Claims

1. A mass flow meter, comprising:

   a main member having a main channel, a first sensor channel, a second sensor channel and a chamber; wherein the first sensor channel and the second sensor channel are communicated with the main channel and the chamber respectively; wherein the main channel is provided with a filter; and

   a sensor, having an inlet nozzle and an outlet nozzle, the sensor being disposed within the chamber such that the inlet nozzle is connected to the first sensor channel and the outlet nozzle is connected to the second sensor channel, whereby a portion of the fluid flowing through the main channel enters the sensor via the first sensor channel and returns to the main channel via the second sensor channel, thereby allowing measurement of a flow rate of the fluid;

   wherein the main member further comprises a pressure chamber and an air channel, the pressure chamber is communicated with the chamber while the air channel is communicated with both the pressure chamber and the main channel, allowing a portion of the fluid in the main channel flows into the pressure chamber via the air channel to keep a pressure in the sensor identical to an outside pressure;

   wherein a diameter of the first sensor channel is greater than that of the inlet nozzle of the sensor, so that a space is formed between the inlet nozzle and a sidewall of the first sensor channel, the space is thereby defined as the air channel.

2. The mass flow meter of claim 1, wherein a volume of the chamber is greater than that of the sensor, so that a space is formed between the sensor and a sidewall of the chamber, the space is thereby defined as the pressure chamber.

3. The mass flow meter of claim 1, wherein an O-ring is disposed on the outlet nozzle of the sensor, so that the pressure chamber is hermetically sealed from the second sensor channel.

4. The mass flow meter of claim 1, further comprising a cover, the cover seals the chamber when the sensor is mounted on the chamber.

5. A mass flow controller, comprising:

   a main member having a main channel, a first sensor channel, a second sensor channel, a chamber, a post-valve main channel, a first valve channel, and a second valve channel; wherein the first sensor channel and the second sensor channel are communicated with the

main channel and the chamber respectively; wherein an end of the first valve channel is communicated with the main channel, and an end of the second valve channel is communicated with the post-valve main channel; wherein the main channel is provided with a filter;

a sensor, having an inlet nozzle and an outlet nozzle; wherein the sensor is disposed within the chamber such that the inlet nozzle is connected to the first sensor channel and the outlet nozzle is connected to the second sensor channel, whereby a portion of the fluid flowing through the main channel enters the sensor via the first sensor channel and returns to the main channel via the second sensor channel, thereby allowing measurement of a flow rate of the fluid; and

a control valve having a valve inlet and a valve outlet; wherein the control valve is disposed in the main member such that the valve inlet is connected to the first valve channel and the valve outlet is connected to the second valve channel, allowing the fluid from the main channel to flow through the control valve via the first valve channel and then flow into the post-valve main channel via the second valve channel; wherein the control valve adjusts a flow rate of the fluid discharged from the valve outlet based on the flow rate detected by the sensor;

wherein the main member further comprises a pressure chamber and an air channel, the pressure chamber is communicated with the chamber while the air channel is communicated with both the pressure chamber and the main channel, allowing a portion of the fluid in the main channel flows into the pressure chamber via the air channel to keep a pressure in the sensor identical to an outside pressure;

wherein a diameter of the first sensor channel is greater than that of the inlet nozzle of the sensor, so that a space is formed between the inlet nozzle and a sidewall of the first sensor channel, the space is thereby defined as the air channel.

6. The mass flow controller of claim 5, wherein a volume of the chamber is greater than that of the sensor, so that a space is formed between the sensor and a sidewall of the chamber, the space is thereby defined as the pressure chamber.
7. The mass flow controller of claim 5, wherein an O-ring is disposed on the outlet nozzle of the sensor, so that the pressure chamber is hermetically sealed from the second sensor channel.

8. The mass flow controller of claim 5, further comprising a cover, the cover seals the chamber when the sensor is mounted on the chamber.