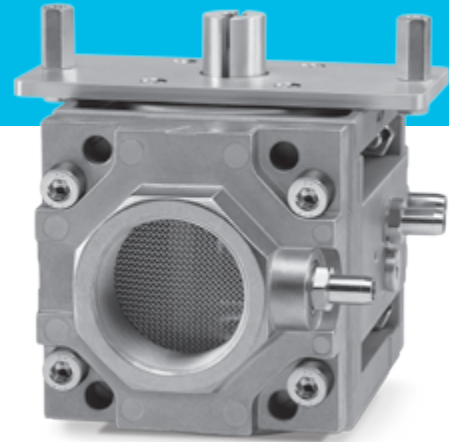


Linear flow control LFC

Technical Information · GB
5.1.3.10 Edition 01.12

- Linear behaviour between adjustment angle and flow rate
- Large control ratio of 25:1
- EC type-tested and certified
- Actuators IC 20 or IC 40 can be mounted without an adapter
- For gas and air
- Low leakage rates
- High control accuracy

CE



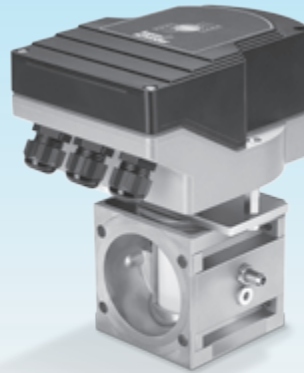
krom
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LFC

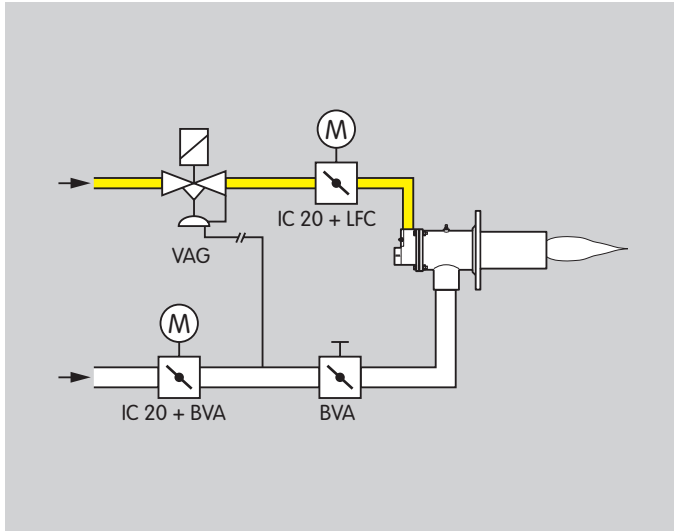


LFC + IC 20

Actuator IC 20 can be mounted directly onto the linear flow control LFC.

1 Application

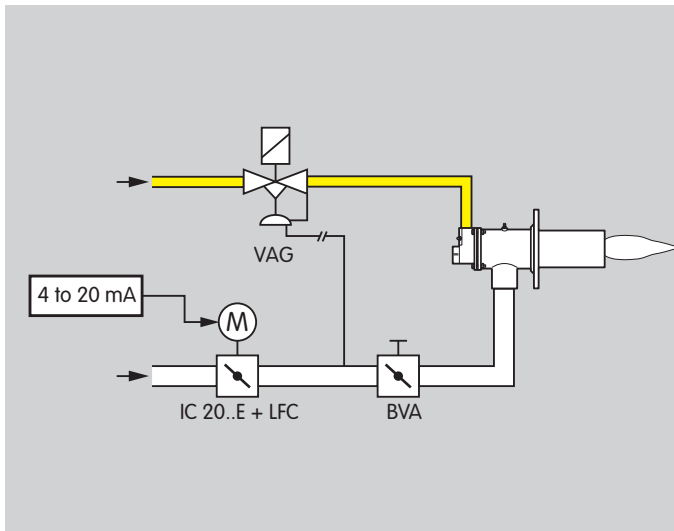
The linear flow control LFC is designed to adjust volumes of gas and cold air on various appliances. It is designed for control ratios up to 1:25, and with the mounted actuator IC 20 or IC 40 it is suitable for regulating flow rates for modulating or stage-controlled combustion processes.



1.1 Examples of application

1.1.1 LFC, lambda control

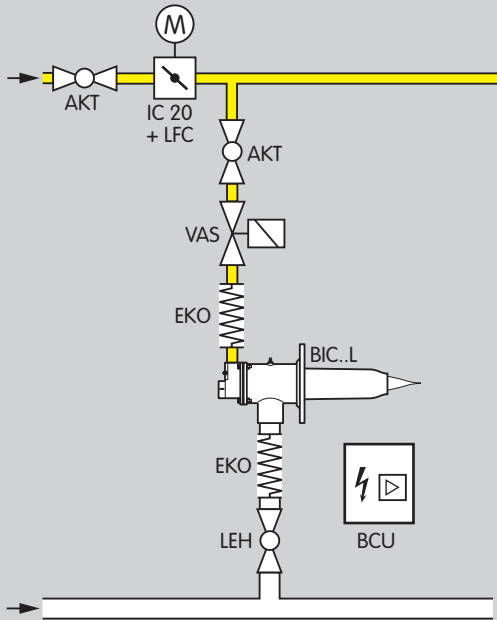
If the burner is to be operated with different lambda values for process reasons, the linear flow control LFC can be used to correct the lambda value.



1.1.2 LFC, adjusting the burner output

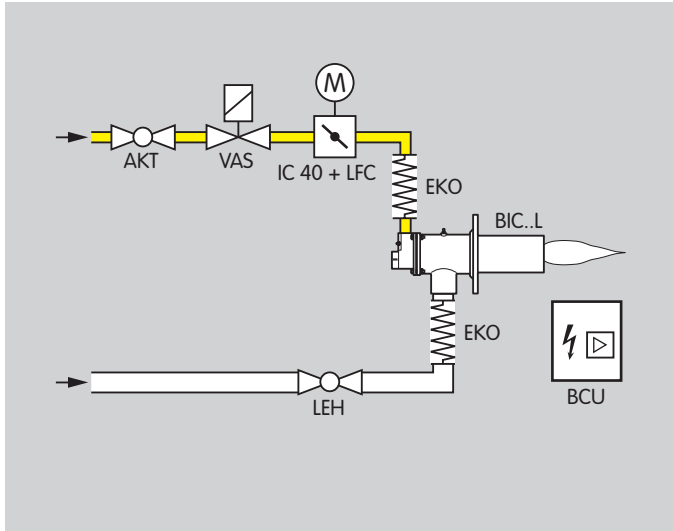
In pneumatic systems the linear flow control with mounted actuator IC 20..E determines the air volume for the required burner output.

The butterfly valve BVA with manual adjustment is used to adjust the high-fire rate.



1.1.3 Zone control

After initiating the burner control unit, the gas solenoid valve and the linear flow control LFC open. The burner is ignited by the burner control unit BCU. The gas flow rate can be adjusted continuously using the linear flow control with actuator IC 20. The air flow rate remains constant.



1.1.4 Excess air burner

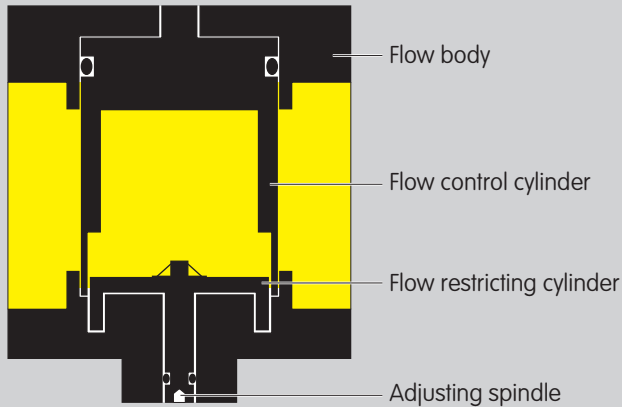
After initiating the burner control unit, the linear flow control LFC moves to the ignition position. The burner is ignited by the burner control unit BCU. The gas flow rate can be adjusted continuously using the linear flow control with actuator IC 20. The air flow rate remains constant.



2 Certification

The linear flow control LFC is EC type-tested and certified pursuant to

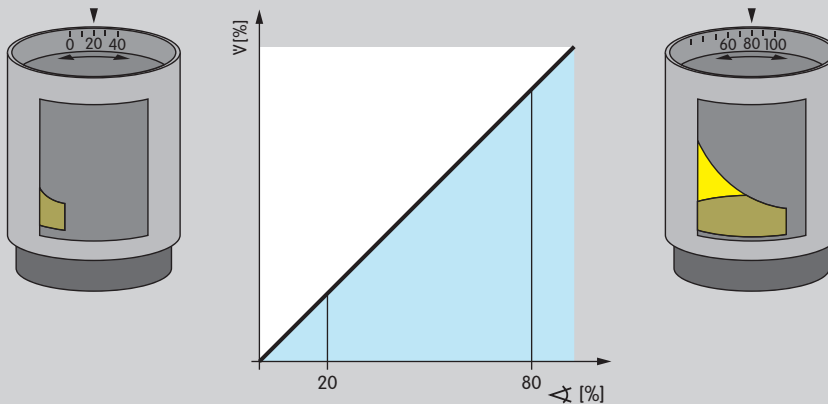
- Gas Appliances Directive (90/396/EEC) on the basis of EN 13611/EN 161.

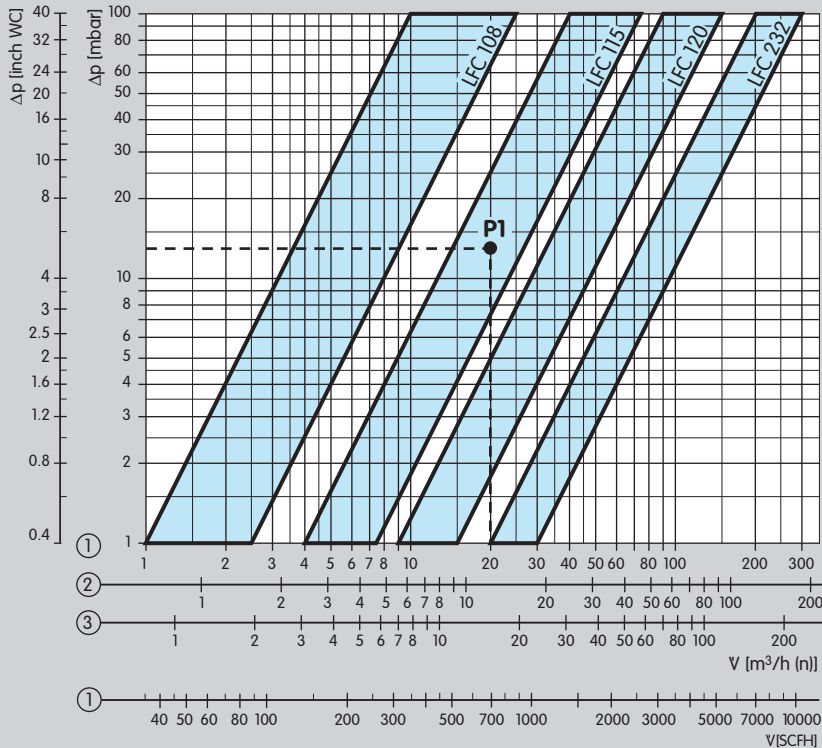


3 Function

The linear flow control LFC uses the rotary valve principle. A flow control cylinder with an opening specially designed for linear flow is installed in the flow body. This flow control cylinder sets the desired flow rate by being turned. The maximum flow can be limited in broad ranges by means of a flow restricting cylinder. This allows optimum adaptation to the output required, without limiting control quality. Adjustment is carried out using an adjusting spindle.

Flow control cylinder





4 Flow rate

- ① = natural gas, $dv = 0.62$, ② = LPG, $dv = 1.56$,
 ③ = air, $dv = 1.00$

The characteristic curves are measured at 15°C with a measurement set-up in accordance with the standards EN 13611/EN 161.

This involves measuring the pressure 5 × DN upstream and downstream of the unit under test. The pressure drop of the pipe is also measured but is not compensated for.

Left curve:

Max. flow rate limited by flow restricting cylinder.

Right curve:

Max. flow rate with no limitation.

5 Selection

5.1 Selection table

Type	/10*	/15*	/20*	/25*	/40*	R	ML	05
LFC 108	●	●	●	●	–	●	○	●
LFC 115	●	●	●	●	–	●	○	●
LFC 120	●	●	●	●	–	●	○	●
LFC 232	–	–	–	●	●	●	○	●

* Only in conjunction with Rp internal thread.

● = standard, ○ = available

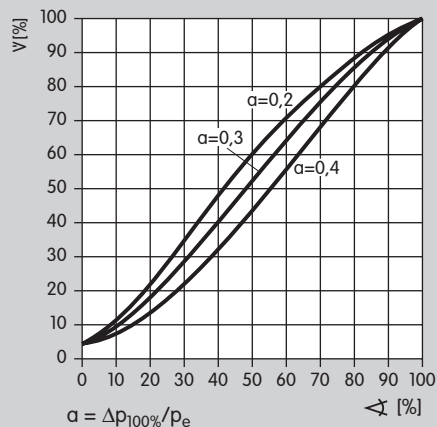
Order example

LFC 115/20R05

5.2 Type code

Code	Description
LFC	Linear flow control
104...232	Series
/10.../40	Connection flange nominal diameter*
R	Rp internal thread
ML	Moduline
p _e max. 500 mbar	05

* If "none", this specification is omitted.



5.3 Control characteristics

In order for the air control valve to be able to influence the flow rate, a proportion of the pressure loss Δp from the entire system has to be caused by the air control valve. Taking into consideration that the overall pressure loss Δp should be kept to a minimum, a control characteristic/valve authority $\alpha = 0.3$ is recommended for the air control valve. This means that of the overall inlet pressure, there is a 30% drop on the fully opened air control valve.

Example

We want to find the LFC for gas to be used for modulating control of a gas burner:

Δp on the linear flow control is determined using the control characteristic α and the outlet pressure p_a .

Recommended control characteristic $\alpha = 0.3$.

$$\Delta p = \frac{\alpha \times p_a}{1 - \alpha}$$

Outlet pressure: $p_a = 30 \text{ mbar}$

Gas flow rate: $V = 20 \text{ m}^3/\text{h}_{(n)}$

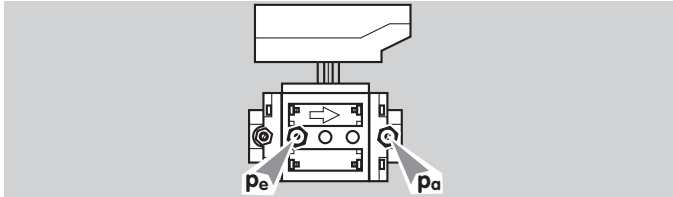
Control characteristic: $\alpha = 0.3$

$$\Delta p = \frac{0.3 \times 30 \text{ mbar}}{1 - 0.3} = 12.9 \text{ mbar} \approx 13 \text{ mbar}$$

Select the appropriate LFC for the required flow rate $V = 20 \text{ m}^3/\text{h}_{(n)}$ and the calculated $\Delta p = 13 \text{ mbar}$:
LFC 115 – see **P1** flow rate diagram.

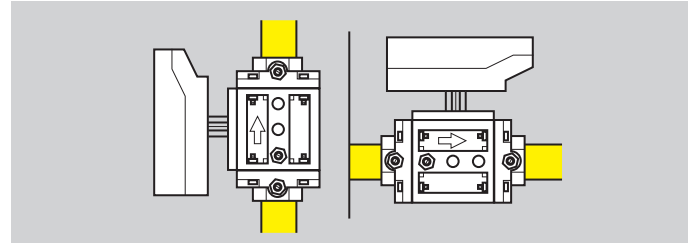
6 Project planning information

The inlet pressure p_e and the outlet pressure p_a can be measured at the pressure test points.

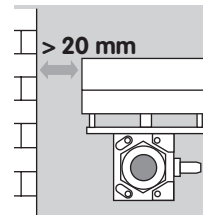


6.1 Installation

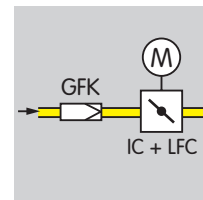
The linear flow control is installed in-between two flanges. The linear actuator LFC and actuators IC 20 and IC 40 are supplied separately. Easy assembly with the actuator using 2 screws can be carried out either before or after installation of the actuator in the pipework.



Installation position of actuators IC 20, IC 40: vertical or horizontal, not upside down.

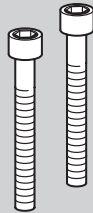


Actuators IC 20 and IC 40, and the linear flow control LFC, must not be in contact with masonry. Minimum clearance 20 mm. Do not store or install the unit in the open air.



Sealing material and thread cuttings must not be allowed to get into the valve housing.

We recommend that a filter be installed upstream of every control.

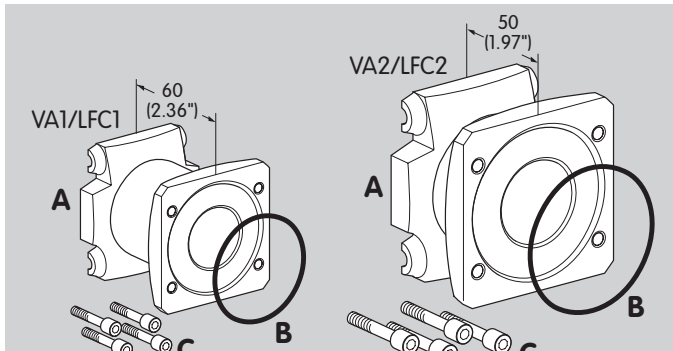


7 Accessories

7.1 Fastening set

To attach an IC 20 or IC 40 to the linear flow control. The fastening set is fitted at the factory or delivered enclosed as an additional item.

Fastening set	Order No.
IC-BVG/BVA/BVH/LFC /E (fitted)	74921084
IC-BVG/BVA/BVH/LFC /B (enclosed)	74921082



7.2 Flange set for Moduline

For attaching VAS/VCS 1, VAS/VCS 2 to LFC, sizes 1 and 2:
 Flange set VA 1/LFC 1, Order No. 74922171,
 Flange set VA 2/LFC 2, Order No. 74922172.

Scope of delivery:

- 1 x flange,
- 1 x O-ring,
- 4 x cheese-head screws,
- 4 x square nuts.

8 Technical data

Gas type:

natural gas, town gas, LPG (gaseous) and air.

Control ratio: 25:1.

Leakage rate: < 2% of k_{VS} value.

Max. inlet pressure p_e : 500 mbar.

Running times: 7.5 s, 15 s, 30 s, 60 s.

Connection flanges: Rp internal thread pursuant to ISO 7-1.

Housing material: aluminium,

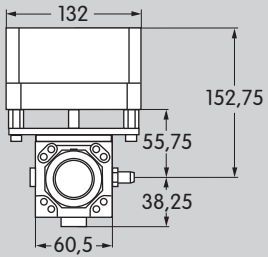
Control cylinder: POM.

Ambient temperature:

-20 to +60°C.

Installation position: any.

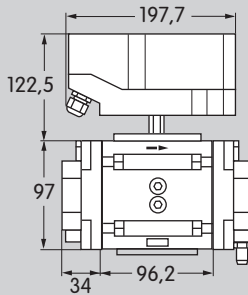
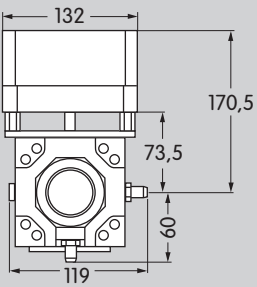
8.1 Dimensions



Type	Connection Rp	kVS m ³ /h	Weight kg
LFC 108	3/8, 1/2, 3/4, 1	2.4	2.8
LFC 115	3/8, 1/2, 3/4, 1	6.7	2.8
LFC 120	3/8, 1/2, 3/4, 1	14	2.8
LFC 232	1, 1½	27	4.1

Technical drawing of LFC 108-120 showing side view. Dimensions are: 122,5 (height to top of valve body), 68,5 (height to center of valve body), 25 (width of valve body), and 61 (width of main body).

LFC 1



LFC 2

Feedback

Finally, we are offering you the opportunity to assess this "Technical Information (TI)" and to give us your opinion, so that we can improve our documents further and suit them to your needs.

Clarity

Found information quickly
Searched for a long time
Didn't find information
What is missing?
No answer

Comprehension

Coherent
Too complicated
No answer

Scope

Too little
Sufficient
Too wide
No answer

Use

To get to know the product
To choose a product
Planning
To look for information

Navigation

I can find my way around
I got "lost"
No answer

My scope of functions

Technical department
Sales
No answer

Remarks

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