General

The UCUF Series Ultrasonic Flowmeter is designed for low flow rate applications. The flowmeter consists of the UCUF Flow Sensors, SFC-700 DSP type Signal Converter. The non-wetted Sensor design, constructed of specific grade PFA material, makes the UCUF Series an ideal choice for semiconductor industry, where extreme cleanliness of pipe line inside is of primary importance.

Equipped with versatile LCD display, and the latest digital signal processing (DSP) technology, the SFC-700 features low flow range measurements as well as significant reduction of adverse bubble influence in the fluids, thus establishing itself as the industry standard.

The SFC-700 delivers flow-linear output over the entire uniform, parabolic and transition flow regions.

- New signal processing has improved anti-bubbles capability of converter.
  Normally, ultrasonic flowmeter has difficulty in measuring fluid containing bubbles, because the bubbles interfere with ultrasonic signal passage. In virtue of high speed DSP, anti-bubbles capability has been remarkably improved. (Excepting a fluid which contains dense, minute cloudy bubbles.)
- Field-proven output linearizer based on kinematic viscosity of the fluid.
- Flow rate readout, zero adjustment, alarm lamp and setting buttons are easily accessible from the Converter front.
- Accuracy ±1% of Reading. (Flow velocity ≥ 1 m/s)
- Wide range-ability of 100:1 (Typical)
- Low flow measurement down to 10 mL/min
- Measures viscous fluids up to 4.0x10⁻⁵m²/s
- Corrosion resistant
- Easy installation with compact meter body
- Easy parameter configuring with LCD display.

Applications

- Pure water and ultra-pure water in semiconductor manufacturing plants
- Chemical Mechanical Polishing (CMP) slurries
- Chemical feedings
- Very low flow measurement of liquid

Operating Principle

The fluid to be measured flows through the U-shaped tube. Two piezoelectric transducers, mounted at both ends of the measuring section, emit and receive an ultrasonic wave alternately. The wave propagating in direction with the fluid flow is accelerated and the wave travelling against the fluid flow is slowed. The difference in transit time of wave is proportional to the velocity of the fluid.

The converter converts received ultrasonic wave signal into digital data, computes flow rate and transmits output signal. Stable transit time measurements is conducted with new signal processing, regardless fluctuation of wave signal level.
Specifications

Sound Velocity of Fluid: 1000 to 2200 m/s
Kinematic Viscosity: 0.3 x 10^-6 m^2/s to 4.0 x 10^-5 m^2/s

SFC-700 Signal Converter

Model Number Break Down
SFC-700-X1 X2
 X1: 1 for 4, 6, 10mm Sensor
     : 2 for 15, 20mm Sensor
 X2: 0 for 4-20mA
     1 for 0-10V

Output:
1) 4 to 20mA
   Load resistance: 0 to 500 ohms
   or
   0 to 10V
   Source resistance: 500 ohms
   Damping time constant: 0.2 to 10s
2) Scaled Pulse
   Open collector / 30VDC, 50mA Max.
   Pulse width: 0.5 ms (Max. 1000 Hz),
               50 ms (Max. 10 Hz,
               100 ms (Max. .5 Hz)
   (Selectabele per pulse rate at full scale)
   Pulse rate: 10 to 1000 pps at full scale
3) Flow rate alarm / Total preset function
   Open collector / 2 points
   30V DC / 50mA Max.
   Indication: LED, visible from front side
   Relay action: NO
Low Cut-off: 0 to 30% of full scale
Display: LCD / 2 line 16 digital alphanumeric
          (with illumination)
Alarm indicator: 1 LED, LCD (Hi or Lo)
Data Entry: By 4 key switches in front panel
Linearizer: Automatic
            : Manual / 15 line-segment approximation
Data Backup: Parameter and Total counts by EEPROM
Zero Adjustment: Accessible from front panel
Power Supply: 24VDC ± 10%
Power Consumption: 200mA (300mA / starting)
Ambient Condition: 0 to 50 °C / 30 to 80% RH
Installation: Panel mounting
Enclosure: Classification; IP20 (indoor use)
Material: Panel; ABS
          Housing; Aluminum alloy
Color: Panel; Blue and yellow
       Housing; Black
Mass: Approx. 530 g

Special Products

Followings are available as special, consult factory.
1. Pulse output selection, flow rate % proportional
   or empty sensor contact instead of volume.
2. Plus side output protection instead of minus
   side when signal is lost.
5. English flow rate units, GPM and GPH.

Outine Dimensions

Terminals

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Polarity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>In</td>
<td>Inlet side</td>
<td>Sensor signal (Coaxial cable connector)</td>
</tr>
<tr>
<td>Out</td>
<td>Outlet side</td>
<td>Pulse output</td>
</tr>
<tr>
<td>1</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>+</td>
<td>Alarm H / Total Preset HH</td>
</tr>
<tr>
<td>4</td>
<td>—</td>
<td>Alarm common</td>
</tr>
<tr>
<td>5</td>
<td>+</td>
<td>Alarm Lo / Total Preset H</td>
</tr>
<tr>
<td>6</td>
<td>+</td>
<td>Reset input (Totalizer)</td>
</tr>
<tr>
<td>7</td>
<td>−</td>
<td>FG (Grounding)</td>
</tr>
<tr>
<td>8</td>
<td>+</td>
<td>Output current 4-20mA</td>
</tr>
<tr>
<td>9</td>
<td>—</td>
<td>or 0-10V</td>
</tr>
<tr>
<td>10</td>
<td>24V</td>
<td>Power supply (DC 24V)</td>
</tr>
<tr>
<td>11</td>
<td>0V</td>
<td></td>
</tr>
</tbody>
</table>

*Specification subject to change without notice