WINNER

Vögtlin Instruments AG

red-y compact 2 series thermal mass flowmeter

Best in flow

Case studies show the brightest innovations in flow technology this year.

Flow Control has honored the fluid handling industry's ongoing commitment to manufacturing excellence through our annual Innovation Awards for two decades. Each year, we are proud to present the latest innovations and technology breakthroughs in our industry based on an open nomination and reader voting process.

Congratulations to this year's winner, Vögtlin's red-y compact mass flowmeter. For the first time, a thermal mass flow instrument is powered with a single AA battery that will run for up to six months. The gas mass flowmeter can be used as a mobile calibration instrument or in any place where power supply is unavailable. The device offers high accuracy (1 percent) and dynamics (100-to-1), built-in totalizer, multiple gases, optional valve and alarm module.

Honorable mentions include Endress+Hauser's Micropilot FMR10/FMR20 non-contact radar device that measures the level and open-channel flow measurement of liquids by emitting continuous microwave signals; Sierra Instruments' InnovaMass 241i iSeries vortex flowmeter that has been specifically designed for precise flow energy management to reduce costs and increase productivity in steam, compressed air, natural gas and water applications; and Siemens Process Instrumentation's HydroRanger 200 ultrasonic controller for level measurement with an improved Human Machine Interface and graphical Quick Start Wizards that essentially render the need to refer to manuals a thing of the past.

On the following pages, we'll see how each technology can be applied to real-world fluid handling applications, resulting in increased process efficiency, measurement accuracy and cost savings. Thanks to everyone who participated in this year's program from nominating products to casting votes.

HONORABLE MENTION

Endress+Hauser

Micropilot FMR10/FMR20 radar level transmitter

HONORABLE MENTION

Sierra Instruments

InnovaMass 240i/241i iSeries vortex flowmeter

HONORABLE MENTION

Siemens Process Instrumentation

HydroRanger 200 ultrasonic controller

Gas flowmeter makes sampling simple

Vögtlin Instruments AG

Gas sampling is the first step in the collection of data that guards our process variables, monitors emissions and verifies that processes are running consistently. We see more and more demand for regular interval sampling that needs to be consistent and reliable. Sample specialists have discovered the simplicity and economics of the Vögtlin red-y compact mass flowmeter with optional integrated alarm module.

Developed in Switzerland, this extraordinary gas measurement instrument offers true portability because of its long life on a single AA battery. All 50-plus variables can be adjusted through a built-in touchscreen. No need exists to connect the unit to a computer unless you want to update the firmware or power the unit through its USB connection.

Available for all kind of gases in ranges from 0 to 10 standard cubic centimeters per unit (sccm) up to 0 to 480 standard liter per minute (slpm) (air equivalent), the compact 2 fits many applications. Sometimes this "fit" is in the small but many details, for instance, OEM users appreciate that if you turn the unit around, the display automatically adjusts its position for the viewer — important if the flow does not go from left to right. Overall, users appreciate the economics, quality and reliability of this device.

Traveling engineers use this portable, battery-powered unit to adjust gas flow settings, test for leaks and verify other flowmeters. Once the battery life reaches its end, batteries can easily be replaced with widely available AA batteries. As an alternative, the unit can be powered through the USB cable by a power bank or a USB port on a laptop or PC.

In the following application, users make use of the alarm module expansion that gives them three alarm points, two I/O inputs and an external power supply. The alarm module replaces the battery compartment and is integrated in the compact 2 at the back with a 3-meter, 12-conduct wire for all the connections.

Making sample-taking simple

In the analytical world, the red-y compact 2 is used as the heart of a reliable automatic, low-cost gas sample-taking device.

Emission or environment measurements often demand periodic samples of a fixed amount of gas, which are collected in a container or sample bag. For example, every hour a 100 standard cubic centimeter (scc) sample is taken. With its optional smart alarm module, the compact 2 has the complete solution without the need for a programmable logic controller (PLC) to control the process. The system runs on 24 voltage direct current (Vdc).

The Vögtlin compact 2 alarm module has three alarm points that are individually programmable for different alarm functions such as totalizer, window, high and low alarm. We will also make use of the timer functions and the ability to reset the alarms and totalizer with an I/O input on the alarm module.

Gas sampling in the field

Alarm 1 is programmed as a totalizer alarm with the sample volume we want to collect in each sample, for example, 100 scc.

In that alarm function, the alarm duration can be programmed between 100 msec and 2.78 hours. This time sets the time between the samples.

Once the process starts, the solenoid will open and a preset amount of gas will flow into the sample bag or container. Once the defined amount is reached, the Alarm 1 will open and close the solenoid, and the gas flow will stop. Because of the programmed Alarm 1 duration setting, the alarm will stay active for the preprogrammed time, in our example, one hour.

Once this hour is over, Alarm 1 is programmed to automatically reset itself and the counter goes back to zero. The solenoid is activated again, the gas will flow and the totalizer starts counting again until the preprogrammed value is reached. The process starts all over again. The process will continue and every hour one sample of 100 scc will flow into the sample container.

Alarm 3 is used for diagnostics. The alarm will sound if:

1. The sample bag/container gets full
2. Water enters the sample line
3. The flow during sampling is too low (sample line blockage)
4. The flow is too high (process pressure too high)

In this case, the user can push the reset button to deactivate the alarm and continue the process.

Many other variations are possible. Every system is a bit different; you can find additions like purging, filtering, pressure reduction, gas drying and more out in the field. Figure 1 shows a simplified diagram as an example.

Many users of these systems obtain a battery-powered, high accuracy compact 2 to verify if the flowmeter in the field is working properly or if it needs calibration or cleaning. The red-y compact 2 has a big internal diameter flow channel, has a low pressure drop, is temperature-compensated and measures the mass flow, independent of changes in pressure and temperature.

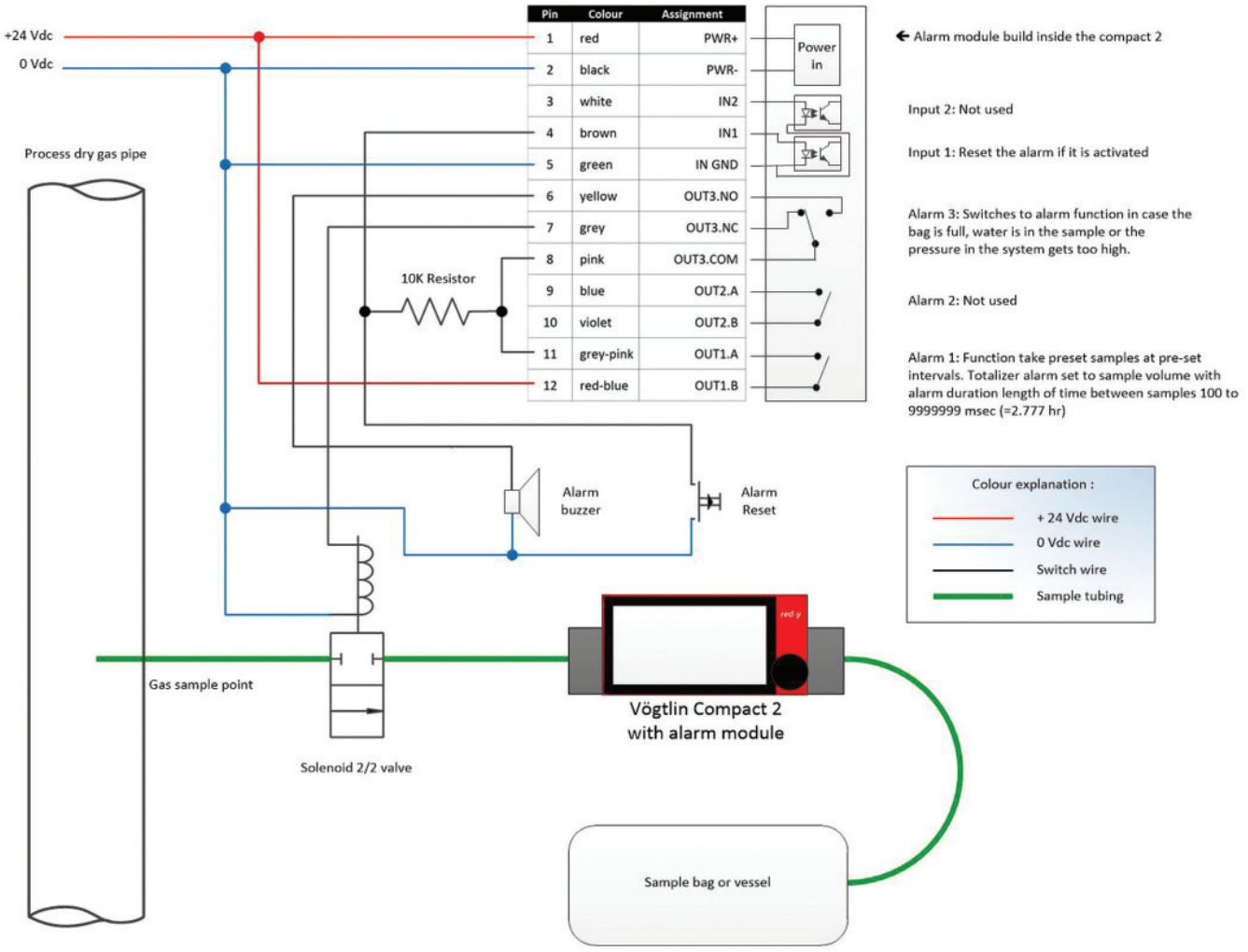

Figure 1. Wiring diagram periodic gas sample system

Flexibility

It is impossible to describe all processes in which these type of flowmeters are used, but if you see a VA meter for gas and you want to improve a process, the experienced Vögtlin engineers can help find a solution. Below are two more applications from users.

Simple gas mixing applications

The compact 2 is available as a meter or with a built-in, high-resolution, positive shut-off needle valve that offers precise control.

Manual gas mixing system

Several customers switched to a compact 2 with needle valve as an alternative to a VA meter. VA meters have several advantages, but the main con is that they are extremely sensitive to changes in gas pressure and temperature. Pressure change of 14 psi or 100 kilopascal may create an error of 50 percent in the reading, and for many applications this is not acceptable.

The red-y compact 2 does not have these problems. It measures the mass and is independent of pressure and temperature, which means that even if the process gas temperature or pressure changes, the instrument still gives an accurate flow value.

For a simple, low-cost but accurate gas mixer, the compact 2 may be the ideal instrument. With its single AA battery-operation, it is also convenient in the field. Up to three gases can be programmed in every unit.

Consumption monitoring

The compact 2 has two built-in totalizers and the menu can be protected with a password. This makes the unit suitable for consumption measurements. With the 100-to-1 turndown, it can measure the small and big flows used in your departments. Customer-

specific turndown ratios higher than 100-to-1 can be realized to obtain an indication of very low consumptions.

Monitoring is more than assigning costs to different applications; it is also about safety and economics. By monitoring gas usage, users can detect leaks and solve the problems before they cost a lot of money or, even more important, create an explosive atmosphere in the laboratory.

Conclusion

These are just three of the many and extensive possibilities of the red-y compact 2 by Vögtlin. Customers around the globe make use of its advantages in the analytical field, in research and development, in light industrial applications, in semiconductor segments and other applications. Very often we hear from the users, "The beauty about the Vögtlin thermal mass flow instruments is that you install, set and forget them, as they work so reliable."

Gas consumption monitoring on USB, AA battery or 24 Vdc

Vögtlin's worldwide network of distribution and sales partners will help select the equipment that best matches specific application needs. Local service centers in the U.S., China and Europe provide after-sales support.

Find out more about the red-y compact 2, the company and its other products at vogtlin.com.

2016 Innovation AWARDS Flow Control HONORABLE MENTION

Ultrasonic radar transmitter provides reliability in harsh conditions

Endress+Hauser

A customer was having issues with its existing ultrasonic level transmitters that were installed to monitor the level of water bodies such as rivers, lakes, open basins, etc. for flooding conditions in case of rainstorm events. The transmitters were installed in outdoor applications under bridges and dams. During times of high winds, fluctuating temperatures and other harsh environmental conditions, the existing mechanical ultrasonic signal would be blown away from the transducer. When the signal was lost, operators would have to go out, find the problem and fix it manually. This increased the cost of ownership and downtime.

The customer needed an economical solution. Endress+Hauser replaced the existing ultrasonic transmitters with the cost-effective Micropilot FMR10/FMR20 radar transmitter. The electromechanical signal from the Micropilot radar transmitter is not susceptible to influences of the changing harsh environmental conditions and cross winds, making it suitable for any environment. This provided the customer with a long-term, stable, reliable and accurate measurement. The non-contact radar technology resulted in lower maintenance costs. The operator no longer had to find the problems and fix them when the signal was lost. The customer's problems were eliminated and applications were performed more efficiently.

The Micropilot FMR10/FMR20 is designed to fit perfectly in water/wastewater and utilities applications with a compact design thanks to the Endress+Hauser direct-emitting radar chip, full hermetically sealed PVDF body, ingress protection class IP66,68 / NEMA4x, 6P and large variation for process connections. The FMR10/FMR20 allows for remote commissioning and operation from a safe and convenient location via HART or wireless via the SmartBlue Bluetooth app.

The economical, non-contact radar transmitter with Bluetooth commissioning, operations and maintenance app sets new standards in the water/wastewater and utility industry. The FMR10/20 features safe and secure wireless remote access via the free SmartBlue app for iOS and Android devices even in hazardous areas and those difficult to reach, reducing time and costs through fast, simple setup for the end user. SmartBlue provides users with diagnostic and maintenance information via signal curve, increasing customer