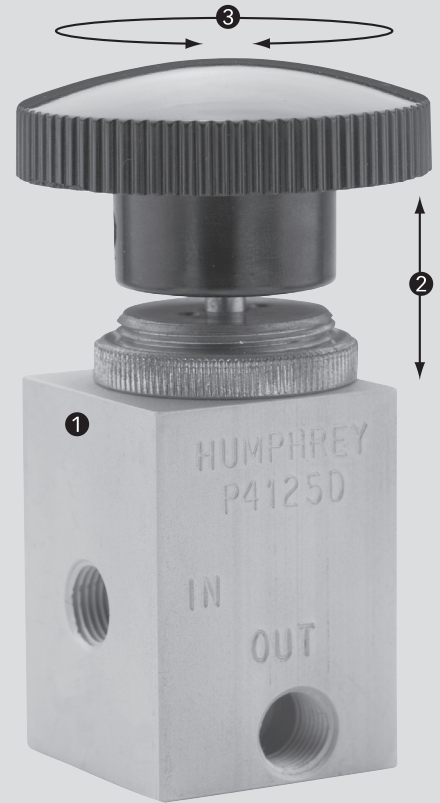


The portable clutch & brake cleaning system consists of a reservoir tank, a cleaning sink and cover/tray, a hose with a cleaning attachment, and a scissors base. The auto service technician raises the scissors base to bring the sink up to the brake or clutch assembly, then turns on the motor and begins cleaning.



- ① Dual function control valve.
- ② Push-pull action starts pump motor.
- ③ Rotation regulates motor speed.
- ④ Rugged assembly designed for reliable operation.

## Custom Valve Assembly

*Has Single Shaft For Both ON/OFF Control and Pressure Regulation*



**ENVIRONMENTAL**  
SIC:4959

### THE CUSTOMER'S PRODUCT

- A well known manufacturer of stationary recirculating cleaning and degreasing systems began developing a self-contained portable unit that would use an aqueous cleaning solution.
- The system would use shop air at 80-120 PSIG, to power the air motor, which drives the pump – creating a flow of cleaning solvent through the hose.
- Dirty solvent drains back into the reservoir tank and is recycled.
- When the solvent is spent, the sink is removed and the reservoir tank capped, making reclamation easy.

### THE REQUIREMENTS

- The unit had to be durable and simple to operate, especially the pump motor control.
- The customer wanted a single valve with a push-pull action to start the pump motor and a rotating action to regulate motor speed.

### THE HUMPHREY ENGINEERED SOLUTION

- Humphrey combined the proven technology of a slide valve and a needle valve to create the P4125 Push-Pull Needle Valve Assembly.
- Single knob handle/shaft provide dual control, while allowing operator to retain flow setting when shutting of the unit.

## THE SOLUTION

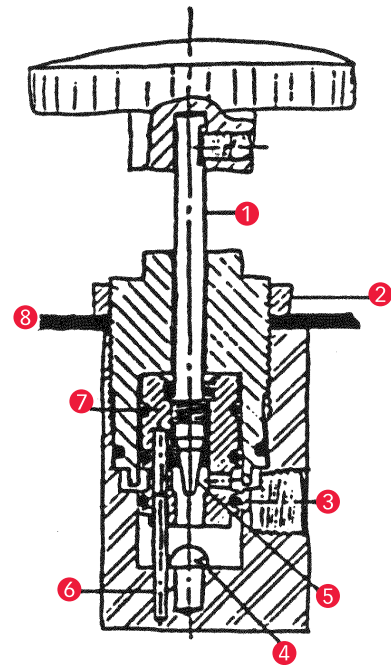
When the customer initiated the request, Humphrey set the Engineered Solutions process in motion – assigning an engineer to work directly with the customer’s engineering department. Having established all the requirements, Humphrey engineers combined the proven technology of a slide valve and a needle valve to produce the P4125 Push-Pull Needle Valve Assembly.

The valve assembly consists of a knob handle/shaft that is connected to the slide valve. When pulled up, it allows air to flow through the ports to the air motor, which drives the fluid pump. The threaded shaft has a needle valve on the end. Rotating the handle clockwise increases the airflow and counterclockwise rotation decreases it. This enables the service technician to turn the system on an off without disturbing the flow setting. The slide valve rides on an integral guide pin to prevent the assembly from turning when the shaft is rotated.

## THE PROCESS

The customer initially wanted to improve the functionality the control valve package on their portable cleaning unit. They had tried using multiple valves to control the flow of the cleaning chemicals, but this added cost and did not provide the ideal degree of flow control. In the process of examining all the factors affecting the product, the Engineered Solutions team also identified the need for a more compact size and zero leakage.

Working with the customer’s engineering department, Humphrey created a single module with a multi-function valve assembly to replace the multiple valves. This eliminated the expense of acquiring and then assembling multiple components with their inevitable multiple leak points. Combining the functions into a single unit dramatically reduced the overall size. And the use of field-proven slide and needle valves, plus precision engineering, resulted in a reliable unit that delivered precise flow control.



- ① Valve Stem
- ② Panel Mounting Nut
- ③ In
- ④ Out
- ⑤ Needle Valve
- ⑥ Guide Pin
- ⑦ Slide Valve
- ⑧ Panel

*Humphrey*