

3rd Generation, Digital Mass Flow Meters & Mass Flow Controllers for Air & Gases

제3세대 디지털 질량유량계와 질량유량컨트롤러



배터리 구동 휴대용 red-y compact
Accuracy 1.0% & 2.0% 지원

Profibus communication



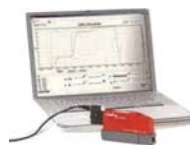
Profibus 인터페이스
(DP-VO 및 DP-V1
프로토콜)와 함께 사용할 수
있습니다.

다양한 종류 가스측정



최대 10개의
다른 가스 또는
가스 혼합물에
사용할 수
있습니다.

무료 소프트웨어 지원 및 컴퓨터 통신



3년 보증기간

고품질 구성 요소를 통해
장기간에 걸쳐 문제 없는
작동을 보장합니다.

3 YEAR WARRANTY

Independent digital convenience: Thermal Mass Flow Meters for Gases

The **red-y compact 2 series** mass flow meters are characterized by powerful technology, intelligent functions and innovative design. This latest generation offers a new level of ease of use: compact design with battery power and touch display for great flexibility.

Touch Interface



The touch display offers intuitive navigation. The many variables that make the unit flexible are easily accessible. Automatic display alignment thanks to position sensor

Independent Operation



The flow meters are powered with a standard AA battery or Micro-USB power supply. Optional 24 Vdc power supply available

Modular Extensions



The instruments can be extended and retrofitted with different modules: battery module, power module and alarm module



High Accuracy & Dynamics



The devices offer high accuracy & a wide dynamic range:

Accuracy up to $\pm 1\%$ of full scale

Turndown ratio up to 1 : 100

(depending on application/measuring range)

Totalizer



In addition to the actual flow, the total consumption is displayed. Ideal for gas consumption measurements

1 Device – Multiple Gases



One measuring device can be used for up to 3 different gases or gas mixtures

Password Protection



To avoid unauthorised change of settings, the menu of the new red-y compact can be locked with a password

3-Year Warranty*



High-quality components ensure long and trouble-free operation

*does not apply to calibration, battery, options and accessories

Instrument versions 'red-y compact 2 series'

Version	Touch Display ¹	Auto display alignment (position sensor)	Choose between multiple home screens	Totalizer	Multigas (up to 3)	Manual valve	Alarm functions	Power supply		
								Micro-USB power supply (DIN62684)	Battery power	24 Vdc supply
compact meter GCM	●	●	●	●	○			●	●	○
compact regulator GCR	●	●	●	●	○	●		●	●	○
compact switch GCS	●	●	●	●	○		●			●
compact all-in GCA	●	●	●	●	○	●	●			●

● Standard ○ Option

¹backlight not available for battery use; backlit only with external power supply (Micro-USB or 24 Vdc)



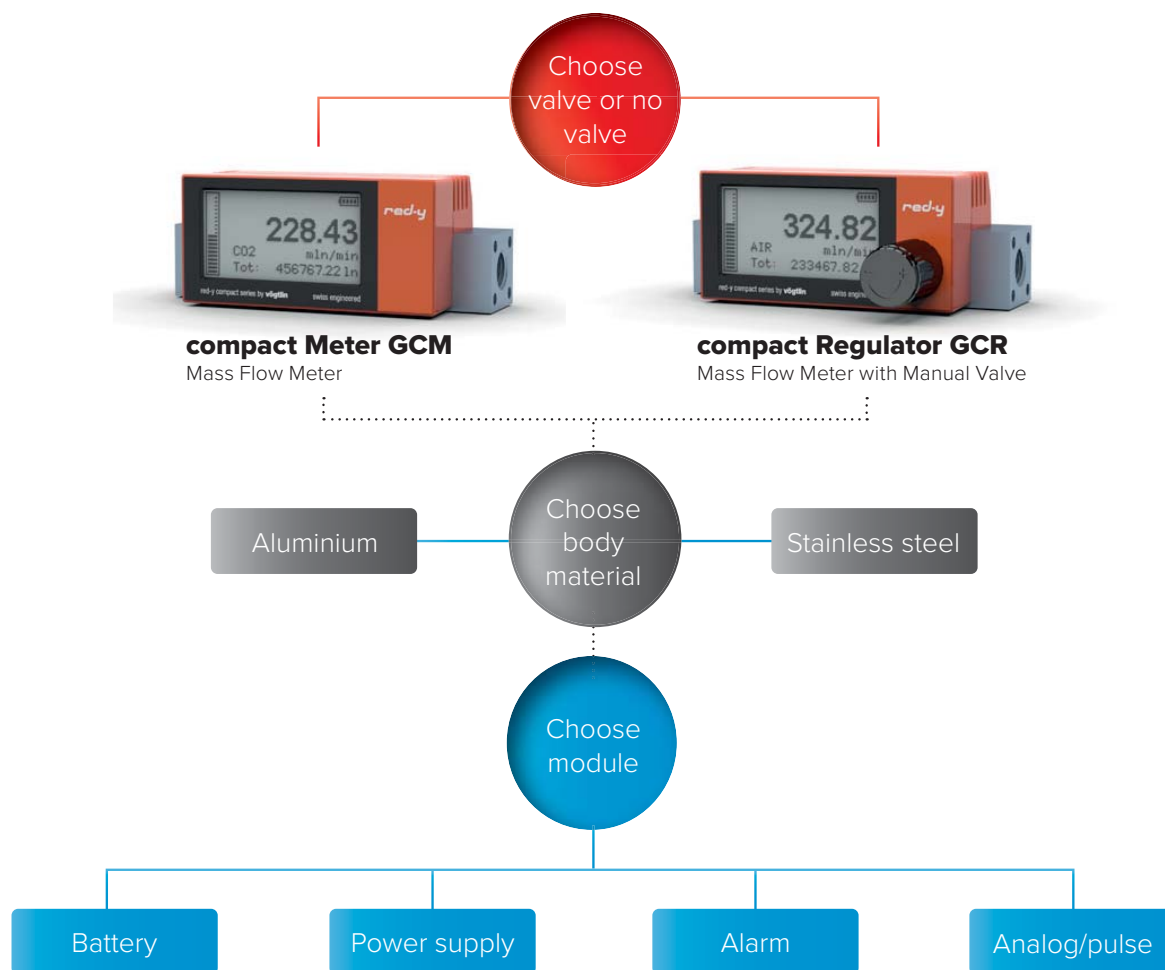
Accuracy, Flexibility, Reliability and Portability

Through the use of **high-precision MEMS technology** (CMOS sensors), the thermal flow meters from Vögtlin Instruments GmbH set the standard in terms of long term stability, response time and measuring accuracy:

- » **The device is compact, can operate in any position and do not need any warm-up time**
- » **The build-in touch display with a simple navigation offers lots of settings**
- » **The devices measure real mass flow, independent of changes in pressure and temperature**
- » **Build-in accurate totalizer for consumption measurements**
- » **A high-precision alternative to variable area flow meters**
- » **High quality: All flow meters are produced and calibrated at our European production center in Germany**

How to select a compact?

Select the **function**, **material specifications** and the **module** for your application.



All modules are interchangeable and can be retrofitted, but only one module can be use at a time.



This selection shows the basics only, other items that need to be selected are the flow rate, elastomers, accuracy and turndown, valve size and valve options.
We recommend you submit your request though this webpage.

red-y Compact Series

- Touch display / screen.
- AA Battery (optional 24 Vdc and Micro-USB power supply) / 80-230V with power supply.
- 높은 정밀도(accuracy) 및 넓고 다양한 측정범위.
 - Accuracy up to $\pm 1\%$ of full scale (depending on application/measuring range)
 - Turndown ratio 1 : 100
- Sealing material : FKM / EPDM.
- Analog module (4-20mA) output signal (optional) - GCY, GCZ.
- 한 개의 장치로 3개의 다른 가스 또는 혼합 가스 측정가능.
- Alarm module 지원.
- USB 사용가능.

GCM

Digital mass flow meter



Media (real gas calibration)	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	2%FS /1:50, > 200 l/min $\pm 3.0\%$ of FS
Accuracy(special)	1%
Measuring range	Flow up to 450 l/min
Process connection	G $\frac{1}{4}$ " up to 60 l/min, G $\frac{1}{2}$ " up to 450 l/min
Power supply	Battery / 24V / 80-230V

GCS

Digital mass flow meter with alarm functions



Alarm module : Relais : 2 x SPST / 1 x SPDT

Media (real gas calibration)	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	2%FS /1:50, > 200 l/min $\pm 3.0\%$ of FS
Accuracy(special)	1%
Measuring range	Flow up to 450 l/min
Process connection	G $\frac{1}{4}$ " up to 60 l/min, G $\frac{1}{2}$ " up to 450 l/min
Power supply	24V

GCY

Digital mass flow meter with analog module



Analog module : 4...20mA output signal

Media (real gas calibration)	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	2%FS /1:50, > 200 l/min $\pm 3.0\%$ of FS
Accuracy(special)	1%
Measuring range	Flow up to 450 l/min
Process connection	G $\frac{1}{4}$ " up to 60 l/min, G $\frac{1}{2}$ " up to 450 l/min
Power supply	24V

- Touch display / screen.
- AA Battery (optional 24 Vdc and Micro-USB power supply) / 80-230V with power supply.
- USB 사용가능.
- 높은 정밀도(accuracy) 및 넓고 다양한 측정범위.
 - Accuracy up to $\pm 1\%$ of full scale (depending on application/measuring range)
 - Turndown ratio 1 : 100
- sealing material : FKM / EPDM.
- Analog module (4-20mA) output signal (optional) - GCY, GCZ.
- 한 개의 장치로 3개의 다른 가스 또는 혼합 가스 측정가능.
- Alarm module.

GCR

Digital mass flow regulator with manual valve



Media (real gas calibration)	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	2%FS /1:50, > 200 l/min $\pm 3.0\%$ of FS
Accuracy(special)	1%
Measuring range	Flow up to 450 l/min
Process connection	G $\frac{1}{4}$ " up to 60 l/min, G $\frac{1}{2}$ " up to 450 l/min
Power supply	Battery / 24V / 80-230V

GCA

Digital mass flow regulator with alarm functions & valve



Alarm module : Relais : 2 x SPST / 1 x SPDT

Media (real gas calibration)	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	2%FS /1:50, > 200 l/min $\pm 3.0\%$ of FS
Accuracy(special)	1%
Measuring range	Flow up to 450 l/min
Process connection	G $\frac{1}{4}$ " up to 60 l/min, G $\frac{1}{2}$ " up to 450 l/min
Power supply	24V

GCZ

Digital mass flow regulator with analog module



Analog module : 4...20mA output signal

Media (real gas calibration)	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	2%FS /1:50, > 200 l/min $\pm 3.0\%$ of FS
Accuracy(special)	1%
Measuring range	Flow up to 450 l/min
Process connection	G $\frac{1}{4}$ " up to 60 l/min, G $\frac{1}{2}$ " up to 450 l/min
Power supply	24V

Technical data «red-y compact 2 series»

Instrument types



compact meter GCM

Mass Flow Meter

compact switch GCS

Mass Flow Meter with Alarm Functions



compact regulator GCR

Mass Flow Meter with manual Valve

compact all-in GCA

Mass Flow Meter with Alarm Functions & Valve



compact G $\frac{1}{2}$ " versions

For 1/2" size with manual valve, the valve is flange mounted

Measuring ranges

(full scale freely selectable)

Type	Measuring range (air)		Process connection
GCM-A	from 0 ... 50 ml/min	to 0 ... 600 ml/min	G $\frac{1}{4}$ "
GCM-B	from 0 ... 600 ml/min	to 0 ... 6000 ml/min	G $\frac{1}{4}$ "
GCM-C	from 0 ... 6 l/min	to 0 ... 60 l/min	G $\frac{1}{4}$ "
GCM-D	from 0 ... 60 l/min	to 0 ... 450 l/min	G $\frac{1}{2}$ "

Performance data

Media (real gas calibration)

Air, O $_2$ *, N $_2$ *, He, Ar, CO $_2$, H $_2$, CH $_4$, C $_3$ H $_8$ (other gases and gas mixtures on request)
*O $_2$ & N $_2$ are calibrated with air

Accuracy (air & equivalents)

Eco: $\pm 2.0\%$ of full scale; ranges > 200 l/min $\pm 3.0\%$ of full scale
Special: $\pm 1.0\%$ of full scale up to 50 l/min

Turndown ratio

Eco: 1 : 50 Special: 1 : 100

Response time

Max. 300 msec (depending on filter settings)

Flow update by sensor

40 msec (battery mode 500 msec)

Display update

240 msec (battery mode 500 msec)

Repeatability

$\pm 0.5\%$ of full scale

Longterm stability

< 1% of measured value / year

Power supply Meter GCM & Regulator GCR

Standard AA battery (lifetime in months depending on operation) or
Micro-USB power supply (DIN 62684)
Option: External power +8...30 Vdc (power consumption max. 120mA)

Power supply Switch GCS & All-in GCA

External power +8...30 Vdc (power consumption max. 300mA) or
Micro-USB power supply (DIN 62684)

Operation pressure

0.2 – 11 bar a

Temperature (environment/gas)

0 – 50°C

Materials

Anodized aluminium, optional stainless steel electropolished

Seals

FKM, optional EPDM (FDA)

Pressure sensitivity

< 0.2% / bar of reading (typical N $_2$)

Temperature sensitivity

< 0.025% FS measuring range type / °C

Warm-up time

< 1 sec. for full accuracy

Integration

Display

Touch display (128x64 px) with automatic position adjustment (position sensor)
Backlighting only with external power supply (Micro-USB or 24 Vdc)

Process connection

G $\frac{1}{4}$ " (BSPF* female) up to 60 l/min, G $\frac{1}{2}$ " (BSPF* female) up to 450 l/min
*British Standard Pipe Parallel

Inlet section

None required

Mounting orientation

Any position, consult manufacturer above 5 bar or vertical mounting

Connection cable

For external power supply or alarm module: 2 m with fly leads

Safety

Test pressure

16 bar a

Leak rate

< 1 x 10⁻⁶ mbar l/s He

Environmental protection

IP-50

EMC

EN 61326-1

Options



Panel Mounting Kit



Vacuum Fittings



Various Inlet and Outlet Fittings

Type code red-y compact series

Instrument type	red-y compact series	G C									
Function	Meter										M
	Meter with manual valve (regulator)										R
	Meter with Alarm module										S
	Meter with manual valve (regulator) and alarm module										A
	Meter with analog module										Y
	Meter with manual valve (regulator) and analog module										Z
Full scale of measuring range (air)	Customer-specific (Divider A, up to 600 mln/min)									A	X
	Customer-specific (Divider B, up to 6000 mln/min)									B	X
	Customer-specific (Divider C, up to 60 lln/min)									C	X
	Customer-specific (Divider D, up to 450 lln/min)									D	X
Instruments version	Eco (±2% of FS above 200 lln/min: ±3% of FS, 1:50)										E
	Special (±1% of FS, 1:100)										S
	Eco plus / 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
Supply (Micro-USB always available)	Battery supply (AA battery)										B
	External supply 15...30 VDC										F
	Customer-specific / OEM										K
Material valve (regulator)	Nickel-plated brass										A
	Stainless steel (303 / 1.4305)										S
	Customer-specific / OEM										K
	No valve										N
Orifice size of manual valve	NS 1.0L (for very low flows, high dynamics)										0 5
	NS 1.0										1 0
	NS 1.5										1 5
	NS 2.0										2 0
	NS 2.5										2 5
	NS 3.0										3 0
	NS 3.5										3 5
	NS 4.0										4 0
	NS 6.5										6 5
	Customer-specific / OEM										9 9
	No valve										0 0
Type code		G	C	-						-	

The compact provides 4 modules as selectable options

Battery module (default)

The battery module is the default for the compact. With this module the compact can autonomously run on a single standard AA battery. This creates an unique portable gas flow meter or regulator.

The unit also has a micro-USB connector that can be used as an alternative power supply and which can also be used to update the firmware free of charge (see website for more information).

Power supply module

With the power supply module the compact can be powered from an external 15...30 VDC power source. The module comes with either a 2 or 5 meter cable with fly leads. This module can also be supplied with a wall plug power supply. This unit converts 100-250 VAC into 24 VDC power for the unit. This AC powered module comes with a 1.5 meter cable and you can select a plug for EU, US, GB, AU or CN. Maximum current is 25 mA at 24 VDC power.

Alarm module

The alarm module option provides:

- › 3 alarm contacts (relays up to 1 amp, 30 VDC)
- › 2 optical isolated input channels (reset alarm)
- › Every alarm contact separately configurable as:
 - › High flow alarm
 - › Low flow alarm
 - › Window flow alarm
 - › Totalizer alarm
- › Hysteresis, delay and alarm duration time adjustable
- › Built-in 15...30 VDC power supply, polyfuse protected
- › 2 or 5 meter fly lead cable included (loose ends)
- › All variables adjustable locally through touch screen

Pin assignments

		Color	Assignment
Power		red	PWR+
		black	PWR-
Input 2		white	IN2
Input 1		brown	IN1
Input GND		green	IN.GND
Alarm 3		yellow	OUT3.NO
		grey	OUT3.NC
		pink	OUT3.COM
Alarm 2		blue	OUT2.A
		violet	OUT2.B
Alarm 1		grey-pink	OUT1.A
		red-blue	OUT1.B

Specifications

Power Input	
Voltage supply range	15...30 VDC
Maximum current	Maximum current 50 mA at 24 VDC power
Protection input	Polyfuse (trip current > 500mA) and reverse polarity protected
Switch ratings switch 1 + 2 (SPST hard contact)	
Maximum rating	30 VDC/0.5 A
Switch ratings switch 3 (DPST hard contact)	
Maximum rating	30 VDC/1 A
Inputs 1 + 2 (Opto-couplers)	
Voltage range (polarity sensitive)	5...30 VDC (@ 5 mA maximum)
Min. recommended pulse width	100 msec (sample interval: 20 msec)



Alarm option «red-y compact 2 series»

The models **GCS** (red-y compact 2 switch) and **GCA** (red-y compact 2 all-in) provide **3 configurable alarm relays**.

The following triggers are available: High alarm, low alarm, window alarm and totalizer alarm.

The alarm module can be retrofitted on existing *red-y compact 2 meters & regulators*.

Features:

- » 3 alarm contacts
(relays that can switch up to 1 amp, 30 Vdc)
- » 2 optical isolated input channels
(to optionally reset an alarm remotely)
- » Every alarm contact separately settable as high, low, window or totalizer alarm
- » Hysteresis, delay and alarm duration time all customer configurable
- » Built-in 8...30 Vdc power supply, polyfuse protected
- » 2 meter fly lead cable included
- » All variables adjustable locally through touch screen

Pin assignments

	Pin	Color	Assignment
Power	1	red	PWR+
	2	black	PWR-
Input 2	3	white	IN2
Input 1	4	brown	IN1
Input GND	5	green	IN.GND
Alarm 3	6	yellow	OUT3.NO
	7	grey	OUT3.NC
	8	pink	OUT3.COM
Alarm 2	9	blue	OUT2.A
	10	violet	OUT2.B
Alarm 1	11	grey-pink	OUT1.A
	12	red-blue	OUT1.B

Functions

Logic functions High alarm, low alarm, window alarm, totalizer alarm

Reset functions Auto, manual, external input 1/Input 2

Power input

Voltage supply range 8...30 Vdc (power supply hereafter referred to as the 24 Vdc power supply)

Max. current 300 mA

Protection input Polyfuse (trip current > 500 mA) and reverse polarity protected

Switch ratings switch 1 + 2 (SPST hard contact) / switch 3 (SPDT contact)

Maximum voltage 30 Vdc

Relais lifetime > 5 million cycles

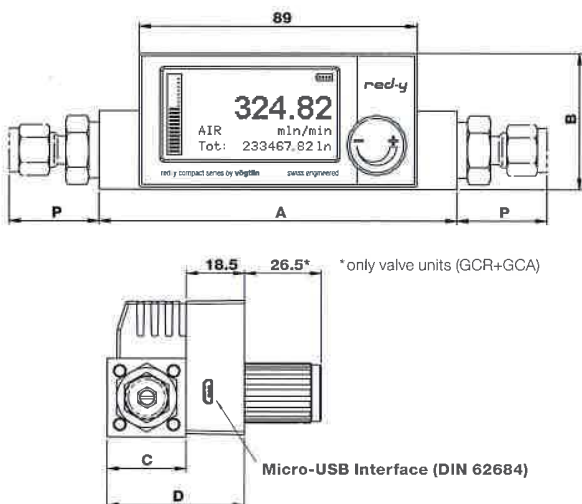
Maximum current Switch 1 + 2 (SPST hard contact): 0.5 A / Switch 3 (SPDT contact): 1 A

Inputs 1 + 2 (opto-couplers)

Voltage range (polarity sensitive) 5...30 Vdc (@ 5 mA max.)

Min. recommended pulse width 100 msec (sample interval 20 msec)

Dimensions «red-y compact 2 series»



Type/Body	Length (mm)				Length of fitting
	A	B	C	D	
GCM G 1/4" GCR G 1/4" GCS G 1/4" GCA G 1/4"	114	44	25	44	We offer a range of different inlet/outlet fittings.
GCM G 1/2" GCS G 1/2"	160	54	35	54	
GCR G 1/2" GCA G 1/2"	207	54	35	54	

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 1×10^{-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



«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

3-year warranty*



High-quality components ensure long and trouble-free operation

*does not apply to calibration, options and accessories

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



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



- 높은 정밀도(accuracy)와 다양한 측정범위 제공 / Standard & Hi-Performance
- Analog & Digital Interface
- get red-y software로 장비 설정 가능
- 옵션 가능 : display 장착, multigas, profibus, industrial ethernet, Gas block systems
- 다양한 interface 옵션
- sealing material : FKM / EPDM / FFKM



GSM

High precision digital mass flow meter



Media (real gas calibration)	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	± 1.0 % of FS / 1:50
(Hi-performance)	± 0.3 % of FS + ± 0.5% of reading / 1:100
Measuring range	Flow up to 450 l/min
Process connection	G ¹ / ₄ " up to 60 l/min, G ¹ / ₂ " up to 450 l/min
Materials	Anodized aluminium, st. steel

GSC

High-precision digital mass flow controller

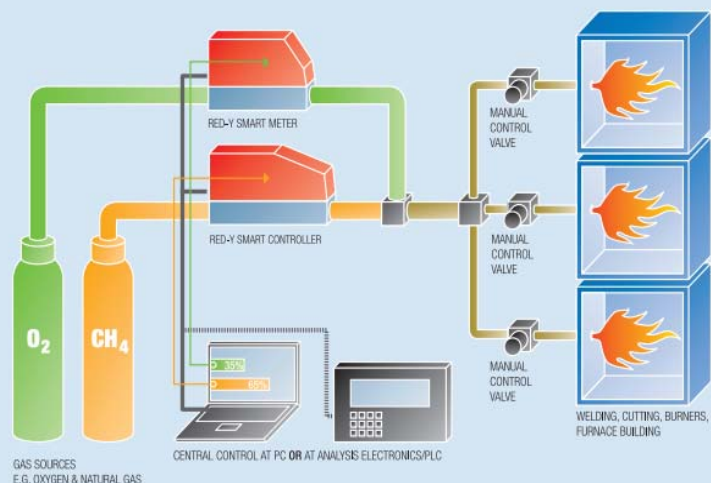


Media (real gas calibration)	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	± 1.0 % of FS / 1:50
(Hi-performance)	± 0.3 % of FS + ± 0.5% of reading / 1:100
Measuring range	Flow up to 450 l/min
Process connection	G ¹ / ₄ " up to 60 l/min, G ¹ / ₂ " up to 450 l/min
Materials	Anodized aluminium, st. steel

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.



gas flow technology by **vögtlin**

red-y smart series mass flow meters & controllers with built-in display

Our proven thermal mass flow meters and controllers of the *red-y smart series* are available with integrated display. The display indicates flow rate, total and measuring units. With the controller version with this clear display, you can add the option of using a local setpoint to set the required flow.



Fig.1 Display SPOT with default parameters



Fig.2 Display SETSPOT with default parameters and +/- buttons to adjust the setpoint

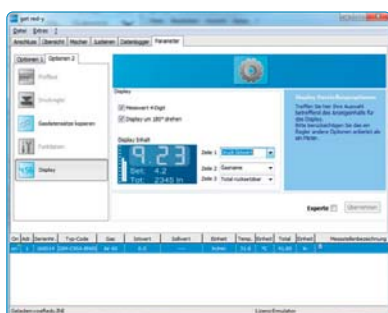


Fig.3 get red-y software: Adjustment of display settings

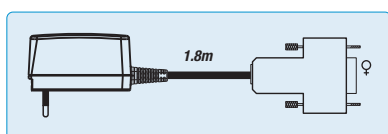


Fig.4 Plug-type power supply device for one red-y smart with display option

Display options SPOT & SETSPOT

The display indicates various parameters: Flow rate, measuring units, total, gas type, setpoint* and valve load*. A bar graph on the left side indicates the actual flow in relation to the full scale. A + and – button allows to set a setpoint*.

Default parameters

- » **smart meter (GSM):** Flow rate, measuring units, total, gas type
- » **smart controller (GSC):** flow rate, measuring units, set point, gas type
- » **smart pressure controller (GSP/GSB):** Pressure rate, pressure setpoint, flow rate, measuring units

Available versions

- » **SPOT:** Display
- » **SETSPOT:** Display & setpoint setting*

Adjust display settings

Do you want to change the measuring unit or do you want the device to indicate the gas type instead of the total? No problem. With the free *get red-y* software you can easily adjust the display settings with just a few mouse clicks. The following settings can be changed:

- » Display the flow rate in 3 or 4 digit
- » Change the display orientation (180°)
- » Change parameters & units

Option

Plug-type power supply device for direct feeding of one *red-y smart* with display option (read-out/operation via display function only)

Input: 100 – 240Vac, 50 – 60Hz

Output: 24Vdc, approx. 0.5A (12W), D-Sub connector

EURO Plug: Art-N° 328-2321, US Plug: Art-N° 328-2322,
UK Plug: Art-N° 328-2323, AU/NZ Plug: Art-N° 328-2324,
CN Plug: Art-N° 328-2325

*available for smart controller & smart pressure controller



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vögtlin
instruments

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: ± 1.0 % of full scale⁽¹⁾

Turndown ratio: 1 : 50

<Hi-Performance>

With highest accuracy and turndown ratio

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

Accuracy: ± 0.3 % of full scale + ± 0.5 % of reading⁽¹⁾

Turndown ratio: 1 : 100

⁽¹⁾An additional error of ± 0.25 % may apply for analogue signals

Measuring ranges

(Air/Full scale freely selectable)	Type	Measuring range (air)		Connection
red-y smart meter GSM Meter	GSM-A	from 0 ... 25 ml/min	to 0 ... 600 ml/min	G1/4"
	GSM-B	from 0 ... 600 ml/min	to 0 ... 6000 ml/min	G1/4"
	GSM-C	from 0 ... 6 l/min	to 0 ... 60 l/min	G1/4"
	GSM-D	from 0 ... 60 l/min	to 0 ... 450 l/min	G1/2"
red-y smart controller GSC Controller	GSC-A	from 0 ... 25 ml/min	to 0 ... 600 ml/min	G1/4"
	GSC-B	from 0 ... 600 ml/min	to 0 ... 6000 ml/min	G1/4"
	GSC-C	from 0 ... 6 l/min	to 0 ... 60 l/min	G1/4"
	GSC-D	from 0 ... 60 l/min	to 0 ... 450 l/min	G1/2"

Performance data

Media (real gas calibration)	Air, O ₂ ⁽²⁾ , N ₂ ⁽²⁾ , He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ (other gases and gas mixtures on request) ⁽²⁾ O ₂ & N ₂ are calibrated with air
Response time	Meter (GSM): ± 80 ms ⁽³⁾ ; Controller (GSC): ± 500 ms ⁽³⁾ ⁽³⁾ depending on device configuration & according to SEMI standard E17-1011, 5-100% of range under optimized conditions
Repeatability	± 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 Standard	Meter (GSM): max. 100mA; Controller (GSC): max. 250mA (GSC with valve type 8 max. 490mA)
Current consumption Profinet RT / EtherCAT	Meter (GSM): max. 125mA; Controller (GSC): max. 340mA (GSC with valve type 8 max. 560mA)
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, EPDM, optional FFKM
Pressure sensitivity	< 0.2% / bar of reading (typical N ₂)
Temperature sensitivity	< 0.025% FS measuring range type / °C
Warm-up time	< 1 sec. for full accuracy

Integration

In- / Output signals analog	0..20 mA, 4..20 mA, 0..5 V, 1..5 V, 0..10 V, 2..10 V
In- / Output signals digital	RS-485; Modbus RTU (Slave); Lab View-VIs available Option: Profibus DP-V0, DP-V1/Profinet RT/EtherCAT
Process connection	G1/4" (BSP ⁽⁴⁾ female) up to 60 l/min, G1/2" (BSP ⁽⁴⁾ female) up to 450 l/min ⁽⁴⁾ 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

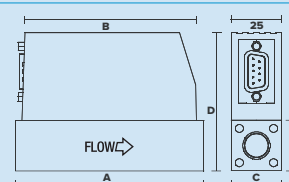
Test pressure	16 bar a
Leak rate	< 1 x 10 ⁻⁶ mbar l/s He
Ingress protection class	IP-50
EMC	EN 61326-1

Dimensions

Dimensions in mm	A	B	C	D ⁽⁵⁾	D ⁽⁶⁾
GSM G1/4"	94	87	25	69	87
GSM G1/2"	145	87	35	79	97
GSC G1/4"	124	117	25	69	87
GSC G1/2"	170	117	35	79	97
GSC G1/2" valve type 8	186.4	117	35	79	97

⁽⁵⁾Standard version

⁽⁶⁾Profinet RT/EtherCAT version



red-y Smart Pressure Controllers

- 한 가지 장비로 3가지 기능.
 - Pressure controller
 - Pressure controller with flow measurement/limitation
 - Flow controller with pressure measurement
- red-y smart series 장비와 결합.
- Digital (Modbus RTU) and analog interface.
- get red-y software로 장비 설정 가능.
- 옵션 가능 : display 장착, multigas, profibus, industrial ethernet, Gas block systems.

GSP

Electronic pressure controller



Media	Air, O2*, N2*, He, Ar, CO2, H2, CH4, C3H8 *O2 & N2 are calibrated with air
Pressure control	from 30mbar up to 10bar / 1:100
Accuracy(standard)	± 1.0 % of FS / 1:50
(Hi-performance)	± 0.3 % of FS + ± 0.5% of reading / 1:100
Measuring range	Flow up to 450 l/min
Process connection	G1/4" up to 60 l/min / G1/2" up to 450 l/min
Materials	Anodized aluminium, stainless steel

GSB

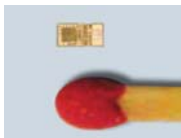
Electronic back pressure controller



Media	Air, O2*, N2*, He, Ar, CO2, H2, CH4, C3H8 *O2 & N2 are calibrated with air
Back pressure control	from 30mbar up to 10bar / 1:100
Accuracy(standard)	± 1.0 % of FS / 1:50
(Hi-performance)	± 0.3 % of FS + ± 0.5% of reading / 1:100
Measuring range	Flow up to 450 l/min
Process connection	G1/4" up to 60 l/min, G1/2" up to 450 l/min
Materials	Anodized aluminium, stainless steel

Advantages

CMOS Sensor technology



The flow meters and controllers make use of the latest MEMS technology and have a digital (Modbus RTU) and analog interface.

Multigas



One meter or controller can be used for up to 10 different gases.

Magnetic valve for safe & fast control



The controller uses a tightly sealed control valve: Leak rate less than 1×10^{-7} mbar l/s He.
The fast control response of 50 ms reduces significantly the setting time.

Technical Data <red-y smart pressure controller>

Instrument types



red-y smart pressure controller GSP
Electronic pressure controller



red-y smart back pressure controller GSB
Electronic back pressure controller



IP67/ATEX versions
red-y industrial pressure controller¹⁾

Measuring & control ranges Pressure

Pressure control	Absolute, differential or gauge pressure Standard measuring ranges from 30 mbar up to 10 bar (graded) Turndown ratio: 1 : 100
Back pressure control	Absolute, differential or gauge pressure Standard measuring ranges from 30 mbar up to 10 bar (graded) Dynamic range depending on the application

Measuring ranges Flow

(Air/Full scale freely selectable)	Connection	Measuring range (air)	
	G¼"	from 0.25 ... 25 ml/min	to 0.6 ... 60 l/min
	G½"	from 0.3 ... 30 l/min	to 4 ... 450 l/min

Turndown ratio & accuracy Flow

<Standard>	Accuracy: ± 1.0 % of full scale Turndown ratio: 1 : 50
<Hi-Performance> (up to 150 l/min)	Accuracy: ± 0.3 % of full scale + ± 0.5% of reading Turndown ratio: 1 : 100

Pressure controller with external transmitter, special measuring ranges (e.g. 0-20 Pa) & customer-specific solutions on request

Performance data

Media (real gas calibration)	Air, O ₂ ²⁾ , N ₂ ²⁾ , He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ (other gases and gas mixtures on request) ²⁾ O ₂ & N ₂ are calibrated with air
Response time Flow Measurement	± 80ms depending on device configuration & according to SEMI standard E17-1011, 5-100% of range under optimized conditions
Response time Pressure Measurement	150ms
Response time Pressure Control	Depending on the measuring section
Repeatability	± 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 Standard	Meter: max. 100mA; Controller: max. 250mA (with valve type 8 max. 490mA)
Current consumption Profinet RT/EtherCAT	Meter: max. 125mA; Controller: max. 340mA (with valve type 8 max. 560mA)
Temperature (environment/gas)	0 – 50°C
Materials	Anodized aluminium, optional stainless steel electropolished 1.4305 or 1.4404 ¹⁾
Seals	FKM, EPDM, optional FFKM
Pressure	Vacuum up to 10 bar g
Pressure sensitivity	< 0.2% / bar of reading (typical N ₂)
Temperature sensitivity	< 0.025% FS measuring range type / °C
Warm-up time	< 1 sec. for full accuracy

Integration

In- / Output signals digital	RS-485; Modbus RTU (Slave); Lab View-VIs available Option: ProfiBus DP-V0, DP-V1/Profinet RT/EtherCAT
In- / Output signals analog	0..20 mA, 4..20 mA, 0..5 V, 1..5 V, 0..10 V, 2..10 V
Analog setpoints	Realizable with AD-converter (on request)
Process connection	G¼" (BSPP ³⁾ female) up to 60 l/min, G½" (BSPP ³⁾ female) up to 450 l/min ³⁾ British Standard Pipe Parallel
Inlet section	None required
Electrical connection	Sub D plug, 9 pole/PG cable gland or M12 plug ¹⁾ Option ProfiBus: Sub D 9 pole/PG cable gland or M12 plug ³⁾ Option Profinet RT or EtherCAT: 2x RJ45 (IN/OUT) / M12 plug ¹⁾
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
Ingress protection class	IP50 (IP67 ¹⁾)
EMC	CE EN 61326-1
ATEX Certification¹⁾	Ex II 3G nA IIC T4 Gc (Category 3/Zone 2) Ex II 3D Ex tc IIIC T100°C Dc (Category 3/Zone 22)

¹⁾Specifications for red-y industrial pressure controller (IP67/ATEX)/Profinet RT & EtherCAT option for red-y industrial series not yet ATEX certified.
Please contact your sales partner for further information.

gas flow technology by **vögtlin**

High accuracy for heavy duties:

Mass Flow Meters & Controllers with IP67 & Ex Protection

Reliable technology and industry standard interfaces for rough environments:

Our tried and tested thermal mass flow meters and controllers for gases now available as IP67 / NEMA 6 version.

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

IP67 / NEMA 6 protection



The instruments offer IP67 / NEMA 6 protection against solid particles and water

ATEX certification



red-y industrial devices come along with ATEX certification (Category 3 / Zone 2 & 22)

Multiple connections



The industrial series are available with different connection types: Cable gland with compression fitting or optional M12 plug on top

Options



Multigas device

A device 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



3-year warranty*



High-quality components ensure long and trouble-free operation

*does not apply to calibration, options and accessories



Setup tool «get red-y»

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

- » **Service tool for remote maintenance**
- » **Switch gas type**
- » **Switch measurement units**
- » **Adjust control parameters**



- 높은 정밀도(accuracy)와 다양한 측정범위 제공 / Standard & Hi-Performance.
- Digital (Modbus RTU) and analog interface.
- IP67 / NEMA 6 Protection.
- ATEX Certification (Category 3 / Zone 2 & 22).

- 다양한 connections / cable gland with compression fitting or optional M12 plug on top.
- get red-y software로 장비 설정 가능.
- 옵션 : Multi gas, Profibus.
- Sealings : EPDM (FDA), optional FKM and FFKM.

GIM



Digital mass flow meter with IP67 & Ex.



Media	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	± 1.0 % of FS / 1:50
(Hi-performance)	± 0.3 % of FS + ± 0.5% of reading / 1:100
Measuring range	Flow up to 450 l/min (480 SLPM)
Process connection	G ¹ / ₄ " up to 60 l/min, G ¹ / ₂ " up to 450 l/min
Materials	Stainless steel 316L

GIC



Digital mass flow meter with IP67 & Ex.



Media	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	± 1.0 % of FS / 1:50
(Hi-performance)	± 0.3 % of FS + ± 0.5% of reading / 1:100
Measuring range	Flow up to 450 l/min (480 SLPM)
Process connection	G ¹ / ₄ " up to 60 l/min, G ¹ / ₂ " up to 450 l/min
Materials	Stainless steel 316L

GIE



Thermal mass flow controller with IP67 & Ex. external valve



Media	Air, O ₂ *, N ₂ *, He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ other gases and gas mixtures on request *O ₂ & N ₂ are calibrated with air
Accuracy(standard)	± 1.0 % of FS / 1:50
(Hi-performance)	± 0.3 % of FS + ± 0.5% of reading / 1:100
Measuring range	Flow up to 450 l/min (480 SLPM)
Process connection	G ¹ / ₄ " up to 60 l/min, G ¹ / ₂ " up to 450 l/min
Materials	Stainless steel 316L

Available connections red-y industrial series

**Cable gland
(Power / Modbus / Analog)**



**M12-A connector
(Power / Modbus / Analog)**



**Cable gland and
2 x M12-D connector (Profinet/ EtherCAT)***



**Cable gland and
M12-B connector (Profibus)**



**M12-A connector and
M12-B connector (Profibus)**



**M12-A connector and
2 x M12-D connector (Profinet/ EtherCAT)***

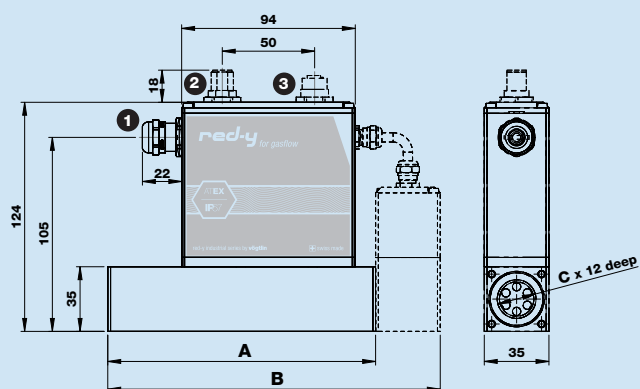


*IP-67 only / Profinet RT & EtherCAT option not yet ATEX certified. Please contact your sales partner for further information.

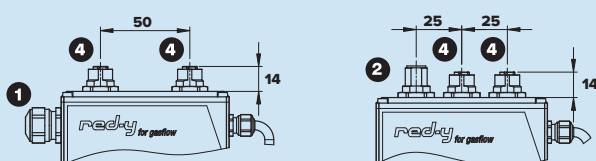
Electrical Connection

- 1 Cable gland / cable diameter 6-8mm
- 2 M12 connector A-Coding 8pol male
- 3 M12 connector B-Coding 5pol female
- 4 M12 connector D-Coding 4pol female

Dimensions red-y industrial series



Profinet/ EtherCAT:



Type	Length (mm)		Process Connection
	A	B	C
GIM-A GIM-B GIM-C	94	—	G1/4"
GIM-D	145	—	G1/2"
GIC-A GIC-B GIC-C	—	134	G1/4"
GIC-D	—	198	G1/2"

Technical Data red-y industrial series

Instrument types



industrial meter GIM
Thermal mass flow meter



industrial controller GIC
Thermal mass flow controller



industrial controller GIE
Thermal mass flow controller with external valve

Instrument versions

«Standard»

The economic solution

Accuracy: $\pm 1.0\%$ of full scale⁽¹⁾

Turndown ratio: 1 : 50

«Hi-Performance»

With highest accuracy and turndown ratio
(available for GIM < 200 l/min / GIC < 150 l/min (air))

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

Turndown ratio: 1 : 100

⁽¹⁾An additional error of $\pm 0.25\%$ may apply for analogue signals

Measuring ranges

(Air/Full scale freely selectable)	Type	Measuring range (air)		Process Connection
red-y industrial meter GIM Meter	GIM-A	from 0 ... 25 ml/min	to 0 ... 600 ml/min	G¼"
	GIM-B	from 0 ... 600 ml/min	to 0 ... 6000 ml/min	G¼"
	GIM-C	from 0 ... 6 l/min	to 0 ... 60 l/min	G¼"
	GIM-D	from 0 ... 60 l/min	to 0 ... 450 l/min	G½"
red-y industrial controller GIC controller	GIC-A	from 0 ... 25 ml/min	to 0 ... 600 ml/min	G¼"
	GIC-B	from 0 ... 600 ml/min	to 0 ... 6000 ml/min	G¼"
	GIC-C	from 0 ... 6 l/min	to 0 ... 60 l/min	G¼"
	GIC-D	from 0 ... 60 l/min	to 0 ... 450 l/min	G½"

Performance data

Media (real gas calibration)	Air, O ₂ ⁽²⁾ , N ₂ ⁽²⁾ , He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ (other gases and gas mixtures on request) ⁽²⁾ O ₂ & N ₂ are calibrated with air
Response time	Meter (GIM): $\pm 80\text{ms}$ ⁽³⁾ ; Controller (GIC): $\pm 500\text{ms}$ ⁽³⁾ ⁽³⁾ depending 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 Standard	Meter (GIM): max. 100mA; Controller (GIC): max. 250mA (GIC with valve type 8 max. 490mA)
Current consumption Profinet RT / EtherCAT	Meter (GIM): max. 100mA; Controller (GIC): max. 340mA (GIC with valve type 8 max. 560mA)
Operation pressure	0.2 – 11 bar a (GIC with valve type 4, 5 and 8 max. 8 bar a)
Temperature (environment/gas)	0 – 50°C
Pressure sensitivity	Less than 0.2% RD per bar (typical N ₂)
Temperature sensitivity	Less than 0.025% FS per °C (typical N ₂)
Warm-up time	< 1 sec. for full accuracy

Materials

Body	Stainless steel 316L (see operating instructions for wetted parts)
Electronic Housing	Aluminum
Seals	EPDM (FDA), optional FKM and FFKM

Integration

In- / Output signals analog	0...20 mA, 4...20 mA, 0...5 V, 1...5 V, 0...10 V, 2...10 V
In- / Output signals digital	RS-485; Modbus RTU 2 wire (Slave); Lab View-VIs available Option: Profibus DP-V0, DP-V1/Profinet RT / EtherCAT
Process connection	G¼" (BSPP ⁽⁴⁾ female) up to 60 l/min, G½" (BSPP ⁽⁴⁾ female) up to 450 l/min ⁽⁴⁾ British Standard Pipe Parallel
Inlet section	None required
Electrical connection	Cable gland with compression fitting M16x1.5 / Option: M12 plug (DIN-standard) (both connection IP67 protected)
Mounting orientation	All orientations are possible. We recommend horizontal mounting. Please contact the manufacturer for further information.

Safety

Test pressure	16 bara
Leak rate	< 1 x 10 ⁻⁶ mbar l/s He
Ingress protection class	IP67 (conforms to NEMA 6)
EMC	CE EN 61326-1
ATEX Certification ⁽⁵⁾	Ex II 3G nA IIC T4 Gc (Category 3 / Zone 2) Ex II 3D Ex tc IIIC T100°C Dc (Category 3 / Zone 22)

⁽⁵⁾Profinet RT & EtherCAT option not yet ATEX certified. Please contact your sales partner for further information.

Type code red-y industrial series

Instrument type	red-y industrial series (Gas)														
Function	Meter	M													
	Controller	C													
	Controller with external valve	E													
Full scale of measuring range (air) defined by manufacturer	Customer-specific (Divider A, up to 600 mln/min)	A X													
	Customer-specific (Divider B, up to 6000 mln/min)	B X													
	Customer-specific (Divider C, up to 60 ln/min)	C X													
	Customer-specific (Divider D, up to 450 ln/min)	D X													
Instruments version	Standard (±1.0% full scale, 1 : 50)	S													
	Hi-Performance (±0.3% full scale, ±0.5% reading, 1 : 100)	T													
	Customer-specific / OEM	K													
Connection / Materials (body, seals)	Cable gland / Stainless steel / EPDM (FDA)**	S													
	M12 plug / Stainless steel / EPDM (FDA)	T													
	Cable gland / Stainless steel / FKM	U													
	M12 plug / Stainless steel / FKM	V													
	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 mounted	9 5													
	Customer-specific / OEM	9 9													
	No valve	0 0													
Type code	G I - -														

**standard

gas flow technology by **vögtlin****Maximum flexibility at high speed:**

Multi-parameter mass flow meter & controller for gases

The *d-flux multi series* is a fast and reliable multi-parameter mass flow device for gases with measurement outputs for mass, normalized and volumetric flow, pressure and temperature. The instrument is based on differential pressure measurement over an internal advanced laminar flow element. One of the many advantages of this laminar flow device is the ability to easily switch to a different gas without a loss in accuracy.

The new d-flux multi series features:★ **Meter and Controller**

The unit is available as meter or with a strong integrated control valve as controller.

★ **Flow rates up to 1400 l/min**

Rate for air, other gases according to conversion (for instance hydrogen: up to 2900 l/min).

★ **Multiple pre-programmed gases**

Up to 15 gases can be pre-programmed in the unit.

★ **State-of-the-art communication**

Advanced Modbus communication & analog output. Optional: Profinet or EtherCAT interface (EtherNet/IP™ available soon).

★ **Wide choice in materials**

The units are available in aluminium (economical and light) and stainless-steel (all wetted parts). Elastomers are available in FKM, EPDM or FFKM. For hydrogen applications, we can supply a gold coated pressure sensor.

★ **5 different sensor options**

Our core sensor is an economical solution for air, nitrogen, oxygen and argon. Our prime sensor is suitable for all gases and has an high accuracy option. For hydrogen we recommend our gold-plated prime sensor.

★ **Wide application scope IP54**

Suitable up to 14 bar a and from -20 to 60 °C. Body in stainless-steel or aluminium Protection IP54.

★ **Minimum inlet required**

Compact design, requires no long straight or special inlet and outlet sections.

★ **Accuracy**

Up to ± 0.3% user full scale and ± 0.5% of measured value.

★ **High sample rate and fast response**

Sample rate of 1 ms, updated data every 10 msec and a total response time of 120 msec (controller 2s).

★ **Custom application profiles**

The unit offers up to 15 application profiles, which allow the storage of individual application details like flow rate, gas, PID, etc. Every profile has an individual totalizer.

★ **Alarm, warning and diagnostic features**

The *d-flux multi series* integrates advanced diagnostics, monitoring and reporting every aspect of its operation. The information is accessible via Vögtlin Connect app, Vögtlin Flow Studio or Modbus.

★ **Autotare**

To minimize uncertainty, the d-flux multi controller detects with an advanced algorithm when there is no flow and will then automatically zero (tare) for optimum performance. For the meter this optimization needs to be performed manually.

★ **Wireless device access with the free Vögtlin Connect app**

Easy device access and configuration of many parameters with our free Android app (Bluetooth®).

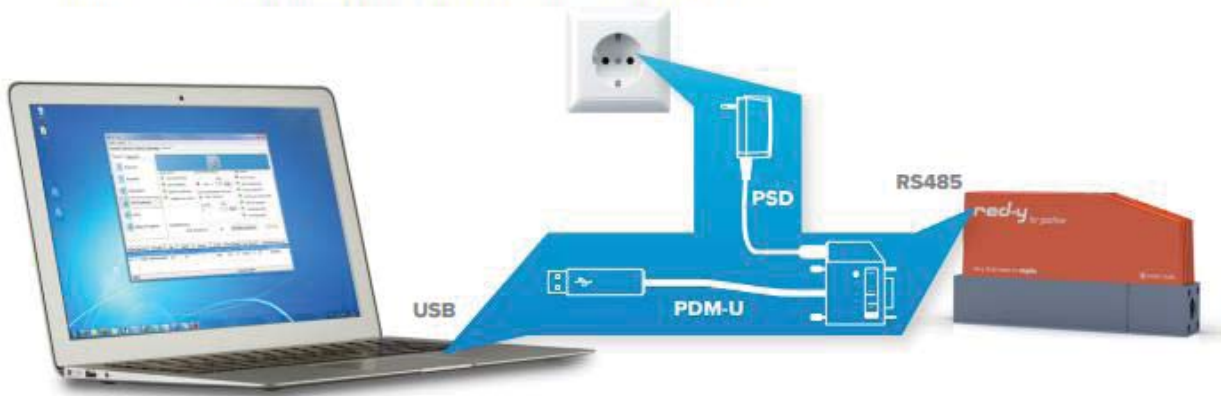
★ **Vögtlin Flow Studio Software**

You can communicate to the d-flux in a Microsoft Windows environment through Modbus. To make this simple, we supply our free software. Easy to install, configure the unit and discover useful options such as graphs and data collection.



Cable accessories for <red-y smart series>

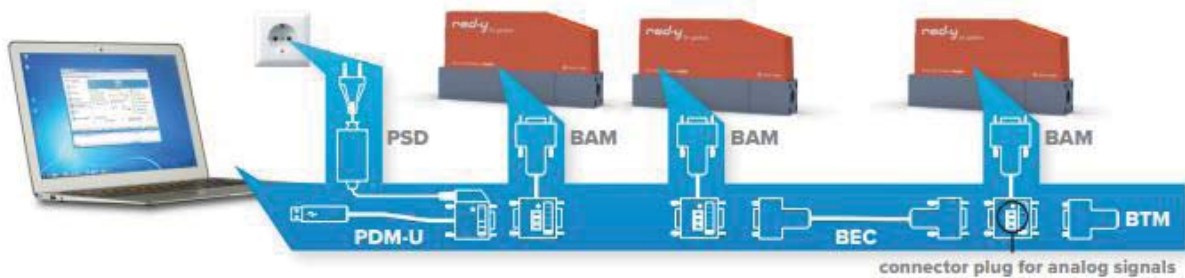
Connection of one thermal mass flow meter or controller to a PC:



The following cables are required:

Type	Description
PDM-U 328-2180	Power Digital Module USB (1.5m) Communication cable PC/red-y (active level converter USB/RS485)
PSD	Plug-Type Power Supply Device (1.8m) Plug-type power supply 24Vdc, approx. 0.5A (12 W)

Connection of several thermal mass flow meters or controllers to a PC:



Example with 3 devices: the following cables are required

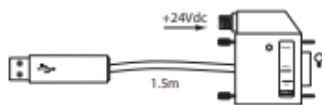
Type	Description	Quantity for above example
PDM-U 328-2180	Power Digital Module USB (1.5m) Communication cable PC/red-y (active level converter USB/RS485)	1
BAM 328-2151	Bus Analog Module (0.1m) For the connection of one device	3
BTM 328-2139	Bus Terminator Module Termination resistor for bus communication	1
PSD	Desktop Power Supply Device (2m) Desktop power supply 24Vdc, approx. 2.2A (53 W)	1

Additional extension cables (BEC) and power supplies are available: See reverse side

Overview cables & modules «red-y smart series»

PDM-U 328-2180

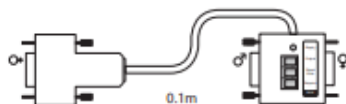
Power Digital Module USB (1.5m)



Communication cable PC/red-y galvanically separated
Active level converter USB/RS485
Powered by power supply PSD

BAM 328-2151

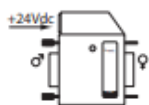
Bus Analog Module (0.1m)



D-Sub network node, digital switch with additional connector for analog setpoint and reading signals
With pluggable screw terminal

PSM 328-2152

Power Separator Module



D-Sub node with connector for power supply
With isolator function to link an additional power supply PSD in the bus

BEC

Bus Extension Cable (0.5/2.0/5.0m)



Extension cable for digital communication and analog signals

Length	Part-No.
0.5 m	328-2160
2.0 m	328-2161
5.0 m	328-2162

BTM 328-2139

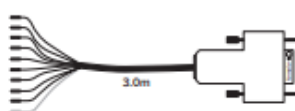
Bus Terminator Module



Termination resistor for bus communication
Always recommended for a bus structure!

PAD 328-2103

Power Analog Digital Cable (3.0m)

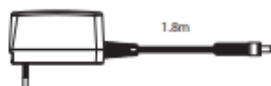


D-sub connector with cable for connecting a measuring or control device to the power supply, to a PLC, or for operation with **digital** signals (Modbus RTU), as well as with **analog** setpoint and measured value signals.
Loose ends with isolated crimp bootlace ferrules

This cable is replacing:
PAC 328-2164 – Power **Analog** Cable (3.0m)
PDC 328-2165 – Power **Digital** Cable (3.0m)

PSD

Plug-Type Power Supply Device (1.8m)



Input: 100 – 240Vac, 50 – 60Hz
Output: 24Vdc, approx. 0.5A (12W),
connector with locking ring, dia. 2.1/5.5mm
Additional exchangeable primary connectors on request

Plug	Part-No.
Euro	328-2311
US	328-2312
GB	328-2313
AU/NZ	328-2314
CN	328-2315

PSD

Desktop Power Supply Device (2m)



Input: 100 – 240Vac, 50 – 60Hz, 1.1A
Output: 24Vdc, approx. 2.2A (53W), dia. 2.1/5.5mm

Plug	Part-No.
Euro	328-2233
US	328-2238
GB	328-2239
AU/NZ	328-2237

PSD

Plug-Type Power Supply Device for Display SPOT / SETSPOT (1.8m)



Plug-type power supply device for direct feeding of **one** red-y smart with display option (read-out/operation via display function only)
Input: 100 – 240Vac, 50 – 60Hz
Output: 24Vdc, approx. 0.5A (12W), D-Sub connector
Additional exchangeable primary connectors on request

Plug	Part-No.
Euro	328-2321
US	328-2322
GB	328-2323
AU/NZ	328-2324
CN	328-2325

gas flow technology by vögtlin

Technical data d-flux multi series

Instrument types



d-flux multi meter/controller **essential**

Mass flow meter/controller with analog signals & Modbus interface

d-flux multi meter/controller **advanced comms**

Mass flow meter/controller with additional Profinet/EtherCAT interface

Measuring ranges	LFE Type	Range (air)	
Standard ranges (air / user adjustable) ¹	LFE1400	from 0-1000 l/min	to 0-1400 l/min
	LFE1000	from 0-700 l/min	to 0-1000 l/min
	LFE700	from 0-500 l/min	to 0-700 l/min
	LFE500	from 0-350 l/min	to 0-500 l/min

Sensor option

Core sensor: suitable for air, nitrogen, oxygen and argon. Only with FKM and EPDM.
 Prime sensor: suitable for all gases excl. H₂. Available with FKM, EPDM and FFKM.
 Prime H₂ sensor: suitable for all gases incl. H₂ (gold coated sensor). Only with FKM and EPDM.
 All sensors are available with both aluminium and stainless-steel bodies. Prime sensors are also available with a high accuracy option.

Gases	Maximum range ¹	Core	Prime	Prime H ₂
Air	0-1400 l/min	✓	✓	✓
N ₂	0-1400 l/min	✓	✓	✓
Ar	0-1240 l/min	✓	✓	✓
O ₂ ³	0-1400 l/min	✓	✓	✓
He	0-1400 l/min		✓	✓
CO ₂	0-740 l/min		✓	✓
CO	0-1390 l/min		✓	✓
H ₂	0-2900 l/min			✓

Above are the default gases pre-programmed for each sensor. More gases can be added as options.²

¹ Unless clearly stated, the specified flow ranges are for an equivalent flow of air at 1013.25 mbar (760 mmHg) and 0°C (32°F). Other common flow, temperature and pressure units can be selected through the Vögtlin Connect app or the digital communication interface. More information available in the d-flux multi operating instructions.

² Additional gases or gas mixtures can be added to the above standard list. Maximum you can store up to 15 gases per unit. Stored gases can be replaced by another gas or gas mixture (except for air). Programmed gases/mixtures can be selected through the Vögtlin Connect app or the digital communication interface.

For other gases, gas mixtures and reference conditions please contact the factory. Only suitable for dry and clean gases.

³ Optional O₂ cleaning possible upon request.

[For other gases and ranges please see our gas list](#)

Profiles

Customer defined profiles

Up to 15 user programmable profiles.
 Profiles are preset configurations where the customer can set the gas, range, dynamics, totalizers, engineering units and reference conditions for up to 15 different applications.

Performance data

Accuracy (after tare at calibration conditions)

A1 Core: ± 0.5% of user full scale ± 1% of measured value.
 B1 Prime : ± 0.3% of user full scale ± 0.7% of measured value.
 B2 Prime high accuracy: ± 0.3% of user full scale ± 0.5% of measured value.
 For hydrogen applications:
 B3 Prime H₂: ± 0.3% of user full scale ± 0.7% of measured value.
 B4 Prime H₂ high accuracy : ± 0.3% of user full scale ± 0.5% of measured value.
 User full scale = ~70...100% standard range.

- 4 종류의 range 가능 / 4 ranges
(0-500, 0-700, 0-1000 and 0-1400 l/min for air).
- 15가지 가스 측정 가능.
- Modbus communication & analog output. (Optional Profinet or EtherCAT interface).
- Voegtlin Connect app으로 장비와 연결 가능.
- 알람, 경고, 진단 기능 가능 (Voegtlin Connect app).
- IP54.

DFM

Multi-parameter mass flow meter



Media	Air, N2, Ar, O2, He, CO2, CO, H2 (More gases can be added as options) * optional O2 cleaning upon request.
Sensor option	High accuracy optional Gold coating for hydrogen
Measuring range	Flow up to 1400 l/min
Materials (body)	Stainless steel 316L (1.4404) / Aluminum
Output signal	Modbus communication & analog output

DFC

Multi-parameter mass flow controller



Media	Air, N2, Ar, O2, He, CO2, CO, H2 (More gases can be added as options) * optional O2 cleaning upon request.
Sensor option	High accuracy optional Gold coating for hydrogen
Measuring range	Flow up to 1400 l/min
Materials (body)	Stainless steel 316L (1.4404) / Aluminum
Output signal	Modbus communication & analog output

DFM advanced comms

Multi-parameter mass flow meter



Media	Air, N2, Ar, O2, He, CO2, CO, H2 (More gases can be added as options) * optional O2 cleaning upon request.
Sensor option	High accuracy optional Gold coating for hydrogen
Measuring range	Flow up to 1400 l/min
Materials (body)	Stainless steel 316L (1.4404) / Aluminum
Output signal	With additional Profinet / EtherCAT

DFC advanced comms

Multi-parameter mass flow controller



Media	Air, N2, Ar, O2, He, CO2, CO, H2 (More gases can be added as options) * optional O2 cleaning upon request.
Sensor option	High accuracy optional Gold coating for hydrogen
Measuring range	Flow up to 1400 l/min
Materials (body)	Stainless steel 316L (1.4404) / Aluminum
Output signal	With additional Profinet / EtherCAT

gas flow technology by **vögtlin**

The Vögtlin Connect App

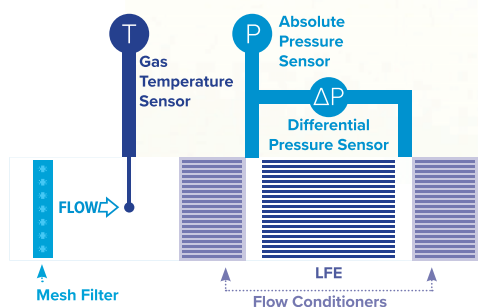


The Vögtlin Connect app can be used with Android phones and lets you easily and securely (password protected) connect to your *d-flux* device. Vögtlin Connect is a user-friendly configuration software and offers the adjustment of many device parameters:

Bluetooth® readable/adjustable variables	Read	Write
Create & edit profiles (set of settings)	✓	✓
Flow range & dynamic range	✓	✓
Filter settings	✓	✓
Alarms and warnings	✓	✓
Analog in-/output configuration	✓	✓
Function of push button*	✓	✓
Read current values	✓	
Show graphs	✓	
Totalizer (read, select, reset)	✓	✓
Node/slave address setting	✓	✓
I/O for external valve on/off	✓	✓
Restart device		✓
Password protection of unit	✓	✓
Factory reset		✓
PID and valve parameters	✓	✓

* The external push button on the device can be programmed for one of the following functions: device restart, measurement on/off, warning reset or tare (long press). Activation/deactivation of Bluetooth® connection (short press).

The app works with Bluetooth® and can be downloaded for free from Google Play store.



d-flux multi series operating principle

The *d-flux multi series* uses a **differential pressure measurement over a laminar flow element**. The sensors measure the pressure differential, the absolute pressure and the gas temperature. With this information the internal electronics calculates the mass flow going through the device.

A unique advantage of the laminar flowmeter is its **linear relationship between flow rate and developed pressure drop**. By adding a control valve and a PID controller, the meter becomes a mass flow controller. You give a setpoint to initiate a repeatable, stable mass flow. This flow rate is not influenced by changes in pressure and temperature.

d-flux multi series configurations

The unit is available in 4 ranges (0-500, 0-700, 0-1000 and 0-1400 l/min for air, different ranges apply to other gases). Each range can be reduced by the user by ~30% without any loss in accuracy. The unit is available with a standard economical sensor and an all stainless-steel sensor for corrosive gases and FDA compliance (gold coated for hydrogen). The *d-flux* is an amazingly flexible product, it can be supplied with up to 15 different gases and has 15 customer programmable application profiles. Please contact us and discuss any special requirements you have.

Applications: The flexibility of the product allows its strengths to shine across a wide range of industries and applications. The unit is used in the bio/pharma industry, gas consumption measurements, burner control, gas mix systems, testing systems, light semi industry, food industry and energy market.

gas flow technology by **vögtlin**

Media	All gases and gas mixtures that are compatible with the selected materials and for which data is available in the NIST refprop database. Contact the factory for more information.
Dynamic range	<i>Fixed dynamics:</i> 1:100 for most gases ³ <i>VADy® dynamics:</i> up to 1:1000 (available for meter only). VADy® or a fixed dynamic range can be selected during order process. This setting can be changed at any time using the Vögtlin Connect app. ³ The dynamic range is gas and pressure dependent, higher pressures means lower dynamic range.
Response time	<i>Meter:</i> Typical 120 msec / <i>Controller:</i> 2000 msec (according to SEMI standard SEMI E17-1011) ⁴ . Update time mass flow value: 10 msec / Sensor sample rate: 1 msec. ⁴ With optimized filter settings. All filter modes and values can be set through the Vögtlin Connect app or the digital communication interface.
Repeatability	± 0.2% of factory full scale (according to SEMI standard E56-0309).
Longterm stability	Typical <0.2% of measured value/year.
Power supply	<i>Meter:</i> 15-36 Vdc, (200 mA@24Vdc, regulated) / <i>Controller:</i> 24 Vdc ±10%, (2000 mA@24Vdc, regulated). Power in through M8-4P connection or optionally through D-sub connection (ripple should not exceed 100 mV peak-to-peak). We recommend that the body of this unit is properly connected to ground.
Operation pressure	1 to 14 bar a.
Temperature (environment/gas)	-20 to +60 °C (-4 to 140 °F).
Humidity gas	0-95% Rh (non-condensing).
Pressure sensitivity	Prime and Prime H2 sensor: ± 0.05% factory full scale per bar (typical air). Core sensor: ± 0.08% of factory full scale + 0.1% of measured value per bar (typical air).
Temperature sensitivity	<0.02% factory full scale (maximum flow range of the device) per 1°C of inlet gas temperature @ 7 bar a pressure.
Accuracy temperature	Typically ± 0.5 °C (not certified).
Accuracy absolute pressure	<0.5% of measured value (not certified).
Warm-up time	<2 sec for full accuracy.
Materials	
Wetted part	Elastomers readily available: FKM, EPDM, FFKM (valve seat). Full FFKM version upon request. Body: Stainless-steel 316L (1.4404). Valve (controller): 316 (1.4401), 416 (1.4005), 430F (1.4104). Inlet filter: Stainless-steel 316 (1.4401), fastener stainless-steel (1.4122) or equivalent. A1 core sensor: Stainless-steel 316Ti (1.4571), silicon, gold, glass, silicone encapsulation, PBT, 30GF, ceramics. B1 + B2 Prime sensor: Stainless-steel 316L (1.4404). B3 + B4 Prime H2 sensor: Stainless-steel 316L (1.4404) with gold coating.
Electronic housing	Powder coated stainless steel.
Integrated inlet filter	50 micron stainless-steel 316 (1.4401) filter. Fastener filter material stainless-steel (1.4122) or equivalent.
Wetted parts surface roughness	1.6 Ra µm or better (contact factory for lower Ra values).
Integration & Installation	
Output signals analog	Linear 4–20 mA or customer defined (max 20 mA), user selectable. Linear 0–5 VDC or 0-10 VDC or customer defined (max. 10 VDC), user selectable mA output: 740 ohms maximum load resistance. VOLT output: 1000 ohms minimum load resistance. All analog outputs are galvanically separated and protected. If used with analog signals add ± 0.2% of factory full scale to the uncertainty.
Setpoint signals analog	Linear 4–20 mA or customer defined (max 20 mA), user selectable. Linear 0–5 VDC or 0-10 VDC or customer defined (max 10 VDC), user selectable.
Output signals digital	RS-485 (Modbus RTU 2-wire). The Modbus address can be set with 2 rotary switches on the outside of the housing. All Modbus settings can be set through the Vögtlin Connect app.
Optional digital communication	Dual port RJ45 with integrated switch (easy to daisy chain). RJ45 LEDs indicating link and activity on the network / Ethernet speed: maximum 100 Mbit. Profinet: Profinet IO specification v2.33 / Profinet IO devices conformance class B (RT) / Endianness: conform Siemens S7 (big). EtherCAT: IEC standard IEC61158 / Endianness: little. EtherNet/IP™ will be available end of 2024.
Configuration interface	Bluetooth® 4.0 (free Vögtlin Connect app available from Google Play store).

gas flow technology by vögtlin

Output I/O MOSFET	On/off for external shut-off valve or alarm available through M8-4P connector (power + open drain/collector output). Contact type: MOSFET (open drain/collector) . Maximum voltage: 36 Vdc, Max current 500 mA (Polyfuse protected).
Electrical connection	9-pin D-sub male (power and signals) and M8-4P connector (power + open drain/collector output). Optional 2 x RJ45 (EtherCAT /Profinet).



Process connection	1" BSPP female (G1"). Optional: ½" BSPP, 1" Compression or Tri-clamp 50.5mm flange size (ISO) (see accessories page).
Inlet section	None required if our standard inlet filter/conditioner is installed. Without filter/conditioner a 10 x D straight inlet is recommended. The inlet filter can be deselected at time of order.
Pressure drop	<i>Meter:</i> Standard 400 mbar at factory full scale air venting to atmosphere (with filter/conditioner). Optional: 325 mbar at factory full scale air venting to atmosphere (without filter/conditioner). Pressure drop is dependent on operating pressure (higher pressure = lower pressure drop). For more information please refer to your sales partner. <i>Controller:</i> Min. pressure difference required for 1400 l/min (air) < 3 bar. Contact your sales partner for other pressure drop requirements.
Mounting orientation	All orientations are possible.
Weight	Stainless-steel: 3.7 kg (meter), 8.7 kg (controller). Aluminium: 1.6 kg (meter), 4.3 kg (controller). All excluding Ethernet interface and fittings.

Safety¹

Test pressure after production	21 bar a.
Maximum overpressure sensor	Core sensor: 28 bar a, Prime and Prime H2 sensor: 90 bar a.
Burst pressure	<i>Meter:</i> 100 bar a, <i>controller:</i> 70 bar a.
Leak rate	< 1 x 10 ⁻⁶ mbar l/s He.
Ingress protection class	IP54, if IP54-D-sub is used (see accessories page). For optional EtherCAT/Profinet: IP40.

¹ For additional safety information please consult the d-flux safety information sheet available on our website.

Certifications

EMC	IEC/EN 61326-1, IEC/EN 61000-6-2/4.
ATEX certification	None.
Material certificates	Contact factory.
FDA compliance	Contact factory.
PED	Fully compliant. Since the unit has 1" process connection, complies with the SEP, as defined in article 4, paragraph 3 of the Pressure Equipment Directive (PED) (2014/68/EU).
RoHS/REACH	All components comply with Directive 2002/95/EC (RoHS) and the REACH guidelines.
Warranty	3 years, excluding cases of corrosion.

Technical specifications and dimensions subject to change without notice.

gas flow technology by **vögtlin****Accessories <d-flux multi series>****Power, plugs and cables****IP54-D9-sub connector**

This plug connects to the male D-sub on top of the d-flux unit to connect the signals and power. With this plug installed and the cap on the DIN M8 connector, the integrity rating of this unit is IP54. Available as plug only (solder connections inside) or with 2 meter cable with fly leads. Maximum current: 2 amp.

Art-N° 328-2093	IP54-D9-sub connector (IP54 rated, 9 solder connections, no cable)
Art-N° 328-2094	IP54-D9-sub connector (IP54 rated with 2 meter cable and fly leads (9))

**IP20-D9-sub connector**

Available as plug only or with 3 meter cable (for indoor IP20 applications only).

Art-N° 328-2102	IP20-D9-sub connector (IP20 rated, 9 solder connections, no cable)
Art-N° 328-2103	IP20-D9-sub connector (IP20 rated with 3 meter cable and fly leads (9))

**IP40-Power supply**

In: 100-240 Vac / Out: 24 Vdc, 2.2A with M8-4pin connector. Not suitable for IP54 applications, for indoor IP40 applications only. Suitable for meters and controllers. Used to configure the d-flux on your desktop with the Vögtlin Connect app.

Art-N° 328-2361	Table top power supply (EU plug)
Art-N° 328-2362	Table top power supply (US plug)
Art-N° 328-2363	Table top power supply (GB plug)
Art-N° 328-2364	Table top power supply (AU plug)
Art-N° 328-2365	Table top power supply (CN plug)

**IP20-RS485 to USB**

A simple way to connect your d-flux over Modbus to your PC. Consisting of 1) RS485 to USB converter (no external power required for converter), 2) a USB-A (version 2.0) connection to your PC and 3) a 9 pin D-sub female connector to the d-flux / Total cable length: 3 meters. USB 2.0-B female to 1 x 9 pin serial RS422/485 male. Chipset: FT232HL, SP3078EE, Dimension: 80 x 72 x 23 (LxWxH). Power supply for the d-flux needs to be purchased separately – not included in this kit.

Art-N° 328-2112

**IP54-M8 plug**

Available as plug only or with 2 meter cable. M8-4pin plugs are suitable for IP54 applications. Maximum current: 4 Amp.

Art-N° 328-2096	IP54-M8 connector (4 pin straight female with screw terminals and cable gland)
Art-N° 328-2097	IP54-M8 connector as above, but with 2 meter cable with fly leads

**IP54-M8 cap**

Cap to seal off M8 connection, if not used (required for IP54 protection). Supplied one with every unit. Only required when IP54 protection is lost or damaged.

Art-N° 632-1221	IP54-M8 cap (to close off/open not used M8 connector)
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Fittings**1" Compression fitting**

Stainless-steel Compression Tube Fitting, Male Connector, 1". Tube OD x 1" BSPP tread. Male ISO Parallel Thread / Material stainless-steel 316 (1.4401), including O-rings. Optional 3.1 Certificate upon request, must be known at time of ordering.

Art-N° 328-1254	FKM
Art-N° 328-1255	EPDM

**DN50 Tri-clamp**

Tri-clamp connection 50.5mm flange (ISO), to 1" BSPP tread. Material 316L (1.4404), including O-rings.

Art-N° 328-1426	FKM
Art-N° 328-1427	EPDM

**Reducer 1" BSPP to 1/2" female BSPP**

Reduced process connections from 1" BSPP male tread to 1/2" BSPP female. Material 316Ti (1.4571), including seal rings.

Art-N° 328-1257	FKM (contact factory for other elastomers)
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gas flow technology by **vögtlin**

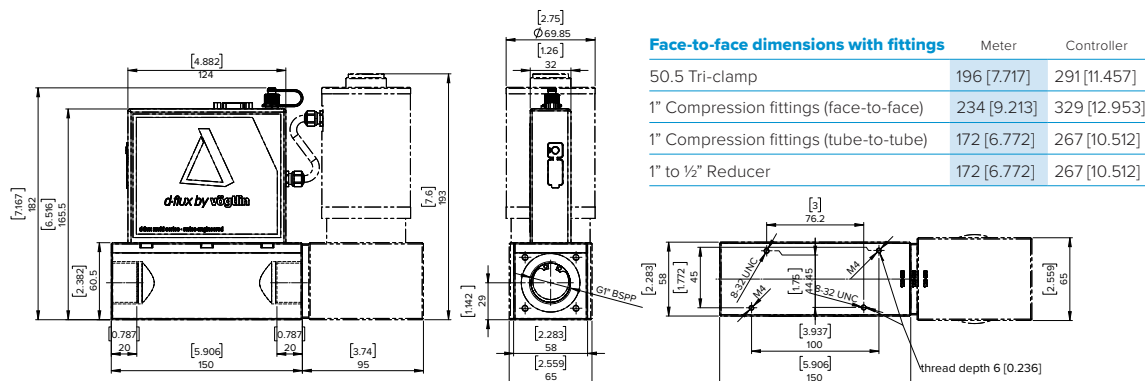
Configuration matrix d-flux multi series

Functionality	<input type="checkbox"/> d-flux multi meter	<input type="checkbox"/> d-flux multi controller
Gas(es) to measure	<input type="text"/>	
Temperature of the gas (range from/to)	<input type="text"/>	
Flow range /flow unit (f.i. l/min)	<input type="text"/>	
Sensor selection	<input type="checkbox"/> Core sensor for Air, N2, O2 and Argon only	
	<input type="checkbox"/> Prime sensor for most gases, all stainless steel	<input type="checkbox"/> High accuracy
	<input type="checkbox"/> Prime H2 sensor with gold coating for H2 applications	<input type="checkbox"/> High accuracy
Dynamic range	<input type="checkbox"/> Fixed dynamics* (default 1:100) See configurator to determine dynamics for process conditions	
	<input type="checkbox"/> VADy® (max. 1:1000) customer adjustable (available for meter only)	
Pressure (please state absolute or gauge)	Pressure inlet (P1) <input type="text"/>	Pressure outlet (P2) <input type="text"/>
Control valve	The valve type, orifice, springs and position (inlet or outlet) will be determine by the factory	
Body material	<input type="checkbox"/> Stainless-steel 316L (1.4404)	<input type="checkbox"/> Aluminium
O-rings	<input type="checkbox"/> FKM	<input type="checkbox"/> EPDM
	<input type="checkbox"/> FFKM	
Valve seat	<input type="checkbox"/> FKM	<input type="checkbox"/> EPDM
	<input type="checkbox"/> FFKM	
Analogue signals	Output signals	Setpoint signal (controller only)
For the output there is one Vdc and one separate mA signal. For the setpoint there is only one analogue input signal. These signals can be adapted through the Vögtlin Connect app.	<input type="checkbox"/> 4-20 mA + 0-5V*	<input type="checkbox"/> 4-20 mA*
	<input type="checkbox"/> 4-20 mA + 1-5V	<input type="checkbox"/> 0-20 mA
	<input type="checkbox"/> 4-20 mA + 0-10V	<input type="checkbox"/> 0-5 Vdc
	<input type="checkbox"/> 4-20 mA + 2-10V	<input type="checkbox"/> 1-5 Vdc
	<input type="checkbox"/> 0-20 mA + 0-5V	<input type="checkbox"/> 0-10 Vdc
	<input type="checkbox"/> 0-20 mA + 1-5V	<input type="checkbox"/> 2-10 Vdc
	<input type="checkbox"/> 0-20 mA + 0-10V	
	<input type="checkbox"/> 0-20 mA + 2-10V	
	Digital communication	<input type="checkbox"/> Modbus communication*
	<input type="checkbox"/> Modbus & EtherCAT (unit becomes IP40)	
	<input type="checkbox"/> Modbus & Profinet (unit becomes IP40)	
Fittings	<input type="checkbox"/> None (1" BSPP female connection)*	
All fittings are mounted & full assembly He leak tested	<input type="checkbox"/> 1" Compression fitting, stainless-steel 316L	
	<input type="checkbox"/> Tri-clamp 50.5 mm flange (ISO), stainless-steel 316L	
	<input type="checkbox"/> Reducer to ½" BSPP female, stainless-steel 316L	
Calibration Certificate	<input type="checkbox"/> Factory calibration 5 points*	
	<input type="checkbox"/> Factory calibration protocol 20 points	

*default

Dimensions d.flux multi series

Dimensions in mm [values in brackets are inch sizes] / Depending on the configuration, the valve can be mounted on the inlet or the outlet.





Precise setting and tightly closing:

High Precision Control Valves for Gases and Liquids

- High-precision flow rate setting
- Leak-proof when closed
- 15 turn spindle, no hysteresis
- Optional digital display for reproducible settings



Looking for a Digital Alternative?

Battery Powered Digital Mass Flow Meters with Needle Valve

- AA battery powered device with touch display
- MEMS sensor technology
- High accuracy & dynamics
- Wide choice of flow units
- Use as a meter, regulator or switch
- Measuring ranges from 25 ml/min up to 450 l/min

Series M-Flow

High-precision control valves for fine dosages of gases & liquids



Measuring range	upto 40 bar
Temperature range	-40°C to 100°C
Straight valve	Available
Valve cartridge	Available
Cw-closed	Available
Connections	M-Flow 25 : G1/4" M-Flow 35 : G1/2"
Material of connections	M-Flow 25 : Aluminum / Stainless steel M-Flow 35 : Aluminum
Sealing	FKM, EPDM, FFKM

- M-Flow micro needle valves는 가스 및 액체의 미세한 투여량을 위해 개발되었으며, 정밀한 OEM 적용을 위한 이상적인 솔루션입니다.

Application Overview

Our digital mass flow meters and controllers optimize numerous applications.

Applications \ Industry	Analytical Technology - Chromatography, Mass Spectrometers, Environmental	Energy - Fuel Cell, Natural Gas	Medicine / Biotechnology / Pharma / Life Science	Building Technology	Glass, Precision Glass Production	Semiconductor Industry	Laboratory - R & D / Technical University	Food Industry	Metallurgy	Surface Technology	Process Industry - Apparatus Engineering, Plant Engineering, Mechanical Engineering	Automotive / Aerospace / Aviation
Air Probe Sampler	✓		✓	✓		✓	✓	✓			✓	✓
Calibration Analyzer	✓		✓				✓	✓				✓
Calibration Equipment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Calibration of Test Equipment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coating Equipment (Vacuum and Plasma)					✓	✓	✓		✓	✓	✓	✓
3D Printer		✓	✓				✓		✓		✓	✓
Consumption Measurement				✓			✓				✓	✓
Food Production	✓						✓	✓			✓	✓
Fuel Cells	✓	✓		✓		✓	✓			✓	✓	✓
Furnace Building	✓	✓			✓	✓	✓		✓	✓	✓	✓
Gas Analyzers	✓	✓	✓				✓	✓			✓	✓
Gas Chromatography	✓	✓	✓				✓	✓	✓		✓	✓
Gas Generator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gas Metering	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gas Mixer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gassing Bioferments Reagents	✓		✓			✓	✓	✓	✓	✓	✓	✓
Gassing of Molten Metals	✓								✓		✓	✓
Ice Cream Manufacturing and Chocolate Aeration								✓			✓	
Laser Welding & Cutting	✓						✓		✓		✓	✓
Leak Testing		✓	✓	✓			✓	✓			✓	✓
Part Inspection			✓		✓		✓		✓		✓	✓
Regulation of Gas Atmosphere	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Spray Drying			✓					✓				
Torch Control / Flame Control		✓	✓		✓		✓		✓		✓	✓
Support Air Control (Tube Production, Catheters)			✓				✓		✓		✓	✓