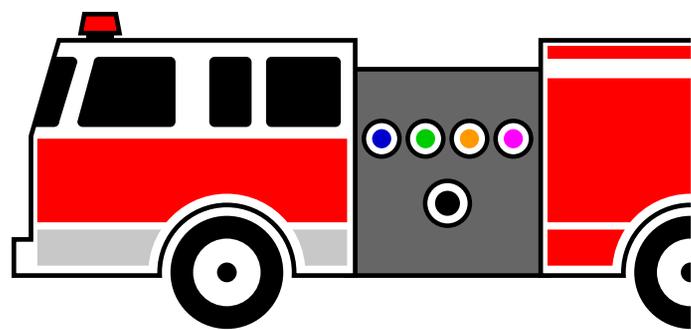


Pump Pressure for Hand Lines



3" x 200' x 200 gpm (fog); 40' elevation

3" x 100' x 200 gpm (fog); 0' elevation

1.5" x 200' x 100 gpm (fog); 20' elevation

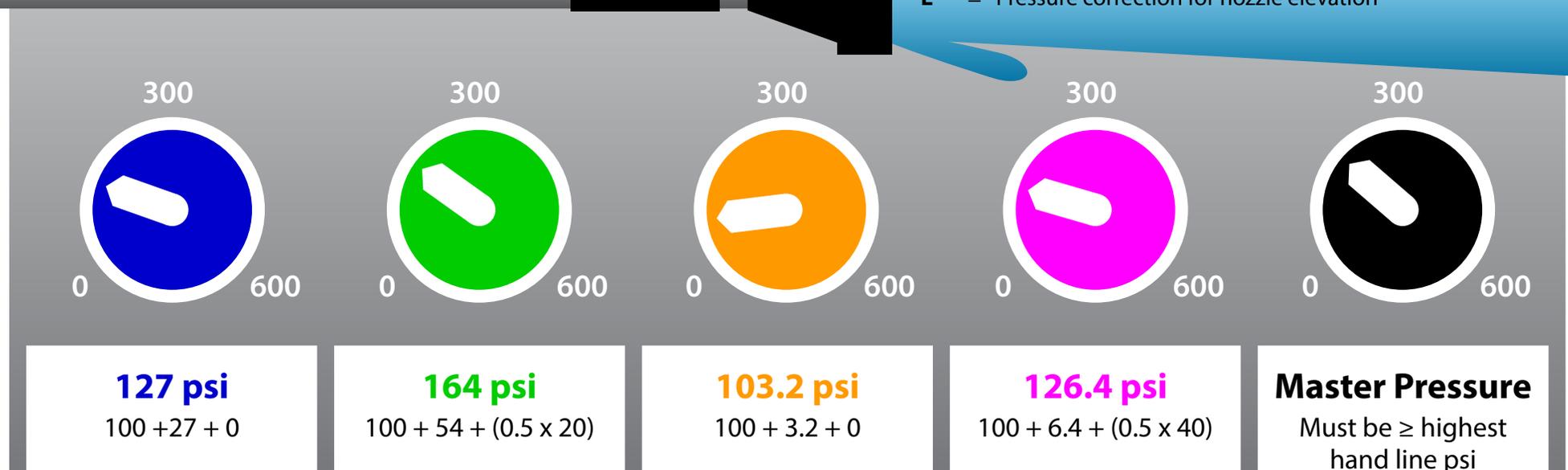
1.5" x 100' x 100 gpm (fog); 0' elevation

Firefighter Safety
depends on correct
pump pressure!

Calculate the correct pump pressure for each hand line

$$PP = NP + FL + E$$

- PP = Pump pressure required to produce the desired flow rate
- NP = Nozzle pressure
- FL = Friction loss
- E = Pressure correction for nozzle elevation



Fire Suppression
depends on correct
pump pressure!

Nozzle Pressure (NP)

Nozzle pressure is determined by the nozzle type.

Smooth bore hand line: NP = 50 psi
Automatic (fog): NP = 100 psi

Elevation (E)

Correct for elevation if the nozzle is above or below the pump level.

$E = 0.5 \text{ psi for each foot of elevation}$
(add if above, subtract if below)

Friction Loss (FL)

It takes extra pump pressure to compensate for friction loss in the hose. Friction is produced when water flows through the hose; this friction causes pressure loss. The amount of friction loss depends primarily on hose diameter, hose length, and the flow rate through the hose.

Flow Rate (gallons/minute)	Length (feet)	Friction Loss (FL) in psi for Hose Diameter	
		1.5"	3"
100	100	27	0.8
100	200	54	1.6
200	100	108	3.2
200	200	216	6.4

Double the flow rate, FL increases x4!

Double the length, FL increases x2

Smaller diameter hose has much greater FL than larger-diameter!