

DirectoValve® Electric Pressure Regulating Valves

The proper regulating valve will enhance the operation of a sprayer, especially one with an automatic rate controller. While advanced electronics provide features and control, the proper regulating valve helps the system to respond quickly to input changes and functions over a wide range of application rates. Choosing the proper valve involves determining the maximum capacity required, the range of application rates and the proper motor speed.

System Capacity

A regulating valve's system requirements will depend on the application amount and the pumping capacity. Additionally, the regulating valve can be used in bypass or throttling mode. In throttling mode, the flow through the valve will be applied through the nozzles. In bypass mode, the excess flow from the pump is recirculated.

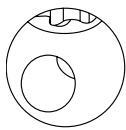
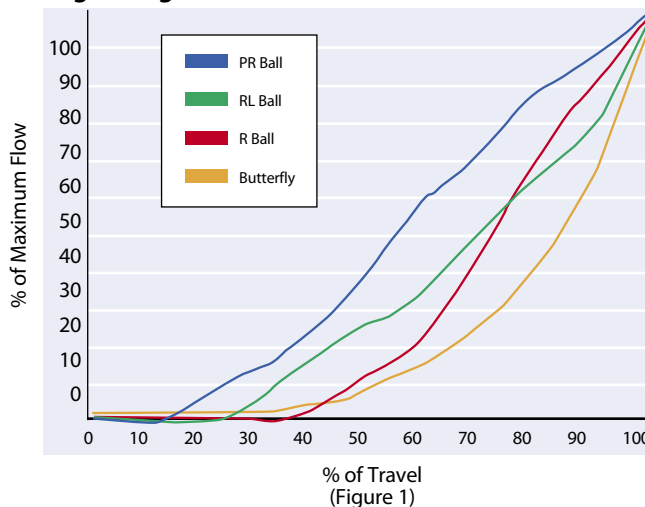
A valve that works well throughout the flow spectrum has the best chance to work in all situations.

Types of Regulating Valves

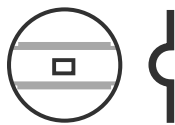
Special ball shapes make regulating valves more responsive and able to work with both high and low application rates. Most agricultural sprayers use either a

2-way ball valve or butterfly valve for regulating purposes. When considering sizing a regulating valve, the first concern is to understand the valve's flow curve to determine how efficiently the valve will regulate. Figure 1 shows typical flow curves for DirectoValve® regulating type valves. This will help to decide the type of valve to use.

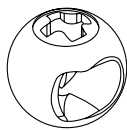
Regulating Valve Flow Curves



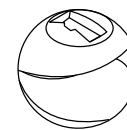
R Type Valve



Butterfly Valve



RL Valve



PR Valve

R Type and Butterfly Valves

As shown on the graph, the butterfly valve has the most non-linear flow curve for final 1/3 (30%) of travel leading to an increase of 75% in flow through the valve. The straight 2-way "R" ball curve is not quite as steep, with the flow through the valve increasing by 60% over the last 30° of travel. The "R" ball, however, has the additional disadvantage of not allowing significant flow during the first 1/3 of its rotation. Since a small change of rotation causes a significant change using these valves, trying to regulate large flows when the valve is two thirds to full open presents a challenge.

RL Valve

Spraying Systems Co.® has developed a special ball that allows the valve to start regulating earlier thus extending the regulating range. This special ball valve also increases flow and the linear characteristic of the valve during the first ¾ of the valve cycle. The flow from the valve starts 10° earlier, than a regular R type ball and increases the flow of the RL ball during the first 70% of travel (Figure 1). The maximum capacity is about 10% less than an R type valve.

PR Valve

The PR valve uses a 3-way valve body and a ball with a wedge removed. The combination of this ball and a motor that rotates past the standard 90° results in a valve with an almost linear flow curve. The 2PR version has one outlet plugged. The 3PR version allows bypass flow to return to the tank.

As noted in Figure 1, the percentage of flow increases by approximately the amount of ball travel thus avoiding the rapid change seen with standard ball valves and butterfly valves.

Ball Type Regulating Valves

* Not available in stainless steel.

MODEL NUMBER	MAXIMUM PRESSURE	MAXIMUM FLOW 5 PSI (0.34 bar) SPEED (RPM)
344BR-2	300 PSI (20 bar)	32 GPM (121 l/min)
344BR-3	300 PSI (20 bar)	32 GPM (121 l/min)
344BRL-2	300 PSI (20 bar)	27 GPM (12 l/min)
* 344BPR-2	300 PSI (20 bar)	12 GPM (45 l/min)
* 344BPR-3	300 PSI (20 bar)	12 GPM (45 l/min)
346BR-2	150 PSI (10 bar)	100 GPM (379 l/min)
346BR-3	150 PSI (10 bar)	64 GPM (242 l/min)
* 346BPR-2	150 PSI (10 bar)	53 GPM (200 l/min)
* 346BPR-3	150 PSI (10 bar)	53 GPM (200 l/min)