



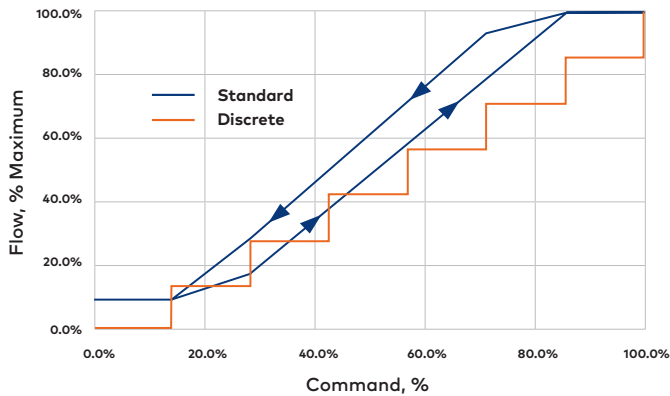
Patent pending

## Discrete Proportional Valve (DPV) System

Discrete Proportional Valve (DPV) technology relies on the intelligent combination of simple binary (ON/OFF) solenoid valves with varied port size to achieve stepped proportional control. Two or more ON/OFF valves with differing flow coefficients are combined in a single manifold. Using selective actuation of the valves, a stepped approximation of a linear flow response is achieved. For example, a system of three valves gives  $2^3$  or eight possible flow states. The DPV can be designed to include a zero-flow state or a specified minimum flow state.

DPV technology allows design teams to structure semi-proportional control that best suits their application needs while realizing the benefits associated with the technology. Based on application requirements, the number of flow stages and associated volumes can be predetermined to achieve the optimal flow characteristics that will enhance any system design.

Discrete Proportional v. Standard Proportional Behavior



Discrete proportional valve system and continuous proportional valve performance curves

### Features & Benefits

- + Customizable flow control for 4, 8, or 16 positions
- + Zero hysteresis by design
- + Debris tolerant
- + Zero steady-state power
- + Coil customizable to any DC voltage signal
- + Flow characteristics can be customized
- + Scalable to meet your application requirements
- + Patent pending

### Applications

- + Thermal management
- + Flow control
- + Processing
- + Spraying systems
- + Other applications

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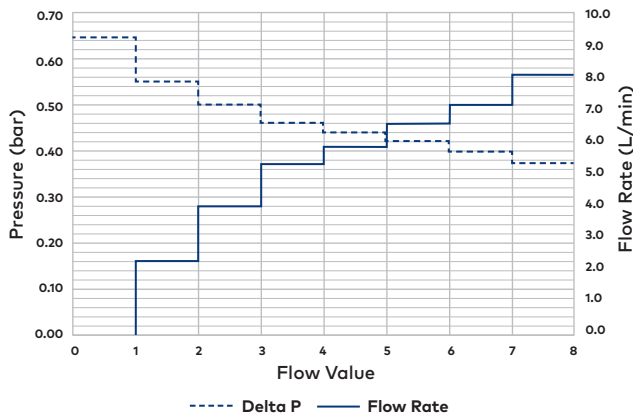
Technical Data (custom configurations available)

Flow Characteristics in a DPV Example

State	Flow Rate GPM	Flow Rate L/min	Delta P psi	Delta P bar
0	0.000	0.0	9.4	0.65
1	0.620	2.3	8	0.55
2	1.060	4.0	7.3	0.50
3	1.400	5.3	6.7	0.46
4	1.540	5.8	6.4	0.44
5	1.730	6.5	6.1	0.42
6	1.900	7.2	5.8	0.40
7	2.130	8.1	5.4	0.37

Flow characteristics in a DPV example with eight discrete positions

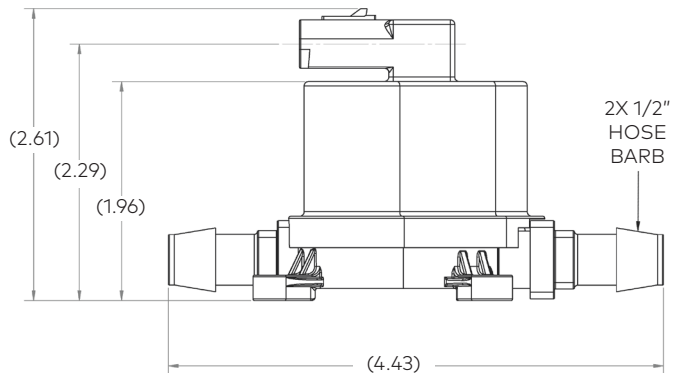
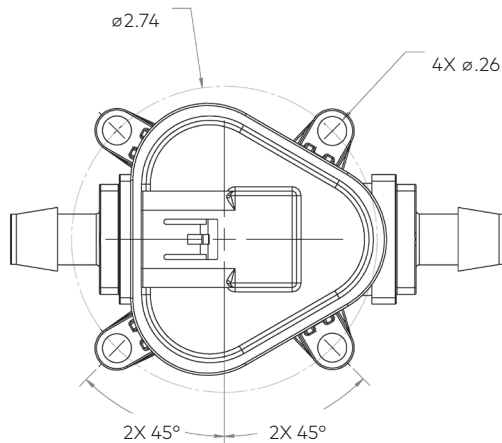
Discrete Proportional Valve Test



- + Permanent magnet latching solenoids
- + 24 Vdc
  - Reverse polarity required to operate solenoid in both directions
  - Can be implemented on a local or vehicle control board
- + Current draw
  - Peak draw at 20°C: 0.85 A
  - Min. pulse signal: 200 ms
  - Latched draw: 0.00 A
- + Resistance at 20°C: 28.2 Ω
- + Power at 20°C: 20.4 W
- + Stroke: 1.25 mm
- + Pressure drop at max flow: .37 bar @ 8.0 L/min
- + 1/2" hose barb connections
- + Package size:
  - Ø: 20.0 mm
  - H: 30.3 mm (top of housing to extended pin tip)
- + See chart and graph for more flow characteristics

*All TLX components are customized to fit system requirements, meaning technical specifications are unique to each customer and design. Examples given are for illustration purposes only.*

Dimensional Drawings (dimensions in inches)



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