) Air Velocities

The Operation & Maintenance Manual shipped with your Labgard Biological Safety Cabinet contains the original Factory Inspected Report as well as recommended procedures for establishing factory standard air velocities per NSF Standard #49.

NuAire recommends that a new cabinet be recertified to factory standards after it is installed and prior to use. Recertification is recommended to be accomplished on an annual basis after initial certification and the Sentry System must be rechecked at the same time.

The Inspection Report test criteria is in accordance with NSF Standard #49. The results of your own testing may or may not meet exactly the Factory Inspection Report. Differences may occur due to test instrumentation, instrument calibration, shipping, voltage, regulation, etc.; however, the results you achieve should be within the prescribed safety standards printed with the Operation and Maintenance Manual and in accordance with NSF Standard #49 and NIH Specification NIH-03-112C.

The precisely held 115 Volt factory test voltage is nominal, representing the normal line voltage of 120 volts less the voltage drop through the blower/motor; therefore, to approximate the test values, the line voltage should be 120 Volts prior to cabinet operation. The precise factory test voltage (115V) was controlled by a variable transformer with digital voltage readout. Motor/blower speed and corresponding air velocities are controlled with the Airflow Control Potentiometer located in the Control Center.

If the Sentry System is in "Alarm", or continues to alarm after the Sentry/Reset slide switch is moved to Reset and back to Sentry, placing the slide switch in the Reset position disables the alarm circuitry and selects the normal operating motor speed control circuit for purposes of establishing factory standard air velocities, when the Sentry System will not permit normal operation. The current value of the lower *setpoint* can then be examined by depressing the "Set Low Limit" push button, and may be lowered to achieve stable operation, if desired.

If neither of these work, the Sentry System Control Electronics Module has failed and must be replaced. Removing the fuse from the Digital Manometer Sentry System Printed Wiring Board will select the normal operating motor speed control circuit until a replacement can be sent. If the factory standard airflow velocities cannot be established, the filters must be changed.

6.2 Zero Adjustment of Digital Manometer

Before beginning any *setpoint* adjustment, the digital display must be set to zero (i.e. the display should read 0.00 with no input signal to the pressure transducer). An access hole is provided on the front of the Control Center. To gain access to the adjustment potentiometer. The following steps should be executed.

1. Remove the plastic cap over the access hole.

2. Place the Sentry/Reset Slide Switch to Reset.

3. Remove the plastic hose(s) from the Pressure Transducer mounted on the printed wiring board.

Note: For some models, a protective screen over the electronics must also be removed.

4. Adjust the Zero Adjust Potentiometer until the Digital Display reads 0.00.

5. Reconnect the plastic hose(s) to the pressure transducer.

Note: When reconnecting the plastic hoses, it is possible to reverse the connections. If the display reads negative (i.e. a minus sign will light), simply reverse the connection. The pressure transducer's input is also labeled A and B. Port B is the velocity pressure connection, Part A is the static pressure connection.

6. Return Slide Switch to Sentry position.

6.3 Setup For Measure of Air Barrier Velocity

The average air barrier inflow has been determined by calculation. Total cabinet exhaust flow CFM (cubic feet per minute) has been established by taking numerous velocity measurements on a grid set of coordinates over the exhaust filter (see Table 6.0 for recommended grid scale).

The exhaust CFM is identical to the air barrier CFM; simply dividing CFM by the area of the work access opening below the viewing window, provides one with the average inflow velocity (you can not the result of this calculation on the Inspection Report).

In order to check or adjust the *setpoint* to the desired average air barrier velocity, it will be necessary to mount a velocity measuring instrument at a location that is reasonably indicative of the average air barrier velocity obtained by calculation. The recommended instrument is an Alnor 8500 Thermoenemometer, but an equivalent performance anemometer may be used. The anemometer must be mounted as displayed in Drawing ACD-02721.

The velocity readings from the hot-wire anemometer may pulsate slightly, this is a normal phenomena influenced by the changing vector direction of the air inflow as it is affected by air currents in the room.

To accommodate a varying velocity, simply note the high/low readings for about 3 minutes and take the average. When reading velocities, note that a person walking by can cause air to move at up to 200 feet per minute, which causes reading error.

The anemometer should be placed in the work access opening midway side-to-side, and about 2 5/8 inches from the top of the airfoil to the hot-wire component of the anemometer. The anemometer may be taped in position to the face of the cabinet as displayed in the sketch, or held with a suitable fixture purchased from NuAire.

The position shown should be the approximate average inflow velocity, calculated as discussed above. The position of the anemometer may be adjusted up or down slightly to obtain closer agreement with the calculated average (note that agreement within ±3 FPM should be considered satisfactory).

To be absolutely certain the lower velocity threshold obtained above is accurate, one must take another set of exhaust flow measurements as shown in Table 6.0.

6.4 Activate the Calibration System

The Calibration System is a parallel electrical system to the normal control system. The two systems are electrically isolated from each other to permit use of the Calibration System to check or adjust the *setpoint* without disturbing the normal control system for air velocities within the cabinet (see 6.1).

Table 6.0
Recommended Velocity Profile Readings for the Exhaust HEPA Filter

Exhaust Filter Efflux Air Velocity is measured on a four by three inch grid scale four inches above the filter, starting from the outer edge of the filter frame.

Back Wall

3							
6							
9							
12							
15							
18							
21							
3 ft.	2	5	8				
4 ft.	3	7	11	15			
6 ft.	3	7	11	15	19	23	27

Exhaust Filter Reading Position - Left to Right

Average Inflow Velocity = $\frac{\text{Measured CFM}}{\text{Access Area}}$ Where Measured CFM = (Exhaust Filter Area) (Average Exhaust Filter Velocity)

		NU-425 Series		**NU-407/408 Series**	
Cabinet Size	***Exhaust Filter Area**	**Access Area 8" High**	**Access Area 10" High**	**Access Area 8" High**	**Access Area 10" High**
3 ft.	1.53	2.02	N/A	1.91	N/A
4 ft.	2.44	2.68	3.36	2.58	3.23
5 ft.	3.36	N/A	N/A		4.06
6 ft.	4.28	4.01	5.02	3.92	4.89

Areas in Sq. Ft. Used to Calculate Inflow Velocity

Turn the Sentry/Reset Slide Switch to Reset position. This will disable the alarm circuitry. Next, enable the calibration system by using the Toggle Switch on the Sentry Relay Module.

Note: THE TOGGLE SWITCH IS PURPOSELY LOCATED WITHIN THE LABGARD CONTROL CENTER TO DISCOURAGE TINKERING.

See sketch of interior of Labgard Control Center for location of the Toggle Switch.

ACD-00819 Sentry System Controls for NU-407
ACD-00865 Sentry System Controls for NU-408
ACD-02575 Sentry System Controls for NU-425

6.5 Establish Low Limit Setpoint

This procedure step establishes the desired *setpoint* for the activation of the Sentry System. By turning the shaft of the potentiometer located on the Sentry Relay Module counterclockwise, the blower speed is reduced so that the anemometer installed as described in Step 3 as indicating the desired low flat activation point, nominally 75 LFPM.

CAUTION

The normal airflow adjustment potentiometer should not be adjusted during this procedure.

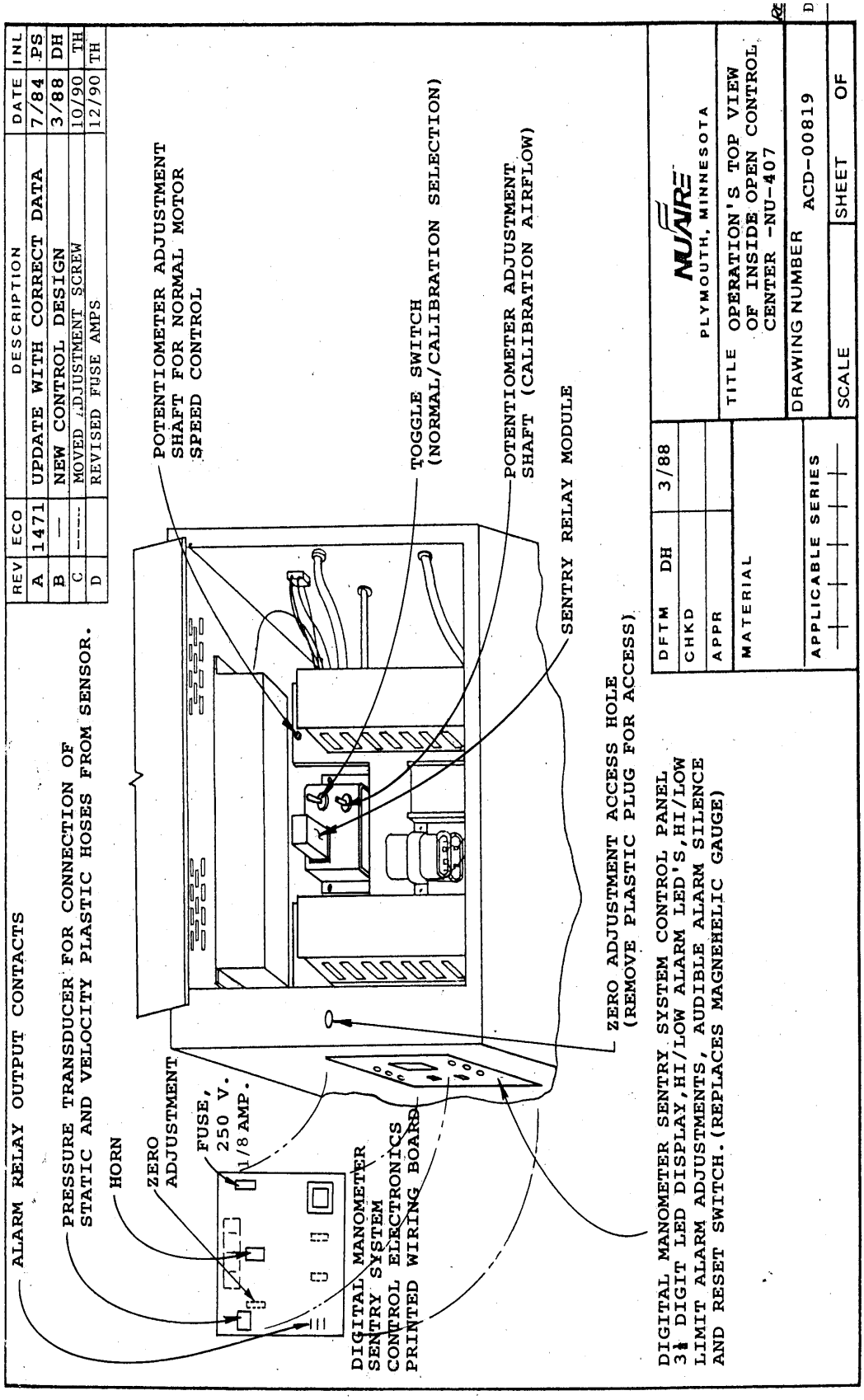
6.6 Adjust Low Limit Setpoint

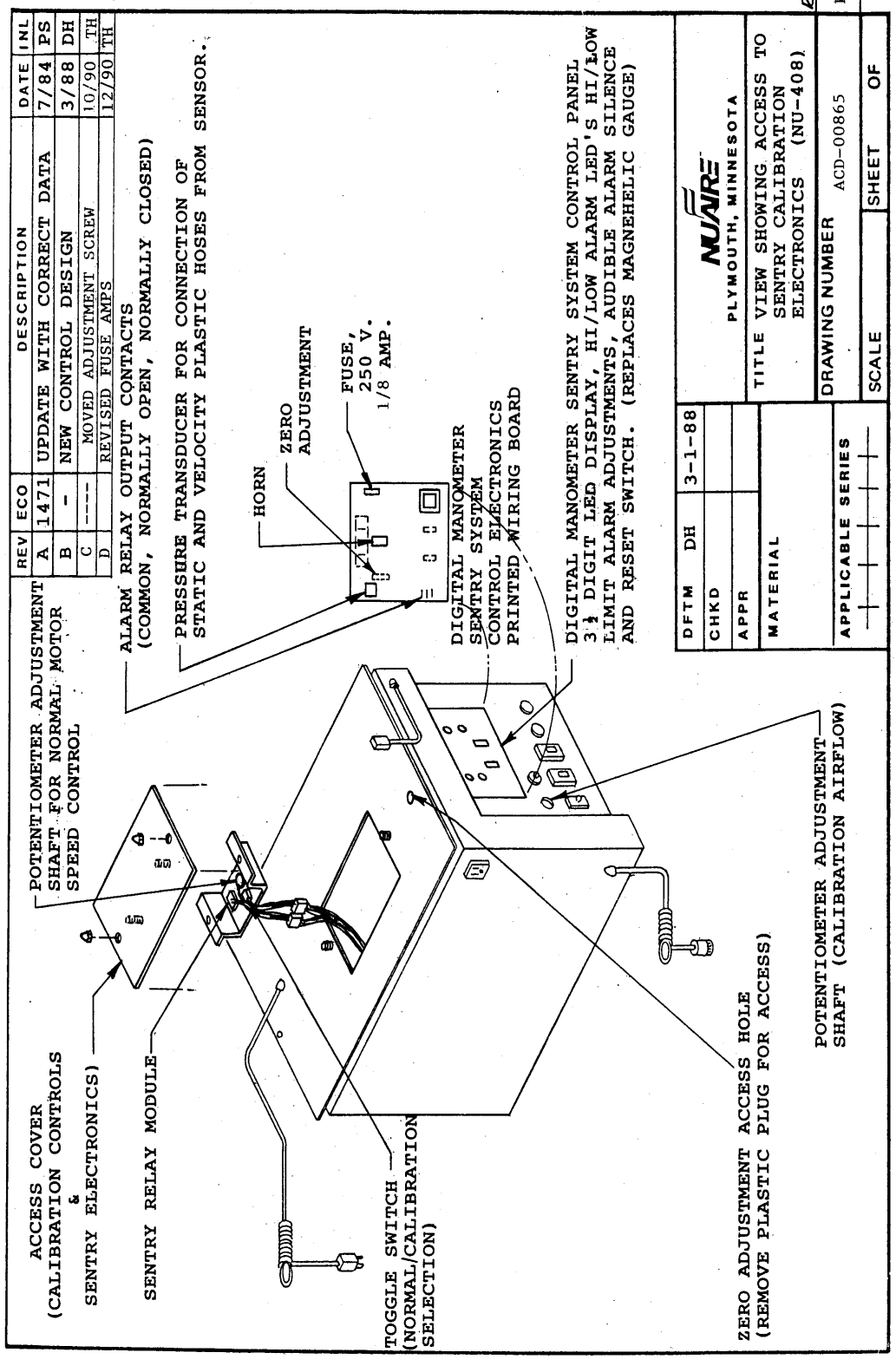
Once the lower inflow velocity activation point has been established by measurement or calculation, the digital display displays the lower *setpoint*. To adjust the lower *setpoint* to the display value, merely press the "Set Low Limit" push button switch and adjust the "Low Limit Adjust" potentiometer to the value. Turning the potentiometer clockwise increases the value (i.e. more positive), while counterclockwise decreases the *setpoint* value.

6.7 Return Cabinet To Normal Control

1. Return calibration Toggle Switch to normal.
2. Place Sentry/Reset Slide Switch to Sentry position.

If desired, the cabinet can be cycled by turning the calibration Toggle Switch to calibrate position to insure the Sentry System will activate the alarms and switch the blower to full line voltage.


ALARM RELAY OUTPUT CONTACTS
PRESSURE TRANSDUCER FOR CONNECTION OF STATIC AND VELOCITY PLASTIC HOSES FROM SENSOR.
HORN
ZERO ADJUSTMENT
FUSE, 250 V. 1/8 AMP.
DIGITAL MANOMETER SENTRY SYSTEM CONTROL ELECTRONICS PRINTED WIRING BOARD
POTENTIOMETER ADJUSTMENT SHAFT FOR NORMAL MOTOR SPEED CONTROL
TOGGLE SWITCH (NORMAL/CALIBRATION SELECTION)
POTENTIOMETER ADJUSTMENT SHAFT (CALIBRATION AIRFLOW)
SENTRY RELAY MODULE
ZERO ADJUSTMENT ACCESS HOLE (REMOVE PLASTIC PLUG FOR ACCESS)
DIGITAL MANOMETER SENTRY SYSTEM CONTROL PANEL
3½ DIGIT LED DISPLAY, HI/LOW ALARM LED'S, HI/LOW LIMIT ALARM ADJUSTMENTS, AUDIBLE ALARM SILENCE AND RESET SWITCH. (REPLACES MAGNEHELIC GAUGE)
REV | ECO | DESCRIPTION | DATE | INL
A | 1471 | UPDATE WITH CORRECT DATA | 7/84 | PS
B | — | NEW CONTROL DESIGN | 3/88 | DH
C | ----- | MOVED ADJUSTMENT SCREW | 10/90 | TH
D | | REVISED FUSE AMPS | 12/90 | TH
DFTM DH 3/88
CHKD
APPR
MATERIAL
APPLICABLE SERIES
MUNRE PLYMOUTH, MINNESOTA
TITLE OPERATION'S TOP VIEW OF INSIDE OPEN CONTROL CENTER -NU-407
DRAWING NUMBER ACD-00819
SCALE
SHEET OF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A | 1471 | UPDATE WITH CORRECT DATA | 7/84 | PS
B | - | NEW CONTROL DESIGN | 3/88 | DH
C | ----- | MOVED ADJUSTMENT SCREW | 10/90 | TH
D | | REVISED FUSE AMPS | 12/90 | TH
ACCESS COVER (CALIBRATION CONTROLS & SENTRY ELECTRONICS)
POTENTIOMETER ADJUSTMENT SHAFT FOR NORMAL MOTOR SPEED CONTROL
SENTRY RELAY MODULE
ALARM RELAY OUTPUT CONTACTS (COMMON, NORMALLY OPEN, NORMALLY CLOSED)
PRESSURE TRANSDUCER FOR CONNECTION OF STATIC AND VELOCITY PLASTIC HOSES FROM SENSOR.
HORN
ZERO ADJUSTMENT
FUSE, 250 V. 1/8 AMP.
DIGITAL MANOMETER SENTRY SYSTEM CONTROL ELECTRONICS PRINTED WIRING BOARD
DIGITAL MANOMETER SENTRY SYSTEM CONTROL PANEL 3½ DIGIT LED DISPLAY, HI/LOW ALARM LED'S HI/LOW LIMIT ALARM ADJUSTMENTS, AUDIBLE ALARM SILENCE AND RESET SWITCH. (REPLACES MAGNEHELIC GAUGE)
TOGGLE SWITCH (NORMAL/CALIBRATION SELECTION)
ZERO ADJUSTMENT ACCESS HOLE (REMOVE PLASTIC PLUG FOR ACCESS)
POTENTIOMETER ADJUSTMENT SHAFT (CALIBRATION AIRFLOW)
DFTM DH 3-1-88
CHKD
APPR
MATERIAL
APPLICABLE SERIES
NUAIRE
PLYMOUTH, MINNESOTA
TITLE VIEW SHOWING ACCESS TO SENTRY CALIBRATION ELECTRONICS (NU-408)
DRAWING NUMBER ACD-00865
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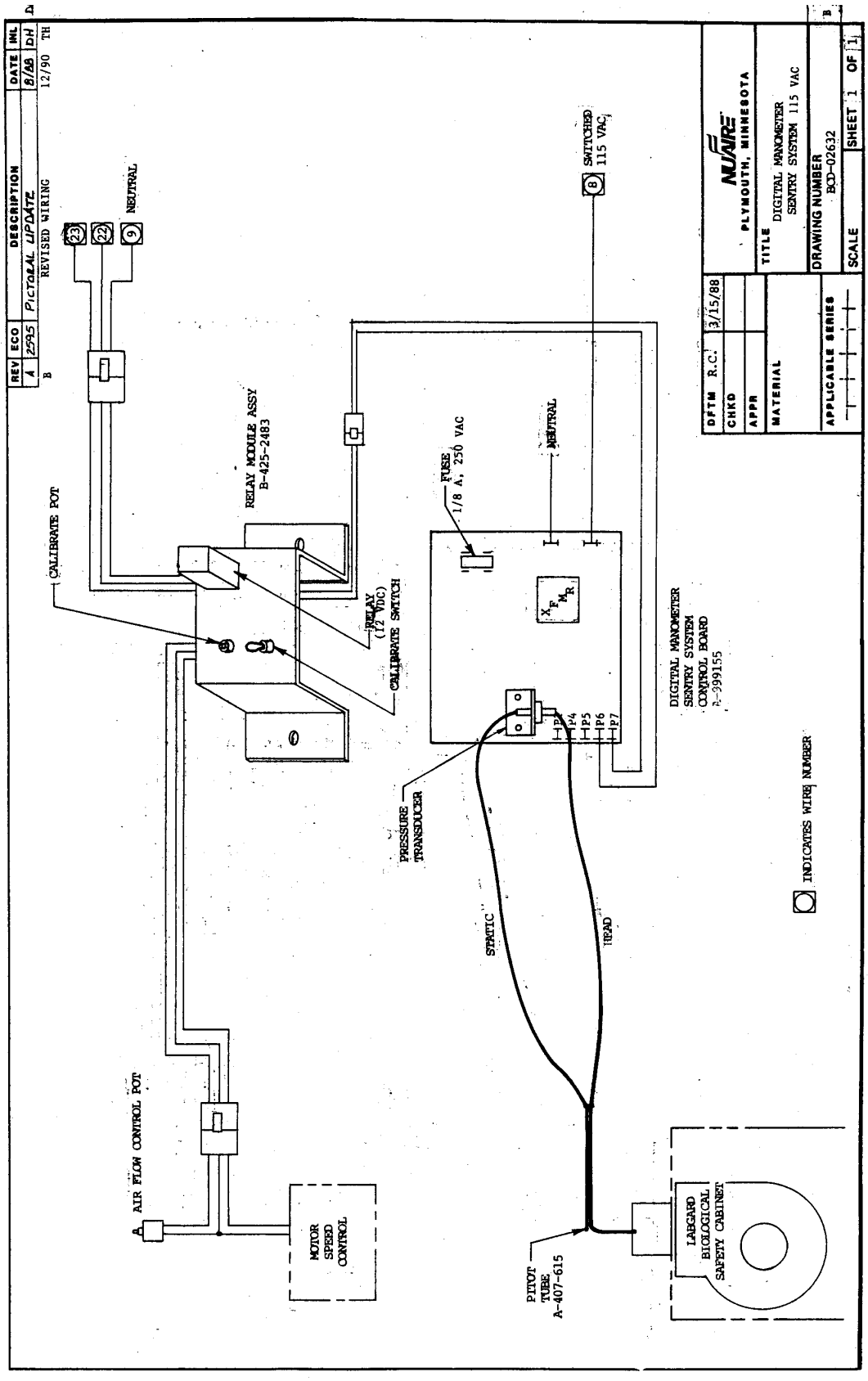
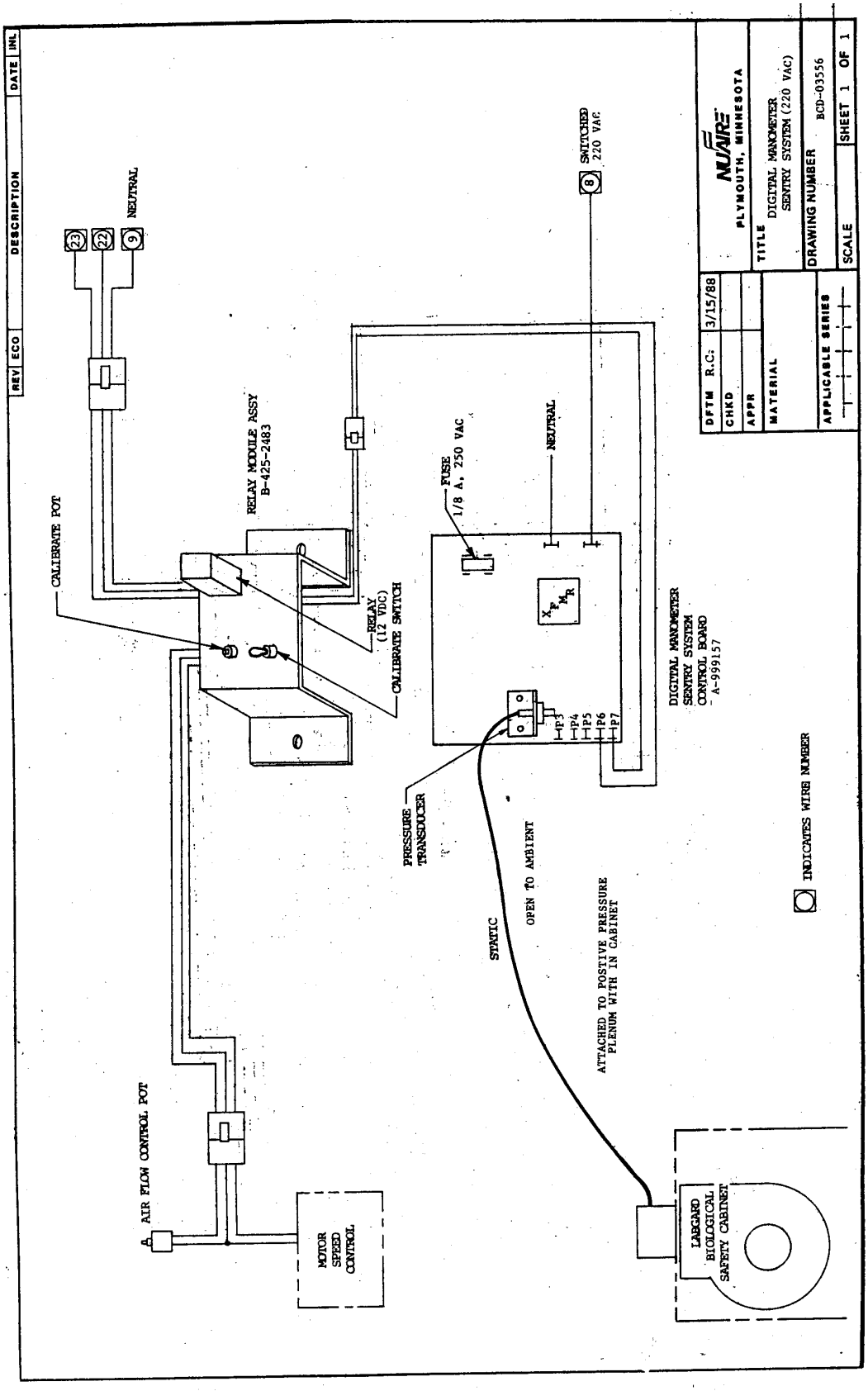
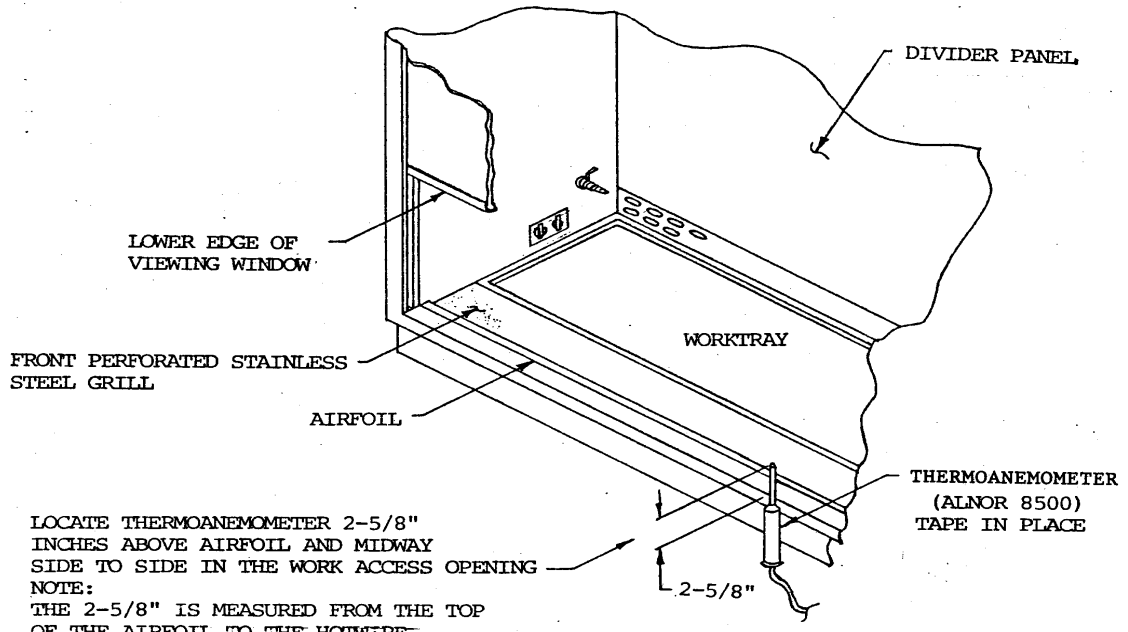
SCALE
SHEET OF


REV
ECO
DESCRIPTION
DATE
INL
A
2595
PICTORIAL UPDATE
8/88
DH
B
REVISED WIRING
12/90
TH
NEUTRAL
23
22
9
8
SWITCHED
115 VAC
CALIBRATE POT
RELAY MODULE ASSY
B-425-2483
RELAY
(12 VDC)
CALIBRATE SWITCH
FUSE
1/8 A, 250 VAC
NEUTRAL
DIGITAL MANOMETER
SENTRY SYSTEM
CONTROL BOARD
A-99915
P3
P4
P5
P6
P7
PRESSURE
TRANSDUCER
AIR FLOW CONTROL POT
MOTOR
SPEED
CONTROL
STATIC
HEAD
PITOT
TUBE
A-407-615
LABGARD
BIOLOGICAL
SAFETY CABINET
INDICATES WIRE NUMBER
DFTM R.C.
3/15/88
CHKD
APPR
MATERIAL
NUAIRE
PLYMOUTH, MINNESOTA
TITLE
DIGITAL MANOMETER
SENTRY SYSTEM 115 VAC
DRAWING NUMBER
BOD-02632
APPLICABLE SERIES
SCALE
SHEET 1 OF 1


REV ECO DESCRIPTION DATE INIT
NEUTRAL
23
22
9
SWITCHED 220 VAC
8
RELAY MODULE ASSY B-425-2483
CALIBRATE POT
RELAY (12 VDC)
CALIBRATE SWITCH
FUSE 1/8 A, 250 VAC
NEUTRAL
DIGITAL MANOMETER SENTRY SYSTEM CONTROL BOARD A-999157
P3
P4
P5
P6
P7
PRESSURE TRANSDUCER
STATIC
OPEN TO AMBIENT
ATTACHED TO POSITIVE PRESSURE PLENUM WITH IN CABINET
AIR FLOW CONTROL POT
MOTOR SPEED CONTROL
LABGARD BIOLOGICAL SAFETY CABINET
INDICATES WIRE NUMBER
DFTM R.C. 3/15/88
CHKD
APPR
MATERIAL
NUAIRE PLYMOUTH, MINNESOTA
TITLE DIGITAL MANOMETER SENTRY SYSTEM (220 VAC)
DRAWING NUMBER BCD-03556
APPLICABLE SERIES
SCALE
SHEET 1 OF 1

REV	ECO	DESCRIPTION	DATE	INL



LOCATE THERMOANEMOMETER 2-5/8" INCHES ABOVE AIRFOIL AND MIDWAY SIDE TO SIDE IN THE WORK ACCESS OPENING

NOTE:
THE 2-5/8" IS MEASURED FROM THE TOP OF THE AIRFOIL TO THE HOTWIRE COMPONENT OF THE ANEMOMETER

DFTM	R.C.	1/11/88
CHKD		
APPR		
MATERIAL		
APPLICABLE SERIES		

nuAire, inc.
MINNEAPOLIS, MINNESOTA

SENTRY SYSTEM CALIBRATION INSTRUMENTATION-OF NU-425

DRAWING NUMBER
ACD-02721

SCALE ~ | SHEET 1 OF 1

7.0 Replacement Parts

The Digital Manometer Sentry System is modular in design to facilitate maintenance in the field. The listed modules represent the lowest replaceable unit (LRU), which is the recommended method of repair. Refer to Drawing BCD-02632.

Generally, this portrays the Sentry System regardless of the model cabinet you have; however, there are some differences in mounting bracketry. For this reason, replacement modules should be ordered by the following information of cabinet model, serial number and part number.