

Evolution of a Custom Control Valve Enhances Conveyor System Operation

THE SITUATION:

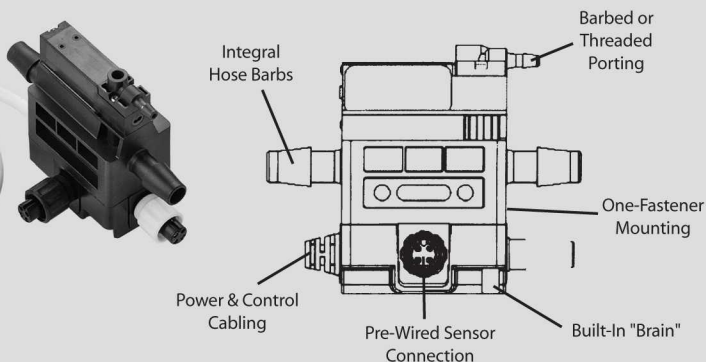
A major manufacturer of accumulation conveyor systems wanted to replace its existing mechanically actuated pneumatic valve control system with a photoelectric sensor-actuated valve control. While the system of mechanical valves was inexpensive to maintain, it was not able to accommodate a wide range of carton weights, and did not offer any specialized functions.

THE OPPORTUNITY:

Working closely in an engineer-to-engineer relationship allowed Humphrey to gain a better understanding of the customer's evolving requirements to meet the changing demands of the market. Starting with simple replacement for the mechanical pneumatic valve, the customer set out an ever-expanding series of challenges to continue reducing total system costs while providing for enhanced operating benefits to the end user. These requirements centered on being able to offer the user a conveyor system with a more flexible control system.

THE SOLUTION:

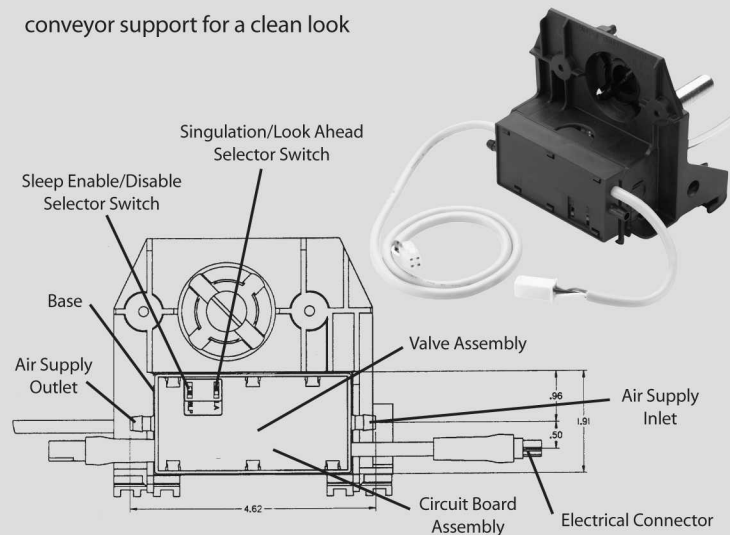
One of the solutions resulted in the development of Humphrey's 555 Series valve -- the first standard valve to incorporate on board programmable logic control. This opened the opportunity to provide a range of custom valve control solutions to meet specific performance requirements, while greatly reducing manufacturing, installation and warranty costs. Some of the additional solutions included a valve assembly that incorporated DIP switches to enable a user to manually change the conveyor logic mode, and a valve assembly capable of supplying two different pressures to the "puck" (the conveyor actuator).



Humphrey 555 valve

- ¥Electronic sensor input from photoelectric eye
- ¥Accepts most standard brands of photoelectric sensors
- ¥On board logic provides look ahead, to determine conveyor status
- ¥Pre-programmed sleep, singulation and slug modes
- ¥Customized module housing "snap fits" inside the customer's existing

conveyor support for a clean look



Humphrey D0077 valve module

- ¥Electronic sensor input
- ¥Slide switches to change operational mode
- ¥Unique electrical termination wire is stripped and crimped to the board (allows more valves in series --control circuit wire is unbroken to reduce impedance loss)
- ¥Utilizes the Mini-Miser with ½ watt current consumption (allows more valves in system or lower cost power unit)
- ¥All components in the Humphrey unit snap into place, and the entire assembly snaps into the rail, lowering assembly costs
- ¥Push-to-connect termination versus the older screw-type "J" connector saves additional assembly time
- ¥Humphrey assembles and tests the complete assembly, including components supplied by the customer

THE PROCESS:

The customer wanted to make their products more competitive by incorporating more end-user benefits -- specifically different logic modes to add flexibility to the system operation -- yet the entire system had to be cost-competitive. The Humphrey Engineered Solutions team approach was the catalyst for investigations of all the customer costs, issues and opportunities -- from initial conveyor design through end user maintenance -- in an effort to enhance their products.

This ongoing relationship enabled Humphrey engineers to gain a greater understanding of the customer's entire manufacturing, installation and warranty structure, and then offer design suggestions that could make a significant contribution. The customer's engineers, now freed from the necessity of designing pneumatic circuits, could focus on their core competency -- conveyor design. The result was a faster new product