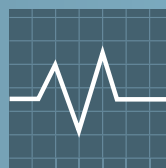


Humphrey's custom valve assembly is used in an automated analytical instrument to provide extremely fast and accurate tissue and fluid sample processing.

- ❶ Custom valve assembly controls the air used to pressurize and dispense reagents.
- ❷ Compact Humphrey assembly is extremely small, making it ideal for desktop instruments.
- ❸ Humphrey's HK5 valve operates with virtually zero leakage, ensuring the customer's gas source will last as long as possible.

Custom Valve Manifold Assembly *For High Precision Medical Laboratory Equipment*



**TESTING
& MEASUREMENT**
SIC:3826

THE CUSTOMER'S PRODUCT

- The customer designs and manufactures a wide range of analytical instruments.
- The customer recognized a need for a totally automated system that was fast and highly accurate.
- The particular model would be used in hospitals and laboratories to stain slides of tissue and fluid samples for pathological analysis.
- The customer was experiencing performance problems with the valves being used on the prototype unit.
- The prototype valve manifold assembly was too large for the target size of the production model.

THE REQUIREMENTS

- Provide a valve manifold system that would fit within the tight space envelope.
- The valve must have a low leak rate.
- Valve response time and subsequent instrument volumetric dispensing must not vary from valve to valve.

THE HUMPHREY ENGINEERED SOLUTION

- Humphrey utilized their standard proven HK5 valve and modified it to achieve ultra-low leakage.
- The custom manifold designed by Humphrey was significantly more compact than the prototype unit.
- Humphrey assembled the complete valve manifold unit and each one is 100% tested prior to shipment.
- Humphrey also developed a liquid version of the HK5 for other applications on the customer's system.

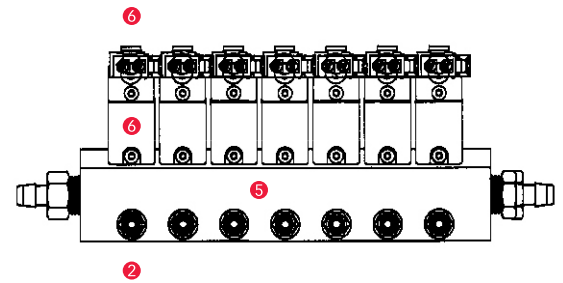
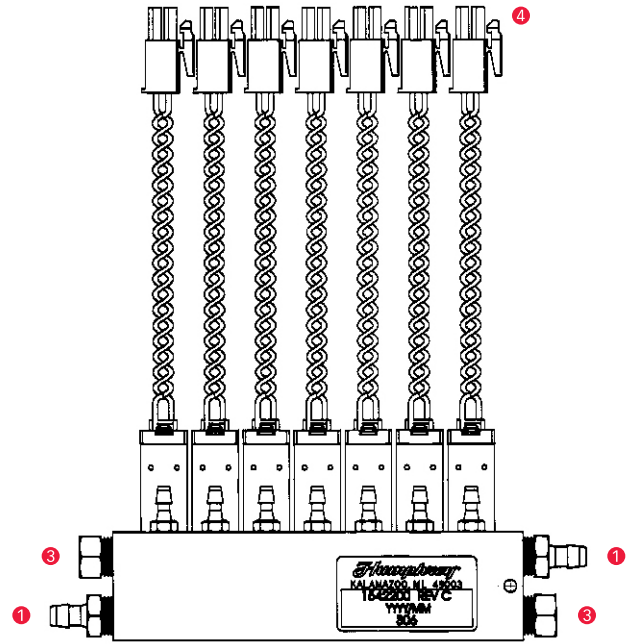
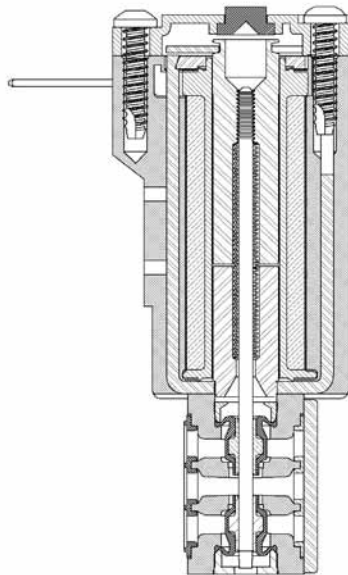
THE SOLUTION

Working on a peer-to-peer basis with the customer's engineering department, the Humphrey Engineered Solutions team started with their proven HK5 valve and modified it to achieve virtually zero leakage and also make it compatible with the harsh reagents used in the assembly process. These reagents could get drawn into the valve during operation, and compatibility ensured that they would have no effect on the valve. The uniform performance of the HK5 solved another major customer requirement—totally automated processing of up to 500 slides without any degradation in quality. Then the Engineered Solutions team designed a custom manifold that could significantly reduce the size of the carousel tray, making the customer's unit smaller.

THE PROCESS

The Humphrey Engineered Solutions team began by evaluating all the customer's needs and requirements. In cases where air is used to pressurize a reagent, the pressure drop after the procedure can result in some reagent being drawn back into the valve.

Humphrey engineers went to work, modifying the standard HK5 valve to deliver an ultra low leak-rate with both air and harsh reagents. They further developed a version of the HK5 that could work in liquid service. Then the Engineered Solutions team designed a compact manifold system designed to fit the customer's space envelope exactly.



- 1 Inlet
- 2 Outlet
- 3 Exhaust
- 4 Electrical Connections
- 5 Manifold
- 6 HK5 Valve

Humphrey