Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 5/17/2024
Return Request: 5/27/2024
Project: CALS Main Library Renovations
Supplier: Knight & Wilson
Manufacturer: Various
Submittal: Air Duct Accessories
Submittal Number: 23 33 00-01
Drawing # and Installation: Mechanical Drawings

ARCHITECT
Polk Stanley Wilcox
801 South Spring St.
Little Rock, AR 72201
501-378-0878

ENGINEER
Bernhard
1 Allied Drive, Bldg. 2, Suite 2600
Little Rock, AR 72202
501-666-6776

GENERAL CONTRACTOR
CDI
3000 Cantrell Rd.
Little Rock, AR 72202
501-5666-4300

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

CSUSA PROJECT NO.
23-8016
dpierce@comfortar.com

K &W

Knight & Wilson, Inc.
"Sheet Metal Contractors"
676 East E.H. Crump Blvd. Memphis TN 38126
901-274-6978

SUBMITTAL

EQUIPMENT:	**FLEXIBLE CANVAS CONNECTOR**
SPEC SECTION:	**23 3300 - 2.10**
PROJECT:	**CALS MAIN LIBRARY RENOVATION**
LOCATION:	**LITTLE ROCK, AR**
CONTRACTOR:	**COMFORT SYSTEMS USA**

WE PROPOSE TO USE DURODYNE **EXCELON** FLEXIBLE DUCT CANVAS CONNECTOR PER THE ATTACHED SUBMITTAL.

CONTACT: LARRY RUSSELL, K&W - OPERATIONS MGR.
DATE: 5/3/2024

SUBMITTAL RECORD
JOB _____
LOCATION _____
SUBMITTED TO _____
SUBMITTAL PREPARED BY _____
APPROVED BY _____
DATE _____

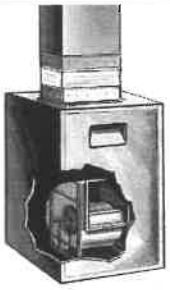
DURO DYNE®

Submittal Form
FDC
Flexible Duct Connector

DESCRIPTION

All air duct installations for heating, cooling or ventilation are attached to mechanical equipment containing a fan or blower. Vibrations, noises and rattles resulting from operation of the fan or blower are transmitted into the metal ducts which carry the noises throughout the system.

In order to isolate the vibration and noises to the source, an air - tight flexible joint, consisting of a fabric which is attached to sheet metal on both side, must be inserted between the equipment and the ductwork. This vibration isolator is called a "Flexible Duct Connector".



Fabric Comparisons	Excelon®	Neoprene (Specification Grade)	Durolon	Teflon
UL Classified Listing #	R4462	R4462	UL Certified NFPA 701	n/a
Continuous Temp. Range	-40°F. to 180°F.	-40°F. to 200°F.	-40°F. to 250°F.	-150°F. to 500°F.
Color	Black	Black	White	Grey Outside/Beige Inside
Commercial Grade Weight	22 oz.	30 oz.	26 oz.	16.5 oz.
Residential Grade Weight	17 oz.	30 oz.	26 oz.	16.5 oz.
Abrasion Resistance[1]	15,000 cycles	600 cycles	500 cycles	1,000 cycles
Leakage Resistance[2]	350	595	250	650
Tear Strength[3]	100 lbs. / 100 lbs.	12 lbs. / 12 lbs.	12 lbs. / 12 lbs.	50 lbs. / 30 lbs.
Tensile Strength[4]	240 lbs. / 220 lbs.	500 lbs. / 450 lbs.	225 lbs. / 300 lbs.	400 lbs. / 300 lbs.
Base Fabric	Woven Nylon/Polyester Blend	Woven Fiberglass	Woven Fiberglass	Fiberglass/Satin Weave
Coating	Vinyl	Neoprene	Hypalon	Teflon
Features	• Excellent water resistance • Excellent tear strength • Excellent all purpose fabric • Unaffected by mildew	• Extremely resistant to alkalies & gasoline • Excellent on systems exposed to toxic fumes • Good general purpose fabric • Unaffected by mildew	• Excellent ozone & weathering resistance • Best overall acid resistance • Recommended for rooftop applications • Unaffected by mildew	• High temperature resistant • High corrosion resistance • Excellent chemical resistance
Metal-Fab® Grip Loc	MBX333 (#10159)	MFN333 (#10003)	MFD333 (#10002)	MCT333 (#10278)
Super Metal-Fab® Grip Loc	MB6X363 (#10160) MB12X3123 (#10252)	MF6N363 (#10012) MFN12N3123 (#10251)	MF6D363 (#10011)	MC6T363 (#10069)
TDC/TDF Grip Loc	MBX444 (#10210) MBX464 (#10214) MBX484 (#10280) MBX4104 (#10286)	MFN444 (#10211) MFN464 (#10246) MFN484 (#10281) MFN4124 (#10254)	MFD444 (#10237) MFD464 (#10245)	MCT444 (#10279) MCT4104 (#10287)

Please see individual submittals for each fabric/configuration for flame/smoke test results (ASTM E84 rating & NFPA 701).
Excelon and Neoprene are available in 1000 foot rolls (Metal-Fab) and 800 foot rolls (TDC/TDF).

All Metal-Fab, Super Metal-Fab and TDC/TDF Flexible Duct Connectors are manufactured with 24 gauge galvanized steel.
Duro Dyne meets or exceeds the SMACNA steel requirements for flexible duct connector.
Other materials are available upon request.

Notes:

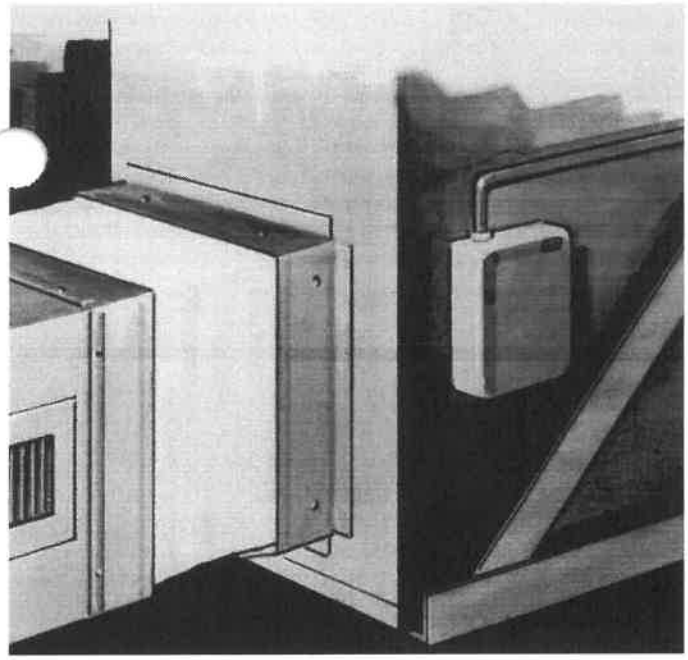
1. Abrasion resistance as per Federal Test Standard 191 Method #5306 using CS 17 wheel with 250 Gram load.
2. Leakage resistance as per Federal Test Standard 191 Method #5512. Results in P.S.I.
(To convert inches of water multiply P.S.I. x 27.176.).
3. Tear strength in tongue pounds as per Federal Test Standard 191 Method #5134.1 (warp/fill).
4. Tensile strength in grab pounds as per Federal Test Standard 191 Method #5100 (warp/fill).
5. Standard Excelon is not LA city approved. Use Excelon-LA when LA city approval is necessary.
(See Specification Form Excelon-LA - 203)

All Duro Dyne Flexible Duct Connector Products are suitable for pressures of -10 to +15 wg. Duro Dyne's standard 'single fold' metal to fabric grip has been tested by an independent testing laboratory to withstand a negative pressure of -10" WC and a positive pressure of +17.25" WC with no tearing or visible separation.

SUGGESTED SPECIFICATION

Vibration Isolating Flexible Duct Connector For Heating, Cooling & Exhaust Supplies & Returns.

At the inlet and discharge of all air handling equipment(unless otherwise noted) furnish and install vibration isolators. Vibration isolators shall be a coated woven fabric named _____ and shall be "Underwriters Laboratories Classified". Vibration isolators shall have a tear strength of not less then _____, and a continuous temperature range of _____ .Vibration isolators shall be preassembled metal to exposed fabric to metal. Fabric and metal shall be joined by means of a double lock seam. Vibration isolators shall be code_____ (called Flexible Duct Connectors) as manufactured by Duro Dyne Corporation, Bay Shore, N.Y.



DURO DYNE®

Specifications

All Listed Duro Dyne Flexible Duct Connector Fabrics are designed to meet the following specifications:

1. MIL-C-20696B Para. 4.4.3. (Oil Resistance).
2. MIL-C-20696B Para. 4.4.4. (Hydro Carbon Resistance).
3. NFPA701 Tests for Flame Propagation of Fabrics and film (except Teflon).
4. California State Fire Marshal Approved.
5. Los Angeles City Approved. *(*See note below)*
6. Denver City Approved.

All Duro Dyne Flexible Duct Connectors utilize galvanized steel meeting ASTM-A-525 G 60 or better.

Duro Dyne Flexible Duct Connectors are also available with 300 series stainless steel or 3003 aluminum upon request.

Note - Standard Excelon is not LA city approved. Use Excelon-LA when LA city approval is necessary. (See Submittal Form for Excelon-LA)

CHEMICAL RESISTANCE

(X = Extremely Resistant)
(NR = Not Recommended)
(O = No Data Available)

Chemical	Excelon	Neoprene	Durolon	Teflon
Acetic Acid	NR	X	X	X
Aluminum Chloride	X	X	X	X
Aluminum Sulfate	X	X	X	X
Ammonia (Anhyd)	X	X	X	X
Ammonium Hydroxide	X	X	X	X
Ammonium Sulfate	X	X	X	X
Barium Sulfide	X	X	X	X
Black Sulfate Liquor	X	X	X	X
Boric Acid	X	X	X	X
Butyl Alcohol	NR	X	X	X
Cadmium Plating Solution	X	NR	NR	O
Calcium Chloride	X	X	X	X
Calcium Hypochlorite	X	NR	X	X
Chlorine Water	X	NR	NR	O
Chromic Acid	X	NR	X	X
Chromium Plating Solution	X	O	O	O
Citric Acid	X	X	X	X
Copper Chloride	X	X	X	X
Copper Sulfate	X	X	X	X
Cottonseed Oil	X	X	X	O
Diacetone Alcohol	NR	X	X	O
Disodium Phosphate	X	NR	NR	O
Ethyl Alcohol	NR	X	X	X
Ethylene Glycol	NR	X	X	X
Ferric Chloride	X	X	X	X
Ferric Sulfate	X	X	X	X
Fluroboric Acid	X	X	X	O
Formaldehyde (40%)	X	X	X	X
Formic Acid	X	X	X	X
Glucose	X	X	X	X
Glycerine	NR	X	X	X
Heptane	NR	X	X	X
Hexane	NR	X	X	X
Hydrobromic Acid (40%)	NR	X	X	X
Hydrochloric Acid (conc)	NR	X	X	X

Chemical	Excelon	Neoprene	Durolon	Teflon
Hydrofluoric Acid (100%)	NR	X	X	X
Hydrogen Peroxide	X	NR	X	NR
Hydrogen Sulfide	X	X	X	X
Lactic Acid	NR	X	X	X
Linseed Oil	NR	X	X	O
Magnesium Chloride	NR	X	X	X
Maleic Acid	X	NR	X	O
Methyl Alcohol	NR	X	X	X
Methyl Cellosolve	NR	X	X	O
Mineral Oil	X	X	X	X
Naptha	NR	NR	NR	X
Nickel Chloride	X	X	X	X
Nickel Sulfate	X	X	X	X
Nitric Acid (40%)	X	NR	X	X
Oleic Acid	X	NR	NR	X
Oleum	NR	NR	X	X
Oxalic Acid	X	X	X	X
Phosphoric Acid (85%)	NR	X	X	X
Pickling Solution	X	NR	X	O
Potassium Chloride	X	X	X	O
Potassium Cyanide	X	X	X	X
Potassium Dichromate	X	X	X	X
Potassium Hydroxide (40%)	X	X	X	X
Potassium Sulfate	X	X	X	X
Propyl Alcohol	NR	X	X	O
Sodium Chloride	X	X	X	X
Sodium Hydroxide (40%)	NR	X	X	X
Sodium Hypochlorite	NR	NR	X	X
Steam	NR	X	NR	X
Sulfur Dioxide (Liquid)	NR	X	X	X
Sulfuric Acid (50%)	X	NR	X	X
Sulfuric Acid (over 50%)	NR	NR	X	X
Tannic Acid	X	X	X	X
Vinegar	X	X	X	X

Duro Dyne National Corporate Headquarters, Bay Shore, NY
631-249-9000 • Fax: 631-249-8346
Duro Dyne Midwest • Duro Dyne West • Duro Dyne Canada
www.durodyne.com • E-mail: durodyne@durodyne.com

DURO DYNE®

5/24/2022
BO010403

CREATING CUSTOMERS FOR LIFE

POWERS

SUBMITTAL

PRODUCT	Takeoff Fittings & Round Balancing Dampers
MANUFACTURER	Dace
JOB NAME	CALS Main Library Renovation
LOCATION	Little Rock, AR
ENGINEER	Bernhard TME
CONTRACTOR	Knight & Wilson
DATE	5/6/2024
SUBMITTED BY	Chris Atwood

5440 Northshore Drive - North Little Rock, Arkansas 72118 - Tel: 501.374.5420 Fax: 501.370.9298

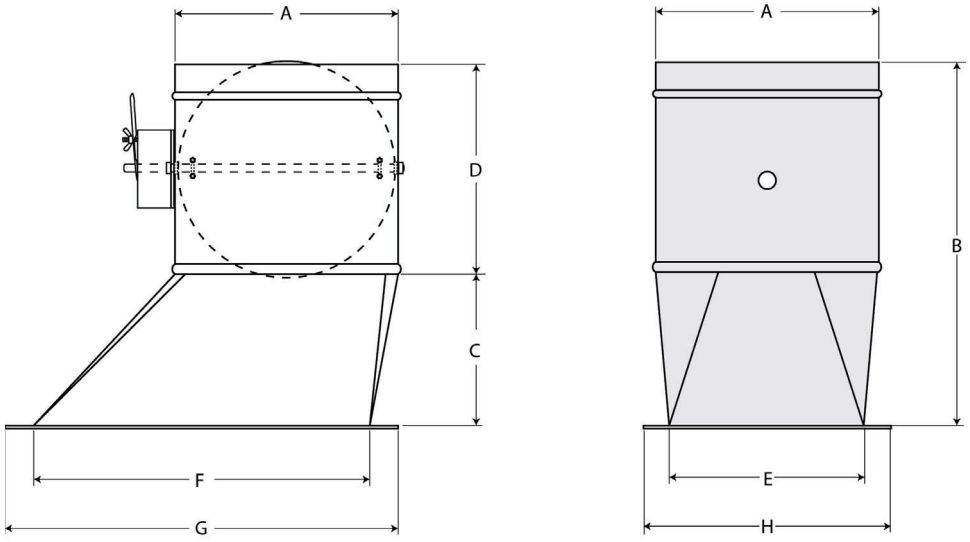
Dace Mfg.
orders@dacemfg.co

SUBMITTAL Feb 2015

SIDE TAKEOFF FITTING w DAMPER

MODEL: STOD CO3

HIGH EFFIENCY SIDE TAKEOFF FITTINGS



SIZE	A	B	C	D	E	F	G	H
5"	4 7/8	13	5 1/2	7 1/2	5	9	11	7
6"	5 7/8	13	5 1/2	7 1/2	5	9	11	7
7"	6 7/8	13	5 1/2	7 1/2	5	11	13	7
8"	7 7/8	13	5 1/2	7 1/2	6	12	14	8
9"	8 7/8	13	5 1/2	7 1/2	7	13	15	9
10"	9 7/8	13	5 1/2	7 1/2	8	14	16	10
12"	11 7/8	13	5 1/2	7 1/2	10	16	18	12
14"	13 7/8	13	5 1/2	7 1/2	12	18	20	14
16"	15 7/8	13	5 1/2	7 1/2	14	20	22	16
18"	17 7/8	13	5 1/2	7 1/2	16	22	24	18
20"	19 7/8	13	5 1/2	7 1/2	18	24	26	20

STANDARD CONSTRUCTION DETAILS

- 26 gauge G90/60 galvanized steel
- 1" flange with die formed corners & pre punched mounting holes
- entire unit is spot welded, SMACNA 3" WG minimum
- adhesive coated rubber perimeter gasket

OPTIONS IN CONSTRUCTION

- material 24 ga, 22 ga galvanized steel,
- all aluminum or all stainless steel
- optional damper—26—16 ga galvanized steel, aluminum, stainless steel
- CO3 damper control is a 2" raised locking quadrant, 3/8" sq. axle, nylon bearings fastened to the damper with U bolts.

Dace Mfg.

orders@dacemfg.co

SUBMITTAL Feb 2015

ROUND MANUAL BALANCE DAMPER

MODEL: RMBD CO3

Purpose Description:
The round manual balancing damper is used to regulate air flow in pipe.

CONSTRUCTION:
BARREL: (B) 6" long, beaded & tapered.

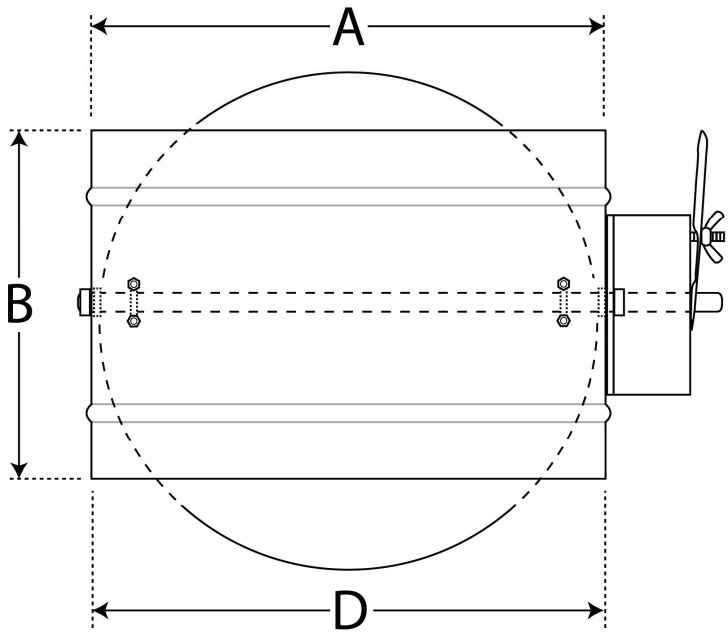
ALL DIAMETERS: (A) sized 1/8" under nominal

BODY MATERIAL:
26 gauge standard
OPTIONS:
24 gauge steel
22 gauge steel
SS 304

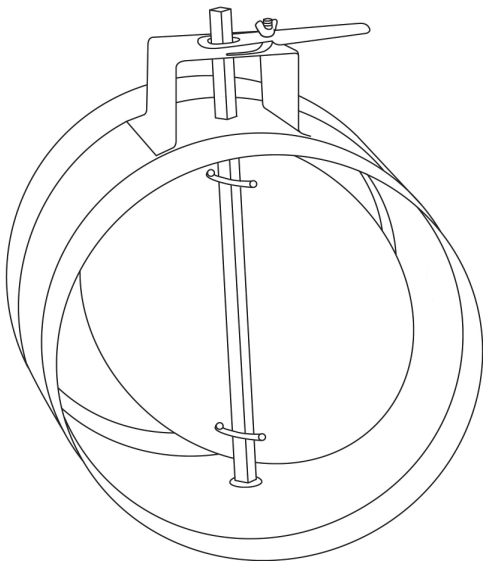
DAMPER BLADES:
26 gauge standard
OPTIONS:
24 GA,
22 GA steel,
20 gauge—16 gauge steel
SS 304

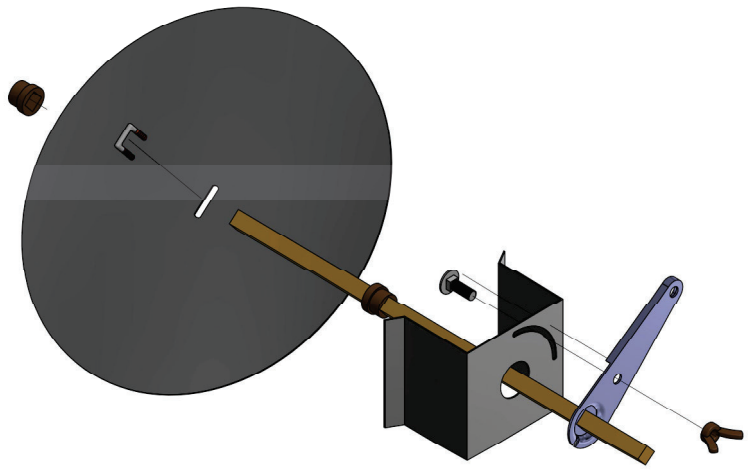
DAMPER CONTROL:
CO3 - 2" raised handle, locking quadrant, 3/8" square continuous rod, 'U' bolts, nylon bearings

All stainless steel option



RMBD–CO3





CREATING CUSTOMERS FOR LIFE

POWERS

SUBMITTAL

PRODUCT	Fire Smoke Dampers
MANUFACTURER	Pottorff
JOB NAME	CALS Main Library Renovation
LOCATION	Little Rock, AR
ENGINEER	Bernhard TME
CONTRACTOR	Knight & Wilson
DATE	5/6/2024
SUBMITTED BY	Chris Atwood

5440 Northshore Drive - North Little Rock, Arkansas 72118 - Tel: 501.374.5420 Fax: 501.370.9298

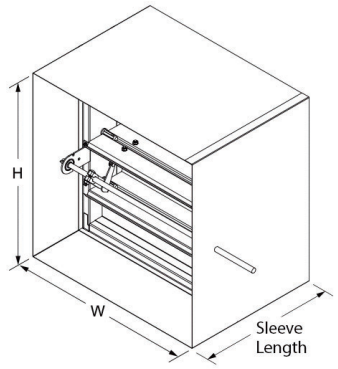
Submittal

Model FSD-141

Combination fire smoke damper, 1-1/2 hour, UL class 1, triple-V blade

General construction

Dimensions: Nominal (approximately 1/4" (6) undersize, sleeve thickness not included)
Material: Galvanized steel
Mount: Vertical
Frame: 5" x 1" (127x25) hat channel, 13 gauge equivalent
Blade style: 6" x 16 gauge, triple-v
Blade action: Parallel
Sleeve: Type: Sleeve
Axles: 1/2" (13) diameter plated steel hex
Linkage: Concealed in frame
Bearings: Stainless steel oilite, sleeve-type
Seals: Blade: Silicone; Jamb: Flexible stainless steel
Fire closure device: HS-10
Fire closure temperature (°F): Primary: 165



Model FSD-141 with sleeve

Options

Angles: Type: Picture frame, 20 ga (2 sides)

Ratings

UL 555 fire resistance rating: 1-1/2 hour
UL 555S leakage class: 1 [8 cfm/sq.ft. @ 4 in.wg.] [(0.04m³/s/m²@1.0 kPa)]
UL HNLJ.V-5: Ventilation Duct Assemblies
Dynamic closure velocity (fpm): 2000
UL555S rated pressure (in.wg.): 4
Application temperature (°F): 250

Air Performance
Pottorff certifies that the model FSD-141 shown herein is licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance ratings only.

Listings

UL 555 and 555S listing: R11767
CSFM listing: 3225-0368:110 and 3230-0368:111

Details

Line item	Tag	Qty	Dimensions (in.xxxx)		Sections	Sleeve or Side Plate			Actuator							
			W x H	D	Wide x High	L (in)	Gauge	Clr (in)	Qty	Model	Volt	Pos	Orien	Loc	Power consumption (per actuator)	Transformer sizing (VA) (per actuator)
5	FIRE SMOKE DAMPER	1	8 x 8		1 x 1	16	20	6	1	FSTF120-S	120V	PO	Perp	Ext/int	3.5VA	3.5
6	FIRE SMOKE DAMPER	1	16 x 8		1 x 1	16	20	6	1	FSTF120-S	120V	PO	Perp	Ext/int	3.5VA	3.5
7	FIRE SMOKE DAMPER	1	14 x 14		1 x 1	16	20	6	1	FSTF120-S	120V	PO	Perp	Ext/int	3.5VA	3.5
8	FIRE SMOKE DAMPERS	2	18 x 18		1 x 1	16	20	6	1	FSNF120-S	120V	PO	Perp	Ext/int	23VA	27
9	FIRE SMOKE DAMPER	1	30 x 12		1 x 1	16	20	6	1	FSNF120-S	120V	PO	Perp	Ext/int	23VA	27

This submittal sheet reflects only the construction and options selected and is not indicative of all constructions and options that are available for the product. For more information, please contact your local representative or visit us at www.pottorff.com.

Information is subject to change without notice or obligation.

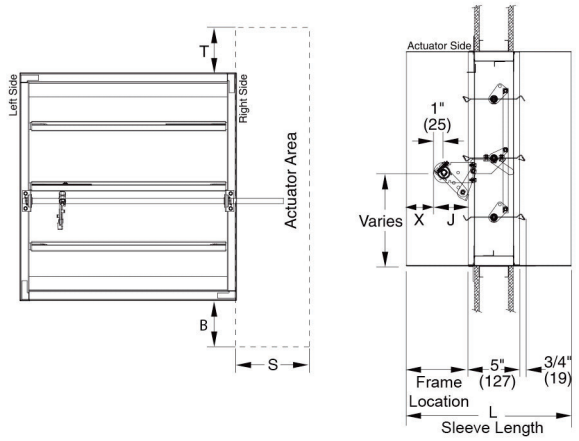
Note: Dimensions in parentheses ( ) are millimeters.

POTTORFF®

Submittal

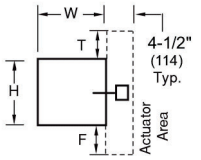
Model FSD-141

Actuator and Sleeve Interference Details



Model FSD-141

The drawings and corresponding table illustrate the position of the damper when mounted in a factory sleeve and the relative space required for a given actuator. The standard mounting locations provide enough space for installation of retaining angles and duct connections.



Detail #11-1

Dimensional Data

Line item	Tag	Qty	Dimensions (in.xxxx)		Sections	Sleeve or Side Plate		Actuator			Dimensional data (in)				
			W x H	D	Wide x High	L (in)	Clr (in)	Qty	Model	Detail	F	T	S	X	J
5	FIRE SMOKE DAMPER	1	8 x 8		1 x 1	16	6	1	FSTF120-S	#11-1	4	1	4.5	2.625	3.375
6	FIRE SMOKE DAMPER	1	16 x 8		1 x 1	16	6	1	FSTF120-S	#11-1	4	1	4.5	2.625	3.375
7	FIRE SMOKE DAMPER	1	14 x 14		1 x 1	16	6	1	FSTF120-S	#11-1	0	1	4.5	2.625	3.375
8	FIRE SMOKE DAMPERS	2	18 x 18		1 x 1	16	6	1	FSNF120-S	#11-1	0	1	4.5	2.625	3.375
9	FIRE SMOKE DAMPER	1	30 x 12		1 x 1	16	6	1	FSNF120-S	#11-1	3	2	4.5	2.625	3.375

Note: Dimensions in parentheses ( ) are millimeters.

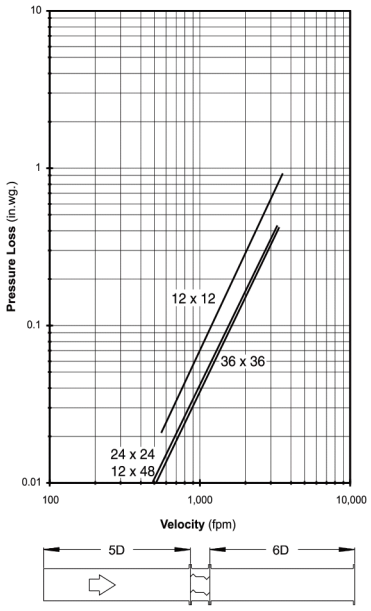
POTTORFF®

Submittal

Model FSD-141
Performance

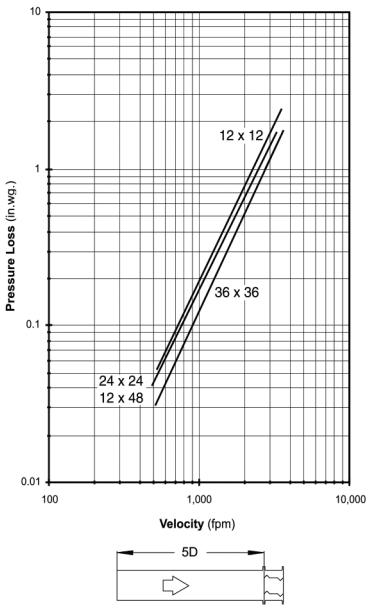
Pressure drop testing

Pressure drop testing was performed in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent air density of 0.075 lb/ft. Actual pressure drop in any ducted HVAC system is a combination of many elements. This information, along with analysis of other system influences, should be used to estimate actual pressure losses for a damper installed in a given HVAC system.



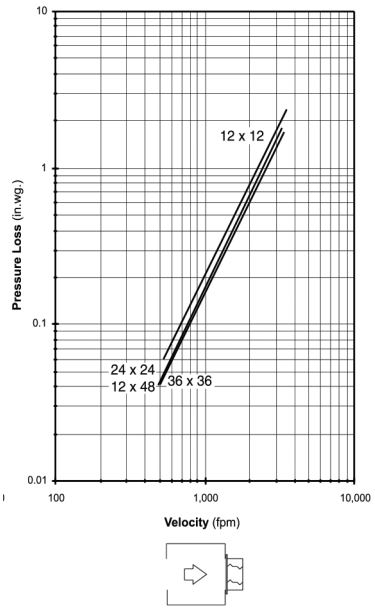
Ducted inlet and outlet

AMCA Figure 5.3 Illustrates a fully ducted damper. This configuration represents the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.



Ducted inlet

AMCA Figure 5.2 illustrates a ducted damper exhausting air into an open area. This configuration has a lower pressure drop than Figure 5.5 because entrance losses are minimized by a straight duct run upstream of the damper.



Plenum mount

AMCA Figure 5.5 Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

Air Performance

Pottorff certifies that the model FSD141 shown herein is licensed to bear the AMCA seal. The ratings shown are based on tests and procedures performed in accordance with AMCA publication 511 and comply with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to air performance ratings only.

This submittal sheet reflects only the construction and options selected and is not indicative of all constructions and options that are available for the product. For more information, please contact your local representative or visit us at www.pottorff.com.

Information is subject to change without notice or obligation.

Note: Dimensions in parentheses ( ) are millimeters.

Application

The HS-10 fire closure device employs a one-temperature, manually resettable, electric thermostat sensor to interrupt the electrical power to actuators used on fire/smoke dampers to permit the controlled closure of the dampers. The HS-10 is designed to replace the fusible link. The HS-10 allows for damper testing per all NFPA specifications. The damper will close once power is removed from the HS-10 and will automatically reopen once power is restored.

Listings

UL 555 listing: R11767

CSFM listing: 3225-0368:110, 3225-0368:111, 3225-0368:112, 3225-0368:113, 3225-0368:115, and 3225-0368:116.

New York City MEA listing: 295-98-E

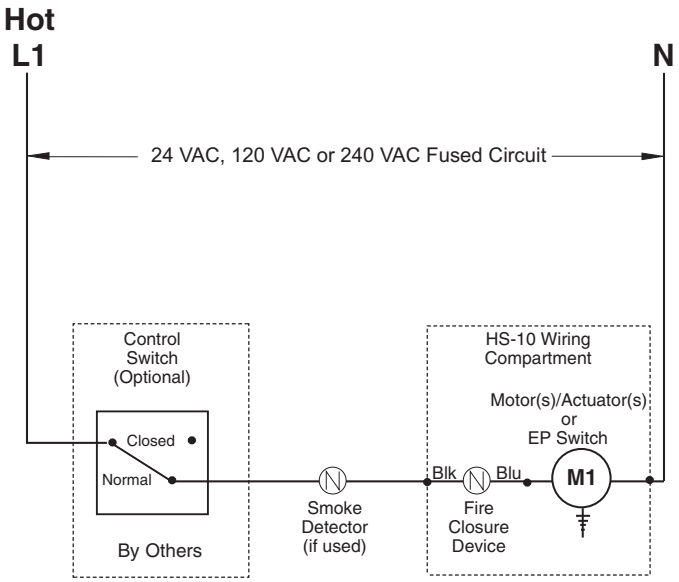
Meets NFPA Standards: 80, 90A, 92A, 92B, 101, and 105

Meets Building Code Standards: IBC, NBC, NFPA, SBC and UBC

Wiring Diagram

Control Switch Function

Normal



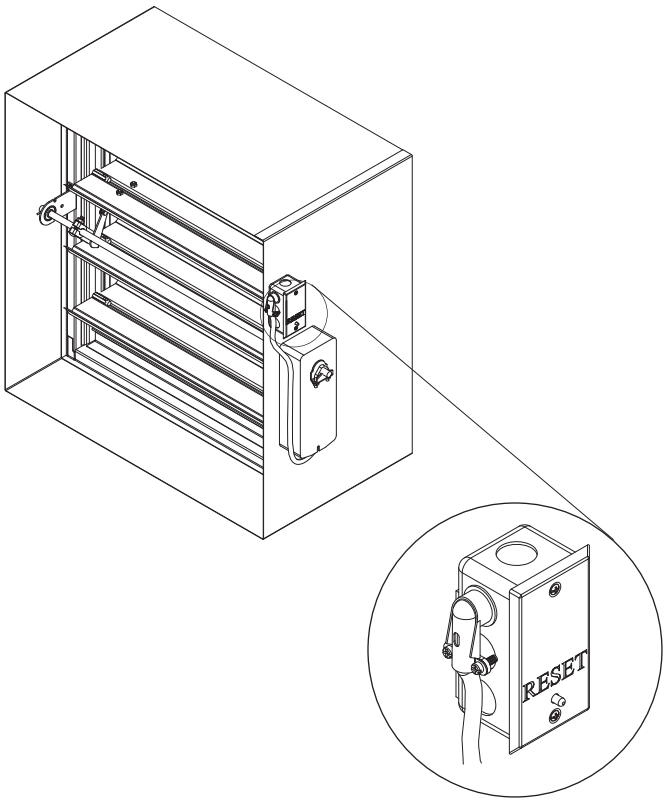
The damper remains open except in either of the following situations:

1 - The smoke detector cuts the power to the "Power-Open" motor/actuator.

2 - An elevated duct temperature causes the fire closure device to cut power to the "Power-Open" motor/operator. The damper will remain closed until the duct temperature has returned to a safe level. At that point the fire closure device can be manually reset, allowing the damper to be reopened.

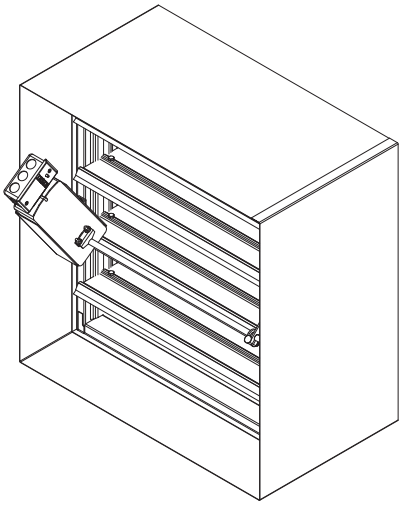
Closed

The damper closes and remains closed regardless of any sensor signal.



Model **HS-10** external

Model **HS-10** internal



FSNF24(-S)(-FC) US, FSNF120(-S)(-FC) US

On/Off, Spring Return, 350°F for Half Hour, 15 Seconds Cycle Time

5 YEAR WARRANTY

LISTED 94 D5 TEMP.IND. & REG. EQUIP. c UL us

Technical Data	FSNF24(-S)(-FC) US, FSNF120(-S)(-FC) US
Power supply	
FSNF24(-S)(-FC) US	24 VAC ± 20%, 50/60 Hz
FSNF120(-S)(-FC) US	120 VAC ± 10%, 50/60 Hz
Power consumption running	17 W, 24 VA
24 VAC holding	4 W, 6.5 VA
120 VAC running	19 W, 23 VA, 0.19 A
holding	6 W, 8.5 VA, 0.07 A
Fusing*	
FSNF24	2.5 amp slow blow
FSNF120	0.5 amp slow blow
Transformer sizing	40 VA per 24 VAC actuator
Electrical connection	
FSNF24 US	3 ft, 18 ga, 2 color coded leads
FSNF120 US	3 ft, 18 ga, 3 color coded leads
FSNF...-S US	3 ft, 18 ga, appliance cable
Overload protection	electronic throughout 0 to 95° rotation grounded enclosure, 120V
Control	microprocessor
Angle of rotation	95°
Torque	70 in-lb [7.9 Nm] minimum from 32°F to 350°F [0°C to 177°C]
Direction of rotation spring	can be selected by CCW/CW mounting
Position indication	visual indicator, 0° to 95°
Running time	between 32°F and 350°F [0°C to 177°C] <15 seconds at rated voltage and torque
Humidity	5 to 95% RH non-condensing
Ambient temperature	32°F to 122°F [0°C to 50°C]
Storage temperature	-40°F to 176°F [-40°C to 80°C]
Housing	NEMA type 1
Housing material	zinc coated steel
Gears	steel, permanently lubricated
Agency listings	cULus listed to UL873 and CAN/CSA C22.2 No. 24 NYC Department of Buildings Materials and Equipment Acceptance Division MEA 197-07-M California State Fire Marshal Listing 3210-1593:101
Servicing	maintenance free
Quality standard	ISO 9001
Weight	
FSNF24(-S) US	6.0 lbs [2.75 kg], (+ 0.5 lbs [+.23 kg])
FSNF120(-S) US	6.7 lbs [3.0 kg], (+ 0.5 lbs [+.23 kg])

FSNF24-S US, FSNF120-S US, FSNF24-S-FC, FSNF120-S-FC	
Auxiliary switch	2xSPST 7A resistive, 2.5A inductive at 120V or 250V, UL Approved, double-insulated, one switch at 10°, one at 85°

Application

The type FSNF spring-return actuator is intended for the operation of smoke and combination fire and smoke dampers in ventilation and air-conditioning systems. The actuator will meet requirements of UL555 and UL555S when tested as an assembly with the damper and will open and close in 15 seconds at 350°F. Square footage of damper operated will depend on make and model of damper and the temperature 250°F or 350°F.

Operation

Mounting of the actuator to the damper axle shaft or jackshaft (3/8" to 1.05") is via a cold-weld clamp. Teeth in the clamp and V-bolt dig into the metal of both solid and hollow shafts maintaining a perfect connection. The specially designed clamp will not crush hollow shafts. The bottom end of the actuator is held by an anti-rotation strap or by a stud provided by the damper manufacturer.

The actuator is mounted in its fail safe position with the damper blade(s) closed. Upon applying power, the actuator drives the damper to the open position. The internal spring is tensioned at the same time. If the power supply is interrupted, the spring moves the damper back to its fail-safe position.

-FC Models have the same electrical and mechanical characteristics except instead of a 1/2" conduit connector a 3/8" screw flex connector is supplied.

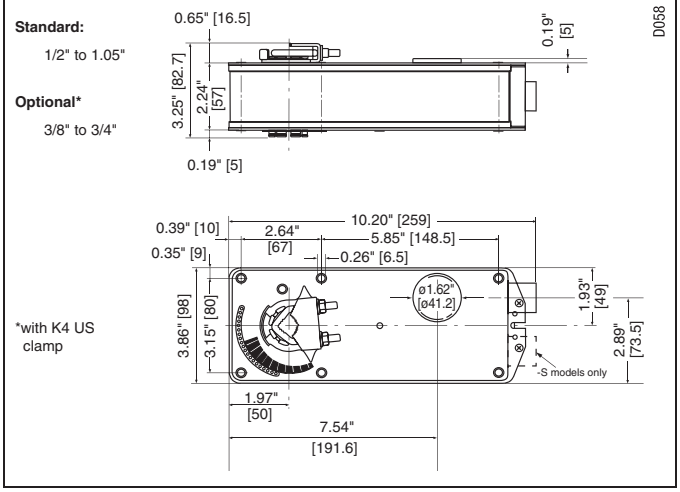
SAFETY NOTES

The actuator contains no components which the user can replace or repair.

1/2" Threaded Connector – Screw a conduit fitting into the actuator's metal bushing. Jacket the actuator's input wiring with suitable flexible conduit. Properly terminate the conduit in a suitable junction box.

3/8" Flexible Connector Models (-FC Screw Connector) – Mount the flexible conduit into the actuator's metal bushing by means of the provided screw with a torque of 0.9 ft-lb. Jacket the actuator's input wiring with suitable flexible conduit. Properly terminate the conduit in a suitable junction box.

Dimensions (Inches [mm])



Accessories

All AF/NF linkages and parts except ZG-102 may be employed.

*** Individual Fusing or Breakers are not required by Belimo.**

The FSNF24 draws higher peak current when driving against any type of stop. Given the technology of fuses & breakers, this requires the value of fuse or breaker to be increased to avoid nuisance opening or tripping. A 2.5 amp slow blow should be used for 24VAC. A 0.5 amp slow blow should be used for 120VAC.

Transformers

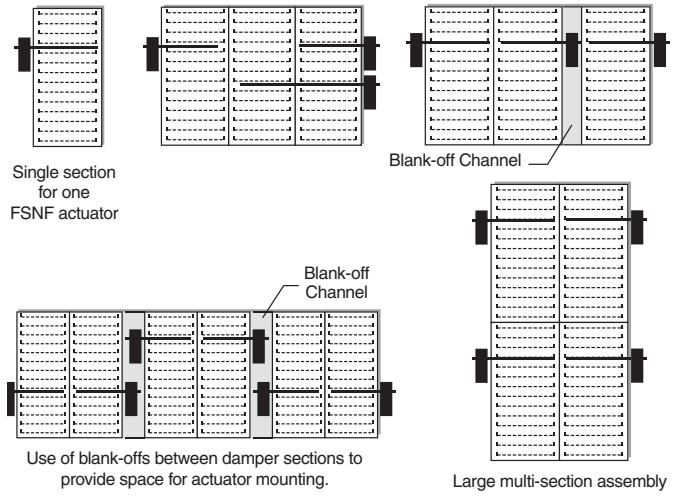
Note that while a 100VA transformer would handle 2 actuators, a 4A breaker is insufficient.

Typical Applications

Multi-section Damper Assemblies

The typical fire and smoke damper requires from 5-15 in-lb of torque per square foot at 250°F – 350°F under dynamic load (2400 fpm velocity). The FSNF will operate multi-section dampers using multiple actuators for multiple sections. Some of the methods used are shown below.

This is a direct coupled actuator. If linkages are needed use those for the FSAF series. Do not use the ZG-102 as close coupled actuators have a shortened life due to the high speed of the FSNF. Mounting at opposite ends of a jackshaft is OK.



Typical Specification

Smoke Control and Combination Fire and Smoke Control Damper Actuators

All smoke and combination fire and smoke dampers shall be provided with Belimo FSTF, FSLF, FSNF, or FSAF actuators. No substitutions allowed.

Damper and actuator shall have UL555S Listing for 250°F (350°F) and shall comply with UBC if required by local codes.

Where proof of closure switches are required, blade switches, actuator auxiliary switches, or proximity switches are allowed if permitted by local codes.

Replacement Applications

The number one "equal or better" requirement for use as a replacement for obsolete defective motors is the UL555S listing of the Belimo actuator with the damper for the application. The local authority having jurisdiction sets the requirements. In some cases a permit and inspection may be required.

Go to **www.belimo.us/firesmoke** for a Cross Reference from old damper actuators to Belimo. Extensive retrofit installation instructions are available, along with technical training information.

CAUTION

Caution must be used when replacing failed motors with new Belimo actuators. Many old motors did not have internal springs and depended on external springs on the side of the damper or wrapped around the damper shaft to close the damper. Old motor springs must be removed or disabled. Do not remove fusible link springs if they had only fire and no smoke functions

In some cases, a BAE 165 or equal thermal sensor must be installed.

Wiring Diagrams

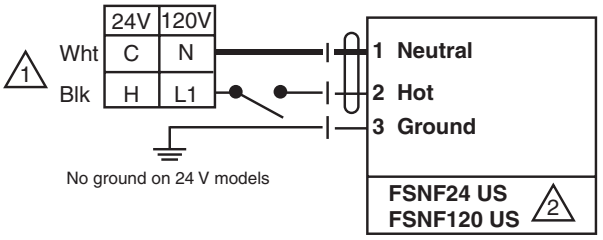
INSTALLATION NOTES

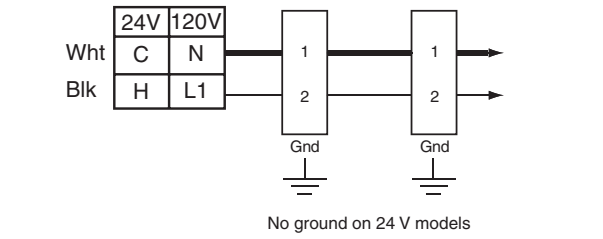
1 Provide overload protection and disconnect as required.

2 ***CAUTION** Equipment Damage!*
Actuators may be connected in parallel.
Power consumption and input impedance must be observed.

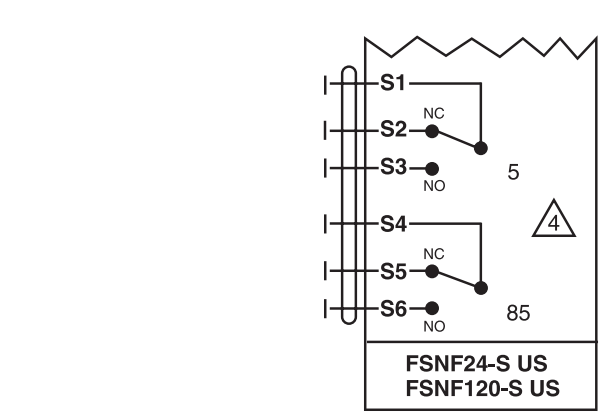
4 For end position indication, interlock control, fan startup, etc., FSNF24-S US and FSNF120-S US incorporate two built-in auxiliary switches:
2 x SPDT, 7A (2.5A inductive)@125/250 VAC, UL Approved, 10° and 85°.
Switch rating is for 250°F 1/2 hour only.

***WARNING** Live Electrical Components!*
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.





Parallel Actuator Wiring



Auxiliary switch wiring for FSNF24-S US, FSNF120-S US

BELIMO

FSTF120(-S) US

On/Off, Spring Return, 120 VAC

Torque min. 18 in-lb, for control of fire and smoke dampers

5 YEAR WARRANTY

LISTED 94 D5 TEMP. IND. & REG. EQUIP. c UL us

Application

The type FSTF spring-return actuator is intended for the operation of smoke and combination fire and smoke dampers in ventilation and air-conditioning systems. The actuator will meet requirements of UL555 and UL555S when tested as an assembly with the damper Square footage of damper operated will depend on make and model.

Operation

Mounting of the actuator to the damper axle shaft or jackshaft is via a cold-weld clamp. Teeth in the clamp and V-bolt dig into the metal of both solid and hollow shafts maintaining a perfect connection. The specially designed clamp will not crush hollow shafts. The bottom end of the actuator is held by an anti-rotation strap or by a stud provided by the damper manufacturer.

The actuator is mounted in its fail safe position with the damper blade(s) typically closed. Upon applying power, the actuator drives the damper to the open position. The internal spring is tensioned at the same time. If the power supply is interrupted, the spring moves the damper back to its fail-safe position.

SAFETY NOTE

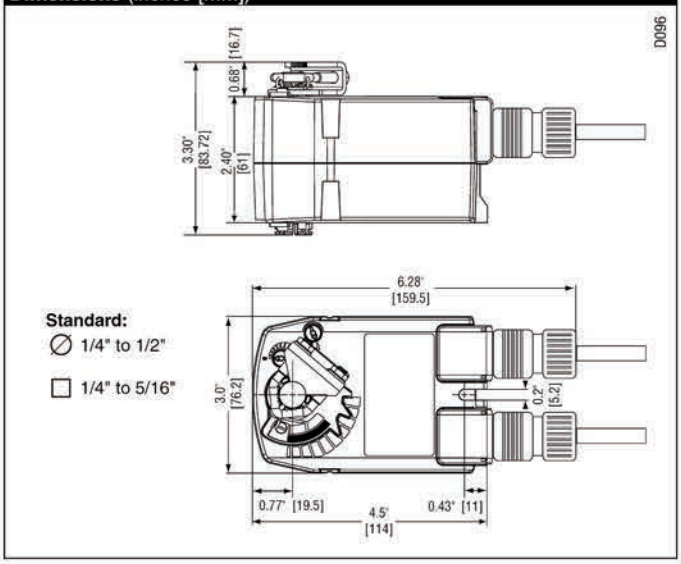
Screw a conduit fitting into the actuator's bushing. Jacket the actuator's input and output wiring with suitable flexible conduit. Properly terminate the conduit in a suitable junction box.

Technical Data		FSTF120(-S) US
Power supply	nominal	120 VAC, 60 Hz
	tolerance	108 to 132 VAC, 60 Hz
Power consumption	running	2 W, 3.5 VA
	holding	1.5 W, 2.5 VA
	max. inrush current	2.1A
Electrical connection (-S models have 2 cables)		3 ft, 18 GA appliance cable 1/2" conduit connector
Overload protection		electronic throughout 0 to 95° rotation
Electrical protection		actuators are double insulated
Angle of rotation		max 95°, adjust. with mechanical stop
Torque		min. 18 in-lb [2 Nm]
Direction of rotation		reversible with cw/ccw mounting
Position indication		visual indicator, 0° to 95° (0° spring return position)
Running time	motor	< 75 sec (0 to 18 in-lb)
	spring	< 25 sec @32°F to 122°F [0°C to 50°C]
Humidity		5 to 95% RH non-condensing
Ambient temperature		32°F to 122°F [0°C to 50°C]
Operating temperature		Up to 250°F for 1/2 hour per UL555S test
Housing		NEMA type 2 / IP42, UL enclosure type 2
Housing material		UL94-5VA. UL2043 Listed for plenum use
Agency listings†		cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02). UL2043 smoke rated
Noise level (max)	running	< 50 db (A)
	spring return	62 dB (A)
	holding	inaudible
Servicing		maintenance free
Quality standard		ISO 9001
Weight	FSTF120 US	1.26 lbs (0.57 kg)
	FSTF120-S US	1.5 lbs (0.68 kg)

† Rated Impulse Voltage 4kV, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

FSTF120-S US	
Auxiliary switch	2 x SPST 3A (0.5A) @ 120 VAC, UL approved One fixed at 10° and one fixed at 80°

Dimensions (Inches [mm])



Accessories

Tool-06	8mm and 10 mm wrench
KH-TF	Crank arm for up to 1/2" round shaft
ZG-TF2	Crank arm adaptor kit for FSTF
ZG-TF112	Mounting bracket, kit for FSTF
ZS-100	Weather shield (metal)
ZS-150	Weather shield (polycarbonate)
10379-00001	Limit stop

NOTE: When using FSTF120 US and FSTF120-S US actuators, only use accessories listed on this page or those provided by damper manufacturers.

For actuator wiring information and diagrams, refer to Belimo Wiring Guide.

Typical Specification

On/Off fire and smoke spring return damper actuators shall be direct coupled type which require no crank arm and linkage and be capable of direct mounting to a shaft up to a 1/2" diameter and center a 1/2" shaft. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall be protected from overload at all angles of rotation. If required, two SPDT auxiliary switches shall be provided. Actuators shall be cULus listed and have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Wiring Diagrams

INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

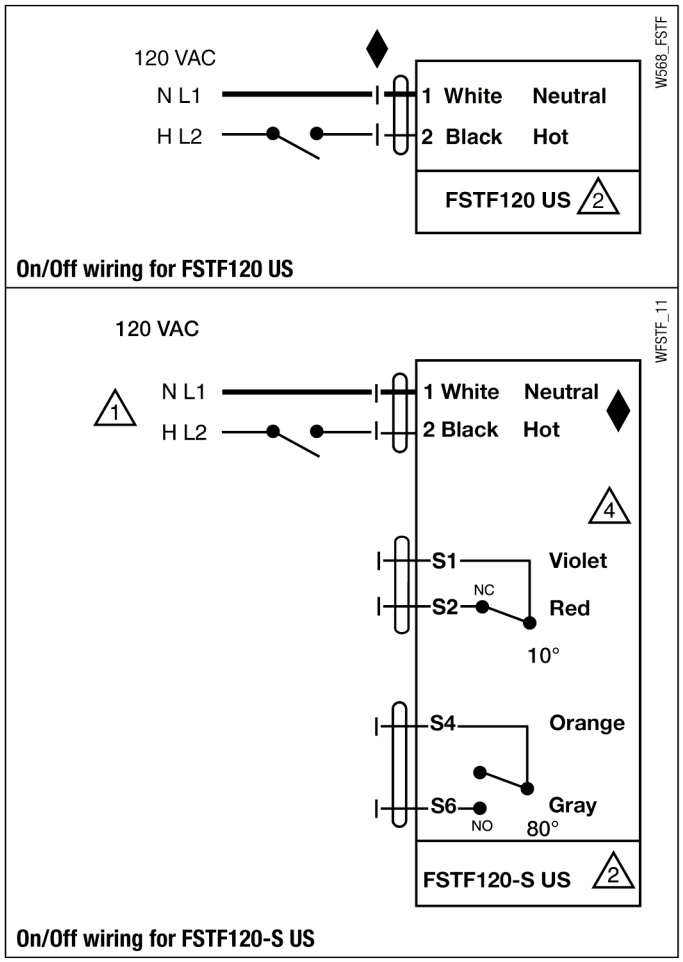
2 ***CAUTION** Equipment Damage!*
Actuators may be connected in parallel.
Power consumption must be observed.

4 Two SPST auxiliary switches for position indication. NC switch opens at 10º and NO switch closes at 80º

APPLICATION NOTES

Meets cULus requirements without the need of an electrical ground connection.

***WARNING** Live Electrical Components!*
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



On/Off wiring for FSTF120 US

On/Off wiring for FSTF120-S US

CREATING CUSTOMERS FOR LIFE

POWERS

SUBMITTAL

PRODUCT	Access Doors
MANUFACTURER	Pottorff
JOB NAME	CALS Main Library Renovation
LOCATION	Little Rock, AR
ENGINEER	Bernhard TME
CONTRACTOR	Knight & Wilson
DATE	5/6/2024
SUBMITTED BY	Chris Atwood

5440 Northshore Drive - North Little Rock, Arkansas 72118 - Tel: 501.374.5420 Fax: 501.370.9298

Submittal

Model HAD

Duct access door, insulated panel

General construction

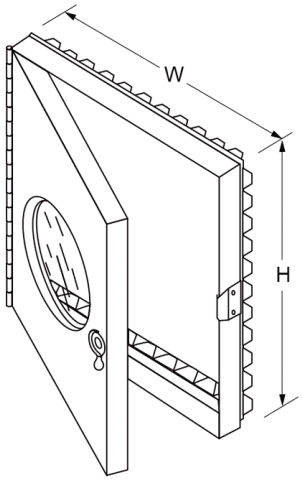
Material: Galvanized steel
Door panel: 24 gauge - double wall, insulated
Insulation: 1" thick fiberglass
Gasket: Compressible closed cell neoprene - door to frame and frame to duct
Latches: Cam

Options

Window: Yes

Ratings

Operating temperature range: -20°F to 200°F



Model HAD with window

Details

Line Item	Tag	Qty	Frame gauge	Door Size (in.xxxx) W x H	Duct Opening Size W x H (in)	Window Size D (in)	Qty Latches W x H	Ratings Press (in.w.g.)
10	ACC DOORS	1	24	8 x 8	7 x 7	3	0 x 1	3
11	ACC DOORS	5	24	12 x 12	11 x 11	6	0 x 1	3

Note: Dimensions in parentheses ( ) are millimeters.

CREATING CUSTOMERS FOR LIFE

POWERS

SUBMITTAL

PRODUCT	Manual Volume Dampers
MANUFACTURER	Pottorff
JOB NAME	CALS Main Library Renovation
LOCATION	Little Rock, AR
ENGINEER	Bernhard TME
CONTRACTOR	Knight & Wilson
DATE	5/6/2024
SUBMITTED BY	Chris Atwood

5440 Northshore Drive - North Little Rock, Arkansas 72118 - Tel: 501.374.5420 Fax: 501.370.9298

Submittal

Model MD-41

Manual balancing damper, triple-V parallel blade

General construction

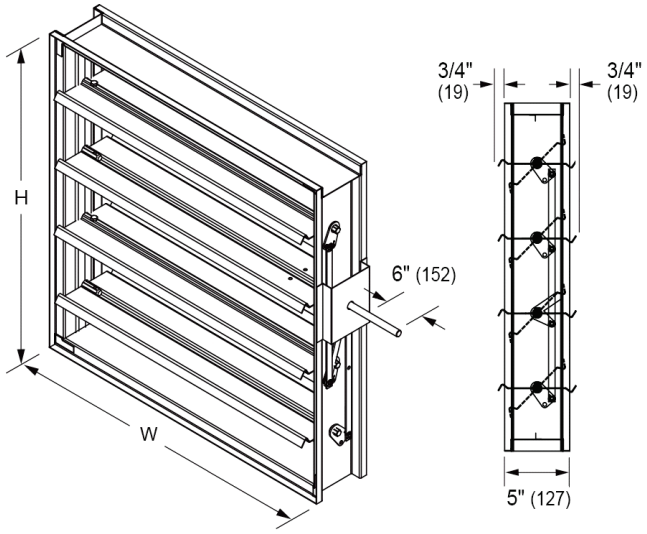
Dimensions: Nominal (approximately 1/4" (6) undersize)
Material: Galvanized steel
Frame: 5" x 1" (127 x 25) hat channel
Blade style: 6" x 16 gauge, triple-v
BladeAction: Parallel
Axles: 1/2" (13) diameter plated steel hex
Linkage: Concealed in frame
Control shaft: 1/2" x 6" (13 x 152) round drive axle
Bearings: Synthetic
Top and bottom stops: Yes

Options

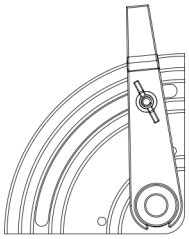
Locking quadrant: Manual locking quadrant, loose
Standoff: Actuator/quadrant standoff bracket

Ratings

Operating temperature range: -25°F to 180°F



Model MD-41



Manual locking quadrant (supplied loose)

Details

Line item	Tag	Qty	Dimensions (in.xxxx)	Sections	Ratings		J (in)
			W x H	Wide x High	Vel (fpm)	Press (in.w.g.)	
1	MVD	10	8 x 6	1 x 1	2000	5	
2	MVD	2	12 x 6	1 x 1	2000	5	
3	MVD	1	16 x 8	1 x 1	2000	4	
4	MVD	1	18 x 10	1 x 1	2000	4	

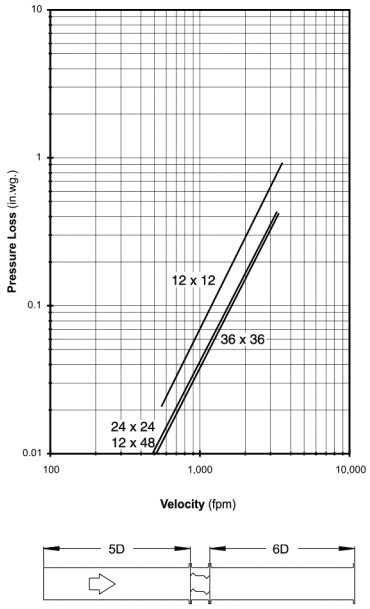
This submittal sheet reflects only the construction and options selected and is not indicative of all constructions and options that are available for the product. For more information, please contact your local representative or visit us at www.pottorff.com.

Information is subject to change without notice or obligation.

Note: Dimensions in parentheses ( ) are millimeters.

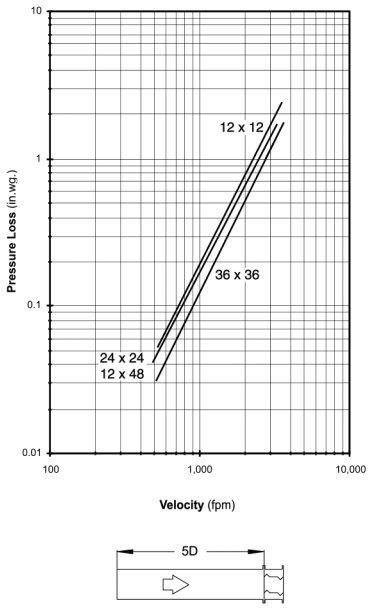
Submittal

Model MD-41
Performance



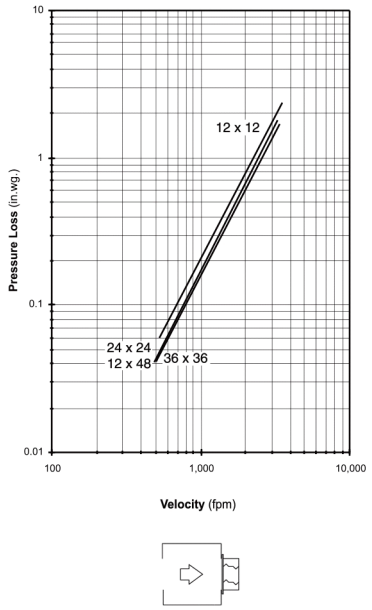
Ducted inlet and outlet

AMCA Figure 5.3 illustrates a fully ducted damper. This configuration represents the lowest pressure drop of the three test configurations because entrance and exit losses are minimized by straight duct runs upstream and downstream of the damper.



Ducted inlet

AMCA Figure 5.2 illustrates a ducted damper exhausting air into an open area. This configuration has a lower pressure drop than Figure 5.5 because entrance losses are minimized by a straight duct run upstream of the damper.



Plenum mount

AMCA Figure 5.5 illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

Pressure drop testing

Pressure drop testing was conducted in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent air density of 0.075 lb/ft. Actual pressure drop in any ducted HVAC system is a combination of many elements. This information, along with analysis of other system influences, should be used to estimate actual pressure losses for a damper installed in a given HVAC system.

Note: Dimensions in parentheses ( ) are millimeters.

CREATING CUSTOMERS FOR LIFE

POWERS

SUBMITTAL

PRODUCT	Louver L-1
MANUFACTURER	Pottorff
JOB NAME	CALS Main Library Renovation
LOCATION	Little Rock, AR
ENGINEER	Bernhard TME
CONTRACTOR	Knight & Wilson
DATE	5/6/2024
SUBMITTED BY	Chris Atwood

5440 Northshore Drive - North Little Rock, Arkansas 72118 - Tel: 501.374.5420 Fax: 501.370.9298

Submittal

Model EFK-430

Extruded aluminum louver, 4" deep, 30 degree K-blade

General construction

Dimensions: Nominal (approximately 1/2" (12) undersized)
Material: 6063-T5 extruded aluminum
Material thickness (in): 0.081
Frame and blade attachment: Mechanically fastened
Frame: 4" deep channel
Blade: 30° k-style
Screen 1 configuration: Material: Aluminum; Type: Bird screen; Pattern: 1/2" x 0.063"

Options

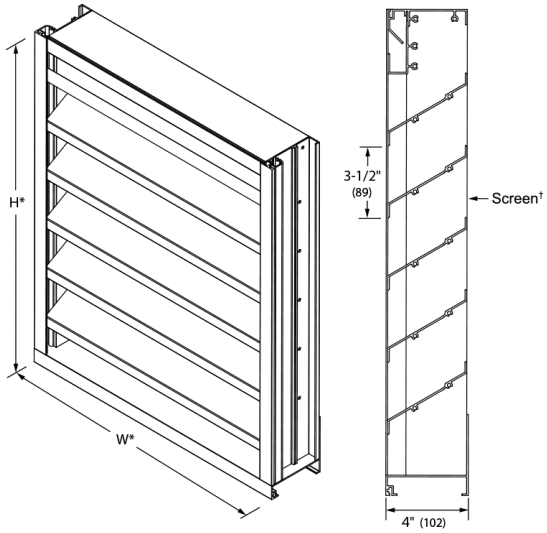
Material: 6063-T5 extruded aluminum
Screen 1 finish: Match louver
Flange: Type: Flange frame, Width (in): 1.5
Installation hardware: Standard clip angles
Finish: Baked enamel, Standard color name: TBD
Finish warranty: 5 years

Ratings

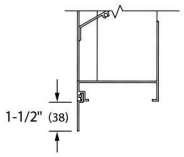
Free area: [48" x 48" (1219 x 1219) unit]: 9.6 ft² (0.89 m²) 59.6% (1 side)
Velocity @ 0.15 in.wg. Pressure Loss: 960 fpm (4.88 m/s)
Std. Design Load: 30 psf

Performance at beginning point of water penetration

Free area velocity: 1002 fpm (5.09 m/s)
Air volume delivered: 9549 cfm (4.51 m³/s)
Pressure loss: 0.16 in.wg. (40 Pa)



Model EFK-430



EFK-430 with flange frame

Details

Line item	Tag	Qty	Louver size (in.xxxx)	Sections	Ratings			Free area		Approx. weight (lbs)
			W x H	Wide x High	CFM	FPM	PD (in.w.g.)	ft²	%	
12	LOUVER L-1	1	32 x 18	1 x 1				1.85	48.3	12

This submittal sheet reflects only the construction and options selected and is not indicative of all constructions and options that are available for the product. For more information, please contact your local representative or visit us at www.pottorff.com.

Note that performance data in the details section of this submittal are calculated values, and are not AMCA certified.

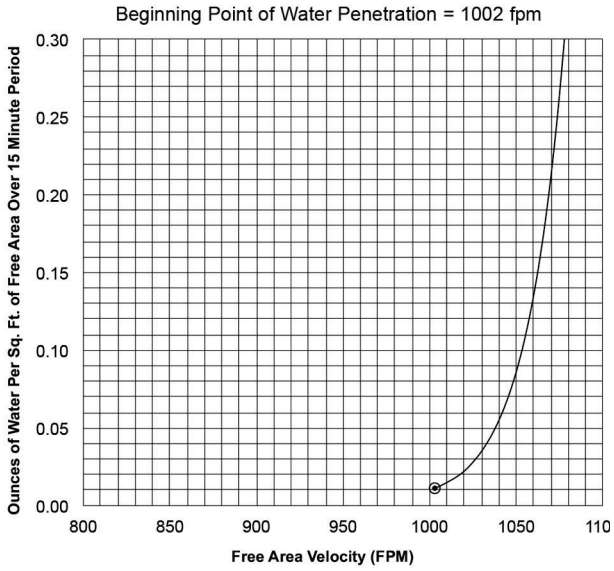
Information is subject to change without notice or obligation.

Note: Dimensions in parentheses ( ) are millimeters.

Submittal

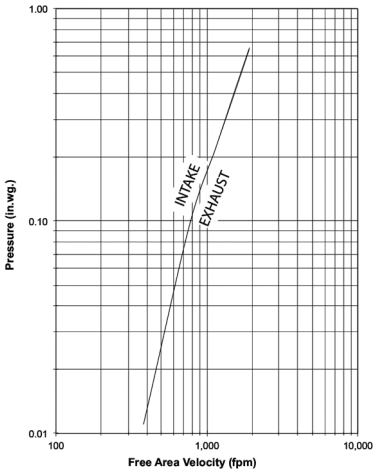
Model EFK-430

Performance



Water penetration

AMCA defines the beginning point of water penetration as the free area velocity at the intersection of a simple linear regression of test data and the line of 0.01 ounces of water per square foot of free area and is measured through a 48" x 48" louver during a 15 minute period. The AMCA water penetration test provides a method for comparing louver models and designs as to their efficiency in resisting the penetration of rainfall under specific lab conditions. Pottorff recommends that intake louvers are selected with a reasonable margin of safety below the beginning point of water penetration in order to avoid unwanted penetration during severe storm conditions.



Pressure loss

Louver test size = 48" x 48" (1219 x 1219)

This submittal sheet reflects only the construction and options selected and is not indicative of all constructions and options that are available for the product. For more information, please contact your local representative or visit us at www.pottorff.com.

Information is subject to change without notice or obligation.

Note: Dimensions in parentheses ( ) are millimeters.

Application and Design

Minimum 1/2" (13), maximum 3" (76) width (height) variable flange. Optional no bottom flange for use typically when a bottom sill pan is required. For use with extruded aluminum and formed steel louver models. On extruded aluminum louvers, flanges greater than the standard 1-1/2 " (38) are welded onto the louver.*

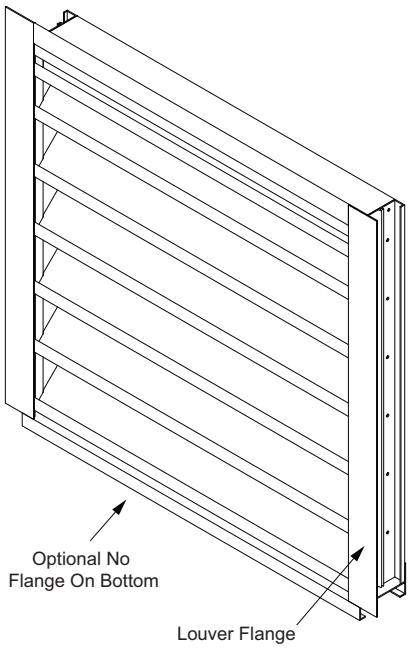
Standard Construction

Material: 0.081" (2) thick 6063-T5 extruded aluminum for aluminum louvers or 20 ga. (1.0) thick galvannealed steel for formed steel louvers.

Finish: To match louver finish.

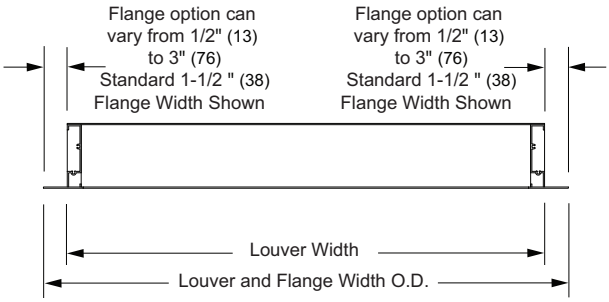
Minimum Size: See appropriate louver minimum.

Maximum Size: See appropriate louver maximum.

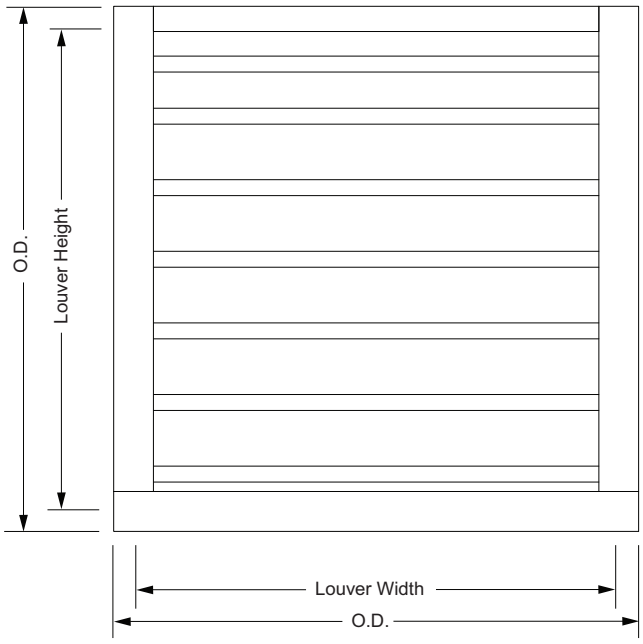


Typical Details

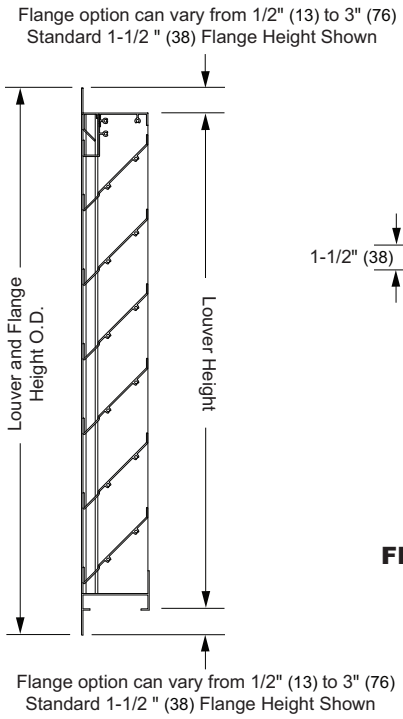
Top, Front, and Side view shown with standard flange on extruded aluminum louvers - formed steel louvers similar.



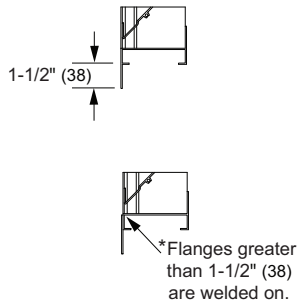
Top View



Front View



Side View



Flange View

Standard Finish colors for aluminum products and acoustical louvers

Apollo White M-18136 M-19136	Bone White M-18137 M-19137	Colonial White M-18138 M-19138	Ivory M-18162 M-19162	Sandstone M-18139 M-19139
Nantucket Dune M-18140 M-19140	Beige M-18141 M-19141	Seawolf M-18142 M-19142	Fashion Gray M-18143 M-19143	Colonial Gray M-18144 M-19144
Charcoal Gray M-18145 M-19145	Light Blue M-18146 M-19146	Interstate Blue M-18147 M-19147	Aged Copper M-18148 M-19148	Hartford Green M-18149 M-19149
Brick Red M-18150 M-19150	Burgundy M-18151 M-19151	Sage Brown M-18152 M-19152	Statuary Bronze M-18153 M-19153	Black M-18154 M-19154

The first M number is for the standard Fluoropolymer finish and the second number is for the same color in Polyester.

Premium Pearl finish colors for aluminum products and acoustical louvers

El Cajon Silver M-18155 M-19155	Champagne M-18156 M-19156	Light Bronze M-18157 M-19157	Medium Bronze M-18158 M-19158	Dark Bronze M-18159 M-19159

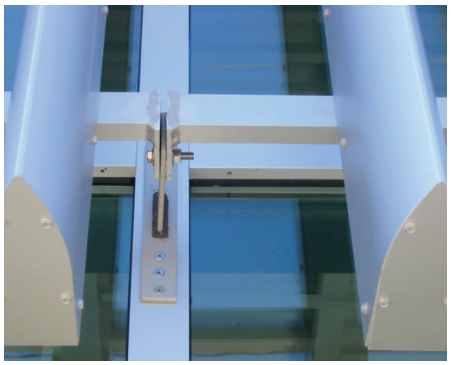
Premium Pearl colors use mica pigments to simulate the appearance of anodized finishes. The first M number is for the standard Fluoropolymer finish and the second number is for the same color in Polyester.

The color samples shown are not the actual paint. The samples are as close as possible to actual colors offered. Actual coating samples are available upon

Our superior performance paint systems are available in a wide range of colors and we can also custom color match to any of your specifications. Our expertise in applying architectural coatings assures you of a high quality finish. With our color options, you get the color you need when you need it!

PRODUCT FACTS

Finish Type	Description/Application	Color Selection	Warranty
Fluoropolymer Decaflon and Newlar meet AAMA 2605. Dry film thickness 2 mil. equivalent to Kynar 500®/Hylar 5000®, Duranar®, Fluoropon®	Our premier finish for extruded aluminum. Tough, long lasting, environmentally friendly powder coating has superior color retention and abrasive properties. Resists chalking, fading, chemical abrasion and weathering.	Standard Colors: 20 standard colors plus Premium Pearl finishes. Custom colors are available. Consult factory.	10 Years (consult factory for availability of extended warranty up to 20 years).
Polyester Powder Coat meets AAMA 2604 dry film thickness 2 mil. equivalent to Baked Enamel.	Environmentally friendly powder coating has good color retention and abrasive properties. Resists chalking, fading, chemical abrasion and weathering.	20 standard colors for aluminum products and acoustical louvers, 18 colors for steel. Custom colors are available. Consult factory.	5 Years
Integral Color Anodize AA-M10C22A42 (>0.7 mil)	Electrochemically deposited inorganic color pigment which is sealed to convert an aluminum oxidation into a corrosion resistant finish. Some shade variation will occur.	Champagne; Light, Medium or Dark Bronze; Black	5 Years
Clear Anodize 215 R-1 AA-M10C22A41 (>0.7 mil)	Electrochemically oxidized aluminum surface for uniform clear finish. More resistant to natural oxidizing. Improved luster and less glossy than mill finish.	Clear	5 Years
Alkyd Prime Coat	Preparation for field applied epoxy, vinyl, urethane, or other heavy-duty coatings. Must be finished within 6 months of application. Contamination can occur in transit and in the field; requires field cleaning prior to painting.	N/A	N/A
Mill	Aluminum or Galvanized Steel. Normal weathering will occur.	N/A	N/A



Finishes enhance louver appearance by matching or contrasting with adjacent surfaces and extending weather resistance. Color matching is available upon request.

CREATING CUSTOMERS FOR LIFE

POWERS

SUBMITTAL

PRODUCT	Fabric Duct
MANUFACTURER	Prihoda
JOB NAME	CALS Main Library Renovation
LOCATION	Little Rock, AR
ENGINEER	Bernhard TME
CONTRACTOR	Knight & Wilson
DATE	5/6/2024
SUBMITTED BY	Chris Atwood

5440 Northshore Drive - North Little Rock, Arkansas 72118 - Tel: 501.374.5420 Fax: 501.370.9298

Project Name: CALS Library

Vendor: Powers of Arkansas

Engineer: Bernhard

Architect: Polk Stanley Wilcox

Material:
100% Fire Retardant Polyester: UL Classified (NFPA90A 25/50) / ULC Listed, Report# R25183

- ☐ PMI (Permeable 2 (+2/-1) cfm, 6.5oz/yd2)
- ☒ PMS (Permeable 2 (+2/-1) cfm, 6.5oz/yd2)
- ☐ NMI (Non permeable 7.7oz/yd2)
- ☐ NLI (Non permeable 2.5oz/yd2)

Choose from following colors:

- ☐ White (RAL9016)
- ☐ Yellow (PANTONE 135/RAL 1017)
- ☐ Light Grey (PANTONE 420/RAL 7035)
- ☐ Dark Grey (PANTONE 424) (RAL 7037)
- ☐ Light Blue (PANTONE 2915 RAL 5012)
- ☐ Blue (PANTONE 7462) (RAL 5005)
- ☐ Green (PANTONE 341) (RAL 6024)
- ☐ Red (PANTONE 187) (RAL 3001)
- ☐ Black (PANTONE 419) (RAL 9017)
- ☐ Prihoda Art _____

Suspension/installation method:

- ☐ Single Track
- ☒ Cable (underfloor)
- ☐ Double Track
- ☐ Double Cable

Hold Open Method:

- ☐ Internal Rings – SS
- ☐ Internal Rings – ALU
- ☐ Internal Arcs
- ☒ None

Air Distribution method(s)

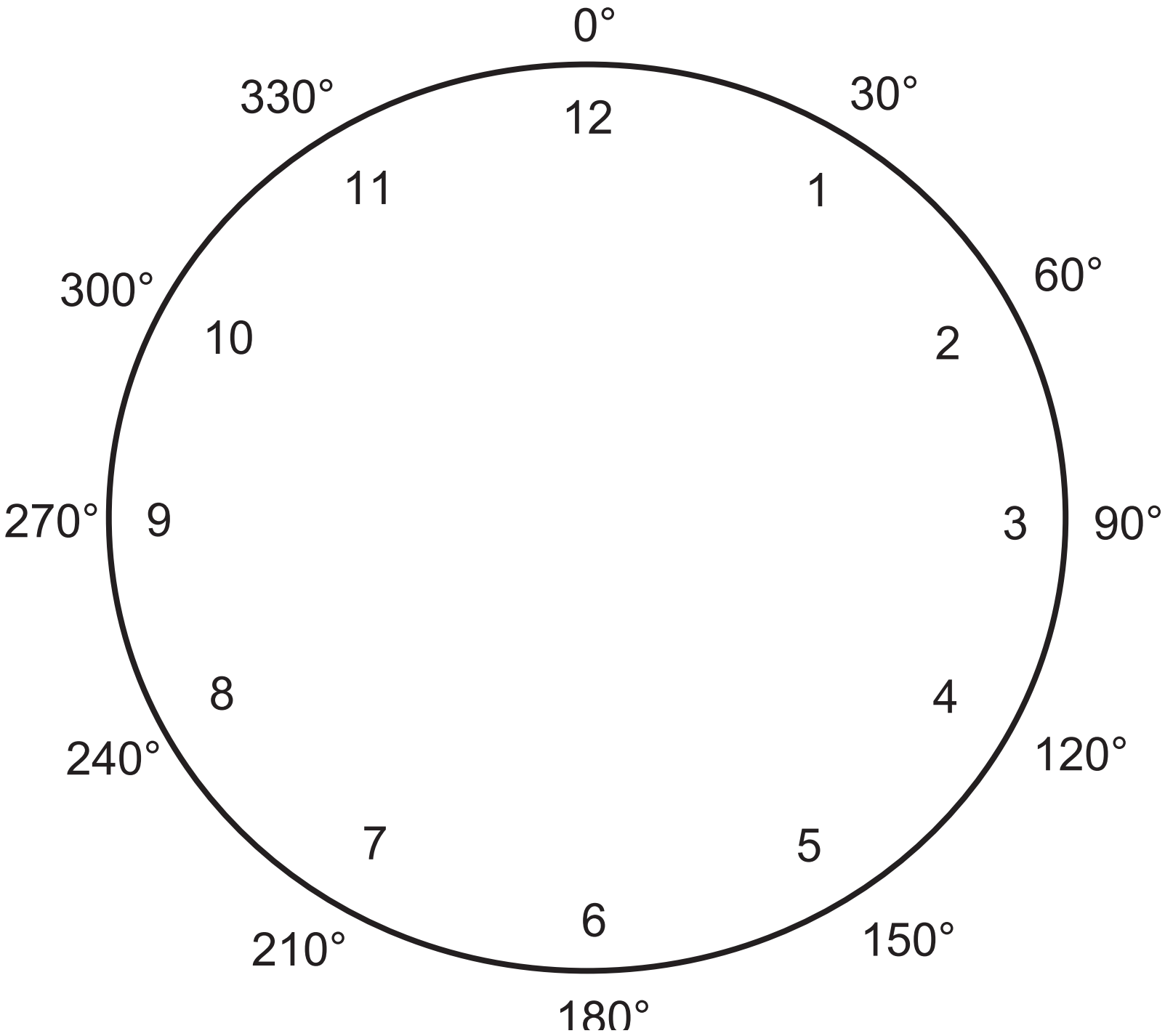
- ☐ Micro-Perforations
- ☒ Perforations
- ☐ Textile Nozzles

Warranty:

- ☒ 10 years
- ☐ 2 years

Perforation/Nozzle Orientation

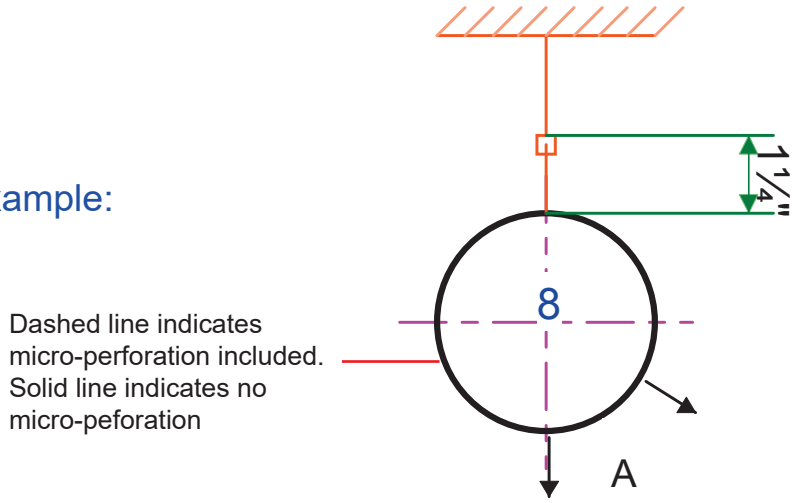
(Looking **from the Inlet to the endcap** with the airflow on the back of your head.)



Perforation/Nozzle Orientation

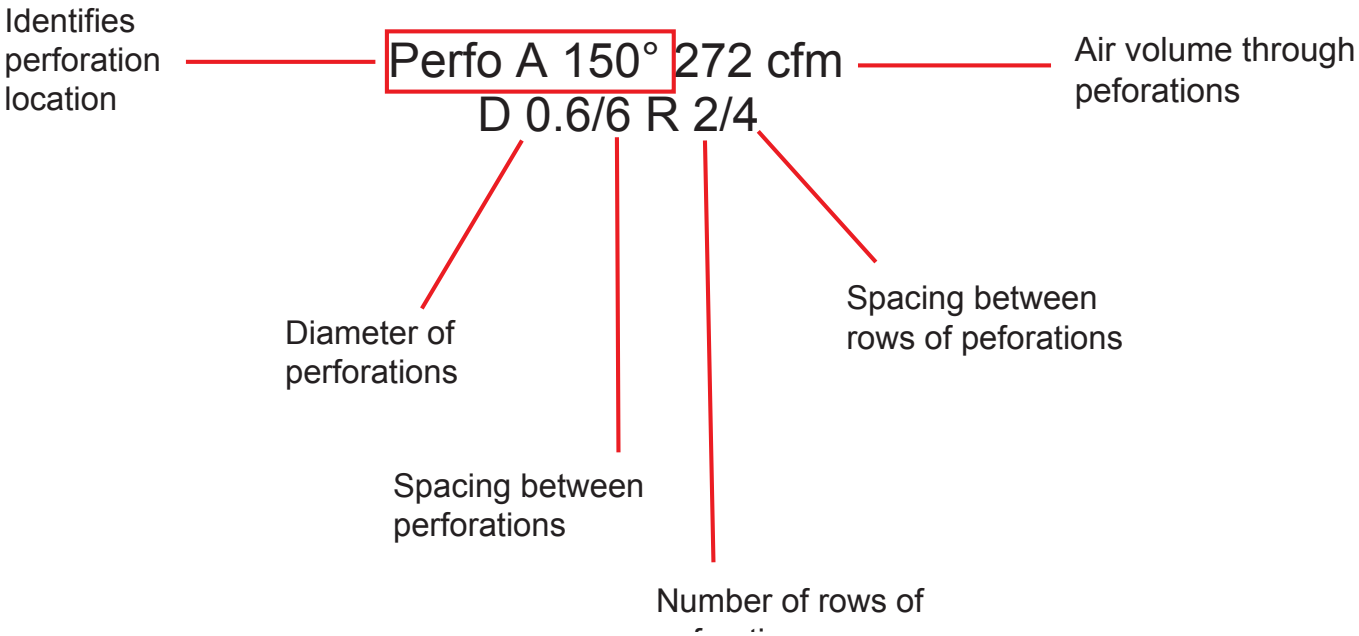
(Looking **from the Inlet to the endcap** with the airflow on the back of your head.)

Example:

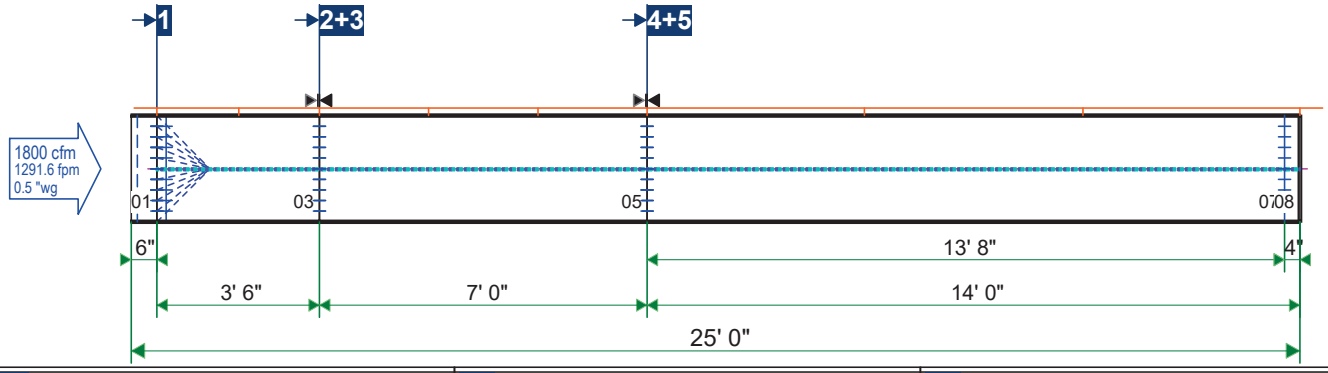


Dashed line indicates micro-perforation included. Solid line indicates no micro-peforation

Perfo A 150° 272 cfm
D 0.6/6 R 2/4



Position 1 - 1pcs ... 1 - C16/300 FB EQr/PMS-1/WHO + 2x16 AArch-45°/1 ZZ
REMOVABLE EQUALIZER



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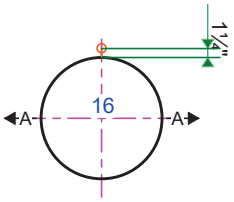
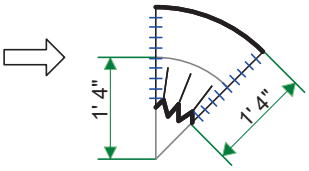


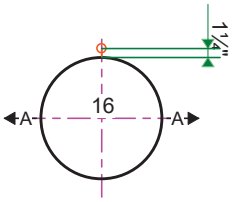
Perfo A
90° + 270°
124 cfm
D 1.6/7 R 1

2



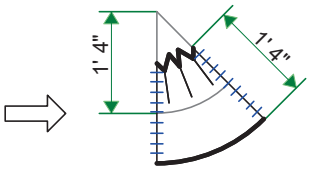
45° Direction 90°

3



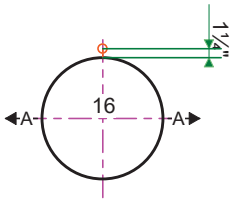
Perfo A
90° + 270°
247 cfm
D 1.6/7 R 1

4



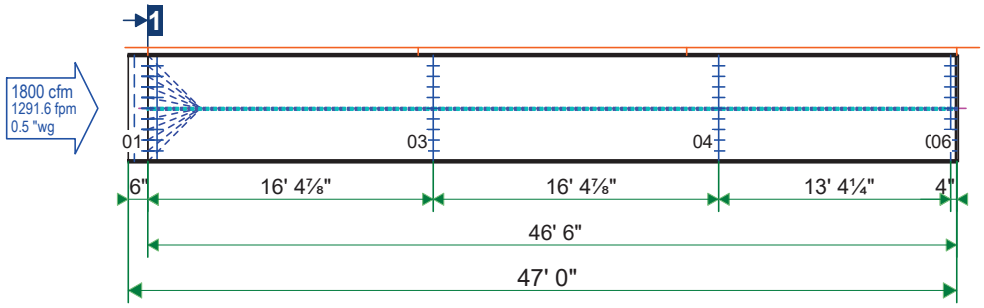
45° Direction 270°

5

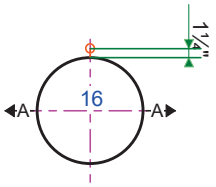


Perfo A
90° + 270°
493 cfm
D 1.5/7 R 1

Position 2 - 1pcs ... 2 - C16/564 FB EQr/PMS-1/WHO
REMOVABLE EQUALIZER



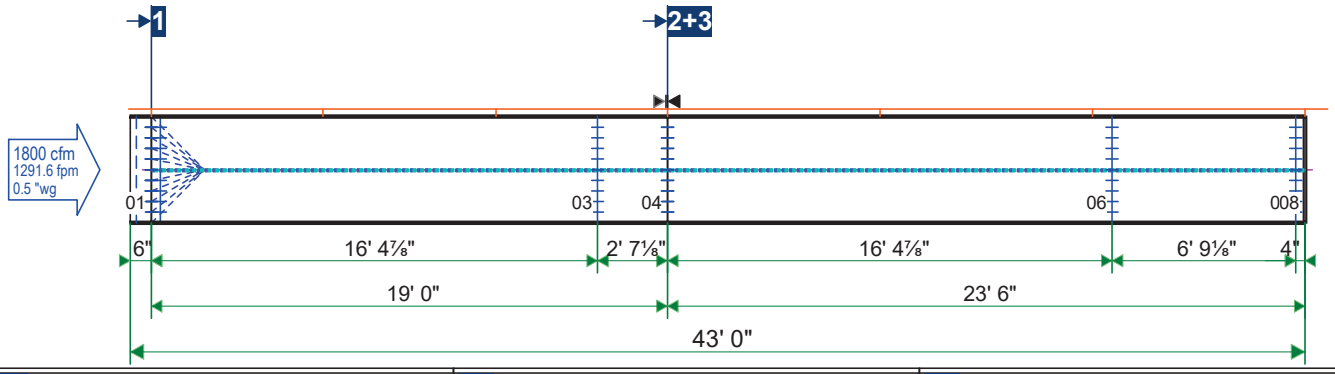
1



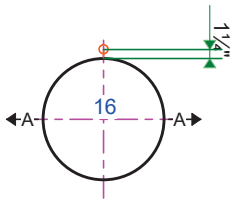
Perfo A 90° + 270° 826 cfm
D 1.0/7 R 1

DRAWING N.	VERSION	PAGE	DATE	DRAW	NO SCALE	přihoda.
Č. VÝKRESU	VERZE	LIST	DATUM	KRESLIL	BEZ	

Position 3 - 1pcs ... 3 - C16/516 FB EQr/PMS-1/WHO + 1x16 AArch-90°/1 ZZ
REMOVABLE EQUALIZER

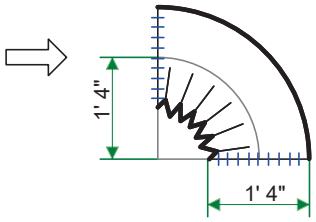


1



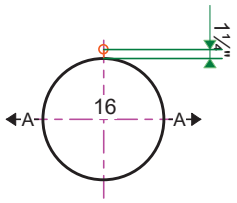
Perfo A
90° + 270°
374 cfm
D 1.1/7 R 1

2



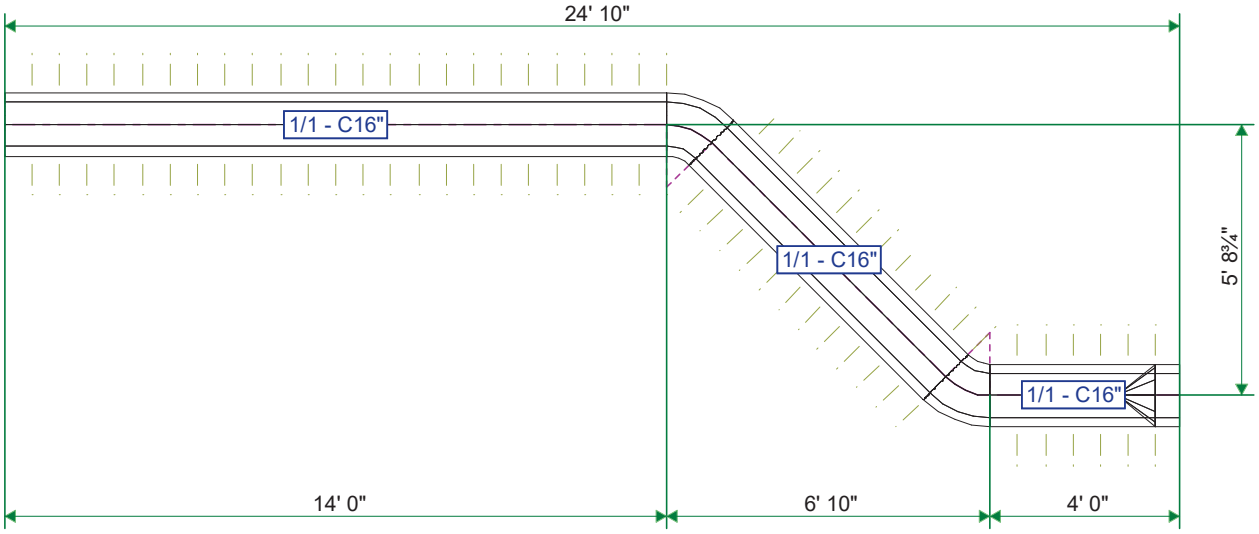
90° Direction 90°

3



Perfo A
90° + 270°
462 cfm
D 1.1/7 R 1

DRAWING N.	VERSION	PAGE	DATE	DRAW	NO SCALE	
Č. VÝKRESU	VERZE	LIST	DATUM	KRESLIL	BEZ	přihoda.

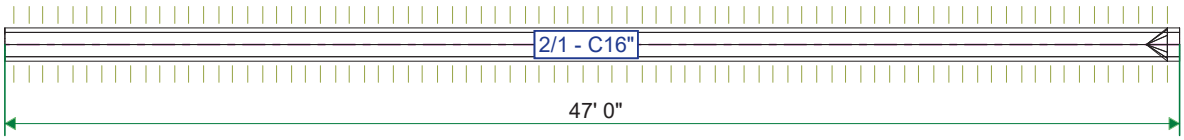


Color

The view is from 0° angle (0° = Top view, 90° or 270° = Side view)

Aspect ratio (Size : Length) 1 : 1

DRAWING N.	VERSION	SYSTEM	DATE	DRAW	NO SCALE	přihoda.
Č. VÝKRESU	VERZE	SYSTÉM	DATUM	KRESLIL	BEZ	
2401019-1	0	1	6.5.2024	Jacob H.	MĚŘÍTKA	

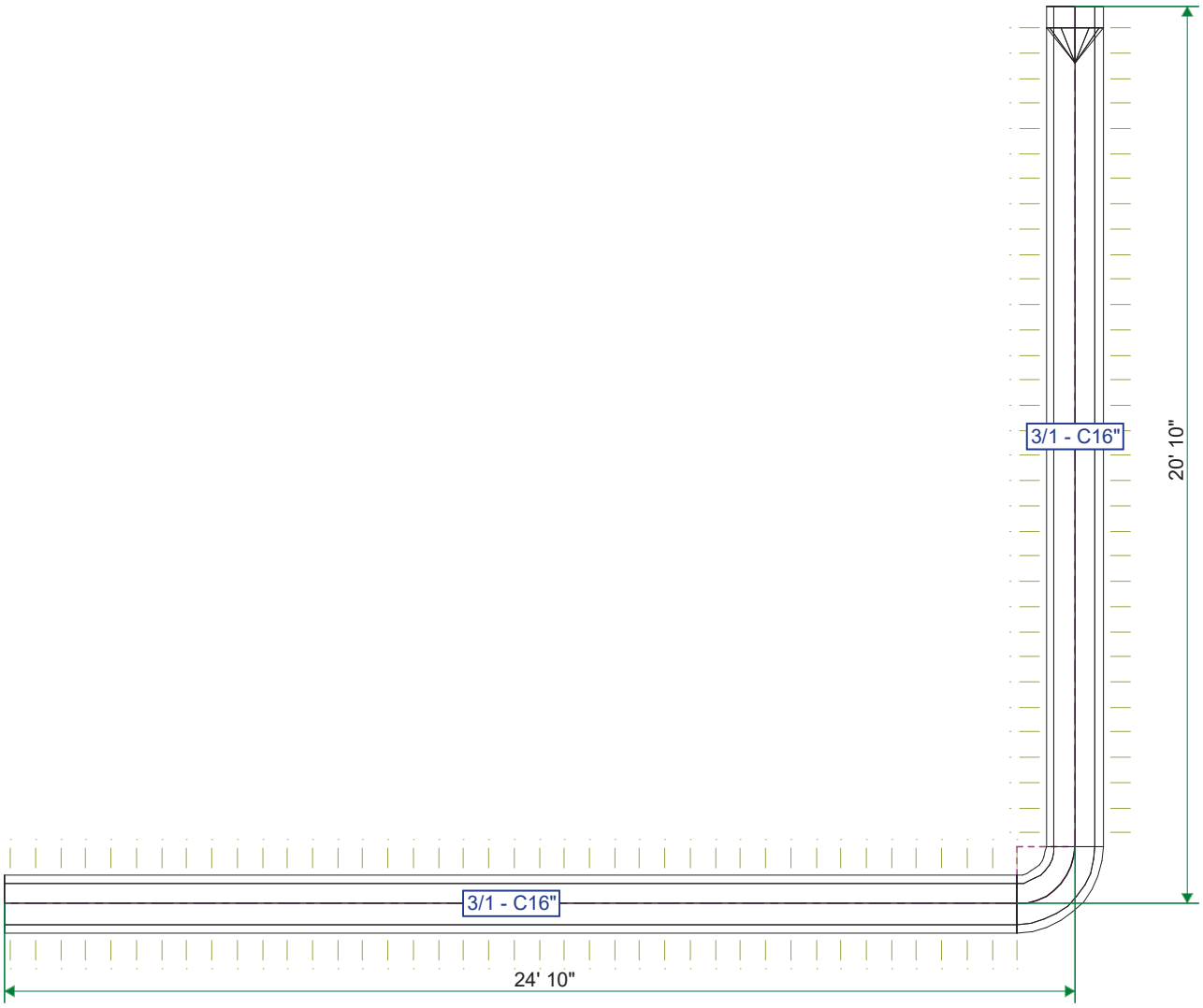


Color

The view is from 0° angle (0° = Top view, 90° or 270° = Side view)

Aspect ratio (Size : Length) 1 : 1

DRAWING N.	VERSION	SYSTEM	DATE	DRAW	NO SCALE	
Č. VÝKRESU	VERZE	SYSTÉM	DATUM	KRESLIL	BEZ	
2401019-1	0	2	6.5.2024	Jacob H.	MĚŘÍTKA	



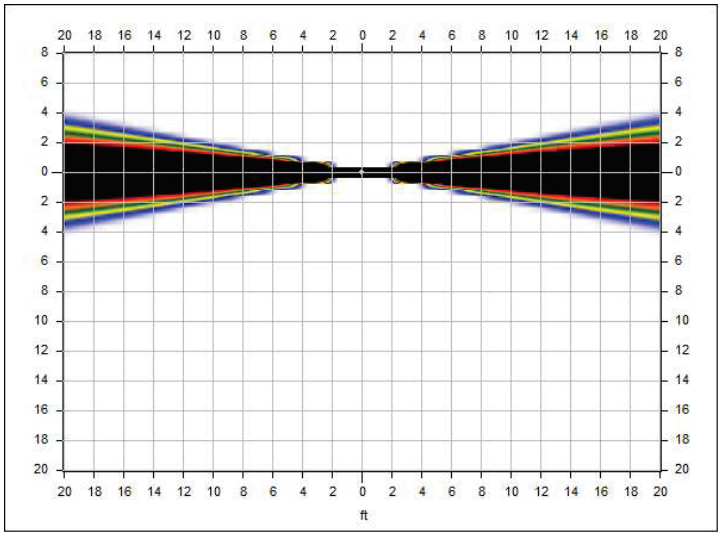
Color

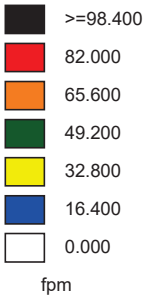
The view is from 0° angle (0° = Top view, 90° or 270° = Side view)

Aspect ratio (Size : Length) 1 : 1

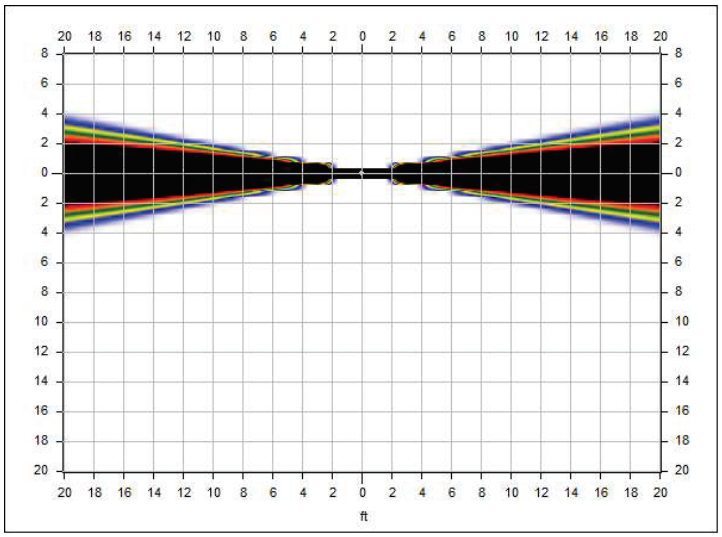
DRAWING N.	VERSION	SYSTEM	DATE	DRAW	NO SCALE	
Č. VÝKRESU	VERZE	SYSTÉM	DATUM	KRESLIL	BEZ	přihoda.
2401019-1	0	3	6.5.2024	Jacob H.	MĚŘÍTKA	

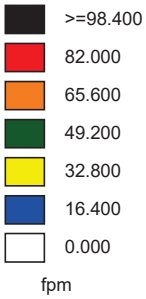
Position 1 Section 1 Mode ventilation Temperature difference 0 ° F



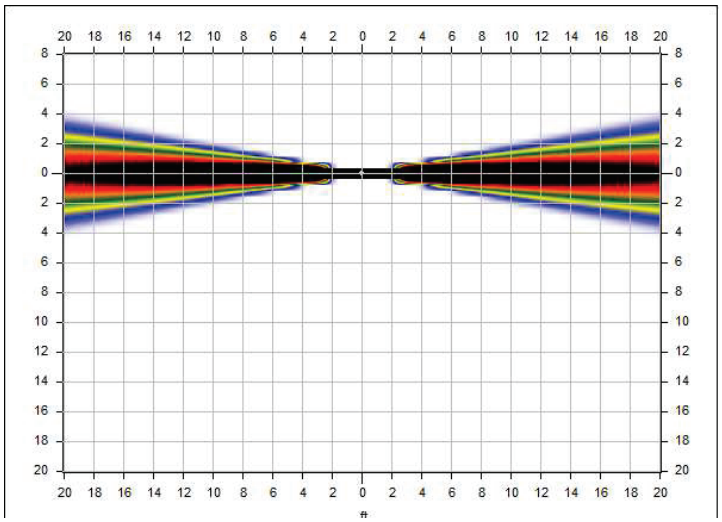


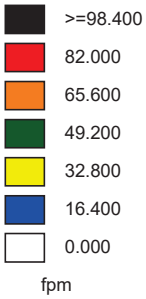
Position 1 Section 2 Mode ventilation Temperature difference 0 ° F



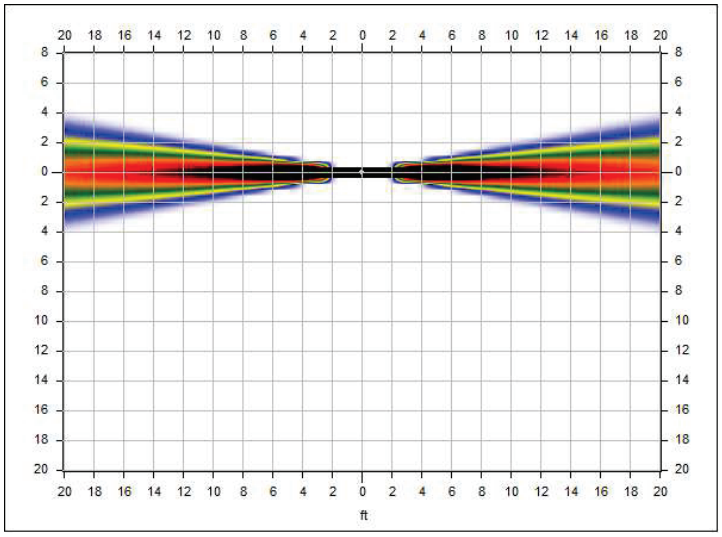


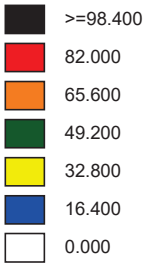
Position 1 Section 3 Mode ventilation Temperature difference 0 ° F



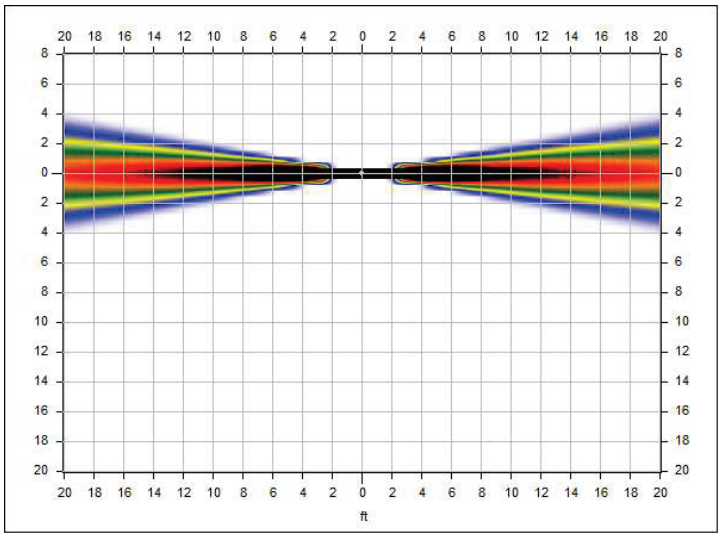


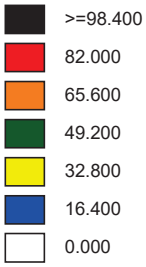
Position 2 Section 1 Mode ventilation Temperature difference 0 ° F



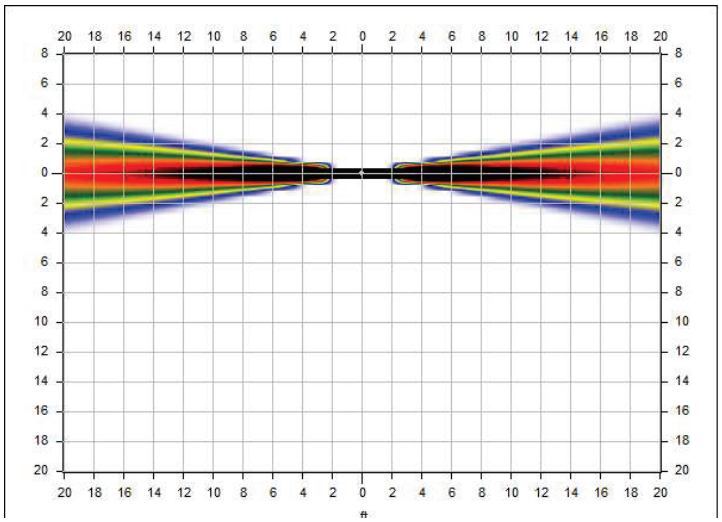


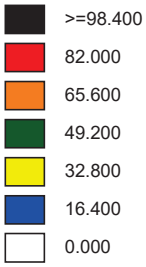
Position 3 Section 1 Mode ventilation Temperature difference 0 ° F





Position 3 Section 2 Mode ventilation Temperature difference 0 ° F





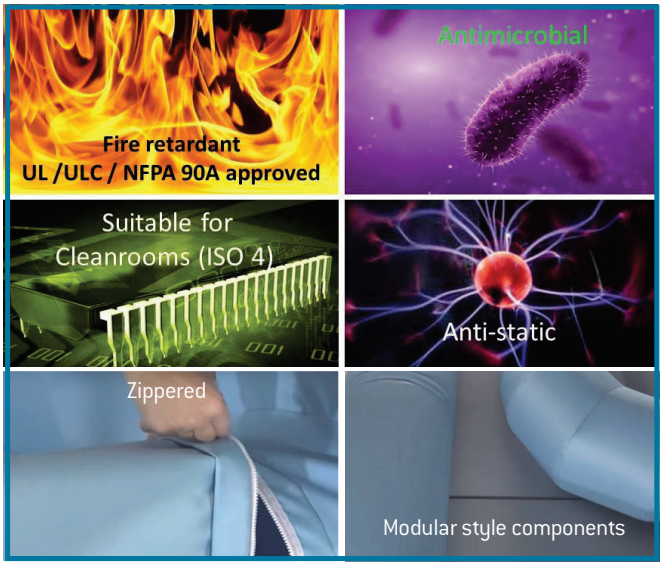
prīhoda®
NORTH AMERICA
Tailor-made Air Ducting & Diffusers

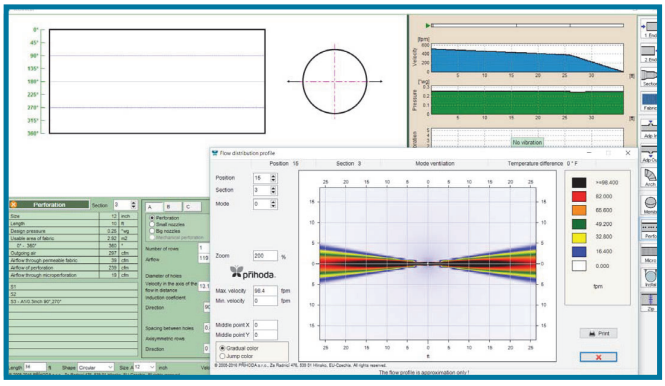
Economical, Effective Solution For Optimum Performance of UFAD sustems

Prihoda's Underfloor Modular (UFM) Air Dispersion systems provide a fast, economical way to optimize the effectiveness of UFAD/Displacement Ventilation designs.

Constructed of highly engineered polyester fabric that is UL Classified and ULC listed, Prihoda UFM systems are built using zip-together, modular sections that allow for full-length supply air distribution for even plenum temperatures or non-distributing sections to direct air to higher load areas and perimeter zones to minimize thermal decay.

Unlike traditional metal highways, the UFM zippered components make tenant up-fits and remodels, which may require rerouting of the underfloor ducts and data-com wiring, as simple as turning off the units, and unzipping the sections and re-configuring as needed within the underfloor plenum.



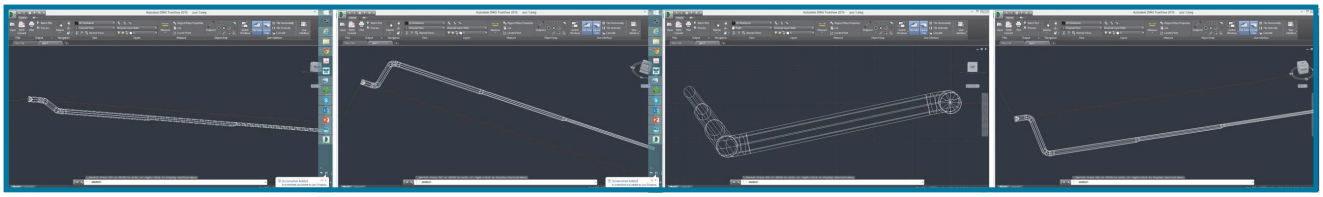


Prihoda UFM ducts can easily facilitate repeatable design for multiple floors of a high-rise or can be customized as needed for the requirements of smaller, unique designs.

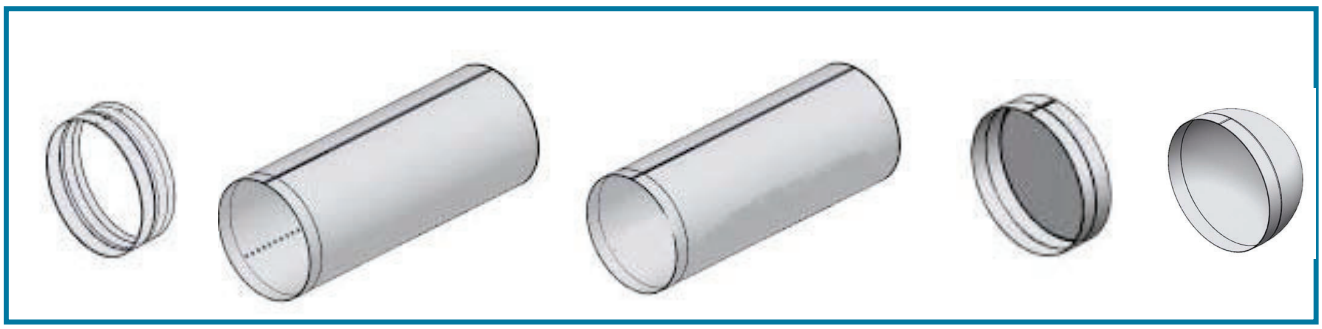
Prihoda's Air Tailor software is utilized to evaluate design parameters of the UFM duct diffusers such as pressure, throw, and sound. Layout models done in the Air Tailor Software can be exported in to .dxf (AutoCad) and .ifc (Revit) files to allow easy integration into the early design stages.

For ultimate sustainability choose Prihoda Recycled, a 100% post-consumer polyester material made from recycled water bottles that has a Life Cycle Analysis and Environmental Product Declaration (EPD type III) which can contribute to Credits in the LEED v4 rating system.

Screen shot from Prihoda's Air Tailor

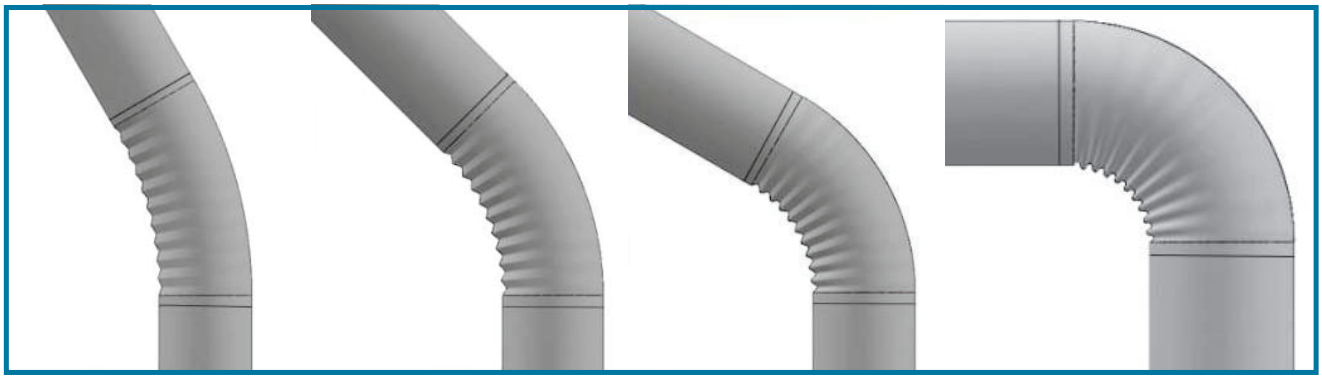


Modular construction

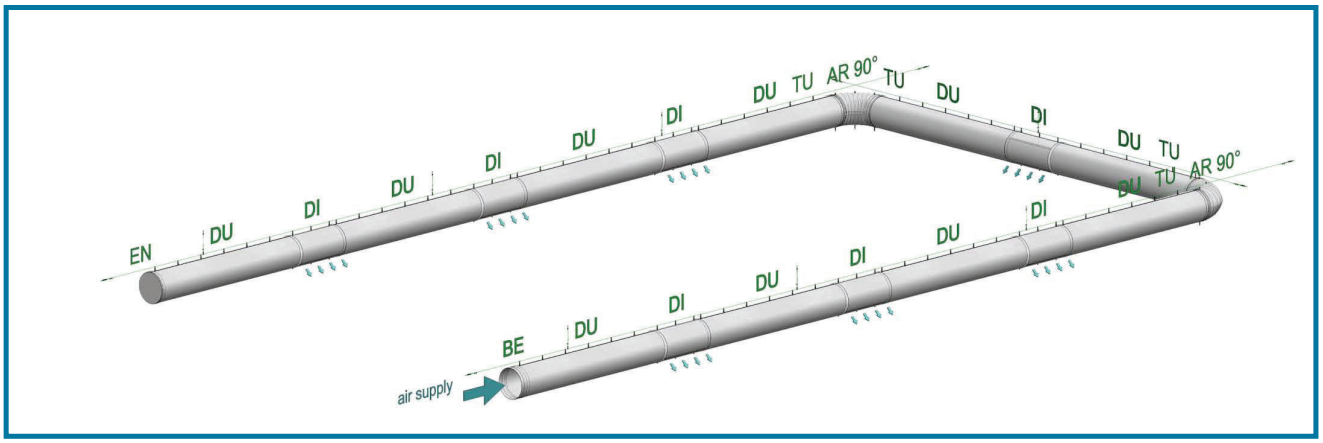


Inlet collar | 5“ perforated ditribution section | 5“ non-perforated transport section | Endcaps

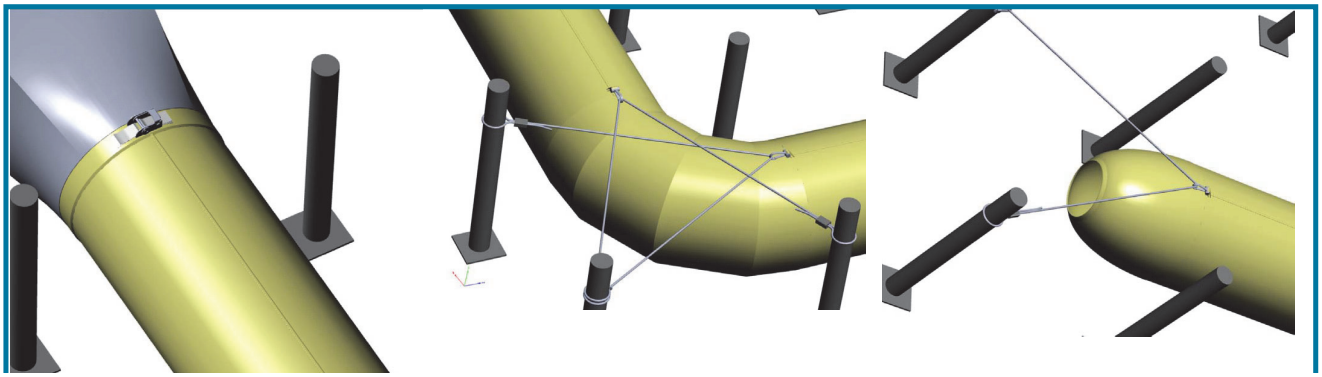
Adjustable elbows



Example



Simple suspension at only the inlet, elbows and endcap



MATERIAL CHARACTERISTICS

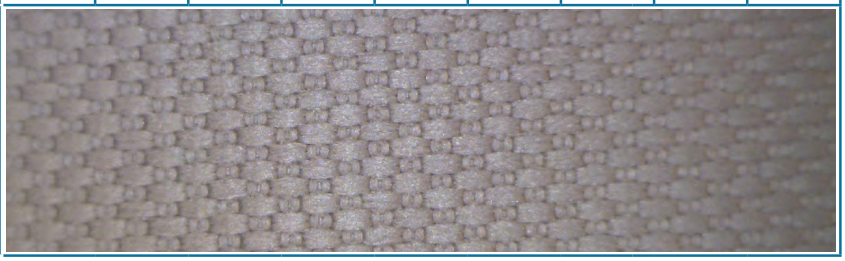
FABRIC: Classic

COMPOSITION	100% polyester endless fibre (multifilament)		
PROPERTIES	suitable for cleanrooms - class No. 4 (EN ISO 14644-1) washable in washing-machine100% polyester		
WEIGHT	EN 12127/ASTM D3776	6.3 (220)	oz/y^2 (g)
THICKNESS	EN ISO 5084	0,30 (.012)	mm (in)
WEAVE	DIN 61101-1	plain	
SETT OF FABRIC 10 CM	EN 1049-2, warp / weft	540 / 310	
STRENGTH WARP / WEFT	EN ISO 13934-1	1830 / 1020	N
PERMEABILITY	at .50" wc	2 (+2/- 1) cfm	cfm/ft^2
FIRE RESISTANCE	UL723/NFPA90A/UL2518(ULR25183)	UL classified	
TEMPERATURE RESISTANCE		-22 to +230	°F
WASHING SHRINKAGE	EN ISO 6330-2000, warp / weft, 40°C	0.5 / 0.5	%
TREATMENT SYMBOLS			

COLORS
Use Color Chart below

WH	YE	LG	DG	LB	BL	GR	RE	BC
	PANTONE 135	PANTONE 420	PANTONE 424	PANTONE 2915	PANTONE 7462	PANTONE 341	PANTONE 187	PANTONE 419
RAL 9016	RAL 1017	RAL 7035	RAL 7037	RAL 5012	RAL 5005	RAL 6024	RAL 3001	RAL 9017

STRUCTURE



1/

SHADECARD

FOR PRIHODA FABRICS **PMS** AND **PMI**

CERTIFICATE OF COMPLIANCE

Certificate Number	20140522-R25183
Report Reference	R25183-20140516
Issue Date	2014-MAY-22

Issued to: PRIHODA

This is to certify that representative samples of DISTRIBUTION DEVICES, AIR

Air distribution device fabric identified as "Classic fabric".

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL723, the Standard for Surface Burning Characteristics for Building Materials

Additional Information: See the UL Online Certifications Directory at www.ul.com/database for additional information

Only those products bearing the UL Classification Mark should be considered as being covered by UL's Classification and Follow-Up Service.

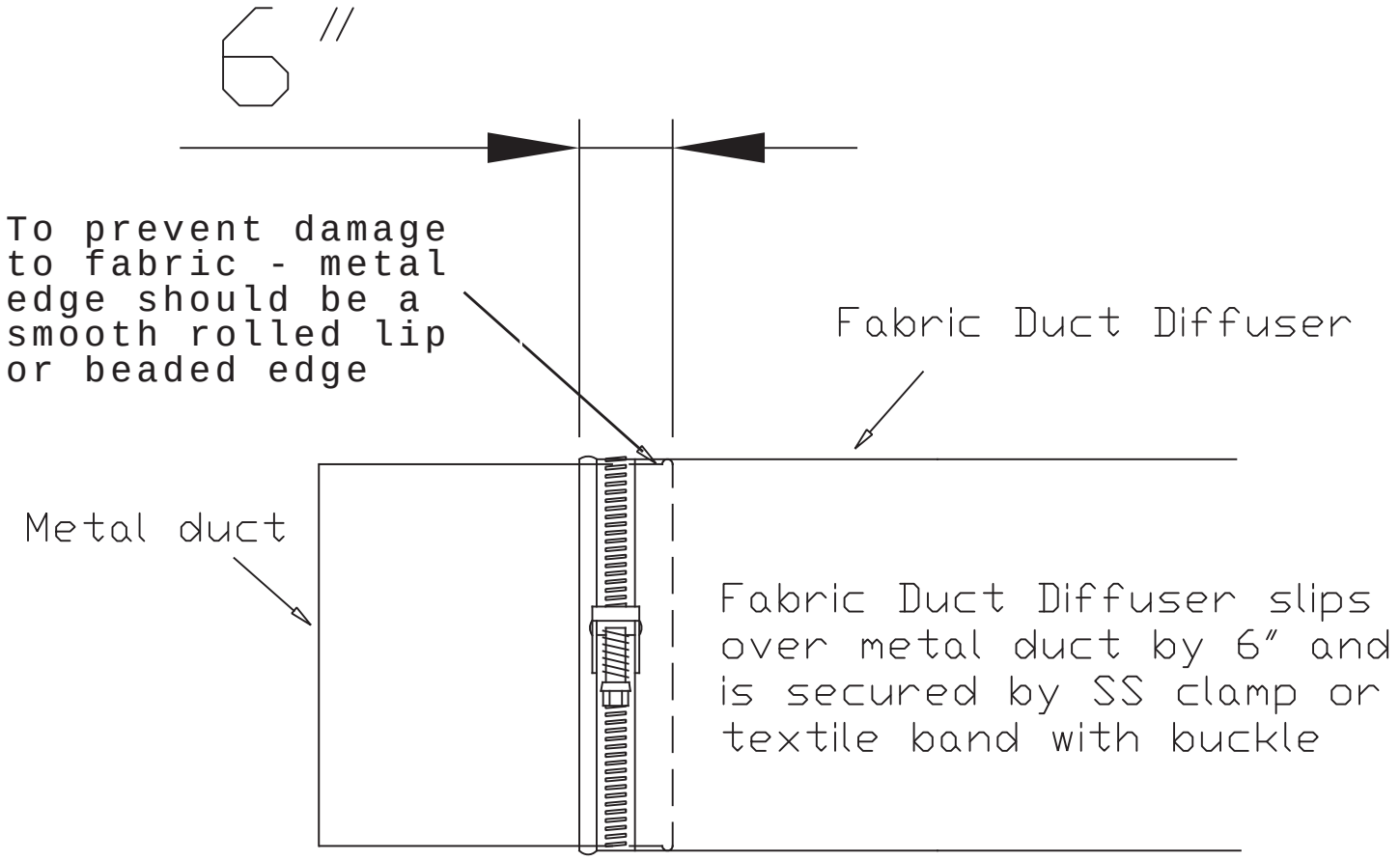
The UL Classification Mark includes: UL in a circle: with the word "CLASSIFIED" (as shown); a control number (may be alphanumeric) assigned by UL; a statement to indicate the extent of UL's evaluation of the product; and the product category name (product identity) as indicated in the appropriate UL Directory.

Look for the UL Classification Mark on the product.

William R. Carney

William R. Carney, Director, North American Certification Programs

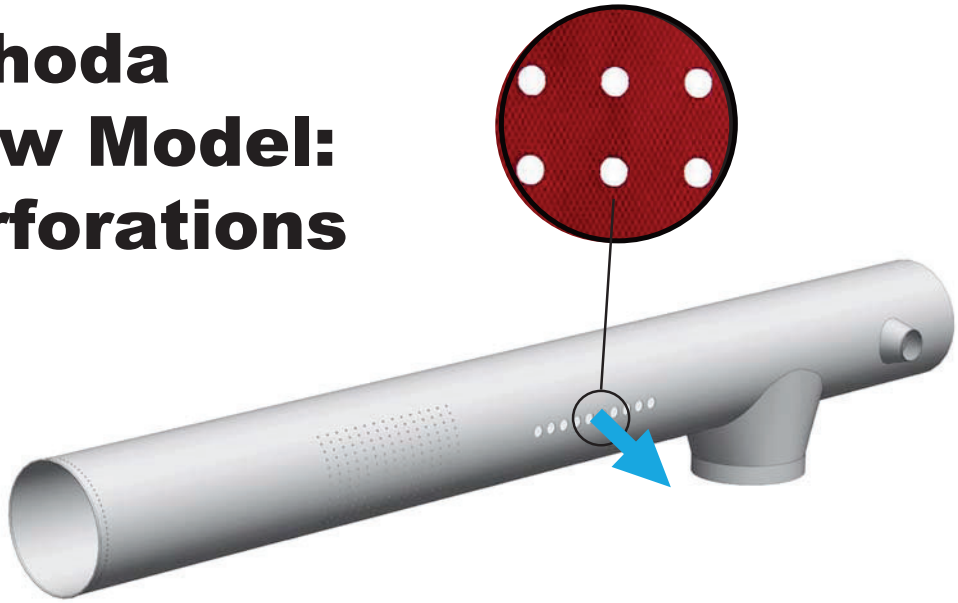
UL LLC



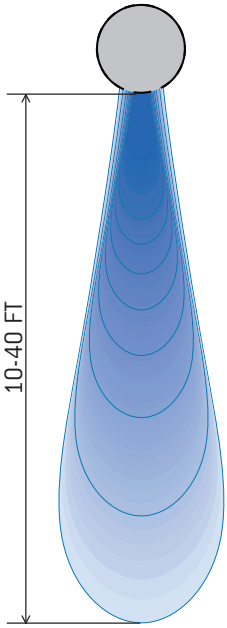
Fabric Duct Inlet connection Detail

(Round, half-round, and quarter-round ducts)

Prihoda Flow Model: Perforations

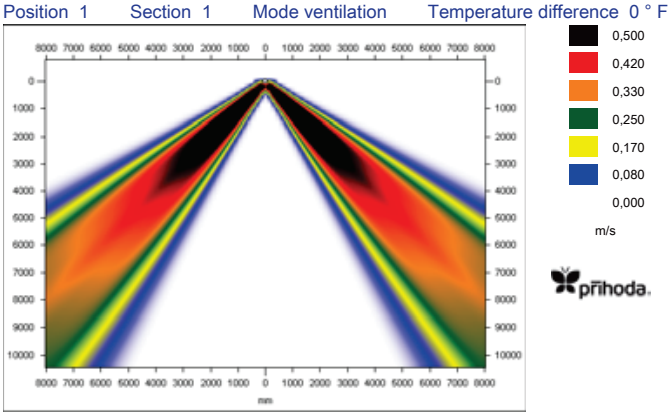


Perforations: Laser cut orifices that range from 5/32" (4mm) - 6" (152mm) dia



Perforations are laser cut orifices that range from 5/32" (4mm) to 6" (152mm) in diameter. Like all flow models, throw from perforations is dependant on volume of air, static pressure, temperature difference, and obstacles (limited to about +/- 40ft throw).

Perforations can be situated at any location around the circumference of the duct and in any pattern. Perforations offer a wide variety of velocities at the delivery point such as low throw / comfortable velocity for classrooms and offices or high throw needed for warehouses, gyms, auditoriums, and large pool rooms. We have the ability to verify the technical parameters in our software which is verified by Ansys Fluent or if highly sensitive or complex the project can be analyzed in the actual Ansys CFD software itself.



Maintenance and Warranty

All of our diffusers and ducts are made of high-quality, temperature and shrink resistant synthetic materials. The material used is specified when your order is processed and is indicated on documents that accompany the shipment and also indicated on the labels sewn in by the zips (STRICTLY FOLLOW THE MAINTENANCE SYMBOLS ON LABELS).

Ducts and diffusers made of permeable fabric (Premium, Classic) can be washed normally in an industrial or commercial washing machine. Impermeable fabrics (Premium) can be machine washed but only on a gentle or "delicate" cycle. NMF, NHE and NLF are to be hand washed only. If the duct or diffuser has hold open accessories such as rings (tyres), arcs (racks), braces or turn-buckles these solid elements must be removed before the washing process. Induction surface dirt on the outside of the duct or diffuser can be vacuumed off and washing may be unnecessary.

Any maintenance must strictly follow the washing label symbols sewn into every section.

1. Wash the diffusers with a regular laundry detergent (follow directions for amount recommended by detergent manufacturer). Since most dirt is collected on the inside of the duct or diffuser its generally best if the diffuser is turned inside out for washing. We advise to repeat the washing up to four times as needed or to use a stronger detergent (acc. to level of contamination). A special detergent (we can recommend one by request according to the particular dirt or application) should be used if the fabric is badly soiled.

2. A disinfectant can be used for added safety (medical or food service applications) but is not generally needed due to the antimicrobial agent already in the material (Premium/Classic). The chemical composition of the disinfectant must not harm the diffuser fabric (see maintenance symbols, no whiteners!). Observe the producer's dosage instructions.

3. Rinse the diffusers in clean water.

4. Spin-dry the diffusers gently, and either drip dry on a line or re-install them and finish drying by the air flow from the ventilator.

washing label

Legend for symbols

40	Machine wash at max. temperature of 40°C (104°F), normal mechanical action, normal rinse, normal spin cycle.
40	gentle/delicate machine wash only, rinse at falling temperature, light spin, max. temperature 40°C (104°F).
	Hand wash only, do not machine wash, max. temperature 40°C (104°F), handle gently.
	Do not bleach product.
	Product may be dried in rotary drum drier at reduced drying temperature.
	Do not dry the product in a rotary drum dryer.
	Iron at a max. temperature of 110°C (230°F), use caution when steam ironing.
	Do not iron product; steaming and steam processing is prohibited.
	Do not dry clean product, do not remove spots using organic solvents.
P	The product is safe to dry clean using perchlorethylene and all solvents specified under the symbol F.

Warranty

Warranty Period

10 year	fabrics (Premiums and Classic)
2 year	membrane diffuser, fabrics NMF/NLF/NHE
2 year(max. 50 washing cycles)	fabrics PLS/NLS/PLI/NLI
12 months	All other items not mentioned above, unwoven accessories (zippers, hooks, etc), printing, assembly and accessories

The warranty period is deemed to start on the day of sale. For warranty to be valid all installation instructions must be followed in addition to regular maintenance of the supply air units and filters. Supply air must be filtered to at least EU3 (MERV5), and the ducts must maintain original operating conditions in respect to design static pressure and air flow stated in the submittal or order confirmation. Any deviation to the original design intent which may have an adverse affect on the material or accessories may void the warranty. See warranty details.

Special conditions for diffusers with silk screening

1. Ambient Temperature within the range +10°C (50°F) to + 40°C (104°F).
2. Do not iron.

UNDERFLOOR SEALING REQUIREMENTS

1. ALL SUBCONTRACTORS ARE RESPONSIBLE FOR SEALING PENETRATIONS REQUIRED FOR ROUTING OF UNDERFLOOR CONDUIT, WIRING, PIPING, ETC. WHERE PENETRATING UNDERFLOOR PLENUMS, AIR HIGHWAYS, AND FLOOR TILES. CONTRACTOR SHALL UTILIZE AIR-TIGHT PLENUM AND PRESSURE RATED SEALANT. GENERAL CONTRACTOR SHALL VERIFY ALL PENETRATIONS ARE SEALED PRIOR TO CLOSING UP THE UNDERFLOOR SYSTEM. WHERE PENETRATING THE AIR HIGHWAY COORDINATE WITH THE SHEETMETAL CONTRACTOR TO PROVIDE UTILITY PATHWAYS PER DETAILS ON M602.
2. REFER TO M305 FOR DUCT HIGHWAY ROUTING, CONTRACTOR SHALL NOT PENETRATE UNDERFLOOR DUCTWORK SERVING A SUPPLY TERMINAL.

UNDERFLOOR GENERAL NOTES:

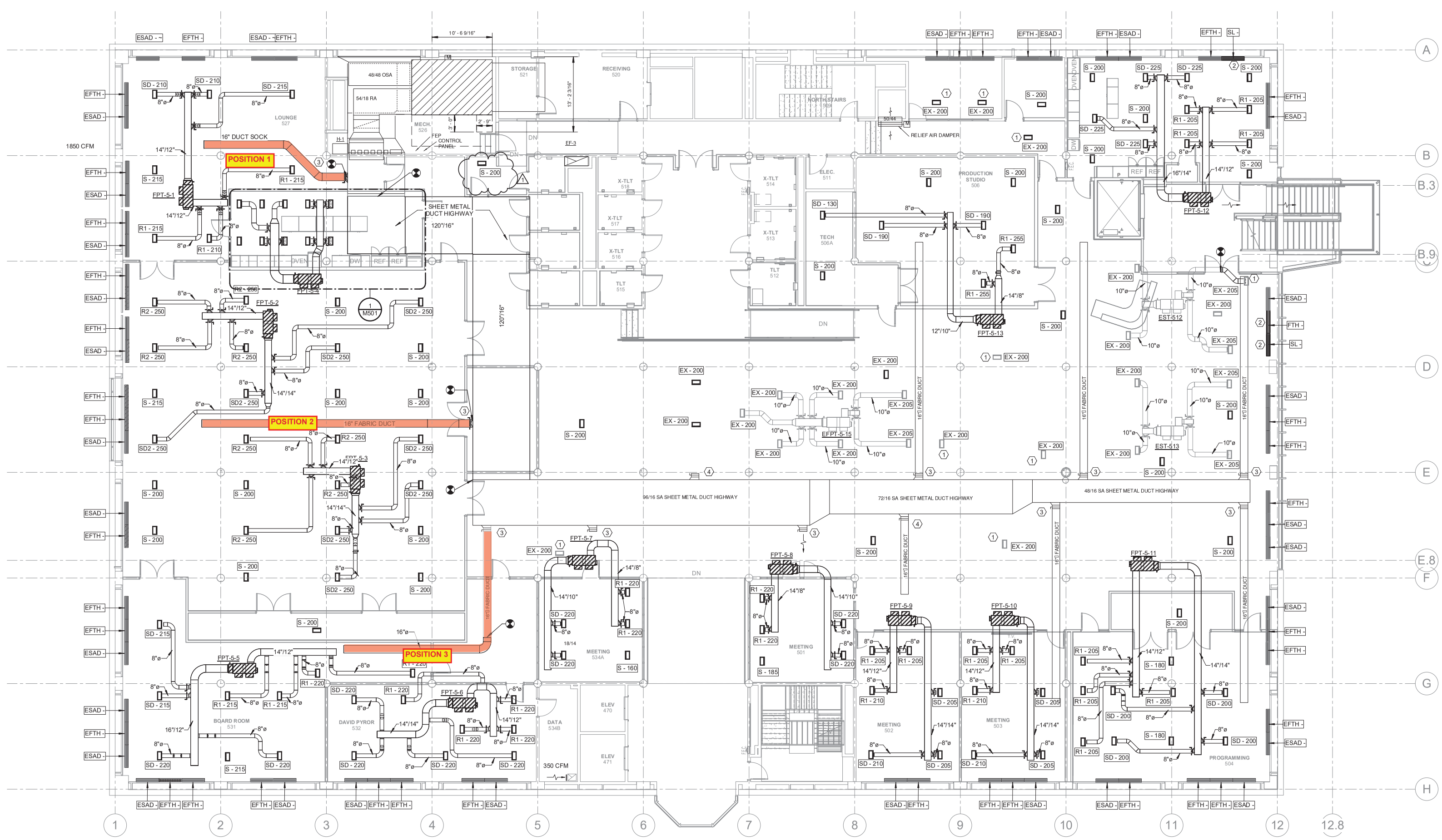
1. THE INTENT IS TO REUSE AS MUCH OF THE EXISTING 5TH FLOOR AS POSSIBLE. EXISTING FLOOR TILES WITH SQUARE DIFFUSER OPENINGS SHALL BE RELOCATED TO MATCH THE NEW DIFFUSER LAYOUT. IF NEW OPENINGS ARE NEEDED THE EXISTING TILES SHALL BE CUT PER THE MANFUCATURER'S INSTRUCTIONS.
2. THE NEW UNDERFLOOR AIR HIGHWAY SHALL BE PRESSURE TESTED TO ENSURE AN AIR TIGHT SEAL IS CREATED. REFER TO SPECIFICATIONS FOR MORE TESTING INFORMATION.
3. WHERE NEW EXTERIOR WALL IS BUILT, THE CONTRACTOR SHALL INSPECT THE EXTERIOR WALL TO ENSURE MINIMAL AIR IS LEAKING THROUGH THE WALL. CONTRACTOR SHALL UTILIZE A THERMAL IMAGING DEVICE TO DETECT ANY SIGNIFIGANT LEAKS IN THE NEW ENVELOPE.
4. EACH SUB CONTRACTOR IS RESPONSIBLE FOR SEALING ANY HOLES OR PENITRATIONS MADE IN UNDERFLOOR PLENUMS OR AIR-HIGHWAYS. THE GENERAL CONTRACTOR SHALL ENSURE ALL SUBS ARE AWARE OF THE REQUIREMENT TO SEAL THE PRESSURIZED UNDERFLOOR SYSTEM.

GENERAL NOTES:

1. CONTRACTOR SHALL ENSURE SPACE IS UNDER TEMPERATURE AND HUMIDITY CONTROL AT ALL TIMES WHILE STORAGE OF BOOKS AND OWNER'S MATERIAL SENSITIVE TO HIGH HUMIDITY OR LOW TEMPERATURES IS ON SITE. COORDINATE WITH THE OWNER ANY RELOCATION OF MATERIALS DURING TIMES WHEN THERE WILL BE INTERRUPTION OF THE MECHANICAL SYSTEMS.
2. ALL SUPPLY, RETURN, AND EXHAUST BRANCHES SHALL HAVE MANUAL DAMPERS LOCATED AS CLOSE TO THE MAIN TRUNK AS POSSIBLE WHILE ENSURING ACCESS IS PROVIDED.
3. CONTRACTOR SHALL COORDIANTE ALL ACCESS REQURIEMENTS WITH GENERAL CONTRACTOR AND ENSURE CEILING IS MODIFIED, OR ACCESS PANELS ARE INSTALLED FOR PROPER ACCESS. WHERE ACCESS PANELS ARE REQUIRED CONFIRM LOCATION WITH ARCHITECT PRIOR TO INSTALLING EQUIPMENT. RELOCATION OF EQUIPMENT AFTER INSTALLATION DUE TO LACK OF COORDINATION WILL BE DONE AT THE COST OF THE CONTRACTOR.
4. ALL EXPOSED DUCTWORK SHALL BE DOUBLE WALL TYPE DUCT WITH SOLID INNER AND OUTER WALLS. ROUND DUCT SHALL BE SPIRAL TYPE WITH SLIP FITTINGS. FITTINGS WITH FLANGES WILL NOT BE ACCEPTED. EXPOSED DUCT SHALL BE PAINTED PER ARCHITECTURAL SPECIFICATIONS.
5. ALL RETURN AIR TRANSFER BOOTS AND DUCTWORK SHALL BE INTERNALLY LINED WITH PLENUM RATED SOUND ABSORBING INSULATION. REFER TO SPECIFICATIONS FOR PRODUCTS

KEYED NOTES:

1. CONTRACTOR SHALL RELOCATE EXISTING GRILLE TO AVOID CONFLICT WITH THE NEW WALL OR FURNITURE LAYOUT. CONTRACTOR SHALL SWAP RAISED FLOOR TILES, AND EXTEND FLEXIBLE DUCT AS REQUIRED.
2. INSTALL NEW LINEAR BAR GRILLES IN EXISTING RAISED FLOOR TILE. CONTRACTOR SHALL CUT EXISTING TILE TO MATCH NEW REQUIRED OPENING.
3. BALANCE UNDERFLOOR HIGHWAY DUCT TAP TO 1,800 CFM.
4. BALANCE UNDERFLOOR HIGHWAY DUCT TAO TO 800 CFM.



5TH FLOOR PLAN - HVAC DUCTWORK

1/8" = 1'-0"

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PH: 501-666-6776

STRUCTURAL
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CIVIL
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Little Rock, AR 72204
PH: 501-371-0272

LANDSCAPE
Ecological Design Group, Inc.
120 S. Izard Street
Little Rock, AR 72201
PH: 501-378-0200

CERTIFICATE OF AUTHORIZATION Bernhard TME, LLC No. 2790 ARKANSAS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 19819 ALEXANDER P. HALLORAN

02/22/24

PSW Job Number:
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NUMBER	DATE	DESCRIPTION
1	02/22/24	ADDENDUM #2

Contents:
5TH FLOOR PLAN - HVAC DUCTWORK

M305