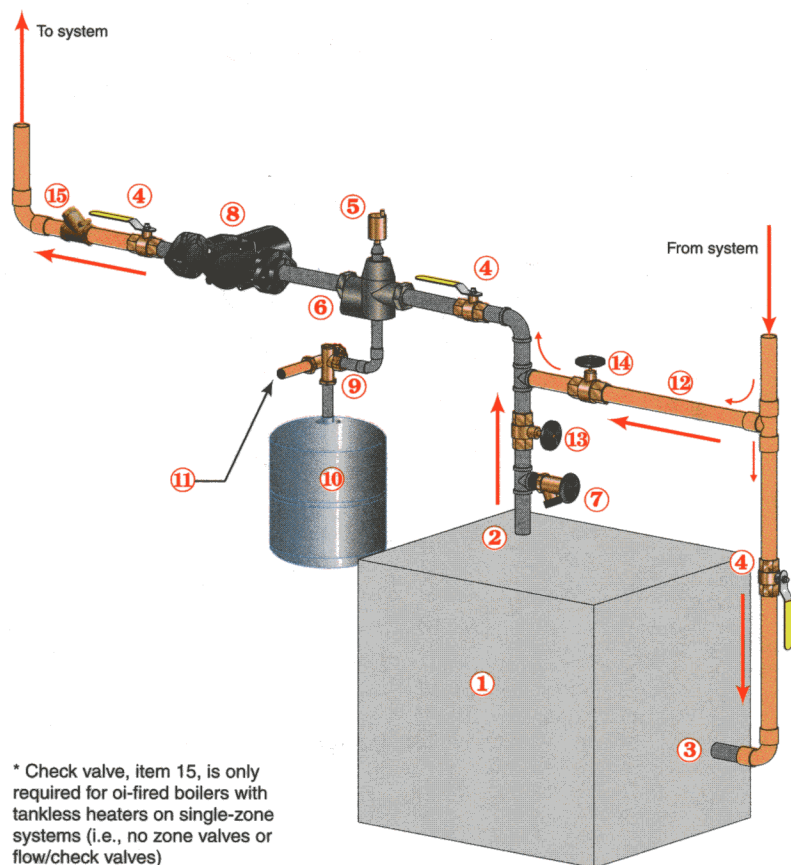
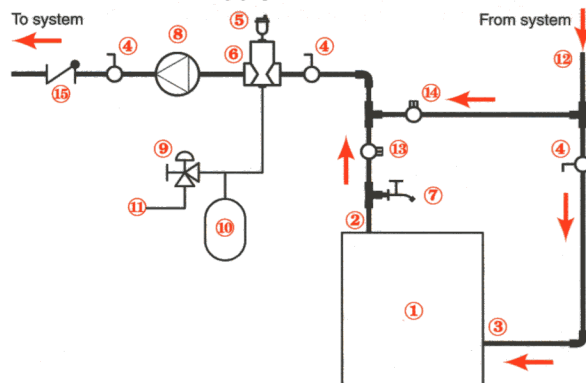


**Figure 19 Boiler bypass piping details**

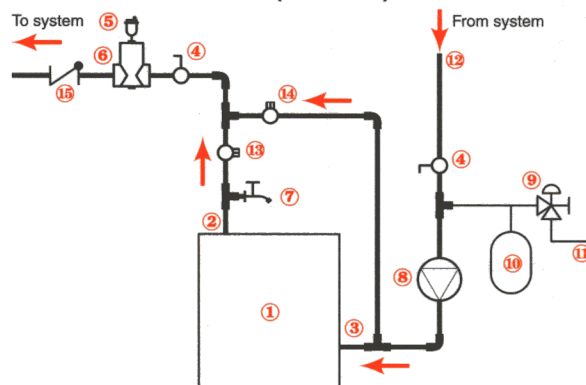


\* Check valve, item 15, is only required for oil-fired boilers with tankless heaters on single-zone systems (i.e., no zone valves or flow/check valves)

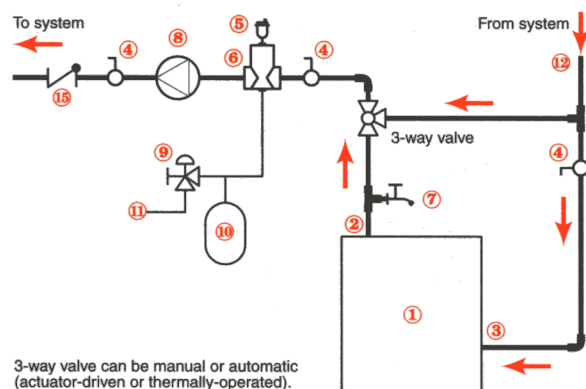
**A. Circulator on supply, as at left**



**B. Circulator on return (alternate)**



**C. Boiler bypass using 3-way valve (circulator on supply)**



3-way valve can be manual or automatic (actuator-driven or thermally-operated).

**Adjusting valves**

Adjust valves (or 3-way manual valve) to obtain the required flow through boiler and bypass. For high-water content systems, such as gravity water or converted steam systems, you will usually set the valves so boiler flow is about 1/3 of system flow. This will cause boiler temperature rise to be 3 times system temperature rise.

Install thermometers in the system supply and return lines to simplify setting flows.

- |  |                               |                                     |                       |
|--|-------------------------------|-------------------------------------|-----------------------|
| ① Hot water boiler                     | ⑤ Automatic air vent, typical | ⑨ Fill valve, typical               | ⑬ Globe or plug valve |
| ② Boiler outlet (hot water supply)     | ⑥ Air separator, typical      | ⑩ Diaphragm expansion tank, typical | ⑭ Globe or plug valve |
| ③ Boiler inlet (water return)          | ⑦ Hose bibb purge valve       | ⑪ To fresh water make-up line       | ⑮ Check valve*        |
| ④ Isolation valves (handle shows flow) | ⑧ Circulator, typical         | ⑫ Bypass line                       |                       |

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