



บริษัท เอดีดี เฟอร์เนส จำกัด

**ADD FURNACE CO.,LTD.**

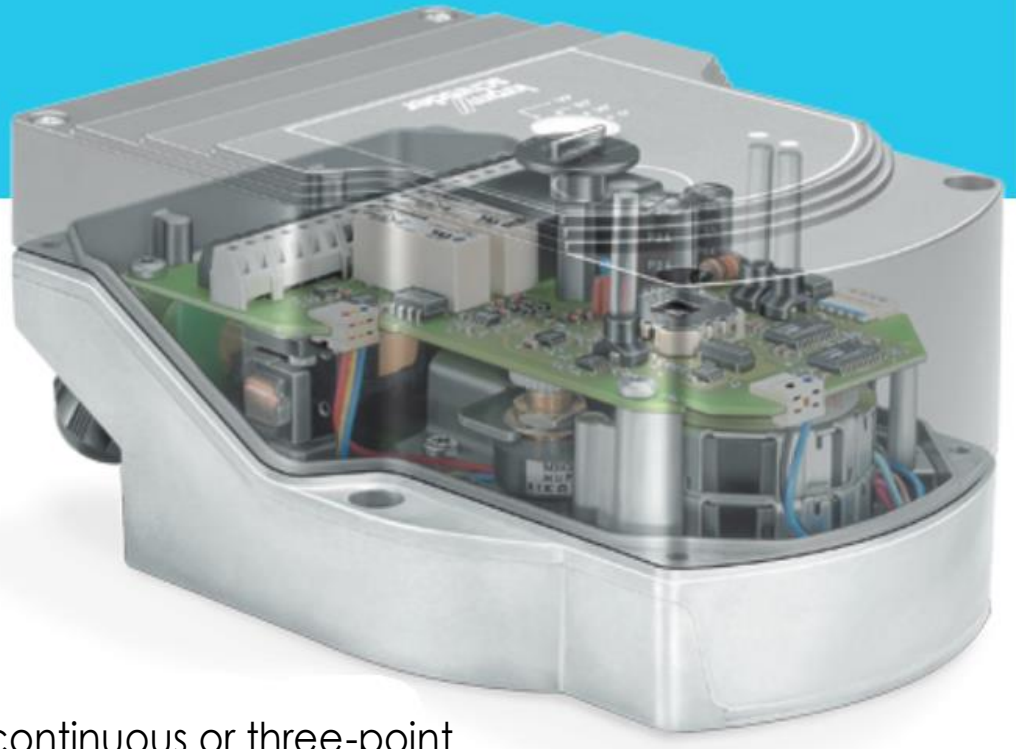
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# Actuators IC 20, IC 40

Product brochure · GB  
3.1.6.4 Edition 06.07



- IC 20 for basic 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 break
- 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
- Actuator can be mounted directly onto the butterfly valves BVG, BVA or BVH





## 2 · Kromschöder



IC 20



IC 40 with status display and optical interface.



The actuator can be mounted directly onto the butterfly valves BVG, BVA or BVH.

### 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, BVA

or BVH in order to control the gas and air flow rates on gas burners. They are designed for control ratios up to 1:10. An optional integrated feedback potentiometer offers the option of monitoring the current position of the actuator. This scan function can be used in automation processes.

### IC 20

IC 20 is used for basic applications. It 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 parameterisation 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.



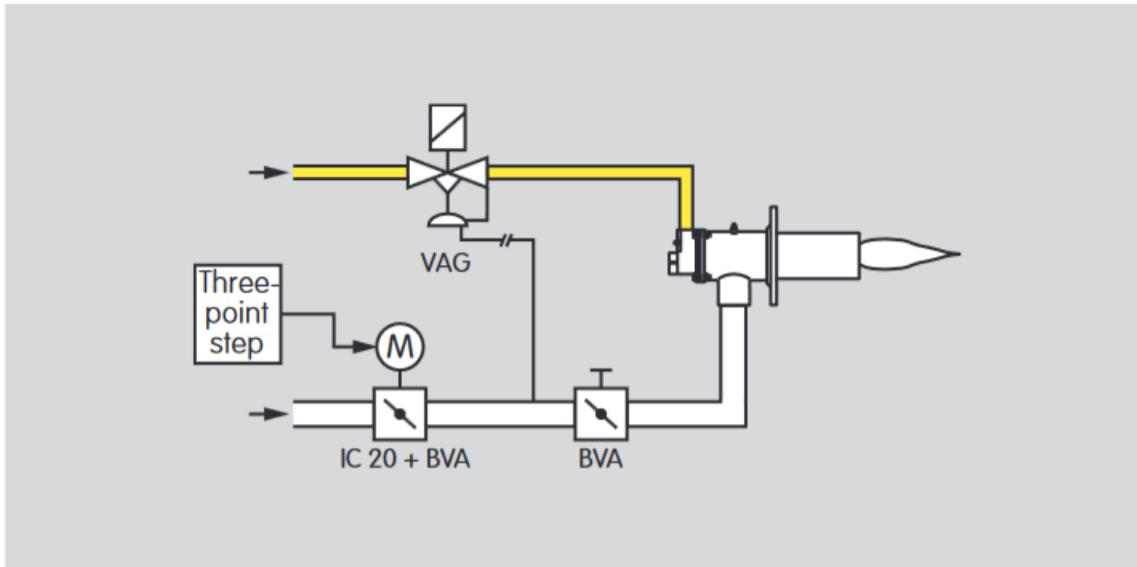
Roller hearth kiln in the ceramics industry.



Forging furnace.

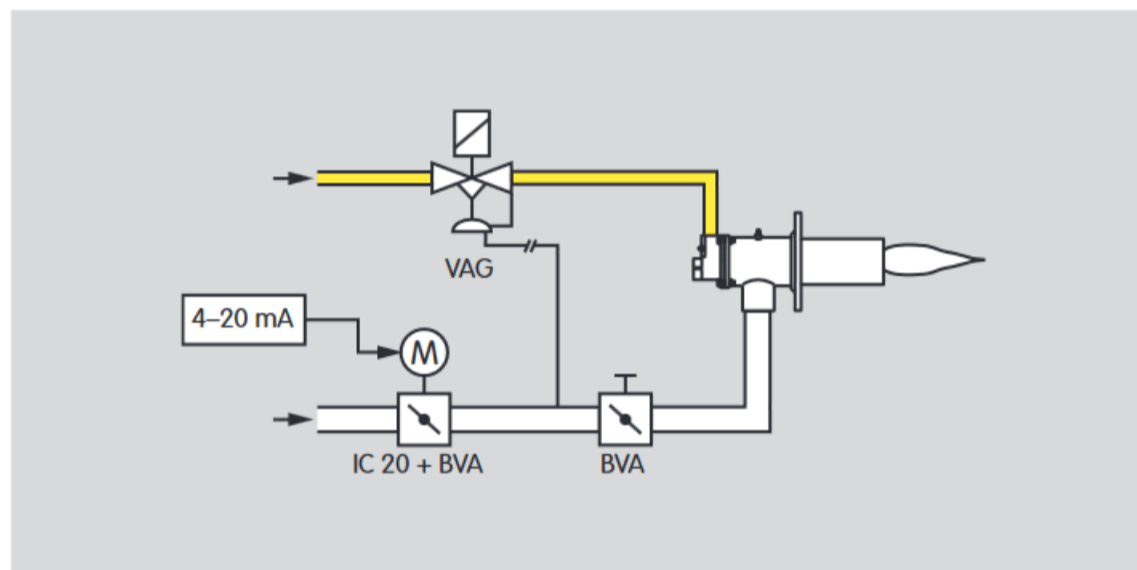


## Application examples



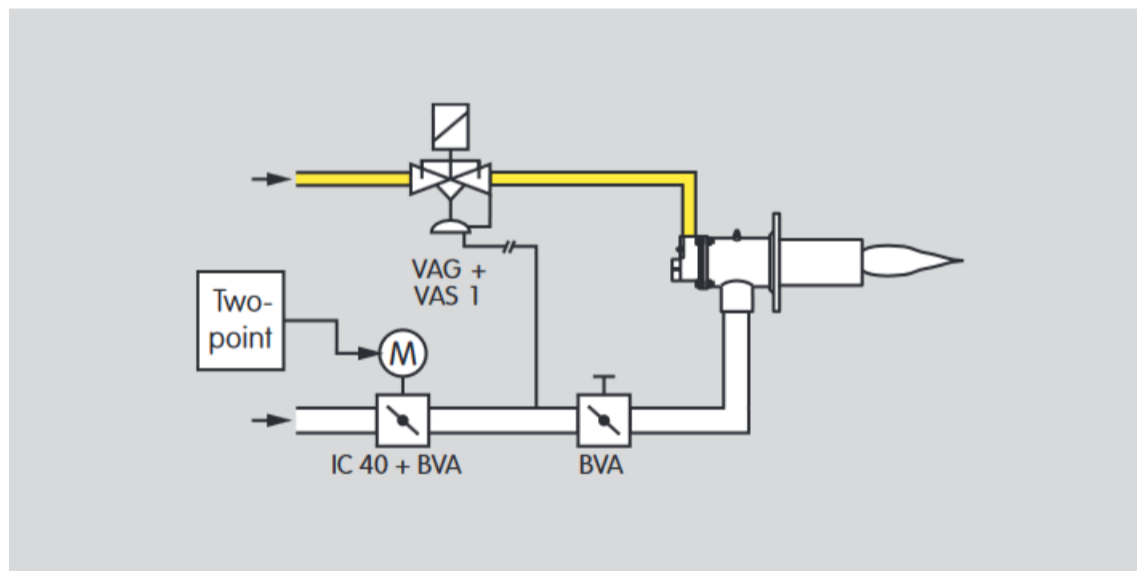
### IC 20, continuous control

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.



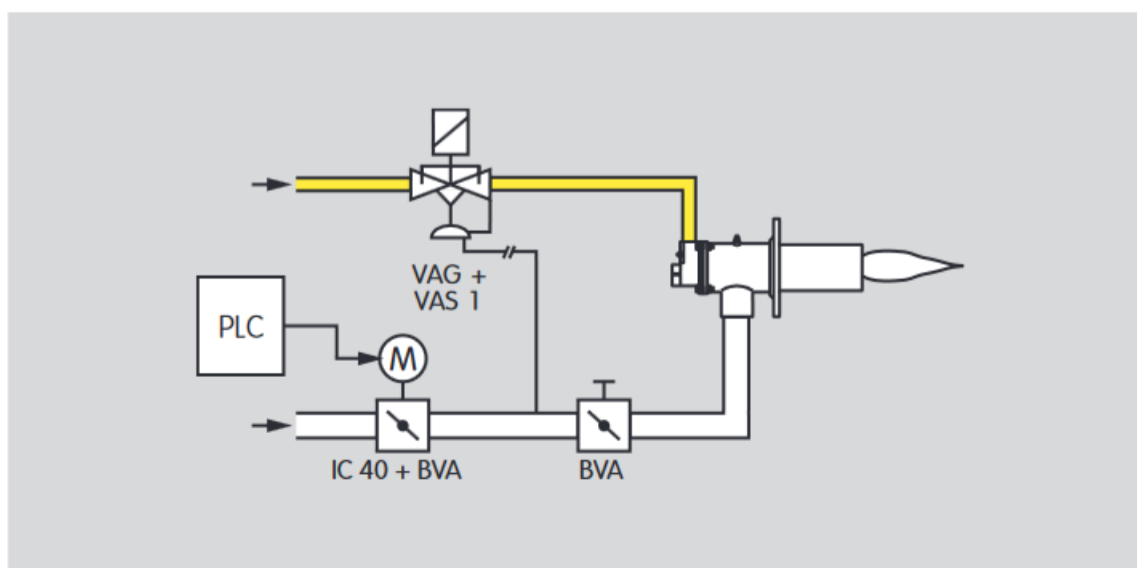
### IC 20..E, continuous control

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.



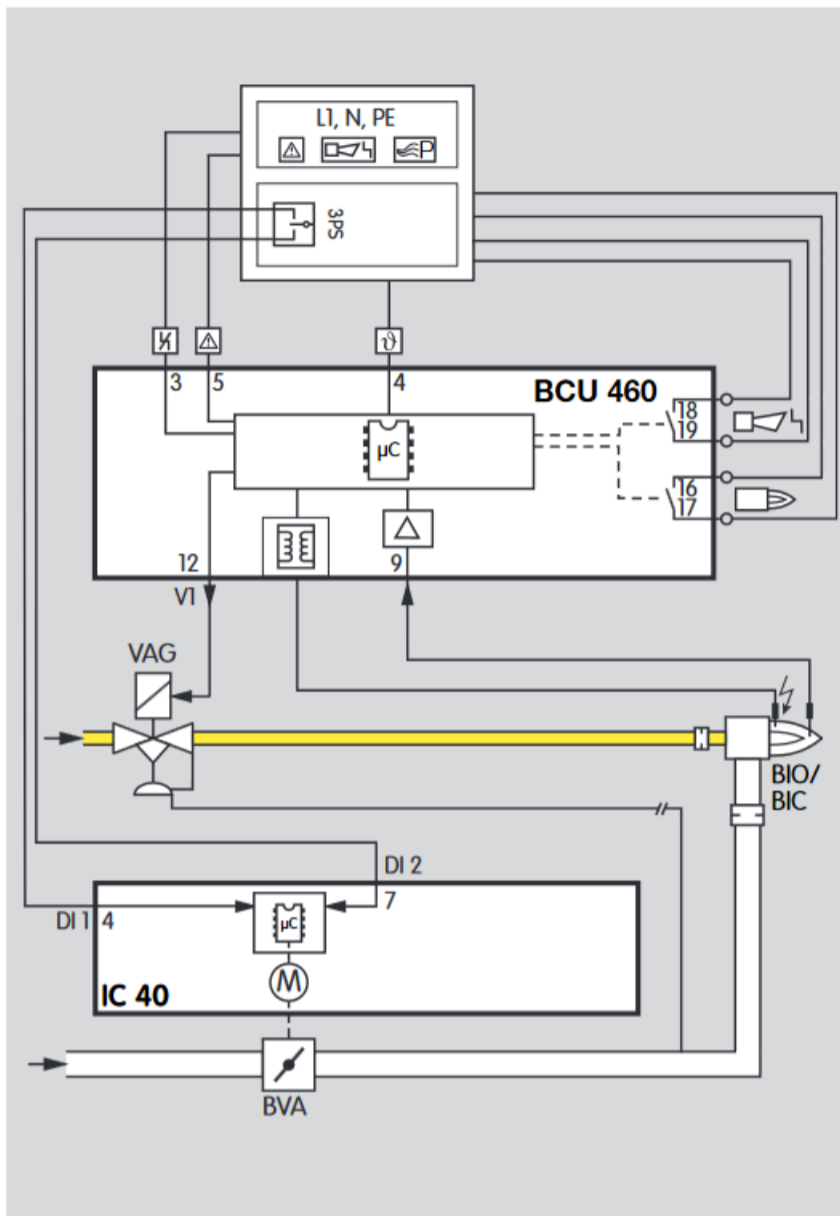
### IC 40, staged control

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 output levels

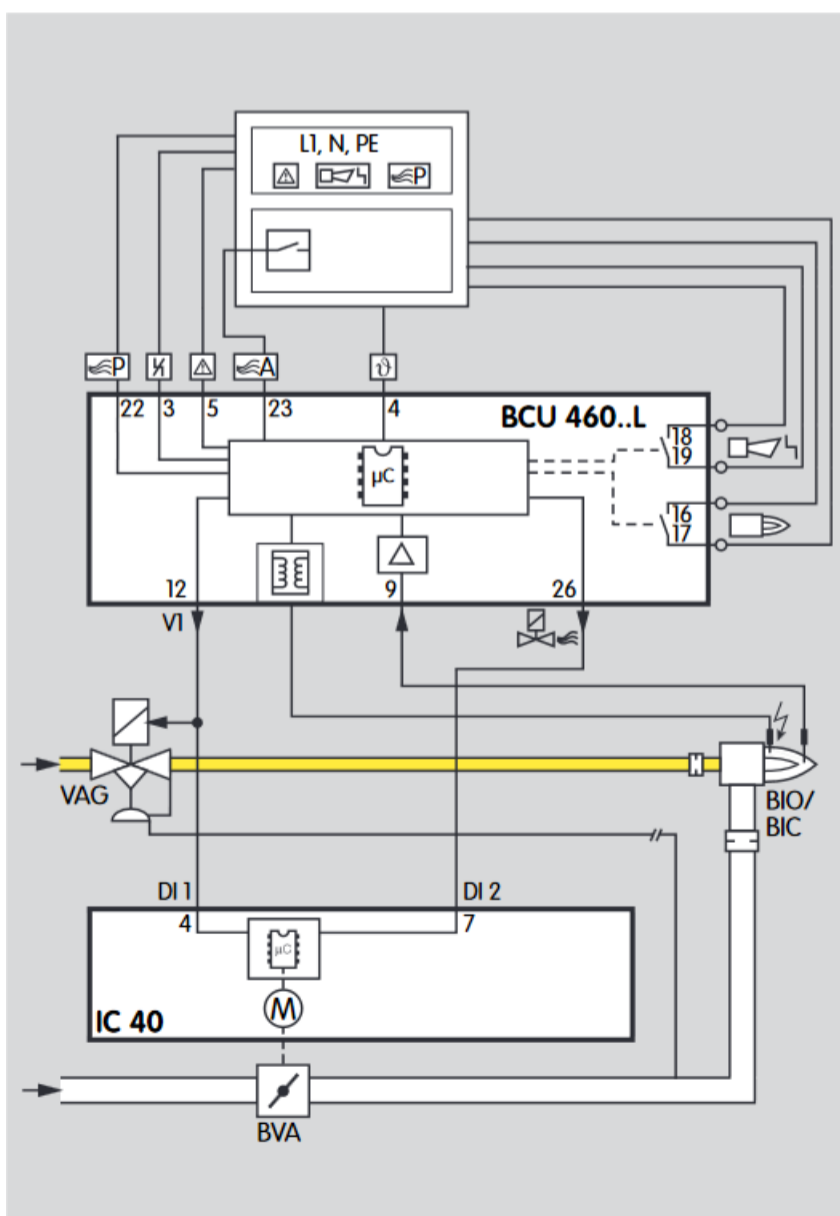
For processes that require a homogeneous temperature distribution in the furnace and three burner output levels. The actuator IC 40 is controlled by a programmable controller and works in High/Medium/Low or High/Medium/Low/Off intermittent operation. This allows the ignition stage to be started. The 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.

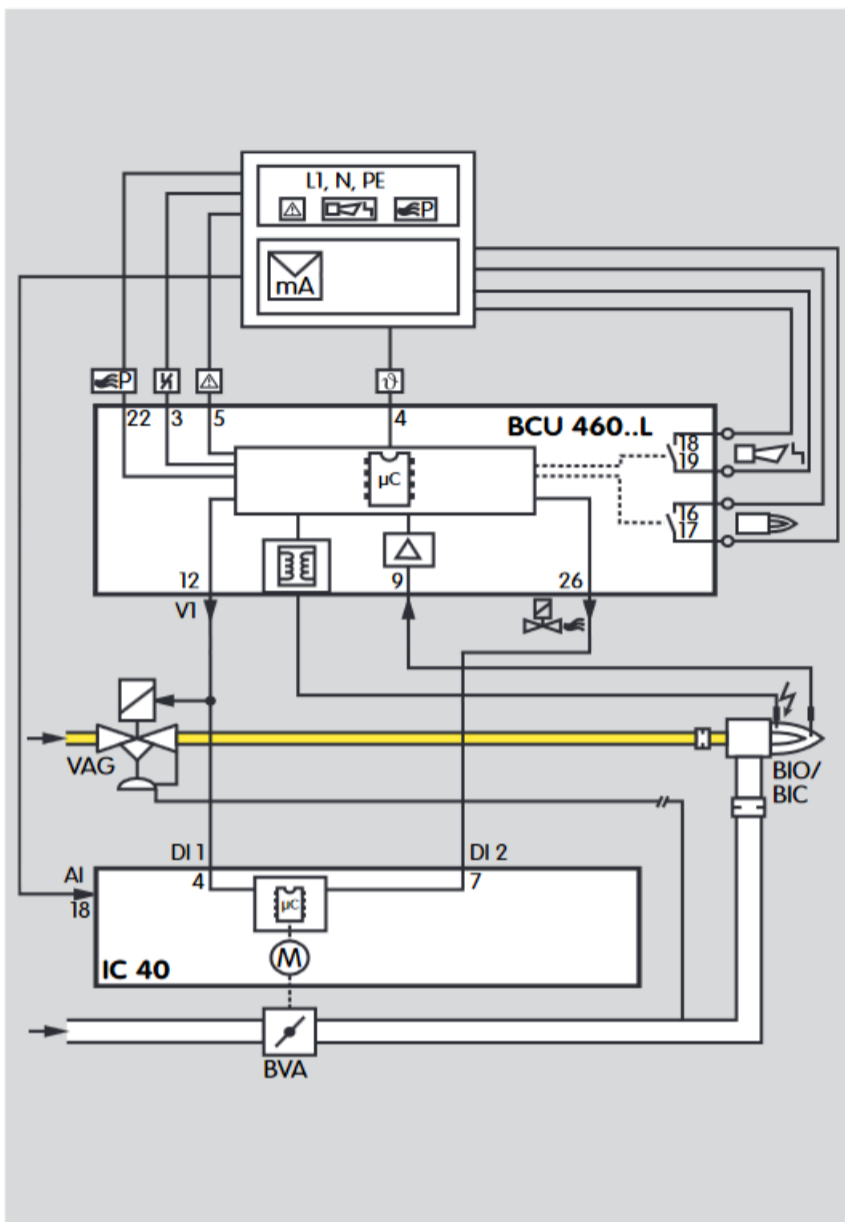
DI 1	DI 2	IC 40 position	Valve Position
Off	Off	Idle/Stop	Idle
On	Off	Open to high position	Open to high-fire rate
Off	On	Close to middle position	Close to low-fire rate
On	On	low	Valve closes further



**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. (Pre-condition: 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.

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



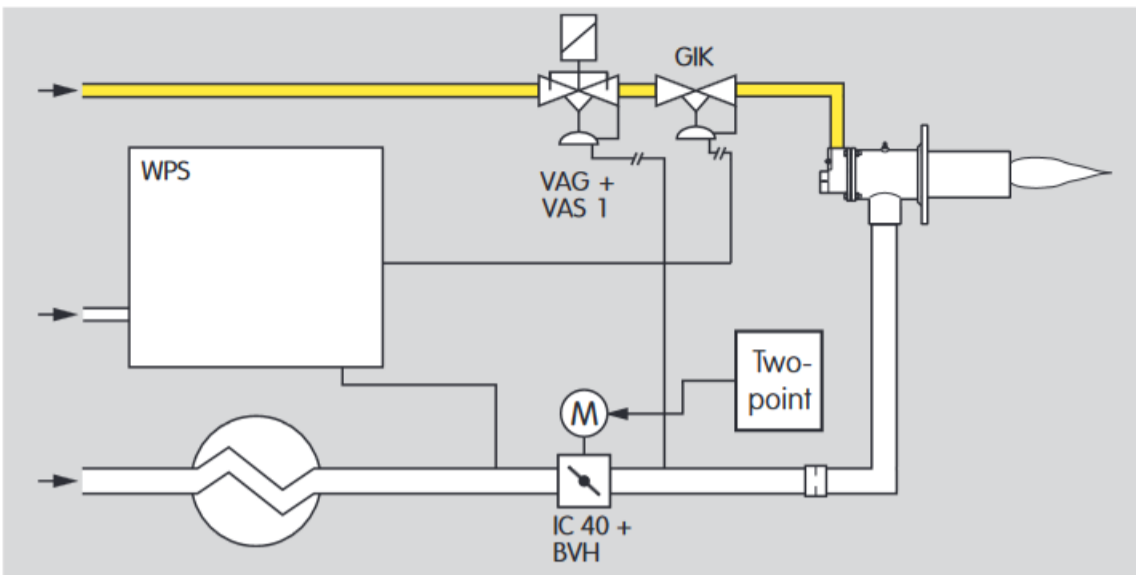
### IC 40, continuous control with defined ignition position

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. (Pre-condition: the IC 40 must have reached the ignition position on the instant of ignition.) The burner starts.

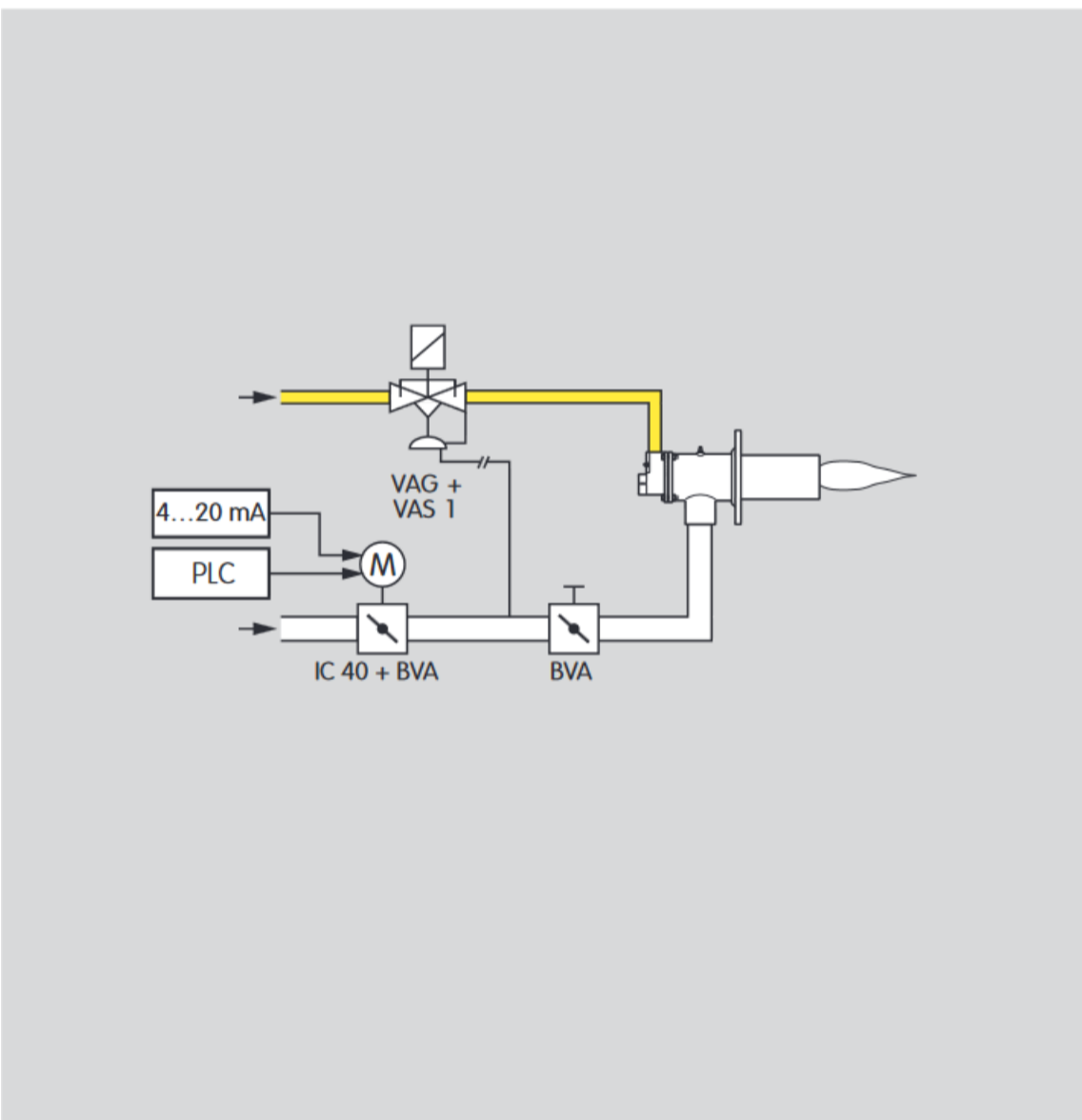
The BCU actuates DI 2 via the air valve output. This enables the analogue input AI on the actuator IC 40. Depending on the capacity demand of the temperature controller, the butterfly valve BVA moves steplessly to the position between the low-fire rate and the high-fire rate as specified by the analogue input AI.

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 output is therefore lowered. This ensures uniform temperature distribution even with a low burner output.

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

Mains voltage:

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

Power consumption:

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

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°, adjustable.

Holding torque = Torque.

Switching power of the position switches:

Voltage	Resistive load	Incand. lamp load	Inductive load
125 V~	2 A	0,5 A	2 A
250V~	2 A	0,5 A	2 A
<30 V=	2 A	2 A	2 A
<50 V=	1 A	2 A	1 A
<75 V=	0,75 A	0,3 A	0,75 A
<125 V=	0,5 A	0,2 A	0,03 A
<250 V=	0,25 A	0,1 A	0,03 A
12...30 V~/=	100 mA		100 mA

### 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.

Feedback output:

galvanically isolated, load impedance max. 500 Ω.

Input: galvanically isolated,

4 (0) – 20 mA: load impedance switchable from 50 Ω to 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;

IC 40T: 120 V AC, ±10%, 60 Hz.

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:

IC 40: 24 V DC or 100 – 230 V AC each,

IC 40T: 24 V DC or 120 V AC each.

Current requirement of digital inputs: 3 mA ± 1.5 mA.

1 analogue input (optional): 4 – 20

mA (IC 40T: Class 2) (internal load impedance max. 500 Ω at 20 mA).

Potentiometer (optional):

1000 Ohm +/- 20%,

linearity tolerance +/- 2%,

max. capacity 0.25 W (IC 40T: Class 2),

conductive plastic element.

Important: Tap wiper at high resistance

– see Project planning information.

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 (IC 40T: 120 V

or 24 V). 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.

### IC 20, IC 40

IC 20, IC 40: Enclosure:

IP 65 pursuant to IEC 529,

IC 40T: NEMA 4 (Indoor Use Only).

Protection class: I pursuant to EN 60335.

Electrical connection:

Line entrance: 3 × M20 plastic

screw connectors.

Ambient temperature:

-20 to 60°C, no condensation permitted.

## Certification



Kromschroder AG certifies that the actuators IC 20 and IC 40 conform to the following EU Directives:

– Low Voltage Directive (73/23/EEC)

on the basis of EN 60730-1,

– Electromagnetic Compatibility Directive

(89/336/EEC) on the basis of

EN 50082-2 and EN 50081-1.

UL approval for actuator IC 40

has been granted.



## Selection

IC 20: Actuator for basic applications

IC 40: Intelligent actuator for complex applications

	S	-07	-15	-30	-60	W	Q	A	2 <sup>1)</sup>	3 <sup>1)</sup>	E <sup>3)</sup>	A <sup>3)</sup>	R10 <sup>3)</sup>
IC 20		●	●	●	●	●	●		●	●			○
IC 40 <sup>2)</sup>					●			●	●	●		○	○ <sup>4)</sup>
Type = IC													
Safety closing function = S (with butterfly valve BVHS only)													
Running time (at 50 Hz)													
7.5 s = -07													
15 s = -15													
30 s = -30													
60 s = -60													
4.5 – 76.5 s programmable													
Mains voltage													
230 V AC, -15/+10%, 50/60 Hz = W													
120 V AC, -15/+10%, 50/60 Hz = Q													
100 – 230 V AC, ±10%, 50/60 Hz = A													
Torque													
2.5 Nm = 2													
3.0 Nm = 3													
Continuous control 0 (4) – 20 mA, 0 – 10 V = E													
Analogue input 4 – 20 mA = A													
Feedback potentiometer													
0 – 1000 Ω = R10													

1) IC 20-07: 2.5 Nm, IC 20-15/-30/-60: 3.0 Nm. IC 40: 2.5 Nm, IC 40S: 3.0 Nm.

2) Various parameter sets can be pre-set ex-works. Please quote the parameter set in your order.

3) If "none", this specification is omitted.

4) Cannot be retrofitted.

● = standard

○ = available

Order example **IC 40A2R10**