

CHAPTER 1: The Domestic Pressure Booster System

SECTION I: WHY IS IT REQUIRED?

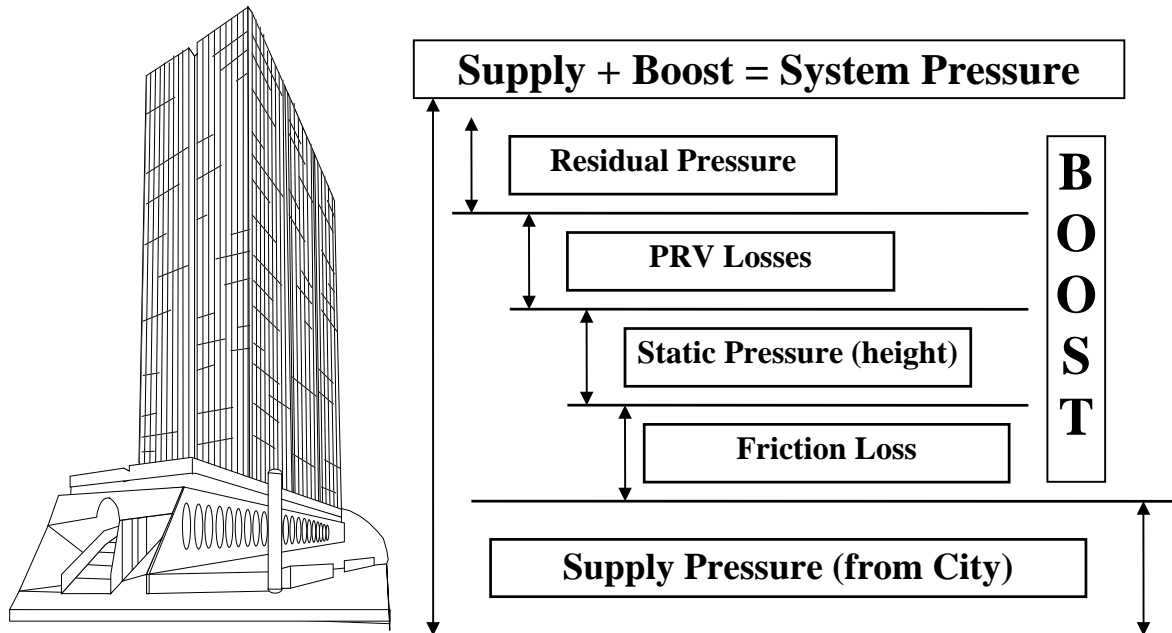
The pressure booster package is required when available street main pressure is not sufficient to serve the building. This pressure deficiency can be caused by a number of different reasons. Below are some of the most common:

- Loss of street pressure due to increased area population or development.
- Pressure loss due to the installation of a backflow preventer.
- Large flow volumes such as stadiums and office buildings reduce main pressure available.
- Aging piping which causes “fouling” thereby restricting flow through the pipe.
- Requirements within the building for minimum fixture pressures in order to achieve optimum performance.

The booster system takes the existing street pressure and increases it to the preferred “System Pressure”. System Pressure refers to the pressure in the piping manifold after the pressure booster. It can be expressed by the following formula:

$$\text{Suction Pressure} + \text{Boost Pressure} - \text{PRV Losses} = \text{System Pressure}$$

Where “suction pressure” is the available street pressure, “boost pressure” is the required additional increase added to the street pressure and PRV Losses are the pressure loss through the pressure reducing valves & the booster system piping.



Relationship of Boost Pressure vs. System Pressure. Boost Pressure is what we design for. Supply pressure is that which is currently available. Combined, these form System Pressure.

TIP: Suction pressure can usually be obtained from a copy of the “Fire Flow Test” which provides suction pressures at various flows. Use the maximum system design flow to determine minimum suction pressure.

SECTION II: INFORMATION REQUIRED

There are minimum informational requirements in order to properly size a Booster package:

- Suction Pressure: mentioned in the previous section, current service available from the local municipality.
- Building Height: can be determined by number of stories (indicate distance between each level), or height can be taken off architectural elevations.
- Friction Loss: can be figured based on pipe distance or 10% of building height.
- Loss through Booster Package: Generally based on 5 PSI for the PRV's and interconnecting piping in the package (12 Feet TDH).
- Residual Pressure: how much pressure is required at the top of the structure after everything else is accounted for (i.e. pressure at the highest fixture).

SECTION III: SYSTEM CONFIGURATIONS

Systems are available in the following most common configurations:

- Simplex = 1 pump system: One pump produces all flow and pressure
- Duplex = 2-pump system: System flow is usually split amongst (2) pumps, equally and un-equally.
- Triplex = 3-pump system: System flow is usually split among (3) pumps, equally and un-equally.
- Quadraplex = 4-pump system: Large system flows are split among (4) pumps, typically un-equally.