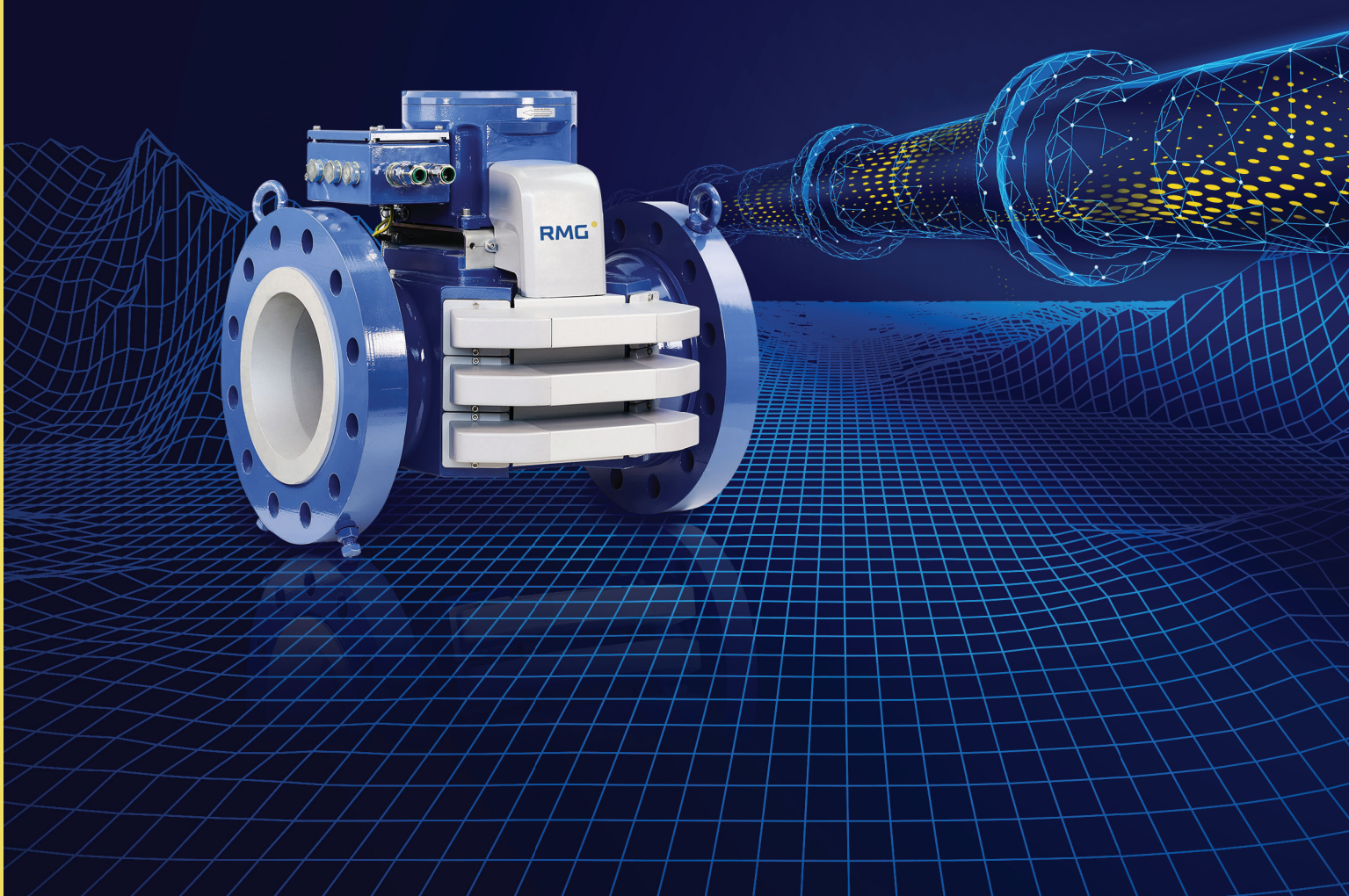
RMG

ULTRASONIC FLOWMETER
USM GT400-3P

The ultrasonic meter USM GT400-3P from RMG delivers high accuracy and reliability at low costs on field proven three path technology.



A 3-PATH METER - BUILT FOR PROCESS MEASUREMENT APPLICATIONS

The popularity of using large volume gas ultrasonic meters (USMs) for fiscal applications has significantly increased over the past two decades. Line sizes from 3" to greater than 30" are very common today. This gain in popularity can be attributed to its many competitive advantages over traditional measurement devices such as turbine and orifice meters.

As RMG technologically evolves with the times, so have our ultrasonic meters. Clients have valued our technology for more than two decades in downstream applications.

Research has identified how upstream/midstream applications, where gas quality isn't ideal, would greatly benefit from RMG's USM technology.

Clients are sometimes reluctant to use ultrasonic technology because they believe liquids, along with hazardous components like sour gas, will cause premature transducer failure. They also don't understand that the right ultrasonic design can reduce uncertainty when liquids are present.

With RMG's transducer technology, liquids and sour gas are not an issue.

Clients continue searching for alternatives to orifice metering. RMG has responded to this need by developing a new generation of gas ultrasonic meter, the GT400-3P, to specifically target these difficult and challenging applications.

There are many advantages in using RMG's 3-Path ultrasonic technology over the many orifice meter disadvantages. Following are just a few...

RMG GT400-3P Advantages	Orifice Disadvantages
• No venting of natural gas with its associated hazards and emissions is required • Rangeability easily exceeds 100-1 with much lower uncertainty • USM diagnostics provide numerous benefits over orifice metering (Speed of Sound, Path Velocity, & Turbulence to name a few) • One line size smaller USM can be used for the same maximum flow rate • An overall smaller and shorter metering package helps reduce cost and saves space • USMs lend themselves to remote monitoring thus helping reduce field visits • Pressure reducing valves near the GT400-3P meter is not a problem for RMG's technology	• High maintenance – periodic plate changes require regular site visits – thus high OpEx • Periodic plate replacements, either due to damage or flow rate changes, further increases O&M costs • Plate inspection requires venting of green-house gases, and potentially hazardous sour gas • Plate inspection results in total loss of primary measurement, and thus billing adjustments are required • Orifice metering has a much higher uncertainty than RMG's GT400-3P uncalibrated ultrasonic meter • Orifice meters significantly over-register when liquids are present, and have no diagnostic indicators • Orifice meter rangeability is far less than the USM, and uncertainty increases at lower flow rates • Orifice permanent pressure losses may result in additional compression which increases O&M

To demonstrate just how well the new RMG GT400-3P USM performs when liquids are present, RMG had independent tests performed on a 4" Schedule 80 meter versus a 4" orifice meter at the CEESI Wet Gas Multiphase Test Facility in February 2022. The **GT400-3P** was tested without using a flow conditioner to eliminate traditional pressure losses experienced with orifice measurement. During these tests, CEESI also collected data on 4" dual-chamber orifice meter with flow conditioning.

TECHNICAL SPECIFICATION

Technical Data	
Gases	Pipeline quality natural gas, raw natural gas up to a gas volume fraction of 0.980, natural gas / H2-mixtures, air
Measurements	Volume flow, totalized volume, velocity of gas, speed of sound
Sizes	DN 80-200 / 3", 4", 6", 8", 10", 12" (ANSI 600); consult RMG for sizes > 12".
Path configuration	3 direct paths; 3 planes
Measurement uncertainty (from Q_t to Q_{max})	Dry calibration with Nitrogen acc. AGA 9: +/-1.0 % (dry gas) +/-2.0 % (wet gas / GVF = 0.99)
Repeatability	+/- 0.1%
Operating pressure range	1 bar (14.5 psi)..... 100 bar (1450 psi); flanges ANSI class 600
Ambient temperature	-40°C (-40°F) to +55°C (131°F)
Gas temperature range	-40°C (-40°F) to +80°C (176°F)
Operating relative humidity	up to 95% condensing
Power supply	24 V/DC +/-10 % ; 7 W typically
Hazardous area approvals	ATEX: Ex II 2G Ex de IIB + H2 T6; IECEx: Ex de IIB + H2 T6 Gb CSA: Class I, Div 1, Groups B, C, D T6
Metrological approval	Measurement Canada (pending)
Appplied Standards	AGA 9, ISO 17089, OIML 137-2012
Outputs	0/4-20 mA (galvanically isolated, programmable, load resistor: max. 400 Ohm, U_{max} =16 V) 2 x HF output with fmax = 5 kHz, Namur or Open Collector 2 x programmable digital output 3 x serial interface RS 485 / Modbus. Ethernet via external module.
Transducer frequency	120 kHz for Sizes >6" (DN 150) 200 kHz for Sizes ≤ 6" (DN 150)
RMGView^{USM} diagnostics software	Visualization, flow data, diagnostics, configuration, parameter changes, export/import of parameters and data
Protection	IP66
Meter body material	Casted steel; CS ASME A352 gr LCC
Material electronics housing Color/Finish	Aluminum cast Blue (RAL 5002) and metallic silver (RAL 9006)
Installation outside	With weather protection cover and sun roof
Remarks	Consult RMG for special requirements

Technical data is subject to change without notice.

RMG
ONE STEP AHEAD

RMG Messtechnik GmbH

Otto-Hahn-Straße 5
35510 Butzbach
Germany

Tel. +49 (0) 6033 897-0
Fax: +49 (0)6033 897-130
Mail info@rmg.com

www.rmg.com

RMG Americas, Inc.

8460 No. Sam Houston Parkway West
Houston, Texas, 77064
USA

Tel. +1 346 293 7070
Mail SalesUSA@rmg.com

www.rmg.com/en

RMG Metering Technology Co., Ltd - Shanghai

Room B639, 6th floor, No. 8 Building
1809 Qixin Rd, Minhang district
Shanghai 201101
China

Tel. +86 159 2160 1160
Mail info@rmg.cn

www.rmg.com

RMG Messtechnik GmbH - Dubai

Building 6EA, Office 117
Dubai Airport Free Zone
Authority (Dafza)
Dubai, United Arab Emirates

Tel. +971 504 517427
Mail info-mea@rmg.com

www.rmg.com

RMG-USMGT400-3P-EN | December 2024 © RMG Messtechnik GmbH