Monday, December 3, 2018

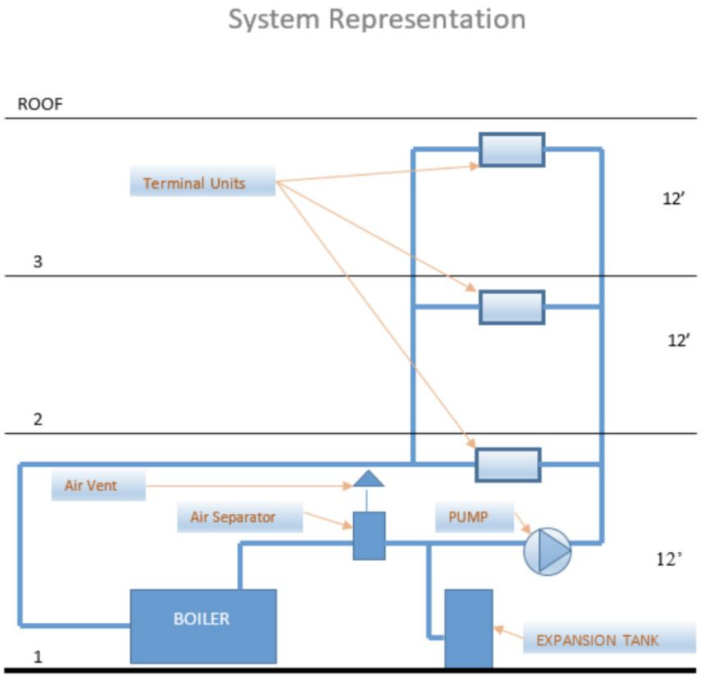
Expansion and Compression Tanks in Hydronic Systems (Part 1): Take a Quiz

Monday Morning Minutes | by Norm Hall, December 3, 2018

I could entitle the next many weeks as TANKS-A-LOT. (Sorry). Over the next many weeks, the R. L. Deppmann Monday Morning Minutes blog will examine compression and expansion tank sizing. Today we will start by offering a quiz you can use to judge how comfortable you are with the sizing of these tanks.

All closed hydronic heating and cooling systems should have a compression or expansion tank. Why not try a selection and look forward to answers over the next few weeks? You may use the Bell & Gossett ESP-Systemwize program and look to the selection choice column on the left to find expansion tanks.

The Quiz



Conditions for the Quiz

Your firm is contracted to put a small addition on an existing hot water heating system. The owner wants the equipment in the mechanical room all replaced but has a concern about costs. The base bid will reuse the existing boilers and Alternate 1 will change the boilers to new condensing boilers. The system components are designed for 125 PSIG working pressure.

A heating system is on the first floor of a three-story building with the highest terminal unit located in the ceiling space third floor. Each floor is 12 feet high.

The first floor mechanical equipment room has two existing 2 million BTUH boilers with 30 PSIG pressure relief valves. Your design will have 40° delta T with 180° supply temperature.

You have determined the system with the addition will have 1,400 gallons of water total which includes your safety factor. The tank will be a full bladder Bell & Gossett style "B" tank mounted on the floor of the mechanical room.

The new pumps will have a capacity of 200 GPM at 85 feet of head. The system is variable speed. The shutoff head is 95 feet.

Questions for the Quiz

Each question will be addressed in the following Monday Morning Minute series.

Question 1: What is the fill pressure at the tank in PSIG? (Part 2)

Question 2: For the base bid, what is the maximum design pressure at the tank? (Part 3)

Question 3: What is the fill temperature you will use? (Part 4)

Question 4: What is the maximum temperature you will use for the tank sizing? (Part 4)

Question 5: Size the tank. What Bell and Gossett model will you use? (Part 7)

Question 6: Under Alternate 1, we are going to replace the boiler with 2 AERCO condensing boilers. The boilers now have a 75# relief valve setting. What maximum

pressure would you use for the tank sizing? (Part 5 and Part 6)

Question 7: Under Alternate 1, what is the Bell and Gossett tank model you would use now?(Part 5 and Part 6)

We will answer each question over the coming many R. L. Deppmann Monday Morning Minutes. Look for Part 2 next week.