RMG Messtechnik GmbH

Customer Newsletter 1/23

Items

Sales Release for RSM 200

Dr. Michael Grexa, Marketing

End of June 2023 the official Sales release was granted to RMG's newest Product line: The Ultrasonic Meter series RSM200.

This product is the perfect solution for volume measurement of natural gas for the distribution grid operators and industrial clients. By ultrasonic measurement technology it provides cost effective, robust, and reliable technology.

Optionally the devices are equipped with a bult in corrector (EVC).

The 2-Path meter is MID approved, so suitable for custody transfer as well as for process Control and internal industrial use.

Thanks a built in flow straightener no Inlet section is required for mild flow disturbances and just 2xDN inlet section is needed in case of severe flow disturbances.

When ordered with the EVC the meter comes along with built-in digital temperature and pressure transmitters. No additional tubing/cabling is required, which minimizes the installation cost.

Further spec highlights:

- Available sizes (2"…8") and pressure ratings (PN10/16 and ANSI Class 150)
- Meter Body length 3 x DN (= ideal for Turbine Meter Replacement!)
- State of the art data logging and communication
- Volume conversion acc. GERG 88 S, SGERG mod H2, AGA 8 Gross 1/2, or AGA NX19 (configurable)
- Digital reading of counters for volume under operating and base conditions and actual flow rate
- ATEX version available, FM-approval in progress
- External power supply (Option Battery operated
- RS 485 serial interface (Modbus)
- Pulse output is standard, analogue output (configurable, e.g. flow) optional
- Measuring range (Turn-down ratio) 1:100 minimum, up to 1:200 (depending on meter size and operating conditions).
- Comes along with software RMGView-RSM for communication and visualisation (free download).

Fast measuring systems for gas quality determination

Christian Schmidt, Marketing

2021 and 2022 were remarkable years for the natural gas industry in Europe. After a very low price environment in 2020 as a result of the Covid pandemic, a spectacular price increase for all energy commodities was observed. Natural gas prices were particularly affected, increasing almost eight-fold and reaching an unprecedented 120 euros/MWh for short-term supplies (spot market) at the end of 2021. This caused an outcry from many consumers, for obvious reasons, and resulted in natural gas topping the agendas of world politics.

It is clear that natural gas plays a crucial role in security of supply. It is simply impossible to switch everything to other energy sources overnight. Pure natural gas consumption must be increasingly replaced by biomethane, green hydrogen and synthetic gases. It also means that gas production is becoming more decentralized, which is not the case with fossil natural gas.

In order to increase the use of renewable gases, it is crucial that process safety is maintained in the industry. Very large fluctuations in the calorific value in ever shorter periods of time require fast calorific value measuring devices not only at every main connection, but at every point that is required to maintain the quality of the process. The cost of such a metering point is significantly different for a transboundary station through which hundreds of thousands m3/h flow than for an industrial process e.g., 400 m3/h consumed. Nevertheless, the measurement requirements are the same in many EU countries.

Correlative measuring systems offer a significant economic and technical advantage here. The latest technological developments allow correlative devices to be sufficiently accurate and much faster, and most importantly, cost a fraction of that of process gas chromatography. RMG's RGQ 5 explosion-proof gas quality analyzer uses the correlative measurement principles.

By combining the patented dynamic viscosity sensor and a thermal conductivity sensor, the RGQ 5 stationary multi-parameter gas analyzer based on MEMS correlates these properties with the parameters calorific value HS, calorific value HI, Wobbe index (WS &WI), density ρ, compressibility, air/fuel ratio λ and methane number MN. Variants that also specify the hydrogen and CO_2 concentration mol% are also available.

Specially developed for plug & play operation, neither special know-how nor experience is required to operate the analyzer.

The device provides the values every second via Modbus RTU (RS485) or one of the values at the analogue output (4-20mA current loop). It is therefore easy to integrate into the system control. Due to the short measurement cycle time, the RGQ 5 is ideally suited for control tasks, even in hazardous areas.

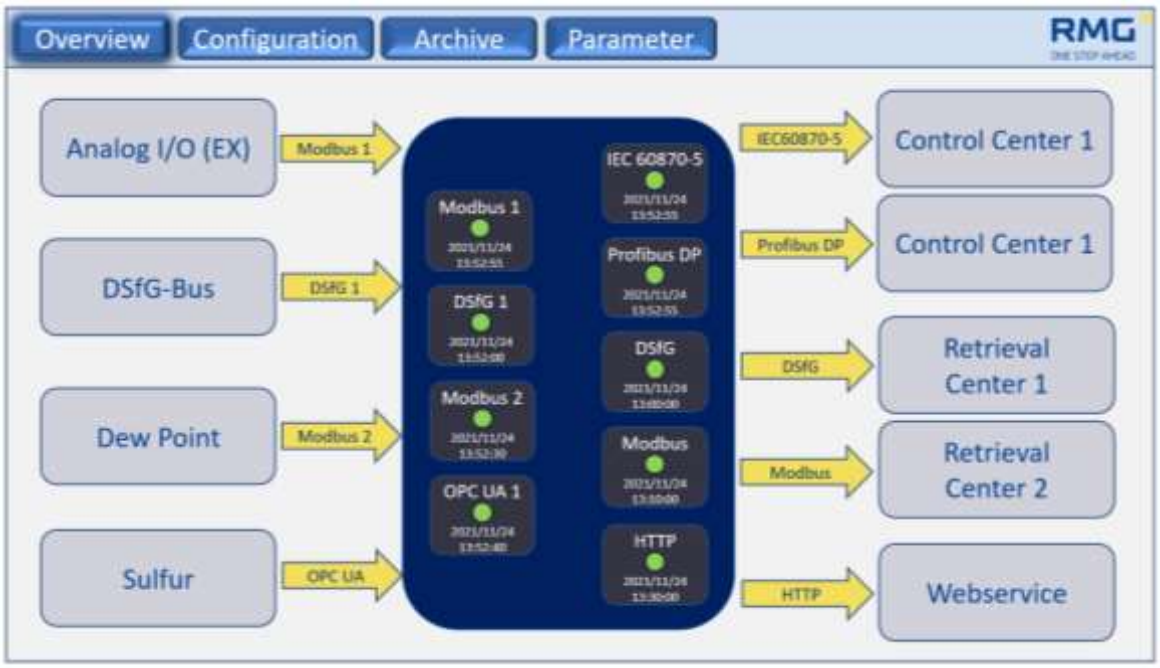
The RGQ 5 is a compact, low CAPEX gas analyzer (no carrier gas or other auxiliary gases required) designed for the continuous measurement of combustible gases.

The RGQ 3 variant was developed for mobile applications, such as the commissioning of gas engines and burners, service technicians troubleshooting or checking deadlines. This mobile device is battery powered, communicates via Bluetooth with a dedicated app (iOS and Android) and saves the measurement sessions to the cloud where the user can analyze the data.

Software Communication Unit

Patrick Bulach, Marketing

The Soft-CU (software communication unit) of the RMG is able to receive and output data via the most diverse protocols by using well-known mechanisms of the Gas Metering Monitor of the RMG. Internal calculations and/or conversions into other units can be parameterized. Since the Soft-CU is software, it can be scaled as required and run on larger and smaller hardware systems. It is possible to create redundancy with several systems, so that if one system fails, communication can be continued by the redundant system.



Various protocols and data formats are supported on the input side and on the output side:

Input Protocols:

- Modbus protocols (TCP, RTU, ASCII)
- DSfG protocol
- IEC 1107 (IEC 62056-21)
- IEC 870-5-101/104
- other proprietary protocols from different manufacturers

Output Protocols:

- IEC60870-5-101 (serial)
- IEC60870-5-104 (TCP/IP)
- Modbus server
- Basic data from devices
- Internally calculated data
- Data provided by third-party systems
- Files in different formats: ASCII, CSV, XML, MS Excel
- File transfer to FTP server
- Email delivery
- Database export (e.g. to MS SQL Server, Oracle, ...)

RMG supplies five master meters size DN600 G16,000 for the new FORCE MEGALOOP test bench in Denmark

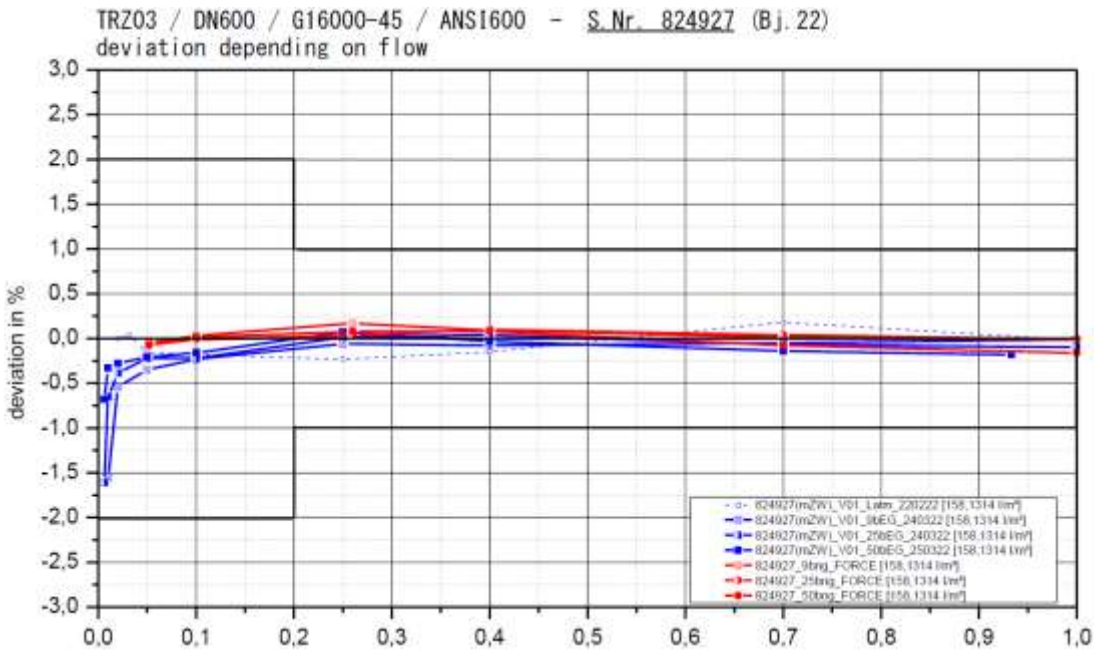
Willi Weden, Sales

Turbine meters have been used in fiscal gas measurement applications for decades. They are a very well proven and reliable technology, and continue to provide clients with extremely accurate and repeatable performance. Thus, when the new FORCE MEGALOOP in Denmark was being designed, using turbine meters for their flow standards was an easy decision. The meter they chose was the RMG TRZ gas turbine. These DN600 G16,000-45 gas turbine meters are the largest in the world. Each of these 5 units can measure flow up to 25,000 m^3/hr.

Due to the very high repeatability, durability, long-term stability, as well as moderate pressure loss and fast response times, gas turbine meters are still the first choice for many operators of gas flow measuring facilities. For example, in the new Pigsar Closed Loop calibration facility, they are using DN500 G10.000-45 RMG TRZ turbine meters for their flow reference. In addition, RMG TRZ meters, in smaller nominal sizes, are often used as a so-called "transfer standard" to transfer the measurand from a primary standard to the test facility.

One of these five DN600 meters will be used as an interlab comparison “transfer standard” for the various European high-pressure natural gas test benches. Data from these tests will be used to harmonize volume measurement in Europe for high flow ranges. This will reduce the measurement uncertainties of the national test benches in Europe.

The graph below shows the calibration results of the high-pressure tests at Pigsar (blue) and FORCE (red) for this transfer standard meter. Tests were carried out at different pressures (9, 25 and 50 bar) at both facilities.



The repeatability of the meter is, depending on the flow, in the range of ±0.01% to maximum of ±0.03%. Also, the linearity and WME in the main flow range are remarkable!

Even though the "MEGALOOP" meter are operated in the flow range < 1:20, it should be emphasized that the above-mentioned meter, at 50 bar test pressure, could easily reach a measuring range of 1:160 (156 m^3/h – 25,000 m^3/h) with a deviation of -0.68% at Q_{min} (156 m^3/h)!

Depending on the operating pressure, the measuring range extension for RMG turbine gas meters is part of the MID approval. Thus, these meters can also be used for billing purposes with an extended measuring range.

Figure 1 internal calibration of a TRZ 03 DN600 ANSI600RF in Butzbach

Please do not hesitate to contact us if you have any questions regarding RMG TRZ turbine meter products.

Accuracy of USM GT 400 now approved as “Class 0.5”

Dr. Michael Grexa, Marketing

On May 22nd, 2023, NMI Certin B.V. issued an official OIML*) approval, which certifies that the USM GT400 series fulfils the requirements of the OIML Recommendation R 137 for meters of accuracy class 0.5.

Accuracy class 0.5 specifies a measurement uncertainty of the actual value of +/- 0.5% for flow rates between transition flowrate Qt and the maximum flowrate Qmax. For flowrates between the minimum flowrate Qmin and the transitionflowrate Qt uncertainties of +/- 1% are acceptable.

According to the rules of the OIML this certificate is based on an extensive test schedule. All tests, including temperature and climatic tests, EMC, and of course the flow–accuracy tests for various flow conditions (undisturbed, mild and severe flow perturbations as described in R137) were performed and passed at the labs of NMI Certin in the Netherlands or witnessed by NMI personnel at other approved test labs (e.g. “pigsar”).

The OIML rules do not accept test results elder than 3 months. Therefore all tests had to be done as if the GT400 was a newly designed meter, also it is in the market since 6+ years and has already passed such tests successfully to get approvals according to ATEX, IECEx and MID (plus various other national approvals). This was a time– and cost-consuming effort, but we learned from our customers that this certificate is just a formal “must have” beside any technological rational behind it. So RMG took the decision to go for this certificate.

Finally we are happy to have it in our hands now. It is proof for the excellent meter performance and allowing a smooth access to international markets without formal hurdles.

*): OIML =International Organization of Legal Metrology

Ultrasonic Meters for Pure Hydrogen

Dr. Michael Grexa, Marketing

The gas industry is looking forward to the “Hydrogen Age”, which by many experts is expected to be the successor of the “Natural Gas Age”. Even if hydrogen may not replace each and any application of natural gas it will play an important role as well as energy source for heating and processes as also as primary product for a multide of chemical products.

Accordingly it is expected that the volumes of hydrogen which willl be used will grow dramatically within the next years. And whatever will be used needs to be transported and also needs to be measured (for process control as well as for billing).

For high volumes (defined by high flowrates and operating pressures) Ultrasonic meters are considered as a possible technology and will be most welcome, since their advantages are well known from the natural gas applications. In addition Ultrasonic meters provide the option to check the quality of pure hydrogen, since the Speed of Sound (SOS), as measured by the meter, is a very sensitive indicator, if there are small amounts of impurities admixed to the hydrogen.

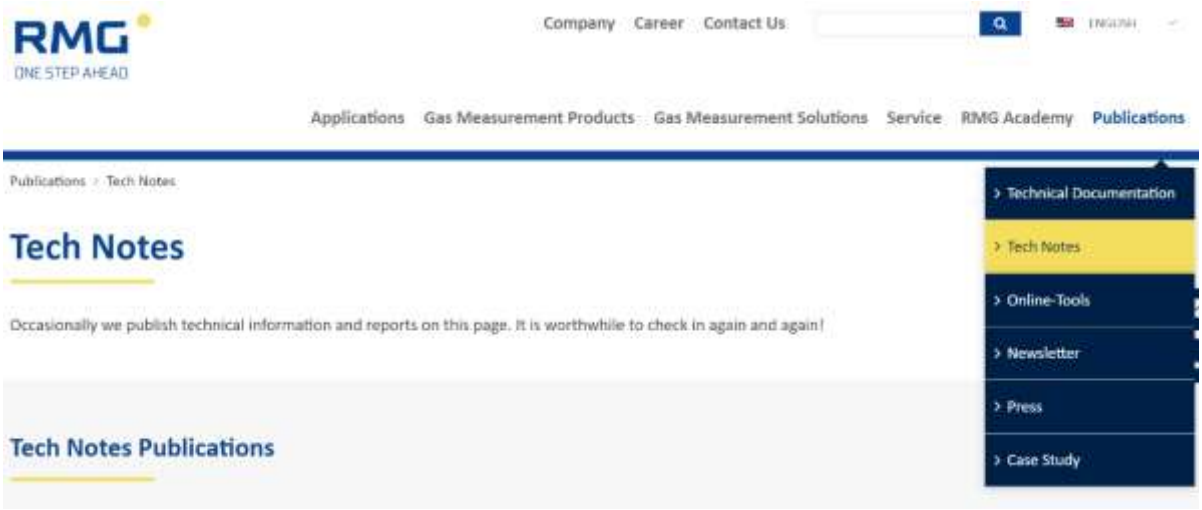
RMG is taking this challenge and offers Ultrasonic Meters for pure hydrogen. Currently these meters are available for a limited number of sizes only. Also there are no official approvals available, since we are still waiting for the availability of a hydrogen-operated flow calibration lab, which is certified by the authorities and acceptable for approval tests. We will be happy to go there as soon as possible and then we will check if our theoretical considerations and our internal pretest will proof as a satisfactory solution for the need of our customers.

Website Services

Dr. Horst Pöppl, Marketing

The RMG website www.rmg.com offers a lot of helpful documents and tools for your daily work in gas metering busines. So there you find:

- Product leaflets
- Product manuals
- Sizing tool for gas meters
- Calculations according to ISO 6976
- Operating and service software for the products
- Tech Notes



The Tech Notes are short articles about our products, most of them are case studies such as "*RMG's GT 400 Gas USM Regulator Noise Immunity Example*". Any time we have a new interesting subject we will add a new Tech Note. So it is worth checking this from time to time.

Short Messages

Trainings 2023

Training program

Look on our website for the trainings offered by RMG. https://www.rmg.com/en/rmg-academy.

Look there for the items you are interested in and contact us. You need not to come to Germany for a training. For all these items we can offer an online training using MS teams.

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