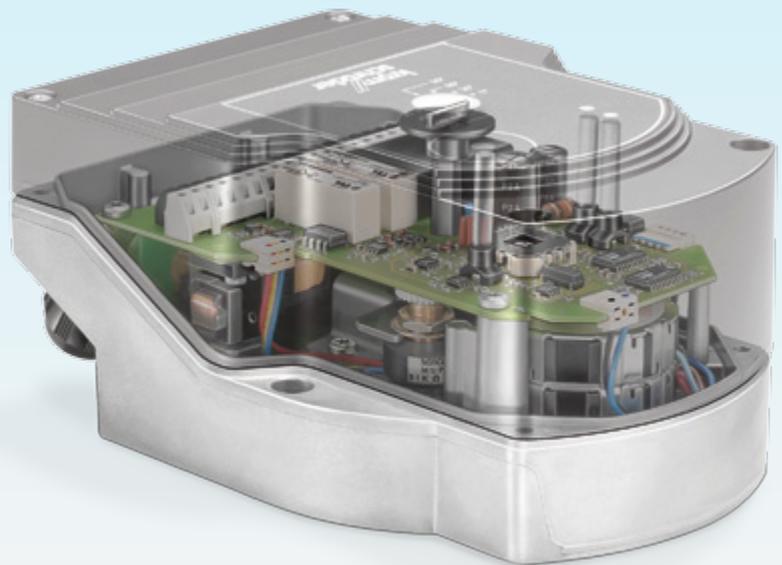


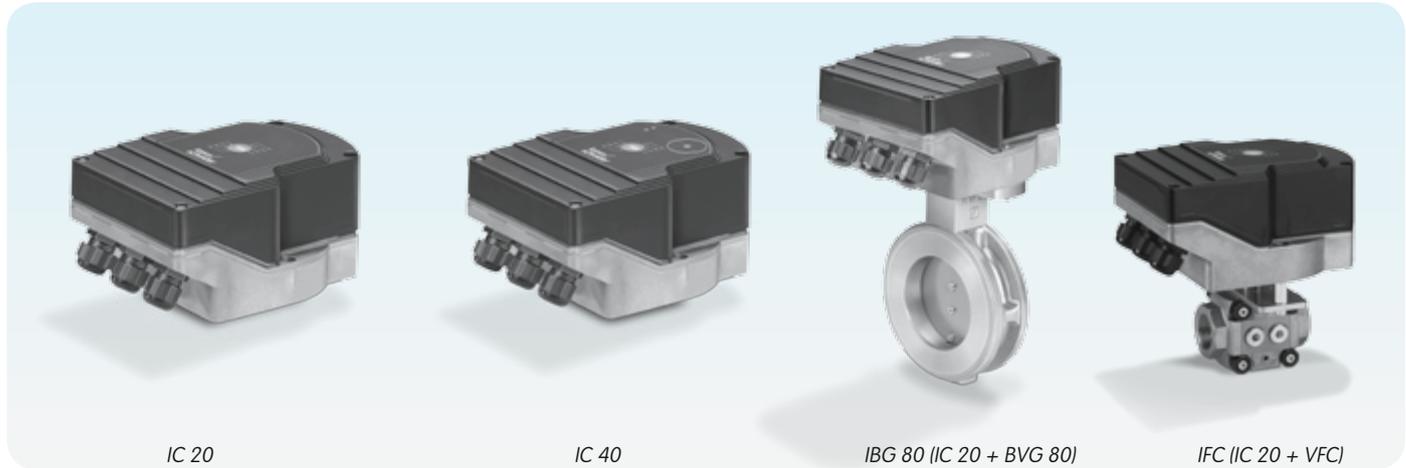
Actuators IC 20, IC 40

Product brochure · GB
3 Edition 07.14



- IC 20 for applications with continuous or three-point step control and Automatic/Manual mode changeover for easy commissioning, IC 20..E with electronic positioning function and adjustable behaviour in the event of cable discontinuity
- IC 40 for complex applications with programmable functions for flexible adjustment to the process, with statistics and error history to support service personnel
- A position indicator that can be read externally
- Spacious connection chamber for ease of installation
- Actuators can be delivered ready installed on butterfly valves BVG, BVGF, BVA, BVAF, BVH, BVHS or linear flow control VFC

Application



The actuators IC 20 and IC 40 are designed for all applications that require precise, controlled rotary movement between 0° and 90°. They can be mounted directly onto the butterfly valves BVG, BVGF, BVA, BVAF, BVH, BVHS or linear flow control VFC in order to control the gas and air flow rates on gas burners.

Actuators and butterfly valves BVG, BVGF, BVA, BVAF, BVH, BVHS or linear flow control VFC can also be delivered ready assembled as butterfly valves with actuator IBG, IBGF, IBA, IBAF, IBH, IBHS or linear flow control IFC.

An optional integrated feedback potentiometer offers the option of monitoring the current position of the actuator. This checking function can be used in automation processes.

IC 20

IC 20 is controlled by a continuous signal or three-point step signal. The Automatic/Manual mode changeover and the position indicator that can be read externally assist in the setting of the infinitely adjustable switching cams upon commissioning. This enables precise settings even in the low-fire rate range.

IC 40

The IC 40 offers additional functions. It can be used in continuously-controlled burners and in step-by-step-controlled burners.

Settings on the actuator IC 40 can be made using a PC with the parameterization software BCSofT. All the relevant settings for the process are made using the software via an optical interface. Various operating modes, which may be modified, are stored in the unit. In addition, the control type (two-point signal, three-point step signal or continuous control), running times, adjustment angles and intermediate positions can be programmed.

The actuator can also be controlled "by hand" using the software.

Once set, all the parameters can be saved on the PC and copied from there into other actuators, thus saving time during the commissioning process.

Service technicians can call up statistical data using BCSofT, such as hours of operation, actuating cycles and an error history. Some values can also be set to zero, for example to record data over a specific period of time.

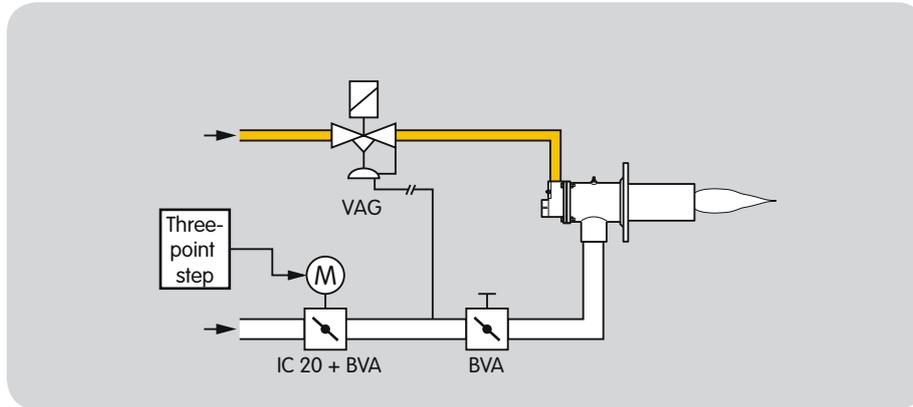


Roller hearth kiln in the ceramics industry



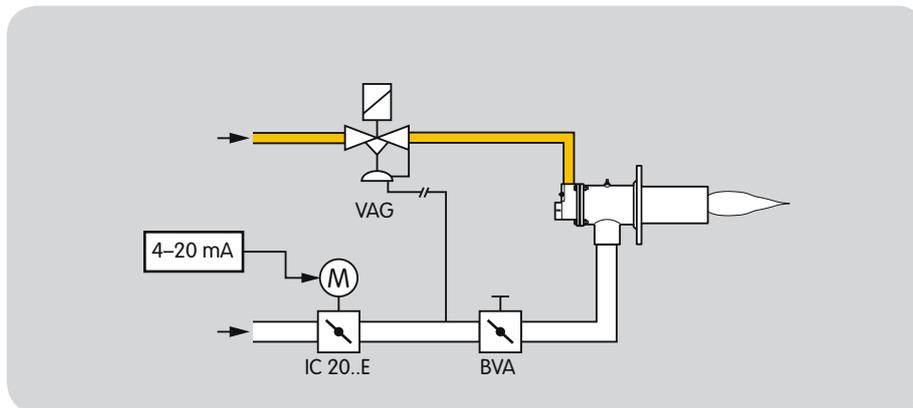
Forging furnace

Application examples



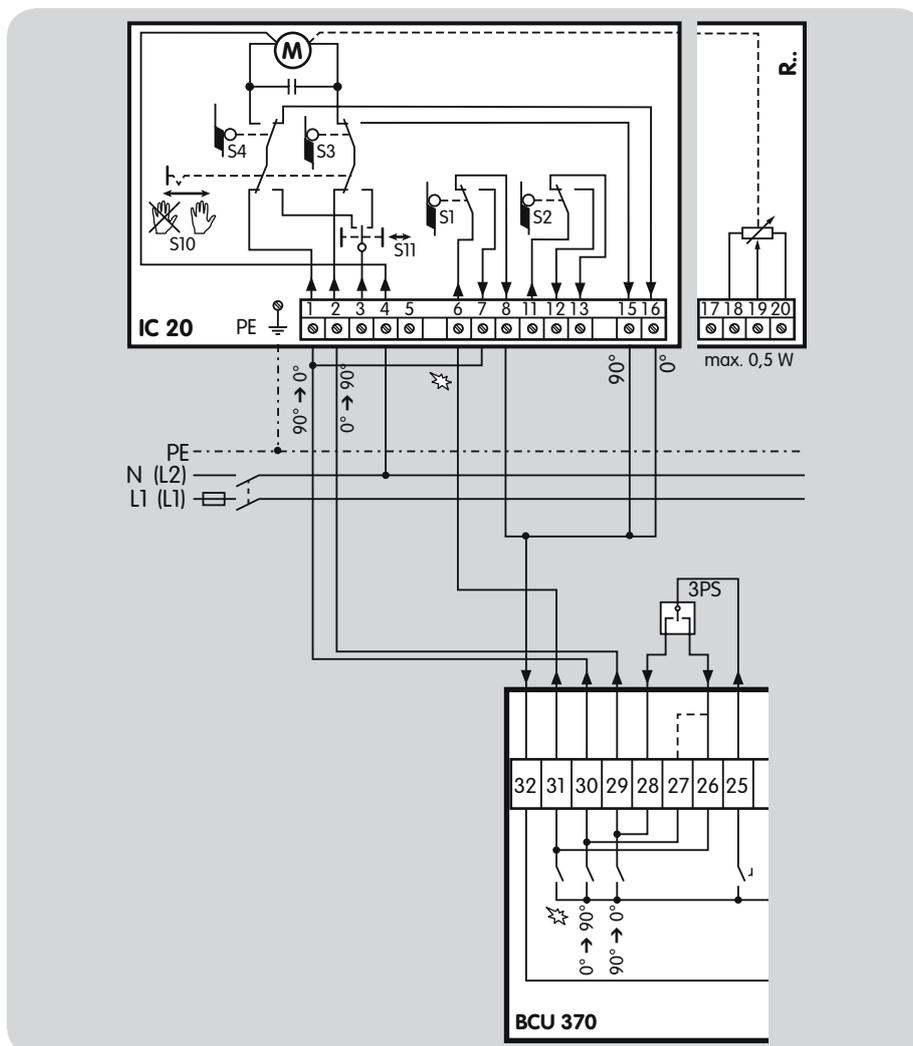
IC 20, continuous control

For processes that require high temperature accuracy and low circulation in the furnace. The actuator IC 20 is controlled by a three-point step controller.



IC 20..E, continuous control

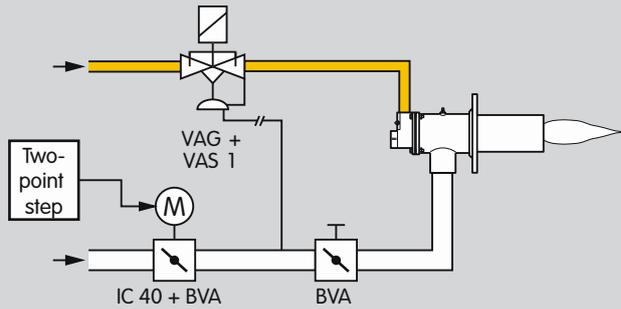
For processes that require high temperature accuracy and low circulation in the furnace. The actuator IC 20..E is controlled by a 4–20 mA, 0–20 mA or 0–10 V signal.



IC 20, modulating control with burner control unit BCU 370

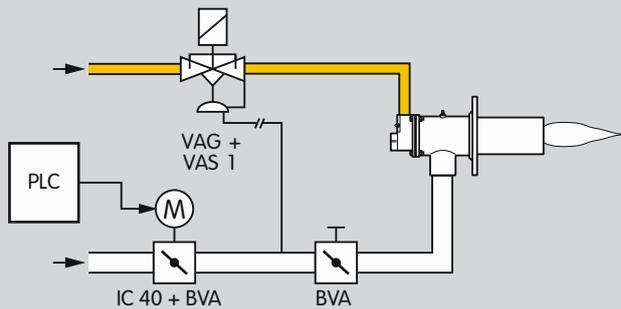
This connection option can be used on modulating forced draught burners. The BCU 370 controls the fan and moves the butterfly valve to pre-purge and ignition position. After pre-purge and burner start, the controller enable signal is issued to an external three-point step controller which positions the butterfly valve in accordance with the capacity demand.

The "Close contact" (90° → 0°) of the external three-point step controller (3PS) can be connected to terminal 26 or 27 of the BCU 370.
Terminal 26: the controller operates between the open and ignition positions.
Terminal 27: the controller operates between the open and closed positions.



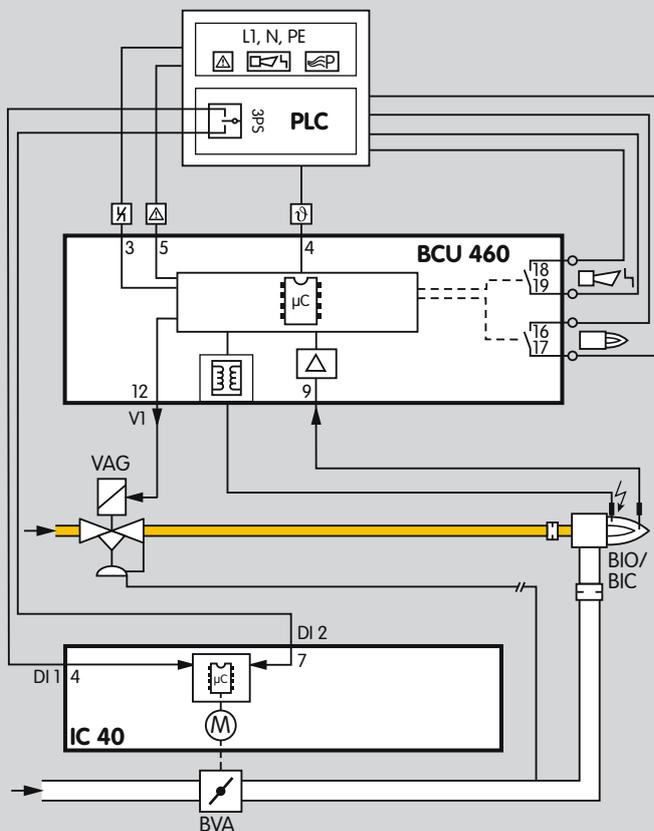
IC 40, staged control

For processes that require a homogeneous temperature distribution in the furnace. The actuator IC 40 is controlled by a two-point controller and operates in On/Off or High/Low intermittent mode. The actuator closes when the voltage supply is interrupted. The running time can be adjusted between 5 and 25 seconds.



IC 40, staged control with three burner capacity levels

For processes that require a homogeneous temperature distribution in the furnace and three burner capacity levels. The actuator IC 40 is controlled by a programmable controller and works in High/Medium/Low or High/Medium/Low/Off intermittent operation. This allows the ignition stage to be started. The pressure switch provides fail-safe monitoring of the maximum pilot air volume. The actuator running time can be adjusted between 5 and 50 (75) seconds.



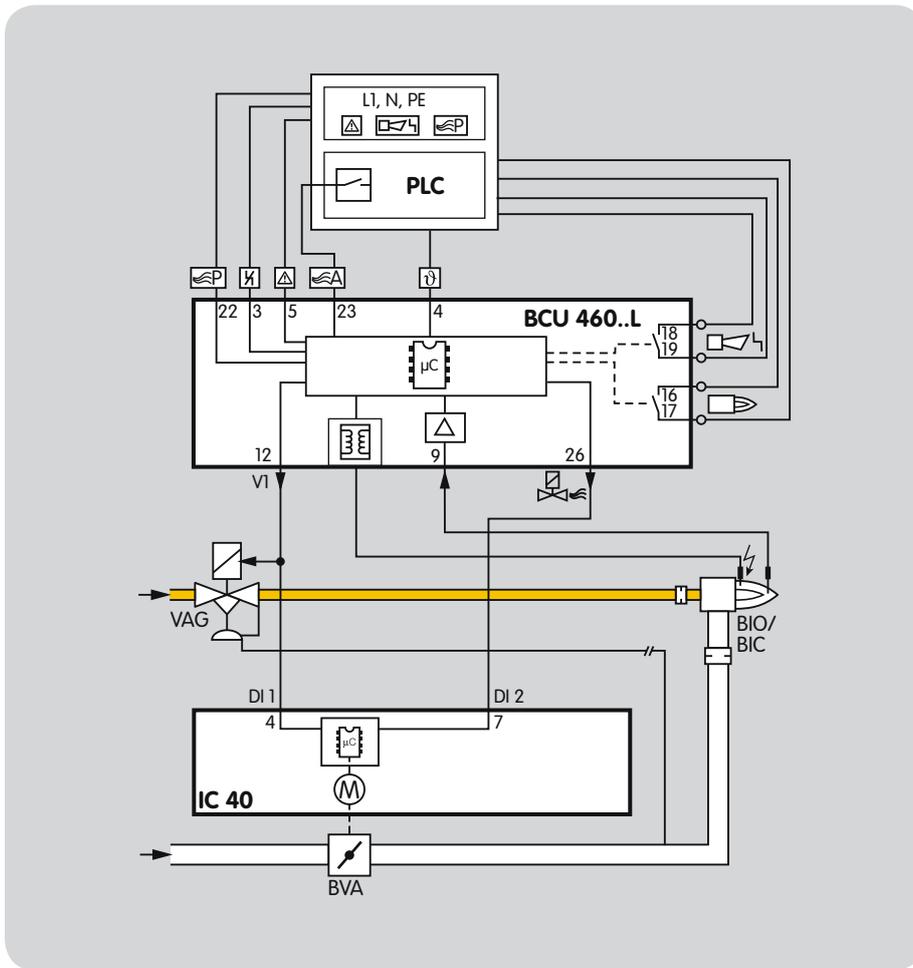
IC 40, continuous control by three-point step signal.

The actuator IC 40 is controlled by the three-point step controller 3PS and moves the butterfly valve BVA to the ignition position. The burner starts.

Once the burner is operating, the operation signalling contact of the burner control unit BCU 460 closes. The BCU issues the Controller enable signal to the temperature controller. The butterfly valve opens or closes between the low-fire and high-fire rate positions depending on the capacity demand of the burner. When the three-point step signal is disconnected, the butterfly valve stops at its current position.

If both inputs on the IC 40 (DI 1 and DI 2) are actuated after the burner has been shut down, the butterfly valve closes further than the low-fire rate position (see Operating mode 12, 3-point step operation with low position)

DI 1	DI 2	IC 40 position	Valve Position
Off	Off	Idle/Stop	Idle
On	Off	Open to high position	Open to high-fire rate
Off	On	Close to middle position	Close to low-fire rate
On	On	low	Valve closes further



IC 40, staged control with pre-purge

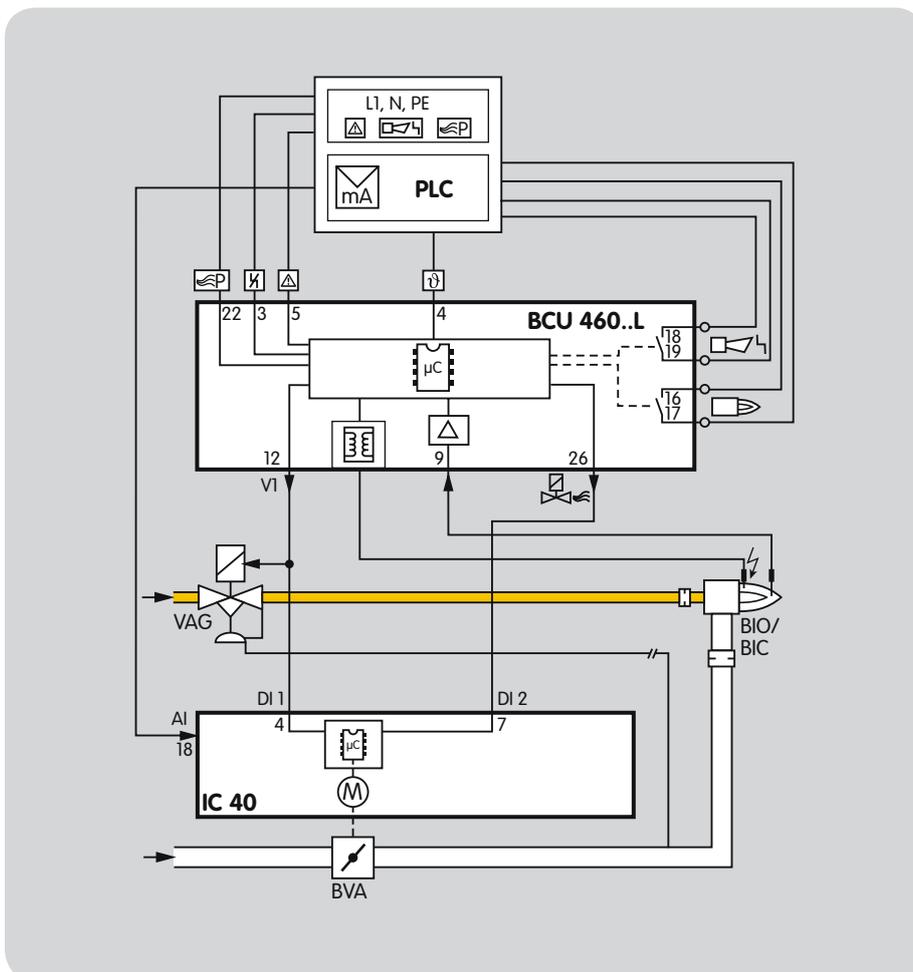
The central control system starts the pre-purge. Input DI 2 is actuated via the air valve output of the BCU and moves the butterfly valve BVA to the pre-purge position.

In the event of a temperature demand, the burner control unit BCU actuates input DI 1 via the valve output V1 and moves the butterfly valve to the ignition position. (Precondition: the IC 40 must have reached the ignition position on the instant of ignition.) The burner starts.

To activate the high-fire rate, DI 2 is actuated via the air valve output on terminal 26 of the BCU.

The butterfly valve moves cyclically between the high-fire rate position and the low-fire rate position (see Operating mode 11, 2-step operation with two digital inputs).

DI 1/ V1	DI 2/ air Valve	IC 40 position	Valve Position
Off	Off	closed	Closed
On	Off	low	Ignition position/ low-fire rate
On	On	middle	High-fire rate
Off	On	high	Pre-purge



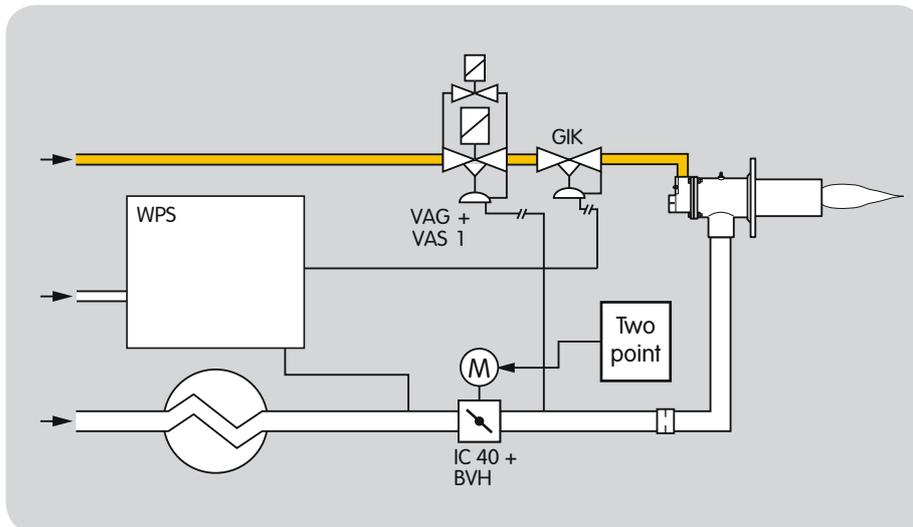
IC 40, continuous control with defined ignition position

The central control system starts the pre-purge. Input DI 2 is actuated via the air valve output of the BCU and moves the butterfly valve BVA to the pre-purge position.

In the event of a temperature demand, the burner control unit BCU actuates input DI 1 via the valve output V1 and moves the butterfly valve to the ignition position. (Precondition: the IC 40 must have reached the ignition position on the instant of ignition.) The burner starts.

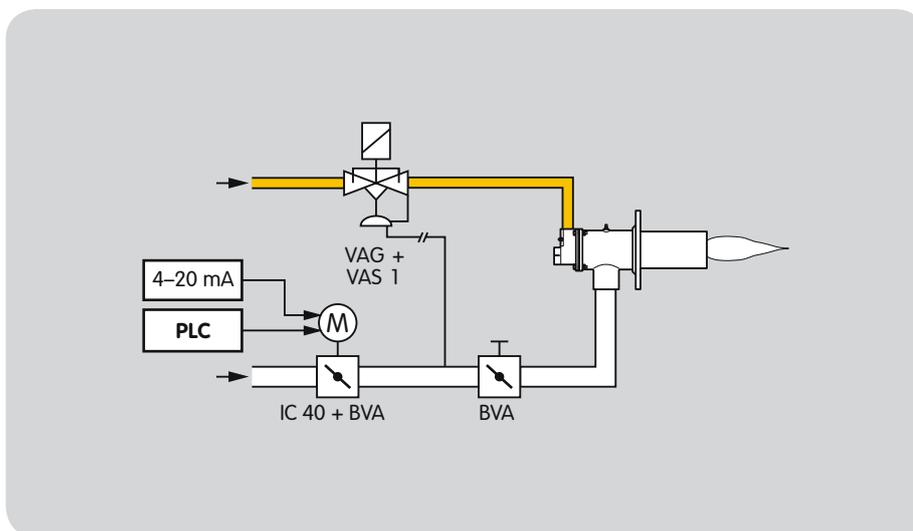
The BCU actuates DI 2 via the air valve output. This enables the analogue input AI on the actuator IC 40. Depending on the capacity demand of the temperature controller, the butterfly valve BVA moves steplessly to the position between the low-fire rate and the high-fire rate as specified by the analogue input AI (see Operating mode 27, 2-step operation with two digital inputs and variable adjustment angle).

DI 1/ V1	DI 2/ air valve	IC 40 position	Valve position
Off	Off	closed	Closed
On	Off	low	Ignition position/ low-fire rate
On	On	AI	Any position between ignition position and pre-purge
Off	On	high	Pre-purge/high-fire rate



IC 40, hot-air compensation

For processes in which preheated combustion air at a temperature of up to 450°C must be controlled. In this example, the actuator IC 40 is regulated by a two-point controller to adjust the burner firing capacity. It runs in High/Low intermittent operation. The running time can be adjusted between 5 and 25 seconds.



IC 40, staged control with online adjustment of the burner firing capacity

For processes that require a homogeneous temperature distribution and high temperature accuracy in the furnace.

If only a low heat output is required, for example to maintain the temperature in the furnace, the burner can continue to run in intermittent operation. The adjustment angle of the valve is reduced by the analogue input (4–20 mA) of the actuator and the burner capacity is therefore lowered. This ensures uniform temperature distribution even with a low burner capacity.

The functions of the actuator IC 40 can also be used in the ceramics industry to correct the lambda value or for temperature compensation purposes in hot-air applications.

Technical data

IC 20, IC 20..E

Mains voltage:

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

Screw terminals using the elevator principles for cables up to 4 mm² (single core cables) and for cables up to 2.5 mm² with wire end ferrules.

Angle of rotation: 0–90°, adjustable.

Holding torque = torque.

Control by three-point step signal to terminals 1 and 2:

minimum pulse duration: 100 ms,
minimum pause between 2 pulses:
100 ms.

Switching capacity of the position switches:

Voltage	Resistive load	Incandescent lamp load	Inductive load
125 V AC	2 A	0.5 A	2 A
250 V AC	2 A	0.5 A	2 A
< 30 V DC	2 A	2 A	2 A
< 50 V DC	1 A	0.4 A	1 A
< 75 V DC	0.75 A	0.3 A	0.75 A
< 125 V DC	0.5 A	0.2 A	0.03 A
< 250 V DC	0.25 A	0.1 A	0.03 A
12–30 V AC/DC	10–100 mA	–	10–100 mA

Enclosure: IP 65 pursuant to IEC 529.

Safety class: I pursuant to EN 60335.

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

Ambient temperature: -20 to +60°C, no condensation permitted.

IC 20

Power consumption:

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

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 40

Mains voltage:

IC 40: 100–230 V AC, ±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 mm² (single core cables) and for cables up to 2.5 mm² with wire end ferrules.

Angle of rotation: 0–90°.

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

2 digital inputs:

IC 40: 24 V DC or 100–230 V AC each.

Current requirement of digital inputs:

3 mA ± 1.5 mA.

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

Potentiometer (optional):

1000 Ω +/- 20%,
linearity tolerance +/- 2%,
max. capacity 0.25 W,
conductive plastic element.

Important: tap wiper at high resistance.

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";
drive in motion = slow flashing light;
manual operation = fast flashing light;
drive 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 pursuant to IEC 529.

Safety class: I pursuant to EN 60335.

Line entrance for electrical connection:

3 × M20 plastic cable glands.

Ambient temperature: -20 to +60°C, no condensation permitted.

Type code

Code	Description
IC 20	Actuator for basic applications
IC 40	Actuator for complex applications
S	Safety closing function
	Running time in s/90°:
-07	7.5
-15	15
-30	30
-60	60
	Mains voltage (50/60 Hz):
W	230 V AC, -15/+10%
Q	120 V AC, -15/+10%
A	100–230 V AC, ± 10%
	Torque:
2	2.5 Nm
3	3 Nm
E	Continuous control
T	Three-point step control
A	4–20 mA analogue input and digital inputs
D	Digital inputs
R10	Feedback potentiometer

Maintenance cycles

The actuators IC 20, IC 40 suffer little wear and require little servicing.

We recommend a function check once a year.

IC 40

A service note is issued after
 3 million cycles (0–90–0°/0–100–0 %),
 3 million relay switching operations,
 5 million changes of direction.



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Detailed information on this product



http://docuthek.kromschroeder.com/doclib/main.php?language=1&folderid=203110&by_class=6

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