

## ERZ 2000-NG FLOW COMPUTER

With decades of natural gas measurement experience, RMG has developed the ERZ 2000-NG – an approved and best-in-class gas flow measurement solution for all areas of gas volume conversion. Competitively priced and offering a low total cost-of-ownership, it meets a wide range of application requirements throughout the natural gas industry. This is the reliable, precision gas measurement system you need.

**Proven Performance. Robust Functionality.**

## Rely on RMG

- Over 150 years of combined experience in the natural gas industry
- Worldwide solution leader in measurement and analysis technology
- Products for natural gas transportation, storage, distribution and consumption
- Local support with global expertise
- Single source provider with a wide portfolio



The natural gas business is demanding. Service organizations need a proven solution to measure gas flow and correct for volume in custody transfer and secondary metering applications.

# RELIABILITY MATTERS

The RMG ERZ 2000-NG Series flow computer and gas volume corrector meets the challenges of today's fast growing natural gas industry. Featuring a new graphical touchscreen user interface, it is a versatile instrument designed to meter gas flow, correct measured volume, calculate energy consumption and display all data via standardized protocols. Simple plug-in operation also reduces the number of on-site visits.

## Inherently Precise

Regardless of pressure and temperature, a gas meter measures only the gas volume flowing through it—in other words, the volume at measuring conditions. Since gas can be compressed, the quantity actually flowing through the meter still must be calculated from the measured volume at measurement conditions. As a measure for this quantity of gas, the volume at base conditions is used.

The ERZ 2000-NG performs gas volume conversion on the basis of the equation of state for ideal gases. Since this equation alone does not meet all the requirements for high-precision gas metering, the gas volume corrector also takes into account the characteristics of the real gas by using the K co-efficient as a correction factor. Such an approach ensures utmost measurement accuracy and repeatability.

## Fully Integrated

The ERZ 2000-NG can be incorporated into a complete solution for the gas train. The unit is easily integrated in a cabinet along with gas chromatographs, specialized flow computers, data loggers and controllers.

## Compatibility is Key

The flow computer can be used for custody transfer and secondary metering applications in conjunction with all types of gas flowmeters, including turbine meters, vortex meters, ultrasonic gas meters and rotary displacement meters, as well as orifice plate metering.



## Typical applications include:

- Custody Transfer
- Compressor Stations
- Gas Pressure Reducing Skids
- Remote Station Monitoring
- Gas Storage
- City/Regional Gas Suppliers
- Biogas Applications

The ERZ 2000-NG utilizes a wide range of communication protocols to deliver data securely to SCADA, ERP or data collection systems.

# MEETING THE CHALLENGE



## Easy to Operate

RMG has optimized the technique for precision, certified and standards-based gas flow measurement and volume correction. The ERZ new-generation system provides an enhanced user experience to simplify operation and improve application results. Its intuitive Human-Machine Interface (HMI) touchscreen navigation—suitable even for operators wearing gloves and using a touch pen—reduces time for commissioning and maintenance. Remote maintenance software capabilities also limit the number of on-site visits. In addition, the device incorporates an optional USB port for use of an external keyboard in service and maintenance.

## Secure Communication

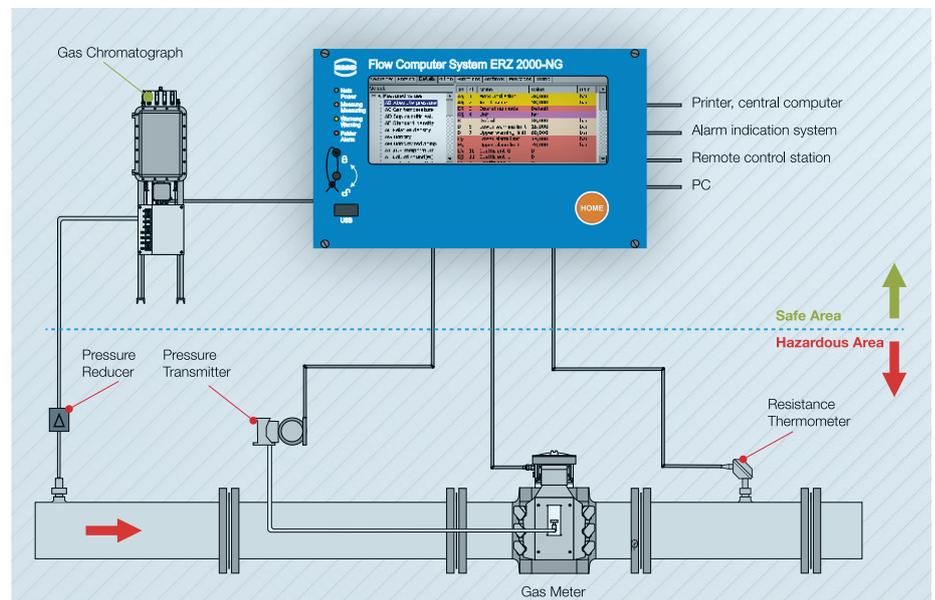
The ERZ 2000-NG utilizes a wide range of communication protocols to deliver data securely to SCADA, ERP or data collection systems.

It also employs a pair of Ethernet plugs (RJ45) to communicate with separate IP networks, ensuring better overall system security and support for separate networks, and eliminating the influence from remote readings.

## Industry Approved

Backed by the proven reliability of RMG, the ERZ 2000-NG is approved as a gas volume and calorific value corrector for the custody transfer metering of natural gases.

The flow computer monitors limits specified for custody transfer metering. An alarm is tripped if these limits are exceeded and separate disturbance totalizers are used for metering. All alarm messages are stored in a log, just like all parameter changes.



The ERZ 2000-NG base module performs neutral measurements of all inputs similar to a multimeter, but no calculations or assignments to physical units are made.

# ROBUST FUNCTIONALITY

## System Configurations

### The ERZ 2000-NG Series

is designed as a universal instrument, which can be used for all metrological tasks in a gas metering station. The flow computer is available in a choice of system configurations, including:

#### ERZ 2004-NG Volume Corrector

Calculates gas volume at base conditions via pressure, temperature and K co-efficient (PTZ).

#### ERZ 2104-NG Calorific Value Corrector (PTZ)

Calculates gas volume at base conditions via pressure, temperature and K co-efficient and energy content with gas quality.

#### ERZ 2014/2114-NG Differential Pressure Computer

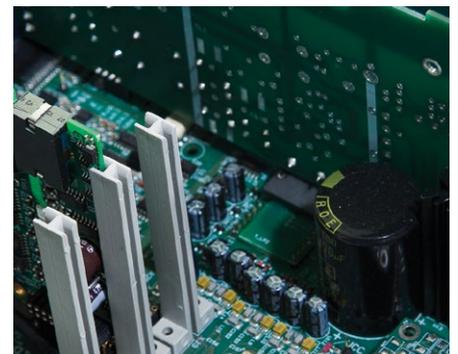
Evaluation computer and gas volume corrector intended for orifice plate metering.

The ERZ 2000-NG base module performs neutral measurements of all inputs similar to a multimeter, but no calculations or assignments to physical units are made. Therefore, the unit only deals with analog values, frequencies and meter contents without knowing the meaning of individual values. The measured values are assigned to the appropriate physical quantities and converted into usable data. The base module also provides all outputs and data interfaces, as well as three spare slots for hardware extensions and future requirements.

The ERZ 2000-NG employs a powerful microprocessor system based on an ARM CPU with an associated program memory (flash memory), random access memory and data memory.

The random access memory contains the variables, fields and buffers required for running the system software and the changeable device parameters of all functional modules. The parameters are protected by means of a checksum, which is automatically verified with each new start of the system.

Parameters relevant for custody transfer metering are protected by a sealable switch, the others by a code number. The program memory contains the operating program for the device. A CRC checksum is calculated via the source code and deposited as a reference value.



Intuitive touchscreen user interface simplifies system configuration and operation, displaying key information in well structured tabs.

# FEATURES AND FUNCTIONS



## Touchscreen HMI

Intuitive touchscreen user interface simplifies system commissioning, maintenance and operation, displaying key information in well structured tabs. For example, measurement data and totalizers are visible at a glance as defined by approval authorities. The operator can also view tools for commissioning, maintenance and calibration. Additionally, the HMI presents tables of all detailed measurement data, parameters, archives; events and alarm log information; and trend graphs.

## Remote Maintenance

With a PC in the control center, the ERZ 2000-NG can be easily maintained remotely via a Web browser.

## Original Totalizer Readings

In the case of gas meters with encoders, it is possible to digitally transmit their readings to the ERZ 2000-NG so the original readings are available in the corrector.

## Digital Inputs for Measured Values

As an alternative to analog transmission of measured values from pressure transmitters and resistance thermometers, the values can also be transmitted digitally in conformity with the HART protocol.

## Calculation of Compressibility Factor K

The ERZ 2000-NG gas volume corrector calculates the K co-efficient of natural gases in accordance with most calculation methods.

## Bus Interface

The device has standard interfaces for Modbus (RTU/ASCII), DSfG and RMG-bus, and Modbus-IP.

## Test Functions

Functions such as "On-the-fly Calibration," "Freeze" or "Functional Test" enable manual or automatic test totalizers to be started or stopped, as well as means to be calculated or measured values to be frozen.

## Data Logging

The ERZ 2000-NG includes a data logger providing conventional data logging and the DSfG archive (i.e., a data memory recording data generated in the corrector and transmitted via the DSfG interface).

## Error Curve Linearization

During high-pressure testing of a gas meter, its error curve (which depends on the flow rate) is determined. This error curve can be simulated in the ERZ 2000-NG gas volume corrector as interpolation points, or as a polynomial applied over the flow rate or the Reynolds Number. As such, the error of measurement can be eliminated.

## Language Selection

The flow computer software is multi-lingual.

# TECHNICAL SPECIFICATION



## Accessories

19" sub-rack

Thermowells for resistance thermometers

Thermal insulation for resistance thermometers

Three-way check valve for pressure transmitters

Stand for accommodating pressure transmitter and three-way check valve



<b>Model Type</b>	<b>ERZ 2000-NG</b>
<b>Housing</b>	19" rack, general purpose
<b>Dimensions</b>	W x H x D = 213 x 128.4 x 310 mm (42 depth units / 3 height units)
<b>Metrological approval</b>	PTB, MID
<b>Hazardous area</b>	No
<b>Ambient conditions</b>	-20°C to +55°C
<b>Power supply</b>	24 V/DC, 115/230 V/AC
<b>Power input</b>	Max. 24 W
<b>Control panel</b>	Touchscreen
<b>Display</b>	LCD-TFT
<b>Communication Inputs</b>	
Dis	7x
Temperature	2x
Analog	8x
Encoder	1x
Volume	2x/4x
<b>Outputs</b>	
Pulse	4x
Alarms	2x
Analog	4x
DOs	8x
<b>Data interfaces</b>	5x serial interfaces / 2x TCP/IP
<b>Communications protocols</b>	<b>Modbus (RTU, ASCII), Modbus TCP, DSFG, RMGBus, DZU, HART</b>
<b>Compressibility</b>	Gerg 88S, AGA 8-92DC, AGA-NX-19, AGANX-19 mod, Beattie-Bridgeman, van der Waals, AGA8 Gross Meth 1+2, AGA8 (1985)
<b>Memory</b>	4GB standard (optional memory extension)
<b>General platform</b>	FC with USZ controller + Storage GC module, USM module
<b>Hardware</b>	Embedded PC, ARM 9 Controller

## Key features

- Intuitive HMI for a new experience in navigating through the flow computer for commissioning, maintenance, operation and data reading
- Calculation of the theoretical Velocity of Sound for online comparison with measured VOS from USM
- In connection with turbine meter, Vortex meter, Ultrasonic meter, Rotary displacemeter and Orifice plate
- PGC communication via Modbus or DSfG
- CO2 emission calculator
- Four-set of totalizers for Vm, Vb, energy, mass flow and CO2 (disturbed and undisturbed)
- On-line documentation in the flow computer
- Internal log book of events and parameter changes
- Hardware always the same, software defines the new model
- No special operating software necessary, only browser software is required



ONE STEP AHEAD

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