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(54) Title: IMPROVED MASS FLOW SENSOR INTERFACE CIRCUIT

(57) Abstract: An improved mass flow sensor interface ("MFSI") circuit and method are disclosed for sensing and measuring mass flow rate of a gas and provide an output voltage proportional to the mass flow rate in a mass flow controller. The improved MFSI circuit of the present invention includes upstream and downstream mass flow sense elements a precision current source to drive the circuit. The circuit further includes an operational amplifier to sum the voltage upstream of the upstream sense element with the voltage downstream of the downstream sense element. A reference voltage is electrically connected to the positive node of the operational amplifier. An upstream shunting resistor and a downstream shunting resistor share a common junction at the negative node of the operational amplifier and are electrically connected in parallel to the upstream and downstream mass flow sense elements. The MFSI circuit of this invention further includes a reference resistor connected between the reference voltage source and the positive node of the operational amplifier and a feedback resistor connected between the positive node and the output of the operational amplifier. The operational amplifier of the MFSI circuit provides an output signal proportional to the resistance change across the upstream and downstream sense elements, and therefore proportional to the gas mass flow rate.

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