



Thermal Instrument White Paper

High Flow Rate Auto Ranging Flow Meter

Who do you contact when an application calls for an instrument that can measure across a wide flow range and still needs to provide good resolution? On top of that, the operating pressure and velocity of the gas traveling through the pipe line can increase in a matter of seconds from a flow rate of 3 – 5 feet per second to hundreds of feet per second, just like that. Sounds like a complicated measurement challenge that you just don't want anyone to work on, you need to work with someone that has experience with these applications.

Thermal Instrument Company has the experience and a solution that utilizes our Model # 62-9 Insertion Probe married to our Model # 926 Electronics. The first challenge is manufacturing a flow element that is sensitive enough at the lower flow rates but robust enough to handle the extreme pressure and velocities that can be reached when a blow down or line evacuation situation occurs.

Thermal Instrument can custom manufacture our flow elements to withstand and meet the most extreme conditions. We can adapt to the application by increasing the OD of the probe, custom welding process connections, and even change the material of construction. This flexibility allows our flow measurement instruments to be used in a wide variety of applications.

The next challenge is providing good data when the measurement can be over such a wide range. Most flow measurement instruments lose resolution as the turn down increases. One way to maintain the resolution is to utilize an electronic transmitter that can automatically adjust between two different ranges of the 4-20mA flow output. Thermal

Instrument can design and configure the transmitter to automatically go between two separate flow ranges according to flow conditions. When the flow range is operating at the lower end of the flow spectrum the transmitter operates within one 4-20mA output range. As soon as the transmitter senses that the flow rates have increased, it automatically switches to the 2nd level 4-20mA output to continue providing flow information for the application.

An example of an application we currently support is the measurement of Natural Gas traveling through compressor stations for a large energy company. In this situation, natural gas travels at a very modest flow rate most of the time. However, at times there may be a line evacuation or blow down where both the flow rates and pressure increases dramatically. The challenge was to be able to build a flow meter that can stand up to both the extreme conditions, and provide measurement across a wide flow range.

Thermal Instrument answered the challenge by designing an insertion probe that was 1.5" in OD and at various lengths to meet pipe line sizes. The flow element utilizes a 3000# welded union process connection to keep it secure when extreme conditions exist. The flow information is then transmitted to our Remote Electronics Model # 926. The electronics monitors the flow rates, and automatically switches between the flow ranges that are programmed into the transmitter. This information is then sent to a control system utilizing the 4-20mA and pulse output.

For more information on this solution, please contact us or one of our Sales Partners.



217 Sterner Mill Rd. | Trevoise | PA | 19053 | USA

Info@thermalinstrument.com

www.ThermalInstrument.com