

Constant Pressure Relay (Maximum Volume)

Implementing a constant pressure relay operation

- Step 1, Position Attack Pumper
- Step 2, Position Source Pumper at "Key" hydrant
- Step 3, Lay out hose and place Relay Pumpers at 750 foot intervals
- Step 4, All pumpers except source pumper open a discharge to exhaust air from the lines
- Step 5, Source pumper throttles up to 175 psi
- Step 6, 1st Relay pumper closes unused discharge once a steady stream of water flows through it, then throttles up to 175 psi.
 - All successive Relay pumpers follow the same procedure
- Step 7, All Driver/Operators set their intake relief valves
- Step 8, Attack pumper adjusts PDP to supply attack lines.
 - Maintain water flow during temporary shutdowns by using one or more discharges as waste or dump lines

Maximum volume at 750 feet by hose layout

	One 2 1/2	One 3	One 4	One 5	Two 2 1/2's	One 2 1/2 & one 3	Two 3's
Max flow	321gpm	508 gpm	1017 gpm	1607 gpm	643 gpm	830 gpm	1017 gpm

Maximum volume relay pump pressure

Source and Relay pumpers - Maintain 175 psi

Attack Pumper - adjust PDP as needed making sure to dump excess pressure

* PDP accounts for 20 psi residual pressure for the next pumper in the relay

Key positions in a relay operation

Source Pumper - Positioned at the "Key" hydrant

Relay Pumper/Pumpers - Spaced evenly throughout the relay at intervals of 750 feet

Attack Pumper - Placed at a forward "Key" attack position

1 mile = 5280 Feet

Maximum Distance Relay

Implementing a Maximum Distance Relay operation

- Step 1, Determine relay distance
- Step 2, Determine required flow
- Step 3, Determine maximum distance between pumpers
- Step 4, Divide relay distance by maximum distance from table 1, round result up and add one additional pumper
- Step 5, Position Attack Pumper
- Step 6, Position Source at "Key" hydrant
- Step 7, Lay out hose and place Relay Pumpers at intervals determined by Table 1
- Step 8, All pumpers except source pumper open a discharge to exhaust air from the lines
- Step 9, Source pumper throttles up to proper PDP
- Step 10, 1st Relay pumper closes unused discharge once a steady stream of water flows through it, then throttles up to proper PDP
 - All successive Relay pumpers follow the same procedure
- Step 11, All Driver/Operators set their intake relief valves
- Step 12, Attack pumper adjusts PDP to supply attack lines.
 - Maintain water flow during temporary shutdowns by using one or more discharges as waste or dump lines

Example: (1,000 gpm relay over 10,000 feet using 5" LDH) $10000 \div 2050 = 4.87(5) + 1 = 6$ Pumpers total

Table 1 - Maximum distance relay lengths in feet

Flow in gpm	One 2 1/2	One 3	One 4	One 5	Two 2 1/2's	One 2 1/2 & one 3	Two 3's
250	1,440	3,600	13,200	33,000	5,760	9,600	14,400
500	360	900	3,300	8,250	1,440	2,400	3,600
750	160	400	1,450	3670	640	1050	1,600
1000	90	225	825	2,050	360	600	900
1250*	50	140	525	1,320	200	375	500

Maximum distance relay pump discharge pressure

2 1/2 & 3 inch - Maintain 200 psi PDP

4 & 5 inch - Maintain 185 psi PDP

***1,250 gpm requires a 1,750 gpm pump to achieve. * PDP accounts for 20 psi residual pressure for the next pumper in the relay**

Key positions in a relay operation

Source Pumper - Positioned at the "Key" hydrant

Relay Pumper/Pumpers - Spaced evenly throughout the relay at intervals determined from Table 1

Attack Pumper - Placed at a forward "Key" attack position

1 mile = 5280 Feet