

GasMultiBloc® Combined regulator and safety shut-off valves Single-stage function

DUNGS®
Combustion Controls

MB-D(LE) 403 B01
MB-D(LE) 053 B01

7.20



Technical description

The DUNGS GasMultiBloc® integrates filter, regulator, valves and pressure switches in one compact fitting.

- Dirt trap: microfilter
- One regulator and two main valves: B01
- Two valves are fast opening
- One valve is fast opening, one valve is slow opening
- Solenoid valves up to 200 mbar (20 kPa) as per DIN EN 161 Class A Group 2
- Sensitive setting of output pressure by proportional regulator as per DIN EN 88 Class A Group 2
- High flow rates with low pressure drop
- DC solenoid drive interference degree N
- Main volume restrictor at valve V2
- Hydraulic opening delay
- Flange connections with pipe threads as per ISO 7/1
- Simple mounting, compact, lightweight

The modular system permits individual solutions by using external ignition gas tap in connection with separately controlled valves, by adding a valve proving system, mini/maxi pressure switches, pressure limiters, partial volume setting by closing stroke limiter at valve V2 and regulator blocking for liquid gas applications.

Application

The modular system permits individual solutions in gas safety and regulator engineering. Suitable for gases of families 1, 2, 3 and other neutral gaseous media.

Approvals

EC type test approval as per EC Gas Appliance Directive:
MB-...403/053 B01 CE-0085 AQ 0810
EC type test approval as per EC Pressure Equipment Directive:
MB-...403/053 B01 CE0036
Approvals in other important gas consuming countries.

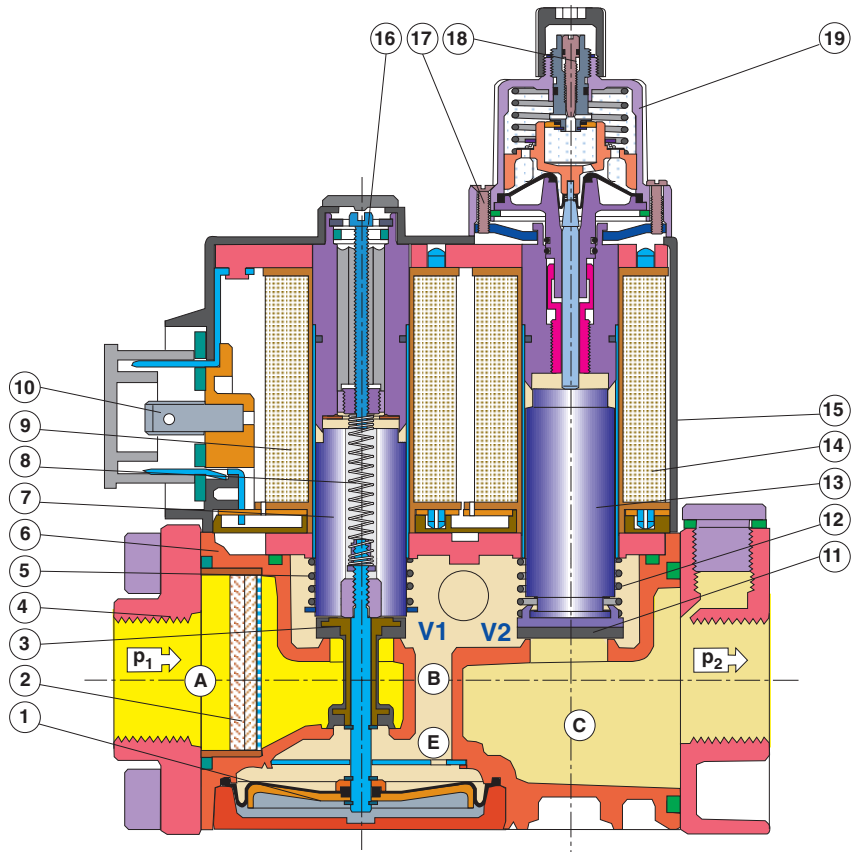
Functional description of gas flow

1. When the valves V1 and V2 are closed, chamber A is under inlet pressure.
2. A hole D in the filter housing connects min. pressure switch with chamber A. If the inlet pressure applied to the pressure switch exceeds the incoming reference value, it switches through to the automatic burner control.
3. After release by the automatic burner control, valves V1 and V2 open. The gas flows through chambers A, B and C of the GasMultiBloc.

Operating method of valve-regulator combination on valve V1

A regulator, compensating for residual pressure is integrated in valve V1 (pressure regulating part). Armature 7 is not connected to valve plate unit 3. When it opens, armature 7 pretensions compression spring (V1) 5 and releases the valve plate unit. When the valve closes, the armature acts directly on the valve plate unit. The output pressure upstream of valve V2 is defined by pretensioning regulating spring 8 (tension spring) via setting screw 16. The output pressure acts via opening E on the working diaphragm of regulator part 1. In regulated state, setting spring inlet pressure and pressure of working diaphragm are in force equilibrium.

Sectional drawing of MB-DLE...



| | | | | | |
|---|--------------------|----|-----------------------|----|----------------------|
| 1 | Pressure regulator | 8 | Regulating spring | 15 | Solenoid housing |
| 2 | Microfilter | 9 | Solenoid V1 | | Setting: |
| 3 | Valve V1 | 10 | Electrical connection | 16 | - Gas pressure p_a |
| 4 | Connection flange | 11 | Valve V2 | 17 | - Main volume |
| 5 | Closing spring V1 | 12 | Closing spring V2 | 18 | - Fast stroke |
| 6 | Housing | 13 | Armature V2 | 19 | Hydraulic brake |
| 7 | Armature V1 | 14 | Solenoid V2 | | |

Operating method of valve V2

Armature 13 of valve V2 is connected to valve plate unit 11. When it opens, armature 13 pretensions closing spring 12. The maximum valve opening can be set by limiting the armature stroke by means of the main volume restrictor 17.

Min. opening (residual stroke) of valve (0.5 to 1.0 mm)

Main volume restrictor 17 is set by rotating the adjusting plate or the hydraulic brake 19. The fast and/or slow opening characteristic is influenced by setting the fast stroke 18 at the hydraulic brake 19 under the cover.

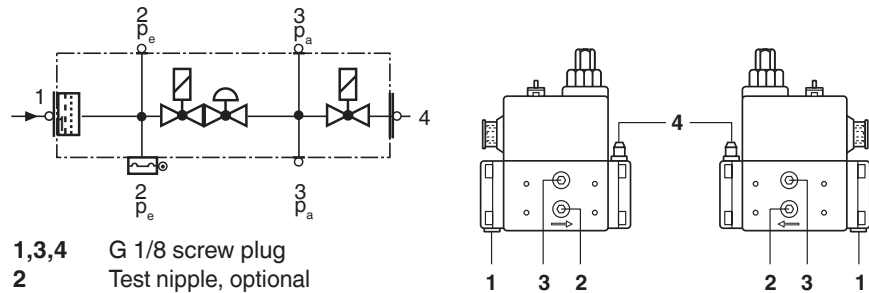
Closing function

When the supply voltage to the solenoid coils of valves V1 and V2 is interrupted, they are closed within < 1 s by the compression springs.

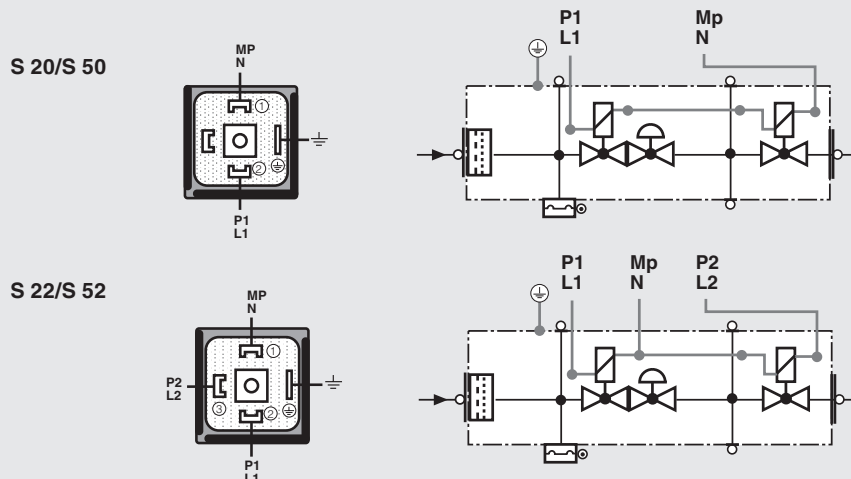
Closing stroke limitation (option)

A partial volume setting is possible by means of a closing stroke limiter. Valve V2 becomes a regulating actuator without zero shutoff. Partial volume and main volume are adjustable.

Pressure taps



Electrical connection



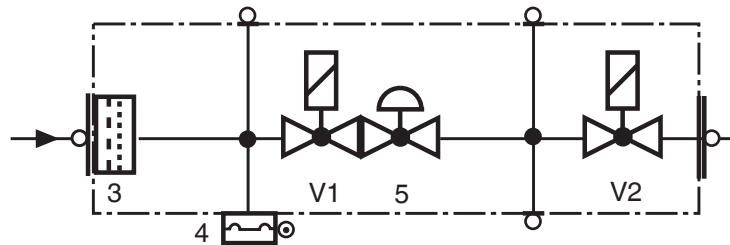
Specifications

| Nominal diameters Flange with pipe threads as per ISO 7/1 (DIN 2999) | MB...403/053 B01 Rp 3/8, 1/2 and their combinations | | | | | | | | | | | | | | | | | | | | |
|--|--|--------------|------------------------|--|------------------------|----|--------------|--------------|---------|------|--------------|--------------|------|--------|--------------|--------------|------|-------|--------------|--------------|---------|
| Max. operating pressure | MB-...403 MB-...053 $p_{max.} = 200 \text{ mbar (20 kPa)}$ $p_{max.} = 60 \text{ mbar (6 kPa)}$ | | | | | | | | | | | | | | | | | | | | |
| Output pressure ranges | MB-...403/053 B01 S20/S22 MB-...403/053 B01 S50/S52 $p_a : 4 \text{ mbar (0.4 kPa) to 20 mbar (2 kPa)}$ $p_a : 4 \text{ mbar (0.4 kPa) to 50 mbar (5 kPa)}$ | | | | | | | | | | | | | | | | | | | | |
| Media | Gases of families 1, 2, 3 and other neutral gaseous media | | | | | | | | | | | | | | | | | | | | |
| Ambient temperature | -15°C to +70°C (Do not operate MB-D below 0°C in liquid gas systems. Only suitable for gaseous liquid gas, liquid hydrocarbons destroy sealing materials.) | | | | | | | | | | | | | | | | | | | | |
| Dirt trap | Sieve with 0.8 mm mesh width, filter made of random laid nonwoven fabric, micro-filter, two-layer, changing the filter is possible by removing the valve. | | | | | | | | | | | | | | | | | | | | |
| Pressure switches | Types GW A5, GW A2, NB A2, ÜB A2 mountable as per DIN EN 1854. For further information, refer to Datasheet GW A2 No. 215 183 and Datasheet GW A5 No. 225 901. | | | | | | | | | | | | | | | | | | | | |
| Pressure regulator | Pressure regulator compensated for residual pressure, leakproof seal when switched off by means of valve V1 as per DIN EN 88 Class A. Setpoint spring permanently installed (no spring exchange possible). A vent line above roof is not required. Internal pulse tap provided. | | | | | | | | | | | | | | | | | | | | |
| Solenoid valve V1 | Valve as per DIN EN 161 Class A Group 2, fast closing, fast opening | | | | | | | | | | | | | | | | | | | | |
| Solenoid valve V2 | Valve as per DIN EN 161 Class A Group 2 | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th></th> <th colspan="2">Valve V2 design</th> <th>Main volume restrictor</th> </tr> </thead> <tbody> <tr> <td>MB</td> <td>fast closing</td> <td>fast opening</td> <td>without</td> </tr> <tr> <td>MB-D</td> <td>fast closing</td> <td>fast opening</td> <td>with</td> </tr> <tr> <td>MB-DLE</td> <td>fast closing</td> <td>slow opening</td> <td>with</td> </tr> <tr> <td>MB-LE</td> <td>fast closing</td> <td>slow opening</td> <td>without</td> </tr> </tbody> </table> | | Valve V2 design | | Main volume restrictor | MB | fast closing | fast opening | without | MB-D | fast closing | fast opening | with | MB-DLE | fast closing | slow opening | with | MB-LE | fast closing | slow opening | without |
| | Valve V2 design | | Main volume restrictor | | | | | | | | | | | | | | | | | | |
| MB | fast closing | fast opening | without | | | | | | | | | | | | | | | | | | |
| MB-D | fast closing | fast opening | with | | | | | | | | | | | | | | | | | | |
| MB-DLE | fast closing | slow opening | with | | | | | | | | | | | | | | | | | | |
| MB-LE | fast closing | slow opening | without | | | | | | | | | | | | | | | | | | |
| Measuring/ignition gas connection | For G 1/8 as per DIN ISO 228, refer to Pressure taps on page 2 | | | | | | | | | | | | | | | | | | | | |
| Voltage / frequency | 50-60 Hz, 220 - 230 V AC, -15% +10% Other preferred voltages: 240 VAC, 110-120 VAC, 48 VDC, 24-28 VDC | | | | | | | | | | | | | | | | | | | | |
| Electrical connection | Plug connection as per DIN EN 175301-803 for valves and pressure switches | | | | | | | | | | | | | | | | | | | | |
| Rating/power consumption Switch-on duration Degree of protection Radio interference | Refer to Dimensions on page 5 100% IP 54 as per IEC 529 (EN 60529) Interference degree N | | | | | | | | | | | | | | | | | | | | |
| Materials of gas conveying parts | Housing Diaphragms, seals Solenoid drive aluminium die casting NBR basis, Silopren (silicone rubber) steel, brass, aluminium | | | | | | | | | | | | | | | | | | | | |
| Installation position | Solenoid vertically upright or lying horizontally as well as its intermediate positions. | | | | | | | | | | | | | | | | | | | | |

| Equipment variants GasMultiBloc®...B01 Single-stage function | 403 B01 | 053 B01 | |
|--|---------|---------|--|
| MB | • | • | |
| MB-D | • | • | |
| MB-DLE | • | • | |
| MB-LE | • | • | |
| Microfilter (standard) with sieve | • | • | |
| Gas pressure switch downstream of filter | • | • | |
| Pressure regulator | • | • | |
| Valve V1, double seat | • | • | |
| Valve V2, single seat | • | • | |
| Closing stroke limitation | (•) | (•) | V2 becomes an actuator without shutoff |
| Valves opening together | • | • | S 20 |
| Valves opening separately | (•) | (•) | S 22 |
| Flange Rp 3/8 | • | • | • = possible (•) = on request - = not possible |
| Rp 1/2 | • | • | |

MB-...B01 version

- V1 = Valve 1
- V2 = Valve 2
- 3 = Filter
- 4 = Pressure switch
- 5 = Regulator



Mounting of VPS 504 valve proving system possible

Type key of MultiBloc®

MB- XX XXX XX BOX SXX

Control of V1 and V2

0 = common
2 = separated

Outlet pressure **Inlet pressure**
2 = 4 - 20 mbar up to 360 mbar
5 = 4 - 50 mbar up to 360 mbar

S = Series (type-independent)

Gas train schematic diagram
1 = two A valves for main gas + regulator
7 = two A valves for main gas, one A valve together with V1 as internal bypass around V2 + regulator

Design type (generation) B

Construction size, nominal diameter

403 = DN 10, V2 = Single-seat valve
405 = DN 15, V2 = Single-seat valve
407 = DN 20, V2 = Double-seat valve
410 = DN 25, V2 = Single-seat valve
412 = DN 32, V2 = Double-seat valve
415 = DN 40, V2 = Double-seat valve
420 = DN 50, V2 = Double-seat valve

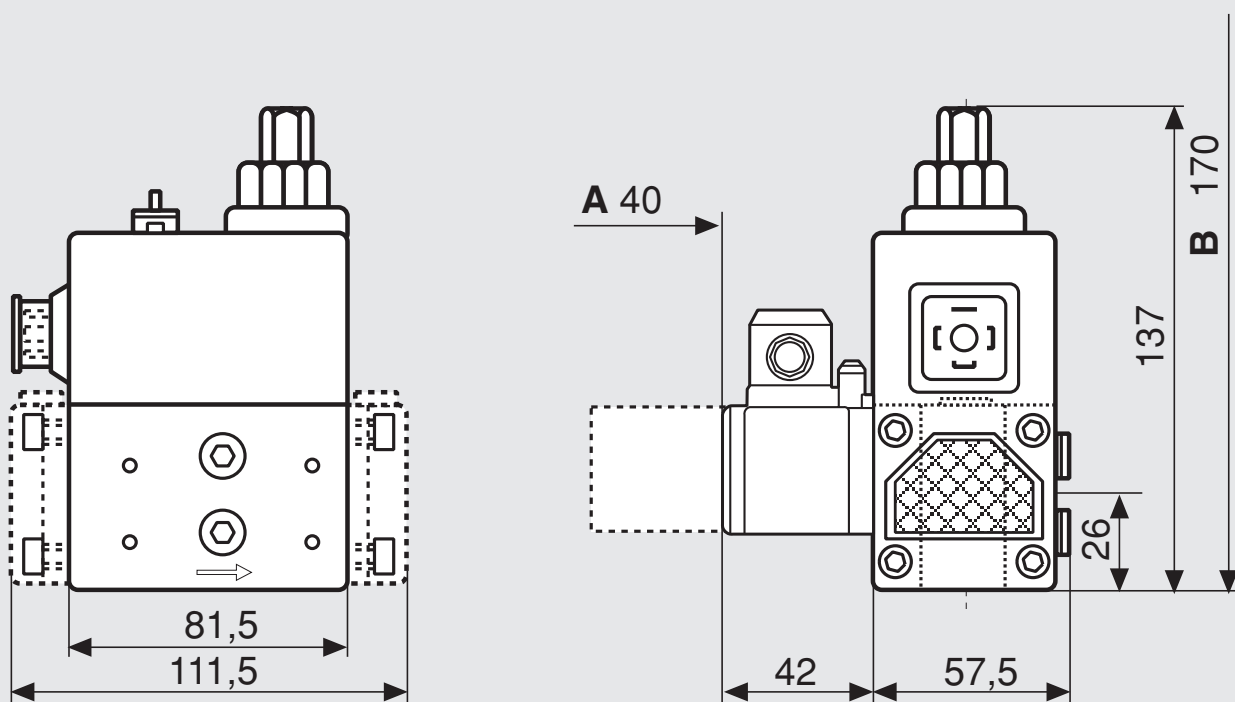
Opening behaviour + main volume restrictor

without = (MB or MB-ZR)
-D = Main volume restrictor
-LE = adjustable opening behaviour
-DLE = D + LE combination

without = single stage
ZR = double-stage with partial volume setting first stage

MultiBloc

Dimensions [mm]



A = Space requirement for opening the cover of pressure switch

B = Space requirement for exchanging the solenoid

| Type | Rp | Opening time | Weight [kg] |
|----------------|--------|--------------|-------------|
| MB-D 403 B01 | Rp 1/2 | < 1 s | 1.4 |
| MB-DLE 403 B01 | Rp 1/2 | < 20 s | 1.5 |
| MB-D 053 B01 | Rp 1/2 | < 1 s | 1.4 |
| MB-DLE 053 B01 | Rp 1/2 | < 20 s | 1.5 |

Rating / power consumption

[VA] 230 V AC; +20°C

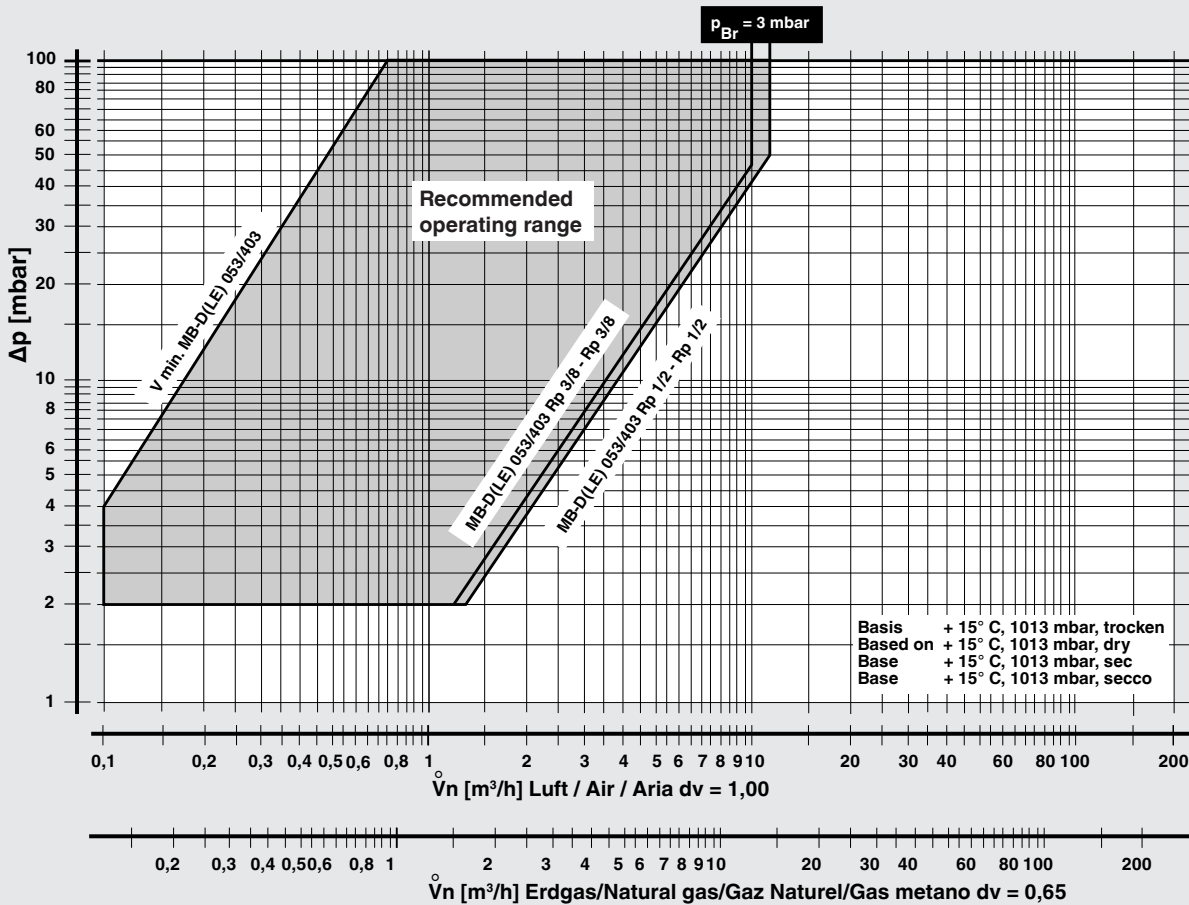
| | |
|-------------------|----|
| MB...403 B01 S 20 | 24 |
| MB...403 B01 S 22 | 36 |
| MB...053 B01 S 20 | 24 |
| MB...053 B01 S 22 | 36 |

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Combined regulator and
safety shut-off valves
Single-stage function

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Volumetric flow pressure loss characteristics in regulated state with microfilter



$$f = \sqrt{\frac{\text{Dichte Luft / Spec. weight air / poids spécifique de l'air / peso específico aria}}{\text{Dichte des verwendeten Gases / Spec. weight of gas used / poids spécifique du gaz utilisé / peso específico del gas utilizado}}}$$

| Gas type | Density [kg/m³] | dv | f |
|----------|-----------------|------|------|
| Nat. gas | 0.81 | 0.65 | 1.24 |
| City gas | 0.58 | 0.47 | 1.46 |
| LPG | 2.08 | 1.67 | 0.77 |
| Air | 1.24 | 1.00 | 1.00 |

$$\dot{V}_{\text{verwendetes Gas/gas used/ gaz utilisé/gas utilizzato}} = \dot{V}_{\text{Luft/air/aria}} \times f$$

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

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