ControlBloc
Control and safety combination with direct-connected automatic burner control
MPA 109x

1.16

Technical description
The ControlBloc is the combination of an EN 298 compliant, automatic gas burner control and an EN 126 compliant multiple actuator of the DUNGS GB 055 or GB 057 family.

Application
- Gas burners with/without fan
- Intermittent operation acc. to EN 298: 2003
- For gases acc. to EN 437 and other neutral gaseous media

Approvals
EU type test approval as per EU Gas Appliance Directive.

EC-87/05/014/M1
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Approvals
EU type test approval as per EU Gas Appliance Directive.

EC-87/05/014/M1

Old documentation - Only for your information!

Product is not available anymore!
Control and safety combination

**ControlBloc**
The ControlBloc comprises the multiple actuator GasBloc and the automatic gas burner control MPA 109x.

**Multiple actuator GasBloc**
Refer to the specified table for a summary of the main types of the GasBloc.
For details: see datasheet GB 055 and GB 057

**Solenoid valves**
Solenoid valves as per EN 161, class B.
DC coils, protected against voltage peaks.

**Dirt trap device**
Narrow-mesh sieve for protecting the fitting.

**Pressure tap**
At the inlet and outlet ends.

**Solenoid valve operating mode**
V1 and V2 are activated separately.
Ignition output is enabled, V1 opens.
When the flame forms, the 'enable' signal is generated and V2 opens.

If the main burner is ignited directly, the MPA 109x activates the valves V1 and V2 simultaneously.

**Automatic gas burner control MPA 109x**
The MPA 109x is accommodated in a plastic housing which is specially designed for mounting to the GasBloc multiple actuator. The automatic gas burner control mounted on a pcb operates with state-of-the-art microprocessor technology. This enables complex program flows (e.g. several start attempts).
In addition, exact switching times are also ensured during voltage and temperature fluctuations or very short switching cycles.
On models without air monitor, ignition starts when the controller sends a heat request after a start-up waiting period and the pilot gas valve V1 opens.
On models with air monitor, the MPA 109x waits until the contact of the air pressure switch is open. Then the blower is switched on and after a waiting period, the air pressure switch opens. After the pre-purge time expires, the ignition switches on and pilot gas valve V1 is opened.

At the end of the start-up safety period (SZA), the ignition switches off. If a flame forms, the main gas valve V2 opens after the stabilising period (STZ) has expired.
On models T..., the pilot gas valve remains open during heat request.

On models M... for direct ignition of the main burner, both valves will be activated common. If no flame forms within the start-up safety period, the pilot gas valve closes and is locked in fault position and/or the programmed number of restarts is attempted. In case of flame failure during operation, all gas valves are switched off, within the operating safety period (SZB). Depending on the model, they are locked in fault position, a restart is attempted.

In the case of power failure, the gas valves are closed. If a flame is signalled before fuel release, start-up is disabled, depending on the model as long as the flame signal exists or locks in fault position (non-volatile lockout).

**Fault unlock**
Depending on the model, the MPA 109x is unlocked in case of fault via an external contact or by switching the power supply on and off.

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**Variants of the GasBloc**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>GB...</td>
<td>Net calorific value appliances, atmospheric, 1-stage, optionally available without pressure regulator</td>
</tr>
<tr>
<td>GB-M...</td>
<td>Net calorific value appliances, atmospheric, electrical modulating</td>
</tr>
<tr>
<td>GB-G...</td>
<td>Gross calorific value appliances, 1:1 gas/air mixture</td>
</tr>
<tr>
<td>GB-N...</td>
<td>Gross calorific value appliances, gas/air mixture with zero pressure control</td>
</tr>
<tr>
<td>GB-WND...</td>
<td>Gross calorific value appliances, integrated Whirlwind gas/air ratio control system</td>
</tr>
</tbody>
</table>
Program flow

Models without air monitor
Start-up with flame formation

Start-up without flame formation (Example with 2 start-up attempts)

Flame failure without restart

Flame failure with restart

except models MCV, MCL, MLL

Models with air monitor
Start-up with flame formation

Start-up without flame formation (example with 2 start-up attempts)

Flame failure without restart

Flame failure with restart

AL  External fault display
AWZ  Start-up waiting period
BF  Blower motor
F  Flame
IE  Ionisation electrode
IZE  Common ionisation and ignition electrode
PS  Air pressure switch
R  Controller
RS  Pushbutton for fault unlock
S  Switch for ionisation current measurement
STZ  Stabilising period
SZB  Start-up safety period
SZB  Operating safety period
V1  Pilot gas valve
V2  Main gas valve
Z  Ignition
ZE  Ignition electrode

Product is not available anymore!
Ionisation flame monitor
An ionisation electrode acts as a probe in the flame and the burner mouth normally as ground. Make sure that there is a proper flame friction at the burner mouth. The burner mouth must be properly connected to PE to return the ionisation current. The insulation resistor of the ionisation electrode should be more than 50 MΩ.

Measuring the ionisation current
The intensity of the ionisation current can be measured using a DC microammeter. Current intensity in operation should not fall below 3 mA. The flame is cancelled when the ionisation current is below approx. 1 mA. For measurement, the microammeter is connected between the ionisation electrode and connector plug (for ionisation current measurement for single electrode mode, see below left).

Installation
The installation position of the automatic gas burner control is defined by the installation position of the valve.

Electrical connection
The electrical connection is performed using a 12-pin MOLEX connector. Perform wiring in accordance with the locally prevailing regulations and the wiring diagram.

Start-up
Before start-up, check whether all terminals are connected properly. During start-up, check the following safety functions:
- Switch off controllers, switches and limiters (if any)
- Switch off switching points of gas pressure switches (if any)
- Stop flame monitors and ionisation line and/or short circuit electrode with ground

Fuses
External fuses of automatic gas burner control using a back-up fuse (F1) 6.3 A slow-blow or 10 A quick-acting. Refer to the permissible switching capacities.

Caution: To protect the measuring device, switch S must always remain closed during ignition phase. In the operating phase, the ionisation current is measured with switch S open. Alternatively, capacitor C (0,22 µF) can be used. Here, the current can also be measured in the ignition phase.

Wiring diagram for models without air monitor

Wiring diagram for models with air monitor

Legend: see page 3
Technical Data
GasBloc 055

Nominal width: DN 15
Main gas connection: Rp 1/2 ISO 7/1
Flanges with tube threads: G 1/2 DIN ISO 228 (internal)
Flanges with tube threads: Rp 1/2 ISO 7/1
Flanges with tube threads: G 3/4 DIN ISO 228 (external)
Max. inlet pressure: 65 mbar
Ambient temperature: 0 °C up to +60 °C
Automatic shut-off valves: class B as per EN 126
Group: 2
Gas governor: class C
Degree of protection: IP 40
Closing time: < 1 s
ON period: 100 % ED
Voltage / frequency (coil): ~ (AC) 50 - 60 Hz 230 V +10 % -15 %
Coil load (230 V): 2 x 5.5 VA
Electrical connection: connection for Molex System
Optional specification: gas failsafe device GW…A3, gas pressure switch GW…A5
Installation position: vertical – horizontal

Dimensions in mm with GB 055

Flachstecker:
1. 6.3 x 0.8 mm
2. 4.8 x 0.8 mm
3. 2.8 x 0.5 mm
4. 2.8 x 0.5 mm

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ControlBloc
Control and safety combination with direct-connected automatic burner control
MPA 109x

Technical Data

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>~(AC) 230 V +/- 10 %</th>
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</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>50 Hz</td>
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<tr>
<td>Performance rating</td>
<td>&lt; 25 VA</td>
</tr>
<tr>
<td>Internal fuse</td>
<td>3,15 A</td>
</tr>
<tr>
<td>Back-up fuse</td>
<td>max. 6.3 A slow-blow or 10 A quick-acting</td>
</tr>
<tr>
<td>Switching capacities:</td>
<td></td>
</tr>
<tr>
<td>Blower motor</td>
<td>230 VAC / 1 A</td>
</tr>
<tr>
<td>Fault signal</td>
<td>230 VAC / 0.1 A</td>
</tr>
<tr>
<td>Flame monitor</td>
<td>Ionisation</td>
</tr>
<tr>
<td>Ionisation current/operation</td>
<td>&gt; 3 mA</td>
</tr>
<tr>
<td>Switch-off sensitivity</td>
<td>&lt; 1 mA</td>
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<tr>
<td>Short-circuit limitation</td>
<td>approx. 100 mA</td>
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<tr>
<td>Ionisation line length</td>
<td>max. 1 m</td>
</tr>
<tr>
<td>Ignition</td>
<td>Cyclic sparks</td>
</tr>
<tr>
<td>Ignition voltage</td>
<td>approx. 20 kV</td>
</tr>
<tr>
<td>Ignition frequency</td>
<td>approx. 15 Hz</td>
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<tr>
<td>Electrode distance</td>
<td>3-4 mm</td>
</tr>
<tr>
<td>Ignition line length</td>
<td>max. 1 m</td>
</tr>
<tr>
<td>Fault unlock</td>
<td>remote control</td>
</tr>
<tr>
<td>Fault display</td>
<td>external</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 40</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0...60 °C</td>
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<tr>
<td>Connectivity</td>
<td>Molex KK3003 (12-pin)</td>
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<tr>
<td>Protective ground terminal</td>
<td>integrated</td>
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<tr>
<td>Weight</td>
<td>0.35 kg</td>
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Order data

<table>
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<tr>
<th>Type</th>
<th>Order No.</th>
<th>Classification as per EN 298</th>
<th>AWZ/VSZ</th>
<th>SZA</th>
<th>SZB</th>
<th>STZ</th>
<th>NSZ</th>
<th>Number of start attempts</th>
<th>Fault switch-off</th>
<th>Re-ignition</th>
<th>Restart</th>
<th>Air monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPA1095</td>
<td>250 869</td>
<td>ATCLXN</td>
<td>5 s</td>
<td>5 s</td>
<td>1 s</td>
<td>1 s</td>
<td>-</td>
<td>3</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
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<tr>
<td>Mod. 5.1.0 TCL</td>
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</tr>
<tr>
<td>MPA1094</td>
<td>250 870</td>
<td>FMCLXN</td>
<td>30 s</td>
<td>5 s</td>
<td>1 s</td>
<td>1 s</td>
<td>20 s</td>
<td>3</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<tr>
<td>Mod. 5.1.30 MCL</td>
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<td>Connecting cable</td>
<td>249 707</td>
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* post purge time after flame failure during operation
additional types on request

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- **On models with air monitor**: The MPA 109x waits until the contact of the air pressure switch is open. Then the air pressure switch opens. After the pre-purge time expires, the ignition switches on and pilot gas valve V1 opens.
- **On models with air monitor**: The MPA 109x waits until the contact of the air pressure switch is open. Then the air pressure switch opens. After the pre-purge time expires, the ignition switches on and pilot gas valve V1 opens.

**Fault unlock**

Depending on the model, the MPA 109x is unlocked in case of fault via an external contact or by switching the power supply on and off.
### Program flow

#### Models without air monitor

**Start-up with flame formation**

<table>
<thead>
<tr>
<th>R</th>
<th>Z</th>
<th>Y1</th>
<th>F</th>
<th>Y2</th>
<th>AL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

**Start-up without flame formation (Example with 2 start-up attempts)**

<table>
<thead>
<tr>
<th>R</th>
<th>Z</th>
<th>Y1</th>
<th>F</th>
<th>Y2</th>
<th>AL</th>
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<td></td>
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</table>

**Flame failure without restart**

<table>
<thead>
<tr>
<th>R</th>
<th>Z</th>
<th>Y1</th>
<th>F</th>
<th>Y2</th>
<th>AL</th>
</tr>
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**Flame failure with restart**

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<th>R</th>
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</table>

Except models MCV, MCL, MLL

#### Models with air monitor

**Start-up with flame formation**

<table>
<thead>
<tr>
<th>R</th>
<th>BF</th>
<th>PS</th>
<th>Z</th>
<th>Y1</th>
<th>F</th>
<th>Y2</th>
<th>AL</th>
</tr>
</thead>
<tbody>
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**Start-up without flame formation (example with 2 start-up attempts)**

<table>
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<tr>
<th>R</th>
<th>BF</th>
<th>PS</th>
<th>Z</th>
<th>Y1</th>
<th>F</th>
<th>Y2</th>
<th>AL</th>
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<tbody>
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**Flame failure without restart**

<table>
<thead>
<tr>
<th>R</th>
<th>BF</th>
<th>PS</th>
<th>Z</th>
<th>Y1</th>
<th>F</th>
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<th>AL</th>
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**Flame failure with restart**

<table>
<thead>
<tr>
<th>R</th>
<th>BF</th>
<th>PS</th>
<th>Z</th>
<th>Y1</th>
<th>F</th>
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<th>AL</th>
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</tbody>
</table>

### Symbols
- **AL**: External fault display
- **AWZ**: Start-up waiting period
- **BF**: Blower motor
- **F**: Flame
- **IE**: Ionisation electrode
- **IZE**: Common ionisation and ignition electrode
- **PS**: Air pressure switch
- **R**: Controller
- **RS**: Pushbutton for fault unlock
- **S**: Switch for ionisation current measurement
- **STZ**: Stabilising period
- **SZA**: Start-up safety period
- **SZB**: Operating safety period
- **V1**: Pilot gas valve
- **V2**: Main gas valve
- **Z**: Ignition
- **ZE**: Ignition electrode
- **VSZ**: Pre-purge time
Ionisation flame monitor
An ionisation electrode acts as a probe in the flame and the burner mouth normally as ground. Make sure that there is a proper flame friction at the burner mouth. The burner mouth must be properly connected to PE to return the ionisation current. The insulation resistor of the ionisation electrode should be more than 50 MΩ.

Measuring the ionisation current
The intensity of the ionisation current can be measured using a DC microammeter. Current intensity in operation should not fall below 3 mA. The flame is cancelled when the ionisation current is below approx. 1 mA. For measurement, the microammeter is connected between the ionisation electrode and connector plug (for ionisation current measurement for single electrode mode, see below left).

Installation
The installation position of the automatic gas burner control is defined by the installation position of the valve.

Electrical connection
The electrical connection is performed using a 12-pin MOLEX connector. Perform wiring in accordance with the locally prevailing regulations and the wiring diagram.

Start-up
Before start-up, check whether all terminals are connected properly. During start-up, check the following safety functions:
- Switch off controllers, switches and limiters (if any)
- Switch off switching points of gas pressure switches (if any)
- Stop flame monitors and ionisation line and/or short circuit electrode with ground

Fuses
External fuses of automatic gas burner control using a back-up fuse (F1) 6.3 A slow-blow or 10 A quick-acting. Refer to the permissible switching capacities.

Caution: To protect the measuring device, switch S must always remain closed during ignition phase. In the operating phase, the ionisation current is measured with switch S open. Alternatively, capacitor C (0.22 µF) can be used. Here, the current can also be measured in the ignition phase.

Wiring diagram for models without air monitor

Legend: see page 3

Wiring diagram for models with air monitor

Legend: see page 3
### Technical Data

**GasBloc 055**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Nominal width</td>
<td>DN 15</td>
</tr>
<tr>
<td>Main gas connection</td>
<td>Rp 1/2 ISO 7/1</td>
</tr>
<tr>
<td>G 1/2 DIN ISO 228 (internal)</td>
<td>Rp 1/2 ISO 7/1</td>
</tr>
<tr>
<td>Flanges with tube threads</td>
<td>G 3/4 DIN ISO 228 (external)</td>
</tr>
<tr>
<td>Max. inlet pressure</td>
<td>65 mbar</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 °C up to +60 °C</td>
</tr>
<tr>
<td>Automatic shut-off valves</td>
<td>class B as per EN 126</td>
</tr>
<tr>
<td>Group</td>
<td>2</td>
</tr>
<tr>
<td>Gas governor</td>
<td>class C</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 40</td>
</tr>
<tr>
<td>Closing time</td>
<td>&lt; 1 s</td>
</tr>
<tr>
<td>ON period</td>
<td>100 % ED</td>
</tr>
<tr>
<td>Voltage / frequency (coil)</td>
<td>~ (AC) 50 - 60 Hz 230 V +10 % -15 %</td>
</tr>
<tr>
<td>Coil load (230 V)</td>
<td>2 x 5.5 VA</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>connection for Molex System</td>
</tr>
<tr>
<td>Optional specification</td>
<td>gas failsafe device GW...A3, gas pressure switch GW...A5</td>
</tr>
<tr>
<td>Installation position</td>
<td>vertical – horizontal</td>
</tr>
</tbody>
</table>

**Dimensions in mm with GB 055**

<table>
<thead>
<tr>
<th>Flachstecker</th>
<th>1</th>
<th>6.3 x 0.8 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>4.8 x 0.8 mm</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2.8 x 0.5 mm</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>2.8 x 0.5 mm</td>
</tr>
</tbody>
</table>

---

*Old documentation is not available anymore!*
Control Bloc
Control and safety combination with direct-connected automatic burner control
MPA 109x

Technical Data
MPA

Nominal voltage  ~(AC) 230 V +/- 10 %
Frequency 50 Hz
Performance rating < 25 VA
Internal fuse 3,15 A
Back-up fuse max. 6.3 A slow-blow or 10 A quick-acting
Switching capacities:
Blower motor 230 VAC / 1 A
Fault signal 230 VAC / 0,1 A
Flame monitor Ionisation
Ionisation current/operation > 3 mA
Switch-off sensitivity < 1 mA
Short-circuit limitation approx. 100 mA
Ionisation line length max. 1 m
Ignition Cyclical sparks
Ignition voltage approx. 20 kV
Ignition frequency approx. 15 Hz
Electrode distance 3-4 mm
Ignition line length max. 1 m
Fault unlock remote control
Fault display external
Degree of protection IP 40
Ambient temperature 0...60 °C
Connectivity Molex KK3003 (12-pin)
Protective ground terminal integrated
Weight 0.35 kg

Order data
Type | Order No. | Classification as per EN 298 | AWZ| SZA | SZB | STZ | NSZ* | Number of start attempts | Fault switch-off not changeable | Re-ignition | Restart | Air monitor
--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | ---
MPA1095 Mod. 5.1.0 TCL | 250 869 | ATCLXN | 5 s | 5 s | 1 s | 1 s | - | 3 | • | • | • | •
MPA1094 Mod. 5.1.30 MCL | 250 870 | FMCLXN | 30 s | 5 s | 1 s | 1 s | 20 s | 3 | • | • | • | •
Connecting cable 1m | 249 707 |

* post purge time after flame failure during operation
additional types on request

We reserve the right to make any changes in the interest of technical progress.

Head offices and factory
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