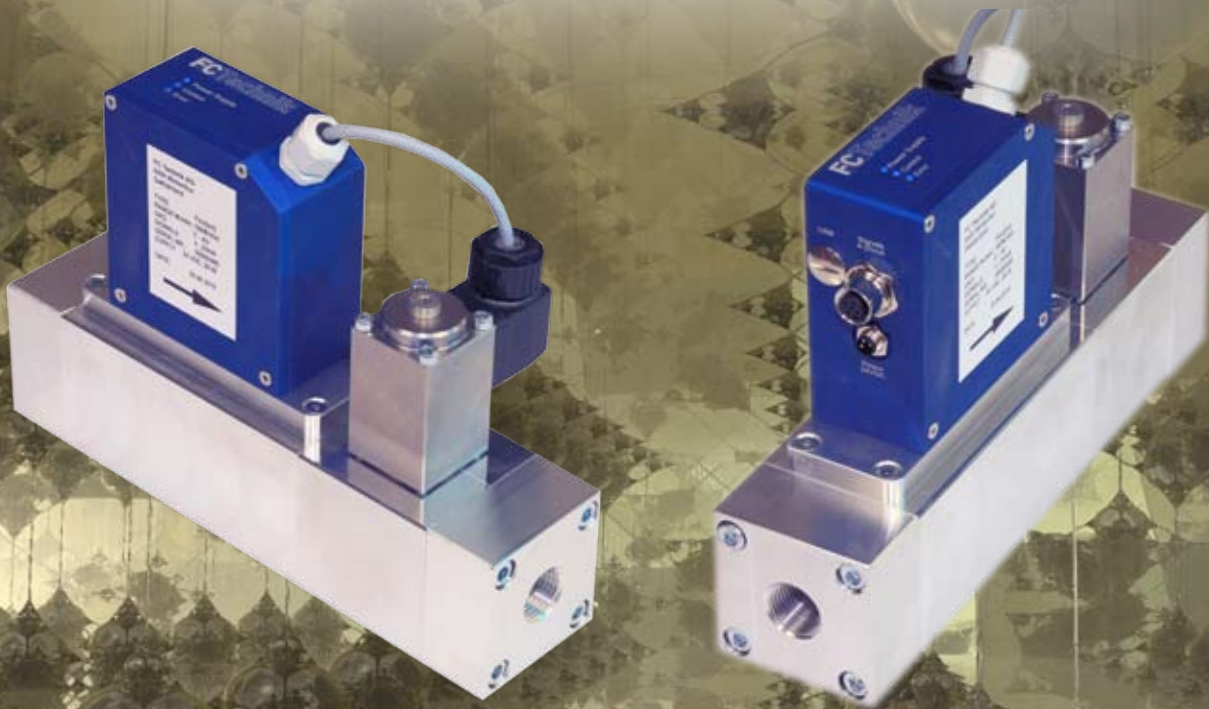


FCTechnik

CONTROLLED PROCESSES IN EVERY SITUATION

flox[on] S

Mass Flow Controller



FLOX[ON] S - PART OF THE FLOX[ON] SERIES

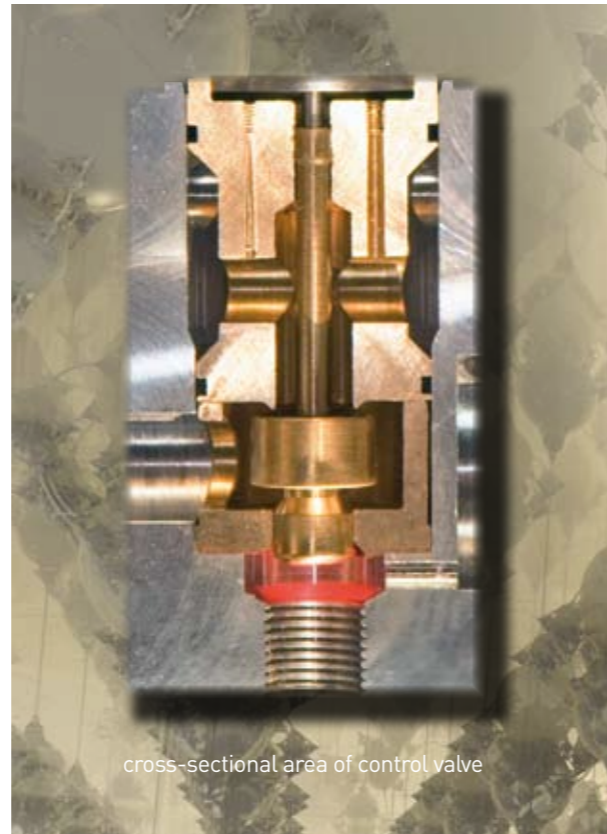
THE FLOX[ON] SERIES

Today it is not rocket science to measure and regulate gas flows. But you can do it traditionally or elegant with a mass flow controller of the flox[on] series.

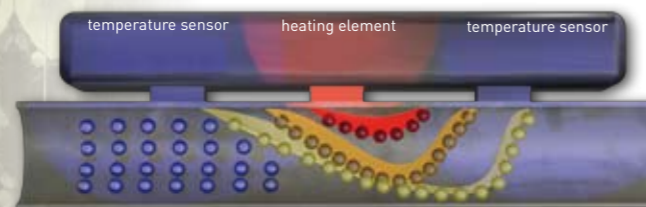
The measurement of the gas flow is temperature and pressure compensated. The regulation of the flow will be made by a pressure compensated proportional valve which is insensitive to incoming pressure (0-16 bar) as well as outflow pressure. The valve is controlled by a solenoid and can be opened fully under any pressure conditions.

All flox[on] B mass flow controller are equipped with a high performance micro controller.

The measurement of all flox[on] B mass flow controller is based on the principle of thermal anemometry. The measuring cell is located in a bypass.

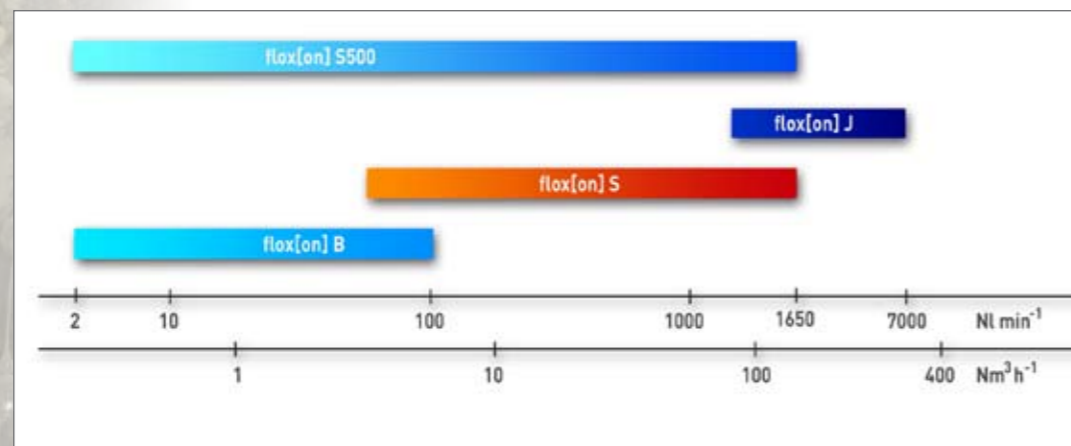


cross-sectional area of control valve



A gas flow of max. ca. 1 NL min^{-1} undergoes a constant energy feed by means of an electric heating element. The thermal feedback is converted to an electrical signal and then linearized through a calibration curve to give the effective flow rate.

Gas flow of the flox[on] series



THE MASS FLOW CONTROLLER

MASS FLOW CONTROLLER AND FC TECHNIK



FC Technik guarantees for every flox[on]:

- Integrated metered bypass as standard equipment
- Individual calibration
- Extremely high accuracy in lower flow range
- Pressure insensitive from 0-16 bar (in- and outlet)
- IP classification
- Vibration insensitive
- Electrical connections guard against reverse polarization
- Electrical connection with fuse

Robust despite fouling

Successfully tested in actual practice

Robust despite extreme heat

Simple operation in harsh environments

High energy efficiency and economy

Maintenance-free

Prompt reproducibility of processes

Constant flow regardless of back-pressure

FC Technik is a company with headquarters in Winterthur, Switzerland and activities all around the world. We offer our customers the advantages which accrue from many years of experience in gas measuring and control technology. FC Technik develops and produces the flox[on] mass flow controller. Our company's collective passion is the control of flowing gases.

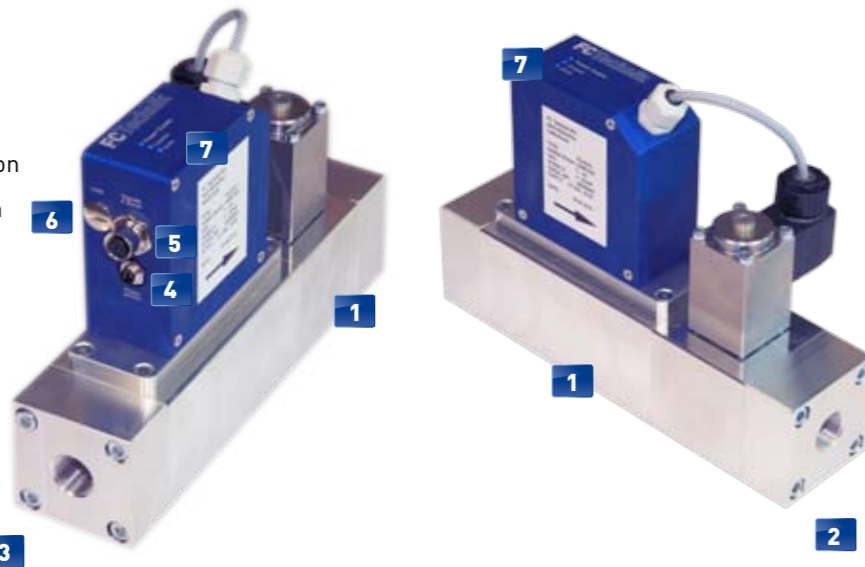


All components are perfectly coordinated into the process. The gas control stations by FC Technik are specially conceived for heavy industry. The integration into the client's existing systems, for internal data retrieval and documentation, is just one of the advantages of the concept at FC Technik.

FLOX[ON] S - DATA

THE FLOX[ON] B

- 1 Proportional valve
- 2 Outlet flange with thread connection
- 3 Inlet flange with thread connection
- 4 M8 Power supply
- 5 M12 Connector signal interface
- 6 Micro USB port
- 7 3 LEDs operating mode



backsight of flox[on] S economy and extended

frontsight of flox[on] S stainless steel

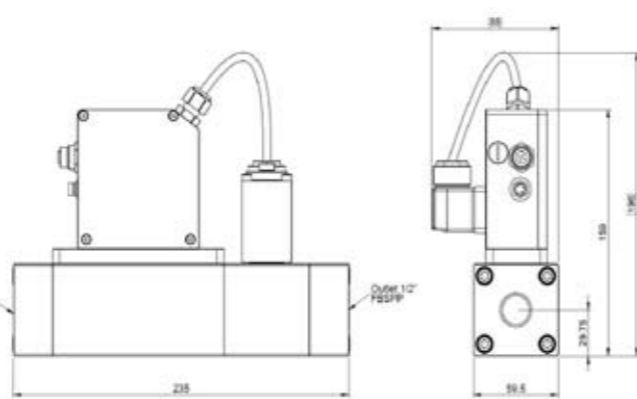
CONNECTION ASSIGNMENT



M8 POWER SUPPLY	
Pin 1	24 VDC
Pin 3	0 V
Pin 4	PE, Ground
20 to 28 VDC at max. 300 mA	

USB PORT
The USB Port connects the flox[on] B with a PC.

DIMENSIONS



M12 ANALOG CONNECTOR

Pin 1	Set Value	4-20 mA → AOP
Pin 2	Set Value	0 V
Pin 3	Real value	4-20 mA → AIP
Pin 4	Real value	0 V
Pin 5	Dig. Input	24 VDC, Bypass Function

LED AND OPERATING MODUS

- LED 1 Power
- LED 2 In operation/run
- LED 3 Error

FLOX[ON] S - DATA

AVAILABLE MODIFICATIONS OF FLOX[ON] B

Three standard versions of the flox[on] B are available:

- The **economy version** is useful for standard applications with gases like compressed air, nitrogen or argon.
- The **extended version** is ready to handle gases like hydrogen, methane and oxygen.
- The **stainless steel version**, free of brass components, can be used in applications like food industry.

PRODUCT FEATURES	
Maximum flow	Nlmin ⁻¹
Minimum flow	Nlmin ⁻¹
Maximum operating pressure	bar
Regulation ratio	
Device Accuracy	
Step response time (10% - 90%)	s
Operating temperature	°C

	ECONOMY	EXTENDED	STAINLESS STEEL
Maximum flow	1650	1650	1650
Minimum flow	70	70	70
Maximum operating pressure	16	16	16
Regulation ratio	1 : 50	1 : 50	1 : 50
Device Accuracy	1% Full Scale	1% Full Scale	1% Full Scale
Step response time (10% - 90%)	1.5 or less	1.5 or less	1.5 or less
Operating temperature	from -10 to +60	from -10 to +60	from -10 to +60

GASES	
Calibration media (see also chapter calibration)	
Process media (gas)	

	ECONOMY	EXTENDED	STAINLESS STEEL
Calibration media (see also chapter calibration)	standard: comp. air, *	standard: comp. air, *	standard: comp. air, *
Process media (gas)	comp. air, N ₂ , Ar, CO ₂	comp. air, N ₂ , Ar, CO ₂ , H ₂ , CH ₄ , O ₂ , **	comp. air, N ₂ , Ar, CO ₂ , H ₂ , CH ₄ , O ₂ , **

* In individual cases, if desired by the customer, the calibration can be made directly with the specific gas intended for use.

** In other cases a compatibility check is required.

MATERIALS	
Housing	
Valveparts	
Inlet / Outlet Port	
Sealing	
Protection	

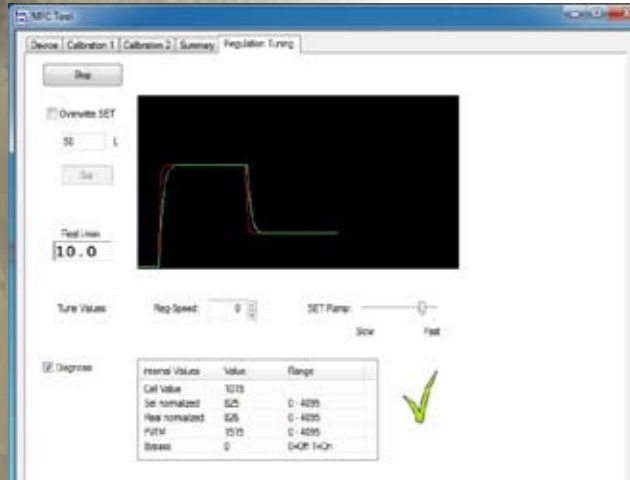
	ECONOMY	EXTENDED	STAINLESS STEEL
Housing	Aluminium and Brass	Aluminium and Brass	steel X2CrNi18-9, 1.4307 and steel X2CrNiMo17-12-2, 1.4404
Valveparts	Brass	Brass	steel X2CrNi18-9, 14307
Inlet / Outlet Port	FBSP 1/2"	FBSP 1/2"	FBSP 1/2", 3/8", 1/4"
Sealing	NBR, FPM	NBR, FPM	NBR, FPM, other
Protection	IP54	IP65	IP65

All information is provided in best conscience. Some clients may desire certain modifications which lead to results other than those found in this brochure.

THE SOFTWARE

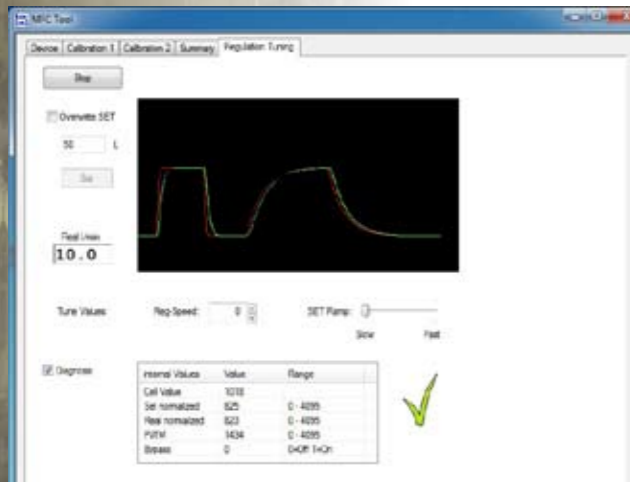
The software for **flox[on] S** can be downloaded. It requires Windows. The software enables to operate the flox[on] B without any other process control.

- The software allows to:
- to get all information about the device,
 - to see and to manipulate the calibration data,
 - to have a look at the actual operation and to overwrite the set point.



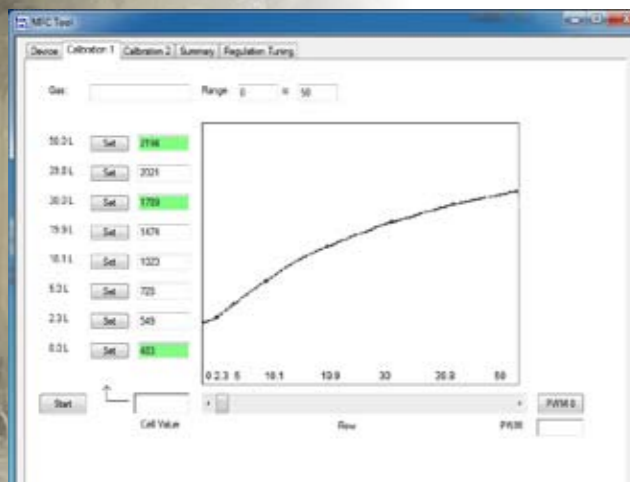
Picture 1 Regulation Tuning

The green line shows the set point, the red line the running point in real time. It is possible to overwrite the set point at every time. In this case it had been done, changing from 50 to 10 lmin⁻¹ (e.g.). SET Ramp. is positioned to fast. The diagnosis shows, that all values are in range.



Picture 2 Regulation Tuning with different SET Ramp.

Comparable to picture 1 the changes of different set points were made with different SET ramp. values. The graphic shows that set point and real points are the same at any time but the alignment to the new set point differs. Therefore the changing of set points can be adapted to different types of processes.



Picture 3 Calibration

Though the measuring cell does not require a recalibration for the rest of its lifetime it might be possible in very special processes to manipulate the calibration (here done in changing three calibration points, that are green marked). Before using this menu, it is recommended to discuss it with FC Technik.

CALIBRATION

CALIBRATION

Before delivery, the measuring cell in every **flox[on] S** is calibrated with atmospheric air. There are correction factors for applications using other gases. In individual cases, if desired by the client, the calibration can be made directly with the specific gas intended for use.

The measuring cell does not require a recalibration for the rest of its operating life.

If a mixed gas such as air or natural gas is used, it should be noted that a change in the composition of the gas can occur during operation.

In such cases, and for all other questions about calibration, please contact our service center (see back page of this manual).

CORRECTION FACTORS

GAS		CORRECTION FACTOR
Hydrogen*	H ₂	0,7
Argon	Ar	0,95
Nitrogen	N ₂	1,0
Oxygen	O ₂	1,0
Methane	CH ₄	1,1
Carbon dioxide	CO ₂	1,35

* For applications using hydrogen gas, we recommend that the **flox[on] S** be calibrated directly with hydrogen by FC Technik

GUARANTEE

The **flox[on] S** is guaranteed for 2 years.

IMPORTANT NOTICES

To ensure trouble-free operation, the **flox[on] S** should be installed in a horizontal position. If installed vertically, the device could produce faulty measurements under certain conditions.

The **flox[on] S** is maintenance-free even under harsh conditions. In case of a fault or failure of the measuring cell, please contact the service center.

When delivered, the **flox[on] S** comes in secure transport packaging. It can be stored under dry conditions for up to two years before installation.

The **flox[on] S** is intended solely for use with gases.

Liquids will ruin the measuring cell. This includes gas condensation, for example, if temperatures during operation drop below the condensation point.

Particulate matter in the form of gas impurities may clog the filter discs and decrease the performance of the **flox[on] S**.

Incorrect wiring can destroy the electronics.

CONTACT

FC Technik AG

St. Gallerstrasse 340
CH-8409 Winterthur

Tel. +41 (0) 52 238 01 75
Fax +41 (0) 52 238 01 77

www.fc-technik.com
info@fc-technik.ch

FC Technik AG
St. Gallerstrasse 340
CH-8409 Winterthur

Tel. +41 (0) 52 238 01 75
Fax +41 (0) 52 238 01 77

www.fc-technik.com
info@fc-technik.ch

