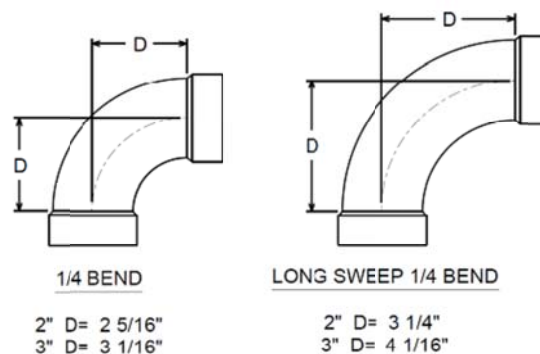




The concept of “equivalent length” is frequently used in the construction of piping systems to account for the pressure drop of fittings, such as elbows and valves. The equivalent length of a fitting is the length of a straight section of pipe that has the same pressure drop in the application as the fitting used.

All Rheem manufactured 90+ condensing furnaces are vented using plastic vent pipe and fittings. Details of how to construct the vent system are included in the Installation Instructions shipped with each furnace. Tables are included that show the maximum allowable length of pipe that can be used for the air intake and flue pipe for a particular model. The tables also show the number of elbows that can be used with a given length.

There are several different types of elbows that can be used for constructing a vent system. The drawings below show the dimensions of common ¼ bend and ¼ bend long sweep 90 degree elbows from ASTM 3311, Standard Specification for Drain, Waste and Vent (DWV) Plastic Fittings Patterns.



A long sweep ¼ bend 90 degree (long radius) elbow has an equivalent length of 5 feet of straight pipe for either 2 or 3 inch plastic pipe. A standard 90° elbow has an equivalent length of 10 feet of pipe. This equivalent length can be used in circumstances where it might be necessary to lengthen the vent at the outside of the structure, such as in areas with large accumulations of snow in winter. Table 1 shows the equivalent lengths of different types of elbows:

Table 1	
Fitting Type	Equivalent Length
45° Standard Elbow	5 feet of pipe
90° Standard Elbow	10 feet of pipe
45° Long Sweep Elbow	2 1/2 feet of pipe
90° Long Sweep Elbow	5 feet of pipe

With the equivalent length vent concept, a vent system can use any number of elbows and length of straight pipe as long as the maximum equivalent vent length is not exceeded.

Example:

An RGRC-06 direct vent installation needs a 31 foot long vent run with 5 elbows and 2 inch pipe:

31 feet of 2 inch pipe =	31 equivalent feet
5 - ¼ bend long sweep elbows =	<u>25 equivalent feet</u>
Total =	56 equivalent feet

Since the maximum equivalent vent length for an RGRC-06 is 60 feet, this installation is acceptable.

If the same installation tried to use standard elbows:

31 feet of 2 inch pipe =	31 equivalent feet
5 - standard 90 degree elbows =	<u>50 equivalent feet</u>
Total =	81 equivalent feet

And this installation is not acceptable as it exceeds the 60 foot maximum listed for the RGRC-06 model.

These changes allow vent application flexibility when more elbows are needed. We will allow these elbow additions to be used to construct “Alternate Vent Terminations” currently marked “NA, not applicable.” Use the “Standard Vent Termination” piping length from the table and reduce the total vent length by 10 feet, 5 feet for each of the two additional elbows needed to install the vent up above the expected snow fall level.

We are removing all references to a maximum number of elbows allowable and spacing between elbows in the instructions. We are also removing the requirement for necking down at the vent termination. Necking down at the vent terminal is optional and is no longer required. This letter serves as authorization to make these changes until such time as the Installation Instructions are also changed.

Tables at the end of this letter show the maximum equivalent vent length for each Rheem 90+ furnace model.

Michael B. Eberlein, PE
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MODEL	Maximum Equivalent Vent Length, feet			
	2 Inch Direct Vent	2 Inch Non-Direct Vent	3 Inch Direct Vent	3 Inch Non-Direct Vent
RGRM-04	60	80	N/A	N/A
RGRM-06	55	50	80	135
RGRM-07	N/A	N/A	60	60
RGRM-09	N/A	N/A	60	105
RGRM-10	N/A	N/A	60	60
RGRM-12	N/A	N/A	55	85
RGTM-06	60	60	60	60
RGTM-07	N/A	N/A	60	60
RGTM-09	N/A	N/A	60	60
RGTM-10	N/A	N/A	60	60
RGRC-04	70	70	N/A	N/A
RGRC-06	60	60	60	70
RGRC-07	35	35	60	60
RGRC-09	N/A	N/A	60	70
RGRC-10	N/A	N/A	60	70
RGTC-04	70	70	N/A	N/A
RGTC-06	60	60	60	70
RGTC-07	N/A	N/A	60	60
RGTC-09	N/A	N/A	60	60
RGTC-10	N/A	N/A	60	60
RGRK-12	N/A	N/A	60	80
RGTK-06	60	60	150	150
RGTK-07	N/A	N/A	150	150
RGTK-09	N/A	N/A	125	125
RGTK-10	N/A	N/A	85	85
RGTK-12	N/A	N/A	60	60
RGRL-04	85	80	N/A	N/A
RGRL-06	60	60	150	150
RGRL-07	N/A	N/A	150	150
RGRL-09	N/A	N/A	125	125
RGRL-10	N/A	N/A	85	85

MODEL	Maximum Equivalent Vent Length, feet			
	2 Inch Direct	2 Inch Non-Direct Vent	3 Inch Direct Vent	3 Inch Non-Direct Vent
RGRA-04	85	80	N/A	145
RGRA-06	50	55	150	145
RGRB-07EM	45	45	150	125
RGRB-07EY	45	45	150	125
RGRA-09	N/A	N/A	125	105
RGRA-10	N/A	N/A	125	95
RGRA-12	N/A	N/A	120	85
RGTA-04	85	80	N/A	145
RGTA-06	60	55	150	145
RGTA-07EM	35	35	150	125
RGTA-07EY	35	35	150	125
RGTA-09	N/A	N/A	125	105
RGTA-10	N/A	N/A	125	95
RGTA-12	N/A	N/A	120	85
RGRS-04	85	80	N/A	145
RGRS-06	50	55	150	145
RGRT-07EM	45	45	150	125
RGRT-07EY	45	45	150	125
RGRS-09EZAGN	N/A	N/A	125	105
RGRS-09EZAJN	N/A	N/A	125	105
RGRS-10	N/A	N/A	125	95
RGRS-12	N/A	N/A	120	85
RGTS-04	85	80	N/A	145
RGTS-06	60	55	150	145
RGTS-07EM	35	35	150	125
RGTS-07EY	35	35	150	125
RGTS-09EZAGSN	N/A	N/A	125	105
RGTS-09EZAJSN	N/A	N/A	125	105
RGTS-10	N/A	N/A	125	95
RGTS-12	N/A	N/A	120	85
RGFE-06	60	60	150	150
RGFE-07	40	40	150	150
RGFE-09	N/A	N/A	125	125
RGFE-10	N/A	N/A	125	125
RGFE-12	N/A	N/A	120	60
RGGE-06	50	50	150	150
RGGE-07	40	40	150	150
RGGE-09	N/A	N/A	85	105
RGGE-10	N/A	N/A	65	65
RGGE-12	N/A	N/A	60	60
RGJF-06	50	50	150	150
RGJF-07	40	40	150	150
RGJF-09	N/A	N/A	85	105
RGJF-10	N/A	N/A	65	65
RGJF-12	N/A	N/A	60	60