

U.S. Fire Administration / National Fire Academy

# Coffee Break Training

## Topic: Fire Pump Relief Valves and Discharge Outlets

**Learning objective:** The student shall be able to identify the requirements for fire pump relief valve and discharge outlet sizes based on rated pump capacity.

When stationary fire pumps are connected to a fire protection system, the designer must be careful to prevent overpressurization of the pipe, valves, or fittings (usually 175 or 300 psi or 1206-2068 kPa).

For diesel drive pumps, a relief valve must be provided when the net rated shutoff (churn) pressure plus the maximum static suction pressure, adjusted for elevation, exceeds 121 percent of the pressure for which the system components are rated.



For electric variable-speed pressure limiting control drivers, a relief valve is required when the maximum total discharge head, adjusted for elevation, with the pump operating at shutoff (churn) and the rated speed exceeds the pressure rating of the system components.

Relief valves may incorporate an internal pressure-responsive spring or have a pilot-operated diaphragm arrangement similar to the one pictured. Water from the relief valve must be piped to a location where it can flow freely, preferably outdoors.

The minimum size of the relief valve assembly and discharge outlet are based on the pump's rating:

Pump Rating		Relief Valve		Discharge Outlet	
(gpm)	(lpm)	(in.)	(cm)	(in.)	(cm)
400-500	1 514-1 892	3	7.62	5	12.7
750	2 840	4	10.2	6	15.2
1,000	3 785	4	10.2	8	20.3
1,250-1,500	4 731-5 678	6	15.2	8	20.3
2,000-2,500	7 570-9 463	6	15.2	10	25.4
3,000-3,500	11 356-13 248	8	20.3	12	30.5
4,000-5,000	15 141 - 18 927	8	20.3	14	35.6

For other pump sizes and additional information, refer to NFPA 20, *Standard for the Installation of Stationary Pumps for Fire Protection*.