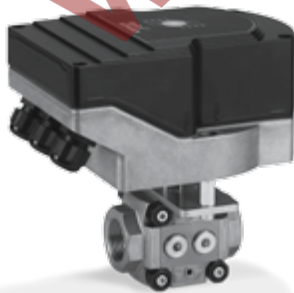


## Linear flow controls VFC

## Linear flow controls with actuator IFC

Product brochure · GB  
3 Edition 01.16

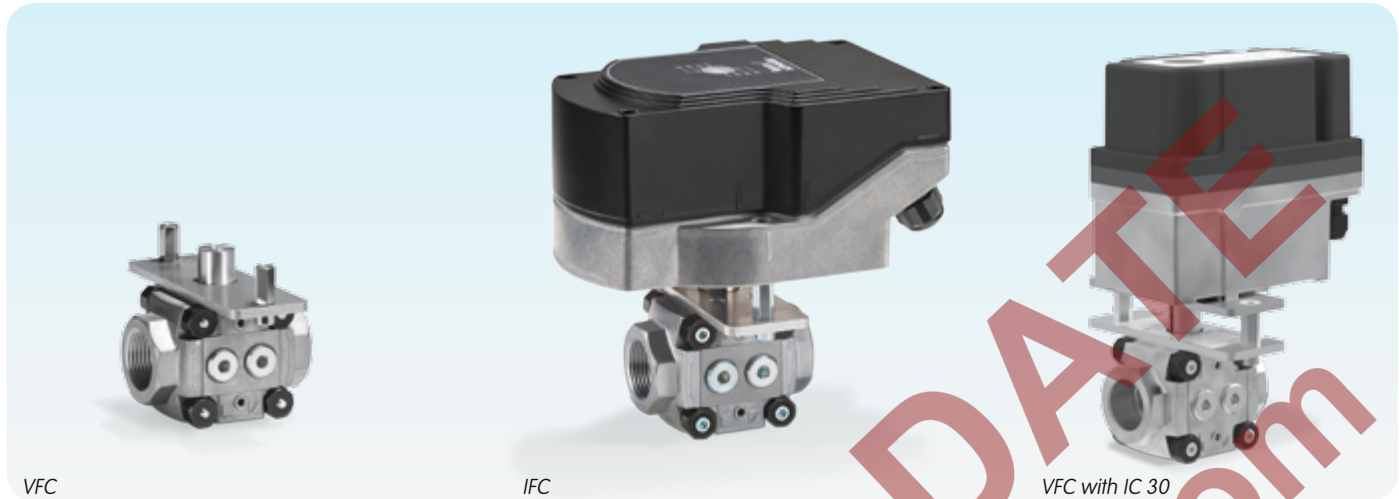
CE



krom  
schroder

- Linear relationship between adjustment angle and flow rate
- Large control ratio of 25:1
- Actuators IC 20 or IC 40 mounted directly
- Actuator IC 30 (24 V DC) can be mounted
- For gas and air
- Low leakage rates
- High control accuracy
- EU certified

## Application

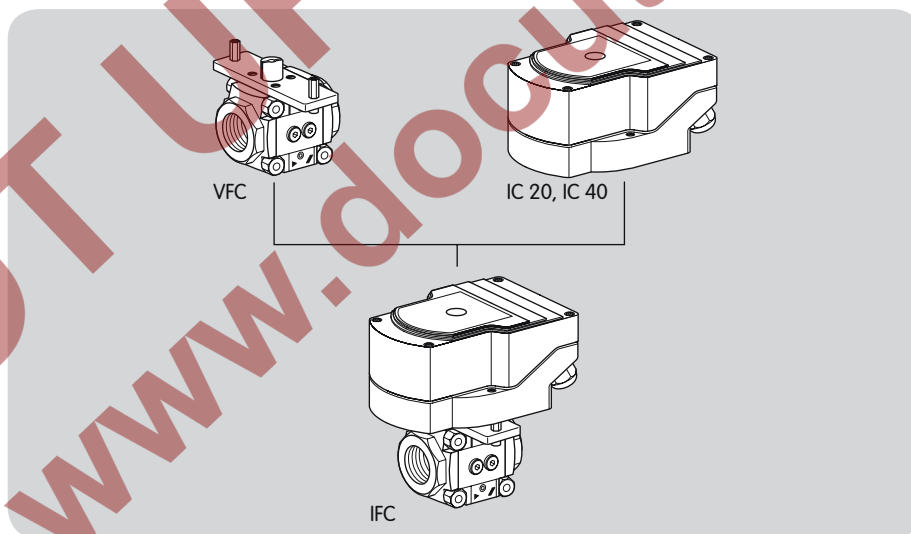


The IFC is composed of linear flow control VFC and actuator IC 20 or IC 40.

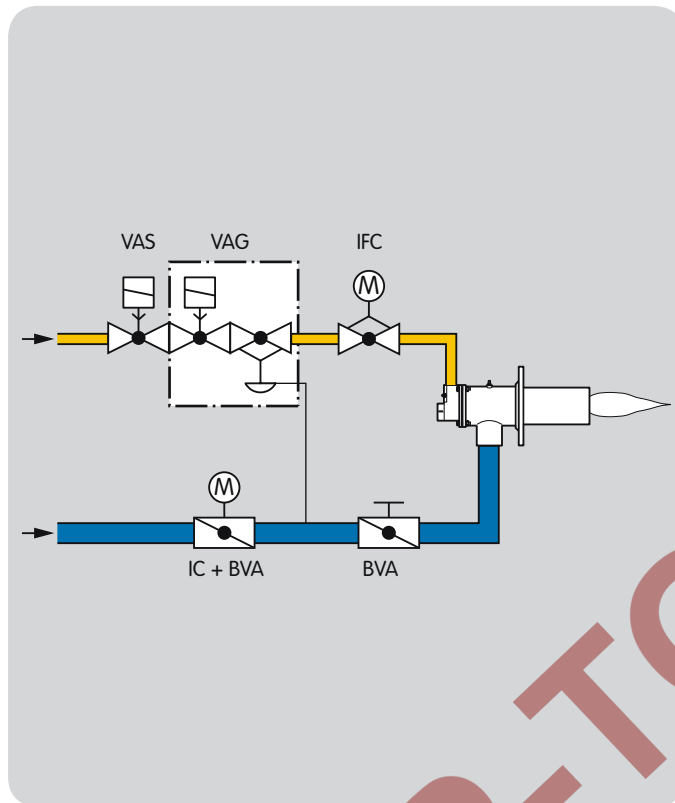
It is designed to adjust volumes of gas and cold air on various appliances. The IFC is designed for control ratios up to 25:1 and is suitable for regulating flow rates for modulating or stage-controlled combustion processes.

Actuator IC 20 is controlled by a modulating signal or three-point step signal. Actuator IC 40 offers additional functions. It can be adjusted using the BCSoft programming software via an optical interface. The control type (two-point signal, three-point step signal or continuous control), running times, angles of rotation and intermediate positions can thus be programmed.

Actuator IC 30 (24 V DC) can also be combined with a VFC.

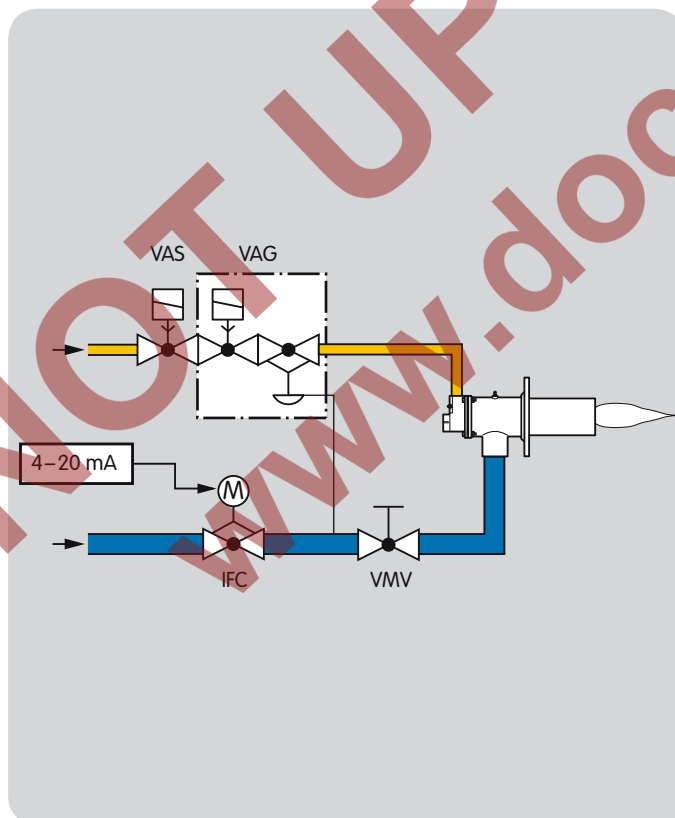


## Examples of application



### Lambda control

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



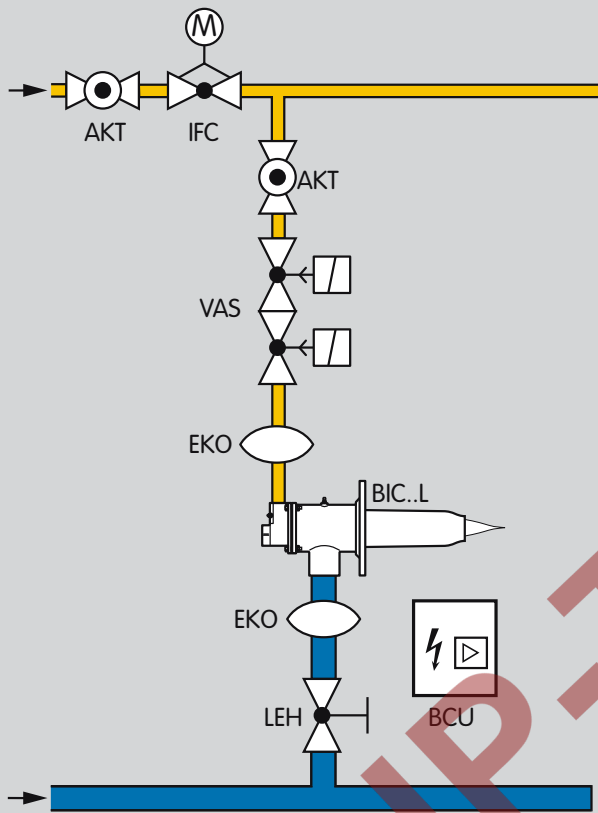
### Adjusting the burner capacity

In pneumatic ratio control systems, the IFC with actuator IC 20..E determines the air volume for the required burner capacity.

The fine-adjusting valve VMV is used to adjust the high-fire rate.

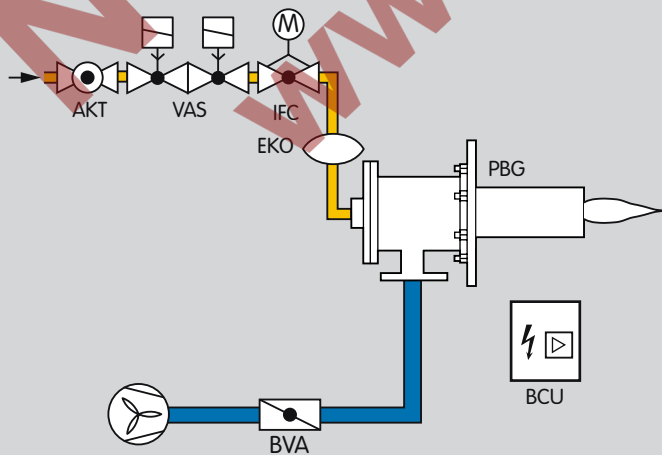
### Zone control

After initiating the burner control unit, the gas solenoid valves open and the IFC is set to ignition position. The burner is ignited by the burner control unit BCU. The gas flow rate can be adjusted continuously using the IFC. The air flow rate remains constant.



### Excess air burner

After initiating the burner control unit, the IFC 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 IFC. The air flow rate remains constant.

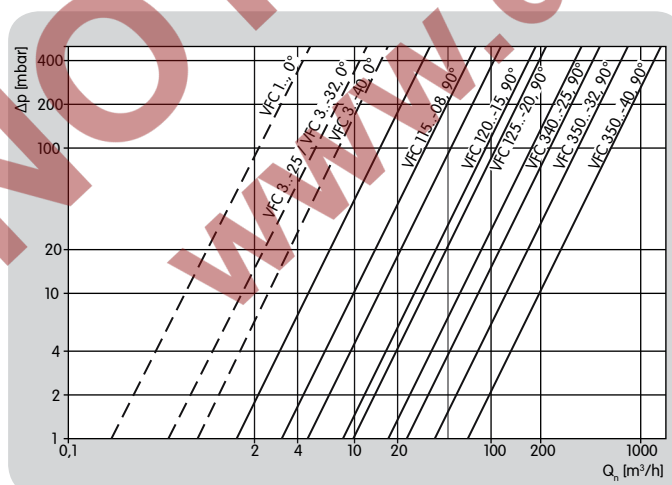


## IFC, VFC type code

| Code                              | Description                       |
|-----------------------------------|-----------------------------------|
| VFC                               | Linear flow control               |
| IFC                               | Linear flow control with actuator |
| 1                                 | Size 1                            |
| 3                                 | Size 3                            |
| T                                 | T-product                         |
| 10, 15, 20, 25, 40, 50, 65        | Inlet flange nominal size         |
| -                                 | No inlet flange                   |
| /10, /15, /20, /25, /40, /50, /65 | Outlet flange nominal size        |
| /-                                | No outlet flange                  |
| R                                 | Rp internal thread                |
| N                                 | NPT internal thread               |
| F                                 | ISO flange                        |
| 05                                | p <sub>U</sub> max. 500 mbar      |
| -08                               | Cylinder                          |
| -15                               |                                   |
| -20                               |                                   |
| -25                               |                                   |
| -32                               |                                   |
| -40                               |                                   |
| <b>Accessories, right, inlet</b>  |                                   |
| P                                 | Plug                              |
| M                                 | Pressure test point               |
| 1                                 | Pressure switch for gas DG 17VC   |
| 2                                 | Pressure switch for gas DG 40VC   |
| 3                                 | Pressure switch for gas DG 110VC  |
| 4                                 | Pressure switch for gas DG 300VC  |
| -                                 | No accessories                    |
| <b>Accessories, right, outlet</b> |                                   |
| P                                 | Plug                              |
| M                                 | Pressure test point               |
| 1                                 | Pressure switch for gas DG 17VC   |
| 2                                 | Pressure switch for gas DG 40VC   |
| 3                                 | Pressure switch for gas DG 110VC  |
| 4                                 | Pressure switch for gas DG 300VC  |
| -                                 | No accessories                    |

| Code                                                                   | Description                                |
|------------------------------------------------------------------------|--------------------------------------------|
| The same accessories can be selected for the left- or right-hand side. |                                            |
| /20                                                                    | Actuator IC 20                             |
| /40                                                                    | Actuator IC 40                             |
| Running time [s]/90°:                                                  |                                            |
| -07                                                                    | 7.5                                        |
| -15                                                                    | 15                                         |
| -30                                                                    | 30                                         |
| -60                                                                    | 60                                         |
| Mains voltage:                                                         |                                            |
| W                                                                      | 230 V AC, 50/60 Hz                         |
| Q                                                                      | 120 V AC, 50/60 Hz                         |
| A                                                                      | 100 – 230 V AC, 50/60 Hz                   |
| Torque:                                                                |                                            |
| 2                                                                      | 2.5 Nm                                     |
| 3                                                                      | 3 Nm                                       |
| T                                                                      | Three-point step control                   |
| E                                                                      | 0 (4) – 20 mA, 0 – 10 V continuous control |
| D                                                                      | Digital input                              |
| A                                                                      | 4 – 20 mA analogue input                   |
| R10                                                                    | 1000 Ohm feedback potentiometer            |
| Mounting actuator with electrical connection:                          |                                            |
| no specification                                                       | outlet side                                |
| -I                                                                     | inlet side                                 |

## Flow rate



## Technical data

### VFC

Gas types: natural gas, LPG (gaseous), biogas (max. 0.1 %-by-vol. H<sub>2</sub>S) or clean air; other types of gas on request. The gas must be dry in all temperature conditions and must not contain condensate.

Control ratio: 25:1.

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

Max. inlet pressure  $p_{U \max}$ : 500 mbar (7.25 psi).

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

Housing material: aluminium, control cylinder: aluminium, flow restricting cylinder: POM, seal: HNBR/NBR.

Ambient temperature: -20 to +60°C (-4 to +140°F).

Storage temperature: -20 to +40°C (-4 to +104°F).

Installation position as required; in conjunction with IC in the vertical upright position or tilted up to the horizontal, not upside down.

### IC 20, IC 20..E

Line entrance for electrical connection: 3 x M20 plastic cable glands.

Screw terminals using the elevator principles for cables up to 4 mm<sup>2</sup> (single core cables) and for cables up to 2.5 mm<sup>2</sup> with wire end ferrules.

Typical designed lifetime:

| Switching current   | Switching cycles   |                      |
|---------------------|--------------------|----------------------|
|                     | $\cos \varphi = 1$ | $\cos \varphi = 0.3$ |
| 1 mA                | 1,000,000          | —                    |
| 22 mA <sup>1)</sup> | —                  | 1,000,000            |
| 100 mA              | 1,000,000          | —                    |
| 2 A                 | 100,000            | —                    |

<sup>1)</sup> Typical contactor application (230 V, 50/60 Hz, 22 mA,  $\cos \varphi = 0.3$ )

Three-point step signal to terminals 1 and 2: minimum pulse duration: 100 ms, minimum pause between 2 pulses: 100 ms.

Enclosure: IP 65, safety class: I.

Ambient temperature: -20 to +60°C (-4 to +140°F), no condensation permitted.

Storage temperature: -20 to +40°C (-4 to +104°F).

Mains voltage: 120 V AC, -15/+10%, 50/60 Hz, 230 V AC, -15/+10%, 50/60 Hz.

| Type     | Running time [s/90°] |       | Torque [Nm] |       |
|----------|----------------------|-------|-------------|-------|
|          | 50 Hz                | 60 Hz | 50 Hz       | 60 Hz |
| IC 20-07 | 7.5                  | 6.25  | 2.5         | 2     |
| IC 20-15 | 15                   | 12.5  | 3           | 3     |
| IC 20-30 | 30                   | 25    | 3           | 3     |
| IC 20-60 | 60                   | 50    | 3           | 3     |

### IC 20

Power consumption:

4.9 VA at 50 Hz, 5.8 VA at 60 Hz.

Resistance of the feedback potentiometer: 1 kΩ, max. 1 W.

### IC 20..E

Power consumption:

terminals 1, 2 and 5:

4.9 VA at 50 Hz, 5.8 VA at 60 Hz,

terminal 3:

8.4 VA at 50 Hz, 9.5 VA at 60 Hz,

in total not exceeding:

8.4 VA at 50 Hz, 9.5 VA at 60 Hz.

Position feedback output:

4–20 mA, electrically isolated, max. 500 Ω load impedance.

The output is always active when supply voltage is applied to terminals 3 and 4.

Input: electrically isolated,

0 (4)–20 mA: load impedance switchable

between 50 Ω and 250 Ω,

0–10 V: 100 kΩ input resistance.

### IC 30

Mains voltage:

24 V DC, ±20%.

Line entrance: 3 x M16 plastic cable glands (enclosed).

Screw terminals using the elevator principles for cables up to 2.5 mm<sup>2</sup> with wire end ferrules.

The running time changes depending on the load. It refers to the torque, see type label.

Contact rating of the cam switches:

| Voltage            | Min. current<br>(resistive load) | Max. current<br>(resistive load) |
|--------------------|----------------------------------|----------------------------------|
| 24–230 V, 50/60 Hz | 1 mA                             | 2 A                              |
| 24 V DC            | 1 mA                             | 100 mA                           |

Enclosure: IP 65.

Duty cycle: 100%.

Ambient temperature:

-15 to +60°C (5 to 140°F), no condensation permitted.

Storage temperature: -15 to +40°C (5 to 104°F).

Resistance of the feedback potentiometer:

1 kΩ, < 50 V,

recommended wiper current: 0.2 μA.

#### IC 40

##### Mains voltage:

100 – 230 V AC,  $\pm 10\%$ , 50/60 Hz, the actuator automatically adjusts to the respective mains voltage.

Power consumption: 8.4 W,  
switch-on peak current:  
max. 8 A for max. 10 ms.

Screw terminals using the elevator principles for cables up to 4 mm<sup>2</sup> (single core cables) and for cables up to 2.5 mm<sup>2</sup> with wire end ferrules.

Angle of rotation: 0 – 90°.

Holding torque = torque as long as permanent supply voltage is applied.

##### 2 digital inputs:

24 V DC or 100 – 230 V AC each.

##### Current requirement of digital inputs:

3 mA  $\pm$  1.5 mA.

1 analogue input (optional): 4 – 20 mA (internal load impedance: max. 500  $\Omega$  at 20 mA).

##### Potentiometer (optional):

1000  $\Omega$   $\pm$  20%,  
linearity tolerance  $\pm$  2%,  
max. capacity 0.25 W,  
conductive plastic element.

##### 2 digital outputs:

Signalling contacts designed as relay change-over contacts. Contact current of digital outputs: min. 5 mA (resistive) and max. 2 A.

The relay contacts can be connected to 100 – 230 V AC or 24 V DC. If the contacts have been connected with a voltage  $> 24$  V and a current  $> 0.1$  A once, the gold plating on the contacts will have been burnt through. This contact can then only be connected with this power rating or higher power rating.

##### 2 LED status displays:

- Blue LED for operation "ON";  
actuator in motion = slow flashing light;  
manual operation = fast flashing light;  
actuator stopped = permanent light.
- Red LED for warnings and faults;  
warning = permanent light;  
fault = flashing light.
- Red and blue LED simultaneously,  
calibration in progress = flashing light.

Enclosure: IP 65.

Safety class: I.

Line entrance for electrical connection:  
3 x M20 plastic cable glands.

##### Ambient temperature:

-20 to +60°C (-4 to +140°F),  
no condensation permitted.

##### Storage temperature:

-20 to +40°C (-4 to +104°F).

#### Running times and torques

| Type  | Running time [s/90°] |            | Torque [Nm] |       |
|-------|----------------------|------------|-------------|-------|
|       | 50 Hz                | 60 Hz      | 50 Hz       | 60 Hz |
| IC 40 | 4.5 – 76.5           | 4.5 – 76.5 | 2.5         | 2.5   |

On the IC 40, the running time and torque are independent of the mains frequency. The running time can be freely programmed between the limits of 4.5 and 76.5 s.

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## Detailed information on this product



## Contact

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