

Vacuum Valves for Winter Profits

AID UNIFORM HEATING, REDUCE FUELOIL COSTS

By
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OF THE NEW HEATING PRODUCTS burner dealers sell in winter, vacuum air valves are being sold in growing volume. Those who sell valves find they can be sold to both old and new burner users, as well as to people who still burn coal. Dealers assert that burner salesmen can easily master the selling arguments that appeal to home owners, and that only a modest capital investment is needed to stock vacuum air valves.

The following numerous advantages of vacuum air valves may be explained to the customer: by converting the one-pipe steam heating plant into a vacuum system, radiators are able to deliver heat more quickly after the burner starts, since the air in the system is expelled and prevented from returning. Due to quicker heating of radiators, and because they hold heat longer after the burner is shut off, the house may be more uniformly heated. The air in the room is kept in circulation, preventing cold temperatures at the floor and high temperatures at the ceiling.

Due to the vacuum in the heating system, water boils and generates steam at temperatures below 212°, the normal boiling point of water. The table gives the temperature at which steam is produced under varying degrees of vacuum.

A vacuumized heating system is also said to be more flexible in that the heat output is adjusted to outdoor temperature. Finally,

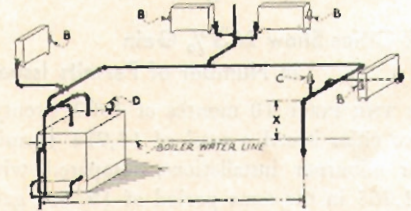
BOILING POINTS OF WATER UNDER VACUUM

Vacuum In Inches	Boiling Point, Degrees F
0	212
3	206
6	201
10	193
12	188
15	176
18	170
20	162

the home owner will likely be most interested in saving fuel. Considerable savings have been reported after vacuum air valves were installed.

In making the installation, the air valves are removed from all radiators and replaced with vacuum air valves. Each steam main in the basement should also be equipped with a quick-venting vacuum valve. These may be larger than the radiator air valves and must vent freely, to permit steam to reach all risers quickly. If the piping is properly designed, all radiators can then receive steam quickly and uniformly. Even if the thermostat is in a room which has radiators nearest the boiler, the rooms farther away will have opportunity to become heated before the thermostat shuts off the burner. In addition to installing vacuum air valves, the boiler steam-pressure gauge must be replaced by one that indicates both pressure and vacuum, called a compound gauge. When the gauge needle moves to the right it indicates

steam pressure in pounds per square inch, and when it moves to the left of the zero mark it records inches of vacuum.



Sketch courtesy of Hoffman Specialty Co.

ONE-PIPE STEAM SYSTEM EQUIPPED WITH VACUUM AIR VALVES. B: VACUUM AIR VALVES; C: VACUUM VENT, TYPE DEPENDING UPON DISTANCE "X"; AND D: COMBINATION PRESSURE AND VACUUM GAUGE.

Each system should be tested for leaks before installing vacuum air valves. By carrying 10 pounds steam pressure, many of the leaks can be discovered. Leaks may be found in the pipe and fittings below the water line as well as above the water line, and it is essential that all pipe and fittings be air-tight.

A cool or cold day should be selected for testing when the system is under vacuum. If the vacuum air valves are installed in the summer, the testing may have to be postponed for a month or more. After starting the burner, the steam pressure should be raised to five or 10 pounds gauge pressure. The steam, under pressure, first forces the air out of the main vents and then through the vents in the vacuum air valves. The burner should then be shut off, so that the steam pressure will drop. To hasten steam condensation in the radiators, the windows should be opened. As the steam condenses, a partial vacuum is created, so that the outside air attempts to rush back through the radiator vacuum air valves.

When the system has cooled the installer should inspect the compound gauge on the boiler to determine how much vacuum has been created. It is generally accepted that from 12 to 15 inches of vacuum indicates that the system will operate efficiently. If the system is commercially tight the gauge should show a loss of not more than one-half inch of vacuum per hour. If the loss is greater, the system should be carefully re-examined for leaks.

The degree of vacuum in the system will vary and is automatically affected by the room thermostat. For example, on one day six inches of vacuum may be attained before the thermostat starts the burner again. On another day the gauge may show 12 to 16 inches of vacuum, depending upon the heat

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MAKING A HOME DEMONSTRATION OF VACUUM AIR VALVES GENERATES INTEREST, OFTEN CLINCHES THE SALE

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losses from the building and the outdoor temperatures. While it is possible to obtain as high as 20 inches of vacuum, it is not practical to carry so much vacuum and still obtain sufficient heat at the radiators.

If a re-examination of the heating system is necessary, because vacuum is lost too quickly, these points should be checked: gauge-glass connections, damper-regulator connections, safety valves, and any other boiler trimmings. If the general boiler overhauling has previously been done, all connections will have been tightened. Should the lower gauge-glass connection be leaking, a column of bubbles will be seen rising in the gauge-glass. Old damper regulators, on boilers previously fired with coal, are often cracked or leak at the connection. A new regulator might be installed, but it is easier to remove the defective one and simply insert a plug in the opening. A match flame is often effective in detecting a large leak as it will be drawn in the direction of air flow at a defective fitting, valve, or pipe. A better method for finding small leaks is to spread soap suds over suspected parts of the piping, fittings or valves. If these are found to be in good condition, and air is still leaking into the

system, there must be a cracked pipe. While the system is still under vacuum, all leaky parts of the piping and fittings should be painted with asphaltum paint.

If this procedure is followed, the dealer or customer will rarely have occasion to complain. However, dealers will often return a valve as "defective" because it does not operate as described by the manufacturer. Of these returned valves, one manufacturer asserts that 90 per cent are in first class condition, but were generally rendered inoperative by sediment, grease, core sand, or dirt. Hence it is necessary to have a clean boiler and heating system before vacuum air valves are installed.

Some inexperienced dealers install vacuum air valves as cures for sick heating plants, after they have unsuccessfully attempted to correct the difficulty. Then when no relief is obtained from the vacuum air valve installation, the manufacturer is told that his vacuum air valves are defective. Although vacuum air valves will correct many heating troubles due to uneven heating, improper venting, and excessive fuel consumption, they must be considered an improvement to a heating system rather than a remedy for basic faults.

Many dealers consider vacuum valves to be as effective as indirect water heaters, for ex-

ample, in stimulating new business and increasing heating satisfaction among old customers. Not content to sit back until the shrinking home owner becomes a robust prospect, they shift their sales attack to vacuum valves when he is not an immediate prospect for a burner. When a Timken salesman in St. Louis found that the owner of an apartment house could not buy a burner, he came away with an order for \$170 worth of vacuum valves.

Dealers who like to make additional sales to burner users can profit by a New Jersey dealer's experience: after the burner is installed, and while he explains its operation to the owner, he casually asks whether any rooms in the house are difficult to heat. If so, he asks to be shown to the room, where he takes out a vacuum valve and replaces the air valve on the radiator. In a week or so he goes back to learn whether any heating improvement has been noted. His demonstration on the most difficult radiator has paved the way for selling the owner valves for each radiator.

Some burner dealers, it is reported, figure the cost of vacuum valves in the price of the burner installation, without telling the prospect that vacuum valves are included. They assert that a few dollars spent in equipping the plant with vacuum air valves makes them complaint-proof.