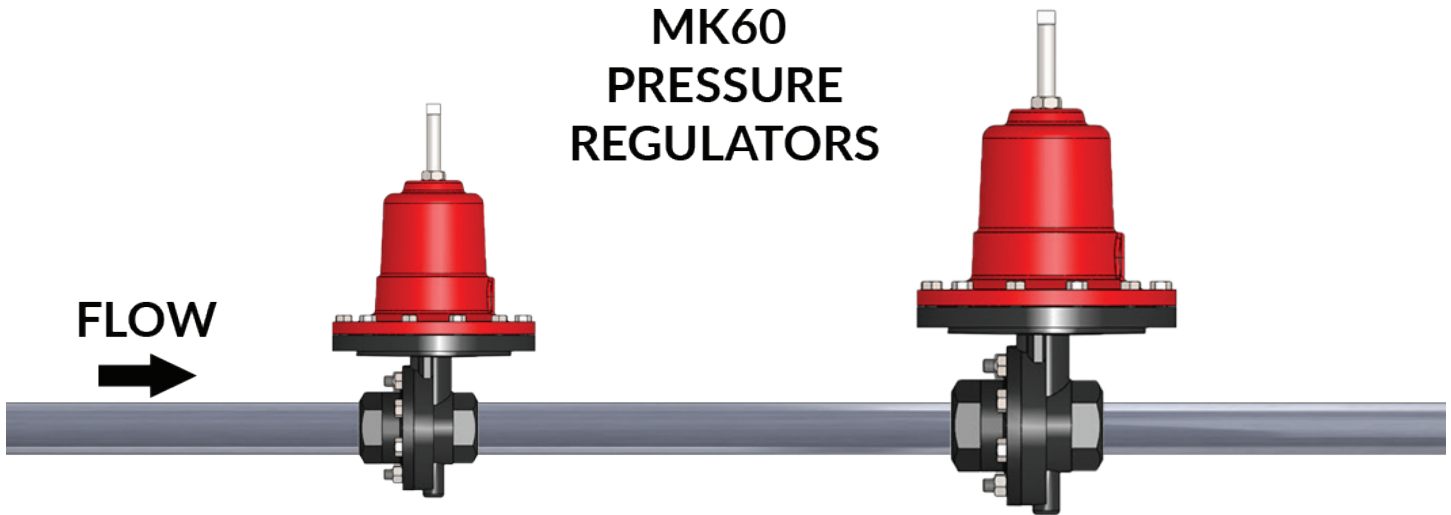


## MK60 PRESSURE REGULATORS



### REGULATORS IN SERIES

Occasionally, you may have an application where just one Jordan regulator will not be able to handle the required pressure drop. Two regulators installed in series can handle the high pressure drop with good sensitivity and avoid the problems encountered when taking large pressure drops across one valve.

For example:

Your customer is looking to regulate 500 psi air down to 50 psi. Line size is ½" and the maximum flow rate is 250 scfm. The media is air at ambient temperature. Your customer would prefer to use a self operated regulator and not a control valve. As the maximum pressure drop for a ½" MK 60 with Jorcote seats is 400 psi, one valve obviously will not work as the Delta P is 450 psi on this application. In this case two valves can be piped in series in order to provide a two stage pressure drop. The Delta P is therefore split between two regulators.

You need first to determine at what pressure you stop the first stage and start the second stage. The intermediate set pressure is adjusted to obtain the maximum output through both regulators.

A basic formula can be used to determine this:

$P_2 = \text{square root of } (P_1 \times P_3)$ .  $P_1 = 500 \text{ psi}$ ,  $P_3 = 50 \text{ psi}$ , then  $P_2 = \text{square root of } (500 \times 50) = 158 \text{ psi}$ .

The first valve can then be sized for 500 psi inlet to 158 psi outlet. The second valve then from 158 psi to 50 psi. In doing this, you will find that the second valve would require a larger Cv than the first one in order to handle the larger volume of lower pressure air. The first valve of the series would be quoted as a ½" MK 60HP with a range of 75-190 psi and a Cv 1.6 with Jorcote seats. The second valve would be selected as a ½" MK 60 with a range of 20-55 psi and a Cv 4.4, with Jorcote seats and double dome bolting.

Always use the equation ( $P_2 = \text{square root of } (P_1 \times P_3)$ ) to determine  $P_2$ . This will assure that the ratio of inlet pressure divided by the outlet pressure for each valve is equal, so that the upstream valve does not overly influence the downstream valve. The second valve in series must be capable of handling the maximum inlet pressure of the service in case the first valve fails. Therefore, double dome bolting is required as the full service would then be passing through this one. The second valve should be installed not less than 10 pipe diameters downstream of the first valve.