

Gas flow meter makes sampling simple



Figure 1 Digital mass flow meter of the red-y compact 2 series with manual control valve

Gas sampling is the first step in the collection of data that guards process variables, monitors emissions and verifies that processes are running consistently.

We notice a growing 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 2 series mass flow meters with optional integrated alarm module.

Developed in Switzerland this extraordinary gas measurement instrument offers true portability due to its long life on a single AA battery. All 50+ variables can be adjusted through a built-in touch screen. No need 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 0-10 sccm up to 0-480 slpm (air equivalent), the *red-y compact 2 meter* fits a lot of 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, the quality and reliability of this device.

Traveling engineers use this portable battery powered unit in adjusting gas flow settings, leak testing and verifying other flow meters. Once the battery reaches its life end, it can easily be replaced as AA batteries are basically just available everywhere. As an alternative, the unit can be powered through the USB cable by a power bank or a USB-port on your laptop or PC.

Making sample taking simple

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

The *compact 2* is the standard GCR model with an integrated needle valve. This needle valve is selected based on your process conditions and with that valve you set the sample rate you want. For instance 100 mln/min.

In the analytical world the *red-y compact 2 meter* 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 and collect these in a container or sample bag. For example every hour a 100 scc sample.

The *red-y compact 2 meter* with its optional smart alarm module has the complete solution without the need of any PLC to control the process.

The system runs on 24 Vdc and a very simplified diagram can be seen in *figure 3*. The *compact 2* alarm module has 3 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.



Figure 2 Gas sampling application with two gas flow meters

We program Alarm 1 as a totalizer alarm with the sample volume we want to collect in each sample, in our example 100 scc (Standard cubic centimetre). In that alarm function we can also program a duration of the alarm 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 pre-set 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 pre-programmed time, in our example 1 hour.

Once this hour is over, Alarm 1 is programmed to automatically reset itself, the counter goes back to zero. The solenoid is activated again, the gas will flow and the totalizer start counting again till the pre-programmed 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.

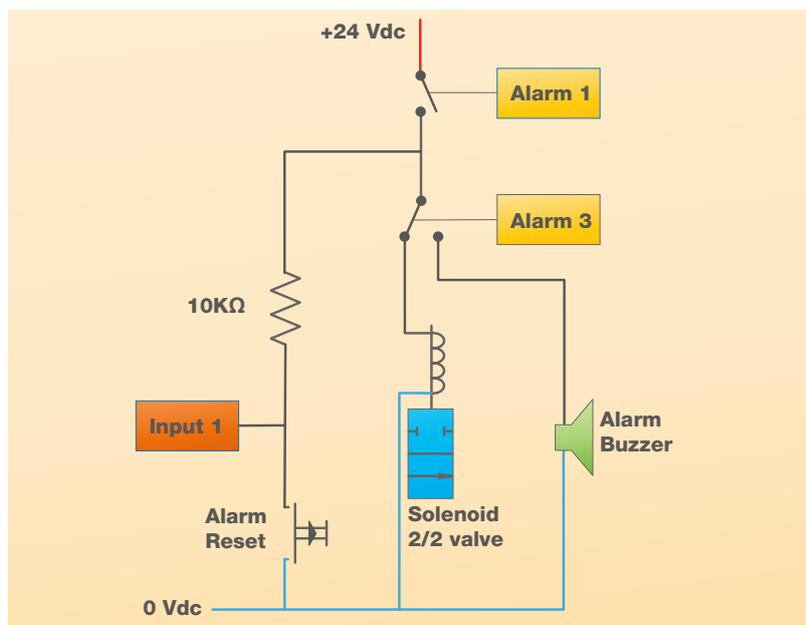
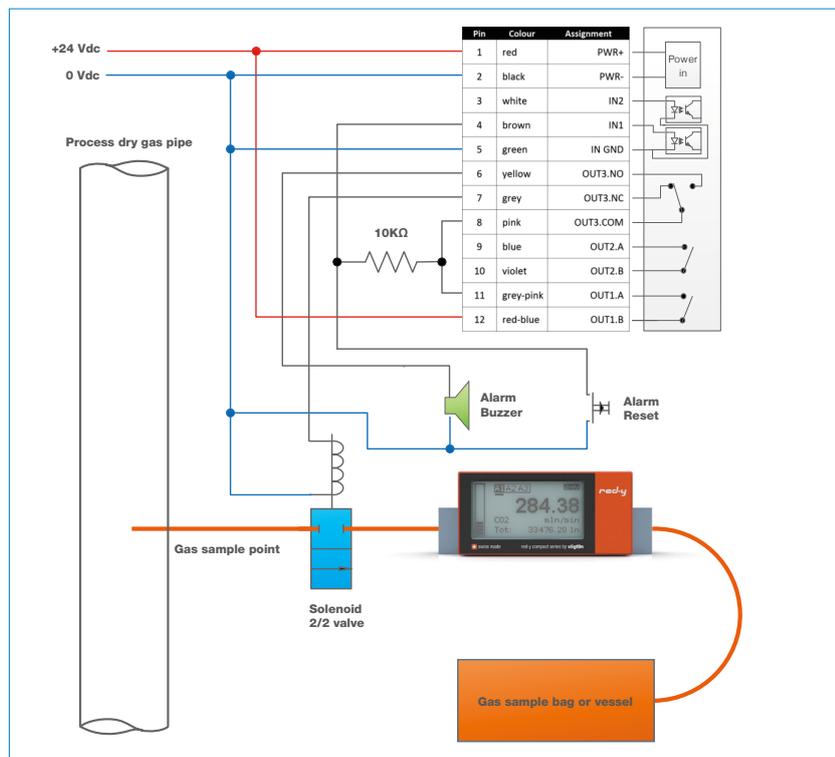


Figure 3 Basic electrical diagram of periodic gas sampling system

Alarm 3 is used as a 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 (blockage of sample line)
4. The flow is too high (Pressure in process too high)

In this case you have to push the reset button to deactivate the alarm and continue the process. There are many other variations possible. Every system is a bit different, you can find additions like purging, filtering, pressure reduction, gas drying, etc. out in the field. In figure 4 you find a simplified diagram that serves as an example.



Explanation figure 4:

- +24 Vdc wire
- 0 Vdc wire
- Switch wire
- Sample tubing

Figure 4 Wiring diagram periodic gas sample system

Many of the users of these systems obtain a battery powered high accuracy *red-y compact 2 meter* to verify if the flow meter 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.

Flexibility

It is impossible to describe all process in which these type of flow meters are used, but if you see a VA meter for gas and you want to improve a process, talk to the experienced *Vögtlin* engineers and they will be pleased to help you to find a solution.



Figure 6 The new *red-y compact 2 series* digital mass flow meter can be powered with one single AA battery (optional 24 Vdc and Micro-USB power supply)

Conclusion

This is just one of the many and extensive possibilities of the *red-y compact 2 meter* by *Vögtlin*. Customer 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."

Vögtlin's world-wide network of distribution and sales partners will help you selecting the equipment that matches best for your application and specific needs. Local service centres in the USA, China and Europe provide the after-sales support.

Find out more about the *red-y compact 2 meter*, the company and their other products on www.voegtlin.com

