SIZING FOR CONDENSATE RECEIVERS

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Peculiarly little engineering data has been published on the selection of condensate receivers. As might be expected, opinions vary regarding the proper size of receivers, and the type, capacity and location of make-up water controls. The following practice has been advocated by several engineers as a reliable guide procedure on installations where a float operated control is mounted on the boiler to regulate the boiler feed pump and maintain a uniform boiler water line.

Sizing Condensate Receivers

For the normal installation, it has been found customary to select a receiver of sufficient size to hold a volume equivalent to the condensate evaporated by the boiler in a one-third to one-half hour period at the normal firing rate of the boiler.

EXAMPLE: Boiler Gross I-B-R Output 840 M.B.H.

$$\frac{840{,}000 \text{ B.T.U.}}{970 \text{ B.T.U.}} = 866 \text{ Lbs. Steam Evaporated Per Hour.}$$

$$\frac{866}{8.33} = 104 \text{ Gals./Hr.}$$

$$(1/3 \text{ Hr.}) \frac{104}{3} = 35 \text{ Gallons} \quad (1/2 \text{ Hr.}) \frac{104}{2} = 52 \text{ Gallons}$$

Assuming 75% of the gross volume of the tank is usable, the receiver should have a gross volume of 47 to 70 gallons, which on the average would result in a 60 gallon receiver.

The extent to which the above selection might be modified will depend on the character of the system:

(1) For instance, if the piping served by the boiler is a heating system extending over a considerable area, such as a one story factory building, the time required for the condensate to return will be slow. Under such circumstances, it is advisable to select a receiver of the larger capacity.

(2) If the piping is concentrated in a high office building on a small ground area, the experience dictates that the condensate returns quickly and the smaller size receiver may be chosen.

Receiver Tank Make-Up Water Feed Control

If an adequately sized receiver tank is chosen, then it is preferred practice to mount a make-up water feeder valve in the lower one-third section of the tank. This permits an ample volume in the tank for the collection of the condensate during the time when the boiler feed pump is not operating. Further, the make-up water feeder should be selected with sufficient capacity to take care of the normal firing rate of the boiler. For example, in this case it is desirable to select a make-up water feeder having a minimum feeding capacity of 866 lbs. of water per hour.

Low Water Cut-Offs on Receiver Tanks

If there is any likelihood that the make-up water supply to the feeder may be accidentally shut off for any reason, it is desirable to mount a float operated low water cut-off switch in the lower level of the tank. The low water cut-off, connected to the motor starter of the boiler feed pump, would stop the pump should a low water condition occur, thus preventing running a dry pump.

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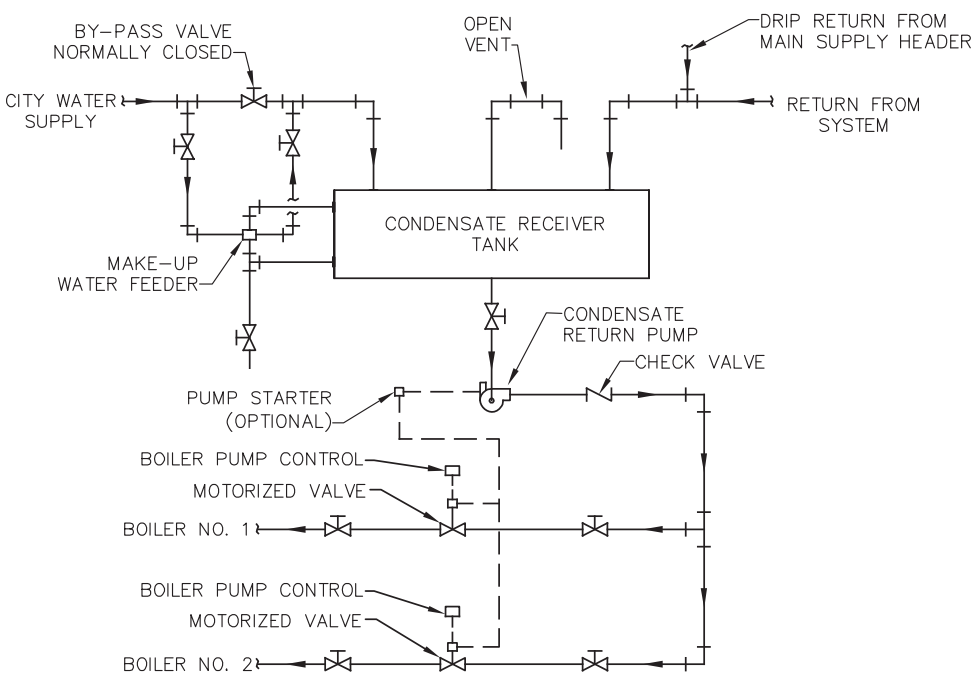
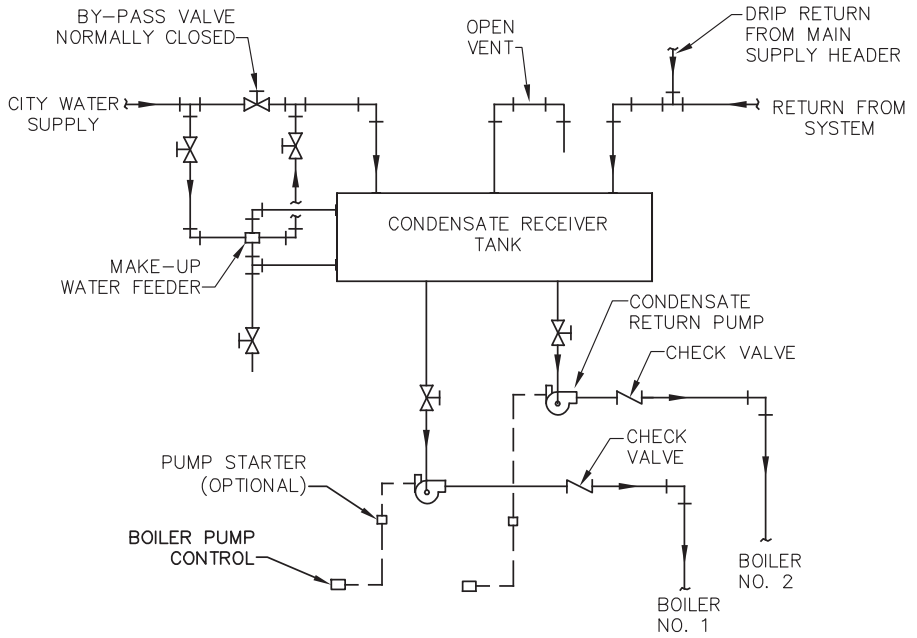


MULTIPLE STEAM BOILERS WITH INDIVIDUAL FEED VALVE CONTROL––
SINGLE CONDENSATE PUMP AND RECEIVER––
PUMP CONTROL AND LOW WATER CUT–OFF INSTALLED IN EACH BOILER



MULTIPLE STEAM BOILERS WITH MULTIPLE CONDENSATE RETURN PUMPS AND RECEIVER–:
PUMP CONTROL AND LOW WATER CUT–OFF INSTALLED IN EACH BOILER

– FOR CONDENSATE RECEIVER SIZING, SEE REVERSE SIDE –