XII. Setting and Testing

A. General Information

Before putting the reconditioned valve in service, it must be set to open at the required set pressure. Although the valve can be set on the service installation, it is more convenient to set the valve, and check seat tightness, on a test stand. Any spring replacement shall be in accordance with current DVCD guidelines.

B. Test Equipment

Test stands for testing DVCD Safety Relief Valves normally consist of a pressure source, a supply line with a throttle valve, and a receiver having the following features:

1. Outlet for attaching valve to be tested.
2. Pressure gauge with a shut-off valve.
3. Drain line with a shut-off valve.
4. A volume in receiver adequate for the valve to be tested to achieve proper operation.

C. Test Media

For best results, steam valves shall be tested on saturated steam; air or gas valves on air or gas, at ambient temperature; and liquid valves on water, at ambient temperature.

D. Setting the Valve

The valve should be set to open at the set pressure as shown on the nameplate. If a cold differential set pressure is indicated on the nameplate, the valve should be set to open at that pressure. The cold differential set pressure is the set pressure corrected to compensate for back pressure and/or operating temperature.

If changes are to be made to the set pressure or back pressure or the service temperature changes, a new cold differential set pressure may need to be determined.

E. Set Pressure Compensation

1. Cold Differential Set Pressure For Temperature Compensation

During production testing of safety and safety relief valves, the valves are often tested at temperatures that are different from the temperature the valve will be exposed to in service. Increasing the temperature from ambient causes the set pressure to decrease. This decrease in set pressure is due to thermal expansion of the seating area and spring relaxation.

Therefore, it is important to compensate for the difference between production test temperature and service temperature. The service temperature is the normal operating temperature of the valve. If the operating temperature is unavailable, no correction due to temperature will be made to valve set pressure.

Table 15, below, gives the set pressure multipliers that should be used when computing the cold differential set pressure for valves being set on an air or water test stand at ambient temperatures.

TABLE 15

Set Pressure Multipliers for Cold Differential Set Pressure at Ambient Temperature

OPERATING TEMP. F	OPERATING TEMP. C	MULTIPLIER	OPERATING TEMP. F	OPERATING TEMP. C	MULTIPLIER
250	120	1.003	900	498	1.044
300	149	1.006	950	510	1.047
350	177	1.009	1000	538	1.050
400	204	1.013	1050	565	1.053
450	248	1.016	1100	593	1.056
500	260	1.019	1150	621	1.059
550	288	1.022	1200	649	1.063
600	316	1.025	1250	676	1.066
650	343	1.028	1300	704	1.069
700	371	1.031	1350	732	1.072
750	415	1.034	1400	760	1.075
800	427	1.038	1450	788	1.078
850	454	1.041	1500	815	1.081

Valves to be used in saturated steam service are tested on saturated steam and, therefore, no CDS is required. However, valves in superheated steam service are tested on saturated steam and, therefore, require a CDS.

Table 16, below, shows the multiplier that should be used based on temperature above the saturated temperature (degrees of superheat).

TABLE 16

Set Pressure Multipliers for Cold Differential Set Pressure (Superheat Temperature)

Degrees of Superheat, Temp. above Sat. Fahrenheit	Celsius	Multiplier
100	38	1.006
200	93	1.013
300	149	1.019
400	187	1.025
500	260	1.031
600	315	1.038
700	371	1.044
800	427	1.050

Not Applicable. We are testing the PRV on Air Test stand.