



Ms. Sharon Helmus
166 S. Marquette Street
Madison, Wisconsin 53704

Subject:
Results of Sub-Slab Depressurization System Inspection, 166 S. Marquette Street,
Madison, Wisconsin 53704

Dear Ms. Helmus:

On December 10, 2013, ARCADIS personnel, on behalf of Madison-Kipp, completed an inspection of the sub-slab depressurization system (SSDS) at your home, located at 166 S. Marquette Street in Madison, Wisconsin.

Based on the observations made during the inspection, the SSDS fan was not operating correctly. An additional visit was completed on December 19, 2013 to confirm fan operation. During this visit, the fan was operating correctly and it was determined the fan operation was affected by ice in the piping during the December 10 site visit due to extreme temperatures. 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 Specifications
2 – Inspection Form

Imagine the result

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:
January 24, 2014

Contact:
Jennine Trask

Phone:
414.277.6203

Email:
Jennine.trask@arcadis-us.com

Our ref:
WI001368.00005

System Description

A sub-slab depressurization system (SSDS) was installed at the home located at 166 South Marquette Street, Madison, Wisconsin as shown on Figure 1. The home is a single story with a full basement foundation. 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 plumbed to a RadonAway RP145 in-line fan located outside the west side of the home. All system piping is 4-inch polyvinyl chloride (PVC). The discharge piping is located approximately one foot above the roof line of the home. A u-tube manometer was installed on the system as shown on Figure 1. The fan has a 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 RadonAway RP145 fan does not require routine maintenance. See attached manufacturer's specification sheet in Attachment 1.

The integrity of the 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 SSDS, 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 reading 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.

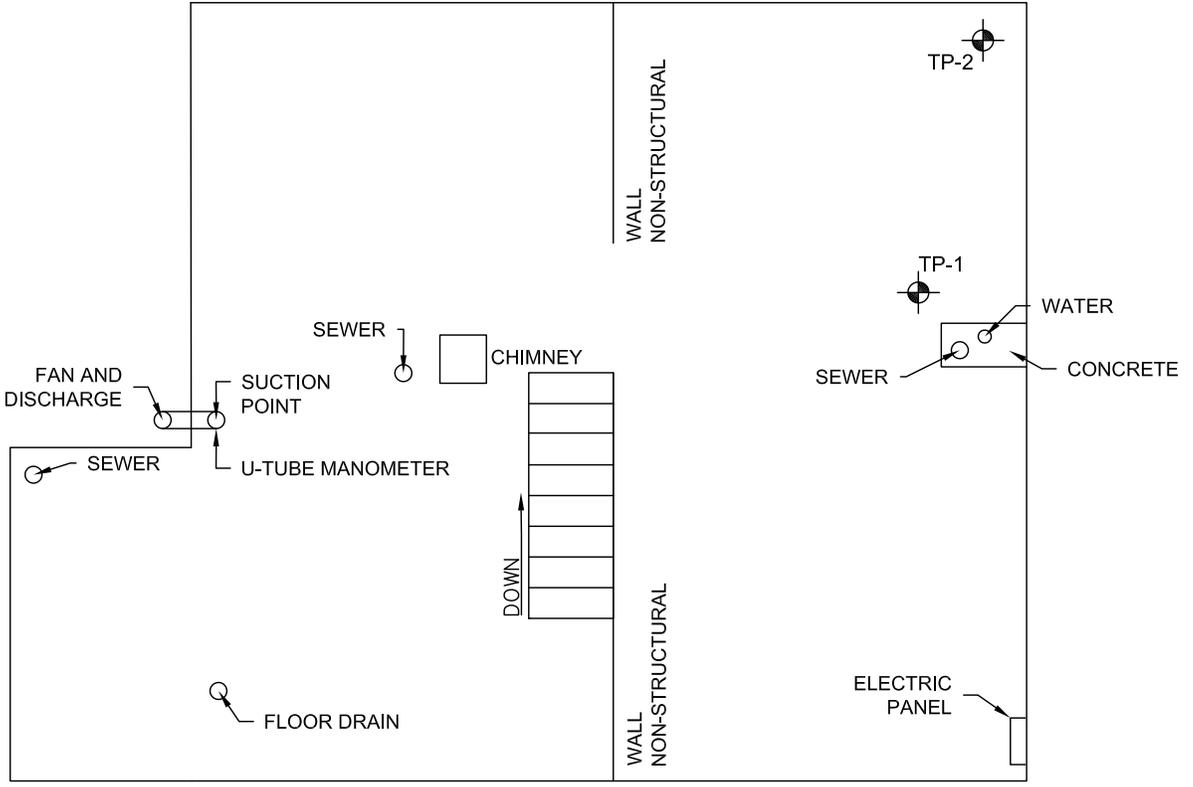
A copy of this Maintenance Plan and inspection forms will be kept on-site for reference by the homeowner.

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. INTERIOR SSD SYSTEM PIPING 4" THIN WALLED PVC
2. EXTERIOR SSD SYSTEM PIPING 4" SCHEDULE 40 PVC
3. FAN: RADONAWAY RP145
4. TP-2: -0.007 IN.W.C. (MAY 22, 2012)
5. U-TUBE: 2.2 IN.W.C. (MAY 22, 2012)
6. OPENINGS: OPEN CRACKS IN BLOCK WALL MORTAR JOINTS, BLOCK TOPS SEALED
7. DISCHARGE LOCATION: MEETS REQUIREMENTS, 1' ABOVE ROOFLINE
8. ELECTRICAL: WIRED TO BREAKER IN ELECTRIC PANEL. DISCONNECT SWITCH INSTALLED NEXT TO FAN
9. FOUNDATION: UNFINISHED BASEMENT, CONCRETE FLOOR, BLOCK WALLS

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 166 S. MARQUETTE STREET	
	FIGURE 1



SSDS fan and discharge piping



SSDS fan and disconnect switch



SSDS suction piping



SSDS suction piping



U-tube manometer, operating level 2.2 in wc



Circuit Breaker controlling fan



The World's Leading
Radon Fan Manufacturer



RP Series

Installation & Operating Instructions

RadonAway

3 Saber Way | Ward Hill, MA 01835

www.radonaway.com

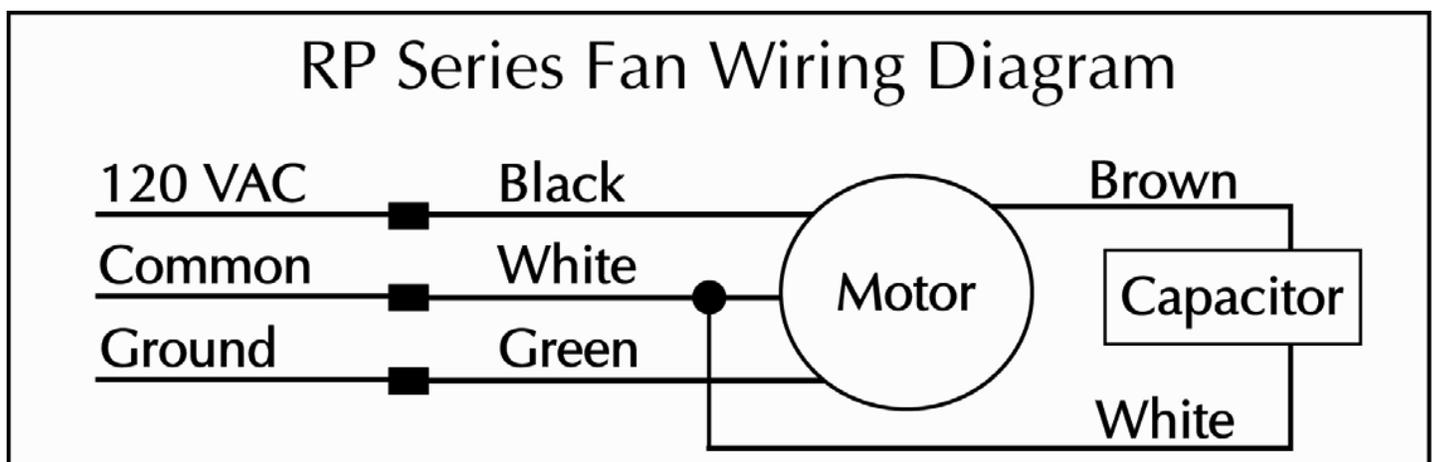


Series Fan Installation & Operating Instructions

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.



**RP Series**

RP140	p/n 23029-1
RP145	p/n 23030-1
RP260	p/n 23032-1
RP265	p/n 23033-1
RP380	p/n 28208

1.0 SYSTEM DESIGN CONSIDERATIONS**1.1. INTRODUCTION**

The RP 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 an RP Series 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. FAN SEALING

The RP Series Fans are factory sealed, no additional caulk or other materials are required to inhibit air leakage.

1.3. ENVIRONMENTALS

The RP 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.

1.4. ACOUSTICS

The RP 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.

(To ensure quiet operation of ENERGY STAR qualified in-line and remote fans, each fan shall be installed using sound attenuation techniques appropriate for the installation. For bathroom and general ventilation applications, at least 8 feet of insulated flexible duct shall be installed between the exhaust or supply grille(s) and the fan).
RP Series fans are not suitable for kitchen range hood remote ventilation applications.

1.5. 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 RP 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.

1.6. SLAB COVERAGE

The RP 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 RP Series Fan best suited for the sub-slab material can improve the slab coverage. The RP140/145/155 are best suited for general purpose use. The RP260 can be used where additional airflow is required and the RP265/380 is best suited for large slab, high airflow applications. 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.

1.7. 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 RP 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 RP Series Fans are **NOT** suitable for underground burial.

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

Pipe Dia.	Minimum Rise per Ft of Run*				
	@25 CFM	@50 CFM	@100 CFM	@200 CFM	@300 CFM
6"	-	3/16	1/4	3/8	3/4
4"	1/8	1/4	3/8	2 3/8	-
3"	1/4	3/8	1 1/2	-	-



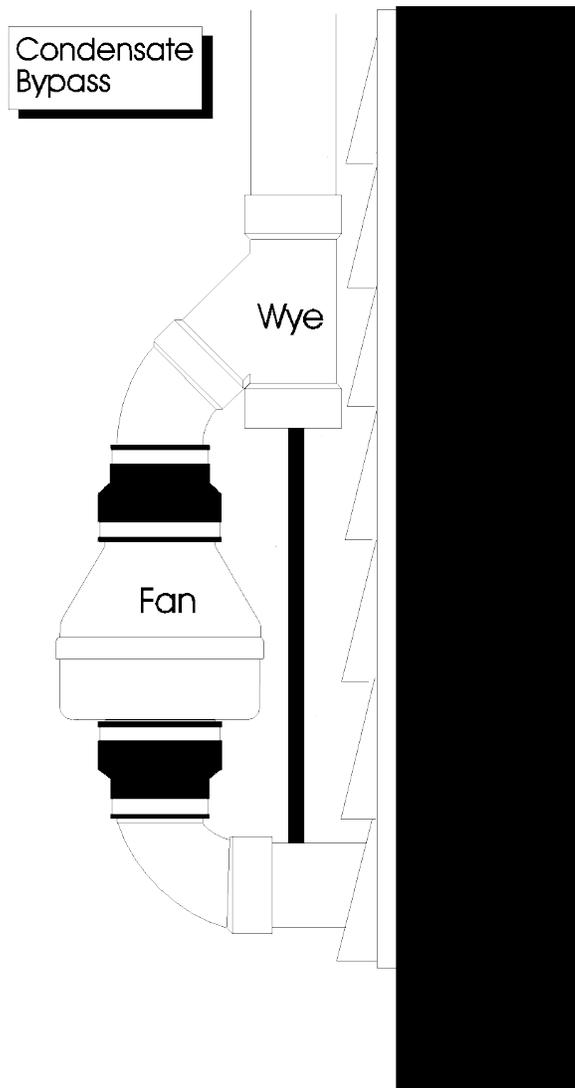
*Typical RP1xx/2xx Series Fan operational flow rate is 25 - 90 CFM on 3" and 4" pipe.
(For more precision, determine flow rate by measuring Static Pressure, in WC, and correlate pressure to flow in the performance chart in the addendum.)

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.

1.8. 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.



1.9. VENTILATION

If used as a ventilation Fan any type of ducting is acceptable, however, flexible nonmetallic ducting is recommended for easy installation and quieter operation. Insulated flexible ducting is highly recommended in cold climates to prevent the warm bathroom air from forming condensation in the ducting where it is exposed to colder attic air. The outlet of the fan should always be ducted to the outside. Avoid venting the outlet of the fan directly into an attic area. The excess moisture from the bathroom can cause damage to building structure and any items stored in the attic. Multiple venting points may be connected together using a "T" or "Y" fitting. Ideally Duct should be arranged such that equal duct lengths are used between intake and "T" or "Y" fitting, this will result in equal flow rates in each intake branch. If adjustable intake grilles are used on multi-intake systems then the opening on each grill should be equal in order to minimize noise and resistance. Straight smooth runs of rigid metal ducting will present the least resistance and maximize system performance. The Equivalent Length of Rigid Metal Ducting resulting in .2" WC pressure loss for each Fan Model is provided in the specification section of these Instructions. Flexible ducting, if used, must always be as close to being fully extended as possible. Formed rigid metal duct elbows will present the least resistance and maximize system performance, recommended bend radius of elbow is at least 1.5 x duct diameter.

RP Series fans are not suitable for kitchen range hood remote ventilation applications. For quietest performance, the fan should be mounted further away from the inlet duct, near the outside vent. A minimum distance of 8 feet is recommended between the fan or T/Y of a multi-intake system and intake grille(s).

Backdraft dampers allow airflow in only one direction preventing cold/hot drafts from entering the vented area and minimize possible condensation and icing within the system while the fan is not operating. Backdraft dampers are highly recommended at each intake grille for bathroom ventilation in all cold climate installations. Installation instructions are included with Spruce back draft dampers.

1.10. ELECTRICAL WIRING

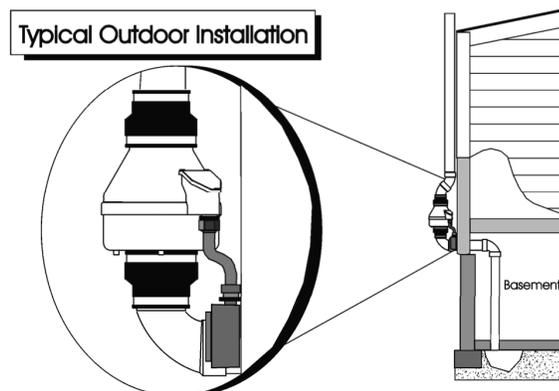
The RP Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA) National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must 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.

1.11. SPEED CONTROLS

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

2.0 INSTALLATION

The RP Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The RP 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 RP 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 RP Series Fan may be optionally secured with the RadonAway P/N 25007-2 (25033 for RP385) mounting bracket. 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. As the fan is typically outside of the building thermal boundary, and is venting to the outside, installation of insulation around the fan is not required.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections (See Section 1.10): Note that the fan is not intended for connection to rigid metal conduit.

Fan Wire	Connection
Green	Ground
Black	AC Hot
White	AC Common

2.5 VENT MUFFLER (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 & ANNUAL SYSTEM MAINTENANCE

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

_____ **Insure** the RP Series Fan and all ducting is secure and vibration-free.

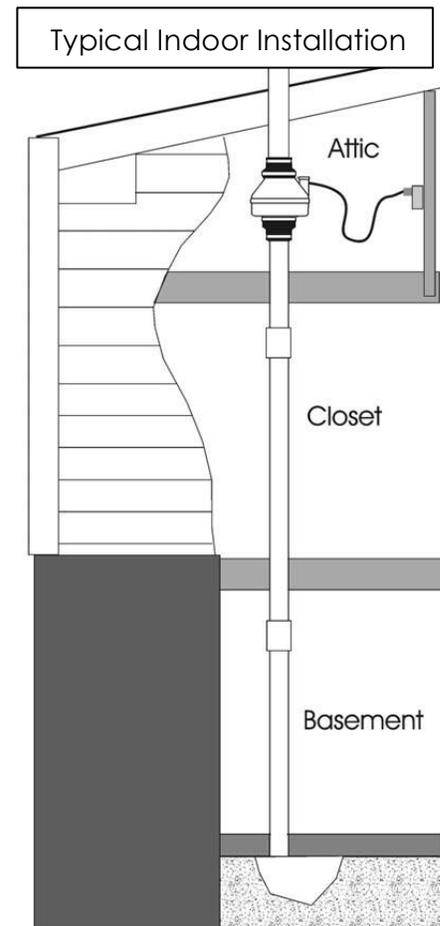
_____ **Verify** system vacuum pressure with manometer. **Insure** vacuum pressure is within normal operating range and **less than** the maximum recommended operating pressure.

(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.**



RP SERIES PRODUCT SPECIFICATIONS

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

Typical CFM Vs Static Pressure "WC									
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
RP140	135	103	70	14	-	-	-	-	-
RP145	166	146	126	104	82	61	41	21	3
RP260	272	220	176	138	103	57	13	-	-
RP265	334	291	247	210	176	142	116	87	52
RP380*	497	401	353	281	220	176	130	80	38

* Tested with 6" inlet and discharge pipe.

Power Consumption 120 VAC, 60Hz 1.5 Amp Maximum			Maximum Recommended Operating Pressure* (Sea Level Operation)**	
RP140	17 - 21	watts	RP140	0.8" W.C.
RP145	41 - 72	watts	RP145	1.7" W.C.
RP260	52 - 72	watts	RP260	1.5" W.C.
RP265	91 - 129	watts	RP265	2.2" W.C.
RP380	95 - 152	watts	RP380	2.0" W.C.

*Reduce by 10% for High Temperature Operation

**Reduce by 4% per 1000 feet of altitude

	Size	Weight	Inlet/Outlet	L.2
RP140	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)	25
RP145	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)	15
RP260	8.6H" x 11.75" Dia.	5.5 lbs.	6.0" OD	48
RP265	8.6H" x 11.75" Dia.	6.5 lbs.	6.0" OD	30
RP380	10.53H" x 13.41" Dia.	11.5 lbs.	8.0" OD	57

L.2 = Estimated Equivalent Length of Rigid Metal Ducting resulting in .2in WC pressure loss for Duct Size listed. Longer Equivalent Lengths can be accommodated at Flows Lower than that at .2in WC pressure loss (see CFM Vs Static Pressure "WC Table).

Recommended ducting: 3" or 4" RP1xx/2xx, 6" RP380, Schedule 20/40 PVC Pipe

Mounting: If used for Ventilation use 4", 6" or 8" Rigid or Flexible Ducting

Mount on the duct pipe or with optional mounting bracket.

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

Thermally Protected

3000 RPM

Rated for Indoor or Outdoor Use

LISTED
Electric Fan



UL
Std. 507



IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GP/XP/XR/RP 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 GP/XP/XR/RP 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/RP 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/RP 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 _____

SSDS Maintenance Log, 166 South Marquette Street, Madison, Wisconsin

Date	Personnel	Company	U-tube #1 (in wc)	TP-2 (in wc)	Fan Operating properly?	Piping damaged?	Foundation sealed?	List repairs needed	Initial repairs made	Notes
5/22/2012	R. Robbennolt	ARCADIS	2.2	-0.007	Yes	No	Yes	None	NA	NA
12/10/2013	R. Robbennolt, V. Yates	ARCADIS	--	--	No	No	Yes	None	NA	TP-2 installed
12/19/2013	J. Baxter, V. Yates	ARCADIS	2.3	-0.031	Yes	No	Yes	None	NA	Fan checked, issues on 12/10/2013 were ice related only