Plastic Tube Rotameter
Instruction Manual

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1. Overview

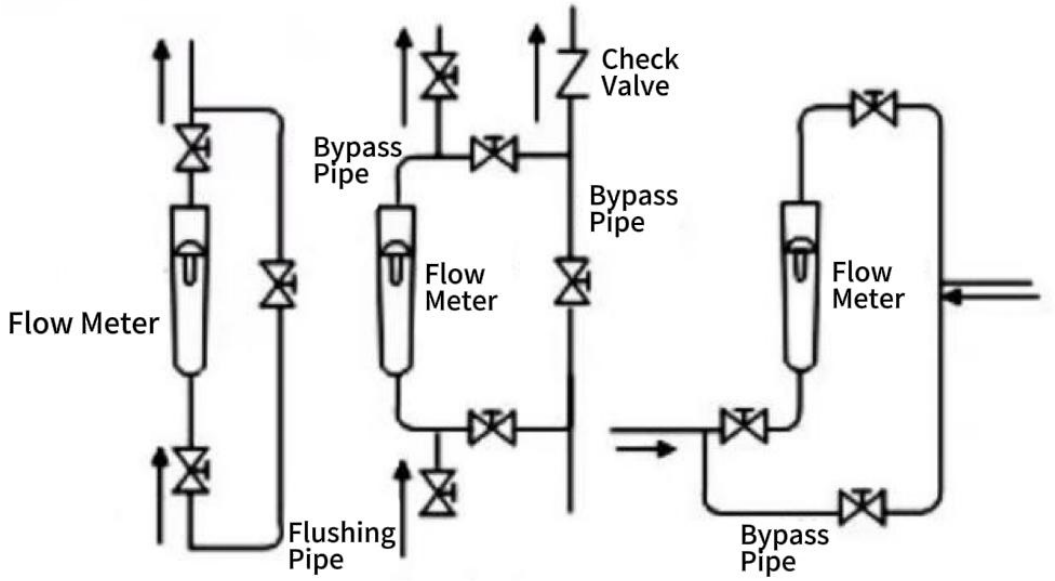
The plastic tube rotameter is characterized by its lightweight design, corrosion resistance, unbreakable structure, non-toxic and odorless materials, and convenient usage. It is mainly used for measuring the flow rate of single-phase, non-pulsating liquids in industries such as chemical, light industry, pharmaceuticals, food, and environmental protection.

2. Working Principle and Structure

The flowmeter structure, as shown in the diagram, mainly consists of a vertically installed transparent plastic tapered tube (with the small end facing downward and the large end facing upward) and a float that moves up and down within the tube as the measuring element. Other components include a nut, pipe fittings, stoppers, and O-rings.
When fluid flows upward through the tapered tube, a pressure difference is created above and below the float, causing it to rise. When this pressure difference balances with the float's weight, buoyant force, and viscous resistance, the float remains stationary. As the flow rate changes, the fluid velocity through the annular gap between the float and the tube changes, thereby altering the pressure difference. The float moves up or down accordingly. The float's stable vertical position within the tube indicates the flow rate.

3. Installation

1. **Pre-Installation**:
   Before installation, carefully remove the foam support inside the instrument using needle-nose pliers. Then reassemble the instrument properly. Ensure that the rubber gasket is correctly placed in the groove of the pipe fitting to prevent leakage.
2. **Connection**:
   The flowmeter can be connected using matching ABS or PVC plastic pipes, joined with special adhesive, or via plastic flanges that are further connected to metal flanges.
   The flowmeter must be installed **vertically without significant tilt**, and at a height convenient for reading. When taking a reading, ensure the line of sight is level with the float.
3. **Flow Rate**:
   For optimal performance, use the flowmeter within **50%–70%** of its maximum rated flow. Avoid operating it at the upper limit for prolonged periods.
4. **Straight Pipe Requirements**:
   A **straight pipe section at least 5 times the inner diameter of the meter** should be maintained upstream and downstream of the flowmeter.
   The measured fluid should maintain a stable pressure. Pressure fluctuations may cause float instability, resulting in inaccurate readings. It is recommended to install a **buffer or pressure stabilizer upstream** of the instrument.



Bypass Pipe Installation Diagram

4. Instrument Transportation and Storage

To prevent damage during handling, please keep the instrument in its original factory packaging as much as possible before it arrives at the installation site. Handle with care during transportation; rough handling or violent loading and unloading is strictly prohibited. The storage location for the instrument should meet the following conditions:

1. **Protection against rain and moisture**, and free from corrosive gases and liquids;
2. **Minimal mechanical vibration**, and avoid impact or shock;
3. **Ambient temperature**: -10°C to 45°C;
4. **Relative humidity**: not more than 85%.