FumeGard Polypropylene Fume hoods
Models NU-162/164/E
Bench Top
Operation & Maintenance Manual

April, 2021
Revision 13

230VAC Only

Manufactured By:
NuAire, Inc.
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About This Operation and Maintenance Manual

The information contained in this manual is intended to reflect our current production, standard configuration models, along with the more frequently purchased options. Because this product is designed to conform to a wide variety of unique customer requirements/options/equipment, any modifications, additions and/or shop drawings are appended in the back flap of this manual, as well as any product test procedures/performance test procedures that may impact the performance of this product according to established test procedures (i.e. SEFA-5th Edition Desk Reference, ASHRAE 110-2016, etc.) for fume hoods. All fume hoods are factory tested to SEFA-5th Edition Desk Reference under controlled (ideal) laboratory environmental conditions, and 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, Inc. retains a copy in our files. A replacement copy can be obtained by calling or writing to NuAire, Inc. stating the model number, job location or serial number and a brief description of the information desired. NuAire, Inc. reserves the right to alter/modify our standard configuration production model in order to provide you, our valued customer, and the best possible fume hood.

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1.0 General Information

1.1 Description

A laboratory fume hood is defined to be a ventilated enclosure designed to capture, contain, and exhaust fumes, gases, vapors, mists, aerosols, and to a lesser extent, particulate matter generated within the hood interior. The enclosure generally consists of rear, side, and top panels with an open face, typically provided with a means to adjust the face opening via a vertical or horizontal sliding sash.

The capture effectiveness of a laboratory fume hood not only depends on a properly designed and balanced hood, but also on the laboratory environment in which the hood is expected to perform. This includes the exhaust system (ducting and blower); make up (supply) air distribution within the laboratory, and the intended application or procedure to be used in the hoods. Careful selection and coordination of the above components will provide a safe and functional fume removal system.

Fume hoods can be constructed from a wide variety of materials; painted cold-rolled steel, fiberglass, specially coated cold-rolled steel, stainless steel, acrylic, PVC and/or thermoplastics. The selection of hood construction material is totally dependent on the intended application. All NuAire fume hoods are constructed from stress relieved white polypropylene, 100 percent metal free, and intended for use in high acid environments, in the fields of trace metal analysis, materials analysis, toxicology, semi-conductor development, prototype/production and/or etching/plating operations. Polypropylene's excellent overall solvent/acid resistance makes this fume hood an excellent choice for long lasting, highly corrosive resistant, metal free applications.

1.2 Fume hood Types

1.2.1 Conventional Hoods

An enclosure without an airfoil directional vane across the bottom of the access opening and without a bypass, as the sash is lowered; the face velocity increases rapidly and may become objectionably high as the sash is closed. With the sash completely closed, airflow through the hood is insufficient to carry vapors away. Conventional hoods are potentially subject to interior rolling or turbulence caused by, for the most part, the increased face velocities as the sash is lowered. This may bring fumes from the hood interior out to the hood face, where room air currents and/or laboratory personnel may cause fumes to escape the hood face.

1.2.2 Bypass Air Hood

A conventional hood that has a bypass, protected by a grill, which maintains a relatively constant volume of airflow through the hood and as the sash is closed, air is bypassed at the top of the hood, causing the hood face velocity to increase much less rapidly than a conventional hood.

A deflector vane or airfoil across the bottom of the hood face opening that directs airflow across the work surface is usually provided. The deflector vane provides a permanent opening even when the sash is closed, exhausting the majority of air through the bypass.

1.2.3 Auxiliary Air Hood

An Auxiliary Air Hood is the same as a bypass air hood with the addition of an auxiliary air bonnet on top of the hood that provides a direct source of make-up air (i.e. an "air-wash" directed down toward hood face opening), in addition to the make-up air provided to the laboratory. Auxiliary air hoods purport to improve capture effectiveness of laboratory hoods as well as save conditioned air. Present experience, however, has shown that these claims may have dubious value in that: (1) the auxiliary air must be tempered for operator/laboratory comfort, (2) the cost of providing a separate auxiliary air supply may have negligible payback, and (3) the improved capture effectiveness of the hood has not been demonstrated with existing test procedures.

1.2.4 Special Purpose Hoods

1.2.4.1 Radioisotope Hoods

Radioisotope Hoods are designed primarily for use with radioactive chemicals and require special treatment. These hoods must be designed for cleanability, typically requiring all-welded stainless steel interiors as well as exhaust air treatment such as HEPA/charcoal filtration. Polypropylene is unsuitable as a construction material.

1.2.4.2 Perchloric Acid Hoods

Hoods for use with perchloric acid require very special treatment. Perchloric acid will form explosive salts particularly if in contact with organic chemicals. These hoods require treatment of exhaust air with scrubbers, wash-down hood plenums, and duct water spray treatment in order to minimize the build-up of explosive salts. Depending upon the concentration of perchloric acid, polypropylene may be suitable construction material.

1.2.4.3 Walk-In Hoods

Walk in hoods are primarily designed with extra interior height to accommodate tall equipment.

1.3 Safety Instructions

These safety instructions describe the safety features of the Model NU-162/164/E.
The fume hood has been manufactured using the latest technological developments and has been thoroughly tested before delivery. **However, the fume hood may present potential hazards if it is not installed and used as instructed for its intended purpose or outside of operating parameters.**
Therefore, the following procedures must always be observed:

- The fume hood must be operated only by trained and authorized personnel.
- For any operation of this fume hood, the operator must prepare clear and concise written instructions for operating and cleaning, utilizing applicable safety data sheets, plant hygiene guidelines, and technical regulations, in particular.
    - Which decontamination or deactivate measures are to be applied for the fume hood and accessories?
    - Which protective measures apply while specific materials are used?
    - Which measures are to be taken in the case of an accident?
- Repairs to the device must be carried out only by trained and authorized expert personnel.
- Keep these operating instructions close to the fume hood so that safety instructions and important information are always accessible.
- Should you encounter problems that are not detailed adequately in the operating instructions, please contact your NuAire Representative of NuAire technical Services.

1.4 Explanation of Symbols

Symbol	Description
	Safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in death of serious injury.
	Safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
☞	**Note:** Used for important information
	Biohazard
	Hazardous Gases! Personal Protection Equipment Required.
	Chemical Hazard
	Ground, Earth
	Potential electrical hazard, only qualified person to access.
	Flammable Hazard
	Lead Free
CAUTION	CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

2.0 Models & Types

All NuAire FumeGard fume hoods are designed and built to be 100 percent free of all metals, including nylon, using primarily stress relieved white polypropylene as well as other thermoplastics as required (PVC,TFE, PVDF). Within this framework NuAire offers both the conventional fume hood and the by-pass fume hood as a bench top style as standard. The fume hoods are manufactured in 4, 5, 6, or 8 foot widths and offer a choice of either 25-1/2 or 31 1/2 inch work surface depths: A total of 16 different configurations to choose from. The following are the dimensional characteristics for each model series:

2.1 Model NU-162, 24" Bench Conventional Fume hood (Drawing BCD-05783)

Overall Dimension Inches (mm):	**424**	**524**	**624**	**824**
Width	48-½" (1232)	60- ½" (1537)	72- ½" (1842)	96- ½" (2451)
Depth	31- ½" (800)	31- ½" (800)	31- ½" (800)	31- ½" (800)
Height (includes exhaust collar)	60-½" (1537)	60-½" (1537)	60-½" (1537)	60-½" (1537)
Work Area Dimensions				
Width	38-½" (978)	50-½" (1283)	62-½" (1588)	86-½" (2197)
Depth	25-½" (648)	25-½" (648)	25-½" (648)	25-½" (648)
Height (average)	34" (864)	34" (864)	34" (864)	34" (864)
Height (peak)	48" (1219)	48" (1219)	48" (1219)	48" (1219)
Duct Opening	12" (305)	12" (305)	12" (305)	12" (305)
Exhaust CFM @ 100 FPM & 18" Window Access	481 CFM	631 CFM	781 CFM	1081 CFM

2.2 Model NU-162, 30" Bench Conventional Fume hood (Drawing BCD-05783)

Overall Dimension Inches (mm):	**430**	**530**	**630**	**830**
Width	48-½" (1232)	60- ½" (1537)	72- ½" (1842)	96- ½" (2451)
Depth	37- ½" (953)	37- ½" (953)	37- ½" (953)	37- ½" (953)
Height (includes exhaust collar)	60-½" (1537)	60-½" (1537)	60-½" (1537)	60-½" (1537)
Work Area Dimensions				
Width	38-½" (978)	50-½" (1283)	62-½" (1588)	86-½" (2197)
Depth	31-½" (800)	31-½" (800)	31-½" (800)	31-½" (800)
Height (average)	34" (864)	34" (864)	34" (864)	34" (864)
Height (peak)	48" (1219)	48" (1219)	48" (1219)	48" (1219)
Duct Opening	12" (305)	12" (305)	12" (305)	12" (305)
Exhaust CFM @ 100 FPM & 18" Window Access	481 CFM	631 CFM	781 CFM	1081 CFM

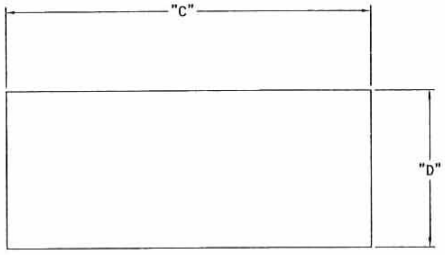
2.3 Model NU-164, 24" Bench By-Pass Fume hood (Drawing BCD-05784)

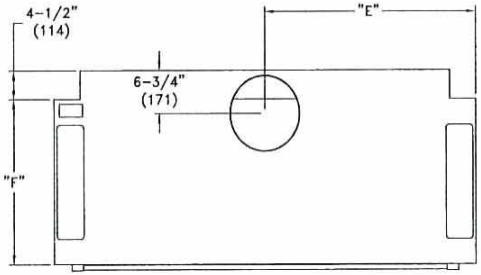
Overall Dimension Inches (mm):	**424**	**524**	**624**	**824**
Width	48-½” (1232)	60- ½” (1537)	72- ½” (1842)	96- ½” (2451)
Depth	34- ½" (876)	34- ½" (876)	34- ½" (876)	34- ½" (876)
Height (includes exhaust collar)	60-½” (1537)	60-½” (1537)	60-½” (1537)	60-½” (1537)
Work Area Dimensions				
Width	38-½” (978)	50-½” (1283)	62-½” (1588)	86-½” (2197)
Depth	25-½" (648)	25-½" (648)	25-½" (648)	25-½" (648)
Height (average)	34” (864)	34” (864)	34” (864)	34” (864)
Height (peak)	48” (1219)	48” (1219)	48” (1219)	48” (1219)
Duct Opening	12” (305)	12” (305)	12” (305)	12” (305)
Exhaust CFM @ 100 FPM & 18" Window Access	506 CFM	665 CFM	823 CFM	1140 CFM

2.4 Model NU-164, 30" Bench By-Pass Fume hood (Drawing BCD-05784)

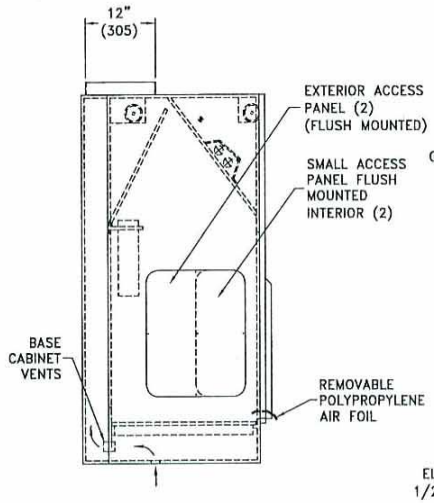
Overall Dimension Inches (mm):	**430**	**530**	**630**	**830**
Width	48-½” (1232)	60- ½” (1537)	72- ½” (1842)	96- ½” (2451)
Depth	40- ½" (1029)	40- ½" (1029)	40- ½" (1029)	40- ½" (1029)
Height (includes exhaust collar)	60-½” (1537)	60-½” (1537)	60-½” (1537)	60-½” (1537)
Work Area Dimensions				
Width	38-½” (978)	50-½” (1283)	62-½” (1588)	86-½” (2197)
Depth	31-½" (800)	31-½" (800)	31-½" (800)	31-½" (800)
Height (average)	34” (864)	34” (864)	34” (864)	34” (864)
Height (peak)	48” (1219)	48” (1219)	48” (1219)	48” (1219)
Duct Opening	12” (305)	12” (305)	12” (305)	12” (305)
Exhaust CFM @ 100 FPM & 18" Window Access	506 CFM	665 CFM	823 CFM	1140 CFM

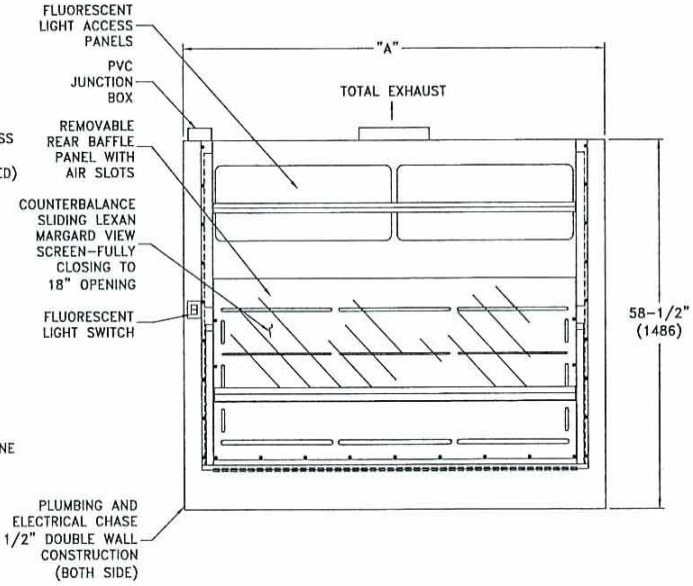
MODEL	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	DIM "F"	TOTAL EXHAUST
NU-162-424	48-1/2" (1232)	31-1/2" (800)	38-1/2" (978)	24-3/4" (629)	24-1/4" (616)	26" (660)	481 CFM
NU-162-430	48-1/2" (1232)	37-1/2" (953)	38-1/2" (978)	30-3/4" (781)	24-1/4" (616)	32" (813)	481 CFM
NU-162-524	60-1/2" (1537)	31-1/2" (800)	50-1/2" (1283)	24-3/4" (629)	30-1/4" (768)	26" (660)	631 CFM
NU-162-530	60-1/2" (1537)	37-1/2" (953)	50-1/2" (1283)	30-3/4" (781)	30-1/4" (768)	32" (813)	631 CFM
NU-162-624	72-1/2" (1842)	31-1/2" (800)	62-1/2" (1588)	24-3/4" (629)	36-1/4" (921)	26" (660)	781 CFM
NU-162-630	72-1/2" (1842)	37-1/2" (953)	62-1/2" (1588)	30-3/4" (781)	36-1/4" (921)	32" (813)	781 CFM
NU-162-824	96-1/2" (2451)	31-1/2" (800)	86-1/2" (2197)	24-3/4" (629)	48-1/4" (1226)	26" (660)	1081 CFM
NU-162-830	96-1/2" (2451)	37-1/2" (953)	86-1/2" (2197)	30-3/4" (781)	48-1/4" (1226)	32" (813)	1081 CFM

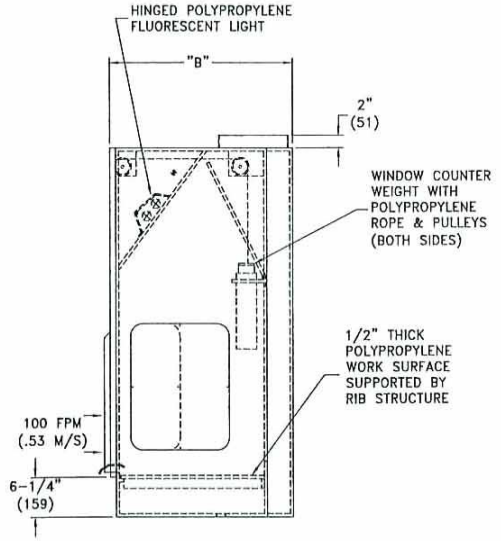




1/2" POLYPROPYLENE
WORK SURFACE





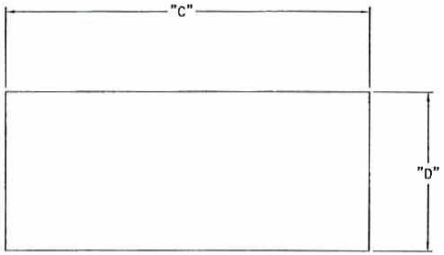


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
-TOLERANCES-
DECIMALS ±.063
ANGLES ±2°

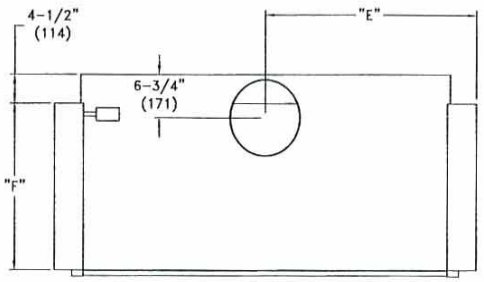
NU-162 STANDARD
POLYPROPYLENE FUME
HOOD BENCH TOP

DFTM	JS	10/05/04	CHKD	BR	SHEET 1 OF 1

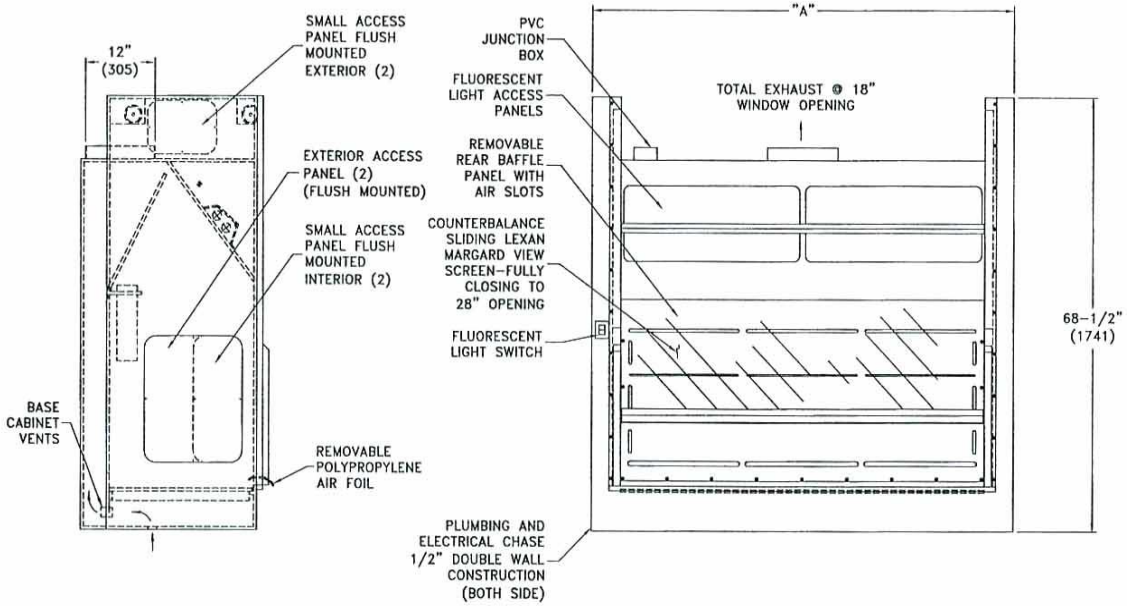
DRAWING NUMBER BCD-05783 E



1/2" POLYPROPYLENE
WORK SURFACE



MODEL	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	DIM "F"	TOTAL EXHAUST
NU-162-424	48-1/2" (1232)	31-1/2" (800)	38-1/2" (978)	24-3/4" (629)	24-1/4" (616)	26" (660)	481 CFM
NU-162-430	48-1/2" (1232)	37-1/2" (953)	38-1/2" (978)	30-3/4" (781)	24-1/4" (616)	32" (813)	481 CFM
NU-162-524	60-1/2" (1537)	31-1/2" (800)	50-1/2" (1283)	24-3/4" (629)	30-1/4" (768)	26" (660)	631 CFM
NU-162-530	60-1/2" (1537)	37-1/2" (953)	50-1/2" (1283)	30-3/4" (781)	30-1/4" (768)	32" (813)	631 CFM
NU-162-624	72-1/2" (1842)	31-1/2" (800)	62-1/2" (1588)	24-3/4" (629)	36-1/4" (921)	26" (660)	781 CFM
NU-162-630	72-1/2" (1842)	37-1/2" (953)	62-1/2" (1588)	30-3/4" (781)	36-1/4" (921)	32" (813)	781 CFM
NU-162-824	96-1/2" (2451)	31-1/2" (800)	86-1/2" (2197)	24-3/4" (629)	48-1/4" (1226)	26" (660)	1081 CFM
NU-162-830	96-1/2" (2451)	37-1/2" (953)	86-1/2" (2197)	30-3/4" (781)	48-1/4" (1226)	32" (813)	1081 CFM



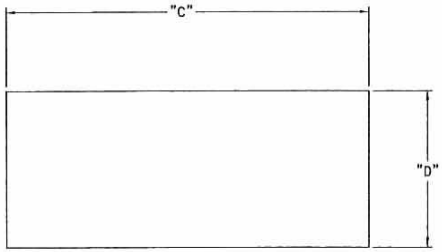
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
-TOLERANCES-
DECIMALS ±.063
ANGLES ±2°

NU-162 28" ACCESS
POLYPROPYLENE FUME
HOOD BENCH TOP

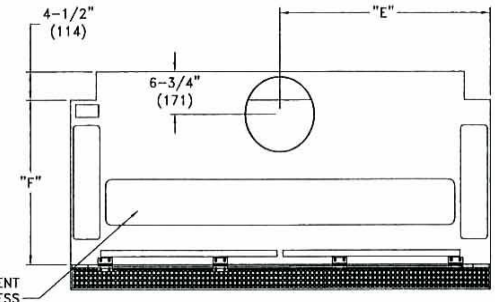
DFTM	JS	10/13/04	CHKD	BR	SHEET 1	OF 1

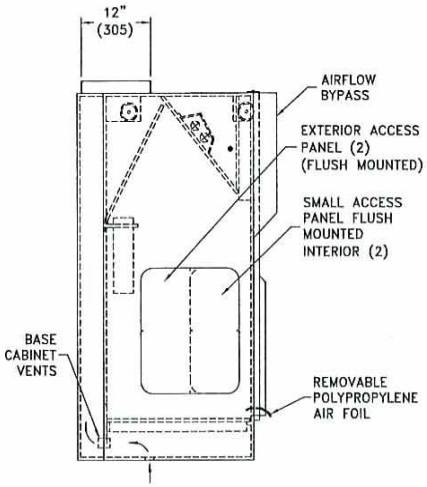
DRAWING NUMBER BCD-05970 D

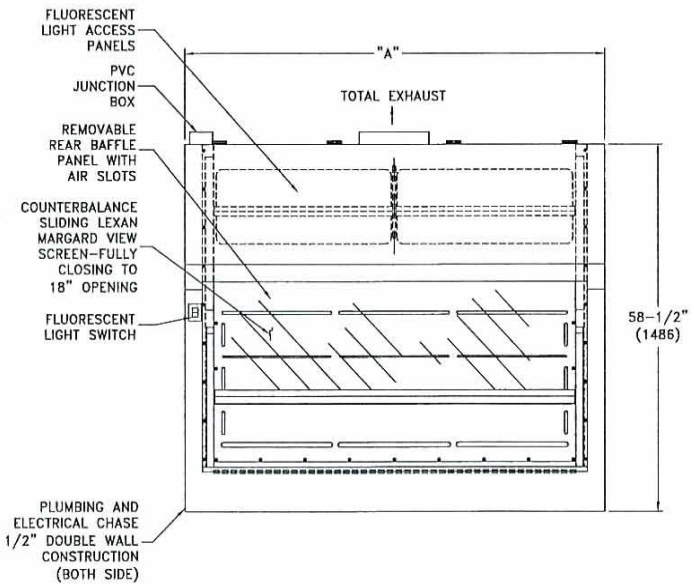
MODEL	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	DIM "F"	TOTAL EXHAUST
NU-164-424	48-1/2" (1232)	31-1/2" (800)	38-1/2" (978)	24-3/4" (629)	24-1/4" (616)	26" (660)	506 CFM
NU-164-430	48-1/2" (1232)	37-1/2" (953)	38-1/2" (978)	30-3/4" (781)	24-1/4" (616)	32" (813)	506 CFM
NU-164-524	60-1/2" (1537)	31-1/2" (800)	50-1/2" (1283)	24-3/4" (629)	30-1/4" (768)	26" (660)	665 CFM
NU-164-530	60-1/2" (1537)	37-1/2" (953)	50-1/2" (1283)	30-3/4" (781)	30-1/4" (768)	32" (813)	665 CFM
NU-164-624	72-1/2" (1842)	31-1/2" (800)	62-1/2" (1588)	24-3/4" (629)	36-1/4" (921)	26" (660)	823 CFM
NU-164-630	72-1/2" (1842)	37-1/2" (953)	62-1/2" (1588)	30-3/4" (781)	36-1/4" (921)	32" (813)	823 CFM
NU-164-824	96-1/2" (2451)	31-1/2" (800)	86-1/2" (2197)	24-3/4" (629)	48-1/4" (1226)	26" (660)	1140 CFM
NU-164-830	96-1/2" (2451)	37-1/2" (953)	86-1/2" (2197)	30-3/4" (781)	48-1/4" (1226)	32" (813)	1140 CFM

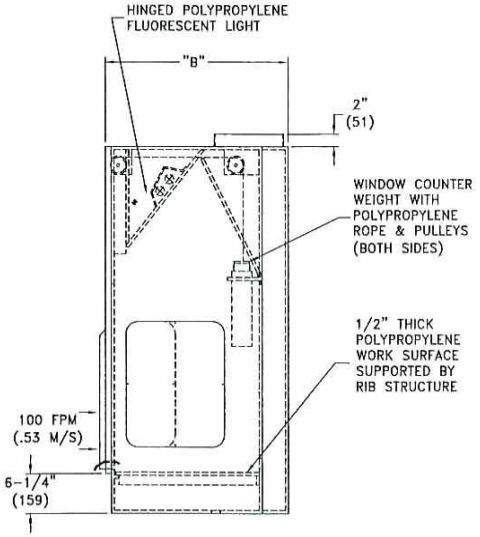


1/2" POLYPROPYLENE WORK SURFACE







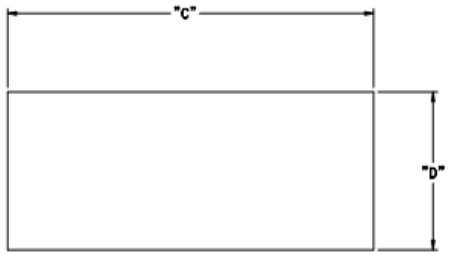


UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
-TOLERANCES-
DECIMALS ±.063
ANGLES ±2°

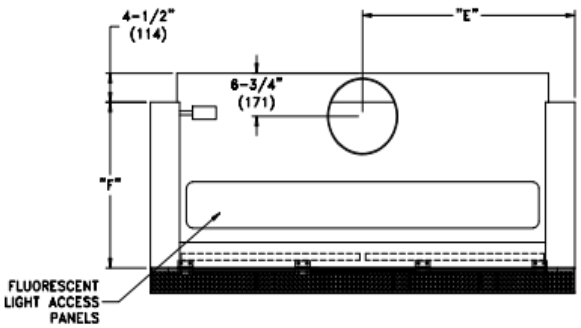
NU-164 STANDARD POLYPROPYLENE FUME HOOD BENCH TOP

DFTM	JS	10/18/04	CHKD	BR	SHEET 1 OF 1

DRAWING NUMBER BCD-05784 D



1/2" POLYPROPYLENE
WORK SURFACE



MODEL	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	DIM "F"	TOTAL EXHAUST
NU-164-424	48-1/2" (1232)	31-1/2" (800)	38-1/2" (978)	24-3/4" (629)	24-1/4" (616)	26" (660)	506 CFM
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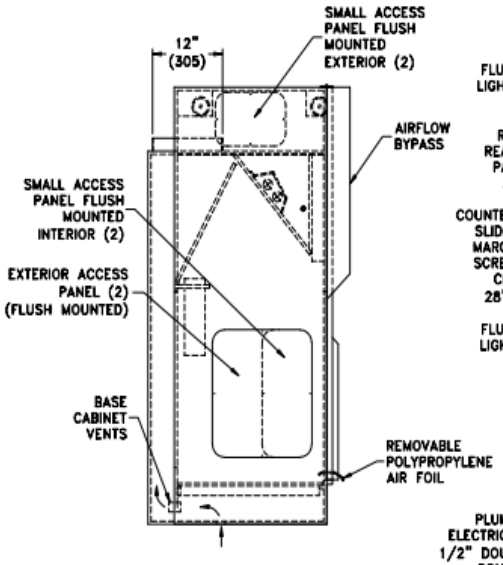
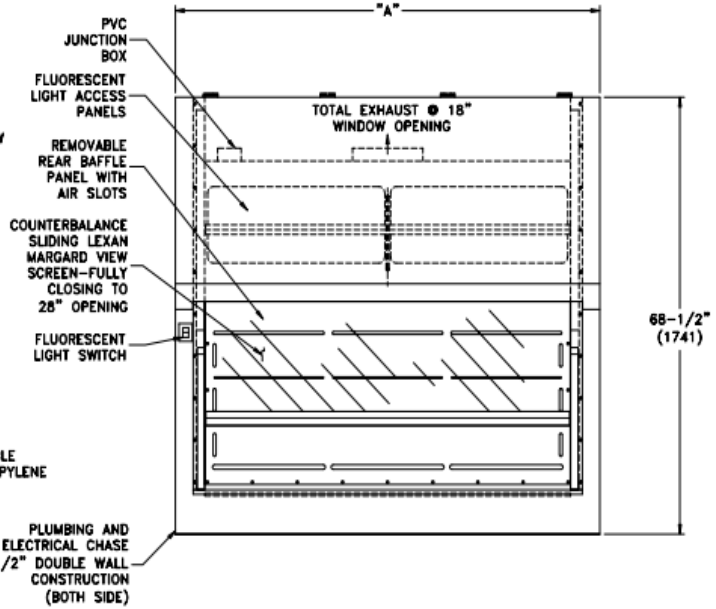
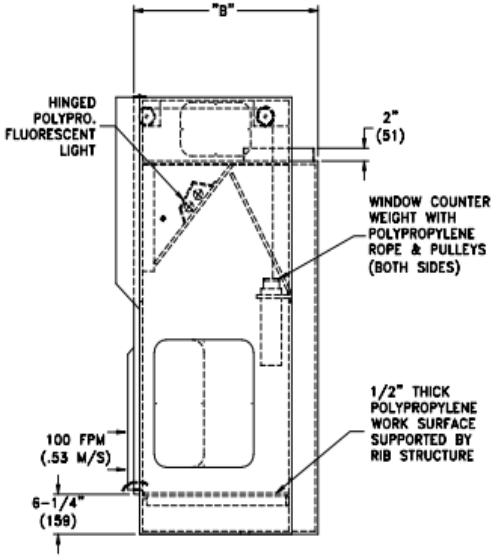
NU-164-524	60-1/2" (1537)	31-1/2" (800)	50-1/2" (1283)	24-3/4" (629)	30-1/4" (768)	26" (660)	665 CFM
NU-164-530	60-1/2" (1537)	37-1/2" (953)	50-1/2" (1283)	30-3/4" (781)	30-1/4" (768)	32" (813)	665 CFM
NU-164-624	72-1/2" (1842)	31-1/2" (800)	62-1/2" (1588)	24-3/4" (629)	36-1/4" (921)	26" (660)	823 CFM
NU-164-630	72-1/2" (1842)	37-1/2" (953)	62-1/2" (1588)	30-3/4" (781)	36-1/4" (921)	32" (813)	823 CFM
NU-164-824	96-1/2" (2451)	31-1/2" (800)	86-1/2" (2197)	24-3/4" (629)	48-1/4" (1226)	26" (660)	1140 CFM
NU-164-830	96-1/2" (2451)	37-1/2" (953)	86-1/2" (2197)	30-3/4" (781)	48-1/4" (1226)	32" (813)	1140 CFM







UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
-TOLERANCES-
DECIMALS ±.063
ANGLES ±2°

NU-164 28" ACCESS
POLYPROPYLENE FUME
HOOD BENCH TOP

DFTM	JS	10/18/04	CHKD	BR	SHEET 1 OF 1

DRAWING NUMBER BCD-10434 A

3.0 Construction Features

The following construction features apply to bench style fume hoods. Bench fume hoods consist of single piece construction and can be placed on a customer bench or on an optional polypropylene base provided for the fume hood (see BCD-05783 and BCD-05784.)

3.1 The fume hoods are constructed from all stress relieved, fully seam welded, and refrigerator white polypropylene. The outer fume hood shell, inner workspace walls, spill trough plenum under work surface (optional), and base cabinet floor are constructed with one half-inch polypropylene. The exhaust duct, access panels, rear baffle, and front hood by-pass cover (as required) are constructed with one-quarter inch polypropylene. All polypropylene walls/floors are reinforced where required to maintain structural integrity.

3.2 The fume hoods are constructed to be 100% metal free and using absolutely no nylon components. The basic construction is polypropylene, but depending upon customer requirements the following thermoplastics may be used: (1) PVC, (2) polypropylene, (3) flame retardant polypropylene, (4) flame retardant polyethylene, (5) PVDF Kynar or (6) TFE Teflon. Any customer requirement that dictates metal to be used (i.e. such as black pipe for gas (may be epoxy coated or Teflon coated per customer direction).

3.3 Sliding vertical, fully counterbalanced sashes are provided as standard on all fume hoods. The sashes provide for a work access opening from fully closed to 18 inches fully open. The sliding sash is constructed of 1/4 inch (6mm) polycarbonate as standard, inset into polypropylene glide channels. A "hard coat" is applied to Lexan to increase abrasive and chemical resistance. A counter weight balance, encased in sealed PVC pipe is located in the plumbing chase. The counter weight is connected to the top of the sash via polypropylene cable that rides over two machined polypropylene pulleys. Access panels are provided on top of the hood for maintenance of the counterweight balance system. Alternative sash materials are: (1) PVC, or (2) tempered glass.

3.4 The fume hoods are "double wall" construction, consisting of an outer wall separated by a 4-inch space and the interior workspace wall of the fume hood. This area forms the plumbing chase for the routing and connection of all services required in the fume hood, including electrical outlets. The plumbing chase is a completely enclosed compartment. It is consistently under negative pressure, to minimize any fume build-up that may occur.

3.5 Base storage cabinets are provided as an option with a compartmentalized shelf area and a large storage area. The large storage area houses the plumbing for any sinks with a "P" trap installed per customer requirements. A single fixed shelf is also provided. All base cabinet compartmentalized areas are vented internally by vent tubes (one per compartment) via the exhaust plenum. The floor of the base cabinet has a one half inch high lip to contain spills. Various size base cabinets are available and are shown per illustration BCD-05967. The base can be attached to the fume hood with hardware per BCD-05957.

3.6 Leg levelers are provided on base units (quantity varies) and are constructed from 1-1/2 inch (38mm) polypropylene rod stock. The leg levelers are adjustable from within the base storage cabinet and are protected by a one-half-inch (13mm) raised lip and cap for spill containment. The leg levelers provide adjustment for leveling the fume hood and can be adjusted with a 3/8 square ratchet extension.

3.7 Interior lighting is provided by two LED bulbs, built into a polypropylene hinged cover to provide access for maintenance. The hinged cover is uses a gasket to prevent the migration of fumes into the light area. A PVC light diffuser is provided in the interior. The LED light ballast is U.L. listed, electronic, and thermally protected. It is housed in a polypropylene enclosure with all electrical wiring protected by U.L. listed PVC flexible conduit. All electrical connections use PVC liquid-tight connectors to minimize direct exposure to fume laden interior air (see Electrical Schematic BCD-08820 & BCD-19226).

3.8 Bench fume hoods can consist of any options illustrated by the customer drawing. Any of these options are dictated by customer needs & requirements (i.e. sink sizes can vary in size or material.)

3.9 A special fume hood with a 28-inch (711mm) window access opening is available for customers who require more front window clearance for special equipment. The maximum 18-inch (457mm) work access should still be maintained to correlate with exhaust flow specifications. This special fume hood is illustrated per BCD-05970, BCD-10434 drawing.

3.10 Some locations have required codes necessary in securing their fume hood to their building structures. BCD-05780 represents seismic securing of the fume hood to the wall. This drawing also portrays optional polypropylene ceiling closure panels and rear plumbing polypropylene closures that hide any obvious plumbing at the fume hood rear.

4.0 Warranty

Details regarding product warranties can be found in the published warranty data separate from this manual and included within the data packet sent with the unit.

5.0 Shipments

NuAire takes every reasonable precaution to assure that your Fume hood 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 Fume hood to be sure that if damage has occurred, the proper claims and actions are taken immediately.

5.1 Damaged Shipments

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

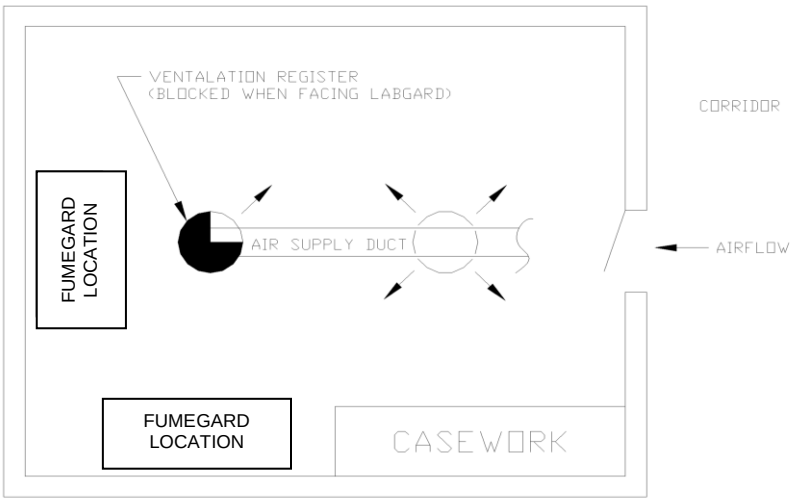
5.1.2 If there is visible damage, the material can be accepted after the driver makes a notation on the consignee's copy of the freight bill. Then an inspection must be made to verify the claim against the carrier. This inspection is the basis of your filing the claim against the carrier.

5.1.3 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.

6.0 Installation Instructions

6.1 Location

Within the laboratory, production process, etc., the ideal location for the FumeGard fume hood 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 fume hood through the access opening, the potential exists for contaminated air to exit or enter the work surface area of the fume hood. It depends on the severity of the air current. Remember, the FumeGard fume hood is no substitute for good laboratory technique. Supply makeup air should be evenly diffused into the room at a rate not to exceed 75 LFPM (.38 m/s), and never “blasted” directly at the floor.

Where space permits, it is recommended to provide a clear 6-inch (152mm) area on each side of the fume hood for maintenance purposes.

The electrical outlet into which the fume hood is connected should be readily accessible for maintenance purposes. **Do not position the fume hood to prevent access to the power cord.** The power cord plug serves as the disconnect and should remain readily accessible. If the outlet is inaccessible, such as a conduit (hardwired) connection, then an appropriate warning label should be applied near the fume hoods on/off switch, to indicate the circuit breaker on the power distribution panel to be used.

As with all types of fume hoods, the FumeGard NU-162 and NU-164 requires careful site planning and preparation, due to the total exhaust nature of the fume hood. Proper sizing of the exhaust and supply systems are critical to the successful installation of the fume hood. In addition, the fume hood provides for the choice of makeup air for the supply (downflow air). The following are airflow requirements:

	Supply Air	Exhaust Air **
NU-162-424/430	481 CFM (818 CMH)	481 CFM (818 CMH)
NU-162-524/530	631 CFM (1073 CMH)	631 CFM (1073 CMH)
NU-162-624/630	781 CFM (1328 CMH)	781 CFM (1328 CMH)
NU-162-824/830	1081 CFM (1838 CMH)	1081 CFM (1838 CMH)
NU-164-424/430	506 CFM (860 CMH)	506 CFM (860 CMH)
NU-164-524/530	665 CFM (1130 CMH)	665 CFM (1130 CMH)
NU-164-624/630	823 CFM (1399 CMH)	823 CFM (1399 CMH)
NU-164-824/830	1140 CFM (1938 CMH)	1140 CFM (1938 CMH)

*CFM exhaust at 0.8 inches (8mm) w.g. negative for 4 ft. models.
CFM exhaust at 0.8 inches (10mm) w.g. negative for 5 ft. models.
CFM exhaust at 0.8 inches (13mm) w.g. negative for 6 ft. models.
CFM exhaust at 1.5 inches (20mm) w.g. negative for 8 ft. models.

6.2 Set-Up Instructions

Remove outer shipping protection (carton or crating). The fume hood is fastened to the base skid and it is usually the best procedure to leave the skid in place until the fume hood is located in its approximate position to facilitate ease in handling. It can then be removed from the skid by removing the banding holding the fume hood to the skid.

6.2.1 Base Cabinet Assembly (BCD-05957/67)

The base cabinet is shipped on a separate skid if accompanied with the fume hood. Remove the banding holding the base cabinet to the base skid. Lift the base cabinet from the skid and place on the floor. Now lift the fume hood on top of the base cabinet and bolt the base cabinet to the fume hood using (4) 1/4-20 x 1-1/2” bolts and washers provided for the attachment process.

6.2.2 Leveling

Using a level placed on the work tray, adjust the leg levelers, first, end-to-end then front to back. The leg levelers located on the floor of the base cabinet are adjusted using a 3/8” drive socket and rotating to raise or lower as necessary.

6.2.3 Bench Installation

Place the fume hood on the bench. Using RTV caulk, seal all around the base of the fume hood and the bench. This provides a tight seal to prevent bench spills from migrating under the fume hood.

6.2.4 Electrical Service

The NU-162/164/E all Polypropylene Fume hoods may be "hardwired" (optional) or plugged into an outlet with protective earthing connection with the standard power cord. The fume hood requires 115 or 230VAC, 50 or 60Hz single phase (correct rating varies per fume hood size, reference Electrical/Environmental Requirements).

It is recommended that power to the fume hood, whether hardwired or plug connected, be on its own branch circuit, protected with a circuit breaker at the distribution panel near the fume hood.

6.2.5 Plumbing Services

Remote controlled polypropylene needle-valve plumbing fixtures are provided within the side walls of the fume hood with control handles located external on the face of the fume hood. The type of service is specified by the colored-wall petcock (i.e. air, gas, vacuum, nitrogen, etc.) Service outlets within the interior are designed for hose connections with ten serrations.

All plumbing services are plumbed within the right or left chase with 1/2 inch flexible polypropylene tubing and compression fittings. Water service plumbing lines are rated at a maximum of 60 PSI (4.5 Bars) as tested at NuAire before shipment. Air and gas lines are tested at a 90 PSI (6.75 Bars) maximum.

All plumbing terminates at the rear of the fume hood (for customer hook-up) with 1/2 inch female NPT polypropylene couplings.

All sinks are plumbed with 1-1/2 inch polypropylene "P" trap and piping that exits out the rear of fume hood in the storage area. A rear access panel is provided for drain connection.

Connection to plant utilities should be made with proper materials for the individual service and according to national and/or local codes. It is not recommended that flammable gases be used in the fume hood unless flame retardant polypropylene is purchased; however, if flammable gas is used, emergency shutoff valves should be located in an accessible area external to the fume hood. Observe all labels pertaining to the type of services and operating pressure.

6.2.6 Exhaust/Supply Duct Installation Guidelines

The exhaust/supply systems must provide conditions similar to that under which the fume hood was certified to meet its stated performance. The following guidelines should be observed when installing exhaust/supply air duct work of either existing plant exhaust systems, or a new exhaust system.

1) Adequate room air inflow to replace exhausted air. Air diffusion rate should not to exceed velocity of 105 LFPM (.53 m/s).

MAKEUP AIR REQUIREMENTS

	Supply Air
NU-162-424/430	481 CFM (818 CMH)
NU-162-524/530	631 CFM (1073 CMH)
NU-162-624/630	781 CFM (1328 CMH)
NU-162-824/830	1081 CFM (1838 CMH)
NU-164-424/430	506 CFM (860 CMH)
NU-164-524/530	665 CFM (1130 CMH)
NU-164-624/630	823 CFM (1399 CMH)
NU-164-824/830	1140 CFM (1938 CMH)

2) Adequate plant exhaust system capability. The exhaust system is usually adequate if it can provide the rated exhaust flow at 1.0 inches water gauge negative.

3) Adequate supply air capability (if used). The supply air system is usually adequate if it can provide the rated supply air at 0.0 inches water gauge positive.

4) All duct losses must be considered in selecting the exhaust blower, for a new exhaust system (i.e. duct diameter, length and number of elbows.)

5) All duct work should be securely anchored to the building construction in a manner to be free from vibration and swaying under all conditions of operation.

6) Sheet metal gauges and seams should be in accordance with the current edition of the ASHRAE guide. A minimum of 24 gauge is required to prevent duct collapse due to high static pressure conditions, required.

7) All duct work should be maintained at a negative pressure within the building (i.e. externally located exhaust blower).

8) The exhaust blower and duct work should be a sealed system, properly vented to the atmosphere to disperse exhausted air.

9) The exhaust duct should be dampered. Dampers should be installed with a locking quadrant with markings to indicate damper position. A polypropylene damper system is available and is located in the upper duct extension.

6.2.7 Final Assembly and Inspection

Remove any remaining packaging materials, tape. etc. along with the window sash and counter balance blocking with in the right and left side service chase. Inspect all fume hood surfaces, service connections and sash assembly operation, rope and counter balance. Lastly, the exterior surfaces and viewing window are easily cleaned with any mild household detergent using a soft cloth. Harsh chemicals, solvent-type cleansers and abrasive cleaners should not be used. Fume Hood interior walls or work surfaces are easily cleaned with any household detergent using a soft cloth. The work surface is removable for access to the sloped drain plenum area for cleaning. The interior should be thoroughly cleaned prior to use. A solution of 70% isopropyl alcohol is suitable for a final cleaning process.

6.3 Testing Methods and Equipment

After installation and prior to use, NuAire recommends that the fume hood be annually recertified to factory standards. At a minimum the following tests should be performed.

1. Airflow velocities
2. Airflow smoke patterns

Of these tests, in order to ensure that no disruptive air currents are penetrating the air inflow barrier smoke flow tests must be performed at a minimum (only tracer gas can confirm containment). These tests must result in the containment of smoke passed around the perimeter of the work access opening, as well as no refluxing or drift of smoke within the interior of the fume hood.

☞ **NOTE: IT IS RECOMMENDED THAT THESE TESTS BE PERFORMED BY A QUALIFIED TECHNICIAN WHO IS FAMILIAR WITH THE METHODS AND PROCEDURES FOR TESTING FUME HOODS (SEE INSERT).**

☞ **NOTE: AFTER THE INITIAL CERTIFICATION, NUAIRE RECOMMENDS THAT THE CABINET BE RECERTIFIED AT A MINIMUM OF AN ANNUAL BASIS AND AFTER EVERY FILTER CHANGE, MAINTENANCE ACTION, OR ANY TIME THE OPERATOR FEELS IT IS NECESSARY.**

The FlowGard fume hoods provide premium performance. Quality control in both design and manufacturing ensure superior reliability; however, protection to both product and operator is so vital that certification to the performance requirements should be accomplished as stated to ensure personnel safety as established by the factory standards.

REV	ECO	DESCRIPTION	DATE	DRFT	CHKD
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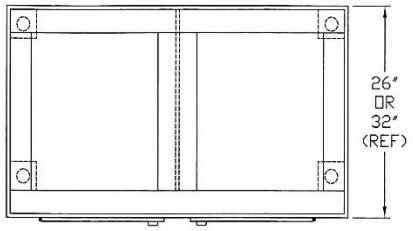
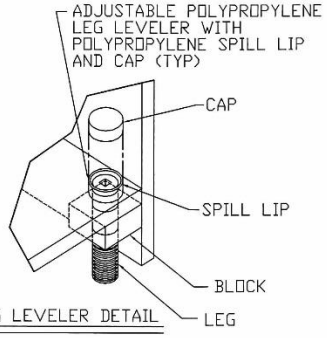
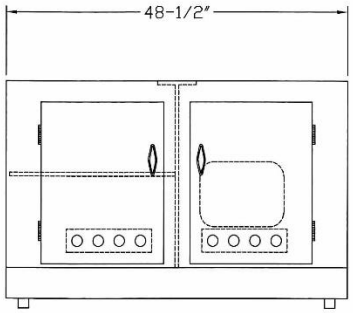
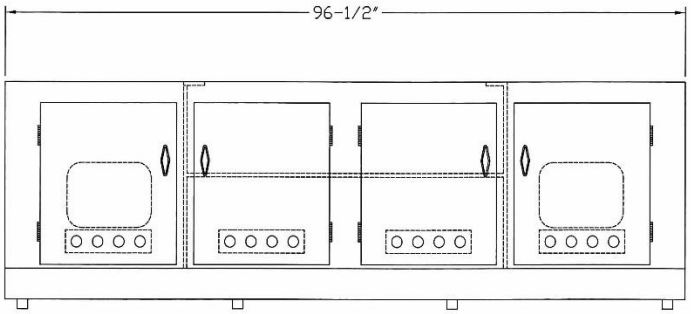




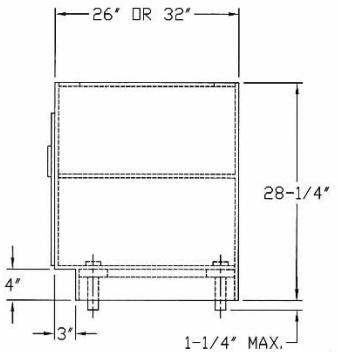
LEG LEVELER DETAIL

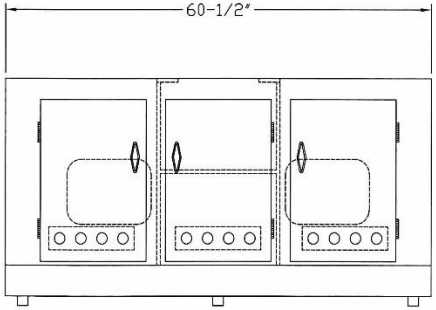


NU-55-424/430

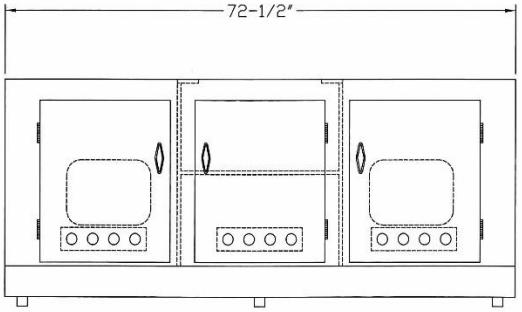


NU-55-824/830





NU-55-524/530



NU-55-624/630

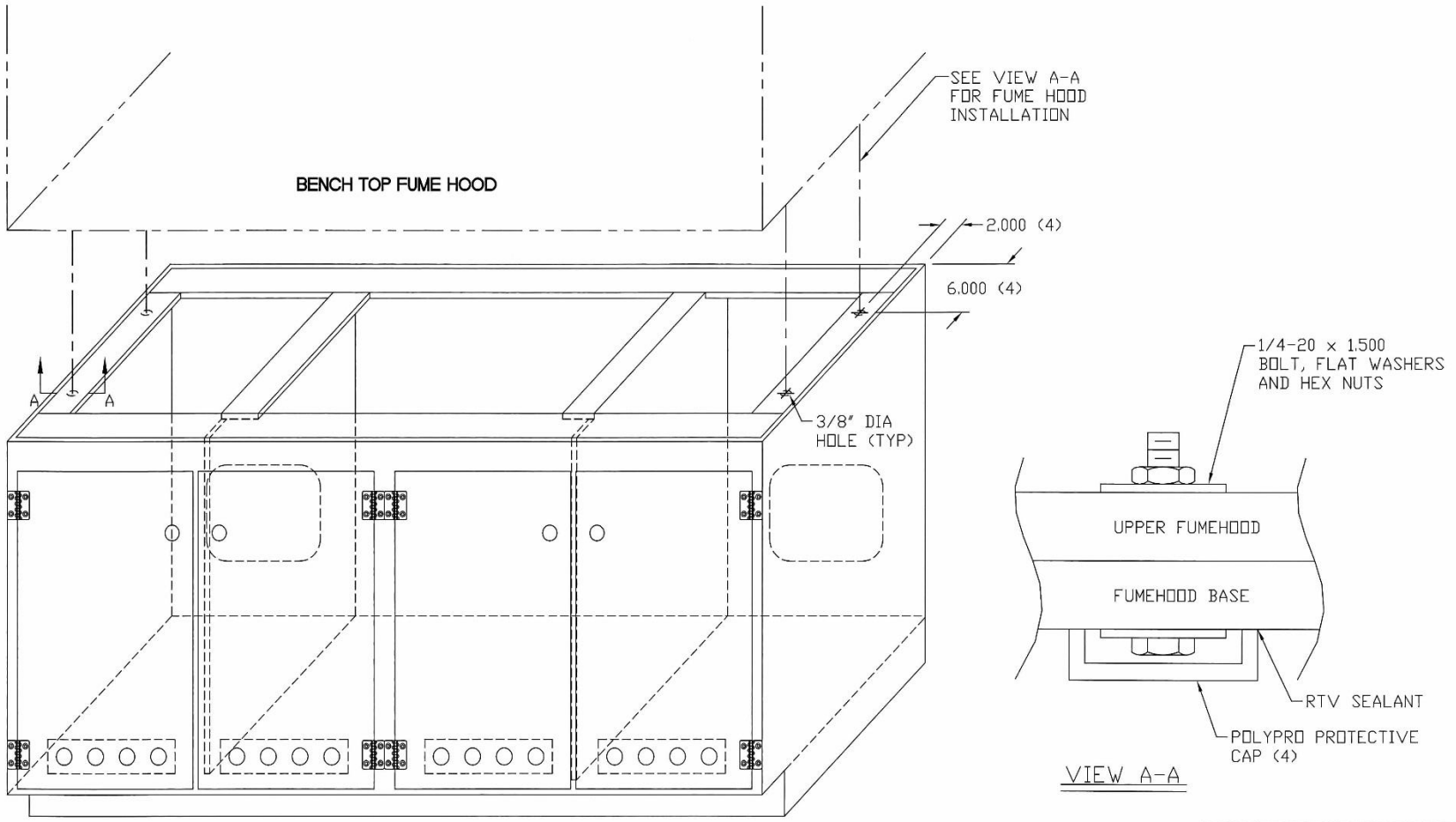
ORIGINAL

NU-55-4,5,6 & 8 FT.
POLYPROPYLENE
FUME HOOD BASE

DFTM	MS	12/11/98	CHKD		SHEET 1 OF 1

DRAWING NUMBER BCD-05967 C

REV	ECO	DESCRIPTION	DATE	DRFT	CHKD
A	12865	RELEASED FOR MANUAL	11/20/15	LS	BP



VIEW A-A

ORIGINAL

FUME HOOD - BASE
CABINET CONNECTION
INSTALLATION

DFTM	CL	07/31/96	CHKD		SHEET 1 OF 1

DRAWING NUMBER BCD-05957 C

7.0 General Maintenance

CAUTION

All maintenance actions on this equipment must be performed by a qualified technician who is familiar with the proper maintenance procedures required for this equipment. This includes certification, inspection as well as repair.

7.1 LED Lamp Replacement

Two LED lamps are in a sealed enclosure external to the Fume Hood work zone to aid maintenance and minimize heat buildup within the Fume Hood. The life rating of the lamp is 9000 hours based on three-hour burning cycles.

To replace the lamp it is necessary to remove the lamp fixture assembly.

1) Switch Fume Hood light switch off and access through either top service panel or through bypass open area under the front decorative hinged panel.
2) Lamp cover is hinged and held in place with fasteners. Remove fasteners and hinge up to access lamps for replacement.
3) Lamps are removed by pressing to one side for release. Reverse the procedure for new lamp installation.

7.2 Preventative Maintenance

The Fume Hood preventative maintenance inspection procedures should be performed annually during The certification and consist of a physical examination of the work zone interior condition and cleanliness. Sash operation and condition, rope, counter balance, light operation and service fixture ware and function. Inspection results should be recorded with the certification results.

7.3 Test Performance and Procedures

All equipment 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. In all instances where product quality cannot be easily assessed on the end item, the product is inspected during sub-assembly fabrication.

Inflow velocity is determined to certify fume hood performance to SEFA – 5th Edition Desk Reference as described below.

7.3.1 SEFA – 5th Edition Desk Reference

7.3.1 Face Velocity

Using a TSI Thermoanemometer Model 8355 or equivalent, determine hood face velocity by averaging velocity readings taken in the vertical plane defined by the bottom of the sash. Face velocity readings shall be taken on a 6-inch (152mm) vertical and horizontal grid. No individual point reading may vary more than 20 percent.

7.3.2 Smoke Flow Patterns

With a smoke stick or cotton swab dipped in titanium tetrachloride and the hood sash in the open position verify all smoke is contained by fume hood. A complete transverse, 1-1/2 inches (38mm) outside hood face and a complete transverse 6-inches (152mm) inside the fume hood. Also verify that all airflow is flowing into the work zone and no refluxing (reverse flow) occurs, particularly against hood sidewalls.

CAUTION: Titanium tetrachloride fumes are toxic and corrosive, use sparingly, avoid inhalation and exposure to body, clothing, and equipment that might be affected by corrosive fumes

7.3.3 Smoke Bomb

A. Place a 60 second smoke bomb on the work surface and ignite. Move the sash up and down and verify that no smoke escapes the face. As the window is closed you may note a rolling or turbulence within the hoods interior for a conventional hood.

B. With a tong or other suitable tool, pick up the smoke bomb with the sash fully open and direct smoke across the work surface, against the sidewalls and rear baffle. All smoke should be contained within the fume hood and be rapidly exhausted.

7.4 ASHRAE Standard 110-2016

NuAire has conducted this test on representative production models in order to validate the design and containment properties of the design under ideal laboratory conditions, as manufactures. NuAire will periodically conduct these tests as a Quality Assurance measure to validate current production models as well as after any significant design change (i.e. baffle configuration, interior height changes, etc.) Fume hoods so tested are labeled prior to shipment. These tests may also be conducted at customer request and expense or by contract obligation.

7.4.1 Procedure

A vapor ejector is placed 6 inches (152mm) behind the view screen and allowed to release a tracer gas (sulfur hexafluoride) at a rate of 4 liters per minute. The ejector releases the tracer gas mixed with fume hood air approximately 11 inches (279mm) above the work surface. A mannequin is placed in front of the view screen with the tip of its nose placed within 3 inches (76mm) of the view screen. A continuous sample of air from the mannequin breathing zone is monitored by an infrared gas analyzer which reads absorbency at the analytical wavelength of the tracer gas. The mannequin and ejector challenge the fume hood at the center and both right and left sides.

The Hood Performance Rating is specified to be the concentration of the tracer gas measured in the breathing zone at the challenged flow rate.

7.4.1 Results

The Hood Performance Rating is reported in the following format XX/AU/M YYY:
Where:

XX= Tracer release rate in hood using the specified diffuser apparatus.
Rates are as follows:
1 liters/minute approximates pouring volatile solvents back and forth from one beaker to another.
4 liters/minute is an intermediate rate between 11 pm and 81 pm.
8 liters/minute approximates violently boiling water on a 500-watt hotplate.
(Other release rates can be specified for special cases.)

YYY= Control level, ppm, at the breathing zone of the worker.

AU/M= “as used” in the laboratory. “AM” would indicate “as manufactured in the manufacturer’s test room.

8.0 Electrical/Environmental Requirements

8.1 Electrical (Supply Voltage Fluctuations not to Exceed +/- 10%)

NU-162/164-424/430/E	115/230 VAC,	50/60 Hz,	1 Amp
NU-162/164-524/530/E	115/230 VAC,	50/60 Hz,	1 Amp
NU-162/164-624/630/E	115/230 VAC,	50/60 Hz,	1 Amp
NU-162/164-824/830/E	115/230 VAC,	50/60 Hz,	1 Amp

8.2 Operational Performance (for indoor use only)

Environment Temperature Range:	60°F-85°F (15°C – 30°C)
Environment Humidity:	Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
Environment Altitude:	6562 Feet (2000M) maximum

8.3 Light Exposure

Standard LED Lighting @ 150 ft. candles (1614 LUX) maximum intensity.

8.4 Installation Category: 2.0

Installation category (overvoltage category) defines the level of transient overvoltage, which the instrument is designed to withstand safely. It depends on the nature of the electricity supply and its overvoltage protection means. For example, in CAT II, which is the category used for instruments in installations supplied from a supply comparable to public mains such as hospital and research laboratories and most industrial laboratories, the expected transient overvoltage is 2500 V for a 230 V supply and 1500 V for a 120 V supply.

8.5 Pollution Degree: 2.0

Pollution degree describes the amount of conductive pollution present in the operating environment. Pollution degree 2 assumes that normally only non-conductive pollution such as dust occurs with the exception of occasional conductivity caused by condensation.

8.6 EMC Performance (classified for light industrial)

Emissions:	EN61326
Immunity:	EN61326

Class A equipment is intended for use in an industrial environment. In the documentation for the user, a statement shall be included drawing attention to the fact that there may be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted as well as radiated disturbances.

9.0 Selection of Hood Face Velocity

The interaction of (1) room air supply distribution, (2) operations/manipulations within the fume hood and (3) fume hood face velocity makes any specific (target) fume hood face velocity inappropriate. These interactions occur as a result of the following:

A) For typical operations within fume hoods the laboratory technician stands at the face of the hood and manipulates apparatus in the hood. As air is drawn into the hood face around the workers body, eddy currents form downstream (i.e. between the hood face and the worker's body). Depending on body width and inflow velocity, the eddy currents may project into the hood face dragging out contaminates to the body and up to the breathing zone. In general; the higher the face velocity the greater the eddy currents will be. For this reason, higher face velocities do not necessarily result in improved protection.

B) The distribution of supply air into the laboratory as well as room air currents has a large effect on hood performance. Personnel walking within three feet of the hood face can generate cross draft velocities exceeding 175 feet per minute (0.89 m/s). In addition, improper diffusion of supply air and/or insufficient supply air may cause cross drafts that exceed the hood face velocity. All disruptions that exceed hood face velocity may force contaminated interior fume hood air to escape into the laboratory and into the worker's breathing zone.

C) ASHRAE research project RP-70, conducted by Caplan and Knutson reached the following conclusions:

1. Lower breathing zone concentrations can be attained at 50 cfm/sq. ft. face velocities with good air supply distribution than at 150 cfm/sq. ft. with poor air distribution. With a good air supply system, and tracer gas released at 8 liters per minute inside the hood, breathing zone concentrations can be kept below 0.1 ppm and usually below 0.01 ppm.
2. The terminal throw velocity of supply air jets should be no more than 1/2 to 2/3 the hood face velocity; such terminal throw velocities are far less than conventional practice.
3. Perforated ceiling panels provide a better supply system than grills or ceiling diffusers in that the system design criteria are simpler and easier to apply and precise adjustment of the fixtures is not required.

For the reasons described above, increased hood face velocities may be self-defeating because the increased air volume handled through the room makes the low velocity distribution of supply air more difficult.

NuAire specifies the exhaust requirements at maximum sash opening and with an average inflow velocity of 100 LFPM (0.51 m/s). This should be adjusted based on the above considerations for each application.

10.0 Perchloric Acid Hoods

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

The properties of perchloric acid heated above ambient temperatures require that a specially designed fume hood be set aside for exclusive use with the material. This hood should be labeled “For Perchloric Acid Operations Only” per NFPA 45, paragraph 6.12.1.

Perchloric acid hoods are equipped with cold water spray devices for the washdown of all surfaces exposed to perchloric acid fumes. NuAire provides for the washdown of the internal exhaust plenum behind the removable rear baffle via three 3/4-inch polypropylene spray head pipes equally spaced in the plenum. A 1-1/2-inch (38mm) drain is provided in the bottom of the plenum for the disposal of waste water. Interior work zone surfaces must be manually cleaned with water. A separate drain trough is provided in the rear of the work surface for waste water collection, draining back into the exhaust plenum.

As much as possible the duct work for perchloric acid hoods and exhaust systems should take the shortest and straightest path to the outside of the building and should not be manifolded with other exhaust systems. Horizontal runs should be as short as possible, with no sharp turns or bends. The duct run from the exhaust blower to the hood should provide a positive drainage slope back to the hood, however, a separate drain should be provided for the collection of duct waste water. All ductwork should consist of completely sealed sections, use no flexible connectors, and be acid resistant and non-reactive with perchloric acid. The exhaust fan must be acid resistant and non-reactive with perchloric acid. The exhaust fan must be acid resistant, non-sparking and the fan motor must not be located within the ductwork or exposed to acid fumes.

Frequency of washdown, both hood and exhaust system, is determined by the usage and concentration of reagents. This can range from a weekly procedure to one that occurs during or after every use. Washdown should always be followed by an inspection to verify that all areas are clean and that wash system is functioning properly.

Some of the hazards of perchloric acid which justify the use of a special hood are:

Hazardous Gases! Personal Protection Equipment Required.

Flammable Hazard

Chemical Hazard

1. Perchloric acid is a very strong acid, capable of producing severe burns when in contact with skin, eyes, or respiratory tract.
2. As an aqueous solution it can cause violent explosions if improperly handled.
3. It reacts with other substances to form unstable materials which are susceptible to exploding either by impact, friction, or spontaneous combustion.

Persons using perchloric acid should be thoroughly familiar with its hazards. Many reported laboratory accidents have involved less than one gram of reactant. Listed below are some common safety practices that should be followed.

1. Spilled perchloric acid should be thoroughly washed away with large amounts of water.
2. The use of organic chemicals or materials in the hood should be avoided.
3. Goggles or other effective eye protection should be used whenever possible, as well as utilization of the fume hood sash for additional safety.
4. Gas flames or oil baths should not be used within the hood.
5. Organic chemicals should not be kept in storage areas set aside for perchloric acid storage.
6. A schedule should be made for regular washdown and inspection of hood interior, ductwork, and blower to guard against a build-up of dangerous perchloric materials.
7. Only fluorocarbon grease should be used as a blower lubricant, since any other type is to be considered potentially hazardous.
8. Washdown procedure should be performed after completion of usage with all apparatus removed from hood.

11.0 Disposal and Recycle

Cabinets that are no longer in use and are ready for disposal contain reusable materials. ALL components with the exception of the HEPA 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 HEPA filter solid waste.


BIOHAZARD


Chemical Hazard


CAUTION **Prior to any disassembly for disposal, the cabinet must be decontaminated.**


RECYCLE

LEAD FREE

Component	**Material**
Base Cabinet	Polypropylene
Window	Polycarbonate
Printed Wiring Assembly	Lead Free Electronic
Wire	PVC Coated Copper
Controls	Various Steel, electronic
LED Lamp	Various plastic, electronic
Armrest	Polypropylene
Connectors	Nylon
Hardware	Teflon Coated Stainless Steel and Steel

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

12.0 Polypropylene

NuAire products manufactured from Polypropylene materials require special consideration for the care and use to assure maximum customer satisfaction. Polypropylene materials have many favorable characteristics, such as being resistant to many chemicals, rigid, durable, and available in many thicknesses. NuAire fabricates the Polypropylene materials in many different ways to produce a variety of products for the laboratory. Understanding about the care and use of the Polypropylene material is important.

12.1 Cleaning

Cleaning laboratory equipment is important in terms of both functionality and general good housekeeping. The information provided below is intended to aid the development of facility Standard Operating Procedures (SOPs) for cleaning equipment. It is strongly recommended that all cleaning materials used be tested and verified in terms of both effectiveness and material compatibility before they are written into the cleaning SOP documentation.

Note: NuAire does not offer any product warranty with respect to cleaning material compatibility. **USE AT YOUR OWN RISK!** The information provided above is from raw material suppliers and known general source documents for use to develop application cleaning SOPs.

12.2 Material Compatibility

High concentrations of some acids may cause staining if in the constant contact with polypropylene. Once it has penetrated the surface of the material, only option would be to replace the surface, if at all possible.

See chemical resistance guide on following page for Polypropylene and other various types of plastics.

CHEMICAL RESISTANCE GUIDE

PLEASE NOTE: This guide is intended as general information only. Since each pair of ratings listed is for *ideal* conditions, consider all factors when evaluating chemical resistance.

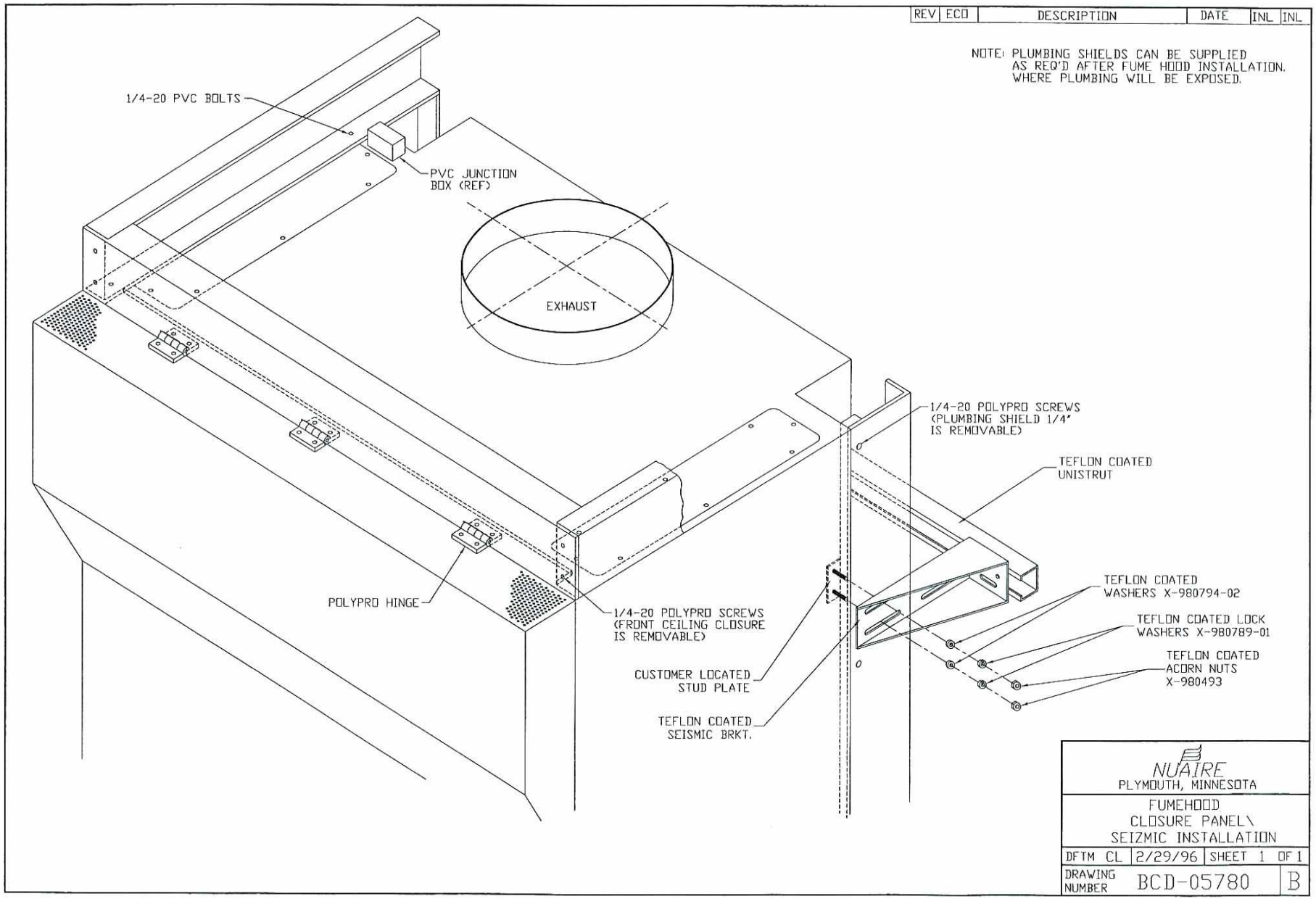
MATERIALS KEY:
LDPE – Low Density Polyethylene
HDPE – High Density Polyethylene
PP/PA – Polypropylene/Polypropylene Copolymer
PMP – Polymethylpentene
PC – Polycarbonate
PVC – Polyvinyl Chloride
PSF – Polysulfone
FEP – Teflon® FEP
TFE – Teflon® TFE
PFA – Teflon® PFA

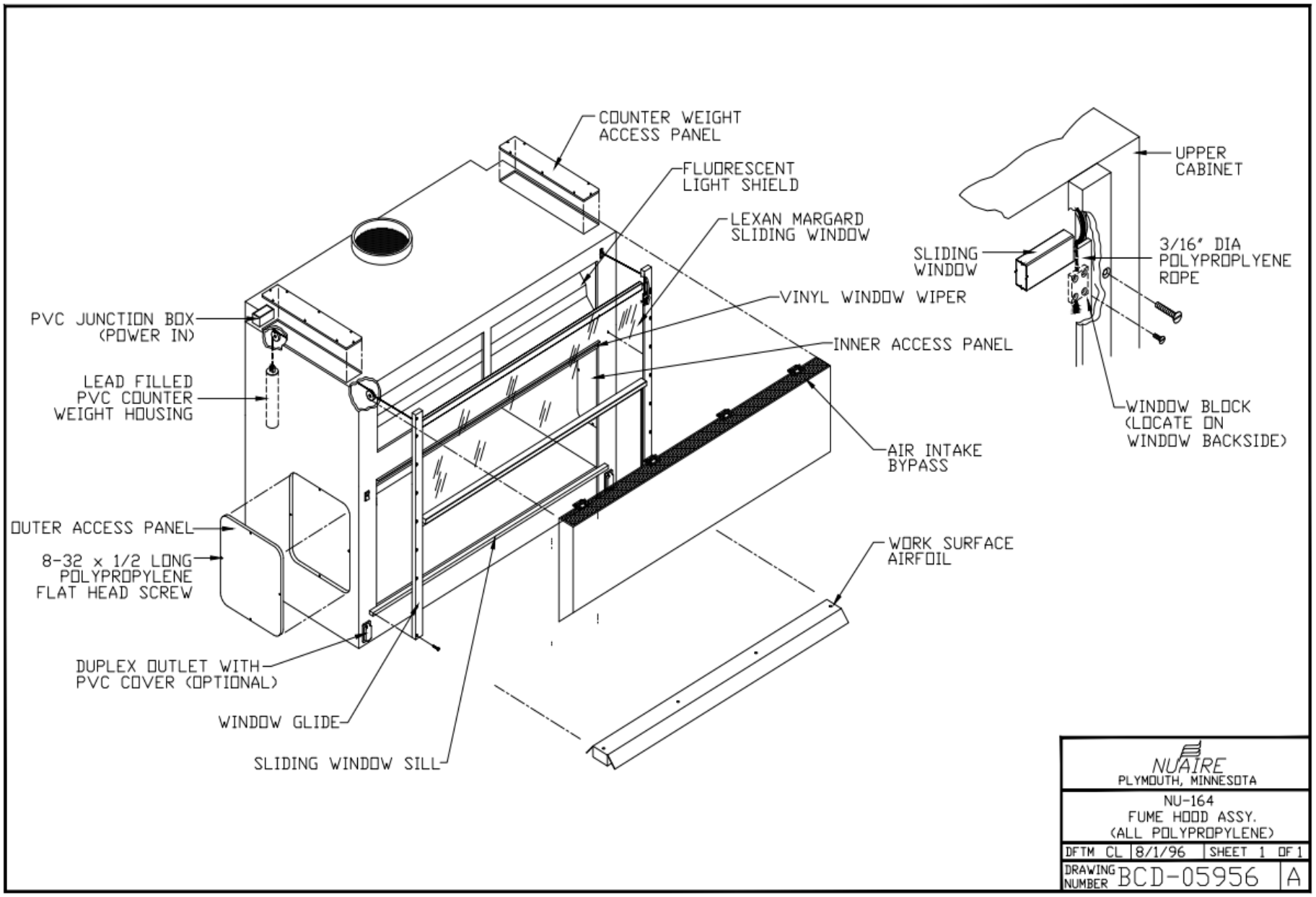
RATINGS KEY: **E** – Excellent **G** – Good **F** – Fair **N** – Not Recommended
First letter of each pair applies to conditions at 20°C; the second to those at 50°C.

▼CHEMICAL / MATERIAL ▶	LDPE	HDPE	PP/ PPCO	PMP	FEP/ TFE/ PFA	PC	RIGID PVC	PSF
Acetaldehyde	GN	GF	GN	GN	EE	FN	GN	NN
Acetamide (saturated)	EE	EE	EE	EE	EE	NN	NN	NN
Acetic Acid (5%)	EE	EE	EE	EE	EE	EG	EE	EE
Acetic Acid (50%)	EE	EE	EE	EE	EE	EG	EG	GG
Acetone	NN	NN	EE	EE	EE	NN	NN	NN
Acetonitrile	EE	EE	FN	FN	EE	NN	NN	NN
Acrylonitrile	EE	EE	FN	FN	EE	NN	NN	NN
Adipic Acid	EG	EE	EE	EE	EE	EE	EG	GG
Alanine	EE	EE	EE	EE	EE	NN	NN	NN
Allyl Alcohol	EE	EE	EE	EG	EE	GF	GF	GF
Aluminum Hydroxide	EG	EE	EG	EG	EE	FN	EG	GG
Aluminum Salts	EE	EE	EE	EE	EE	EG	EE	EE
Amino Acids	EE	EE	EE	EE	EE	EE	EE	EE
Ammonia	EE	EE	EE	EE	EE	NN	EG	GF
Ammonium Acetate (saturated)	EE	EE	EE	EE	EE	EE	EE	EE
Ammonium Glycolate	EG	EE	EG	EG	EE	GF	EE	GG
Ammonium Hydroxide (5%)	EE	EE	EE	EE	EE	FN	EE	GG
Ammonuim Hydroxide (30%)	EG	EE	EG	EG	EE	NN	EG	GG
Ammonium Oxalate	EG	EE	EG	EG	EE	EE	EE	EE
Ammonium Salts	EE	EE	EE	EE	EE	EG	EG	EE
n-Amyl Acetate	GF	EG	GF	GF	EE	NN	NN	NN
Amyl Chloride	NN	FN	NN	NN	EE	NN	NN	NN
Aniline	EG	EG	GF	GF	EE	FN	NN	NN
Benzaldehyde	EG	EE	EG	EG	EE	FN	NN	FF
Benzene	NN	NN	NN	GF	EE	NN	NN	NN
Benzoic Acid (saturated)	EE	EE	EG	EG	EE	EG	EG	FF
Benzyl Acetate	EG	EE	EG	EG	EE	FN	NN	NN
Benzyl Alcohol	NN	FN	NN	NN	EE	NN	GF	NN
Bromine	NN	FN	NN	NN	EE	FN	GN	NN
Bromobenzene	NN	FN	NN	NN	EE	NN	NN	NN
Bromoform	NN	NN	NN	NN	EE	NN	NN	NN
Butadiene	NN	FN	NN	NN	EE	NN	FN	NN
n-Butyl Acetate	GF	EG	GF	GF	EE	NN	NN	NN
n-Butyl Alcohol	EE	EE	EE	EG	EE	GF	GF	GF
sec-Butyl Alcohol	EG	EE	EG	EG	EE	GF	GG	GF
tert-Butyl Alcohol	EG	EE	EG	EG	EE	GF	EG	GF
Butyric Acid	NN	FN	NN	NN	EE	FN	GN	GG

▼ CHEMICAL / MATERIAL ▶	LDPE	HDPE	PP/ PPCO	PMP	FEP/ TFE/ PFA	PC	RIGID PVC	PSF
Calcium Hydroxide (concentrated)	EE	EE	EE	EE	EE	NN	EE	GG
Calcium Hypochlorite (saturated)	EE	EE	EE	EG	EE	FN	GF	EE
Carbazole	EE	EE	EE	EE	EE	NN	NN	NN
Carbon Disulfide	NN	NN	NN	NN	EE	NN	NN	NN
Carbon Tetrachloride	FN	GF	GF	NN	EE	NN	GF	NN
Cedarwood Oil	NN	FN	NN	NN	EE	GF	FN	FF
Cellosolve Acetate	EG	EE	EG	EG	EE	FN	FN	NN
Chlorine (10% in air)	GN	EF	GN	GN	EE	EG	EE	NN
Chlorine (10% (moist))	GN	GF	FN	GN	EE	GF	EG	NN
Chloroacetic Acid	EE	EE	EG	EG	EE	FN	FN	NN
p-Chloroacetophenone	EE	EE	EE	EE	EE	NN	NN	NN
Chloroform	FN	NN	NN	NN	EE	NN	NN	NN
Chromic Acid (10%)	EE	EE	EE	EE	EE	GF	EG	NN
Chromic Acid (50%)	EE	EE	GF	GF	EE	FN	EF	NN
Cinnamon Oil	NN	FN	NN	NN	EE	GF	NN	FF
Citric Acid (10%)	EE	EE	EE	EE	EE	EG	GG	EE
Cresol	NN	FN	GF	NN	EE	NN	NN	NN
Cyclohexane	FN	FN	FN	NN	EE	EG	GF	NN
Decalin	GF	EG	GF	FN	EE	NN	EG	NN
o-Dichlorobenzene	FN	FF	FN	FN	EE	NN	NN	NN
p-Dichlorobenzene	FN	GF	GF	GF	EE	NN	NN	NN
Diethyl Benzene	NN	FN	NN	NN	EE	FN	NN	NN
Diethyl Ether	NN	FN	NN	NN	EE	NN	FN	NN
Diethyl Ketone	NN	NN	GG	GF	EE	NN	NN	NN
Diethyl Malonate	EE	EE	EE	EG	EE	FN	GN	FF
Diethylene Glycol	EE	EE	EE	EE	EE	GF	FN	GG
Diethylene Glycol Ethyl Ether	EE	EE	EE	EE	EE	FN	FN	FF
Dimethylformamide	EE	EE	EE	EE	EE	NN	FN	NN
Dimethyl Sulfoxide	EE	EE	EE	EE	EE	NN	NN	NN
1, 4-Dioxane	GF	GG	GF	GF	EE	GF	FN	GF
Dipropylene Glycol	EE	EE	EE	EE	EE	GF	GF	GG
Ether	NN	FN	NN	NN	EE	NN	FN	NN
Ethyl Acetate	EE	EE	EE	FN	EE	NN	NN	NN
Ethyl Alcohol (Absolute)	EG	EE	EG	EG	EE	EG	EG	EG
Ethyl Alcohol (40%)	EG	EE	EG	EG	EE	EG	EE	EG
Ethyl Benzene	NN	NN	NN	NN	EE	NN	NN	NN
Ethyl Benzoate	FF	GG	GF	GF	EE	NN	NN	NN
Ethyl Butyrate	GN	GF	GN	FN	EE	NN	NN	NN
Ethyl Chloride (liquid)	FN	FF	FN	FN	EE	NN	NN	NN
Ethyl Cyanoacetate	EE	EE	EE	EE	EE	FN	FN	FF
Ethyl Lactate	EE	EE	EE	EE	EE	FN	FN	FF
Ethylene Chloride	GN	GF	FN	NN	EE	NN	NN	NN
Ethylene Glycol	EE	EE	EE	EE	EE	GF	EF	EE
Ethylene Glycol Methyl Ether	EE	EE	EE	EE	EE	FN	FN	FF
Ethylene Oxide	FF	GF	FF	FN	EE	FN	FN	EE
Fluorides	EE	EE	EE	EE	EE	EE	EE	EE
Fluorine	FN	GN	FN	FN	EG	GF	EG	NN
Formaldehyde (10%)	EE	EE	EE	EG	EE	EG	GF	GF

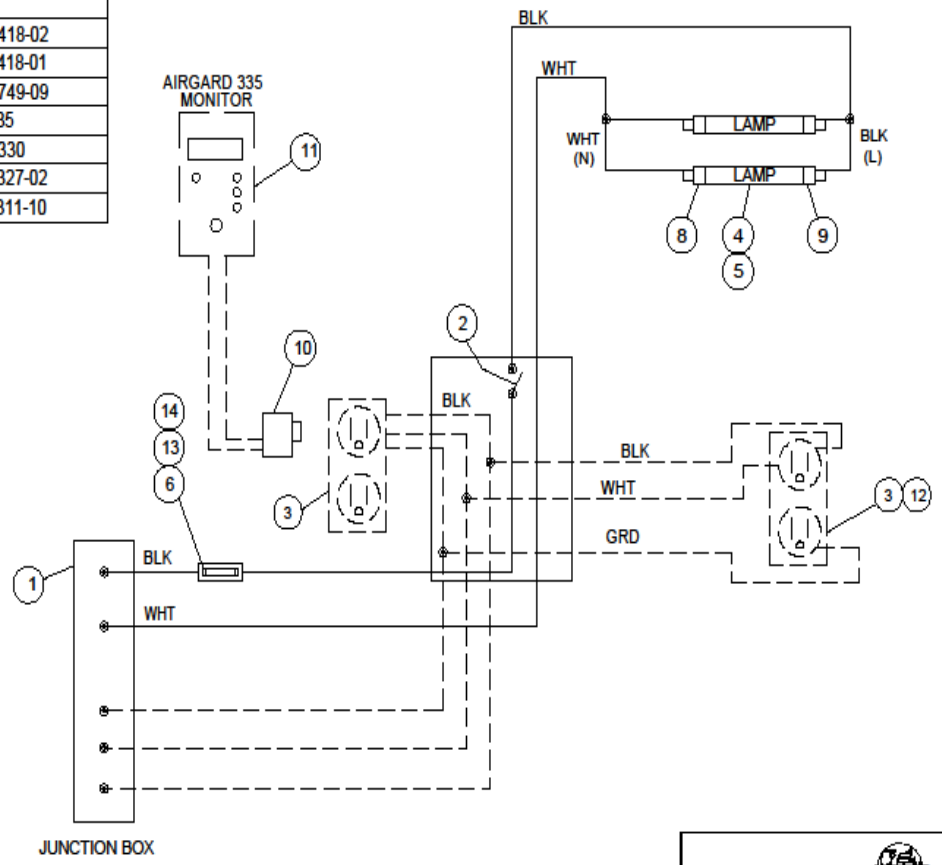
▼ CHEMICAL / MATERIAL ▶	LDPE	HDPE	PP/ PPCO	PMP	FEP/ TFE/ PFA	PC	RIGID PVC	PSF
Formaldehyde (40%)	EG	EE	EG	EG	EE	EG	GF	GF
Formic Acid (3%)	EG	EE	EG	EG	EE	EG	GF	GG
Formic Acid (50%)	EG	EE	EG	EG	EE	EG	GF	GG
Formic Acid (98-100%)	EG	EE	EG	EF	EE	EF	FN	FF
Fuel Oil	FN	GF	EG	GF	EE	EG	EE	EG
Gasoline	FN	GG	GF	GF	EE	FF	GN	FF
Glacial Acetic Acid	EG	EE	EG	EG	EE	NN	EG	FN
Glycerin	EE	EE	EE	EE	EE	EE	EE	EE
n-Heptane	FN	GF	FF	FF	EE	EG	GF	EG
Hexane	NN	GF	GF	FN	EE	FN	GN	EG
Hydrochloric Acid (1-5%)	EE	EE	EE	EG	EE	EE	EE	EE
Hydrochloric Acid (20%)	EE	EE	EE	EG	EE	GF	EG	EE
Hydrochloric Acid (35%)	EE	EE	EG	EG	EE	NN	GF	EE
Hydrofluoric Acid (4%)	EG	EE	EG	EG	EE	GF	GF	GF
Hydrofluoric Acid (48%)	EE	EE	EE	EE	EE	NN	GF	FN
Hydrogen Peroxide (3%)	EE	EE	EE	EE	EE	EE	EE	EE
Hydrogen Peroxide (30%)	EG	EE	EG	EG	EE	EE	EE	EE
Hydrogen Peroxide (90%)	EG	EE	EG	EG	EE	EE	EG	EE
Isobutyl Alcohol	EE	EE	EE	EG	EE	EG	EG	EG
Isopropyl Acetate	GF	EG	GF	GF	EE	NN	NN	NN
Isopropyl Alcohol	EE	EE	EE	EE	EE	EE	EG	EE
Isopropyl Benzene	FN	GF	FN	NN	EE	NN	NN	NN
Kerosene	FN	GG	GF	GF	EE	EE	EE	GF
Lactic Acid (3%)	EG	EE	EG	EG	EE	EG	GF	EE
Lactic Acid (85%)	EE	EE	EG	EG	EE	EG	GF	EE
Methoxyethyl Oleate	EG	EE	EG	EG	EE	FN	NN	NN
Methyl Alcohol	EE	EE	EE	EE	EE	GF	EF	GF
Methyl Ethyl Ketone	NN	NN	EG	NN	EE	NN	NN	NN
Methyl Isobutyl Ketone	NN	NN	GF	FF	EE	NN	NN	NN
Methyl Propyl Ketone	GF	EG	GF	FF	EE	NN	NN	NN
Methylene Chloride	FN	FN	FN	FN	EE	NN	NN	NN
Mineral Oil	GN	EE	EE	E&	EE	EG	EG	EE
Nitric Acid (1-10%)	EE	EE	EE	EE	EE	EG	EG	EF
Nitric Acid (50%)	GN	GN	FN	GN	EE	GF	GF	GF
Nitric Acid (70%)	FN	GN	NN	GF	EE	NN	FN	NN
Nitrobenzene	NN	FN	NN	NN	EE	NN	NN	NN
n-Octane	EE	EE	EE	EE	EE	GF	FN	GF
Orange Oil	FN	GF	GF	FF	EE	FF	FN	FF
Ozone	EG	EE	EG	EE	EE	EG	EG	EE
Perchloric Acid	GN	GN	GN	GN	GF	NN	GN	NN
Perchloroethylene	NN	NN	NN	NN	EE	NN	NN	NN
Phenol, Crystals	GN	GF	GN	FG	EE	EN	FN	FF
Phosphoric Acid (1-5%)	EE	EE	EE	EE	EE	EE	EE	EE
Phosphoric Acid (85%)	EE	EE	EG	EG	EE	EG	EG	EE
Pine Oil	GN	EG	EG	GF	EE	GF	FN	FF
Potassium Hydroxide (1%)	EE	EE	EE	EE	EE	FN	EE	EE
Potassium Hydroxide (conc.)	EE	EE	EE	EE	EE	NN	EG	EE
Propane Gas	NN	FN	NN	NN	EE	FN	EG	FF
Propylene Glycol	EE	EE	EE	EE	EE	GF	FN	GG
Propylene Oxide	EG	EE	EG	EG	EE	GF	FN	GG
Resorcinol (saturated)	EE	EE	EE	EE	EE	GF	FN	NN
Resorcinol (5%)	EE	EE	EE	EE	EE	GF	GN	NN


REV
ECO
DESCRIPTION
DATE
INL
INL
NOTE: PLUMBING SHIELDS CAN BE SUPPLIED AS REQ'D AFTER FUME HOOD INSTALLATION. WHERE PLUMBING WILL BE EXPOSED.
1/4-20 PVC BOLTS
PVC JUNCTION BOX (REF)
EXHAUST
1/4-20 POLYPRO SCREWS (PLUMBING SHIELD 1/4" IS REMOVABLE)
TEFLON COATED UNISTRUT
TEFLON COATED WASHERS X-980794-02
TEFLON COATED LOCK WASHERS X-980789-01
TEFLON COATED ACORN NUTS X-980493
POLYPRO HINGE
1/4-20 POLYPRO SCREWS (FRONT CEILING CLOSURE IS REMOVABLE)
CUSTOMER LOCATED STUD PLATE
TEFLON COATED SEISMIC BRKT.
NUAIRE
PLYMOUTH, MINNESOTA
FUMEHOOD
CLOSURE PANEL\
SEIZMIC INSTALLATION
DFTM CL
2/29/96
SHEET 1 OF 1
DRAWING NUMBER
BCD-05780
B


COUNTER WEIGHT ACCESS PANEL
FLUORESCENT LIGHT SHIELD
LEXAN MARGARD SLIDING WINDOW
VINYL WINDOW WIPER
INNER ACCESS PANEL
AIR INTAKE BYPASS
WORK SURFACE AIRFOIL
PVC JUNCTION BOX (POWER IN)
LEAD FILLED PVC COUNTER WEIGHT HOUSING
OUTER ACCESS PANEL
8-32 x 1/2 LONG POLYPROPYLENE FLAT HEAD SCREW
DUPLEX OUTLET WITH PVC COVER (OPTIONAL)
WINDOW GLIDE
SLIDING WINDOW SILL
UPPER CABINET
SLIDING WINDOW
3/16" DIA POLYPROPLYENE ROPE
WINDOW BLOCK (LOCATE ON WINDOW BACKSIDE)
NUAIRE
PLYMOUTH, MINNESOTA
NU-164
FUME HOOD ASSY.
(ALL POLYPROPYLENE)
DFTM CL
8/1/96
SHEET 1 OF 1
DRAWING NUMBER BCD-05956
A

ITEM	QTY	DESCRIPTION	NUAIRE P/N
1	1	JUNCTION BOX	X-999018-01
2	1	ROCKER SWITCH SPST	X-999678-03
3	A/R	DUPLEX OUTLET 15 AMP	X-999511
4	2	LED LAMP (5/6/8 FT)	999-000014-03
5	2	LED LAMP (4 FT)	999-000014-02
6	1	FUSE HOLDER	X-999316-01
7			
8	2	LAMP SOCKET SOLID BASE	X-999418-02
9	2	LAMP SOCKET SPRING BASE	X-999418-01
10	1	24V TRANSFORMER	X-999749-09
11	1	VELOCITY MONITOR	AIN-335
12	1	GFI OUTLET	X-999330
13	1	FUSE COVER	X-999327-02
14	1	FUSE 1A - 1/4 X 1 1/4	X-999311-10

REV	CO	DESCRIPTION	DATE	DFTR	CHKD
D	000773	UPDATED LIGHTING TO BALLAST FREE	4/5/2021	TH	DSH



POWER SPECIFICATIONS:
115 VAC 60 Hz SINGLE PHASE
15 AMP OUTLET TOTAL CIRCUIT

( ) INDICATES ITEM NUMBER

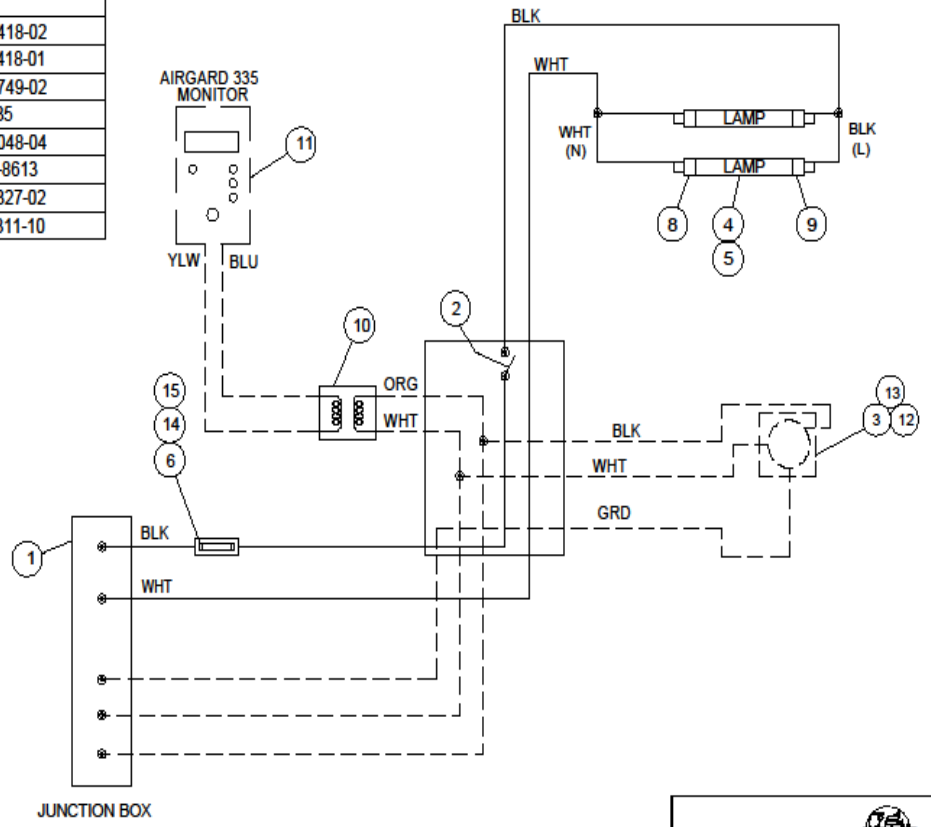
— — INDICATES OPTION

TITLE
NU-162 & NU-164 ELECTRICAL SCHEMATIC

DFTR	BR	DATE	6/29/2002	CHKD	BR	SHEET	1	OF	1
DRAWING NUMBER	BCD-08820								D

ITEM	QTY	DESCRIPTION	NUAIRE P/N
1	1	JUNCTION BOX	X-999018-01
2	1	ROCKER SWITCH SPST	X-999678-03
3	A/R	OUTLET	A/R
4	2	LED LAMP (5/6/8 FT)	999-000014-03
5	2	LED LAMP (4 FT)	999-000014-02
6	1	FUSE HOLDER	X-999316-01
7			
8	2	LAMP SOCKET SOLID BASE	X-999418-02
9	2	LAMP SOCKET SPRING BASE	X-999418-01
10	1	24V TRANSFORMER	X-999749-02
11	1	VELOCITY MONITOR	AIN-335
12	1	OUTLET COVER	X-999048-04
13	1	OUTLET BEZEL	B-480-8613
14	1	FUSE COVER	X-999327-02
15	1	FUSE 1A - 1/4 X 1 1/4	X-999311-10

REV	CO	DESCRIPTION	DATE	DFTR	CHKD
B	000773	UPDATED LIGHTING TO BALLAST FREE	4/5/2021	TH	DSH



POWER SPECIFICATIONS:
230 VAC 50/60 Hz SINGLE PHASE

(1) INDICATES ITEM NUMBER

— — INDICATES OPTION

TITLE
NU-162E & NU-164E ELECTRICAL SCHEMATIC

DFTR	TH	DATE	7/18/2017	CHKD	DSH	SHEET	1	OF	1

DRAWING NUMBER	BCD-19226	B