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MICRO TURBINE FLO-SENSORS WITH A 20 YEAR HISTORY OF PROVIDING AN EXCELLENT ALTERNATIVE TO BALL AND TUBE ROTAMETERS

ABSTRACT

McMillan Model 100 and 101 gas and liquid microturbine flow sensors have an excellent history of 20+ years of usage. Thousands have been sold to original equipment manufacturers all over the world for inclusion in products that formerly used ball and tube rotameters. What factors motivated designers of analyzers and other products to switch to these economically priced flow sensors? Read on to see if they may be suitable for inclusion in a product now under development at your company. Further, thousands more have been sold to research labs, quality control facilities, environmental facilities, chemical labs, etc for precision measurement of gas and liquid flow rates.

INTRODUCTION

As noted in the abstract, McMillan Model 100 and 101 gas and liquid micro-turbine flow sensors have been used all over the world for inclusion in products that formerly used ball and tube rotameters. This article features conditions wherein usage of these flow sensors would be a very desirable choice for designers choosing to measure flow rates in original equipment manufacturer (OEM) products.

GAS MICROTURBINE FLOW SENSORS

Without question, it can be seen from advertising articles that many instruments and analyzers currently employ rotameters to measure gas flow rates when such products employ various gases in the determination of their specific chemical analysis or concentration. Certainly, it is reasonable for a number of such instruments to utilize rotameters primarily because of the cost effectiveness of obtaining gas flow rates for that specific instrument.

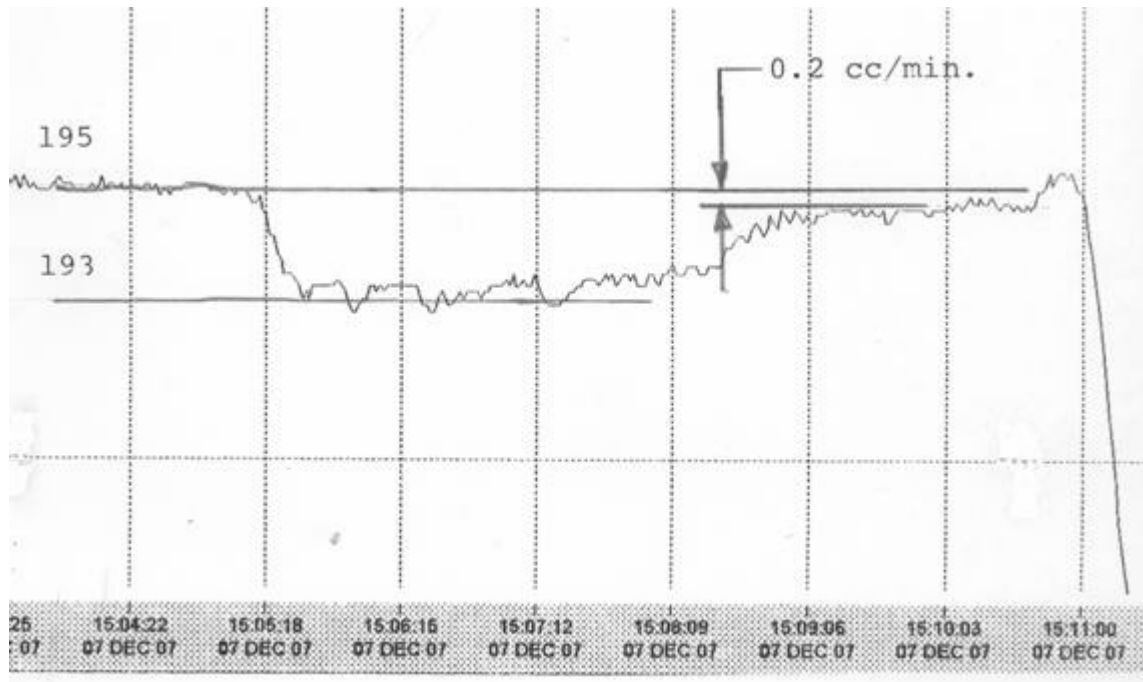
However, the designer of instruments planning on employing some type of gas flow rate device for a particular instrument should realize that certain advantages in the precision and features of an instrument can be gained by a judicious usage of a flow sensor capable of providing an electronic output signal proportional to gas flow rate. The Model 100 Gas FLO-SENSOR is an option that should deserve serious consideration as it can provide a 0-5 VDC output signal proportional to flow rate. Many current OEM products employing this very small flow sensor have found it to be exactly what they have needed in either designing a new product or in upgrading an existing product that formerly employed rotameters.

Here are a number of reasons that caused such designers to choose to use the Model 100 FLO-SENSOR:

- Extreme repeatability capability
- Very good linearity of out put signal with $\pm 3\%$ of full scale accuracy. (In special cases, it is possible to provide $\pm 3\%$ of reading for some applications.)
- Large quantity pricing in the low \$100 USD range
- Fast recovery when drops of liquid pass through the flow sensor as in measurement of certain "wet" or moist gases
- Two screw top mounting for ease of installation or removal
- Inexpensive 4 pin cable to plug into sensor
- Compression tube fittings standard with tube size as specified by user
- Rugged design with capability of long life and carrying a limited one year warranty.

Figure 1 that follows shows typical repeatability of a 1000 sccm Model 100 gas flow sensor measuring air flow rate around 195 cc/minute. The air flow was

manually reduced to 193 sccm and then brought back to the original air flow rate of 195 cc/minute. Note that the actual air flow rate came back to 194.8 sccm or to within 0.1% of original setting or to within 0.02% of full scale reading. This ability to closely track slowly varying flow rates is a quality not found in many types of flow sensors.



*FIGURE 1:
OUTPUT SIGNAL OF A MODEL 100-6 GAS FLOW SENSOR SHOWING ITS ABILITY TO
RECOVER FROM A CHANGING FLOW RATE*

The above data was obtained under controlled laboratory conditions and may not always be reproduced in actual field tests with varying environmental conditions. It has been presented to show the capability of this very sensitive gas flow sensor. Users familiar with ball and tube rotameters are aware that to reset the flow rate to within 0.02% of full scale on a rotameter is not feasible.

LIQUID MICRO TURBINE FLOW SENSORS

The McMillan Model 101 Liquid FLO-SENSORS are popular for usage in a wide variety of liquid analyzers and monitoring instruments all over the world. These flow sensors are very similar in size and appearance to the Model 100 Gas FLO-SENSORS, but certain differences internally are required. Cost and performance characteristics previously stated for the gas flow sensors also typify the liquid flow sensors. The largest selling McMillan Liquid FLO-SENSOR is our Model 101-3 which accurately covers flow rates from 13-100 mL/minute.

WHY SUCH FLOW SENSORS ARE ATTRACTING OEM TO INCORPORATE THEM IN THEIR PRODUCTS

In this 21st century, buyers of sophisticated gas and liquid analyzers and instruments employing flow devices that measure flow rates are increasingly

turning to electronic flow products to be able to digitally display flow rates and to also use the signal output from such flow sensors to furnish diagnostic output when such analyzers are remotely located away from service personnel. Also, in an effort to provide long term accuracy, these equipment manufacturers are increasingly utilizing micro processors to accept the output signal of a gas or liquid flow sensor to automatically adjust the span accuracy of the instrument as the gas or liquid flow rate changes over time.

For more information on McMillan products, visit our web site at <http://www.mcmflow.com> or give us a call at +1 512 863 0231.