

**TECHNICAL BULLETIN  
ACCESSORY INFORMATION**



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**Chart Recorder Outputs  
Operation & Installation Instructions  
for NuAire Biological Safety Cabinet Models:  
NU-427/430/435/440 (D/E/G)**

**Operation**

The chart recorder output board is provided as an optional feature for the above NuAire BSC models. The chart recorder output board produces an analog signal, conditioned and linearized from 0 to 10 VDC, 0 to 5 VCD, and 4 to 20 mA to represent downflow and exhaust flow (inflow). By using either the identified jumper or selector switch, the output desired can be obtained as shown below. For purposes of metric conversion, 1 fpm = .005 m/s.

**Analog Output Specification (0 to 10 VDC)**

Model/Airflow (Units)	Analog Output @ Scale Limits		Display Output Multiplier	Change in Output VDC = Units
	VDC = 0	VDC = 10		
NU-427 Downflow (FPM)	0	200	1	.05 = 1 FPM
NU-427 Exhaust (CFM/CMH)	0	200	2/3	.05 = 2 CFM/3 CMH
NU-430/435 Downflow (FPM)	0	200	1	.05 = 1 FPM
NU-430/435 Exhaust (CFM/CHM)	0	200	4	.05 = 4 CFM/CMH
NU-440 Downflow (FPM)	0	200	1	.05 = 1 FPM
NU-440 Inflow (FPM)	0	200	1	.05 = 1 FPM

**Analog Output Specification (0 to 5 VDC)**

Model/Airflow (Units)	Analog Output @ Scale Limits		Display Output Multiplier	Change in Output VDC = Units
	VDC = 0	VDC = 5		
NU-427 Downflow (FPM)	0	200	1	.025 = 1 FPM
NU-427 Exhaust (CFM/CMH)	0	200	2/3	.025 = 2 CFM/3 CMH
NU-430/435 Downflow (FPM)	0	200	1	.025 = 1 FPM
NU-430/435 Exhaust (CFM/CHM)	0	200	4	.025 = 4 CFM/CMH
NU-440 Downflow (FPM)	0	200	1	.025 = 1 FPM
NU-440 Inflow (FPM)	0	200	1	.025 = 1 FPM

**Analog Output Specification (4 to 20 mA)**

Model/Airflow (Units)	Analog Output @ Scale Limits		Display Output Multiplier	Change in Output VDC = Units
	mA = 4	mA = 20		
NU-427 Downflow (FPM)	0	200	1	0.008 = 1 FPM
NU-427 Exhaust (CFM/CMH)	0	200	2/3	0.008 = 2 CFM/3 CMH
NU-430/435 Downflow (FPM)	0	200	1	0.008 = 1 FPM
NU-430/435 Exhaust (CFM/CHM)	0	200	4	0.008 = 4 CFM/CMH
NU-440 Downflow (FPM)	0	200	1	0.008 = 1 FPM
NU-440 Inflow (FPM)	0	200	1	0.008 = 1 FPM

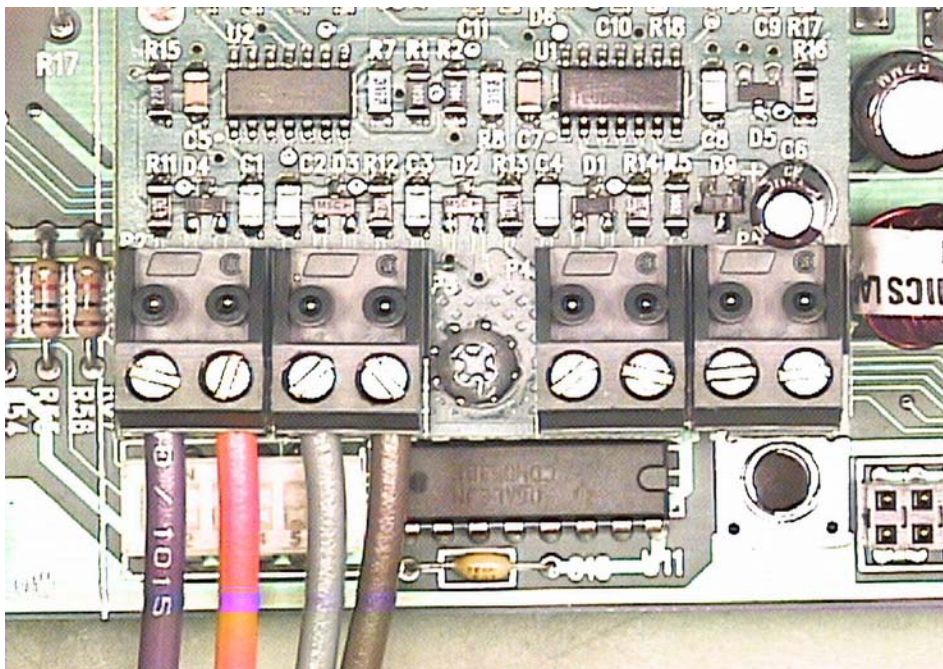
The output from the chart recorder board is a relative value based upon the thermistor airflow probe value during the BSC calibration process. The output value is not absolute (i.e. 0 to 10 VDC equals 0 to 2000 CFM), but is established from the calibration point and using the change in output values establishing the airflow velocity or volume voltage or current output relative to the original calibration point.

For example, a NuAire Model NU-430-600 has a nominal setpoint of 60 FPM downflow and 1100 CFM exhaust flow. Once the unit is calibrated at these values, the voltage output from the chart recorder board is measured at 4.3 VDC for the downflow output and 5.6 VDC for the exhaust output, respectively.

Description	Downflow	Exhaust Flow
Change in Output Conversion Factor	1 FPM = .05 VDC	4 CFM = .05 VDC
Nominal Airflow	60 FPM = 4.3 VDC	1100 CFM = 5.6 VDC
Scale Examples	50 FPM = 3.8 VDC 70 FPM = 4.8 VDC	1000 CFM = 4.35 VDC 1200 CFM = 6.85 VDC

The voltage output could have measured any voltage between 0 to 10 VDC. The change in output conversion factor was then applied to the nominal airflow value to determine the scale, which can be taken as high or low as described. Note, each BSC will have a different scale and are not adjustable.

The chart recorder board is installed just behind the heatsink on the open single row multiple pin header and fastened down with a #6/32 screw. The chart recorder board voltage output wires are taken from the main control board, as shown below, located in the control center and can be routed up to the top of the left side window faring or as desired.



Down Flow Monitor      In Flow Monitor

If any questions arise during the installation process, please call NuAire Technical Service at 1-800-328-3352 or 763-553-1270.

## **WARRANTY**

NuAire, Inc., warrants that it will repair F.O.B. its factory or furnish without charge F.O.B. its factory, a similar part to replace any material in its equipment within 12 months after the date of sale if proved to the satisfaction of the company to have been defective at the time it 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. Prior to returning any item, for any reason, contact NuAire, Inc. for a Return Authorization Number. This number must accompany all returns. Any product shipped to NuAire without this number will be returned, refused shipment, or collect freight.

## **SHIPMENTS**

NuAire, Inc. takes every reasonable precaution to assure that your Incubator, and or hardware, arrive without damage. Motor carriers are carefully selected and shipping cartons have been specifically designed to insure your purchase. However, damage can occur in any shipment and the following outlines are steps you should take on receipt of a NuAire Incubator, and or hardware, to be sure that if damage has occurred, the proper claims and actions are taken immediately.

## **DAMAGED SHIPMENTS**

Terms are factory, unless stated otherwise. Therefore, it is important to check each shipment before acceptance.

If there is visible damage, the material can be accepted after the driver makes a notation on the consignee's copy of the freight bill. Then an inspection must be made to verify the claim against the carrier. This inspection is the basis of your filing the claim against the carrier.

If concealed damage is found, it is absolutely necessary to NOTIFY THE FREIGHT AGENT AT ONCE, and request an inspection. Without this inspection, the transportation company may not accept a claim for loss or damage. If the carrier will not perform the inspection, an affidavit must be prepared stating that he was contacted on a certain date and that he failed to comply with the request. This along with other papers in the customer's possession will support the claim.