WALSH CONSTRUCTION CO.

BUILDING VALUE | www.walshconstruction.com

Submittal Sheet

122221- The Moraine

Project: 122221-
The Moraine
1402 Tacoma Ave
Tacoma, WA
97214

Spec Section: 23 05 00
Submittal: 230500-01
Revision: 0
Package:
Date: 6/29/2022 PDT

Submittal Title: HVAC Product Data Package
Submittal Detail: Division 23: HVAC full combined package including product data, warranty, maintenance and test results.
Response Due By: 7/13/2022 PDT

Walsh Review:

Project Name: The Moraine
Submittal Package #:
Submittal ID #: 230500-01
Date Submitted: 6/29/2022 PDT
Spec Section: 23 05 00

The review by ("Walsh Construction Co") of the above Submittal is subject to the Contract Documents and Shall not relieve the Subcontractor/Supplier from any of its obligations under the agreement with Walsh nor give rise to any claim in favor of the Subcontractor/Supplier or third parties against Walsh or Owner.

By: Tran Nguyen

Architect Review:

Other Review:

SHOP DRAWINGS AND PRODUCT DATA

MFIA INC.

Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contact documents. Any action shown is subject to the requirements of the plans and specifications. Contractor is responsible for: Dimensions, which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and the satisfactory performance of this work.

- ☐ NO EXCEPTION TAKEN
- ☒ REVIEWED AS NOTED
- ☐ REVISE AND RESUBMIT

see notes on each product sheet. Products with no notes are considered "No Exception Taken"

DATE: 07/20/2022 SIGNED: mark.denyer

Notes:

please verify all electrical components, including wire size, over current protection, disconnects, voltage and number of wires with electrical contractor prior to ordering any equipment

MORAINE - 1402 Tacoma
Submittal #230000-01
HVAC PrD

TO: Walsh Construction Inc.

PROJECT: The Moraine

EAI PROJECT: 222-0206

WARRANTY

Emerald Aire, Inc. warrants that the heating, ventilating, and air conditioning work installed at the above project has been performed in full accordance the current iteration of the Mechanical / Energy Codes.

Emerald Aire, Inc. further guarantees this work from defects in workmanship or material for a period of one year from date of initial operations**:**

Emerald Aire, Inc. shall remedy, within a reasonable time, any defects without additional cost to the Owner. Emerald Aire, Inc. and its suppliers shall have no obligations as to any product which has been improperly handled or which has been operated improperly along with any equipment that has not been properly maintained.

A preventative maintenance agreement, providing service to manufacturer's standards with documented service records, is required during the warranty period for a guarantee of warranty coverage.

Emerald Aire, a Linc Service Contractor, will provide a customized preventative maintenance program and/or extended warranty solution, upon request. Please contact the Emerald Aire Service Team for information: (253) 872.5665 or dispatch@emeraldaire.com.

Any alterations, additions, or repairs made by others during the above-mentioned warranty period unless authorized or agreed upon by Emerald Aire, Inc., will be cause to terminate the obligation under this warranty.

All calls for warranty on any equipment, sheet metal or miscellaneous items deemed by Emerald Aire, Inc., as not a normal warranty item will be considered a nuisance/billable call and will be charged at standard hourly service rates or overtime rates, if applicable. Items not covered under warranty include, but are not limited to, fuses, belts and air filters. Routine documented inspection and regular replacement of such items are to be addressed within the required preventative maintenance agreement, which can be provided by the Emerald Aire Service team.

Emerald Aire, Inc. will respond to a reported warranty service call during normal business hours, Monday through Friday between the hours of 7:30 AM and 4:00 PM. If a response is desired on an after-hours basis, the difference between the current standard labor rate and the premium or overtime labor rate will be charged.

EMERALD AIRE, INC.

Grant Middleton
Co-Presidents

David Happe

Note: This is the full HVAC PrD submittal which includes product data, Warranty, Maintenance, and Test Results of the products

TO: Walsh Construction Inc.

PROJECT: The Moraine

EAI PROJECT: 222-0206

PREVENATATIVE MAINTENANCE

Emerald Aire, Inc. is committed to continuing our partnership by protecting the asset investment made during this project through proactive preventative maintenance.

75-85% of your total mechanical system cost is spent after construction, within the owning and operating costs of the equipment life cycle. ASHRAE (American Society of Heating, Refrigeration, Air Conditioning Engineers) has identified eight (8) areas of the owning and operating costs - Capital Expense, Energy, Lost Productivity, Administration, In-House Staff, Contracted Services, Major Repairs, Parts & Materials - all of which can be positively affected by proactive preventative maintenance.

Emerald Aire, a Linc Service Contractor, can coauthor a customized preventative maintenance solution that can stabilize your facility operating budget, ensure your new equipment is operating at the intended efficiency, extend equipment life, take on the risks and cost of emergency failure, replacement and downtime. We are also able to offer an extended warranty for any length in conjunction with your maintenance agreement.

Please note that a preventative maintenance agreement, providing service to the manufacturer's standards with documented service records, is required during the warranty period for a guarantee of warranty coverage.

Please contact the Emerald Aire Service Team for information: (253) 872.5665 or dispatch@emeraldaire.com to learn how we can continue our partnership and protect your investment.

The Emerald Aire Service Team looks forward to working with you!

EMERALD AIRE, INC.

Tawnya Wilson
Service General Manager

START & TEST SHEET

FAN

EMERALD AIRE	PROJECT NAME / DATE
	PROJECT ID / INITIALS

UNIT DATA

TAG	LOCATION
MANUFACTURER	SERVES
MODEL	SERIAL NUMBER

TECHNICAL DATA

FAN TYPE	VOLTAGE
HORSEPOWER	SPEED CONTROL
BELT SIZE & QUANTITY	FULL LOAD AMPS (FLA)
VFD SETTING (HZ)	FILTER SIZE
VFD PROGRAMMED	

AIR BALANCE

AREA SUPPLIED	TYPE	SIZE	DESIGN	FIRST	FINAL	%

NOTES

AIR BALANCE SHEET

UNIT TAG

EMERALD AIRE

PROJECT NAME	DATE
PROJECT ID	INITIALS

GRAND TOTALS

SUPPLY AIR (DESIGN)	SUPPLY AIR (ACTUAL)	OSA	--

SUPPLY AIR

AREA SUPPLIED	TYPE	SIZE	DESIGN	FIRST	FINAL	%

RETURN AIR

AREA SUPPLIED	TYPE	SIZE	DESIGN	FIRST	FINAL	%

3.3.14 Metal Hit Anchor

3.3.14.1 Product Description

The Hilti Metal Hit Anchor is a drive-in type expansion anchor consisting of a zinc plated or stainless steel drive pin and an alloy expanding body for light duty fastenings in concrete, masonry and brick.

Product Features

- Quick and easy fastening for maximum speed and installation
- Low profile mushroom head style provides a clean, tamper proof fastening
- Anchor design allows easy through-type fastenings even in bottomless holes
- Consistent load values provide light duty fastenings in concrete and masonry
- Choice of stainless steel or carbon steel finish allows outdoor or indoor use

3.3.14.2 Material Specifications

Body material: Aluminum/Zinc Alloy

Drive Pin: Zinc plated carbon steel conforming to AISI 1018. Type 304 Stainless Steel (Stainless Steel Version)

3.3.14.3 Technical Data

Metal Hit allowable loads in normal weight concrete, hollow concrete block and red Clay brick

Anchor size in.	Embed. depth in. (mm)		Concrete						Hollow concrete block				Red clay brick			
			Tension lb (kN)				Shear lb (kN)		Tension lb (kN)		Shear lb (kN)		Tension lb (kN)		Shear lb (kN)	
			2000psi		4000psi		2000psi									
3/16	5/8	(16)	–		–		–		180	(0.8)	180	(0.8)	–		–	
1/4	3/4	(19)	135	(0.6)	210	(0.9)	280	(1.2)	255	(1.1)	320	(1.4)	180	(0.8)	280	(1.2)
1/4	1	(25)	160	(0.7)	240	(1.1)	315	(1.4)	310	(1.4)	320	(1.4)	245	(1.1)	290	(1.3)

For overhead application reduce the allowable load values by a factor of 2.

3.3.14.4 Installation Instructions

Installation Instructions For Use (IFU) are included with each product package.
They can also be viewed or downloaded on line at www.us.hilti.com (US) and www.hilti.ca (Canada). Because of the possibility of changes, always verify that downloaded IFU are current when used. Proper installation is critical to achieve full performance. Training is available on request. Contact Hilti Technical Services for applications and conditions not addressed in the IFU.

3.3.14.5 Ordering Information

Description	Carbon Item No.	Stainless Item No.	Bolt Diameter[1] In.	Box Qty
Metal Hit 3/16" x 7/8"	66137	N/A	3/16	100
Metal Hit 1/4" x 3/4"	15538	N/A	1/4	100
Metal Hit 1/4" x 1"	66138	230567	1/4	100
Metal Hit 1/4" x 1-1/4"	66139	230568	1/4	100
Metal Hit 1/4" x 1-1/2"	66140	230569	1/4	100
Metal Hit 1/4" x 2"	45453	230570	1/4	100
Metal Hit 1/4" x 2-1/2"	2173408	2173260	1/4	100
Metal Hit 1/4" x 3"	2173409	2173261	1/4	100

GENERAL INFORMATION

ZAMAC HAMMER-SCREW®

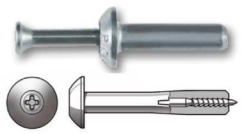
Nail Anchor

SECTION CONTENTS

PRODUCT DESCRIPTION

The Zamac Hammer-Screw is a unique, one-step nail drive anchor featuring a Phillips type head and a screw thread for use in concrete, block, brick or stone. It is available in 1/4" diameter and lengths ranging from 3/4" to 3". With a body formed from corrosion resistant Zamac alloy and a zinc plated carbon steel drive screw, this anchor has been developed as an improvement over standard nailin anchors.

The Zamac Hammer-Screw has been designed to provide a removable anchor with higher tension load capacities compared with traditional nailin when installed in concrete. The anchor is not recommended for overhead, life-safety or sustained tensile loading applications (see performance data section).



ZAMAC HAMMER-SCREW

GENERAL APPLICATIONS AND USES

- Brick ties and masonry anchorage
- Electrical fixtures
- Signage
- Flashing
- Drywall track
- Maintenance
- Surveillance equipment
- Light gage attachments

ANCHOR MATERIALS

- Zamac Alloy body with Carbon Steel Drive Screw

ANCHOR SIZE RANGE (TYP.)

- 1/4" x 3/4" to 1/4" x 3" diameter

SUITABLE BASE MATERIALS

- Normal-Weight Concrete
- Concrete Masonry (CMU)
- Brick Masonry
- Stone

FEATURES AND BENEFITS

+ General purpose anchoring
+ Installs in a variety of base materials
+ Removable anchor - screw can be backed out with a Phillips head driver

APPROVALS AND LISTINGS

- Federal GSA Specification - Meets the proof load requirements of FF-S-325C, Group V, Type 2, Class 3, (superseded) and CID A-A 1925A, Type 1

GUIDE SPECIFICATIONS

CSI Divisions: 03 16 00 - Concrete Anchors, 04 05 19.16 - Masonry Anchors and 05 05 19 - Post-Installed Concrete Anchors. Anchors shall be Zamac Hammer-Screw anchors as supplied by DEWALT, Towson, MD. Anchors shall be installed in accordance with published instructions and the Authority Having Jurisdiction.

INSTALLATION AND MATERIAL SPECIFICATIONS

Installation Specifications

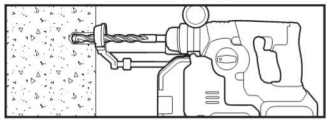
Dimension	Anchor Diameter, d
	1/4
ANSI Drill Bit Size (in.)	1/4
Fixture Clearance Hole (in.)	5/16
Head Height (in.)	9/64
Head Width (in.)	35/64

Material Specifications

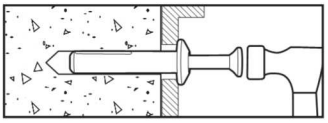
Anchor Component	Mushroom Head Carbon Steel Screw
Anchor Body	Zamac Alloy
Drive Screw	AISI 1018
Screw Plating/ Coating	ASTM B 633, SC1, Type III (Fe/Zn5)

Installation Guidelines

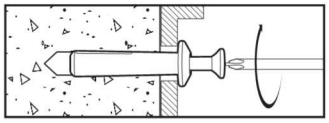
1. Drill a hole into the base material to a depth of at least 1/4" deeper than the required embedment. The tolerances of the drill bit used should meet the requirements of ANSI Standard B212.15. Remove dust and debris from the hole during drilling (e.g. dust extractor) or following drilling (e.g. suction, forced air) to extract loose particles created by drilling.



2. Insert the anchor through the fixture. Drive the screw into the anchor body to expand it. Be sure the head is seated firmly against the fixture and that the anchor is at the proper embedment. Take care not to overdrive the screw. This anchor is not recommended for installations at an angle or for use overhead.



Optional: To remove – Press a Phillips screw driver firmly into the screw head and turn counterclockwise. Remove the screw from the anchor body, then pry out the fixture and anchor body simultaneously by working the claw of a hammer under the fixture



PERFORMANCE DATA

Ultimate and Allowable Load Capacities for Zamac Hammer-Screw in Normal-Weight Concrete[1,2,3,4,5]

Rod/ Anchor Diameter d in. (mm)	Min. Embed. Depth h_v in. (mm)	Minimum Concrete Compressive Strength, f 'c											
		2,000 psi				4,000 psi				6,000 psi			
		Tension		Shear		Tension		Shear		Tension		Shear	
		Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)	Ultimate lbs. (kN)	Allowable lbs. (kN)
1/4 (6.4)	5/8 (16)	675 (3.0)	170 (0.8)	650 (2.9)	165 (0.7)	850 (3.8)	215 (1.0)	880 (3.9)	220 (1.0)	890 (4.0)	225 (1.0)	880 (3.9)	220 (1.0)
	3/4 (19)	790 (3.5)	200 (0.9)	805 (3.6)	200 (0.9)	1,135 (5.0)	285 (1.3)	1,115 (5.0)	280 (1.2)	1,190 (5.3)	300 (1.3)	1,115 (5.0)	280 (1.2)
	7/8 (22)	930 (4.1)	235 (1.0)	990 (4.4)	250 (1.1)	1,205 (5.4)	300 (1.3)	1,230 (5.5)	310 (1.4)	1,250 (5.6)	315 (1.4)	1,230 (5.5)	310 (1.4)
	1-1/8 (29)	1,220 (5.4)	305 (1.4)	1,365 (6.1)	340 (1.5)	1,350 (6.0)	340 (1.5)	1,470 (6.5)	370 (1.6)	1,450 (6.4)	365 (1.6)	1,470 (6.5)	370 (1.6)
	1-3/8 (35)	1,325 (5.9)	330 (1.5)	1,555 (6.9)	390 (1.7)	1,450 (6.4)	365 (1.6)	1,645 (7.3)	410 (1.8)	1,530 (6.8)	385 (1.7)	1,645 (7.3)	410 (1.8)
	1-3/4 (44)	1,480 (6.6)	370 (1.6)	1,840 (8.2)	460 (2.0)	1,600 (7.1)	400 (1.8)	1,910 (8.5)	480 (2.1)	1,660 (7.4)	415 (1.8)	1,910 (8.5)	480 (2.1)
	1-7/8 (48)	1,480 (6.6)	370 (1.6)	1,840 (8.2)	460 (2.0)	1,600 (7.1)	400 (1.8)	1,910 (8.5)	480 (2.1)	1,660 (7.4)	415 (1.8)	1,910 (8.5)	480 (2.1)

1. Tabulated load values are for anchors installed in concrete. Concrete compressive strength must be at the specified minimum at the time of installation.
2. Allowable load capacities listed are calculated using an applied safety factor of 4.0. Anchors are not recommended for use overhead or for life safety. Consideration of safety factors of 20 or higher may be necessary depending on the application, such as in sustained tensile loading applications.
3. Linear interpolation may be used to determine allowable loads for anchors at intermediate embedment depths and compressive strengths.
4. The tabulated load values are applicable to single anchors installed at critical edge and spacing distances. Allowable load capacities are multiplied by reduction factors when anchor spacing or edge distances are less than critical distances.
5. Anchors installed flush with face or end of concrete surface.

Ultimate and Allowable Load Capacities for Zamac Hammer-Screw in Hollow Concrete Masonry[1,2,3,4]

Nominal Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	f'm ≥ 1,500 psi (10.4 MPa)			
		Ultimate Load		Allowable Load	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	5/8 (15.9)	420 (1.9)	1,160 (5.2)	85 (0.4)	230 (1.0)
	3/4 (19.1)	825 (3.7)	1,215 (5.5)	165 (0.7)	245 (1.1)
	1 (25.4)	1,000 (4.5)	1,265 (5.7)	200 (0.9)	255 (1.1)
	1-1/8 (28.6)	1,090 (4.9)	1,290 (5.8)	220 (1.0)	260 (1.2)
	1-3/8 (34.9)	1,145 (5.2)	1,345 (6.1)	230 (1.0)	270 (1.2)
	1-1/2 (38.1)	1,145 (5.2)	1,345 (6.1)	230 (1.0)	270 (1.2)

1. Tabulated load values are for anchors installed in minimum 6-inch wide, Grade N, Type II, medium and normal-weight and lightweight concrete masonry units. Mortar must be Type N, S or M. Masonry compressive strength must be 1,500 psi minimum at the time of installation. Hollow masonry cells may also be grouted or solid.
2. The tabulated values are for anchors installed at a minimum of 16 anchor diameters on center for 100 percent capacity. Spacing distances may be reduced to 8 anchor diameters on center provided the capacities are reduced by 50 percent. Linear interpolation may be used for intermediate spacing.
3. Allowable load capacities listed are calculated using and applied safety factor of 5.0. Anchors are not recommended for use overhead or for life safety. Consideration of safety factors of 20 or higher may be necessary depending upon the application such as in sustained tensile loading applications.
4. Anchors installed flush with face or end of masonry surface.

DEWALT ENGINEERED BY Powers

DESIGN CRITERIA

MECHANICAL ANCHORS

ZAMAC HAMMER-SCREW® Nail Anchor

Ultimate and Allowable Load Capacities for Zamac-Hammer Screw in Solid Clay Brick Masonry[1,2,3,4]

Nominal Anchor Diameter d in. (mm)	Minimum Embedment Depth h_v in. (mm)	f'm ≥ 1,500 psi (10.4 MPa)			
		Ultimate Load		Allowable Load	
		Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
1/4 (6.4)	5/8 (15.9)	680 (3.1)	1,025 (4.6)	135 (0.6)	205 (0.9)
	3/4 (19.1)	930 (4.2)	1,200 (5.3)	185 (0.8)	240 (1.1)
	1 (25.4)	990 (4.5)	1,350 (6.0)	200 (0.9)	270 (1.2)
	1-1/8 (28.6)	1,040 (4.7)	1,350 (6.0)	210 (0.9)	270 (1.2)
	1-3/8 (34.9)	1,150 (5.2)	1,350 (6.0)	230 (1.0)	270 (1.2)
	1-1/2 (38.1)	1,260 (5.7)	1,350 (6.0)	250 (1.1)	270 (1.2)

1. Tabulated load values are for anchors installed in multiple wythe, minimum Grade SW, solid clay brick masonry walls conforming to ASTM C 62. Mortar must be minimum Type N. Masonry compressive strength must be at the specified minimum at the time of installation ($f'm \geq 1,500$ psi).
2. The tabulated values are for anchors installed at a minimum of 16 anchor diameters on center for 100 percent capacity. Spacing distances may be reduced to 8 anchor diameters on center provided the capacities are reduced by 50 percent. Linear interpolation may be used for intermediate spacing.
3. Allowable load capacities listed are calculated using and applied safety factor of 5.0. Anchors are not recommended for use overhead or for life safety. Consideration of safety factors of 20 or higher may be necessary depending upon the application such as in sustained tensile loading applications.
4. Anchors installed flush with face or end of masonry surface.

DESIGN CRITERIA

Combined Loading

For anchors loaded in both shear and tension, the combination of loads should be proportioned as follows:

$$\left(\frac{Nu}{Nn}\right) + \left(\frac{Vu}{Vn}\right) \leq 1$$

Where: N_u = Applied Service Tension Load, V_u = Applied Service Shear Load, N_n = Allowable Tension Load, V_n = Allowable Shear Load

Load Adjustment Factors for Spacing and Edge Distances in Normal-Weight Concrete[1]

Anchor Dimension	Load Type	Critical Distance (Full Anchor Capacity)	Critical Load Factor	Minimum Distance (Reduced Capacity)	Minimum Load Factor
Spacing (s)	Tension and Shear	s_{cr} = 10d	$F_{NS} = F_{VS} = 1.0$	s_{min} = 5d	$F_{NS} = F_{VS} = 0.50$
Edge Distance (c)	Tension	c_{cr} = 12d	$F_{NC} = 1.0$	c_{min} = 6d	$F_{NC} = 0.80$
	Shear	c_{cr} = 12d	$F_{VC} = 1.0$	c_{min} = 6d	$F_{VC} = 0.50$

1. Allowable load values found in the performance data tables are multiplied by reduction factors when anchor spacing or edge distances are less than critical distances. Linear interpolation is allowed for intermediate anchor spacing and edge distances between critical and minimum distances. When an anchor is affected by both reduced spacing and edge distance, the spacing and edge reduction factors must be combined (multiplied). Multiple reduction factors for anchor spacing and edge distance may be required depending on the anchor group configuration.

ORDERING INFORMATION

Mushroom Head with No. 2 Phillips Head Screw

Cat No.	Anchor Size	Drill Diameter	Std. Box	Std. Carton	Wt./100
2839	1/4" x 3/4"	1/4"	100	500	1-1/2
2840	1/4" x 1"	1/4"	100	500	1-3/4
2842	1/4" x 1-1/4"	1/4"	100	500	2-1/4
2844	1/4" x 1-1/2"	1/4"	100	500	2-1/2
2846	1/4" x 2"	1/4"	100	500	3
2848	1/4" x 2-1/4"	1/4"	100	500	3-1/2
2850	1/4" x 3"	1/4"	100	500	4-1/4

The published size includes the diameter and length of the anchor measured from under the shoulder of the anchor body.

Master Pack

Cat No.	Anchor Size	Drill Diameter	Std. Carton	Wt./100
2939	1/4" x 3/4"	1/4"	1,000	1-1/2
2940	1/4" x 1"	1/4"	1,000	1-3/4
2942	1/4" x 1-1/4"	1/4"	1,000	2-1/4
2944	1/4" x 1-1/2"	1/4"	1,000	2-1/2
2946	1/4" x 2"	1/4"	1,000	3
2948	1/4" x 2-1/4"	1/4"	1,000	3-1/2
2949	1/4" x 3"	1/4"	1,000	4-1/4

The published size includes the diameter and length of the anchor measured from under the shoulder of the anchor body.

FLUSH ANCHOR SOLUTION FOR SHALLOW EMBEDMENT CRACKED CONCRETE AND SEISMIC APPLICATIONS

Flush anchors
HDI-P TZ technical supplement

FLUSH ANCHOR SOLUTION FOR SHALLOW EMBEDMENT

Flush anchor HDI-P TZ

The Hilti HDI-P TZ is the best-in-class anchor for applications requiring cracked concrete and seismic approval when minimal concrete embedment is allowed. Requiring just 3/4" of concrete embedment, this anchor is ideal for concrete slabs with post-tensioned cable. The HDI-P TZ anchor can be set with a hand setting tool and a hammer, or with a hammer drill and the auto setting tool. Using the auto setting tool with a Hilti hammer drill and the Hilti Dust Removal System (DRS), the installation of this anchor is virtually dust free, and provides an OSHA 1926.1153 Table 1 compliant solution.

Make all of your post-installed anchor attachments in the ceiling cracked concrete compliant with the new HDI-P TZ.

APPLICATIONS AND ADVANTAGES

Mechanical (Hanging pipes, HVAC)

Electrical (Hanging conduit, cable tray)

Sprinkler (Hanging pipes)

Anchor design

- Carbon steel anchor with zinc plating
- 3/8" inner thread diameter

Technical data

- Uncracked and cracked concrete
- Seismic category A-F
- FM/UL approval for pipe hanging up to 4" diameter

Productivity

- Shallow embedment of 3/4" allows minimal drilling time
- Easy installation with Auto Setting Tool
- Auto Setting Tool includes stop drill bit and setting tool, no tool change necessary

Safety

- Use of Hilti's Dust Removal System (DRS) helps ensure an OSHA 1926.1153 Table 1 compliant solution

Technical data

Product	Carbon-steel with zinc coating
Inner thread diameter	3/8”
Drill bit diameter	ANSI 9/16”
Nominal embedment	3/4"

Description	Item number
Flush anchor HDI-P TZ 3/8"	2204029
HDI-P TZ 3/8" MC (1200 PCS / MC)	3596870
HDI-P TZ 3/8" (1/3 Pallet = 9600 PCS)	3596872
HDI-P TZ 3/8" Pallet	3597043
HDI-P TZ 3/8" (300) with auto set tool	3597044
HDI-P TZ 3/8" (600) with auto set tool	3597045
HDI-P TZ 3/8" (1200) with 3 auto set tools	3597046

Accessories

Description	Item number
Auto setting tool HDI-P TZ 3/8”	2204112
Setting tool HST HDI-P TZ 3/8”x20	2204110

PRODUCT DESCRIPTION

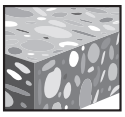
Carbon steel HDI-P TZ

Auto-setting tool HDI-P TZ

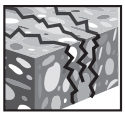
Hand-setting tool HDI-P TZ

Product Features

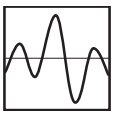
- Flush anchor with optimized length for reliable fastenings in post-tensioned cable concrete slabs
- Shallow drilling for fast installations
- Lip provides flush installation, consistent anchor depth, and easy rod alignment
- Suitable for uncracked and cracked concrete including seismic areas
- Productive installation with HDI-P TZ automatic setting tool with hammer drill
- Used with Hilti Dust Removal System (DRS) for compliance with Table 1 of OSHA 1926.1153 regulations for silica dust exposure



Uncracked concrete



Cracked concrete



Seismic Design Categories A-F

Approvals/ Listings

ICC-ES (International Code Council) - 2018 International Building Code / International Residential Code (IBC/IRC)	ESR-4236 in concrete per ACI 318-14 Ch. 17 / ACI 355.2 / ICC-ES AC193
City of Los Angeles	2017 LABC Supplement (within ESR-4236)
Florida Building Code	2017 FBC Supplement (within ESR-4236)
FM (Factory Mutual)	Pipe hanger components for automatic sprinkler systems 3/8 (4-inch nominal pipe diameter)
UL and cUL (Underwriters Laboratory)	Pipe hanger equipment for fire protection services for 3/8 (4-inch nominal pipe diameter)

MATERIAL SPECIFICATIONS

HDI-P TZ flush anchors are manufactured from carbon steel with zinc plating per DIN EN ISO 4042 A2K.

INSTALLATION PARAMETERS

Figure 1 - Hilti HDI-P TZ installation parameters

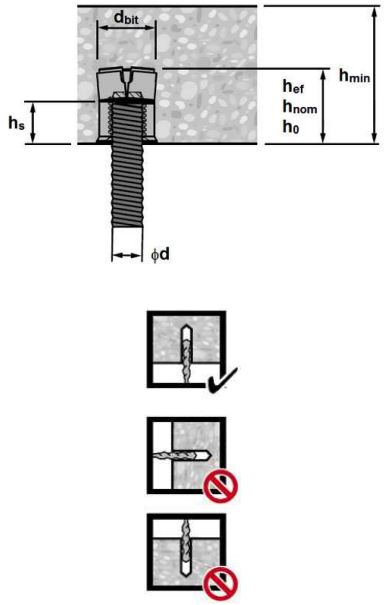


Table 1 - Hilti HDI-P TZ Setting Information

Setting information	Symbol	Unit	Nominal anchor size / internal thread dia. (in)
			3/8
Internal thread diameter	d	in.	3/8
Nominal bit diameter	d_{bit}	in.	9/16
Nominal embedment	h_{nom}	in. (mm)	3/4 (19)
Hole depth in concrete	h_0	in. (mm)	3/4 (19)
Minimum concrete thickness	h_{min}	in. (mm)	2-1/2 (64)
Thread engagement length	h_s	in. (mm)	3/8 (10)
Minimum edge distance	c_{min}	in. (mm)	6 (153)
Minimum anchor spacing	s_{min}	in. (mm)	8 (204)

Installation Instructions

Installation Instructions For Use (IFU) are included with each product package. They can also be viewed or downloaded online at www.hilti.com or www.hilti.ca. Because of the possibility of changes, always verify that downloaded IFU are current when used. Proper installation is critical to achieve full performance. Training is available on request. Contact Hilti Technical Services for applications and conditions not addressed in the IFU.

DESIGN DATA IN CONCRETE PER ACI 318

ACI 318-14 Chapter 17 Design

The design tables in Tables 2 to 4 are Hilti Simplified Design Tables. The load values were developed using the design parameters and variables of ICC Evaluation Services ESR-4236 and the equations within ACI 318-14 Chapter 17 as amended by ICC-ES AC193. The strength design capacities calculated from the tables below are to be compared to the factored loads determined from strength design load combinations. For a detailed explanation of the Hilti Simplified Design Tables, refer to Section 3.1.8 of the Hilti North American Product Technical Guide Volume 2 - Anchor Fastening Ed. 17 [Anchor Tech Guide Ed. 17]. Data tables from ESR-4236 are not contained in this section, but can be found at www.hilti.com or www.icc-es.org.

Table 2 - Hilti HDI-P TZ design strength based on concrete failure modes in uncracked concrete per ACI 318 14 Ch. 17[1,2,3,4,5]

Nominal anchor diameter in.	Nominal embed. in. (mm)	Tension (lesser of concrete breakout / pullout) - ϕN_n				Shear (lesser of concrete breakout or pryout) - ϕV_n			
		f'_c = 2500 psi (17.2 MPa) lb (kN)	f'_c = 3000 psi (20.7 MPa) lb (kN)	f'_c = 4000 psi (27.6 MPa) lb (kN)	f'_c = 6000 psi (41.4 MPa) lb (kN)	f'_c = 2500 psi (17.2 MPa) lb (kN)	f'_c = 3000 psi (20.7 MPa) lb (kN)	f'_c = 4000 psi (27.6 MPa) lb (kN)	f'_c = 6000 psi (41.4 MPa) lb (kN)
3/8	3/4 (19)	310 (1.4)	340 (1.5)	395 (1.8)	485 (2.1)	350 (1.6)	385 (1.7)	445 (2.0)	545 (2.4)

Table 3 - Hilti HDI-P TZ design strength based on concrete failure modes in cracked concrete per ACI 318 14 Ch. 17[1,2,3,4,5,6,7]

Nominal anchor diameter in.	Nominal embed. in. (mm)	Tension (lesser of concrete breakout / pullout) - ϕN_n				Shear (lesser of concrete breakout or pryout) - ϕV_n			
		f'_c = 2500 psi (17.2 MPa) lb (kN)	f'_c = 3000 psi (20.7 MPa) lb (kN)	f'_c = 4000 psi (27.6 MPa) lb (kN)	f'_c = 6000 psi (41.4 MPa) lb (kN)	f'_c = 2500 psi (17.2 MPa) lb (kN)	f'_c = 3000 psi (20.7 MPa) lb (kN)	f'_c = 4000 psi (27.6 MPa) lb (kN)	f'_c = 6000 psi (41.4 MPa) lb (kN)
3/8	3/4 (19)	190 (0.8)	200 (0.9)	220 (1.0)	255 (1.1)	250 (1.1)	270 (1.2)	315 (1.4)	385 (1.7)

The following footnotes apply to both Table 2 and 3:
[1] See Section 3.1.8.6 of the Anchor Tech Guide Ed. 17 to convert design strength value to ASD value.
[2] Linear interpolation between concrete compressive strengths is not permitted.
[3] Tabular values are for a single anchor with a minimum edge distance of 6-1/2-in (166mm) and a minimum spacing of 8-in (204mm). For a 6-in (153mm) edge distance multiply uncracked concrete tension and shear values by 0.92. No reduction needed for cracked concrete.
[4] Compare to the steel values in Table 4. The lesser of the values is to be used for the design.
[5] Tabular values are for normal weight concrete only. For lightweight concrete multiply design strength by λ_a as follows: For sand-lightweight, λ_a = 0.68. For all-lightweight, λ_a = 0.60.
[6] Tabular values are for static loads only. For seismic tension loads, multiply cracked concrete tabular values in tension by $\alpha_{N,seis}$ = 0.74.
[7] No additional reduction needed for seismic shear for concrete breakout or pryout failure. See Section 3.1.8.7 of the Anchor Tech Guide Ed. 17 for additional information on seismic applications.

Table 4 - Hilti HDI-P TZ design strength based on steel failure per ACI 318-14 Ch. 17 [1,2,3]

Nominal anchor diameter in.	Steel strength of HDI-P TZ anchor			Steel strength of ASTM A36 threaded rod		
	Tensile[4] ϕN_{sa} lb (kN)	Shear[5] ϕV_{sa} lb (kN)	Seismic Shear[6,9] ϕV_{sa} lb (kN)	Tensile[4] $\phi N_{sa,rod}$ lb (kN)	Shear[7] $\phi V_{sa,rod}$ lb (kN)	Seismic Shear[8,9] $\phi V_{sa,rod,eq}$ lb (kN)
3/8	4,065 (18.1)	585 (2.6)	585 (2.6)	3,370 (15.0)	1,885 (8.4)	1,320 (5.9)

[1] See Section 3.1.8.6 of the Anchor Tech Guide Ed. 17 to convert design strength value to ASD value.
[2] Steel strength in tension and shear determined from the lesser of the HDI-P TZ or the inserted threaded rod.
[3] Hilti HDI-P TZ anchors are considered a brittle steel element. ASTM A36 threaded rod is considered a ductile steel element.
[4] Tensile $\phi N_{sa} = \phi A_{se,N} f_{uta}$ as noted in ACI 318-14 Ch. 17.
[5] Shear values for HDI-P TZ determined by static shear tests with $\phi V_{sa} \le \phi\ 0.60\ A_{se,V} f_{uta}$ as noted in ACI 318-14 Ch. 17.
[6] Seismic shear values for HDI-P TZ determined by seismic shear tests with $\phi V_{sa} < \phi\ 0.60\ A_{se,V} f_{uta}$ as noted in ACI 318-14 Ch. 17.
[7] Shear values for threaded rod determined by $\phi V_{sa,rod} = \phi\ 0.60\ A_{se,V} f_{uta}$ as noted in ACI 318-14 Ch. 17.
[8] Seismic shear values for threaded rod determined by $\phi V_{sa,rod,eq} = \phi\ 0.70\ V_{sa,rod}$.
[9] See Section 3.1.8.7 of the Anchor Tech Guide Ed. 17 for additional information on seismic applications.

DESIGN DATA IN CONCRETE PER CSA A23.3

CSA A23.3-14 Annex D Design

Limit State Design of anchors is described in the provisions of CSA A23.3-14 Annex D for post-installed anchors tested and assessed in accordance with ACI 355.2 for mechanical anchors and ACI 355.4 for adhesive anchors. Tables 8 and 9 in this section contains the Limit State Design tables that are based on the published loads in ICC Evaluation Services ESR-4236 and converted for use with CSA A23.3-14 Annex D. Tables 5 to 7 below are Hilti Simplified Design Tables which are pre-factored resistance tables based on the design parameters and variables in Tables 8 and 9. All the figures in the previous ACI 318 14 Chapter 17 design section are applicable to Limit State Design and the tables will reference these figures.

For a detailed explanation of the tables developed in accordance with CSA A23.3-14 Annex D, refer to Section 3.1.8 of the Hilti North American Product Technical Guide Volume 2 - Anchor Fastening Ed. 17 [Anchor Tech Guide Ed. 17]. Technical assistance is available by contacting Hilti Canada at (800) 363-4458 or at www.hilti.ca.

Table 5 - Hilti HDI-P TZ factored resistance based on concrete failure modes in uncracked concrete per CSA A23.3-14 Annex D [1,2,3,4,5]

Nominal anchor diameter in.	Nominal embed. in. (mm)	Tension (lesser of concrete breakout / pullout) - N_r				Shear (lesser of concrete breakout or pryout) - V_r			
		f'_c = 20 MPa (2,900 psi) lb (kN)	f'_c = 25 MPa (3,625 psi) lb (kN)	f'_c = 30 MPa (4,350 psi) lb (kN)	f'_c = 40 MPa (5,800 psi) lb (kN)	f'_c = 20 MPa (2,900 psi) lb (kN)	f'_c = 25 MPa (3,625 psi) lb (kN)	f'_c = 30 MPa (4,350 psi) lb (kN)	f'_c = 40 MPa (5,800 psi) lb (kN)
3/8	3/4 (19)	325 (1.5)	365 (1.6)	400 (1.8)	460 (2.1)	380 (1.7)	425 (1.9)	465 (2.1)	540 (2.4)

Table 6 - Hilti HDI-P TZ factored resistance based on concrete failure modes in cracked concrete per CSA A23.3-14 Annex D [1,2,3,4,5,6,7]

Nominal anchor diameter in.	Nominal embed. in. (mm)	Tension (lesser of concrete breakout / pullout) - N_r				Shear (lesser of concrete breakout or pryout) - V_r			
		f'_c = 20 MPa (2,900 psi) lb (kN)	f'_c = 25 MPa (3,625 psi) lb (kN)	f'_c = 30 MPa (4,350 psi) lb (kN)	f'_c = 40 MPa (5,800 psi) lb (kN)	f'_c = 20 MPa (2,900 psi) lb (kN)	f'_c = 25 MPa (3,625 psi) lb (kN)	f'_c = 30 MPa (4,350 psi) lb (kN)	f'_c = 40 MPa (5,800 psi) lb (kN)
3/8	3/4 (19)	195 (0.9)	210 (0.9)	220 (1.0)	245 (1.1)	270 (1.2)	300 (1.3)	330 (1.5)	380 (1.7)

The following footnotes apply to both Table 5 and 6:
[1] See Section 3.1.8.6 of the Anchor Tech Guide Ed. 17 to convert design strength value to ASD value.
[2] Linear interpolation between concrete compressive strengths is not permitted.
[3] Tabular values are for a single anchor with a minimum edge distance of 6-1/2-in (166mm) and a minimum spacing of 8-in (204mm). For a 6-in (153mm) edge distance multiply uncracked concrete tension and shear values by 0.92. No reduction needed for cracked concrete.
[4] Compare to the steel values in Table 7. The lesser of the values is to be used for the design.
[5] Tabular values are for normal weight concrete only. For lightweight concrete multiply design strength by λ_a as follows: For sand-lightweight, λ_a = 0.68. For all-lightweight, λ_a = 0.60.
[6] Tabular values are for static loads only. For seismic tension loads, multiply cracked concrete tabular values in tension by $\alpha_{N,seis}$ = 0.74.
[7] No additional reduction needed for seismic shear for concrete breakout or pryout failure. See Section 3.1.8.7 of the Anchor Tech Guide Ed. 17 for additional information on seismic applications.

Table 7 - Hilti HDI-P TZ factored resistance based on steel failure per CSA A23.3-14 Annex D [1,2,3]

Nominal anchor diameter in.	Steel strength of HDI-P TZ anchor			Steel strength of ASTM A36 threaded rod		
	Tensile[4] N_{sar} lb (kN)	Shear[5] V_{sar} lb (kN)	Seismic Shear[6,9] $V_{sar,eq}$ lb (kN)	Tensile[4] N_{sar} lb (kN)	Shear[7] V_{sar} lb (kN)	Seismic Shear[8,9] $V_{sar,eq}$ lb (kN)
3/8	3,720 (16.5)	540 (2.4)	540 (2.4)	3,055 (13.6)	1,720 (7.7)	1,200 (5.3)

[1] See Section 3.1.8.6 of the Anchor Tech Guide Ed. 17 to convert design strength value to ASD value.
[2] Steel strength in tension and shear determined from the lesser of the HDI-P TZ or the inserted threaded rod.
[3] Hilti HDI-P TZ anchors are considered a brittle steel element. ASTM A36 threaded rod is considered a ductile steel element.
[4] Tensile $N_{sar} = A_{se,N}\ \varphi_s\ f_{uta}$ as noted in CSA A23.3-14 Annex D.
[5] Shear values for HDI-P TZ determined by static shear tests with $V_{sar} \le 0.6\ A_{se,V}\ \varphi s\ f_{uta}$ R as noted in CSA A23.3-14 Annex D.
[6] Seismic shear values for HDI-P TZ determined by seismic shear tests with $V_{sar,eq} \le 0.60\ A_{se,V}\ \varphi_s\ f_{uta}$ R as noted in CSA A23.3-14 Annex D.
[7] Shear values for threaded rod determined by $V_{sar} = 0.6\ A_{se,V}\ \varphi_s\ f_{uta}$ R as noted in CSA A23.3-14 Annex D.
[8] Seismic shear values for threaded rod determined by $V_{sar,rod,eq} = 0.70\ V_{sar,rod}$.
[9] See Section 3.1.8.7 of the Anchor Tech Guide Ed. 17 for additional information on seismic applications.

Table 8 - Design information, Hilti HDI-P TZ, in accordance with CSA A23.3-14 [1]

Setting information	Symbol	Unit	Nominal anchor size / internal thread dia. (in)	Ref
			3/8	CSA A23.3-14
Anchor O.D.	d_a	in. (mm)	0.561 (14.25)	
Effective embedment	h_{ef}	in. (mm)	3/4 (19)	
Steel embed. material resistance factor for reinforcement	φ_s	-	0.85	8.4.3
Resistance modification factor for tension, steel failure modes [2,3]	$R_{s,N}$	-	0.70	D.5.3 b)
Min. specified yield strength	f_{ya}	psi (N/mm^2)	70,400 (484)	
Min. specified ultimate strength	f_{uta}	psi (N/mm^2)	88,000 (605)	
Effective-cross sectional steel area in tension	$A_{se,N}$	in^2 (mm^2)	0.071 (45.8)	
Factored steel resistance in tension [4]	N_{sa}	lb (kN)	6,250 (27.8)	D.6.1.2 Eq. D.2
Concrete material resistance factor	φ_c	-	0.65	8.4.2
Anchor category	-	-	1	D.5.3 c)
Resistance modification factor for tension, concrete failure [3]	$R_{c,N}$	-	0.60	
Coeff. for factored conc. breakout resistance, uncracked concrete	$k_{c,uncr}$	in-lb (SI)	24 (10.0)	D.6.2.2
Coeff. for factored conc. breakout resistance, cracked concrete	$k_{c,cr}$	in-lb (SI)	17 (7.1)	D.6.2.2
Modification factor for anchor resistance, tension, uncracked conc. [5]	$\psi_{c,N}$	-	1.0	D.6.2.6
Critical edge distance	c_{ac}	in. (mm)	6 (152)	
Factored pullout resistance in 20 MPa uncracked concrete [6]	$N_{pr,uncr}$	lb (kN)	N/A	D.6.3.2
Factored pullout resistance in 20 MPa cracked concrete [6]	$N_{pr,cr}$	lb (kN)	495 (2.2)	D.6.3.2
Factored pullout resistance in 20 MPa cracked concrete, seismic [6]	$N_{pr,eq}$	lb (kN)	490 (2.2)	D.6.3.2
Resistance modification factor for shear, steel failure modes [2,3]	$R_{s,V}$	-	0.65	D.5.3 b)
Factored steel resistance in shear [7]	V_{sa}	lb (kN)	975 (4.3)	D7.1.2
Factored steel resistance in shear, seismic [7]	$V_{sa,eq}$	lb (kN)	975 (4.3)	
Resistance modification factor for shear, concrete failure modes [3]	$R_{c,V}$	-	0.70	
Coefficient for pryout resistance	k_{cp}	-	1.0	D.7.3

[1] Design information is taken from ICC-ES ESR-4236, dated July 2018, table 2, and converted for use with CSA A23.3-14 Annex D.
[2] The HDI-P TZ is considered a brittle steel element as defined by CSA A23.3-14 Annex D Section D.2.
[3] All values of R are applicable with the load combinations of CSA A23.3-14 Chapter 8. For concrete failure modes, no increase for Condition A is permitted.
[4] $N_{sar} = N_{sa}\ \varphi_s\ R_{s,N}$ where N_{sa} tabular value above is precalculated from $A_{se,N}\ f_{uta}$.
[5] For all design cases, $\psi_{c,N} = 1.0$. The appropriate effectiveness factor for cracked concrete ($k_{c,cr}$) or uncracked concrete ($k_{c,uncr}$) must be used.
[6] For all design cases, $\psi_{c,P} = 1.0$. Tabular value for pullout resistance is for a concrete compressive strength of 20 MPa (2,900 psi). Pullout resistance for concrete compressive strength greater than 20 MPa (2,900 psi) may be increased by multiplying the tabular pullout resistance by $(f'_c / 20)^{0.35}$ for MPa or $(f'_c / 2{,}900)^{0.35}$ for psi. NA (not applicable) denotes that pullout strength does not need to be considered for design.
[7] Shear and seismic shear tests are all performed in cracked concrete member per ICC-ES AC193 section 9.4 and 9.6 respectively. Value of $V_{sa(eq)} < 0.6\ A_{se,V}\ f_{uta}$ for all cases. Multiply V_{sa} tabular value above by $\varphi_s\ R_{s,V}$ to get V_{sar} and $V_{sar,eq}$.

Table 9 - Steel design information for inserted threaded rod, in accordance with CSA A23.3-14 [1]

Setting information	Symbol	Unit	Nominal anchor size / internal thread dia. (in)
			3/8
Nominal rod diameter	d_{rod}	in.	0.375
Steel embed. material resistance factor for reinforcement	φ_s	-	0.85
Resistance modification factor for tension, steel failure modes [2]	$R_{s,N}$	-	0.80
Min. specified ult. strength	f_{uta}	psi (MPa)	58,000 (400)
Rod effective cross-sectional area	$A_{se,rod}$	in.^{2} (mm^2)	0.0775 (50)
Factored steel resistance in tension ASTM A36 steel material [3]	$N_{sa,rod}$	lb (kN)	4,495 (20.0)
Factored steel resistance in tension, seismic ASTM A36 steel material [3]	$N_{sa,rod,eq}$	lb (kN)	4,495 (20.0)
Resistance modification factor for steel in shear ASTM A36 steel material [2]	$R_{sa,rod,V}$	-	0.75
Factored steel resistance in shear ASTM A36 steel material [4]	$V_{sa,rod}$	lb (kN)	2,695 (12.0)
Factored steel resistance, seismic ASTM A36 steel material [4]	$V_{sa,rod,eq}$	lb (kN)	1,885 (8.4)

[1] Values provided for steel element material types, or equivalent, based on minimum specified strengths and calculated in accordance with CSA A23.3 14 Eq. D.2 and Eq. D.30, as applicable.
[2] All values of R are applicable with the load combinations of CSA A23.3-14 Chapter 8. Values correspond to a ductile steel element.
[3] $N_{sar,rod(eq)} = N_{sa,rod(eq)} \varphi_s R_{s,N}$ where $N_{sa,rod(eq)}$ tabular value above is precalculated from $A_{se,rod} f_{uta}$. N_{sar} shall be the lower of $N_{sar,rod}$ or $N_{sar,HDI\text{-}P\ TZ}$ for static steel strength in tension; for seismic loads, $N_{sar,eq}$ shall be the lower of $N_{sar,rod,eq}$ or $N_{sar,eq}$, HDI-P TZ.
[4] $V_{sar,rod(eq)} = V_{sa,rod(eq)} \varphi_s R_{s,V}$ where $V_{sa,rod}$ tabular value above is precalculated from 0.6 $A_{se,rod} f_{uta}$, and $V_{sa,rod,eq}$ must be taken as 0.7 $V_{sa,rod}$. V_{sar} shall be the lower of $V_{sar,rod}$ or $V_{sar,HDI\text{-}P\ TZ}$ for static steel strength in tension; for seismic loading, $V_{sar,eq}$ shall be the lower of $V_{sar,eq}$,rod or $V_{sar,eq,HDI\text{-}P\ TZ}$.

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SM - 07/18

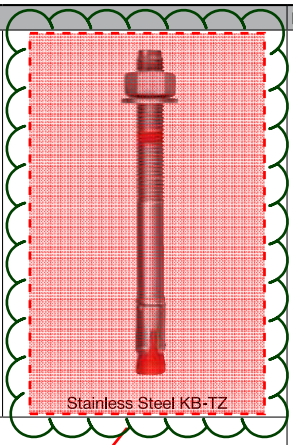
The data contained is this literature was current as of the date of publication. Updates and changes may be made based on later testing. If verification is needed that the data is still current, please contact Hilti Technical Support Specialists at 1-800-879-8000. All published load values contained in this literature represent the results of testing by Hilti or test organizations. Local base materials were used. Because of variations in materials, on-site testing is necessary to determine performance at any specific site. Laser beams represented by red lines in this publication. Printed in the United States.

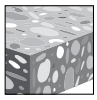
No Exception Taken

3.3.5 KWIK BOLT TZ EXPANSION ANCHOR

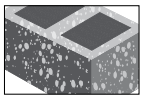
PRODUCT DESCRIPTION

KWIK Bolt TZ carbon steel and stainless steel anchors

Anchor System	Features and Benefits
 Carbon Steel KB-TZ  Stainless Steel KB-TZ  Hilti SIW-6AT-A22 impact wrench and the SI-AT-A22 Adaptive Torque Module	• Used with Hilti Dust Removal System (DRS) for dustless drilling and installation (compliant with Table 1 of OSHA 1926.1153 regulations for silica dust exposure). • Accurate SafeSet™ installation when using the Hilti SIW-6AT-A22 impact wrench and the SI-AT-A22 Adaptive Torque Module • Product and length identification marks facilitate quality control after installation. • Through fixture installation and variable thread lengths improve productivity and accommodate various base plate thicknesses. • Type 316 stainless steel wedges provide superior performance in cracked concrete. • Ridges on expansion wedges provide increased reliability. • Mechanical expansion allows immediate load application. • Raised impact section (dog point) prevents thread damage during installation. • Bolt meets ductility requirements of ACI 318-14 Section 2.3. • ACI 349-01 Nuclear Design Guide is available. Call Hilti Technical Support.


Uncracked concrete

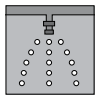

Cracked concrete


Grout-filled concrete masonry


Seismic Design Categories A-F

Hollow Drill Bit with Adaptive Torque Tool (AT)

Profis Anchor design software


Fire sprinkler listings

Approvals/Listings	
ICC-ES (International Code Council) - 2018 International Building Code / International Residential Code (IBC/IRC) - 2015 National Building Code of Canada (NBC-C)	ESR-1917 in concrete per ACI 318-14 Ch. 17 / ACI 355.2/ ICC-ES AC193 ESR-3785 in grout-filled CMU per ICC-ES AC01 ELC-1917 in concrete per CSA A23.3-14 / ACI 355.2
City of Los Angeles	2017 LABC Supplement (within ESR-1917) RR 26057 grout-filled CMU
Florida Building Code	2010 FBC with HVHZ
FM (Factory Mutual)	Pipe hanger components for automatic sprinkler systems 3/8 through 3/4
UL and cUL (Underwriters Laboratory)	Pipe hanger equipment for fire protection services for 3/8 through 3/4

MATERIAL SPECIFICATIONS

Carbon steel with electroplated zinc

Carbon steel KB-TZ anchors have the following minimum bolt fracture loads.[1]

Anchor diameter (in.)	Shear (lb)	Tension (lb)
3/8	NA	6,744
1/2	7,419	11,240
5/8	11,465	17,535
3/4	17,535	25,853

Carbon steel anchor components plated in accordance with ASTM B633 to a minimum thickness of 5 µm.

Nuts conform to the requirements of ASTM A563, Grade A, Hex.

Washers meet the requirements of ASTM F844.

Expansion sleeves (wedges) are manufactured from type 316 stainless steel

Stainless steel

Stainless steel KB-TZ anchors are made of type 304 or 316 material and have the following minimum bolt fracture loads.[1]

Anchor diameter (in.)	Shear (lb)	Tension (lb)
3/8	5,058	6,519
1/2	8,543	12,364
5/8	13,938	19,109
3/4	22,481	24,729

All nuts and washers for type 304 anchors are made from type 304 stainless.

All nuts and washers for type 316 anchors are made from type 316 stainless.

Nuts meet the dimensional requirements of ASTM F594.

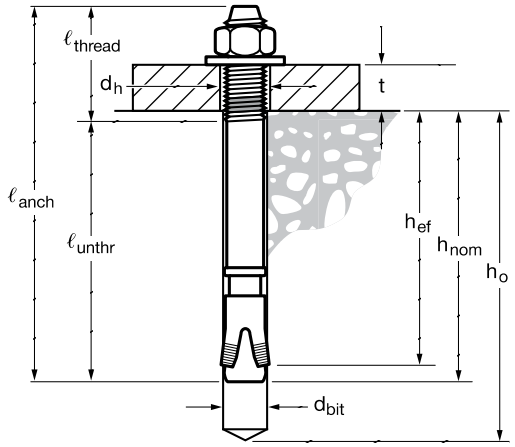
Washers meet the dimensional requirements of ANSI B18.22.1, Type A, plain.

Expansion sleeve (wedges) are made from type 316 stainless steel.

1 Bolt fracture loads are determined by testing in a universal tensile machine for quality control at the manufacturing facility. These loads are not intended for design purposes. See tables 4 and 16 for the steel design strengths of carbon steel and stainless steel, respectively.

INSTALLATION PARAMETERS

Figure 1 - Hilti KWIK Bolt TZ specifications



No Exception Taken

SUBMITTAL RECORD_____
JOB _____
LOCATION_____
SUBMITTED TO_____
SUBMITTAL PREPARED BY_____
APPROVED BY_____
DATE_____

Submittal Form
Hanging Strap

Coiled Galvanized Duro Strap

- Coiled Duro Strap is manufactured from 16, 18, 22, 24, 26, 28 and 30 gauge steel
- Coiled straps make it convenient to carry and easy to cut without wasting material

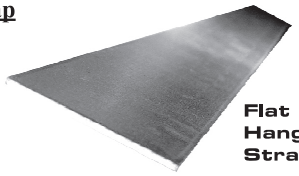
Item #	Code	Description	Length
13250	GS161-200	Galvanized Duro Strap-1in. - 16ga.	200ft.
13251	GS181-200	Galvanized Duro Strap-1in. - 18ga	200ft.
13252	GS221-200	Galvanized Duro Strap-1in. - 22ga.	200ft.
13253	GS241-200	Galvanized Duro Strap-1in. - 24ga.	200ft.
13254	GS261-200	Galvanized Duro Strap-1in. - 26ga.	200ft.
13285	GS221-100	Galvanized Duro Strap-1in. - 22ga.	100ft.
13291	GS241-100	Galvanized Duro Strap-1in. - 24ga.	100ft.
13292	GS261-100	Galvanized Duro Strap-1in. - 26ga.	100ft.
13281	GS281-100	Galvanized Duro Strap-1in. - 28ga.	100ft.
13166	GS301-100	Galvanized Duro Strap-1in. - 30ga.	100ft.
13286	GS2215-100	Galvanized Duro Strap-1-1/2in. - 22ga.	100ft.
13294	GS2415-100	Galvanized Duro Strap-1-1/2in. - 24ga.	100ft.
13295	GS2615-100	Galvanized Duro Strap-1-1/2in. - 26ga.	100ft.
13282	GS2815-100	Galvanized Duro Strap-1-1/2in. - 28ga.	100ft.
13167	GS3015-100	Galvanized Duro Strap-1-1/2in. - 30ga.	100ft.

Coiled Duro Strap

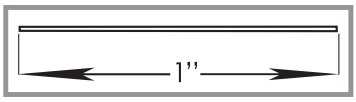
Flat Galvanized Hanging Strap

- Flat Hanging Strap is manufactured from 14, 16, 18, 20, 22, 24 and 26 gauge steel
- Flat Hanging Strap is sold in pre-cut lengths

Item #	Code	Description	Length
13269	HS1410	14ga. Galvanized Hanging Strap-1in.	10ft.
13270	HS1610	16ga. Galvanized Hanging Strap-1in.	10ft.
13271	HS1810	18ga. Galvanized Hanging Strap-1in.	10ft.
13274	HS2010	20ga. Galvanized Hanging Strap-1in.	10ft.
13272	HS2210	22ga. Galvanized Hanging Strap-1in.	10ft.
13273	HS2410	24ga. Galvanized Hanging Strap-1in.	10ft.
13057	HS1608	16ga. Galvanized Hanging Strap-1in.	8ft.
13187	HS1806	18ga. Galvanized Hanging Strap-1in.	6ft.
13280	HS2604	26ga. Galvanized Hanging Strap-1in.	4ft.



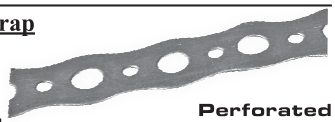
Flat Hanging Strap



Perforated Scalloped Galvanized Hanging Strap

- For both HVAC and Plumbing markets.
- Manufactured from 24 gauge steel.
- Perforated with alternating different hole sizes to accommodate sheet metal screws as well as nut and bolt combinations.
- The strap has an hourglass shape with no sharp edges for the contractor to get cut or snagged on.

Item #	Code	Description	Length
13249	PGS24	Perforated Galvanized Strap - 3/4 in. - 24ga.	100ft.



Perforated Scalloped Galvanized Strap

Perforated Galvanized Hanging Strap (Straight Edge)

- Manufactured from 26, 28 and 30 gauge steel.
- Perforated with a 3/16" size hole sizes - 3-7/8" spacing between holes.

Item #	Code	Description	Length
13339	PGS261	Perforated Galvanized Strap - 1in. - 26ga.	100ft.
13343	PGS281	Perforated Galvanized Strap - 1in. - 28ga.	100ft.
13168	PGS301-100	Perforated Galvanized Strap - 1in. - 30ga.	100ft.
13169	PGS3015-100	Perforated Galvanized Strap - 1-1/2in. - 30ga.	100ft.

Perforated Galvanized Strap (Straight Edge)

Duro Dyne East Division, Bay Shore, NY 631-249-9000 Fax: 631-249-8346
Duro Dyne Midwest Division, Hamilton, OH 513-870-6000 Fax: 513-870-6005
Duro Dyne West Division, Fontana, CA 562-926-1774 Fax: 562-926-5778
Duro Dyne Canada, Lachine, Quebec, Canada 514-422-9760 Fax: 514-636-0328
www.durodyne.com E-mail: durodyne@durodyne.com

No Exception Taken

Snap N Strut

SALES MANUAL

UL Listed

One-piece Hangers for Pipe, Cable, & Conduit

snapnstrut.com

Welcome!

Welcome to Snap N Strut pipe hanger fittings and accessories. We are the home of the fastest, most versatile, and thoroughly engineered one-piece hinged pipe hangers, cable hangers, and conduit hangers ever made. For engineers and contractors alike, Snap N Strut has it all!

Products are available in
Black, Gray, or White

STRUT-N-ROD + PIPE HANGER SUPPORT

This patented hanger can either be snapped into a strut, or threaded onto a rod, without the use of extra hardware or tools! The pipe is simply snapped into the hanger and locked in place using the snug-fit size-adjusting lock arm.

HANDY-SNAP PIPE HANGER SUPPORT

Used for supporting conduits on flat surfaces, such as beams, walls, machinery or the flat side of a strut. Like the Strut-N-Rod Hanger, Handy-Snap hangers accept several different pipe sizes. Offset design allows space for fittings and couplings.

PIPE HANGER SUPPORT MATERIAL

The Snap N Strut line of pipe hangers is produced from a high-performance, UV stabilized 6/6 nylon resin possessing exceptional long term stress resistance and chemical stability over a wide range of temperatures.

Design Features

NO NUTS REQUIRED

When used in a strut, Strut-N-Rod hangers are self-gripping. When used on a rod, the hanger itself is threaded onto the rod. When the pipe is inserted into the hanger, the hanger can no longer turn. Thus, even the need for a lock nut is eliminated.

GREATER LOADS & EXTREME TEMPERATURES

Produced from a specialty engineered, high strength, high temperature nylon resin, the Snap N Strut pipe hangers allow for larger factors of safety: at 250°F, working temperatures and for intermediate temperatures up to 480°F. For refrigeration, allowable working temperatures down to -70°F.

ADJUSTABILITY & FIT

The hinged, snap-on lock arm adjusts for pipe O.D. variations, affording each hanger the ability to accommodate several different pipe sizes. The pipe is nestled in a snug fit without any crimping of its wall.

CORROSION-PROOF & CHEMICAL-RESISTANT

With a totally non-metallic design, there is no need to isolate copper tubing. Eliminate the concern for galvanic corrosion. The Snap N Strut hangers will withstand most commonly encountered chemicals and refrigerants, including Freon and Ammonia.

VIBRATION ABSORBENT

The nature of the nylon material utilized, combined with the uniquely engineered design, absorbs vibration and acts as a cushion between the piping and its supporting structure.

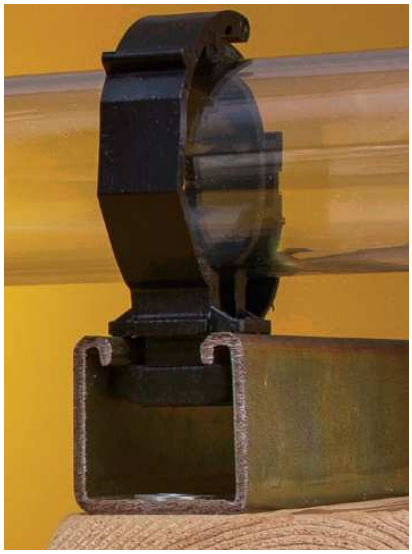
SELF-GRIPPING MECHANISM

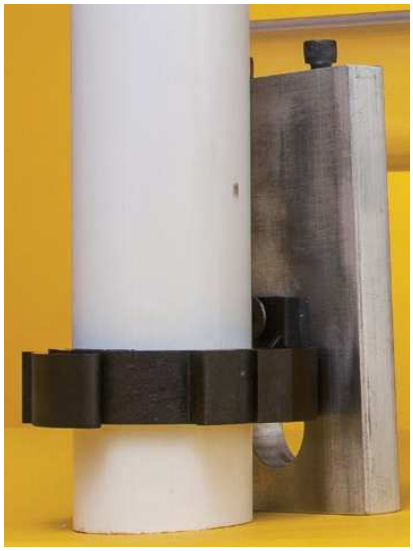
When used in a strut, the upper and lower engagement plates are designed to grip the strut and restrain lateral movement along its length.

VERSATILITY & ADAPTABILITY FOR SUPPORTS

Each Strut-N-Rod hanger is threaded to receive a rod and each can be snapped into a strut. Handy-Snap hangers possess two receptacles for screw mounting to a flat surface (i.e., walls, beams, flat side of strut or machinery) while automatically positioning pipe centerline to allow space for fittings. Each hanger accommodates several different sizes and all types of pipe, conduit and tubing. Versatile hangers for many different jobs means less inventory required.

Product Sizes





Snap N Strut Pipe Hanger Support (P, E & U sizes)

This patented hanger can either be snapped into a strut, or threaded onto a rod, without the use of extra hardware or tools! The pipe is simply snapped into the hanger and locked into place using the Snug-fit size-adjusting lock arm.

Installation is a "Snap"

1. Snap in a strut and twist ¼ turn
2. Snap the pipe into the hanger.
3. Snap the lock closed.

This product can be top mounted and snap-in, top or bottom mounted and screwed in, or threaded onto a rod.

P sizes have a 3/8" -16/tpi

E sizes have a ¼' -20/tpi

U sizes have no thread

Handy-Snap Pipe Hanger Support (HS sizes)

Used for supporting conduits on flat surfaces, such as beams, walls, machinery or the flat side of a strut. Like the Snap N Strut Hanger, Handy-Snap hangers accept several different pipe sizes. Offset design allows space for fittings and couplings.

Snap N Strut Specific Installations

DE-IONIZED WATER AND RESIDENTIAL WATER LINES

- Culligan Water Systems, copper tube, stainless steel tube

METRO TRANSIT SYSTEMS

- San Francisco Bay Area Rapid Transit (BART) Radix Cable
- Prudential Tunnel, Boston, MA
- Fiberglass Conduit approved for:
- Washington D.C. Transit System
- Baltimore Transit System

PNEUMATIC AIR LINES

- Henry Dorley Zoo
- Omaha Copper Tube
- Decoster Farms, Livestock Containment, Nebraska, Iowa, S. Dakota
- Hotels and Schools
- Amazon Warehouses

PHARMACEUTICAL CHEMICAL

- Pfizer / GlaxoSmithKline
- Stainless steel pipe
- DuPont Chemical, Wilmington, OE

MEDICAL GAS LINES

- Georgetown University Hospital, Washington, D.C.
- Children's Hospital, Philadelphia, PA
- University of Pennsylvania Hospital, Philadelphia, PA
- Hamilton Hospital, Hamilton, NJ
- Rehabilitation Center, Harvey, IL
- St. Francis Hospital, Indianapolis, IN

GOVERNMENT INSTALLATIONS

- Department of Agriculture & Veterinary Science Bldg., Beltsville, MD
- Kennedy Space Center, FL

Corrosion Resistance

SNAP N STRUT PRODUCTS MADE WITH NYLON 6/6 HAVE AN EXCELLENT RATING FOR RESISTANCE TO THE FOLLOWING CHEMICALS:

Acetic Acid (5%), Acetone, Ammonia, Ammonium Chloride (10%), Amyl Acetate, Barium Sulphide, (10%), Benzene, Boric Acid (10%), Butylene Glycol, Camphor, Carbon Disulphide, Carbon Tetrachloride, Cyclohexane, Cyclohexanol, Dimethyl Formamide, Diesel Oil, Dioctyl Phthalate, Dioxan, Edible Oils, Ethanol (90%), Ether, Ethyl Acetate, Ethylene Chloride, Freon (12%), Formaldehyde (30%), Gasoline, Gasohol W/10% Ethanol, Glycerine, Heptane, Hexane, Lactic Acid (10%), Linseed Oil, Magnesium Chloride (10%), Methanol, Methyl Acetate, Methyl Ethyl Ketone, Milk, Mineral Oil, Parafin, Pechlorethylene, Potassium Bromide (10%), Potassium Carbonate (60%), Potassium Hydroxide (50%), Potassium Hydroxide (10%), Potassium Nitrate (10%), Propanol, Salicyclic Acid, Silicone Oils, Sodium Bicarbonate Aq. (50%), Sodium Bisulphite, Sodium Carbonate (10%), Sodium Chloride (10%), Sodium Hydroxide (10% & 50%), Sodium Nitrate (10%), Sodium Phosphate (90%), Sodium Sulphate (90%), Sulphur, Tataric Acid (10%), Tetrachlorethylene, Toluene, Turpetine, Urea, Vaseline, Water, Wax Molten, Wine and Xylene

SNAP N STRUT PRODUCTS MADE WITH NYLON 6/6 HAVE A GOOD RATING FOR RESISTANCE OF THE FOLLOWING CHEMICALS:

Butyl Acetate, Calcium Chloride (10%), Clorox Bleach, Formaldehyde (40%), Fruit Juices, Hydrogen Sulfide, Isopropyl Alcohol, and Tar

"We believe this information is the best currently available on the subject. It is subject to revision as additional knowledge and experience are gained. Beloit Plastics makes no guarantee of results and assumes no obligation of liability whatsoever in connection with this information. Anyone intending to use recommendations contained in this publication should first satisfy himself that the recommendations are suitable for his use and meet all appropriate safety and health standards. This publication is not a license to operate under, or intended to suggest infringement of any existing patents"

UL2239 & UL94

ONLINE CERTIFICATIONS DIRECTORY

DWMU.E218244
Conduit and Cable Hardware

Page Bottom

Conduit and Cable Hardware

See General Information for Conduit and Cable Hardware

SNAP-N-STRUT LTD E218244
4115 HWY 51 N
JANESVILLE, WI 53545 USA

Hangers, Cat. Nos. 21-24, 25-29, 30-34, 35-38, 40-44, 48-54, 56-63, 66-76, 79-93, 101-115, may be followed by a P or E.

Last Updated on 2002-11-11

Questions? Print this page Terms of Use Page Top

Component - Plastics
File Number: E157012

RAVAGO MANUFACTURING AMERICAS L L C
405 PARKTOWER RD, MANCHESTER TN 37355-6483

c UL us

Hylon: 6609, 6609H, N1000TL, N1000THL, N1000THL, N1000TL-HF, N1000THL-HF
Polyamide 66 (PA66), pellets

Flammability	Value	Test Method
Flame Rating		
1.50 mm, NC	HB	UL 94
1.50 mm, NC	HB75	IEC 60695-11-10, -20
Thermal	**Value**	**Test Method**
RTI Elec (1.50 mm)	65.0 °C	UL 746
RTI Imp (1.50 mm)	65.0 °C	UL 746
RTI Str (1.50 mm)	65.0 °C	UL 746

Air Handling Spaces - UL2043

Underwriters Laboratories Inc.®

Research Triangle Park Division
12 Laboratory Drive
P.O. Box 13995
Research Triangle Park, NC 27709-3995 USA
www.ul.com
tel: 1 919 549 1400
fax: 1 919 547 6000
Customer service: 1 877 854 3577

4/5/2004

Ms. S Witkowski
Snap-N-Strut Ltd
4115 Hwy 51 N
Janesville WI 53545

Our Reference: File E218244
Your Reference: S WITKOWSKI
Subject: Preliminary Evaluation

Dear Ms. Witkowski:

We have completed our preliminary evaluation of your product and have the following comments.

For the record we are investigating the above subject product, using requirements from our standard for Hardware for the Support of Conduit, Tubing, and Cable, UL 2239. Please note that all paragraphs referenced below are from this Standard.

The constructions submitted are identical to the constructions currently covered in File E218244. This investigation is for the construction type 30-34 and smaller. These samples are being submitted to our Northbrook office for testing to the requirements for Smoke and Heat Release as described in Section 6.9.

MARKINGS

Provided that the tested constructions comply with the applicable requirements of the Standard, the following marking may be applied on the smallest unit carton or installation instructions:

"Suitable for use in Air Handling Spaces in accordance with Section 300.22 (C) and (D) of the National Electrical Code, and Rules 12-010 (3), (4), and (5), and 12-020 of the Canadian Electrical Code, Part 1" or an equivalent wording.

Please advise how you intend to provide these markings.

If you have any questions, please do not hesitate to contact us.

Sincerely,

Bryan L. Tatum
Senior Project Engineer
Department: 3015ERTP
Tel: 919-549-1939
Fax: 919-547-0637
E-mail: bryan.l.tatum@us.ul.com

Reviewed by:

Vincent L Quiett
Staff Engineer
Department: 3015ERTP
E-mail: vincent.l.quiett@us.ul.com

Vibration Testing

UNIVERSITY OF WISCONSIN - MADISON
Structures and Materials Testing Laboratory

2266 Engineering Hall, 1415 Johnson Drive, Madison, WI 53706-1691
Telephone: (608)-262-7711, Fax: (608)-262-5199, E-mail: cramer@engr.wisc.edu

September 6, 1995

Ms. Linette Scott
Snap-N-Strut
P.O. Box 8301
Janesville, WI 53547-8301

Dear Ms. Scott:

We have completed the testing you requested for the conduit hangars being considered for the San Francisco application. Herein is brief description of the test and attached is a certificate of test completion.

Three hangars were fastened in their normal mounting on a test fixture consisting of two aluminum plates (3/4 inch thick). The plates were fastened to form a right angle and were mounted to the table of the electrodynamic vibration exciter. An accelerometer was mounted on the test fixture to provide feedback for maintaining a constant acceleration level during the test. A second accelerometer was mounted on one specimen to monitor the acceleration level at the specimen. A thermocouple was mounted on one of the specimens at the mounting point to monitor temperature levels throughout the test.

To provide the necessary 63 lb force dynamic load to the specimens, a 6.625 lb mass was mounted in each conduit hangar specimen and an acceleration of 9.5 g's was applied to the specimens. The 6.625 lb mass was provided to simulate the conduit load.

A 70 Hz excitation frequency was ultimately chosen with the approval Mr. Jack Grice. This excitation frequency avoided exciting resonances that would occur at lower frequencies around 20 Hz. The testing proceeded through the requested 2,500,000 cycles and the test observations are summarized on the attached certificate. The response of the accelerometer attached to the hangar was monitored with an oscilloscope but a permanent record was not recorded.

Thank you for working with the University of Wisconsin-Madison. We are pleased to assist businesses in the State with their technical needs. If you have any question concerning this test program or the results please call John Dreger at 608-262-3993 or myself at 608-262-7711.

Sincerely,

Steven M. Cramer
Director and
Assoc Prof. of Civil Engrg.

John W. Dreger, Jr.
Test Engineer

MSS SP-58

GJ Grice Engineering
Product Design
Market Development

July 31, 2015

Malcolm Peacock
Snap-N-Strut Ltd.
2820 Prairie Ave.
Beloit, Wisconsin 53511

RE: MSS Standards Application

I have reviewed the Standard Practice of MSS SP-58 "Pipe hangers and Supports Material Design and Manufacture" as it may relate to the Snap-N-Strut line of non-metallic hangers as you requested.

As these standards were largely developed by representatives of pipe hanger manufacturers of metallic hangers, prior to the development of the non-metallic hanger by Snap-N-Strut, Ltd., naturally most of the language used is directed toward the use of various metal hangers. SP-58, however does allow for use of other materials via section 3.2 "Other material may be used provided they comply with the allowable stress requirement of Subsection 4.4 or 4.6." Tensile and Yield strength are considered equal with this material. The material consistency of the Snap-N-Strut hanger is a nylon 6/6 material with a tensile strength of 9800 psi. Per section 4.4a the allowable tensile stress would thus be 2400 psi (1/4 of minimum tensile strength at service temperature).

In accordance with Table 1 of SP-58 the minimum design load rating for rigid pipe hanger assemblies for pipe sizes 1", 1 ¼ ", 1 ½", and 2" pipe is 150 pounds. Using the worst-case scenario, the material cross section in tensile of the 1" Snap-N-Strut hanger carrying this load is 0.0742in. Thus, in the worst case, the tensile stress of the SNS Hanger with a 150-pound load would be 2021 psi, satisfying the requirement of section 4.4 (Max stress 1/5 of tensile strength versus ¼ allowable).

Importantly, the SNS hangers have been tested to and listed under UL Standard 2239 for use with "conduit tubing and cable." This standard appears to be the most relevant UL Standard which may apply to the SNS line of hangers as used for plumbing and other such conduits. The 6/6 nylon material of the SNS hangers has a UL 94 flammability rating.

In summary, it is my opinion that the SNS line of pipe hangers meets the requirements of SP-58 and further, the UL Listing to UL Standard 2239 is applicable to use with plumbing systems as well as to other types of conduit.

Sincerely,

G.J. Grice, P.E.

GJ Grice Engineering
P.O. Box 8128
Janesville, WI 53547
PH: 1-888-933-2248 FAX: 608-314-8712

Material Specification

ENTEC

Wednesday, September 16, 2015

Hylon® N1000H

Units English

Ravago Manufacturing Americas, LLC - *Polyamide 66*

Legend (Open)

General Information

Product Description	
Nylon 66	
General	
Material Status	• Commercial: Active
Availability	• North America
RoHS Compliance	• RoHS Compliant
UL File Number	• E157012

ASTM & ISO Properties [1]

Physical	**Nominal Value Unit**	**Test Method**
Density	1.14 g/cm³	ISO 1183
Molding Shrinkage - Flow (0.125 in)	1.4 to 1.8 %	ISO 294-4
Water Absorption (73°F, 24 hr)	1.3 %	ISO 62
Mechanical	**Nominal Value Unit**	**Test Method**
Tensile Stress (Break)	12000 psi	ISO 527-2
Tensile Strain (Break)	30 %	ISO 527-2
Flexural Modulus	439000 psi	ISO 178
Flexural Stress	16500 psi	ISO 178
Impact	**Nominal Value Unit**	**Test Method**
Notched Izod Impact Strength	1.9 ft·lb/in²	ISO 180
Thermal	**Nominal Value Unit**	**Test Method**
Heat Deflection Temperature (66 psi, Unannealed)	460 °F	ISO 75-2/B
Heat Deflection Temperature (264 psi, Unannealed)	190 °F	ISO 75-2/A
Flammability	**Nominal Value Unit**	**Test Method**
Flame Rating		UL 94
0.0591 in	V-2	
0.118 in	V-2	

Notes

[1] Typical properties: these are not to be construed as specifications.

Snap N Strut vs. Standard U-shaped Clamps

SNAP N STRUT VS STANDARD U-SHAPED CLAMPS

This is a testimonial of a customer in Nevada who has installed a hydronic heating system in a crawl space:

- ✔ "Using the nail pipe clamps, I got hit in the face by a flying nail, one in the eye. (Yes, I wear safety glasses). [I had] no issues of this type with [the Snap N Strut] product."
- ✔ "When re-work was necessary (removing the clamps) the nails were destroyed and not reusable. The Snap N Strut clamps were [reusable].
- ✔ "When utilizing metal struts for holding the Snap N Struts, I did not have to nail into the engineered floor joist, thus I did not have any issues with the integrity of the floor joists."
- ✔ "I found that the strength of the Snap N Strut far exceeded what was required."
- ✔ "The ability to move the Snap N Strut on the struts made the layout neat and simple."

The picture below is of the project that was recently completed using Snap N Strut products.

FTP SITE

The FTP site contains photographs, specifications, detail approvals, Solidworks ® 3D files, pdf drawings etc. You may sign up for access to the FTP site by sending an email to info@snapnstrut.com.

We at **BELOIT PLASTICS, LLC** are very proud of the fact that the Snap N Strut line of hangers are manufactured within the United States of America. Should you need additional documentation please feel free to contact us.

PLUMBING SELECTION CHART

Hanger No. (mm range)	Steel-Plastic Sch. 40 & 80	Copper Types K, L, M, DWV	Refrigeration Copper	Max Load
12-16	1/4″ .540	3/8″-1/2″ .500-.625	1/2″-5/8″ .500-.625	170
17-20	3/8″ .675	5/8″ .750	3/4″ .750	195
21-24	1/2″ .840	3/4″ .875	7/8″ .875	215
25-29	3/4″ 1.050	1″ 1.125	1-1/8″ 1.125	315
30-34	1″ 1.315			320
35-38		1-1/4″ 1.375	1-3/8″ 1.375	342
40-44	1-1/4″ 1.660	1-1/2″ 1.625	1-5/8″ 1.625	365
48-54	1-1/2″ 1.900	2″ 2.125	2-1/8″ 2.125	380
56-63	2″ 2.375			410
66-76	2-1/2″ 2.875	2-1/2″ 2.625	2-5/8″ 2.625	500
79-93	3″ 3.500	3″-3-1/2″ 3.125-3.625	3″-3-1/2″ 3.125-3.625	600
101-115	3-1/2″ to 4″ 4.000-4.500	4″ 4.125	4″ 4.125	950

NOTE: Fractional numbers reflect nominal pipe diameter, decimal numbers reflect actual O.D. in inches.

ELECTRICAL SELECTION CHART

Electric EMT	Electric Heavy Wall	Electric IMC
1/2″ .706		
3/4″ .922	1/2″ .840	1/2″ .815
	3/4″ 1.050	3/4″ 1.029
1″ 1.163	1″ 1.315	1″ 1.290
1-1/4″ 1.510		
1-1/2″ 1.740	1-1/4″ 1.660	1-1/4″ 1.638
	1-1/2″ 1.900	1-1/2″ 1.883
2″ 2.197	2″ 2.375	2″ 2.360
2-1/2″ 2.875	2-1/2″ 2.875	2-1/2″ 2.857
3″ 3.500	3″ 3.500	3″ 3.500
4″ 4.500	4″ 4.500	4″ 4.500

NOTE: Fractional numbers reflect nominal pipe diameter, decimal numbers reflect actual O.D. in inches.

Beloit Plastics, LLC
2820 Prairie Avenue
Beloit, Wisconsin USA

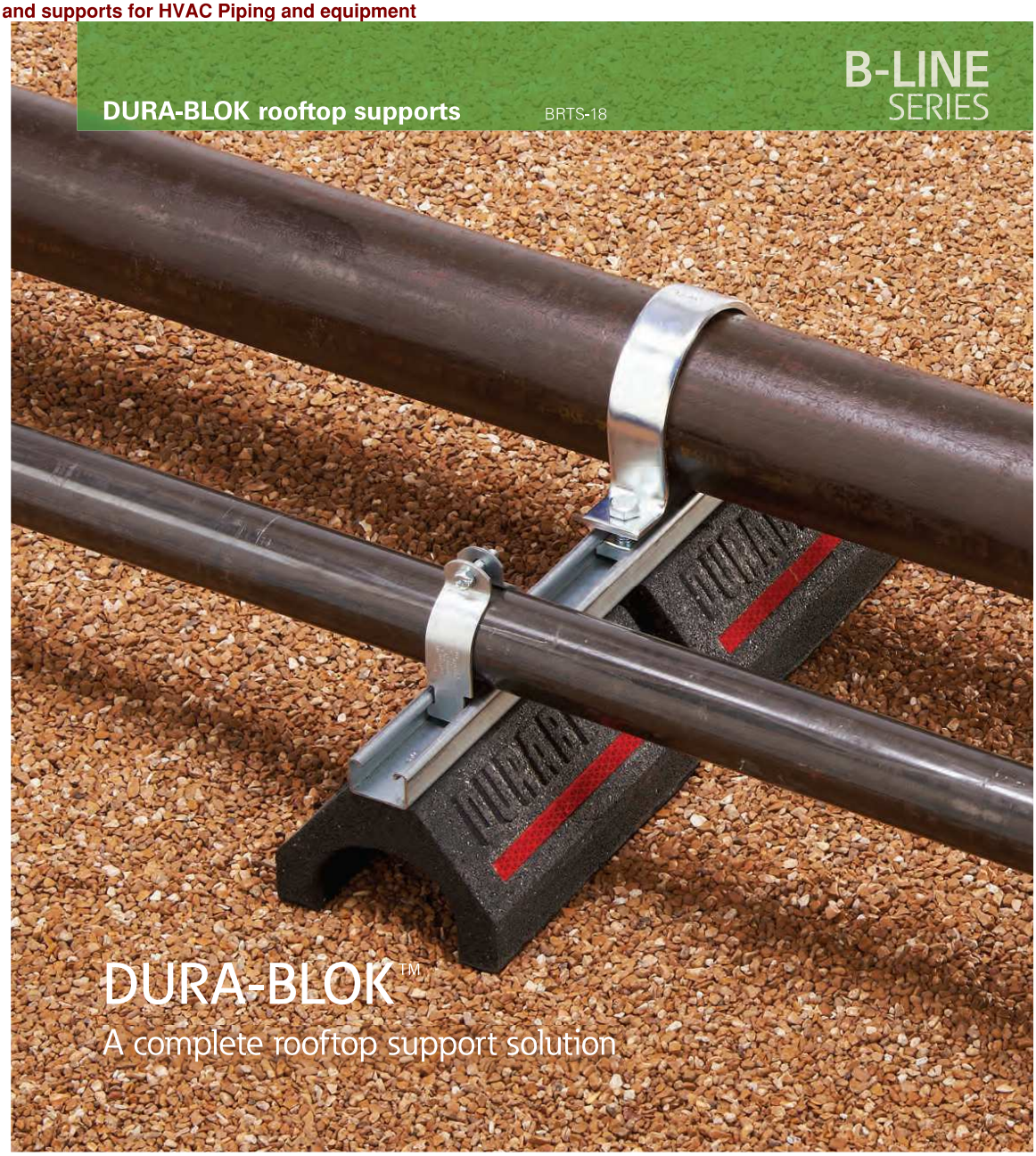
Toll Free: [800] 435-9148
Local: [608] 757-1464
FAX: [608] 757-1488

snapnstrut.com

LIABILITY

Beliot Plastics, LCC makes no representations or warranties, express or implied, of any kind or nature, including, but not limited to, any representation or warranties that Snap N Strut products are merchantable or fit for any particular purpose. Under no circumstances will Beliot Plastics, LCC be liable for, any incidental, indirect, special or consequential damage, loss, penalty or expense of any kind, including, but not limited to, any expense incurred for product removal or re-installation. Beliot Plastics, LCC will not be liable for any damage to or defect in any Snap N Strut product which has been subject to misuse, neglect, or accident or which has been stored, used or installed in violation of recommended installation or maintenance procedures. Patent No. 5133523 (Other patents pending)

No Exception Taken



EATON
Powering Business Worldwide

DURA-BLOK rooftop solutions support

DURA-BLOK™ supports are made of 100% recycled rubber and are designed to provide an economical way to support pipes, HVAC systems, rooftop walkway systems, ducting, conduit, cable tray, and more.

FEATURES & BENEFITS

- Made from 100% recycled rubber
- Qualifies for LEED credits
- Reflective strip on both sides allow for easy product visibility
- Channel is through bolted on all sizes for added strength
- 1" gap between blocks allows water to flow freely around longer assemblies
- No roof penetration required
- Product composition is not sharp or abrasive; helping to extend the roof life
- Resistant to freeze/thaw
- Dampens vibration
- No need for supplemental rubber pad
- Will not float or blow away
- UV resistant
- Suitable for any type roofing material or other flat surface
- For sloped roofs see adjustable hinge fitting (B634)
- Open ends allows for easier adjustments to DBE, DBR, and DBM series
- Drainage channel through center of block

Components & accessories

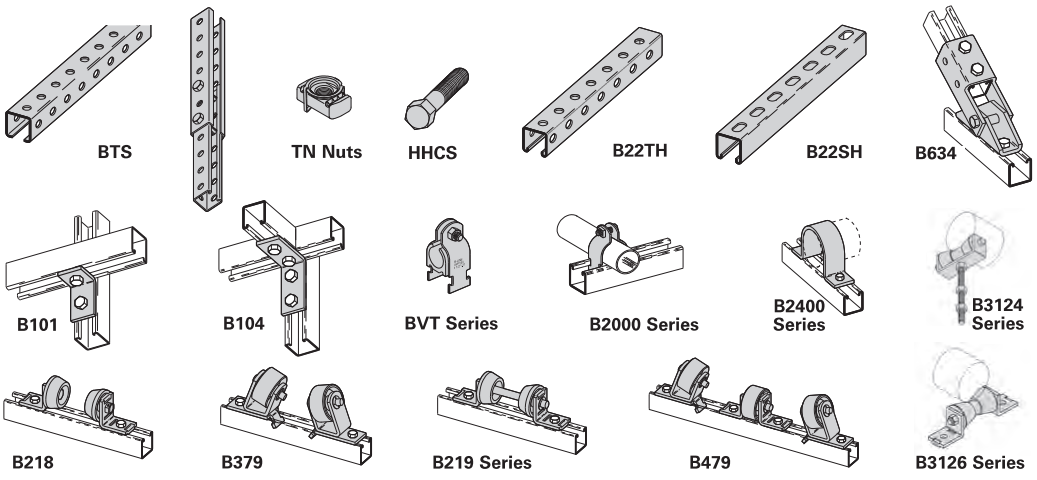
CLDP10 Load Distribution Plate
Material - steel
Increases ultimate uniform load capacity on DBE & DBR Series supports to 500 lbs. (2.22kN)

UPC/Part #	Cat. #	Thickness	Width	Length	Weight Each
782051 36110	**CLDP10**	11 Ga. (3.0mm)	1⅝" (41mm)	9.5" (241mm)	0.53 (0.24kg)

Loosen hex nuts and slide plate under the flat washers

Retighten the hex nuts with plate in place

Compatible components



See Eaton's B-Line series Strut Systems Catalog for more information.

Rooftop applications

DB10

DB Series

Base with Galv. Channel - 1" (25mm) high
Dimensions - 5" (127mm) High x 6" (152mm) Wide x Length (overall length)
Ultimate Load Capacity - (uniform load) *

DB5 = 200 lbs. (0.89kN)
DB10 = 500 lbs. (2.22kN)
DB20 = 1,000 lbs. (4.45kN)
DB30 = 1,500 lbs. (6,67kN)
DB40 = 2,000 lbs. (8.89kN)
DB48 = 2,500 lbs. (11.12kN)

UPC/Part #	Cat. #	Height	Width	Overall Length	Weight Each
782051 50035	**DB5**	5" (127mm)	6" (152mm)	4.8" (122mm)	2.75 (1.25kg)
782051 49972	**DB10**	5" (127mm)	6" (152mm)	9.6" (244mm)	5.28 (2.39kg)
782051 49974	**DB20**	5" (127mm)	6" (152mm)	20.2" (513mm)	10.63 (4.82kg)
782051 50021	**DB30**	5" (127mm)	6" (152mm)	30.8" (782mm)	15.99 (7.25kg)
782051 50022	**DB40**	5" (127mm)	6" (152mm)	41.4" (1052mm)	21.34 (9.68kg)
782051 50023	**DB48**	5" (127mm)	6" (152mm)	52.0" (1321mm)	26.70 (12.4kg)

DB630

DB6 Series

Base with 12 ga. (2.6mm) Galv. Channel - 2 7/16" (62mm) high
Dimensions - 6 7/16" (163mm) High x 6" (152mm) Wide x Length (overall length)
Ultimate Load Capacity - (uniform load) *

DB610 = 500 lbs. (2.22kN)
DB620 = 1,000 lbs. (4.45kN)
DB630 = 1,500 lbs. (6.67kN)
DB640 = 2,000 lbs. (8.89kN)
DB648 = 2,500 lbs. (11.12kN)

UPC/Part #	Cat. #	Height	Width	Overall Length	Weight Each
782051 50024	**DB610**	6 7/16" (163mm)	6" (152mm)	9.6" (244mm)	6.36 (2.88kg)
782051 50025	**DB620**	6 7/16" (163mm)	6" (152mm)	20.2" (513mm)	12.90 (5.85kg)
782051 50026	**DB630**	6 7/16" (163mm)	6" (152mm)	30.8" (782mm)	19.45 (8.82kg)
782051 50027	**DB640**	6 7/16" (163mm)	6" (152mm)	41.4" (1052mm)	26.00 (11.79kg)
782051 50028	**DB648**	6 7/16" (163mm)	6" (152mm)	52.0" (1321mm)	32.55 (14.76kg)

DB10-36

DB10 Series

Two (2) Bases with 12 ga. (2.6mm) Galv. Channel - 1 5/8" (41mm) high
Dimensions - 6 7/16" (143mm) High x 6" (152mm) Wide x Length (bridge length - see below)
Ultimate Load Capacity - 1,000 lbs. (4.45kN) (uniform load) *

UPC/Part #	Cat. #	Height	Individual Base Length	Bridge Length	Weight Each
782051 50029	**DB10-28**	5 5/8" (143mm)	9.6" (244mm)	28" (711mm)	2.75 (1.25kg)
782051 50031	**DB10-36**	5 5/8" (143mm)	9.6" (244mm)	36" (914mm)	5.28 (2.39kg)
782051 50032	**DB10-42**	5 5/8" (143mm)	9.6" (244mm)	42" (1067mm)	10.63 (4.82kg)
782051 50033	**DB10-50**	5 5/8" (143mm)	9.6" (244mm)	50" (1270mm)	15.99 (7.25kg)
782051 50034	**DB10-60**	5 5/8" (143mm)	9.6" (244mm)	60" (1524mm)	21.34 (9.68kg)

* **For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.**

Duct supports

DB2318DS

DB_DS Series

Two (2) Base Supports with Galv. Channel - 1" (25mm) high
Dimensions - Height (overall) x Width (overall) x Length (overall) See table
Riser Channels (SH Style) - 1⅝" (41mm) x 1⅝" (41mm) x 12 ga. (2.6mm)
Fittings & Hardware - Electro-Plated Steel
Ultimate Load Capacity - 1,000 lbs. (4.45kN) (uniform load)*

UPC/Part #	Cat. #	A (Minimum)	A (Maximum)	B	Weight Each
782051 50717	**DB2318DS**	10.56" (268mm)	20.75" (527mm)	13.50" (343mm)	33.31 (15.11kg)
782051 50718	**DB2918DS**	10.56" (268mm)	26.75" (679mm)	13.50" (343mm)	35.00 (15.88kg)
782051 50719	**DB4118DS**	10.56" (268mm)	38.75" (984mm)	13.50" (343mm)	38.40 (17.42kg)
782051 50720	**DB5318DS**	10.56" (268mm)	50.75" (1289mm)	13.50" (343mm)	41.80 (18.96kg)
782051 50721	**DB2324DS**	10.56" (268mm)	20.75" (527mm)	19.50" (495mm)	34.15 (15.49kg)
782051 50722	**DB2924DS**	10.56" (268mm)	26.75" (679mm)	19.50" (495mm)	35.84 (16.26kg)
782051 50723	**DB4124DS**	10.56" (268mm)	38.75" (984mm)	19.50" (495mm)	39.25 (17.80kg)
782051 50724	**DB5324DS**	10.56" (268mm)	50.75" (1289mm)	19.50" (495mm)	42.65 (19.34kg)
782051 50725	**DB2336DS**	10.56" (268mm)	20.75" (527mm)	31.50" (800mm)	35.84 (16.26kg)
782051 50726	**DB2936DS**	10.56" (268mm)	26.75" (679mm)	31.50" (800mm)	37.55 (17.03kg)
782051 50727	**DB4136DS**	10.56" (268mm)	38.75" (984mm)	31.50" (800mm)	40.95 (18.57kg)
782051 50728	**DB5336DS**	10.56" (268mm)	50.75" (1289mm)	31.50" (800mm)	44.34 (20.11kg)
782051 50729	**DB2348DS**	10.56" (268mm)	20.75" (527mm)	43.50" (1105mm)	37.55 (17.03kg)
782051 50730	**DB2948DS**	10.56" (268mm)	26.75" (679mm)	43.50" (1105mm)	39.25 (17.80kg)
782051 50731	**DB4148DS**	10.56" (268mm)	38.75" (984mm)	43.50" (1105mm)	42.65 (19.34kg)
782051 50732	**DB5348DS**	10.56" (268mm)	50.75" (1289mm)	43.50" (1105mm)	46.03 (20.88kg)

Cat. #	Height (overall)	Width (overall)	Length (Overall)
DB2318DS	23" (584mm)	25⅝" (651mm)	20.2" (513mm)
DB2918DS	29" (736mm)	25⅝" (651mm)	20.2" (513mm)
DB4118DS	41" (1041mm)	25⅝" (651mm)	20.2" (513mm)
DB5318DS	53" (1346mm)	25⅝" (651mm)	20.2" (513mm)
DB2324DS	23" (584mm)	31⅛" (803mm)	20.2" (513mm)
DB2924DS	29" (736mm)	31⅛" (803mm)	20.2" (513mm)
DB4124DS	41" (1041mm)	31⅛" (803mm)	20.2" (513mm)
DB5324DS	53" (1346mm)	31⅛" (803mm)	20.2" (513mm)
DB2336DS	23" (584mm)	43⅝" (1108mm)	20.2" (513mm)
DB2936DS	29" (736mm)	43⅝" (1108mm)	20.2" (513mm)
DB4136DS	41" (1041mm)	43⅝" (1108mm)	20.2" (513mm)
DB5336DS	53" (1346mm)	43⅝" (1108mm)	20.2" (513mm)
DB2348DS	23" (584mm)	55⅝" (1415mm)	20.2" (513mm)
DB2948DS	29" (736mm)	55⅝" (1415mm)	20.2" (513mm)
DB4148DS	41" (1041mm)	55⅝" (1415mm)	20.2" (513mm)
DB5348DS	53" (1346mm)	55⅝" (1415mm)	20.2" (513mm)

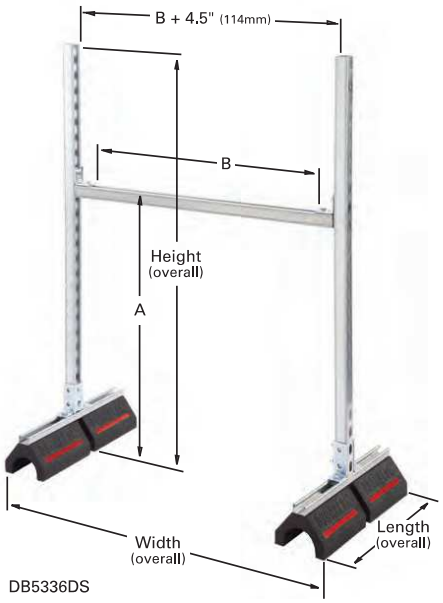
A = Adjustable height from bottom of DURA-BLOK™ to top of horizontal channel.

B = Space between fittings that support horizontal channel.

Height (overall) = Distance from bottom of DURA-BLOK to top of upright channel.

Width (overall) = Distance from outside-to-outside of DURA-BLOK supports.

Length (overall) = Distance from end-to-end of DURA-BLOK supports.



DB5336DS

Product is shipped unassembled.

* **For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.**

Pipe supports

DBR4-6

DBR Series Fixed Height

Base with Galv. Channel - 1" (25mm) high and Pipe Roller Assembly
Dimensions - Height to Bottom of Pipe x 6" (152mm) Wide x Long (length) - See Below
Pipe Roller Material - Cast Iron - Electro-Plated
Brackets, Axle & Hardware - Electro-Plated Steel
Ultimate Load Capacity - (uniform load) *

DBR2-31/2 = 500 lbs. (2.22kN)
DBR4-6 = 500 lbs. (2.22kN)
DBR8-10 = 1000 lbs. (4.44kN)
DBR12-14 = 1000 lbs. (4.44kN)
DBR16-20 = 1000 lbs. (4.44kN)

UPC/Part #	Cat. #	Roller Part No.†	Height**	Width	Length	Weight Each
782051 50745	**DBR2-3½**	B3126-2 to 3½	7.09" (180mm)	6" (152mm)	9.6" (244mm)	5.28 (2.39kg)
782051 50746	**DBR4-6**	B3126-4 to 6	7.09" (180mm)	6" (152mm)	9.6" (244mm)	10.63 (4.82kg)
782051 50747	**DBR8-10**	B3126-8 to 10	8.34" (212mm)	6" (152mm)	20.2" (513mm)	15.99 (7.25kg)
782051 50748	**DBR12-14**	B3126-12 to 14	8.34" (212mm)	6" (152mm)	20.2" (513mm)	21.34 (9.68kg)
782051 50749	**DBR16-20**	B3126-16 to 20	8.34" (212mm)	6" (152mm)	20.2" (513mm)	26.70 (12.11kg)

DBR10-12

DBR Series Adjustable Height

Base with two (2) ½"-13" Electro Zinc All Threaded
Rod Risers and a B3114-3½" Pipe Roll with Sockets
Dimensions - Overall Height as Specified Base - 4" High (101mm) x 6" (152mm) Wide x 9.6" (244mm) Length (base length)
Ultimate Load Capacity - 200 lbs. (0.89kN) *
To increase load capacity use CLDP10 load distribution plate.

UPC/Part #	Cat. #	Adjustable Height	Width	Length	Weight Each
782051 50750	**DBR10-12**	up to 12" (305mm)	6" (152mm)	9.6" (244mm)	6.46 (2.93kg)

DBE10-12

DBE Series Elevated

Base with two (2) ½"-13 Electro Zinc All Threaded Rod
Risers and Galv. Slotted Channel - 1" (25mm) high
Dimensions - Overall Height as Specified Base - 4" High (101mm) x 6" (152mm) Wide x 9.6" (244mm) Length (base length)
Ultimate Load Capacity - 200 lbs. (0.89kN) *
To increase load capacity use CLDP10 load distribution plate.

For pipe straps/clamps, rollers and roller supports that can be used with these DURA-BLOK supports, see other components on page 2.

UPC/Part #	Cat. #	Adjustable Height	Width	Channel Length	Weight Each
782051 50036	**DBE10-8**	5½" - 8" (140 - 203mm)	6" (152mm)	9.35" (161mm)	5.68 (2.58kg)
782051 50037	**DBE10-12**	5½" - 12" (140 - 305mm)	6" (152mm)	9.35" (161mm)	5.72 (2.59kg)
782051 50038	**DBE10-16**	5½" - 16" (140 - 406mm)	6" (152mm)	9.35" (161mm)	5.76 (2.61kg)

Longer base lengths available.

Note: At heights above 12" (305mm), we suggest using the DB_DS Series Channel Support with Risers for additional stability to piping system.

† *See Eaton B-Line series Pipe Hanger Catalog for dimensions and specifications.*

** *From bottom of DURA-BLOK™ to bottom of pipe/tubing.*

* **For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.**

Rooftop pipe supports

DBM Series

Base with one (1) ⅜"-16 Electro Zinc All Threaded Rod and Hinged Pipe Clamp

Dimensions - Height to Pipe Center x 6" (152mm) Wide x 4.8" (122mm) Long (overall length)
Pipe Clamp Material - Malleable Iron
Threaded Rod / Hardware - Electro-Plated Steel
Ultimate Load Capacity - 50 lbs. (022kN) (uniform load) *

DBM-2CT

Copper Tubing Supports

UPC/Part #	Cat. #	Clamp Part No.†	Height (Min.)**	Height (Max)**	Width	Length	Weight Each
782051 50733	**DBM-½CT**	B3198HCT-½	9.69" (246mm)	11.19" (284mm)	6" (152mm)	4.80" (122mm)	2.75 (1.25kg)
782051 50734	**DBM-¾CT**	B3198HCT-¾	9.84" (250mm)	11.34" (288mm)	6" (152mm)	4.80" (122mm)	2.76 (1.25kg)
782051 50735	**DBM-1CT**	B3198HCT-1	9.95" (253mm)	11.45" (291mm)	6" (152mm)	4.80" (122mm)	2.84 (1.29kg)
782051 50736	**DBM-1¼CT**	B3198HCT-1¼	10.13" (257mm)	11.63" (295mm)	6" (152mm)	4.80" (122mm)	2.95 (1.34kg)
782051 50737	**DBM-1½CT**	B3198HCT-1½	10.28" (261mm)	11.78" (299mm)	6" (152mm)	4.80" (122mm)	2.96 (1.34kg)
782051 50738	**DBM-2CT**	B3198HCT-2	10.53" (267mm)	12.03" (305mm)	6" (152mm)	4.80" (122mm)	3.03 (1.37kg)

DBM-1

Steel Pipe Supports

UPC/Part #	Cat. #	Clamp Part No.†	Height (Min.)**	Height (Max)**	Width	Length	Weight Each
782051 50739	**DBM-½**	B3198H-½	9.86" (250mm)	11.36" (288mm)	6" (152mm)	4.80" (122mm)	2.78 (1.26kg)
782051 50740	**DBM-¾**	B3198H-¾	10.06" (255mm)	11.56" (293mm)	6" (152mm)	4.80" (122mm)	2.84 (1.29kg)
782051 50741	**DBM-1**	B3198H-1	10.14" (257mm)	11.64" (296mm)	6" (152mm)	4.80" (122mm)	2.86 (1.30kg)
782051 50742	**DBM-1¼**	B3198H-1¼	10.25" (260mm)	11.75" (298mm)	6" (152mm)	4.80" (122mm)	2.93 (1.33kg)
782051 50743	**DBM-1½**	B3198H-1½	10.42" (265mm)	11.92" (303mm)	6" (152mm)	4.80" (122mm)	2.99 (1.36kg)
782051 50744	**DBM-2**	B3198H-2	10.66" (271mm)	12.16" (309mm)	6" (152mm)	4.80" (122mm)	3.10 (1.41kg)

Base only

DURA-BLOK™ channel support is designed as an economical support for piping systems, cable tray, HVAC equipment and many other applications.

Dimensions - 4" (101mm) High x 6" (152mm) Wide x 9.6" (244mm) Long (base length)
Ultimate Load Capacity - (uniform load) *
DBP - 500 lbs. (2.22kN) DBM - 200 lbs. (0.89kN)

DBP

DBM

UPC/Part #	Cat. #	Height	Width	Length	Weight Each
782051 49691	**DBP**	4" (101mm)	6" (152mm)	9.6" (244mm)	4.48 (2.03kg)
782051 50005	**DBM**	4" (101mm)	6" (152mm)	4.8" (122mm)	2.35 (1.07kg)

† See Eaton B-Line series Pipe Hanger Catalog for dimensions and specifications.

*** From bottom of DURA-BLOK™ to bottom of pipe/tubing.*

*** For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.**

Specifications

PART 1 GENERAL

1.01 SECTION INCLUDES
A. The work covered by this specification consists of furnishing all labor, equipment, materials and accessories, and performing all operations required for the correct installation of recycled rubber pipe [conduit] supports for mechanical piping [electrical conduit] systems.

1.02 REFERENCES
A. ASTM A653 G90 SS Gr. 33 - Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot Dipped Process
B. ASTM B633 - Specification for Electrodeposited Coatings of Zinc on Iron and Steel
C. ASTM C531 – Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical Resistant Mortars, Grouts, Monolithic Surfaces, and Polymer Concretes
D. ASTM C642 – Test Method for Specific Gravity, Absorption, and Voids in Hardened Concrete
E. ASTM C672 – Test Methods for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals
F. ASTM D412 – Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension
G. ASTM D395 – Standard Test Methods for Rubber Property – Compression Set
H. ASTM D573 – Test Method for Rubber – Deterioration in an Air Oven
I. ASTM D746 – Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
J. ASTM D2240 – Test Method for Rubber Property – Durometer Hardness
K. NFPA 70 – National Electrical Code

1.03 QUALITY ASSURANCE
A. Rubber / steel pipe supports shall be manufactured under a strict quality control program assuring quality product delivered to the jobsite. Pipe supports that are damaged shall not be installed.
B. Workmanship: All pipe [conduit] supports to be installed by a qualified piping [electrical] contractor and installed in accordance with manufacturer's recommendations.
   1. All work shall comply with all applicable federal, state, and local codes and laws having jurisdiction.
   2. All work shall conform to accepted industry and trade standards for pipe support [conduit] installations.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS
A. Manufacturer: Subject to compliance with these specifications, pipe support systems shall be DURA-BLOK™ design as supplied by Eaton [or engineer approved equal].

2.02 MATERIALS
A. Curb base must be made of 100% recycled rubber and polyurethane prepolymer with a uniform load capacity of 500 pounds per linear foot of support.* In addition, each base to have a reflective red stripe. (*See 3.01(C))
B. Dimensions: 6-inches wide by [4] [5.0] [6.75] inches tall by [9.6] [20.2] [30.8] [41.4] [52.0] inches long.
C. Steel frame: Steel, strut galvanized per ASTM A653 or strut galvanized per ASTM A653 for bridge series.
D. Attaching hardware: Zinc-plated threaded rod, nuts and attaching hardware per ASTM B633.
E. Any products claiming to be a similar, like, or equal must demonstrate (meet or exceed) the same physical and performance characteristics as specified below:
   1. Density: 0.52 oz/cu in ASTM D575
   2. Durometer Hardness: 67.2A ± 1 ASTM D575
   3. Tensile Strength: 231 psi minimum ASTM D575
   4. Compression Deformation: 5% at 70psi and 72°F ASTM D575
   5. Brittleness at Low Temp: -50°F ASTM D746
   6. Weathering: 70 hours at 120°F ASTM D573
      a. Hardness retained: 100% (±5%)
      b. Compressive strength: 100% (±5%)
      c. Tensile strength: 100% (±5%)
      d. Elongation retained: 100% (±5%)

2.03 TYPE OF ROOFTOP SUPPORTS
A. Rubber block supports – DURA-BLOK™ model # [DBP] [DMB] base dimensions: 6-inch wide by 4-inch tall by [9.6] [4.8]-inch length. Accessories are fastened directly into rubber material with weather resistant type 12 lag screws.
B. Continuous block channel supports – DURA-BLOK DB Series or DB6 Series: Dimensions 6-inch wide bt [5.0] [6.5]-inch tall bt [9.6] [20.2] [30.8] [41.4] [52.0]-inch length. Assembly has 1" gaps between blocks for free flow of water. Standard strut accessories can be used for attachment.
C. Bridge channel supports – DURA-BLOK DB10 Series; Dimensions 6-inch wide by 5⅝ -inch tall by [28.0] [36.0] [42.0] [50.0] [60.0]-inch length. Standard strut accessories can be used for attachment.
D. Extendible height support – DURA-BLOK model DBE 10-[8][12][16], height to suit application: 8-inch, 12-inch or 16-inch (200 pound maximum load). Base to be 9.6 inches in length or otherwise specified sizes available. Heavier loads, may require CLDP load distribution plate.
E. Roller supports– DURA-BLOK DBR10 Series & DBR Series: DBR10 Series is sized for pipe up to 3½ inches, with vertical adjustment up to 12 inches. DBR Series is sized for [2-3½] [4-6] [8-10] [12-14] [16-20]-inch pipe sizes.
F. Elevated single pipe supports– DURA-BLOK DBM Series: [Copper] or [Steel] pipe sizes [½] [¾] [1] [1¼] [1½] [2]-inch.

PART 3 EXECUTION

3.01 INSTALLATION
A. Install in accordance with manufacturer's instructions and recommendations.
B. If gravel top roof, gravel must be removed around and under pipe support.
C. Always consult roofing manufacturer for roof membrane compression capacities. If necessary, a compatible sheet of roofing material (rubber pad) may be installed under rooftop support to disperse concentrated loads and add further membrane protection.
D. Gas pipe spacing subject to local gas authorities.
E. Use properly sized clamps to suit pipe [conduit] sizes.

For more information, visit
cooperbline.com/dura-blok

Eaton
1000 Eaton Boulevard
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United States
Eaton.com

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B-Line Division
509 West Monroe Street
Highland, IL 62249
Eaton.com
Phone: 800-851-7415

www.cooperbline.com/contactus

Follow us on social media to get the latest product and support information.

No Exception Taken

Heavy Duty Wall Bracket

Technical data
Heavy duty brackets made of galvanized and painted sheet metal.
Supplied with screws only.

Tested and approved by TÜV Rheinland
Capacity: 200 Kg/440 Lbs

Code	9794-130
Model	BS520
Dimension (mm.) (AxB)	520x400
Dimension (inch.) (AxB)	20-1/2"x15-3/4"
Qty/pallet (pcs)	100

TÜV APPROVED

Vibration Dampers for Wall Brackets

Technical data
Made of vulcanized natural rubber with threaded metal inserts they feature excellent vibration dampening properties. Delivered in plastic bags of 4 pieces each. Nuts and washers included.

Code	9898-028	9898-027
Model	BVD30	BVD40
Dimension (mm.)	30x20	40x40
Dimension (inch.)	1-3/16"x3/4"	1-9/16"x1-9/16"
Qty/ctn (pack)	25	25

Raw Materials > Rubber > Rubber Grommets

Grommet, Buna-N, MS 35489-72, Pk 50

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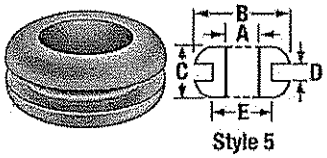
Share This Product

Rubber Grommet, Oil Resistant, Military Specification, Buna-N/Nitrile Rubber, Inside Dia. (A) 1/2 In, Outside Dia. (B) 1 1/16 In, Overall Thickness (C) 7/16 In, Panel Thickness (D) 3/16 In, Panel Hole Dia. (E) 13/16 In, MS 35489 Number 72, AN 931 Number B8-13, Black, Min. Temp. Rating -35 Deg. F, Max. Temp. 225 F, Durometer 50A +/- 5, Elongation 300%, Tensile Strength 870 PSI, Standards ASTM D2000 2BG506, Package Quantity 50

Customers Also Viewed

Grainger Item #	3MRK8
Package Qty.	50
Brand	GRAINGER APPROVED VENDOR
Mfr. Model #	3MRK8
UNSPSC #	31162401
Ship Qty.	1
Sell Qty. (Will-Call)	1
Ship Weight (lbs.)	0.46
Availability	**Typically in Stock**
Catalog Page No.	3448
Country of Origin (Country of Origin is subject to change.)	China



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Tech Specs | Additional Information | Compliance & Restrictions | MSDS | Required Accessories | Optional Accessories | Alternate Products | Repair Parts

Item	Rubber Grommet
Application	Oil Resistant
Type	Military Specification
Material	Buna-N/Nitrile Rubber
Inside Dia. (A)	1/2"
Outside Dia. (B)	1-1/16"
Overall Thickness (C)	7/16"
Panel Thickness (D)	3/16"
Panel Hole Dia. (E)	13/16"
MS 35489 Number	72
AN 931 Number	B8-13
Color	Black
Min. Temp. Rating (Deg. F)	-35
Max. Temp. (F)	225
Durometer	50A +/- 5
Elongation	300%
Tensile Strength (PSI)	870
Standards	ASTM D2000 2BG506
Package Quantity	50

Description	Grommet, Buna-N, MS 35489-72, Pk 50
Brand	GRAINGER APPROVED VENDOR
Mfr. Model #	3MRK8
Availability	Typically in Stock
Catalog 404 Page	3448
Item	Rubber Grommet
Application	Oil Resistant
Type	Military Specification
Material	Buna-N/Nitrile Rubber
Inside Dia. (A)	1/2"
Outside Dia. (B)	1-1/16"
Overall Thickness (C)	7/16"
Panel Thickness (D)	3/16"
Panel Hole Dia. (E)	13/16"
MS 35489 Number	72
AN 931 Number	B8-13
Color	Black
Min. Temp. Rating (Deg. F)	-35
Max. Temp. (F)	225
Durometer	50A +/- 5
Elongation	300%
Tensile Strength (PSI)	870
Standards	ASTM D2000 2BG506

No Exception Taken

Air Handling Systems

Microlite® XG™

Formaldehyde-free™ Fiber Glass Duct Wrap Insulation

Description

Microlite XG Formaldehyde-free™ duct wrap insulation is a white, lightweight, highly resilient, blanket-type thermal insulation. The insulation blanket is manufactured from rotary-process fiber glass bonded with a special thermosetting acrylic resin.

Available Forms

Microlite XG Formaldehyde-free™ insulation is available in a variety of densities, thicknesses and roll lengths. It is supplied with an FSK (foil-scrim-kraft) vapor barrier facing to meet installed performance requirements, with a 2" (51 mm) stapling tab.

Uses

Microlite XG is recommended as thermal insulation for the exterior of HVAC systems or other spaces or surfaces where temperature control is required.

Facing Information

FSK Aluminum Foil
Reinforced with fiber glass scrim laminated to UL rated kraft.
Permeance: 0.02 perms*

**Per ASTM E96, Procedure A for facing material prior to lamination. After lamination, permeance values may be higher.*

General Properties

Temperature (max.) – ASTM C411	250°F (121°C)
Water vapor sorption – ASTM C1104	<5% by weight
Corrosivity with steel – ASTM C665	Does not accelerate
Fungi resistance – ASTM C1338	Does not breed or promote

Standard Thicknesses and Packaging

	100' Roll (31 m)	75' Roll (23 m)	50' Roll (15 m)
Type	Thickness, in (mm)		
75	1½ (38)	2, 2½ (51, 58)	3 (76)
100	1½ (38)	2 (51)	–
150	–	1½ (38)	2 (51)

Note: Additional thicknesses, widths and other lengths available on special order. Contact Regional Sales Office for availability.

Surface Burning Characteristics

Microlite XG meets the Surface Burning Characteristics and Limited Combustibility of the following standards:

Standard/Test Method
- ASTM E84
- UL 723
- NFPA 90A and 90B
- UL Guide No. 40 U8.3. Card R3711
- CAN/ULC S102-1188

Maximum Flame Spread Index	25
Maximum Smoke Developed Index	50

Notes: Faced materials are tested as composite products (insulation, adhesive and facing). UL labels supplied on packages when requested on order.

Specification Compliance

ASTM C1290	Type 75, 100 & 150
ASTM C553*	
Type II	Type 75, 100 & 150
Type III	Type 150

**For faced material: 250°F (121°C) maximum temperature.*

ASTM C1136s†	
Type II	FSK Facing

†Replaces HH-B-100B, Type II.

Canada: CGSB 51-GP-11M
NYC MEA 40-75-M

Green Building Certifications

Recycled Content	SCS Certified
ES 1350	Meets Requirements
ENERGY STAR®	Yes
LEED® Credits LEED®-NC	See JM.com/buildgreen, JM LEED® Credit Guide (HIG-1231)

SCS CERTIFIED INDOOR ADVANTAGE GOLD
PLUS FORMALDEHYDE FREE
SCIENTIFIC CERTIFICATION SYSTEMS SCS-IAQ-02088

SCS CERTIFIED Minimum 25% Recycled Content
5% Pre-consumer
20% Post-consumer
SCIENTIFIC CERTIFICATION SYSTEMS SCSEMC-01073

JM Certified Formaldehyde-free™ Fiber Glass Insulation

JM certified Formaldehyde-free™ fiber glass insulation offers superior thermal and acoustical performance—and it improves indoor air quality because it's made without formaldehyde. Why is that important? Because the U.S. Environmental Protection Agency (U.S. EPA) recommends limiting exposure to formaldehyde as much as possible, and the California Air Resources Board, a division of the California EPA, recommends that builders and architects use building materials and insulation made without formaldehyde.

Microlite® XG™

Formaldehyde-free™ Fiber Glass Duct Wrap Insulation

Application Recommendations

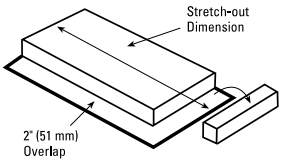
The R-value will vary depending upon how much the insulation is compressed during installation. To obtain the published installed R-values, the insulation stretch-out should be determined using the following table:

Duct Wrap Stretch-outs

Labeled Thick. (in)	Installed Compressed Thickness (in)	Round	Square	Rectangular
1	0.75	P+ 7.0"	P+ 6.0"	P+ 5.0"
1½	1.125	P+ 9.5"	P+ 8.0"	P+ 7.0"
2	1.50	P+ 12.0"	P+ 10.0"	P+ 8.0"
2⅓	1.75	P+ 13.0"	P+ 11.0"	P+ 8.5"
3	2.25	P+ 17.0"	P+ 14.5"	P+11.5"

Stretch-outs include 2" (51 mm) for overlap. P = perimeter of duct to be insulated.

Prepare overlap by removing approximately 2" (51 mm) of insulation from facing.



Before applying duct wrap, sheet metal duct shall be clean, dry and tightly sealed at all joints and seams.

Wrap insulation around duct with facing to the outside so the 2" (51 mm) flap completely overlaps facing and insulation at the other end of stretch-out. Insulation shall be snugly butted.

Secure seams with outward clinching staples placed approximately 6" (152 mm) on center. If required, seal seam with pressure-sensitive tape designed for use with duct insulation. Insulation on the underside of ducts spanning 24" (610 mm) or greater shall be secured with mechanical fasteners and speed clips spaced approximately 18" (457 mm) on center. Fasteners should be cut off flush after the speed clips are installed, and when required, sealed with the same tape as specified above.

Adjacent sections of duct wrap insulation shall be snugly butted with the circumferential 2" (51 mm) tape flap overlapping and secured as recommended for the longitudinal seam. When a vapor seal is required, two coats of vapor retarder mastic reinforced with one layer of 4" (102 mm) wide, open-weave glass fabric may be used in lieu of pressure-sensitive tape.

Guide Specifications

Insulation for Metal Ducts. All ducts shall be insulated on the outside with a Formaldehyde-free™, flexible glass fiber blanket. Microlite XG Formaldehyde-free™ fiber glass duct wrap insulation should have a minimum installed R-value* of _____, and a Type_____ facing. Insulation shall be furnished with a factory-applied facing with a composite UL FHC rating of 25/50.

**The minimum insulation installed R-value should be determined in accordance to the duct operating and ambient conditions.*

Thermal Conductivity (ASTM C518)

Type	k* Compressed Thickness Btu•in/(hr•ft²•°F)	k* Compressed Thickness W/m•°C	k Labeled Thickness Btu•in/(hr•ft²•°F)	k Labeled Thickness W/m•°C
75	0.27	0.039	0.29	0.042
100	0.25	0.036	0.27	0.039
150	0.24	0.035	0.25	0.036

Conductivity at 75°F (24°C) mean temperature.
**Tested with material thickness compressed 25%.*

Installed R-values

Type	Labeled Thickness in	Labeled Thickness mm	Installed "R"[1] (hr•ft²•°F)/Btu	Installed "R"[1] m²•°C/W	Out-of-Package "R" (hr•ft²•°F)/Btu	Out-of-Package "R" m²•°C/W
75	1½	38	4.2	0.74	5.2	0.92
	2	51	5.6	0.99	6.9	1.22
	2⅓	58	6.5	1.15	8.0	1.41
	3	76	8.3	1.46	10.3	1.81
100	1½	38	4.5	0.79	5.6	0.99
	2	51	6.0	1.06	7.4	1.30
150	1½	38	4.7	0.83	6.0	1.06
	2	51	6.3	1.11	8.0	1.41

[1]Installed R-value calculated with a material thickness compressed to a maximum of 25% following recommended duct wrap stretch-outs.

Johns Manville

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Denver, CO 80202
(800) 654-3103
specJM.com

AHS-331 06/10 (Replaces 02/10)

JMCOM100250

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(800) 368-4431
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The physical and chemical properties of the Microlite® XG™ listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Numerical flame spread and smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the Regional Sales Office nearest you to ensure current information. **All Johns Manville products are sold subject to Johns Manville's standard Terms and Conditions, including Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville standard Terms and Conditions, Limited Warranty and Limitation of Remedy, and information on other Johns Manville thermal insulation and systems, call (800) 654-3103.**

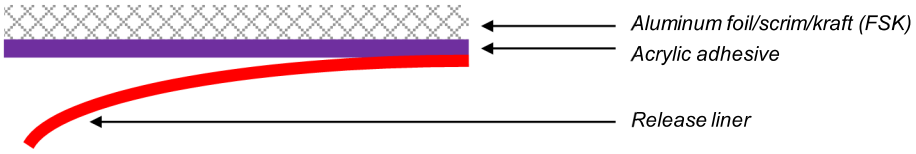
Printed on recycled paper.

1525CW

FSK INSULATION TAPE

VentureTape® 1525CW COLD WEATHER FSK is a foil/scrim/kraft (FSK) lamination coated with Venture's cold weather solvent acrylic pressure sensitive adhesive. This versatile FSK tape applies easily to both fibrous and sheet metal ducts and easily conforms to irregular surfaces. Venture Tape 1525CW excels in demanding temperature and humidity applications and provides superior performance and durability over a wide range of environmental conditions.

Product Construction



Features & Benefits

- *UL723 Listed (5/10 Flame/Smoke Rating)*
  UL file # R10984
- *Tri-directionally reinforced 2 x 3 squares per inch fiberglass scrim, UL listed FSK lamination*
- *High performance insulation tape is ideal for use as a vapor seal for reinforced fiberglass or mineral wool thermal insulation*
- *Venture CW® cold weather solvent acrylic adhesive performs well over a wide temperature range*

Test	Typical Value	Typical Value (Metric)	Test Method
Product Thickness Ω	9.5 mils	0.24 mm	PSTC-133
Peel Adhesion Δ	45 oz/in	12.5 N/25 mm	PSTC-101
Shear Adhesion	>24 hrs @ 2.2 psi	>24 hrs @ 15.2 kPa	PSTC-107
Tensile Strength	40 lb/in	180.8 N/25 mm	PSTC-131
Elongation	2 %	2 %	PSTC-131
Service Temperature	-40 to 250 °F	-40 to 121 °C	

Ω - excluding liner Δ - 20 minute dwell

Typical values are not intended to be used for specification development. Technical data is believed to be true and accurate; Venture Tape recommends that the purchaser test for fitness of use in all applications.

Product Configurations

- *Standard sizes: 3" x 50Y, 4" x 50Y, 5" x 50Y, 6" x 50Y*
- *Custom widths and lengths available, contact Venture Tape for specifications and requirements*

Contact Venture Tape today for a complete list of products or a free sample

Toll Free North America 800-343-1076
From United Kingdom 0-800-962-957
From Australia 1-800-122-797
www.venturetape.com

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FAX (0) 1327 876444

Australasia
Venture Tape Australasia, Pty., Ltd.
11B Production Drive
Campbellfield 3061 Victoria
Australia
(03) 9357 6025
FAX (03) 9357 6045

0610

No Exception Taken

Venture Tape™ FSK Facing Tape 1525CW/1528CW

Technical Data **April, 2015**

Product Description

3M™ Venture Tape™ FSK Facing Tape 1525CW is a foil/scrim/kraft (FSK) lamination coated with a cold weather solvent acrylic pressure sensitive adhesive. 3M™ Venture Tape™ FSK Facing Tape 1528CW is a 2.5" disc version of 1525CW.

Product Construction

Backing	Adhesive	Color	Standard Roll Length
FSK	Acrylic	Natural Aluminum	50 yds (45.7 m)

Features

- Excels in demanding temperature and humidity applications
- Conforms well to irregular surfaces

Typical Physical Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Test	Typical Value	Typical Value (Metric)	Test Method
Product Thickness	9.5 mils	0.24 mm	PSTC-133
Peel Adhesion	45 oz/in	12.5 N/25 mm	PSTC-101
Shear Adhesion	>24 hrs @ 2.2 psi	>24 hrs @ 15.2 kPa	PSTC-107
Tensile Strength	40 lb/in	180.8 N/25 mm	PSTC-131
Elongation	2%	2%	PSTC-131
Service Temperature	-40° to 240°F	-40° to 116°C	

Application Ideas

- Applies easily to both fibrous and sheet metal duct
- Use as a vapor seal for reinforced aluminum faced fiberglass or mineral wool thermal insulation

Classifications

- UL723 Classified (5/10 Flame/Smoke Rating) [UL file #R10984]
- Facing meets ASTM C1136, type II and IV

3M™ Venture Tape™ FSK Facing Tape 1525CW

Storage	Store in a clean, dry place. Temperature of 40-80°F (4-26°C) and 40 to 50% relative humidity are recommended.
Shelf Life	To obtain best performance, use this product within 12 months from date of manufacture
Technical Information	The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.
Product Use	Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.
Warranty, Limited Remedy, and Disclaimer	Unless an additional warranty is specifically stated on the applicable 3M product packaging or product literature, 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM OR USAGE OF TRADE. If the 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.
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ISO 9001

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building Fire alarm

SYSTEM SENSOR®

D4120W Watertight Duct Smoke Detector

The InnovairFlex™ Series are the only duct smoke detectors flexible enough to fit configurations from square to rectangular and everything in between.

Innovairflex™

Features

- NEMA Type 4 UL listed for non-hazardous indoor and outdoor applications
- UV Resistant, UL listed housing and cover material
- 4-Wire Photoelectric, integrated low-flow technology
- Air velocity rating from 100 ft/min to 4,000 ft/min (0.5 m/s to 20.32 m/sec)
- Versatile mounting options: square or rectangular configuration
- Plug-in sensor offers superb false alarm immunity and the latest sensor technology
- Broad ranges for operating temperature (–4°F to 158°F) and humidity (0% to 95% non-condensing)
- Patented sampling tube installs from front or back of the detector with no tools required
- Increased wiring space with a newly added ¾-inch conduit knockout
- One easy-access Test/Reset button and improved LED status
- Patented interconnect feature for multi-fan shutdown
- New high contrast terminal designations
- Built-in short circuit protection from operator wiring errors
- Field selectable settings for configuring the detector
- Two DPDT Form-C relay contacts
- 24 VAC/DC or 120VAC
- Backward compatibility with existing Innovair products, including remote accessories

Agency Listings

UL LISTED S911

3242-1653:0209

FM APPROVED 3037269-797

The InnovairFlex D4120W watertight 4-wire photoelectric duct smoke detector is UL listed as a watertight enclosure providing protection against falling dirt, rain, windblown dust, splashing and hose directed water. D4120W duct smoke detector features a pivoting housing that fits various applications: both square and rectangular footprints mount to round or rectangular ductwork.

This unit senses smoke in the most challenging conditions, operating in airflow speeds of 100 to 4,000 feet per minute, temperatures of –4°F to 158°F, and a humidity range of 0 to 95 percent (non-condensing). A plug-in sensor head offers superior false alarm immunity. These features, plus a NEMA 4 rating, allow operators to mount the detector to rooftop HVAC equipment or use the detector in other harsh environments.

The new design provides the same form, fit, and wiring terminations as the standard InnovairFlex unit. Superior test and operational features added to the standard model are also available in this watertight unit. As the only watertight duct smoke detector on the market, D4120W provides unsurpassed environmental protection while simplifying installation, testing, and maintenance.

This InnovairFlex duct smoke detector can be customized to meet local codes and specifications without additional wiring. The new InnovairFlex product line is compatible with all previous Innovair models, including remote test accessories.

WARNING: Duct smoke detectors are **NOT** a substitute for open area smoke detectors; **NOT** a substitute for early warning detection; **NOT** a replacement for a building's regular fire detection system. Refer to NFPA 72 and 90A for additional information.

NOTE: To maintain the watertight properties of this duct smoke detector, watertight conduit and fittings must be used. Mount the product with the conduit holes facing downwards, if possible

InnovairFlex Duct Smoke Detector Specifications

Architectural/Engineering Specifications

The air duct smoke detector shall be a System Sensor InnovairFlex™ D4120W Watertight NEMA4 Photoelectric Duct Smoke Detector. The detector housing shall be UL listed per UL 268A specifically for use in air handling systems. The flexible housing of the duct smoke detector fits multiple footprints from square to rectangular. The detector shall operate at air velocities of 100 feet per minute to 4000 feet per minute (0.5 to 20.32 meters/second). The unit shall be capable of controlling up to 50 air handling systems when interconnected with other detectors. The detector shall be capable of providing a trouble signal in the event that the front cover is removed. It shall be capable of local testing via magnetic switch, test button on the cover, or remote testing using the RTS2 - AOS Multi-Signaling Accessory or the RTS151KEY Remote Test Station. Terminal connections shall be of the strip and clamp method suitable for 12–18 AWG wiring.

Physical Specifications

Size: (Rectangular Dimensions)	14.38 in (37 cm) Length; 5 in (12.7 cm) Width; 2.5 in (6.36 cm) Depth
(Square Dimensions)	7.75 in (19.7 cm) Length; 9 in (22.9 cm) Width; 2.5 in (6.35 cm) Depth
Weight:	2.5 lbs (1.14 kg)
Operating Temperature Range:	–4° to 158°F (–20° to 70°C)
Storage Temperature Range:	–22°F to 158°F (–30°C to 70°C)
Operating Humidity Range:	0% to 95% relative humidity non-condensing
Air Duct Velocity:	100 to 4000 ft/min (0.5 m/sec to 20.3 m/sec)
NEMA Enclosure Rating:	Type 4 – Watertight Indoor/Outdoor

Electrical Ratings

Power supply voltage:	20–29 VDC	24 VAC 50–60 Hz	120 VAC 50–60 Hz
Input capacitance:	270 µF max	270 µF max	N/A
Reset voltage:	3.0 VDC min	2.0 VAC min	10 VAC min
Reset time: (with RTS151)	.03 to 0.3 sec	.03 to 0.3 sec	.03 to 0.3 sec
Reset time: (by power down)	0.6 sec max	0.6 sec max	0.6 sec max
Power up time:	35 sec max	35 sec max	35 sec max
Alarm response time:	15 sec	15 sec	15 sec
Sensitivity test:	See detector label	See detector label	See detector label
Current Requirements: (Using No Accessories)			
Max. standby current:	21 mA @ 24 VDC	65 mA RMS @ 24 VAC 60 Hz	20 mA RMS @ 120 VAC 60 Hz
Max. alarm current:	65 mA @ 24 VDC	135 mA RMS @ 24 VAC 60 Hz	35 mA RMS @ 120 VAC 60 Hz

Contact Ratings

Alarm initiation contacts: (SPST)	2.0A @ 30 VDC (resistive)
Alarm auxiliary contacts: (DPDT)	10A @ 30 VDC; 10A @ 250 VAC; ½ HP @ 240VAC; ¼ HP @ 120VAC

Note: Alarm auxiliary contacts shall not be connected to initiating circuits of control panels. Use the alarm initiation contact for this purpose.

Accessory Current Loads at 24 VDC

Device	Standby	Trouble	Alarm
APA151	12.5 mA	N/A	30 mA Max
MHR/MHW	0 mA	N/A	29 mA Max
RA100Z	0 mA	N/A	12 mA Max
RTS151	0 mA	N/A	12 mA Max
RTS151KEY	12 mA	N/A	12 mA Max
RTS2-AOS	3.0mA max	16 mA Max	with strobe: 55 mA max; without strobe 30 mA max

Note: Any combination of accessories may be used such that the given accessory loads are: 110mA or less at the Aux output, and 50mA or less at the alarm output.

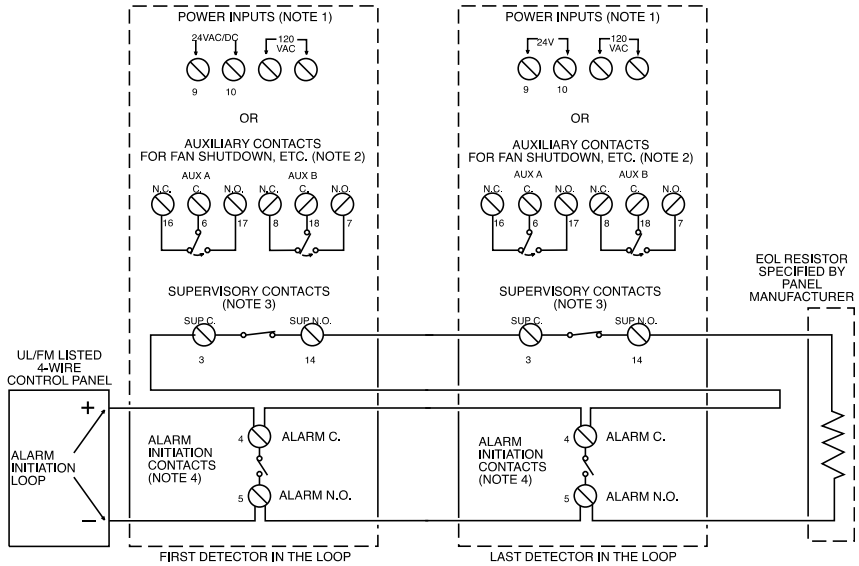
HVDS00600

Installing the InnovairFlex Sampling Tube

The InnovairFlex sampling tube may be installed from the front or back of the detector. The tube locks securely into place and can be removed by releasing the front or rear locking tab (front locking tab shown below right).



Wiring for Watertight 4-wire Duct Smoke Detector



NOTE 1: 24V Power Inputs accept a non-polarized 24VDC or 24VAC 50-60Hz. 120VAC Power Inputs accept only 120VAC 50-60Hz. Connect power source to appropriate terminals of each detector. See specifications for additional power supply information.

NOTE 2: Auxiliary contacts shown in standby position. Contacts switch during alarm as indicated by arrows. Auxiliary contacts are not to be used for connection to the control panel. See specifications for contact ratings.

NOTE 3: Supervisory contacts shown in standby position. Open contacts indicate a trouble condition to the panel. See specifications for contact ratings.

NOTE 4: Alarm Initiation contacts shown in standby position. Closed contacts indicate an alarm condition to the panel. See specifications for contact ratings.

*Please refer to the corresponding installation manual for accessory wiring diagrams.

Important Interconnect Notes

- When using the interconnect feature, all interconnected units must be powered using the same independent supply.
- Polarity must be maintained throughout the interconnect wiring. Connect the INT+ terminal on unit 1 to the INT+ terminal on unit 2 and so on. Similarly, connect the INT/AUX– terminal on unit 1 to the INT/AUX- terminal on unit 2 and so on.
- Up to 50 D4120W units may be interconnected.
- Up to 10 DH100ACDC units may be interconnected. Please note that each of the 9 DH100ACDC units interconnected may be replaced by three D4120W units. Therefore, when using the interconnect feature a single DH100ACDC can drive either 9 DH100ACDCs or 27 D4120W units.

* NOTE: Alarm can be reset only at the initiating device and not at the devices interconnected.

HVDS00600

Accessories

System Sensor provides system flexibility with a variety of accessories, including two remote test stations and several different means of visible and audible system annunciation. As with our duct smoke detectors, all duct smoke detector accessories are UL listed.

RTS151 UL S4011

RTS151KEY UL S2522

APA151 UL S4011

RTS2-AOS UL S2522

RA100Z UL S2522

MHW UL S4011

MHR UL S4011

AOS

Ordering Information

Part No.	Description		
D4120W	Watertight 4-wire photoelectric low-flow duct smoke detector		
Accessories			
2D51	4-wire conventional photoelectric sensor head	M02-04-00	Test magnet
DST1	Metal sampling tube duct width up to 1ft (0.3m)	MHR	Mini Horn, Red
DST1.5	Metal sampling tube duct widths 1 ft to 2 ft (0.3 to 0.6 m)	MHW	Mini Horn, White
DST3	Metal sampling tube duct widths 2 ft to 4 ft (0.6 to 1.2 m)	P48-21-00	End cap for metal sampling tubes
DST5	Metal sampling tube duct widths 4 ft to 8 ft (1.2 to 2.4 m)	RA100Z	Remote annunciator alarm LED
DST10	Metal sampling tube duct widths 8 ft to 12 ft (2.4 to 3.7 m)	RTS151	Remote test station
APA151	Remote annunciator with piezo alarm	RTS151KEY	Remote test station with key lock
DH400OE-1	Weatherproof enclosure	RTS2-AOS	Multi-signaling accessory with add on strobe
ETX	Metal exhaust tube duct width 1ft (0.3m)		

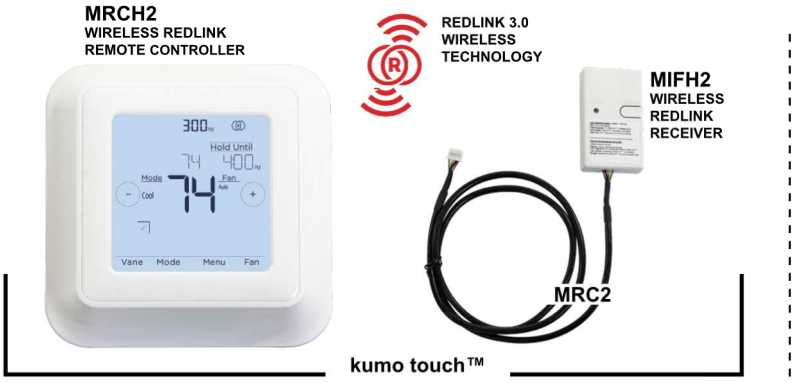
SYSTEM SENSOR

3825 Ohio Avenue • St. Charles, IL 60174
Phone: 800-SENSOR2 • Fax: 630-377-6495
www.systemsensor.com

No Exception Taken

MHK2 kumo touch™

Job Name:
System Reference: Date:



MRCH2 WIRELESS REDLINK REMOTE CONTROLLER SPECIFICATIONS

- Touch panel, Backlit, easy-to-read display
- New RedLINK™ 3.0 wireless technology
  - Not compatible with MHK1, MOS1, MCCH1, or Gateway (Rig) RedLINK 2.0 wireless technology environment.
- User functions allow user to set:
  - On/Off
  - Operation modes cool, heat, drying, fan
  - Set temperature (separate dual set points for heat and cool)
  - Fan speed setting
  - Airflow direction
- Set temperature range limits (dependent on the system connected):
  - Cooling from 50° to 99° F
  - Heating from 40° to 90° F
  - Auto from 50° to 90° F with dual temperature setting
- MHK2 Scheduling options:
  - No Schedule
  - MO-SU = Every day the same
  - MO-FR, SA, SU = 5-1-1 schedule
  - MO-FR, SA-SU = 5-2 schedule
  - Each Day = Every day individual
  - Allow kumo cloud to be schedule holder
- Hold function
- Temporary or Permanent schedule override
- Lockout:
  - On, Off, Mode, Fan Speed, Set point, Vane Direction
- Day/Time display with a 12 or 24-hour clock
- Supports both Fahrenheit and Celsius
- RedLINK™ Wireless Connection Status
- Filter sign display
- Diagnostics: Displays and records error codes
- Adjustable auto mode deadband
- Space temperature offset adjustment
- Space humidity offset adjustment
- Hide (on screen only)
  - Indoor temperature, Indoor humidity
- Temperature Sensing Source
  - MHK2
  - Indoor Unit
  - RedLINK Wireless Indoor Air Sensor (IAS)
  - Average of MHK2 and RedLINK Wireless Indoor Air Sensor (IAS)
- Indoor Humidity Source
  - MHK2
  - RedLINK Wireless Indoor Air Sensor (IAS)
  - Average of MHK2 and RedLINK Wireless Indoor Air Sensor (IAS)
- Improved indoor unit function code list
  - Indoor unit type
  - Expanded to 28 indoor unit codes
- Reset to factory default
- Uses two “AA” alkaline batteries (included)
- Dimensions: 4-5/64” x 4-5/64” x 1-1/16” (104 x 104 x 27 mm)
- Operating Ambient Temperature: 32° to 120° F (0° to 48.9° C)
- Operating Relative Humidity: 5% to 90%

MIFH2 WIRELESS RECEIVER SPECIFICATIONS:

- Included in MHK2 Kit
- Mounts next to or near indoor units to allow MRCH2 Remote Controller operation
- Connects to indoor unit control board with MRC2 Cable
- Dimensions: 3-3/32” H x 1-3/4” W x 39/64” D (74.8 x 44.4 x 15.4 mm)
- Operating Ambient Temperature: -40° to 165° F (-40° to 73.9° C)
- Operating Relative Humidity: 5% to 95%

MRC2 CABLE

- Included in MHK2 Kit in the MIFH2 box
- Connects MIFH2 Wireless Receiver to the CN105 connector on indoor unit control board
- Length: 39-23/64" (1 m)

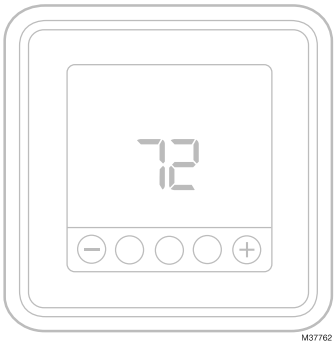
Specifications are subject to change without notice.

No Exception Taken

Honeywell Home

T6 Pro Programmable Thermostat

User Guide

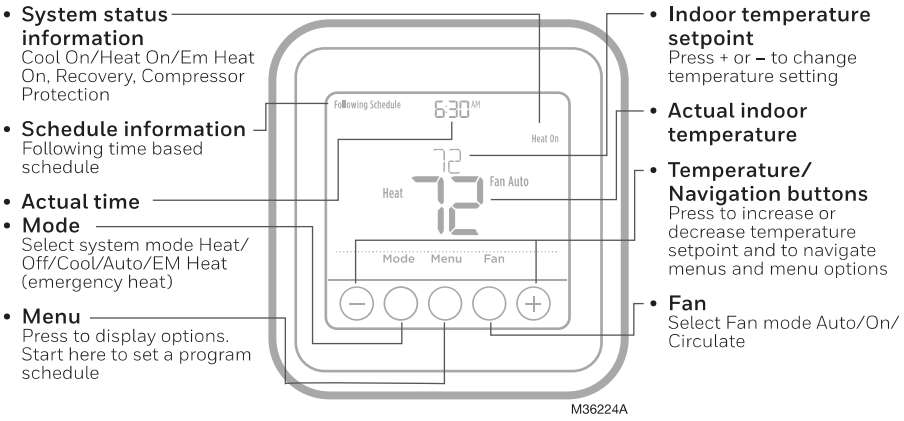


Package Includes:

- T6 Pro Thermostat
- UWP™ Mounting System
- Decorative Cover Plate
- Screws and Anchors
- 2 AA Batteries
- Thermostat Literature

TH6320U2008,
TH6220U2000,
TH6210U2001,
Read before installing

Thermostat controls



The screen will wake up by pressing any of the five buttons. If powered by the C wire, the screen stays lit for 45 seconds after you complete changes. If powered by battery only, the screen stays lit for 8 seconds. Depending on how your thermostat was installed, the screen light may always be on.

Customer assistance

Visit **https://www.honeywellhome.com/support**

System operation settings

1 Press the **Mode** button to cycle to the next available System mode.
2 Cycle through the modes until the required System mode is displayed and leave it to activate.

NOTE: Available System modes vary by model and system settings.

System modes:
- **Auto**
- **Heat**
- **Cool**
- **Em Heat**
- **Off**

M36117

Fan operation settings

1 Press the **Fan** button to cycle to the next available Fan mode.
2 Cycle through the modes until the required Fan mode is displayed and leave it to activate.

NOTE: Available Fan modes vary with system settings.

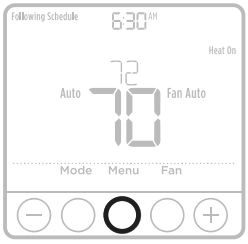
Fan modes:
- **Auto:** Fan runs only when the heating or cooling system is on.
- **On:** Fan is always on.
- **Circ:** Fan runs randomly about 33% of the time.

M35959

Set the time and date

Time

1 Press **Menu** on your thermostat.
2 Press ⊕ or ⊖ to go to **TIME**. Press **Select.**
3 Press ⊕ or ⊖ to choose between 12 or 24 hour. Press **Select**.
4 Use ⊕ or ⊖ to adjust the hour. Press **Select**.
5 Use ⊕ or ⊖ to adjust the minutes. Press **Select** to exit Time menu.



M35966

Date

1 If previously setting time, continue to Step 2. If at the Home screen, press **Menu** on your thermostat.
2 Press ⊕ or ⊖ to go to **DATE**. Press **Select.**
3 Use ⊕ or ⊖ to adjust year. Press **Select**.
4 Use the ⊕ or ⊖ to adjust month. Press **Select**.
5 Use the ⊕ or ⊖ to adjust day. Press **Select** to save and exit Date menu.

M36119

Program Schedule

You can program four time periods each day, with different settings for weekdays and weekends. We recommend the pre-sets (shown in the table below), since they can reduce your heating/cooling expenses.

Wake - Set to the time you wake up and the temperature you want during the morning, until you leave for the day.

Away - Set to the time you leave home and the temperature you want while you are away (usually an energy-saving level).

Home - Set to the time you return home and the temperature you want during the evening, until bedtime.

Sleep - Set to the time you go to bed and the temperature you want overnight (usually an energy-saving level).

	Heat	Cool
Wake (6:00 am)	70°	78°
Away (8:00 am)	62°	85°
Home (6:00 pm)	70°	78°
Sleep (10:00 pm)	62°	82°

M36013

NOTE: To temporarily or permanently override any of the above program schedules, see page 4.

To adjust program schedules

1 Press **Menu** on your thermostat.

2 **PROG** is displayed. Press **Select**. Then **ON** is displayed. (If you do not want to use a schedule, press ⊕ or ⊖ to display **OFF**. Press **Select**.) Press **Select**.

3 Press ⊕ or ⊖ to select day or set of days to edit. Press **Select**.

4 Press ⊕ or ⊖ to select a schedule period to edit (Wake, Away, Home, and Sleep). Press **Select**.

5 **ON** is displayed. Press **Select** to keep the schedule period on. Or press ⊕ and then **Select** to turn off the schedule period.

6 Time starts blinking. Press ⊕ or ⊖ to adjust the schedule period start time. Press **Select**.

7 Temperature starts blinking. Press ⊕ or ⊖ to adjust the “Heat” setpoint temperature. Press **Select**. Press ⊕ or ⊖ to adjust the “Cool” temperature setpoint. Press **Select**.

8 Repeat steps 4 through 7 for the remaining schedule periods.

9 Press **Home** when you’re finished to save and return to the home screen.

10 Schedule can be adjusted and turned **ON** or **OFF** by returning to **Menu** and following the steps provided above.

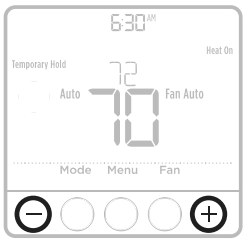
M35966

Program schedule override (temporary)

1 Press ⊕ or ⊖ to adjust the temperature.

2 Once at the desired setpoint temperature, no further action is needed. The new setpoint temperature will be held until the next scheduled time period begins. For more information on schedule time periods, see “Program Schedule” on page 3.

3 To cancel the Temporary Hold, Press ⊕ or ⊖ and then press **Cancel**.



M36240

Program schedule override (permanent)

1 Press ⊕ or ⊖ to adjust the temperature.

2 **TEMPORARY HOLD** is displayed and the setpoint temperature flashes. While it’s flashing, press **Hold** (Mode) button to change to Permanent Hold.

3 To cancel the Permanent Hold, press ⊕ or ⊖ and then press **Cancel**.

M36241

Adjusting keypad lockout

1 Press **Menu** on the thermostat.

2 Press + or − to go to **LOCK**. Press **Select**.

3 Press + or − to go to **OFF, PART,** or **ON**, and then press **Select**.
OFF: Unlocked, and full access allowed.
PART: Partial lockout, allowing only the temperature to be changed.
ON: No access allowed.

4 To unlock the keypad, press the **CENTER** button and then enter the password "1234". To enter the password, press + or − to change the first digit of the number. Then press **Select**. Repeat this process to enter the second through fourth digits of the number. Once all four numbers have been entered, press **Select** again.

5 This will unlock the keypad.

6 If the code is incorrect, the screen will flash the lines "--".

7 Press **Back** to go back a step to enter the correct number and press **Select**.

NOTE: On some models, the keypad lockout setting is not available in the user menu if the installer didn't configure the thermostat to allow this setting.

Adaptive Intelligent Recovery

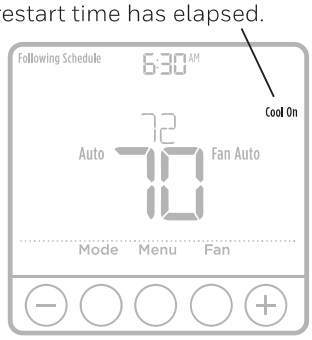
Over time, the T6 Pro Thermostat "learns" how long it takes your system to reach the temperature you want. It turns on the heating or cooling system earlier to make sure you're comfortable at the time you expect.

Built-in compressor protection

Damage can occur if the compressor is restarted too soon after shutdown. This feature forces the compressor to wait for a few minutes before restarting.

During the wait time, the display will flash the message Cool On (or Heat On if you have a heat pump). When the safe wait time has elapsed, the message stops flashing and the compressor turns on.

Message flashes until safe restart time has elapsed.



Battery replacement

Batteries are optional (to provide backup power) if your thermostat was wired to run on AC power when installed. If your thermostat was not wired to run on AC power, then batteries are required.

Install fresh batteries immediately when the low battery icon appears. The icon appears about two months before the batteries are depleted.

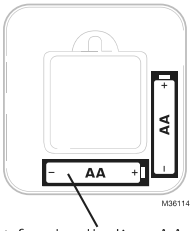
Even if the low battery icon does not appear, you should replace batteries once a year, or before leaving home for more than a month.

If batteries are inserted within two minutes, the time and day will not have to be reset. All other settings are permanently stored in memory, and do not require battery power.

NOTE: When replacing batteries, alkaline batteries are recommended.

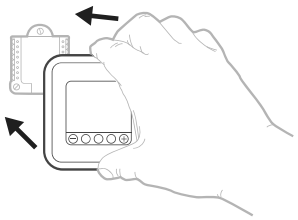
M36010

When the low battery warning appears, carefully pull the thermostat from the wall mount.



M36114

Insert fresh alkaline AA batteries and reinstall thermostat.



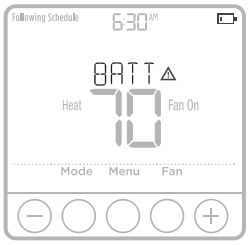
M36116

Alerts

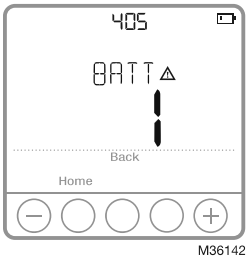
If there is an alert or reminder, the alert icon ⚠ appears on the Home screen.

Low Battery Warning

1. The batteries need to be replaced when **BATT**, the alert icon ⚠, and the battery icon are displayed on the Home screen.
2. When the battery power is very low, the thermostat's backlight is disabled to save battery power.
3. When battery power is critically low, only **BATT**, the alert icon ⚠, and the battery icon are displayed.

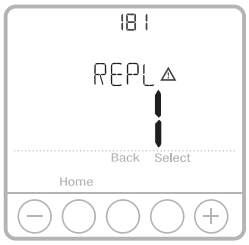


M36141



M36142

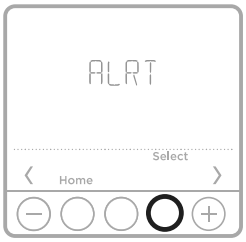
Air Filter Reminder



M36144

1 The alert icon ⚠ appears on the Home screen.
2 Press **Menu**, and then press ⊕ until display shows **ALRT**.
3 Press **Select** to display which alert(s) are present.
4 The message **REPL** (REPLACE AIR FILTER) appears.
5 The reminder can be snoozed or cleared. Resideo recommends changing the air filter before clearing the reminder.
6 To snooze, press **Select**. The word **SNZE** (SNOOZE) appears.
7 Press **Select** again to snooze the reminder for 7 days.
8 To clear, press **Select,** and then press ⊕ to go to **CLER** (Clear).
9 Press **Select** to clear the air filter reminder.

Snoozing and Clearing Alerts or Reminders*



M36145

1 Press **Menu**, and then press ⊕ until display shows **ALRT**.
2 Press **Select** to display which alert(s) are present.
3 The word **SNZE** (SNOOZE) appears.
4 Press **Select** again to snooze the reminder for 7 days.
5 To clear the alert, press **Select,** and then press ⊕ to go to **CLER** (Clear).
6 Press **Select** to clear the reminder.

* Some alerts cannot be snoozed or cleared. Please call your local heating and cooling professional if this occurs. The heating and cooling system may require service.

Troubleshooting

If you have difficulty with your thermostat, please try the following suggestions. Most problems can be corrected quickly and easily.

Display is blank

- Check circuit breaker and reset if necessary.
- Make sure power switch for heating & cooling system is on.
- Make sure furnace door is closed securely.
- Make sure fresh AA alkaline batteries are correctly installed (see page 6).

Heating or cooling system does not respond

- Press **Mode** button to set system Heat (see page 2). Make sure the desired temperature is set higher than the inside temperature.
- Press **Mode** button to set system Cool (see page 2). Make sure the desired temperature is set lower than the inside temperature.
- Check circuit breaker and reset if necessary.
- Make sure power switch for heating & cooling system is on.
- Make sure furnace door is closed securely.
- Wait 5 minutes for the system to respond.

Temperature settings do not change

Make sure heating and cooling temperatures are set to acceptable ranges:

- Heat: 40 °F to 90 °F (4.5 °C to 32.0 °C)
- Cool: 50 °F to 99 °F (10.0 °C to 37.0 °C)

“Cool On” or “Heat On” is flashing

- Compressor protection feature is engaged. Wait 5 minutes for the system to restart safely, without damage to the compressor (see page 5).

Electrical Ratings

Terminal	Voltage (50 Hz/60 Hz)	Running Current
W Heating	20 Vac - 30 Vac	0.02 A - 1.0 A
W2 (Aux) Heating	20 Vac - 30 Vac	0.02 A - 1.0 A
E Emergency Heat	20 Vac - 30 Vac	0.02 A - 0.5 A
Y Compressor Stage 1	20 Vac - 30 Vac	0.02 A - 1.0 A
Y2 Compressor Stage 2	20 Vac - 30 Vac	0.02 A - 1.0 A
G Fan	20 Vac - 30 Vac	0.02 A - 0.5 A
O/B Changeover	20 Vac - 30 Vac	0.02 A - 0.5 A
L/A Input	20 Vac - 30 Vac	0.02 A - 0.5 A

5-year limited warranty

https://www.honeywellhome.com/support

CAUTION: ELECTRICAL HAZARD
Can cause electrical shock or equipment damage. Disconnect power before beginning installation.

CAUTION: EQUIPMENT DAMAGE HAZARD
Compressor protection is bypassed during testing. To prevent equipment damage, avoid cycling the compressor quickly.

CAUTION: MERCURY NOTICE
If this product is replacing a control that contains mercury in a sealed tube, do not place the old control in the trash. Contact your local waste management authority for instructions regarding recycling and proper disposal.

CAUTION: ELECTRONIC WASTE NOTICE
The product should not be disposed of with other household waste. Check for the nearest authorized collection centers or authorized recyclers. The correct disposal of end-of-life equipment will help prevent potential negative consequences for the environment and human health.

https://customer.resideo.com/en-US/support/residential/codes-and-standards/FCC15105/Pages/default.aspx

resideo
www.resideo.com

Resideo Technologies, Inc.
1985 Douglas Drive North, Golden Valley, MN 55422
https://www.honeywellhome.com/support
33-00182EFS-10 M.S. Rev. 04-22 | Printed in United States

33-00182EFS-10

No Exception Taken

fantech®
a systemair company

FH 20 Dehumidistat

surface mount, 7.5A
Item #: 410727
Variant: 120V 1~ 60Hz

Dehumidistat
Wall mounted dehumidistat. Adjustable between 20% and 80% relative humidity. A white powder-coated finish.

Technical parameters

Nominal data		
Voltage (nominal)	120	V
Input current	7.5	A

Dimensions and weights		
Weight	0.4	lb

No Exception Taken
Please have all components associated with the smoke pressurization system reviewed by the firm preparing the rational analysis.

PRODUCT OVERVIEW

ACH580-01/-31

The ACH580 drive sets new standards in both simplicity and reliability, and ensures smooth, energy-efficient operation of your HVAC systems in normal and mission-critical situations.

ACH580-01, wall-mounted base drives
The ACH580-01 wall-mounted drives are available from 1 to 100 HP at 208/240 V, 1 to 350 HP at 480 V, and 2 to 250 HP at 575 V. The ACH580-01 drives are available in UL (NEMA) Type 1 and 12 configurations. In standard installations, the drive is mounted directly onto a wall and uses the provided conduit box. Conduit openings are provided for bottom conduit entry & exit. For mounting in a customer-supplied cabinet, the conduit box may be removed. The drive has a 100 kA SCCR rating when paired with appropriately sized upstream fuses.

ACH580-31, ultra low harmonic wall-mounted base drives
The ACH580-31 wall-mounted drives are available from 5 to 400 HP at 480 V. The ACH580-31 are available in UL (NEMA) Type 1 and 12 configurations. In standard installations, the drive is mounted directly onto a wall and uses the provided conduit box. Conduit openings are provided for bottom conduit entry and exit. For mounting in a customer-supplied cabinet, the conduit plate may be removed.

Features for HVAC
The ACH580 comes standard with an intuitive control panel used to configure, control, and monitor the drive. An optional Bluetooth control panel allows the drive to be configured via the control panel or the DriveTune app.

A robust HVAC firmware package provides drive, motor, and application protection features. Examples of drive protection features include undervoltage, overvoltage, overcurrent, and ground fault protection. The ACH580 also has a variety of motor protection features including overload and stall protections.

Application specific features, such as accepting four separate start interlocks (safeties), along with broken belt detection, are also included. The drive includes BACnet MS/TP, Modbus RTU, and Johnson N2 as standard. Additional protocols, such as BACnet/IP and LonWorks , are available with optional fieldbus adapters.

Technical specifications

Product compliance (complete list on following page)	
ACH580-01/-31	CE, UL, cUL, and EAC
Supply connection	
Input voltage (U_1) ACH580-xx-xxxA-2 ACH580-xx-xxxA-4 ACH580-xx-xxxA-6 Input voltage tolerance Phase	 208/240V 480V 600V +10% / -15% 3-phase (1-phase, 240 V)
Frequency	48 to 63 Hz
Line Limitations	Max ±3% of nominal phase to phase input voltage
Power Factor (cos φ) at nominal load ACH580-01 ACH580-31	 0.98 1.0
Efficiency at rated power ACH580-01 ACH580-31	 98.0% 96.5%
Power Loss	Approximately 2% of rated power
Motor connection	
Supported motor control	Scalar and vector
Supported motor types	Asynchronous motor, permanent magnet motor (vector), SynRM (vector)
Voltage	3-phase, from 0 to supply voltage
Frequency	0 to 500 Hz
Short Term Overload Capacity Variable Torque	110% for 1 min/10min
Peak Overload Capacity Variable Torque	1.35 for 2 second (2 sec / 10 min)
Switching Frequency	2, 4, 8 or 12 kHz Automatic fold back in case of overload
Acceleration/Deceleration Time	0 to 1800 s
Short Circuit Current Rating (SCCR)	100 ka with fusing
Inputs and outputs (drive)	
2 analog inputs	Selection of Current/Voltage input mode is user programmable.
Voltage reference	0 (2) to 10 V, R_{in} > 200 kΩ
Current reference	0 (4) to 20 mA, R_{in} = 100 Ω
Potentiometer reference value	10 V ±1% max. 20 mA
2 analog outputs	AO1 is user programmable for current or voltage. AO2 current
Voltage reference	0 to 10 V, R_{load}: > 100 kΩ
Current reference	0 to 20 mA, R_{load}: < 500 Ω
Applicable potentiometer	1 kΩ to 10 kΩ
Internal auxiliary voltage	24 V DC ±10%, max. 250 mA
Accuracy	+/- 1% full scale range at 25°C (77°F)
Output updating time	2 ms
6 digital inputs	12 to 24 V DC, 10 to 24 V AC, Connectivity of PTC sensors supported by a single digital input.

	PNP or NPN connection (5 DIs with NPN connection). Programmable
Input Updating Time	2 ms
3 relay outputs	Maximum switching voltage 250 V AC/30 V DC. Maximum continuous current 2 A rms. Programmable, Form C
Adjustable filters on analog inputs and outputs	
All control inputs isolated from ground and power	
Operation	
Air temperature	0 to -15 °C (32 to 5 °F). -15 to +50 °C (5 to 122 °F): No frost allowed. Output derated above +40 °C (104 °F)
Installation site altitude	0 to 4000 m (13123 ft) above sea level Output derated above 1000 m (3281 ft)
Relative humidity	5 to 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Atmospheric pressure	70 to 106 kPa (10.2 to 15.4 PSI) 0.7 to 1.05 atmospheres
Vibration	Risk category IV Certified (IBC 2018)
Environmental protections	
Chemical Gasses	Class 3C2
Solid Particles	Class 3S2 No conductive dust allowed
Pollution degree (IEC/EN 61800-5-1)	Pollution degree 2
Product compliance	
Standards and directives	Low Voltage Directive 2006/95/EC EMC Directive 2004/108/EC 60721-3-3: 2002 60721-3-1:1997 Quality assurance system ISO 9001 and Environmental system ISO 14001 CE, UL, cUL, and EAC approvals Galvanic isolation according to PELV RoHS2 (Restriction of Hazardous Substances) EN 61800-5-1: 2007; IEC/EN 61000-3-12; EN61800-3: 2017 + A1: 2012 Category C2 (1st environment restricted distribution); Safe torque off (EN 61800-5-2) BACnet Testing Laboratory (BTL) Seismic (IBC, OSHPD) Plenum (ACH580-01 only)
EMC (according to EN61800-3)	ACH580-01 and ACH580-31 class C2 (1st environment restricted distribution)

Storage (in Protective Shipping Package)	
Air Temperature	-40 to +70 °C (-40 to +158 °F)
Relative Humidity	Less than 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Chemical Gasses	Class 1C2
Solid Particles	Class 1S2 Contact ABB regarding Class 1S3
Atmospheric pressure	70 to 106 kPa 0.7 to 1.05 atmospheres
Vibration (ISTA) R1…R4 R5…R9	 In accordance with ISTA 1A In accordance with ISTA 3E
Transportation (in Protective Shipping Package)	
Air Temperature	-40° to 70°C (-40° to 158°F)
Relative Humidity	Less than 95% No condensation allowed Maximum relative humidity is 60% in the presence of corrosive gasses
Atmospheric Pressure	60 to 106 kPa (8.7 to 15.4 PSI) 0.6 to 1.05 atmospheres
Free Fall	R1: 76 cm (30 in) R2: 61 cm (24 in) R3: 46 cm (18 in) R4: 31 cm (12 in) R5: 25 cm (10 in)
Chemical Gasses	Class 2C2
Solid Particles	Class 2S2
Shock/ Drop (ISTA) R1…R4 R5…R9	 In accordance with ISTA 1A In accordance with ISTA 3E
Vibration (ISTA) R1…R4 R5…R9	 In accordance with ISTA 1A In accordance with ISTA 3E

Feature overview

Communication
Protocols as standard (EIA-485): BACnet MS/TP, Modbus RTU, Johnson Controls N2
Available as plug-in options: BACnet/IP, Modbus TCP, PROFIBUS-DP, DeviceNet, EtherNet/IP, LonWorks (coming 2019)

Application functions
Start interlock
Delayed start
Run permissive (damper monitoring)
Override operation mode
Real-time clock (scheduling)
PID controllers for motor and process
Motor flying start
Motor preheating
Energy optimizer and calculators
Timer
2 or 3 wire start/stop
Ramp to stop
2 independent adjustable accel/decel ramp

Protection functions
Overvoltage controller
Undervoltage controller
Motor earth-leakage monitoring
Motor short-circuit protection
Motor overtemperature protection
Output and input switch supervision
Motor overload protection (UL508C)
Phase-loss detection (both motor and supply)
Under load supervision (belt loss detection)
Overload supervision
Stall protection
Loss of reference
Panel loss
Ground fault
External events
Overcurrent
Current limit regulator
Transient/Surge protection (MOV and choke)

Panel functions
First start assistant
Primary settings for HVAC applications
Hand-Off-Auto operation mode
HVAC quick set-up
Includes Day, Date and Time
Operator Panel Parameter Backup (read/write)
Full Graphic and Multilingual Display for Operator Control, Parameter Set-Up and Operating Data Display:
- Output Frequency (Hz)
- Speed (RPM)
- Motor Current
- Calculated % Motor Torque
- Calculated Motor Power (kW)
- DC Bus Voltage
- Output Voltage
- Heatsink Temperature
- Elapsed Time Meter (resettable)
- kWh (resettable)
- Input / Output Terminal Monitor
- PID Actual Value (Feedback) & Error Fault Text
- Warning Text
- Three (3) Scalable Process Variable Displays
- User-Definable Engineering Units

Motor control features
Scalar (V/Hz) and vector modes of motor control
V/Hz shapes
- Linear
- Squared

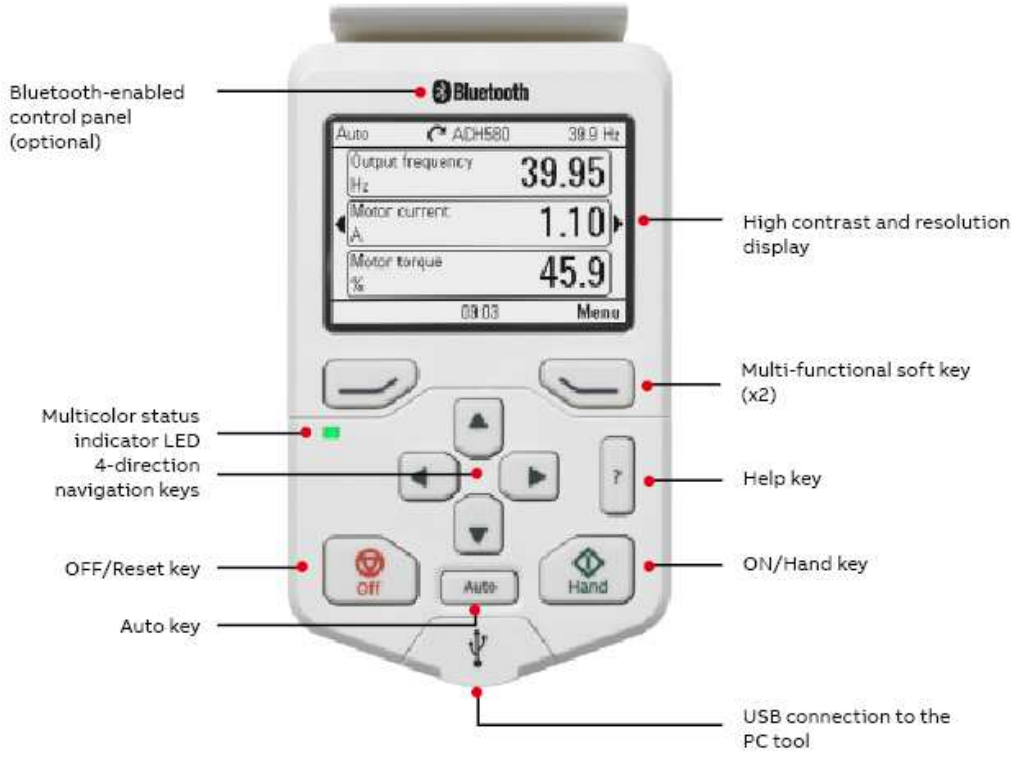
Energy optimization
IR compensation
Slip compensation
Three (3) Critical Frequency Lockout Bands

PID control
One (1) Process PID
Four (4) Integral Independent Programmable PID Setpoint Controllers (Process and External)
External Selection between Two (2) Sets of Process PID Controller Parameters
PID Sleep/Wake-Up

Control panel features

The ACH580 Assistant Control Panel features:

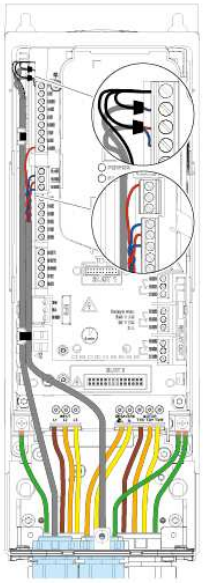
- Intuitive to operate
- Primary Setting menu to ease drive commissioning
- Real-time clock
- Diagnostic and maintenance functions
- Full-graphic display, including chart, graph, and meter options
- 21 editable home views
- USB interface for PC and tool connection as standard
- Parameters are alpha-numeric
- North American version supports 14 languages as standard
- Dedicated “Help” key
- 4 user sets
- Parameter are stored in control panel memory for later transfer to other drives or for backup of a particular system
- Back-up and restore parameters and/or motor data
- Automatic back-up 2 hours after parameter change
- Modified parameter display
- Creates unique short menu
- Shows parameters that differ from the default
- Bluetooth connectivity for use with mobile device (requires +J429 option)



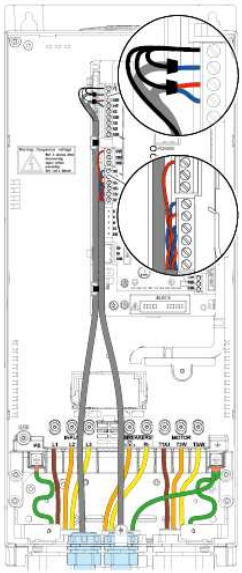
Cable connections

The following illustrations show the ACH580-01 and ACH580-31 cable connection points for the base drive. The illustrations indicate the location of input and output power connections as well as equipment and motor grounding connection points.

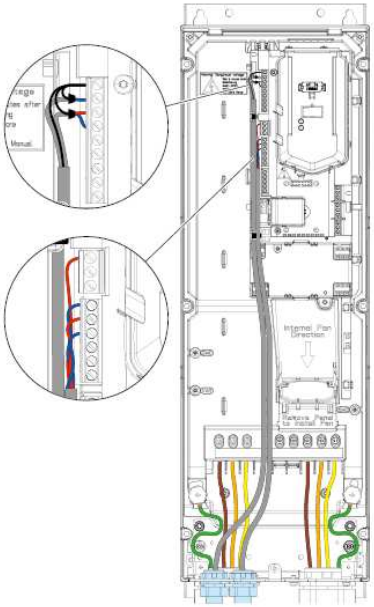
ACH580 drives are configured for wiring access from the bottom only. At least three separate metallic conduits are required, one for input power, one for output power to the motor and one for control signals.



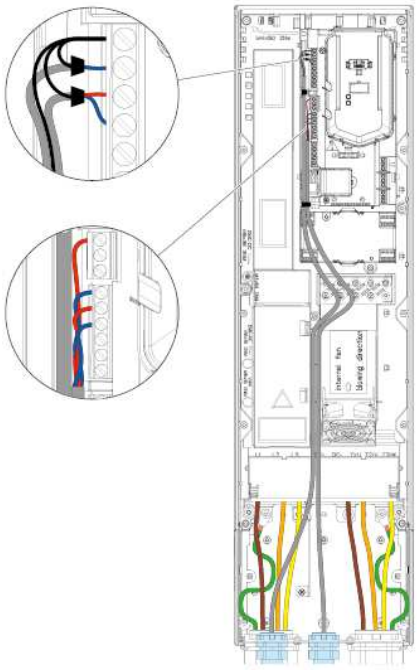
ACH580-01, R1-R2, UL (NEMA) Type 1 and 12



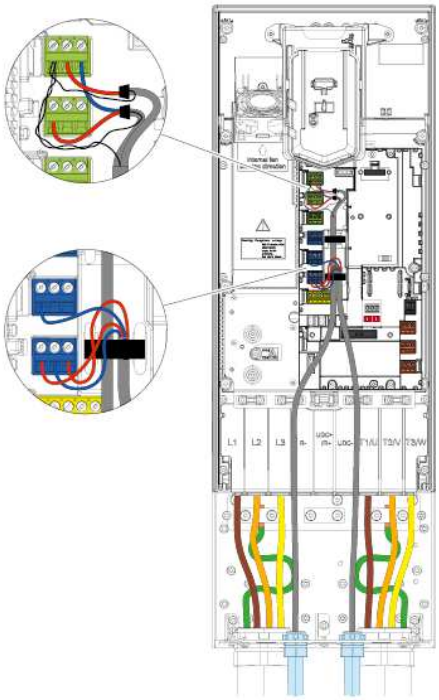
ACH580-01, R3, UL (NEMA) Type 1 and 12



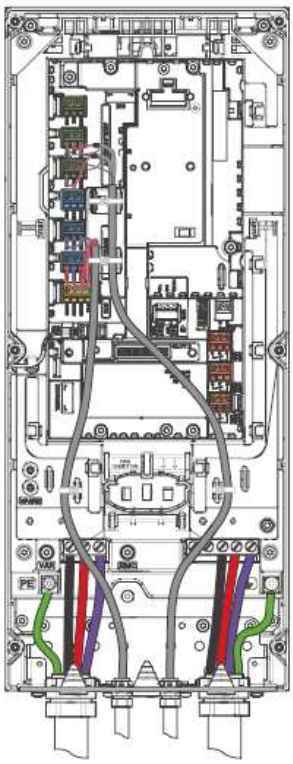
ACH580-01, R4, UL (NEMA) Type 1 and 12



ACH580-01, R5, UL (NEMA) Type 1 and 12



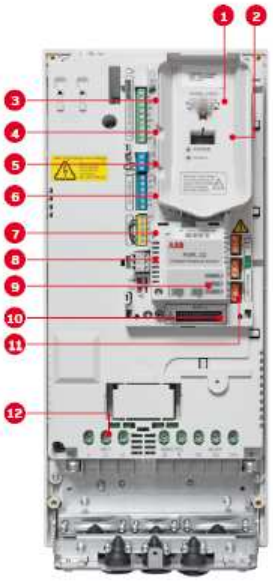
ACH580-01, R6-9, UL (NEMA) Type 1 and 12



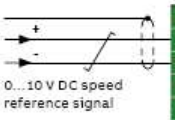
ACH580-31, R3, UL (NEMA) Type 1 and 12

Control connections

Default control connections



1. Panel port (PC tools, control panel)
2. ABB drive customizer port for programming the drive without mains
3. Analog inputs (2 × AI)
4. Analog outputs (2 × AO)
5. 24 V DC output
6. Digital inputs (6 × DI)
7. Safe torque off (STO)
8. Embedded fieldbus
9. Communication options (fieldbuses)
10. Analog and digital I/O extensions
11. Relay outputs (3 × RO)
12. Mains connection

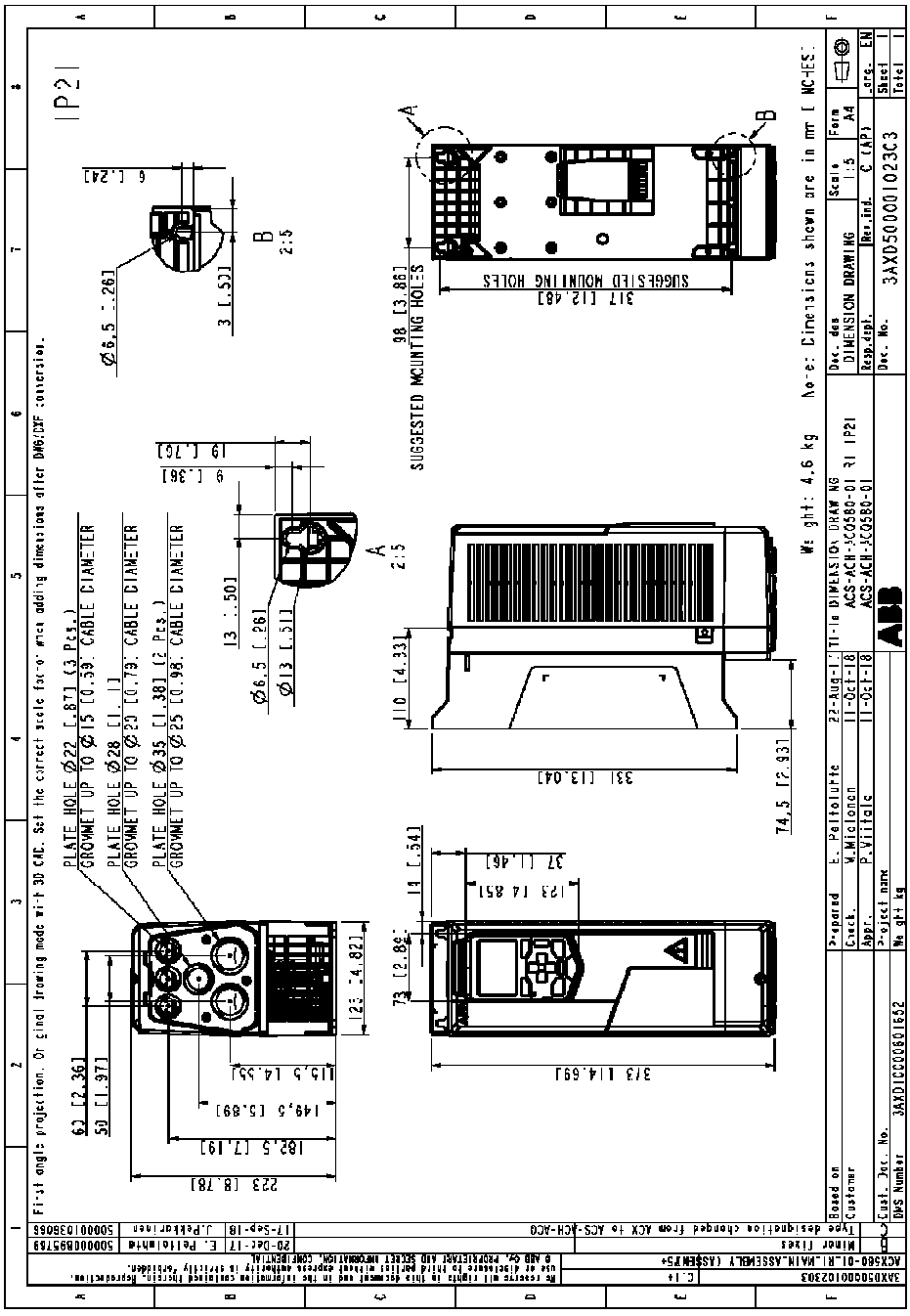


0...10 V DC speed reference signal

Terminal	Meaning	Default macro connections		
X1	**Reference voltage and analog inputs and outputs**			
1	SCR	Signal cable shield (screen)		
2	AI1	**Output frequency/speed reference:** 0 to 10 V		
3	AGND	Analog input circuit common		
4	+10 V	Reference voltage 10 V DC		
5	AI2	**Actual feedback:** 0 to 20 mA		
6	AGND	Analog input circuit common		
7	AO1	**Output frequency:** 0 to 10 V		
8	AO2	**Motor current:** 0 to 20 mA		
9	AGND	Analog output circuit common		
X2 & X3	**Aux. voltage output and programmable digital inputs**			
10	+24 V	Aux. voltage output +24 V DC, max. 250 mA		
11	DGND	Aux. voltage output common		
12	DCOM	Digital input common for all		
13	DI1	**Stop (0)/Start (1)**		
14	DI2	Not configured		
15	DI3	**Constant frequency/speed selection**		
16	DI4	**Start interlock 1 (1 = allow start)**		
17	DI5	Not configured		
18	DI6	Not configured		
X6, X7, X8	**Relay outputs**			
19	RO1C	Damper actuator	**Damper control** 250 V AC/30 V DC 2 A	Energize damper 19 connected to 21
20	RO1A			
21	RO1B			
22	RO2C	Run status	**Running** 250 V AC/30 V DC 2 A	Running 22 connected to 24
23	RO2A			
24	RO2B			
25	RO3C	Fault status	**Fault (-1)** 250 V AC/30 V DC 2 A	Fault condition 25 connected to 26
26	RO3A			
27	RO3B			
X5	**Embedded fieldbus**			
29	B+	Embedded fieldbus, EFB (EIA-485)		
30	A-			
31	DGND			
S4	TERM	Termination switch		
S5	BIAS	Bias resistors switch		
X4	**Safe torque off**			
34	OUT1	Safe torque off. Factory connection. Both circuits must be closed for the drive to start. See chapter *The Safe torque off function* in the *hardware manual* of the drive.		
35	OUT2			
36	SGND			
37	IN1			
38	IN2			
X10	**24 V AC/DC**			
40	24 V AC/DC+ in	R6-R11 only: Ext. 24V AC/DC input to power up the control unit when the main supply is disconnected.		
41	24 V AC/DC- in			

Notes:
- Connected with jumpers at the factory.
- Only frames R6-R11 have terminals 40 and 41 for external 24 V AC/DC input.

Item	Part Number	Customer Designation
1	ACH580-01-03A0-4	SPF-1 | SPF-2



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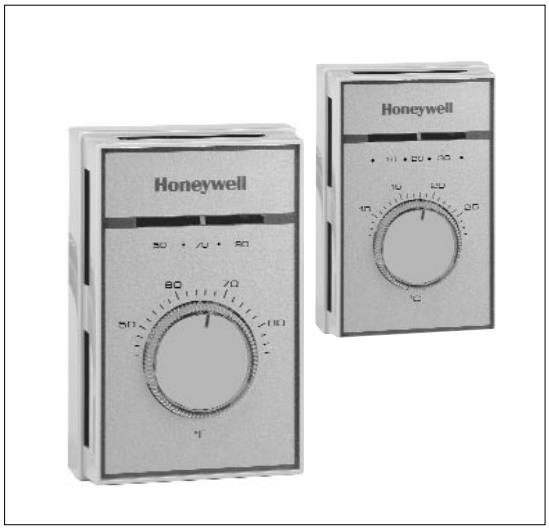
55060994

No Exception Taken

Honeywell

T451, T651
Motor-Rated Precision Thermostats

PRODUCT DATA



APPLICATION

The T651 thermostat provides direct, accurate line voltage control of inductively-rated heating, ventilating, or cooling equipment used in commercial or industrial environments.

The T451 provides precision line voltage control of motor-rated electric, gas or oil heating equipment.

FEATURES

- **Deluxe styling for commercial buildings.**
- **Industrial grade MICRO SWITCH™ mechanism rated 1/2 hp inductive, 5 kW resistive.**
- **Vertical mounting on 2” x 4” NEMA-standard single-gang outlet box.**
- **High-sensitivity, vapor-filled stainless steel dual diaphragm sensing element.**
- **Engineering plastic base to isolate sensor from switch heat and minimize droop.**
- **CSA Certified, UL Listed.**
- **Altitude compensation.**
- **44°F (7°C) “frost protection” setting for heating application, independent of calibration or altitude.**
- **Color-coded leadwire connections.**
- **Range stops/locking cover security features for public areas.**

Contents

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95C-10903-1

Important: *The specifications given in this publication do not include normal manufacturing tolerances. Therefore this unit may not exactly match the listed specifications . This product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if these conditions are changed.*

Models:
T451A SPST and T451B DPST (with positive off) for heating only.
T651A SPDT for heating/cooling.

Control Range:
44 - 86°F (7 - 28°C) for models T451A, T651A.
50 - 86°F (10 - 28°C) for model T451B.

Sensing Element: Vapor-filled dual diaphragm.

Differential: 2°F (1°C)

Droop: 2°F @ mid load range.

Barometer Sensitivity: 1/8°F/"wc (0.3°C/kPa).

Thermometer: 50 - 90°F (10 - 30°C) in 10°F (5°C) increments.

Electrical Ratings:

50/60Hz	120 V	208V	240V	277V
Full Load	9.8A	5.6A	4.9A	4.2A
Locked Rotor	58.8A	33.6A	29.4A	25.2A
Pilot Duty	125 VA			
Resistive	22A Non Inductive			19ANI
Heating Only	2.5kW	4.5kW	5kW	

Finish: Classic beige-and-light gold standard.
White models available.

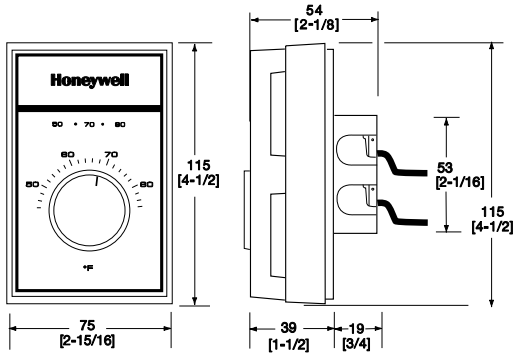
Mounting:
Mounts directly on vertical, single-gang NEMA Standard (2" x 4") electrical box.

Wiring Connections:
6" (150 mm) leadwires suitable for connecting to aluminum conductors wiring if used with approved special service CO/ALR solderless wire connectors. Leadwires color-coded red for heating, blue for cooling, black for common.

Approvals:
Canadian Standards Association Certified; File No. LR1322
Performance Certified for electric heating per C273.4A.
UL file E47434.

Accessories:
272804A Range stops and cover locking assembly (included in selected models only).
220213 Wallplate, covers old T451/T651 (1000 series) wall marks.
TG511 Thermostat guard for security and protection.

Fig. 1 — Dimensions of T451, T651 in inches (mm):



ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or your distributor, refer to the TRADELINE catalog or price sheets for complete ordering number, or specify:

1. Model
2. Electrical load(s)
3. Accessories.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Honeywell Home and Building Control Sales Office (check white pages or phone directory).
2. Home and Building Control Customer Satisfaction
   Honeywell Inc., 1885 Douglas Drive North.
   Minneapolis, MN 55422 (612) 951-1000
3. In Canada—Honeywell Limited, 35 Dynamic Drive, Toronto, ON M1V 4Z9, 1-800-405-9835.

International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

WHEN INSTALLING THIS PRODUCT:

1. Read these instructions carefully. Failure to follow instructions can damage product or cause a hazardous condition.
2. Check ratings given in instructions and on product to make sure product is suitable for your application.
3. Make sure installer is a trained, experienced service technician.
4. After completing installation, use these instructions to check out product operation.

⚠ WARNING

This thermostat is a line voltage (120 to 277 Vac) control. Do not install it unless you are completely familiar and competent with home wiring. If improperly handled there can be a risk of 240 volt electric shock hazard which may cause serious injury or death.

⚠ CAUTION

1. Disconnect power supply before making wiring connections to prevent electrical shock or equipment damage.
2. All wiring must comply with national and local codes and ordinances.
3. When using aluminum conductors, all wiring connections to this thermostat must be made to the factory installed leadwires using approved CO/ALR solderless connectors. A fire hazard may result otherwise.
4. To avoid handling the sensing element, do not remove thermostat cover until wiring is completed.
5. Thermostats are designed for use with appliances having a limit control.

New Installations

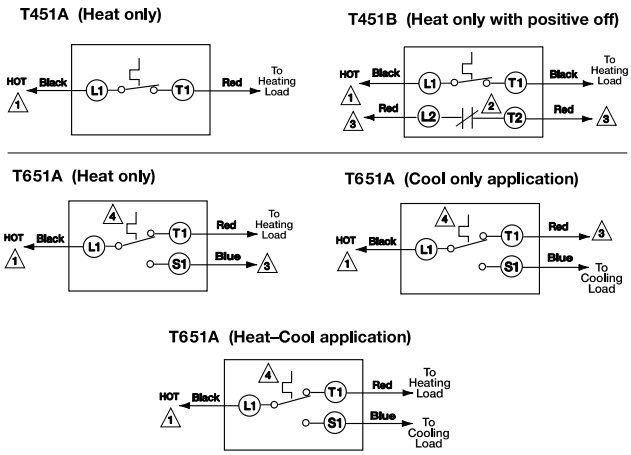
1. Install a single-gang electrical box oriented vertically about 4’ to 5’ (1.5 m) above the floor on an inside wall or pillar where the thermostat will be subjected to typical room temperature.

   NOTE: *To sense temperature properly, the thermostat must be placed away from concealed warm or cold water pipes, air ducts, or drafts from hallways, fireplaces or stairways. Do not place thermostat above convectors or in the flow from supply fans. Ideally, a thermostat should be close to the return air path to effectively measure average room temperature.*
2. Wire installation in an approved fashion.

   NOTE: *T651A and T451A do not feature a Positive Off setting, and may not be used as a disconnect switch.*
3. Leave cover on the thermostat while making wiring connections. Use solderless connectors approved for the type, number and gauge of wires being joined.

   Connect as per Fig. 2 for the appropriate application.

Fig. 2 — Wiring connections



1. Power supply; provide disconnect means and overload protection as required.
2. Breaks on Positive Off.
3. Exposed unused wires must be properly insulated.
4. Contact makes Black to Red on temperature fall; Black to Blue on temperature rise.

4. Pre-bend and push leadwires into the electrical junction box.
5. Hold the thermostat base with one hand and remove the thermostat cover by grasping two sides of the cover and pulling outward.

   NOTE: *If locking cover feature is desired, insert the locking cover clip in the thermostat base BEFORE mounting the thermostat on the wall (see Fig. 7).*
6. Using the screwdriver, secure the thermostat to the box by tightening the two mounting screws. Handle thermostat with care. Excessive pressure may damage the control knob or sensing element.

   IMPORTANT: *Before mounting the thermostat, turn the setting dial to the mid-position (indicator pointing to the top of the thermostat): this will prevent damage to the dial stop if the dial is accidentally turned by the screw driver when the top mounting screw is tightened. Do NOT press on diaphragm, diaphragm lever arm or setpoint knob to seat thermostat on the box: thermostat will be damaged.*

Replacement Applications

1. Disconnect power supply before making wiring connections to prevent electrical shocks or equipment damage. All wiring must comply with applicable codes and standards.
2. Remove the old thermostat from the wall, taking care not to damage the wiring insulation.
3. Check the old insulation for cracks, nicks or fraying. Apply certified electrical tape where necessary to insulate wires, or replace the wires in an approved fashion.
4. Complete installation following steps 3 to 6 in the New Installations section.

Check Out

Turn on power. Raise the temperature setting to energize the heating contact and break the cooling contact. The HVAC equipment should begin heating or stop cooling, as appropriate.

NOTE: For T451A and T651A models only, the thermostat will call for heat (disable cooling) when the setpoint dial is at full counter-clockwise position. This setting is the phase change point of the diaphragm's vapor fill and is independent of calibration. To de-energize the load(s), turn off power at the circuit breaker panel, or add a separate disconnect switch.

Altitude Compensation

T451, T651 units are calibrated at the factory for accuracy at 500 feet above sea level. No recalibration is needed if the switch operates at the same temperature indicated on the thermometer.

The vapor-filled diaphragm sensor is affected by barometric pressure and altitude. Deviations up to ± 1°F (1/2°C) are within normal operation. Control point drops 2°F every 1000 ft. (1°C/300 m) above sea level. See Fig. 3 for recommended action.

Fig. 3 — Altitude Correction

Elevation (in feet)	Typical City	Recommended Action
0 to 2000	Toronto, Ontario Phoenix, Arizona	Leave as is
2000 to 4000	Las Vegas, Nevada Calgary, Alberta	Move clockwise 2 to 3 marks
4000 to 6000	Denver, Colorado Salt Lake City, Utah	Move clockwise 4 to 5 marks

To Recalibrate

1. Remove cover. Set the tab on setpoint knob to the leftmost radial mark visible on top of the triangular arm that holds the dual diaphragm sensor (Fig. 4).
2. *Without rotating the knob*, remove it from the thermostat by pulling straight out, while holding the base against the wall.
3. *Now*, rotate the removed setpoint knob clockwise by the amount of temperature error. Each mark on the triangular arm represents 2°F (1°C) of adjustment. Snap the knob back onto the setpoint cam.
4. Install the cover. Wait five minutes to let the thermostat thermally stabilize and re-check calibration.
   Do not assume a thermostat is out of calibration until it has been installed and allowed to operate for several hours.

Fig. 4 — Recalibrating Thermostat

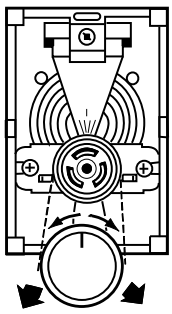
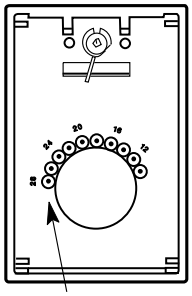


Fig. 5 — Installing Range Stops

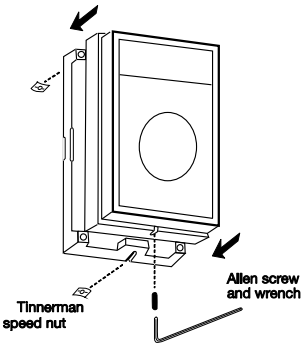


Security Features:

Range Stops

1. Set thermostat to desired setpoint. Remove cover.
2. Install plastic dowels supplied (or purchased separately) into minimum and/or maximum range stop holes on inside back of cover (Fig. 5).
3. Re-install cover. Check operation of range stops.

Fig. 6 — Cover Locking Kit



Locking Cover

1. Remove cover by pulling straight out.
2. Insert Tinnerman Speed Nut®s into slots top and bottom of thermostat base.

3 Drive Allen screw into Speed Nut until head is flush with outside edge of thermostat base.

4. Re-install cover. Lock by *backing out* Allen screw until screw body protrudes through cover hole. To unlock cover, drive Allen screw *into* thermostat base.

Home and Building Control
Honeywell Inc.
1985 Douglas Drive North
Golden Valley, MN 55422

Home and Building Control
Honeywell Limited-Limitée
35 Dynamic Drive
Toronto, ON M1V 4Z9

Honeywell

No Exception Taken

HVAC/R
Service Products
REFCO

Condensate Pump

Gobi II

Quiet mode:
Installer configurable pump performance using dip-switches to optimize each individual installation for the best performance and sound parameters.

Diagnostic LED:
Patented two color long-life LED to ensure correct inital installation and to assist in diagnostics on future service calls.

USB connection:
Patented access for wholesalers or installing contractors to review pump history.

Digital sensor:
Unique digital water level sensor with no moving parts to get stuck or clogged.

Universal application:
Widest application range for exposed mount pumps in the market from 6,000 Btu/H to 120,000 Btu/H (1.75kW to 35kW).

Integrated replaceable 10 A fuse:
Factory installed replaceable 5 × 20 mm HRC 10A fuse for NO or NC alarm relay operation.

Mode silencieux :
Puissance de la pompe configurables à l'installation à l'aide de commutateurs permettant d'optimiser chaque mise en service, pour un rendement et un niveau sonore optimal.

LED de diagnostic :
LED longue durée bicolore brevetée pour une installation initiale correcte et une aide au diagnostic des pannes.

Connexion USB :
Accès breveté pour les distributeurs et installateurs, afin de consulter l'historique de la pompe.

Sonde numérique :
Sonde numérique de niveau d'eau, sans pièces mobiles pour éviter tous risques de blocage ou d'obstruction.

Utilisation universelle :
La pompe à montage externe/interne la plus polyvalente du marché, de 1,75 kW à 35 kW (de 6 000 Btu/H à 120 000 Btu/H).

Relais d'alarme à fusible intégré :
Fusible HRC 10 A remplaçable en usine de 5 × 20 mm pour fonctionnement d'alarme relais en NO ou NC.

Technical specification Gobi II

Power rating:	100 – 240V, 50–60 Hz, 8W Class II
Alarm relay:	Interchangeable NO or NC, rated 250V, 10A Max or 28VDC, 10AMax
Minimum flow rate:	42 l/hr. (11 GPH)
Maximum suction:	3.0 m (10 ft.)
Maximum head:	20.0 m (65.60 ft.)
Sound:	20dBA at 1 m (3 ft.) / 19dBA at 1 m EN ISO 3744:2010
Discharge star tube:	6.25 mm (1/4") ID, 1m (3.3 ft.) in length
Overall dimensions:	250 x 340 x 54 mm (9.84 x 11.81 x 2.1 inches)
Bulk pack:	10 Pcs dimensions are 590 x 265 x 365 mm (23.2 x 10.4 x 14.4 inches)
Color:	RAL #9003 white
Weight:	600g (1.3 lbs.)
Operation temperature:	Ambient & water 5–40ºC (41–104ºF)
Compliance:	Conforms to UL: 778 and Certified to CSA C22.2 #68

SAFETY INSTRUCTIONS

The Gobi II Condensate pump is to be installed in accordance with local and regional electrical codes.

Save these instructions for further reference.

The following symbols related to safety are used on the product or throughout the product documentation

WARNING/CAUTION
An appropriate safety instruction should be followed or caution to a potential hazard exists.

DANGEROUS VOLTAGE
To indicate hazards arising from dangerous voltages.

WARNING: Please read all safety instructions and the installation instructions completely before commencing.
To prevent any risk only certified and appropriately trained staff with sufficient technical training and tools shall install this product.
Product installation and electrical connections both require professional training for safe installation and correct product operation.

WARNING: Disconnect all electrical power before starting installation, maintenance, or service work.

WARNING: Disconnect electrical power before removing and checking internal fuse.

CAUTION: This pump is not submersible and for indoor use and connection only.

CAUTION: Do not install The REFCO condensate pump if there are any signs of damage.

WARNING: Check the cables REFCO condensate pump power and alarm cords prior to, during and periodically for signs of damage.
If either the power or alarm cords are damaged, isolate and disconnect the condensate pump from service. Contact REFCO for a replacement.

** The Gobi II combined power/alarm cable lead-out is non-replaceable. If this is damaged the entire pump must be replaced.

WARNING: The REFCO condensate pump cables should not be cut, and should be routed so that they cannot be damaged during and after installation.

CAUTION: All tubing connections are to be secured in place on the barb connections using self-locking cable tie-wraps.

DO NOT use tools to connect the tubing.

DO NOT operate this product in ambient temperatures below 5 ºC (41 ºF).

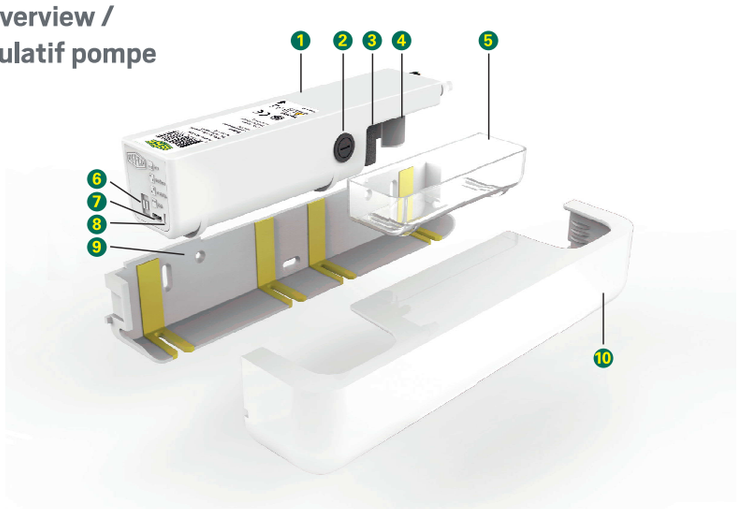
DO NOT operate with incoming water above a temperature of 40 ºC (104 ºF).

CAUTION: Do not allow any chemicals to come in contact with this condensate pump. Please remove the pump and water sensor before using any coil cleaning solutions and other chemicals. Flush the evaporator coils with water before re-installing the condensate pump and water sensor.

Ensure the coils are chemical free before reinstallation.

CAUTION: In all installations where any property damage and or personal injury may result from an inoperative, failed, incorrectly installed or leaking condensate pump, it is strongly recommended that the alarm relay shall be used in fail-safe mode to completelyshut down the air conditioning unit, should a pump failure occur.

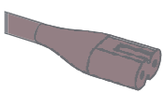
Pump Overview / Récapitulatif pompe



1. Pump body / Corps de la pompe
2. Factory-installed fuse / Fusible installé en usine
3. Replaceable filter / Filtre interchangeable
4. Digital sensor / Sonde numérique
5. Water tray / Bac à eau
6. Dip-switches / Commutateurs
7. USB port / Port USB
8. Diagnostic LED / LED de diagnostic
9. Wall back plate / Plaque de protection arrière
10. Cover / Couvercle

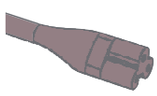
Accessories Supplied / Accessoires fournis

11



Power cable / Câble d'alimentation
Type: SJT/AWM 2103, 2x18 AWG, 105 °C, VW-1
Part No. / Référence 3004008

12

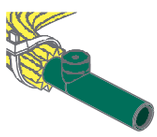


Alarm cable / Câble d'alarme
Part No. / Référence 3004006

13

Screws, 3 pcs. /
Vis, 3 pces.

14



Star tube and Stop-Siphon device /
Tuyaux de condensats étoilé et clapets anti-retour
Part No. / Référence 3004065

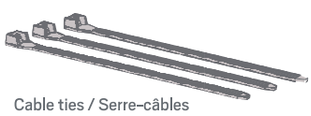
15

Alarm relay HRC 10A fuse /
Fusible HRC 10 amp. installé en usine
Part No. / Référence 3004050

16

Screw anchors, 3 pcs /
Chevilles, 3 pces.

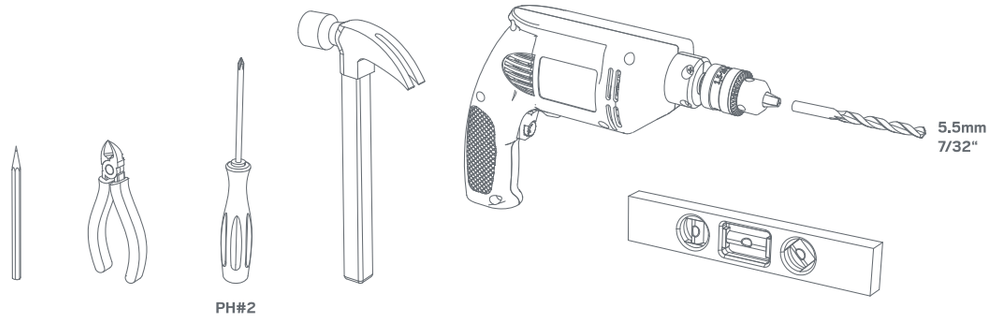
17



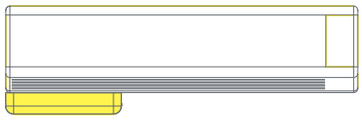
Cable ties / Serre-câbles

18

Wire nut / Connecteur
Indoor use only /
Uniquement utilisation intérieure



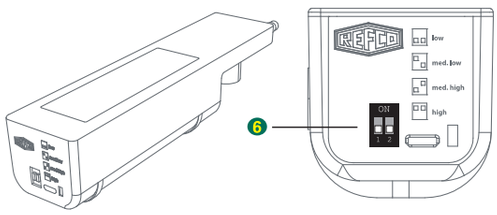
Application / Installation



The Gobi II pump can be mounted on the right or left side of an evaporator unit.

La pompe Gobi II peut être installée sur le côté droit ou sur le côté gauche du climatiseur.

1



low
up to 18K Btu/h
(5.3kW)

faible
jusqu'à 18K Btu/h
(5.3kW)

medium low
up to 42K Btu/h
(12kW)

moyen faible
jusqu'à 42K Btu/h
(12kW)

medium high
up to 72K Btu/h
(21.1kW)

moyen élevé
jusqu'à 72K Btu/h
(21.1kW)

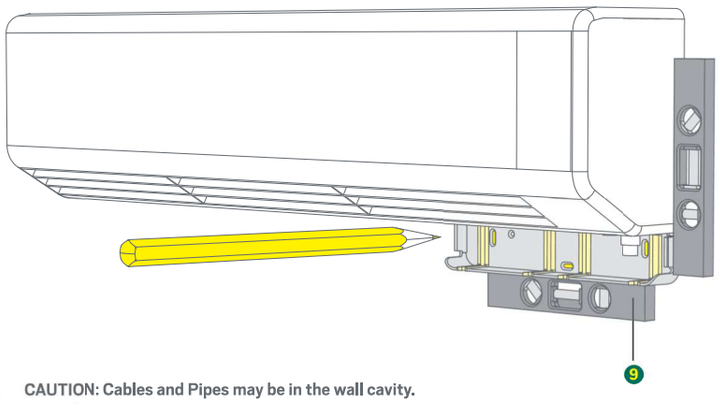
high
up to 120K Btu/h
(35kW)

pleine puissance
jusqu'à 120K Btu/h
(35kW)

Ratings for air conditioning units

Réglages pour climatiseurs

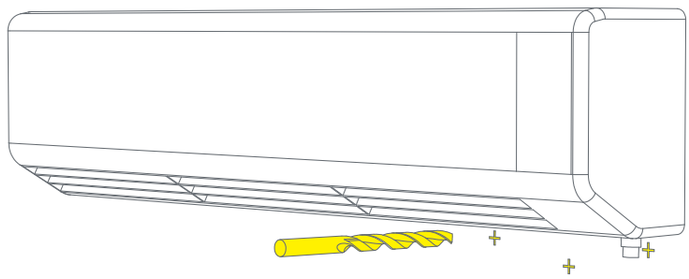
2 Locate the wall plate / Repèrer sur le mur



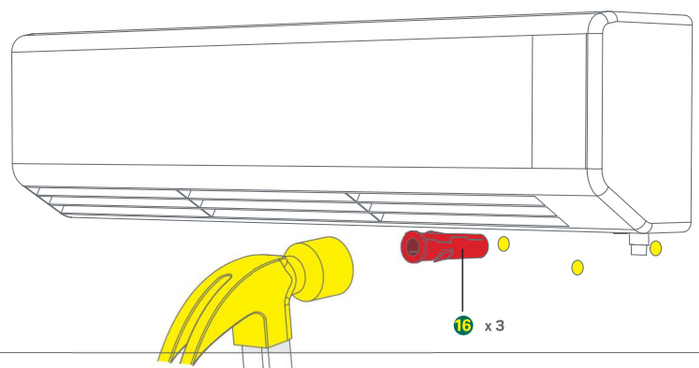
CAUTION: Cables and Pipes may be in the wall cavity.
Be carfull while drilling anchors.

ATTENTION : Les câbles et les tuyaux peuvent se trouver dans la cavité murale.
Soyez vigilant pendant le perçage.

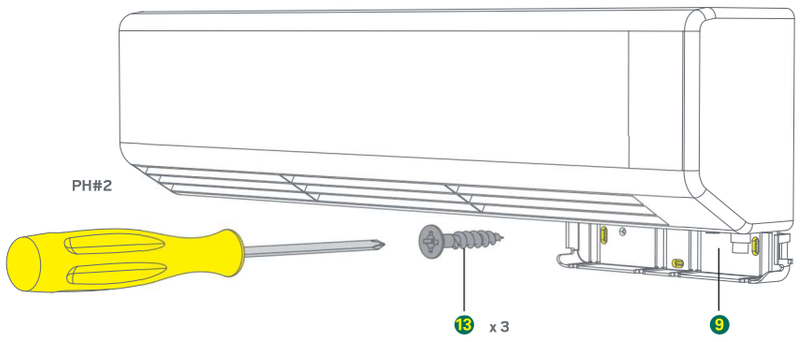
3



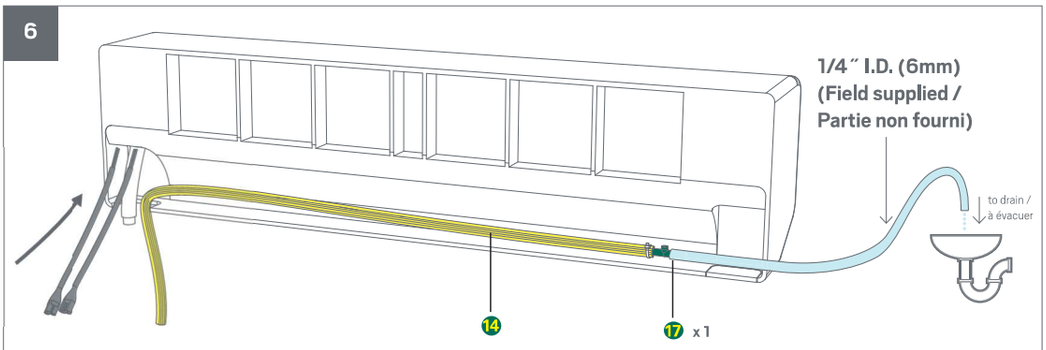
4



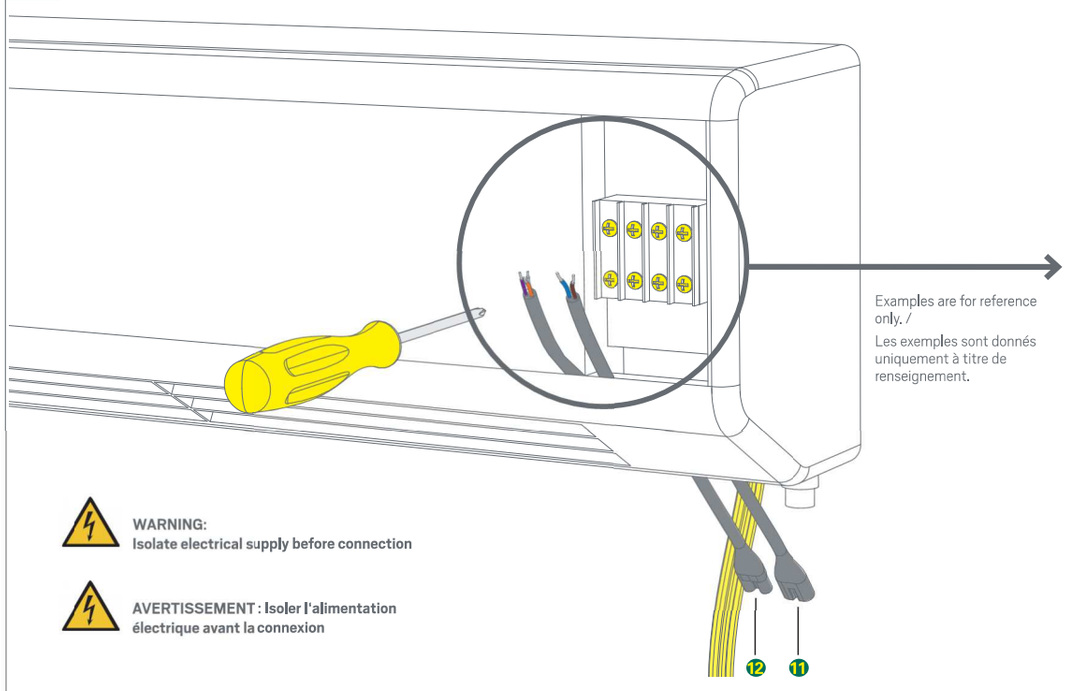
5



6



7



Examples are for reference only. /
Les exemples sont donnés uniquement à titre de renseignement.

WARNING:
Isolate electrical supply before connection

AVERTISSEMENT : Isoler l'alimentation électrique avant la connexion

To change Alarm Relay Operation:

1. Unplug pump
2. Move DIP switch positions to 
3. Plug pump in
4. Wait for one green LED blink 
5. Move DIP switch positions to 
6. Wait for one red LED blink 
7. Reset DIP switch positions to 
8. Wait for one green LED blink 
9. Unplug pump
10. Set the DIP switches back to the desired capacity configuration. (Low, Medium-Low, Medium-High, High)
11. Plug Pump in and check that power up LED sequence matches the desired alarm relay operation
12. Done.

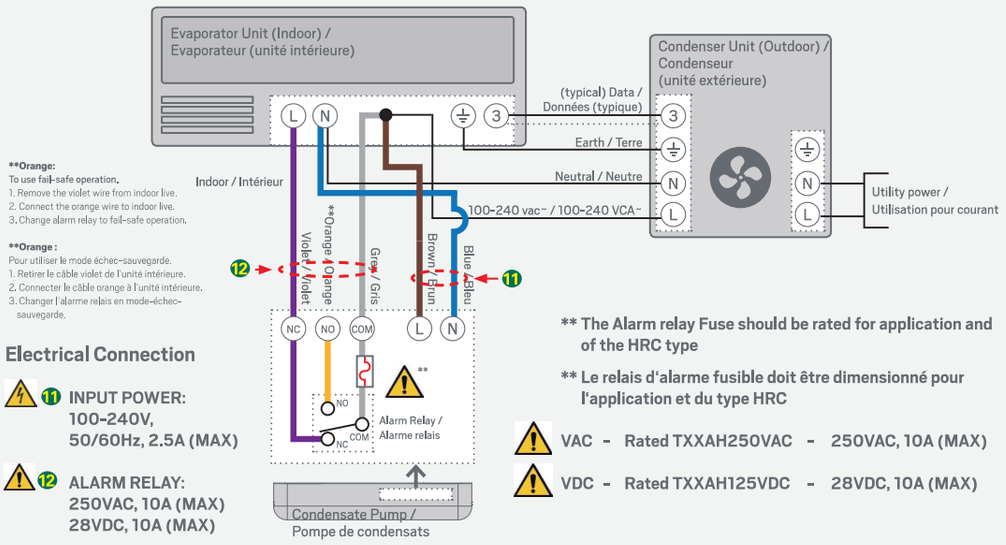
To reset default alarm relay operation repeat steps 1 thru 11.

Pour modifier le mode Alarme-relais :

1. Débrancher la pompe
2. Modifier les commutateurs sur 
3. Brancher la pompe
4. Attendre que la LED verte clignote 
5. Modifier les commutateurs sur 
6. Attendre que la LED rouge clignote 
7. Remettre les commutateurs comme cela 
8. Attendre le clignotement de la LED verte 
9. Débrancher la pompe
10. Régler les commutateurs sur la puissance désirée (Basse, Moyenne-basse, Moyenne-haute, Haute)
11. Brancher la pompe et verifier que la sequence LED correspondent au mode Alarme-relais
12. C'est fait.

Pour redémarrer le mode défaut Alarme-relais, répéter les étapes de 1 à 11.

When Indoor Evaporator Unit is powered from the Outdoor Condenser Unit /
Dans le cas où l'évaporateur intérieur est alimenté par un condenseur extérieur



Orange:
To use fail-safe operation,
1. Remove the violet wire from indoor live.
2. Connect the orange wire to indoor live.
3. Change alarm relay to fail-safe operation.

Orange :
Pour utiliser le mode échec-sauvegarde.
1. Retirer le câble violet de l'unité intérieure.
2. Connecter le câble orange à l'unité intérieure.
3. Changer l'alarme relais en mode-échec-sauvegarde.

Electrical Connection

⚠ 11 **INPUT POWER:**
100-240V,
50/60Hz, 2.5A (MAX)

⚠ 12 **ALARM RELAY:**
250VAC, 10A (MAX)
28VDC, 10A (MAX)

** The Alarm relay Fuse should be rated for application and of the HRC type

** Le relais d'alarme fusible doit être dimensionné pour l'application et du type HRC

⚠ VAC - Rated TXXAH250VAC - 250VAC, 10A (MAX)

⚠ VDC - Rated TXXAH125VDC - 28VDC, 10A (MAX)

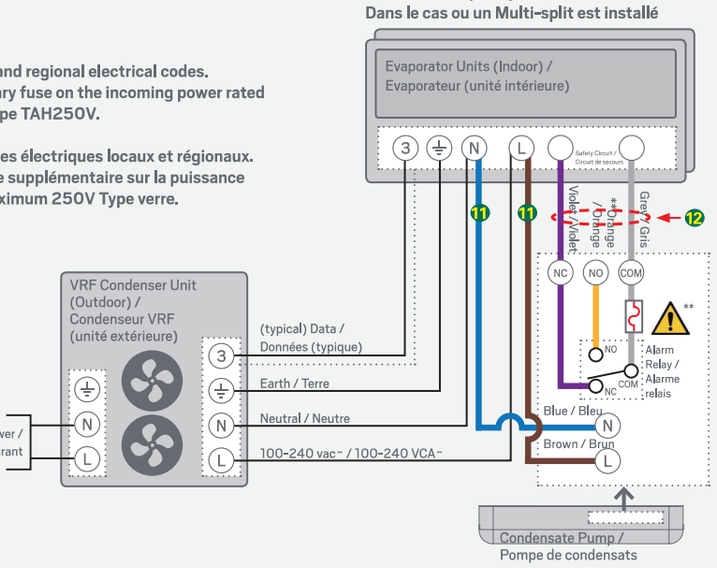
Please refer to all safety and installation instructions and isolate first.

Veuillez en premier vous référer à toutes les instructions de sécurité, d'installation et d'isolement.

Install in accordance with local and regional electrical codes.
If required install a supplementary fuse on the incoming power rated at maximum 200mA 250vac type TAH250V.

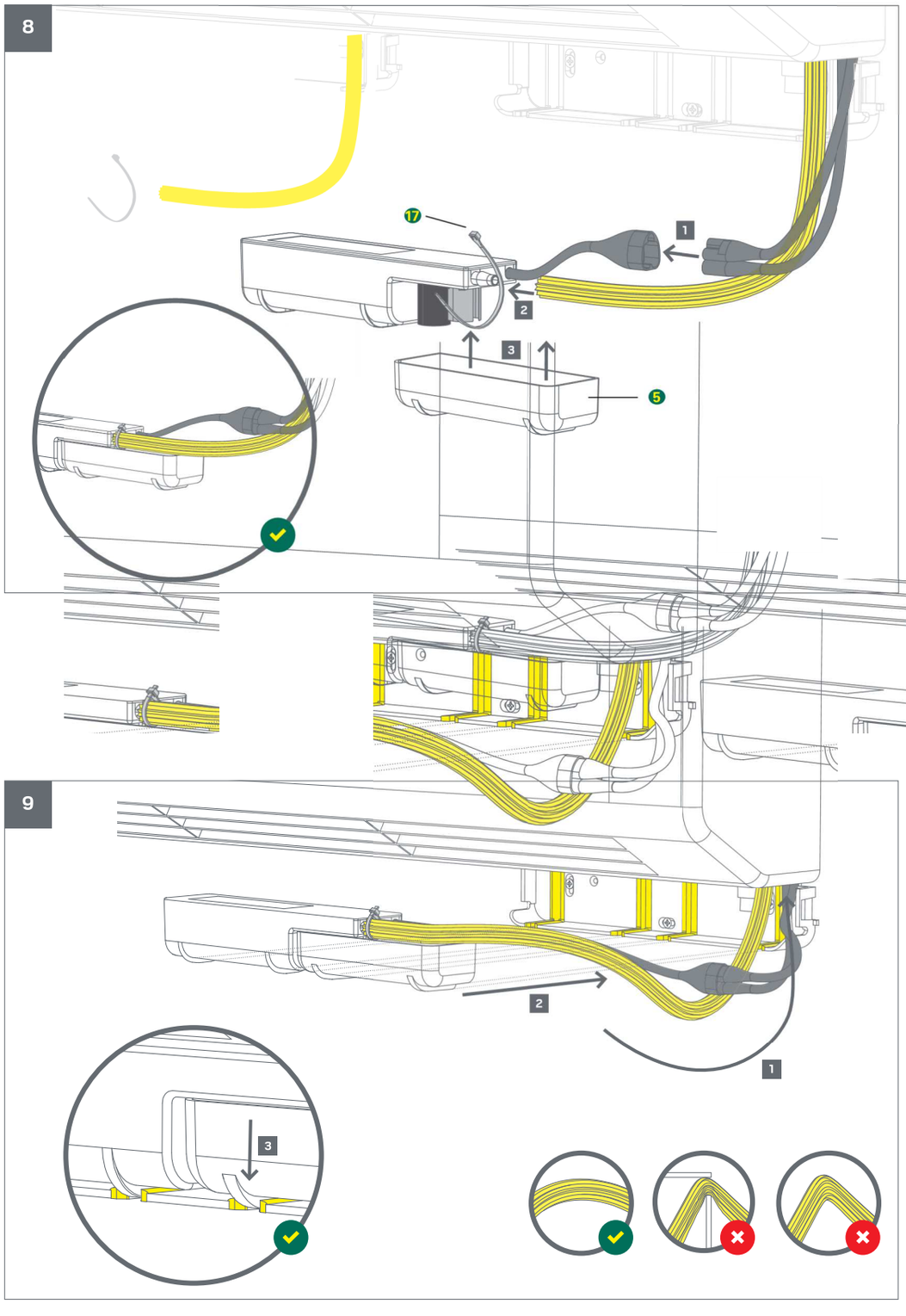
Installez conformément aux codes électriques locaux et régionaux.
Si nécessaire installez un fusible supplémentaire sur la puissance d'entrée nominale à 200mA maximum 250V Type verre.

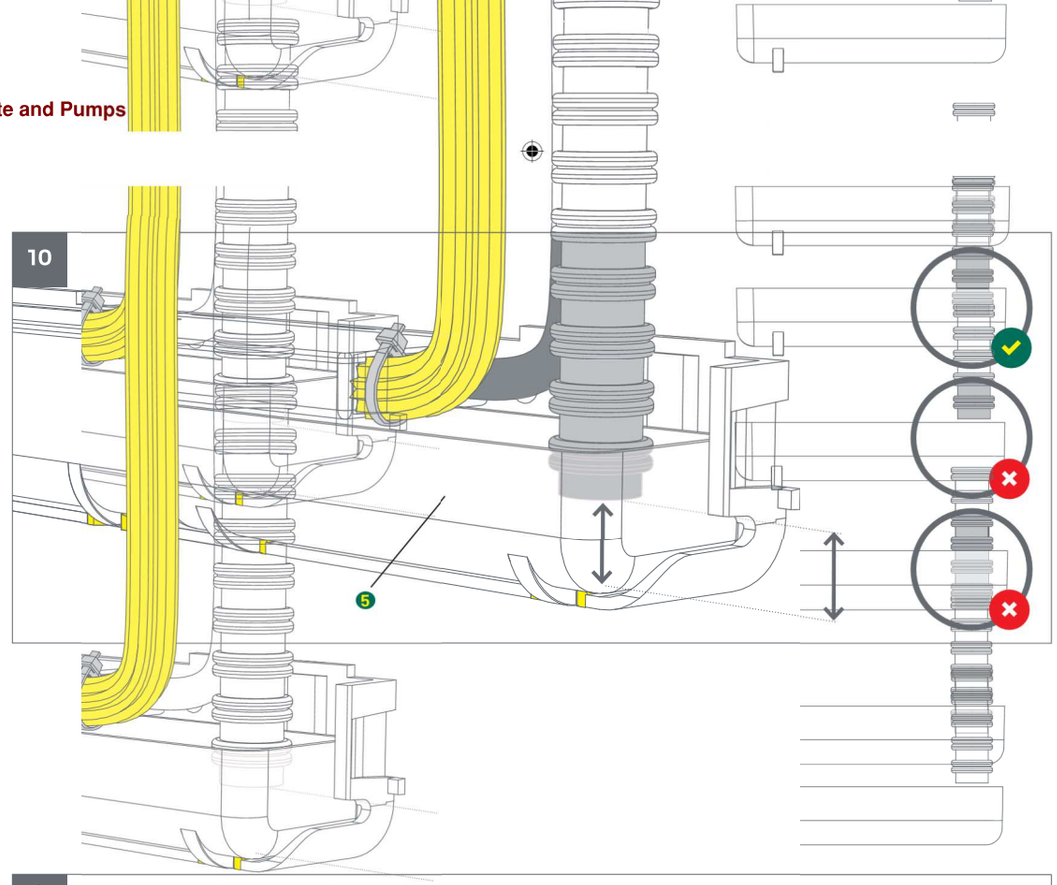
When Multi-Split System is installed /
Dans le cas ou un Multi-split est installé



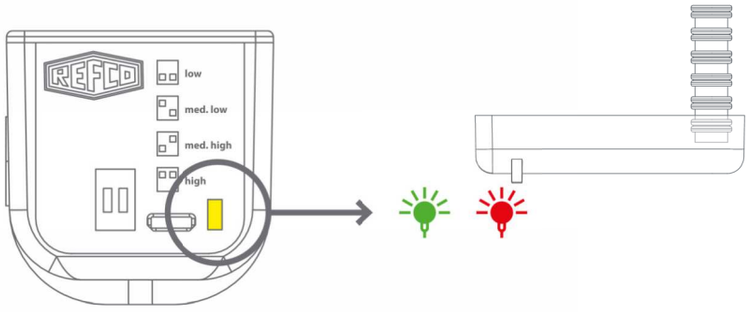
Orange:
To use fail-safe operation,
1. Remove the violet wire from indoor live.
2. Connect the orange wire to indoor live.
3. Change alarm relay to fail-safe operation.

Orange :
Pour utiliser le mode échec-sauvegarde.
1. Retirer le câble violet de l'unité intérieure.
2. Connecter le câble orange à l'unité intérieure.
3. Changer l'alarme relais en mode-échec-sauvegarde.





LED Alarm Relay Indications / Relais d'alarme indication

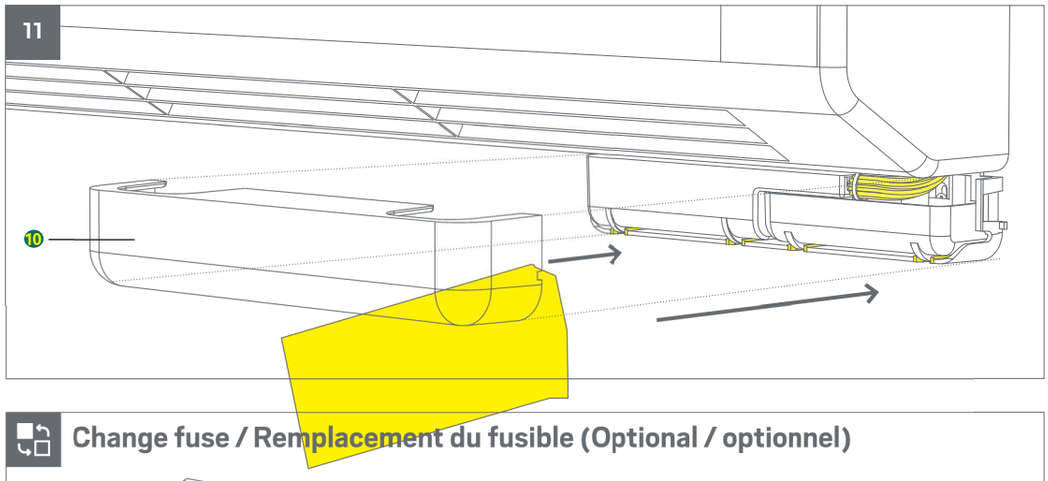


Start Up Sequence / Séquence de démarrage		N/C	N/O
Pump Status / Etat de la pompe	**Condensate Level / Niveau condensation**	**Default Operation / Mode défaut**	**Fail-Safe Operation / Mode échec sauvegarde**
Not powered / Non alimentation	N/A	NO COM NC	NO COM NC
Powered / Alimenté	Below Alarm Level / En dessous du niveau d'alarme	NO COM NC	NO COM NC
Powered / Alimenté	Alarm-Activated / Alarme activée	NO COM NC	NO COM NC

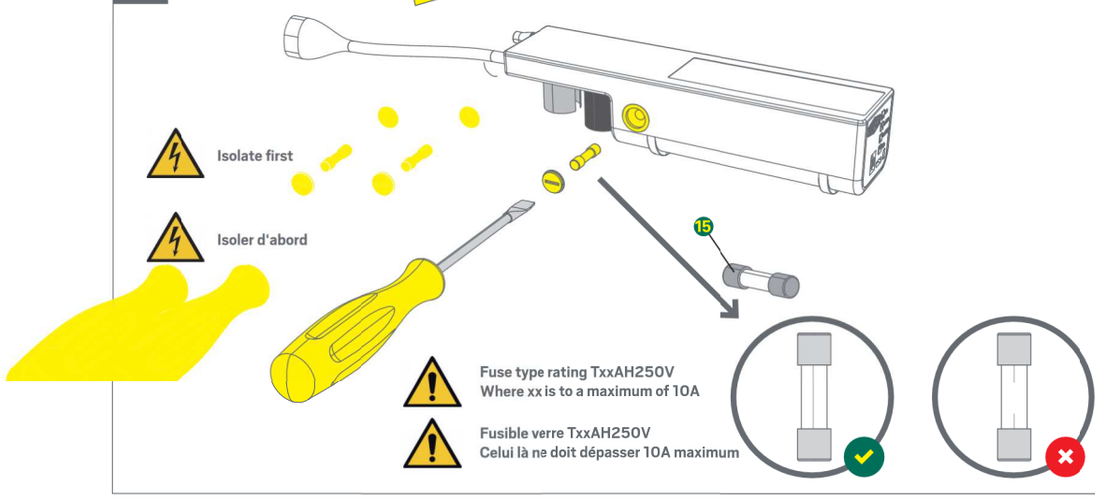
LED Indications in Operation / Indications de LED en fonctionnement

No Power / Pas de courant	
Power up LED sequence (default) N/C / Séquence LED d'allumage (default) N/C	
Or / Ou	
Power up LED sequence (Fail Safe) N/O / Séquence LED d'allumage (Fail Safe) N/O	
Standby waiting for water / Veille en attente d'eau	
Pumping water / Pompage de l'eau	
High water level mode / Mode niveau d'eau élevé	
Alarm relay activated / Relais d'alarme activé	
Reconfigure code / Code de reconfiguration	

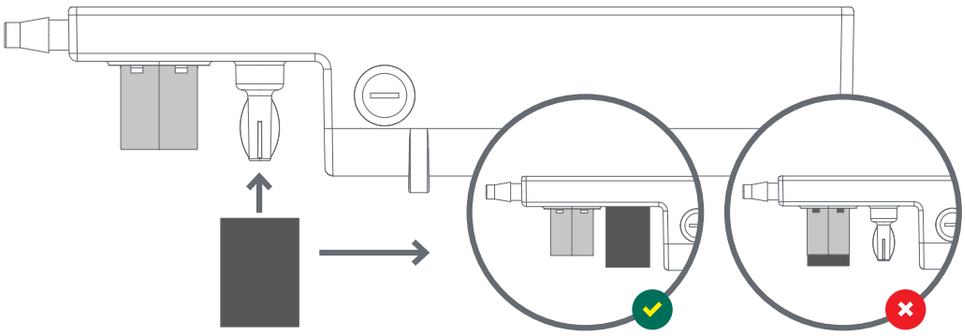
11



Change fuse / Remplacement du fusible (Optional / optionnel)

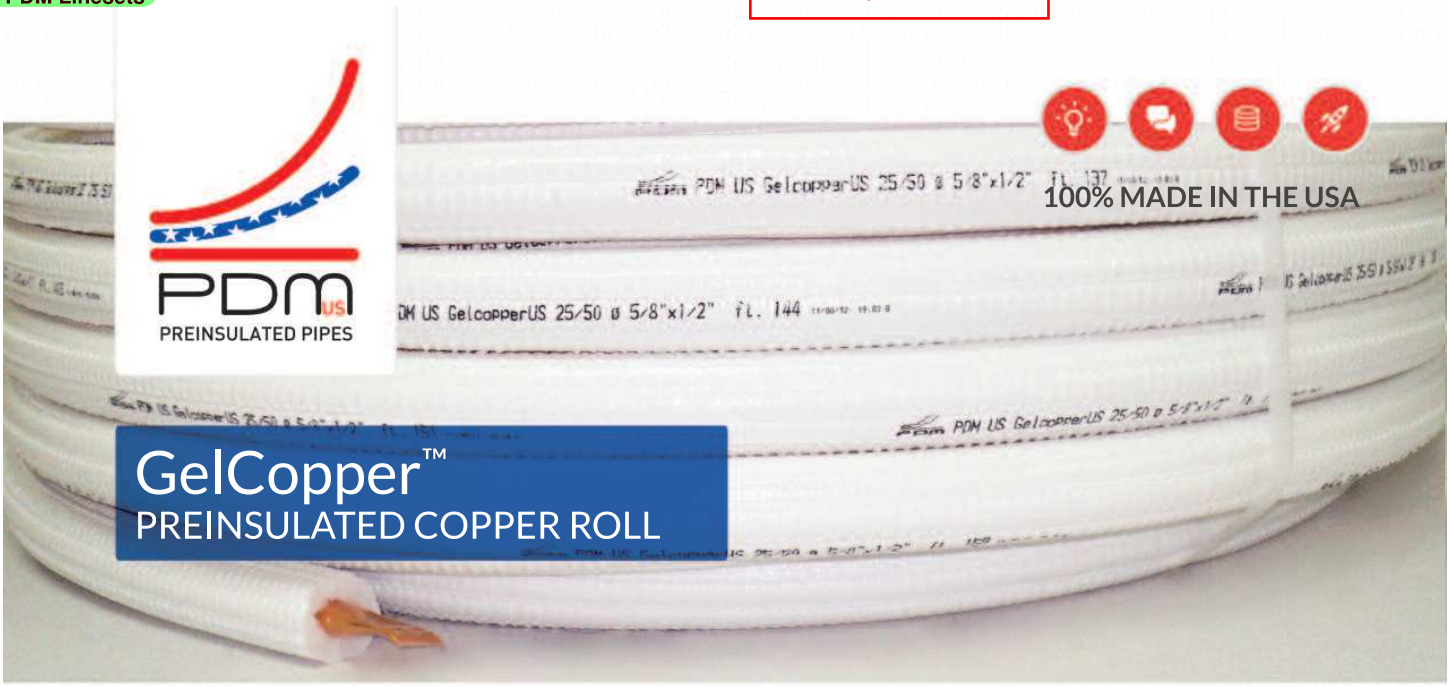


Change filter / Remplacement du filtre



23 23 00
Refrigeration Piping
PDM Linesets

No Exception Taken



APPLICATIONS

Individual preinsulated rolls that perfectly fits every air conditioning, such as ductless mini-splits, VRF, heat pumps and unitary systems. Available in 50 ft and 164 ft with 1/2", 3/4" or 1" insulation thickness. All rolls are marked by the foot for proper line charging and maximum waste reduction.

TECHNICAL SPECS

INSULATION

Polyethylene closed cell foam: assures thermal insulation from surroundings
ASTM C 1427-07 compliant
Type I (tubular)
Grade I (insulation material for use on typical commercial system non-crosslinked)
Low-density polyethylene foam: closed cells foam, CFC and HCFC gas free
Water vapor permeability: ASTM E96-00 compliant
Working temperature: ASTM C 1427-07 compliant
Wall thickness: 1/2", 3/4" and 1"
Surface burning characteristics: UL 94, top rated – UL 723, ASTM E84 (25/50) compliant, flame and Spread Index less than 25 and Smoke Development Index less than 50 as tested according to UL 723
R-Value: between 9.0 and 4.0 (depending on pipe diameter and insulation thickness)

COPPER

Pipes: Manufactured according to ASTM B280
Copper: No. C122200 DHP (phosphorous deoxidized, high residual phosphorous), 99.90%

SPECIAL FEATURES

Outer Jacket: additional white polyethylene jacket cover protects foam insulation from tearing during installation process
Foot Marking: insulation incrementally marked by every foot to ensure accurate initial unit charge and reduce copper waste.
R410: Gelcopper can be used in applications where high-pressure gases are used as refrigeration source
Anti UV: This product is 100% Anti UV and successfully tested against any related degradation, discoloration or deterioration for a minimum of 3 years
Paintable: the insulation can be painted to match the surroundings
Infinitek-ready: product can be ordered with Infinitek technology for the ultimate in copper durability. Please refer to pages 3-4 for additional information about Infinitek.

PDM US recommends using a high quality exterior paint for added protection when installed in exposed exterior areas. Installation under plastic duct is recommended to protect from severe weather conditions, accidental damages, or theft.

TRY IT, LOVE IT.

PRODUCT TABLE

PDM US PART NUMBER	COIL SIZE	INSULATION	COILS (per pallet)	LENGTH (of coils)
F100.GUS145012	1/4	1/2	26	50 FT
F100.GUS385012	3/8	1/2	22	50 FT
F100.GUS125012	1/2	1/2	20	50 FT
F100.GUS585012	5/8	1/2	14	50 FT
F100.GUS345012	3/4	1/2	14	50 FT
F100.GUS785012	7/8	1/2	14	50 FT
F100.GUS1185012	1-1/8	1/2	6	50 FT
F100.GUS1416412	1/4	1/2	10	164 FT
F100.GUS3816412	3/8	1/2	8	164 FT
F100.GUS1216412	1/2	1/2	8	164 FT
F100.GUS5816412	5/8	1/2	6	164 FT
F100.GUS348212	3/4	1/2	10	82 FT
F100.GUS788212	7/8	1/2	10	82 FT
F100.GUS145034	1/4	3/4	14	50 FT
F100.GUS385034	3/8	3/4	14	50 FT
F100.GUS125034	1/2	3/4	12	50 FT
F100.GUS585034	5/8	3/4	12	50 FT
F100.GUS345034	3/4	3/4	10	50 FT
F100.GUS785034	7/8	3/4	10	50 FT
F100.GUS1450100	1/4	1	12	50 FT
F100.GUS3850100	3/8	1	10	50 FT
F100.GUS1250100	1/2	1	10	50 FT
F100.GUS5850100	5/8	1	10	50 FT
F100.GUS3450100	3/4	1	8	50 FT
F100.GUS7850100	7/8	1	8	50 FT

No Exception Taken

HVAC
DUCT CONSTRUCTION
SUBMITTAL PACKAGE

Emerald Aire, Inc. is the contractor and the manufacturer fabricating the duct system per SMACNA and HVAC Duct Construction Standards 2005.

Materials and gauge:	2" and under.
Pressure class:	2" and under.
Transverse joint length and reinforce rigidity class with designated joint "T" number of proprietary duct connection utilized for each system:	Per 2005 SMACNA Standards
Type of longitudinal seam:	Snap lock and Pittsburgh
Joint construction:	2" and under pressure class
Fitting construction:	2" and under pressure class
Support methods:	Table 4.1, 4.2 SMACNA 2005 Edition
Sealant and gasket:	Type 'C'

Maximum Half of Duct Perimeter	Pair at 10 ft Spacing		Pair at 8 ft Spacing		Pair at 5 ft Spacing		Pair at 4 ft Spacing	
	Strap	Wire/ Rod	Strap	Wire/ Rod	Strap	Wire/ Rod	Strap	Wire/ Rod
P/2 = 30"	1" × 22 ga	10 ga (.135")	1" × 22 ga	10 ga (.135")	1" × 22 ga	12 ga (.106")	1" × 22 ga	12 ga (.106")
P/2 = 72"	1" × 18 ga	⅜"	1" × 20 ga	¼"	1" × 22 ga	¼"	1" × 22 ga	¼"
P/2 = 96"	1" × 16 ga	⅜"	1" × 18 ga	⅜"	1" × 20 ga	⅜"	1" × 22 ga	¼"
P/2 = 120"	1½" × 16 ga	½"	1" × 16 ga	⅜"	1" × 18 ga	⅜"	1" × 20 ga	¼"
P/2 = 168"	1½" × 16 ga	½"	1½" × 16 ga	½"	1" × 16 ga	⅜"	1" × 18 ga	⅜"
P/2 = 192"	Not Given	½"	1 ½ " × 16 ga	½"	1" × 16 ga	⅜"	1" × 16 ga	⅜"
P/2 = 193" up	Special Analysis Required							

When Straps are Lap Joined Use These Minimum Fasteners:	Single Hanger Maximum Allowable Load	
	Strap	Wire or Rod (Dia.)
1" × 18, 20, 22 ga -two #10 or one ¼" bolt 1" × 16 ga -two ¼" dia. 1½" × 16 ga -two ⅜" dia Place fasteners in series, not side by side.	1" × 22 ga - 260 lbs. 1" × 20 ga - 320 lbs. 1" × 18 ga - 420 lbs. 1" × 16 ga - 700 lbs. 1½" × 16 ga - 1100 lbs.	0.106" - 80 lbs. 0.135" - 120 lbs. 0.162" - 160 lbs. ¼" - 270 lbs. ⅜" - 680 lbs. ½" - 1250 lbs. ⅝" - 2000 lbs. ¾" - 3000 lbs.

Table 5–1 Rectangular Duct Hangers Minimum Size

NOTES:

a. Dimensions other than gage are in inches.

b. Tables allow for duct weight, 1 lb./sf insulation weight and normal reinforcement and trapeze weight, but no external loads!

c. For custom design of hangers, designers may consult SMACNA's *Rectangular Industrial Duct Construction Standards,* the AISI *Cold Formed Steel Design Manual* and the AISC Steel *Construction Manual.*

d. Straps are galvanized steel; other materials are uncoated steel.

e. Allowable loads for P/2 assume that ducts are 16 ga maximum, except that when maximum duct dimension (w) is over 60 in. then P/2 maximum is 1.25 w.

f. For upper attachments *see* Figs. 5-2, 5-3 and 5-4.

g. For lower attachments *see* Fig. 5-5.

h. For trapeze sizes *see* Table 5-3 and Fig. 5-6.

i. 12, 10, or 8 ga wire is steel of black annealed, bright basic, or galvanized type.

j. Cable hanging systems with adjustable mechanical device.

Dia.	Maximum Spacing	Wire Dia.	Rod	Strap
10 in. dn 250 mm dn	12 ft 3.7 m	One 12 ga One 2.75 mm	¼ in. 6.4 mm	1 in. × 22 ga 25.4 x 0.85 mm
11-18 in. 460 mm	12 ft 3.7 m	Two 12 ga or One 8 ga One 4.27 mm	¼ in. 6.4 mm	1 in. × 22 ga 25.4 × 0.85 mm
19-24 in. 610 mm	12 ft 3.7 m	Two 10 ga Two 3.51 mm	¼ in. 6.4 mm	1 in. × 22 ga 25.4 × 0.85 mm
25-36 in. 900 mm	12 ft 3.7 m	Two 8 ga Two 2.7 mm	⅜ in. 9.5 mm	1 in. × 20 ga 25.4 × 1.00 mm
37-50 in. 1270 mm	12 ft 3.7 m	→	Two ⅜ in. Two 9.5 mm	Two 1 in. × 20 ga (2) 25.4 × 1.00 mm
51-60 in. 1520 mm	12 ft 3.7 m	→	Two ⅜ in. Two 9.5 mm	Two 1 in. × 18 ga (2) 25.4 × 1.31 mm
61-84 in. 2130 mm	12 ft 3.7 m	→	Two ⅜ in. Two 9.5 mm	Two 1 in. × 16 ga (2) 25.4 × 1.61 mm
85-96 in. 2400 mm	12 ft 3.7 m	→	Two ½ in. Two 12 mm	Two 1½ in. × 16 ga (2) 38 × 1.61 mm

Table 5–2 Minimum Hanger Sizes for Round Duct

NOTES:

a. Straps are galvanized steel; rods are uncoated or galvanized steel; wire is black annealed, bright basic or galvanized steel. All are alternatives.

b. *See* Figure 5-5 for lower supports.

c. *See* Figs. 5-2, 5-3 and 5-4 for upper attachments.

d. Table allows for conventional wall thickness, and joint systems plus one lb./sf (4.89 Kg/m^2) insulation weight. If heavier ducts are to be installed, adjust hanger sizes to be within their load limits; see allowable loads with Table 5-1. Hanger spacing may be adjusted by special analysis.

e. Designers: For industrial grade supports, including saddles, single point trapeze loads, longer spans and flanged joint loads, *see* SMACNA's *Round Industrial Duct Construction Standards.*

f. *See* Figs. 3-9 and 3-10 for flexible duct supports.

Neg. Pressure 2 in. wg	Stiffener Spacing											
	Unstiff.		20 ft		12 ft		10 ft		6 ft		5 ft	
Diameter, in.	GA	R	GA	R	GA	R	GA	R	GA	R	GA	R
4	28	NR	28	A	28	A	28	A	28	A	28	A
6	28	NR	28	A	28	A	28	A	28	A	28	A
8	28	NR	28	A	28	A	28	A	28	A	28	A
10	28	NR	28	A	28	A	28	A	28	A	28	A
12	26	NR	28	A	28	A	28	A	28	A	28	A
14	24	NR	28	A	28	A	28	A	28	A	28	A
16	24	NR	26	A	28	A	28	A	28	A	28	A
18	22	NR	26	A	28	A	28	A	28	A	28	A
20	22	NR	24	A	28	A	28	A	28	A	28	A
22	22	NR	24	A	26	A	28	A	28	A	28	A
24	20	NR	24	A	26	A	26	A	28	A	28	A
30	18	NR	22	A	24	A	26	A	28	A	28	A
36	16	NR	22	A	24	A	24	A	26	A	28	A
42	16	NR	22	A	22	A	24	A	26	A	26	A
48	N/A	NR	20	B	22	A	22	A	24	A	26	A
54	N/A	NR	20	B	22	B	22	A	24	A	24	A
60	N/A	NR	20	B	22	B	22	B	24	A	24	A
66	N/A	NR	18	C	20	B	22	B	24	B	24	A
72	N/A	NR	18	C	20	B	20	B	22	B	24	B
78	N/A	NR	18	D	20	C	20	C	22	B	22	B
84	N/A	NR	18	E	20	C	20	C	22	B	22	B
90	N/A	NR	18	E	18	D	20	C	22	B	22	B
96	N/A	NR	18	E	18	E	20	D	22	C	22	B

Table 3–6 Min. Required Gage for Longitudinal Seam Duct Under Neg. Pressure

NOTES:

a. N/A – Not Applicable

b. NR – Not Required

c. R – Reinforcement (stiffener) Class

Diameter, in.	Longitudinal Seam	Spiral Seam
4	28	28
6	28	28
8	28	28
10	28	28
12	28	28
14	28	28
16	26	26
18	26	26
20	24	26
22	24	26
24	24	26
30	22	24
36	22	24
42	22	24
48	20	22
54	20	22
60	20	22
66	18	22
72	18	20
78	18	20
84	18	20
90	18	20
96	18	20

Table 3–5 Round Duct Gage Unreinforced Positive Pressure To 10 in. wg

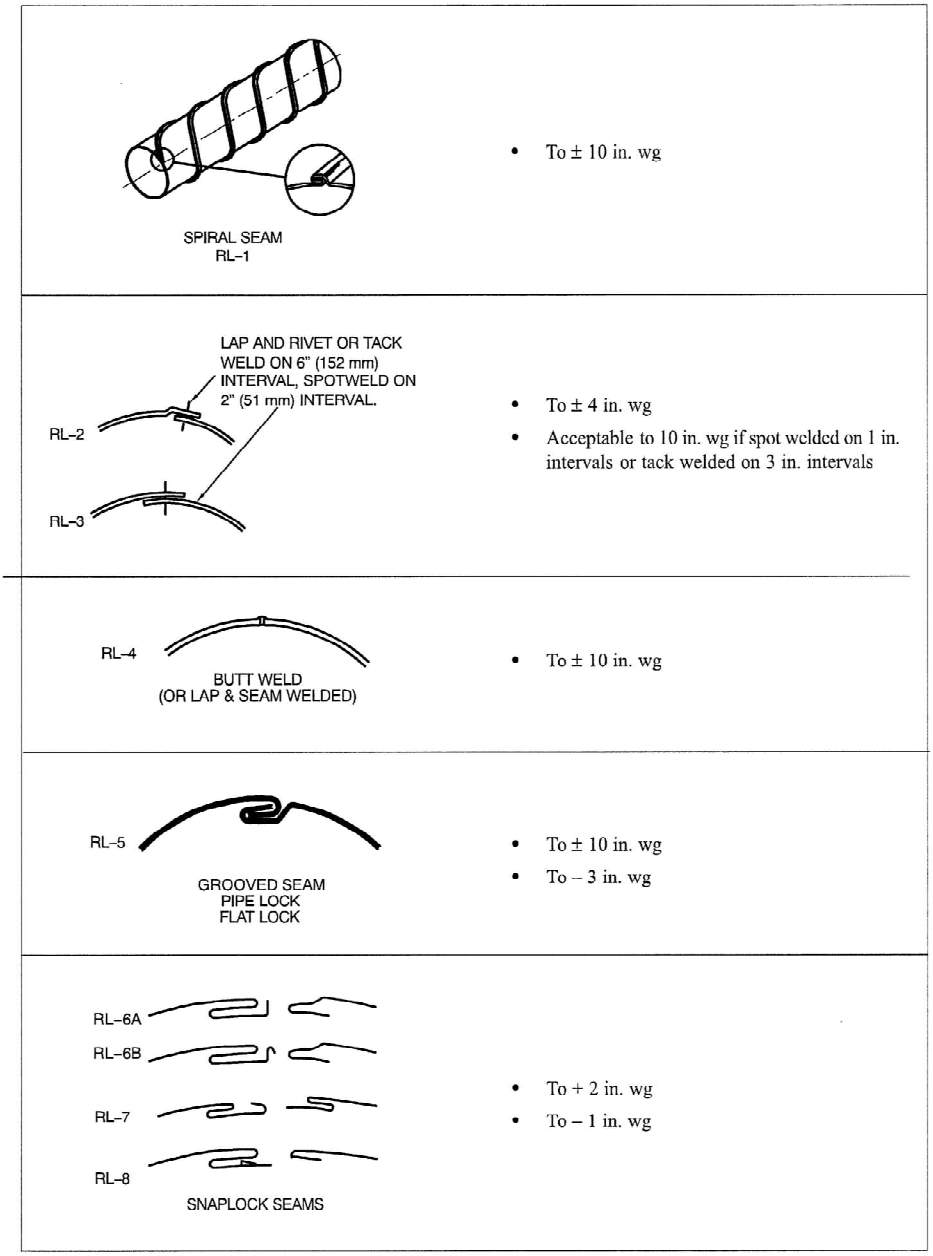


FIGURE 3–2 ROUND DUCT LONGITUDINAL SEAMS

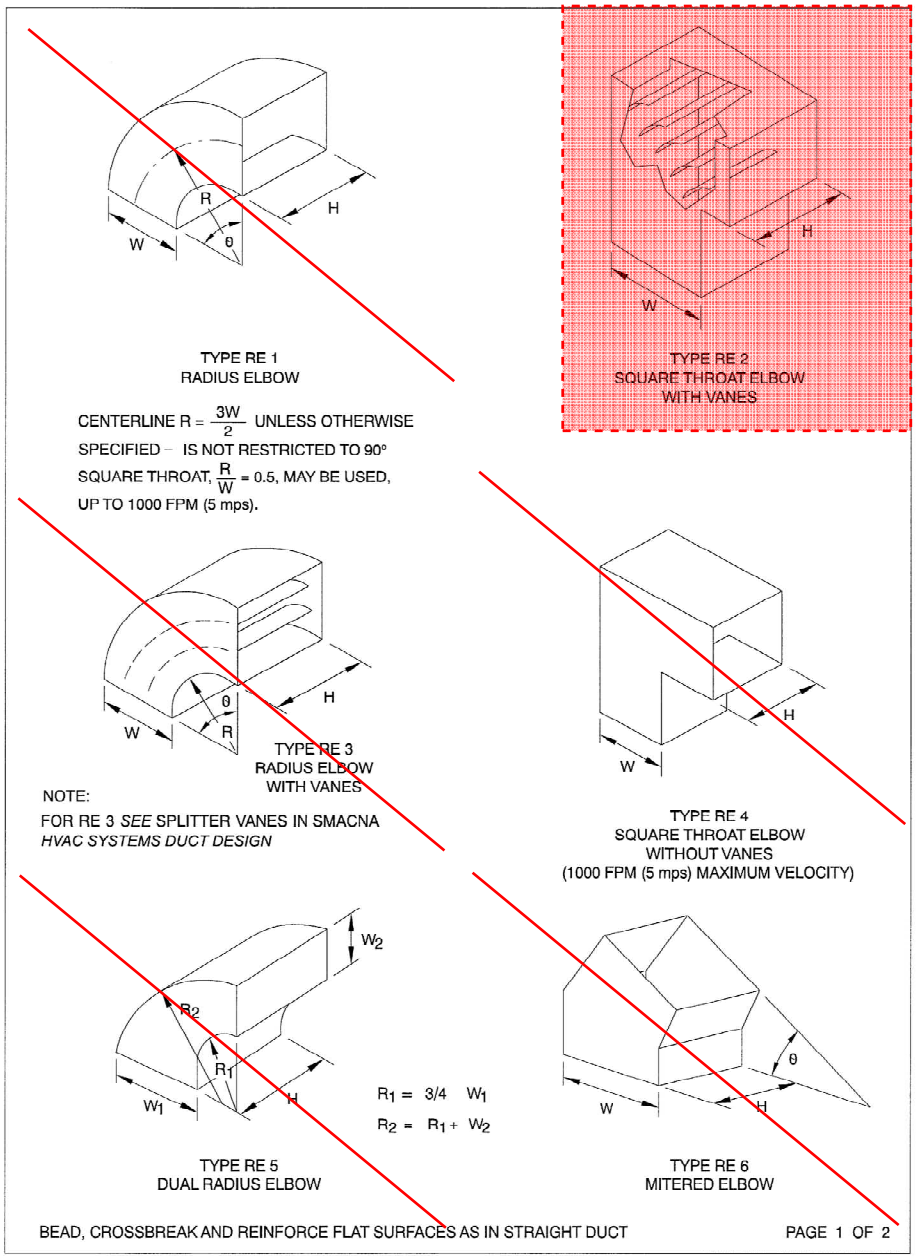


FIGURE 4–2 RECTANGULAR ELBOWS

No Exception Taken

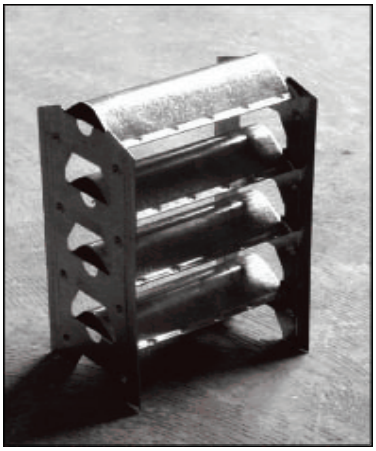
Turning Vane & Rail

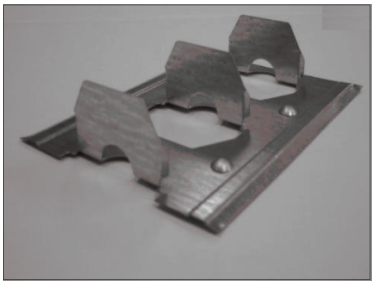
2~~" and 4~~" Turning Vane and Rail

please confirm if this is acceptable

Specifications

- Available in 2~~" and 4"~~
- Available in galvanized, stainless, and aluminum
- ~~Available in 4" Acoustical~~
- Vane conforms to SMACNA Standards
- Rail conforms to SMACNA Standards

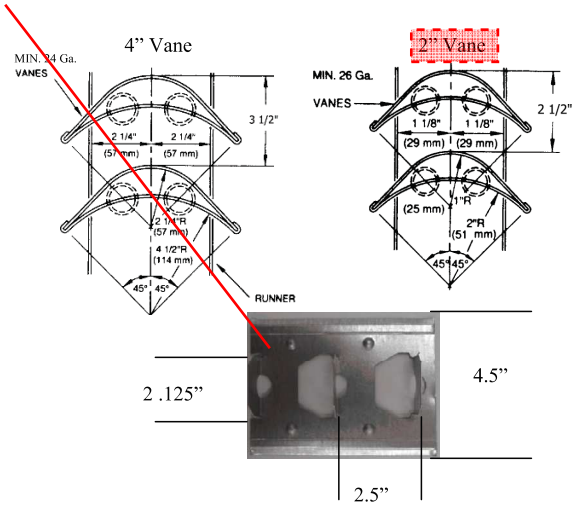




Packaging

Size	Gauge	Ft./Bundle	Wt./Bundle
2" Vane	26	100	43 lbs
2" Rail	22	200	39 lbs
~~4" Vane~~	~~24~~	~~50~~	~~65 lbs~~
~~4" Rail~~	~~22~~	~~100~~	~~73 lbs~~
~~4" Acoustical Vane~~	~~24~~	~~50~~	~~66 lbs~~

Profile



C.L. WARD & FAMILY INC.
1100 Ashwood Drive Suite 1102
Canonsburg, PA 15317
888.973.7600
www.clward.com

No Exception Taken

PR-25
R4.2, R6 & R8
Insulated Class 1 Flexible Air Duct

PRODUCT DATA & SUBMITTAL

PHYSICAL DESCRIPTION

PR-25 (25' length) flexible duct is constructed with a spring steel wire helix, encapsulated in a 2-ply, air-tight inner core. Fiberglass insulation choices of R4.2, R6 & R8 encompass the core and a black polyethylene vapor barrier surrounds the entire duct.

PRODUCT DATA

Diameters: 4",5",6",7",8",9",10",12",14",16",18",20"
Length: 25 feet
Packaging: 1 section per poly-bag or carton . To meet thermal properties, packaging complies with recommended 12:1 or less compression ratio.
Vapor Barrier: Black Polyethylene
End Treatments: Raw Ended
Inner Core: Air Tight 2-Ply Black Pigmented Polyester

PERFORMANCE DATA

Thermal Value: R4.2, R6 & R8 Classified by Underwriters Laboratories, Inc. and bears the ADC Thermal Certification Mark.
Maximum Positive Pressure: 6" W.G. (4" – 12") 4" W.G. (14" – 22") determined per ADC Test FD-72R1 at 180° F temperatures in a 90° elbow.
Maximum Negative Pressure: 1" W.G. (4" – 10") ½" W.G. (12" – 20")
Vapor Barrier: Flexible air ducts are for indoor applications and should not be exposed to direct ultraviolet light.
Maximum Velocity: 5,000 FPM
Operating Temperatures: 0 - 200° F
Permeance: (Vapor – Barrier) 0.19 US Perms per ASTM E96A – 94.

FEATURES & BENEFITS

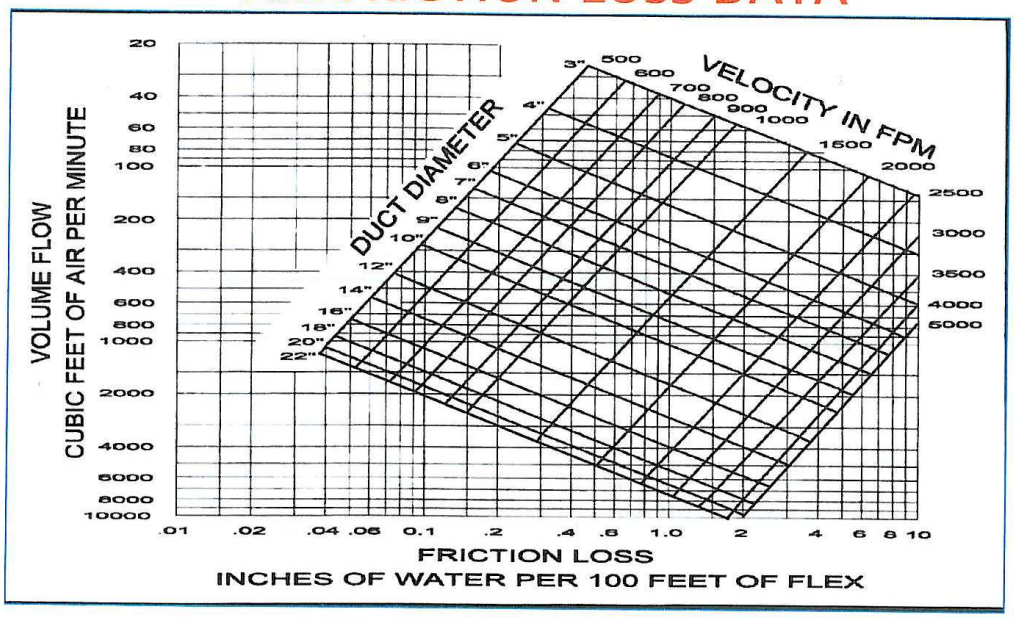
UL Listed & Labeled
Guaranteed out of package lengths
10 Year limited warranty
GREENGUARD Children & Schools Certification
Formaldehyde free (see www.jplflex.com for more info)
3/8" oversize inner core
Certified R-Values

CODE COMPLIANCE & APPROVALS

Listed & Labeled Underwriters Laboratories, Inc. File # MH11637 UL-181 Class 1 Air Duct, Flame Spread 25 or Less / Smoke Developed 50 or Less. Meets the requirements of NFPA 90A & 90B, UMC & IMC and most model codes. California Insulation Manufacturer #TD-1092

JP Lamborn Co. • 3663 E. Wawona Ave. • Fresno, CA. • 93725
TEL: (559) 650-2120 • FAX: (559) 650-2112
Plants in California, Colorado, Florida & Tennessee
www.jplflex.com

AIR FRICTION LOSS DATA



Friction Loss Slide Chart Calculators are available at a minimum cost

JPL™

10 YEAR LIMITED WARRANTY

J.P. LAMBORN CO. warrants that all of its UL-181 Flexible Air Ducts (the "Product") will be free from defects in materials and workmanship under normal use for a period of ten (10) years from date of manufacture.* This warranty shall apply only to the Product installed in the U.S.A. and in accordance with **J.P. LAMBORN CO.'s** written installation instructions and within the conditions and limitations of the published performance data.

**Contact Company for details and limitations.*

AIR DIFFUSION COUNCIL ADC
MANUFACTURERS OF FLEXIBLE AIR DUCT

HARDI
HEATING, AIRCONDITIONING & REFRIGERATION DISTRIBUTORS INTERNATIONAL

Children & Schools GREENGUARD Indoor Air Quality Certified

♦ Specifications subject to change without notice. ♦
Proper use and installation of these products shall be in accordance with UL-181 and ADC recommended installation instructions in each package.

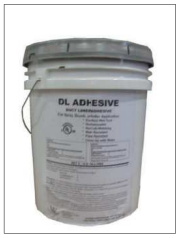
Duct Liner Adhesive

Premium Duct Liner Adhesive

Qualifies for LEED Credit EQ 4.1

UL181B-M
61MF

Specifications



- Water Based
- UL Classified
- Fast Dry Time
- Exceptional Coverage
- Water Resistant
- Cleans with soap and water or mineral spirits
- Excellent Tack
- Base: Synthetic Latex
- Color: Black
- Solvent: Water
- Weight per Gallon: 9.5 ± 0.5 lbs.
- Solids: 44 ± 2%
- Viscosity: 1,500 CPS
- Application Temp: 40°F to 90°F
- Service Temp: -20°F to 120°F
- Storage Temp: 40°F to 90°F
- Open Time: 10-20 minutes, depending on temperature, humidity, and application thickness
- Flammability: None
- Flash Point: No flash to boiling
- Coverage: Approximatley 500 sq.ft./gal., depending on application technique
- Freeze Thaw Stability: 5 cycles
- Shelf Life: (Unopened containers) 1 year
- Flame Spread: 0
- Smoke Developed: 0
- Meets ASTM C 916 Type II
- Meets NFPA 90A & 90B
- No VOC's

Test as applied on two 2" wide strips 8" on center (coverage 16% of the exposed test sample area) at a coverage rate of 400 sq.ft. per gal. Flash point of finished sealant, closed cup. No flash boiling.

Packaging

- 5 gallon pails - 45 lbs/pail
- 54 gallon drum - 494 lbs/drum

Directions

- Can Be applied by brush, roller, standard spray equipment, or roller coated. May be applied to galvanized steel or the fibrous insulation. All surfaces should be free from all dirt, oil, and grease. For best results adhesive should not be thinned.

Applications:

- Bonding fibrous duct liner insulation to galvanized ductwork.
- Sealing cut edges of fiberglass insulation.
- Bonding multiple layers of fibrous insulation board.
- Bonding kraft backed foil covering to fiberglass and urethane flat stock or pipe.

Limited Product Warranty

CL WARD & FAMILY, INC is not liable for consequential, incidental or special damages. There are no statutory or implied warranties including the warranties for fitness for a particular purpose and merchantability. There are no warranties other than as set forth below and CL WARD & FAMILY, INC neither assumes nor authorizes any person to assume any liability or other obligation in connection with Duct Liner Adhesive.

Duct Liner Adhesive is warranted to be free from any and all defects in material and workmanship only at the time of shipment from our plant. If material is shown to be defective at the time of shipment from our plant, CL WARD & FAMILY will replace or issue credit for the original price.

CL WARD & FAMILY, INC does not guarantee the results from the use of Duct Liner Adhesive because of the extreme differences in surface texture and porosity of available materials and the possibility of structural movement or externally caused damages.

KEEP OUT OF REACH OF CHILDREN
Consult The MSDS Sheet Before Using Product
KEEP FROM FREEZING

No Exception Taken

D U C T M A T E

FIBERseal®

UNION
MADE IN THE
USA

Water Based High Velocity Duct Sealant

Low Brush Drag and Spreadability Reduces Labor Costs

- Indoor/outdoor grade
- For applications up to 15" WG
- Highly crack resistant
- Comes in fiber and non-fiber
- UL 181 B-M Listed
- UL 723 Classified
- LEED® Compliant
- Remains flexible

DUCTMATE® Industries, Inc.

FIBERseal®

Premium Water Based High Velocity Duct Sealant

DESCRIPTION

FIBERseal is a premium water based high-velocity duct sealant.

BASIC USE

To seal metal joints against air leaks in low, medium, and high pressure duct systems.

TECHNICAL INFORMATION

BASE:	Synthetic latex emulsion with fiber reinforcement
COLOR:	Gray
TYPE:	Water Base
WEIGHT:	11.3 ± .3 lbs per gallon
SOLID CONTENTS:	66% ± 3%
VISCOSITY:	350,000 c.p.s.
APPLICATION TEMPERATURE:	35°F to 110°F
SERVICE TEMPERATURE:	0°F to 220°F
STORAGE TEMPERATURE:	35°F to 110°F
DRY TO TOUCH:	1 hour (approximate)
CURE TIME:	24 to 72 hours + (depending on humidity, application, and temperature)
FLASH POINT:	No flash to boiling
WATER RESISTANCE:	Excellent
MILDEW RESISTANCE:	Excellent
FREEZE THAW STABILITY:	5 cycles
COVERAGE:	25 sq. ft./gal. at 1/16" 50 sq. ft./gal. at 1/32"
ODOR:	Mild (wet) None (dry)
SHELF LIFE:	1 year (unopened container)
CURED SEALANT:	Tough and permanently flexible
PACKAGING:	1/12 gallon tubes (25 tubes/case) 1 gallon pail (4 pails/case) 5 gallon pail 54 gallon drum

UL LISTED UL-181B-M 61MF

ALSO CLASSIFIED C UL US CAULKINGS AND SEALANTS SURFACE BURNING CHARACTERISTICS 51RF

SURFACE BURNING CHARACTERISTICS

USC – Classification
Applied to Inorganic Reinforced Cement Board +

FLAME SPREAD	5
SMOKE DEVELOPED	5

+ - Tested as applied in two 2 in. wide strips 8 in. on center covering 16 percent of the test sample area at a coverage rate of 25 sq ft per gal.

CNC - Classification
Applied to Inorganic Reinforced Cement Board +

FLAME SPREAD	5
SMOKE DEVELOPED	5

+ - Tested as applied in two 5.08 cm wide strips 20.32 cm on center covering 16 percent of the test sample area at a coverage rate of 0.6 sq. m/l.

SPECIAL CHARACTERISTICS

- Indoor/outdoor grade
- For applications up to 15" WG
- Low brush drag and spreadability
- Permanently seals metal duct joints
- Highly crack resistant
- Remains flexible
- Excellent UV, water, and mold resistance
- Paintable with latex or epoxy based paint
- Will not drip or sag
- Mild odor
- UL 181B-M Listed
- UL 723 Classified
- LEED® Compliant
- Conforms to requirements of NFPA 90A and 90B
- Manufactured by S.M.W.I.A. Local 12

DIRECTIONS FOR USE

Surface Preparation: For good brushability, store at room temperature at least 24 hours before applying. Surfaces should be clean, dry and free of any dirt, oil, grease, water or foreign matter.

Application: (DO NOT THIN) Do not apply when rain or freezing temperatures will occur within 36 hours.

When Used In Conjunction With Sheet Metal: Apply by brush, hand, trowel or spray. FIBERseal should be applied to duct connections according to all applicable SMACNA standards. Apply to the inside of female fittings and outside of male fittings. Assemble the joint.

Brush sealant over the assembled joint. Thoroughly cover joint and screws with a 2" to 3" wide band. Assembly should cure for 24-72 hours before pressure testing the system. Since field temperature/ humidity conditions may vary, longer set times may be required for specific installations. Apply at a rate of 50 sq. ft. per gallon (1/32" thick).

When Used in Conjunction With UL 181 Listed Flexible Air Ducts: Apply by brush a 1/16" (25 sq.ft. per gallon) coating and allow to dry a minimum of 24-72 hours. Since field temperature/humidity conditions may vary, longer set times may be required for specific installations. Use with mechanical fasteners per Air Duct installation instructions.

Clean Up: Use warm, soapy water to clean up sealant while it is still wet.

When Used In Conjunction With Duct Cover: Allow the sealant to cure fully before encapsulating duct ends with ProGuard, or any duct cover products. You may set the duct upright on a palate and encapsulate just the top, allowing air to flow through the bottom until the sealant has cured.

LIMITED PRODUCT WARRANTY

Ductmate warrants that FIBERseal when properly installed and maintained, will be free from defects in material and workmanship, and will comply with all written specifications made by Ductmate at the time of sale. Ductmate's warranty shall run for a period of one year from the date of manufacture.

Warranty Limitation:
The warranty stated above is in lieu of all other warranties, express or implied, including but not limited to the implied warranties of MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Although Ductmate may have suggested the product, or provided written or oral advice to the Purchaser, it is the Purchaser's responsibility to test and determine the suitability of FIBERseal for the intended use and purpose, and Purchaser and/or its customer assumes all risk and liability whatsoever regarding such suitability.

Limitation of Liability:
In the event of a breach of the above warranty, Ductmate's sole obligation, and Purchaser's sole and exclusive remedy, shall be, at Ductmate's option, repair or replacement of any defective products, or refund of an applicable portion of the purchase price. Ductmate shall have no liability for costs of removal or reinstallation of the product. The Purchaser agrees that no other remedy, including but not limited to loss of profits, loss sales, injury to person or property, or any other special, incidental or consequential damages, shall be available to the Purchaser for any claim arising out of this Agreement, regardless of whether such claim is made in contract or in tort, including strict liability in tort. In no event will Ductmate be obligated to pay damages to the Purchaser in any amount exceeding the purchase price that the Purchaser paid to Ductmate for the allegedly defective product.

KEEP OUT OF REACH OF CHILDREN. Consult MSDS (Material Safety Data Sheet) Before Using

DUCTMATE Industries, Inc.

Charleroi, PA
210 Fifth Street
Charleroi, PA 15022
800-245-3188
724-258-0500
FAX: 724-258-5494

Lodi, CA
810 S. Cluff Avenue
Lodi, CA 95240-9141
800-245-3188
724-258-0500
FAX: 209-333-4678

www.ductmate.com

SFI www.sfiprogram.org
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679 - 05/13

No Exception Taken

Air Handling Systems

Linacoustic® RC

Fiber Glass Duct Liner with Reinforced Coating System

Description

Linacoustic RC insulation is a flexible duct liner made from strong, glass fibers bonded with a thermosetting resin. The airstream surface is protected with JM's exclusive Reinforced Coating system, which combines our state-of-the-art Permacote® acrylic coating with a flexible glass mat reinforcement to provide a smooth airstream surface.

Factory-Applied Edge Coating

Edge coating is factory applied to the edges of the liner core, ensuring coverage of the leading edges per NAIMA/SMACNA requirements. Shop fabrication cuts may be coated with SuperSeal® edge treatment (refer to publication AHS-202).

Uses

Linacoustic RC insulation is specifically designed for lining sheet metal ducts in air conditioning, heating and ventilating systems, providing superior acoustical and thermal performance.

General Properties

Operating temperature (max.) – ASTM C411	250°F (121°C)
Air velocity (max.) – ASTM C1071	6,000 fpm (30.5 m/sec)
Water repellency – INDA IST 80.6	≥6
Fungi resistance – ASTM C1338	Does not breed or promote
Fungi resistance – ASTM G21	No growth
Bacteria resistance – ASTM G22	No growth

Standard Thicknesses and Packaging

Thickness		Roll Length		Roll Widths for All Thicknesses*	
in	mm	lineal feet	lineal meters	in	mm
½	13	100, 150, 200	31, 46, 61	34 to 36	864 to 914
1	25	50,100,150, 200	15, 31, 46, 61	44 to 48	1118 to 1219
1½	38	50, 100	15, 31	56 to 60	1422 to 1524
2	51	50	15	66 to 72	1676 to 1829

**Available in ¼" (6.4 mm) increment.*

Contact your Regional Sales Office for stock items and availability of special sizes.

Surface Burning Characteristics

Linacoustic RC duct liner meets the Surface Burning Characteristics and Limited Combustibility of the following standards:

Standard/Test Method
- ASTM E84
- UL 723
- NFPA 255
- NFPA 90A and 90B
- NFPA 259
- CAN/ULC S102-M88

Maximum Flame Spread Index	25
Maximum Smoke Developed Index	50

UL labels supplied on packages when requested on order.

Specification Compliance

- ASTM C1071, Type I
- ICC Compliant
- California Title 24
- MEA #353-93-M
- Conforms to ASHRAE 62
- SMACNA Application Standards for Duct Liners
- NAIMA Fibrous Glass Duct Liner Installation Standard
- Canada: CGSB 51-GP-11M and CAN/CGSB 51.11

Advantages

Improves Indoor Building Environment. Linacoustic RC duct liner improves indoor environmental quality by helping to control both temperature and sound.

Resistant to Dust and Dirt. The tough acrylic polymer Permacote coating helps guard against the incursion of dust or dirt into the substrate, minimizing the potential for biological growth.

Will Not Support Microbial Growth. Permacote coating is formulated with an immobilized EPA-registered protective agent to protect the coating from potential growth of fungi and bacteria.

Linacoustic RC duct liner meets all requirements for fungi and bacterial resistance. Tests were conducted in accordance with ASTM C1338 and ASTM G21 (fungi testing) and ASTM G22 (bacteria resistance testing). Detailed information is available in Johns Manville fact sheet HSE-103FS.

Note: As with any type of surface, microbial growth may occur in accumulated duct system dirt, given certain conditions. This risk is minimized with proper design, filtration, maintenance and operation of the HVAC system.

Cleanability. If HVAC system cleaning is required, the Reinforced Coating airstream surface may be cleaned with industry-recognized dry methods. See the North American Insulation Manufacturers Association (NAIMA) "Cleaning Fibrous Glass Insulated Air Duct Systems."

Highly Resistant to Water. The reinforced coating surface provides superior resistance to penetration of incidental water into the fiber glass wool core.

Green Building Attributes

GREENGUARD® certification is not intended for residential environments. Instead, the certification is intended only for buildings meeting ASHRAE 62.1-2007 commercial building ventilation rates. This certification is proof that the product meets the GREENGUARD Environmental Institute's indoor air quality standards and product emission standards for VOCs.

Recycled Content

15% minimum post consumer

Linacoustic® RC

Fiber Glass Duct Liner with Reinforced Coating System

Installation

Linacoustic RC duct liner installation must be performed in accordance with the requirements of the NAIMA Fibrous Glass Duct Liner Standards or SMACNA HVAC Duct Construction Standard. All transverse edges, or any edges exposed to airflow, must be coated with an approved duct liner coating material, such as Johns Manville SuperSeal products.

Minimizes Pre-installation Damage. Linacoustic RC duct liner's Reinforced Coating System is highly resistant to damage that can occur during in-shop handling, fabrication, jobsite shipping and installation.

Easy to Fabricate. Linacoustic RC duct liner is lightweight and easy to handle. Clean, even edges can be accurately cut with regular shop tools.

Thermal Performance

Thickness		R-value		Conductance	
in	mm	(hr•ft²•°F)/Btu	m²•°C/W	Btu/(hr•ft²•°F)	W/m²•°C
½	13	2.2	0.39	0.46	2.61
1	25	4.2	0.74	0.24	1.36
1½	38	6.3	1.11	0.16	0.91
2	51	8.0	1.41	0.13	0.74

R-value and conductance are calculated from the material thermal conductivity tested in accordance with ASTM C518 at 75°F (24°C) mean temperature.

Sound Absorption Coefficients (Type "A" Mounting)

Thickness		Sound Absorption Coefficient at Frequency (Cycles per Second) of						
in	mm	125	250	500	1000	2000	4000	NRC
½	13	0.07	0.20	0.44	0.66	0.84	0.93	0.55
1	25	0.08	0.31	0.64	0.84	0.97	1.03	0.70
1½	38	0.10	0.47	0.85	1.01	1.02	0.99	0.85
2	51	0.25	0.66	1.00	1.05	1.02	1.01	0.95

Coefficients were tested in accordance with ASTM C423 and ASTM E795.

ISO 9000 Certification

Johns Manville mechanical insulation products are designed, manufactured and tested in our own facilities, which are certified and registered to stringent ISO 9000 (ANSI/ASQC 90) series quality standards. This certification, along with regular, independent third-party auditing for compliance, is your assurance that Johns Manville products deliver consistent high quality.

Johns Manville

717 17th St.
Denver, CO 80202
1-800-654-3103
specJM.com

AHS-329 3/13 (Replaces 5/12)

North American Sales Offices, Insulation Systems

Eastern Region
P.O. Box 158
Defiance, OH 43512
(800) 334-2399
Fax: (419) 784-7866

Western Region and Canada
P.O. Box 5108
Denver, CO 80217
(800) 368-4431
Fax: (303) 978-4661

The physical and chemical properties of the Linacoustic® RC Fiber Glass Duct Liner with Reinforced Coating System listed herein represent typical, average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Numerical flame spread and smoke developed ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with the Regional Sales Office nearest you to ensure current information.
All Johns Manville products are sold subject to Johns Manville's standard Terms and Conditions, including Limited Warranty and Limitation of Remedy. For a copy of the Johns Manville standard Terms and Conditions, Limited Warranty and Limitation of Remedy, and information on other Johns Manville thermal insulation and systems, call (800) 654-3103.

JMCOM130160

No Exception Taken

model **AC-41, AC-42**
control damper
triple-V blade

Application

AC-41 and AC-42 control dampers employ triple-V blades and a rugged hat channel frame for automatic air control and manual balancing in medium pressure and velocity applications.

Standard Construction

Frame: 5" × 1" (127 × 25) galvanized steel hat channel with interlocking corner gusset. Equivalent to 13 gauge (2.4) channel frame. Low profile head and sill are used on sizes less than 13" (330) high.

Blades: 6" × 16 gauge (152 × 1.5) galvanized steel — triple-V. Parallel (model AC-41) or opposed (model AC-42) action.

Axles: 1/2" (13) diameter plated steel hex.

Linkage: Concealed in frame.

Bearings: Synthetic

Control Shaft: 1/2" × 6" (13 × 152) round drive axle with outboard shaft support bracket and bearing supplied on all single section dampers for field installation. Factory installed jackshaft supplied with all multiple section dampers: 1/2" (13) dia. for W>48" (1219) or H>72" (1829), 3/4" (19) dia. for W >96" (2438).

Minimum Size: Model AC-41 (one blade): 6" × 5" (152 × 127)
Model AC-41 and AC-42 (two blades): 6" × 10" (152 × 254)

Maximum Size: Single section: 48" × 72" (1219 × 1829)
Multiple sections: Unlimited

Options

☐ Factory installed actuators:
- ☐ Manual locking quadrant (supplied loose)
- ☐ 24 VAC ☐ 120 VAC ☐ 230 VAC
  ☐ Pneumatic ☐ Modulating
- ☐ External mount (requires sleeve or sideplate option)
- ☐ Internal mount (requires jackshafting)

☐ Factory installed sleeve. ☐ Factory installed side plate.
Gauge: ☐ 20 (1.0) ☐ 16 (1.6)
Length: ☐ 16" (406) ☐ 24" (610) ☐ Other_____

☐ Transitions (sleeve required): ☐ Flanged
- ☐ Round ☐ Oval
- ☐ Duct connections: ☐ DM-25 ☐ DM-35 ☐ S & Drive

☐ Flanged frame: ☐ One side ☐ Both sides

☐ Low leakage seals: PVC blade edge and flexible stainless steel jamb.

☐ PI-50 – Dual position indicator switch package.

☐ Actuator/Quadrant standoff bracket — accommodates up to 3" (76) thick insulated duct.

☐ Stainless steel oilite sleeve-type bearings.

☐ Type-304 stainless steel construction.

☐ Jackshafting (required with internal mounted actuators and standard on all multiple section dampers).

☐ Vertical mounted blades.

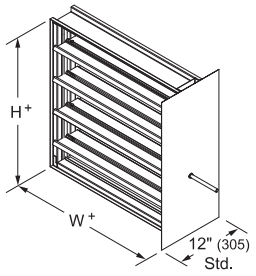
☐ Face and by-pass assemblies:
- ☐ Model MDFBR ☐ Model MDFBH ☐ Model MDFBV

Ratings

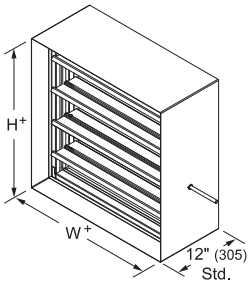
Damper Width	Maximum System Pressure	Maximum System Velocity
12" (305)	5.0 in. wg (1.2 kPa)	3000 fpm (15.2 m/s)
24" (610)	4.0 in. wg (1.0 kPa)	3000 fpm (15.2 m/s)
36" (914)	3.0 in. wg (0.8 kPa)	2500 fpm (12.7 m/s)
48" (1219)	2.5 in. wg (0.6 kPa)	2000 fpm (10.2 m/s)

Leakage (with seals): 8.0 cfm/ft² @ 4 in. wg (0.04m³/s/ m² @ 1.00 kPa)
4.0 cfm/ft² @ 1 in. wg (0.02m³/s/ m² @ 0.25 kPa)

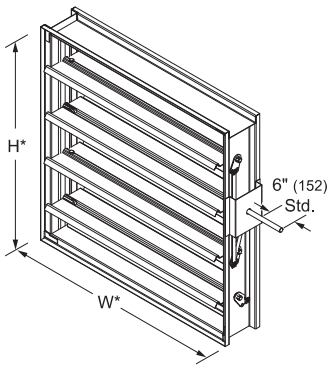
Temperature: –25°F to 180°F (–32°C to +83°C)



Sideplate
(optional)



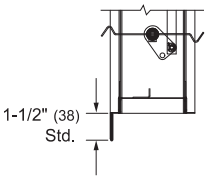
Sleeve (optional)
+Damper dimensions furnished approximately 1/4" (6) undersize (sleeve thickness not included.



Model **AC-42** (standard)
*Damper dimensions furnished approximately 1/4" (6) undersize. (Drive axle supplied loose for field installation)


AC-41

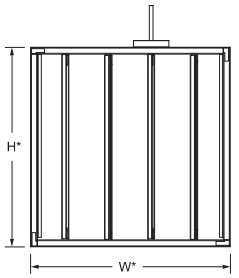

AC-42



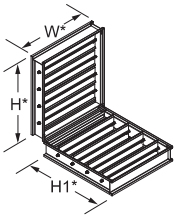
Flanged Frame

NOTE: Dimensions in parentheses ( ) are millimeters.

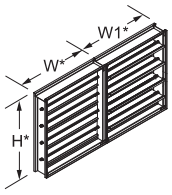
Typical Damper Dimensional Details



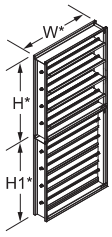
Vertical Bladed



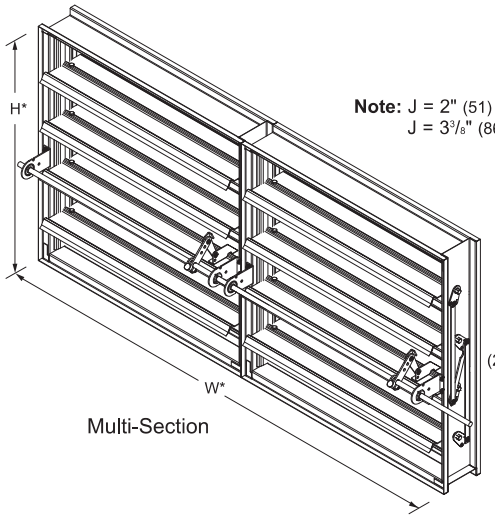
Model **MDFBR**



Model **MDFBH**

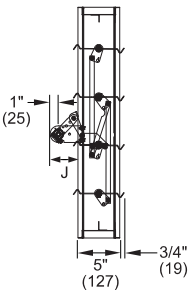


Model **MDFBV**



Multi-Section

Note: J = 2" (51) for H < 8" (203)
J = 3 3/8" (86) for H ≥ 8" (203)



Dampers are designed to be self-supporting in the maximum single section size. When dampers are installed in multiple section assemblies, bracing may be required to support the weight of the dampers and to ensure structural integrity against system pressures. It is recommended that multiple sections be appropriately braced. In horizontal installations, it is recommended that suitable supports be installed every 8 feet of damper width. Dampers installed in vertical multiple assemblies and/or higher system pressures, may require additional bracing.

*Damper dimensions furnished approximately 1/4" (6) undersize.

Airflow Performance Data

Pressure Loss vs. Velocity

Figure 5.3 — Ducted Inlet and Outlet

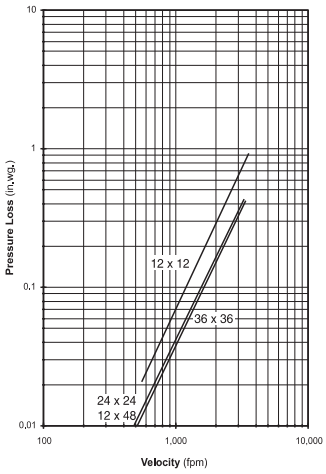


Figure 5.2 — Ducted Inlet

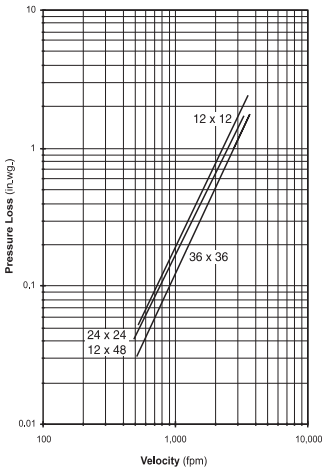
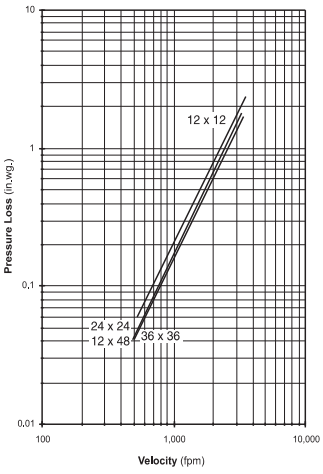
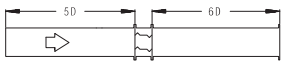
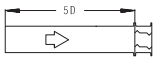


Figure 5.5 Plenum Mount







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.

Information is subject to change without notice or obligation.

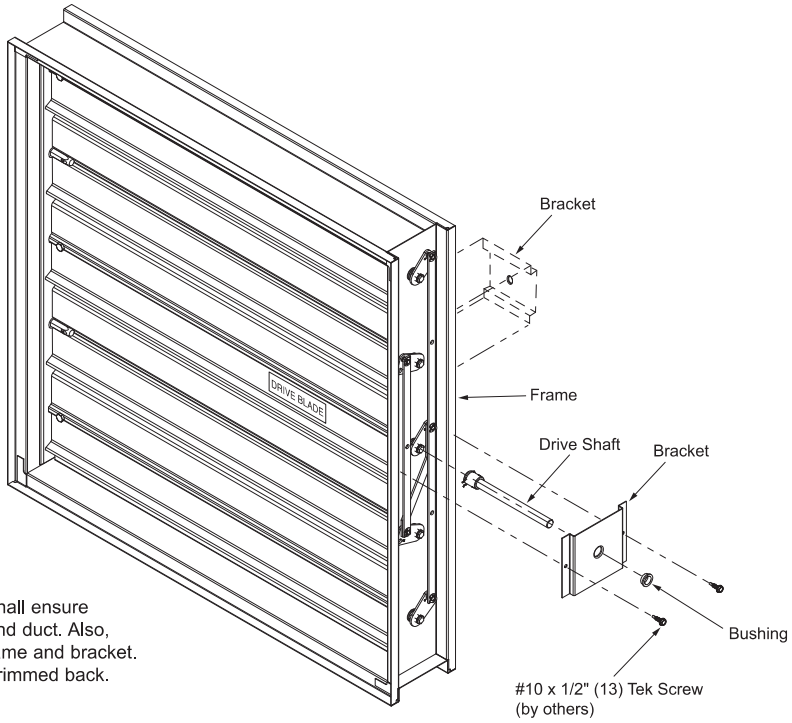
NOTE: Dimensions in parentheses ( ) are millimeters.

control dampers
installation instructions

The following installation details apply to models **AC-41, AC-42, AC-45, AC-46, AC-51, AC-52, AC-53 and AC-54**

Direct Drive Field Installation

1. Remove bracket from frame by removing screw.
2. Remove drive shaft and bushing from bracket.
3. Reinsert screw into the hole left in the frame.
4. Insert the driveshaft onto the axle of the drive blade on the linkage side. The drive blade is identified with a label.
5. Insert the bushing, flanged end first, onto the drive shaft.
6. Insert the bracket onto the coupler assembly, fitting the bushing onto the bracket hole.
7. Screw the bracket to the frame using #10 x $^1/_2$" (13) Tek screw (by others). Minimum of one on each side.



Note: All Dampers installed within an insulated duct shall ensure that the insulation is not between the damper frame and duct. Also, no insullation shall be located between the damper frame and bracket. Damper operation can be affected if insulation is not trimmed back.

Single Section or Multi-Section Installation

A. Inspect ductwork or opening where damper is to be installed for any obstructions or irregularities that might interfere with blade or linkage rotation or actuator mounting. Duct opening should measure approximately $^1/_4$" (6) larger than the damper dimensions and should be square and level. Duct work must be properly supported around damper to prevent sagging. Care must be taken to prevent dropping, dragging, stepping on, bending, twisting, ranking, etc. Do not lift by blades, linkage, axle, motor, or jackshafting.

B. Position damper section(s) together in duct or opening. Align and match frame markings or labels on adjacent sections, see figure 1. Unless specifically designed for vertical blades, damper must be mounted with blade axis horizontal.

C. Fasten adjacent frame sections together on front and back sides with screws or nuts and bolts. Shim damper frame and duct opening properly to prevent distortion of frame. Damper should be braced at every horizontal mullion, minimum 8 feet (2438) center-to-center. Dampers in high velocity / high static pressure systems require additional bracing.

4B	3B	2B	1B
4A	3A	2A	1A

Figure 1 - Multiple Assembly Tags

NOTE: Dimensions in parentheses ( ) are millimeters.

shouldn't we have dynamic fire dampers or combination fire smoke dampers?

model **FD-4-A**
1½ hour — static fire damper
curtain style blade

Application

The FD-4-A fire damper employs curtain style blades for point-of-origin control of fire in static HVAC systems. The FD-4-A may be installed in vertical walls or partitions, or horizontally in floors or assemblies with fire resistance ratings up to 2 hours.

Standard Construction

Frame: 22 gauge (0.85) galvanized steel.

Blades: 24 gauge (0.7) galvanized steel – curtain style.

Fire Closure Device: Fusible link.

Fire Closure Temperature: 165°F (75°C).

Minimum Size: Vertical mount: 4" × 4" (102 × 102)
Horizontal mount: 6" × 6" (152 × 152)

Maximum Size: Single section: Vertical: 48" × 48" (1219 × 1219)
Horizontal: 40" × 40" (1016 × 1016)
Multiple Section: Vertical: 120" × 80" (3048 × 2032) or 80" × 120" (2032 × 3048)
Horizontal: 80" × 80" (2032 × 2032)

Stainless Steel: Single section: 40" × 40" (1016 × 1016)
Multiple Section: Vertical: 80" × 40" (2032 × 1016) or 40" × 80" (1016 × 2032) or 108" × 24" (2743 × 559)
Horizontal: 80" × 40" (2032 × 1016) or 40" × 80" (1016 × 2032)

Options

☐ Factory installed sleeve: ☐ Integral
Gauge: ☐ 20 (1.0) ☐ 18 (1.3) ☐ 16 (1.6) ☐ 14 (2.0) ☐ 10 (3.5)
Length: ☐ 12" (305) ☐ 16" (406) ☐ 24" (610) ☐ Other ___

☐ Low leakage taped joints. (Integral sleeve required)

☐ Transitions: ☐ Flanged (sleeve required)
☐ Round ☐ Oval
☐ Duct connections (sleeve required):
☐ 1" (25) S-clip ☐ DM-25 ☐ DM-35 ☐ S & Drive ☐ WARD

☐ Retaining angle systems:
Gauge: ☐ 20 (1.0) ☐ 16 (1.6)
Picture frame: ☐ SSPF (single-side) ☐ DSPF (2-side)
Individual angle sets: ☐ SS (single-side) ☐ DS (2-side)

☐ Alternate fire closure temperature.
☐ 212°F (100°C)

☐ Duct access door factory mounted in common sleeve.

☐ Generic mullion for oversized masonry or concrete openings.

☐ Type-304 stainless steel construction.

Please select correct option(s)

Ratings

UL 555 Fire Resistance Rating: 1½ hour (vertical and horizontal)

UL HNLJ.V-5: Ventilation Duct Assemblies

Listings

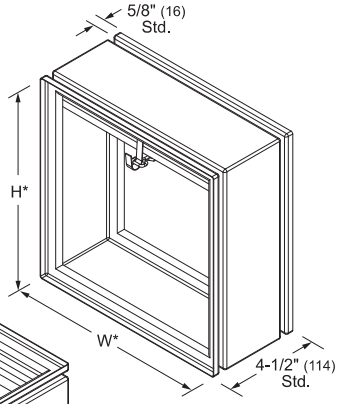
UL 555 listing: R14981

CSFM listing: 3225-1404:101

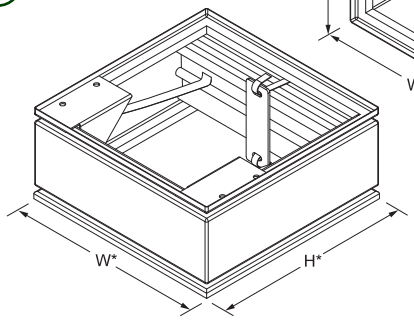
New York City MEA listing: 295-98-E

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

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

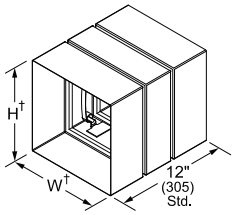


Model **FD-4-A**
(standard-vertical)



Model **FD-4-A**
(standard-horizontal)

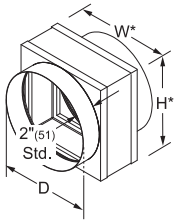
* Damper dimensions furnished approximately 1/4" (6) undersize.
† Damper dimensions furnished approximately 1/8" (3) undersize.



Sleeve Style ISA (optional)

Round Transitions

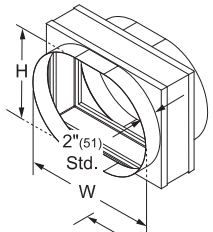
(Standard with D=W=H. Available with D<W and H)



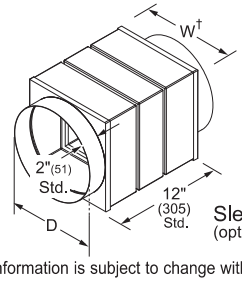
Style AR (optional)

Oval Transitions

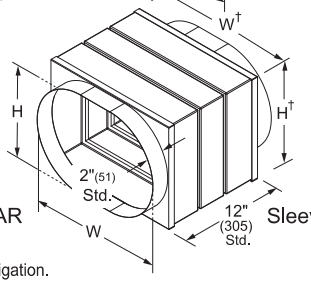
(Standard with W and H equal to damper width and height dimensions. Available with W and H smaller than damper width and height)



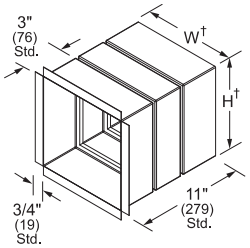
Style AO (optional)



Sleeve Style ISAR (optional)



Sleeve Style ISAO (optional)



Sleeve Style ISAF (optional)
With standard flange.
(Typical for use with grille.)

Information is subject to change without notice or obligation.

NOTE: Dimensions in parentheses ( ) are millimeters.

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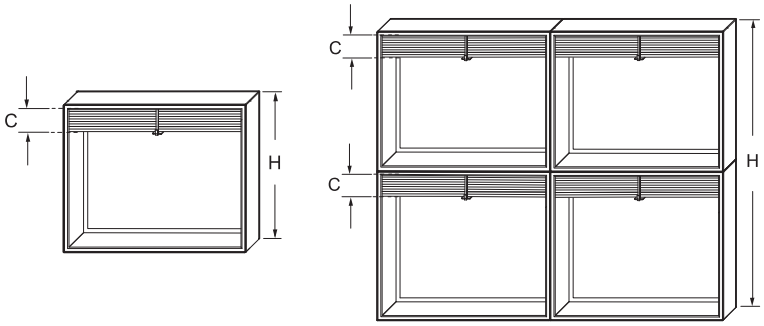
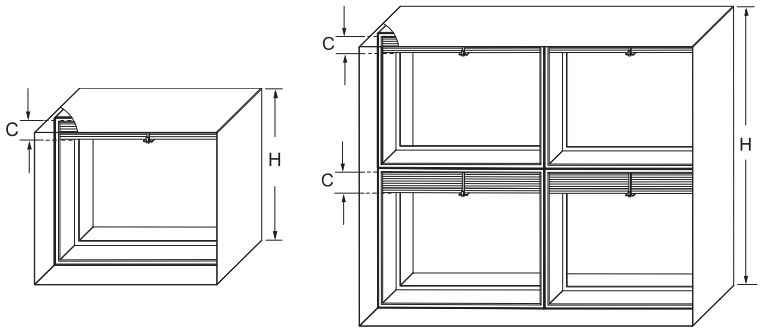
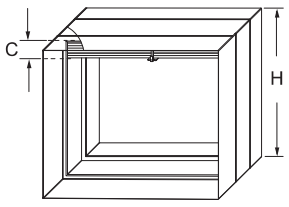
Blade Stack Dimensional Data



Framed Unit — No Sleeve
(Multiple section units supplied as individual dampers for field assembly)



Sleeve Style S — Common Sleeve
(Multiple section units suppled as a single assembly)



Sleeve Style IS — Integral Sleeve

Single Section

Nominal Duct Height 'H'	Blade Stack Height 'C'	
4" (102)	1-1/16" (27)	
5" (127)	1-1/16" (27)	
6" (152)	1-1/16" (27)	
7" (178)	1-3/16" (30)	
8" (203)	1-3/16" (30)	
9" (229)	1-3/16" (30)	
10" (254)	1-7/16" (37)	
11" (279)	1-7/16" (37)	
12" (305)	1-7/16" (37)	
13" (330)	1-9/16" (40)	
14" (356)	1-9/16" (40)	
15" (381)	1-13/16" (46)	
16" (406)	1-13/16" (46)	
17" (432)	1-13/16" (46)	
18" (457)	1-15/16" (49)	
19" (483)	1-15/16" (49)	
20" (508)	2-3/16" (56)	
21" (533)	2-3/16" (56)	
22" (559)	2-3/16" (56)	
23" (584)	2-5/16" (59)	
24" (610)	2-5/16" (59)	
25" (635)	2-9/16" (65)	
26" (660)	2-9/16" (65)	
27" (686)	2-9/16" (65)	
28" (711)	2-11/16" (68)	
29" (737)	2-11/16" (68)	
30" (762)	2-15/16" (75)	
31" (787)	2-15/16" (75)	
32" (813)	2-15/16" (75)	
33" (838)	3-1/16" (78)	
34" (864)	3-1/16" (78)	
35" (889)	3-5/16" (84)	
36" (914)	3-5/16" (84)	
37" (940)	3-5/16" (84)	
38" (965)	3-7/16" (87)	
39" (991)	3-7/16" (87)	
40" (1016)	3-11/16" (94)	
41" (1041)	3-11/16" (94)	Vertical Dampers Only
42" (1067)	3-11/16" (94)	
43" (1092)	3-13/16" (97)	
44" (1118)	3-13/16" (97)	
45" (1143)	4-1/16" (103)	
46" (1168)	4-1/16" (103)	
47" (1194)	4-1/16" (103)	
48" (1219)	4-3/16" (106)	

Multiple Section

Nominal Duct Height 'H'	Blade Stack Height 'C'	
41" (1041)	2-3/16" (56)	
42" (1067)	2-3/16" (56)	
43" (1092)	2-3/16" (56)	
44" (1118)	2-3/16" (56)	
45" (1143)	2-3/16" (56)	
46" (1168)	2-5/16" (59)	
47" (1194)	2-5/16" (59)	
48" (1219)	2-5/16" (59)	
49" (1245)	2-5/16" (59)	
50" (1270)	2-9/16" (65)	
51" (1295)	2-9/16" (65)	
52" (1321)	2-9/16" (65)	
53" (1346)	2-9/16" (65)	
54" (1372)	2-9/16" (65)	
55" (1397)	2-9/16" (65)	
56" (1422)	2-11/16" (68)	
57" (1448)	2-11/16" (68)	
58" (1473)	2-11/16" (68)	
59" (1499)	2-11/16" (68)	
60" (1524)	2-15/16" (75)	
61" (1549)	2-15/16" (75)	
62" (1575)	2-15/16" (75)	
63" (1600)	2-15/16" (75)	
64" (1626)	2-15/16" (75)	
65" (1651)	2-15/16" (75)	
66" (1676)	3-1/16" (78)	
67" (1702)	3-1/16" (78)	
68" (1727)	3-1/16" (78)	
69" (1753)	3-1/16" (78)	
70" (1778)	3-5/16" (84)	
71" (1803)	3-5/16" (84)	
72" (1829)	3-5/16" (84)	
73" (1854)	3-5/16" (84)	
74" (1880)	3-5/16" (84)	
75" (1905)	3-5/16" (84)	
76" (1930)	3-7/16" (87)	
77" (1956)	3-7/16" (87)	
78" (1981)	3-7/16" (87)	
79" (2007)	3-7/16" (87)	
80" (2032)	3-11/16" (94)	
81" (2057)	2-9/16" (64)	Vertical Dampers Only
82" (2083)	2-9/16" (64)	
83" (2108)	2-9/16" (64)	
84" (2134)	2-11/16" (68)	
85" (2159)	2-11/16" (68)	
86" (2184)	2-11/16" (68)	
87" (2210)	2-11/16" (68)	
88" (2235)	2-11/16" (68)	
89" (2261)	2-11/16" (68)	
90" (2286)	2-15/16" (75)	
91" (2311)	2-15/16" (75)	
92" (2337)	2-15/16" (75)	
93" (2362)	2-15/16" (75)	
94" (2388)	2-15/16" (75)	
95" (2413)	2-15/16" (75)	
96" (2438)	2-15/16" (75)	
97" (2464)	2-15/16" (75)	
98" (2489)	2-15/16" (75)	
99" (2515)	3-1/16" (78)	
100" (2540)	3-1/16" (78)	
101" (2565)	3-1/16" (78)	
102" (2591)	3-1/16" (78)	
103" (2616)	3-1/16" (78)	
104" (2642)	3-1/16" (78)	
105" (2667)	3-5/16" (84)	
106" (2692)	3-5/16" (84)	
107" (2718)	3-5/16" (84)	
108" (2743)	3-5/16" (84)	
109" (2769)	3-5/16" (84)	
110" (2794)	3-5/16" (84)	
111" (2819)	3-5/16" (84)	
112" (2845)	3-5/16" (84)	
113" (2870)	3-5/16" (84)	
114" (2896)	3-7/16" (87)	
115" (2921)	3-7/16" (87)	
116" (2946)	3-7/16" (87)	
117" (2972)	3-7/16" (87)	
118" (2997)	3-7/16" (87)	
119" (3023)	3-7/16" (87)	
120" (3048)	3-11/16" (94)	

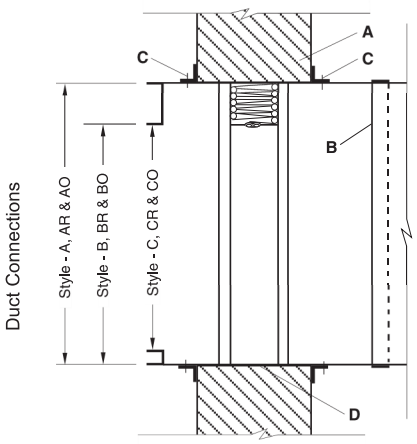
Note: Vertical dampers exceeding 48" in width or height will be manufactured in sections not exceeding 40" x 40". Stainless steel vertical dampers exceeding 80" in width will be manufactured in sections not exceeding 36" x 24".

Dampers shown as vertical mount. Horizontal mount supplied in the same orientation.

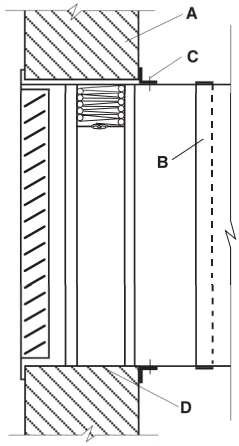
NOTE: Dimensions in parentheses ( ) are millimeters.

vertical 1½ hour — fire dampers installation instructions

The following installation details apply to models **FD4D, FD4, FD2** and **FD2D**



Damper Installation For Typical Fire Rated Partition



Damper Installation For Typical Flange Termination with Grille / Register

CLASSIFIED UL SEE DETAILS ON UL CLASSIFICATION MARKING ON ENCLOSED PRODUCT CLASSIFIED UL

LISTING STATE OF CALIFORNIA STATE FIRE MARSHAL SERVICE

A. Concrete or masonry fire partition shown. See Wood Stud and/or Steel Stud Framing for Fire Dampers In Drywall and/or Cavity Shaftwall Partitions Supplemental Installation Instructions for further vertical installation details. The opening shall be a minimum of 1/4" (6) with a maximum of 3/4" (19) larger than the overall damper and sleeve assembly size. When openings are larger than 3/4" (19), but less than 6" (152) the mounting angles must be a minimum of 16 gauge (1.5) and must be tall enough to overlap the opening by a minimum of 1" (25). Damper must be installed with leading edge of closed blade within the partition.

B. For rigid type duct connections, the sleeve shall be a minimum of 16 gauge (1.5) for dampers up to 36" wide by 24" high (914 × 610) and 14 gauge (1.9) for larger units. When lighter gauge sleeves are used, one or more of commonly used breakaway style connections are required. Refer to Sleeve Termination Supplemental Installation Instructions for further details. In no case will the sleeve gauge be less than the duct gauge to which it is connected. Damper sleeve shall not extend more than 6" (152) beyond the rated partition unless an access door or Smoke Detector is installed in the sleeve which then permits the extension to be a maximum of 16" (406).

C. Mounting angles shall be a minimum of 3/4" × 1-1/2" tall × 20 gauge (19 × 38 × 1.0). For opening sizes ≤ 80" wide (2032), 96" high (2438), and not exceeding 26.67 square feet in area retaining angles are only required on one side of the partition and must be attached to the sleeve and the partition. For larger openings (or optional on smaller openings), 1-1/2" × 1-1/2" × 16 gauge (38 × 38 × 1.5). retaining angles are required on both sides of the partition and must be attached to the sleeve. Attachment to the sleeve shall be with No. 10 (M5) screws or bolts, 3/16" (4.8) diameter steel rivets, Quick-Lock joints or welds, at 12" (305) o.c. maximum. Attachment to partition/opening shall be with min. No. 10 fasteners with a minimum length as follows: For metal stud and the angles under the drywall, the fasteners must be a min. 1/2" long. For metal stud and the angles over the drywall the fastener must be a min. 1/2" longer than the thickness of the drywall. i.e. if the partition has one layer of 5/8" drywall on the attachment side, the screws must be 1/2" + 5/8" = 1-3/8" long. For wood stud openings, the min. length is 1-1/2" longer than the thickness of drywall on the attachment side. For concrete or masonry openings, the anchors must be for min. No. 10 fasteners- screws or bolts. In lieu of masonry anchors and bolts/screws, self-tapping masonry screws can be used. The fasteners in the partition should be located such that they are 1/2" below the top of the 1-1/2" flange of the retaining angles. Fasteners in the partition should be spaced 12" o.c. max. A minimum of two connections per side, top and bottom. A minimum 3/4" × 20 gauge (19 × 1) flange termination may be used in lieu of mounting angles. Refer to Sleeve Termination Supplemental Installation Instructions and Framing for Fire Dampers for further details. Ensure that attachment device does not interfere with the operation of the damper and the free movement of the damper blades. Note: If optional sealing between the retaining angle (or flange) leg and the surface of the partition, wall, or floor, and/or between the retaining angle leg and the surface of the damper sleeve is required, the following sealants may be used: Dow Corning 732 or DOWSIL 732 or GE RTV 108 or SCS 1201 RTV. These sealants should be applied such that they do not intrude into the annular space between the outside surface of the damper sleeve and the opening of the partition, wall, or floor, into which the damper/sleeve is being installed.

Note:
Annular space between damper sleeve and wall opening shall not be filled with firestop materials such as fill, void or cavity materials.
*Maximum single section is 36" × 96" (914 × 914) for multiple sections larger than 36" × 96" (914 × 2438) or 72" × 48" (1829 × 1219)

DUCT SIZES	Model FD4		Model FD4D		Model FD2	Model FD2D
	GALVANIZED STEEL	STAINLESS STEEL	GALVANIZED STEEL	STAINLESS STEEL	GALVANIZED STEEL	GALVANIZED STEEL
Maximum Single Section	48" × 48" (1219 × 1219)	40" × 40" (1016 × 1016)	*36" × 48" (914 × 1219)	36" × 36" (914 × 914)	36" × 48" (914 × 1219)	36" × 48" (914 × 1219)
Maximum Multiple Section	120" × 80" or 80" × 120" (3048 × 2032)(2032 × 3048)	80" × 40" or 40" × 80" (2032 × 1016)(1016 × 2032) 108" × 24" (2743 × 610)	*120" × 72" or 72" × 120" (3048 × 2032)(2032 × 3048)	NA	36" × 72" or 72" × 36" (915 × 1829)(1829 × 915)	36" × 72" or 72" × 36" (915 × 1829)(1829 × 915)
Minimum	4" × 4" (102 × 102)	4" × 4" (102 ×102)	6" × 6" (152 × 152)	6" × 6" (152 × 152)	4" × 4" (102 × 102)	6" × 6" (152 × 152)

Product Listing Underwriter's Laboratories file #R14981 and CSFM File # 3225-1104:101

Information is subject to change without notice or obligation.

NOTE: Dimensions in parentheses ( ) are millimeters.

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vertical 1 1/2 hour — fire dampers
installation instructions

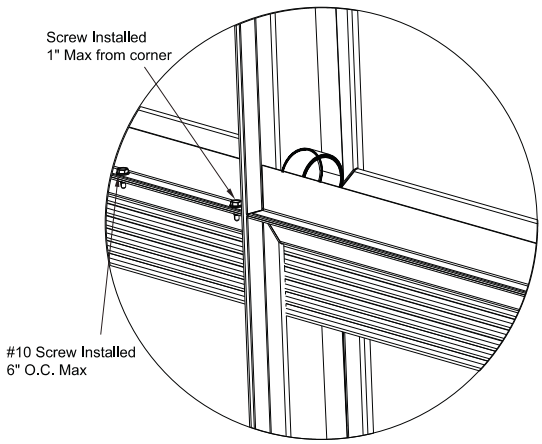
The following installation details apply to models **FD4D, FD4, FD2** and **FD2D**

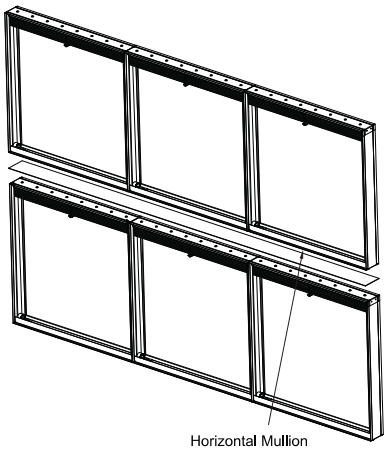
D. When joining multiple sections or fastening the dampers to the sleeve, the damper shall be fastened with 3/16" (4.8) diameter steel rivets, Quick-Lock joints, welds or No. 10 (M5) bolts or sheet metal screws at 8" (203) o.c. maximum if multiple sections assemblies are smaller than 36" × 96" (914 x 2438) and 72" × 48" (1829 × 1219) or 6" (152) o.c. maximum for multiple sections larger than 36" × 96" (914 x 2438) and 72" × 48" (1829 x 1219). There must be a minimum of two connections per side, top and bottom.

On multiple sections larger than 36" × 96" (914 × 2438) and 72" × 48" (1829 × 1219) the maximum single section size shall be 36" × 36" (914 × 914).

For assemblies multiple sections wide and multiple sections high a minimum 14 gauge × 5" (127) wide supplemental steel mullion plate is required. The mullion plate length should be either full length or full height of the multiple sections assembly. The mullion plate must be installed between adjacent damper frames running parallel to the sleeve/duct width/height. Mullions are not required for dampers assemblies that are single sections wide and multiple high or single sections high and multiple wide.

The support mullion must be attached to the damper frames using welds or No. 10 (M5) bolts, sheet metal screws or minimum 3/16" (4.8) diameter steel rivets at 6" (152) o.c. maximum and 1" maximum from the frame corner.





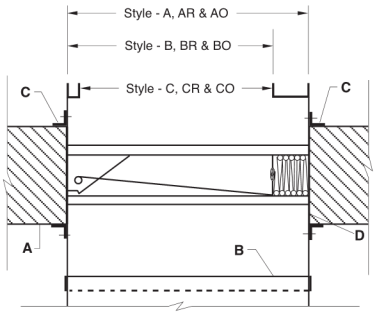
NOTE: Dimensions in parentheses ( ) are millimeters.

horizontal 1½ hour — fire dampers installation instructions

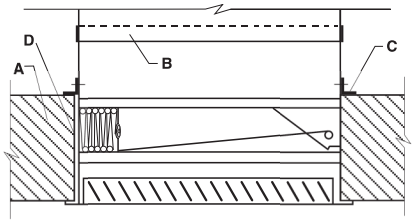
The following installation details apply to models **FD4D** and **FD4**

CLASSIFIED SEE DETAILS ON UL CLASSIFICATION MARKING ON ENCLOSED PRODUCT CLASSIFIED

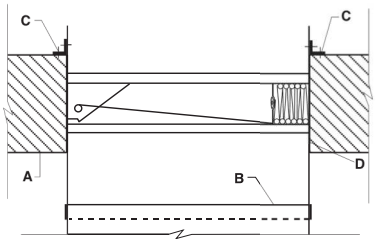
Duct Connections



Damper Installation (2-sided Mounting Angle)



Damper Installation For Typical Flange Termination with Grille / Register



Single Side Mounting Angle Damper Installation

A. Concrete or masonry fire partition shown. The opening shall be a minimum or equal to ¼" (6) with a maximum of ¾" (19) larger than the overall damper and sleeve assembly size. When openings are larger than ¾" (19), but less than or equal to 6" (152) the mounting angles must be a minimum of 16 gauge (1.5) and must be wide enough to overlap the opening by a minimum of 1" (25). Damper must be installed with leading edge of closed blade within the partition.

B. For rigid type duct connections, the sleeve shall be a minimum of 16 gauge (1.5) for dampers up to 36" wide by 24" high (914 x 610) and a minimum of 14 gauge (1.9) for larger units. When lighter gauge sleeves are used, one or more of commonly used break away style connections are required. Refer to Sleeve Termination Supplemental Installation Instructions for further details. In no case will the sleeve gauge be less than the duct gauge to which it is connected. Damper sleeve shall not extend more than 6" (152) beyond the rated partition unless an access door or Smoke Detector is installed in the sleeve which then permits the extension to be a maximum of 16" (406).

C. Mounting angles shall be a minimum 1-½" x 1-½" x 16 gauge (38 x 38 x 1.5). Mounting angles are only required on the top side of the opening and must be attached to the sleeve at 6" (152) o.c. maximum, to the partition at 24" (610) o.c. maximum, with a minimum of two fasteners per side to both the sleeve and partition on all four sides. Alternately, mounting angles may be installed on both sides of the partition and must be attached only to the sleeve at 12" (305) o.c. maximum, with a minimum of two connections per side on all four sides. Attachment to the sleeve shall be a minimum of No. 10 (M5) steel fasteners: anchors, bolts, or self-tapping masonry screws. A minimum ¾" x 20 gauge (19 x 1) flange termination may be used in lieu of mounting angles. Ensure that the attachment device does not interfere with the operation of the damper and the free movement of the damper blades.

Note: If optional sealing between the mounting angle (or flange) leg and the surface of the partition, or floor, and/or between the mounting angle leg and the surface of the damper sleeve is required, the following sealants may be used: Dow Corningr 732 or DOWSIL 732 or GE RTV 108 or SCS 1201 RTV. These sealants should be applied such that they do not intrude into the annular space between the outside surface of the damper sleeve and the opening of the partition, or floor, into which the damper sleeve is being installed. Annular space between damper sleeve and opening shall not be filled with firestop materials such as fill, void, or cavity materials.

D. When joining multiple sections or fastening the damper to the sleeve, the damper shall be fastened with 3/16" (4.8) diameter steel rivets, Quick-Lock Joints, welds, No. 10 (M5) bolts or sheet metal screws at 8" (203) o.c. maximum. A minimum of two connections per side, top and bottom.

DUCT SIZES	Model VFD-10	VFD-10D	Model VFD-10
	GALVANIZED STEEL		STAINLESS STEEL
Maximum Single Section	40" x 40" (1016 x 1016)	36" x 36" (914 x 914)	40" x 40" (1016 x 1016)
Maximum Multiple Section	80" x 80" (2032 x 2032)	36" x 36" or 72" x 18" (914 x 914) (1829 x 457)	80" x 40" or 40" x 80" (2032 x 1016) (1016 x 2032)

Underwriter's Laboratories file #R14981. The product is also listed by CSFM File # 3225-1404:101.

Individually sleeved dampers can be installed in partitions wider than the maximum U.L. multiple section size using the Support Mullion for Oversized Floor Openings. See Support Mullion for Oversized Floor Openings Installation Instructions for further details.

Information is subject to change without notice or obligation.

NOTE: Dimensions in parentheses ( ) are millimeters.

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No Exception Taken

model **FSD-122**

1½ hour • **UL class 2** — combination fire smoke damper
triple-V blade

Application

The FSD-122 combination fire smoke damper employs triple-V blades for point-of-origin control of fire and smoke in static and dynamic smoke management systems. The FSD-122 is qualified to 2,000 ft/min (10.2 m/s) and 4 in.wg. (1.0 kPa) and may be installed in vertical walls or partitions, or horizontally in floors or assemblies with fire resistance ratings up to 2 hours.

Standard Construction

Frame: 5" × 1" (127 × 25) galvanized steel hat channel with interlocking corner gusset. Equivalent to 13 gauge (2.4) channel frame. Low profile head and sill are used on sizes less than 13" (330) high.

Blades: 6" × 16 gauge (152 × 1.6) galvanized steel — triple-V.

Sleeve: 16" × 20 gauge (406 × 1.0) galvanized steel.

Axles: ½" (13) diameter plated steel hex.

Linkage: Concealed in frame.

Bearings: Stainless steel oilite, sleeve-type.

Seals: Silicone blade edge seals and flexible metal jamb seals.

Actuator: 120 VAC, power-open, spring-close, external mount.

Fire Closure Device: HS-10 (electric actuators)
PFV (pneumatic actuators)

Fire Closure Temperature: 165°F (75°C).

Minimum Size: 6" × 6" (152 × 152)

Maximum Size: Single section: 36" × 48" (914 × 1219)
Vertical mount: 144" × 96" (3658 × 2438)
Horizontal mount: 108" × 48" (2743 × 1219)
Stainless steel (vertical/horizontal): 72" × 48" (1829 × 1219)

Options

Please select correct option(s)

☐ Alternate actuator:
☐ Internal mount (actuator in air-stream).
☐ 24 VAC ☐ 24 VDC** ☐ 230 VAC ☐ Pneumatic
☐ Modulating

☐ DRS-30 — Two temperature fire closure device. (Includes PI-50 switch package)

☐ PI-50 — Dual position indicator switch package.

☐ Alternate factory installed sleeve:
Gauge: ☐ 18 (1.3) ☐ 16 (1.6) ☐ 14 (2.0) ☐ 10 (3.5)
Length: ☐ 20" (508) ☐ 24" (610) ☐ Other_____
☐ Side Plate ☐ No Sleeve (Actuator must be internally mounted)

☐ Transitions: ☐ Flanged
☐ Round ☐ Oval
☐ Duct connections: ☐ 1" (25) S-clip
☐ DM25 ☐ DM35 ☐ S & Drive ☐ Ward

☐ Retaining angle systems:
Gauge: ☐ 20 (1.0) ☐ 16 (1.6)
Picture frame: ☐ SSPF (single-side) ☐ DSPF (2-sided)
Individual angle sets: ☐ SS (single-side) ☐ DS (2-sided)

☐ Alternate fire closure temperature:
☐ 212°F (100°C) ☐ 250°F (121°C)
☐ 350°F (177°C).

☐ Duct smoke detector factory mounted and wired:
☐ D4120 (100-4,000 fpm [0.5-20.3 m/s])
☐ 2151 (0-3,000 fpm [0-15.2 m/s])

☐ Duct access door factory mounted in common sleeve.

☐ Remote control stations:
☐ RCP-1 (single) ☐ RCP-1K (single, key controlled)
☐ RCP-1M (single, momentary switch)

☐ Generic mullion for oversized masonry or concrete wall openings.

☐ Type-304 stainless steel construction.

** Maximum Temperature: 250°F (121°C)

Information is subject to change without notice or obligation.

Ratings

UL 555 Fire Resistance Rating: 1½ hour (vertical and horizontal)

UL 555S Leakage Class: 2 [20 cfm/sq.ft. @ 4 in.wg.]
[(0.10 m³/s/m² @ 1.0 kPa)]

UL HNLJ.V-5: Ventilation Duct Assemblies

Maximum Dynamic Closure Velocity: 2,000 fpm (10.2 m/s)

Maximum UL555S Rated Pressure: 4 in.wg. (1.0 kPa)

Maximum Temperature: 350°F (177°C)

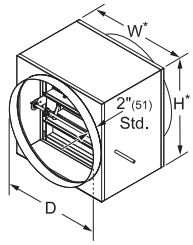
Listings

UL 555 and 555S listing: R14981

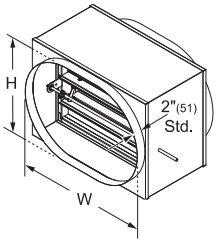
CSFM listing: 3225-1404:105 and 3230-1404:106

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

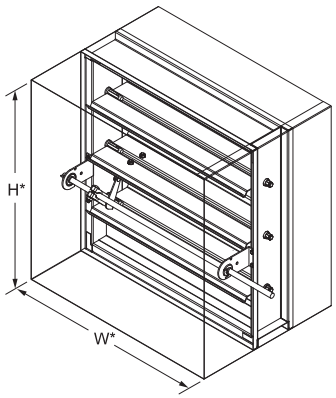
Meets Building Code Standards: IBC, NBC, NFPA, SBC and UBC



Type R (optional)
Round duct transitions are standard with D=W=H. (available with D<W and H)



Type O (optional)
Oval duct transitions are standard with W and H equal to damper width and height dimensions. (available with W and H smaller than damper width and height)



Model **FSD-122**
(standard)

*Damper dimensions furnished approximately 1/4" (6) undersize. (sleeve thickness not included)

NOTE: Dimensions in parentheses ( ) are millimeters.

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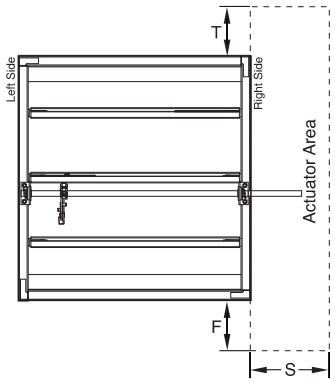
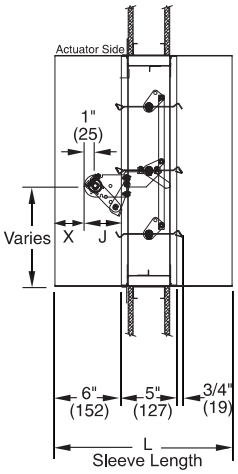
Actuator and Sleeve Dimensional Data

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.

	Damper Height	Actuator Model					
		FSLF120 FSLF24	FSNF120 FSNF24	GGD221 GGD121	ML4115 ML8115	331-4826	331-2998
F	6"-7"	5"	7"	9"	5"	9"	13"
	8"-9"	4"	7"	8"	4"	8"	12"
	10-11"	1"	4"	6"	1"	5"	9"
	12"-13"	0"	3"	5"	0"	4"	8"
	14"	0"	2"	4"	0"	4"	8"
	15"-16"	0"	1"	3"	0"	3"	7"
	17"	0"	3"	5"	0"	5"	9"
	18" and 23"	0"	0"	0"	0"	0"	3"
	19"-20" and 25"	0"	0"	0"	0"	0"	2"
	21"-22" and 24"	0"	0"	0"	0"	0"	0"
	26"-27"	0"	0"	0"	0"	0"	1"
	>27"	0"	0"	0"	0"	0"	0"
T	6" and 10"	3"	3"	3"	3"	3"	3"
	7" and 11"-12"	2"	2"	2"	2"	2"	2"
	8", 13"-14" and 21"	1"	1"	1"	1"	1"	1"
	9", 15"-17", and 20"	0"	0"	0"	0"	0"	0"
	18"-19"	0"	1"	1"	0"	1"	1"
	22"-23" and >24"	0"	0"	0"	0"	0"	0"
	24"	0"	0"	0"	0"	0"	1"
S	All	4-1/2"	4-1/2"	4-1/2"	4-1/2"	5"	7-1/4"
X	<8"	4"	4"	4"	4"	4"	4"
	≥8"	2-5/8"	2-5/8"	2-5/8"	2-5/8"	2-5/8"	2-5/8"
J	<8"	2"	2"	2"	2"	2"	2"
	≥8"	3-3/8"	3-3/8"	3-3/8"	3-3/8"	3-3/8"	3-3/8"



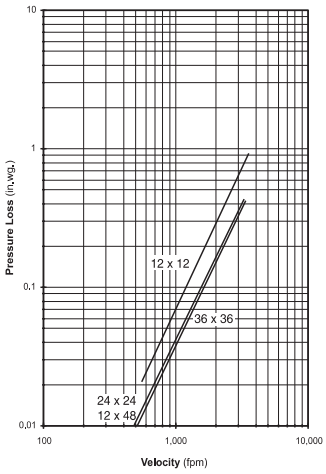


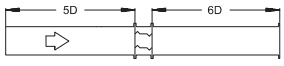
NOTE:
1. Sleeve length "L" = wall/floor thickness + 10" (254). Standard sleeve length "L" = 16" (406).
2. Damper may be rotated 180° to position actuator area on the left side.
3. The entire damper frame is not required to be installed within the wall, partition or floor. However, the closed plane of the damper blades must be inside the wall, partition or floor.
4. Dimensions for FSLF120 apply to FSTF120.
5. Dimensions for FSNF120/FSNF24 apply to FSAF120/FSAF24.
6. Dimensions for ML4115/ML8115 apply to MS4209/MS8209.
7. For dimensions on actuators not shown above, contact factory.

Airflow Performance Data

Pressure Loss vs. Velocity

Figure 5.3 — Ducted Inlet and Outlet

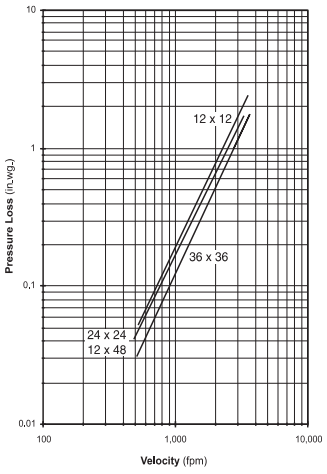


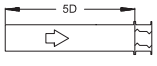


Ducted Inlet and Outlet

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.

Figure 5.2 — Ducted Inlet

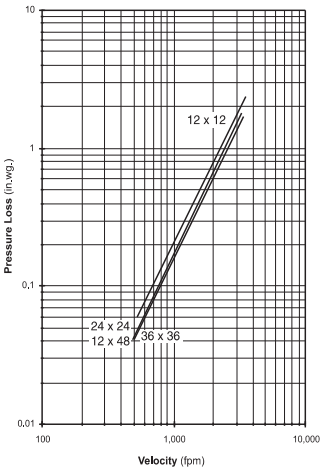




Ducted Inlet

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.

Figure 5.5 Plenum Mount



Plenum Mount

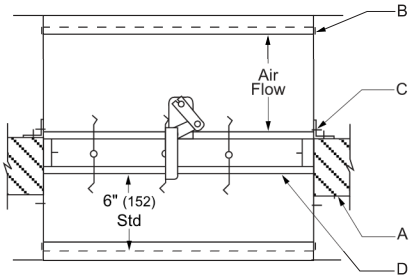
AMCA Figure 5.5 Illustrates a plenum mounted damper. This configuration has the highest pressure drop because of extremely high entrance and exit losses due to the sudden changes of area in the system.

Information is subject to change without notice or obligation.

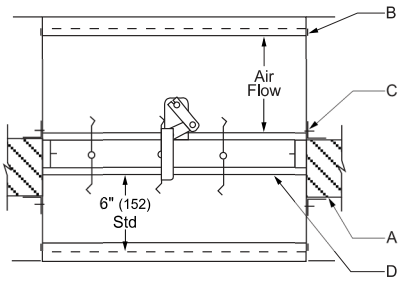
NOTE: Dimensions in parentheses ( ) are millimeters.

1½ hour — combination fire smoke dampers horizontal installation instructions

The following installation details apply to models **CFS-131, CFS-132, FSD-121, FSD-122, FSD-123, FSD-181, FSD-182, FSD-131** and **FSD-132**



Horizontal Mount
(Single Side Mounting Angle)



Horizontal Mount
(2-sided Mounting Angles)

CLASSIFIED UL SEE DETAILS ON UL CLASSIFICATION MARKING ON ENCLOSED PRODUCT CLASSIFIED UL C

Illustration depicts damper installed from the top down with the actuator above the floor line. Damper may also be installed from the bottom up with the actuator below the floor line. Illustrations show triple-V bladed (120/130 type), steel airfoil blade (180 type) similar.

A. Concrete or masonry fire partition shown. The opening shall be a minimum of ¼" (6) with a maximum of ¾" (19) larger than the overall damper and sleeve assembly size. When openings are larger than ¾" (19), but less than or equal to 6" (152) the mounting angles must be a minimum of 16 gauge (1.5) and must be wide enough to overlap the opening by a minimum of 1" (25). The damper must be installed with leading edge of closed blade within the partition.

B. For rigid type duct connections, the sleeve shall be a minimum of 16 gauge (1.5) for dampers up to 36" wide by 24" high (914 × 610) and a minimum of 14 gauge (1.9) for larger units. When lighter gauge sleeves are used, one or more of commonly used breakaway style connections are required. Refer to Sleeve Termination Supplemental Installation Instructions for further details. In no case will the sleeve gauge be less than the duct gauge to which it is connected. The damper sleeve shall not extend more than 16" (406) beyond the rated partition on the actuator side. The opposite side extension shall be a maximum of 6" (152) unless an access door is installed in the sleeve which then permits the extension to be a maximum of 16" (406).

C. Mounting angles shall be a minimum 1-½" × 1-½" × 16 gauge (38 × 38 × 1.5). Mounting angles are only required on the top side of the opening and must be attached to the sleeve at 6" (152) o.c. maximum, to the partition at 24" (610) o.c. maximum. There must be a minimum of two fasteners per side to both the sleeve and partition on all four sides. Alternately, mounting angles may be installed on both sides of the partition and must be attached only to the sleeve at 12" (305) o.c. maximum, with a minimum of two connections per side on all four sides. Attachment to the sleeve shall be with a minimum of #10 (M5) screws or bolts, 3/16" (4.8) diameter steel rivets, Quick-Lock joints, or welds.Attachment to the partition shall be with a minimum of #10 (M5) steel fasteners: anchors, bolts, or self-tapping masonry screws. A minimum ¾" × 20 gauge (19 × 1) flange termination may be used in lieu of mounting angles. Ensure that the attachment device does not interfere with the operation of the damper and the free movement of the damper blades.

Note: If optional sealing between the mounting angle (or flange) leg and the surface of the partition, or floor and/or between the mounting angle leg and the surface of the damper sleeve is required, any of the following sealants may be used: Dow Corning 700 or 732 or DOWSIL 700 or 732 or GE RTV 108 or SCS 1201 RTV These sealants must be applied such that they do not intrude into the annular space between the outside surface of the damper sleeve and the opening of the partition, or floor into which the damper/sleeve is installed. The annular space between damper sleeve and opening must not be filled with firestop materials such as fill, void, or cavity materials.

D. When joining multiple sections or fastening the damper to the sleeve, the damper shall be fastened with minimum 3/16" (4.8) diameter steel rivets, Quick-Lock Joints, welds or #10 (M5) bolts or sheet metal screws at 8" (203) o.c. maximum. There must be a minimum of two connections per side, top and bottom. For FSD-181 and 182 installations more than one damper high and three dampers wide, a minimum 14 gauge × 5" (1.9 × 127) supplemental steel mullion is required. The mullion should be the same length as the opening/duct height and must be installed between the damper frames running parallel to the opening/duct height, at the center of the assembly. Support mullions should be attached to the damper frames using the same fasteners indicated previously in this section.

E. A continuous bead of Dow Corning 700 or 732 or DOWSIL 700 or 732 or GE RTV 108 or SCS 1201 RTV silicone rubber sealant shall be applied between the damper and the sleeve and between sections of a multiple damper assembly. Sealant is only required on one side of the damper.

F. Fire/Leakage rated dampers and qualified operators are tested together by Underwriters Laboratories and are factory installed to qualify for standard damper/operator warranties. Damper operator/actuator must be tested prior to system start-up to ensure proper operation. Before applying power to the operator/actuator, the power must be verified.

DUCT SIZES	GALVANIZED STEEL				STAINLESS STEEL
	FSD-121, 122, 123	FSD-181, 182	FSD-131, 132	CFS-131, 132	FSD-121, 122, 123
Maximum Single Section	36" x 48" (914 x 1219)	32" x 48" (813 x 1219)	24" x 24" (610 x 610)	12" x 12" (305 x 305)	36" x 48" (914 x 1219)
Maximum Multiple Section	108" x 48"* (2743 x 1219)	144" x 96"* (3658 x 2438)	N/A	N/A	72" x 48" or 36" x 96"* (1829 x1219 or 914 x 2438)

*Individually sleeved dampers can be installed in partitions wider than the maximum U.L. multiple section size using the Support Mullion for Oversized Floor Openings. See Support Mullion for Oversized Floor Openings Installation Instructions for further details.

Information is subject to change without notice or obligation.

NOTE: Dimensions in parentheses ( ) are millimeters.

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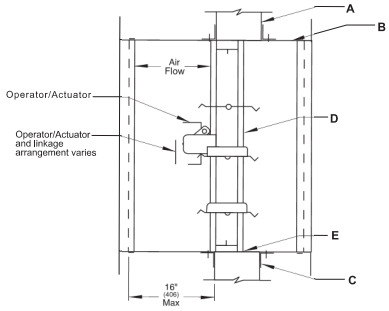
1½ hour — combination fire smoke dampers vertical installation instructions

The following installation details apply to models **FSD-121, FSD-122, FSD-123, FSD-181, FSD-181V, FSD-182, FSD-182V, FSD-131** and **FSD-132**



Vertical Mount

All dimensions shown in ( ) are in millimeters. Illustration depicts damper installed vertical right side up. Damper may also be installed upside down.

Illustrations show triple-V bladed (120/130 type), steel airfoil blade (180 type) similar.

CLASSIFIED UL SEE DETAILS ON UL CLASSIFICATION MARKING ON ENCLOSED PRODUCT CLASSIFIED UL C

A. Concrete or masonry fire partition shown. See Wood Stud and/or Steel Stud Framing for Fire Dampers In Drywall and/or Cavity Shaftwall Partitions Supplemental Installation Instructions for further vertical mount installation details. The opening shall be a minimum of 1/4" (6) with a maximum of 3/4" (19) larger than the overall damper and sleeve assembly size. When openings are larger than 3/4" (19), but less than 6" (152) the mounting angles must be a minimum of 16 gauge (1.5) and must be tall enough to overlap the opening by a minimum of 1" (25). Damper must be installed with leading edge of closed blade within the partition.

B. For rigid type duct connections, the sleeve shall be a minimum of 16 gauge (1.5) for dampers up to 36" wide by 24" high (914 x 610) and 14 gauge (1.9) for larger units. When lighter gauge sleeves are used, one or more of commonly used breakaway style connections are required. Refer to Sleeve Termination Supplemental Installation Instructions for further details. In no case will the sleeve gauge be less than the duct gauge to which it is connected. Damper sleeve shall not extend more than 16" (406) beyond the rated partition on the actuator side. The opposite side extension shall be a maximum of 6" (152) unless an access door is installed in the sleeve which then permits the extension to be a maximum of 16" (406).

C. Mounting angles shall be a minimum of 3/4" × 1-1/2" tall x 20 gauge (19 × 38 × 1.0). For opening sizes ≤80" wide (2032), 96" tall (2438) and not exceeding 26.67 square feet (2.48 square meters) mounting angles are required on only one side of the partition and must be attached to the sleeve and the partition. For larger openings (or optional on smaller openings) 1-1/2" × 1-1/2" × 16 gauge (38 × 38 × 1.5) mounting angles are required on both sides of the partition and must be attached to the sleeve only. Attachment to the sleeve shall be with a minimum of #10 (M5) screws or bolts, 3/16" (4.8) diameter steel rivets, Quick-Lock joints, or welds at 12" (305) o.c. maximum. Attachment to the partition/opening shall be with minimum #10 (M5) fasteners with a minimum length as follows: For metal studs and the angles under the drywall, the fasteners must be a minimum of 1/2" (12.7) long. For metal studs and the angles over the drywall the fastener must be a minimum of 1/2" (12.7) longer than the thickness of the drywall, i.e. if the partition has one layer of 5/8" (15.9) drywall on the attachment side, the screws must be 1/2" + 5/8" = 1 1/8" (12.7 + 15.9 = 28.6) long. For wood stud openings, the minimum length is 1-1/2" (38) longer than the thickness of the drywall on the attachment side. For concrete or masonry openings, the anchors must be a minimum of #10 (M5) fasteners: screws, bolts or self-tapping masonry screws. Fasteners in the partition should be spaced at 12" (305) o.c. maximum. There must be a minimum of two connections per side on all four sides. A minimum of 3/4" × 20 gauge (19 × 1) flange termination may be used in lieu of mounting angles. Refer to Sleeve Termination Supplemental Installation Instructions and Framing for Fire Dampers for further details. Ensure that the attachment device does not interfere with the operation of the damper and the free movement of the damper blades.

Note: If optional sealing between the mounting angle (or flange) leg and the surface of the partition, wall, or floor and/or between the mounting angle leg and the surface of the damper sleeve is required, any of the following sealants may be used: Dow Corning 700 or 732 or DOWSIL 700 or 732 or GE RTV 108 or SCS 1201 RTV These sealants must be applied such that they do not intrude into the annular space between the outside surface of the damper sleeve and the opening of the partition, wall or floor into which the damper/sleeve is installed. The annular space between damper sleeve and wall opening must not be filled with firestop materials such as fill, void, or cavity materials.

D. When joining multiple sections or fastening the damper to the sleeve, the damper shall be fastened with 3/16" (4.8) diameter steel rivets, Quick-Lock Joints, welds or #10 (M5) bolts or sheet metal screws at 8" (203) o.c. maximum. There must be a minimum of two connections per side, top and bottom. For vertical installations >108" wide x 96" high (2743 × 2438), a minimum 14 gauge × 5" wide (1.9 × 127) supplemental steel mullion is required. The mullion must be the same length as the opening/duct height. The mullion must be installed between the damper frames running parallel to the opening/duct height located at the center of the assembly. Supplemental support mullions should be attached to the damper frames using any of the same fasteners indicated previously in this section.

E. A continuous bead of Dow Corning 700 or 732 or DOWSIL 700 or 732 or GE RTV 108 or SCS 1201 RTV silicone rubber sealant shall be applied between the damper and the sleeve and between sections of a multiple damper assembly. Sealant is only required on one side of the damper.

F. Fire/Leakage rated dampers and qualified operators are tested together by Underwriters Laboratories and are factory installed to qualify for standard damper/operator warranties. Damper operator/actuator must be tested prior to system start-up to ensure proper operation. Before applying power to the operator/actuator, the power must be verified.

DUCT SIZES	GALVANIZED STEEL				STAINLESS
	FSD-121, 122, 123	FSD-181, 182	FSD-181V, 182V	FSD-121, 122	FSD-121, 122, 123
Maximum Single Section	36" × 48" (914 × 1219)	32" × 48" (813 × 1219)	48" × 32" (1219 × 813)	24" × 24" (610 × 610)	36" × 48" (914 × 1219)
Maximum Multiple Section	144" × 96" (3658 × 2438)	144" × 96" (3658 × 2438)	48" × 64" (1219 × 1626)	N/A	72" × 48" or 36" × 96" (1829 × 1219 or 914 × 2438)

The above information for dampers installed in a vertical fire separation pertains to those where the damper blades are horizontal. However, as an exception, if the dampers are Model FSD-121 and are 6" (152) wide by 6" (152) high, they may be installed wth the blades in a vertical orientation. All other installation details are as outlined above except that the mounting angle on the top of the damper sleeve needs only to be a minimum of 3/4" (19) tall.

Information is subject to change without notice or obligation.

NOTE: Dimensions in parentheses ( ) are millimeters.

No Exception Taken
please note that this device is not the same as the one for a face mount grille

model **FSD-122-OP**

1½ hour • **UL class 2 —** combination fire smoke damper actuator in the airstream — out-of-partition

Application

The FSD-122-OP combination fire smoke damper employs triple-V blades for point-of-origin control of fire and smoke in static and dynamic smoke management systems. These specialty dampers are approved for installation with the closed plane of the blades up to 14½" (368) outside the fire rated partition and come standard with the actuator in the airstream allowing for direct service access from the face of the damper through the HVAC grille. The FSD-122-OP is qualified to 2,000 ft/min (10.2 m/s) and 4 in.wg. (1.0 kPa) and may be installed in vertical walls and partitions, or horizontally in floors or assemblies with fire resistance ratings up to 2 hours.

Standard Construction

Frame: 5" × 1" (127 × 25) galvanized steel hat channel with interlocking corner gusset. Equivalent to 13 gauge (2.4) channel frame. Low profile head and sill are used on sizes less than 13" (330) high.

Blades: 6" × 16 gauge (152 × 1.5) galvanized steel — triple-V.

Sleeve: 20 gauge (1.0) galvanized steel with 1" (25) flange and factory installed thermal insulation on four sides.

Axles: ½" (13) diameter plated steel hex.

Linkage: Concealed in frame.

Bearings: Stainless steel oilite, sleeve-type.

Seals: Silicone blade edge seals and flexible metal jamb seals.

Actuator: 120 VAC, power-open, spring-close, internal mount.

Fire Closure Device: HS-10 (electric actuators)
PFV (pneumatic actuators)

Fire Closure Temperature: 165°F (75°C).

Minimum Size: 10" × 6" (254 × 152)

Maximum Size: 36" × 48" (914 × 1219)

Options

☐ Alternate actuator:
☐ External Mount ☐ 24 VAC ☐ 230 VAC
☐ Pneumatic

☐ DRS-30 — Two temperature fire closure device. (Includes PI-50 switch package)

☐ PI-50 — Dual position indicator switch package.

☐ Alternate factory installed sleeve:
Gauge: ☐ 18 (1.3) ☐ 16 (1.6) ☐ 14 (2.0) ☐ 10 (3.5)

☐ Transitions: ☐ Round ☐ Oval
☐ Duct connections: ☐ 1" (25) S-clip
☐ DM25 ☐ DM35 ☐ WARD

☐ Alternate fire closure temperature:
☐ 212°F (100°C) ☐ 250°F (121°C)
☐ 350°F (177°C).

☐ Duct smoke detector factory mounted and wired:
☐ 2151 (0-3,000 fpm [0-15.2 m/s])

☐ Remote control stations:
☐ RCP-1 (single) ☐ RCP-1K (single, key controlled)
☐ RCP-1M (single, momentary switch)

Ratings

UL 555 Fire Resistance Rating: 1½ hour (vertical and horizontal)

UL 555S Leakage Class: 2 [20 cfm/sq.ft. @ 4 in.wg.]
[(0.10 $m^3/s/m^2$ @ 1.0 kPa)]

Maximum Dynamic Closure Velocity: 2,000 fpm (10.2 m/s)

Maximum UL555S Rated Pressure: 4 in.wg. (1.0 kPa)

Maximum Temperature: 350°F (177°C)

Listings

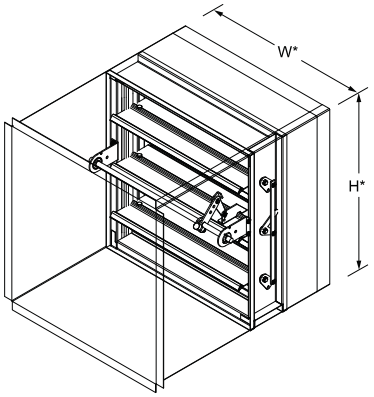
UL 555 and 555S listing: R14981

CSFM listing: 3225-1404:105 and 3230-1404:106

New York City MEA listing: 295-98-E

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

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



Model **FSD-122-OP**
(standard)
*Standard sleeve O.D. including thermal blanket wrap, is approximately 3/8" (9) over nominal duct size. Standard sleeve I.D. is approximately nominal duct size.

NOTE: The opening for the damper assembly in the fire wall must be sized appropriately. If not, serious damage to the thermal blanket wrap could occur and this will nullify the U.L. rating. Contact the factory if necessary for additional information.

NOTE: Dimensions in parentheses ( ) are millimeters.

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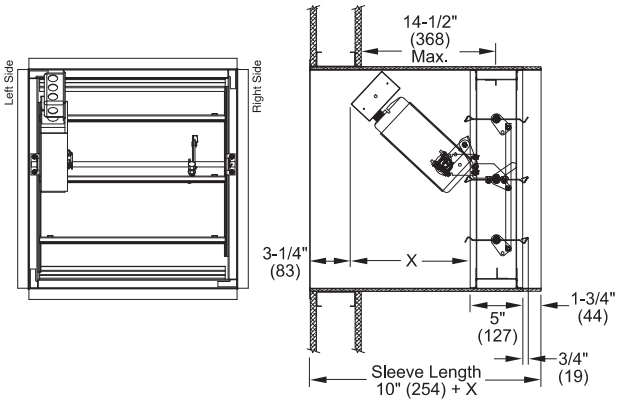
Actuator and Sleeve Dimensional Data

The drawings and corresponding table show 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.

Actuator Model	X Dimension		Minimum Damper Size (w x h)
FSTF120	10" (254) (H < 15")	6" (152) (H ≥ 15")	10" x 6" (254 x 152)
FSLF120/24	11" (279) (H < 15")	6" (152) (H ≥ 15")	10" x 6" (254 x 152)
FSNF120/24	14" (356) (H < 18")	11" (279) (H ≥ 18")	10" x 10" (254 x 254)
ML4115/8115 MS4209/8209	10 1/2" (267) (H < 13")	7 1/2" (191) (H ≥ 13")	10" x 8" (254 x 203)
331-4826	N/A	8" (203) (H ≥ 20")	10" x 20" (254 x 508)

NOTE: 1. Damper may be rotated 180° to position actuator on right side.
2. For dimensions on actuators not shown above, contact factory.
3. If actuator is ordered with optional external mount, sleeve flange should be ordered loose, for field assembly.



Airflow Performance Data

Pressure Loss vs. Velocity

Figure 5.3 — Ducted Inlet and Outlet

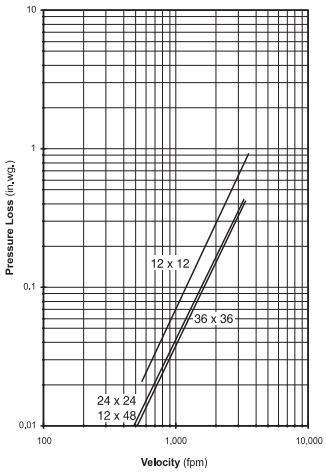


Figure 5.2 — Ducted Inlet

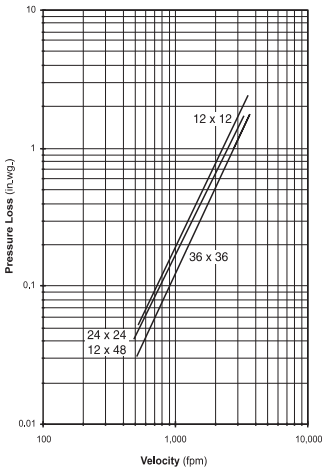
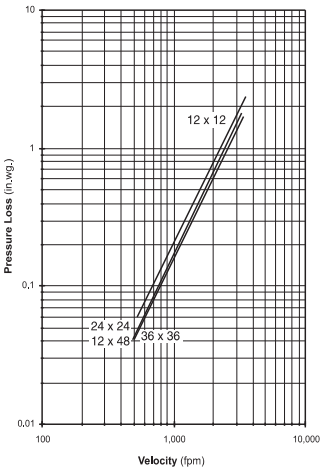
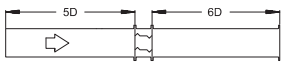


Figure 5.5 Plenum Mount

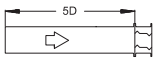


Pressure drop testing was performed in accordance with AMCA Standard 500-D using the three configurations shown. All data has been corrected to represent air density of 0.075 lb/ft. Actual pressure drop in any ducted HVAC system is a combination of many elements. This information, along with analysis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

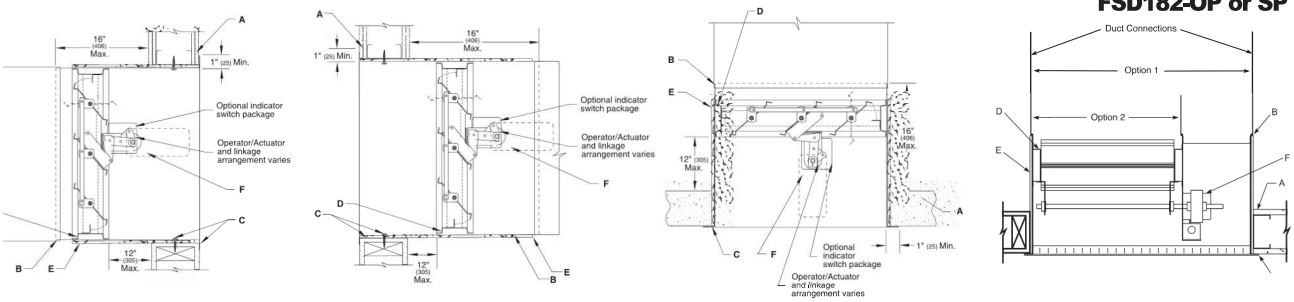
Information is subject to change without notice or obligation.

NOTE: Dimensions in parentheses ( ) are millimeters.

out-of-partition and side panel

1½ hour — combination fire smoke dampers installation instructions

The following installation details apply to models **FSD-121-OP or SP, FSD-122-OP or SP, FSD-123-OP, FSD-181-OP or SP and FSD182-OP or SP**



Illustrations show triple-V bladed (120 type), steel airfoil blade (180 type) similar.

Vertical Mount (Side View)

Notes:
- All dimensions shown in ( ) are in millimeters.
- Vertical illustration depicts damper installed vertical right side up. Damper may also be installed upside down.
- Above detail applicable for concrete partitions also.

Horizontal Mount (Side View)

- Horizontal illustration depicts damper installed from the top down with the actuator above the floor line. Damper may also be installed from the bottom up with the actuator below the floor line.

Vertical Mount SP (Top View)

- Illustration shows side panel with motor on right side. The unit can also be installed with the motor/side panel on the left side.
- Above detail applicable for concrete partitions also.

A. Typical 2 hour steel stud vertical and concrete horizontal fire partition shown. See steel Stud Framing for Fire Dampers In Drywall and/or Cavity Shaftwall Partitions Supplemental Installation Instructions for further details. The opening shall be a minimum of 1/4" (6) larger than the overall damper and sleeve assembly size. Damper must be installed with leading edge of the damper frame no more than 12" (305) outside the partition.

B. For rigid type duct connections, the sleeve shall be a minimum of 16 gauge (1.5) for dampers up to 36" wide by 24" high (914 x 610) and 14 gauge (1.9) for larger units. When lighter gauge sleeves are used, one or more of commonly used breakaway style connections are required. Refer to Sleeve Termination Supplemental Installation Instructions for further details. In no case will the sleeve gauge be less than the duct gauge to which it is connected. Damper sleeve shall not extend more than 16" (406) beyond the rated partition on the actuator side.

C. Mounting flange shall be a minimum of 1" x 20 gauge . The flange shall be attached to the sleeve with 3/16" (4.8) diameter steel rivets. Quick-Lock joint, welds, No.10 (M5) bolts or sheet metal screws at 8" (203) o.c. maximum. The damper sleeve shall be fastened directly to the partition with 3/4" (4.8) diameter steel rivets, or No.10 (M5) sheet metal screws at 8" (203) o.c. maximum. A minimum of two connections per side, top and bottom. A minimum 1-1/2" x 3/4" x 20 gauge (38 x 19 x 1) mounting angle may be used on the opposite side of the partition from the mounting flange in lieu of fastening the sleeve directly to the partition. When using mounting angles they shall be attached to the sleeve under the same guideline as the mounting flange.

D. When fastening the damper to the sleeve, the damper shall be fastened with 3/16" (4.8) diameter steel rivets, Quick-Lock Joints, welds, No. 10 (M5) bolts or sheet metal screws at 12" (305) o.c. maximum. A minimum of two connections per side, top and bottom.

E. A factory installed minimum of one layer of thermal blanket wrap shall encase the exterior of the damper sleeve and shall span the entire length of the sleeve from the outer most edge of the damper frame to the mounting flange. Care should be taken during handling & installation to prevent tearing or bending of the material. To aide in this the thermal blanket may be fastened to the sleeve with adhesive.

F. Fire/Leakage rated dampers and qualified operators are tested together by Underwriters Laboratories and are factory installed to qualify for standard damper/operator warranties. Damper operator/actuator must be tested prior to system start-up to ensure proper operation. Before applying power to the operator/actuator, the power must be verified.

Special Notes for Dampers Installed in Wood Stud Construction:

1. The opening must be made larger to permit the attachment of gypsum wallboard to the sides and top of the outside of the damper sleeve. The wallboard must be a minimum of 1/2" thick and must be UL rated for use in fire protective construction. The bottom of the damper requires no wallboard. Therefore, if 1/2" (13) thick wallboard is used, the opening will have to be 1" (25) wider and 1/2" (13) higher than normal.
2. The wallboard must be attached to outside of the damper sleeve with a minimum of 2 drywall screws on each of the sides and on the top. The screws on the sides should be located approx. 1-1/2" (38) from the back edge of the sleeve and approx. 1-1/2" (38) down from the top and 1-1/2" (38) up from the bottom of the sleeve. The screws on the top should be located approx. 1-1/2" (38) from the back edge of the sleeve and approx. 1-1/2" (38) in from each side of the sleeve. The screws should be a #6 or larger and must be 3/8" (10) longer than the thickness of the drywall attached to the sleeve.
3. In lieu of the sleeve to partition attachment details above, the damper/sleeve must be attached to the opening with min. #10 screws (drywall, wood or equivalent), 3" (76) long. The screws must be at a max. of 8" (203) o.c. and must be located such that they penetrate the wood framing members around the opening.
4. A steel grille must be installed on the flange of the damper sleeve. The grille must be a min. of 24 ga. thick and have a min. 1" (25) tall flange that overlaps the damper flange.

For use in Dynamic or Static Systems 1-1/2 (38) Hour Rated for Vertical or Horizontal Installation
Galvanized or Stainless Steel

Notes:

1. The annular space between damper sleeve and wall opening must not be filled with firestop materials such as fill, void, or cavity materials. However, if optional sealing between the retaining angle (or flange) leg and the surface of the partition, wall, or floor and/or between the retaining angle leg and the surface of the damper sleeve is required, any of the following sealants may be used:
   Dow Corning 700 or 732 DOWSIL 700 or 732 GE RTV 108 or SCS 1201 RTV
   These sealants must be applied such that they do not intrude into the annular space between the outside surface of the damper sleeve and the opening of the partition, wall or floor into which the damper/sleeve is being installed.

CLASSIFIED SEE DETAILS ON UL CLASSIFICATION MARKING ON ENCLOSED PRODUCT CLASSIFIED

2. In order to run the necessary electrical wiring or pneumatic piping/tubing to facilitate supplying power to the actuator it will be necessary to cut a hole in the damper sleeve. Care should be taken such that the hole is as small as possible but will still permit the necessary electrical wiring or pneumatic piping/tubing to connect through and/or attach to the sleeve. As is always the case, all electrical and pneumatic connections should be done in accordance with the local code requirements.

Underwriter's Laboratories file #R14981. City of New York listing # MEA 295-98-E
The product is also listed by CSFM file # 3225-0368:110 and 3230-0368:111 and conforms to NFPA 90-A and NFPA 92-A.

Information is subject to change without notice or obligation.

NOTE: Dimensions in parentheses ( ) are millimeters.

C&S AIR PRODUCTS 5101 Blue Mound Road, Fort Worth, Texas 76106 www.csairproducts.com

model **HS-10**
fire closure device
one-temperature manually resettable

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 permits testing of the damper closure by applying direct heat to the sensor's disc or by physically depressing the disc from the inside of the damper sleeve. The damper can be reopened by manually resetting the sensor from the exterior side of the damper sleeve, once the disc has cooled down below its set temperature.

Listings

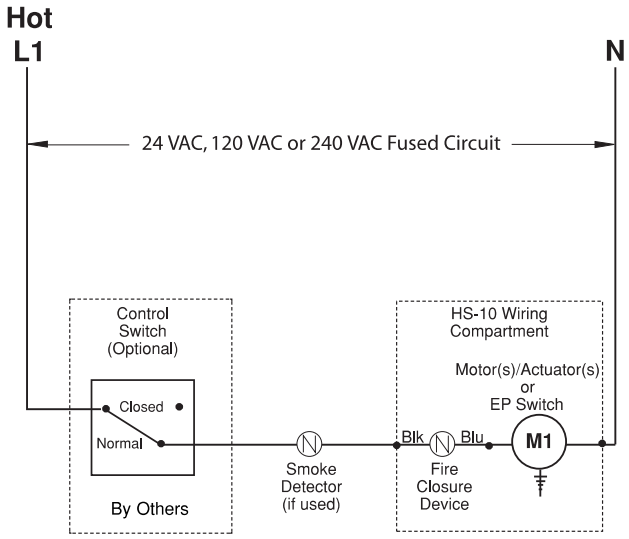
UL 555 listing: R14981

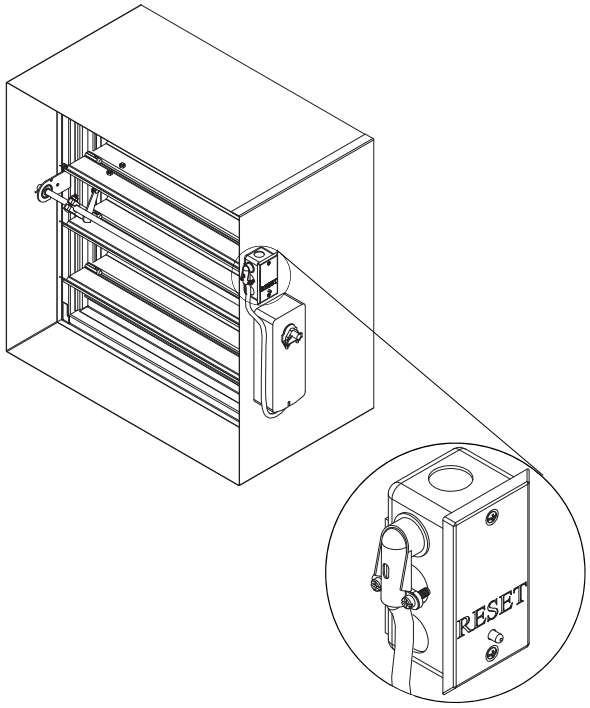
CSFM listing: 3225-1404:109, 3225-1404:105, 3225-1404:108, 3230-1404:111, 3230-1404:106, 3230-1404:107

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

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

Wiring Diagram





Model **HS-10** external

Control Switch Function

Normal

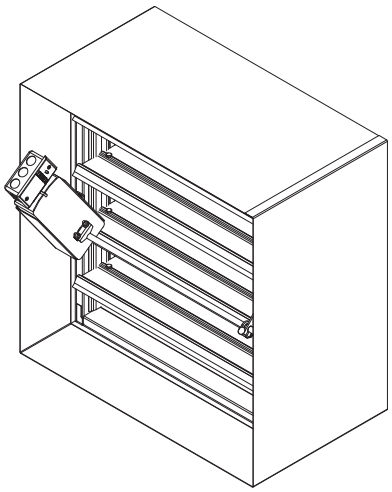
The damper remains open except in either of the following situations:

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** internal

Information is subject to change without notice or obligation.

NOTE: Dimensions in parentheses ( ) are millimeters.

C&S AIR PRODUCTS 5101 Blue Mound Road, Fort Worth, Texas 76106 www.csairproducts.com

model **PI-50**
indicator switch package
in-jamb dual position

Application

The PI-50 indicator switch package employs an in-jamb assembly plate consisting of two single pole, double throw micro switches to provide full open and full closed blade indication from a remote location. The PI-50 indicator switch package is factory installed directly to a damper blade.

Ratings

125/250 VAC, 12A
250 VAC, 1/3HP; 125 VAC, 1/6HP
250 VDC, 1/4A; 125 VDC, 1/2A
Max. ambient temp. 257°F (125°C)

Listings

UL 555 listing: R14981

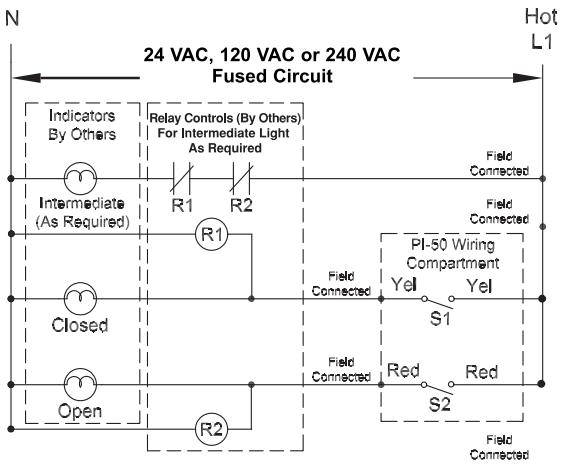
CSFM listing: 3225-1404:110, 3225-1404:111, 3225-1404:112, 3225-1404:113, 3225-1404:115, and 3225-1404:116.

New York City MEA listing: 295-98-E

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

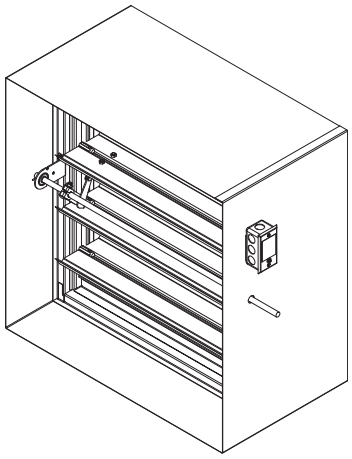
Meets Building Code Standards: IBC, NBC, NFPA, SBC and UBC

Wiring Diagram

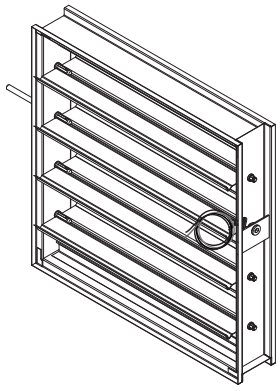


Verify continuity before final wiring.

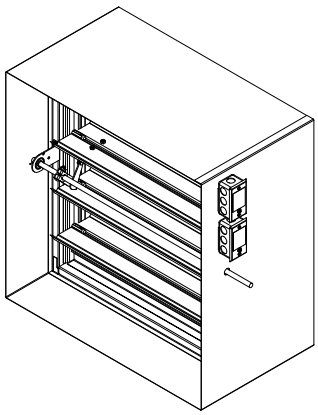
S1 & S2 - Damper position indicator switches.
S1 - Closes when damper is closed.
S2 - Closes when damper is open.
R1 - Relay control for intermediate position indication.
R2 - Relay control for intermediate position indication.



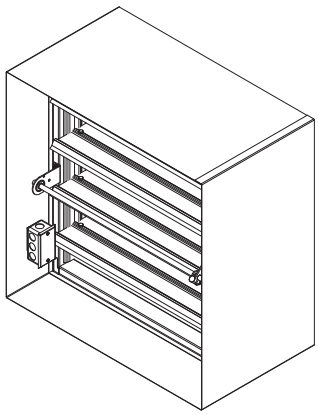
Model **PI-50** (sleeve option), external mount wiring box



Model **PI-50** (no sleeve)



Model **PI-50** (sleeve and two per ordered size option), external mount wiring box (internal mount wiring box available)



Model **PI-50** (sleeve option), internal mount wiring box

Information is subject to change without notice or obligation.

NOTE: Dimensions in parentheses ( ) are millimeters.

C&S AIR PRODUCTS 5101 Blue Mound Road, Fort Worth, Texas 76106 www.csairproducts.com

No Exception Taken

COLUMBIA

ROUND AND FITTING DAMPERS

COL

Product Application:

Round and Fitting style dampers are used to balance air volume within heating and cooling systems.

Features:

- Easy to install in pipe and / or most round fittings
- Available in single and double bearing models (RD style pictured)

"RD" Style		
Size	**Product #**	**Gauge**
5"	COL RD5	30
6"	COL RD6	30
7"	COL RD7	30

"FD" Style		
Size	**Product #**	**Gauge**
4"	COL FD4	26
5"	COL FD5	26
6"	COL FD6	26
7"	COL FD7	26
8"	COL FD8	26
9"	COL FD9	26
10"	COL FD10	26
12"	COL FD12	26
14"	COL FD14	24
16"	COL FD16	24
18"	COL FD18	24

Revision Date: 06/04/18

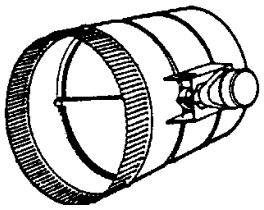
COLUMBIA
4402 20th Street East Tacoma, WA 98424 | Phone: (877) 620-8258 | Fax: (253) 922-0769 | mfgquote@gensco.com
If desired size is not listed, contact Columbia today!

No Exception Taken

GENSCO

PRODUCT SPECIFICATION SHEET

PRODUCT INFORMATION	
Description:	**Motorized Spring Return Round Damper**

Prefix Code: **CVP** **Unit of Measures** Sold by the: Each Inventoried by the: Each Stocked by the: Each, PKG	

PRODUCT APPLICATION

- Motorized damper can be used as fresh air intake damper or zoning damper.

GENSCO

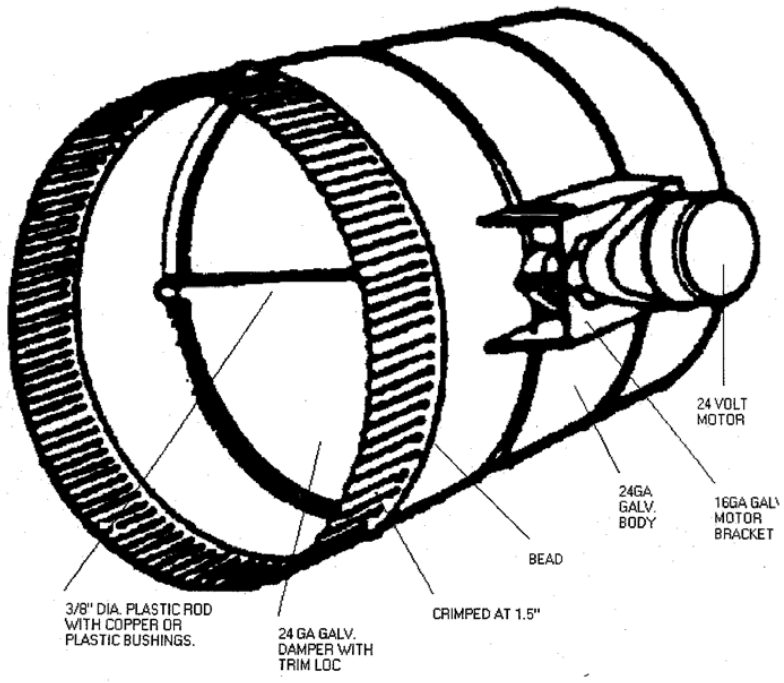
PRODUCT SPECIFICATION SHEET

PRODUCT SAFETY

Sheet metal parts should not be handled or installed without the use of leather gloves.

ASSOCIATED PRODUCTS

- Columbia Chimney and Venting Products



GENSCO

PRODUCT SPECIFICATION SHEET

AVAILABLE STOCK SIZES

SPRING RETURN ROUND DAMPER			
SIZE	**CODE**	**OVERALL LENGTH**	
6	CVP SRRD 6 24V	8”	
7	CVP SRRD 7 24V	8”	
8	CVP SRRD 8 24V	8”	
10	CVP SRRD 10 24V	10”	

GENSCO

PRODUCT SPECIFICATION SHEET

PRODUCT FEATURES AND BENEFITS

- Made in America, Union Made.
- U.L. Approved (Stock sizes).
- Assembled.
- Body is 24 ga construction. 20 ga junction box motor cover. 16 ga motor mount.
- 24 volt motor only.
- Motor is 60 Hz, 6 watts, and 60 RPH.
- Stock = closed – power open.
- Can be made via special order to be open – power close.
- Adjustable air flow control.

GENSCO

PRODUCT SPECIFICATION SHEET

Columbia™

INSTALLATION INSTRUCTIONS

SR RD ROUND DAMPER (24 Volt)
WITH ADJUSTABLE AIR FLOW

Installation Instructions

Flexible Round Duct:
Slip duct over ends of flexible round duct section and strap in place.

Rigid Round Duct:
Slip duct over rigid round duct section and screw in place.

Motor Lead Identification

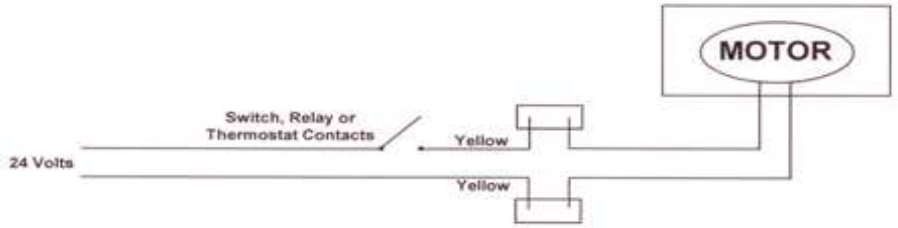
Yellow leads: 24 Volt input

IMPORTANT

This motor is designed for use with 24 VAC power source.

WIRE ACCORDING TO LOCAL CODE

Energizing the yellow leads with 24 Volts will **OPEN** the damper. Removing power from the yellow leads will cause the damper to return to a fully **CLOSED** position.



Damper Volume Adjustment

1. Loosen adjustment screw on the motor bracket.
2. Slide the screw assembly to the desired position.
3. Tighten the screw securely to lock in place.
4. Repeat these steps whenever damper adjustment is required.

Columbia Products is a Trademark of:
Gensco, Inc.
4402 – 20th Street East
Tacoma, WA. 98424-1815
(253) 622-8203 (877) 620-8203 FAX: (253) 922-0769

Your Distributor:

Gensco, Inc.
Columbia Manufacturing

Revised: 9/29/06
Round Damper Installation Instructions.doc

GENSCO

PRODUCT SPECIFICATION SHEET

V E N D O R I N F O R M A T I O N

Columbia Manufacturing
4402 – 20th Street East
Tacoma, WA. 98424

CUSTOMER SERVICE CONTACTS

STOCK PRODUCTS & SPECIAL FABRICATION
Sheet Metal Estimators
(253) 926-2057
E-mail: mfgquote@gensco.com

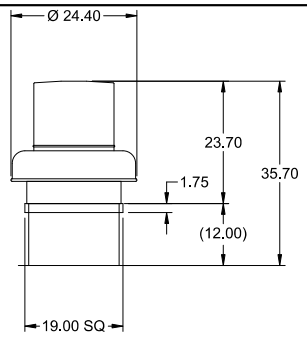
No Exception Taken
please verify all electrical requirements with electrical contractor.

GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: EF-4
Model: G-099-VG

Model: G-099-VG

Direct Drive Centrifugal Roof Exhaust Fan

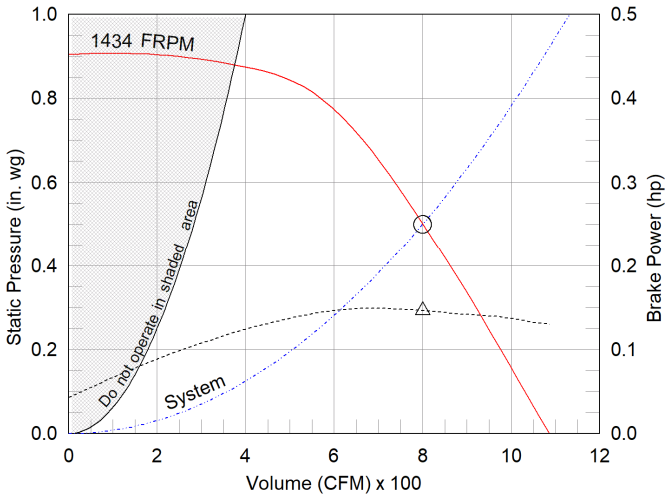


OVERALL HEIGHT MAY BE GREATER DEPENDING ON MOTOR, ADAPTER, AND/OR HINGE BASE.

Dimensional	
Quantity	1
Weight w/o Acc's (lb)	28
Weight w/ Acc's (lb)	38
Weight w/ Acc's and Curb (lb)	54
Standard Curb Cap Size (in.)	19 x 19
Optional Damper (in.)	12 x 12
Roof Opening (in.)	14.5 x 14.5

Performance	
Requested Volume (CFM)	800
Actual Volume (CFM)	800
Total External SP (in. wg)	0.5
Fan RPM	1434
Operating Power (hp)	0.15
Elevation (ft)	30
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.075
Tip Speed (ft/min)	4,200
Static Eff. (%)	43

Misc Fan Data	
Fan Eff. Index (FEI)	-
Outlet Velocity (ft/min)	833



△ Operating Bhp point
○ Operating point at Total External SP
Fan curve
System curve
Brake horsepower curve

Motor	
Motor Mounted	Yes
Size (hp)	1/4
Voltage/Cycle/Phase	115/60/1
Enclosure	TENV
Motor RPM	1725
Efficiency Rating	High
Windings	1
FLA (Amps)	2.85
Min. Circuit Ampacity (MCA)	4
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	72	75	75	66	62	60	55	49	70	59	9.6

Notes:

All dimensions shown are in units of in.
*NEC FLA, MCA and MOP are for reference only – based on tables 430.248 or 430.25 of National Electric Code 2020. Actual motor FLA may vary, for sizing thermal overload, consult factory. MCA and MOP values shown only account for the motor, not accessories (damper actuator, field supplied VFD, etc).
LwA - A weighted sound power level, based on ANSI S1.4
dBA - A weighted sound pressure level, based on 11.5 dB attenuation per Octave band at 5 ft - dBA levels are not licensed by AMCA International
Sones - calculated using ANSI/AMCA 301 at 5 ft

GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: EF-4
Model: G-099-VG

Model: G-099-VG

Direct Drive Centrifugal Roof Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward inclined composite (sizes 60-95) or aluminum (sizes 97-300) wheel - Aluminum curb cap with prepunched mounting holes - Birdscreen - Ball bearing motors (sizes 85-300 and all Vari Green), sleeve bearing motors (sizes 60-80) - Motor isolated on shock mounts - Corrosion resistant fasteners

Selected Options & Accessories:

Motor - Vari-Green EC motor
Control - Dial for balancing
Provided motor meets the motor efficiency requirements set forth in 2015 Washington St Energy Code
Standard Curb Cap Size - 19 Square
UL/cUL 705 Listed - "Power Ventilators"
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Foam Curb Seal (Factory Applied)
Birdscreen: Galvanized, nom. 84% Free Area
Unit Warranty: 1 Yr (Standard)
Damper Shipped Loose, WD-100-PB-12X12, Gravity Operated, Not Coated

Selected Sub Marks

See individual submittals for full details
GPI-19-G12

The Vari-Green Motor included in this order has a 'Multi-Voltage' ability. The red wire on the motor is called a 'Voltage Doubler', and when it is connected the motor can be powered by 115V.
If the Red wire is disconnected, then the motor can be powered with 208-230/277V. The motor will leave the factory with the voltage doubler wired per the order.

GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: EF-4
Model: G-099-VG

Disconnect Switch

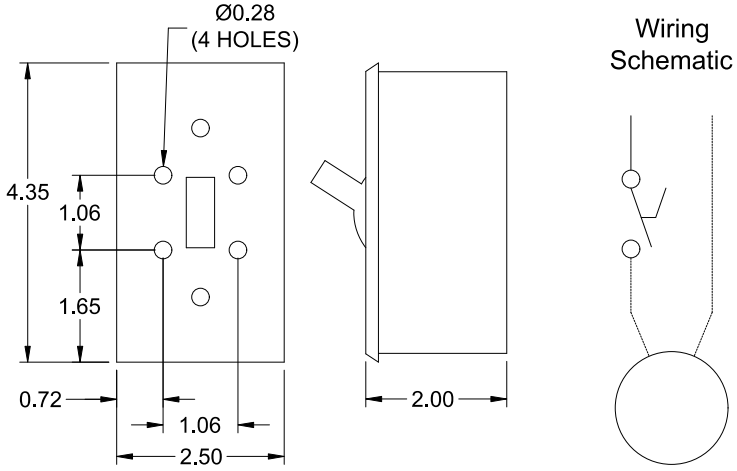
Enclosure Rating: NEMA-1

Standard Construction Features:
Enclosure constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment and to provide a degree of protection against falling dust. This enclosure meets the rod entry and the indoor corrosion protection design tests. The rod entry test is intended to simulate incidental contact with enclosure equipment. Enclosure is equipped with provision to lockout in the off position with customer supplied lock.

Disconnect Switch Configuration

Type:	Toggle	Motor Size:	1/4 hp	Voltage:	115	UL Listed:	Yes
Manufacturer:	Pass and Seymour	Cycle:	60	Amperage:	15	CSA Approved:	Yes
Overload Protection:	None	Phase:	1	Switch Pole(s):	1	Rating:	1/2 hp
Junction Box Mtg.:	Mounted and Wired	RPM:	1725	Exp. Resist. Wiring:	None		
Switch Mounting:	Shipped With Unit						

Electrical Drawing Details



Notes: All dimensions shown are in units of in.

GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: EF-4
Model: G-099-VG

Vari-Green
Motor & Control Options

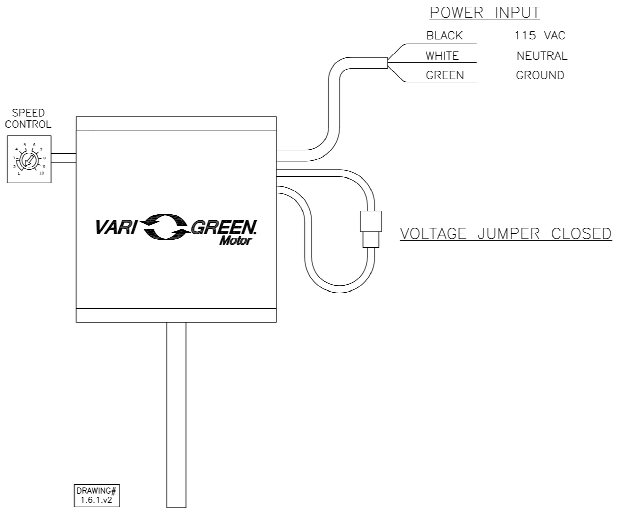
An EC motor that uses AC input power and internally converts it to DC power. Potentiometer (dial) mounted on the motor enclosure adjusts the speed (RPM) down 80%. Vari-Green motors feature a soft-start and inherent thermal and current protection built into each unit. Inrush current at start up is eliminated and the motor will automatically reduce speed or turn off if overloaded or it becomes too hot.

Motor Configuration

Input Voltage:	115
Speed Reference:	Dial on Motor
Permanent Dial:	Yes

Control Configuration

Control Type:	N/A
Transformer:	None



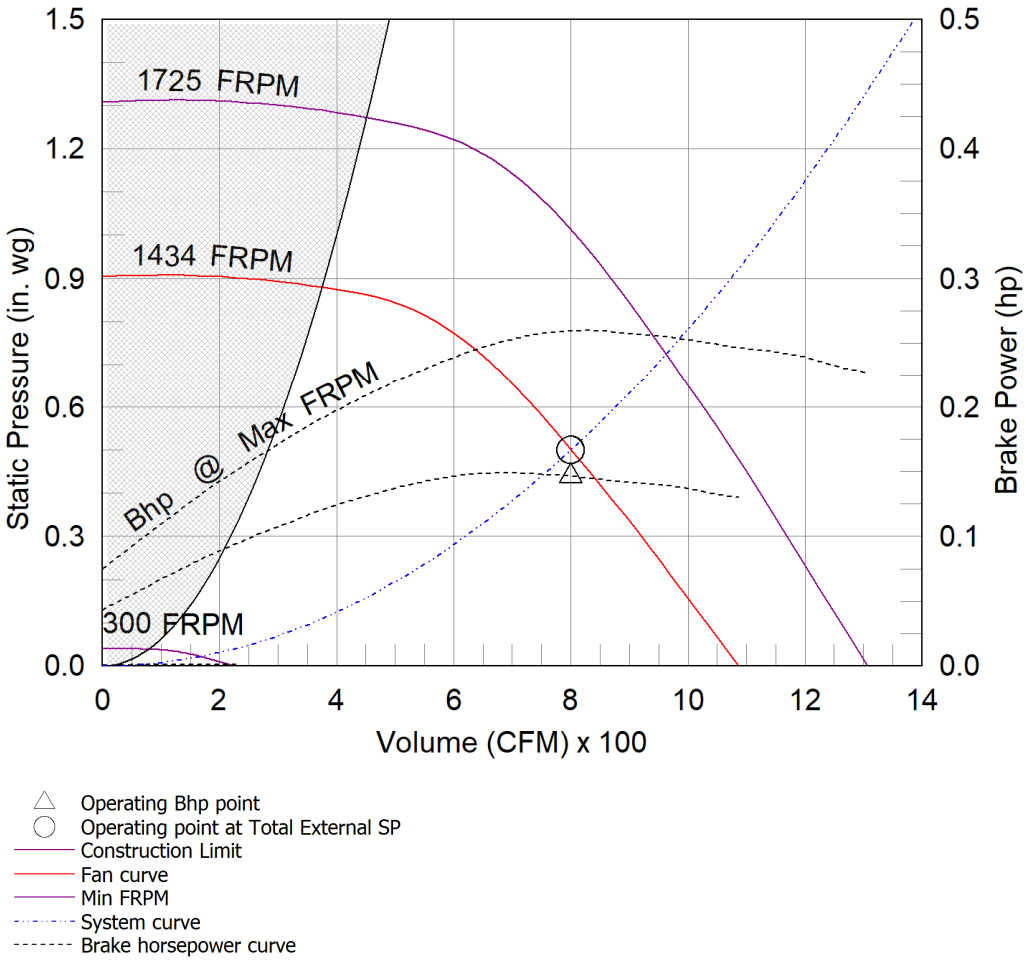
GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: EF-4
Model: G-099-VG

G-099-VG Min/Max Fan Curve

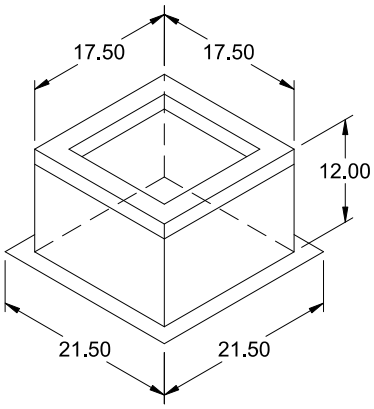
Performance

Requested Volume (CFM)	Actual Volume (CFM)	Total External SP (in. wg)	Fan RPM	Operating Power (hp)
800	800	0.5	1434	0.15



GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: EF-4
Model: GPI-19-G12



Model: GPI

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. mounting flange - 3 lb density insulation - Height - Available from 12 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPI-19	Nominal	1.5	16	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Actual Inside Width (in.)	Actual Inside Length (in.)	Flange Width (in.)	Flange Length (in.)	Hinge Base Width* (in.)	Hinge Base Length* (in.)
12	19	19	17.5	17.5	14	14	21.5	21.5	18	18
*May not be applicable										

Accessories

Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
Galvanized	No	No	1	R4.3

please have all components of the smoke pressurization system reviewed by the firm producing the rational analasys Required cfms and pressures may be different from design based on building testing.

GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: SPF-1
Model: USF-27

Performance	
Quantity	1
Volume (CFM)	9,000
Total External SP (in. wg)	1.439
Operating Power (hp)	3.73
Required Power (hp)	3.73
Fan RPM	965
Max Fan RPM	1,425
Oper. Frequency (Hz)	60
Elevation (ft)	30
Start-up Temp.(F)	70
Operating Temp.(F)	70

Fan Configuration	
Size	27
Wheel Type	BI
Arrangement	10
Class	I
Rotation	CCW
Discharge Position	TH
Construction Type	PermaLock
Spark Resistance	None
Scroll Material	Steel
Wheel Material	Steel
Inlet Cone Material	Steel
Pedestal Material	Steel

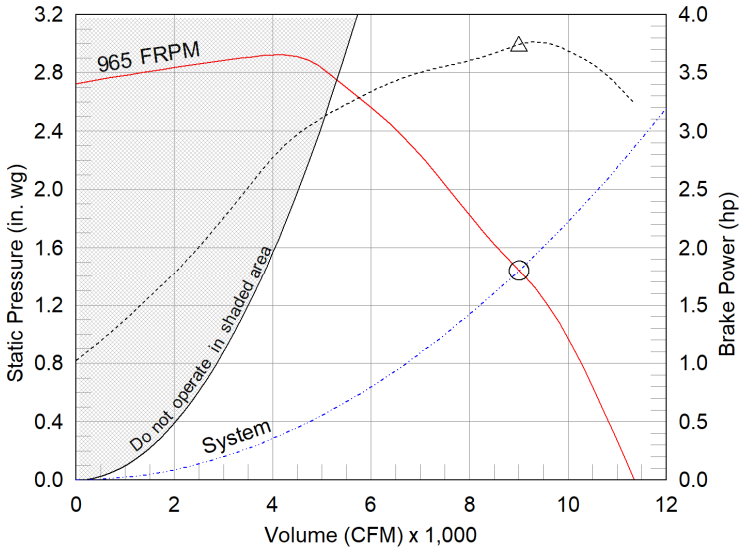
Equipment Weights	
Fan (LMD)(lb)	546
Motor/Drive (lb)	101
Accessories (lb)	112

Misc Fan Data	
Fan Energy Index (FEI)	1.31
Outlet Velocity (ft/min)	2,148
Static Efficiency (%)	57
Tip Speed (ft/min)	6,819

Motor and Drives	
Motor	Included
Size (hp)	5
RPM	1725
Enclosure	TEFC
V/C/P	460/60/3
Frame Size	184T
Max Frame Size	256
Location	Centered
Pulley Type	Constant
Drive Loss (%)	4.2
Drives	1.5 x Standard
Drive Service Factor	N/A
NEC FLA* (Amps)	7.6

Model: USF-27
Universal Single Width Fan

Operating Performance



△ Operating Bhp point
○ Operating point at Total External SP
Fan curve
System curve
Brake horsepower curve

Nameplate Model: USF-27-3-B4-00-01-01

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	81	85	83	76	77	74	69	63	82	70	18.8
Outlet	90	94	85	81	80	75	71	63	85	74	25

*FLA - based on tables 150 or 148 of National Electrical Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.
LwA - A weighted sound power level, based on ANSI S1.4
dBA - A weighted sound pressure level, based on 11.5 dB attenuation per octave band at 5 ft- dBA levels are not licensed by AMCA International
Sones - calculated using AMCA 301 at 5 ft

CAPS 4.38.923

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GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: SPF-1
Model: USF-27

Model: USF-27

Universal Single Width Fan

Standard Construction Features:

HOUSING: Class 0, I, and II feature Perma-Lock construction on sizes 4 - 49 and continuously welded on sizes 54 - 73 and all class III fans - Unit support angles with pre-punched mounting holes - Adjustable motor plate - Corrosion resistant fasteners - Inlet collars - Punched outlet flange standard (except for downblast - DB) on class 0, I, and II sizes 33 - 73 and all class III fans - all steel parts are processed through a multi-stage cleaning and pre-treatment and then finished with a high performance powder coating.
BEARINGS, SHAFT, AND WHEEL: Air handling quality, self-aligning, ball bearing in pillow block housing - Polished, solid steel shafts - Centrifugal wheel

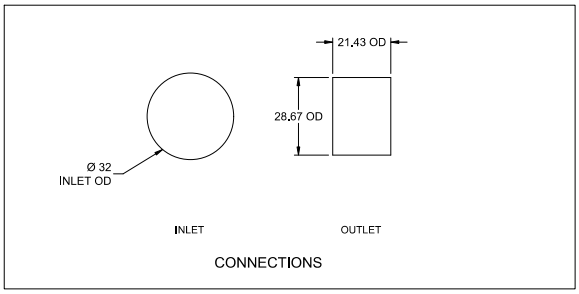
Selected Options & Accessories:

NEMA Premium Efficient Motor - meets NEMA Table 12-12
Motor VFD Rated without Shaft Grounding Protection
Motor with Class F or Greater Insulation
Drives for Emergency Duty-UBC 905.7.6/IBC 909 - 1.5 x Standard, Minimum 2 Grooves (Min 2.4 SF)
Finish - Coated
Coating - Permatector, Concrete Gray-RAL 7023, Fan and Attached Accessories
Switch - NEMA-3R, Toggle, For Indoor or Outdoor Use, Ship Separate
Rotation - CCW
Bearings - L(10) Life of 80k Hours
Discharge Position - TH
UL Listed - Emergency Smoke Control (500F/4hrs, 572F/2hrs, 752F/2hrs, 1000F/15min)
Polished Steel Shaft
Access Door - Bolted
Drain Connection - 1" Pipe Thread w/Plug
Inlet Connection, Slip Fit
Outlet Connection, Slip Fit
Weatherhood - Steel
Heat Slinger
Shaft Seal - High Temp
Unit Warranty: 1 Yr (Standard)

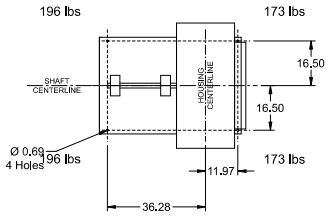
GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: SPF-1
Model: USF-27

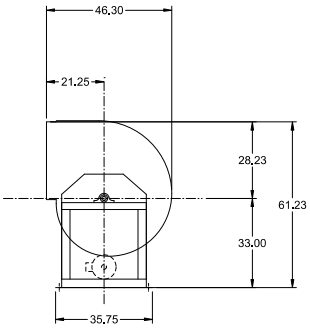
Model: USF-27 Universal Single Width Fan



CONNECTIONS

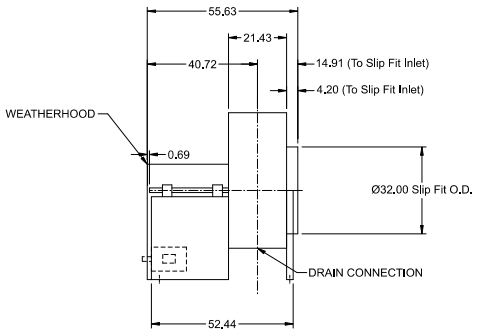


FAN FOOTPRINT



SIDE VIEW

*SIDE VIEW IS VIEWED FROM DRIVE SIDE



END VIEW

Notes: All dimensions shown are in units of in.

CAPS 4.38.923

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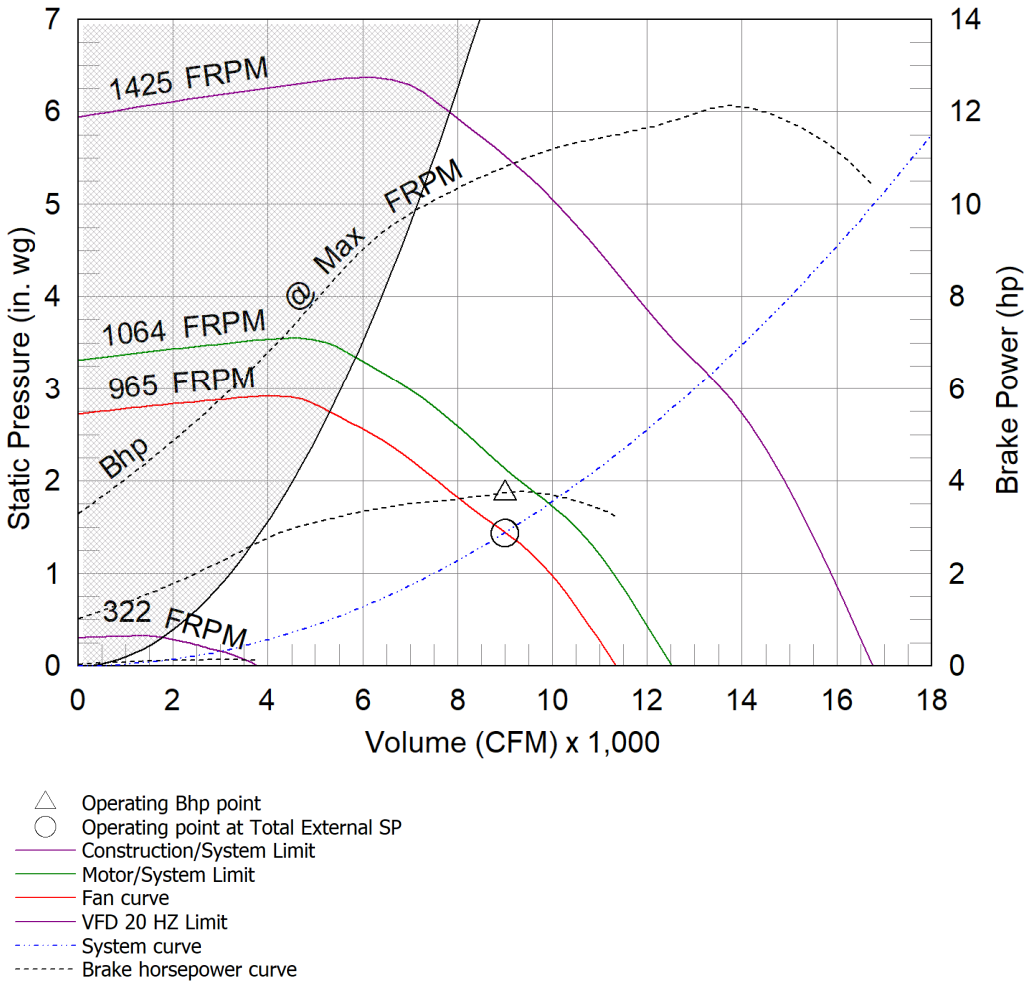
GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: SPF-1
Model: USF-27

USF-27 Min/Max Fan Curve

Performance

Requested Volume (CFM)	Actual Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	Fan RPM	Operating Power (hp)
9,000	9,000	1.439	1.439	965	3.73



△ Operating Bhp point
○ Operating point at Total External SP
Construction/System Limit
Motor/System Limit
Fan curve
VFD 20 HZ Limit
System curve
Brake horsepower curve

CAPS 4.38.923

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please have all components of the smoke pressurization system reviewed by the firm producing the rational analasys Required cfms and pressures may be different from design based on building testing.

GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: SPF-2
Model: USF-24

Performance	
Quantity	1
Volume (CFM)	7,000
Total External SP (in. wg)	1.439
Operating Power (hp)	2.76
Required Power (hp)	2.76
Fan RPM	1038
Max Fan RPM	1,570
Oper. Frequency (Hz)	60
Elevation (ft)	30
Start-up Temp.(F)	70
Operating Temp.(F)	70

Fan Configuration	
Size	24
Wheel Type	BI
Arrangement	10
Class	I
Rotation	CCW
Discharge Position	TH
Construction Type	PermaLock
Spark Resistance	None
Scroll Material	Steel
Wheel Material	Steel
Inlet Cone Material	Steel
Pedestal Material	Steel

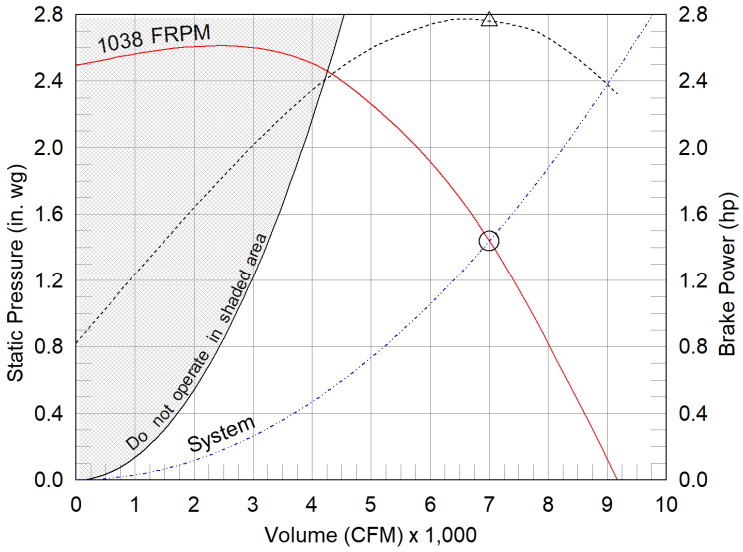
Equipment Weights	
Fan (LMD)(lb)	352
Motor/Drive (lb)	99
Accessories (lb)	1

Misc Fan Data	
Fan Energy Index (FEI)	1.37
Outlet Velocity (ft/min)	2,029
Static Efficiency (%)	60
Tip Speed (ft/min)	6,655

Motor and Drives	
Motor	Included
Size (hp)	5
RPM	1725
Enclosure	TEFC
V/C/P	460/60/3
Frame Size	184T
Max Frame Size	215
Location	Centered
Pulley Type	Constant
Drive Loss (%)	4.4
Drives	1.5 x Standard
Drive Service Factor	N/A
NEC FLA* (Amps)	7.6

Model: USF-24
Universal Single Width Fan

Operating Performance



Operating Bhp point
Operating point at Total External SP
Fan curve
System curve
Brake horsepower curve

Nameplate Model: USF-24-3-B1-00-01-01

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	85	87	87	81	76	73	66	61	83	72	21
Outlet	95	92	87	81	80	75	68	63	85	74	25

*FLA - based on tables 150 or 148 of National Electrical Code 2002. Actual motor FLA may vary, for sizing thermal overload, consult factory.
LwA - A weighted sound power level, based on ANSI S1.4
dBA - A weighted sound pressure level, based on 11.5 dB attenuation per octave band at 5 ft- dBA levels are not licensed by AMCA International
Sones - calculated using AMCA 301 at 5 ft

CAPS 4.38.923

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GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: SPF-2
Model: USF-24

Model: USF-24

Universal Single Width Fan

Standard Construction Features:

HOUSING: Class 0, I, and II feature Perma-Lock construction on sizes 4 - 49 and continuously welded on sizes 54 - 73 and all class III fans - Unit support angles with pre-punched mounting holes - Adjustable motor plate - Corrosion resistant fasteners - Inlet collars - Punched outlet flange standard (except for downblast - DB) on class 0, I, and II sizes 33 - 73 and all class III fans - all steel parts are processed through a multi-stage cleaning and pre-treatment and then finished with a high performance powder coating.
BEARINGS, SHAFT, AND WHEEL: Air handling quality, self-aligning, ball bearing in pillow block housing - Polished, solid steel shafts - Centrifugal wheel

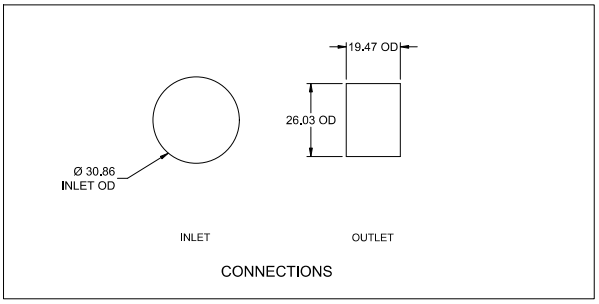
Selected Options & Accessories:

NEMA Premium Efficient Motor - meets NEMA Table 12-12
Motor VFD Rated without Shaft Grounding Protection
Motor with Class F or Greater Insulation
Drives for Emergency Duty-UBC 905.7.6/IBC 909 - 1.5 x Standard, Minimum 2 Grooves (Min 2.4 SF)
Finish - Coated
Coating - Permatector, Concrete Gray-RAL 7023, Fan and Attached Accessories
Switch - NEMA-3R, Toggle, For Indoor or Outdoor Use, Mounted and Wired
Rotation - CCW
Bearings - L(10) Life of 80k Hours
Discharge Position - TH
UL Listed - Emergency Smoke Control (500F/4hrs, 572F/2hrs, 752F/2hrs, 1000F/15min)
Polished Steel Shaft
Access Door - Bolted
Drain Connection - 1" Pipe Thread w/Plug
Inlet Connection, Slip Fit
Outlet Connection, Slip Fit
Weatherhood - Steel
Heat Slinger
Shaft Seal - High Temp
Unit Warranty: 1 Yr (Standard)

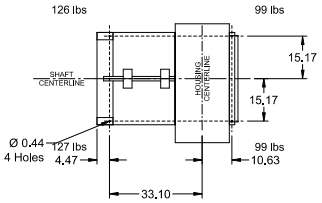
GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: SPF-2
Model: USF-24

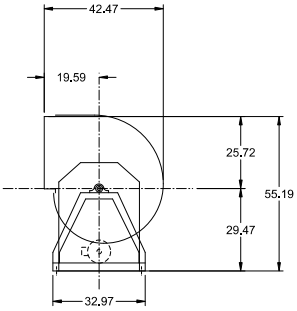
Model: USF-24 Universal Single Width Fan



CONNECTIONS



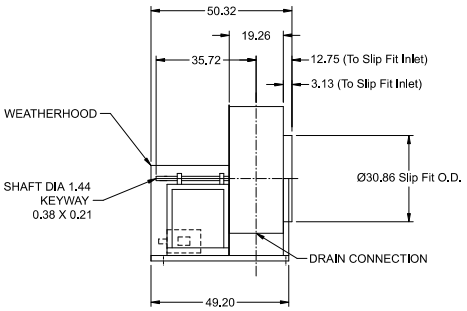
FAN FOOTPRINT



SIDE VIEW

*SIDE VIEW IS VIEWED FROM DRIVE SIDE

*FANS ARE SUBJECT TO ±.125 INCH TOLERANCE
*DUE TO CONTINUAL IMPROVEMENTS DIMENSIONS MAY CHANGE



END VIEW

Notes: All dimensions shown are in units of in.

CAPS 4.38.923

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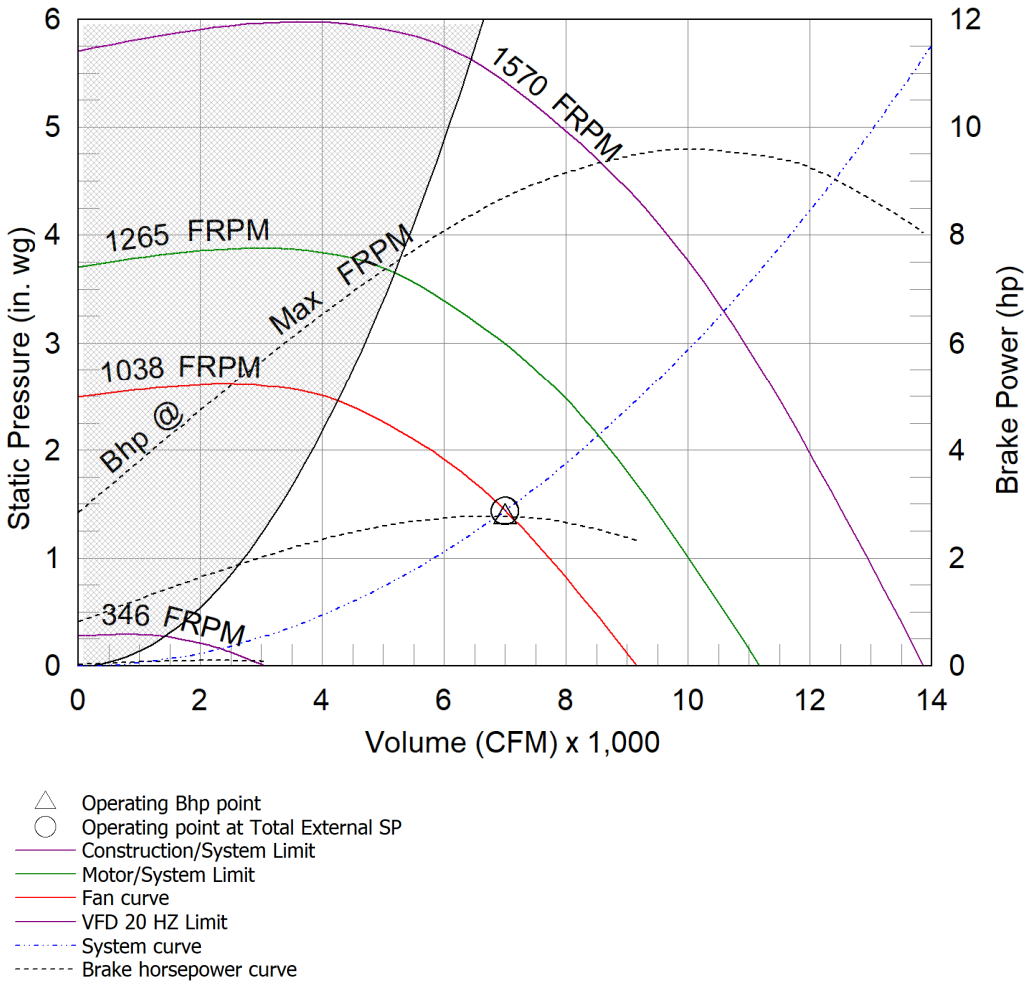
GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine
Mark: SPF-2
Model: USF-24

USF-24 Min/Max Fan Curve

Performance

Requested Volume (CFM)	Actual Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	Fan RPM	Operating Power (hp)
7,000	7,000	1.439	1.439	1038	2.76



Operating Bhp point
Operating point at Total External SP
Construction/System Limit
Motor/System Limit
Fan curve
VFD 20 HZ Limit
System curve
Brake horsepower curve

CAPS 4.38.923

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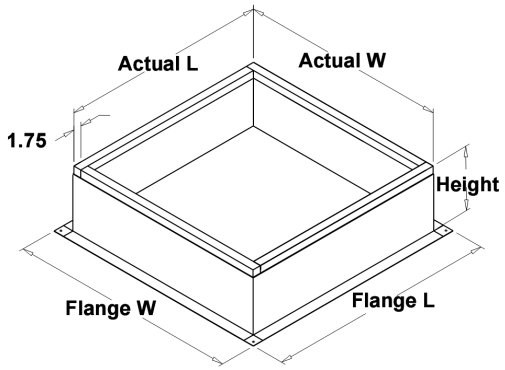
GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine

Roof Curb
Model: GPI



Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. mounting flange - 3 lb density insulation - Height - Available from 12 in. to 42 in. as specified in 0.5 in. increments.

Notes:
- The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in..
- The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size.
- The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension.
- Damper Tray is optional and must be specified. Tray size is same as damper size.
- Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

Roof Curb Configuration:

ID #:	Tag:	Qty:	Curb Cap W x L:	Actual W x L:	Flange W:	Flange L:	Height:	Step Hgt:	Damper Tray W x L:
4	EF-4	1	19 x 19	17.5 x 17.5	21.5	21.5	12	N/A	x

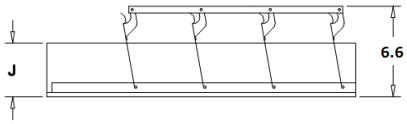
Notes: All dimensions shown are in units of in.

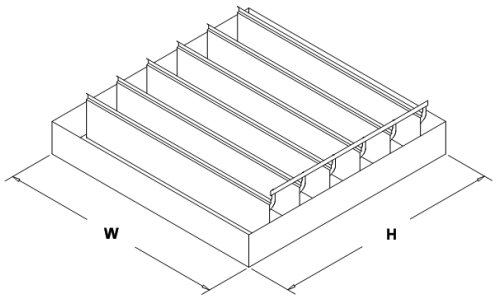
GREENHECK
Building Value in Air.

Printed Date: 04/07/2022
Job: The Moraine

Horizontal Mount Exhaust Damper

Model: WD-100





Standard Construction Features:

- Model WD-100 is a horizontal mount exhaust damper (air flow up) and is constructed of 18 ga galvanized steel with pre-punched mounting holes - Damper blades are 0.025 in. roll formed aluminum with vinyl seals on the closing edge, and spring assisted for ease of opening - Steel axles are 0.188 in. diameter zinc plated mounted in nylon bushings - Synthetic axle bearings

Damper Configuration:

ID #:	Tag:	Quantity:	W (in.):	H (in.):	J (in.):	Act Qty:	Actuator Model:
4	EF-4	1	12	12	2.5	0	

Notes: All dimensions shown are in units of in.
Width And height furnished approximately 0.125 in. undersize

No Exception Taken

Built-In Self Adjusting Airflow Capability

FV-0511VKS2

WhisperGreenSelect™ VENTILATION FAN

Specification Submittal Data / Panasonic Ventilation Fan

Description

Customizable ceiling mount ventilating fan, low sone and rated for continuous operation. ENERGY STAR® rated and certified by the Home Ventilating Institute (HVI). Evaluated by the Underwriters Laboratories and conforms to both UL and cUL standards.

Motor/Blower:

- Enclosed brushless ECM smart motor technology rated for continuous operation
- Adjustable ventilation rates at 50 – 80 – 110 CFM
- Power rating of 120 volts and 60 Hz
- UL and cUL listed for tub/shower enclosure when GFCI protected.
- Motor equipped with thermal cutoff fuse
- Removable permanently lubricated plug-in motor

Housing:

- Environmentally friendly 26 gauge Zinc-Aluminum-Magnesium (ZAM) housing
- Integrated dual 4" or 6" diameter duct adapter
- Built-in damper reduces back draft and helps with blower door testing
- Built-in metal flange provides blocking for penetrations through drywall as an Air Barrier, and assists with the decrease in leakage in the Building Envelope during blower door testing
- Suitable for installation in ceilings insulated up to R60
- Articulating and expandable installation bracket up to 24"

Grille:

- Attractive design using Poly Pro material
- Attaches directly to housing with torsion springs
- Includes a motion sensor cap for use as a cover when the motion sensor Plug 'n Play™ module has not been selected

Warranty:

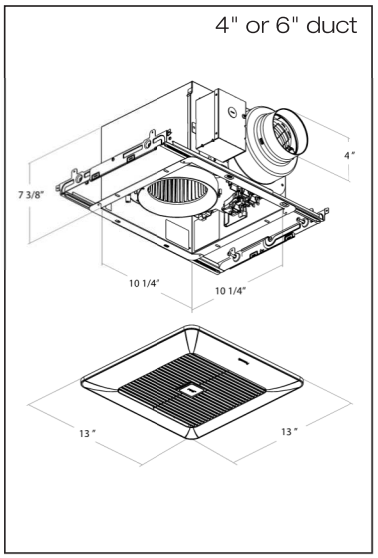
- ECM Motor: 6 Years from original purchase date
- ALL Parts: 3 Years from original purchase date

Architectural Specifications:

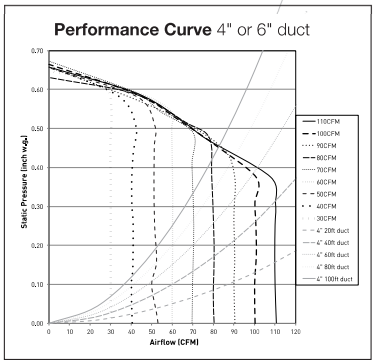
Customizable ceiling mount ventilation fan, ENERGY STAR® rated with multi-speed control (0, 30-100 CFM, in 10 CFM increments) and a built-in high/low adjustable time delay activated by a wall switch, SmartAction Motion Sensor Plug 'N Play™ module or Condensation Sensor Plug 'N Play™ module. Features a built-in speed selector. Select from 50/80/110 CFM with <0.3 sone as certified by the Home Ventilating Institute (HVI) at 0.1 w.g. with 51/80/110 CFM and no more than 0.4/0.5/0.8 sones at 0.25 w.g. and 51/79/108 CFM at 0.375 w.g. Power Consumption shall be no greater than 3.1/5.1/9.9 watts at 0.1 w.g. and 6.2/9.6/15.4 watts at 0.25 w.g. and 9.6/13.4/20.0 watts at 0.375 w.g. ENERGY STAR® rated with efficiency of no less than 16.2/15.7/11.1 CFM/watt at 0.1 w.g. and 8.3/8.3/7.1 CFM/watt at 0.25 w.g. and 5.3/5.9/5.4 CFM/watt at 0.375 w.g. The motor shall be enclosed with brushless ECM motor engineered to run continuously. ECM motor speed shall automatically increase when the fan senses static pressure to maintain selected CFM. Power rating shall be 120v/60Hz. Duct diameter shall be no less than 4", inclusive of an integrated dual 4" or 6" duct adapter. **Plug 'N Play™ modules** provide up to two additional features. Select from Condensation Sensor, and SmartAction Motion Sensor. Fan shall be RoHS Compliant and UL and cUL listed for tub/shower enclosure when GFCI protected. Also suitable for installation in ceilings insulated up to R60. Fan can be used to comply with ASHRAE 62.2, LEED, ENERGY STAR®, IAP, EarthCraft, California Title-24 and WA Ventilation Code.

ECM Motor Technology:

When fan senses static pressure, its speed is automatically increased to ensure that the desired CFM is not compromised, which allows the fan to perform as rated.



FV-0511VKS2



Model	Quantity	Comments	Project:
			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:

For complete Installation Instructions visit **us.panasonic.com/ventfans**

Ceiling Radiation Damper: WhisperGreen Select™ is UL listed for use with the Panasonic Ceiling Radiation Damper (Model #: PC-RD05CS, sold separately).

WhisperGreenSelect™ VENTILATION FAN

Built-In Self Adjusting Airflow Capability

FV-0511VKS2

Plug 'N Play™ Modules

Plug 'N Play™ modules provide up to **two** additional features (multi-speed is already built-in to FV-0511VKS2). Select from Motion Sensor and Condensation Sensor.

~~FV-VS15VK1: Multi-Speed with Time Delay - N/A for this Fan, already built-in.~~

Allows you to select the proper CFM settings to satisfy ASHRAE 62.2 continuous ventilation requirements. The fan runs continuously at a pre-set lower level (0, 30-100 CFM, in 10 CFM increments), then elevates to a maximum level of operation (50-80-110 CFM) when the wall switch is turned on, or when the motion sensor or Condensation Sensor module is activated. A High/Low delay timer returns the fan to the pre-set CFM level after a period of time set by the user.

FV-MSVK1: Motion Sensor

Automatically activates when someone enters the room. Once the settings have been applied, the fan becomes truly automatic. This module also activates a 20 minute delay off timer for the fan.

~~FV-CSVK1: Condensation Sensor~~

Helps control bathroom condensation to prevent mold and mildew. Sensor technology detects relative humidity and temperature to anticipate dew point, automatically turning the fan on to control humidity. Built-in Relative Humidity (RH) sensitivity adjustment enables fine tuning for moist conditions and for satisfying CalGreen requirements. When the condensation sensor is used in conjunction with multi-speed functionality, the fan will kick up to high speed when the condensation sensor detects moisture in the room. This module also activates a 20 minute delay off timer for the fan.

Fan Specifications	WhisperGreen Select™: FV-0511VKS2													
Static Pressure in inches w.g.	0.1	0.25	0.375	0.1	0.25	0.375	0.1	0.25	0.375	0.1	0.25	0.375	0.1	0.25
Air Volume (CFM)	110	110	108	100	101	101	90	90	90	80	80	79	70	71
Noise (sones)	<0.3	0.8	-	<0.3	0.7	-	<0.3	0.6	-	<0.3	0.5	-	<0.3	0.5
Power Consumption (watts)	9.9	15.4	20.0	7.9	13.1	17.8	6.5	11.2	16.0	5.1	9.6	13.4	4.3	8.5
Energy Efficiency (CFM/Watt)	11.1	7.1	5.4	12.7	7.7	5.7	13.9	8.0	5.6	15.7	8.3	5.9	16.7	8.5
Speed (RPM)	920	1182	1356	889	1164	1356	839	1135	1351	795	1113	1315	760	1112
Current (amps)	0.10	0.16	0.20	0.09	0.14	0.18	0.07	0.12	0.16	0.06	0.10	0.14	0.05	0.09
MAX. Current (amps)	0.20													
Power Rating (V/Hz)	120/60													
ENERGY STAR rated	Yes													

0.375=Installed Performance

Panasonic Eco Solutions Company of North America
Eco Products Division
Two Riverfront Plaza
Newark, NJ 07102

us.panasonic.com/ventfans

Most Efficient 2018 ENERGY STAR www.energystar.gov

Panasonic

VF18972SS-FV-0511VKS2

No Exception Taken

WhisperValue® DC™ VENTILATION FAN

FV-0510VS1

Specification Submittal Data / Panasonic Ventilation Fan

Description:

Ventilating fan shall be Low Noise ceiling or wall mount type rated for continuous run. Fan shall be ENERGY STAR® rated and certified by the Home Ventilation Institute (HVI). Evaluated by Underwriters Laboratories and conform to both UL and cUL safety standards.

Motor/Blower:

- Enclosed DC brushless motor technology rated for continuous run.
- Fan ventilation rates shall be manually adjustable for 50-80-100 CFM.
- Power rating shall be 120 volts and 60 Hz.
- Fan shall be UL and cUL listed for tub/shower enclosure when GFCI protected and used in insulated ceiling (TYPE I.C).
- Motor equipped with thermal–cutoff fuse.
- Removable with permanently lubricated plug-in motor.

Housing:

- Rust proof epoxy and polyester resin coating, 26 gauge galvanized steel body.
- 4" round compatible, oval duct.
- Optional 24 gauge steel, fire code rated 4" oval to 3" round duct adaptor sold separately (Model # FV-VS43R).
- Built in backdraft damper.
- Built-in metal flange provides blocking for penetrations through drywall as an Air Barrier, and assists with the decrease in leakage in the Building Envelope during blower door testing.
- Unique L-shaped bracket simplifies installation and provides strong support.

Grille:

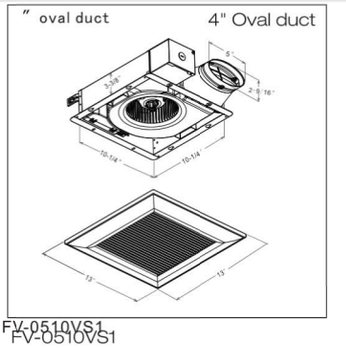
- Attractive design using Poly Pro material.
- Attaches directly to housing with torsion springs.

Warranty:

- DC Motor: 6 Years from original purchase date.
- ALL Parts: 3 Years from original purchase date.

Architectural Specifications:

Ventilation fan shall be ceiling or wall mount, ENERGY STAR® certified, with a built-in speed selector. Choose from 50-80-100 CFM and no more than <0.3/0.4/0.9 sone as certified by the Home Ventilating Institute (HVI) at 0.1 static pressure in inches water gauge (w.g.) with no less than 53/81/100 CFM and no more than 0.5/0.8/1.3 sone as certified by HVI at 0.25 w.g. Power Consumption shall be no greater than 4.4/7.2/11.1 watts at 0.1 w.g. and 7.5/11.5/16.0 watts at 0.25 w.g., with efficiency of no less than 12.8/11.4/9.2 CFM/watt at 0.1 w.g. and 7.9/7.2/6.4 CFM/watt at 0.25 w.g. The motor shall be totally enclosed with a brushless DC motor engineered to run continuously. DC motor speed shall automatically increase when the fan senses static pressure to maintain selected CFM. Power rating shall be 120v/60Hz. Duct diameter shall be no less than 4". Optional 24 gauge steel, fire code rated 4" oval to 3" round duct adaptor sold separately (Model # FV-VS43R). Fan shall be UL and cUL listed for ceiling or wall installation and tub/shower enclosure when GFCI protected. Fan can be used to comply with ASHRAE 62.2, LEED, EarthCraft, California Title-24 and WA Ventilation Code.



FV-0510VS1

FV-0510VS1

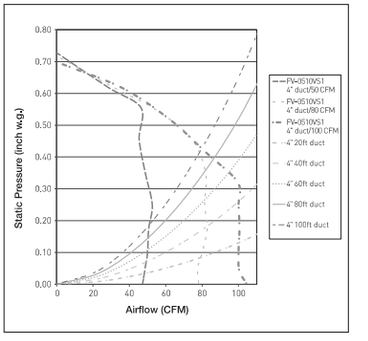
DC Motor Technology

When the fan senses static pressure, its speed is automatically increased to ensure that the desired CFM is not compromised, which allows the fan to perform as rated.

Specifications: **WhisperValueDC** FV-0510VS1		4" Oval		4" Oval		4" Oval	
Ventilation Fan Characteristics (HVI Certified Data)	Static Pressure in inches w.g.	0.1	0.25	0.1	0.25	0.1	0.25
	Air Volume (CFM)	100	100	80	81	50	53
	Noise (sones)	0.9	1.3	0.4	0.8	<0.3	0.5
	Power Consumption (watts)	11.1	16.0	7.2	11.5	4.4	7.5
	Energy Efficiency (CFM/Watt)	9.2	6.4	11.4	7.2	12.8	7.9
	Speed (RPM)	902	1121	797	1070	708	1025
	Current (amps)	0.20	0.27	0.13	0.20	0.09	0.14
	MAX. Current (amps)	0.39					
	Power Rating (V/Hz)	120/60					
	ENERGY STAR rated	YES					

0.25=Installed Performance

Performance Curve 4" Oval duct



For complete Installation Instructions visit **us.panasonic.com/ventfans**

Model	Quantity	Comments	Project:
			Location:
			Architect:
			Engineer:
			Contractor:
			Submitted by:
			Date:

Panasonic Eco Solutions North America
Eco Products Division
Two Riverfront Plaza
Newark, NJ 07102

us.panasonic.com/ventfans

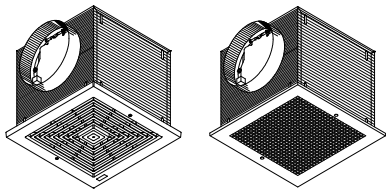
Panasonic

VF16549SS1216

No Exception Taken

BROAN® LoSone Select® SPECIFICATION SHEET

LOSONE SELECT®
CEILING MOUNT VENTILATORS
L200, L250, L300 SERIES, L300KMG



Incredibly reliable. Unbelievably quiet. Offering the CFM choices you need at the lowest sound levels in the industry.

FEATURES

GRILLE:
- Conceals interior
- Low profile styling blends with any decor
- White polymeric ("MG" models - metal, finished with white painted enamel)

BLOWER:
- Low RPM for quiet operation
- Resilient anti-vibration mounts
- Dynamically-balanced, polymeric, centrifugal blower wheel for quiet, efficient performance (Model L300KMG-metal wheel)
- Permanently lubricated, thermally protected motor
- Plug-in motor rated at 120 VAC
- Designed for continuous operation

HOUSING:
- Rugged, 20 gauge galvanized steel
- 8" round duct connector
- 1/2" acoustic insulation inside (Model L300KMG - no insulation - for kitchen applications)
- May be installed in ceiling or wall (size permitting)
- 8-position mounting brackets for easy installation and greater adaptability to various mounting requirements
- Automatic backdraft damper located within duct connector
- Factory-shipped in horizontal discharge position - easily converted to vertical discharge
- May be installed as an in-line ventilator with addition of accessory kit Model 981L (purchase separately)

ACCESSORIES (purchase all separately):
- Model 57V (Ivory) / 57W (White) 3-Amp, Electronic Variable Speed Control
- Model 59V (Ivory) / 59W (White) 60-Minute Time Control
- Model 61V (Ivory) / 61W (White) 15-Minute Time Control
- Model 71V (Ivory) / 71W (White) 12-Hour Time Control
- 6-Amp, Electronic Variable Speed Controls Model 72V/72W (120 VAC)
- Model 981L In-line Adapter Kit
- Model RD1 Radiation Damper
- Model LAF1 Grease Filter (for Model L300KMG)
- Model 80L Electronic Speed Control (Internal)

TYPICAL SPECIFICATION

Ventilator shall be Broan Model L200, (L200MG), (L250), (L250MG), (L300), (L300KMG).

Ventilator shall have galvanized steel housing insulated with at least 1/2" of acoustic insulation (with no insulation - Model L300KMG). Housing to have adjustable mounting brackets.

Automatic backdraft damper to be located within duct connector. Duct connector, blower assembly, and wiring plate shall be adjustable for either horizontal or vertical installation.

Blower unit shall be removable from housing and will have a polymeric, dynamically balanced centrifugal-type blower wheel. Motor to be permanently lubricated and mounted with resilient anti-vibration mounts. RPM not to exceed number listed for each model.

Air delivery shall be no less and sound levels no greater than listed for each model. All air and sound ratings shall be certified by AMCA. Units to be UL and cUL listed.

"Broan-NuTone LLC certifies that the models shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 (and AMCA Publication 311 if sound is also certified) and comply with the requirements of the AMCA Certified Ratings Program"

Models L200, L250, and L300 are UL listed for use over bathtubs and showers when connected to a GFCI-protected branch circuit.

Broan-NuTone LLC, 926 West State Street, Hartford, Wisconsin 53027 (1-800-637-1453)
Broan-NuTone Canada, 1140 Tristar Drive, Mississauga, Ontario, L5T 1H9 (1-888-882-7626)

REFERENCE	QTY.	REMARKS	
			Project
			Location
			Architect
			Engineer
			Contractor
			Submitted by Date

PERFORMANCE RATINGS - LOSONE SELECT® CEILING MOUNT VENTILATORS L200, L250, L300 SERIES, L300KMG

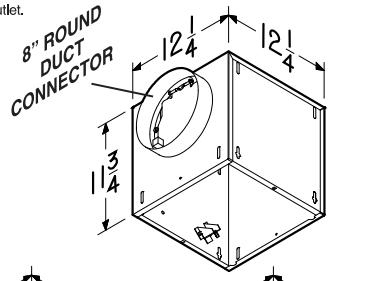
AMCA LICENSED PERFORMANCE

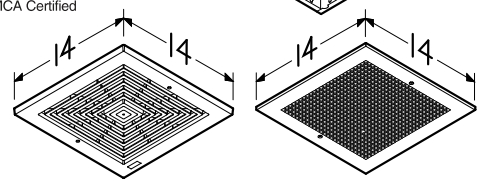
CFM / SONES - AT STATIC PRESSURES (Ps - inches of H_2O)															
MODEL NO.	NOMINAL VOLTAGE		0.0" Ps	.10" Ps	.125" Ps	.250" Ps	.375" Ps	.50" Ps	.625" Ps	.750" Ps	.875" Ps	1.0" Ps	NOMINAL RPM	AMPS @60 Hz	WATTS
L200	120 VAC	CFM Hor.	231	214	210	196	186	177	165	144	113	51	740	1.8	127
		SONES Hor.	1.6	1.8	1.7	2.3	2.9	3.5	4.1	4.9	5.3	5.3			
		CFM Ver.	224	210	207	197	187	179	167	144	99	41	760	1.8	127
		SONES Ver.	1.5	1.8	2.0	2.3	2.7	3.4	4.0	4.5	5.1	5.2			
L200MG	120 VAC	CFM Hor.	237	218	215	199	190	180	167	144	108	47	715	1.8	127
		SONES Hor.	1.4	1.8	1.9	2.4	3.0	3.6	4.2	5.1	5.6	5.5			
		CFM Ver.	228	213	209	198	190	182	168	145	105	56	730	1.8	127
		SONES Ver.	1.5	1.7	1.8	2.3	2.8	3.4	4.1	4.6	5.1	5.2			
L250	120 VAC	CFM Hor.	272	261	259	250	242	233	218	201	165	99	830	2.1	166
		SONES Hor.	2.1	2.3	2.2	2.9	3.3	3.9	4.4	4.8	5.5	5.8			
		CFM Ver.	269	261	259	253	248	239	224	203	171	101	860	2.1	166
		SONES Ver.	2.3	2.6	2.7	3.0	3.3	3.7	4.2	4.7	5.4	5.6			
L250MG	120 VAC	CFM Hor.	280	267	265	254	246	238	224	209	172	105	805	2.1	166
		SONES Hor.	2.1	2.5	2.5	2.9	3.4	3.9	4.3	4.6	5.6	5.9			
		CFM Ver.	275	263	262	255	250	241	229	210	178	105	830	2.1	166
		SONES Ver.	2.2	2.6	2.7	3.0	3.4	3.8	4.3	4.8	5.5	5.8			
L300	120 VAC	CFM Hor.	312	309	308	303	296	287	273	254	219	125	905	2.6	212
		SONES Hor.	2.8	2.9	2.9	3.3	3.5	3.9	4.3	4.7	5.1	5.6			
		CFM Ver.	319	314	313	306	299	288	274	251	219	120	940	2.6	212
		SONES Ver.	2.6	2.9	3.0	3.4	3.6	3.9	4.4	4.7	5.0	5.5			
L300MG	120 VAC	CFM Hor.	323	317	316	312	305	298	283	266	235	153	860	2.6	212
		SONES Hor.	3.0	2.8	3.0	3.2	3.5	3.9	4.3	4.8	5.2	5.7			
		CFM Ver.	322	315	314	308	302	292	278	259	227	119	885	2.6	212
		SONES Ver.	2.4	2.7	2.8	3.3	3.5	3.9	4.3	4.7	5.1	5.5			
L300KMG	120 VAC	CFM Hor.	286	279	277	272	268	261	253	241	222	173	790	2.6	212
		SONES Hor.	2.8	3.0	3.1	3.4	3.8	4.4	4.8	5.1	5.5	6.1			
		CFM Ver.	287	280	277	273	266	259	247	231	208	164	815	2.6	212
		SONES Ver.	3.3	3.6	3.7	4.1	4.7	5.2	5.6	6.3	6.8	6.9			

Performance ratings include the effects of inlet grille and backdraft damper in the airstream. Speed (RPM) shown is nominal. Performance is based on actual speed of test. The sound ratings shown are loudness values in fan sones at 5' (1.5m) in a hemispherical free field calculated per AMCA Std. 301. Values shown are for Installation Type B: Free inlet fan sone levels. Performance shown is for Installation Type B: Free inlet, Ducted outlet.

"Broan-NuTone LLC certifies that the models shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 (and AMCA Publication 311 if sound is also certified) and comply with the requirements of the AMCA Certified Ratings Program."

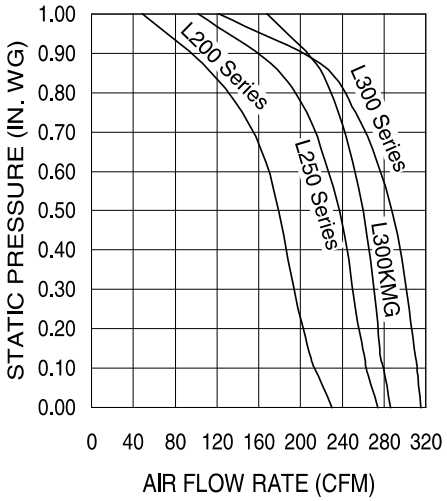
Models L200, L250, and L300 are UL listed for use over bathtubs and showers when connected to a GFCI-protected branch circuit.





POLYMERIC GRILLE MODELS L200, L250, L300

METAL GRILLE MODELS L200MG, L250MG, L300MG, L300KMG



WEIGHT

MODEL NO.	SHIPPING WT.
L200	23.0 lbs.
L250, L300	23.1 lbs.
L200MG	23.9 lbs.
L250MG, L300MG	24.0 lbs.
L300KMG	25.2 lbs.

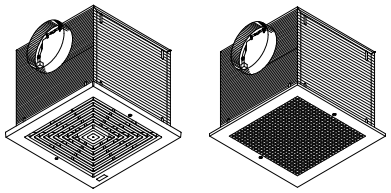
BROAN®

Broan-NuTone LLC, 926 West State Street, Hartford, Wisconsin 53027 (1-800-637-1453)
Broan-NuTone Canada, 1140 Tristar Drive, Mississauga, Ontario, L5T 1H9 (1-888-882-7626)

No Exception Taken

BROAN LoSone Select SPECIFICATION SHEET

LOSONE SELECT®
CEILING MOUNT VENTILATORS
L100 SERIES & L150 SERIES



Incredibly reliable. Unbelievably quiet. Offering the CFM choices you need at the lowest sound levels in the industry.

FEATURES

GRILLE:
- Conceals interior
- Low profile styling blends with any decor
- White polymeric ("MG" models - metal, finished with white painted enamel)

BLOWER:
- Low RPM for quiet operation
- Resilient anti-vibration mounts
- Dynamically-balanced, polymeric, centrifugal blower wheel for quiet, efficient performance
- Permanently lubricated, thermally protected motor
- Plug-in motor rated at 120 VAC
- Designed for continuous operation

HOUSING:
- Rugged, 20 gauge galvanized steel
- 6" round duct connector
- 1/2" acoustic insulation inside
- May be installed in ceiling or wall (size permitting)
- 8-position mounting brackets for easy installation and greater adaptability to various mounting requirements
- Automatic backdraft damper located within duct connector
- Factory-shipped in horizontal discharge position - easily converted to vertical discharge
- May be installed as an in-line ventilator with addition of accessory kit Model 961L (see "Accessories")

ACCESSORIES (purchase all separately):
- Model 57V (Ivory) / 57W (White) Electronic Variable Speed Control
- Model 59V (Ivory) / 59W (White) 60-Minute Time Control
- Model 61V (Ivory) / 61W (White) 15-Minute Time Control
- Model 71V (Ivory) / 71W (White) 12-Hour Time Control
- Electronic Variable Speed Controls – Model 72V (120 VAC)
- Model 961L In-line Adapter Plate
- Model RD1 Radiation Damper
- Model 80L Electronic Speed Control (Internal)

TYPICAL SPECIFICATION

Ventilator shall be Broan Model L100, (L100MG), (L150), (L150MG).

Ventilator shall have galvanized steel housing insulated with at least 1/2" of acoustic insulation. Housing to have adjustable mounting brackets.

Automatic backdraft damper to be located within duct connector. Duct connector, blower assembly and wiring plate shall be adjustable for either horizontal or vertical installation.

Blower unit shall be removable from housing and will have a polymeric, dynamically balanced centrifugal-type blower wheel. Motor to be permanently lubricated and mounted with resilient anti-vibration mounts. RPM not to exceed number listed for each model.

Air delivery shall be no less and sound levels no greater than listed for each model. All air and sound ratings shall be certified by AMCA. Units to be UL and cUL listed.

"Broan-NuTone LLC certifies that the models shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 (and AMCA Publication 311 if sound is also certified) and comply with the requirements of the AMCA Certified Ratings Program"

Models L100 and L150 are UL listed for use over bathtubs and showers when connected to a GFCI-protected branch circuit.

Broan-NuTone LLC, 926 West State Street, Hartford, Wisconsin 53027 (1-800-637-1453)
Broan-NuTone Canada, 1140 Tristar Drive, Mississauga, Ontario, L5T 1H9 (1-888-882-7626)

REFERENCE	QTY.	REMARKS	Project
			Location
			Architect
			Engineer
			Contractor
			Submitted by Date

No Exception Taken

PERFORMANCE RATINGS - LOSONE SELECT® CEILING MOUNT VENTILATORS L100 SERIES & L150 SERIES

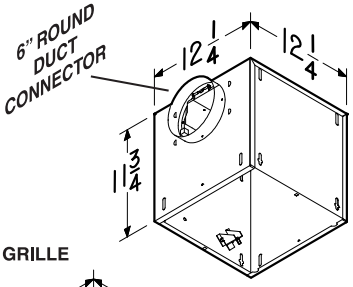
AMCA LICENSED PERFORMANCE

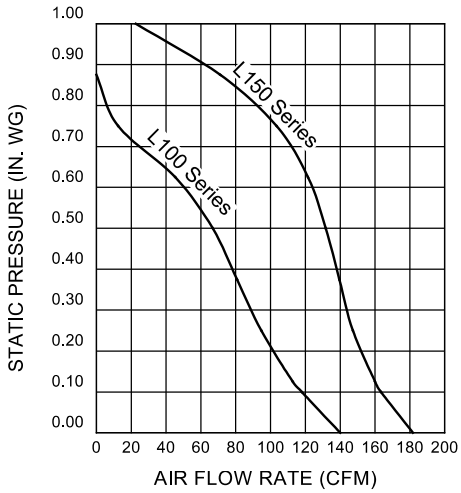
MODEL NO.	NOMINAL VOLTAGE		CFM / SONES - AT STATIC PRESSURES (Ps - inches of H_2O) 0.0" Ps	10" Ps	125" Ps	250" Ps	375" Ps	50" Ps	625" Ps	750" Ps	875" Ps	1.0" Ps	NOMINAL RPM	AMPS @60 Hz	WATTS
L100	120 VAC	CFM Hor.	136	115	109	93	80	65	44	12			640	1.1	87
		SONES Hor.	0.5	0.8	0.9	1.3	1.8	2.3	3.0	3.2					
		CFM Ver.	138	117	112	94	80	67	46	13			650	1.1	87
		SONES Ver.	0.7	0.9	1.0	1.3	1.8	2.2	2.8	3.0					
L100MG	120 VAC	CFM Hor.	144	121	115	97	83	68	46	12			630	1.1	87
		SONES Hor.	0.5	0.8	0.9	1.2	1.8	2.4	3.0	3.3					
		CFM Ver.	142	119	115	95	80	67	45	13			640	1.1	87
		SONES Ver.	0.5	0.8	0.9	1.4	1.8	2.3	2.9	3.1					
L150	120 VAC	CFM Hor.	181	161	157	141	132	124	114	94	62		710	1.3	100
		SONES Hor.	1.3	1.4	1.5	2.2	2.6	3.1	3.6	4.1	4.6				
		CFM Ver.	179	163	160	149	142	133	122	105	73	23	750	1.3	100
		SONES Ver.	1.4	1.6	1.6	2.0	2.5	3.0	3.3	3.6	3.9	4.2			
L150MG	120 VAC	CFM Hor.	180	163	160	143	130	118	102	76	50	10	710	1.3	100
		SONES Hor.	1.1	1.4	1.4	1.9	2.3	2.8	3.2	3.8	4.1	4.5			
		CFM Ver.	180	163	160	143	130	118	102	76	50	10	725	1.3	100
		SONES Ver.	1.4	1.6	1.6	2.0	2.5	3.0	3.3	3.6	4.0	4.4			

Performance ratings include the effects of inlet grille and backdraft damper in the airstream. Speed (RPM) shown is nominal. Performance is based on actual speed of test. The sound ratings shown are loudness values in fan sones at 5' (1.5m) in a hemispherical free field calculated per AMCA Std. 301. Values shown are for Installation Type B: Free inlet fan sone levels. Performance shown is for Installation Type B: Free inlet, Ducted outlet.

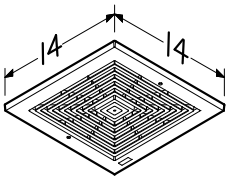
"Broan-NuTone LLC certifies that the models shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 (and AMCA Publication 311 if sound is also certified) and comply with the requirements of the AMCA Certified Ratings Program."

Models L100 and L150 are UL listed for use over bathtubs and showers when connected to a GFCI-protected branch circuit.

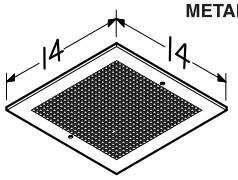




POLYMERIC GRILLE MODELS
L100
L150



METAL GRILLE MODELS
L100MG
L150MG



WEIGHT

MODEL NO.	SHIPPING WT.
L100	22.8 lbs.
L100MG	23.7 lbs.
L150	23.1 lbs.
L150MG	23.7 lbs.

Broan-NuTone LLC, 926 West State Street, Hartford, Wisconsin 53027 (1-800-637-1453)
Broan-NuTone Canada, 1140 Tristar Drive, Mississauga, Ontario, L5T 1H9 (1-888-882-7626)

No Exception Taken

Inline Duct and Sidewall Centrifugal Fans

For High Static Pressure Applications

CA-CF0211

The World's Leading Producer of Air Movement Products

Fans for Life!

Soler&Palau Ventilation Group

February 2011

POWERVENT (PV) SERIES

The POWERVENT (PV) series of direct drive centrifugal in-line duct ventilation fans consists of twelve model sizes 4”, 5”, 6”, 8”, 10” and 12.4” respectively. All models are designed for direct connection in-line with standard diameter round ducting. Airflow performance values range from 108 CFM (PV-100) up to 942 CFM (PV-315x).

All PV fan models incorporate a powerful external rotor motor that has been factory matched to a nonoverloading backward curved centrifugal fan wheel.

This powerful combination enables the PV fans to deliver exceptional airflow performances against high static pressure typically found in ducted ventilation systems. All motors within PV fans are fully speed controllable using voltage or frequency control regulators.

The PV series of duct exhaust or supply fans have been specifically designed for simple installation and many years of maintenance free operation. The PV fans can be mounted at any angle and at any point along the duct. The totally enclosed motor design allows the PV fans to operate in high moisture, lint and dust laden air. All models are manufactured with high quality materials and workmanship that is supported by a comprehensive **five (5) year warranty**.

All PV Fans feature a corrosion resistant galvanized steel casing with black baked enamel coating and are supplied with a strong mounting bracket and prewired junction box. The interconnect wiring between the fan and the junction box provides installation flexibility and permits easy access to the fan for service and maintenance.

The PV100x fans feature Class F Motor Insulation making them the ideal fans for Clothes Dryer Boosting applications. See page 8 for more details.

Applications

The PV fans are ideally suited for a wide range of residential, commercial and industrial exhaust and intake ventilation applications. Among typical applications would include the following:

Residential
- Kitchen Range Hoods
- Warm or Cool Air Transfer
- Bathrooms
- Laundry Rooms
- Radon Mitigation

Commercial
- Conference Rooms
- Offices
- Bars & Restaurants
- Cafeterias
- Locker Rooms
- Make-Up Air Applications

Industrial
- Warehouses
- Welding Fume Extraction
- Spot Ventilation
- Equipment Cooling
- Workshops & Smoking Areas

Technical Specifications

All twelve PV model sizes (PV 100, 100x, 125, 125x, 150, 150x, 200, 200x, 250, 250x, 315 and 315x) include the following specifications:

Warranty
Five (5) year limited warranty.

Casing
- Manufactured from high grade pressed galvanized steel, with black baked enamel coating.
- Extra long inlet and discharge collars make installation quick and trouble free.
- Supplied with a strong galvanized steel mounting bracket.
- Supplied with a prewired junction box.

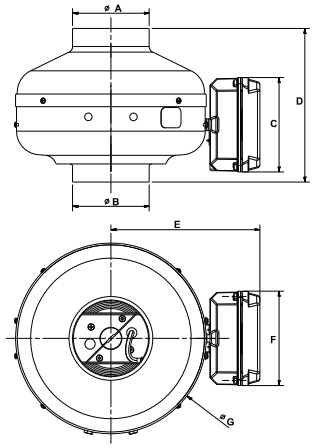
Wheel / Impeller
- Backward curved centrifugal type.
- Factory matched to an external rotor motor and dynamically balanced to eliminate vibration.

Accessories
- Available with cord set.
- A wide range of accessories is available

Motor
- Totally enclosed permanent split capacitor start and run external rotor motors.
- 115V 60Hz (single phase) electrical connection.
- Permanently sealed, self lubricating precision ball bearings.
- Safety Thermal Overload Protection Cut-Out (Automatic Reset Type).
- All Models are suitable for working airstreams up to 140° F

Code Approval
- All models have been independently safety tested by Underwriters Laboratories, Inc. and are UL and cUL Listed.
- Independently safety tested by Intertek Laboratories, and are ETL Listed.
- Independently tested for Airflow Performance. The PV range is licensed to bear the AMCA seal for Air Performance.
- The PV product range is certified by the Home Ventilating Institute (HVI) for Air Performance.

Dimensions in inches/mm



Model	A	B	C	D	E	F	G	Weight lbs(kgs)
PV-100	3 13/16 97.5	3 13/16 97.5	4 3/4 120	7 11/16 196	7 1/2 190	4 3/4 120	9 9/16 243	7 3.0
PV-100x	3 13/16 97.5	3 13/16 97.5	4 3/4 120	7 11/16 196	7 1/2 190	4 3/4 120	9 9/16 243	7 3.0
PV-125	4 13/16 122.5	4 13/16 122.5	4 3/4 120	7 13/16 198	7 1/2 190	4 3/4 120	9 9/16 243	7 3.0
PV-125x	4 13/16 122.5	4 13/16 122.5	4 3/4 120	7 13/16 198	7 1/2 190	4 3/4 120	9 9/16 243	7 3.0
PV-150	5 13/16 147	5 13/16 147	4 3/4 120	8 7/16 214	9 5/16 236	4 3/4 120	13 1/8 334	11 5.0
PV-150x	5 13/16 147	5 13/16 147	4 3/4 120	8 7/16 214	9 5/16 236	4 3/4 120	13 1/8 334	11 5.0
PV-200	7 13/16 198	7 13/16 198	4 3/4 120	8 3/4 223	9 5/16 236	4 3/4 120	13 1/8 334	11 5.0
PV-200x	7 13/16 198	7 13/16 198	4 3/4 120	8 3/4 223	9 5/16 236	4 3/4 120	13 1/8 334	11 5.0
PV-250	9 3/4 248	9 3/4 248	4 3/4 120	8 1/16 205	9 5/16 236	4 3/4 120	13 1/8 334	13 6.0
PV-250x	9 3/4 248	9 3/4 248	4 3/4 120	8 1/16 205	9 5/16 236	4 3/4 120	13 1/8 334	13 6.0
PV-315	12 5/16 312	12 5/16 312	4 3/4 120	9 3/16 233	10 9/16 269	4 3/4 120	15 13/16 401	21 10.0
PV-315x	12 5/16 312	12 5/16 312	4 3/4 120	9 3/16 233	10 9/16 269	4 3/4 120	15 13/16 401	21 10.0

Air Performance

Trade Name	Model No.	Nom. RPM	Volts	Max. Watts	CFM v Static Pressure (SP) Ins. WG									Max. SP	Duct Dia,Ins.
					0"	0.125"	0.25"	0.375"	0.5"	0.75"	1.0"	1.25"	1.5"		
Power Vent-100	PV-100	1400	115	57	108	100	92	85	78	66	52	33	18	1.70	4"
Power Vent-100x	PV-100x	2880	115	84	153	142	130	120	111	96	80	63	34	1.85	4"
Power Vent-125	PV-125	2350	115	58	128	104	85	74	63	47	32	15	-	1.43	5"
Power Vent-125x	PV-125x	2745	115	85	206	190	170	153	135	110	88	62	33	1.77	5"
Power Vent-150	PV-150	2750	115	78	245	205	177	157	129	93	59	-	-	1.20	6"
Power Vent-150x	PV-150x	2700	115	130	390	367	340	312	285	233	193	153	110	2.05	6"
Power Vent-200	PV-200	3100	115	130	402	375	350	327	296	239	179	135	85	1.94	8"
Power Vent-200x	PV-200x	2930	115	180	544	515	485	446	415	360	312	273	230	2.64	8"
Power Vent-250	PV-250	3000	115	200	587	555	525	495	472	412	355	312	270	2.61	10"
Power Vent-250x	PV-250x	3045	115	214	618	595	570	540	510	450	390	340	297	2.80	10"
Power Vent-315	PV-315	2600	115	170	654	605	570	525	487	408	333	265	203	2.21	12.4"
Power Vent-315x	PV-315x	2650	115	370	942	905	859	811	762	622	508	440	390	3.90	12.4"

Performance certified is for installation type D-Ducted inlet, Ducted outlet. Performance ratings do not include the effects of appurtenances (accessories). Speed (RPM or RPS) shown is nominal. Performance is based on actual speed of test.

Soler & Palau USA certifies that the PV range shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and comply with the requirements of the AMCA Certified Ratings Program.

*PV 150x and larger ENERGY STAR® qualified.

The PV-POWERVENT Series fans are California Title 24 compliant and meet ASHRAE 62.2 when installed with 3 way switch and remotely mounted speed control.

Sound

Fan sound levels are measured in sones. At this time there are no sone level test standards available through HVI due to the fact that remote mounted fan noise levels are in proportion to the following: type of duct, length of duct, fan distance from the intake source and other random factors. It is generally accepted that remote mounted venting is usually quieter than standard (in room) venting.

Accessories

BOC
Interior
Air Valve

CAR
Backdraft
Damper

ACOP-VENT
Antivibrating
coupling

SIL
Sound
Attenuator

PER
Plastic louver
shutter

SC 15
Variable speed
control

MFL
Filtration
Box

please coordinate with the architect for dryer exhaust locations and with the supplied dryers to see if booster fans are still required.

SWF-SIDEWALL FAN (SWF) SERIES

The SWF series utilizes the same powerful (high static) motor found in the popular PV Series fans, yet the SWF series is encased in an exterior mounted housing. The outdoor rated exterior housing provides easy access from the outside of a building or dwelling. This makes the SWF a great solution for installations where attic space or easy indoor access is difficult and not suitable for traditional PV style in-line mounting. The Sidewall Fan Series (SWF) of direct drive centrifugal ventilation fans consists of five model sizes ranging from 4-8". All models are designed for direct connection in-line with standard diameter round ducting. Airflow performance values range from 119 CFM up to 416 CFM.

All SWF series models incorporate a powerful external rotor motor that has been factory matched to a nonoverloading backward curved centrifugal fan wheel.

This powerful combination enables the SWF to deliver exceptional airflow performances against high static pressure typically found in ducted ventilation systems. All motors within the SWF series are fully speed controllable using voltage or frequency control regulators.

The SWF series has been designed for easy through the wall installation. The totally enclosed motor design allows for the SWF to operate in high moisture, lint and dust laden air. All models are manufactured with high quality materials and workmanship that is supported by a comprehensive **five (5) year warranty.**

The SWF series features a corrosion resistant galvanized steel casing with a baked enamel coating that can be painted to match the exterior wall. The unit also includes a built-in backdraft damper and an extended opening exhaust grille. The larger grille allows for the easy exhaust of "dirty" or lint laden air while the spring-loaded backdraft damper helps prevent insects, etc. from entering duct work.

The SWF100x fans feature Class F Motor Insulation making them the ideal fans for Clothes Dryer Boosting applications. See page 8 for more details.

Applications

The SWF series is ideally suited for a wide range of residential, commercial and industrial exhaust and intake ventilation applications. Typical applications would include the following:

Residential
•Bathrooms
•Laundry room
•Kitchen Range Hoods
•Apartments or Townhouses

Commercial
•Conference Rooms
•Offices
•Bars & Restaurants

Industrial
•Welding Fume Extraction
•Spot Ventilation
•Workshops & Smoking Areas

Technical Specifications

All five SWF models sizes (SWF-100, 100x, 150, 150x & 200) include the following specifications:

Warranty
Five (5) year limited warranty.

Casing
- Manufactured from high grade pressed galvanized steel, with baked enamel coating.
- Removable top for easy access to motor for cleaning or inspection.
- Large grille opening for easy passing of lint and other potentially clogging materials.
- Includes prewired terminal box.

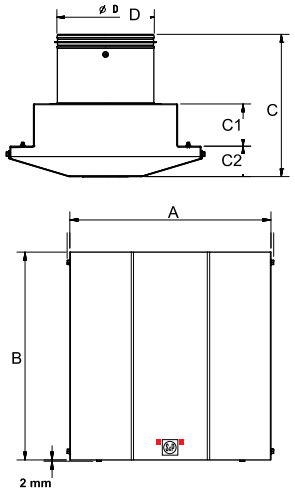
Wheel/Impeller
- Backward curved centrifugal type.
- Factory matched to an external rotor motor and dynamically balanced to eliminate vibration.

Accessories
- A wide range of accessories is available to complete the most demanding installation.

Motors
- Totally enclosed permanent split capacity start and run external rotor motors.
- 115V 60Hz (single phase) electrical connection.
- Permanently sealed, self lubricating precision ball bearings.
- Safety Thermal Overload Protection Cut-Out (Automatic Reset Type).
- All models are suitable for working airstreams up to 140ºF.

Code Approval
- All models have been independently safety tested by Underwriters Laboratories, Inc. and are UL and cUL listed.
- The SWF product range is certified by the Home Ventilating Institute (HVI) for Air Performance.

Dimensions inches/mm



Model	A	B	C	C1	C2	D
SWF-100	13 1/4 / 337	13 1/4 / 337	9 / 228	3 / 76	2 7/16 / 62	4 / 100
SWF-100x	13 1/4 / 337	13 1/4 / 337	9 / 228	3 / 76	2 7/16 / 62	4 / 100
SWF-150	15 1/2 / 394	13 1/4 / 337	10 3/16 / 256	3 / 76	2 7/16 / 62	6 / 150
SWF-150x	15 1/2 / 394	16 1/16 / 408	10 / 254	3 3/16 / 81	2 7/16 / 62	6 / 150
SWF-200	15 1/2 / 394	16 1/16 / 408	11 7/16 / 290	3 3/8 / 87	2 7/16 / 62	8 / 200

Performance

Model	RPM	Volts	Frequency	Current	Watts	CFM vs. Static Pressure (SP) Ins. WG								
						0”	0.125”	0.25”	0.375”	0.5”	0.75”	1.0”	1.25”	1.5”
SWF-100	2200	120	60 Hz	0.52 A	57	119	106	92	78	64	44	26	-	-
SWF-100X	2600	120	60 Hz	0.8 A	90	171	162	152	142	118	90	66	46	28
SWF-150	2600	120	60 Hz	0.8 A	90	235	221	197	181	168	122	81	60	27
SWF-150X	2800	120	60 Hz	1.0 A	115	354	332	310	287	266	230	192	147	96
SWF-200	2800	120	60 Hz	1.0 A	115	416	395	368	341	324	287	233	184	132

Sound

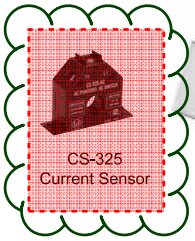
Fan sound levels are measured in sones. At this time there are no sone level test standards available through HVI due to the fact that remote mounted fan noise levels are in proportion to the following: type of duct, length of duct, fan distance from the intake source and other random factors. It is generally accepted that remote mounted venting is quieter than standard (in room) venting.

Accessories


SC 15
Variable speed control


BOC/BOR
Interior Air Valve


SPT-100x
Pressure Switch


CS-325
Current Sensor


MFL
Filter Box

No Exception Taken

No Exception Taken

Clothes Dryer Boosting with Centrifugal Fans

If you have a dryer with long or complicated duct runs, S&P offers the perfect solution to increase dryer efficiency: the PV100x Dryer Booster Fan. The PV100x has been specifically designed to handle dryer boosting applications when overcoming long or complicated duct runs. This system helps save on drying time, moisture build-up, wear and tear on your dryer, and helps save on your electric bill. The centrifugal blade design is able to overcome extreme resistance from the most challenging installations. The PV-100x offers a fully enclosed motor with Class F insulation which ensures a long, trouble free life; thus making it the right choice for enhancing the performance of your clothes dryer.

NOTE
The PV-100x Dryer Booster fan is suitable for use with duct runs of up to 105 linear feet of 4" rigid duct or a maximum of 6 elbows and 80 feet.

The PV-100x fan is available separately or as part of a kit that includes everything necessary for a hands-free operation. Once the system is installed you will no longer waste time, energy or unnecessary wear and tear on your dryer. The next step is to select which activation best fits your needs.

How to activate the PV-100x fan for clothes dryer boosting

PV-100xps

Pressure Switches

Pressure switches are a viable method of fan activation and a good solution for many installations. The pressure switch senses the pressure differential in the duct created by the dryer operation, thus activating the fan. Conversely, when the dryer is deactivated, the pressure switch senses this differential and the fan is deactivated. S&P's PV-100xps utilizes a compact pressure sensor and run timer enclosed within the junction box and mounted to the fan housing. The pressure sensor is also available as an accessory.

DBM-100xc

Current Sensors

Current sensors are S&P's "preferred" method of activation. They are "fail-safe", as there is no maintenance required on the current sensor and they're easy to install. The current sensing device can be installed at the outlet (where the dryer plugs into the wall) or at the circuit breaker box. When the device senses current going to the dryer, it activates the fan and vice-versa. No thought! No maintenance! Our choice!

IL-115/230

Interlocks

Interlocks, like Current Sensors, are another "fail-safe" method of clothes dryer booster activation. The interlocks senses when the fan is running and activates the dryer. Used as a safety feature, if the fan is not running or if there is a problem with the fan the dryer will not turn on.

All 3 activation methods are available as accessories or in the S&P's all inclusive dryer booster kits.

SWF - Sidewall Mount Exhaust Fan for Dryer Boosting

SWF100x

The sidewall unit can be paired with a current sensor or pressure switch when interior duct access in a home, apartment or townhouse is limited or difficult. The expanded exhaust grille allows for the easy passing of lint laden air. The SWF utilizes the same powerful motor as the PV-100x and is also suitable for duct runs up to 105 feet or up to 80 feet with 6 elbows. The low profile SWF fan is easy to install with an epoxy coating that can be painted to match the exterior of the building. The SWF also offers the same trusted 5 year warranty.

2100 HVI CERTIFIED

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Jacksonville, FL 32217
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Mississauga, ON L4W 2K9
P. 866.733.0233
F. 866.358.5346
www.solerpalaucanada.com

CENTRIFUGAL JET FANS
IFFT Series

Centrifugal Jet fans to induce air movement in large spaces. Suitable for ventilation only at ambient temperature.

Description
Nominal thrust 50N, 75N and 100N.
Backward curved centrifugal impeller in galvanised steel and balanced in accordance with ISO 1940-1, G6.3.
Fan casing in galvanised steel.
Fan external electrical terminal box.
Supplied with inlet steel guard.

Motors
IEC from 80 to 90, 3 phase /380-415V / 50Hz, Class F.
Two speed 4/8 pole Dahlander winding.
Ambient temperature: -20 C to +40 C.
Available in 60Hz.

On request
Factory fitted IP65 isolator in place of electrical terminal box, isolator also available as an accessory for use with standard terminal box fan.

Inlet guard.

Low profile
Useful in low structures.

External terminal box for ease of connection.

Optional isolator
Electrical isolator fitted to fan for security or as an accessory.

No Exception Taken

CENTRIFUGAL JET FANS
IFFT Series

REFERENCE

I	F	F	T	/	4/8	-	1	0	0	N	C/I	2,3/0,37 kW	400 V	50 Hz
1					2		3				4	5	6	7

1 - Series IFFT for ventilation only in ambient temperature.
2 - Motor speed (poles).
3 - Nominal thrust.
4 - C = terminal box (standard). I = On/off electrical isolation switch (optional).
5 - Motor power in kW.
6 - Nominal electrical supply.
7 - Frequency (Hz).

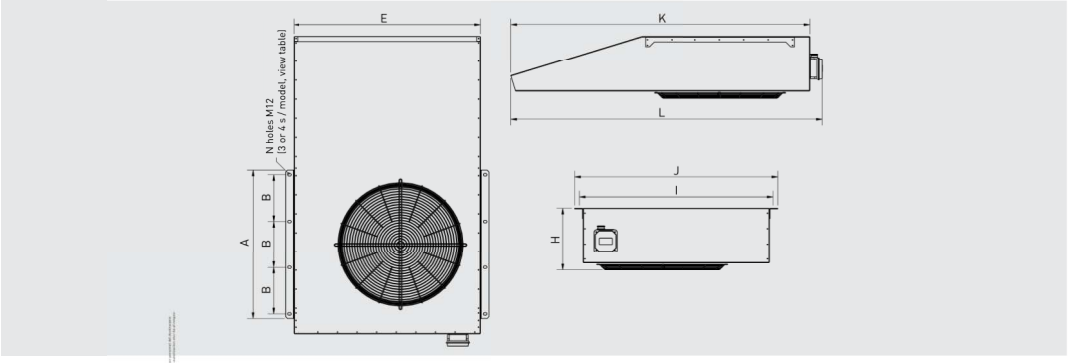
TECHNICAL CHARACTERISTICS

Before installation check that the product electrical characteristics listed on the data plate label (voltage, power, frequency, etc.) match those of the intended electrical supply.

Model	Speed (poles)	Speed (rpm)	Thrust (N)	Airflow (m³/h)	Nominal power (kW)	Absorbed current (A)	Starting current (A)	Sound pressure level* (LpA)	Weight (kg)
IFFT/4/8-50N-C	4/8	1345/710	50/13	5.500/2.880	1,21/0,20	3,0/1,1	9,8/2,4	75/59	76
IFFT/4/8-75N-C	4/8	1420/710	75/19	8.300/4.150	2,3/0,37	5,4/1,9	30/7,5	77/61	120
IFFT/4/8-100N-C	4/8	1420/710	95/24	8.900/4.450	2,3/0,37	6,0/2,0	30/7,5	78/63	120

* Sound pressure at 3 m, in free field conditions.

DIMENSIONS (mm)



Model	A	B	E	H	I	J	K	L	N
50	600	275	800	272	844	890	1232	1298	3
75	800	250	1000	337	1044	1090	1600	1666	4
100	800	250	1000	337	1044	1090	1600	1666	4

ACOUSTIC CHARACTERISTICS

Sound power levels ref 1pW, tested in accordance with ISO 13347:2004.

IFFT (4 pole)

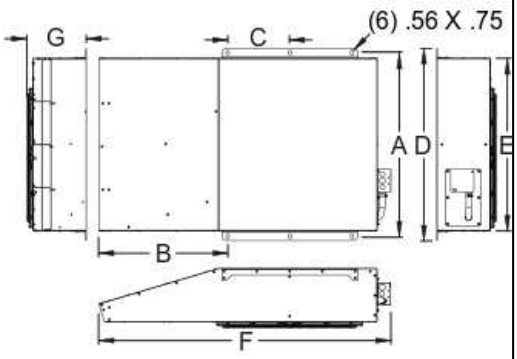
Model	63	125	250	500	1000	2000	4000	8000	LwA
50	61	79	84	87	87	85	80	73	93
75	63	83	85	87	89	85	80	73	94
100	65	83	87	90	91	87	81	74	95

IFFT (8 pole)

Model	63	125	250	500	1000	2000	4000	8000	LwA
50	46	64	69	72	72	70	65	58	76
75	48	68	70	72	74	70	65	58	78
100	50	68	72	75	76	72	66	59	80

S&P USA

Optisizer Version 2.0
Printed: 2022-05-11



IFFT-50N-Low Speed

Centrifugal Jet Fan

STANDARD FEATURES:
Statically and Dynamically Balanced Impeller • Low-Profile Construction • cULus 705 Listed • Galvanized Steel Housing • 5 Year Fan & 1 Year Motor Warranty

Performance

Flow (CFM)	SP (in W.G.)	Nominal RPM	Max Power (W/HP)	Max Amps	Sones
1754	0	855	1491.4 / 2	6.13	-

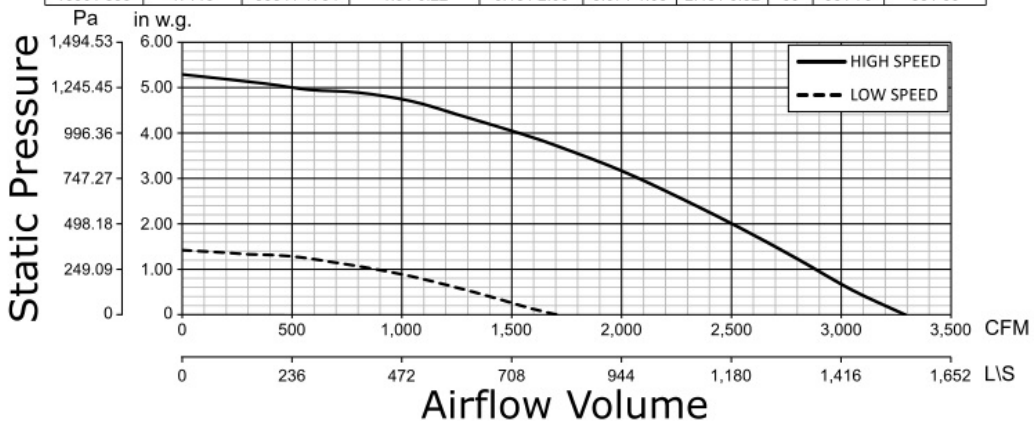
Altitude (Feet): 0 **Temperature (Fahrenheit):** 70 **Density (Lb/Ft3):** .075

Dimensions (Inches)											
A	33.44	B	22.50	C	10.81	D	35.00	E	31.63
F	50.88	G	12.19	H		I		J	
K		L		M		N		O	
P		Q		R		S		T	
U		V		W		X		Y	

Note: Accessories may effect dimensions shown.

Avg. Shipping Weight (Lbs)*: 168
*Includes fan, motor, and packaging.

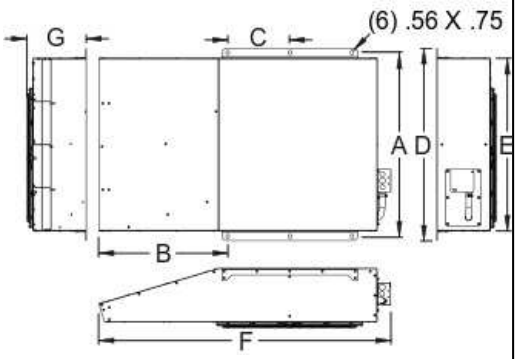
RPM	Thrust (N)	Flow (CFM)	Nominal Power (kW)	Full Load Current (A) 230V	460V	575V	Hz	LwA	dBA @ 5 ft
1650 / 855	47 /13	3384 / 1754	1.5 / 0.22	6.13 / 2.06	3.07 / 1.03	2.45 / 0.82	60	95 / 79	83 / 66



No Exception Taken

S&P USA

Optisizer Version 2.0
Printed: 2022-05-11



IFFT-50N-High Speed

Centrifugal Jet Fan

STANDARD FEATURES:
Statically and Dynamically Balanced Impeller • Low-Profile Construction • cULus 705 Listed • Galvanized Steel Housing • 5 Year Fan & 1 Year Motor Warranty

Performance

Flow (CFM)	SP (in W.G.)	Nominal RPM	Max Power (W/HP)	Max Amps	Sones
3384	0	1650	1491.4 / 2	6.13	-

Altitude (Feet): 0 **Temperature (Fahrenheit):** 70 **Density (Lb/Ft3):** .075

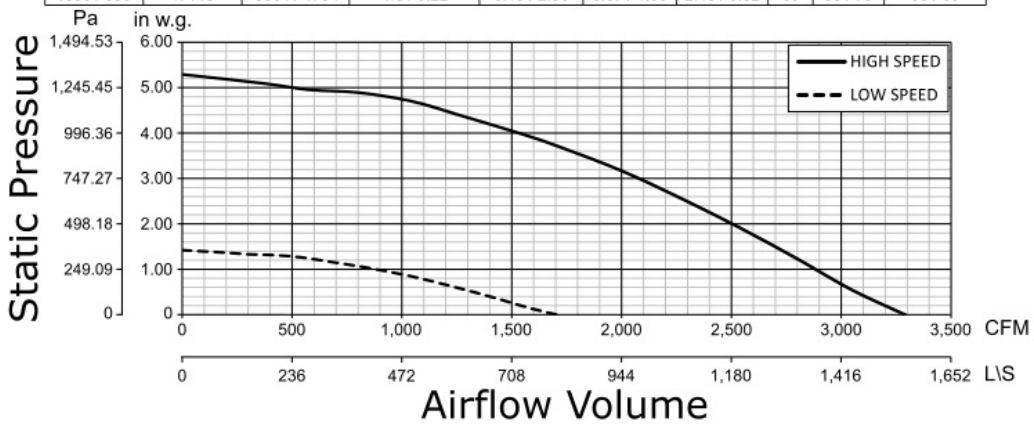
Dimensions (Inches)

A	33.44	B	22.50	C	10.81	D	35.00	E	31.63
F	50.88	G	12.19	H		I		J	
K		L		M		N		O	
P		Q		R		S		T	
U		V		W		X		Y	

Note: Accessories may effect dimensions shown.

Avg. Shipping Weight (Lbs)*: 168
*Includes fan, motor, and packaging.

RPM	Thrust (N)	Flow (CFM)	Nominal Power (kW)	Full Load Current (A) 230V	460V	575V	Hz	LwA	dBA @ 5 ft
1650 / 855	47 /13	3384 / 1754	1.5 / 0.22	6.13 / 2.06	3.07 / 1.03	2.45 / 0.82	60	95 / 79	83 / 66



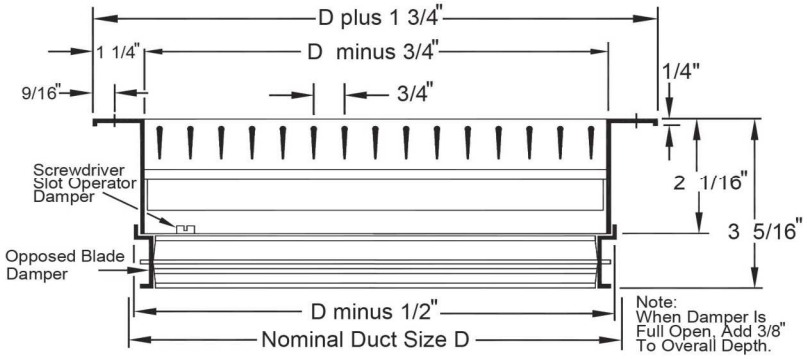
Project	GRD A	Date	No Exception Taken
Architect		Office	
Engineer		Preparer	
Contractor		Version	
Designation			

300RS

Double Deflection Supply Grille, ¾" Spacing, front blades parallel to short dimension, Steel.

Main Product 300RS-1

300RS



Screw Hole Fastrening, Grille Mounting Detail

Duct Width	Duct Height	Grille OA Width	Grille OA Height
24	12	25.75	13.75
18	18	19.75	19.75

General Description 300RS-1

- Front louvers are vertical to width.
- Front and rear louvers are individually adjustable.
- Srcew hole fastening includes #8 x 1 ¼" lg. Phillip's flat head sheet metal screws painted color of grille.
- Sizes larger than 48" x 48" are shipped in multiple sections with joining strips for field assembly.
- Odd and fractional sizes are available at additional cost.
- Optional opposed blade damper has screwdriver adjustment accessible through face of register.
- Insect and debris screens are not available when dampers are fitted.
- All dimensions are ± 1/16"
- Material: Steel

Option Schedule 300RS-1

ID	Quantity	Tag	WIDTH IN INCHES	HEIGHT IN INCHES
1	4		24	12
2	5		18	18

Project
Architect
Engineer
Contractor
Designation

Titus
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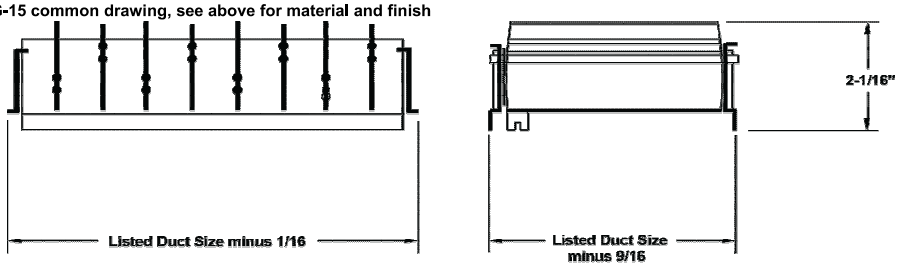
Date
Office
Preparer
Version

Option Schedule (continued)	300RS-1

MODULE SIZE	NONE	**DAMPER MODEL**	AG-15 - STEEL OBD
BORDER	1 - SURFACE MOUNT	**ACCESSORY 1**	NONE
FINISH	26 - WHITE	**ACCESSORY 2**	NONE
FASTENING	A - SCREW HOLES	**ACCESSORY 3**	NONE

Accessories	300RS-1

Damper: AG-15 common drawing, see above for material and finish



No Exception Taken

Project			Date
Architect	GRD B		Office
Engineer			Preparer
Contractor			Version
Designation			

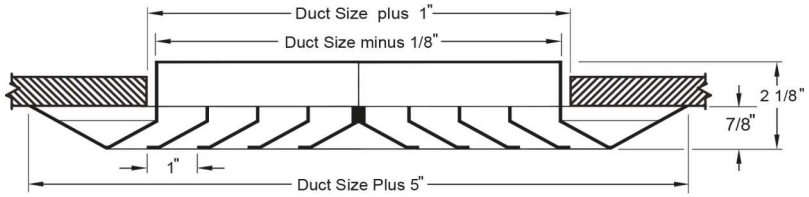
MCD

Modular core diffuser, Steel.

Main Product MCD-1

MCD

Border Type 6 (Beveled Drop Face)



Duct Size
10" x 10"

General Description MCD-1

- The Model MCD modular core diffuser is an extremely flexible diffuser. The model MCD can be adjusted for 1, 2, 3, or 4-way air patterns after being installed.
- Model MCD diffuser maintains a horizontal flow pattern from maximum to minimum CFM making it an excellent choice for variable air volume applications.
- MCD is shipped with the modular cores set for 4-way throw.
- Material is Steel

Option Schedule MCD-1

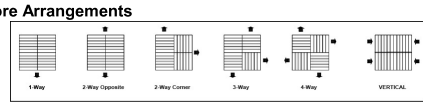
ID	Quantity	Tag	DIM 1 NECK SIZE	DIM 2 NECK SIZE
1	1		10 INCHES	10 INCHES
2	1		10 INCHES	10 INCHES

MODULE SIZE NONE
BORDER 6 - BEVELED
FINISH 26 - WHITE
DAMPER MODEL AG-95 - NECK MOUNTED OBD

ACCESSORY 1 NONE
ACCESSORY 2 NONE
ACCESSORY 3 NONE

Accessories MCD-1

Modular Core Arrangements



Project
Architect
Engineer
Contractor
Designation

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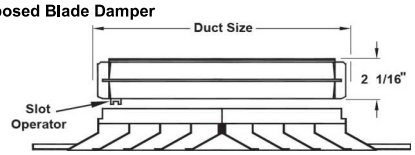
Date
Office
Preparer
Version

Accessories (continued)	MCD-1

AG-95, Opposed Blade Damper



AG-95 Neck Mounted OBD

No Exception Taken

Project		Date	
Architect		Office	
Engineer		Preparer	
Contractor		Version	
Designation	GRD E		

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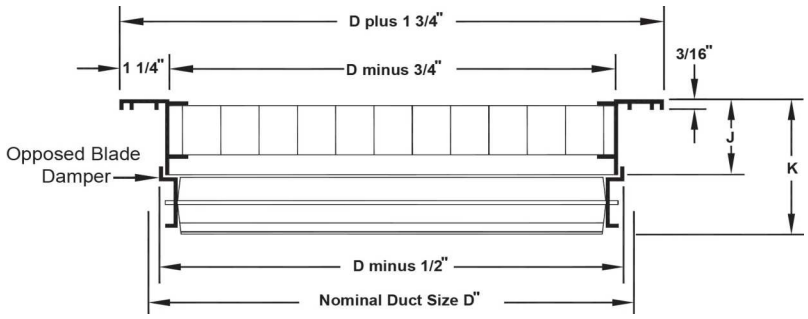
50F

Eggcrate return, aluminum border and aluminum grid.

Main Product 50F-1

50F



Surface mount with ½ x ½ x ½ Aluminum Grid

Duct Width	Duct Height	Grille OA Width	Grille OA Height	J	K
10	10	11.75	11.75	1 1/4"	2 1/2"
6	6	7.75	7.75	1 1/4"	2 1/2"

General Description 50F-1

- Insect and debris screens are not available when damper are fitted.
- #8 x 1 ¼" lg. Phillips flat head sheet metal screws painted white.
- All dimensions are ± 1/16"
- Material: Aluminum

Option Schedule 50F-1

ID	Quantity	Tag	WIDTH IN INCHES	HEIGHT IN INCHES
1	1		10	10
2	1		6	6

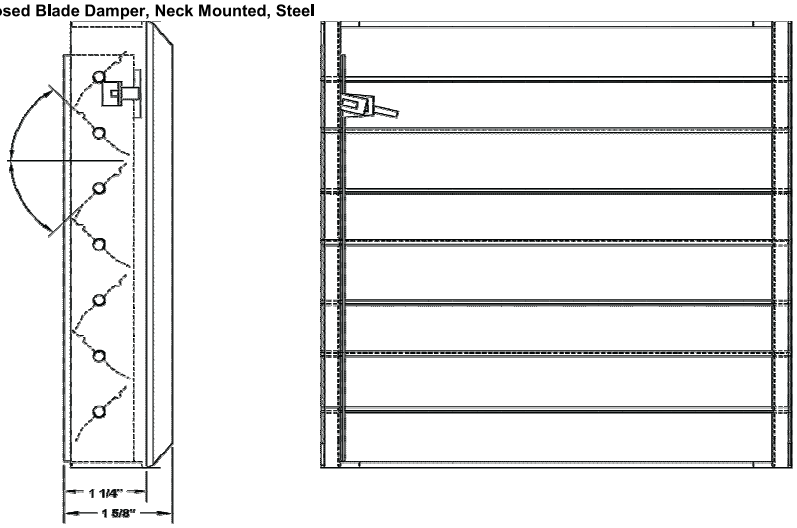
MODULE SIZE NONE
BORDER 1 - SURFACE MOUNT
FINISH 26 - WHITE
FASTENING A - SCREW HOLES

DAMPER MODEL AG-15 - STEEL OBD
EGGCRATE CORE CORE A (BORDER 1 OR 3)
ACCESSORY 2 NONE
ACCESSORY 3 NONE

Project		Date	
Architect		Office	
Engineer		Preparer	
Contractor		Version	
Designation			

Accessories	50F-1

AG-15 Opposed Blade Damper, Neck Mounted, Steel



- Slot Operated
- Sizes larger than 24" x 18" but smaller than 48" x 48" are made in multiple sections and shipped as one piece.
- Gang operated opposed blades meter air volume with minimal disturbance.
- Mounts on grille using spring steel S-clips.
- Slot operated model shown above.
- Galvanized Steel

Project GRD C
Architect
Engineer
Contractor
Designation

Titus
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Date
Office
Preparer
Version

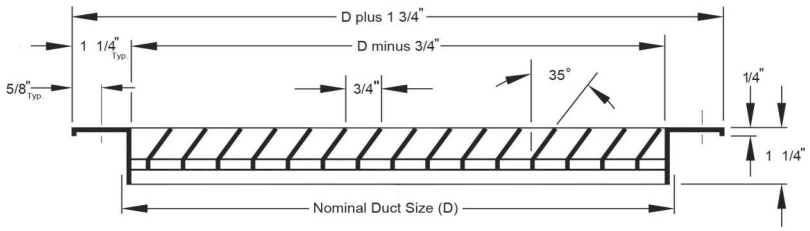
No Exception Taken

350RL

Louvered Return Grille, 35º Deflection, ¾" Spacing, blades parallel to long dimension, Steel.

Main Product 350RL-1

350RL



Screw Hole Fastening, Grille Mounting Detail

Duct Width	Duct Height	Grille OA Width	Grille OA Height
12	6	13.75	7.75

General Description 350RL-1

- Louvers are horizontal to width with ¾" spacing at a 35 degree deflection.
- Optional opposed blade damper has screwdriver adjustment accessible through face of register.
- Odd and fractional sizes are available at additional cost.
- Sizes larger than 48" x 48" are shipped in multiple sections with joining strips for field assembly.
- Srcew hole fastening includes #8 x 1 ¼" lg. Phillip's flat head sheet metal screws painted color of grille.
- Wall or duct opening should be duct size ± 1/8".
- All dimensions are ± 1/16"
- Material: Steel

Option Schedule 350RL-1

ID	Quantity	Tag	WIDTH IN INCHES	HEIGHT IN INCHES
1	1		12	6

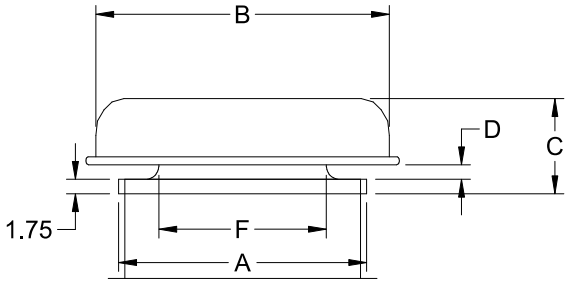
MODULE SIZE NONE
BORDER 1 - SURFACE MOUNT
FINISH 26 - WHITE
FASTENING A - SCREW HOLES

DAMPER MODEL 0 - NONE
ACCESSORY 1 NONE
ACCESSORY 2 NONE
ACCESSORY 3 NONE

No Exception Taken

GREENHECK
Building Value in Air.

Cut Sheet - Not for Submittal
Printed Date: 04/14/2022
Mark: IH-1
Model: GRSI



Model: GRSI

Standard Construction Features:

- Aluminum housing. - Aluminum curb cap with prepunched mounting holes. - Recommended roof opening dimension is at least 2.5 in. larger than the damper size.

Dimensions

ID#	Tag	Qty	Model	Model Size (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	Curb Cap Width (in.)	Curb Cap Length (in.)	Weight (lb)
5-1	IH-1	1	GRSI-18	18	30	35.5	11.5	1.75	N/A	20.25	30	30	19

Performance

ID#	Tag	Qty	Volume (CFM)	SP (in. wg)	Throat Area (ft2)	Throat Velocity (ft/min)
5-1	IH-1	1	1,200	0.071	1.83	656

Construction

ID#	Flashing Flange	Installation Type	Insect Screen	Birdscreen Material	Unit Material
5-1	No	Non-Ducted	No	Galvanized	Aluminum

Accessories

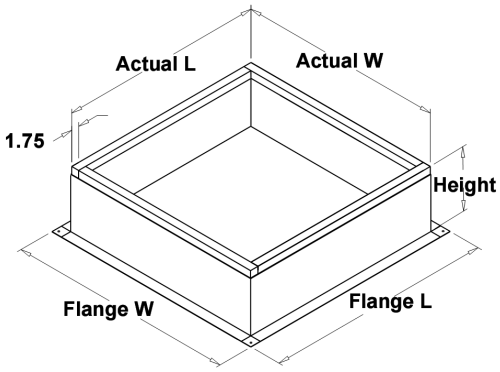
ID#	Hinged Curb Cap	Curb Seal	Hood Insulation (in.)	Tie Down Points
5-1	No	No	None	No

Roof Curbs

ID#	Model	Height (in.)	Width (in.)	Length (in.)
5-1	GPI	12	30	30

GREENHECK
Building Value in Air.

Cut Sheet - Not for Submittal
Printed Date: 04/14/2022
Mark: IH-1
Model: GPI



Model: GPI

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. mounting flange - 3 lb density insulation - Height - Available from 12 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

General

ID#	Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Made
5-1		1	GPI-30-G12	Nominal	1.5	29	Yes	No Preference

Dimensions

ID#	Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Flange Width (in.)	Flange Length (in.)
5-1	12	30	30	28.5	28.5	32.5	32.5

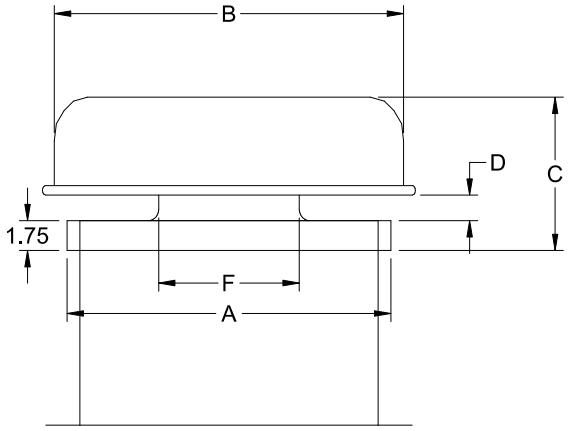
Accessories

ID#	Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
5-1	Galvanized	No	No	1	R4.3

No Exception Taken

GREENHECK
Building Value in Air.

Cut Sheet - Not for Submittal
Printed Date: 04/14/2022
Mark: RH-1
Model: GRSR



Model: GRSR

Standard Construction Features:

- Aluminum housing. - Aluminum curb cap with prepunched mounting holes. - Recommended roof opening dimension is at least 2.5 in. larger than the damper size.

Dimensions

ID#	Tag	Qty	Model	Model Size (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	F (in.)	Curb Cap Width (in.)	Curb Cap Length (in.)	Weight (lb)
6-1	RH-1	1	GRSR-8	8	19	20.5	9	1.5	N/A	8.25	19	19	7

Performance

ID#	Tag	Qty	Volume (CFM)	SP (in. wg)	Throat Area (ft2)	Throat Velocity (ft/min)
6-1	RH-1	1	200	0.03	0.37	541

Construction

ID#	Flashing Flange	Installation Type	Insect Screen	Birdscreen Material	Unit Material
6-1	No	Non-Ducted	No	Galvanized	Aluminum

Accessories

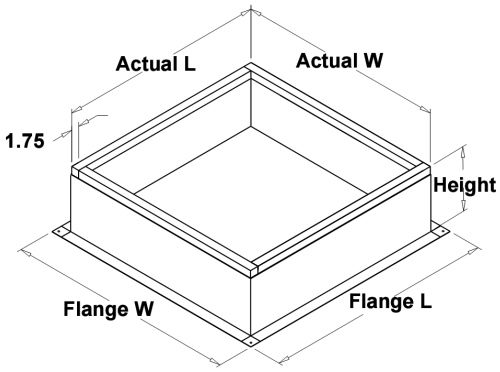
ID#	Hinged Curb Cap	Curb Seal	Hood Insulation (in.)	Tie Down Points
6-1	No	No	None	No

Roof Curbs

ID#	Model	Height (in.)	Width (in.)	Length (in.)
6-1	GPI	12	19	19

GREENHECK
Building Value in Air.

Cut Sheet - Not for Submittal
Printed Date: 04/14/2022
Mark: RH-1
Model: GPI



Model: GPI

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. mounting flange - 3 lb density insulation - Height - Available from 12 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

General

ID#	Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Made
6-1		1	GPI-19-G12	Nominal	1.5	16	Yes	No Preference

Dimensions

ID#	Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Flange Width (in.)	Flange Length (in.)
6-1	12	19	19	17.5	17.5	21.5	21.5

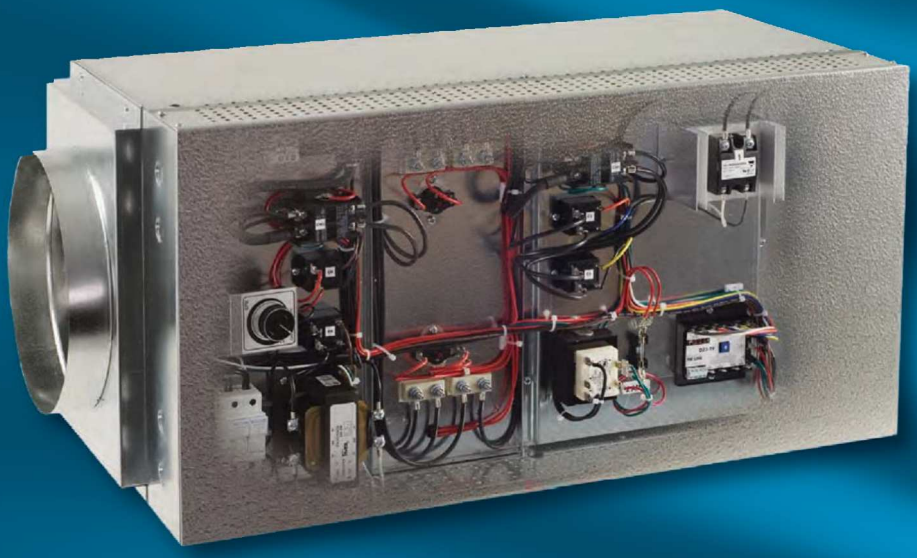
Accessories

ID#	Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
6-1	Galvanized	No	No	1	R4.3

No Exception Taken

COMPLETE MINI MAKE UP AIR

FER MODEL



- Tempered makeup air from 50 to 600 CFM
- Packaged unit reduces field installation cost
- Compact size
- Meets IRC M1503.4 makeup air requirements for residential range hoods
- Meets ASHRAE 62.1-2016 and 62.2-2016 ventilation requirements

THERMOLEC

MODEL FER

STANDARD FEATURES:

- Built in fan with variable speed controller
- Integrated backdraft damper
- Modulating (SCR) temperature control
- Low and High temperature limit protection
- Listed for zero clearance
- Current sensing relay to start fan
- Inlet and supply air temperature sensors
- Listed for horizontal installation
- Automatic and manual reset high limit
- Aluminum mesh permanent washable filter
- 10-year open coil element warranty
- 2-year parts warranty
- Made in North America

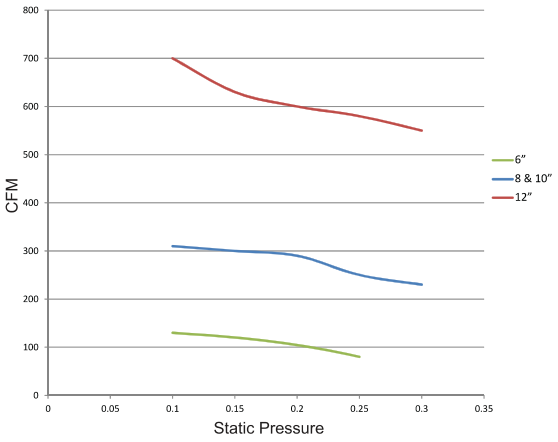
Available sizes:

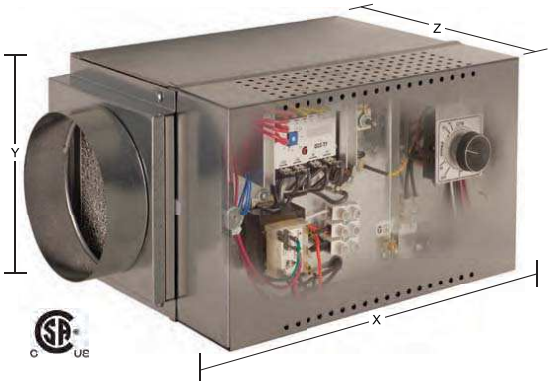
	100 CFM Fan		200 CFM	300 CFM	600 CFM Fan
Collar Size	6"	6"	8"	10"	12"
Single Phase	●	○	●	●	●
Three Phase		●	●	●	●
Max Voltage	240	600	600	600	600
Max kW	3	3	6	10	20
Dimensions (X x Y x Z)	X x Y x Z 19 3/8" x 8" x 10 1/2"	31 1/2" x 10" x 13 3/4"	35 1/2" x 15" x 15"	35 1/2" x 15" x 15"	43 1/2" x 16" x 21"
Controls Included	Current Sensor	Current Sensor	Current Sensor	Current Sensor	Current Sensor

○ 208 V > 12.5 Amps

Note: Sizes are approximate and may change without notice

Fan performance:





When ordering please specify the collar size, kW and voltage/phase as in the following example:

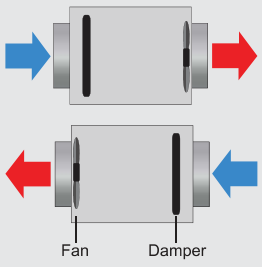
FER-12-20-600/3

Collar size (inches) — kW — Voltage/Phase

Reversible Airflow

There is no need to modify the fan or any wiring to reverse the airflow, simply rotate the unit 180°. This is possible due to the automatic thermal cutouts located on both the top and bottom of the unit.

NOTE:
Not suitable for vertical airflow.



THERMOLEC

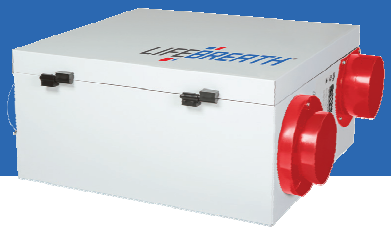
2060 LUCIEN-THIMENS, MONTREAL • QUEBEC, CANADA, H4R 1L1 • Tel.:514-336-9130 Fax:514-336-3270 • www.thermolec.com

V2.1 Oct. 2019

23 72 00
Air to Air Energy Recovery Equipment
ERV-1

No Exception Taken

METRO 120ERV
ENERGY RECOVERY VENTILATOR



BRINGING COMPACT TO A WHOLE NEW LEVEL

- Designed for high-rise condos, apartments and townhomes with limited mechanical space
- Low profile, fits in bulkhead and drop ceilings, slim height 9.75 in.
- 50-130 CFM operational range
- 3 High speed selections
- Brackets included for easy install
- No drains required
- Fan Defrost
- Removable motor and electronic assembly for easy maintenance and service
- Swing open e-box cover for quick access to circuit board and DIP switches
- Convenient hinged door - no screws

ENGINEERING DATA:

TOTAL RECOVERY ERV CORE
Cross-flow energy recover core transfers heat and water vapor between two airstreams. It is easily removed for cleaning or service.

MOTORS AND BLOWERS
Each airstream has an independent centrifugal blower with multiple fan speed operation.

FILTERS
Washable MERV-6 air filters in exhaust and supply airstreams. Upgrade to MERV-13 option available.

MOUNTING
Mounting brackets supplied.

DEFROST
Supply air shuts off to defrost core with warm exhaust air
at high speed. Drains not required.

CASE
20 gauge prepainted galvanized steel for superior corrosion resistance, insulated to prevent exterior condensation.

INSTALLER SELECTABLE HIGH SPEED SETTINGS
Adjustable DIP switches are located on the circuit board. Hi3 is the factory setting. Refer to the installation manual for adjustment instructions.

ELECTRONICS
Main control can be wall mounted in a central location. 3 wire 20 gauge (min.) 100 ft. length (max.)

OPTIONAL ACCESSORIES:

Dual Hood
99-190
99-194

Weather Hood
99-185
99-186
99-187

TechGrille
99-EAG4
99-EAG5
99-EAG6
99-EAG8

Terminator Fitting
99-TM4
99-TM5
99-TM6

LIFEBREATH CONTROL OPTIONS

FEATURES	99-DXPL02	99-BC02	99-BC03	99-BC04
5 speed fan operation on each mode	✓			
2 speed fan operation (Low/High)		✓		✓
Continuous low speed fan operation	✓	✓	✓	✓
Humidity control through adjustable Dehumidistat	✓	✓	✓	
Large digital LCD screen	✓			
LED status indicator lights		✓	✓	✓
Continuous Ventilation	✓	✓	✓	✓
Continuous Recirculation*	✓		✓	
20 ON/40 OFF	✓		✓	✓
10 ON/50 OFF	✓			
20 ON/40 Recirculation*	✓		✓	✓
20/40/60 min. High speed override button	✓			
Compatible with 99-DET02 Wireless Timer	✓	✓	✓	✓
3 wire connection	✓	✓	✓	✓

*Recirculation features not available on fan defrost models.

TIMER OPTIONS

99-DET01 - 20/40/60 Minute Timer
Initiates high speed ventilation for 20, 40 or 60 minutes. 3 wire connection.

99-DET02 - 20/40/60 Minute Timer
Initiates high speed ventilation for 20, 40 or 60 minutes. Wirelessly connects to main control for ease of installation. 40 ft approximate range.

99-RX02 - Wireless Repeater
Extends range of 99-DET02 Wireless Timers. Plugs into 120V power outlet. Wirelessly connects to main control and 99-DET02. Install at halfway point between timer and main wall control if timer is out of range.

99-BC02 99-BC03 99-BC04 99-DET02 99-DET01

LIFEBREATH Indoor Air Systems
www.lifebreath.com

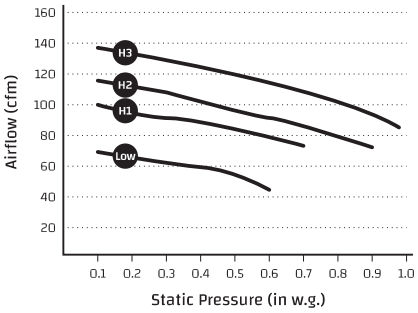
METRO 120ERV
ENERGY RECOVERY VENTILATOR

PERFORMANCE (HVI CERTIFIED)

IN. W.G. (PA)	0.2 (50) CFM (L/s)	0.3 (75) CFM (L/s)	0.4 (100) CFM (L/s)	0.5 (125) CFM (L/s)	0.6 (150) CFM (L/s)	0.7 (175) CFM (L/s)	0.8 (200) CFM (L/s)	0.9 (225) CFM (L/s)
Net Supply Airflow	133 (63)	129 (61)	125 (59)	119 (56)	114 (54)	108 (51)	102 (48)	93 (44)
Gross Supply Airflow	136 (64)	131 (62)	127 (60)	121 (57)	117 (55)	110 (52)	102 (48)	93 (44)
Gross Exhaust Airflow	133 (63)	129 (61)	125 (59)	121 (57)	114 (54)	110 (52)	104 (49)	95 (45)

ELECTRICAL SPECIFICATIONS	
VAC @ 60Hz	120
Watts / Low Speed	60
Watts / High Speed	154
Amp Rating	1.4

Sensible Effectiveness (ASE) @ 49 CFM (23 L/s)	32°F (0°C)	83%
Sensible Efficiency (SRE) @ 64 CFM (30 L/s)	32°F (0°C)	71%
Sensible Efficiency (SRE) @ 49 CFM (23 L/s)	32°F (0°C)	72%
Total Efficiency (TRE) @ 64 CFM (30 L/s)	95°F (35°C)	45%



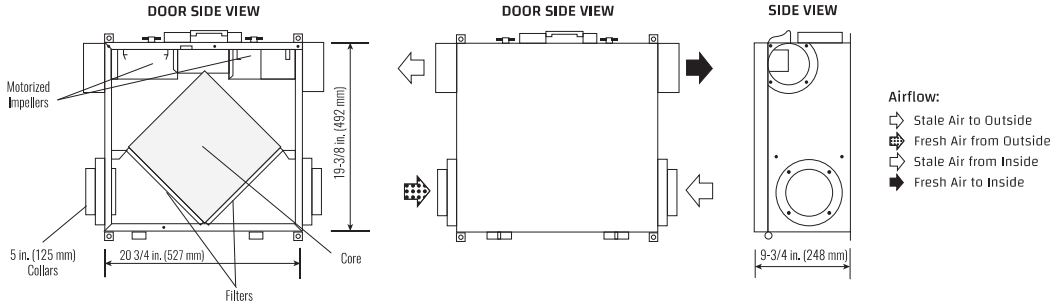
WEIGHT:
34 LBS (15.5 KG)

SHIPPING WEIGHT:
36 LBS (16 KG)

NOTE:
Front clearance of 25 in. (635 mm) is recommended for servicing unit. All ducts use 5 in. (125 mm) round collars.

MERV 13 Upgrade: 65-195-6R

DIMENSIONS



Date: _____ Contractor: _____

Tag: _____ Supplier: _____

Project: _____ Qty: _____ Quote # : _____

Engineer: _____ Submitted By: _____

Control: _____ Timer: _____ Timer Qty: _____

WARRANTY
Units carry a 5 year warranty on the enthalpic (ERV) core and a 5 year replacement parts warranty.

All units conform to CSA and UL standards

LIFEBREATH Indoor Air Systems

www.lifebreath.com

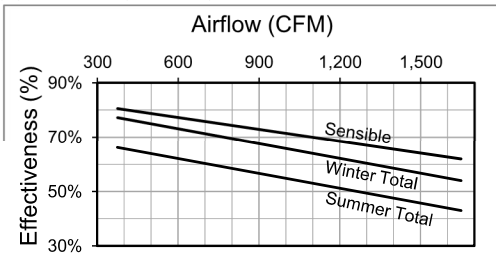
METRO 120 ERV - 0921

No Exception Taken

HE1.5XINH

INDOOR UNIT

CORE PERFORMANCE



SPECIFICATIONS

Ventilation Type: Static Plate, Heat and Humidity Transfer

Typical Airflow Range: 375 – 1,575 CFM

AHRI 1060 Certified Core: One L62 and one L125-G5

Number Motors: Two direct drive motorized impeller packages

V	HZ	Phase	FLA (per motor)	Min. Cir. Amps	Max. Overcurrent Protection Device
115	60	Single	6.5	14.6	20
208-230	60	Single	3.3-3.4	7.7	15
277	60	Single	2.7	6.1	15
208-230	60	Three	2.2-2.2	5.0	15
460	60	Three	1.1	2.5	15

Standard Features: Non-fused Disconnect
24VAC Transformer/Relay Package

Filters: Four total, MERV 8, 2" pleated, 14" x 20" (2) and 16" x 20" (2)

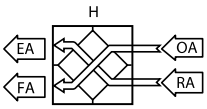
Weight: 340 lbs (unit), 400 lbs (shipping weight on pallet)

Shipping Dimensions: 63" x 48" x 60"

Options:
EC Motor – Two, 115V or 208-230V 1.0 hp (Single Phase)
Fused Disconnect
Double Wall Construction
Gravity backdraft dampers
Motorized isolation dampers, OA, EA or both airstreams
Factory mounted Filter Alarms (2)
Independent Blower Control

Accessories: Backdraft Dampers

BASE TYPE/AIRFLOW ORIENTATIONS

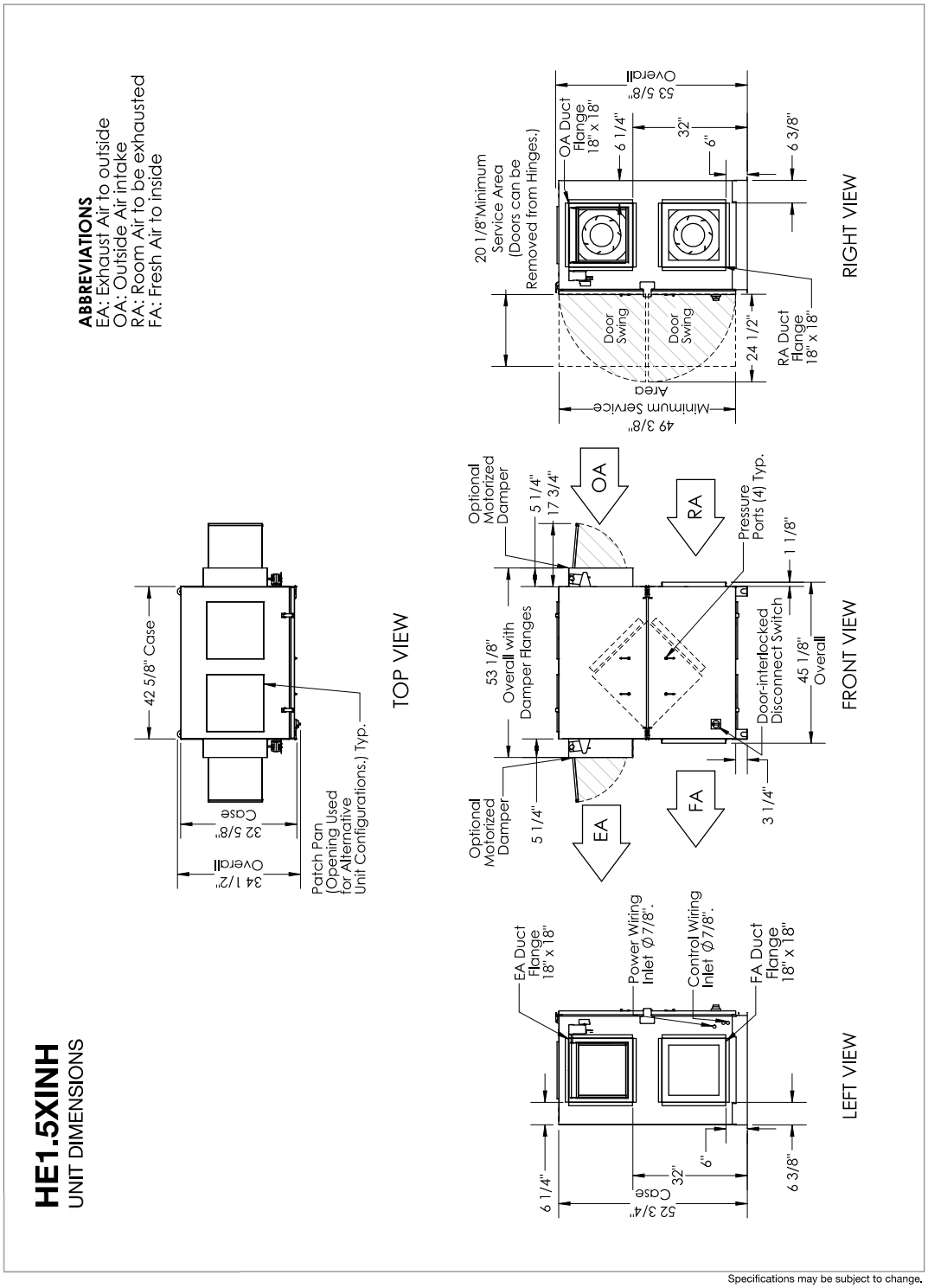


AIRFLOW PERFORMANCE

Motor HP Phase	External Static Pressure (Inches Water Column)						
	0.0	0.25	0.50	0.75	1.00	1.25	1.50
1.0 Single Phase	1,575 CFM 1,545 Watts	1,470 CFM 1,525 Watts	1,350 CFM 1,500 Watts	1,225 CFM 1,475 Watts	1,090 CFM 1,435 Watts	950 CFM 1,380 Watts	795 CFM 1,300 Watts
1.0 Three Phase	1,675 CFM 1,410 Watts	1,570 CFM 1,400 Watts	1,435 CFM 1,380 Watts	1,280 CFM 1,340 Watts	1,115 CFM 1,280 Watts	940 CFM 1,210 Watts	760 CFM 1,135 Watts

Note: Watts is for the entire unit (two motors).

Specifications may be subject to change.



Specifications may be subject to change.

23 54 13
Air to Air Energy Recovery Equipment
ERV-3

Trane Seattle - Zach Williamson

The Moraine - ERV-3

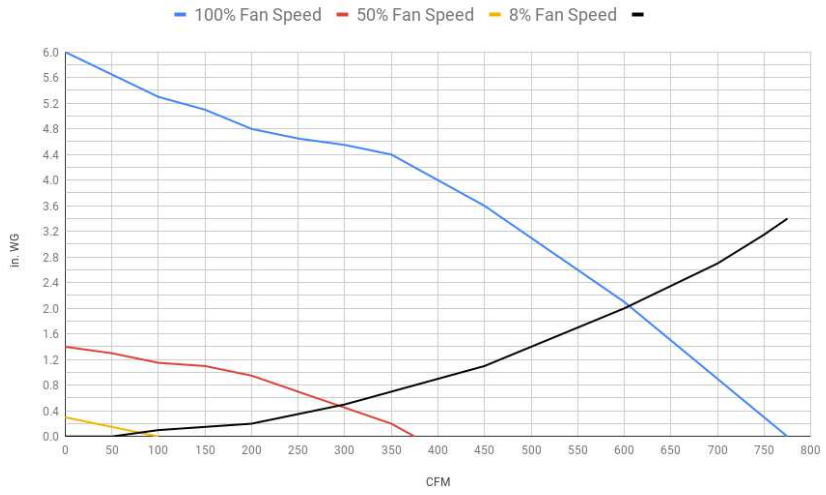
U-ERV-600

Product Info	
Dimensions	56" x 34" x 12"
Weight (lbs)	98
Location	Indoor
Orientation	Horizontal
Assembly	Field
Fan Control	Manual
Coil	No
Economizer Damper	No
BACnet Protocol	Yes
Freezestat	Yes
Defrost	Yes (Fan Modulation)
Filters	MERV 13
Temp/RH Sensor	Yes
Remote HMI	No
Note - Fan cube locations require 10ft. of 3/4" internal acoustic lined duct.	

Electric Data	
Voltage	208
Phase	1
Rated Amps	7.4
MCA	8.3
MOP	15

No Exception Taken
please coordinate carefully with field conditions. ceiling ht and horizontal space is very tight, so configure unit to fit with architectural layout.

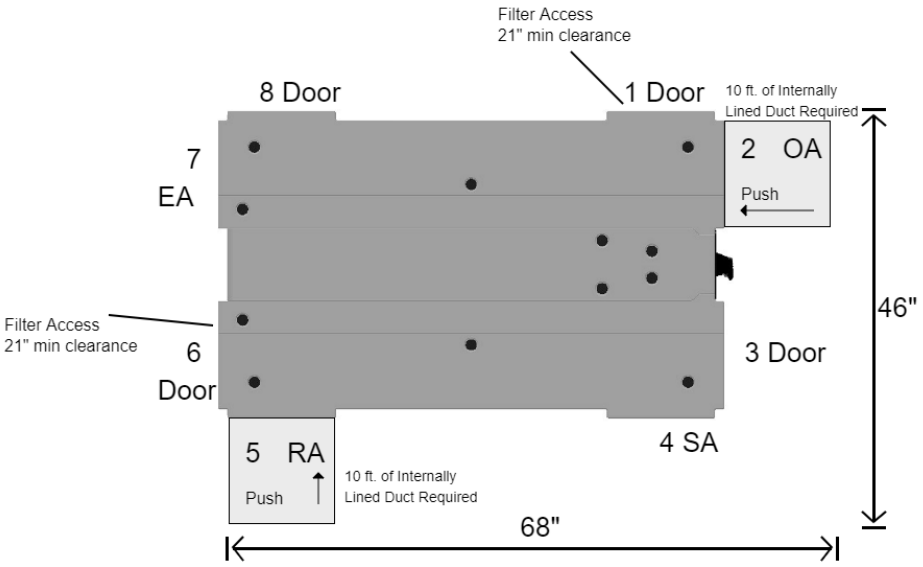
Energy Wall Fan Curve



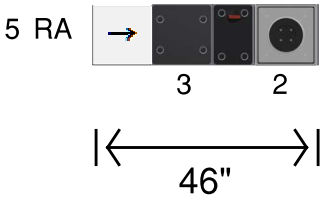
Trane Seattle - Zach Williamson

The Moraine - ERV-3

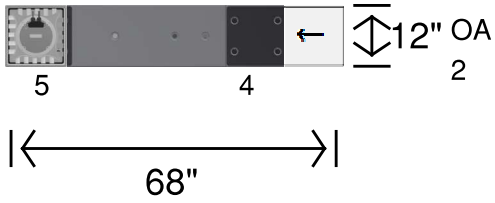
Unit Dimensions - Top View



Front View



Side View



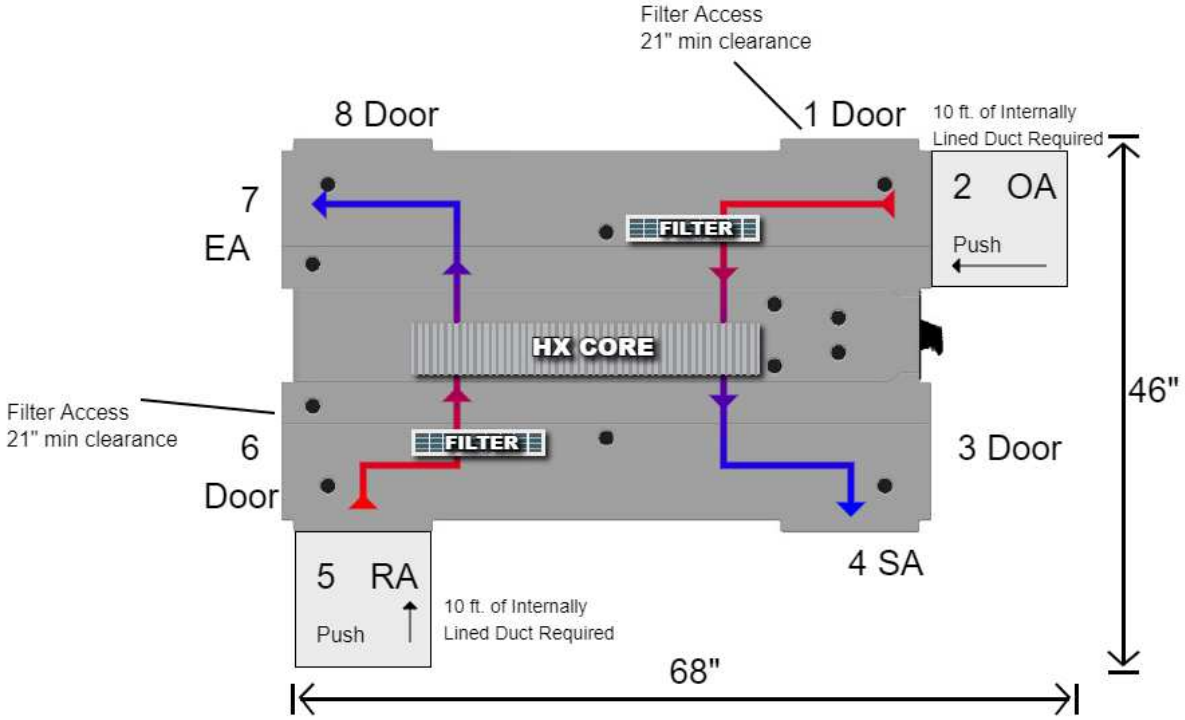
Trane Seattle - Zach Williamson

The Moraine - ERV-3

Airflow Configuration (Unconfirmed)

Horizontal Orientation

Top View



EnergyWall

Trane Seattle - Zach Williamson

The Moraine - ERV-3

SUMMER CONDITIONS				
	Outside Air	Return Air	Exhaust Air	Supply Air
Standard Air Volume (scfm)	402.6	412.0	404.3	410.3
Air Volume (cfm)	417.0	417.0	417.0	417.0
Dry Bulb Temp (°F)	86.3	74.0	84.1	76.2
Wet Bulb Temp (°F)	66.0	61.0	65.1	62.1
Relative Humidity (%)	33.1	47.0	35.6	44.8
Absolute Humidity (gr/lb)	63.0	59.2	61.9	60.3
Enthalpy (BTU/lb)	30.6	27.0	29.9	27.7

RA-EA Results	
Sensible Efficiency (%)	81.94
Latent Efficiency (%)	70.76
Total Efficiency (%)	80.07
External Static (in. WG)	2.00

Energy Results	
Sensible BTUs/hr Saved	4,539
Latent BTUs/hr Saved	779
Sensible BTUs to Neutral	1,000
Latent BTUs to Neutral	322

OA-SA Results	
Sensible Efficiency (%)	81.94
Latent Efficiency (%)	70.76
Total Efficiency (%)	80.10
External Static (in. WG)	2.00

U-ERV-600

EnergyWall

Trane Seattle - Zach Williamson

The Moraine - ERV-3

WINTER CONDITIONS				
	Outside Air	Return Air	Exhaust Air	Supply Air
Standard Air Volume (scfm)	456.4	416.5	448.6	423.2
Air Volume (cfm)	417.0	417.0	417.0	417.0
Dry Bulb Temp (°F)	24.0	70.0	32.3	61.7
Wet Bulb Temp (°F)	22.0	50.0	27.8	45.2
Relative Humidity (%)	73.8	19.7	59.3	23.8
Absolute Humidity (gr/lb)	13.4	21.7	15.8	19.3
Enthalpy (BTU/lb)	7.8	20.2	10.2	17.8

RA-EA Results	
Sensible Efficiency (%)	81.94
Latent Efficiency (%)	70.76
Total Efficiency (%)	80.82
External Static (in. WG)	2.00

Energy Results	
Sensible BTUs/hr Saved	16,976
Latent BTUs/hr Saved	1,686
Sensible BTUs to Neutral	3,741
Latent BTUs to Neutral	697

OA-SA Results	
Sensible Efficiency (%)	81.94
Latent Efficiency (%)	70.76
Total Efficiency (%)	80.75
External Static (in. WG)	2.00

U-ERV-600

SUBMITTAL

Project

The Moranie

Date

Thursday, March 24, 2022

see notes below

Unit Report For RTU-1

Project: The Moranie
Prepared By:

03/24/2022
10:58AM

verify with elect contractor

Unit Parameters

Unit Model: **48HCTG14J2A6-0A2G0**
Unit Size: **14 (12.5 Tons)**
Volts-Phase-Hertz: **460-3-60**
Heating Type: **Gas**
Duct Cfg: **Horizontal Supply / Horizontal Return**
Stainless Steel, High Heat
Two stage cooling models with MotorMaster Low Ambient Controller

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length: **9' 7.875"**
Unit Width: **5' 3.375"**
Unit Height: **4' 9.375"**
*** Total Operating Weight: **1789** lb

*** Weights and Dimensions are approximate. Weight does not include unit packaging. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Lines and Filters

Gas Line Size: **3/4**
Condensate Drain Line Size: **3/4**
Return Air Filter Type: **Throwaway**
Return Air Filter Quantity: **6**
Return Air Filter Size: **18 x 24 x 2**

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Unit Configuration

high static would be better due to architectural building revisions

Condensate Overflow Switch
Medium Static Option - Belt Drive
Al/Cu - Al/Cu
Base Electromechanical Controls
Powered Convenience Outlet
Standard Packaging
2-Speed indoor fan motor controlled by VFD

Warranty Information

1-Year parts
5-Year compressor parts
15-Year heat exchanger - Stainless Steel

No optional warranties were selected.

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quanti ty
48HCTG14J2A6-0A2G0	Rooftop Unit	1
Field Installed Accessories		
CRRFCURB074A00	14-inch Roof Curb	1
CRDUCTCV002A00	Supply Duct Cover	1

Performance Summary For RTU-1

Project: The Moranie 03/24/2022
Prepared By: 10:58AM

Part Number:48HCTG14J2A6-0A2G0

ARI EER:	**12.20**	
IEER:	**13.9**	
Base Unit Dimensions		
Unit Length:	**115.9**	in
Unit Width:	**63.4**	in
Unit Height:	**57.4**	in
Operating Weight		
Base Unit Weight:	**1430**	lb
Stainless Steel, High Heat:	**42**	lb
Two stage cooling models with MotorMaster Low Ambient Controller:	**32**	lb
Condensate Overflow Switch:	**5**	lb
Medium Static Option - Belt Drive:	**45**	lb
Powered Convenience Outlet:	**35**	lb
2-Speed Indoor Fan (VFD) Controller:	**20**	lb
Accessories		
14-inch Roof Curb:	**180**	lb
Total Operating Weight:	**1789**	lb
Unit		
Unit Voltage-Phase-Hertz:	**460-3-60**	
Air Discharge:	**Horizontal**	
Fan Drive Type:	**Belt**	
Actual Airflow:	**4000**	CFM
Site Altitude:	**0**	ft
Cooling Performance		
Condenser Entering Air DB:	**95.0**	F
Evaporator Entering Air DB:	**80.0**	F
Evaporator Entering Air WB:	**67.0**	F
Entering Air Enthalpy:	**31.44**	BTU/lb
Evaporator Leaving Air DB:	**55.6**	F
Evaporator Leaving Air WB:	**55.3**	F
Evaporator Leaving Air Enthalpy:	**23.32**	BTU/lb
Gross Cooling Capacity:	**146.11**	MBH
Gross Sensible Capacity:	**105.54**	MBH
Compressor Power Input:	**9.71**	kW
Coil Bypass Factor:	**0.163**	
Heating Performance		
Heating Airflow:	**4000**	CFM
Entering Air Temp:	**70.0**	F
Leaving Air Temp:	**115.1**	F
Gas Heating Input Capacity:	**192.0 / 240.0**	MBH
Gas Heating Output Capacity:	**156.0 / 195.0**	MBH
Temperature Rise:	**45.1**	F
Thermal Efficiency (%):	**81.0**	
Supply Fan		
External Static Pressure:	**1.22**	in wg
Fan RPM:	**766**	
Fan Power:	**2.30**	BHP
NOTE:	**Selected IFM RPM Range: 609 - 778**	

NOTE:**At the selected supply CFM value, a saturated suction temperature of less than 32 F (0 C) is possible ifrunning less than 62 F (16.7 C) ambient. This implies a slight risk of freezing the evaporator coil duringoperation. To avoid this slight risk, it is suggested to re-program the VFD 'low fan speed' to at least 2704 cfm using the accessory VFD display kit.**

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Performance Summary For RTU-1

Project: The Moranie 03/24/2022
Prepared By: 10:58AM

Electrical Data

Voltage Range:	**414 - 506**
Compressor #1 RLA:	**8.2**
Compressor #1 LRA:	**66**
Compressor #2 RLA:	**8.2**
Compressor #2 LRA:	**66**
Indoor Fan Motor Type:	**MED**
Indoor Fan Motor FLA:	**4.9**
Combustion Fan Motor FLA (ea):	**0.25**
Power Supply MCA:	**28**
Power Supply MOCP (Fuse or HACR):	**30**
Disconnect Size FLA:	**30**
Disconnect Size LRA:	**179**
Electrical Convenience Outlet FLA (based on unit line voltage):	**2.2**
Outdoor Fan [Qty / FLA (ea)]:	**3 / 0.8**

NOTE: Convenience outlet must be field connected to the line/load side of the unit disconnect per local code.

verify with elect contractor

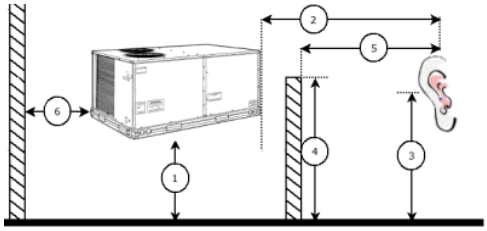
Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Acoustics

Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	98.4	94.0	89.3
125 Hz	94.6	84.1	86.0
250 Hz	79.9	72.7	82.9
500 Hz	72.4	62.9	80.7
1000 Hz	68.7	61.7	78.5
2000 Hz	67.3	61.4	73.6
4000 Hz	73.1	63.3	69.6
8000 Hz	74.2	64.0	64.5
A-Weighted	82.3	73.8	83.0

Advanced Acoustics



Advanced Accoustics Parameters

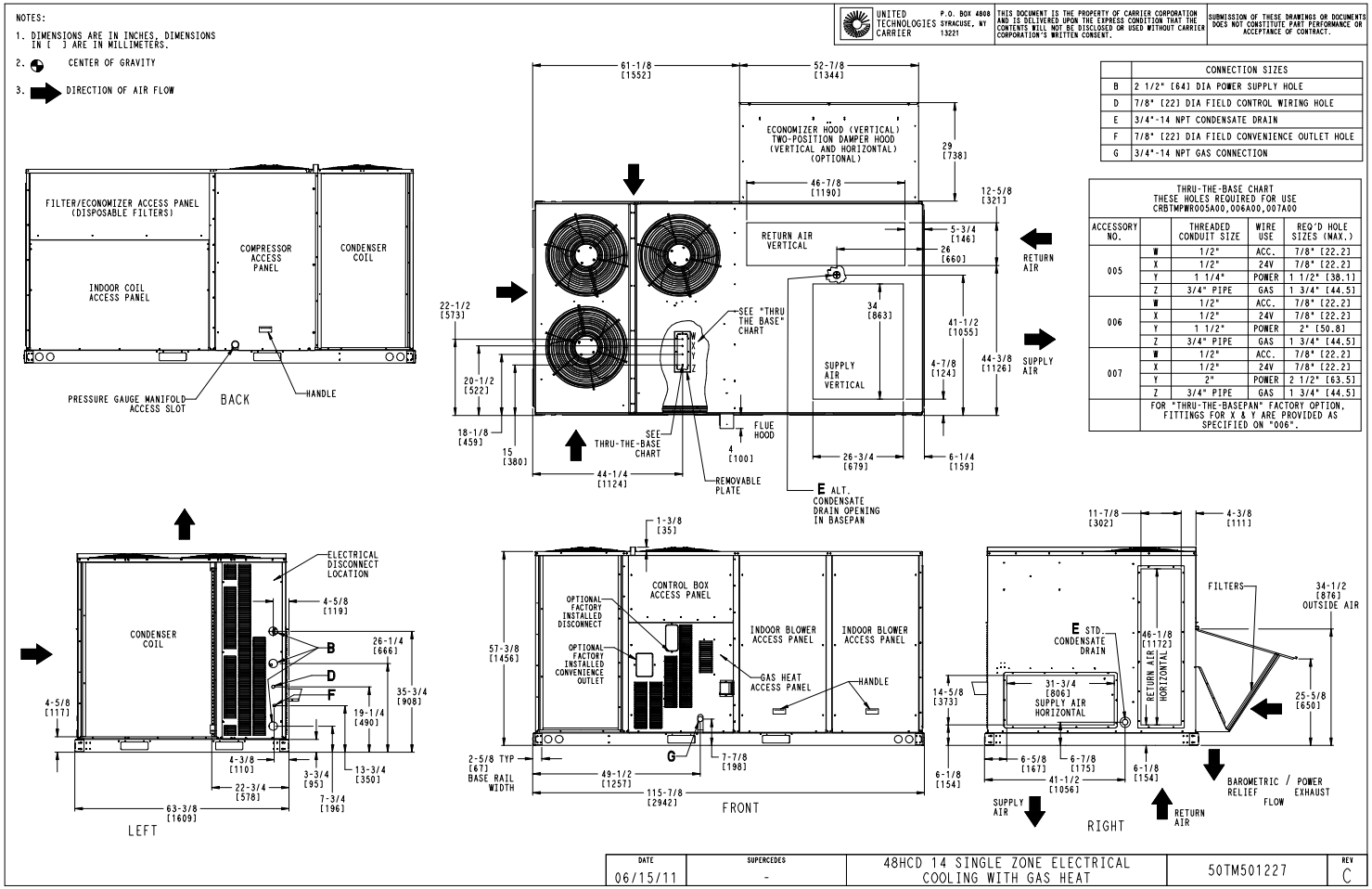
1. Unit height above ground:	**30.0**	ft
2. Horizontal distance from unit to receiver:	**50.0**	ft
3. Receiver height above ground:	**5.7**	ft
4. Height of obstruction:	**0.0**	ft
5. Horizontal distance from obstruction to receiver:	**0.0**	ft
6. Horizontal distance from unit to obstruction:	**0.0**	ft

Detailed Acoustics Information

Certified Drawing for RTU-1

Project: The Moranie
Prepared By:

03/24/2022
10:58AM

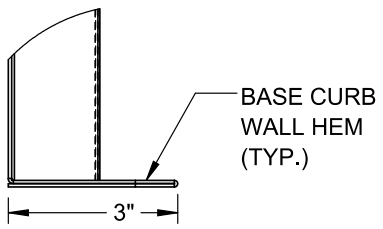


STANDARD CONSTRUCTION DETAILS
DUCT FLEX CONNECTIONS PROVIDED BY OTHERS
INSULATED PANELS (WHERE REQUIRED)
2X4 WOOD NAILER
SPRING ACCESS DOORS ARE GASKETED AND SCREWED ON
GASKET MATERIAL PROVIDED FOR THE TOP PERIMETER (INCLUDING BRACES)
FULLY WELDED GALVANIZED (G-90) CONSTRUCTION
WEATHER SEAL BETWEEN UPPER & LOWER SECTIONS PROVIDED(BULB SEAL)
SPRING PACKS MAY REQUIRE FIELD ADJUSTMENT (BY OTHERS)
ANCHORING CURB TO ROOF FOR STEEL, CONCRETE OR WOOD, SEE DETAIL DRAWING "CURB ATTACHMENTS"

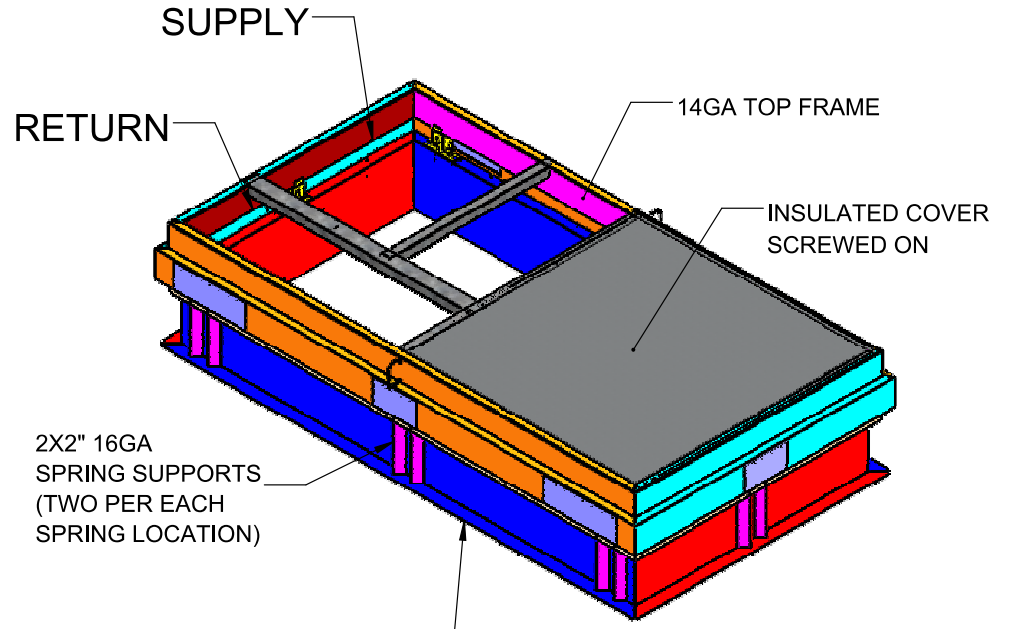
DIMENSIONED AND TOLERENCED PER ANSI Y14.5M-1982

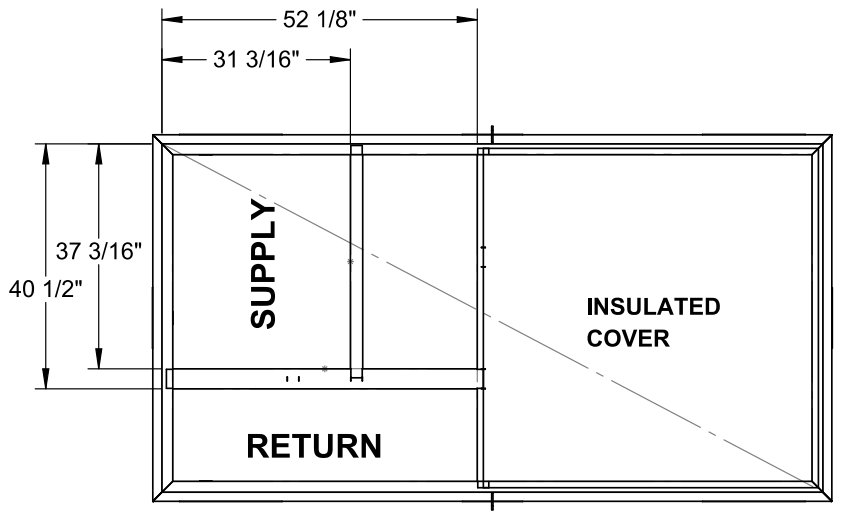
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
1	INITIAL DRAWING	10/21/21	KJ

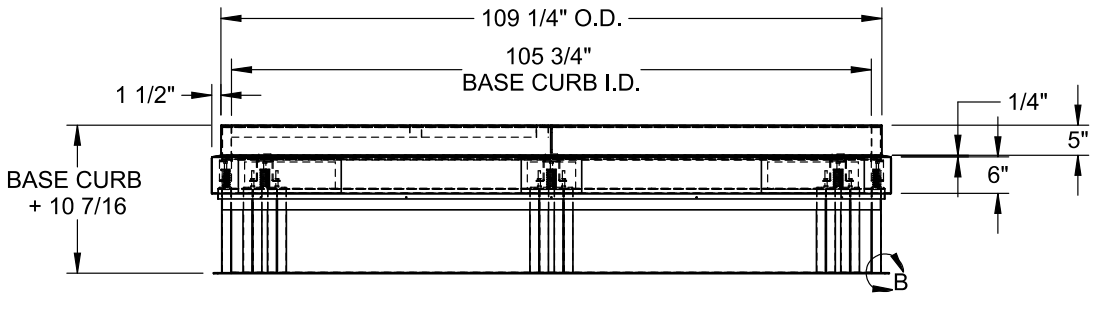
FROM DRAWING				
OVERALL HEIGHT (in)	21 7/16	24 7/16	28 7/16	34 7/16
BASE CURB HEIGHT (in)	11	14	18	24
BASE MATERIAL GAUGE	16	16	16	16
CURB WEIGHT (lbs)	345	356	371	393

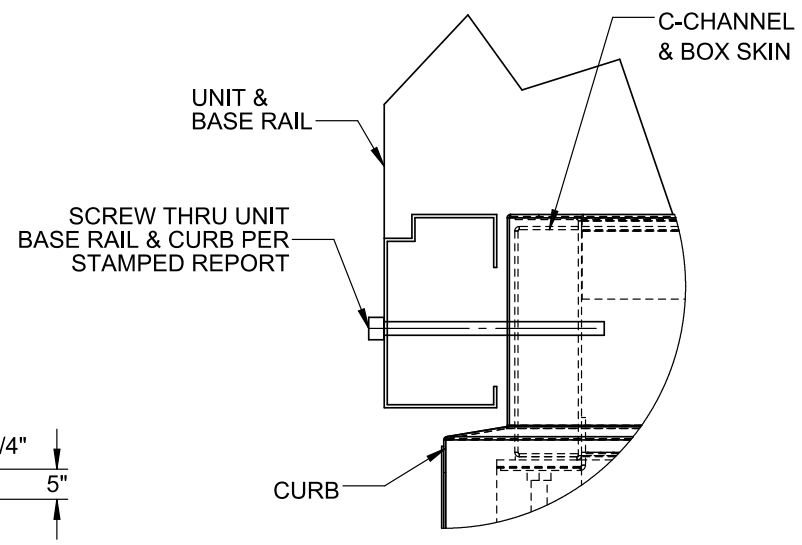


DETAIL B
SCALE 1 : 3

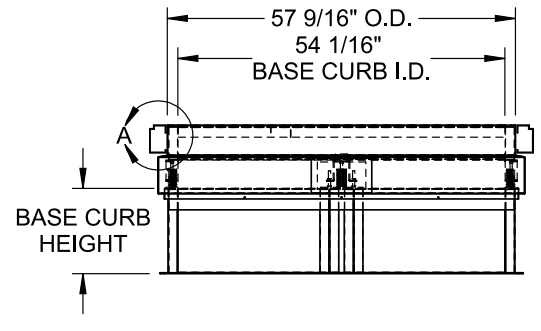








DETAIL A
SCALE 1 : 4



ISOLATION CURB 3D ASSEMBLY

VAK Construction Engineering Services, LLC
8285 SW Nimbus Avenue, Suite 104
Beaverton, Oregon 97008
503.718.5999 tel 503.718.5980 fax
www.vakengineering.com

CURB DESIGNED TO MEET SEISMIC & WIND LOAD REQUIREMENTS FOR 2018 IBC/ASCE 7-16 & 2020 FBC FLORIDA BUILDING CODE
WIND DESIGN: MAX BUILDING HEIGHT 60FT, Kzt FACTOR = 1.00,
MAX 185 MPH ULTIMATE DESIGN WIND SPEED, RISK CATEGORY II, III, OR IV BUILDING, EXPOSURE C
SEISMIC: Ss = 2.00 MAX, IMPORTANCE FACTOR Ip = 1.5, SDS = 1.33

CURB SHOWN IS CDI STANDARD CONFIGURATION CDI RESERVES THE RIGHT TO CHANGE LAYOUT WITHOUT NOTIFICATION. IF CURB IS NEEDED IN A DIFFERENT CONFIGURATION CDI MUST BE NOTIFIED PRIOR TO PLACING AN ORDER.

CURB WEIGHT (LBS.): See Table

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE:
.X ± 0.05
.XX ± 0.03
.XXX ± 0.01
Ø.XX ± .007
ANGLES ± 1/2°

DIMENSIONS ARE AS FOLLOWS: 1.00 in [25.40 mm]

3RD ANGLE PROJECTION

APPROVALS	DATE
DRAWN: kjones	
CHECKED: .	.

Thursday, October 21, 2021 5:14:20 PM

CDI
17560 TYLER ST NW
ELK RIVER, MN 55330
(763)391-7790
(763)391-7851

TITLE: C7-00XX-4008

FILE NAME: C7-00XX-4008
ECO #:
DRAWING NO.:
REV: 1
SCALE: 1:28
SHEET: 1 OF 6

S:\CURBS_CURB_ADAPTERS\CX-XXXX-XXXX_CONFORMING\C7-XXXX-XXXX_ISO_CURBS_RAILS\C7-XXXX-4XXX_CARRIER\4008\2018 IBC 2020 FBC\

No Exception Taken

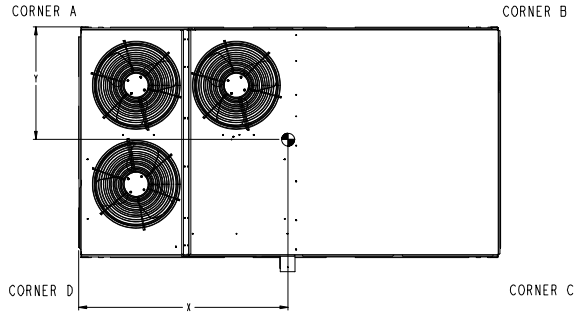
Certified Drawing for RTU-1

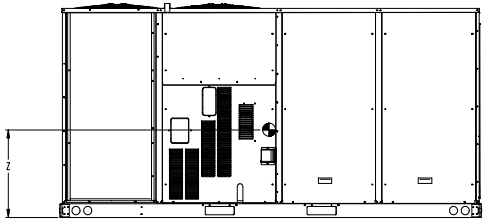
Project: The Moranie
Prepared By:

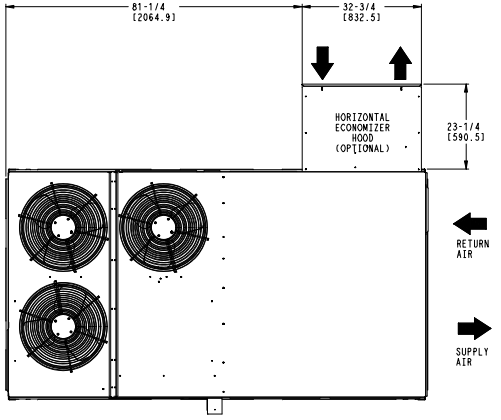
03/24/2022
10:58AM

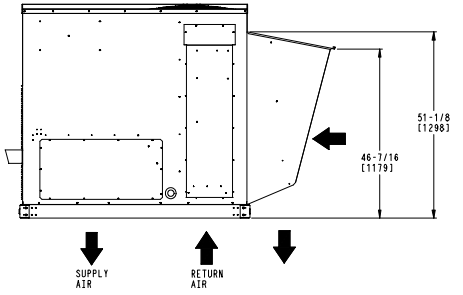
UNIT	STD UNIT WEIGHT		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48HCD 14	1430	649	342	155	377	171	372	169	338	153	60 3/4 [1543]	31 1/2 [800]	20 5/8 [524]

STANDARD UNIT WEIGHT IS WITH LOW HEAT & WITHOUT PACKAGING.
FOR OPTIONS & ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.









HORIZONTAL ECONOMIZER

UNITED TECHNOLOGIES CARRIER P.O. BOX 4808 SYRACUSE, NY 13221

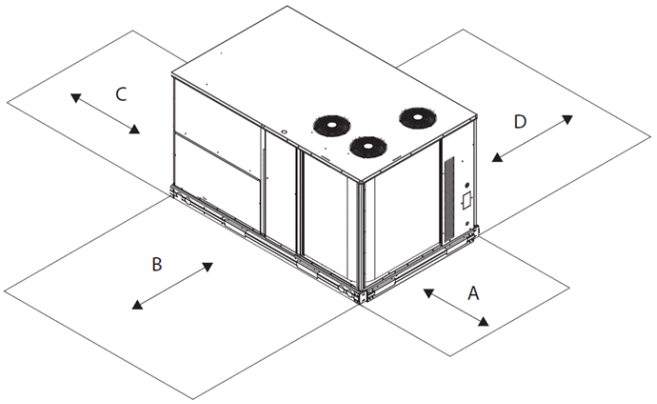
DATE	SUPERCEDES			REV
06/15/11	-	48HCD 14 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	50TM501227	C

Certified Drawing for RTU-1

Project: The Moranie
Prepared By:

03/24/2022
10:58AM

Service Clearance



C1057B

LOCATION	DIMENSION	CONDITION
A	48-in (1219 mm)	• Unit disconnect is mounted on panel
	18-in (457 mm)	• No disconnect, convenience outlet option • Recommended service clearance
	12-in (305 mm)	• Minimum clearance
B	42-in (1067 mm)	• Surface behind servicer is grounded (e.g., metal, masonry wall)
	36-in (914 mm)	• Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)
	Special	• Check for sources of flue products within 10-ft of unit fresh air intake hood
C	36-in (914 mm)	• Side condensate drain is used
	18-in (457 mm)	• Minimum clearance
D	48-in (1219 mm)	• No flue discharge accessory installed, surface is combustible material
	42-in (1067 mm)	• Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36-in (914 mm)	• Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)
	Special	• Check for adjacent units or building fresh air intakes within 10-ft of this unit's flue outlet

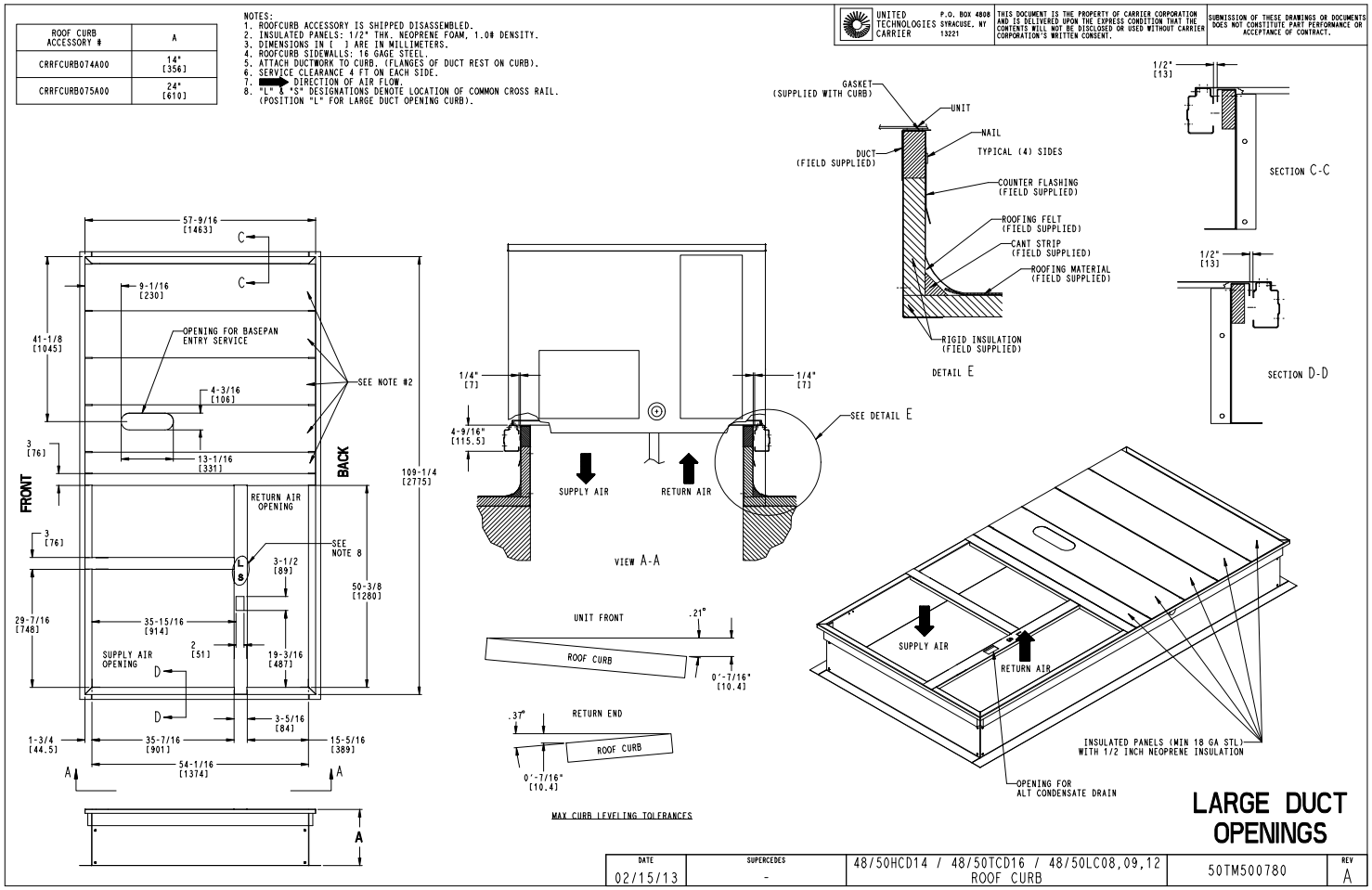
NOTE: Unit not designed to have overhead obstruction. Contact Application Engineering for guidance on any application planning overhead obstruction or vertical clearances.

Chassis 5

Certified Drawing for RTU-1

Project: The Moranie
Prepared By:

03/24/2022
10:58AM



Performance Summary For RTU-1

Project: The Moranie
Prepared By:

03/24/2022
10:58AM

Octave Band Center Freq. Hz	63	125	250	500	1k	2k	4k	8k	Overall
A	89.3	86.0	82.9	80.7	78.5	73.6	69.6	64.5	92.2 Lw
B	63.1	69.9	74.3	77.5	78.5	74.8	70.6	63.4	83.2 LwA
C	56.9	53.6	50.5	48.3	46.1	41.2	37.2	32.1	59.8 Lp
D	30.7	37.5	41.9	45.1	46.1	42.4	38.2	31.0	50.8 LpA

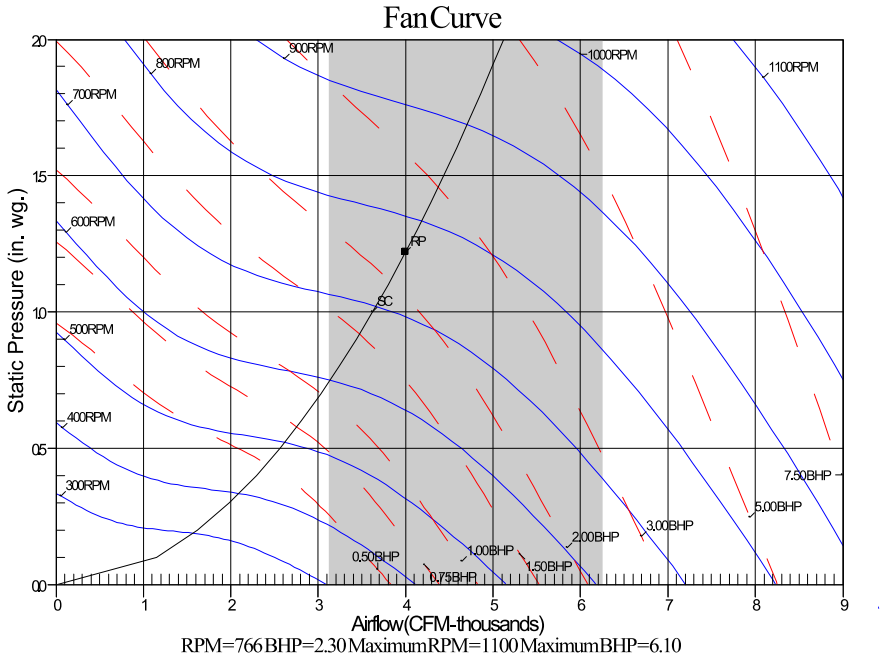
Legend
A Sound Power Levels at Unit's Acoustic Center, Lw
B A-Weighted Sound Power Levels at Unit's Acoustic Center, LwA
C Sound Pressure Levels at Specific Distance from Unit, Lp
D A-Weighted Sound Pressure Levels at Specific Distance from Unit, LpA

Calculation methods used in this program are patterned after the ASHRAE Guide; other ASHRAE Publications and the AHRI Acoustical Standards. While a very significant effort has been made to insure the technical accuracy of this program, it is assumed that the user is knowledgeable in the art of system sound estimation and is aware of the tolerances involved in real world acoustical estimation. This program makes certain assumptions as to the dominant sound sources and sound paths which may not always be appropriate to the real system being estimated. Because of this, no assurances can be offered that this software will always generate an accurate sound prediction from user supplied input data. If in doubt about the estimation of expected sound levels in a space, an Acoustical Engineer or a person with sound prediction expertise should be consulted.

Performance Summary For RTU-1

Project: The Moranie
Prepared By:

03/24/2022
10:58AM



RPM=766 BHP=2.30 Maximum RPM=1100 Maximum BHP=6.10
Note: Please contact application engineering for selections outside the shaded region.
SC-System Curve RP-Rated Point

No Exception Taken

Unit Report For RTU-2

Project: The Moranie
Prepared By:

03/24/2022
10:58AM

Unit Parameters

Unit Model: **48GCTM06F2A6-6U2A0**
Unit Size: **06 (5 Tons)**
Volts-Phase-Hertz: **460-3-60**
Heating Type: **Gas**
Duct Cfg: **Vertical Supply / Vertical Return**
Stainless Steel, High Heat
Two Stage Cooling Models

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length: **6' 2.375"**
Unit Width: **3' 10.625"**
Unit Height: **3' 5.375"**
*** Total Operating Weight: **698** lb

*** Weights and Dimensions are approximate. Weight does not include unit packaging. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Lines and Filters

Gas Line Size: **1/2**
Condensate Drain Line Size: **3/4**
Return Air Filter Type: **Throwaway**
Return Air Filter Quantity: **4**
Return Air Filter Size: **16 x 16 x 2**

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Unit Configuration

RA Smoke Detector and CO2 Sensor
Direct Drive - EcoBlue - Medium Static
Al/Cu - Al/Cu
Electromechanical Controls w/W7220 Econo Controller
Temp Ultra Low Leak Economizer w/Baro Relief
Powered Convenience Outlet
Standard Packaging

Warranty Information

1-Year parts(std.)
5-Year compressor parts(std.)
15-Year heat exchanger - Stainless Steel(std.)

No optional warranties were selected.

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
48GCTM06F2A6-6U2A0	Rooftop Unit	1

Performance Summary For RTU-2

Project: The Moranie 03/24/2022
Prepared By: 10:58AM

Part Number:48GCTM06F2A6-6U2A0

ARI SEER:	**16.10**	
Base Unit Dimensions		
Unit Length:	**74.4**	in
Unit Width:	**46.6**	in
Unit Height:	**41.4**	in
Operating Weight		
Base Unit Weight:	**555**	lb
Stainless Steel, High Heat:	**63**	lb
RA Smoke Detector and CO2 Sensor:	**9**	lb
Temp Ultra Low Leak Economizer w/Baro Relief:	**35**	lb
Powered Convenience Outlet:	**36**	lb
Total Operating Weight:	**698**	lb
Unit		
Unit Voltage-Phase-Hertz:	**460-3-60**	
Air Discharge:	**Vertical**	
Fan Drive Type:	**Vane Axial**	
Actual Airflow:	**2000**	CFM
Site Altitude:	**0**	ft
Cooling Performance		
Condenser Entering Air DB:	**95.0**	F
Evaporator Entering Air DB:	**80.0**	F
Evaporator Entering Air WB:	**67.0**	F
Entering Air Enthalpy:	**31.44**	BTU/lb
Evaporator Leaving Air DB:	**57.6**	F
Evaporator Leaving Air WB:	**57.1**	F
Evaporator Leaving Air Enthalpy:	**24.44**	BTU/lb
Gross Cooling Capacity:	**63.00**	MBH
Gross Sensible Capacity:	**48.32**	MBH
Compressor Power Input:	**4.11**	kW
Coil Bypass Factor:	**0.047**	
Heating Performance		
Heating Airflow:	**2000**	CFM
Entering Air Temp:	**70.0**	F
Leaving Air Temp:	**125.6**	F
Gas Heating Input Capacity:	**120.0 / 150.0**	MBH
Gas Heating Output Capacity:	**96.0 / 120.0**	MBH
Temperature Rise:	**55.6**	F
Thermal Efficiency (%):	**80.0**	
Supply Fan		
External Static Pressure:	**0.50**	in wg
Options / Accessories Static Pressure		
Economizer:	**0.12**	in wg
Total Application Static (ESP + Unit Opts/Acc.):	**0.62**	in wg
Fan RPM:	**2024**	
Fan Power:	**0.88**	BHP
NOTE:	**Selected IFM RPM Range: 1387 - 2390**	

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Electrical Data		
Voltage Range:	**414 - 506**	
Compressor #1 RLA:	**7.6**	

Performance Summary For RTU-2

Project: The Moranie
Prepared By:

03/24/2022
10:58AM

Compressor #1 LRA: **52**
Indoor Fan Motor Type: **MED**
Indoor Fan Motor FLA: **1.9**
Combustion Fan Motor FLA (ea): **0.25**
Power Supply MCA: **15**
Power Supply MOCP (Fuse or HACR): **20**
Disconnect Size FLA: **14**
Disconnect Size LRA: **59**
Electrical Convenience Outlet FLA (based on unit line voltage): **2.2**
Outdoor Fan [Qty / FLA (ea)]: **1 / 0.8**
NOTE: Convenience outlet must be field connected to the line/load side of the unit disconnect per local code.

verify with elect contractor

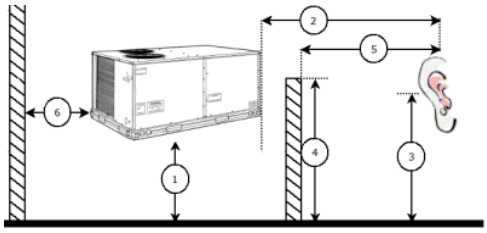
Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Acoustics

Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	91.6	89.0	85.6
125 Hz	82.7	78.7	84.7
250 Hz	76.7	71.5	80.5
500 Hz	73.4	65.4	76.0
1000 Hz	70.0	67.7	72.4
2000 Hz	67.4	58.9	68.0
4000 Hz	63.7	52.2	62.8
8000 Hz	59.9	46.5	59.3
A-Weighted	76.6	71.6	79.0

Advanced Acoustics



Advanced Accoustics Parameters

1. Unit height above ground: **30.0** ft
2. Horizontal distance from unit to receiver: **50.0** ft
3. Receiver height above ground: **5.7** ft
4. Height of obstruction: **0.0** ft
5. Horizontal distance from obstruction to receiver: **0.0** ft
6. Horizontal distance from unit to obstruction: **0.0** ft

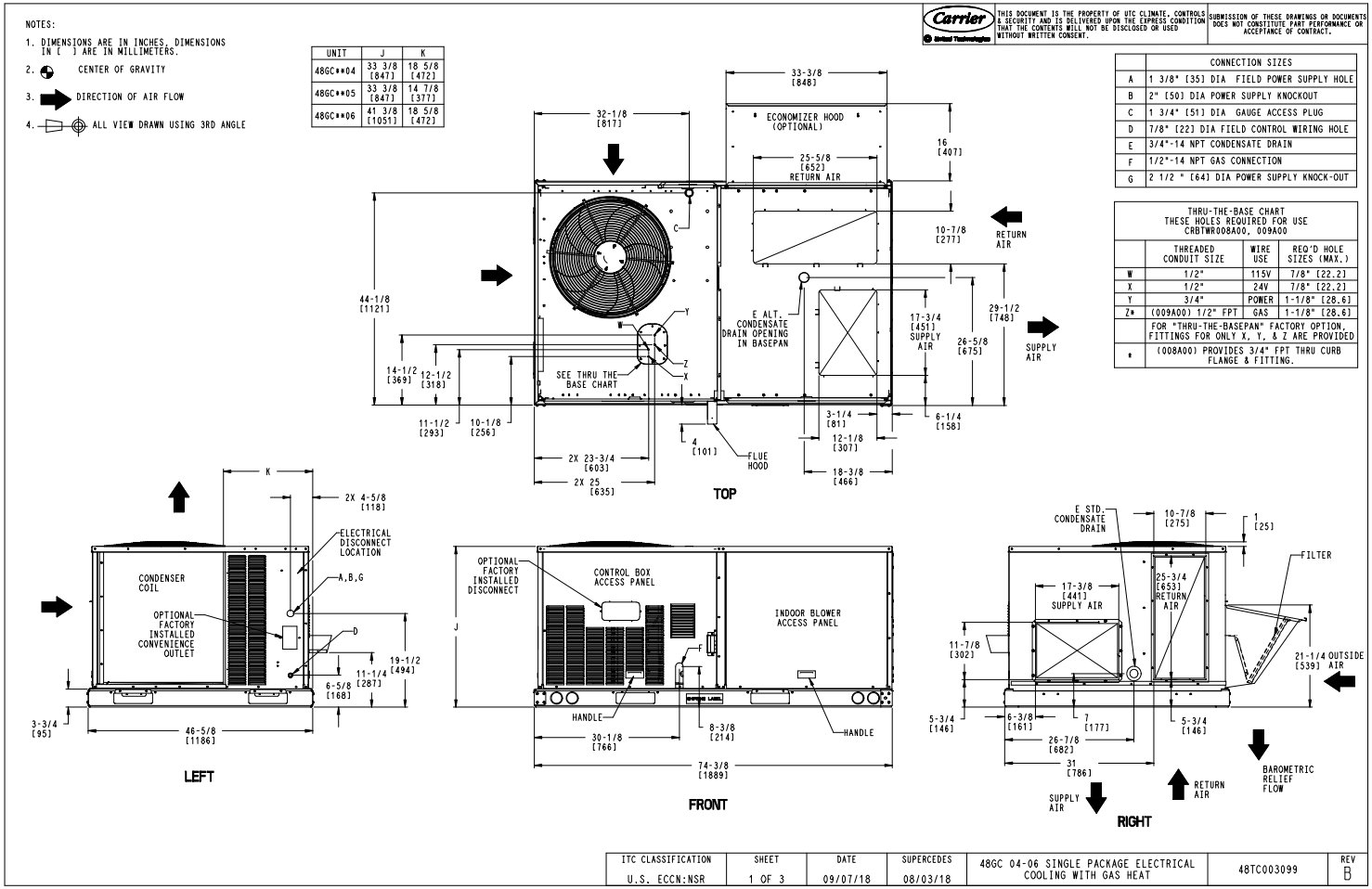
Detailed Acoustics Information

Octave Band Center Freq. Hz	63	125	250	500	1k	2k	4k	8k	Overall
A	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3	89.2 Lw
B	59.4	68.6	71.9	72.8	72.4	69.2	63.8	58.2	78.5 LwA
C	53.2	52.3	48.1	43.6	40.0	35.6	30.4	26.9	56.8 Lp

Certified Drawing for RTU-2

Project: The Moranie
Prepared By:

03/24/2022
10:58AM



UNIT	J	K
48GC**04	33 3/8 [847]	18 5/8 [472]
48GC**05	33 3/8 [847]	14 7/8 [377]
48GC**06	41 3/8 [1051]	18 5/8 [472]

	CONNECTION SIZES
A	1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B	2" [50] DIA POWER SUPPLY KNOCKOUT
C	1 3/4" [51] DIA GAUGE ACCESS PLUG
D	7/8" [22] DIA FIELD CONTROL WIRING HOLE
E	3/4"-14 NPT CONDENSATE DRAIN
F	1/2"-14 NPT GAS CONNECTION
G	2 1/2 " [64] DIA POWER SUPPLY KNOCK-OUT

THRU-THE-BASE CHART THESE HOLES REQUIRED FOR USE CRBTWR008A00, 009A00			
	THREADED CONDUIT SIZE	WIRE USE	REQ'D HOLE SIZES (MAX.)
W	1/2"	115V	7/8" [22.2]
X	1/2"	24V	7/8" [22.2]
Y	3/4"	POWER	1-1/8" [28.6]
Z*	(009A00) 1/2" FPT	GAS	1-1/8" [28.6]
	FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X, Y, & Z ARE PROVIDED		
*	(008A00) PROVIDES 3/4" FPT THRU CURB FLANGE & FITTING.		

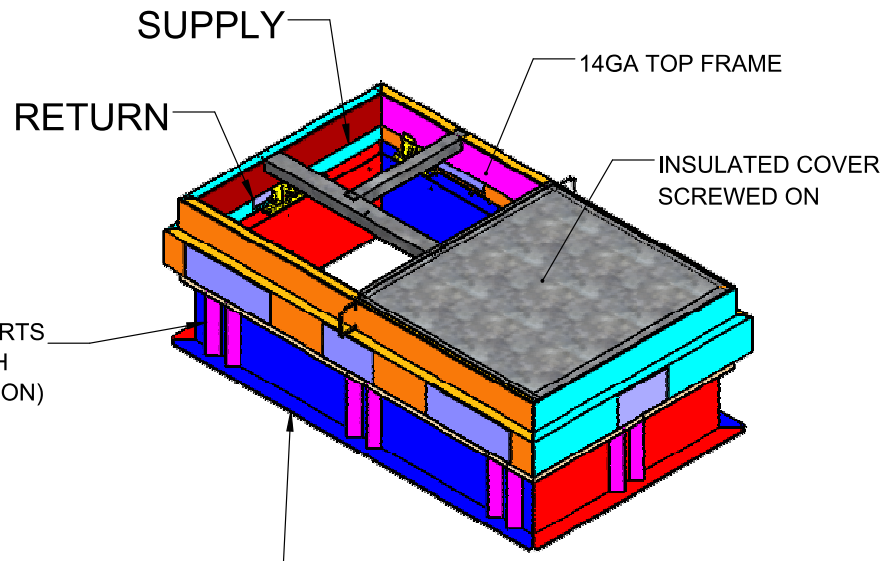
ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES		REV
U.S. ECCN:NSR	1 OF 3	09/07/18	08/03/18	48GC 04-06 SINGLE PACKAGE ELECTRICAL COOLING WITH GAS HEAT	48TC003099	B

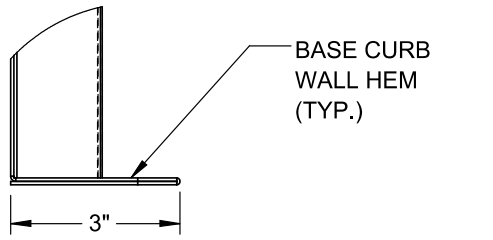
STANDARD CONSTRUCTION DETAILS
DUCT FLEX CONNECTIONS PROVIDED BY OTHERS
INSULATED PANELS (WHERE REQUIRED)
2X4 WOOD NAILER
SPRING ACCESS DOORS ARE GASKETED AND SCREWED ON
GASKET MATERIAL PROVIDED FOR THE TOP PERIMETER (INCLUDING BRACES)
FULLY WELDED GALVANIZED (G-90) CONSTRUCTION
WEATHER SEAL BETWEEN UPPER & LOWER SECTIONS PROVIDED(BULB SEAL)
SPRING PACKS MAY REQUIRE FIELD ADJUSTMENT (BY OTHERS)
ANCHORING CURB TO ROOF FOR STEEL, CONCRETE OR WOOD, SEE DETAIL DRAWING "CURB ATTACHMENTS"

DIMENSIONED AND TOLERENCED PER ANSI Y14.5M-1982

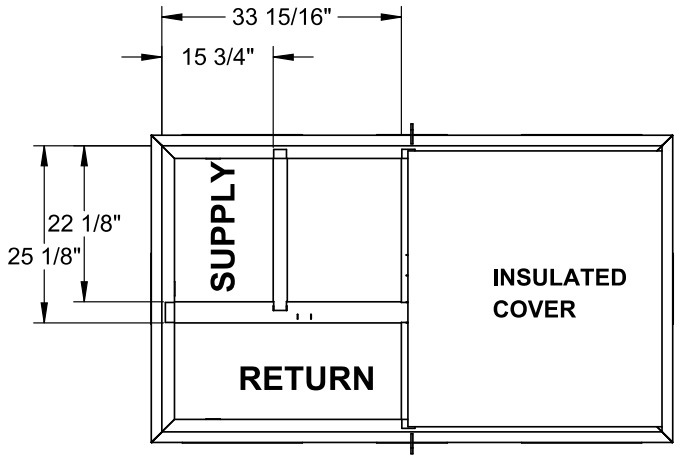
FROM DRAWING				
OVERALL HEIGHT (in)	21 7/16	24 7/16	28 7/16	34 7/16
BASE CURB HEIGHT (in)	11	14	18	24
BASE MATERIAL GAUGE	16	16	16	16
CURB WEIGHT (lbs)	235	243	255	273

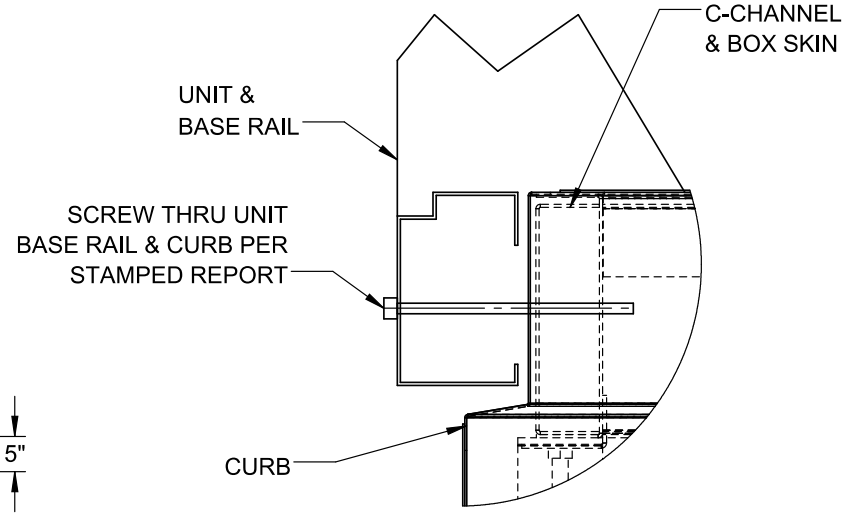
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
1	INITIAL DRAWING	10/21/21	KJ



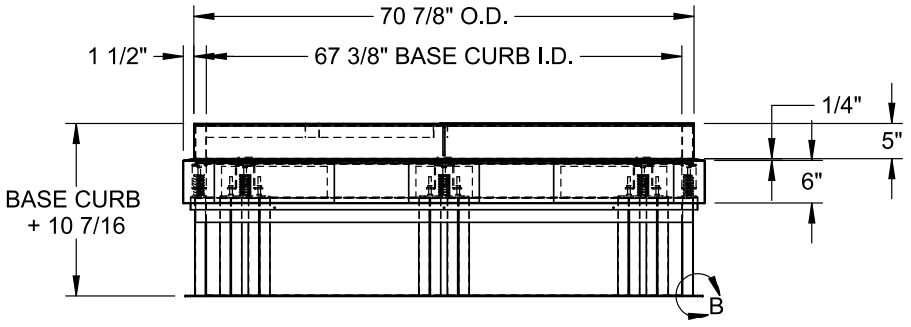


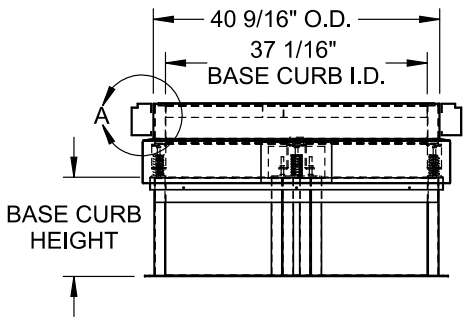
DETAIL B
SCALE 1 : 3





DETAIL A
SCALE 1 : 4





ISOLATION CURB 3D ASSEMBLY

VAK Construction Engineering Services, LLC
8285 SW Nimbus Avenue, Suite 104
Beaverton, Oregon 97008
503.718.5999 tel 503.718.5980 fax
www.vakengineering.com

CURB DESIGNED TO MEET SEISMIC & WIND LOAD REQUIREMENTS FOR 2018 IBC/ASCE 7-16 & 2020 FBC FLORIDA BUILDING CODE
WIND DESIGN: MAX BUILDING HEIGHT 60FT, Kzt FACTOR = 1.00,
MAX 185 MPH ULTIMATE DESIGN WIND SPEED, RISK CATEGORY II, III, OR IV BUILDING, EXPOSURE C
SEISMIC: Ss = 2.00 MAX, IMPORTANCE FACTOR Ip = 1.5, SDS = 1.33

CURB SHOWN IS CDI STANDARD CONFIGURATION CDI RESERVES THE RIGHT TO CHANGE LAYOUT WITHOUT NOTIFICATION. IF CURB IS NEEDED IN A DIFFERENT CONFIGURATION CDI MUST BE NOTIFIED PRIOR TO PLACING AN ORDER.

CURB WEIGHT (LBS.): See Table

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE: .X ± 0.05, .XX ± 0.03, .XXX ± 0.01, Ø.XX= ± .007, ∠'S ± 1/2°

DIMENSIONS ARE AS FOLLOWS: 1.00 in [25.40 mm]

3RD ANGLE PROJECTION

APPROVALS	DATE
DRAWN: kjones	
CHECKED:	

Thursday, October 21, 2021 5:16:34 PM

CDI
17560 TYLER ST NW
ELK RIVER, MN 55330
(763)391-7790
(763)391-7851

TITLE: C7-00XX-4000

FILE NAME: C7-00XX-4000
ECO #:
DRAWING NO.:
REV: 1
SCALE: 1:24
SHEET: 1 OF 6

S:\CURBS_CURB_ADAPTERS\CX-XXXX-XXXX_CONFORMING\C7-XXXX-XXXX_ISO_CURBS_RAILS\C7-XXXX-4XXX_CARRIER\4000\2018 IBC 2020 FBC\

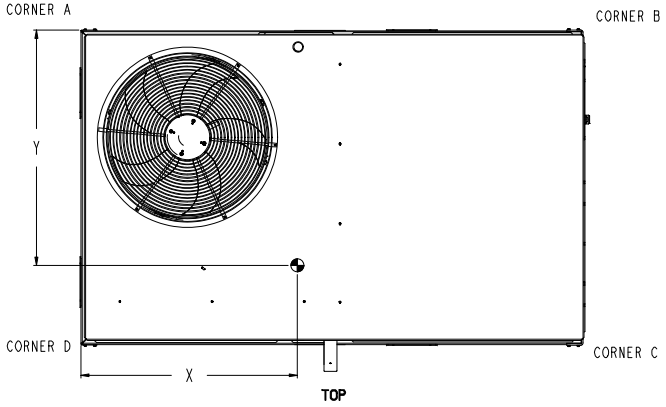
Certified Drawing for RTU-2

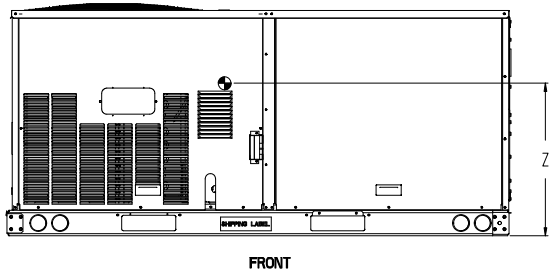
Project: The Moranie
Prepared By:

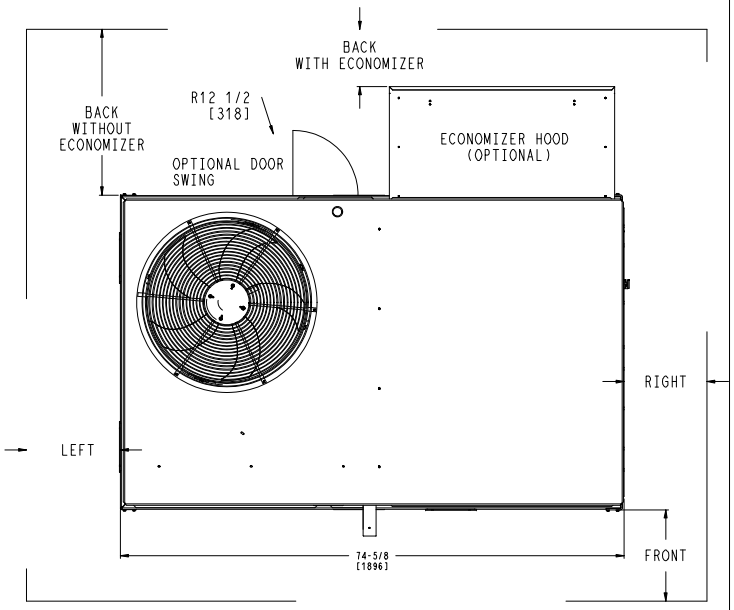
03/24/2022
10:58AM

UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		HEIGHT
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48GC**04	513	233	131	59	127	58	125	57	130	59	36 1/2 [927]	23 1/4 [591]	18 1/4 [464]
48GC**05	555	252	142	64	137	62	135	61	141	64	36 1/2 [927]	23 1/4 [591]	18 [457]
48GC**06	600	272	161	73	151	68	140	64	149	68	36 [914]	22 1/2 [572]	19 3/8 [492]

*- STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTINS AND ACCESSORIES REFER TO THE PRODUCT DATA CATALOG.







NOTES:

1. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

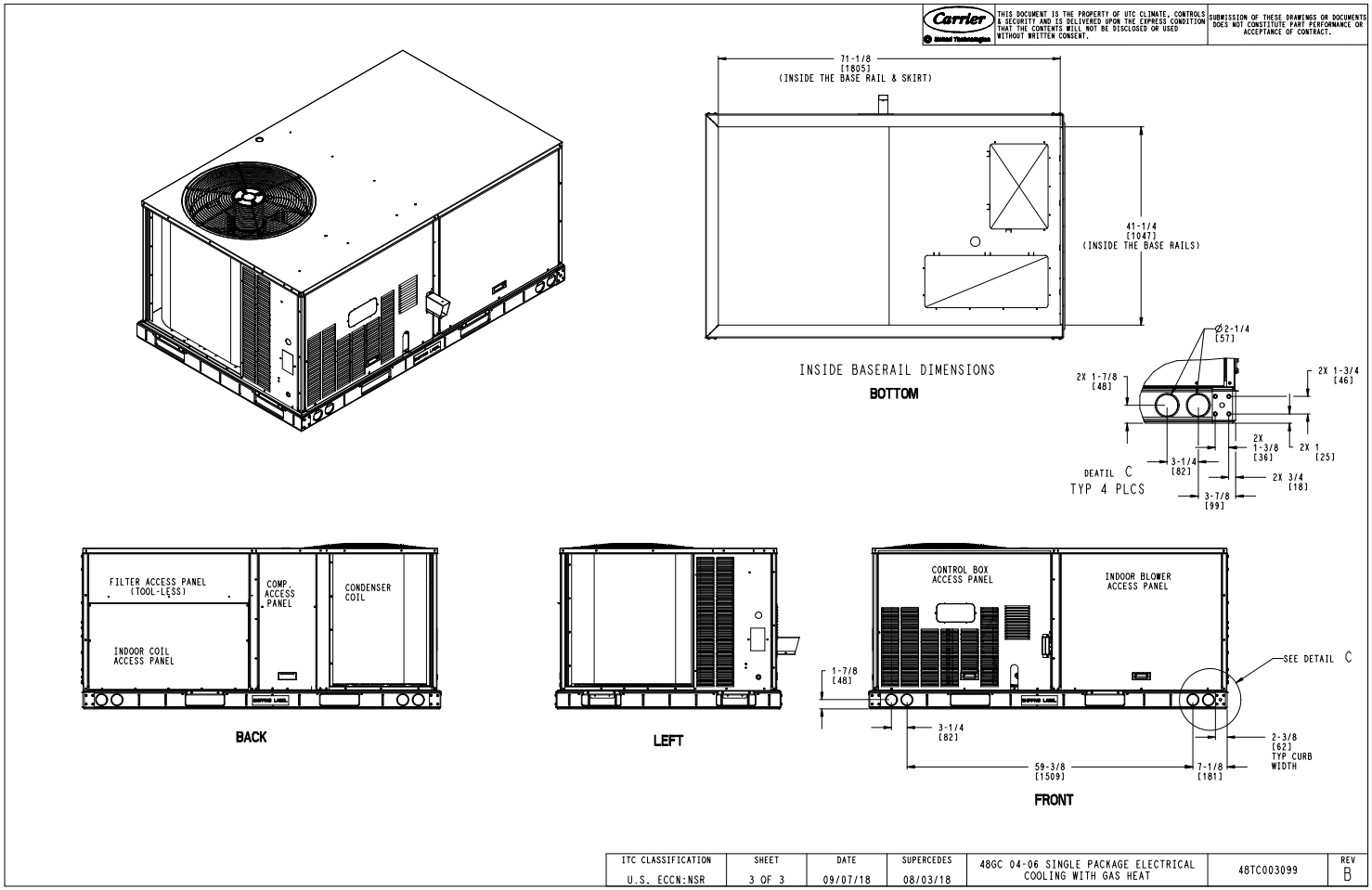
	CLEARANCE		
	SERVICE WITH:	SERVICE WITH:	OPERATING
SURFACE	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER	CLEARANCE
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/HOOD	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	2 OF 3	09/07/18	08/03/18	48GC 04-06 SINGLE PACKAGE ELECTRICAL COOLING WITH GAS HEAT	48TC003099	B

Certified Drawing for RTU-2

Project: The Moranie
Prepared By:

03/24/2022
10:58AM



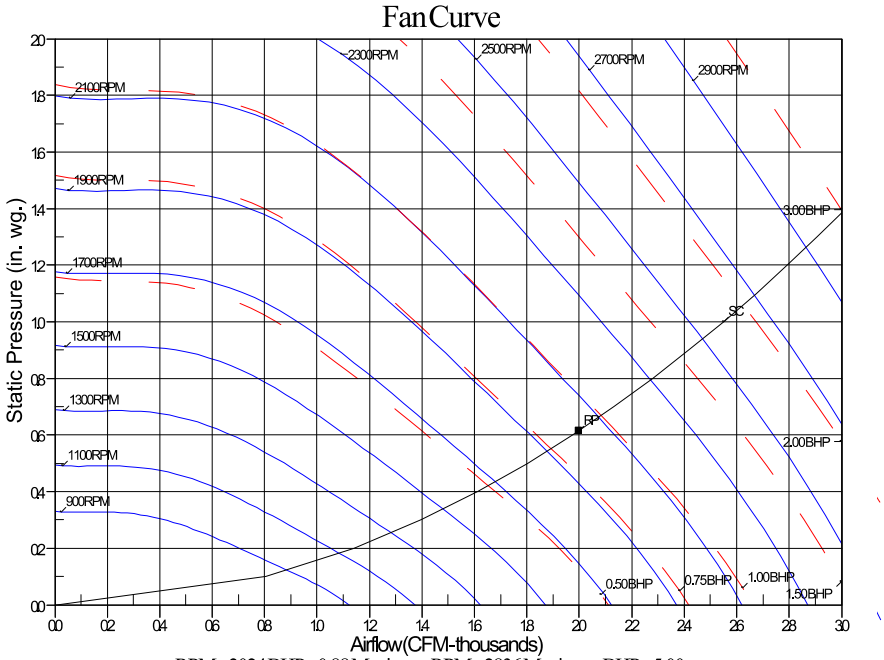
Performance Summary For RTU-2

Project: The Moranie 03/24/2022
Prepared By: 10:58AM

D	27.0	36.2	39.5	40.4	40.0	36.8	31.4	25.8	46.1 LpA

Legend
A Sound Power Levels at Unit's Acoustic Center, Lw
B A-Weighted Sound Power Levels at Unit's Acoustic Center, LwA
C Sound Pressure Levels at Specific Distance from Unit, Lp
D A-Weighted Sound Pressure Levels at Specific Distance from Unit, LpA

Calculation methods used in this program are patterned after the ASHRAE Guide; other ASHRAE Publications and the AHRI Acoustical Standards. While a very significant effort has been made to insure the technical accuracy of this program, it is assumed that the user is knowledgeable in the art of system sound estimation and is aware of the tolerances involved in real world acoustical estimation. This program makes certain assumptions as to the dominant sound sources and sound paths which may not always be appropriate to the real system being estimated. Because of this, no assurances can be offered that this software will always generate an accurate sound prediction from user supplied input data. If in doubt about the estimation of expected sound levels in a space, an Acoustical Engineer or a person with sound prediction expertise should be consulted.



RPM=2024 BHP=0.88 Maximum RPM=2836 Maximum BHP=5.00
SC-System Curve RP-Rated Point

No Exception Taken

Unit Report For RTU-3

Project: The Moranie
Prepared By:

03/24/2022
10:58AM

Unit Parameters

Unit Model:	48FCRA04A2A6-0A2A0
Unit Size:	04 (3 Tons)
Volts-Phase-Hertz:	460-3-60
Heating Type:	Gas
Duct Cfg:	Horizontal Supply / Horizontal Return

Stainless Steel, Medium Heat
Standard One Stage Cooling Models

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length:	6' 2.375"
Unit Width:	3' 10.625"
Unit Height:	2' 9.375"
*** Total Operating Weight:	530 lb

*** Weights and Dimensions are approximate. Weight does not include unit packaging. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Lines and Filters

Gas Line Size:	1/2
Condensate Drain Line Size:	3/4
Return Air Filter Type:	Throwaway
Return Air Filter Quantity:	2
Return Air Filter Size:	16 x 25 x 2

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Unit Configuration

Direct Drive - EcoBlue - Medium Static
Al/Cu - Al/Cu
Base Electromechanical Controls
Powered Convenience Outlet
Standard Packaging

Warranty Information

1-Year parts(std.)
5-Year compressor parts(std.)
15-Year heat exchanger - Stainless Steel(std.)

No optional warranties were selected.

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
48FCRA04A2A6-0A2A0	Rooftop Unit	1

Performance Summary For RTU-3

Project: The Moranie 03/24/2022
Prepared By: 10:58AM

Part Number:48FCRA04A2A6-0A2A0

ARI SEER:	**14.00**	
Base Unit Dimensions		
Unit Length:	**74.4**	in
Unit Width:	**46.6**	in
Unit Height:	**33.4**	in
Operating Weight		
Base Unit Weight:	**437**	lb
Stainless Steel, Medium Heat:	**57**	lb
Powered Convenience Outlet:	**36**	lb
Total Operating Weight:	**530**	lb
Unit		
Unit Voltage-Phase-Hertz:	**460-3-60**	
Air Discharge:	**Horizontal**	
Fan Drive Type:	**Vane Axial**	
Actual Airflow:	**1200**	CFM
Site Altitude:	**0**	ft
Cooling Performance		
Condenser Entering Air DB:	**95.0**	F
Evaporator Entering Air DB:	**80.0**	F
Evaporator Entering Air WB:	**67.0**	F
Entering Air Enthalpy:	**31.44**	BTU/lb
Evaporator Leaving Air DB:	**60.4**	F
Evaporator Leaving Air WB:	**57.9**	F
Evaporator Leaving Air Enthalpy:	**24.93**	BTU/lb
Gross Cooling Capacity:	**35.13**	MBH
Gross Sensible Capacity:	**25.39**	MBH
Compressor Power Input:	**2.50**	kW
Coil Bypass Factor:	**0.180**	
Heating Performance		
Heating Airflow:	**1200**	CFM
Entering Air Temp:	**70.0**	F
Leaving Air Temp:	**137.9**	F
Gas Heating Input Capacity:	**82.0 / 110.0**	MBH
Gas Heating Output Capacity:	**65.0 / 88.0**	MBH
Temperature Rise:	**67.9**	F
Thermal Efficiency (%):	**80.0**	
Supply Fan		
External Static Pressure:	**0.50**	in wg
Fan RPM:	**1549**	
Fan Power:	**0.27**	BHP
NOTE:	**Selected IFM RPM Range: 1079 - 2190**	

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Electrical Data		
Voltage Range:	**414 - 506**	
Compressor #1 RLA:	**5.8**	
Compressor #1 LRA:	**38**	
Indoor Fan Motor Type:	**MED**	
Indoor Fan Motor FLA:	**1.2**	
Combustion Fan Motor FLA (ea):	**0.25**	
Power Supply MCA:	**12**	

Packaged Rooftop Builder 1.63 Page 54 of 74

verify with elect contractor

Performance Summary For RTU-3

Project: The Moranie 03/24/2022
Prepared By: 10:58AM

Power Supply MOCP (Fuse or HACR): 15
Disconnect Size FLA: 12
Disconnect Size LRA: 44
Electrical Convenience Outlet FLA (based on unit line voltage): 2.2
Outdoor Fan [Qty / FLA (ea)]: 1 / 0.8
NOTE: Convenience outlet must be field connected to the line/load side of the unit disconnect per local code.

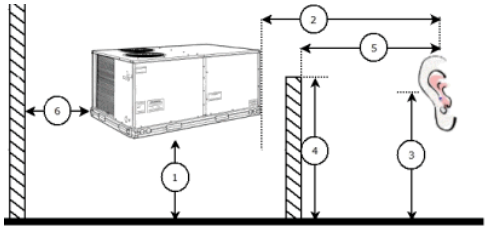
Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Acoustics

Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	86.5	81.0	85.6
125 Hz	79.1	72.7	84.7
250 Hz	71.4	64.6	80.5
500 Hz	63.1	56.4	76.0
1000 Hz	60.1	58.3	72.4
2000 Hz	56.9	49.5	68.0
4000 Hz	53.5	43.4	62.8
8000 Hz	54.8	39.8	59.3
A-Weighted	69.1	63.4	79.0

Advanced Acoustics



Advanced Accoustics Parameters

1. Unit height above ground: **30.0** ft
2. Horizontal distance from unit to receiver: **50.0** ft
3. Receiver height above ground: **5.7** ft
4. Height of obstruction: **0.0** ft
5. Horizontal distance from obstruction to receiver: **0.0** ft
6. Horizontal distance from unit to obstruction: **0.0** ft

Detailed Acoustics Information

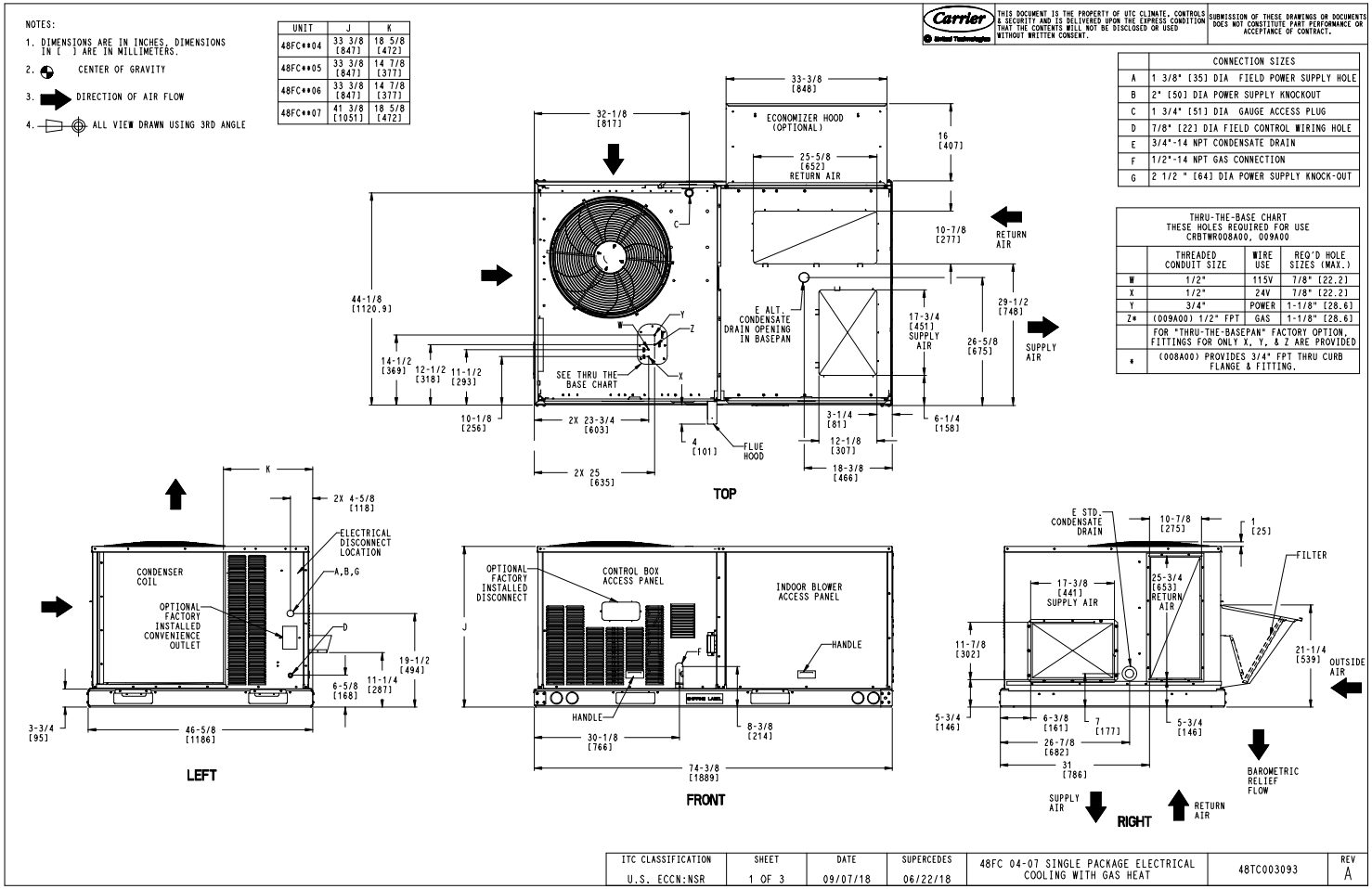
Octave Band Center Freq. Hz	63	125	250	500	1k	2k	4k	8k	Overall
A	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3	89.2 Lw
B	59.4	68.6	71.9	72.8	72.4	69.2	63.8	58.2	78.5 LwA
C	53.2	52.3	48.1	43.6	40.0	35.6	30.4	26.9	56.8 Lp
D	27.0	36.2	39.5	40.4	40.0	36.8	31.4	25.8	46.1 LpA

Legend
A Sound Power Levels at Unit's Acoustic Center, Lw

Certified Drawing for RTU-3

Project: The Moranie
Prepared By:

03/24/2022
10:58AM

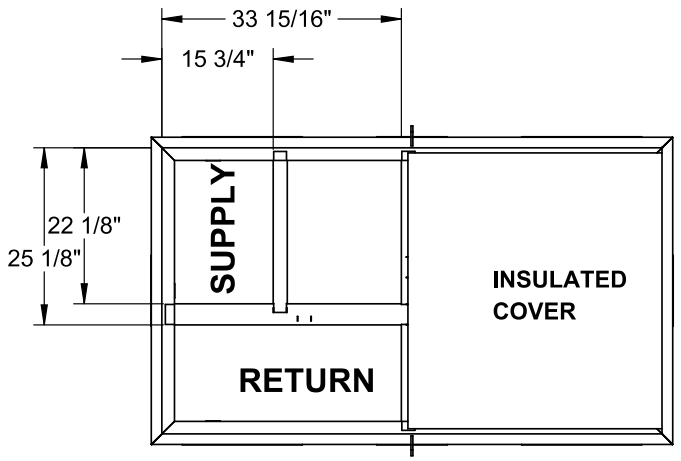


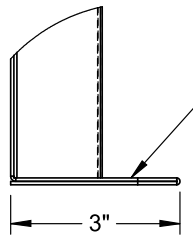
STANDARD CONSTRUCTION DETAILS
DUCT FLEX CONNECTIONS PROVIDED BY OTHERS
INSULATED PANELS (WHERE REQUIRED)
2X4 WOOD NAILER
SPRING ACCESS DOORS ARE GASKETED AND SCREWED ON
GASKET MATERIAL PROVIDED FOR THE TOP PERIMETER (INCLUDING BRACES)
FULLY WELDED GALVANIZED (G-90) CONSTRUCTION
WEATHER SEAL BETWEEN UPPER & LOWER SECTIONS PROVIDED(BULB SEAL)
SPRING PACKS MAY REQUIRE FIELD ADJUSTMENT (BY OTHERS)
ANCHORING CURB TO ROOF FOR STEEL, CONCRETE OR WOOD, SEE DETAIL DRAWING "CURB ATTACHMENTS"

DIMENSIONED AND TOLERENCED PER ANSI Y14.5M-1982

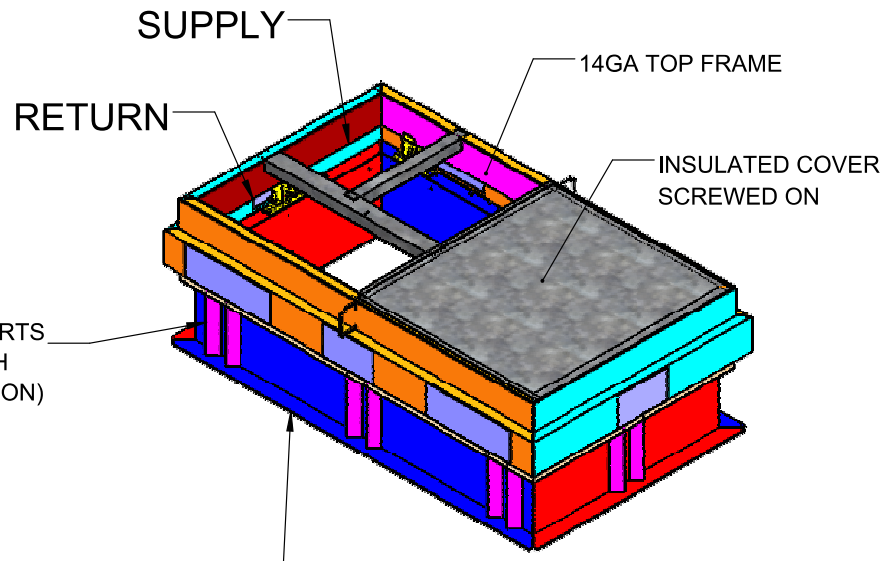
FROM DRAWING				
OVERALL HEIGHT (in)	21 7/16	24 7/16	28 7/16	34 7/16
BASE CURB HEIGHT (in)	11	14	18	24
BASE MATERIAL GAUGE	16	16	16	16
CURB WEIGHT (lbs)	235	243	255	273

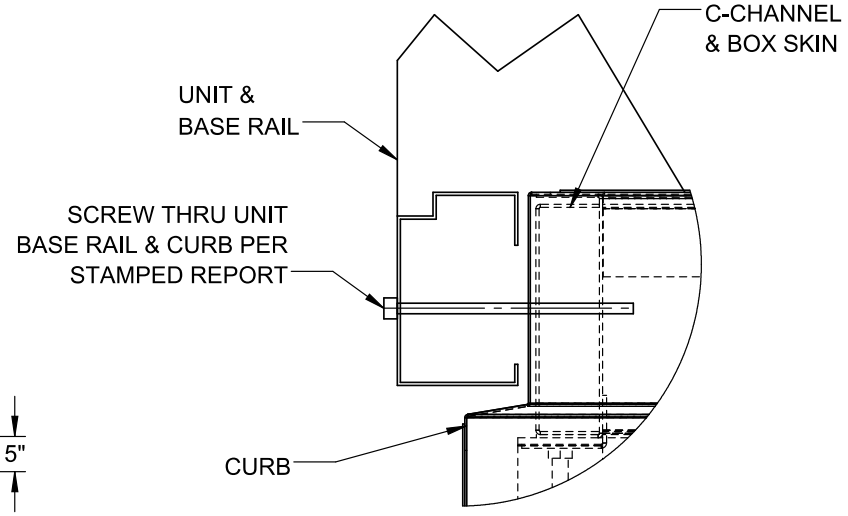
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
1	INITIAL DRAWING	10/21/21	KJ



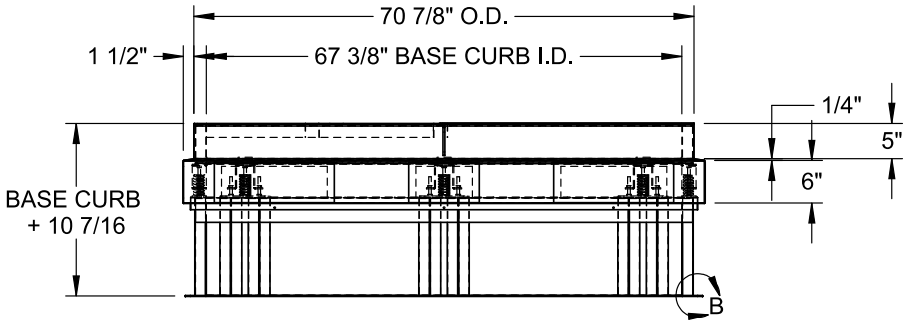


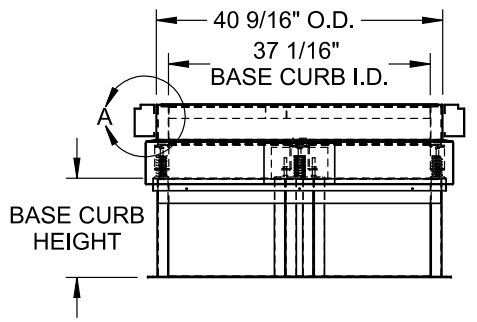
DETAIL B
SCALE 1 : 3





DETAIL A
SCALE 1 : 4





ISOLATION CURB 3D ASSEMBLY

VAK Construction Engineering Services, LLC
8285 SW Nimbus Avenue, Suite 104
Beaverton, Oregon 97008
503.718.5999 tel 503.718.5980 fax
www.vakengineering.com

CURB DESIGNED TO MEET SEISMIC & WIND LOAD REQUIREMENTS FOR 2018 IBC/ASCE 7-16 & 2020 FBC FLORIDA BUILDING CODE
WIND DESIGN: MAX BUILDING HEIGHT 60FT, Kzt FACTOR = 1.00,
MAX 185 MPH ULTIMATE DESIGN WIND SPEED, RISK CATEGORY II, III, OR IV BUILDING, EXPOSURE C
SEISMIC: Ss = 2.00 MAX, IMPORTANCE FACTOR Ip = 1.5, SDS = 1.33

CURB WEIGHT (LBS.): See Table

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE: .X ± 0.05, .XX ± 0.03, .XXX ± 0.01, Ø.XX= ± .007, ∠'S ± 1/2°

DIMENSIONS ARE AS FOLLOWS: 1.00 in [25.40 mm]

3RD ANGLE PROJECTION

APPROVALS	DATE
DRAWN: kjones	
CHECKED: .	.

Thursday, October 21, 2021 5:16:34 PM

CDI
17560 TYLER ST NW
ELK RIVER, MN 55330
(763)391-7790
(763)391-7851

TITLE: C7-00XX-4000

FILE NAME: C7-00XX-4000
ECO #:
DRAWING NO.:
REV: 1
SCALE: 1:24
SHEET: 1 OF 6

S:\CURBS_CURB_ADAPTERS\CX-XXXX-XXXX_CONFORMING\C7-XXXX-XXXX_ISO_CURBS_RAILS\C7-XXXX-4XXX_CARRIER\4000\2018 IBC 2020 FBC\

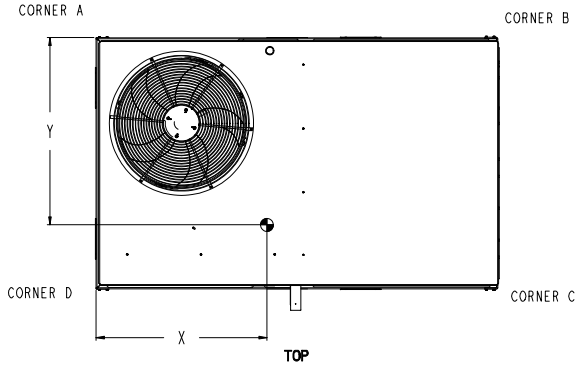
Certified Drawing for RTU-3

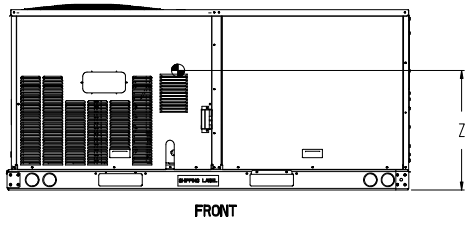
Project: The Moranie
Prepared By:

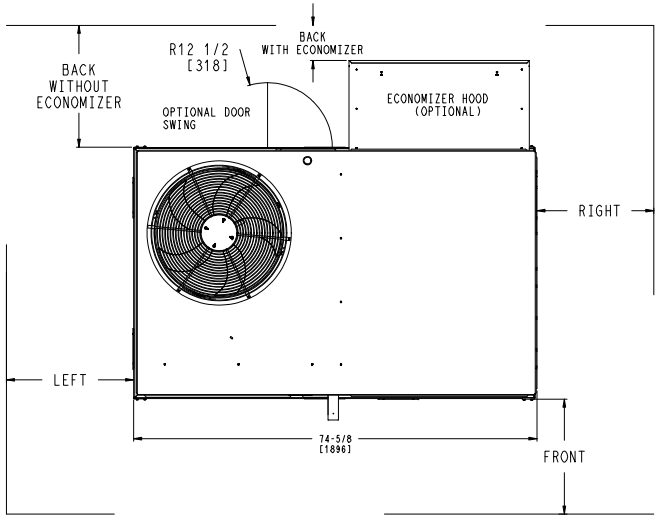
03/24/2022
10:58AM

UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		HEIGHT
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48FC**04	482	219	113	51	116	53	128	58	125	57	37 5/8 [956]	24 9/16 [624]	18 1/4 [464]
48FC**05	543	246	138	63	133	60	133	60	138	63	36 1/2 [927]	23 3/8 [594]	18 [457]
48FC**06	556	252	142	64	136	62	136	62	142	64	36 1/2 [927]	23 3/8 [594]	18 [457]
48FC**07	607	275	162	73	152	69	141	64	151	68	36 [914]	22 1/2 [572]	19 3/8 [492]

* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.







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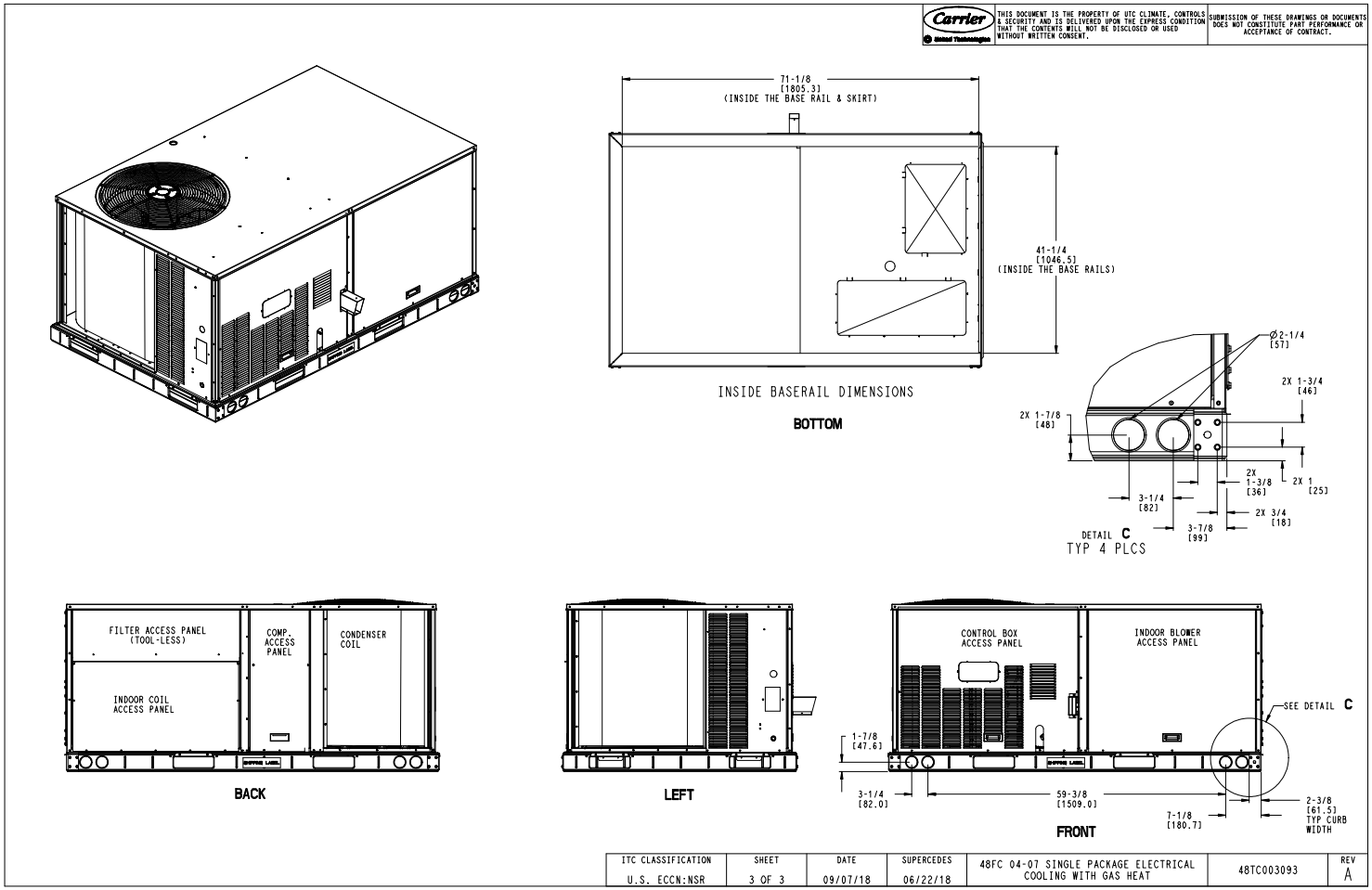
ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	2 OF 3	09/07/18	06/22/18	48FC 04-07 SINGLE PACKAGE ELECTRICAL COOLING WITH GAS HEAT	48TC003093	A

Certified Drawing for RTU-3

Project: The Moranie
Prepared By:

03/24/2022
10:58AM

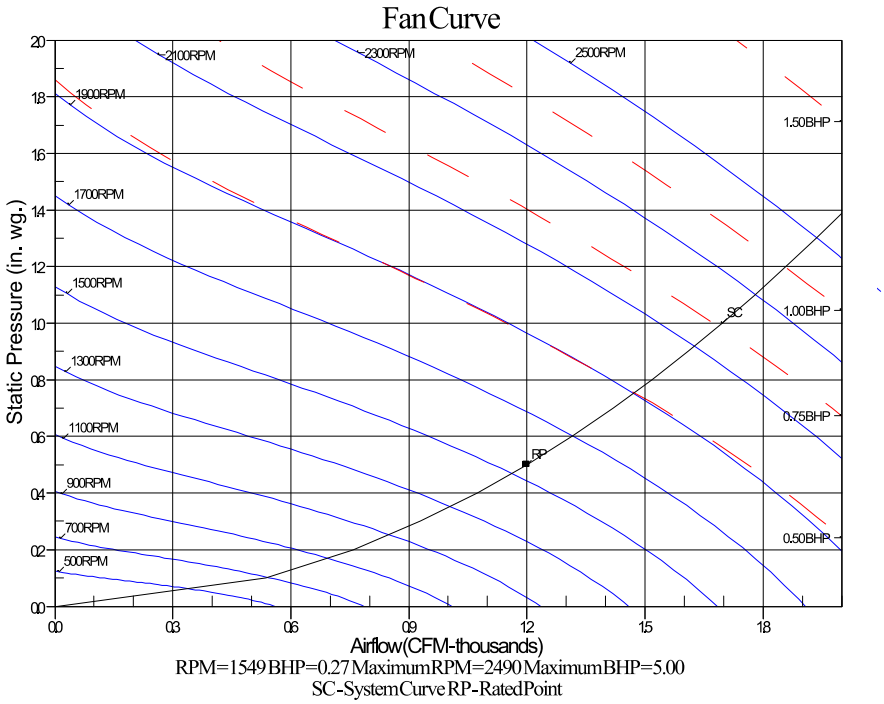


Performance Summary For RTU-3

Project: The Moranie 03/24/2022
Prepared By: 10:58AM

B A-Weighted Sound Power Levels at Unit's Acoustic Center, LwA
C Sound Pressure Levels at Specific Distance from Unit, Lp
D A-Weighted Sound Pressure Levels at Specific Distance from Unit, LpA

Calculation methods used in this program are patterned after the ASHRAE Guide; other ASHRAE Publications and the AHRI Acoustical Standards. While a very significant effort has been made to insure the technical accuracy of this program, it is assumed that the user is knowledgeable in the art of system sound estimation and is aware of the tolerances involved in real world acoustical estimation. This program makes certain assumptions as to the dominant sound sources and sound paths which may not always be appropriate to the real system being estimated. Because of this, no assurances can be offered that this software will always generate an accurate sound prediction from user supplied input data. If in doubt about the estimation of expected sound levels in a space, an Acoustical Engineer or a person with sound prediction expertise should be consulted.



No Exception Taken
see notes below

Heating & Air Conditioning
Amana®

PACKAGE TERMINAL AIR CONDITIONER (PTAC) AND HEAT PUMP

Specifications and Accessories Catalog

Premium Amana® Brand Quality / Featuring DigiSmart® / Web-Based Monitoring

DIGISMART®

A Combination of Energy Management and PTAC Performance

Amana® brand DigiSmart® brings together our best PTAC with our best energy management software that now integrates with optional property management and front desk management software. Reduce PTAC energy consumption up to 35% OR MORE* through the power of the in-unit energy management system, programmable temperature set-back, and temperature limiting combined. Our Maintenance Notification System can alert when there is a potential maintenance issue with the PTAC.

Amana brand DigiSmart Solution

In-Room "Self-Installable" Wireless Peripherals

The DigiSmart Wireless Remote Thermostat can be mounted on the wall anywhere in the guest room. It is Battery powered and with its own wireless ability to communicate with the PTAC to maintain room temperature. Best of all, there are no wires to run. The PTAC and thermostat connect at the press of a button and work in-sync to display accurate temperature.

verify with owner if occ sensors are desired

The DigiSmart Occupancy Sensor and Door Switch Combo Device completes the in-room equipment. This infrared sensor can determine whether the room is occupied or empty and when empty, signal the PTAC to adjust the temperature to save energy based on programmable set-backs.

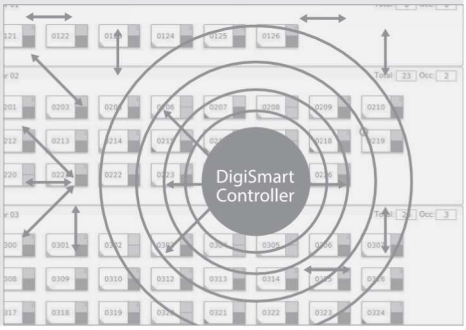
The DigiSmart Wireless Antenna installs inside the PTAC with a snap-in connector like a telephone jack. Installing the antenna allows the PTAC to communicate wirelessly with other devices in the room and to the DigiSmart network.

- 60,000+ rooms have had wireless installations since 2005
- Total wireless devices deployed to date: 425,000+

The Amana brand DigiSmart PTAC with antenna, combined with the self-installable, wireless thermostat and occupancy sensor give the property owner complete control over the equipment settings and can reduce PTAC energy usage up to **35% OR MORE.***

Site-Level — Central Wireless Controller

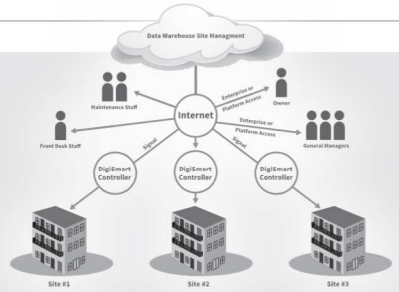
- Site-wide PTAC Configuration
- Site-wide PTAC Diagnostics
- Front-Desk System Interface
- Email Reporting
- Internet Accessible Web User Interface Enterprise



Heating & Air Conditioning
Amana
AMERICA'S BRAND FOR COMFORT™

* These savings represent estimated savings over time and were generated using general assumptions including energy loads, local weather averages and use of occupancy controls. Actual savings will vary according to actual use habits, room square footage, and how the unit is installed and maintained.

Heating & Air Conditioning
Amana
AMERICA'S BRAND FOR COMFORT



Enterprise – Multiple Wireless Controllers

Central Monitoring and Control of Multiple Properties

- Data Warehousing
- Virtual Metering
- Savings Analysis
- Load Shedding
- Email Reporting

Web-Based Monitoring – Amana® brand DigiSmart® Controller

All PTACs in a building can be managed through a single interface on a PC.

Features Include:

- Full unit details for every PTAC, visible from the front desk or home office
- Automatic emails for PTAC maintenance
- Ability to change all settings on the unit
- Enhanced diagnostics
- Monitors up to 170 PTACs WIRELESSLY with one controller
- Expand the network with additional controllers
  - System Verification
  - Global Setbacks
  - EMS Configuration
  - Site Statistics
  - Site Statistics
  - Email Reporting
  - Unit Health
  - Unit Code Alerts

Unrented Set-Points

By integrating with your property's Front Desk System, the PTACs will adjust to specific set-points when no longer identified as rented in the system.

Temp Limiting

Each PTAC can be configured with a heating and cooling temperature set-point limit.

Set-backs

Once a room is declared unoccupied by the occupancy sensor, the PTAC progresses through three different temperature set-backs, configured as three degree and time pairs (An example configuration is listed below).

1. **2°, 30 mins** – Setback the temp 2 degrees after 30 minutes
2. **4°, 1 hr** – Setback the temp 2 more degrees after 30 more minutes
3. **8°, 3 hrs** – Setback the temp 4 more degrees after 2 more hours

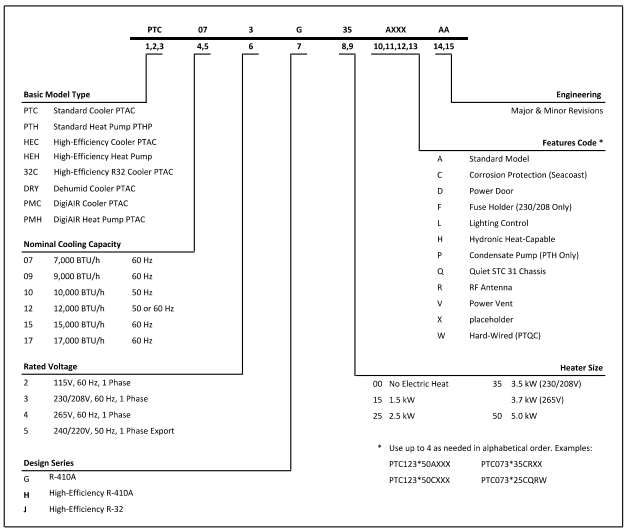
Talk to your Amana brand dealer about opportunities to optimize the efficiency of your new unit. Before purchasing this appliance, read important information about its estimated annual energy consumption, yearly operating cost or energy efficiency rating that is available from your dealer.

Standard Features

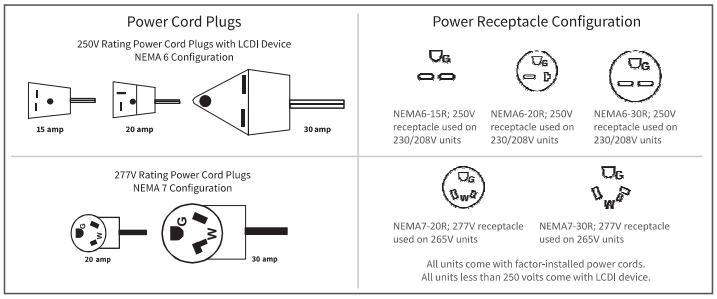
- **Energy Efficiencies:** With EERs up to 13.1 and COPs up to 3.6, our unit's high efficiencies may qualify you for many of the rebates offered by electrical power companies.
- **Quiet Operation:** Our PTAC has been redesigned to be the quietest PTAC we've ever built. The unit's state-of-the-art design and construction provide a quiet environment, allowing guests to enjoy peaceful, sleep-filled nights.
  - Two fan motors (indoor/outdoor)
  - Indoor tangential fan for quiet operation
  - STC of 28
- **Assembled in the USA for 40 years:** assembled at our plant in Fayetteville, TN, using Goodman resources including engineering, production, and testing.
- **Increased Dehumidification Capacity:** Maintain lower humidity levels in rooms while cooling them without the need for expensive add-ons. As a result, guests feel more comfortable at higher temperatures, thus reducing cooling costs.
- **Seven-Button Touch Pad:** Provides complete control to guests for in-room comfort while maintaining energy efficiency.
- **Five-Year Limited Warranty:** Enjoy one of the most comprehensive warranties in the industry: First Year: parts & labor; Second through fifth years: parts & labor on certain sealed system components; second through fifth years: on certain functional parts only. For complete warranty details, visit www.amana-ptac.com.
- **100% Run Tested:** All units are 100% run tested at our plant in Fayetteville, TN, including leak checks during manufacturing and again prior to shipment at the warehouse.
- **7⅝" Unit Front Depth:** Enhance valuable room space with our slim unit front, which has a sleek 7⅝" depth, one of the shallowest silhouettes in the industry today. In addition, to inhibit guest-tampering, the front can be secured to the chassis with a hidden screw.
- **Easy Pull-Out Filters:** Our filters are washable and easy to maintain.
- **Filter Dryer for Sealed System Refrigerant:** Standard in all units to protect the compressor and lengthen the life of the unit by removing moisture and preventing acid formation.
- **Condensate Dispersion System:** Our condensate dispersion system removes condensate from indoor cooling operation by throwing water directly on to the outdoor coil for rapid evaporation and increased cooling efficiencies. The slinger ring on the new, enhanced fan draws water up and into the fan blades. This water is then atomized and evaporated into the atmosphere through the condenser. Increased surface area from the coil allows more water to be evaporated on the sides of the coils and helps to minimize condensate run-off.
- **Front Desk Control:** Each unit comes equipped with the DigiSmart™ control and energy management software. Using the DigiSmart™ software and optional RF Antenna, all units can be wirelessly connected to a central hub for enhanced energy savings and diagnostics. Amana brand PTACs also have a low-voltage interface capability with a field-supplied front-desk ON/OFF switch. (See inside front cover.)

- **Room Freeze Protection**: When the unit senses temperatures of 40°F or below, the unit activates the fan motor and either the electric resistance heater or the hydronic heater.
- **Easy-to-use Controls:** No complex controls to confuse your guests and create phone calls for your manager. Controls are easy to read, understand, and activate. Our new 7-button control panel provides guests with complete control of the unit for their in-room comfort while maintaining overall energy efficiency.
- **Easy to Service with On-Board LED Diagnostics:** The main components are easily serviced and there is no guessing to determine the problem with our easy-to-read diagnostics.
- **Stonewood Room Front:** Our Stonewood room front strikes the balance between attractive styling and practical design. Distinctive contours and a modern appearance enhance the character of even the most luxurious room, while the sleek 7⅝" depth maximizes usable space for your guests.
- **Remote Thermostat Control:** When the DigiSmart™ wireless remote thermostat (DS01E, sold separately) is set up, both the remote thermostat and unit control panel continue to control the unit, providing flexibility and home-like system control. Installation requires no more than pressing two buttons. No need to run wires or make electrical connections.
- **Extended Heat Pump Heating:** Heat pump models will operate in the heating mode down to as low as 24°F outdoor ambient temperature.
- **Zero Floor Clearance:** The unit can be installed flush to a finished floor, if desired. (Some accessories do not have zero clearance).
- **30-Second Fan-Off Delay:** The fan continues to run 30 seconds after the compressor has stopped in either cooling or heat pump mode and after electric heat has been turned off. This improves efficiency by dispersing the conditioned air on the coils into the room.
- **Compressor Lock-In**: This feature helps prolong the life of the compressor by preventing short-cycling. When the compressor is switched from Off to On because room temperature has risen or fallen below the specified limit, it will remain on for at least 4 minutes. If the temperature set-point is changed during this 4 minutes, the lock-in feature is overridden.
- **Automatic Emergency Heat:** No more “my unit is not heating” complaints during the middle of the night. Heat pump units will automatically switch over to electric resistance heat if the heat pump compressor system fails or if the heating load is greater than the unit capacity.
- **Constant Fan Mode:** Take advantage of each unit’s dual options — select continuous fan operation or cycle the fan ON and OFF with the thermostat. Our 7-button design allows guests to select fan performance while allowing the owner to have the unit revert to the desired program of continuous fan or cycle with conditioning.
- **Hidden Ventilation Control:** The ventilation control lever is hidden from the occupant's view to allow you to manage ventilation requirements.
- **High-Pressure Switch:** Protects the unit from high pressure and damage to the unit, helping to ensure long unit life.

Nomenclature



Power Cord Configuration



verify coord or hard wire configuration with elect contractor prior to ordering unit

Product Specifications: 32C Models — Cooling/Electric Heat

230/208 Volts					
Model [6, 8, 9]		**32C 073J***XXX**	**32C 093J***XXX**	**32C 123J***XXX**	**32C 153J***XXX**
Voltage [3]		230/208	230/208	230/208	230/208
Capacity (BTU/h)		7,700/7,700	9,000/9,000	11,700/11,500	15,000/14,700
Amps [10]		4.3/4.3	4.6/4.6	6.2/6.2	7.5/7.5
Watts [10]		590/585	705/695	1050/1040	1415/1385
EER		13.0/13.1	12.7/12.9	11.5/11.5	10.6/10.6
Unit without Electric Heater					
Min. Circuit Amps [2, 4, 10]		**5.1**	**5.4**	**7.4**	**9.1**
CFM (Cool/Wet Coil)	High	290	290	290	340
	Low	264	264	264	314
CFM (Dry Coil)	High	310	310	310	360
	Low	282	282	282	332
Ventilated Air, CFM (Fan Only)*		65	65	65	65
Dehumidification (Pints/Hr.)		1.7	2.2	3.6	4.4
Net Weight (lbs.)		98	102	102	113
Ship Weight (lbs.)		113	117	119	130

Product Specifications: PTH Models — Cooling/Heat Pump/Electric Heat

Model [1, 6, 8, 9]		**PTH073G **AXXX**	**PTH093G **AXXX**	**PTH123G **AXXX**	**PTH153G **AXXX**	**PTH074G **AXXX**	**PTH094G **AXXX**	**PTH124G **AXXX**	**PTH154G **AXXX**
Voltage [1, 3]		230 / 208	230 / 208	230 / 208	230 / 208	265	265	265	265
Capacity (BTU/h)		7,600 / 7,600	9,000 / 9,000	12,000 / 12,000	14,700 / 14,700	7,600	9,100	12,000	14,600
Amps [10]		3.9 / 3.9	4.2 / 4.2	5.8 / 5.8	7.0 / 7.0	3.1	3.7	5.0	6.1
Watts [10]		650 / 633	750 / 750	1,090 / 1,090	1,515 / 1,515	650	758	1,091	1,505
EER		11.7 / 12.0	12.0/12.0	11.0/11.0	9.7 / 9.7	11.7	12.0	11.0	9.7
Unit without Electric Heater									
Min. Circuit Amps [2, 4, 10]		**4.7**	**5.1**	**7.1**	**8.5**	**3.8**	**4.5**	**6.1**	**7.4**
CFM (Cool/Wet Coil)	High	340	330	340	390	340	330	340	390
	Low	245	245	245	340	245	245	245	340
CFM (Dry Coil)	High	370	360	370	410	370	360	370	410
	Low	270	270	270	370	270	270	270	370
Ventilated Air, CFM (Fan Only)*		65*	65*	65*	65*	65*	65*	65*	65*
Dehumidification (Pints/Hr.)		1.7	2.2	3.6	4.4	1.7	2.2	3.6	4.4
Net Weight (lbs.)		108	112	115	126	108	112	115	125
Ship Weight (lbs.)		123	127	132	143	123	127	132	142

* Actual vent CFM performance will vary due to application and installation conditions.

Notes

1. All 265-volt models must use an Amana® brand sub-base (PTSB4**E) or an Amana® brand hard-wire kit PTPWHWK4 and disconnect switch PSHW04A.
2. Minimum Circuit Ampacity (MCA) ratings conform to the National Electric Code; however, local codes should apply.
3. Minimum voltage on 230/208-volt models is 197 volts; maximum is 253 volts. Minimum voltage on 265-volt models is 239 volts; maximum is 292 volts.
4. Overcurrent protection for all units without electric heaters is 15 amps. Overcurrent protection on 265-volt models must be cartridge-style time-delay fuses (included and factory-installed on all Amana® brand 265-volt chassis). See heater performance
5. Heating capacity and efficiency based on unit operation without condensate pump; unit automatically switches to electric heat at approximately 24°F outdoor ambient.
6. Specify two-digit heater kW size to complete model number.
7. R-410A refrigerant used in all systems.
8. All units meet or exceed ASHRAE 90.1 standards.
9. All units less than 250 volts have a Leak Current Detector Interrupter (LCDI) power cord and meet UL 484 standards.
10. Refer to electric heat performance data for total MCA and recommended overcurrent protection. Amps and Watts notation refers to compressor only.

Product Specifications: PTC/PTH Models — Electric Heat Performance

(Primary Heating for PTC Models; Auxiliary Heating for PTH Models; See below for Power Cord Configuration)

Voltage	Electric Heater Size (kW)	No. of Stages	Nominal Heating (BTU/h)			Total Watts[6]	Total Amps	Min. Circuit Ampacity[2]	MOP[4] (amps)	Power Cord
			@ 230V	@ 208V	@ 265V					
230/208V	1.5 / 1.3	1	5,100	4,200	--	1,570 / 1,295	6.8 / 6.2	8.5	15	6-15 P
230/208V	2.5 / 2.1	1	8,500	6,800	--	2,570 / 2,115	11.2 / 10.1	14.1	15	6-15 P
230/208V	3.5 / 3.0	1	12,000	9,900	--	3,570 / 2,935	15.5 / 14.1	19.5	20	6-20 P
230/208V	5.0 / 4.1	1	17,100	14,000	--	5,070 / 4,160	22.1 / 20.0	27.6	30	6-30 P
265V	1.5	1	--	--	5,100	1,570	5.9	7.4	15	7-20P
265V	2.5	1	--	--	8,500	2,570	9.7	12.2	15	7-20 P
265V	3.7	1	--	--	12,600	3,770	14.2	17.9	20	7-20 P
265V	5	1	--	--	17,100	5,070	19.2	23.9	25	7-30 P

Notes

1. All 265-volt models must use an Amana® brand sub-base (PTSB4**E) or an Amana® brand hard-wire kit (PTPWHWK4).
2. Minimum branch circuit ampacity ratings conform to the National Electric Code; however, local codes should apply.
3. Minimum voltage on 230/208-volt models is 197 volts; maximum is 253 volts. Minimum voltage on 265-volt models is 239 volts; maximum is 292 volts.
4. Overcurrent protection for all units without electric heaters is 15 amps. Overcurrent protection on 265-volt models must be cartridge-style time-delay fuses (included and factory-installed on all Amana® brand 265-volt chassis).
5. Heating capacity and efficiency based on unit operation without condensate pump; unit automatically switches to electric heat at approximately 24°F outdoor ambient.
6. Total watts for 15,000 BTU/h models; subtract 20 watts for PT07/09/12
7. Specify two-digit heater kW size to complete model number.
8. R-410A refrigerant used in all systems.
9. All units meet or exceed ASHRAE 90.1 standards.
10. All units less than 250 volts have a Leak Current Detector Interrupter (LCDI) power cord and meet UL 484 standards.

Product Specifications: HEH Models — Reverse-Cycle Heating Performance

Heating Capacity [1]	HEH073H **AXXX	HEH074H **AXXX	HEH093H **AXXX	HEH094H **AXXX	HEH123H **AXXX	HEH124H **AXXX
Voltage [1, 3]	230/208	265	230/208	265	230/208	265
BTU/h [5]	6,800/6,800	6800	8,300/8,100	8300	11,500/11,300	11400
Amps [10]	4.1/4.1	3.6	4.7/4.7	4.2	6.2/6.2	5.4
Watts [10]	600/600	600	735/715	735	1,085/1,065	1075
COP [5]	3.3/3.3	3.3	3.3/3.3	3.3	3.1/3.2	3.1
CFM (Dry)	360	360	370	370	370	370

Notes

1. All 265-volt models must use an Amana® brand sub-base (PTSB4**E) or an Amana® brand hard-wire kit (PTPWHWK4).
2. Minimum branch circuit ampacity ratings conform to the National Electric Code; however, local codes should apply.
3. Minimum voltage on 230/208-volt models is 197 volts; maximum is 253 volts. Minimum voltage on 265-volt models is 239 volts; maximum is 292 volts.
4. Overcurrent protection for all units without electric heaters is 15 amps. Overcurrent protection on 265-volt models must be cartridge-style time-delay fuses (included and factory-installed on all Amana® brand 265-volt chassis).
5. Heating capacity and efficiency based on unit operation without condensate pump; unit automatically switches to electric heat at approximately 24°F outdoor ambient.
6. Specify two-digit heater kW size to complete model number.
7. R-410A refrigerant used in all systems.
8. All units meet or exceed ASHRAE 90.1 standards.
9. All units less than 250 volts have a Leak Current Detector Interrupter (LCDI) power cord and meet UL 484 standards.
10. Refer to electric heat performance data for total MCA and recommended overcurrent protection. Amps and Watts notation refers to compressor only.

Product Specifications: PTH Models — Reverse-Cycle Heating Performance

Heating Capacity [1]	PTH073G **AXXX	PTH074G **AXXX	PTH093G **AXXX	PTH094G **AXXX	PTH123G **AXXX	PTH124G **AXXX	PTH153G **AXXX	PTH154G **AXXX
Voltage [1, 3]	230/208	265	230/208	265	230/208	265	230/208	265
BTU/h [5]	6,800/6,800	6,800	8,300/8,100	8,300	11,500/11,300	11,400	13,800/13,600	13,700
Amps [10]	3.9/3.9	3.1	4.2/4.2	3.7	5.6/5.8	5	7.0/7.0	6.1
Watts [10]	585/585	585	715/700	715	1,085/1,055	1,080	1,350/1,330	1,340
COP [5]	3.4/3.4	3.4	3.4/3.4	3.4	3.1/3.2	3.1	3.0/3.0	3
CFM (Dry)	370	370	360	360	370	370	410	410

Notes

1. All 265-volt models must use an Amana® brand sub-base (PTSB4**E) or an Amana® brand hard-wire kit (PTPWHWK4).
2. Minimum branch circuit ampacity ratings conform to the National Electric Code; however, local codes should apply.
3. Minimum voltage on 230/208-volt models is 197 volts; maximum is 253 volts. Minimum voltage on 265-volt models is 239 volts; maximum is 292 volts.
4. Overcurrent protection for all units without electric heaters is 15 amps. Overcurrent protection on 265-volt models must be cartridge-style time-delay fuses (included and factory-installed on all Amana® brand 265-volt chassis).
5. Heating capacity and efficiency based on unit operation without condensate pump; unit automatically switches to electric heat at approximately 24°F outdoor ambient.
6. Specify two-digit heater kW size to complete model number.
7. R-410A refrigerant used in all systems.
8. All units meet or exceed ASHRAE 90.1 standards.
9. All units less than 250 volts have a Leak Current Detector Interrupter (LCDI) power cord and meet UL 484 standards.
10. Refer to electric heat performance data for total MCA and recommended overcurrent protection. Amps and Watts notation refers to compressor only.

Accessories

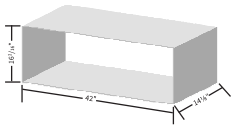
Wall Sleeves
All our wall sleeves have industry standard dimensions of 42" wide x 16 1/16" high. The WS900E, SC and INTERNAL 14⅛" depth is the industry standard. Sleeves may be shipped separately to allow for installation during construction.

Standard-Depth Sleeves

WS900-GS	Heavy Sound Isolation Insulation Sleeve
WS900E	Standard PTAC sleeve
WS900SC	Seacoast triple protected
WS900D-INTERNAL	Internal drain only for window-wall installations (DK900D sold separately)

Extra Deep Sleeves: in several depths for thicker wall installations or special room configurations

WS9XXD1	16" to 24" in 1" increments
WS928D1	Extra deep 28"
WS930D1	Extra deep 30"
WS936D1	Extra deep 36"
WS9XXD1-Internal	Extra deep Internal drain only for window-wall installations (DK900D sold separately)



verify sleeve depth prior to ordering

Outdoor Grilles
Available in stamped-aluminum or architecturally louvered for application with an Amana brand WS900E wall sleeve.

AGK: Extruded aluminum architectural grille available with anodized aluminum finish or a baked-on paint finish for durability. Choose from 3 stock colors or a custom color to blend with your building's exterior color scheme. Colors include:
CB (Clear Anodized), DB (Dark Brown/Bronze)
TB (Stonewood Beige), WB (White),
SB (Special/Custom Colors)

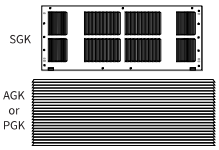
PGK: One-piece injection molded grille using a polymer blend of engineered thermoplastic high-impact strength material with chemical resistance and an exterior UV protective coating.
Choose from 3 stock colors:
DB (Dark Brown/Bronze), TB (Stonewood Beige), WB (White)

Standard Outdoor Grille

SGK01B	Single Pack
SGK01TB	Stonewood Beige

Architectural Outdoor Grille

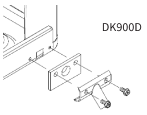
AGK01CB	Anodized Aluminum
AGK01DB	Dark Bronze/Brown
AGK01TB	Stonewood Beige
AGK01WB	Amana White
AGK01SB	Custom Colors
PGK01DB	Dark Bronze/Brown
PGK01TB	Stonewood Beige
PGK01WB	Amana White



verify grille size and configuration with architect prior to ordering equipment

Condensate Drain Kit
Attaches to the wall sleeve base pan for controlled internal or external disposal of condensate.

DK900D	Condensate Drain Kit (use with WS900E)
DK9001D	Condensate Drain Kit (use with WS900B)



select drain kit option to best work with condensate drain system (down flow drains)

Low-Voltage Wire Harness Kit (not shown)
For quick connections of the remote, or wired, thermostats, wired EMS, or front desk with jumpers and connectors.

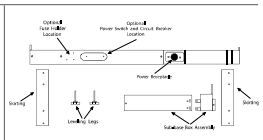
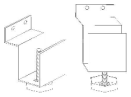
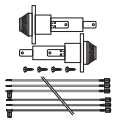
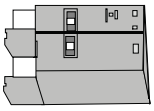
PWHK01C	Wire Harness Kit

Remote Escutcheon Kit (not shown)
Optional kit for use with units controlled via a wired, remote thermostat. Covers control touch-pad for wired thermostat installations.

REK10B	Remote Escutcheon Kit (10-pack)
REK10A	Remote Escutcheon Plates

Each "B" kit contains 80 wires and wire nuts, enough to attach a thermostat and one additional accessory to 10 PTAC units. Wires come in assorted colors for easy attachment. Each "A" kit contains 10 Escutcheon plates only.

Accessories (cont.)

SUB-BASE KIT The fully skirted sub-base conceals wiring while providing strong support, if needed. Plug-in receptacle and field-wiring access speeds installation. Electrical accessories, such as fuse holders, circuit breakers and disconnect switches, meet N.E.C. requirements.	**PTSB215E**	115V/15A	
	PTSB320E	230/208V 15/20A	
	PTSB330E	230/208V 30A	
	PTSB420E	265V 15/20A	
	PTSB430E	265V 25A	
	PTSB000E	Non-electrical	
LEVELING LEGS Gives wall sleeve front support and helps to level the unit for installation.	**LL2B**	Leveling legs for WS9** sleeves	
HARD-WIRE KITS Used to permanently wire to the chassis when a standard sub-base and power cord are not utilized. **FACTORY INSTALLED Feature Code - W**	**PTPWHWK4**	Armored Cable – all voltages	
	PTQC3A	Quick Connect – 230/208V	
	PTQC4A	Quick Connect – 265 & 115 V	
POWER DISCONNECT SWITCH The PSHW**A power disconnect switch can be used for 265-volt or 230/208-volt physical disconnect, where required by local codes. The switch is rated at 30-amp capacity. The switch is for use with and Amana® brand standard sub-bases or PTPWHWK4 Hard Wire Kit.	**PSHW03A**	230/208V	
	PSHW04A	265V	
FUSE HOLDER KIT Cartridge-style fuses can be installed in the fuse holder for use in the sub-base or chassis. Available in 15, 20 and 30 amp (included on 265-volt unit).	**FHK315E**	230/208V 15A	
	FHK315E	230/208V 15A (R-410A)	
	FHK320C	230/208V 20A	
	FHK320E	230/208V 20A (R-410A)	
	FHK330C	230/208V 30A	
	FHK330E	230/208V 30A (R-410A)	
CIRCUIT BREAKER KIT (230/208V ONLY) The circuit breaker kit, available in 15, 20 or 30 amp, can be used with Amana brand sub-bases. It gives overcurrent protection, and its location allows you to turn the unit on or off without tools.	**CBK15C**	15 amp Circuit Breaker Kit	
	CBK20C	20 amp Circuit Breaker Kit	
	CBK30C	30 amp Circuit Breaker Kit	

provide disconnect as required by local AHJ

Accessories (cont.)

Duct Extension Kit
Extends air distribution to an adjoining room. Consists of a main duct for the room of origin and an extension duct to reach the adjoining room and terminal duct. PTDK01A allows for the "B" series unit to work with the "A" series duct kits.

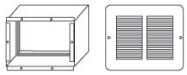
MDK02B	Main Duct – R-22
MDK01E	Main Duct – R-410A
EDK02B	42" Extension Duct

Main Duct Kit

Extension Duct Kit

TDK02B	Terminal Duct
PTDK01A	Transition Duct Only – R-22
PTDK01E	Transition Duct Only – R-410A

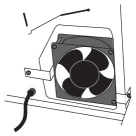
Terminal Duct Kit



Power Vent Kit
Installation of Power Vent increases CFM up to approximately 95. Vent door will automatically close when unit fan is off.

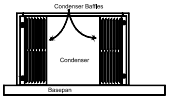
Factory Installed Feature Code – V
R-410A models must have these kits installed at the factory.

PVK3A	230/208V – R-22
PVK4A	265V – R-22



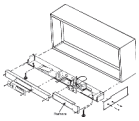
Condenser Baffle Kit
For use on non-baffled grilles. These deflectors direct the air in toward the center and away from the inlet to prevent recirculation of the hot condenser air.

DGK1B	Condenser Baffle Kit



Sub-base Extension Cover Kit
Converts older 30-amp sub-bases to allow for installation of the larger 30-amp LCDI power cord and plugs.

SBEC10A	10 Pack



Condensate Removal Pump
Can be field-installed. Assists in removing condensate developed by heat pump operation and transfers it to indoor coil to dissipate into room while adding humidity to the room.

Factory Installed Feature Code – P

CDP302	230/208V – R-22
CDP402	265V – R-22
CDP303E	230/208V – R-410A

Security Key Locks
In conjunction with the tamper-resistant front, the installation of Amana® brand security key locks prevents tampering of the controls used to set temperature, heating and cooling functions. UL approved for institutional use only.

KL03B	Security Key Lock (R-22)
KL03E	Security Key Lock (R-410A)

provide wall mount T-stat

Accessories (cont.)

Thermostats
The following thermostats offer remote control. Any thermostat other than those listed must be submitted to Goodman Company, L.P., for approval prior to use.

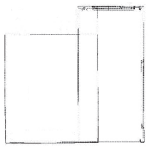
Model #		Heat Stages	Cool Stages	Fan Speed	# of Wires Required	Temp Limiting	Backlit	Display	Type	Shape & Orientation	Connection
2246002		1	1	1	5	No	Yes	Digital	Manual	Rect./Horiz.	Wired
2246007		2	2	1	7	Yes	Yes	Digital	Auto-Change	Rect./Horiz.	Wired
PHWT-A150H		2	2	2	7	Yes	Yes	Digital	Manual	Square/ Vertical	Wired
PHWT-A200		2	2	2	7	Yes	Yes	Digital	Programmable/ Auto-Change	Square/ Vertical	Wired
DS01E*		2	2	2	0	Yes	Yes	Digital	Manual	Rect./Horiz.	Wireless

*Battery powered, but has optional hard wire capability. Requires DT01G Antennae for operation

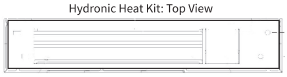
Hydronic Heat Kit
Add-on kits fit all units allowing the addition of hydronic water or hydronic steam heat to cooling and heating units. The kits feature left- or right-hand piping. Unit retains complete service access with a kit installed. Unit must be connected to and operated by a wall thermostat.

HWK03B	Hydronic Water Kit – R-22
HVK03B	Hydronic Steam Kit – R-22
HWK03E	Hydronic Water Kit – R-410A
HVK03E	Hydronic Steam Kit – R-410A

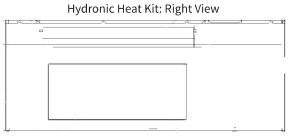
Hydronic Heat Kit: Side View



Hydronic Heat Kit: Top View



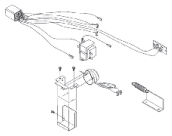
Hydronic Heat Kit: Right View



Accessories (cont.)

Power Door Kit
Vent door will automatically open when unit fan is on.
Factory Installed Feature Code - D

PDK3A	230/208V – R-22
PDK4A	265V – R-22
PDK3E	230/208V – R-410A
PDK4E	265V – R-410A



Hydronic Valves
Water and steam valves are available for use with the HWK03 (water) and HVK03 (steam) heat kits.

VS2WNCA*	2-way/24V/NC/Steam
VS2WNOA*	2-way/24V/NO/Steam
VW2WNCA*	2-way/24V/NC/End Switch
VW2WNOA*	2-way/24V/NO/End Switch
VW3WNC2B*	3-way/24V/NC/NO/End Switch

* Poptop Actuator

Wireless RF (Radio Frequency) Controls
All DigiSmart PTACs come factory-ready to be controlled via wireless RF devices. 2.4 Ghz 802 15.4 protocol assures robust communications and response.

DS01E	Thermostat: 2-way[2] Communications
DD01E	Occupancy Sensor: EMS Activation[2]
DT01G	Antenna / Router **Factory Installed Feature Code - R**
GT01G	Generic Radio Antenna / Router[3]
DD01F	Door Switch: EMS Activation[2]
DP01G	Web-enabled Platform Server
DL01G	Web-enabled Platform Server Link BAC-NET capable
DR01G	Mesh Repeater[1]
DL01G-SERIAL	Serial Repeater[1]

[1] Consult Amana Sales representative prior to purchase
[2] Requires DT01G for use
[3] Requires DS01E for use

Wall Sleeve Extension Adapter Kits
Room-side extension kits to increase the depth of the existing sleeve to allow for an industry-standard PTAC to be installed.

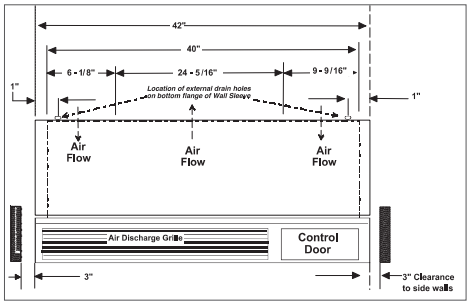
SECM1001A	1.5" Extension for 12½" Climate Master Sleeve (10 Pack)
SEZA0501A	2.5" Extension for 11½" Zone Air Sleeve (5 pack)

Curtain Baffle Kit
The color matched polymer curtain baffles help to prevent curtains from falling into the discharge air stream and causing recirculation, reducing efficiencies and shortening compressor life.

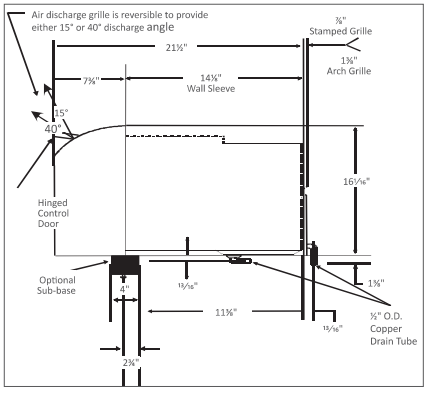
PTCB10B	10 Pack for R-22 units
PTCB10E	10 Pack for R-410A units

Unit with Accessory Wall Sleeve and Sub-base Accessory

TOP VIEW

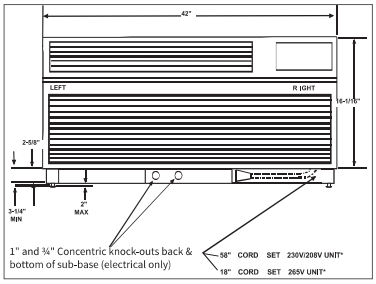


RIGHT VIEW



FRONT VIEW

58" LCDI CORD SET — 230V/208V UNIT*



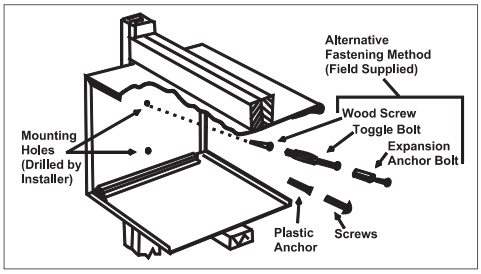
Framing for Accessory Wall Sleeve (WS9XX)

Fastening Wall Sleeve
When installed in an opening, the Wall Sleeve must be horizontally level (side-to-side) and pitched **¼ bubble** to the outside.

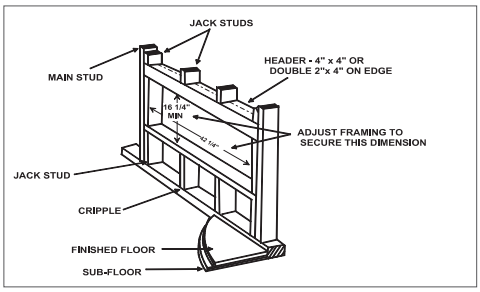
(**NOTE:** To ensure unit's maximum efficiency, **DO NOT** over- or under-pitch.)

Installation Notes

1. If **Sub-base** (PTSB***E) is installed, allow minimum 3¼" height clearance and maximum 5" height clearance between wall sleeve and floor; allow minimum 2¾" protrusion from a finished wall. *See Note 4 if using hydronic units.*
2. **Drain Kit** (DK900D) shipped separately. Can be mounted either right side, left side or bottom of sleeve. If mounted to bottom of sleeve, allow 2" height clearance from floor to bottom of sleeve.
3. For UL approval, 265V units must use Amana® brand **Sub-base** (PTSB***E) or Amana® brand **Hard Wire Kit** (PSHW04A). Overcurrent protection on 265V units must be by cartridge-style time delay fuses, **which are included and factory-installed on the Amana® brand 265V chassis.**
4. If **Hydronic Kit** (HWK03 or HVK03) is installed, **Wall Sleeve** must extend exactly 3" into the room from the finished interior wall. If using the Amana® brand **Sub-base** (PTSB***E), only the minimum 3¼" height clearance between wall sleeve and floor is permissible. Unit must also be operated with a remote-mounted thermostat.
5. If **Duct Kit** (MDK***) is installed, allow a minimum of 2⅜" into the room from the finished interior wall.



Wall Sleeve must extend a minimum of ¼" beyond outside wall to allow for proper caulking.



Wall sleeve opening height should be squared with wall sleeve opening width.	H = 16¼"
	W = 42¼"

Heating & Air Conditioning
Amana
AMERICA'S BRAND FOR COMFORT™

A legacy of comfort

The impeccable reputation of an American original

Amana heating and cooling systems are a part of the enduring legacy of one of America's most recognized and respected brands. Originating eight decades ago in Amana, Iowa, the brand is synonymous with long-lasting, premium-quality products — from home appliances to heating and air conditioning equipment. Chances are, you and generations before you have enjoyed the dependable performance and longevity the Amana brand continues to deliver.

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PROUDLY ASSEMBLED IN THE USA FOR OVER
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YEARS

Call your Amana brand PTAC sales representative at 800-647-2982 for complete details.

Before purchasing this appliance, read important information about its estimated annual energy consumption, yearly operating cost, or energy efficiency rating that is available from your retailer.

www.amana-ptac.com

MC-DPTAC 12-17
Supersedes 4-16

No Exception Taken
see notes below on
wiring requirements

M-SERIES

SUBMITTAL DATA: MSZ-GL18NA & MUZ-GL18NA
18,000 BTU/H WALL-MOUNTED HEAT PUMP SYSTEM

MITSUBISHI ELECTRIC

Job Name:	
System Reference:	Date:

Indoor Unit: MSZ-GL18NA	Outdoor Unit: MUZ-GL18NA	Wireless Remote Controller
		

GENERAL FEATURES

- Slim wall-mounted indoor units provide zone comfort control
- The outdoor unit powers the indoor unit, and should a power outage occur, the system is automatically restarted when power returns
- INVERTER-driven compressor and LEV provide high efficiency and comfort while using only the energy needed to maintain maximum performance
- Multiple fan speed options: Quiet, Low, Medium, High, Super-high, Auto
- Multiple control options available:
  - Hand-held Remote Controller (provided with unit)
  - kumo cloud® smart device app for remote access
  - Third-party interface options
  - Wired or wireless controllers
- Quiet operation
- Smart Set: recalls a preferred preset temperature setting at the touch of a button
- Blue Fin anti-corrosion treatment applied to the outdoor unit heat exchanger for increased coil protection and longer life

Specifications are subject to change without notice.

SPECIFICATIONS: MSZ-GL18NA & MUZ-GL18NA

Cooling[1]	Maximum Capacity	BTU/H	22,000
	Rated Capacity	BTU/H	18,000
	Minimum Capacity	BTU/H	5,800
	Maximum Power Input	W	2,105
	Rated Power Input	W	1,340
	Moisture Removal	Pints/h	2.1
	Sensible Heat Factor		0.87
	Power Factor	%	99 / 99
Heating at 47°F[2]	Maximum Capacity	BTU/H	25,000
	Rated Capacity	BTU/H	21,600
	Minimum Capacity	BTU/H	5,400
	Maximum Power Input	W	2,455
	Rated Power Input	W	1,680
	Power Factor	%	99 / 99
Heating at 17°F[3]	Maximum Capacity	BTU/H	18,200
	Rated Capacity	BTU/H	13,800
	Maximum Power Input	W	2,105
	Rated Power Input	W	1,435
Heating at 5°F[4]	Maximum Capacity	BTU/H	14,900
	Maximum Power Input	W	1,880
Heating at -4°F[5]	Maximum Capacity	BTU/H	15,520
Efficiency	SEER		20.5
	EER[1]		13.4
	HSPF (IV)		11.2
	COP at 47°F[2]		3.77
	COP at 17°F in Maximum Capacity[3]		2.53
	COP at 5°F in Maximum Capacity[4]		2.32
	ENERGY STAR® certified units (ENERGY STAR products are third-party certified by an EPA-recognized Certification Body.)		YES
Electrical	Voltage, Phase, Frequency		208/230V, 1 phase, 60Hz
	Guaranteed Voltage Range	V AC	187 - 253
	Voltage: Indoor - Outdoor, S1-S2	V AC	208 / 230
	Voltage: Indoor - Outdoor, S2-S3	V DC	24
	Short-circuit Current Rating (SCCR)	kA	5
	Recommended Fuse/Breaker Size (Outdoor)	A	15
	Recommended Wire Size (Indoor - Outdoor)	AWG	14
Indoor Unit	MCA	A	1
	MOCP	A	15
	Blower Motor Full Load Amperage	A	0.67
	Blower Motor Output	W	30
	Airflow Rate at Cooling, Dry	CFM	646-522-417-332-258

Specifications are subject to change without notice.

provide wire bundle rated for use with mini split systems between indoor and outdoor unit (power and comm wires) verify elect wiring overcurrent protection with elect contractor.

SPECIFICATIONS: MSZ-GL18NA & MUZ-GL18NA

	Airflow Rate at Cooling, Wet	CFM	581-470-375-299-232
	Airflow Rate at Heating, Dry	CFM	646-565-469-385-297
	Sound Pressure Level (Cooling)	dB(A)	49-44-38-33-28
	Sound Pressure Level (Heating)	dB(A)	48-43-38-33-28
	Drain Pipe Size	In. (mm)	5/8 (15.88)
	Heat Exchanger Type		Plate fin coil
	External Finish Color		Munsell 1.0Y 9.2/0.2
	Unit Dimensions	W: In. (mm)	36-5/16 (923)
		D: In. (mm)	9-13/16 (250)
		H: In. (mm)	12 (305)
	Package Dimensions	W: In. (mm)	39 (990)
		D: In. (mm)	13 (330)
		H: In. (mm)	15 (380)
	Unit Weight	Lbs. (kg)	28 (13)
	Package Weight	Lbs. (kg)	33 (15)
Indoor Unit Operating Temperature Range	Cooling Intake Air Temp (Maximum / Minimum)*	°F	90 DB, 73 WB / 67 DB, 57 WB
	Heating Intake Air Temp (Maximum / Minimum)	°F	80 DB / 70 DB
Outdoor Unit	MCA	A	14
	MOCP	A	15
	Fan Motor Full Load Amperage	A	0.93
	Fan Motor Output	W	77
	Airflow Rate	CFM	1,691 / 1,691
	Refrigerant Control		LEV
	Defrost Method		Reverse cycle
	Heat Exchanger Type		Plate fin coil
	Sound Pressure Level, Cooling[1]	dB(A)	54
	Sound Pressure Level, Heating[2]	dB(A)	55
	Compressor Type		DC INVERTER-driven
	Compressor Model		SNB130FQBMT
	Compressor Rated Load Amps	A	10.0
	Compressor Locked Rotor Amps	A	12.5
	Compressor Oil Type // Charge	oz.	FV50S // 11.8
	External Finish Color		Munsell 3Y 7.8/1/1
	Base Pan Heater		Optional
	Unit Dimensions	W: In. (mm)	33-1/16 (840)
		D: In. (mm)	13 (330)
		H: In. (mm)	34-5/8 [880]
	Package Dimensions	W: In. (mm)	38-9/16 (980)
		D: In. (mm)	16-9/16 (420)
		H: In. (mm)	39 (990)
	Unit Weight	Lbs. (kg)	121 (55)

Specifications are subject to change without notice.

SPECIFICATIONS: MSZ-GL18NA & MUZ-GL18NA

	Package Weight	Lbs. (kg)	141 (64)
Outdoor Unit Operating Temperature Range	Cooling Air Temp (Maximum / Minimum)*	°F	115 / 14
	Cooling Thermal Lock-out / Re-start Temperatures**	°F	-1 / 3
	Heating Air Temp (Maximum / Minimum)	°F	75 / -4
	Heating Thermal Lock-out / Re-start Temperatures**	°F	-9 / -4
Refrigerant	Type		R410A
	Charge	Lbs, oz	3, 9
Piping	Gas Pipe Size O.D. (Flared)	In. (mm)	1/2 (12.7)
	Liquid Pipe Size O.D. (Flared)	In. (mm)	1/4 (6.35)
	Maximum Piping Length	Ft. (m)	100 (30)
	Maximum Height Difference	Ft. (m)	50 (15)
	Maximum Number of Bends		10

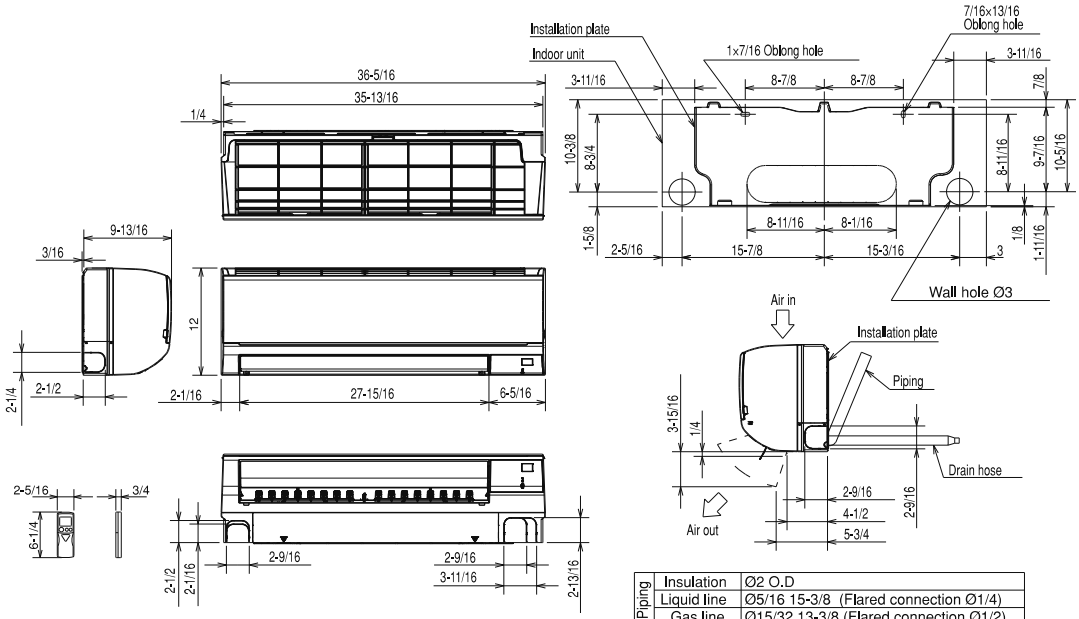
Notes

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)	[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
	[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
	[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB
Conditions	[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
	[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
*Applications should be restricted to comfort cooling only; equipment cooling applications are not recommended for low ambient temperature conditions. **System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.			

Specifications are subject to change without notice.

DIMENSIONS: MSZ-GL18NA

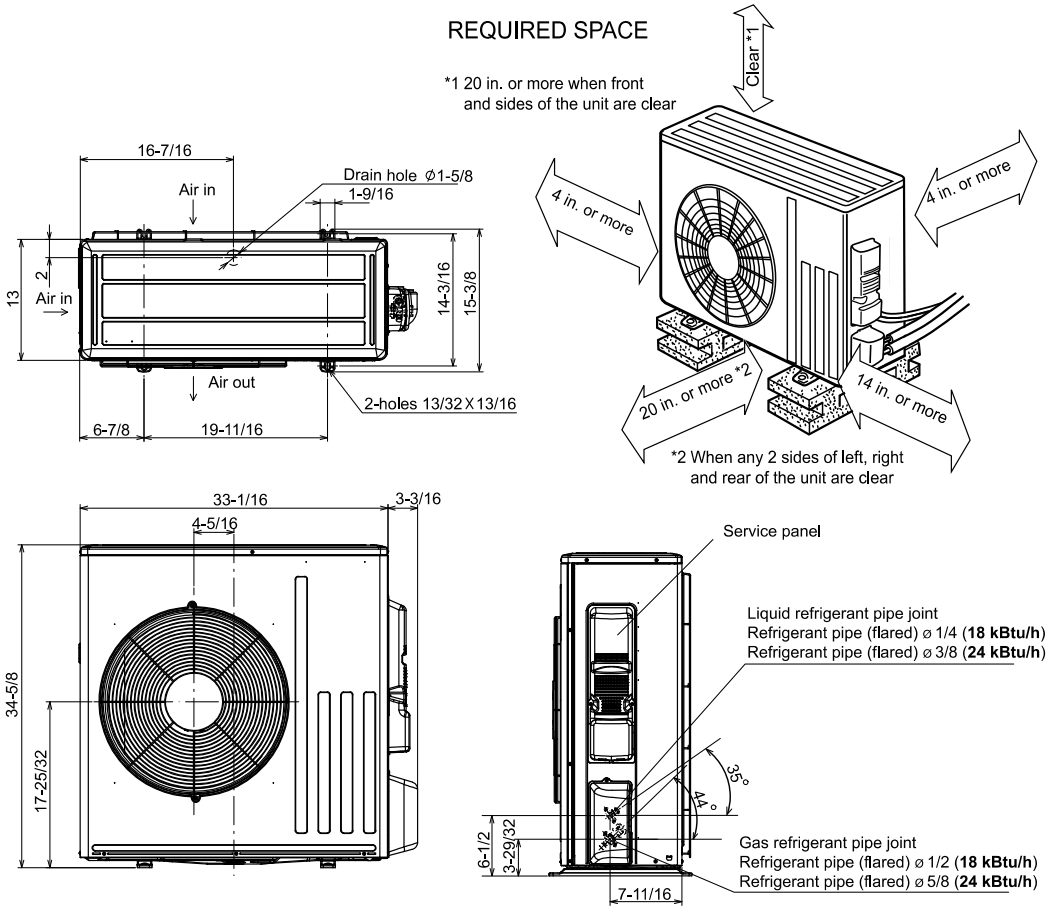
Unit: inch



Piping	Insulation	Ø2 O.D
	Liquid line	Ø5/16 15-3/8 (Flared connection Ø1/4)
	Gas line	Ø15/32 13-3/8 (Flared connection Ø1/2)
Drain hose		Insulation Ø1-1/8 Connected part Ø5/8 O.D

DIMENSIONS: MUZ-GL18NA

Unit: inch



1340 Satellite Boulevard, Suwanee, GA 30024
Toll Free: 800-433-4822 www.mehvac.com

FORM# MSZ-GL18NA / MUZ-GL18NA - 202003

Specifications are subject to change without notice.

No Exception Taken
see notes above for elect
requirements and wiring

PKA-A12LA & PUZ-A12NKA7(-BS)
12,000 BTU/H WALL MOUNT
12,000 BTU/H HEAT PUMP UNIVERSAL OUTDOOR

MITSUBISHI ELECTRIC

Job Name:
System Reference: Date:

Indoor Unit PKA-A12LA

Outdoor Unit
- ☐ Standard Model PUZ-A12NKA7
- ☐ Seacoast Model PUZ-A12NKA7-BS

INDOOR UNIT FEATURES
- Selectable high sensible vs high latent capacity mode
- UL 60335-2-40 compliant
- Sleek, compact design
- Simple installation
- Airflow direction control
- Auto fan mode
- Suitable for: server rooms, daycare centers, classrooms, churches, small offices, and more
- Multiple control options available:
  - kumo cloud® smart device app for remote access
  - Third-party interface options
  - Wired or wireless controllers

OUTDOOR UNIT FEATURES
- Variable speed INVERTER-driven compressor
- Power receiver pre-charged with refrigerant volume for piping length up to 70 ft
- Low ambient cooling down to 0°F providing 100% capacity
- 24-hour continuous operation (cooling mode)
- High pressure protection
- Fast restart
- Superior energy and operational efficiency

Specifications are subject to change without notice.

SPECIFICATIONS: PKA-A12LA & PUZ-A12NKA7(-BS)

Cooling at 95°F[1]	Maximum Capacity	BTU/H	12,000
	Rated Capacity	BTU/H	12,000
	Minimum Capacity	BTU/H	4,400
	Maximum Power Input	W	900
	Rated Power Input	W	900
	Moisture Removal	Pints/h	2.7
	Sensible Heat Factor		0.88
	Sensible Heat Factor - High Latent		0.75
	Power Factor	%	92.5/92.5
Heating at 47°F[2]	Maximum Capacity	BTU/H	18,000
	Rated Capacity	BTU/H	14,000
	Minimum Capacity	BTU/H	4,400
	Maximum Power Input	W	1,600
	Rated Power Input	W	1,030
	Power Factor	%	92.5/92.5
Heating at 17°F[3]	Maximum Capacity	BTU/H	10,600
	Rated Capacity	BTU/H	10,600
	Maximum Power Input	W	1,190
	Rated Power Input	W	1,190
Heating at 5°F[4]	Maximum Capacity	BTU/H	9,100
	Maximum Power Input	W	1,120
Efficiency	SEER		21.0
	EER[1]		13.3
	HSPF [IV]		10.2
	COP at 47°F[2]		3.9
	COP at 17°F at Maximum Capacity[3]		2.6
	COP at 5°F at Maximum Capacity[4]		2.3
	ENERGY STAR® Certified		Yes
Electrical	Voltage, Phase, Frequency		208/230, 1, 60
	Guaranteed Voltage Range	V AC	198 - 253
	Voltage: Indoor - Outdoor, S1-S2	V AC	208/230
	Voltage: Indoor - Outdoor, S2-S3	V DC	24
	Short-circuit Current Rating [SCCR]	kA	5
	Recommended Fuse/Breaker Size (Oudoor)	A	15
	Recommended Wire Size [Indoor - Outdoor]	AWG	14
	Power Supply		Indoor unit is powered by the outdoor unit
Indoor Unit	MCA	A	1.0
	Fan Motor Full Load Amperage	A	0.19
	Fan Motor Output	W	30
	Fan Motor Type		DC Motor
	Airflow Rate at Cooling, Dry	CFM	265–310–385–455
	Airflow Rate at Cooling, Wet	CFM	215–255–320–375
	Airflow Rate at Heating, Dry	CFM	265–290–325–385
	Sound Pressure Level [Cooling]	dB[A]	34–39–44–48
	Sound Pressure Level [Heating]	dB[A]	34–37–40–43
	Drain Pipe Size	In. [mm]	5/8 [16]
	Condensate Lift Mechanism, Maximum Distance	In. [mm]	19-11/16 [850]
	Coating on Heat Exchanger		—
	External Finish Color		White Munsell 0.7PB 9.2/0.4
	Unit Dimensions	W x D x H: In. [mm]	35-23/64 x 9-11/32 x 11-25/32 [898 x 237 x 299]
	Package Dimensions	W x D x H: In. [mm]	38-3/16 x 13-25/64 x 14-11/64 [970 x 340 x 360]
	Unit Weight	Lbs. [kg]	28 [12.7]
	Package Weight	Lbs. [kg]	32 [14.5]

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB

Conditions

[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -13 DB, -14 WB

Select high sensible versus high latent capacity mode via function setting mode 08, "Fan speed" (accessible through Touch MA, Deluxe MA, kumo touch® and kumo cloud® app control options):
- "High ceiling" mode = high sensible capacity
  - » Mode 08, setting 3 (factory default)
- "Standard" mode = high latent capacity
  - » Mode 08, setting 2

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):
- Wind baffles required to operate below 23°F DB in cooling mode.
- Heat pump system with wind baffle: 0°F - 115°F.
- Refer to wind baffle documentation for further information.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

SEACOAST PROTECTION (-BS MODELS)
- External Outer Panel: Phosphate coating + Acrylic-Enamel coating
- Fan Motor Support: Epoxy resin coating (at edge face)
- Separator Assembly Valve Bed: Epoxy resin coating (at edge face)
- Blue Fin treatment is an anti-corrosion treatment that is applied to the condenser coil to protect it against airborne contaminants.

Specifications are subject to change without notice.

SPECIFICATIONS: PKA-A12LA & PUZ-A12NKA7(-BS)

Indoor Unit Operating Temperature Range	Cooling Intake Air Temp [Maximum / Minimum]*	°F	90 DB, 73 WB / 66 DB, 59 WB
	Heating Intake Air Temp [Maximum / Minimum]	°F	82 DB / 50 DB
Outdoor Unit	MCA	A	11.0
	MOCP	A	28
	Fan Motor Full Load Amperage	A	0.5
	Fan Motor Output	W	46
	Airflow Rate	CFM	1590/1590
	Refrigerant Control		LEV
	Defrost Method		Reverse Cycle
	Coating on Heat Exchanger		Blue Fin Coating (BS Model only)
	Sound Pressure Level, Cooling[1]	dB(A)	44
	Sound Pressure Level, Heating[2]	dB(A)	46
	Compressor Type		INVERTER-driven twin rotary
	Compressor Model		SNB092FQCMC
	Compressor Rated Load Amps	A	7
	Compressor Locked Rotor Amps	A	12.0
	Compressor Oil Type // Charge	oz.	FV50S // 12
	External Finish Color		Ivory Munsell 3Y 7.8/1.1
	Base Pan Heater		N/A
	Unit Dimensions	W x D x H: In. [mm]	31-13/16 (2+7/16) x 11-13/16 x 24-13/16 [809 (+62) x 300 x 630]
	Package Dimensions	W x D x H: In. [mm]	37-1/16 x 16-3/16 x 27-7/16 [941 x 411 x 697]
	Unit Weight	Lbs. [kg]	93 [42]
	Package Weight	Lbs. [kg]	104 [47]
Outdoor Unit Operating Temperature Range	Cooling Air Temp [Maximum / Minimum]*	°F	115 DB / 0 DB
	Heating Air Temp [Maximum / Minimum]	°F	70 DB, 59 WB / 12 DB, 14 WB
	Heating Thermal Lock-out / Re-start Temperatures**	°F	8 / 12
Refrigerant	Type		R410A
	Charge	Lbs, oz	4, 7.0
	Chargeless Piping Length	Ft. [m]	70.0 [21.0]
	Additional Refrigerant Charge Per Additional Piping Length	oz./Ft. [g/m]	0.2 [19]
Piping	Gas Pipe Size O.D. [Flared]	In.[mm]	1/2 [12.7]
	Liquid Pipe Size O.D. [Flared]	In.[mm]	1/4 [6.35]
	Maximum Piping Length	Ft. [m]	100 [30]
	Maximum Height Difference	Ft. [m]	100 [30]
	Maximum Number of Bends		15

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB

Conditions

[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -13 DB, -14 WB

Select high sensible versus high latent capacity mode via function setting mode 08, "Fan speed" (accessible through Touch MA, Deluxe MA, kumo touch® and kumo cloud® app control options):

- "High ceiling" mode = high sensible capacity
  - » Mode 08, setting 3 (factory default)
- "Standard" mode = high latent capacity
  - » Mode 08, setting 2

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):

- Wind baffles required to operate below 23°F DB in cooling mode.
- Heat pump system with wind baffle: 0°F - 115°F.
- Refer to wind baffle documentation for further information.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):

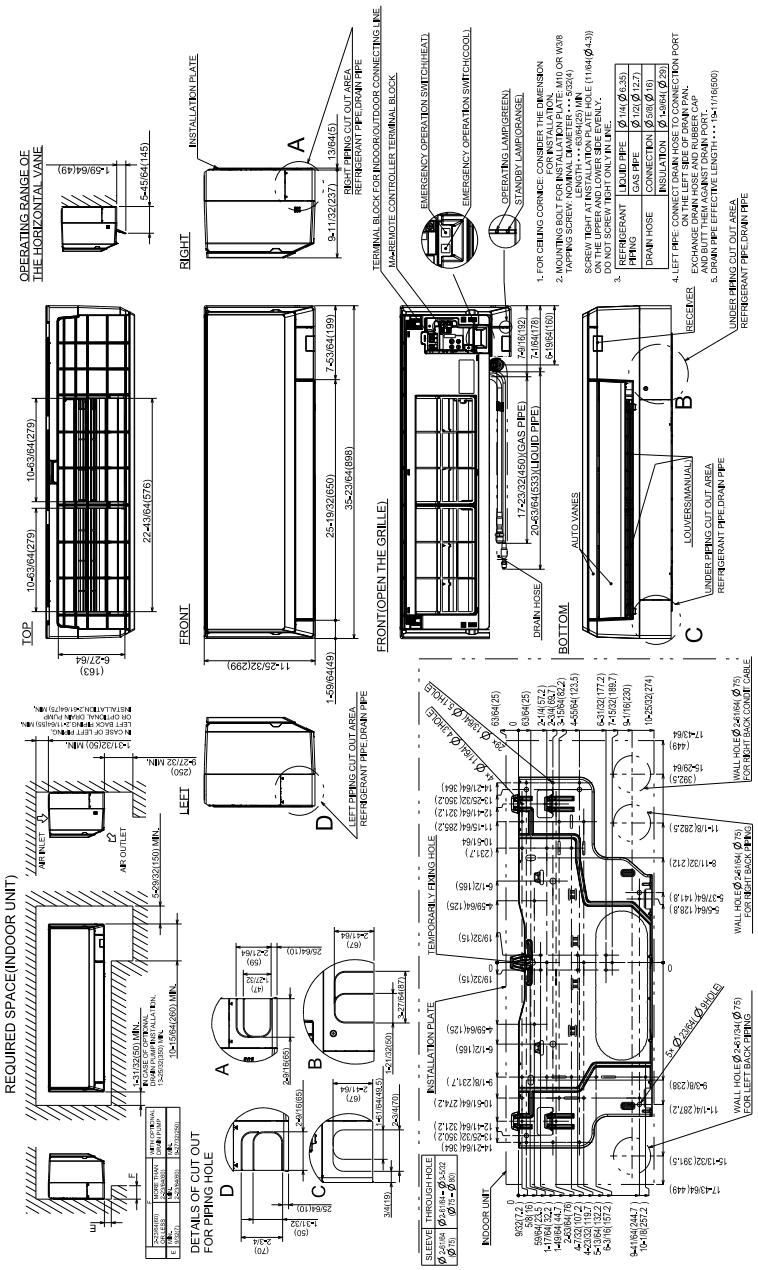
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

SEACOAST PROTECTION (-BS MODELS)

- External Outer Panel: Phosphate coating + Acrylic-Enamel coating
- Fan Motor Support: Epoxy resin coating (at edge face)
- Separator Assembly Valve Bed: Epoxy resin coating (at edge face)
- Blue Fin treatment is an anti-corrosion treatment that is applied to the condenser coil to protect it against airborne contaminants.

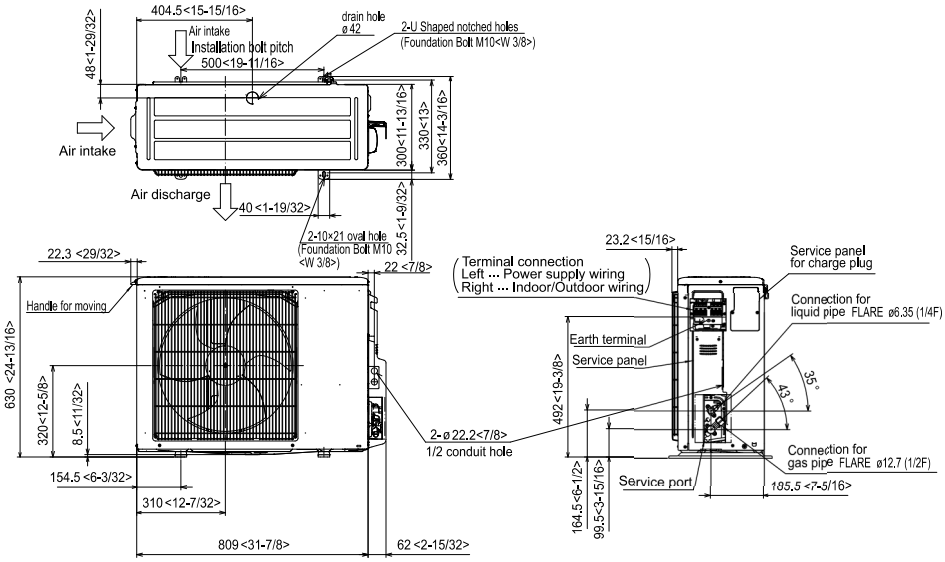
INDOOR UNIT DIMENSIONS: PKA-A12LA

Unit: inch (mm)

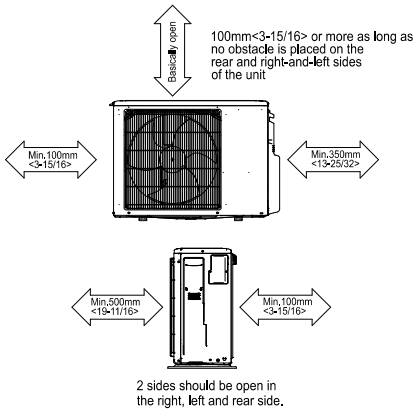


OUTDOOR UNIT DIMENSIONS: PUZ-A12NKA7(-BS)

Unit: mm<in>



Free space around the outdoor unit (basic example)

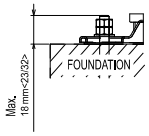


2 sides should be open in the right, left and rear side.

FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation (M10<W3/8>) bolts. (Bolts, washers and nut must be purchased locally).

<Foundation bolt height>



PIPING-WIRING DIRECTION

Piping and wiring connection can be made from the rear direction only.

1340 Satellite Boulevard Suwanee, GA 30024
Toll Free: 800-433-4822 www.mehvac.com

FORM# PKA-A12LA & PUZ-A12NKA7(-BS) - 202108

No Exception Taken
see notes above on wiring

PKA-A18LA & PUZ-A18NKA7(-BS)
18,000 BTU/H WALL MOUNT
18,000 BTU/H HEAT PUMP UNIVERSAL OUTDOOR

MITSUBISHI ELECTRIC

Job Name:
System Reference: Date:

Indoor Unit PKA-A18LA

Outdoor Unit
Standard Model PUZ-A18NKA7
Seacoast Model PUZ-A18NKA7-BS

INDOOR UNIT FEATURES
- Selectable high sensible vs high latent capacity mode
- UL 60335-2-40 compliant
- Sleek, compact design
- Simple installation
- Airflow direction control
- Auto fan mode
- Suitable for: server rooms, daycare centers, classrooms, churches, small offices, and more
- Multiple control options available:
  - kumo cloud® smart device app for remote access
  - Third-party interface options
  - Wired or wireless controllers

OUTDOOR UNIT FEATURES
- Variable speed INVERTER-driven compressor
- Power receiver pre-charged with refrigerant volume for piping length up to 70 ft
- Low ambient cooling down to 0°F providing 100% capacity
- 24-hour continuous operation (cooling mode)
- High pressure protection
- Fast restart
- Superior energy and operational efficiency

Specifications are subject to change without notice.

SPECIFICATIONS: PKA-A18LA & PUZ-A18NKA7(-BS)

Cooling at 95°F[1]	Maximum Capacity	BTU/H	18,000
	Rated Capacity	BTU/H	18,000
	Minimum Capacity	BTU/H	5,600
	Maximum Power Input	W	1,680
	Rated Power Input	W	1,680
	Moisture Removal	Pints/h	5.8
	Sensible Heat Factor		0.73
	Sensible Heat Factor - High Latent		0.64
	Power Factor	%	96.7/96.7
Heating at 47°F[2]	Maximum Capacity	BTU/H	22,000
	Rated Capacity	BTU/H	19,000
	Minimum Capacity	BTU/H	5,400
	Maximum Power Input	W	2,150
	Rated Power Input	W	1,640
	Power Factor	%	96.7/96.7
Heating at 17°F[3]	Maximum Capacity	BTU/H	13,600
	Rated Capacity	BTU/H	13,600
	Maximum Power Input	W	1,560
	Rated Power Input	W	1,560
Heating at 5°F[4]	Maximum Capacity	BTU/H	9,300
	Maximum Power Input	W	1,110
Efficiency	SEER		19.8
	EER[1]		10.7
	HSPF [IV]		11.2
	COP at 47°F[2]		3.4
	COP at 17°F at Maximum Capacity[3]		2.5
	COP at 5°F at Maximum Capacity[4]		2.4
	ENERGY STAR® Certified		No
Electrical	Voltage, Phase, Frequency		208/230, 1, 60
	Guaranteed Voltage Range	V AC	198 - 253
	Voltage: Indoor - Outdoor, S1-S2	V AC	208/230
	Voltage: Indoor - Outdoor, S2-S3	V DC	24
	Short-circuit Current Rating [SCCR]	kA	5
	Recommended Fuse/Breaker Size (Oudoor)	A	15
	Recommended Wire Size [Indoor - Outdoor]	AWG	14
	Power Supply		Indoor unit is powered by the outdoor unit
Indoor Unit	MCA	A	1.0
	Fan Motor Full Load Amperage	A	0.19
	Fan Motor Output	W	30
	Fan Motor Type		DC Motor
	Airflow Rate at Cooling, Dry	CFM	265–310–385–455
	Airflow Rate at Cooling, Wet	CFM	215–255–320–375
	Airflow Rate at Heating, Dry	CFM	265–310–385–455
	Sound Pressure Level [Cooling]	dB[A]	34–39–44–48
	Sound Pressure Level [Heating]	dB[A]	34–37–40–43
	Drain Pipe Size	In. [mm]	5/8 [16]
	Condensate Lift Mechanism, Maximum Distance	In. [mm]	19-11/16 [850]
	Coating on Heat Exchanger		—
	External Finish Color		White Munsell 0.7PB 9.2/0.4
	Unit Dimensions	W x D x H: In. [mm]	35-23/64 x 9-11/32 x 11-25/32 [898 x 237 x 299]
	Package Dimensions	W x D x H: In. [mm]	38-3/16 x 13-25/64 x 14-11/64 [970 x 340 x 360]
	Unit Weight	Lbs. [kg]	28 [12.7]
	Package Weight	Lbs. [kg]	32 [14.5]

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB

Conditions

[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
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[7]Heating at -13°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -13 DB, -14 WB

Select high sensible versus high latent capacity mode via function setting mode 08, "Fan speed" (accessible through Touch MA, Deluxe MA, kumo touch® and kumo cloud app® control options):
- "High ceiling" mode = high sensible capacity
  - » Mode 08, setting 3 (factory default)
- "Standard" mode = high latent capacity
  - » Mode 08, setting 2

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):
- Wind baffles required to operate below 23°F DB in cooling mode.
- Heat pump system with wind baffle: 0°F - 115°F.
- Refer to wind baffle documentation for further information.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

SEACOAST PROTECTION (-BS MODELS)
- External Outer Panel: Phosphate coating + Acrylic-Enamel coating
- Fan Motor Support: Epoxy resin coating (at edge face)
- Separator Assembly Valve Bed: Epoxy resin coating (at edge face)
- Blue Fin treatment is an anti-corrosion treatment that is applied to the condenser coil to protect it against airborne contaminants.

Specifications are subject to change without notice.

SPECIFICATIONS: PKA-A18LA & PUZ-A18NKA7(-BS)

Indoor Unit Operating Temperature Range	Cooling Intake Air Temp [Maximum / Minimum]*	°F	90 DB, 73 WB / 66 DB, 59 WB
	Heating Intake Air Temp [Maximum / Minimum]	°F	82 DB / 50 DB
Outdoor Unit	MCA	A	11.0
	MOCP	A	28
	Fan Motor Full Load Amperage	A	0.5
	Fan Motor Output	W	46
	Airflow Rate	CFM	1590/1590
	Refrigerant Control		LEV
	Defrost Method		Reverse Cycle
	Coating on Heat Exchanger		Blue Fin Coating (BS Model only)
	Sound Pressure Level, Cooling[1]	dB(A)	44
	Sound Pressure Level, Heating[2]	dB(A)	46
	Compressor Type		INVERTER-driven twin rotary
	Compressor Model		SNB130FQCMC-L1
	Compressor Rated Load Amps	A	7
	Compressor Locked Rotor Amps	A	12.0
	Compressor Oil Type // Charge	oz.	FV50S // 16
	External Finish Color		Ivory Munsell 3Y 7.8/1.1
	Base Pan Heater		N/A
	Unit Dimensions	W x D x H: In. [mm]	31-13/16 (2+7/16) x 11-13/16 x 24-13/16 [809 (+62) x 300 x 630]
	Package Dimensions	W x D x H: In. [mm]	37-1/16 x 16-3/16 x 27-7/16 [941 x 411 x 697]
	Unit Weight	Lbs. [kg]	100 [45]
	Package Weight	Lbs. [kg]	112 [51]
Outdoor Unit Operating Temperature Range	Cooling Air Temp [Maximum / Minimum]*	°F	115 DB / 0 DB
	Heating Air Temp [Maximum / Minimum]	°F	70 DB, 59 WB / 12 DB, 14 WB
	Heating Thermal Lock-out / Re-start Temperatures**	°F	8 / 12
Refrigerant	Type		R410A
	Charge	Lbs, oz	4, 14.0
	Chargeless Piping Length	Ft. [m]	70.0 [21.0]
	Additional Refrigerant Charge Per Additional Piping Length	oz./Ft. [g/m]	0.2 [19]
Piping	Gas Pipe Size O.D. [Flared]	In.[mm]	1/2 [12.7]
	Liquid Pipe Size O.D. [Flared]	In.[mm]	1/4 [6.35]
	Maximum Piping Length	Ft. [m]	100 [30]
	Maximum Height Difference	Ft. [m]	100 [30]
	Maximum Number of Bends		15

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB

Conditions

[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -13 DB, -14 WB

Select high sensible versus high latent capacity mode via function setting mode 08, "Fan speed" (accessible through Touch MA, Deluxe MA, kumo touch® and kumo cloud app® control options):

- "High ceiling" mode = high sensible capacity
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- "Standard" mode = high latent capacity
  - » Mode 08, setting 2

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):

- Wind baffles required to operate below 23°F DB in cooling mode.
- Heat pump system with wind baffle: 0°F - 115°F.
- Refer to wind baffle documentation for further information.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):

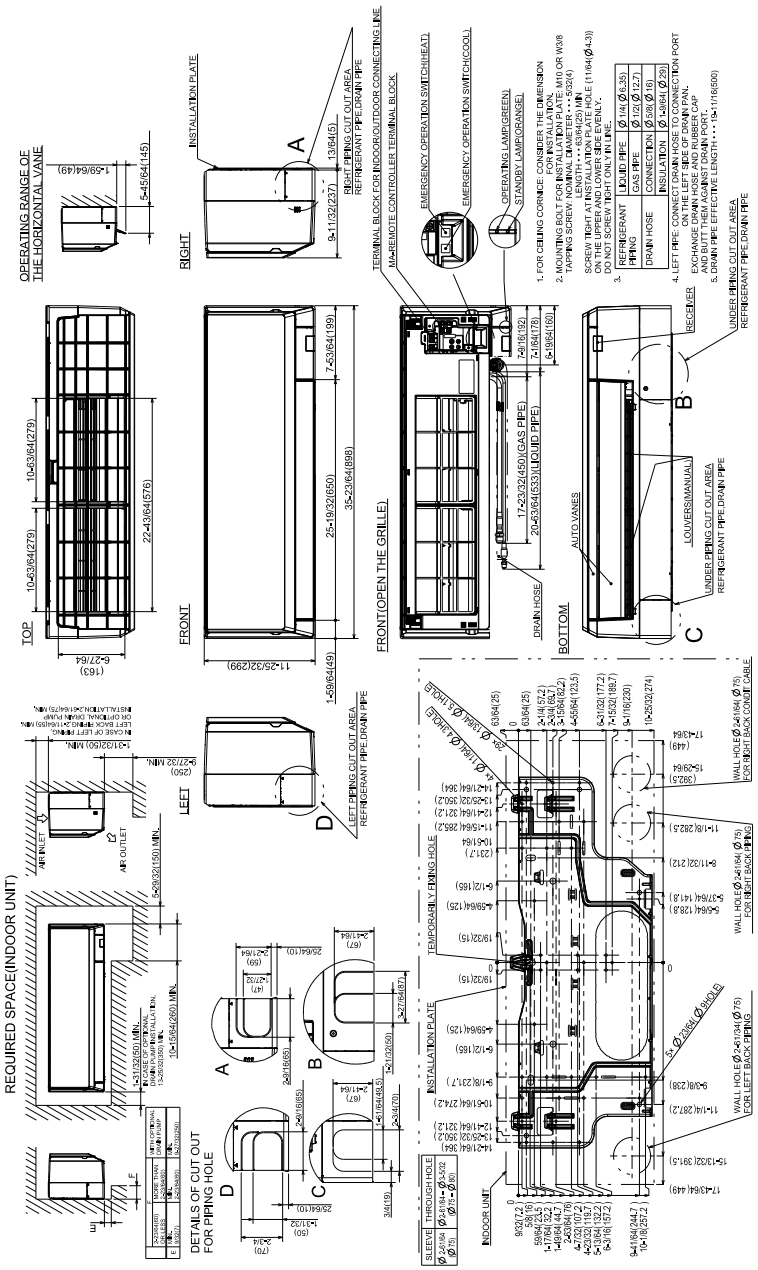
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

SEACOAST PROTECTION (-BS MODELS)

- External Outer Panel: Phosphate coating + Acrylic-Enamel coating
- Fan Motor Support: Epoxy resin coating (at edge face)
- Separator Assembly Valve Bed: Epoxy resin coating (at edge face)
- Blue Fin treatment is an anti-corrosion treatment that is applied to the condenser coil to protect it against airborne contaminants.

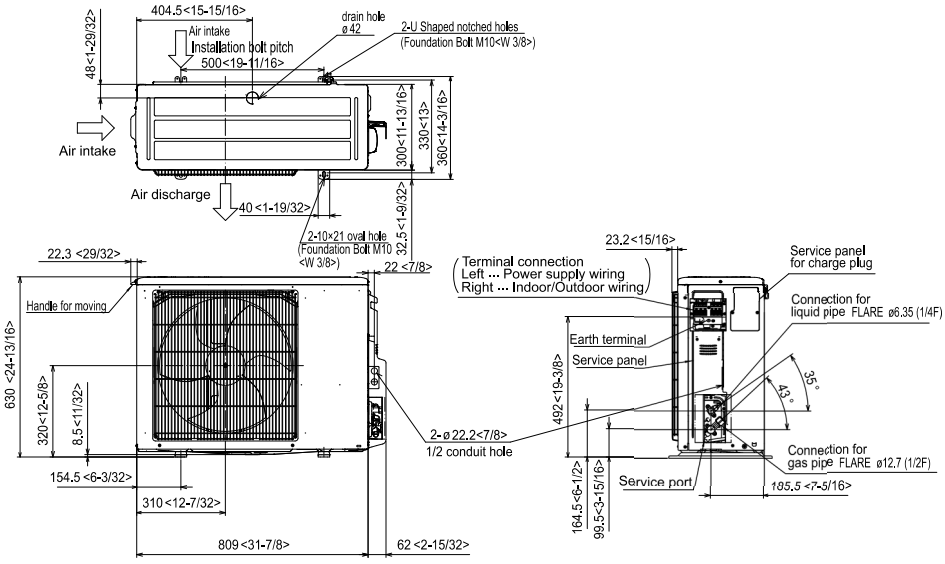
INDOOR UNIT DIMENSIONS: PKA-A18LA

Unit: inch (mm)

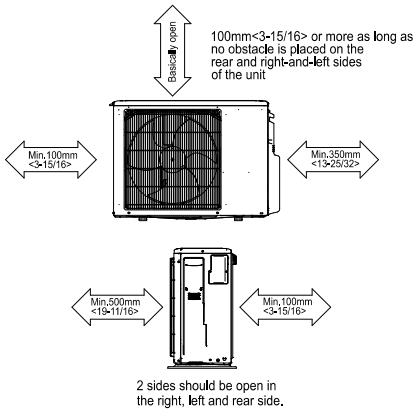


OUTDOOR UNIT DIMENSIONS: PUZ-A18NKA7(-BS)

Unit: mm<in>



Free space around the outdoor unit (basic example)

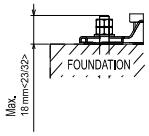


2 sides should be open in the right, left and rear side.

FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation (M10<W3/8>) bolts. (Bolts, washers and nut must be purchased locally).

<Foundation bolt height>



PIPING-WIRING DIRECTION

Piping and wiring connection can be made from the rear direction only.

1340 Satellite Boulevard Suwanee, GA 30024
Toll Free: 800-433-4822 www.mehvac.com

FORM# PKA-A18LA & PUZ-A18NKA7(-BS) - 202108

No Exception Taken
see notes above on
wiring requirements

PKA-A30KA7 & PUZ-A30NHA7(-BS)
30,000 BTU/H WALL-MOUNTED INDOOR UNIT
30,000 BTU/H HEAT PUMP UNIVERSAL OUTDOOR

MITSUBISHI ELECTRIC

Job Name:
System Reference: Date:

Indoor Unit	PKA-A30KA7
Outdoor Unit	
Standard Model	PUZ-A30NHA7
Seacoast Model	PUZ-A30NHA7-BS

INDOOR UNIT FEATURES
- Sleek, compact design
- Simple installation
- Vane setting for air flow direction control
- Auto fan speed mode
- Ideal for spaces such as server rooms, daycare centers, classrooms, churches, small offices, and more
- Multiple control options available:
  - kumo cloud® smart device app for remote access
  - Third-party interface options
  - Wired or wireless controllers

OUTDOOR UNIT FEATURES
- Variable speed INVERTER-driven compressor
- Power receiver pre-charged with refrigerant volume for piping length up to 70 ft
- Low ambient cooling down to 0°F providing 100% capacity
- 24-hour continuous operation (cooling mode)
- High pressure protection
- Fast restart
- Superior energy and operational efficiency

Specifications are subject to change without notice.

SPECIFICATIONS: PKA-A30KA7 & PUZ-A30NHA7(-BS)

Cooling at 95°F[1]	Maximum Capacity	BTU/H	30,000
	Rated Capacity	BTU/H	30,000
	Minimum Capacity	BTU/H	9,000
	Maximum Power Input	W	3,150
	Rated Power Input	W	3,150
	Moisture Removal	Pints/h	8.1
	Sensible Heat Factor		0.70
	Power Factor	%	96.4/96.4
Heating at 47°F[2]	Maximum Capacity	BTU/H	34,000
	Rated Capacity	BTU/H	32,000
	Minimum Capacity	BTU/H	8,900
	Maximum Power Input	W	2,620
	Rated Power Input	W	2,460
	Power Factor	%	960.0/960.0
Heating at 17°F[3]	Maximum Capacity	BTU/H	21,000
	Rated Capacity	BTU/H	18,300
	Maximum Power Input	W	2,080
	Rated Power Input	W	1,960
Efficiency	SEER		19.8
	EER[1]		9.5
	HSPF [IV]		9.9
	COP at 47°F[2]		3.81
	COP at 17°F at Maximum Capacity[3]		2.96
	ENERGY STAR® Certified		No
Electrical	Voltage, Phase, Frequency		208/230, 1, 60
	Guaranteed Voltage Range	V AC	198 - 253
	Voltage: Indoor - Outdoor, S1-S2	V AC	208/230
	Voltage: Indoor - Outdoor, S2-S3	V DC	24
	Short-circuit Current Rating [SCCR]	kA	5
	Recommended Fuse/Breaker Size (Oudoor)	A	25
	Recommended Wire Size [Indoor - Outdoor]	AWG	14
	Power Supply		Indoor unit is powered by the outdoor unit
Indoor Unit	MCA	A	1.0
	Fan Motor Full Load Amperage	A	0.36
	Fan Motor Output	W	56
	Fan Motor Type		DC Motor
	Airflow Rate at Cooling, Dry	CFM	635–705–775
	Airflow Rate at Cooling, Wet	CFM	570–635–700
	Airflow Rate at Heating, Dry	CFM	635–705–775
	Sound Pressure Level [Cooling]	dB[A]	39–42–45
	Sound Pressure Level [Heating]	dB[A]	39–42–45
	Drain Pipe Size	In. [mm]	5/8 [16]
	Coating on Heat Exchanger		—
	External Finish Color		White Munsell 1.0Y 9.2/0.2
	Unit Dimensions	W x D x H: In. [mm]	46-1/16 x 11-5/8 x 14-3/8 [1170 x 295 x 365]
	Package Dimensions	W x D x H: In. [mm]	51 x 14-1/4 x 18-1/2 [1295 x 362 x 470]
	Unit Weight	Lbs. [kg]	46 [21]
	Package Weight	Lbs. [kg]	53 [24]
Indoor Unit Operating Temperature Range	Cooling Intake Air Temp [Maximum / Minimum]*	°F	90 DB, 72 WB / 66 DB, 61 WB
	Heating Intake Air Temp [Maximum / Minimum]	°F	77 DB / 59 DB

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB

Conditions

[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -13 DB, -14 WB

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):
- Wind baffles required to operate below 23°F DB in cooling mode.
- Heat pump system with wind baffle: 0°F - 115°F.
- Refer to wind baffle documentation for further information.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

SEACOAST PROTECTION (-BS MODELS)
- External Outer Panel: Phosphate coating + Acrylic-Enamel coating
- Fan Motor Support: Epoxy resin coating (at edge face)
- Separator Assembly Valve Bed: Epoxy resin coating (at edge face)
- Blue Fin treatment is an anti-corrosion treatment that is applied to the condenser coil to protect it against airborne contaminants.

Specifications are subject to change without notice.

SPECIFICATIONS: PKA-A30KA7 & PUZ-A30NHA7(-BS)

Outdoor Unit	MCA	A	19.0
	MOCP	A	26
	Fan Motor Full Load Amperage	A	0.4
	Fan Motor Output	W	86
	Airflow Rate	CFM	1940/1940
	Refrigerant Control		LEV
	Defrost Method		Reverse Cycle
	Coating on Heat Exchanger		Blue Fin Coating (BS Model only)
	Sound Pressure Level, Cooling[1]	dB(A)	47
	Sound Pressure Level, Heating[2]	dB(A)	48
	Compressor Type		INVERTER-driven twin rotary
	Compressor Model		SNB172FWHM1
	Compressor Rated Load Amps	A	7
	Compressor Locked Rotor Amps	A	11.0
	Compressor Oil Type // Charge	oz.	FV50S // 23
	External Finish Color		Ivory Munsell 3Y 7.8/1.1
	Base Pan Heater		N/A
	Unit Dimensions	W x D x H: In. [mm]	37-13/32 x 13 (+1-3/16) x 37-1/8 [950 x 330 (+30) x 943]
	Package Dimensions	W x D x H: In. [mm]	40-15/16 x 17-11/16 x 40-11/16 [1040 x 450 x 1033]
	Unit Weight	Lbs. [kg]	153 [69]
	Package Weight	Lbs. [kg]	179 [81]
Outdoor Unit Operating Temperature Range	Cooling Air Temp [Maximum / Minimum]*	°F	115 DB / 0 DB
	Heating Air Temp [Maximum / Minimum]	°F	70 DB, 59 WB / -4 DB, -4 WB
	Heating Thermal Lock-out / Re-start Temperatures**	°F	-8 / -4
Refrigerant	Type		R410A
	Charge	Lbs, oz	7, 11.0
	Chargeless Piping Length	Ft. [m]	70.0 [20.0]
	Additional Refrigerant Charge Per Additional Piping Length	oz./Ft. [g/m]	0.7 [50]
Piping	Gas Pipe Size O.D. [Flared]	In.[mm]	5/8 [15.88]
	Liquid Pipe Size O.D. [Flared]	In.[mm]	3/8 [9.52]
	Maximum Piping Length	Ft. [m]	165 [50]
	Maximum Height Difference	Ft. [m]	100 [30]
	Maximum Number of Bends		15

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB

Conditions

[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -13 DB, -14 WB

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):
- Wind baffles required to operate below 23°F DB in cooling mode.
- Heat pump system with wind baffle: 0°F - 115°F.
- Refer to wind baffle documentation for further information.

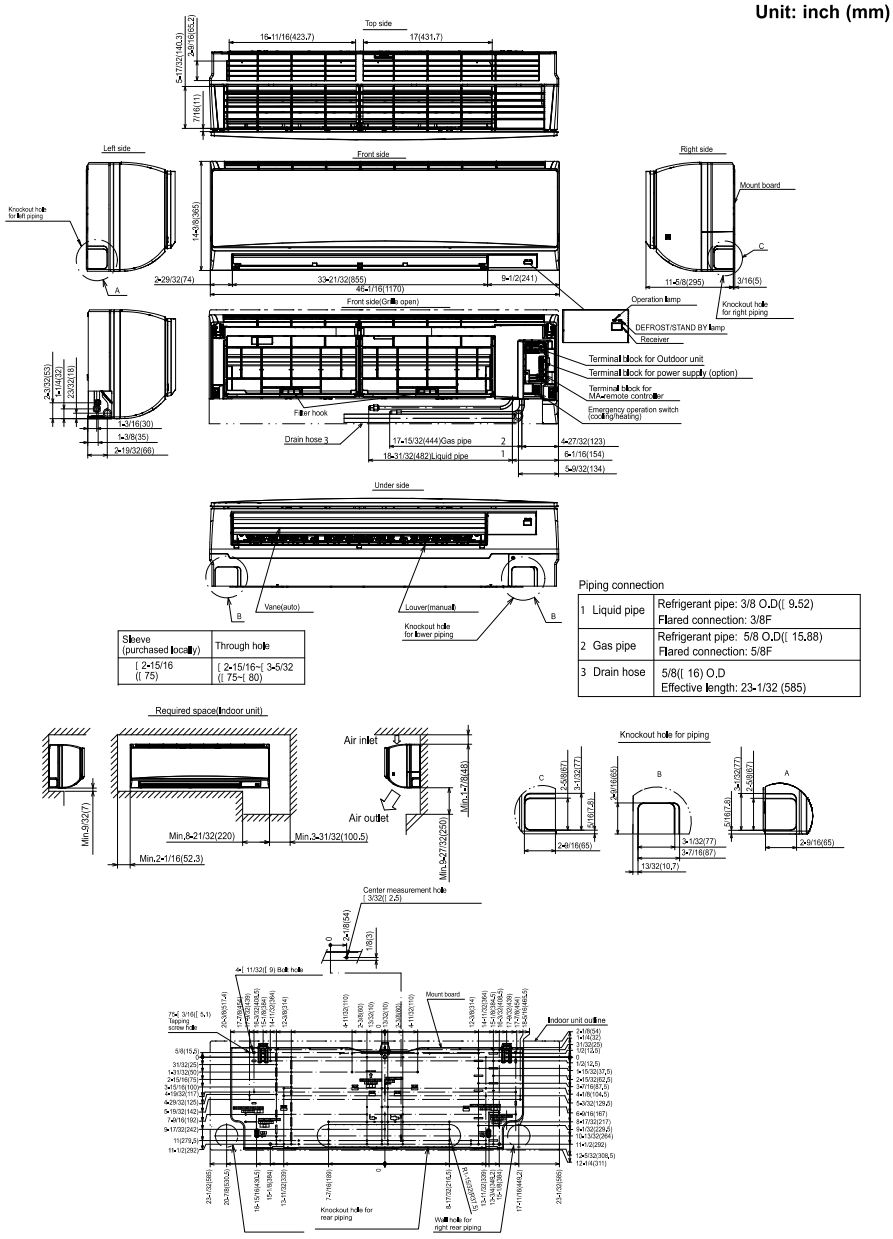
**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

SEACOAST PROTECTION (-BS MODELS)
- External Outer Panel: Phosphate coating + Acrylic-Enamel coating
- Fan Motor Support: Epoxy resin coating (at edge face)
- Separator Assembly Valve Bed: Epoxy resin coating (at edge face)
- Blue Fin treatment is an anti-corrosion treatment that is applied to the condenser coil to protect it against airborne contaminants.

Specifications are subject to change without notice.

INDOOR UNIT DIMENSIONS: PKA-A30KA7

Unit: inch (mm)

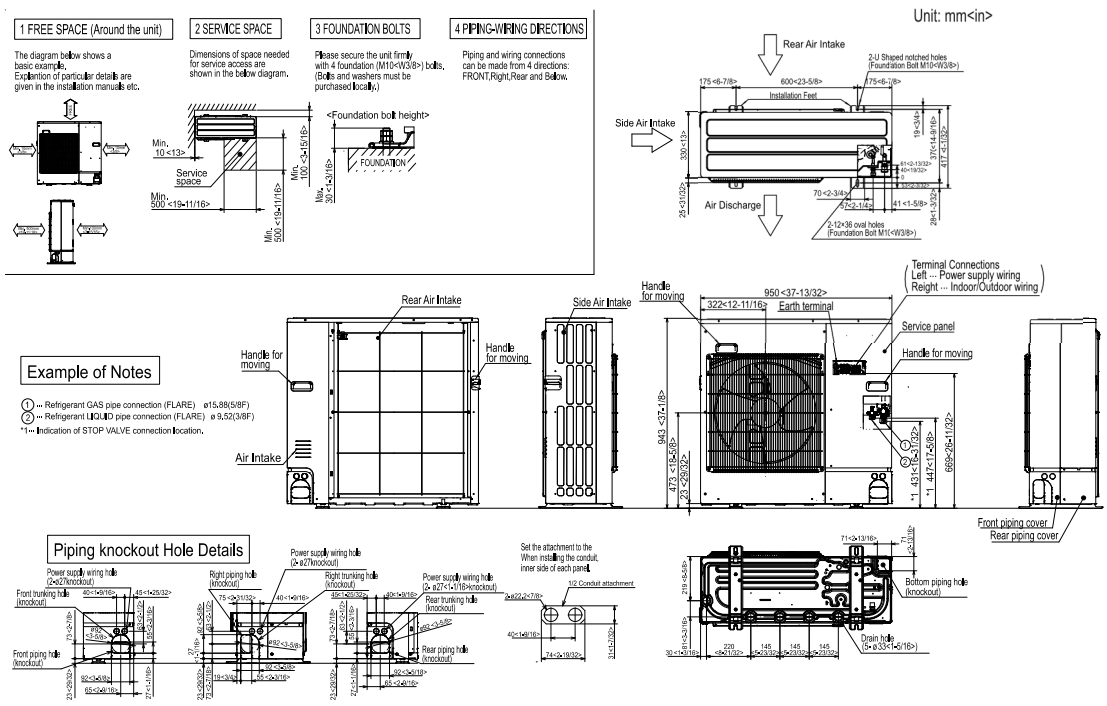


Sleeve (purchased locally)	Through hole
{ 2-15/16 ({ 75)	{ 2-15/16~{ 3-5/32 ({ 75~{ 80)

Piping connection

1 Liquid pipe	Refrigerant pipe: 3/8 O.D({ 9.52) Flared connection: 3/8F
2 Gas pipe	Refrigerant pipe: 5/8 O.D({ 15.88) Flared connection: 5/8F
3 Drain hose	5/8({ 16) O.D Effective length: 23-1/32 (585)

OUTDOOR UNIT DIMENSIONS: PUZ-A30NHA7(-BS)



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FORM# PKA-A30KA7 & PUZ-A30NHA7(-BS) - 202108

No Exception Taken

PEAD-A42AA7 & PUZ-A42NKA7(-BS)
MID STATIC HORIZONTAL-DUCTED INDOOR UNIT
42,000 BTU/H HEAT PUMP UNIVERSAL OUTDOOR

MITSUBISHI ELECTRIC

Job Name:
System Reference: Date:

Indoor Unit PEAD-A42AA7

Outdoor Unit
Standard Model PUZ-A42NKA7
Seacoast Model PUZ-A42NKA7-BS

INDOOR UNIT FEATURES
- Unobtrusive ceiling-concealed design for short-run ductwork
- Wide ranging external static pressure (0.14-0.60 in. WG)
- Built-in condensate lift mechanism (up to 27-9/16")
- Auto fan speed mode
- Optional FB Series filter boxes for easy access and service
- Ideal for residential homes, retail shopping centers, larger classrooms, office complexes, conference rooms, ballrooms, fitness centers, and more
- Multiple control options available:
  - kumo cloud® smart device app for remote access
  - Third-party interface options
  - Wired or wireless controllers

OUTDOOR UNIT FEATURES
- Variable speed INVERTER-driven compressor
- Power receiver pre-charged with refrigerant volume for piping length up to 100 ft
- Low ambient cooling down to 0°F providing 100% capacity
- 24-hour continuous operation (cooling mode)
- High pressure protection
- Fast restart
- Superior energy and operational efficiency

SPECIFICATIONS: PEAD-A42AA7 & PUZ-A42NKA7(-BS)

Cooling at 95°F[1]	Maximum Capacity	BTU/H	42,000
	Rated Capacity	BTU/H	42,000
	Minimum Capacity	BTU/H	16,000
	Maximum Power Input	W	3,920
	Rated Power Input	W	3,920
	Moisture Removal	Pints/h	9.0
	Sensible Heat Factor		0.76
	Power Factor	%	93.6/93.6
Heating at 47°F[2]	Maximum Capacity	BTU/H	48,000
	Rated Capacity	BTU/H	45,000
	Minimum Capacity	BTU/H	18,100
	Maximum Power Input	W	3,700
	Rated Power Input	W	3,290
	Power Factor	%	92.9/92.9
Heating at 17°F[3]	Maximum Capacity	BTU/H	33,700
	Rated Capacity	BTU/H	30,600
	Maximum Power Input	W	3,080
	Rated Power Input	W	3,040
Heating at 5°F[4]	Maximum Capacity	BTU/H	29,400
	Maximum Power Input	W	3,000
Efficiency	SEER		16.1
	EER[1]		10.7
	HSPF [IV]		10.0
	COP at 47°F[2]		4.0
	COP at 17°F at Maximum Capacity[3]		3.21
	COP at 5°F at Maximum Capacity[4]		2.87
	ENERGY STAR® Certified		No
Electrical	Voltage, Phase, Frequency		208/230, 1, 60
	Guaranteed Voltage Range	V AC	198 - 253
	Voltage: Indoor - Outdoor, S1-S2	V AC	208/230
	Voltage: Indoor - Outdoor, S2-S3	V DC	24
	Short-circuit Current Rating [SCCR]	kA	5
	Recommended Fuse/Breaker Size (Oudoor)	A	30
	Recommended Wire Size [Indoor - Outdoor]	AWG	14
	Power Supply		Indoor unit is powered by the outdoor unit
Indoor Unit	MCA	A	3.5
	Fan Motor Full Load Amperage	A	2.8
	Fan Motor Output	W	244
	Fan Motor Type		DC Motor
	Airflow Rate at Cooling, Dry	CFM	1042–1254–1483
	Airflow Rate at Cooling, Wet	CFM	1002–1214–1443
	Airflow Rate at Heating, Dry	CFM	1042–1254–1483
	Sound Pressure Level [Cooling]	dB[A]	36–40–44
	Sound Pressure Level [Heating]	dB[A]	36–40–44
	External Static Pressure	in.WG	0.14–0.2–0.28–0.4–0.6
	Drain Pipe Size	In. [mm]	1-1/4 [32]
	Condensate Lift Mechanism, Maximum Distance	In. [mm]	27-9/16 [700]
	Coating on Heat Exchanger		—
	External Finish Color		Galvanized
	Unit Dimensions	W x D x H: In. [mm]	55-1/8 x 28-7/8 x 9-7/8 [1400 x 732 x 250]
	Package Dimensions	W x D x H: In. [mm]	65 x 34-11/16 x 13-7/16 [1650 x 880 x 341]
	Unit Weight	Lbs. [kg]	91 [41]
	Package Weight	Lbs. [kg]	106 [48]
Indoor Unit Operating Temperature Range	Cooling Intake Air Temp [Maximum / Minimum]*	°F	90 DB, 72 WB / 66 DB, 61 WB
	Heating Intake Air Temp [Maximum / Minimum]	°F	77 DB / 59 DB

NOTES:
AHRI Rated Conditions
(Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor) °F 80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor) °F 70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor) °F 70 DB, 60 WB // 17 DB, 15 WB

Conditions

[4]Heating at 5°F (Indoor // Outdoor) °F 70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor) °F 70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor) °F 70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor) °F 70 DB, 60 WB // -13 DB, -14 WB

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):
- Wind baffles required to operate below 23°F DB in cooling mode.
- Heat pump system with wind baffle: 0°F - 115°F.
- Refer to wind baffle documentation for further information.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

SEACOAST PROTECTION (-BS MODELS)
- External Outer Panel: Phosphate coating + Acrylic-Enamel coating
- Fan Motor Support: Epoxy resin coating (at edge face)
- Separator Assembly Valve Bed: Epoxy resin coating (at edge face)
- Blue Fin treatment is an anti-corrosion treatment that is applied to the condenser coil to protect it against airborne contaminants.

Specifications are subject to change without notice.

SPECIFICATIONS: PEAD-A42AA7 & PUZ-A42NKA7(-BS)

Outdoor Unit	MCA	A	25.0
	MOCP	A	31
	Fan Motor Full Load Amperage	A	0.5 + 0.5
	Fan Motor Output	W	74
	Airflow Rate	CFM	3880/3880
	Refrigerant Control		LEV
	Defrost Method		Reverse Cycle
	Coating on Heat Exchanger		Blue Fin Coating (BS Model only)
	Sound Pressure Level, Cooling[1]	dB(A)	52
	Sound Pressure Level, Heating[2]	dB(A)	53
	Compressor Type		INVERTER-driven twin rotary
	Compressor Model		MNB33FBRMC-L
	Compressor Rated Load Amps	A	8
	Compressor Locked Rotor Amps	A	13.0
	Compressor Oil Type // Charge	oz.	FV50S // 45
	External Finish Color		Ivory Munsell 3Y 7.8/1.1
	Base Pan Heater		N/A
	Unit Dimensions	W x D x H: In. [mm]	41-5/16 x 13 (+1-3/16) x 52-11/16 [1050 x 330 (+30) x 1338]
	Package Dimensions	W x D x H: In. [mm]	42-15/16 x 17-11/16 x 56-4/16 [1091 x 450 x 1429]
	Unit Weight	Lbs. [kg]	214 [97]
	Package Weight	Lbs. [kg]	245 [111]
Outdoor Unit Operating Temperature Range	Cooling Air Temp [Maximum / Minimum]*	°F	115 DB / 0 DB
	Heating Air Temp [Maximum / Minimum]	°F	70 DB, 59 WB / -4 DB, -4 WB
	Heating Thermal Lock-out / Re-start Temperatures**	°F	-8 / -4
Refrigerant	Type		R410A
	Charge	Lbs, oz	10, 6.0
	Chargeless Piping Length	Ft. [m]	0.0 [30.0]
	Additional Refrigerant Charge Per Additional Piping Length	oz./Ft. [g/m]	0.7 [50]
Piping	Gas Pipe Size O.D. [Flared]	In.[mm]	5/8 [15.88]
	Liquid Pipe Size O.D. [Flared]	In.[mm]	3/8 [9.52]
	Maximum Piping Length	Ft. [m]	165 [50]
	Maximum Height Difference	Ft. [m]	100 [30]
	Maximum Number of Bends		15

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)

Conditions			
[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB
[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -13 DB, -14 WB

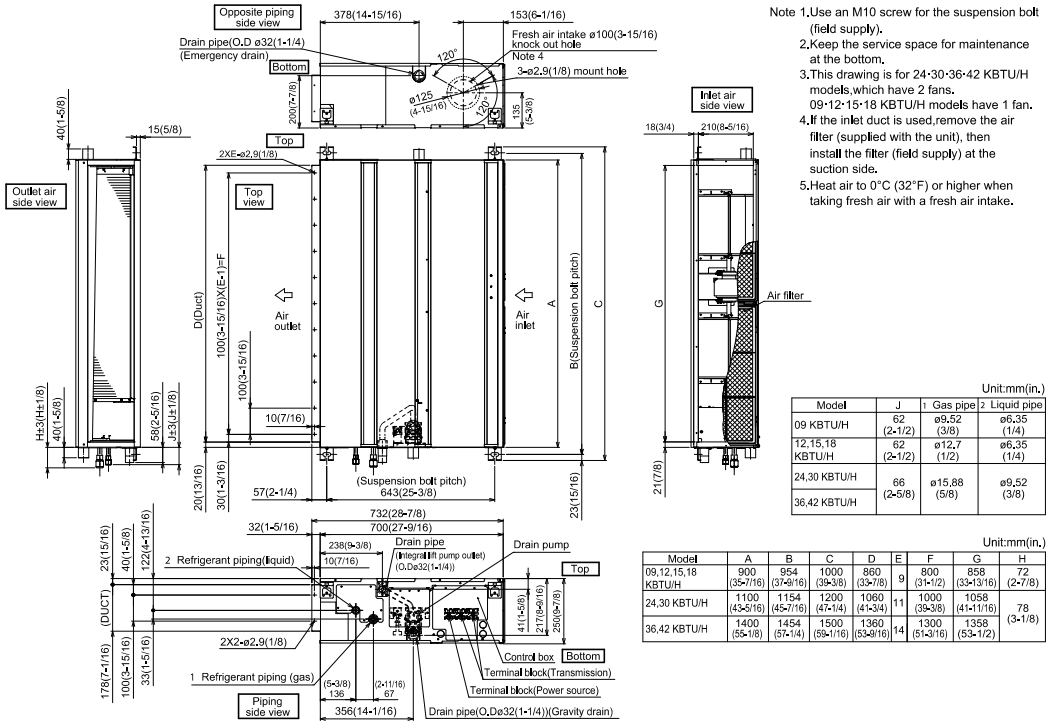
*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):
- Wind baffles required to operate below 23°F DB in cooling mode.
- Heat pump system with wind baffle: 0°F - 115°F.
- Refer to wind baffle documentation for further information.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

SEACOAST PROTECTION (-BS MODELS)
- External Outer Panel: Phosphate coating + Acrylic-Enamel coating
- Fan Motor Support: Epoxy resin coating (at edge face)
- Separator Assembly Valve Bed: Epoxy resin coating (at edge face)
- Blue Fin treatment is an anti-corrosion treatment that is applied to the condenser coil to protect it against airborne contaminants.

Specifications are subject to change without notice.

INDOOR UNIT DIMENSIONS: PEAD-A42AA7



Unit:mm(in.)

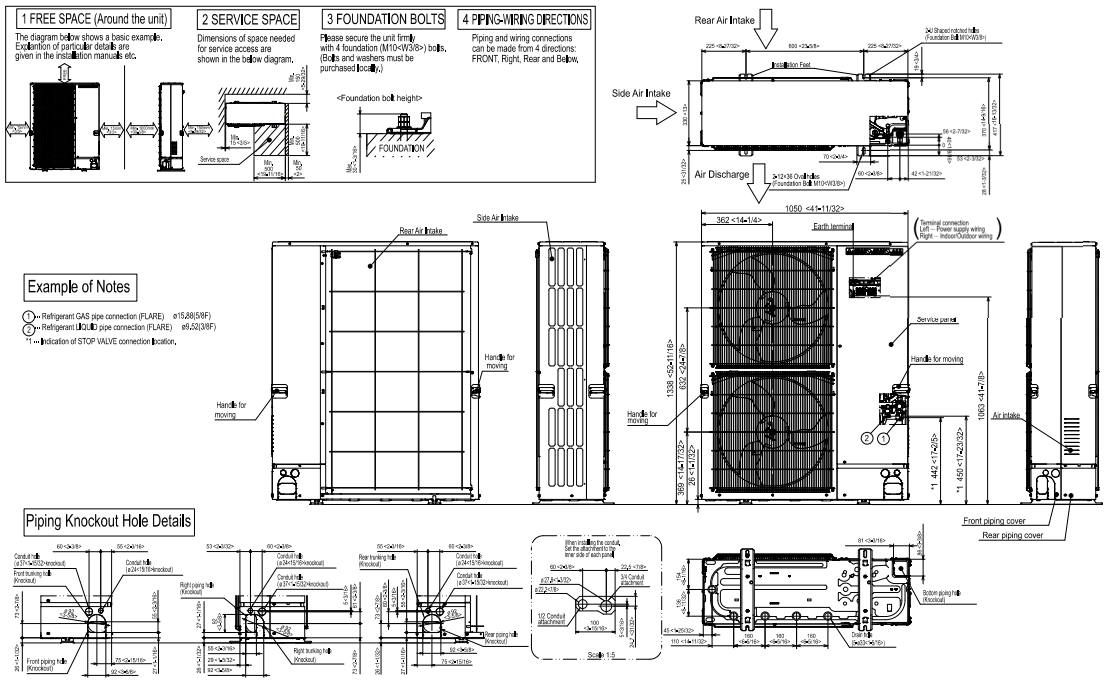
Model	J	1 Gas pipe	2 Liquid pipe
09 KBTU/H	62 (2-1/2)	ø9.52 (3/8)	ø6.35 (1/4)
12,15,18 KBTU/H	62 (2-1/2)	ø12.7 (1/2)	ø6.35 (1/4)
24,30 KBTU/H	66 (2-5/8)	ø15.88 (5/8)	ø9.52 (3/8)
36,42 KBTU/H			

Unit:mm(in.)

Model	A	B	C	D	E	F	G	H
09,12,15,18 KBTU/H	900 (35-7/16)	954 (37-9/16)	1000 (39-3/8)	860 (33-7/8)	9	800 (31-1/2)	858 (33-13/16)	72 (2-7/8)
24,30 KBTU/H	1100 (43-5/16)	1154 (45-7/16)	1200 (47-1/4)	1060 (41-3/4)	11	1000 (39-3/8)	1058 (41-11/16)	78 (3-1/8)
36,42 KBTU/H	1400 (55-1/8)	1454 (57-1/4)	1500 (59-1/16)	1360 (53-9/16)	14	1300 (51-3/16)	1358 (53-1/2)	

OUTDOOR UNIT DIMENSIONS: PUZ-A42NKA7(-BS)

Unit: mm<in>



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FORM# PEAD-A42AA7 & PUZ-A42NKA7(-BS) - 202108

No Exception Taken

PCA-A36KA7 & PUZ-HA36NKA
36,000 BTU/H CEILING SUSPENDED
36,000 BTU/H HYPER-HEATING UNIVERSAL OUTDOOR

MITSUBISHI ELECTRIC

Job Name:
System Reference: Date:

Indoor Unit PCA-A36KA7

Outdoor Unit PUZ-HA36NKA

INDOOR UNIT FEATURES
- Airflow settings for high and low ceiling applications
- Knock-out for outside-air intake
- Optional i-see Sensor™ for air distribution and energy saving
- Auto fan speed mode
- Filter status indicator
- Easy-to-clean, washable filter
- Suspends from ceiling for quick and easy installation
- Ideal for larger retail stores, classrooms, and restaurants
- Multiple control options available:
  - kumo cloud® smart device app for remote access
  - Third-party interface options
  - Wired or wireless controllers

OUTDOOR UNIT FEATURES
- Variable speed INVERTER-driven compressor
- High heating capacity: flash injection circuit maintains 100% heating capacity at 5°F outdoor temperature
- Wide heating range: heating performance down to -13°F (average of 80% heating capacity)
- High speed heating at start up: Hyper-Heating INVERTER® reduces the time for heating at start up by about half compared to standard models
- Suction accumulator pre-charged with refrigerant volume for piping length up to 100 ft.
- Twinning of two indoor units possible with the 36 KBTU/H model
- High pressure/temperature protection
- Built-in base pan heater
- Flash injection circuit provides efficient high heating capacities at low ambient temperatures

Specifications are subject to change without notice.

SPECIFICATIONS: PCA-A36KA7 & PUZ-HA36NKA

Cooling at 95°F[1]	Maximum Capacity	BTU/H	34,000
	Rated Capacity	BTU/H	34,000
	Minimum Capacity	BTU/H	14,900
	Maximum Power Input	W	2,700
	Rated Power Input	W	2,700
	Moisture Removal	Pints/h	7.9
	Sensible Heat Factor		0.74
	Power Factor	%	95.0/95.0
Heating at 47°F[2]	Maximum Capacity	BTU/H	40,000
	Rated Capacity	BTU/H	38,000
	Minimum Capacity	BTU/H	17,400
	Maximum Power Input	W	3,700
	Rated Power Input	W	3,360
	Power Factor	%	96.0/96.0
Heating at 17°F[3]	Maximum Capacity	BTU/H	38,000
	Rated Capacity	BTU/H	25,400
	Maximum Power Input	W	5,275
	Rated Power Input	W	3,125
Heating at 5°F[4]	Maximum Capacity	BTU/H	38,000
	Maximum Power Input	W	6,095
Heating at -13°F[7]	Maximum Capacity	BTU/H	30,400
Efficiency	SEER		18.0
	EER[1]		12.5
	HSPF [IV]		10.3
	COP at 47°F[2]		3.31
	COP at 17°F at Maximum Capacity[3]		2.1
	COP at 5°F at Maximum Capacity[4]		1.75
	COP at -13°F at Maximum Capacity[7]		1.4
	ENERGY STAR® Certified		Yes
Electrical	Voltage, Phase, Frequency		208/230, 1, 60
	Guaranteed Voltage Range	V AC	198 - 253
	Voltage: Indoor - Outdoor, S1-S2	V AC	208/230
	Voltage: Indoor - Outdoor, S2-S3	V DC	24
	Short-circuit Current Rating [SCCR]	kA	5
	Recommended Fuse/Breaker Size (Oudoor)	A	35
	Recommended Wire Size [Indoor - Outdoor]	AWG	14
	Power Supply		Indoor unit is powered by the outdoor unit
Indoor Unit	MCA	A	2.0
	Fan Motor Full Load Amperage	A	0.97
	Fan Motor Output	W	160
	Fan Motor Type		DC Motor
	Airflow Rate at Cooling, Dry	CFM	775–850–920–990
	Airflow Rate at Cooling, Wet	CFM	705–775–850–920
	Airflow Rate at Heating, Dry	CFM	775–850–920–990
	Sound Pressure Level [Cooling]	dB[A]	37–39–41–43
	Sound Pressure Level [Heating]	dB[A]	37–39–41–43
	Drain Pipe Size	In. [mm]	1-1/32 [26]
	Coating on Heat Exchanger		—
	External Finish Color		White Munsell 6.4Y 8.9/0.4
	Unit Dimensions	W x D x H: In. [mm]	63 x 26-3/4 x 9-1/16 [1600 x 680 x 230]
	Package Dimensions	W x D x H: In. [mm]	65-3/4 x 29-15/16 x 13-3/4 [1670 x 760 x 350]
	Unit Weight	Lbs. [kg]	79 [36]
	Package Weight	Lbs. [kg]	93 [42]
Indoor Unit Operating Temperature Range	Cooling Intake Air Temp [Maximum / Minimum]*	°F	90 DB, 72 WB / 68 DB, 61 WB
	Heating Intake Air Temp [Maximum / Minimum]	°F	77 DB / 59 DB

NOTES:

AHRI Rated Conditions
(Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor) °F 80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor) °F 70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor) °F 70 DB, 60 WB // 17 DB, 15 WB

Conditions

[4]Heating at 5°F (Indoor // Outdoor) °F 70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor) °F 70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor) °F 70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor) °F 70 DB, 60 WB // -13 DB, -14 WB

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):
- Wind baffles required to operate below 23°F DB in cooling mode.
- Refer to wind baffle documentation for further information.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

Specifications are subject to change without notice.

SPECIFICATIONS: PCA-A36KA7 & PUZ-HA36NKA

Outdoor Unit	MCA	A	24.0
	MOCP	A	40
	Fan Motor Output	W	74
	Airflow Rate	CFM	3880/3880
	Refrigerant Control		LEV
	Defrost Method		Reverse Cycle
	Sound Pressure Level, Cooling[1]	dB(A)	52
	Sound Pressure Level, Heating[2]	dB(A)	53
	Compressor Type		Scroll
	Compressor Model		ANB33FJMMT
	Compressor Rated Load Amps	A	18
	Compressor Locked Rotor Amps	A	27.5
	Compressor Oil Type // Charge	oz.	FV50S // 1.4,47
	External Finish Color		Ivory Munsell 3Y 7.8/1.1
	Base Pan Heater		Built-in
	Unit Dimensions	W x D x H: In. [mm]	41-5/16 x 14-3/16 x 52-11/16 [1050 x 360 x 1338]
	Package Dimensions	W x D x H: In. [mm]	43 x 18 x 57 [1110 x 480 x 1440]
	Unit Weight	Lbs. [kg]	261 [118]
	Package Weight	Lbs. [kg]	285 [129]
Outdoor Unit Operating Temperature Range	Cooling Air Temp [Maximum / Minimum]*	°F	115 DB / 0 DB
	Heating Air Temp [Maximum / Minimum]	°F	70 DB, 59 WB / -13 DB, -13 WB
	Heating Thermal Lock-out / Re-start Temperatures**	°F	-22 / -13
Refrigerant	Type		R410A
	Charge	Lbs, oz	11, 7.0
	Chargeless Piping Length	Ft. [m]	0.0 [30.0]
	Additional Refrigerant Charge Per Additional Piping Length	oz./Ft. [g/m]	0.6 [56]
Piping	Gas Pipe Size O.D. [Flared]	In.[mm]	5/8 [15.88]
	Liquid Pipe Size O.D. [Flared]	In.[mm]	3/8 [9.52]
	Maximum Piping Length	Ft. [m]	245 [75]
	Maximum Height Difference	Ft. [m]	100 [30]
	Maximum Number of Bends		15

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB

Conditions

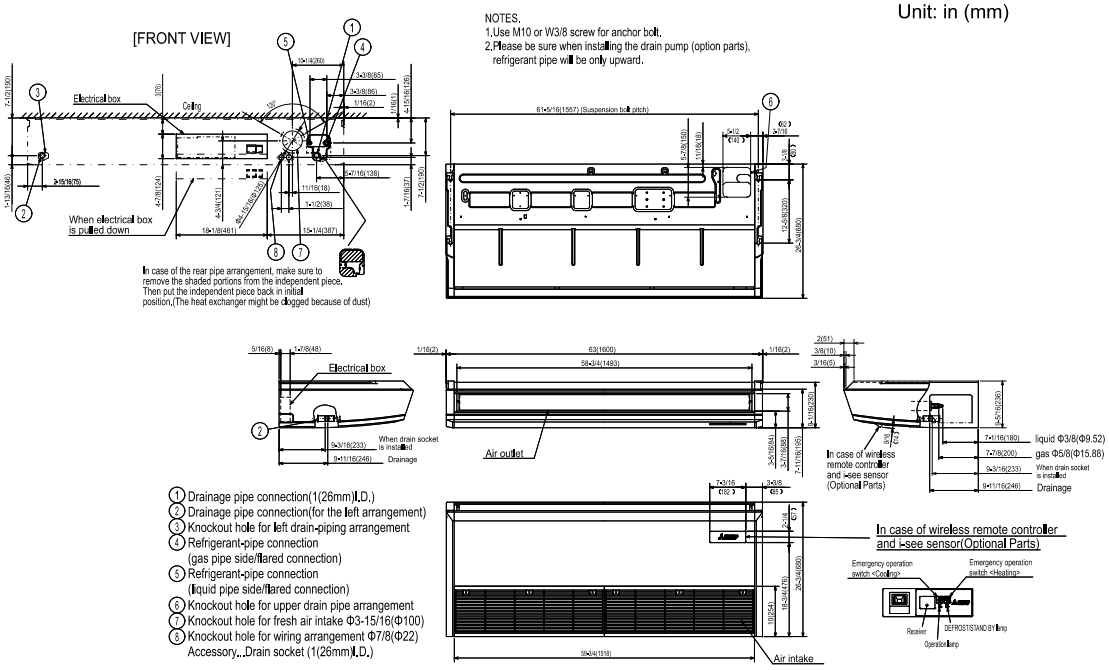
[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -13 DB, -14 WB

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):
- Wind baffles required to operate below 23°F DB in cooling mode.
- Refer to wind baffle documentation for further information.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

INDOOR UNIT DIMENSIONS: PCA-A36KA7

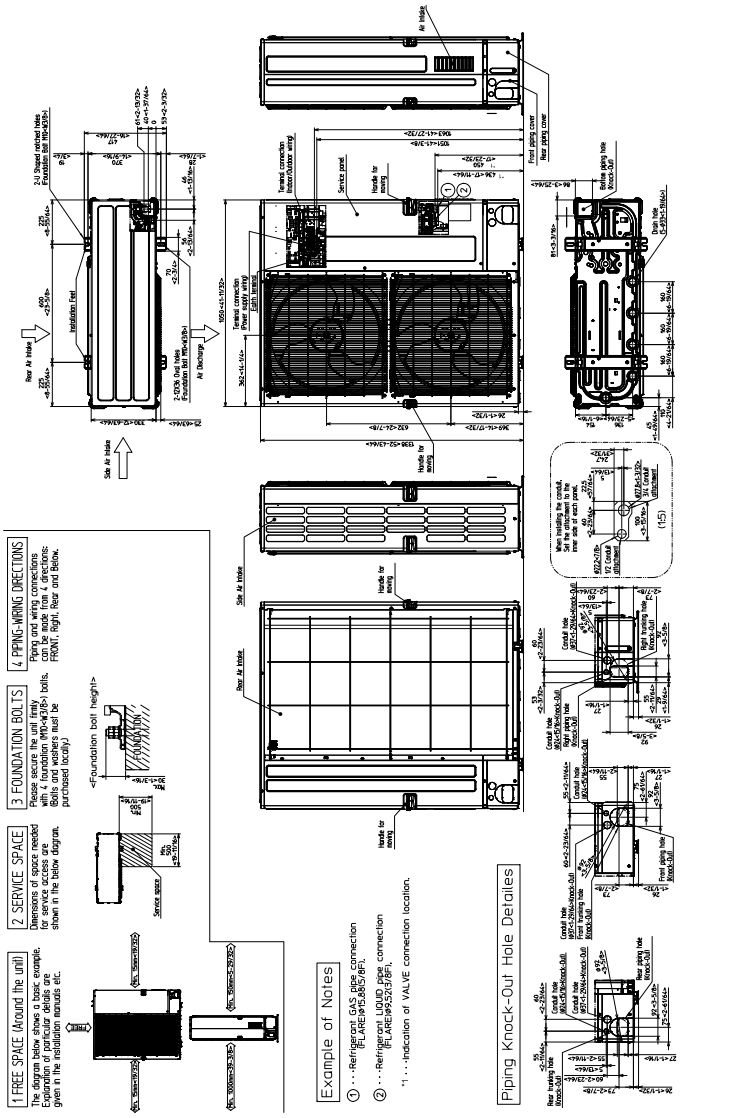
Unit: in (mm)



① Drainage pipe connection(1(26mm)I.D.)
② Drainage pipe connection(for the left arrangement)
③ Knockout hole for left drain-piping arrangement
④ Refrigerant-pipe connection (gas pipe side/flared connection)
⑤ Refrigerant-pipe connection (liquid pipe side/flared connection)
⑥ Knockout hole for upper drain pipe arrangement
⑦ Knockout hole for fresh air intake Φ3-15/16(Φ100)
⑧ Knockout hole for wiring arrangement Φ7/8(Φ22)
Accessory...Drain socket (1(26mm)I.D.)

OUTDOOR UNIT DIMENSIONS: PUZ-HA36NKA

Unit: mm<in>



1340 Satellite Boulevard Suwanee, GA 30024
Toll Free: 800-433-4822 www.mehvac.com

FORM# PCA-A36KA7 & PUZ-HA36NKA - 202108

PEAD-A18AA7 & PUZ-A18NKA7(-BS)
MID STATIC HORIZONTAL-DUCTED INDOOR UNIT
18,000 BTU/H HEAT PUMP UNIVERSAL OUTDOOR

MITSUBISHI ELECTRIC

Job Name:
System Reference: Date:

Indoor Unit PEAD-A18AA7

Outdoor Unit
- ☐ Standard Model PUZ-A18NKA7
- ☐ Seacoast Model PUZ-A18NKA7-BS

INDOOR UNIT FEATURES
- Unobtrusive ceiling-concealed design for short-run ductwork
- Wide ranging external static pressure (0.14-0.60 in. WG)
- Built-in condensate lift mechanism (up to 27-9/16")
- Auto fan speed mode
- Optional FB Series filter boxes for easy access and service
- Ideal for residential homes, retail shopping centers, larger classrooms, office complexes, conference rooms, ballrooms, fitness centers, and more
- Multiple control options available:
  - kumo cloud® smart device app for remote access
  - Third-party interface options
  - Wired or wireless controllers

OUTDOOR UNIT FEATURES
- Variable speed INVERTER-driven compressor
- Power receiver pre-charged with refrigerant volume for piping length up to 70 ft
- Low ambient cooling down to 0°F providing 100% capacity
- 24-hour continuous operation (cooling mode)
- High pressure protection
- Fast restart
- Superior energy and operational efficiency

SPECIFICATIONS: PEAD-A18AA7 & PUZ-A18NKA7(-BS)

Cooling at 95°F[1]	Maximum Capacity	BTU/H	18,000
	Rated Capacity	BTU/H	18,000
	Minimum Capacity	BTU/H	8,000
	Maximum Power Input	W	1,660
	Rated Power Input	W	1,660
	Moisture Removal	Pints/h	3.7
	Sensible Heat Factor		0.77
	Power Factor	%	91.4/91.4
Heating at 47°F[2]	Maximum Capacity	BTU/H	22,000
	Rated Capacity	BTU/H	19,000
	Minimum Capacity	BTU/H	7,900
	Maximum Power Input	W	1,750
	Rated Power Input	W	1,400
	Power Factor	%	92.0/92.0
Heating at 17°F[3]	Maximum Capacity	BTU/H	13,500
	Rated Capacity	BTU/H	11,000
	Maximum Power Input	W	1,440
	Rated Power Input	W	1,350
Efficiency	SEER		19.9
	EER[1]		10.8
	HSPF [IV]		10.2
	COP at 47°F[2]		3.97
	COP at 17°F at Maximum Capacity[3]		2.75
	ENERGY STAR® Certified		No
Electrical	Voltage, Phase, Frequency		208/230, 1, 60
	Guaranteed Voltage Range	V AC	198 - 253
	Voltage: Indoor - Outdoor, S1-S2	V AC	208/230
	Voltage: Indoor - Outdoor, S2-S3	V DC	24
	Short-circuit Current Rating [SCCR]	kA	5
	Recommended Fuse/Breaker Size (Oudoor)	A	15
	Recommended Wire Size [Indoor - Outdoor]	AWG	14
	Power Supply		Indoor unit is powered by the outdoor unit
Indoor Unit	MCA	A	1.69
	Fan Motor Full Load Amperage	A	1.35
	Fan Motor Output	W	85
	Fan Motor Type		DC Motor
	Airflow Rate at Cooling, Dry	CFM	424–512–600
	Airflow Rate at Cooling, Wet	CFM	382–461–540
	Airflow Rate at Heating, Dry	CFM	424–512–600
	Sound Pressure Level [Cooling]	dB[A]	30–33–37
	Sound Pressure Level [Heating]	dB[A]	30–33–37
	External Static Pressure	in.WG	0.14–0.2–0.28–0.4–0.6
	Drain Pipe Size	In. [mm]	1-1/4 [32]
	Condensate Lift Mechanism, Maximum Distance	In. [mm]	27-9/16 [700]
	Coating on Heat Exchanger		—
	External Finish Color		Galvanized
	Unit Dimensions	W x D x H: In. [mm]	35-7/16 x 28-7/8 x 9-7/8 [900 x 732 x 250]
	Package Dimensions	W x D x H: In. [mm]	45-5/16 x 34-11/16 x 13-7/16 [1150 x 880 x 341]
	Unit Weight	Lbs. [kg]	62 [28]
	Package Weight	Lbs. [kg]	71 [32]
Indoor Unit Operating Temperature Range	Cooling Intake Air Temp [Maximum / Minimum]*	°F	90 DB, 72 WB / 66 DB, 61 WB
	Heating Intake Air Temp [Maximum / Minimum]	°F	77 DB / 59 DB

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 17 DB, 15 WB

Conditions

[4]Heating at 5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // 5 DB, 4 WB
[5]Heating at -4°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -4 DB, -5 WB
[6]Heating at -5°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -5 DB, -6 WB
[7]Heating at -13°F (Indoor // Outdoor)	°F	70 DB, 60 WB // -13 DB, -14 WB

*Outdoor Unit Operating Temperature Range (Cooling Air Temp (Maximum / Minimum)):
- Wind baffles required to operate below 23°F DB in cooling mode.
- Heat pump system with wind baffle: 0°F - 115°F.
- Refer to wind baffle documentation for further information.

**Outdoor Unit Operating Temperature Range (Cooling Thermal Lock-out / Re-start Temperatures; Heating Thermal Lock-out / Re-start Temperatures):
- System cuts out in heating mode to avoid thermistor error and automatically restarts at these temperatures.

SEACOAST PROTECTION (-BS MODELS)
- External Outer Panel: Phosphate coating + Acrylic-Enamel coating
- Fan Motor Support: Epoxy resin coating (at edge face)
- Separator Assembly Valve Bed: Epoxy resin coating (at edge face)
- Blue Fin treatment is an anti-corrosion treatment that is applied to the condenser coil to protect it against airborne contaminants.

Specifications are subject to change without notice.

SPECIFICATIONS: PEAD-A18AA7 & PUZ-A18NKA7(-BS)

Outdoor Unit	MCA	A	11.0
	MOCP	A	28
	Fan Motor Full Load Amperage	A	0.5
	Fan Motor Output	W	46
	Airflow Rate	CFM	1590/1590
	Refrigerant Control		LEV
	Defrost Method		Reverse Cycle
	Coating on Heat Exchanger		Blue Fin Coating (BS Model only)
	Sound Pressure Level, Cooling[1]	dB(A)	44
	Sound Pressure Level, Heating[2]	dB(A)	46
	Compressor Type		INVERTER-driven twin rotary
	Compressor Model		SNB130FQCMC-L1
	Compressor Rated Load Amps	A	7
	Compressor Locked Rotor Amps	A	12.0
	Compressor Oil Type // Charge	oz.	FV50S // 16
	External Finish Color		Ivory Munsell 3Y 7.8/1.1
	Base Pan Heater		N/A
	Unit Dimensions	W x D x H: In. [mm]	31-13/16 (2+7/16) x 11-13/16 x 24-13/16 [809 (+62) x 300 x 630]
	Package Dimensions	W x D x H: In. [mm]	37-1/16 x 16-3/16 x 27-7/16 [941 x 411 x 697]
	Unit Weight	Lbs. [kg]	100 [45]
	Package Weight	Lbs. [kg]	112 [51]
Outdoor Unit Operating Temperature Range	Cooling Air Temp [Maximum / Minimum]*	°F	115 DB / 0 DB
	Heating Air Temp [Maximum / Minimum]	°F	70 DB, 59 WB / 12 DB, 14 WB
	Heating Thermal Lock-out / Re-start Temperatures**	°F	8 / 12
Refrigerant	Type		R410A
	Charge	Lbs, oz	4, 14.0
	Chargeless Piping Length	Ft. [m]	70.0 [21.0]
	Additional Refrigerant Charge Per Additional Piping Length	oz./Ft. [g/m]	0.2 [19]
Piping	Gas Pipe Size O.D. [Flared]	In.[mm]	1/2 [12.7]
	Liquid Pipe Size O.D. [Flared]	In.[mm]	1/4 [6.35]
	Maximum Piping Length	Ft. [m]	100 [30]
	Maximum Height Difference	Ft. [m]	100 [30]
	Maximum Number of Bends		15

NOTES:

AHRI Rated Conditions (Rated data is determined at a fixed compressor speed)	[1]Cooling (Indoor // Outdoor)	°F	80 DB, 67 WB // 95 DB, 75 WB
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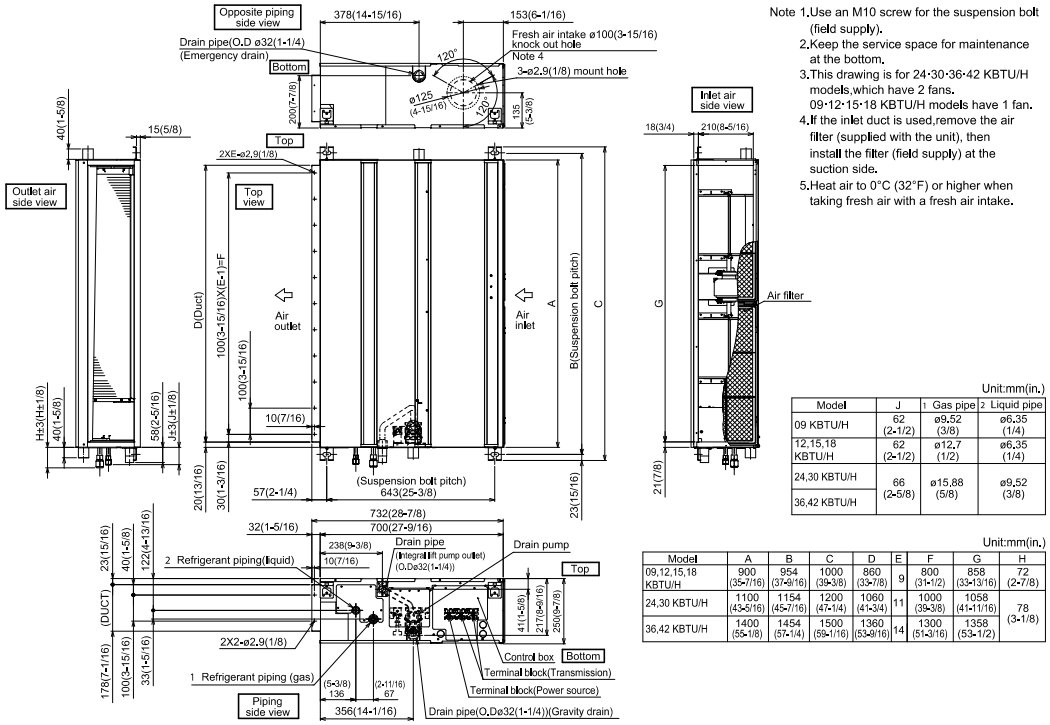
INDOOR UNIT DIMENSIONS: PEAD-A18AA7



Note 1. Use an M10 screw for the suspension bolt (field supply).
2. Keep the service space for maintenance at the bottom.
3. This drawing is for 24·30·36·42 KBTU/H models,which have 2 fans. 09·12·15·18 KBTU/H models have 1 fan.
4. If the inlet duct is used,remove the air filter (supplied with the unit), then install the filter (field supply) at the suction side.
5. Heat air to 0°C (32°F) or higher when taking fresh air with a fresh air intake.

Unit:mm(in.)

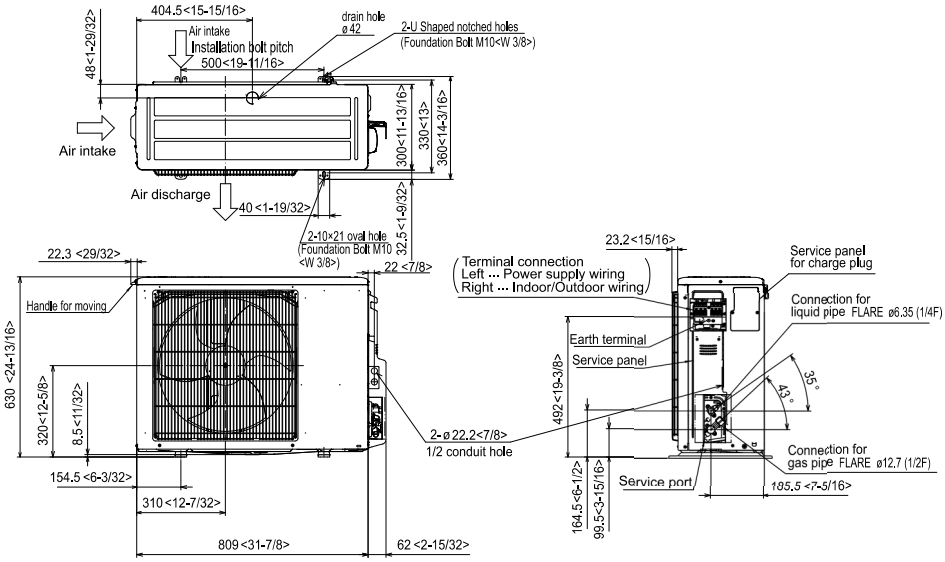
Model	J	1 Gas pipe	2 Liquid pipe
09 KBTU/H	62 (2-1/2)	ø9.52 (3/8)	ø6.35 (1/4)
12,15,18 KBTU/H	62 (2-1/2)	ø12.7 (1/2)	ø6.35 (1/4)
24,30 KBTU/H	66 (2-5/8)	ø15.88 (5/8)	ø9.52 (3/8)
36,42 KBTU/H			

Unit:mm(in.)

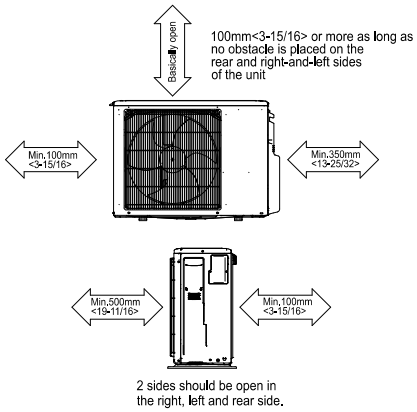
Model	A	B	C	D	E	F	G	H
09,12,15,18 KBTU/H	900 (35-7/16)	954 (37-9/16)	1000 (39-3/8)	860 (33-7/8)	9	800 (31-1/2)	858 (33-13/16)	72 (2-7/8)
24,30 KBTU/H	1100 (43-5/16)	1154 (45-7/16)	1200 (47-1/4)	1060 (41-3/4)	11	1000 (39-3/8)	1058 (41-11/16)	78 (3-1/8)
36,42 KBTU/H	1400 (55-1/8)	1454 (57-1/4)	1500 (59-1/16)	1360 (53-9/16)	14	1300 (51-3/16)	1358 (53-1/2)	

OUTDOOR UNIT DIMENSIONS: PUZ-A18NKA7(-BS)

Unit: mm<in>



Free space around the outdoor unit (basic example)

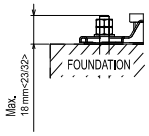


2 sides should be open in the right, left and rear side.

FOUNDATION BOLTS

Please secure the unit firmly with 4 foundation (M10<W3/8>) bolts. (Bolts, washers and nut must be purchased locally).

<Foundation bolt height>



PIPING-WIRING DIRECTION

Piping and wiring connection can be made from the rear direction only.

1340 Satellite Boulevard Suwanee, GA 30024
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FORM# PEAD-A18AA7 & PUZ-A18NKA7(-BS) - 202108