



**red-y smart series** product information

# Thermal Mass Flow Meters and Controllers for Gases

# Reliable and accurate: Thermal Mass Flow Meters and Controllers

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.

## 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

## Safe & fast control



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

## Operating status indication



The instruments offer an inbuilt LED status indication

## 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



Fig. 1 red-y smart controller GSC with Industrial Ethernet interface at the top of the device

## <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



Fig. 2 Configuration of the devices via the free get red-y software

## 3-year warranty\*



High-quality components ensure long and trouble-free operation

\*does not apply to calibration, options and accessories



## 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 maximum convenience:



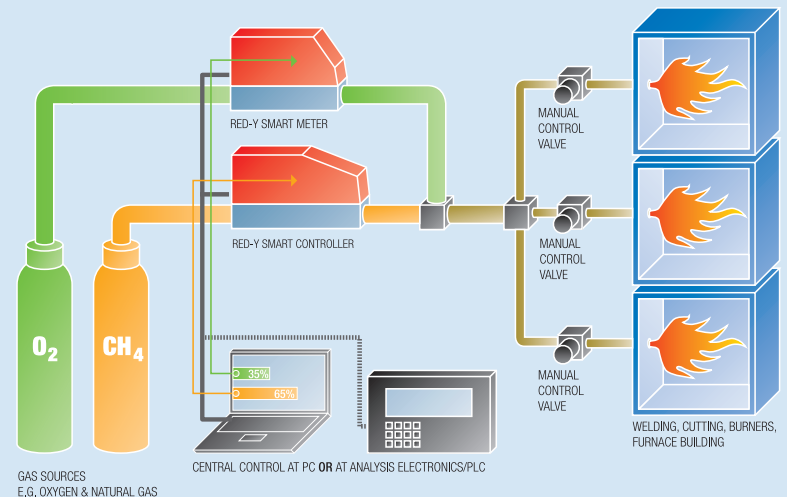
Fig. 3 High-tech in a very compact design: The flow meters and controllers use advanced MEMS technology

- » **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 production center in Germany**

## 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



Fig. 4 Process Control Unit PCU-10

### 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.

Our specialists will be happy to advise: **+41 61 756 63 00** or **www.voegtlin.com**

# Technical Data <red-y smart series>

## 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<sup>(1)</sup>

Turndown ratio: 1 : 50

### <Hi-Performance>

With highest accuracy and turndown ratio

(available for GSM < 200 l/min / GSC < 150 l/min (air))

Accuracy:  $\pm 0.3\%$  of full scale +  $\pm 0.5\%$  of reading<sup>(1)</sup>

Turndown ratio: 1 : 100

<sup>1</sup>An additional error of  $\pm 0.25\%$  may apply for analogue signals

## Measuring ranges

(Air/Full scale freely selectable)	Type	Measuring range (air)		Connection
<b>red-y smart meter GSM</b> Meter	GSM-A	from 0 ... 25 ml/min	to 0 ... 600 ml/min	G $\frac{1}{4}$ "
	GSM-B	from 0 ... 600 ml/min	to 0 ... 6000 ml/min	G $\frac{1}{4}$ "
	GSM-C	from 0 ... 6 l/min	to 0 ... 60 l/min	G $\frac{1}{4}$ "
	GSM-D	from 0 ... 60 l/min	to 0 ... 450 l/min	G $\frac{1}{2}$ "
<b>red-y smart controller GSC</b> Controller	GSC-A	from 0 ... 25 ml/min	to 0 ... 600 ml/min	G $\frac{1}{4}$ "
	GSC-B	from 0 ... 600 ml/min	to 0 ... 6000 ml/min	G $\frac{1}{4}$ "
	GSC-C	from 0 ... 6 l/min	to 0 ... 60 l/min	G $\frac{1}{4}$ "
	GSC-D	from 0 ... 60 l/min	to 0 ... 450 l/min	G $\frac{1}{2}$ "

## Performance data

<b>Media</b> (real gas calibration)	Air, O <sub>2</sub> <sup>(2)</sup> , N <sub>2</sub> <sup>(2)</sup> , He, Ar, CO <sub>2</sub> , H <sub>2</sub> , CH <sub>4</sub> , C <sub>3</sub> H <sub>8</sub> (other gases and gas mixtures on request) <sup>2</sup> O <sub>2</sub> & N <sub>2</sub> are calibrated with air
<b>Response time</b>	Meter (GSM): $\pm 80\text{ms}$ <sup>(3)</sup> ; Controller (GSC): $\pm 500\text{ms}$ <sup>(3)</sup> <sup>3</sup> depending on device configuration & according to SEMI standard E17-1011, 5-100% of range under optimized conditions
<b>Repeatability</b>	$\pm 0.2\%$ of full scale (according to SEMI standard E56-0309)
<b>Longterm stability</b>	< 1% of measured value / year
<b>Power supply</b>	24 Vdc (18 – 30 Vdc), 15 Vdc on request
<b>Current consumption</b> Standard	Meter (GSM): max. 100mA; Controller (GSC): max. 250mA (GSC with valve type 8 max. 490mA)
<b>Current consumption</b> Profinet RT / EtherCAT	Meter (GSM): max. 125mA; Controller (GSC): max. 340mA (GSC with valve type 8 max. 560mA)
<b>Operation pressure</b>	0.2 – 11 bar a (GSC with valve type 4.5 and 8 max. 8 bar a)
<b>Temperature</b> (environment/gas)	0 – 50°C
<b>Materials</b>	Anodized aluminium, optional stainless steel electropolished
<b>Seals</b>	FKM, EPDM, optional FFKM
<b>Pressure sensitivity</b>	< 0.2% / bar of reading (typical N <sub>2</sub> )
<b>Temperature sensitivity</b>	< 0.025% FS measuring range type / °C
<b>Warm-up time</b>	< 1 sec. for full accuracy

## Integration

<b>In- / Output signals analog</b>	0..20 mA, 4..20 mA, 0..5 V, 1..5 V, 0..10 V, 2..10 V
<b>In- / Output signals digital</b>	RS-485; Modbus RTU (Slave); Lab View-VIs available Option: Profibus DP-V0, DP-V1/Profinet RT / EtherCAT
<b>Process connection</b>	G $\frac{1}{4}$ " (BSPP <sup>(4)</sup> female) up to 60 l/min, G $\frac{1}{2}$ " (BSPP <sup>(4)</sup> female) up to 450 l/min <sup>4</sup> British Standard Pipe Parallel
<b>Inlet section</b>	None required
<b>Electrical connection</b>	Sub D plug, 9 pole Option Profibus: Sub D 9 pole / Option Profinet RT or EtherCAT: 2x RJ45 (IN/OUT)
<b>Mounting orientation</b>	Any position (consult manufacturer above 5 bar or vertical mounting)

## Safety

<b>Test pressure</b>	16 bar a
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<b>Leak rate</b>	< 1 x 10 <sup>-6</sup> mbar l/s He
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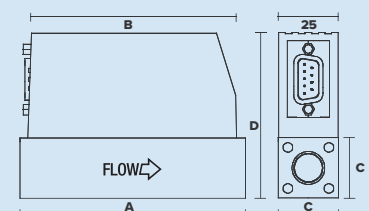
<b>Ingress protection class</b>	IP-50
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<b>EMC</b>	EN 61326-1
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Dimensions	Dimensions in mm	A	B	C	D <sup>(5)</sup>	D <sup>(6)</sup>
GSM G $\frac{1}{4}$ "		94	87	25	69	87
GSM G $\frac{1}{2}$ "		145	87	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

<sup>5</sup>Standard version

<sup>6</sup>Profinet RT / EtherCAT version



## Type code <red-y smart series>

Instrument type	red-y smart series (Gas)	G	S													
<b>Function</b>	Meter															M
	Controller															C
<b>Full scale of measuring range (air)</b> defined by manufacturer	Customer-specific (Divider A, up to 600mln/min)															A X
	Customer-specific (Divider B, up to 6000mln/min)															B X
	Customer-specific (Divider C, up to 60 lln/min)															C X
	Customer-specific (Divider D, up to 450ln/min)															D X
<b>Instrument versions</b>	Standard (±1.0% full scale, 1: 50)															S
	Hi-Performance (±0.3% full scale, ±0.5% reading, 1: 100)															T
	Customer-specific / OEM															K
<b>Materials (body, seals)</b>	Aluminium, FKM**															A
	Aluminium, EPDM															B
	Stainless steel, FKM															S
	Stainless steel, EPDM															T
	Customer-specific / OEM															K
<b>Analog signals (output)</b>	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
<b>Analog signals (input)</b>	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
<b>Control valve (integrated)</b> 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
<b>Type code</b>		G	S	-											-	

\*\*Standard

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