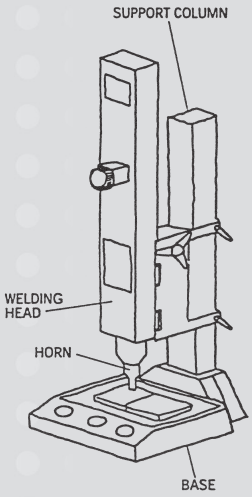
Humphrey®



Ultrasonic welding is a method of joining two nonferrous metal pieces using high frequency acoustic vibrations to create a strong metallurgical bond without heat, solder or flux.

The high power vibrations are transmitted through a specially designed velocity transformer called a "horn" to the clamped workpiece. The vibrations disrupt the oxide layer at the mating surface causing the metal atoms to diffuse from one piece to the other. This creates a cross-linking that produces a true bond.

1. Humphrey P5045B Flow Control Valve (internal)
2. Custom Control Knob
3. Graduated Index Indicator
4. Single Rotation -- Fully Open/Fully Close
5. Custom Shape and Footprint
6. Custom Port Locations (end view - not shown)

Compact Custom Valve

Assembly for Ultrasonic Welding Equipment Met Exacting Design and Performance Specifications

MANUFACTURING EQUIPMENT
SIC:3559

THE CUSTOMER'S PRODUCT

- The customer designs and manufactures ultrasonic welding equipment.
- The fast cycle time (typically under 1 second), the elimination of joining materials, and the low energy consumption greatly reduce production costs.
- The consistent quality of the bond is superior to that created by conventional soldering and welding techniques.

THE REQUIREMENTS

- To ensure the highest possible weld quality, a pneumatic flow control device must provide precise, repeatable control over the position of the velocity transformer ("horn").

THE HUMPHREY ENGINEERED SOLUTION

- Created a custom valve assembly that fit the requirements for shape and mounting.
- Incorporates Humphrey's proven diaphragm poppet design with a flow control needle valve.
- Custom single turn control knob with graduated index.
- Single rotation from fully open to fully closed.

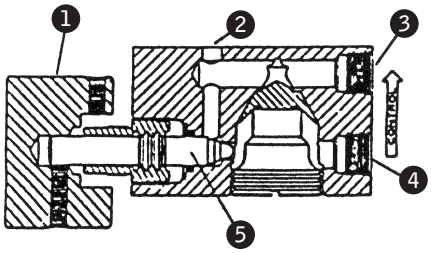
THE SOLUTION

Ultrasonic welding is rapidly becoming the accepted method for joining non-ferrous metals and copper wire in many electrical and electronic applications. Its fast cycle time (typically under 1 second), the elimination of joining materials, and the low energy consumption greatly reduce production costs. Plus, the consistent quality of the bond is superior to that created by conventional soldering and welding techniques.

Working on an engineer-to-engineer basis, the Humphrey Engineered Solutions team developed a custom flow control device that contained a 2-stage custom needle valve. This delivered linear flow from fully closed to fully open with a single rotation of the control knob. As a result, the operator could precisely control the position the horn. Other design features included custom porting and a compact size that fit into a specific, predetermined area.

THE PROCESS

Failing to find any standard flow control devices that met the design requirements, the customer contacted Humphrey. Working closely with the customer's engineering department, the Engineered Solutions team developed a custom assembly that met all the parameters. While cost was a consideration, the benefits of improved equipment performance could easily be justified.



P5045B Valve Assembly

1. Single Turn Knob with Graduated Index
2. Exhaust
3. Out To Horn Control
4. In
5. Precision Needle Valve

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BUILD ON OUR EXPERIENCE

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