



Mr. Prentice Berge
154 S. Marquette Street
Madison, Wisconsin 53704

Subject:
Results of Sub-Slab Depressurization System Inspection, 154 S. Marquette Street,
Madison, Wisconsin 53704

Dear Mr. Berge:

On December 11, 2013, ARCADIS personnel, on behalf of Madison-Kipp, completed an inspection of the sub-slab depressurization system (SSDS) at your home, located at 154 S. Marquette Street in Madison, Wisconsin.

Based on the observations made during the inspection, the SSDS is depressurizing the basement sub-slab appropriately. Attached please find the SSDS Maintenance Plan, which includes the SSDS Maintenance Log for these activities.

Should you have any questions regarding your SSDS, please contact Madison-Kipp:

Alina Walcek
Environmental and Safety Coordinator
Madison-Kipp Corporation
awalcek@madison-kipp.com
Office: 608-242-5200; Cell: 518-265-7183

Sincerely,

ARCADIS U.S., Inc.

Jennine L. Trask, PE
Project Manager

Copies:
Dr. Henry Nehls-Lowe – WDHS
Michael Schmoller – WDNR

Attachments:
1 – RadonAway and VenTech Dominator Specifications
2 – Inspection Form

ARCADIS U.S., Inc.
126 North Jefferson Street
Suite 400
Milwaukee
Wisconsin 53202
Tel 414 276 7742
Fax 414 276 7603
www.arcadis-us.com

ENVIRONMENT

Date:
February 13, 2014

Contact:
Jennine Trask

Phone:
414.277.6203

Email:
Jennine.trask@arcadis-us.com

Our ref:
WI001368.00005

Imagine the result

System Description

A combination sub-slab/sub-membrane depressurization system (SSDS) was installed at the home located at 154 South Marquette Street, Madison, Wisconsin as shown on Figure 1. The home is a two story with a combination foundation made up of a basement and a crawlspace. The SSDS was installed to prevent vapor intrusion of tetrachloroethene (PCE).

System Design

The SSDS consists of one suction point located within the basement of the home and one suction point located within the crawlspace located on the east end of the home. The crawlspace suction point consists of perforated piping installed beneath 6-mil polyethylene sheeting that was sealed to the perimeter of the crawlspace. The basement suction point is plumbed to a VenTech Dominator 801 in-line fan located outside the north side of the home. The crawlspace suction point is plumbed to a RadonAway RP145 in-line fan also located outside the north side of the home. System piping consists of 4-inch polyvinyl chloride (PVC) installed from the basement suction point to the associated exterior fan and discharge and 4- inch Schedule (Scd.) 40 PVC piping installed from the crawlspace suction point to the associated exterior fan and discharge. Each discharge is located approximately one foot above the roof line on the north side of the home. A u-tube manometer was installed on each system as shown on Figure 1. The fan for the basement system is powered through a junction box and outlet. All electrical components are labeled. The fan for the crawlspace system has a disconnect switch mounted next to the fan on the exterior of the home. The circuit breaker operating the fans is labeled in the electric panel. Photos of the SSDS components are attached.

System Maintenance

The VenTech Dominator 801 and RadonAway RP145 fans do not require routine maintenance. See attached manufacturer's specification sheets in Attachment 1.

The integrity of the crawlspace liners, basement floor and walls, and the presence of any modifications to the home or SSDS will be assessed during the annual inspections. The occupant of the home may also report any modifications or needed repairs at any time. Repairs will be made promptly to maintain the integrity of the liner and SSDSs as necessary. All repairs will be tracked on the inspection form presented in Attachment 2.

Inspections

Inspections will be completed annually and will be documented on the form presented in Attachment 2. A visual inspection of the system components will be completed. Any damaged system components will be repaired promptly. The manometer readings will be recorded and compared to the previous operating level. Sub-slab vacuum readings will be collected at test points and compared to previous readings. Any changes in the manometer or sub-slab vacuum operating levels will be evaluated and any necessary repairs or system modifications will be made promptly.

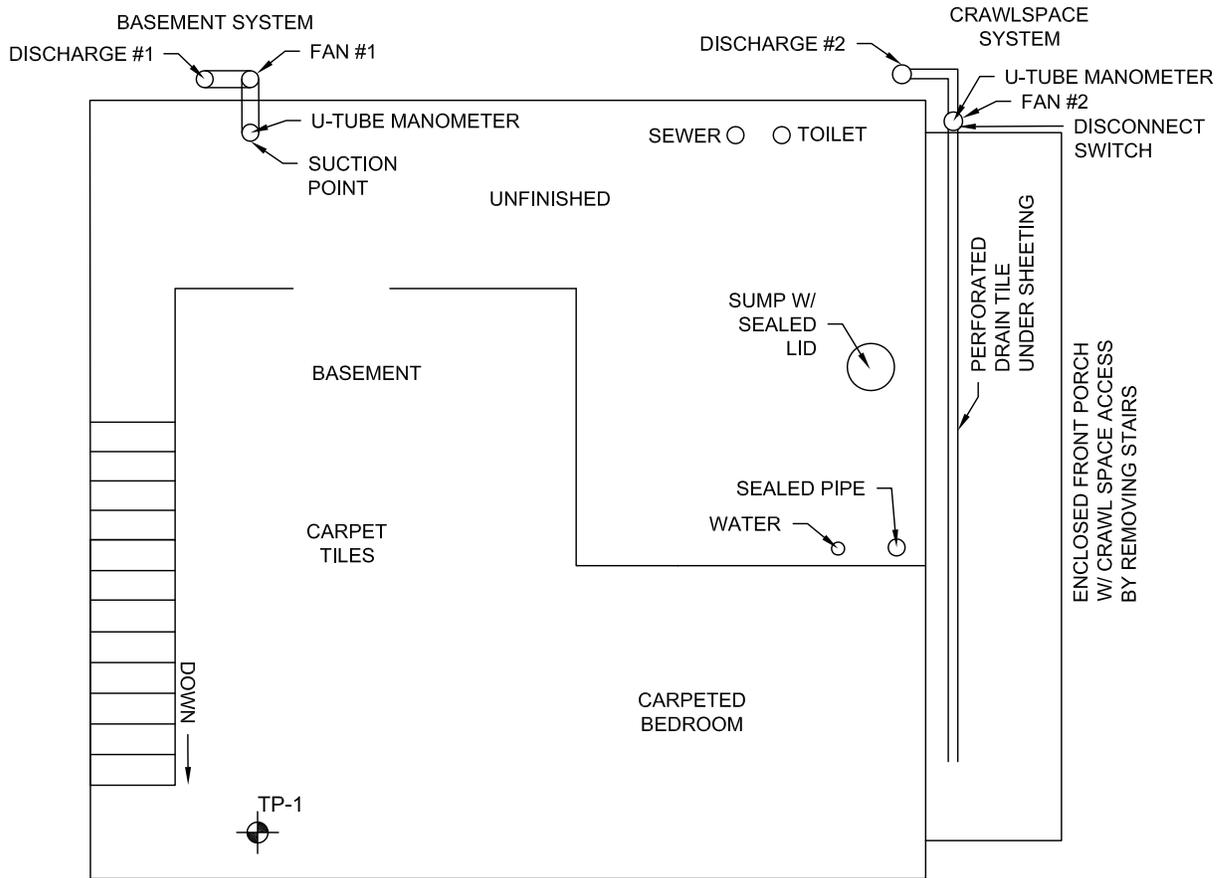
A copy of this Maintenance Plan and inspection forms will be kept on-site for reference by the homeowner.

Contacts

The homeowner may contact Madison-Kipp Corporation to coordinate any necessary system maintenance.

Alina Walcek
Environmental and Safety Coordinator
Madison-Kipp Corporation
awalcek@madison-kipp.com
Office: 608-242-5200
Cell: 518-265-7183

XREFS: IMAGES: PROJECTNAME: ---



SPECIFICATIONS:

1. SSD SYSTEM PIPING: 4" THIN WALLED PVC (BASEMENT SYSTEM), 4" SCHEDULE 40 PVC (CRAWLSPACE SYSTEM)
2. FAN #1: VANTECH DOMINATOR 801, FAN #2: RADONAWAY RP145
3. TP-1: -0.004 TO -0.005 IN.W.C. (MARCH 1, 2012)
4. BASEMENT SYSTEM U-TUBE: 3.6 IN.W.C. (MARCH 1, 2012), CRAWLSPACE SYSTEM U-TUBE: 0.9 IN.W.C. (JUNE 22, 2012)
5. OPENINGS: SUMP LID, CRAWLSPACE, WALL CRACK, OPEN PIPE - ALL SEALED
6. DISCHARGE LOCATIONS: MEET REQUIREMENTS, 1' ABOVE ROOFLINE
7. ELECTRICAL: JUNCTION BOX AND PLUG LABELED FOR FAN #1. DISCONNECT SWITCH INSTALLED NEXT TO FAN #2. BREAKER IN ELECTRIC PANEL LABELED.
8. FOUNDATION: PARTIALLY FINISHED BASEMENT WITH CONCRETE FLOOR AND POURED WALLS, 1 CRAWL SPACE SEALED WITH 6 MIL POLYETHYLENE SHEETING

LEGEND

-  TP-1 TEST POINT
- PVC POLYVINYL CHLORIDE
- IN.W.C. INCHES WATER COLUMN



NOT TO SCALE

MADISON KIPP CORPORATION 201 WAUBESA STREET MADISON, WISCONSIN
SSD SYSTEM 154 S. MARQUETTE STREET
 <div style="text-align: right;"> FIGURE 1 </div>



Crawlspace SSDS fan and discharge piping



Crawlspace SSDS Disconnect Switch and Fan



Crawlspace SSDS manometer, operating level 0.9 in wc



Crawlspace liner and suction piping



Circuit Breaker controlling fan



Basement SSDS fan and discharge piping



Basement SSDS suction piping



Basement SSDS manometer, operating level 3.6 in wc



Sealed sump lid



Labeled wiring controlling basement SSDS fan



The World's Leading
Radon Fan Manufacturer



GP/XP/XR Series Installation & Operating Instructions

Please Read And Save These Instructions

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED. MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION. DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible or flammable materials.
2. **WARNING!** Do not use fan to pump explosive or corrosive gases.
See Vapor Intrusion Application Note #AN001 for important information on VI applications. RadonAway.com/vapor-intrusion
3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.
5. **NOTICE!** There are no user serviceable parts located inside the fan unit.
Do NOT attempt to open. Return unit to the factory for service.
6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA) "National Electrical Code, Standard #70" -current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician.
7. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.
8. **WARNING - TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING:**
 - a) Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
 - b) Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

RadonAway

3 Saber Way | Ward Hill, MA 01835
www.radonaway.com



Installation & Operating Instructions IN014 Rev J

XP/XR Series

XP101 p/n 23008-1
XP151 p/n 23010-1
XP201 p/n 23011-1
XR261 p/n 23019-1

GP Series

GP201 p/n 23007-1
GP301 p/n 23006-1
GP401 p/n 23009-1
GP501 p/n 23005-1

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The GP/XP/XR Series Radon Fans are intended for use by trained, professional, certified/licensed Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of a fan. This instruction should be considered as a supplement to EPA/radon industry standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2 ENVIRONMENTALS

The GP/XP/XR Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F.

1.3 ACOUSTICS

The GP/XP/XR Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

1.4 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the GP/XP/XR Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes allowing for return to normal operation.

1.5 SLAB COVERAGE

The GP/XP/XR Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the GP/XP/XR Series Fan best suited for the sub-slab material can improve the slab coverage. The GP & XP Series have a wide range of models to choose from to cover a wide range of subslab material. The higher static suction fans are generally used for tighter subslab materials. The XR Series is specifically designed for high flow applications such as stone/gravel and drain tile. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.6 CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The GP/XP/XR Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The GP/XP/XR Series Fans are **NOT** suitable for underground burial.

For GP/XP/XR Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

Pipe Dia.	Minimum Rise per Foot of Run*		
	@25 CFM	@50 CFM	@100 CFM
4"	1/8"	1/4"	3/8"
3"	1/4"	3/8"	1 1/2"

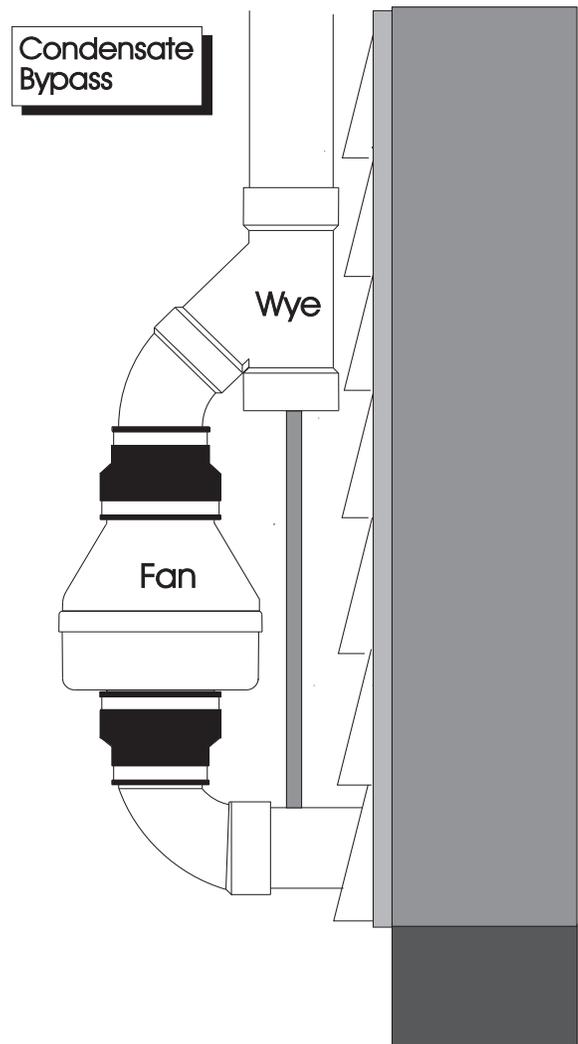
*Typical GP/XP/XR Series Fan operational flow rate is 25 - 90 CFM.
(For more precision, determine flow rate by using the chart in the addendum.)

Under some circumstances in an outdoor installation a condensate bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping.

The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.

1.7 SYSTEM MONITOR & LABEL

A System Monitor, such as a manometer (P/N 50006-1) or audible alarm (P/N 28001-2) is required to notify the occupants of a fan system malfunction. A System Label (P/N 15022) with instructions for contacting the installing contractor for service and also identifying the necessity for regular radon tests to be conducted by the building occupants, must be conspicuously placed where the occupants frequent and can see the label.



1.8 ELECTRICAL WIRING

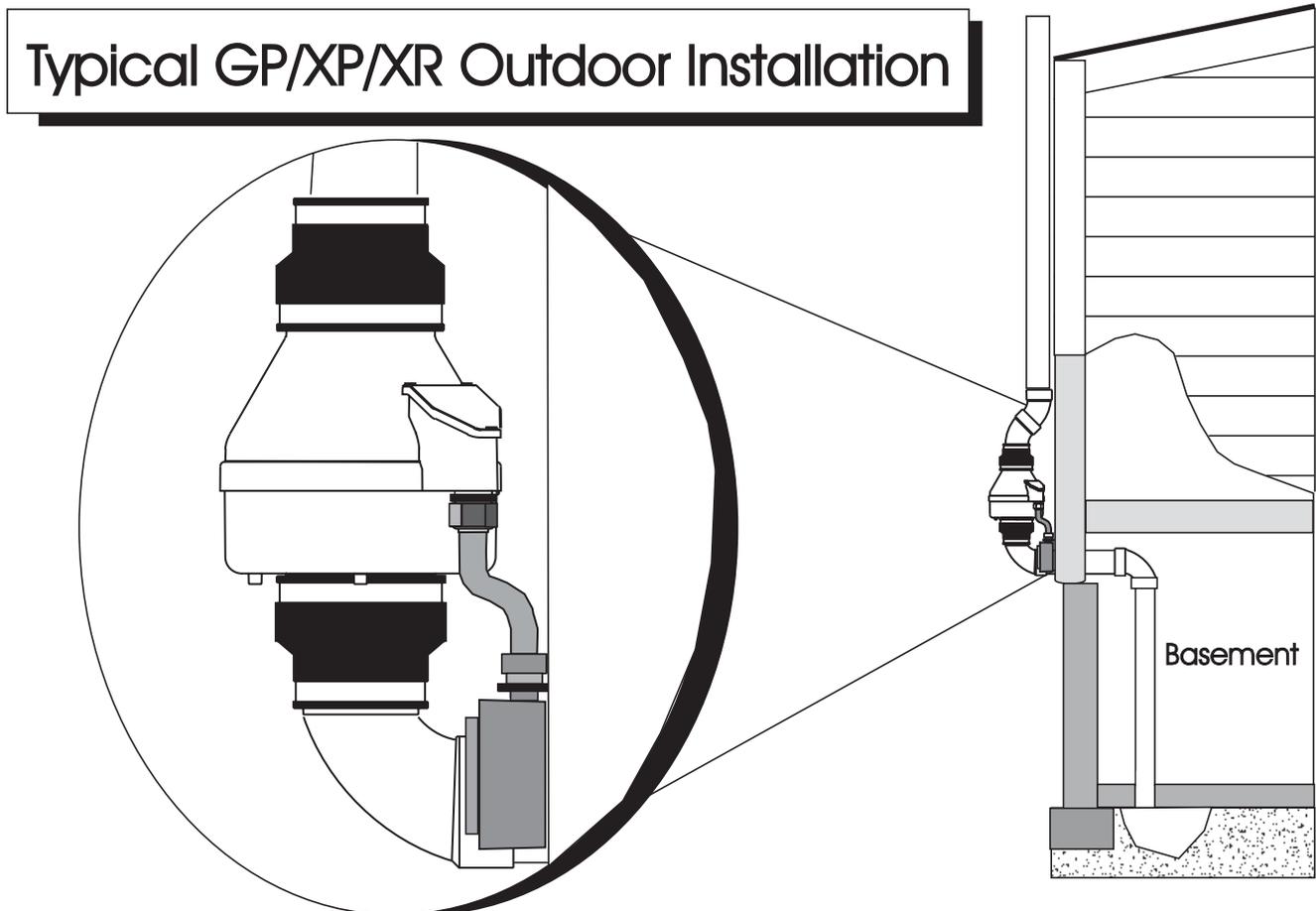
The GP/XP/XR Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA) National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.9 SPEED CONTROLS

The GP/XP/XR Series Fans are rated for use with electronic speed controls, however, they are generally not recommended. If used, the speed control recommended is Pass & Seymour Solid State Speed Control Cat. No. 94601-I.

2.0 INSTALLATION

The GP/XP/XR Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The GP/XP/XR Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket.



2.1 MOUNTING

Mount the GP/XP/XR Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

2.2 MOUNTING BRACKET (optional)

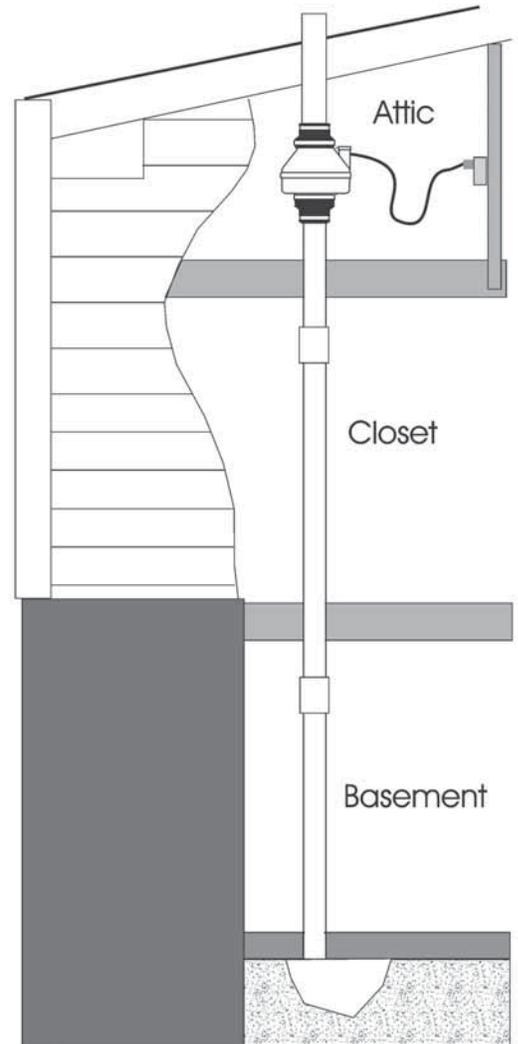
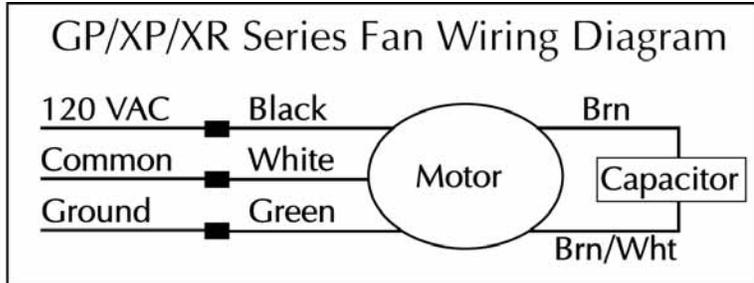
The GP/XP/XR Series Fan may be optionally secured with the integral mounting bracket on the GP Series fan or with RadonAway P/N 25007-2 mounting bracket for an XP/XR Series Fan. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.8):



2.5 VENT MUFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS AND ANNUAL SYSTEM MAINTENANCE

___ **Verify** all connections are tight and **leak-free**.

___ **Insure** the GP/XP/XR Series Fan and all ducting is secure and vibration-free.

___ **Verify** system vacuum pressure with manometer. **Insure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.

(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 Feet.)

(Further reduce Maximum Operating Pressure by 10% for High Temperature environments)

See Product Specifications. If this is exceeded, increase the number of suction points.

___ **Verify** Radon levels by testing to EPA protocol.

XP/XR SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the XP & XR Series Fan:

	Typical CFM Vs Static Suction "WC								
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
XP101	125	118	90	56	5	-	-	-	-
XP151	180	162	140	117	78	46	10	-	-
XP201	150	130	110	93	74	57	38	20	-
XR261	250	215	185	150	115	80	50	20	-

Maximum Recommended Operating Pressure*	
XP101	0.9" W.C. (Sea Level Operation)**
XP151	1.3" W.C. (Sea Level Operation)**
XP201	1.7" W.C. (Sea Level Operation)**
XR261	1.6" W.C. (Sea Level Operation)**

**Reduce by 10% for High Temperature Operation*

***Reduce by 4% per 1000 feet of altitude*

Power Consumption @ 120 VAC	
XP101	40 - 49 watts
XP151	45 - 60 watts
XP201	45 - 66 watts
XR261	65 - 105 watts

XP Series Inlet/Outlet: 4.5" OD (4.0" PVC Sched 40 size compatible)

XR Series Inlet/Outlet: 5.875" OD

Mounting: Mount on the duct pipe or with optional mounting bracket.

Recommended ducting: 3" or 4" Schedule 20/40 PVC Pipe

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Size: 9.5H" x 8.5" Dia.

Weight: 6 lbs. (XR261 - 7 lbs)

Continuous Duty

Thermally Protected

Class B Insulation

3000 RPM

Rated for Indoor or Outdoor Use



GP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the GP Series Fan:

	Typical CFM Vs Static Suction "WC						
	1.0"	1.5"	2.0"	2.5"	3.0"	3.5"	4.0"
GP501	95	87	80	70	57	30	5
GP401	93	82	60	38	12	-	-
GP301	92	77	45	10	-	-	-
GP201	82	58	5	-	-	-	-

Maximum Recommended Operating Pressure*		
GP501	3.8" W.C.	(Sea Level Operation)**
GP401	3.0" W.C.	(Sea Level Operation)**
GP301	2.4" W.C.	(Sea Level Operation)**
GP201	1.8" W.C.	(Sea Level Operation)**

**Reduce by 10% for High Temperature Operation*

***Reduce by 4% per 1000 feet of altitude*

Power Consumption @ 120 VAC	
GP501	70 - 140 watts
GP401	60 - 110 watts
GP301	55 - 90 watts
GP201	40 - 60 watts

Inlet/Outlet: 3.5" OD (3.0" PVC Sched 40 size compatible)

Mounting: Fan may be mounted on the duct pipe or with integral flanges.

Weight: 12 lbs.

Size: 13H" x 12.5" x 12.5"

Recommended ducting: 3" or 4" Schedule 20/40 PVC Pipe

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Continuous Duty

Class B Insulation

3000 RPM

Thermally Protected

Rated for Indoor or Outdoor Use



IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GPx01/XP/XR Series Fan for shipping damage within 15 days of receipt. Notify RadonAway of any damages immediately. Radonaway is not responsible for damages incurred during shipping. However, for your benefit, Radonaway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

Install the GPx01/XP/XR Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

Provide a copy of this instruction or comparable radon system and testing information to the building occupants after completing system installation.

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the GPx01/XP/XR Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").

RadonAway will replace any Fan which fails due to defects in materials or workmanship. The Fan must be returned (at Owner's cost) to the RadonAway factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway.

5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway will extend the Warranty Term of the fan to 5 years from date of manufacture if the Fan is installed in a professionally designed and professionally installed radon system or installed as a replacement fan in a professionally designed and professionally installed radon system. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE GPx01/XP/XR SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

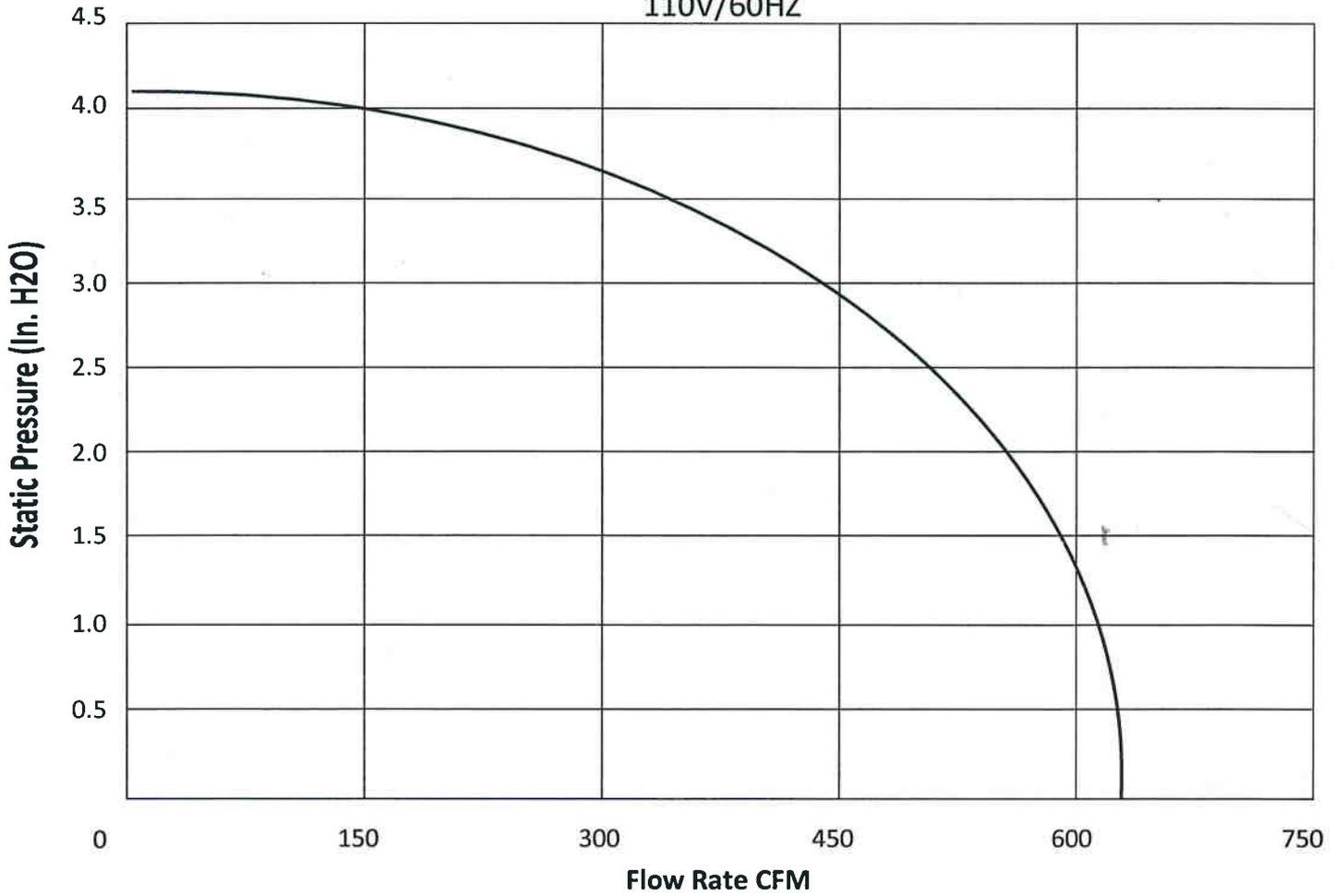
Record the following information for your records:

Serial No. _____
Purchase Date _____

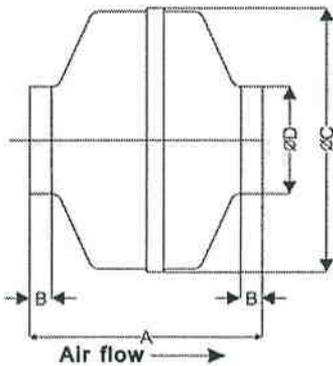
VenTech Engineering

Model: "Dominator 801"

110V/60HZ



POWER (WATTS)	SPEED (RPM)	MAX AIR FLOW(CFM)	MAX PRESSURE (In. H2O)
60 - 150	2500	630	4.15



DIMENSIONS			
A	B	C	D
8.8"	1.0"	13.1"	4.5"

SSDS Maintenance Log, 154 South Marquette Street, Madison, Wisconsin

Date	Personnel	Company	U-tube #1 (in wc)	U-tube #2 (in wc)	TP-1 (in wc)	Fans operating properly?	Piping damaged?	Foundation and crawlspaces	List repairs needed	Initial repairs made	Notes
3/1/2012	R. Robbenolt	ARCADIS	3.6	-	-0.004	Yes	No	Yes	None	NA	
6/22/2012	D. Skelton	Radon, Inc.	-	0.9	-	-	-	-	-	NA	
12/11/2013	R. Robbenolt, V. Yates	ARCADIS	3.75	0.9	-0.001 to -0.004	Yes	No	Yes	None	NA	TP-1 Installed. Permanent point located in 2nd full square @ base of stairs.