WATER BY-PASS AND ICE BLOCKING DEVICE WITH CLEAN-OUT PORT TO PROTECT OUTDOOR RADON FANS

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Abstract

Protecting an outdoor radon fan from water and ice damage is key to the extended life of the outdoor radon mitigation system. With winter freezing conditions, the radon fan may be exposed to back draining of condensate and falling ice. Water by-pass devices are a defense against condensate flowing back through the fan housing. Diverta Drain[1] is a system that protects the fan from water condensate and ice that may dislodge from the exhaust pipe and fall into the fan. Additionally, the Diverta Drain includes a port which allows visual inspections and air flow testing, all of which can be performed without climbing on the roof or entering the residence. The ice screen located inside the Diverta Drain can eliminate the need of a critter screen at the top end of the exhaust pipe. Traditionally, the critter screen at the top end of the exhaust pipe has been a factor in ice build-up. The Diverta Drain clean-out port allows debris removal at ground level.

Introduction

Dominion Radon has found a need for a product that will help to keep the outdoor radon fan from getting damaged from water and ice in the radon exhaust pipe. As a Radon Mitigator we could not find one that had all of the features we were looking for. So we decided to develop a product that we know will meet the needs of a water by-pass system with the added value of the features of the Diverta Drain system. The following paper will explain the value and the features of the Diverta Drain system, but more importantly, the need for a water by-pass system to be installed on all new and existing Radon Mitigation systems.

Methodology

The Diverta Drain water by-pass system is designed to drain water and block ice away from the Radon fan system. The system was conceived and engineered to combine five principles for protection and ease of maintenance.

Enhanced Water By-pass Using a Water Diverting Gutter

The Diverta Drain is based on a 45-degree elbow for 4” or 6” inch PVC pipe. At the bottom portion of the bend in the elbow, a water diverting gutter and drain hose connection allows water to be both collected and diverted more effectively away from the fans internal components. The proximity of the gutter and drain enhances the use of gravity for controlling the direction of the water flow that may otherwise damage the fans internal components.

(1) Note: The Diverta Drain is a commercial product produced and marketed by the author.

Proximity to the Radon Fan for Reducing Ice Formation.

The proximity of the Diverta Drain to the radon fan should be carefully chosen for the efficient way it protects the fan and drains away excess moisture. It should be installed directly above the fan or at least in close proximity above the fan. This is important because freezing temperatures are to be avoided and the pipe cools the further away from the fan the air travels. The thermal image in figure 1 below demonstrates the major temperature difference between where the fan is installed and the top of the radon mitigation system.

Figure 1 – Thermal Image (Temperature differences within radon system piping).

Ice and Debris Screen Guard

The ice screen was designed to block any falling ice and debris from damaging the radon fan blades while the size of the screen was designed to allow maximum air flow. See figure 2.

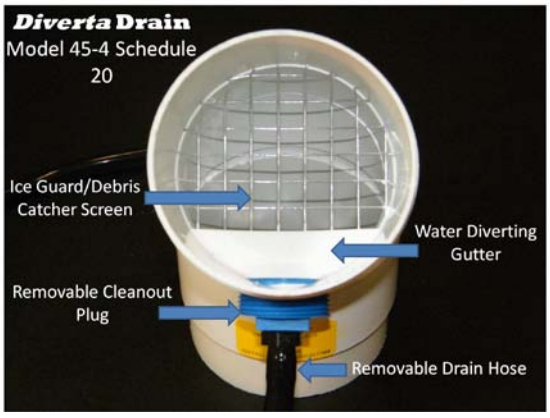

Figure 2 – Features of Diverta Drain

Clean-Out Plug for Inspection, Maintenance and Air Flow Testing.

The design of the clean-out plug located at the drain hose connection was carefully conceived. It is large enough to allow an average worker to use his or her fingers for cleaning debris out of the device that might be collected and to visually inspect of the ice screen. It also provides convenience for airflow testing.

Proximity to the Ground for Inspection, Maintenance and Air Flow Testing.

The Diverta Drain is designed to be installed close to the ground for easily inspecting the device. In doing this there is no need for a ladder to climb onto the roof. The inspection can be performed safely at ground level. See figure 3.

Figure 3 – Diverta Drain Installed

Conclusion

The need for a water by-pass system is known in Radon Mitigation professional circles and government agencies. The Diverta Drain's key features allow for easily checking the fan's air flow and cleaning the ice blocking screen. This all can be done from the ground level. Consequently, there is no need for a ladder. This alone will save either the installer or the client time by making it more efficient to check the device and radon fan. Ground level also allows for the possibility of either a warranty service or maintenance checkup without a lot of time to perform the inspection. By having a screen installed in the device eliminates the need for the critter screen at the top of the Radon Mitigation exhaust pipe. The Diverta Drain system brings the basic outdoor radon mitigation installation to a higher level of long-term safety and reliability for the homeowner.

References

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