

Vented Enclosure

Model
NU-819-300/400
Portable Bench Top

Operation & Maintenance Manual

June, 2008
Revision 4

Manufactured By:
NuAire, Inc.
2100 Fernbrook Lane
Plymouth, MN 55447
Toll-Free: 1-800-328-3352
In Minnesota: (763)-553-1270
Fax: (763)-553-0459

ABOUT THIS OPERATION & MAINTENANCE MANUAL

The information contained in this manual is intended to reflect our current production standard configuration model along with the more frequently purchased options. Any unique additions/modifications/shop drawings are appended in the back flap of this manual, along with any modifications and/or additions to procedures as outlined in this manual. A copy of the original factory test report is also appended to this manual. In case this manual and/or test report is lost or misplaced, NuAire retains a copy in our files. A replacement copy can be obtained by calling or writing NuAire, Inc. stating the model number and serial number and a brief description of the information desired.

**Vented Enclosure
Models NU-819-300/400
Operation & Maintenance Manual**

TABLE OF CONTENTS

Section No. 1.....	General Description
Section No. 2.....	Performance Parameters
Section No. 3.....	Models & Features
Section No. 4.....	Test Performance & Procedures
Section No. 5.....	Warranty
Section No. 6.....	Shipments
Section No. 7.....	Installation Instructions
Section No. 8.....	Certification
Section No. 9.....	Operating Guidelines
Section No. 10.....	Cleaning & Material Compatibility
Section No. 11.....	Disposal and Recycle

Manual Drawings

BCD-12646.....	NU-819-300 Specification Drawing
BCD-12647.....	NU-819-400 Specification Drawing

Assembly Drawings

BCD-12648.....	NU-819 Mass Airflow Monitor Installation
BCD-11753.....	NU-819 Base Stand Assembly

**Vented Enclosure
Model
NU-819-300/400
Portable Bench Top
Manufactured By:
NuAire, Inc. - Plymouth, Minnesota, USA**

1.0 General Description

1.1 The NuAire Vented Enclosure, when connected to an external vacuum source, provides personnel protection for handling low risk aerosols and particulate matter. It may also provide personnel protection from solvents, such as those employed in cytology. However, with the Enclosure being constructed of acrylic materials, a material compatibility evaluation should be made (see Cleaning Material & Compatibility section 10.0) to assure that no degradation occurs.

1.2 Explanation of Symbols



WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION:

CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

CAUTION

CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.



Potential electrical hazard, only qualified person to access.



NOTE:

Used for important



Ground, Earth



Lead Free

2.0 Performance Parameters

2.1 Standard Features

2.1.1 The NU-819 Enclosure is intended to be connected to an external vacuum source for operation.

2.1.2 The Enclosure provides a partially enclosed work space into which room air is drawn to form an air barrier for personnel protection. The recommended inflow velocity is from 75 to 100 fpm (.38 to .51 m/s) provided by an external vacuum source (i.e. NuAire Model NU-819-001 blower module or customer's building exhaust system).

2.1.3 The Enclosure air barrier inflow velocity is recommended for operation at 75 to 100 fpm (.38 to .51 m/s). The following table lists inflow velocity and its required exhaust volume.

NU-819-300	75 fpm (.38 m/s) 145 CFM (246 CMH) @ .2 inches (5mm) w.g.	100 fpm (.51 m/s) 193 CFM (328 CMH) @ .2 inches (5mm) w.g.
------------	---	--

NU-819-400	75 fpm (.38 m/s) 195 CFM (331 CMH) @ .4 inches (10mm) w.g.	100 fpm (.51 m/s) 260 CFM (442 CMH) @ .4 inches (10mm) w.g.
------------	--	---

2.1.4 The Enclosure worksurface is constructed from Epoxy Resin. The worksurface is dished at the front of the work access opening for spill protection.

2.1.5 The Enclosure has two 1-1/4 inch (32mm) service access ports for electrical wires or tubing.

2.2 Optional Features

2.2.1 The base support stand is constructed from 16-gauge, all welded steel tubing finished in textured baked urethane. The base support stand provides worksurface heights of 30 inches or 36 inches (762mm or 914mm) respectively. Adjustable leg levelers are provided. The base support stand is shipped knocked-down for on-site assembly.

2.2.2 NU-AIN-200 Airflow Monitor

This system automatically warns of a low airflow condition by audio and visual means, providing a stable, repeatable signal.

A green indicator on the front of the monitor indicates normal flow conditions. When flow conditions lower than setpoint are encountered, a red indicator is activated along with an audible horn.

The NU-AIN-200 Airflow Monitor Pressure System is contained in PVC housing and comes complete with an internal power supply/power cord, tubing, and tubing adapter.

3.0 Models & Features

The NU-819 comes in two standard sizes: 36" (914mm) (Model 300) and a 48" (1219mm) width (Model-400).

Overall Dimensions: Inches (mm)	<u>NU-819-300</u>	<u>NU-819-400</u>
Width	36" (914)	48" (1219)
Depth	31-3/4" (806)	31-3/4" (806)
Height	22-7/8" (581)	22-7/8" (581)

Work Area Dimensions: Inches (mm)		
Width	34-3/4" (883)	46-3/4" (1187)
Depth	21-1/4" (540)	21-1/4" (540)
Height	18-1/8" (460)	18-1/8" (460)

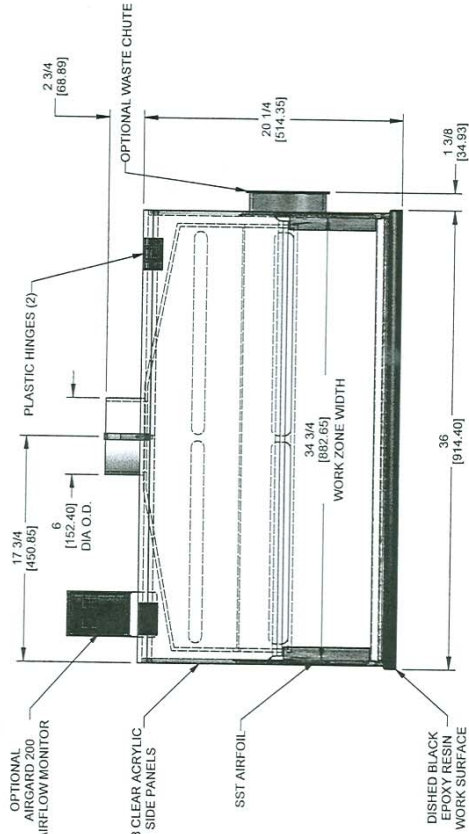
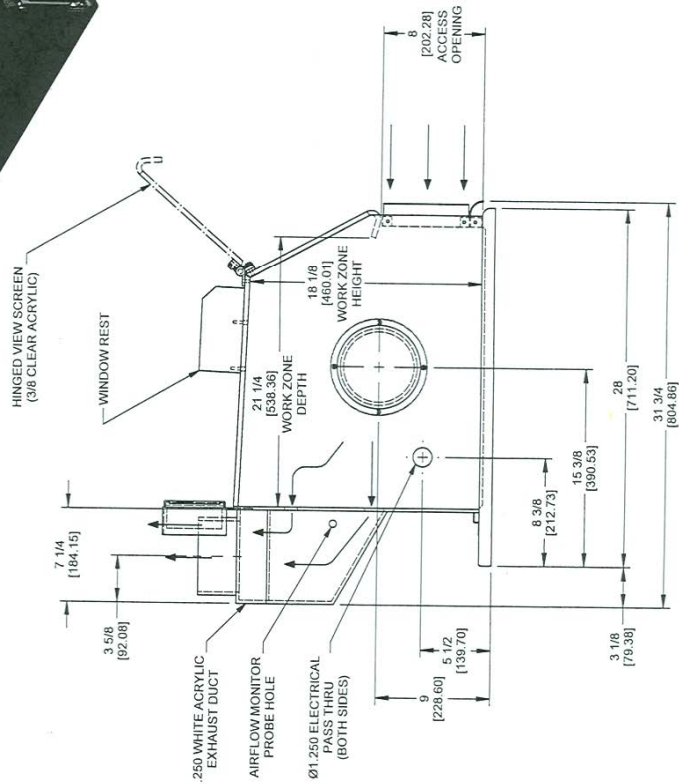
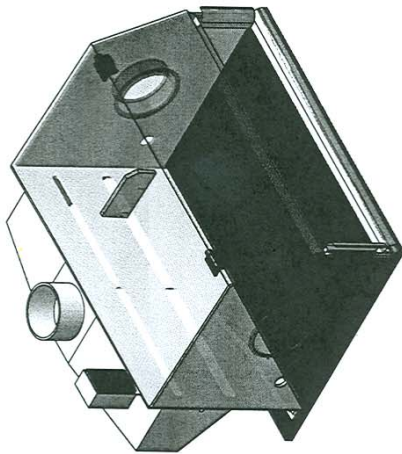
Standard Features

Top/Side Panels of 3/8" (10mm) Thick Clear Acrylic
Viewing Window of 3/8" (10mm) Thick Clear Acrylic
Back Panel of 1/4" (6mm) White Acrylic
Hinged Viewing Window with Detent
Two Service Ports
Recommended Inflow Velocity 75-100 FPM (.38 to .51 m/s)
Dished Epoxy Resin Worksurface

Optional Features

30" Support Stand
36" Support Stand
Low Airflow Alarm

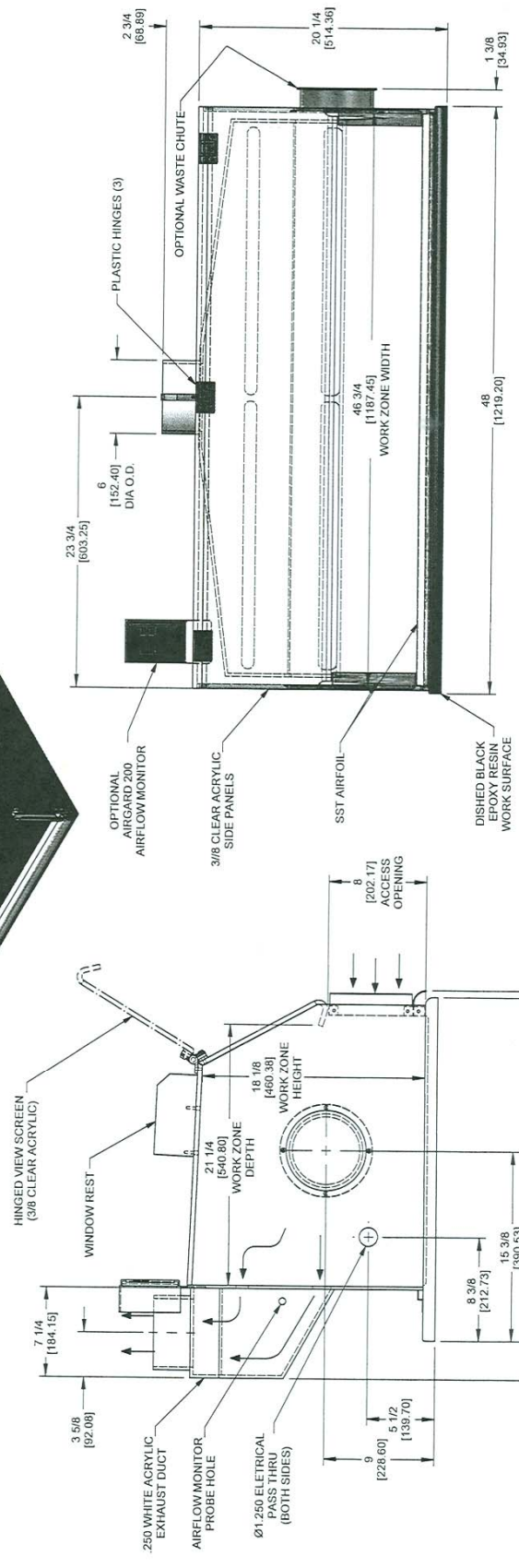
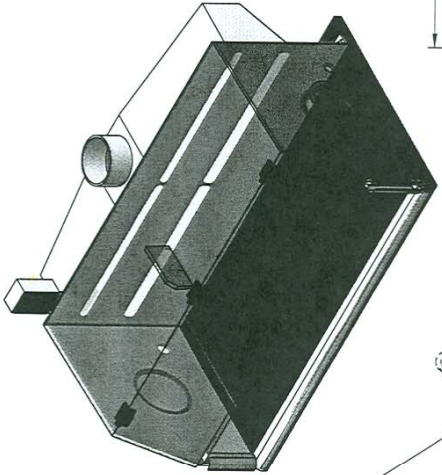
REV	ECO	DESCRIPTION	DATE	DFTM	CHKD
B	10317	UPDATED DIMENSIONS	12/17/2008	PL	MSS



TITLE		NU-819-300 S-20		CLASS I ENCLOSURE	
DFTM	DATE	CHKD	SHEET	1	OF
LS	6/9/2008	MSS			1
DRAWING NUMBER			BCD-12646		
					B

ORIGINAL

REV	ECO	DESCRIPTION	DATE	DFTM	CHKD
B	10317	UPDATED DIMENSIONS	12/17/2008	PL	MSS



TITLE		NU-819-400 S-20	
CLASS I ENCLOSURE			
DFTM	DATE	CHKD	SHEET
L.S.	6/6/2008	MSS	1 OF 1
DRAWING NUMBER		BCD-12647	

ORIGINAL

4.0 Test Performance & Procedures

The Enclosure is thoroughly inspected at the NuAire factory at the time of shipment. Quality Control is maintained by constant surveillance over the product, beginning at the receipt of purchased material and concluding with a final inspection, as well as any unique customer requirements. The Enclosure design has been tested at the NuAire factory to meet the personnel protection requirements of ASHREA 110-1995 and NSF Standard 49. Each Enclosure is inspected to meet the design requirements. Upon installation, field tests should be performed, as stated below, to assure proper performance.

4.1 Air Velocity/Volume at Work Access Opening

The air velocity or volume shall be measured at the work access opening using either a thermoanemometer or flowhood. The air velocity measurements shall be taken on a 6 inch (152mm) grid, in a vertical plane of the window at 25% and 75% of the work access opening height. The air volume measurements shall be taken using a flowhood. The flowhood should be taped to the Enclosure to assure all airflow moves through the flowhood. The average inflow air velocity shall be 75 to 100 fpm (.38 to .51 m/s).

4.2 Smoke Flow Patterns

Smoke is passed 1-1/2 inches (38mm) in front of the entire perimeter of the work access opening. All smoke shall be pulled inward.

5.0 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 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.

6.0 Shipments

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

6.1 Damaged Shipments

- 6.1.1** Terms are factory, unless stated otherwise. Therefore, it is important to check each shipment before acceptance.
- 6.1.2** 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.
- 6.1.3** 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.

7.0 Installation Instructions

Within the laboratory, pharmacy, etc., the ideal location of the Vented Enclosure is away from personnel traffic lanes, air vents (in or out), doors and/or any other source of disruptive air currents.

If drafts or other disruptive air currents exceed the intake velocity of the cabinet through the access opening, the potential exists for contaminated air to exit the cabinet. It depends on the severity of the air current. Remember; a Vented Enclosure is no substitute for good laboratory technique.

The Vented Enclosure's worksurface is shipped loose from the Acrylic Enclosure. The Acrylic Enclosure should be placed within the groove cutout on the worksurface. The gap between the worksurface and Enclosure may be filled with silicon RTV, if desired, to prevent materials from getting into the gap.

Service access ports, 1-1/4 inches (32mm) in diameter are located on each side of the Enclosure. The service access ports may be used for either electrical wires or tubing as necessary. All applicable safety precautions should be taken when setting up the Vented Enclosure.

8.0 Certification

After installation and prior to use, NuAire recommends that the cabinet be certified to factory standards. At a minimum, the following tests should be performed (see Section 4.0):

1. Airflow velocity
2. Airflow smoke patterns

Of these tests, in order to insure that no disruptive air currents are penetrating the air inflow barrier, smoke flow tests must be performed at a minimum. These tests must result in the containment of smoke passed around the perimeter of the work access opening. A smoke source shall be passed along the entire perimeter of the work opening edges, approximately 1.5 inches (38mm) outside the cabinet. No smoke shall be refluxed out of the cabinet once the smoke has been drawn in.

IT IS RECOMMENDED THAT THESE TESTS BE PERFORMED BY A QUALIFIED TECHNICIAN WHO IS FAMILIAR WITH THE METHODS AND PROCEDURES FOR CERTIFYING BIOLOGICAL SAFETY CABINETS.

After the initial certification, NuAire recommends that the cabinet be recertified at a minimum on an annual basis, or after any maintenance action or any time the operator feels it is necessary. Note that the Vented Enclosure provides premium performance; Quality Control in both design and manufacturing assure superior reliability. However, protection to the operator is so vital that certification to the performance requirements should be accomplished as stated to insure safety established by the factory standards.

9.0 Operating Guidelines

9.1 The intent herein is to present general operating guidelines that will aid in the use of the Vented Enclosure to control airborne contaminants of low to moderate risk.

9.2 Procedure protocols defined in terms of the barrier of control concepts unique to Vented Enclosures must be developed in order to obtain a maximum potential for safety and protection. The pre-planning necessary to develop these protocols is based on several fundamental considerations, each of which will contribute to optimum benefits from the equipment:

- a. Minimize disruption of "air curtain"
- b. Minimize room activity
- c. Employ proper techniques

9.3 The minimum number of items necessary should be placed into the hood to prevent overloading, but the work should also be planned to minimize the number of times an operator's hands and arms must enter and leave the air curtain at the open face. The ideal situation is to have everything needed for the complete procedure placed in the Enclosure before starting, so that nothing need pass in or out through the air barrier at the face until the procedure is completed. This is especially important in working with moderate risk agents.

9.4 Minimize Room Activity

Activity in the room itself should be held to a minimum. Unnecessary activity may create disruptive air currents as well as interfere with the work of the operator. A person walking past the front of the Enclosure can cause draft velocities up to 175 fpm (.88 m/s), which are sufficient to disrupt the air barrier provided by the work access opening.

9.5 Employ Proper Technique

The operator must not assume an attitude of "let the cabinet do it" during this procedure within a Vented Enclosure. Properly used, the Enclosure will do an excellent job of containing viable or toxic agents. This precaution is merely an extension of proper technique as practiced on open bench tops. The good laboratory practices designed to minimize creating and/or release of aerosols to the environment should not be discontinued.

Items of equipment in direct contact with the etiological agent must remain in the Enclosure until enclosed or until surface-decontaminated. Trays of discard pipettes must be covered before removal from the Enclosure (aluminum foil may substitute for fabricated covers).

If an accident occurs which spills or splatters suspensions of etiologic agent around the work area, all surfaces and items in the Enclosure must be surface-decontaminated before being removed.

In brief, the consideration which should be made in order to obtain optimal personnel safety may be reiterated:

- a. Pre-plan the procedures carefully
- b. Minimize disruption of the "air curtain"
- c. Employ proper techniques

9.6 Operating Sequence

Start Up - Turn on exhaust system, check air intake and exhaust portals of the cabinet to make sure they are unobstructed.

Allow exhaust system to operate for a minimum of 5 minutes before manipulations are begun in the Enclosure.

9.7 Wipedown for Enclosure Operation

The interior surfaces of the work space should next be disinfected by wiping them thoroughly with the appropriate cleaning or disinfectant solution (see Cleaning & Material Compatibility Section 10.0).

9.8 Materials & Equipment

The apparatus and materials should next be placed into the Enclosure. Materials should be arranged so that clean, dirty (used), and virus materials are well separated. Passage of contaminated materials over uninoculated cultures or clean glassware should be avoided and transfer of viable materials should be performed as deeply into the cabinet (away from open face) as possible.

9.9 Air Purge

Additional purging of the work space without user activity should be allowed for 2-3 minutes after materials and apparatus have been placed in it. This will rid the area of all "loose" contamination that has been introduced with the items.

9.10 Perform work

The work can now be performed. The technician performing the work is encouraged to wear a long-sleeved gown with knit cuffs and rubber gloves. This will protect the hands and arms from viable agent and chemical contamination. At a minimum, the hands and arms should be washed well with germicidal soap before and after work.

9.11 Terminal Purging & Wipedown

Following completion of the work, allow the hood to run for a 2-3 minute period without personnel activity to purge the unit. The decontamination of the interior surfaces should be repeated after removal of all materials, culture, apparatus, etc. A careful check of grills and diffuser grids should be made for spilled or splashed nutrients which may support fungus growth and resulting spore liberation that contaminates the protected work environment.

9.12 Shut Down

Turn off blowers. Do not use Enclosure as a depository for excess laboratory equipment during periods of non-operation.

10.0 Cleaning & Material Compatibility

10.1 Cleaning Acrylic Enclosure

A liquid detergent and water solution is recommended to clean acrylic. DO NOT USE ABRASIVE CLEANERS, SUCH AS AJAX, SOFT SCRUB, ETC. ON ACRYLIC. The following brand name cleaners have been found to work well with acrylic materials.

Fantastik household cleaner
Glass Plus cleaner
Formula 409 household cleaner
Cinch household cleaner

Scratches and abrasions may be buffed out using commercial polishing materials. Use of alcohol greater than 30% and acetone can cause irreversible damage and is not recommended (see Cleaning & Material Compatibility Section 10.0).

10.2 Material Compatibility of Acrylic Enclosure

The table below gives an indication of the chemical resistance of Acrylic sheet. The code used to describe chemical resistance is as follows:

R = Resistant

Acrylic withstands this substance for long periods and at temperatures up to 120°F (49°C).

LR = Limited Resistance

Acrylic only resists the action of this substance for short periods at room temperatures. The resistance for a particular application must be determined.

N = Not Resistant

Acrylic is not resistant to this substance. It is either, swelled, attached, dissolved or damaged in some manner.

Plastic materials can be attacked by chemicals in several ways. The methods of fabrication and/or conditions of exposure of acrylic sheet as well as the manner in which the chemicals are applied, can influence the final results even for "R" coded chemicals. Some of these factors are listed below:

Fabrication - Stress generated while sawing, sanding, machining, drilling, and/or forming.

Exposure - Length of exposure stresses induced during the life of the product due to various loads, changes in temperatures, etc.

Application of Chemicals - by contact, rubbing, wiping, spraying, etc.


NuAire would not recommend the use of any LR and N rated materials. R rated materials should be tested with sample material to assure that no degradation will occur.

The table should therefore be used only as a general guide and, in case of doubt; it should be supplemented by tests made under actual working conditions.

Chemical	Code	Chemical	Code
Acetic Acid (5%)	LR	Hydrogen Peroxide (3%)	R
Acetic Acid (Glacial)	N	Hydrogen Peroxide (28%)	LR
Acetone	N	Isopropyl Alcohol	LR
Ammonium Chloride	R	Kerosene	R
Ammonium Hydroxide (10%)	R	Lacquer Thinner	N
Ammonium Hydroxide (Conc.)	R	Methyl Alcohol (30%)	LR
Aniline	N	Methyl Alcohol (100%)	N
Battery Acid	R	Methyl Ethyl Ketone (MEK)	N
Benzene	N	Methylene Chloride	N
Butyl Acetate	N	Mineral Oil	R
Calcium Chloride (Sat.)	R	Nitric Acid (10%)	R
Calcium Hypochlorite	R	Nitric Acid (40%)	LR
Carbon Tetrachloride	LR	Nitric Acid (Conc.)	N
Chloroform	N	Oleic Acid	R
Chromic Acid	LR	Olive Oil	R
Citric Acid (10%)	R	Phenol Solution (5%)	N
Cottonseed Oil (Edible)	R	Soap Solution (Mild dish soap)	R
Detergent Solution (Heavy Duty)	R	Sodium Carbonate (2%)	R
Diesel Oil	R	Sodium Carbonate (20%)	R
Diethyl Ether	N	Sodium Chloride (10%)	R
Dimethyl Formamide	N	Sodium Hydroxide (1%)	R
Diethyl Phthalate	N	Sodium Hydroxide (10%)	R
Ethyl Acetate	N	Sodium Hydroxide (60%)	R
Ethyl Alcohol (30%)	LR	Sodium Hypochlorite (5%)	R
Ethyl Alcohol (95%)	N	Sulfuric Acid (3%)	R
Ethylene Dichloride	N	Sulfuric Acid (30%)	R
Ethylene Glycol	R	Sulfuric Acid (Conc.)	N
Gasoline	LR	Toluene	N
Glycerine	R	Transformer Oil	R
Heptane	R	Trichloroethylene	N
Hexane	R	Turpentine	R
Hydrochloric Acid	R	Water	R
Hydrofluoric Acid (25%)	N	Xylene	N

11.0 Disposal and Recycle

Blower modules that are no longer in use and are ready for disposal contain reusable materials. ALL components with the exception of the charcoal filters may be disposed and/or recycled after they are known to be properly disinfected.

 NOTE: Follow all local, state and federal guidelines for disposal of charcoal filter solid waste.



CAUTION Prior to any disassembly for disposal, the blower module must be decontaminated.



RECYCLE




LEAD FREE

Component

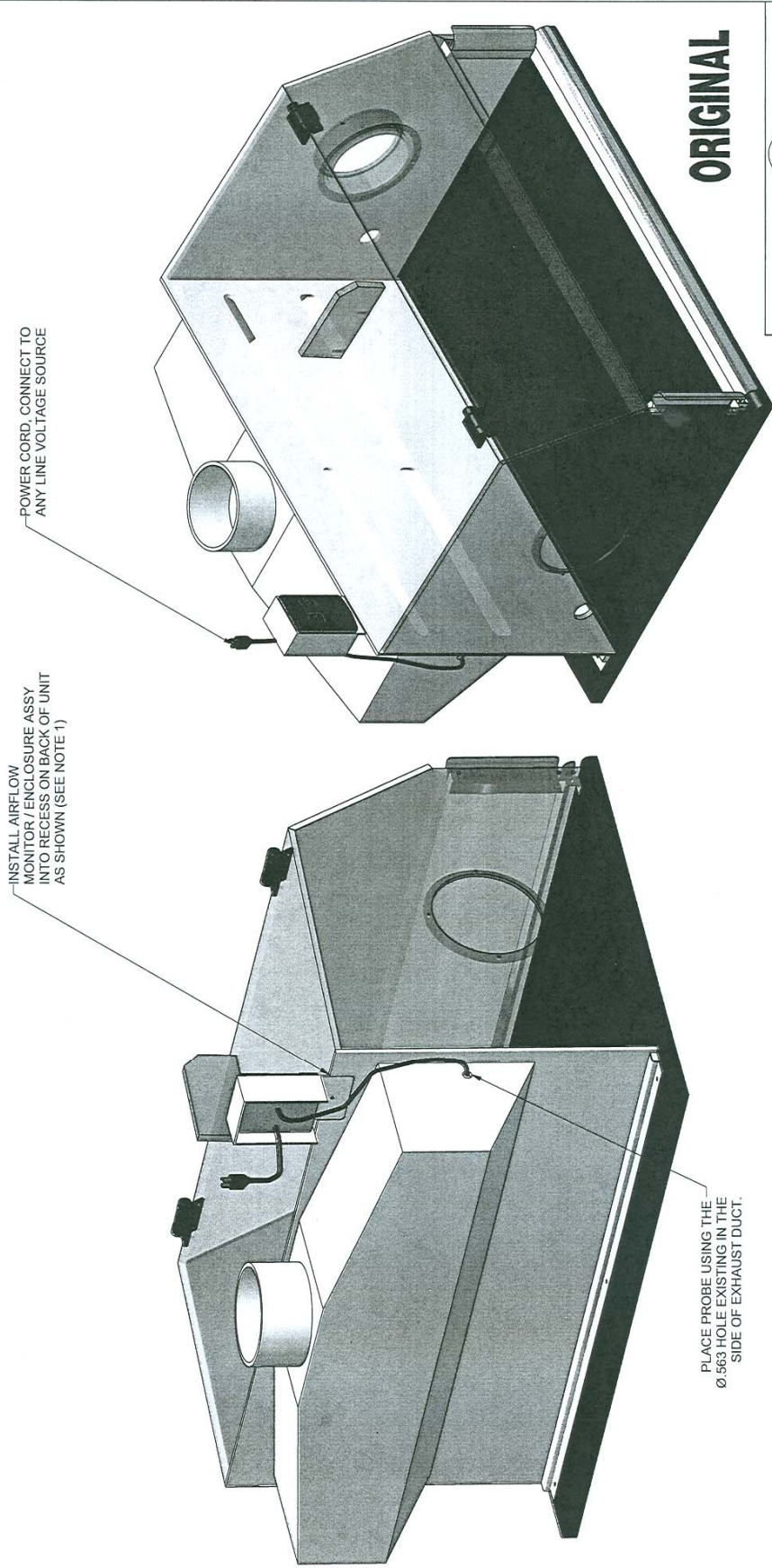
Enclosure
Worksurface
Airfoils
Hardware
Flexduct

Material

Acrylic
Epoxy Resin
Stainless Steel
Stainless Steel and Steel
Steel and PVC

 NOTE: Material type can be verified with use of a magnet with stainless and aluminum being non-magnetic.

REV	ECO	DESCRIPTION	DATE	DFTM	CHKD
A	10153	RELEASED TO PRODUCTION	6/9/2008	LS	MSS

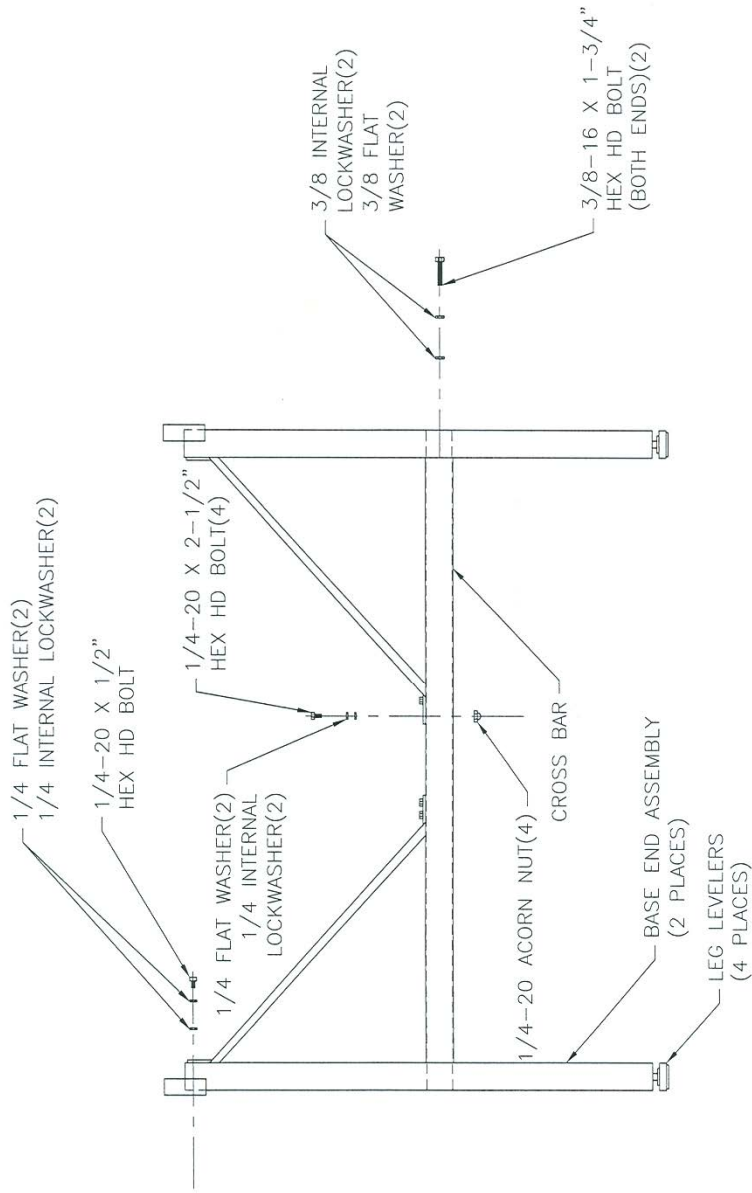


ORIGINAL

TITLE					
NU-819 MASS AIRFLOW MONITOR INSTALLATION					
DFTM	DATE	CHKD	SHEET	1	OF
LS	6/9/2008	MSS			1
DRAWING NUMBER			BCD-12648		
			A		

NOTE:
1. LOCATE MONITOR INTO RECESS, LOCATE AND MARK THRU SCREW HOLE IN ENCLOSURE. DRILL AND TAP #8-32.

REV	ECO	DESCRIPTION	DATE	DRF	CHKD
A	9612	RELEASED TO PRODUCTION	06/13/08	LS	



ORIGINAL



NU-813/819
BASE STAND

ASSEMBLY INSTRUCTIONS

DFTM/LS 12/28/06 | CHKD/BP | SHEET 1 OF 1

DRAWING NUMBER
BCD-11753 A