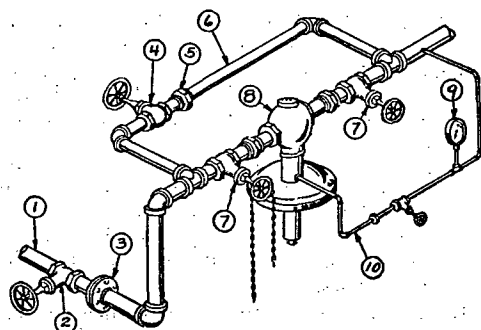


Typical service connections are shown in Fig. 2 for low-pressure service and Fig. 3 for high-pressure service. The district-heating industry refers to valves according to their functional use. The pressure-reducing valve reduces pressure to a safe point, and the pressure-regulating valve regulates pressure to that required by equipment served. Fig. 2 illustrates the use of a pressure-regulating valve with a by-pass such as generally provided for larger installations. This by-pass permits the operation of the system in case of failure in the pressure-regulating valve. In the smaller sizes, the by-pass is usually omitted. When servicing is required, the pressure-regulating valve can be removed, a filler installed, and the gate valves (part 7 in Fig. 2) used to throttle the flow of steam until repairs are made.



1. Service Pipe
2. Service Valve
3. Flanged Union
4. Globe Valve
5. Ground Joint Union

6. By-pass
7. Gate Valve
8. Pressure-Regulating Valve
9. Pressure Gage
10. Balance Pipe to connect into steam main not less than 10 ft from pressure regulating valve

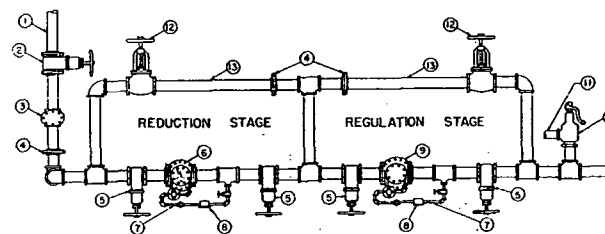
FIG. 2. PRESSURE-REGULATING VALVE WITH BY-PASS*

* From District Heating Handbook, Third Edition.

Fig. 3 shows a typical installation where the pressure in the district-steam main exceeds 50 psig, which pressure is usually higher than can safely be applied to building heating systems, as much heating equipment is not intended to withstand more than 15 psig.¹ The first or pressure-reducing valve effects the initial pressure reduction. The pressure-regulating valve controls the steam at the desired pressure.

It is often advisable to install a separate pressure-regulating valve for each steam use in the building such as for water heating, building heating, cooking, so that each system may operate at the optimum pressure.

Pressure-reducing valves are more fully described in Chapter 21. For use with district heating, dead-end type valves of the pilot-operated or spring-loaded type are generally preferred where applicable. Pressure-regulating valves should be sized to supply adequately the maximum steam requirements of the heating system or equipment. This is especially important with temperature control systems using intermittent flow of steam



PLAN VIEW

1. Service Pipe
2. Service Valve
3. Strainer
4. Flanged Union
5. Gate Valve
6. Pilot-Operated Pressure-Reducing Valve
7. Balance Line
8. Pressure Gage
9. Pilot-Operated Pressure-Reducing Valve
10. Pressure Relief Valve (optional)
11. Vent
12. Globe Valve
13. By-pass Line

Note: All fittings should be American Standard Class 250 cast iron.

FIG. 3. TWO-STAGE PRESSURE-REDUCING AND PRESSURE-REGULATING EQUIPMENT*

(Used Where High-Pressure Steam is Supplied for Low-Pressure Requirements).

* From District Heating Handbook, Third Edition.

to heat the building. Pressure-regulating valve capacity recommended for use with various types of temperature control are shown in Table 4.

ZONING AND OPERATION

Zoning. Where the hours of occupancy or heating loads differ in various sections of the building, it is good practice to install separate supply lines to the different sections. For example, in an office building with stores or restaurants on the first floor which are open in the evening, a separate main supplying the first floor will permit the steam to be shut off from the remainder of the building in the late afternoon. The division of the building into zones, each with a separately-controlled heat supply, is sometimes desirable, as it permits the heat to be adjusted according to variations in sunshine and wind.

Fig. 4 shows a typical service installation with a separate line to the

TABLE 4. SUGGESTED CAPACITY OF PRESSURE-REGULATING VALVES AND TRAPS

TYPE OF CONTROL	PRESSURE-REGULATING VALVE CAPACITY, LB/(HR) (Sq Ft of Radiation ^a)	TRAP CAPACITY, LB/(HR) (Sq Ft of Pipe and Radiation ^a)
Continuous or modulating operation, intermittent with on periods over 3 hr in duration	$\frac{1}{2}$	$\frac{1}{4}$
Intermittent operation with on periods of $\frac{1}{4}$ to 3 hr in duration	$\frac{1}{2}$	$\frac{1}{4}$
Intermittent operation with on periods of $\frac{1}{4}$ hr or less	1	$\frac{1}{4}^b$

^a Square Feet EDR.

^b Except for drip traps on mains which should be 1 lb per sq ft EDR.