

red-y Smart Series

THERMAL MASS FLOW METERS AND CONTROLLERS FOR GASES



Reliable technology and standardized interfaces make the red-y smart series thermal mass flow meters and controllers

particularly suitable for measurement and control in gas delivery systems and plant engineering applications.

Reliable and accurate:

Accurate measurement

- The devices offer high accuracy and a wide dynamic range.
2 instrument versions:
«Standard» and «Hi-Performance»
- Accuracy up to $\pm 0.3\%$ of full scale
+ $\pm 0.5\%$ of reading
Turndown ratio 1 : 100
Extended turndown ratio on request

Analog & digital: 2 in 1

- The flow meters and controllers make use of the latest CMOS technology and have a digital (Modbus RTU) and analog interface as standard

Operating status indication

- The instruments offer an inbuilt LED status indication

Safe & fast control

- The controller uses a tightly sealed control valve with leak rate less than 1×10^{-6} mbar l/s He. The fast control response of approx. 300 ms significantly reduces the setting time

3-year warranty*

- High-quality components ensure long and trouble-free operation
* does not apply to calibration, options and accessories

Options

Built-in display

- Display of flow rate, total and measuring unit. Defining a set point (controller only)



Multigas

- One meter or controller can be used for up to 10 different gases or gas mixtures

Profibus

- The instruments are available with Profibus interface: DP-V0 & DP-V1 protocols

Industrial Ethernet

- Two industrial ethernet protocols Profinet RT and EtherCAT are available

«get red-y» software



Efficient device management with the free «get red-y» software:

- View flow rate & temperature
 - Change set points
 - Select measured gas
 - Visualization of measured data
 - Adjusting control parameter
- Optional modules «get red-y» software:
 - Datalogging
 - Gasmixing
 - Adjustment/Calibration



red-y Smart Serie

High-quality technology offers maximal value for any application

Through the application of high-precision MEMS technology (CMOS sensors), the thermal flow meters and controllers from Vögtlin Instruments GmbH set new standards in terms of response characteristics and measuring accuracy, and are characterized by



High-tech in a very compact design

The flow meters and controllers use advanced

- Standardized signals enable simple connection to control systems
- Measurements are insensitive to pressure and temperature changes
- All devices are calibrated with real gas. This ensures high accuracy and reproducibility.

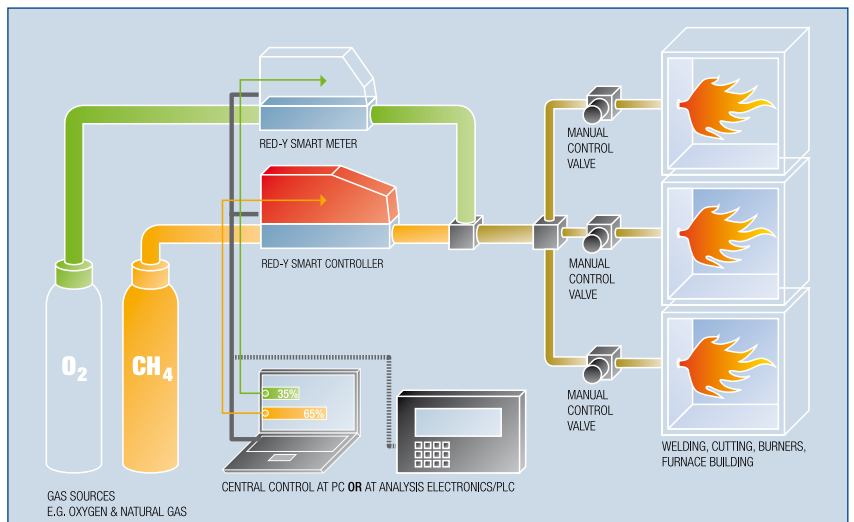
The calibration is traceable to the METAS standard (Federal Office of Metrology, Switzerland)

- Meters and controllers are easy to service and maintain
- The devices have minimal pressure drop
- A full range of accessories is available: Cables, fittings, etc.
- «Plug & control» with the free software «get red-y»: Simple access via any PC (no additional electronic equipment required)
- High quality: All flow meters are produced and calibrated at our European

Flexibility in mixing processes and consumption measurement

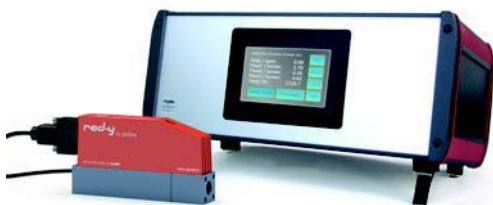
Devices with high measuring accuracy and stable control characteristics are important for ensuring precise and consistent quality of gas mixtures.

The thermal mass flow meters and controllers from Vögtlin offer unbeatable technological performance and cost-effectiveness.



Wide range of accessories – immediately ready for operation

- **Connection cables, power supplies**
Optimal range of cables and power supply units for fast integration of flow meters and controllers:
Cables for communication with PC (USB), cables for analog communication, power supply (24 Vdc)
- **Display and control devices**
Permit the operation of up to 10 flow meters and controllers with predefined process recipes.
- **Fittings, filters**
All flow meters and controllers are available with fittings and filters.
Contact our sales department for more information.



Process Control Unit PCU-10

Technical Data

Instrument types



smart meter GSM
Thermal mass flow meter



smart controller GSC
Thermal mass flow controller



OEM Version
For customer-specific requirements

Instrument versions

Standard

The economic solution

Accuracy: $\pm 1.0\%$ of full scale*

Turndown ratio: 1 : 50

Hi-Performance

With highest accuracy and turndown ratio (available for GSM < 200 l_n/min / GSC < 150 l_n/min (air))

Accuracy: $\pm 0.3\%$ of full scale + $\pm 0.5\%$ of reading*

Turndown ratio: 1 : 100

*An additional error of $\pm 0.25\%$ may apply for analogue signals

Measuring ranges

(Air/Full scale freely selectable)

red-y smart meter GSM

Meter

| Type | Measuring range (air) | Connection |
|-------|-------------------------------------|------------------------------------|
| GSM-A | from 0 ... 25 ml _n /min | to 0 ... 600 ml _n /min |
| GSM-B | from 0 ... 600 ml _n /min | to 0 ... 6000 ml _n /min |
| GSM-C | from 0 ... 6 l _n /min | to 0 ... 60 l _n /min |
| GSM-D | from 0 ... 60 l _n /min | to 0 ... 450 l _n /min |
| GSC-A | from 0 ... 25 ml _n /min | to 0 ... 600 ml _n /min |
| GSC-B | from 0 ... 600 ml _n /min | to 0 ... 6000 ml _n /min |
| GSC-C | from 0 ... 6 l _n /min | to 0 ... 60 l _n /min |
| GSC-D | from 0 ... 60 l _n /min | to 0 ... 450 l _n /min |

red-y smart controller GSC

Controller

Performance data

Media

(real gas calibration)

Air, O₂*, N₂*, He, Ar, CO₂, H₂, CH₄, C₃H₈ (other gases and gas mixtures on request)

*O₂ & N₂ are calibrated with air

Response time

Meter (GSM): $\pm 80\text{ms}^{(3)}$; Controller (GSC): $\pm 500\text{ms}^{(3)}$

³depending on device configuration & according to SEMI standard E17-1011, 5-100% of range under optimized conditions

Repeatability

$\pm 0.2\%$ of full scale (according to SEMI standard E56-0309)

Longterm stability

< 1% of measured value / year

Power supply

24 Vdc (18 – 30 Vdc), 15 Vdc on request

Current consumption

Meter (GSM): max. 100 mA; Controller (GSC): max. 250 mA (GSC with valve type 8 max. 410mA)

Operation pressure

0.2 – 11 bar a (GSC with valve type 4.5 and 8 max. 8 bar a)

Temperature (environment/gas)

0 – 50°C

Materials

Anodized aluminium, optional stainless steel electropolished

Seals

FKM, NBR, optional EPDM

Pressure sensitivity

< 0.2% / bar of reading (typical N₂)

Temperature sensitivity

< 0.025% FS measuring range type / °C

Warm-up time

< 1 sec. for full accuracy

Integration

Output signals analog

0..20 mA, 4..20 mA, 0..5 V, 1..5 V, 0..10 V, 2..10 V

Output signals digital

RS-485; Modbus RTU (Slave); Lab View-VIs available / option: Profibus DP-V0, DP-V1 / Profinet RT / EtherCAT

Process connection

G $\frac{1}{4}$ " (BSPP* female) up to 60 l_n/min, G $\frac{1}{2}$ " (BSPP* female) up to 450 l_n/min

*British Standard Pipe Parallel

Inlet section

None required

Electrical connection

Sub D plug, 9 pole (Option Profibus: Sub D 9 pole / Option Profinet RT or EtherCAT: 2x RJ45 (IN/OUT))

Mounting orientation

Any position (consult manufacturer above 5 bar or vertical mounting)

Safety

Test pressure

16 bar a

Leak rate

< 1 x 10⁻⁶ mbar l/s He

Environmental protection

IP-50

EMC

EN 61326-1

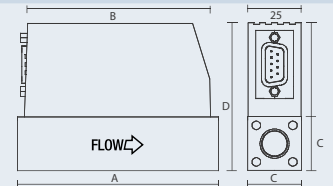
Dimensions

Dimensions in mm

| | A | B | C | D* | D** |
|------------------------------------|-------|-----|----|----|-----|
| GSM G $\frac{1}{4}$ " | 94 | 87 | 25 | 69 | 87 |
| GSM G $\frac{1}{2}$ " | 145 | 87 | 35 | 79 | 97 |
| GSC G $\frac{1}{4}$ " | 124 | 117 | 25 | 69 | 87 |
| GSC G $\frac{1}{2}$ " | 170 | 117 | 35 | 79 | 97 |
| GSC G $\frac{1}{2}$ " valve type 8 | 186.4 | 117 | 35 | 79 | 97 |

* Standard version

** Profinet RT / EtherCAT version



red-y smart series

| Type code | | | | | | | | | | |
|---|--|---|---|---|---|---|---|--|---|-----|
| Instrument type | red-y smart series (Gas) | G | S | | | | | | | |
| Function | Meter | | | M | | | | | | |
| | Controller | | | C | | | | | | |
| Full scale of measuring range (air) defined by manufacturer | Customer-specific (Divider A, up to 600lIn/min) | | | | A | X | | | | |
| | Customer-specific (Divider B, up to 6000lIn/min) | | | | B | X | | | | |
| | Customer-specific (Divider C, up to 60 lIn/min) | | | | C | X | | | | |
| | Customer-specific (Divider D, up to 450lIn/min) | | | | D | X | | | | |
| Instruments version | Standard ($\pm 1.0\%$ full scale, 1 : 50) | | | | | | S | | | |
| | Hi-Performance ($\pm 0.3\%$ full scale, $\pm 0.5\%$ reading, 1 : 100) | | | | | | T | | | |
| | Customer-specific / OEM | | | | | | K | | | |
| Materials (body, seals) | Aluminium, FKM** | | | | | | A | | | |
| | Aluminium, EPDM | | | | | | B | | | |
| | Stainless steel, FKM | | | | | | S | | | |
| | Stainless steel, EPDM | | | | | | T | | | |
| | Customer-specific / OEM | | | | | | K | | | |
| Analog signals (output) | Current 4..20 mA** | | | | | | | | B | |
| | Current 0..20 mA | | | | | | | | C | |
| | Voltage 0..5 V | | | | | | | | D | |
| | Voltage 1..5 V | | | | | | | | E | |
| | Voltage 0..10 V | | | | | | | | F | |
| | Voltage 2..10 V | | | | | | | | G | |
| | Customer-specific / OEM | | | | | | | | K | |
| | | | | | | | | | | |
| Analog signals (input) | Current 4..20 mA** | | | | | | | | B | |
| | Current 0..20 mA | | | | | | | | C | |
| | Voltage 0..5 V | | | | | | | | D | |
| | Voltage 1..5 V | | | | | | | | E | |
| | Voltage 0..10 V | | | | | | | | F | |
| | Voltage 2..10 V | | | | | | | | G | |
| | Not defined | | | | | | | | N | |
| | Customer-specific / OEM | | | | | | | | K | |
| Control valve (integrated) defined by manufacturer | Type 0.1 | | | | | | | | | 2 1 |
| | Type 0.2 | | | | | | | | | 2 2 |
| | Type 0.5 | | | | | | | | | 2 3 |
| | Type 1.2 | | | | | | | | | 2 6 |
| | Type 4.5 | | | | | | | | | 1 2 |
| | Type 8.0 | | | | | | | | | 1 3 |
| | Valve not defined | | | | | | | | | 8 8 |
| | Valve mounted | | | | | | | | | 9 5 |
| | Customer-specific / OEM | | | | | | | | | 9 9 |
| | No valve | | | | | | | | | 0 0 |

**Standard