

Архангельск (8182)63-90-72  
Астана (7172)727-132  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Волгоград (844)278-03-48  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89  
Иваново (4932)77-34-06

Ижевск (3412)26-03-58  
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Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
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Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Липецк (4742)52-20-81

Магнитогорск (3519)55-03-13  
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Орел (4862)44-53-42  
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Пенза (8412)22-31-16

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Тула (4872)74-02-29  
Тюмень (3452)66-21-18  
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## Рампы газовых горелок



Газовая рампа - это, интегрированное устройство, включающее в себя — основной газовый клапан, предохранительный газовый клапан, реле минимального давления газа, регулятор давления газа, газовый фильтр, запорно-присоединительная арматура. На средних и больших мощностях горелок, необходимо устанавливать блок контроля герметичности клапанов. Газовая рампа является первостепенным элементом в конструкции газовой горелки, через который идет подача и регулировка количество газа для сжигания в теплообменнике котла.

KIT G/VALVOLA VGD 20.403 (F2"+

Газовая Рампа MB-ZRDLE 415

Рампа CE MBC 1900 VEF (FDN65) - CT (J)

Рампа CE MBC 1900 VEF (FDN65) - CT (L)

Рампа CE MBC 3100 VEF (FDN80) - CT (J)

Рампа CE MBC 3100 VEF (FDN80) - CT (L)

Рампа CE MBC 5000 VEF (FDN100) - CT (J)

Рампа CE MBC 5000 VEF (FDN100) - CT (L)

Рампа MB-ZRDLE 415 - F.

Рампа MBC 700 (J)

Рампа MBC 700 (L)

Рампа VGD 20.403 (F 2") (J)

Рампа VGD 20.403 (F 2") (L)

Рампа VGD 20.503 (F2"+CT) (J)

Рампа VGD 20.503 (F2"+CT) (L)

Рампа VGD 40.065 + CT (J)

Рампа VGD 40.065 + CT (L)

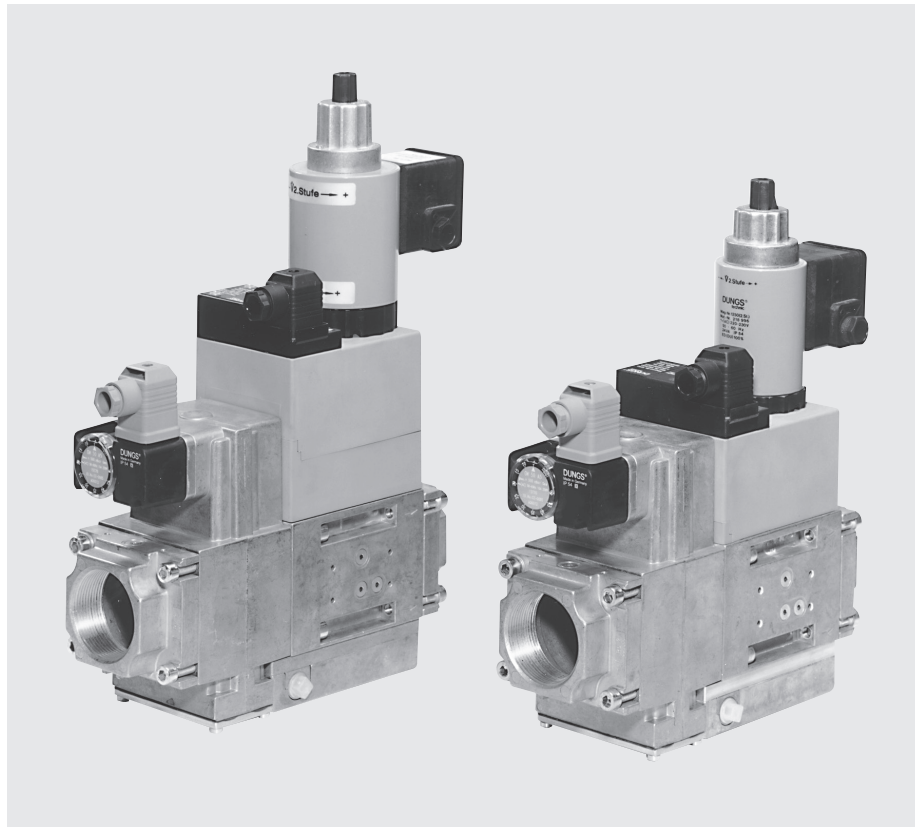
# GasMultiBloc®

## Combined regulator and safety shut-off valves

### Two-stage function

MB-ZRD(LE) 415 - 420 B01

7.26



#### 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
- One one-stage valve and one two-stage valve
- One valve is fast opening, one valve is slow or fast opening
- Solenoid valves up to 360 mbar (36 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 and partial volume restrictor at valve V2
- Hydraulic opening delay
- Flange connections with pipe threads as per ISO 7/1
- Simple mounting, compact, light-weight

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, limit switch at valve V2.

#### 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

EU type testing certificate as per:

- EU-Gas Appliances Regulation
- EU-Pressure Equipment Directive

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.
4. On request, the second stage of valve V2 opens.

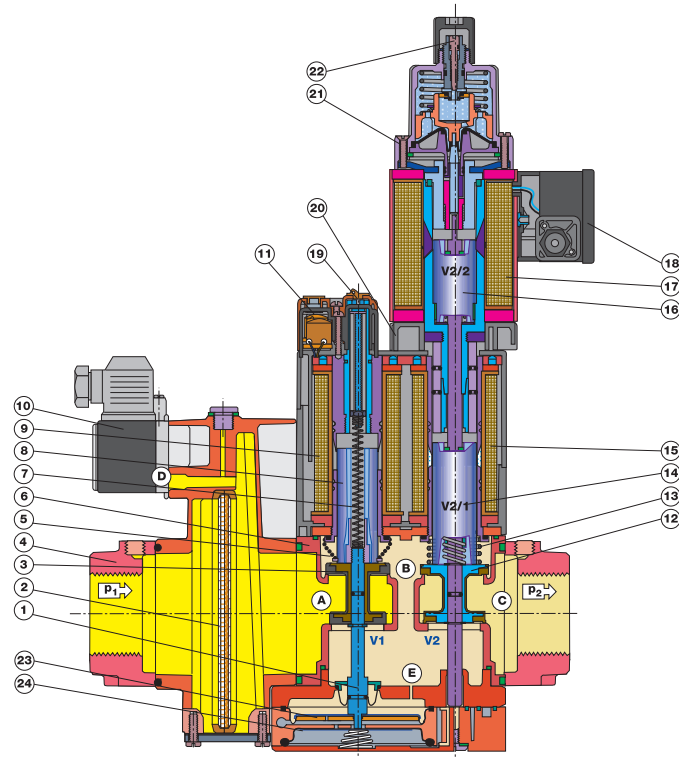
### Operating method of valve-regulator combination on valve V1

A regulator, compensating for residual pressure is integrated in valve V1 (pressure regulating part). Armature 8 is not connected to valve plate unit 3. When it opens, armature 8 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 7 (tension spring) via setting screw 18.

The output pressure acts via opening E on the working diaphragm 22 of the regulator part. In regulated state, setting spring inlet pressure and pressure of working diaphragm are in force equilibrium.

The compensating diaphragm 23 ensures the fast closing function of valve V1 and a high regulating quality.

### Sectional drawing of MB-ZRDLE...



|                      |                            |                                |
|----------------------|----------------------------|--------------------------------|
| 1 Pressure regulator | 10 Gas pressure switch     | Setting:                       |
| 2 Microfilter        | 11 Electrical connection   | 19 - Gas pressure $p_a$        |
| 3 Valve V1           | 12 Valve V2                | 20 - Partial volume, 1st stage |
| 4 Connection flange  | 13 Closing spring V2       | 21 - Main volume               |
| 5 Closing spring V1  | 14 Armature V2 (1st stage) | 22 - Fast stroke               |
| 6 Housing            | 15 Solenoid V2 (1st stage) | 23 Working diaphragm           |
| 7 Regulating spring  | 16 Armature V2 (2nd stage) | 24 Compensation diaphragm      |
| 8 Armature V1        | 17 Solenoid V2 (2nd stage) |                                |
| 9 Solenoid V1        | 18 Electrical connection   |                                |

### Operating method of valve V2

Armature 14 of valve V2 is connected to valve plate unit 11. When it opens, armature 14 pretensions closing spring 13. The valve opening of stage 1 can be set by limiting the armature stroke by means of main volume restrictor 19.

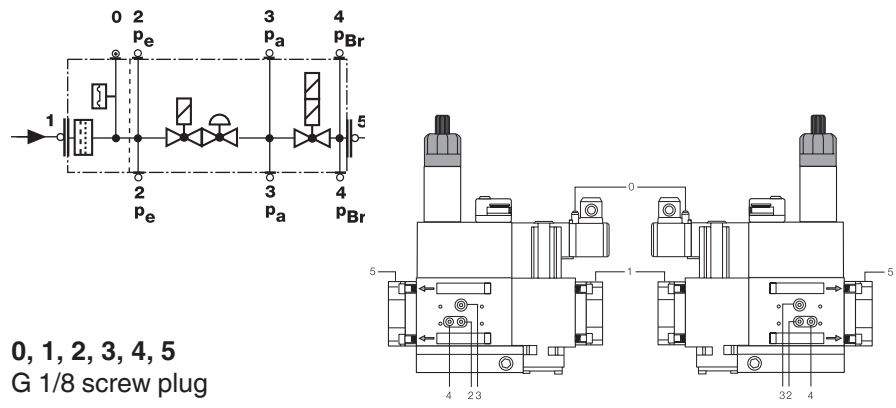
### Min. opening (residual stroke) of valve (0.5 to 1.0 mm)

If the second stage of valve 2 opens, closing spring 13 is continuously pretensioned. The maximum valve opening of stage 2 can be set by limiting the armature stroke of armature 16 by means of the main volume restrictor. Main volume restrictor 20 is set by rotating the adjusting plate or the hydraulic brake. The fast and/or slow opening characteristic acts on both stages. It is influenced by setting the fast stroke at the hydraulic brake under the cover.

### Closing function

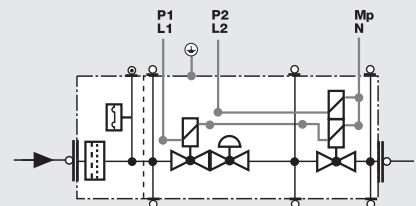
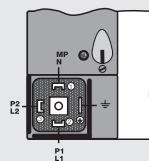
When the supply voltage to the solenoid coils of valves V1 and V2 is interrupted, they are closed within < 1 s by the compression springs.

### Pressure taps

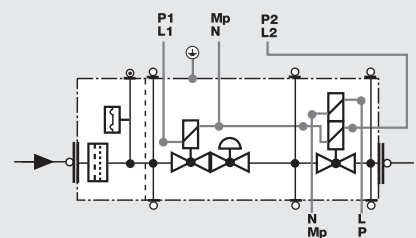
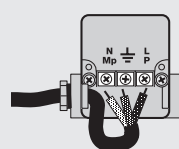
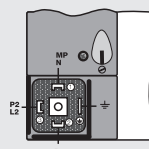


### Electrical connection

S 20/S 50



S 22/S 52



Valves V1, V2  
1st stage

Valve V2  
2nd stage

## Specifications

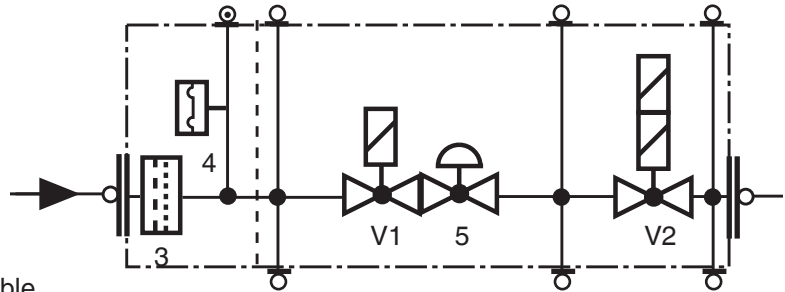
| Nominal diameters<br>Flange with pipe threads as per ISO 7/1 (DIN 2999)                        | MB-ZR...415 B01<br>Rp 1, 1 1/4, 1 1/2, 2<br>and their combinations                                                                                                                                                                                                                                                                                                                                                                                                                                             | MB-ZR...420 B01<br>Rp 1, 1 1/4, 1 1/2, 2<br>and their combinations                        |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------|-----------------|---------------------------|------------------------|-------|--------------|------|---------|--------|--------------|------|------|----------|----------------|------|------|---------|----------------|------|---------|
| <b>Max. operating pressure</b>                                                                 | <b>360 mbar (36 kPa)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| <b>Output pressure ranges</b>                                                                  | <b>MB-ZR... S20/S22 p<sub>a</sub>: 4 mbar (0.4 kPa) to 20 mbar (2 kPa)</b><br><b>MB-ZR... S50/S52 p<sub>a</sub>: 20 mbar (2 kPa) to 50 mbar (5 kPa)</b>                                                                                                                                                                                                                                                                                                                                                        |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Media                                                                                          | Gases of families 1, 2, 3 and other neutral gaseous media                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Ambient temperature                                                                            | -15 °C to +70 °C (Do not operate MB-ZR below 0 °C in liquid gas systems. Only suitable for gaseous liquid gas, liquid hydrocarbons destroy sealing materials.)                                                                                                                                                                                                                                                                                                                                                 |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Dirt trap                                                                                      | Sieve, microfilter, changing the filter is possible without removing the valve.                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Pressure switches                                                                              | Types GW...A5, ÜB...A2 / NB...A2 to DIN EN 1854 may be attached. For further information, refer to Datasheets 5.02 and 5.07 "Pressure Switches for DUNGS Multiple Actuators"                                                                                                                                                                                                                                                                                                                                   |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| 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, fast closing                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
|                                                                                                | <table border="1"> <thead> <tr> <th></th> <th>Valve V2 design</th> <th>Partial volume restrictor</th> <th>Main volume restrictor</th> </tr> </thead> <tbody> <tr> <td>MB-ZR</td> <td>fast opening</td> <td>with</td> <td>without</td> </tr> <tr> <td>MB-ZRD</td> <td>fast opening</td> <td>with</td> <td>with</td> </tr> <tr> <td>MB-ZRDLE</td> <td>slowly opening</td> <td>with</td> <td>with</td> </tr> <tr> <td>MB-ZRLE</td> <td>slowly opening</td> <td>with</td> <td>without</td> </tr> </tbody> </table> |                                                                                           |                        | Valve V2 design | Partial volume restrictor | Main volume restrictor | MB-ZR | fast opening | with | without | MB-ZRD | fast opening | with | with | MB-ZRDLE | slowly opening | with | with | MB-ZRLE | slowly opening | with | without |
|                                                                                                | Valve V2 design                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Partial volume restrictor                                                                 | Main volume restrictor |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| MB-ZR                                                                                          | fast opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | with                                                                                      | without                |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| MB-ZRD                                                                                         | fast opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | with                                                                                      | with                   |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| MB-ZRDLE                                                                                       | slowly opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | with                                                                                      | with                   |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| MB-ZRLE                                                                                        | slowly opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | with                                                                                      | without                |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Measuring / Ignition gas connection                                                            | For G 1/8 as per DIN ISO 228, refer on page 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Burner pressure monitor p <sub>Br</sub>                                                        | Connection downstream of valve V2, pressure switch mountable on adapter laterally                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Voltage / Frequency                                                                            | 50 - 60 Hz, 220 - 230 V AC, -15 % +10 %                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Electrical connection                                                                          | Plug connection as per DIN EN 175301-803 for valves and pressure switches                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Rating / Power consumption<br>Switch-on duration<br>Degree of protection<br>Radio interference | Refer to Dimensions on page 5<br>100 %<br>IP 54 as per IEC 529 (EN 60529)<br>Interference degree N                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Materials of gas conveying parts                                                               | Housing<br>Diaphragms, seals<br>Solenoid drive                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | aluminium die casting<br>NBR basis, Silopren (silicone rubber)<br>steel, brass, aluminium |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Installation position                                                                          | Solenoid vertically upright or lying horizontally as well as its intermediate positions.                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Closed position signal contact                                                                 | Closed position signal contact, type K01/1 (DIN-tested), mountable to V2                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |



| Equipment variants<br>GasMultiBloc®...B01<br>Two-stage function                            | 415 B01          | 420 B01          |                                                                                            |
|--------------------------------------------------------------------------------------------|------------------|------------------|--------------------------------------------------------------------------------------------|
| MB-ZR                                                                                      | •                | •                | Filter element can be removed. A suitable GF.../1 gas filter must then be fitted upstream. |
| MB-ZRD                                                                                     | •                | •                |                                                                                            |
| MB-ZRDLE                                                                                   | •                | •                |                                                                                            |
| MB-ZRLE                                                                                    | •                | •                |                                                                                            |
| Microfilter (standard) with sieve                                                          | •                | •                |                                                                                            |
| Gas pressure switch<br>downstream of filter<br>downstream of valve V2 on adapter laterally | •<br>•           | •<br>•           |                                                                                            |
| Pressure regulator                                                                         | •                | •                |                                                                                            |
| Valve V1, double seat<br>Valve V2, double seat                                             | •<br>•           | •<br>•           |                                                                                            |
| Valves opening together<br>Valves opening separately                                       | •<br>•           | •<br>•           | S 20, S 50<br>S 22, S 52                                                                   |
| Flange Rp 1<br>Rp 1 1/4<br>Rp 1 1/2<br>Rp 2                                                | •<br>•<br>•<br>• | •<br>•<br>•<br>• | • = possible<br>(•) = on request<br>- = not possible                                       |

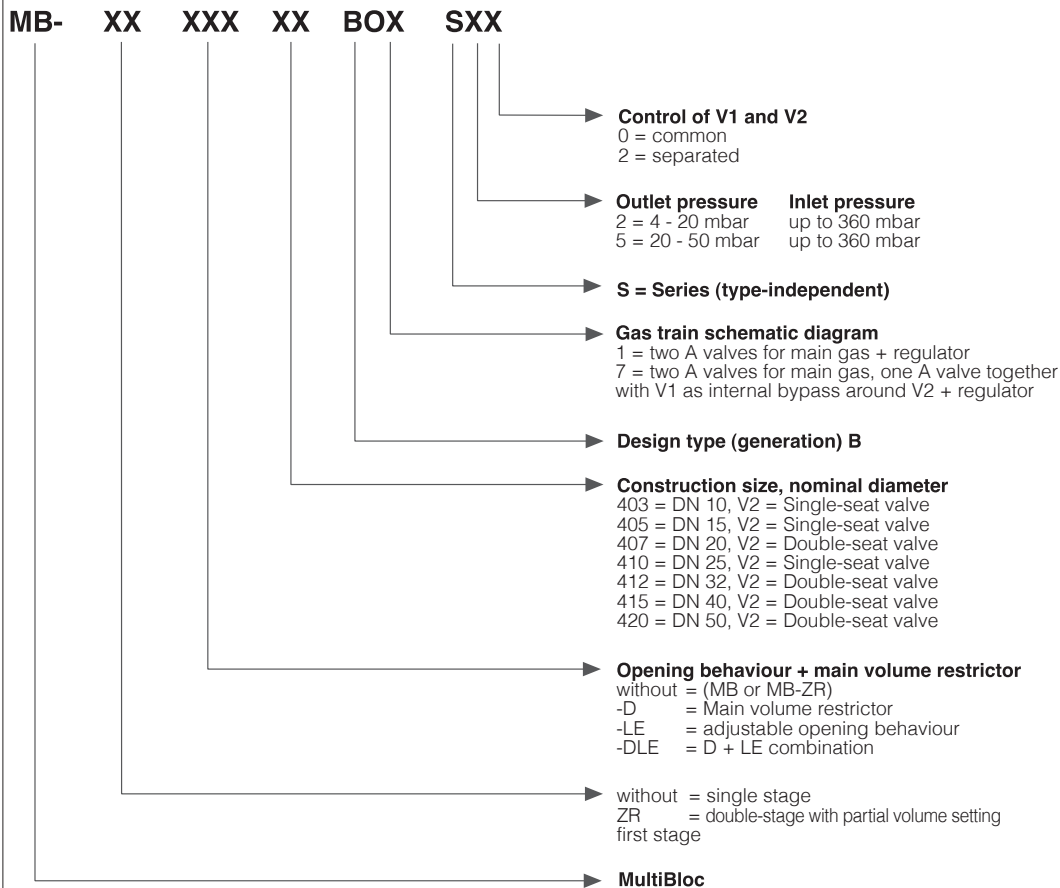
### MB-ZR...B01 design

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

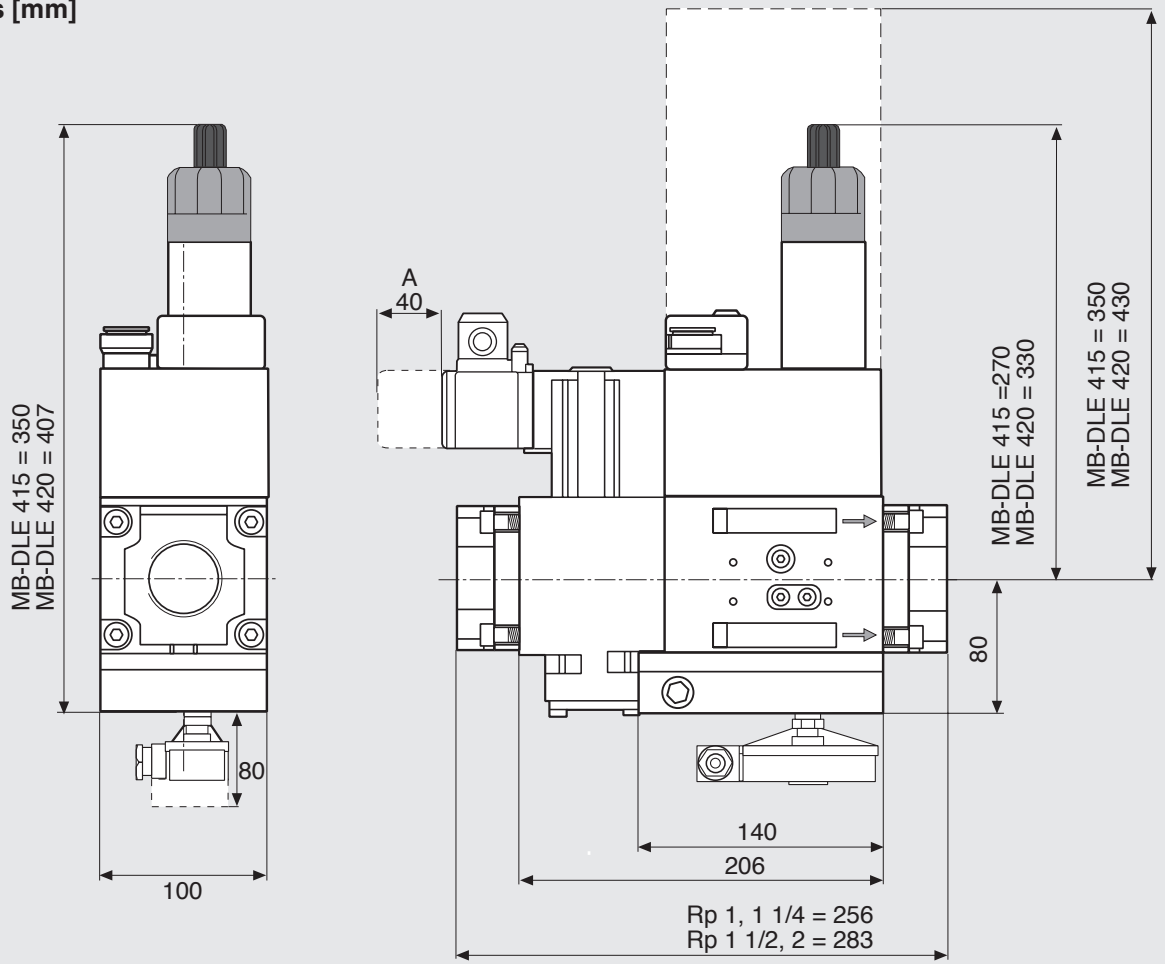


Mounting of VPS 504 valve proving system possible  
Mounting of K01/1 closed position signal contact possible

### Type key of MultiBloc®



**Dimensions [mm]**

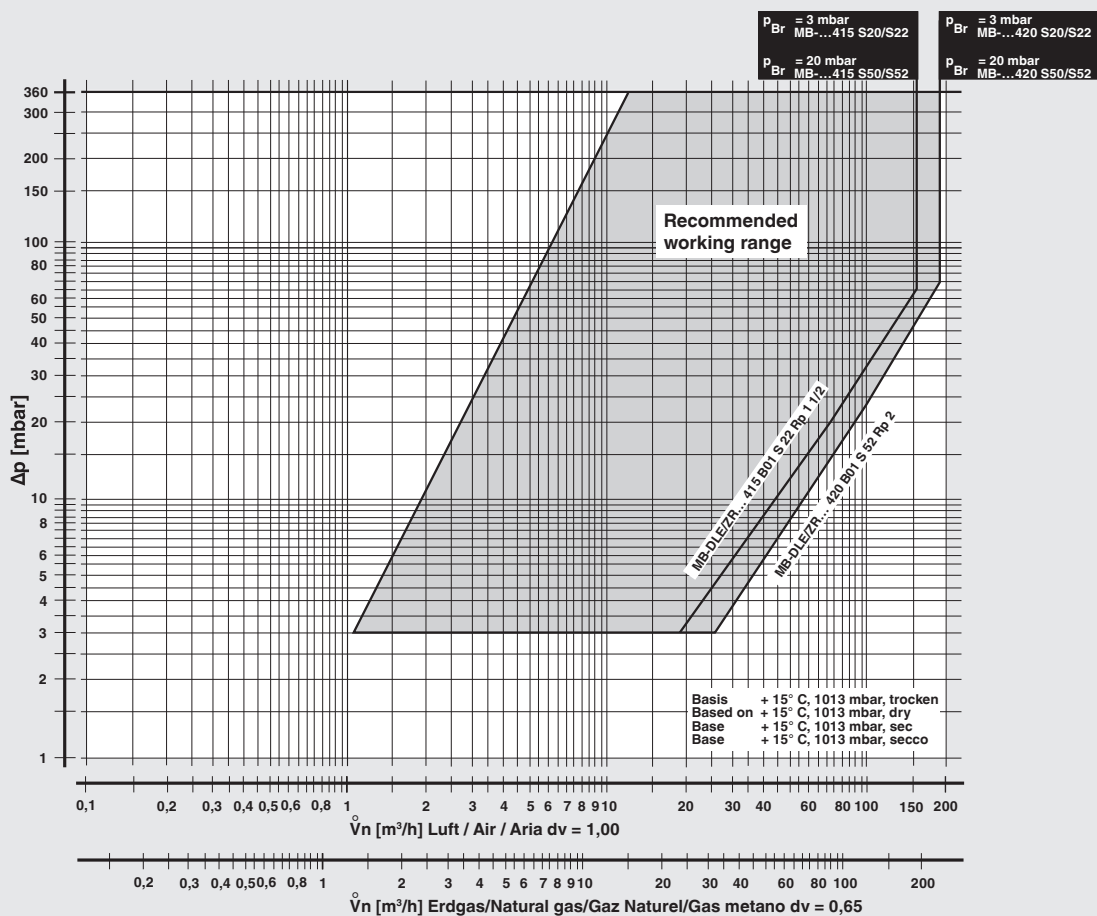


| Type             | Rp       | Opening time | Nominal rating [VA]<br>230 V AC; +20 °C |     |     |     | Weight [kg] |
|------------------|----------|--------------|-----------------------------------------|-----|-----|-----|-------------|
|                  |          |              | S20                                     | S50 | S22 | S52 |             |
| MB-ZRD 415 B01   | Rp 1 - 2 | < 1 s        | 80                                      | 80  | 120 | 120 | 8.0         |
| MB-ZRDLE 415 B01 | Rp 1 - 2 | < 20 s       | 80                                      | 80  | 120 | 120 | 8.1         |
| MB-ZRD 420 B01   | Rp 1 - 2 | < 1 s        | 115                                     | 115 | 135 | 135 | 10,1        |
| MB-ZRDLE 420 B01 | Rp 1 - 2 | < 20 s       | 115                                     | 115 | 135 | 135 | 10.2        |

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

**MB-ZRD(LE) 415 - 420 B01**

**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.

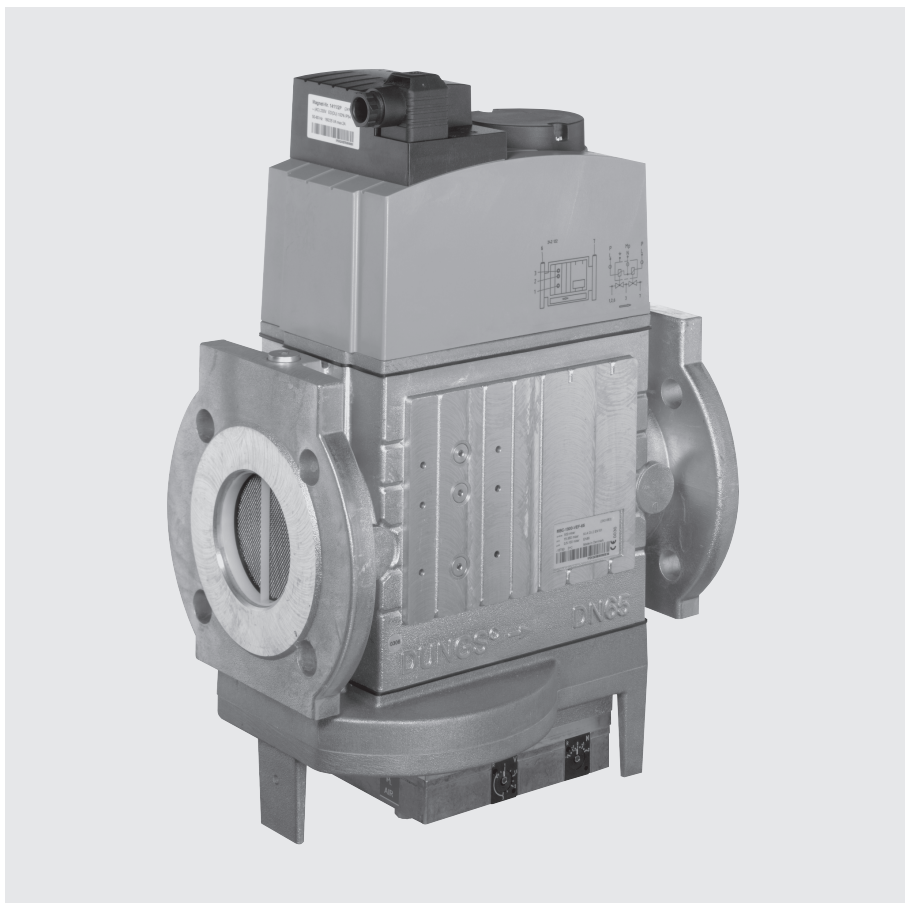
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**Postfach 12 29**  
**D-73602 Schorndorf, Germany**  
**e-mail info@dungs.com**  
**Internet www.dungs.com**

# Double solenoid valve Combined pressure regulator and safety valves Gas-air-ratio-control

**MBC-...-VEF**  
**DN 65 - DN 100**

7.36



## Technical Description

The DUNGS multiple actuator MBC-...-VEF integrates 2 valves and 1 gas-air ratio regulator in one compact unit:

- Solenoid valves up to 500 mbar (50 kPa) as per DIN EN 161 Class A Group 2
- Fine setting of gas and air pressure ratio
- Servo pressure regulator as per DIN EN 88 class A group 2; EN 12067-1
- Internal stepping lines for optimised outlet pressure stability, external as an option.
- Flange connection as per ISO 7005
- Easy to install

As this system has a modular design, we can offer individual solutions with valve testing system, mini/maxi pressure switch and pressure limiter. Despite the compact design, high flow rates can be achieved at low pressure difference.

## Application

The gas-air ratio regulator permits optimal mixture formation in forced air burners and premix burners. This applies to modulating and two-stage variable operating modes. Suitable for gases belonging to gas families 1, 2, 3 and other inert gaseous media.

## Approvals

EU type test approval as per EU Gas Appliance Directive.

MBC-...-VEF CE-0085 BO 0236

EU type test approval as per EU Pressure Equipment Directive:

MBC-...-VEF CE0036

Approvals in other important gas-consuming countries.

## Functional Description

### Gas flow

1. If the valves V1 and V2 are closed, chamber a is subjected to inlet pressure up to the double seat of the valve V1.
2. The min. pressure switch (option) is connected to chamber a via a bore hole. If the inlet pressure exceeds the desired value set on the pressure switch, the pressure switch connects through to the gas burner control system.
3. The valves V1 and V2 open after they are enabled by the gas burner control system. Gas flow through chambers a, b and c is enabled.

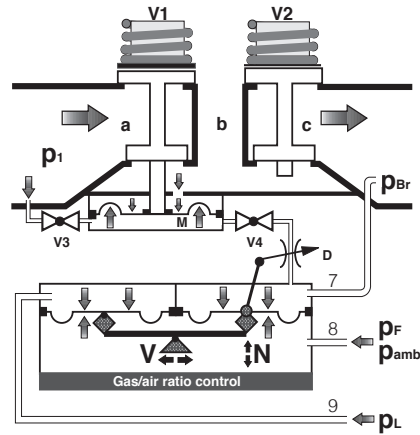
### Functional description of the combined valve-regulator unit at valve V1

A regulator (pressure regulator unit) with admission pressure compensation is integrated in valve V1. The plunger V1 is not connected to the valve disc unit. When the plunger opens, it preloads the compression spring and releases the regulator unit. When the plunger closes, the closing pressure is applied directly to the valve discs of the regulator unit. Valves V1 and V2 are driven together electrically. When valve V3 is in the closed position, it closes off the pressure chamber under the working diaphragm M so that this chamber is not affected by the inlet pressure  $p_1$  in chamber a. The plunger of valve V1 controls the valve V3. The pressure under the working diaphragm M depends on a variable flow cross-section D. The comparison diaphragms for burner pressure  $p_{Br}$  and blower pressure  $p_L$  are connected with a bar. The ratio V can be set by shifting the bearing point. The zero point compensation N acts on this bar. Ambient pressure  $p_{amb}$  or firing chamber pressure  $p_F$  must be applied to the opposite side of the comparison diaphragms. The firing chamber overpressure reduces the burner pressure when the ratio  $V > 1$ . If there are any changes in the equilibrium of forces, the flow cross-section D after the valve V4 is changed. The pressure under the working diaphragm is re-adjusted, and the valve disc unit V1 changes the free cross-section.

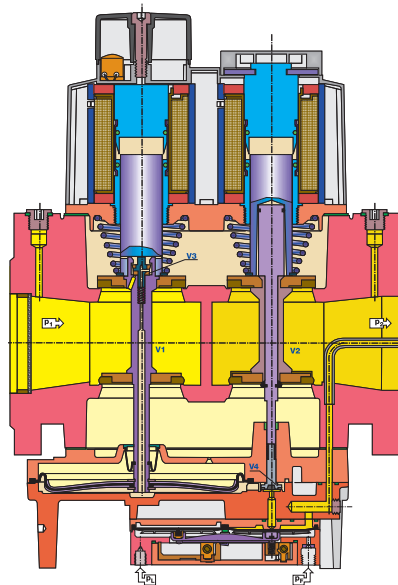
### Functional description valve V2

The plunger of the valve V2 is connected to the valve disc unit. When the plunger opens, it preloads the compression spring. The valve V2 opens completely without any delay. The valve V4 is actuated by the valve V2. When the valve V4 is in the closed position, it closes off the area under the working

## Schematic diagram MBC-...-VEF

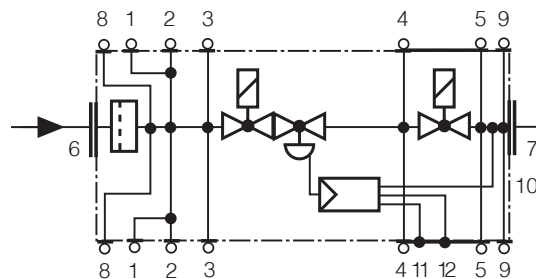


|    |                         |            |                                        |
|----|-------------------------|------------|----------------------------------------|
| V1 | Main valve 1            | a, b, c    | Pressure chambers in flow direction    |
| V2 | Main valve 2            |            |                                        |
| V3 | Control valve 3         | $p_1$      | Inlet pressure                         |
| V4 | Control valve 4         | $p_{Br}$   | Burner pressure, outlet pressure       |
|    |                         | $p_{amb}$  | Ambient pressure                       |
| M  | Working diaphragm       |            |                                        |
| D  | Restrictor              | 2, 3, 4, 5 | Screw plug G 1/8                       |
| V  | Ratio setting           | 1, 6       | Screw plug G 1/4                       |
| N  | Zero point compensation | 7, 8, 9    | Stepping line $p_{Br}$ , $p_F$ , $p_L$ |



## Pressure taps, gas train diagram

### MBC-...-VEF



diaphragm M so that this area is not affected by the burner pressure.

### Closing function

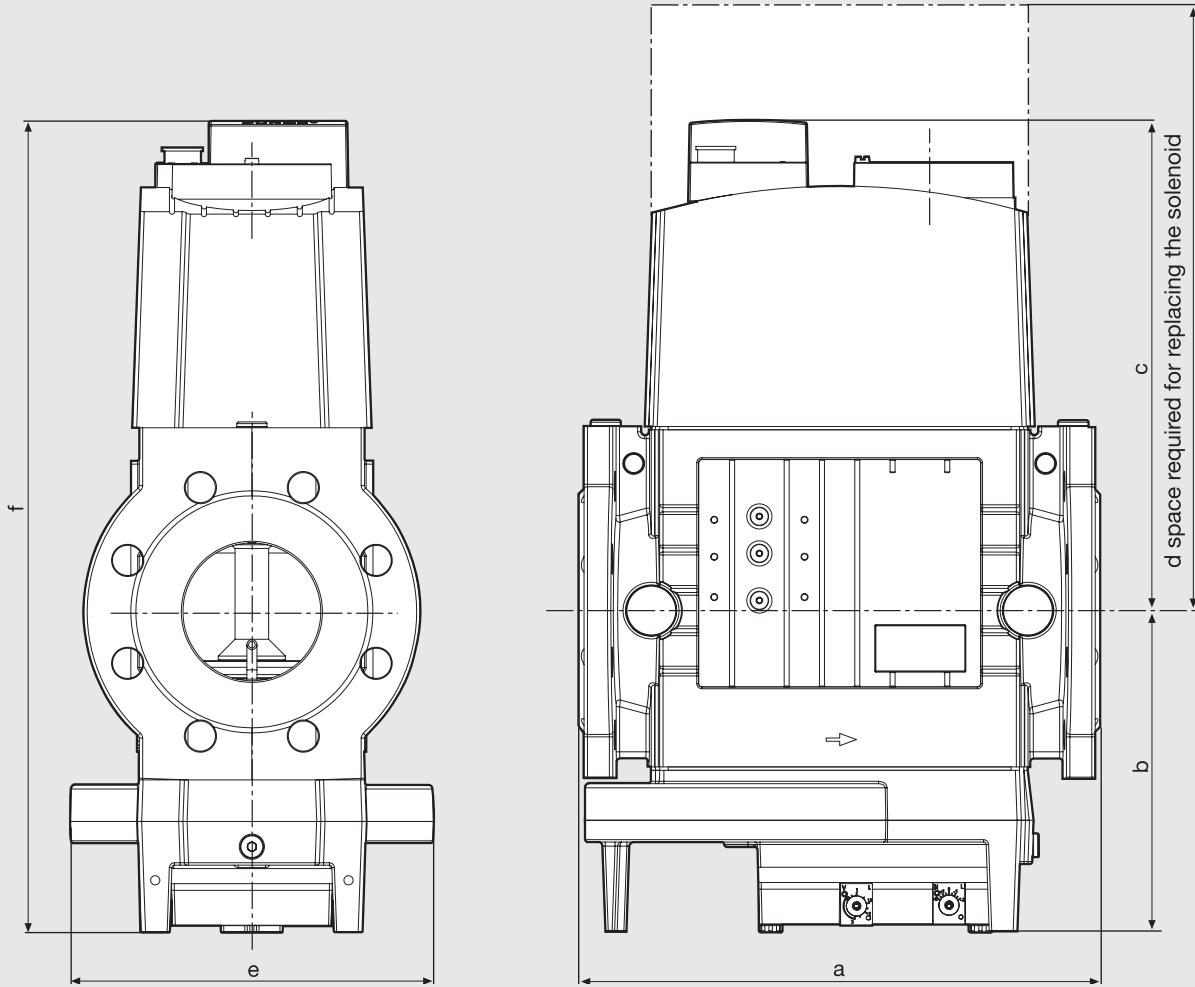
If there is an interruption in the power supply to the solenoid coils of the main valves V1 and V2, they are closed by the compression springs in  $<1s$ .



## Technical Data

| Nominal widths                                                                                                            | DN 65 80 100<br>Connection flanges as per EN 1092-1 for welding neck flanges as per DIN 2633 (PN16) DN 65 - DN 100<br>Length as per DIN 3202 part 1, series F1.                                                                                                                                                                                                                                                                                                                                                                                                  |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------|---------------------------|-----------------------------------|---------------------|-----------------|--------|--------|----------|----------|-----------------|---------|--------|----------|----------|------------------|---------|--------|----------|----------|
| <b>Max. operating overpressure</b><br><b>Inlet pressure range</b><br><b>Burner pressure range</b><br><b>Guiding range</b> | <b>500 mbar (50 kPa)</b><br><b>p<sub>e</sub> : 15 mbar (1.5 kPa) to 360 mbar (36 kPa)</b><br><b>p<sub>Br</sub> : 0,5 mbar (0.05 kPa) to 100 mbar (10 kPa)</b><br><b>p<sub>L</sub> : 0,4 mbar (0.04 kPa) to 100 mbar (10 kPa)</b>                                                                                                                                                                                                                                                                                                                                 |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Media                                                                                                                     | Gases belonging to gas families 1, 2, 3 and other inert gaseous media.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Ambient temperature                                                                                                       | -15 °C to +60 °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Dirt trap device                                                                                                          | Filter. <b>A suitable gas filter must be connected upstream.</b><br>For further information, see data sheet 11.02 "Gas and air filter".                                                                                                                                                                                                                                                                                                                                                                                                                          |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Pressure switch                                                                                                           | The system can be equipped with pressure switch types GW A5, ÜB A2, NB A2 as per DIN EN 1854. In case of DN 65 GW...A5 cannot be mounted on item 2. For further information, see data sheets 5.07 and 5.02 "Pressure switches for DUNGS multiple actuators".                                                                                                                                                                                                                                                                                                     |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Servo pressure regulator                                                                                                  | Pressure regulator with admission pressure compensation, sealed with valve V1 when switched off, as per DIN EN 88 Class A<br>Gas-air ratio regulator with adjustable ratio V as well as zero point compensation N and firing chamber pressure connection                                                                                                                                                                                                                                                                                                         |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Ratio setting range V                                                                                                     | Ratio V = p <sub>Br</sub> / p <sub>L</sub> 0.75 : 1 ... 3 : 1, other ratios on request                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Zero point compensation N                                                                                                 | possible                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Solenoid valve V1, V2                                                                                                     | Valve as per DIN EN 161 Class A Group 2; fast-closing, fast-opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Measuring gas connection                                                                                                  | G 1/4 DIN ISO 228; at inlet and outlet flanges, G 1/8 on both sides after the filter, on both sides between V1 and V2, after V2 (if the pressure switch is assembled, it may not be possible to install a measuring gas connection in some cases)                                                                                                                                                                                                                                                                                                                |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Burner pressure monitoring device p <sub>Br</sub>                                                                         | after valve V2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Stepping line                                                                                                             | G 1/8 connection as per DIN ISO 228 for burner pressure (p <sub>Br</sub> : gas)<br><b>Stepping and connection lines must be made of steel and ≥ PN1, DN4. Condensate from stepping and connection lines may not enter the fitting. The operating and assembly instructions must be strictly followed.</b>                                                                                                                                                                                                                                                        |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Voltage / frequency                                                                                                       | ~ (AC) 50 -60 Hz 230 V -15 % +10 %<br>Standard voltages: 110 - 120 VAC, 24 – 28 VDC                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Electrical connection                                                                                                     | Plug-in connection as per DIN EN 175301-803                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Power / current draw<br>Switch-on duration<br>Degree of protection                                                        | at ~ (AC) 230 V; +20 °C: see type overview<br>100 % duty<br>IP 54 as per IEC 529 (EN 60529)                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Material used for gas-conveying parts                                                                                     | Housing cast aluminium<br>Diaphragms, seals NBR-based, Silopren (silicone rubber)<br>Solenoid drive aluminium, steel, brass                                                                                                                                                                                                                                                                                                                                                                                                                                      |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Installation position                                                                                                     | Vertical with upright solenoid                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                           |                                   |                           |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| Power / current draw at ~(AC) 230 V, + 20 °C<br>all indications are effective values                                      | <table border="1"> <thead> <tr> <th>Type</th> <th>Starting power approx. [W]</th> <th>Holding power approx. [W]</th> <th>Break-away start- ing current [A]</th> <th>Holding current [A]</th> </tr> </thead> <tbody> <tr> <td>MBC-1900...- 65</td> <td>2 x 95</td> <td>2 x 20</td> <td>2 x 0.54</td> <td>2 x 0.20</td> </tr> <tr> <td>MBC-3100...- 80</td> <td>2 x 125</td> <td>2 x 25</td> <td>2 x 0.54</td> <td>2 x 0.20</td> </tr> <tr> <td>MBC-5000...- 100</td> <td>2 x 125</td> <td>2 x 25</td> <td>2 x 0.54</td> <td>2 x 0.20</td> </tr> </tbody> </table> | Type                      | Starting power approx. [W]        | Holding power approx. [W] | Break-away start- ing current [A] | Holding current [A] | MBC-1900...- 65 | 2 x 95 | 2 x 20 | 2 x 0.54 | 2 x 0.20 | MBC-3100...- 80 | 2 x 125 | 2 x 25 | 2 x 0.54 | 2 x 0.20 | MBC-5000...- 100 | 2 x 125 | 2 x 25 | 2 x 0.54 | 2 x 0.20 |
| Type                                                                                                                      | Starting power approx. [W]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Holding power approx. [W] | Break-away start- ing current [A] | Holding current [A]       |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| MBC-1900...- 65                                                                                                           | 2 x 95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2 x 20                    | 2 x 0.54                          | 2 x 0.20                  |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| MBC-3100...- 80                                                                                                           | 2 x 125                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2 x 25                    | 2 x 0.54                          | 2 x 0.20                  |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |
| MBC-5000...- 100                                                                                                          | 2 x 125                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 2 x 25                    | 2 x 0.54                          | 2 x 0.20                  |                                   |                     |                 |        |        |          |          |                 |         |        |          |          |                  |         |        |          |          |

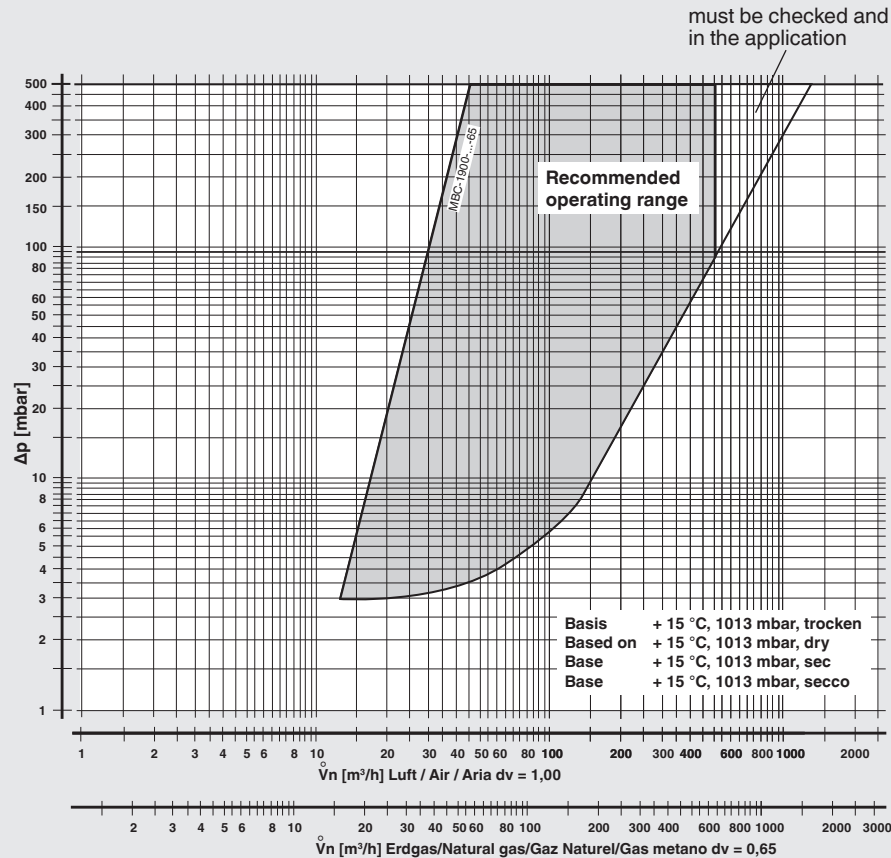
## Dimensions MBC-...-VEF



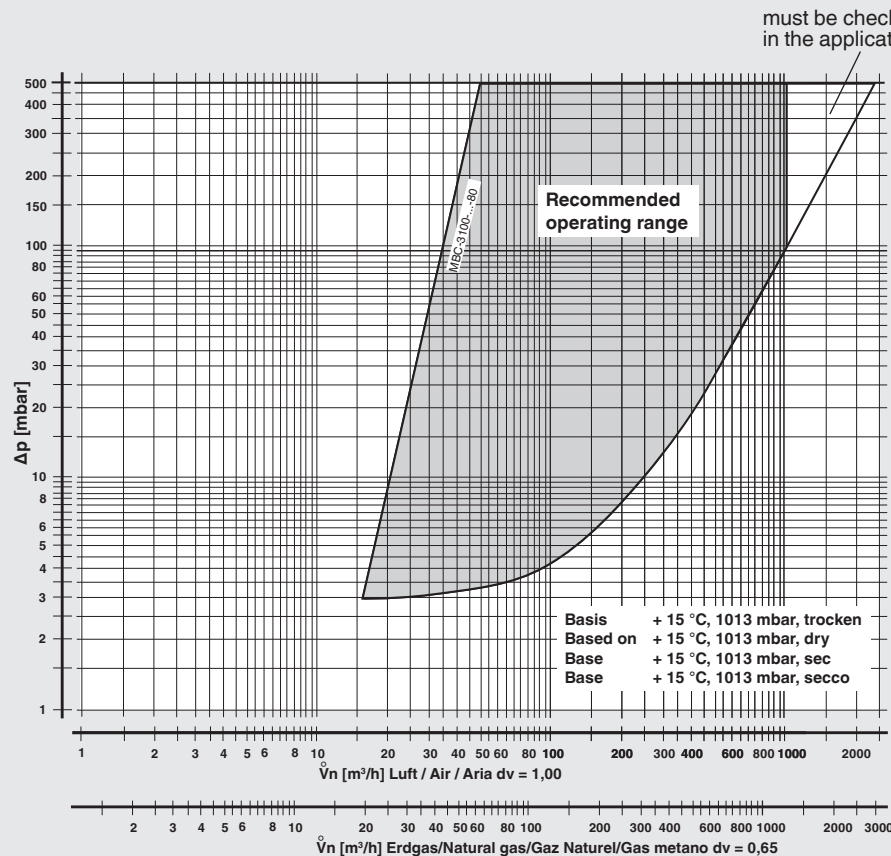
| Type             | Ordering No. | DN     | P <sub>max.</sub><br>[W] | I <sub>max.</sub><br>~[A] | Opening time | Dimensions<br>[mm] |     |     |     |     |     | Solenoid<br>No. | Switching<br>operations/h | Weight<br>[kg] |
|------------------|--------------|--------|--------------------------|---------------------------|--------------|--------------------|-----|-----|-----|-----|-----|-----------------|---------------------------|----------------|
|                  |              |        |                          |                           |              | a                  | b   | c   | d   | e   | f   |                 |                           |                |
| MBC-1900-VEF-65  | 243 083      | DN 65  | 190                      | 1.8                       | < 1 s        | 290                | 168 | 246 | 365 | 196 | 414 | 1511/2P         | 60                        | 18.4           |
| MBC-3100-VEF-80  | 244 428      | DN 80  | 250                      | 1.8                       | < 1 s        | 310                | 190 | 292 | 450 | 216 | 482 | 1611/2P         | 60                        | 26.0           |
| MBC-5000-VEF-100 | 244 301      | DN 100 | 250                      | 1.8                       | < 1 s        | 350                | 235 | 329 | 500 | 250 | 564 | 1711/2P         | 60                        | 33.3           |

Characteristic curves for volume flow pressure difference in steady state with filter. A suitable gas filter must be used.

**MBC-1900-VEF-65**



**MBC-3100-VEF-80**



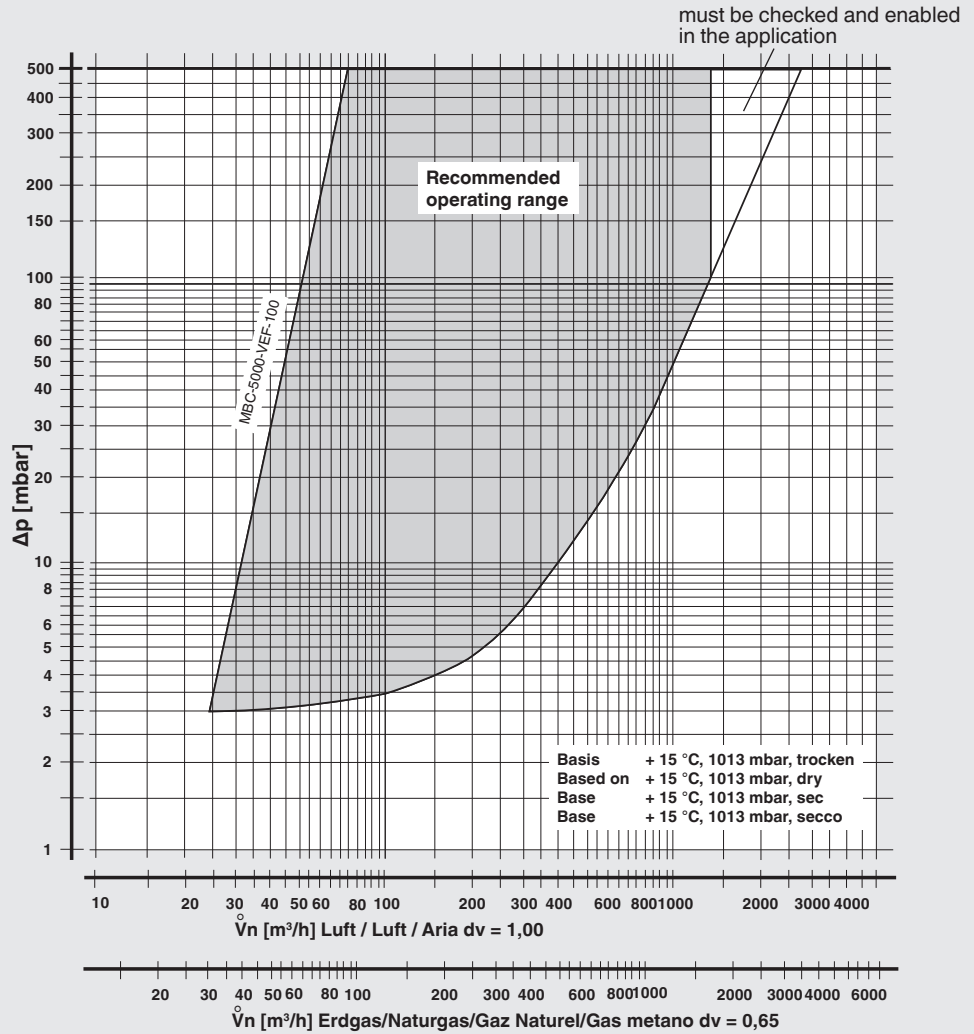
$$f = \sqrt{\frac{\text{Air density}}{\text{Density of the gas used}}}$$

$$\dot{V}_{\text{gas used}} = \dot{V}_{\text{air}} \times f$$

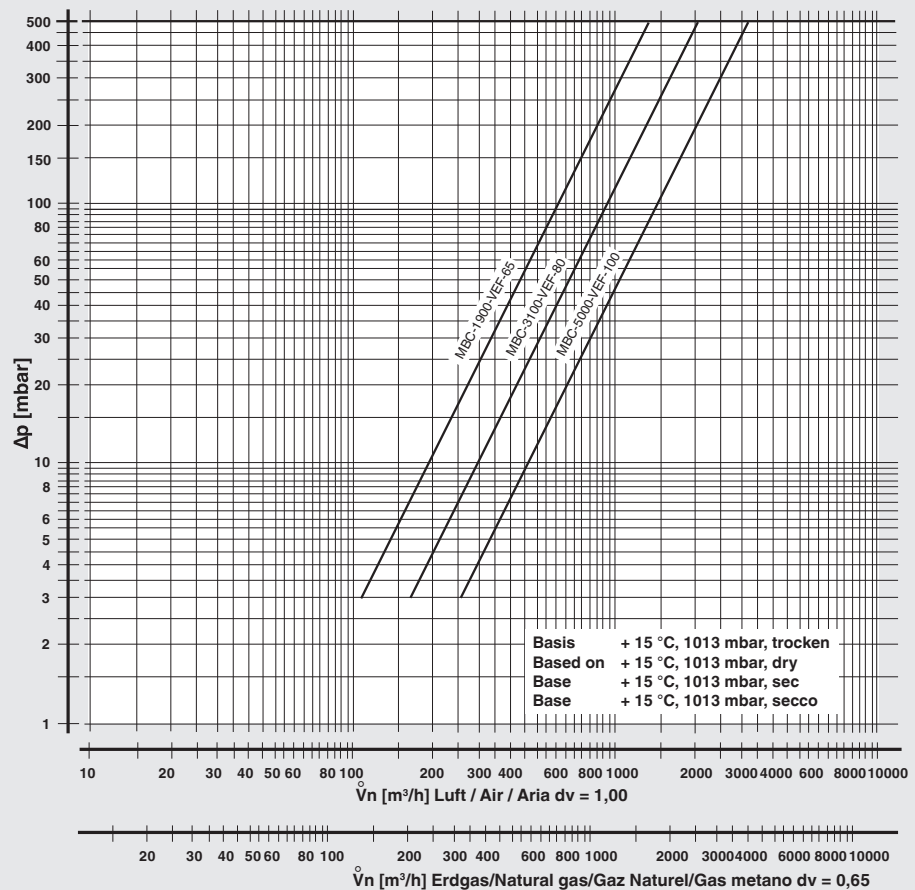
| Gas type      | Density [kg/m³] | f    |
|---------------|-----------------|------|
| Natural gas   | 0,81            | 1,24 |
| Town gas      | 0,58            | 1,46 |
| Liquefied gas | 2,08            | 0,77 |
| Air           | 1,24            | 1,00 |

Characteristic curves for volume flow pressure difference in steady state with filter. A suitable gas filter must be used.


**MBC-5000-VEF-100**



**mechanically open**



| System accessories                                    | Further information                |
|-------------------------------------------------------|------------------------------------|
| <b>Pressure switch</b><br>ÜB...A2, NB...A4<br>GW...A5 | Data sheet 5.07<br>Data sheet 5.02 |
| <b>Gas filter</b><br>GF/3 DN...                       | Data sheet 11.02                   |
| <b>Valve testing system</b><br>VPS 504 S04            | Data sheet 8.10                    |
| <b>Motorised butterfly valve</b><br>DMK DN...         | Data sheet 11.11                   |

 The DMV-VEF has been designed for direct assembly of DUNGS system accessories and supplementary equipment.

|                                                | Ordering no.   |
|------------------------------------------------|----------------|
| <b>Line socket 3 pole + PE</b>                 | <b>210 319</b> |
| <b>Adapter, pressure gauge flange set G1/2</b> | <b>216 675</b> |
| <b>Ignition gas flange G 3/4</b>               | <b>219 006</b> |
| <b>Cover, on the side</b>                      | <b>219 005</b> |

 Flanges, plug-in connection and system accessories must be ordered separately.



**Double solenoid valve  
 Combined pressure regulator and  
 safety valves  
 Infinitely variable operating mode**

**MBC-...-VEF  
 DN 65 - DN 100**

**Key data**

| Key data MBC-...-VEF                                                                             | Application 1 | Application 2 |
|--------------------------------------------------------------------------------------------------|---------------|---------------|
| <b>Gas</b><br>Type of gas / specific density [kg/m <sup>3</sup> ]                                |               |               |
| <b>Volumetric flow V [m<sup>3</sup>/h]</b><br>V <sub>min.</sub><br><br>V <sub>max.</sub>         |               |               |
| <b>Inlet pressure p<sub>e</sub> [mbar]</b><br>p <sub>e,min.</sub><br><br>p <sub>e,max.</sub>     |               |               |
| <b>Burner pressure p<sub>Br</sub> [mbar]</b><br>at V <sub>min.</sub><br><br>at V <sub>max.</sub> |               |               |
| <b>Control range, power range</b>                                                                |               |               |
| <b>Time taken to re-adjust volume restrictors from small load to large load [s]</b>              |               |               |
| <b>Starting load [m<sup>3</sup>/h]</b>                                                           |               |               |
| <b>Company / address</b>                                                                         |               |               |
| <b>Name / person in charge</b>                                                                   |               |               |
| <b>Telephone</b>                                                                                 |               |               |

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

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 Internet www.dungs.com**

# GasMultiBloc®

## Combined servo pressure regulator and safety shut-off valves

**MBC-300-SE**  
**MBC-700-SE**  
**MBC-1200-SE**  
**MBC-300-N**  
**MBC-700-N**

7.01

neovità  
nouveau new

- Max. operating pressure  
360 mbar (36 kPa)
- Compact design
- High flow rates
- Low weight
- Low power consumption
- Modulating mode
- Adjustable outlet pressure up  
to 300 mbar (30 kPa)
- Other servo pressure regulator  
variants:
  - zero pressure
  - constant pressure
- Mountable accessories
  - Pressure switch
  - VPS



### Technical Description

The DUNGS multiple actuator MBC...SE integrates filter, valves and servo pressure regulator in one compact unit:

- Dirt trap: Microfilter
- 2 Solenoid valves up to 360 mbar (36 kPa) to DIN EN 161 Class A Group 2, fast opening
- Servo pressure regulator unit to DIN EN 88 Class A Group 2
- Outlet pressure: 0 - 300 mbar (0 - 30 kPa)
- Precision regulation of outlet pressure
- For optimal outlet pressure stability
- Flanged joints with pipe threads to ISO 7/1 or NPT
- Easy to install
- Low weight

The modular system permits individual solutions with valve proving system, min./max. pressure switches and pressure limiters. High flow rates at low pressure differences.

### Application

The servo pressure regulator permits optimal mixture formation in forced air burners and premix burners in conjunction with mechanical or electronic integrated gas-air regulation units; this applies to modulating and multi-stage floating operating mode. Suitable for gases of gas families 1,2,3 and other inert gaseous media.

### Approvals

EC type test approval as per EC Gas Appliance Directive:

MBC...SE CE-0085 BM 0345

EC type test approval as per EC Pressure Equipment Directive:

MBC...SE CE0036

Approvals in other important gas consuming countries.

## Functional Description

### Gas flow

1. If valves V1 and V2 are closed, chamber a is subjected to inlet pressure.
2. The min. pressure switch (option) is connected to chamber a via a boring.
3. After they are enabled by the gas burner control system, valves V1 and V2 open. Gas flow is released through chambers a and b.

### Functional description of the combined valve-regulator unit

Valves V1 and V2 can be controlled electrically and separately. Each valve preloads its own compression spring when the plunger opens. When the two valves are open, a pressure pulse runs below the working diaphragm. The size of the pressure pulse changes as a factor of the variable restrictor position D. The outlet pressure  $p_{br}$  acts against the setting spring force via the servo diaphragm until a force equilibrium is attained.

The opposite side of the servo diaphragm is subjected to ambient pressure  $p_{amb}$ .

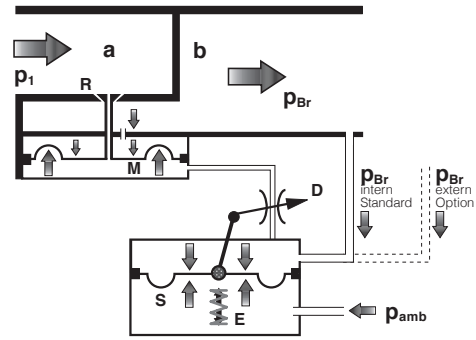
Changes in the equilibrium of forces lead to a change in flow cross-section.

The pressure under the working diaphragm re-adjusts itself. The regulator unit adapts the free valve cross-section to the new flow requirement.

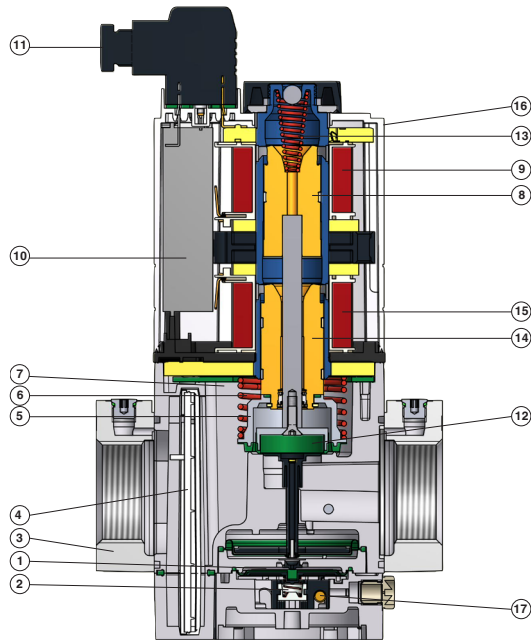
### Closing function

If there is an interruption in power supply to the solenoids of valves V1 and V2, they are closed by the compression springs within <1s.

## Schematic diagram MBC...SE/N

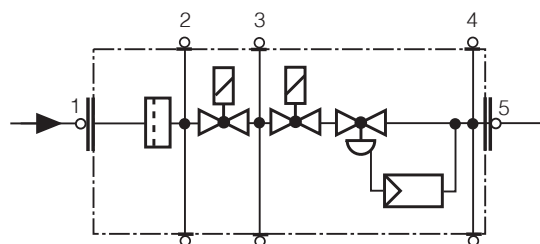


|   |                                             |           |                                     |
|---|---------------------------------------------|-----------|-------------------------------------|
| M | Working diaphragm                           | a, b      | Pressure chambers in flow direction |
| D | Restrictor                                  | $p_1$     | Inlet pressure                      |
| S | Servo diaphragm                             | $p_{br}$  | Burner pressure, outlet pressure    |
| E | Setting spring for outlet pressure $p_{br}$ | $p_{amb}$ | Ambient pressure                    |
| R | Regulator disc                              |           |                                     |



|   |                         |    |                       |    |                                        |
|---|-------------------------|----|-----------------------|----|----------------------------------------|
| 1 | Pressure regulator unit | 8  | Plunger V1            | 15 | Solenoid V2                            |
| 2 | Regulator spring        | 9  | Solenoid V1           | 16 | Solenoid housing                       |
| 3 | Connecting flange       | 10 | PCB                   | 17 | Adjustment:<br>- Gas pressure $p_{br}$ |
| 4 | Micro-filter            | 11 | Electrical connection |    |                                        |
| 5 | Valve V1                | 12 | Valve V2              |    |                                        |
| 6 | Closing spring V1       | 13 | Closing spring V2     |    |                                        |
| 7 | Housing                 | 14 | Plunger V2            |    |                                        |

### Pressure taps, gas train diagram MBC...SE/N



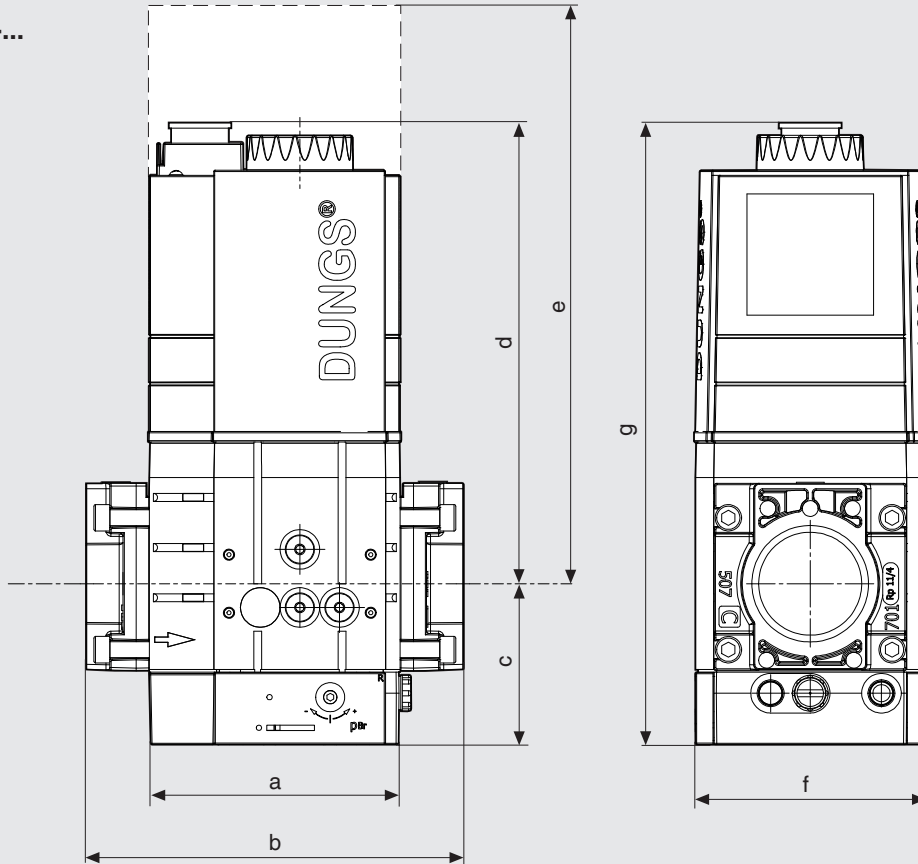
1, 2, 3, 4, 5 Screw plug G 1/8

## Technical Data

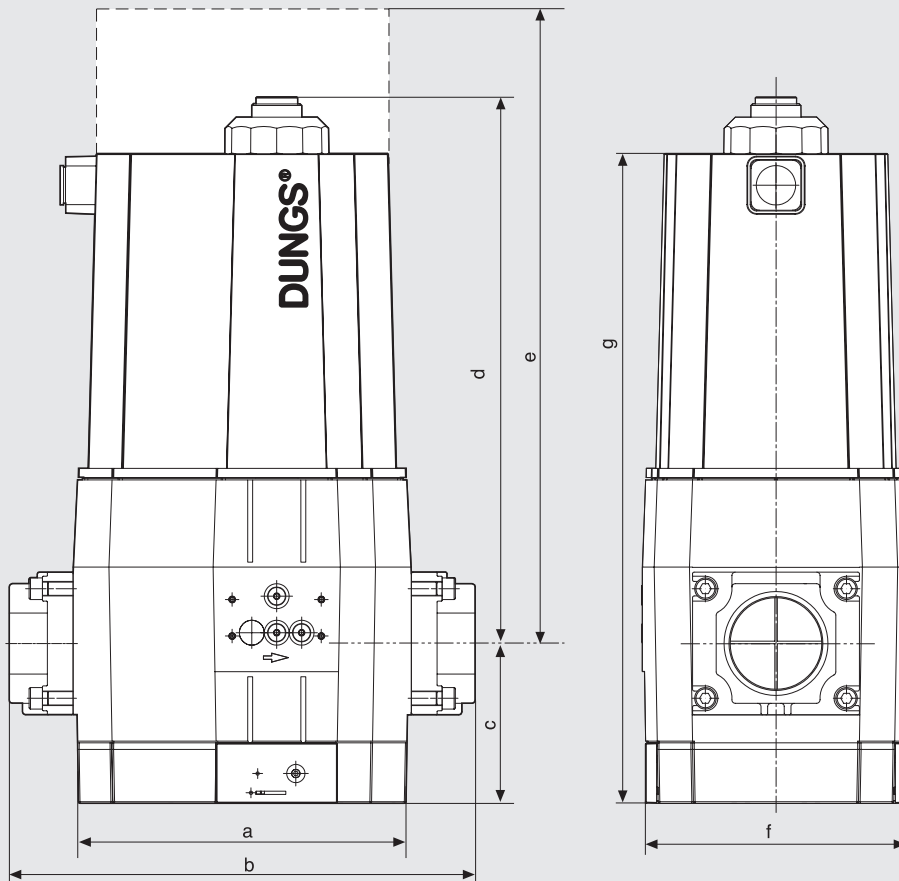
|                                                                      |                                                                                                                                                                                                                                                             |                                                               |                                                                |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------|
| Nominal widths<br>Flanges with pipe threads to<br>ISO 7/1 (DIN 2999) | MBC-300-SE<br>Rp 1/2, 3/4, 1, 1 1/4<br>and their combinations                                                                                                                                                                                               | MBC-700-SE<br>Rp 1, 1 1/4, 1 1/2, 2<br>and their combinations | MBC-1200-SE<br>Rp 1, 1 1/4, 1 1/2, 2<br>and their combinations |
| <b>Max. operating pressure</b>                                       | <b>360 mbar (36 kPa)</b>                                                                                                                                                                                                                                    |                                                               |                                                                |
| <b>Inlet pressure ranges</b>                                         | <b>S22/S82:</b> $p_e = 15 - 360 \text{ mbar (1.5 - 36 kPa)}$<br><b>S302:</b> $p_e = 35 - 360 \text{ mbar (3.5 - 36 kPa)}$<br><b>S02/N:</b> $p_e = 15 - 100 \text{ mbar (1.5 - 10 kPa)}$                                                                     |                                                               |                                                                |
| <b>Burner pressure ranges</b>                                        | <b>S22:</b> $p_{Br} = 4 - 20 \text{ mbar (0.4 - 2 kPa)}$<br><b>S82:</b> $p_{Br} = 5 - 80 \text{ mbar (0.5 - 8 kPa)}$<br><b>S302:</b> $p_{Br} = 30 - 300 \text{ mbar (3 - 30 kPa)}$<br><b>S02/N:</b> $p_{Br} = 0 \pm 2 \text{ mbar (0} \pm 0.2 \text{ kPa)}$ |                                                               |                                                                |
| Media                                                                | Gases of gas families 1, 2, 3 and other inert gaseous media                                                                                                                                                                                                 |                                                               |                                                                |
| Ambient temperature                                                  | -15 °C up to +70 °C (in LPG plants, do not operate MBC...SE below 0 °C. Only suitable for gaseous LPG, liquid hydrocarbons destroy the seal materials)                                                                                                      |                                                               |                                                                |
| Dirt trap device                                                     | Micro-filter made of chopped-strand nonwoven fabric. Filter replaceable without removing fitting                                                                                                                                                            |                                                               |                                                                |
| Pressure switch                                                      | Types GW A5, NB A2, ÜB A2 as per DIN EN 1854 retrofitable.<br>For further information refer to Data Sheets „Pressure switch for DUNGS multiple actuators“ 5.03 and 5.12                                                                                     |                                                               |                                                                |
| Servo pressure regulator                                             | Servo pressure regulator with adjustable burner pressure, as per DIN EN 88 Class A, Group 2<br>Versions for constant pressure and zero pressure available                                                                                                   |                                                               |                                                                |
| Solenoid valve V1, V2                                                | Valves as per DIN EN 161 Class A Group 2, fast-closing, fast-opening                                                                                                                                                                                        |                                                               |                                                                |
| Measuring gas connection                                             | G 1/8 DIN ISO 228, at inlet and outlet flanges, on both sides downstream of filter, between V1 and V2, downstream of V2 (fitting pressure switch may partially exclude measuring gas connection)                                                            |                                                               |                                                                |
| Voltage/frequency                                                    | ~(AC) 50 - 60 Hz 230 V -15 % +10 %, other voltages on request.<br>Standard voltages: ~(AC) 100 V - 120 V, =(DC) 24 V - 28 V                                                                                                                                 |                                                               |                                                                |
| Electrical connection                                                | Plug-in connection as per DIN EN 175301-803                                                                                                                                                                                                                 |                                                               |                                                                |
| Rating/power consumption                                             | at ~ (AC) 230 V; +20 °C: see type summary                                                                                                                                                                                                                   |                                                               |                                                                |
| Switch-on duration                                                   | 100 % ED                                                                                                                                                                                                                                                    |                                                               |                                                                |
| Switching cycles                                                     | 60 per hour (30 s on/off)                                                                                                                                                                                                                                   |                                                               |                                                                |
| Degree of protection                                                 | IP 54 as per IEC 529 (EN 60529)                                                                                                                                                                                                                             |                                                               |                                                                |
| Radio interference suppression                                       | Interference level N                                                                                                                                                                                                                                        |                                                               |                                                                |
| Materials of gas-conveying parts                                     | Housing<br>Diaphragms, seals<br>Solenoid drive                                                                                                                                                                                                              | die-cast aluminium<br>on NBR base<br>steel, aluminium         |                                                                |
| Installation position                                                | S22/S82/S302: Vertical with upright solenoid or horizontal with horizontal solenoid, as well as their spacers.<br>S02/N: Vertical with upright solenoid                                                                                                     |                                                               |                                                                |

Mounting dimensions [mm]

MBC-300/700-...



MBC-1200-...




e = space requirement for solenoid replacement



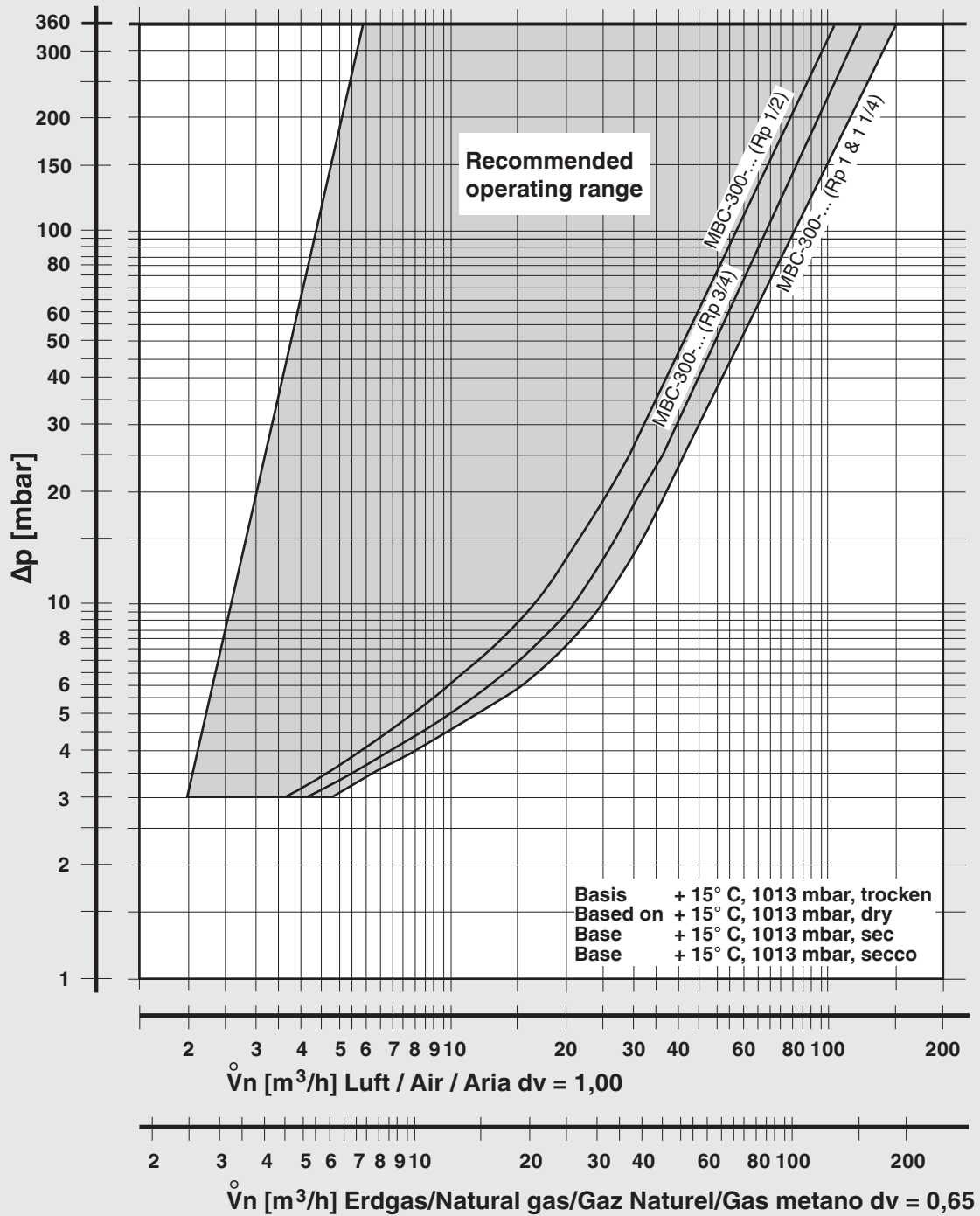
| Type Version     | Order No. 230 VAC | DN Rp      | Opening time | Mounting dimensions [mm] |     |    |     |     |     |     |       |    | Solenoid No. | Switching ops/h | Weight [kg] |
|------------------|-------------------|------------|--------------|--------------------------|-----|----|-----|-----|-----|-----|-------|----|--------------|-----------------|-------------|
|                  |                   |            |              | a                        | b   | c  | d   | e   | f   | g   |       |    |              |                 |             |
| MBC-300-SE S22   | 261 645           | 1/2 - 11/4 | < 1 s        | 95                       | 143 | 61 | 175 | 297 | 87  | 236 | 032/P | 60 | 3.6          |                 |             |
| MBC-300-SE S82   | 261 644           | 1/2 - 11/4 | < 1 s        | 95                       | 143 | 61 | 175 | 297 | 87  | 236 | 032/P | 60 | 3.6          |                 |             |
| MBC-300-SE S302  | 261 647           | 1/2 - 11/4 | < 1 s        | 95                       | 143 | 61 | 175 | 297 | 87  | 236 | 032/P | 60 | 3.6          |                 |             |
| MBC-300-N        | on request        | 1/2 - 11/4 | < 1 s        | 95                       | 143 | 61 | 175 | 297 | 87  | 236 | 032/P | 60 | 3.6          |                 |             |
| MBC-700-SE S22   | 261 646           | 1 - 2      | < 1 s        | 126                      | 176 | 80 | 187 | 310 | 114 | 267 | 042/P | 60 | 5.1          |                 |             |
| MBC-700-SE S82   | 261 652           | 1 - 2      | < 1 s        | 126                      | 176 | 80 | 187 | 310 | 114 | 267 | 042/P | 60 | 5.1          |                 |             |
| MBC-700-SE S302  | 261 648           | 1 - 2      | < 1 s        | 126                      | 176 | 80 | 187 | 310 | 114 | 267 | 042/P | 60 | 5.1          |                 |             |
| MBC-700-N        | on request        | 1 - 2      | < 1 s        | 126                      | 176 | 80 | 187 | 310 | 114 | 267 | 042/P | 60 | 5.1          |                 |             |
| MBC-1200-SE S22  | 245 623           | 1 - 2      | < 1 s        | 204                      | 281 | 96 | 328 | 530 | 161 | 424 | 052/P | 60 | 16.8         |                 |             |
| MBC-1200-SE S82  | 243 408           | 1 - 2      | < 1 s        | 204                      | 281 | 96 | 328 | 530 | 161 | 424 | 052/P | 60 | 16.8         |                 |             |
| MBC-1200-SE S302 | 243 409           | 1 - 2      | < 1 s        | 204                      | 281 | 96 | 328 | 530 | 161 | 424 | 052/P | 60 | 16.8         |                 |             |

|              | $P_{max}$ [VA] for t = 3 s | $P_{max}$ [VA] Operation |
|--------------|----------------------------|--------------------------|
| MBC-300-...  | 120                        | 15                       |
| MBC-700-...  | 180                        | 20                       |
| MBC-1200-... | 200                        | 30                       |

| Flange for       | Rp/NPT    | Order No. |                                                                                                                                                                           | Order No.                     |
|------------------|-----------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| MBC-300-...      | Rp 1/2    | 222 341   | <b>Line socket</b>                                                                                                                                                        | 3 pole + PE<br><b>210 319</b> |
| MBC-300-...      | Rp 3/4    | 222 342   |                                                                                                                                                                           |                               |
| MBC-300-...      | Rp 1      | 222 001   |                                                                                                                                                                           |                               |
| MBC-300-...      | Rp 1 1/4  | 240 506   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | Rp 1      | 222 343   | <b>Adapter, pressure gauge flange set G1/2</b>                                                                                                                            | <b>216 675</b>                |
| MBC 700/1200-... | Rp 1 1/4  | 222 344   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | Rp 1 1/2  | 221 884   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | Rp 2      | 221 926   |                                                                                                                                                                           |                               |
| MBC-300-...      | NPT 1/2   | 222 371   |  <b>Flanges, plug-in connection and system accessories must be ordered separately.</b> |                               |
| MBC-300-...      | NPT 3/4   | 222 368   |                                                                                                                                                                           |                               |
| MBC-300-...      | NPT 1     | 221 999   |                                                                                                                                                                           |                               |
| MBC-300-...      | NPT 1 1/4 | 231 718   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | NPT 1     | 222 369   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | NPT 1 1/4 | 222 370   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | NPT 1 1/2 | 222 003   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | NPT 2     | 221 997   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | NPT 1     | 222 369   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | NPT 1 1/4 | 222 370   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | NPT 1 1/2 | 222 003   |                                                                                                                                                                           |                               |
| MBC 700/1200-... | NPT 2     | 221 997   |                                                                                                                                                                           |                               |

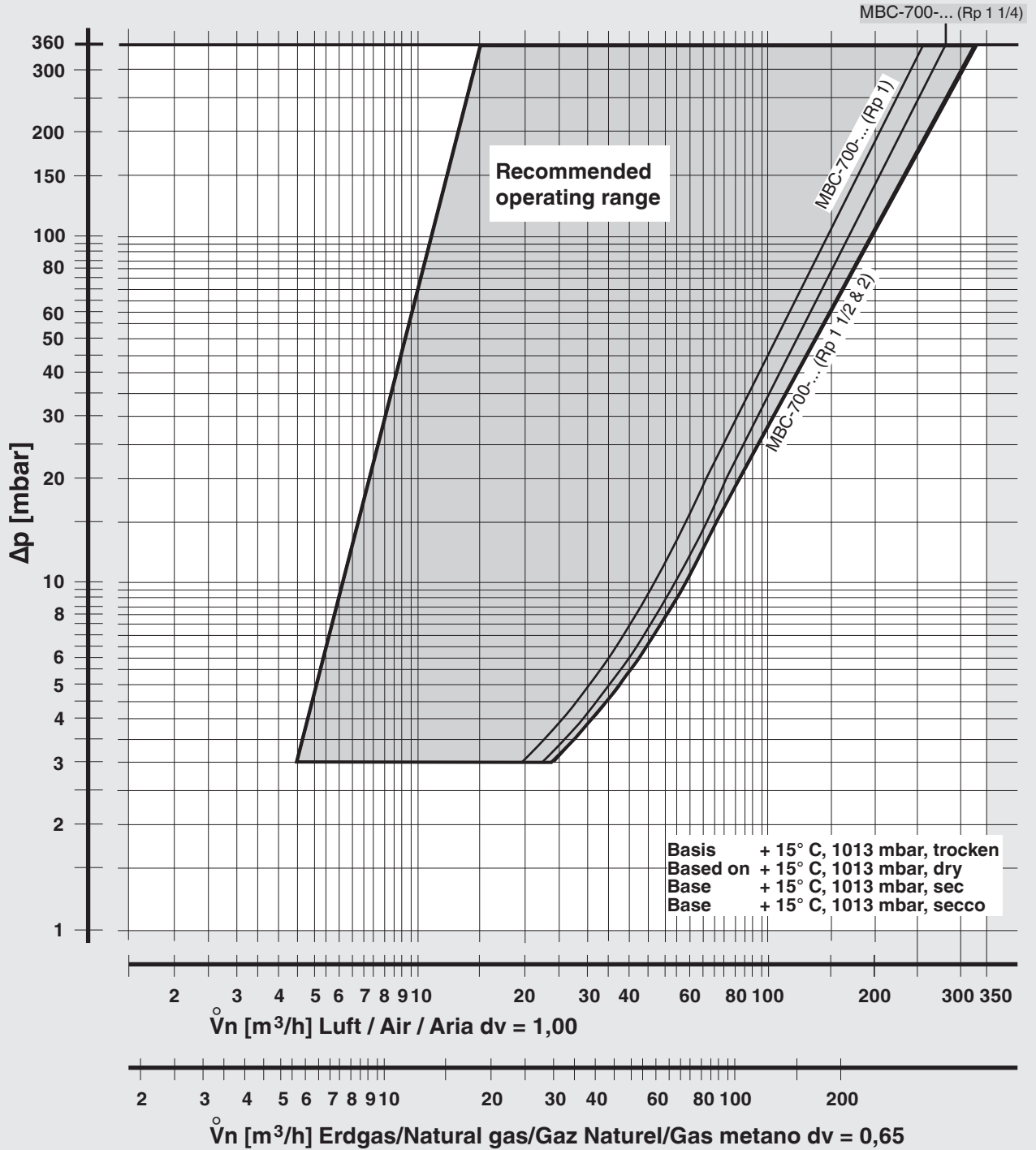
Volume flow pressure difference characteristics in steady state with microfilter.

MBC-300-...



Volume flow pressure difference characteristics in steady state with microfilter.

MBC-700-...

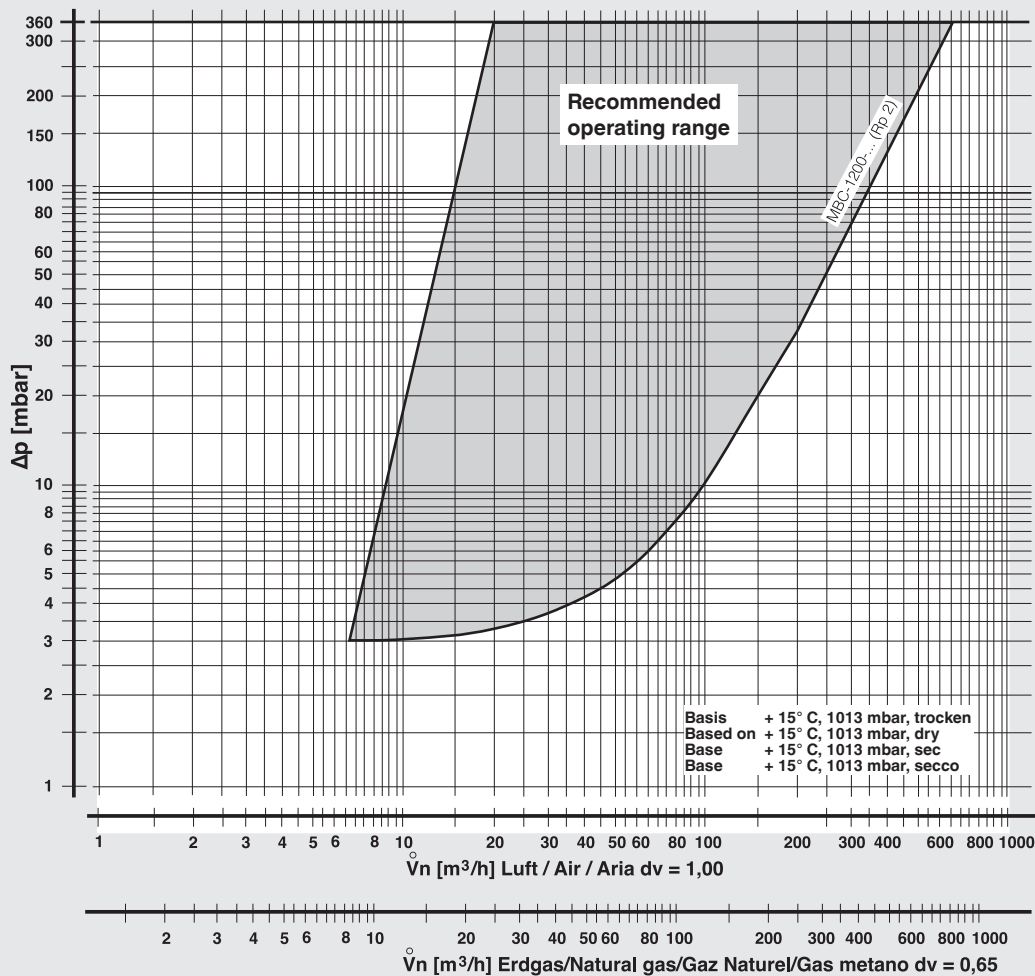


**GasMultiBloc®**  
**Combined servo pressure regulator**  
**and safety shut-off valves**

**MBC-300-SE**  
**MBC-700-SE**  
**MBC-1200-SE**  
**MBC-300-N**  
**MBC-700-N**

**Volume flow pressure difference characteristics in steady state with microfilter.**

**MBC-1200-...**



$$f = \sqrt{\frac{\text{Air density}}{\text{Density of gas used}}}$$

$$\dot{V}_{\text{gas used}} = \dot{V}_{\text{air}} \times f$$

| Gas type    | Density [kg/m³] | dv   | f    |
|-------------|-----------------|------|------|
| Natural gas | 0.81            | 0.65 | 1.24 |
| Town gas    | 0.58            | 0.47 | 1.46 |
| Liquid gas  | 2.08            | 1.67 | 0.77 |
| Air         | 1.24            | 1.00 | 1.00 |

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

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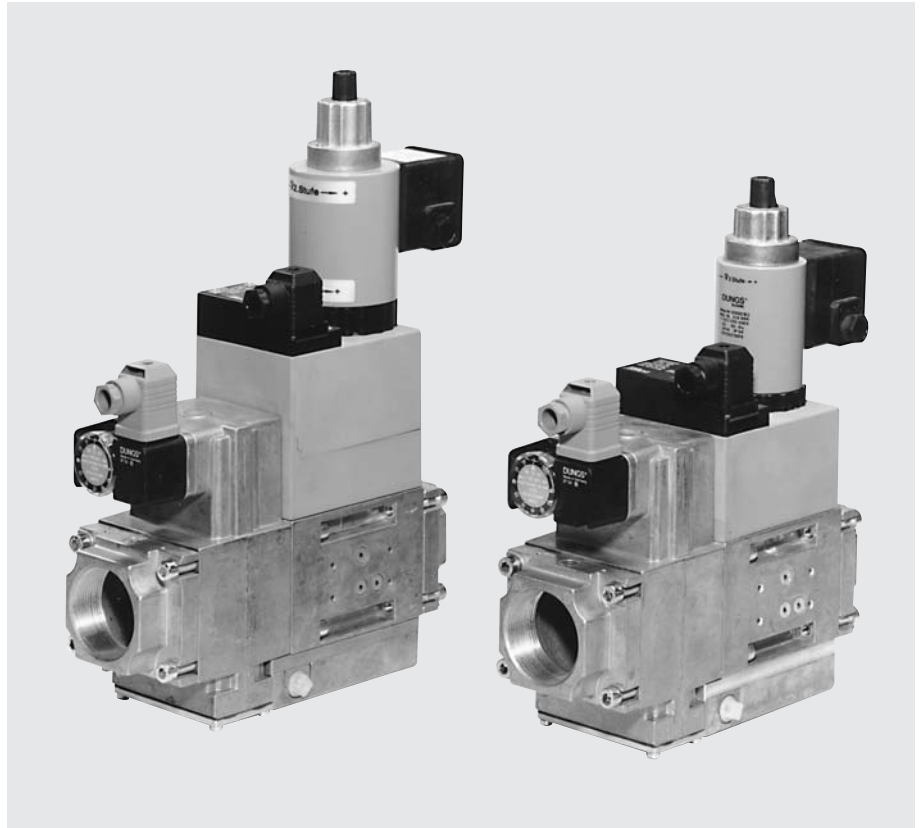
# GasMultiBloc®

## Combined regulator and safety shut-off valves

### Two-stage function

MB-ZRD(LE) 415 - 420 B01

7.26



#### 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
- One one-stage valve and one two-stage valve
- One valve is fast opening, one valve is slow or fast opening
- Solenoid valves up to 360 mbar (36 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 and partial volume restrictor at valve V2
- Hydraulic opening delay
- Flange connections with pipe threads as per ISO 7/1
- Simple mounting, compact, light-weight

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, limit switch at valve V2.

#### 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-ZR...415-420 B01 CE-0085 AP 3156

EC type test approval as per EC Pressure Equipment Directive:  
MB-ZR...415-420 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.
4. On request, the second stage of valve V2 opens.

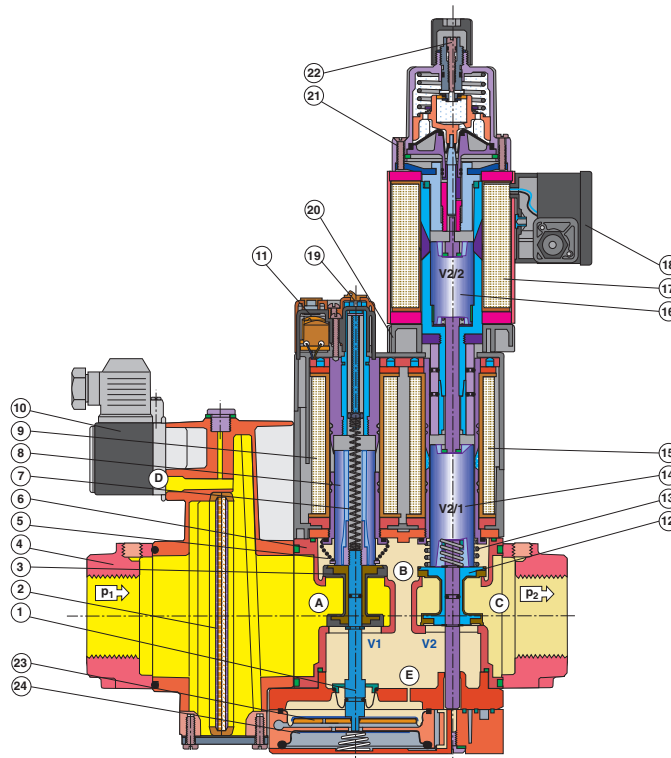
### Operating method of valve-regulator combination on valve V1

A regulator, compensating for residual pressure is integrated in valve V1 (pressure regulating part). Armature 8 is not connected to valve plate unit 3. When it opens, armature 8 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 7 (tension spring) via setting screw 18.

The output pressure acts via opening E on the working diaphragm 22 of the regulator part. In regulated state, setting spring inlet pressure and pressure of working diaphragm are in force equilibrium.

The compensating diaphragm 23 ensures the fast closing function of valve V1 and a high regulating quality.

### Sectional drawing of MB-ZRDLE...



|                      |                            |                                |
|----------------------|----------------------------|--------------------------------|
| 1 Pressure regulator | 10 Gas pressure switch     | Setting:                       |
| 2 Microfilter        | 11 Electrical connection   | 19 - Gas pressure $p_a$        |
| 3 Valve V1           | 12 Valve V2                | 20 - Partial volume, 1st stage |
| 4 Connection flange  | 13 Closing spring V2       | 21 - Main volume               |
| 5 Closing spring V1  | 14 Armature V2 (1st stage) | 22 - Fast stroke               |
| 6 Housing            | 15 Solenoid V2 (1st stage) | 23 Working diaphragm           |
| 7 Regulating spring  | 16 Armature V2 (2nd stage) | 24 Compensation diaphragm      |
| 8 Armature V1        | 17 Solenoid V2 (2nd stage) |                                |
| 9 Solenoid V1        | 18 Electrical connection   |                                |

### Operating method of valve V2

Armature 14 of valve V2 is connected to valve plate unit 11. When it opens, armature 14 pretensions closing spring 13. The valve opening of stage 1 can be set by limiting the armature stroke by means of main volume restrictor 19.

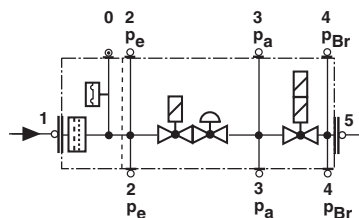
### Min. opening (residual stroke) of valve (0.5 to 1.0 mm)

If the second stage of valve 2 opens, closing spring 13 is continuously pretensioned. The maximum valve opening of stage 2 can be set by limiting the armature stroke of armature 16 by means of the main volume restrictor. Main volume restrictor 20 is set by rotating the adjusting plate or the hydraulic brake. The fast and/or slow opening characteristic acts on both stages. It is influenced by setting the fast stroke at the hydraulic brake 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.

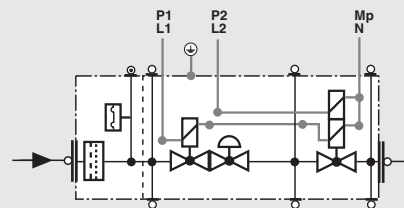
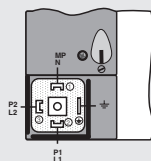
### Pressure taps



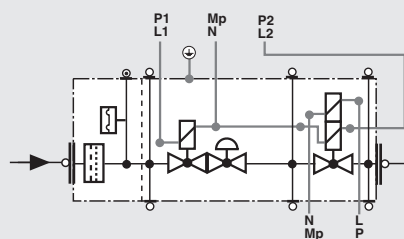
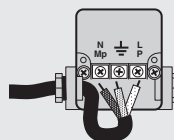
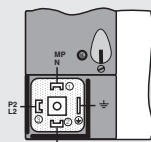
0, 1, 2, 3, 4, 5  
G 1/8 screw plug

### Electrical connection

S 20/S 50



S 22/S 52



Valves V1, V2  
1st stage

Valve V2  
2nd stage

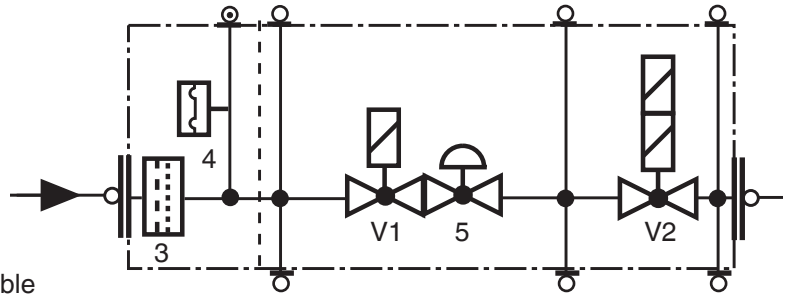
## Specifications

| Nominal diameters<br>Flange with pipe threads as per ISO 7/1 (DIN 2999)                        | MB-ZR...415 B01<br>Rp 1, 1 1/4, 1 1/2, 2<br>and their combinations                                                                                                                                                                                                                                                                                                                                                                                                                                             | MB-ZR...420 B01<br>Rp 1, 1 1/4, 1 1/2, 2<br>and their combinations                        |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
|------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------|-----------------|---------------------------|------------------------|-------|--------------|------|---------|--------|--------------|------|------|----------|----------------|------|------|---------|----------------|------|---------|
| <b>Max. operating pressure</b>                                                                 | <b>360 mbar (36 kPa)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| <b>Output pressure ranges</b>                                                                  | <b>MB-ZR... S20/S22 p<sub>a</sub>: 4 mbar (0.4 kPa) to 20 mbar (2 kPa)</b><br><b>MB-ZR... S50/S52 p<sub>a</sub>: 20 mbar (2 kPa) to 50 mbar (5 kPa)</b>                                                                                                                                                                                                                                                                                                                                                        |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Media                                                                                          | Gases of families 1, 2, 3 and other neutral gaseous media                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Ambient temperature                                                                            | -15 °C to +70 °C (Do not operate MB-ZR below 0 °C in liquid gas systems. Only suitable for gaseous liquid gas, liquid hydrocarbons destroy sealing materials.)                                                                                                                                                                                                                                                                                                                                                 |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Dirt trap                                                                                      | Sieve, microfilter, changing the filter is possible without removing the valve.                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Pressure switches                                                                              | Types GW...A5, ÜB...A2 / NB...A2 to DIN EN 1854 may be attached. For further information, refer to Datasheets 5.02 and 5.07 "Pressure Switches for DUNGS Multiple Actuators"                                                                                                                                                                                                                                                                                                                                   |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| 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, fast closing                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
|                                                                                                | <table border="1"> <thead> <tr> <th></th> <th>Valve V2 design</th> <th>Partial volume restrictor</th> <th>Main volume restrictor</th> </tr> </thead> <tbody> <tr> <td>MB-ZR</td> <td>fast opening</td> <td>with</td> <td>without</td> </tr> <tr> <td>MB-ZRD</td> <td>fast opening</td> <td>with</td> <td>with</td> </tr> <tr> <td>MB-ZRDLE</td> <td>slowly opening</td> <td>with</td> <td>with</td> </tr> <tr> <td>MB-ZRLE</td> <td>slowly opening</td> <td>with</td> <td>without</td> </tr> </tbody> </table> |                                                                                           |                        | Valve V2 design | Partial volume restrictor | Main volume restrictor | MB-ZR | fast opening | with | without | MB-ZRD | fast opening | with | with | MB-ZRDLE | slowly opening | with | with | MB-ZRLE | slowly opening | with | without |
|                                                                                                | Valve V2 design                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Partial volume restrictor                                                                 | Main volume restrictor |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| MB-ZR                                                                                          | fast opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | with                                                                                      | without                |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| MB-ZRD                                                                                         | fast opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | with                                                                                      | with                   |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| MB-ZRDLE                                                                                       | slowly opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | with                                                                                      | with                   |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| MB-ZRLE                                                                                        | slowly opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | with                                                                                      | without                |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Measuring / Ignition gas connection                                                            | For G 1/8 as per DIN ISO 228, refer to Pressure taps on page 2                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Burner pressure monitor p <sub>Br</sub>                                                        | Connection downstream of valve V2, pressure switch mountable on adapter laterally                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Voltage / Frequency                                                                            | 50 - 60 Hz, 220 - 230 V AC, -15 % +10 %<br>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<br>Switch-on duration<br>Degree of protection<br>Radio interference | Refer to Dimensions on page 5<br>100 %<br>IP 54 as per IEC 529 (EN 60529)<br>Interference degree N                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Materials of gas conveying parts                                                               | Housing<br>Diaphragms, seals<br>Solenoid drive                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | aluminium die casting<br>NBR basis, Silopren (silicone rubber)<br>steel, brass, aluminium |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Installation position                                                                          | Solenoid vertically upright or lying horizontally as well as its intermediate positions.                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |
| Closed position signal contact                                                                 | Closed position signal contact, type K01/1 (DIN-tested), mountable to V2                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |                |      |      |         |                |      |         |

| Equipment variants<br>GasMultiBloc®...B01<br>Two-stage function                            | 415 B01          | 420 B01          |                                                                                            |
|--------------------------------------------------------------------------------------------|------------------|------------------|--------------------------------------------------------------------------------------------|
| MB-ZR                                                                                      | •                | •                | Filter element can be removed. A suitable GF.../1 gas filter must then be fitted upstream. |
| MB-ZRD                                                                                     | •                | •                |                                                                                            |
| MB-ZRDLE                                                                                   | •                | •                |                                                                                            |
| MB-ZRLE                                                                                    | •                | •                |                                                                                            |
| Microfilter (standard) with sieve                                                          | •                | •                |                                                                                            |
| Gas pressure switch<br>downstream of filter<br>downstream of valve V2 on adapter laterally | •<br>•           | •<br>•           |                                                                                            |
| Pressure regulator                                                                         | •                | •                |                                                                                            |
| Valve V1, double seat<br>Valve V2, double seat                                             | •<br>•           | •<br>•           |                                                                                            |
| Valves opening together<br>Valves opening separately                                       | •<br>•           | •<br>•           | S 20, S 50<br>S 22, S 52                                                                   |
| Flange Rp 1<br>Rp 1 1/4<br>Rp 1 1/2<br>Rp 2                                                | •<br>•<br>•<br>• | •<br>•<br>•<br>• | • = possible<br>(•) = on request<br>- = not possible                                       |

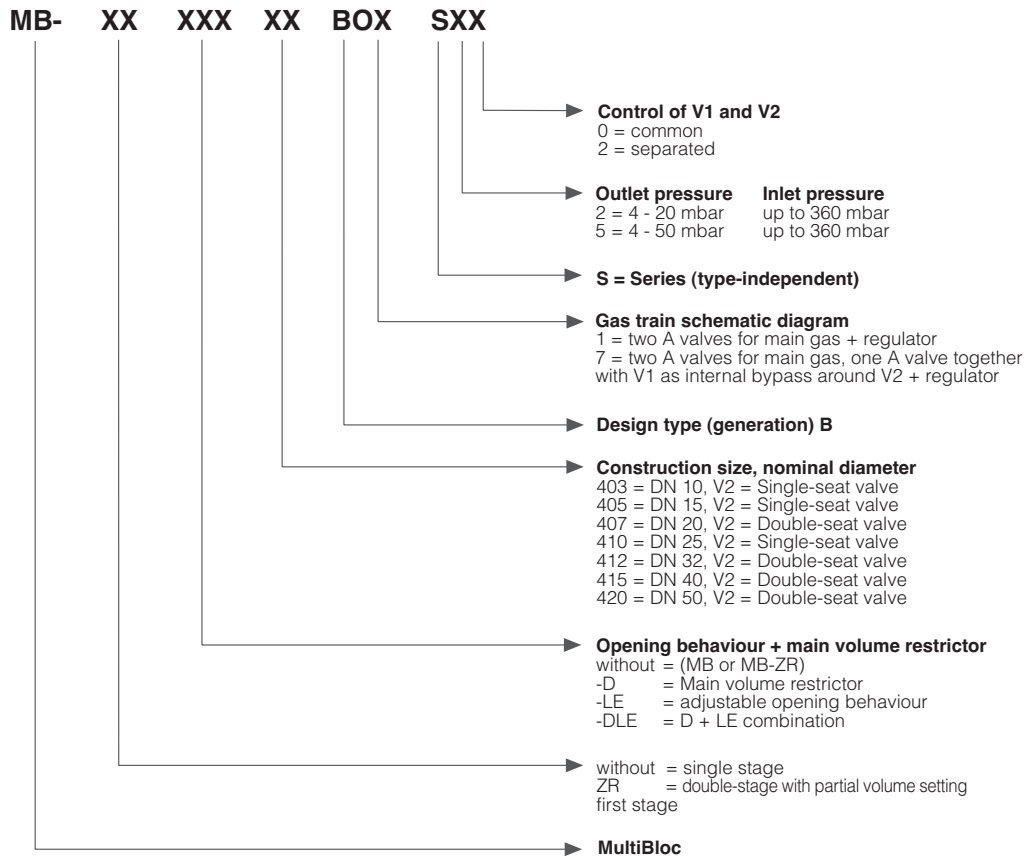
### MB-ZR...B01 design

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

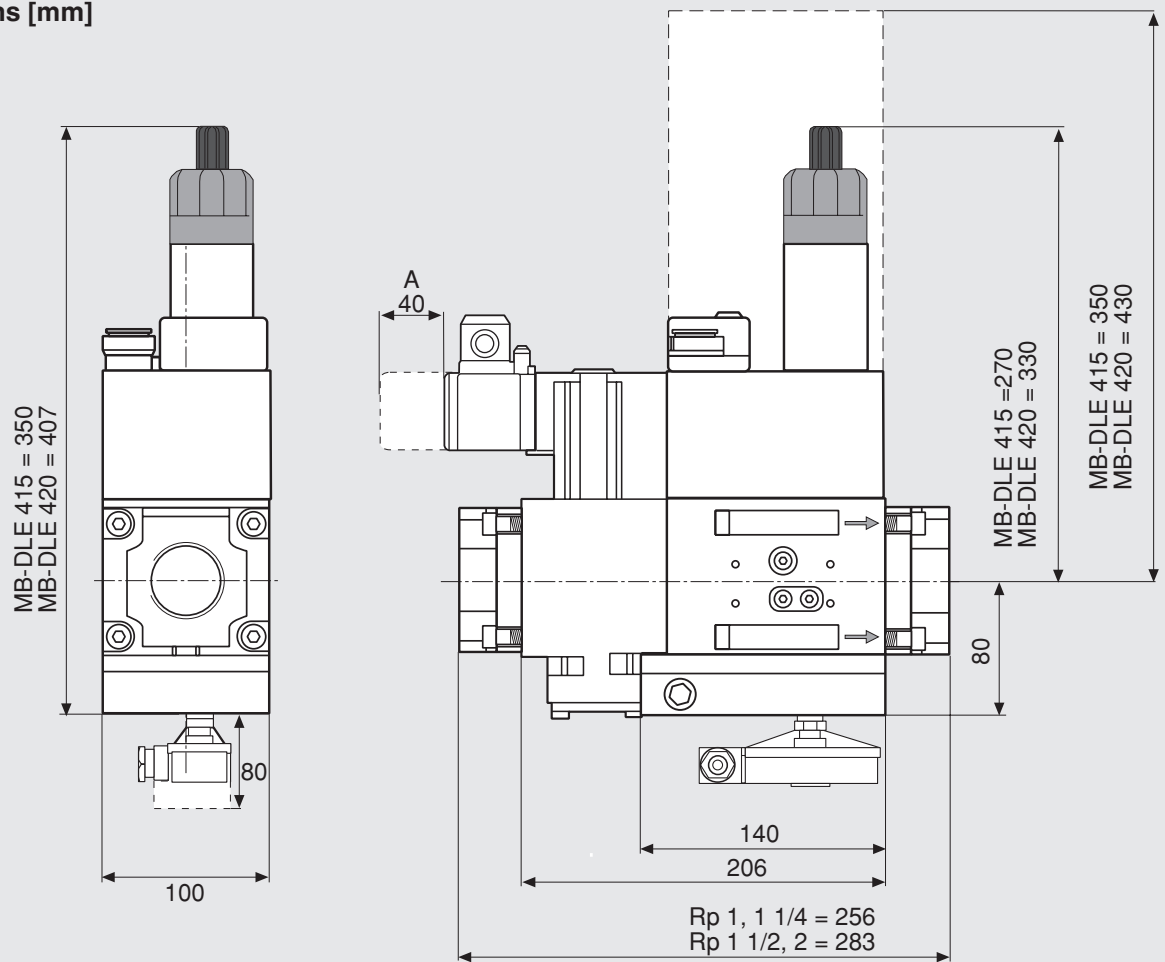


Mounting of VPS 504 valve proving system possible  
Mounting of K01/1 closed position signal contact possible

### Type key of MultiBloc®



Dimensions [mm]

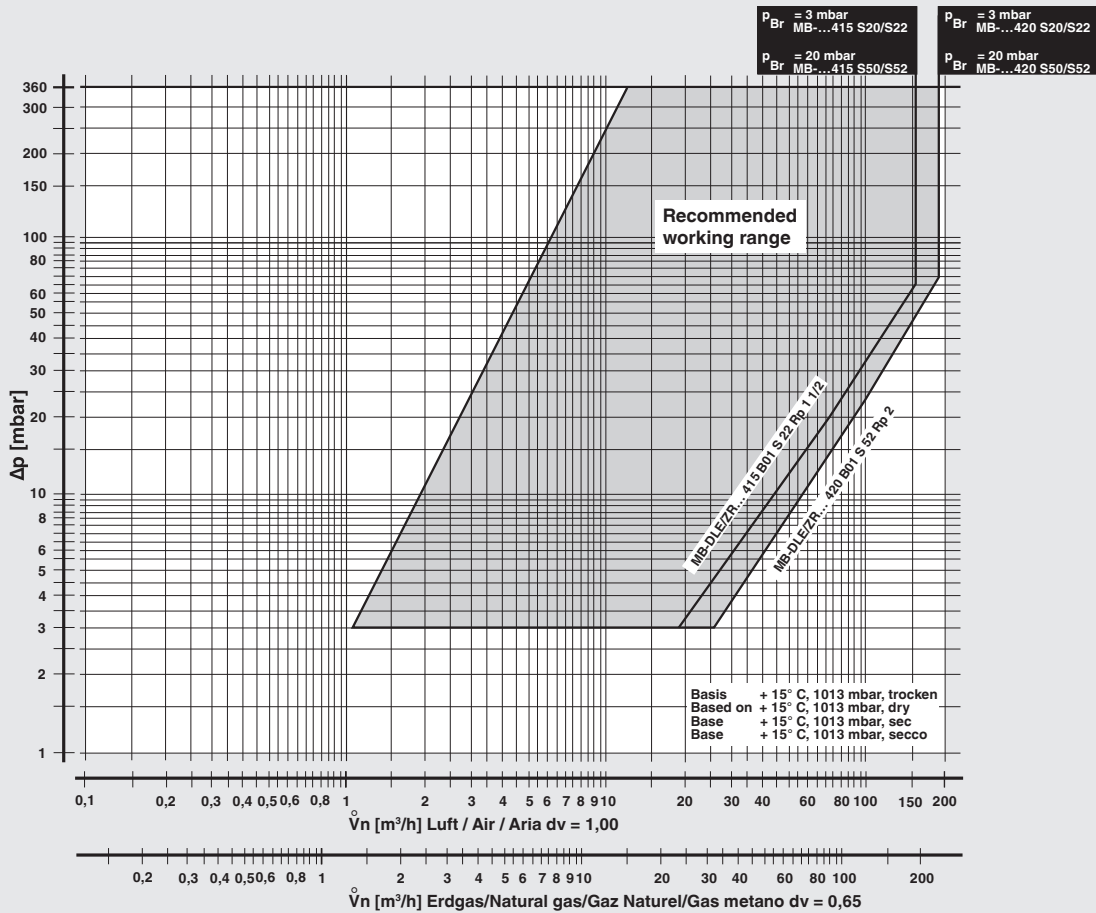


| Type             | Rp       | Opening time | Nominal rating [VA]<br>230 V AC; +20 °C |     |     |     | Weight [kg] |
|------------------|----------|--------------|-----------------------------------------|-----|-----|-----|-------------|
|                  |          |              | S20                                     | S50 | S22 | S52 |             |
| MB-ZRD 415 B01   | Rp 1 - 2 | < 1 s        | 80                                      | 80  | 120 | 120 | 8.0         |
| MB-ZRDLE 415 B01 | Rp 1 - 2 | < 20 s       | 80                                      | 80  | 120 | 120 | 8.1         |
| MB-ZRD 420 B01   | Rp 1 - 2 | < 1 s        | 115                                     | 115 | 135 | 135 | 10,1        |
| MB-ZRDLE 420 B01 | Rp 1 - 2 | < 20 s       | 115                                     | 115 | 135 | 135 | 10.2        |

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

**MB-ZRD(LE) 415 - 420 B01**

**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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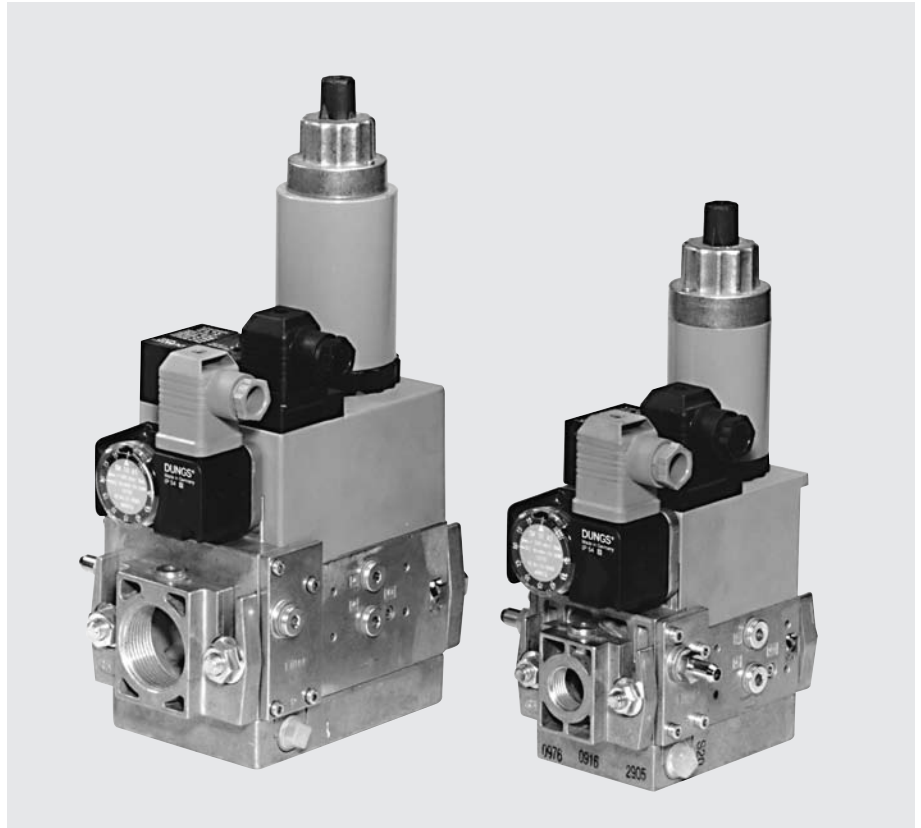
# GasMultiBloc®

## Combined regulator and safety shut-off valves

### Two-stage function

MB-ZRD(LE) 405 - 412 B01

7.24



#### 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
- One one-stage valve and one two-stage valve
- One valve is fast opening, one valve is slow or fast opening
- Solenoid valves up to 360 mbar (36 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 and partial volume restrictor at valve V2
- Hydraulic opening delay
- Flange connections with pipe threads as per ISO 7/1
- Simple mounting, compact, light-weight

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, limit switch and closing stroke limiter at valve V2, 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-ZR...405-412 B01 CE-0085 AP 3156

EC type test approval as per EC Pressure Equipment Directive:

MB-ZR...405-412 B01 CE0036

Approvals in other important gas consuming countries.

### Functional description of gas flow

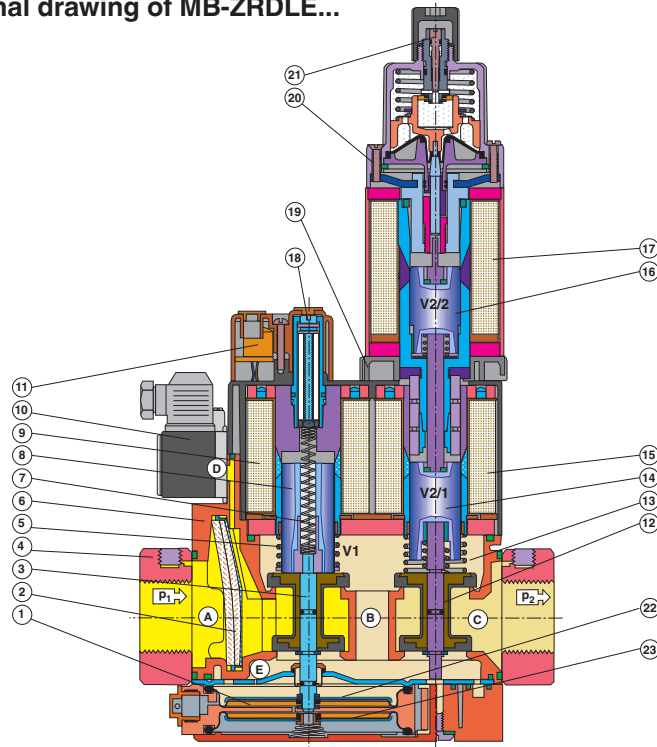
1. When the valves V1 and V2 are closed, chamber A is under inlet pressure.
2. A hole D in the filter housing connects min. pressure switch with chamber A. If the inlet pressure applied to the pressure switch exceeds the incoming reference value, it switches through to the automatic burner control.
3.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

### Operating method of valve-regulator combination on valve V1

A regulator compensating for residual pressure is integrated in valve V1 (pressure regulating part). Armature 8 is not connected to valve plate unit 3. When it opens, armature 8 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 7 (tension spring) via setting screw 18.

The output pressure acts via opening E on the working diaphragm 22 of the regulator part. In regulated state, setting spring inlet pressure and pressure of working diaphragm are in force equilibrium. The compensating diaphragm ensures the fast closing function of valve V1 and a high regulating quality.

### Sectional drawing of MB-ZRDLE...



|   |                    |    |                         |                                |
|---|--------------------|----|-------------------------|--------------------------------|
| 1 | Pressure regulator | 10 | Gas pressure switch     | Setting:                       |
| 2 | Microfilter        | 11 | Electrical connection   | 18 - Gas pressure $p_a$        |
| 3 | Valve V1           | 12 | Valve V2                | 19 - Partial volume, 1st stage |
| 4 | Connection flange  | 13 | Closing spring V2       | 20 - Main volume               |
| 5 | Closing spring V1  | 14 | Armature V2 (1st stage) | 21 - Fast stroke               |
| 6 | Housing            | 15 | Solenoid V2 (1st stage) | 22 Working diaphragm           |
| 7 | Regulating spring  | 16 | Armature V2 (2nd stage) | 23 Compensation diaphragm      |
| 8 | Armature V1        | 17 | Solenoid V2 (2nd stage) |                                |
| 9 | Solenoid V1        |    |                         |                                |

### Operating method of valve V2

Armature 14 of valve V2 is connected to valve plate unit 12. When it opens, armature 14 pretensions closing spring 13. The valve opening of stage 1 can be set by limiting the armature stroke by means of the main volume restrictor 19.

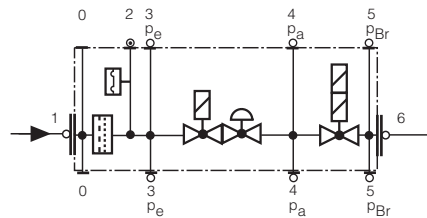
### Min. opening (residual stroke) of valve (0.5 to 1.0 mm)

When the second stage of valve 2 opens, closing spring 13 is continuously pretensioned. The maximum valve opening of stage 2 can be set by limiting the armature stroke of armature 16 using the main volume restrictor 20. Main volume restrictor 20 is set by rotating the adjusting plate or the hydraulic brake. The fast and/or slow opening characteristic acts on both stages. It is influenced by setting the fast stroke at the hydraulic brake under the cover.

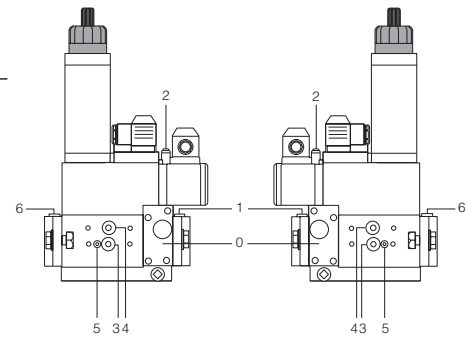
### Closing function

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.

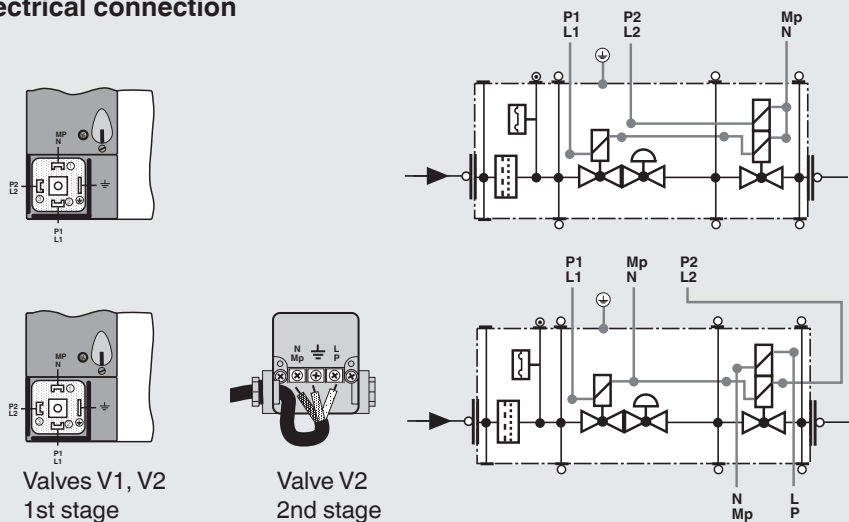
### Pressure taps



- 0 Filter cover
- 1, 3, 4, 6 G 1/8 screw plug
- 2 Test nipple
- 5 M4 screwed sealing plug



### Electrical connection



Valves V1, V2  
1st stage

Valve V2  
2nd stage



## Specifications

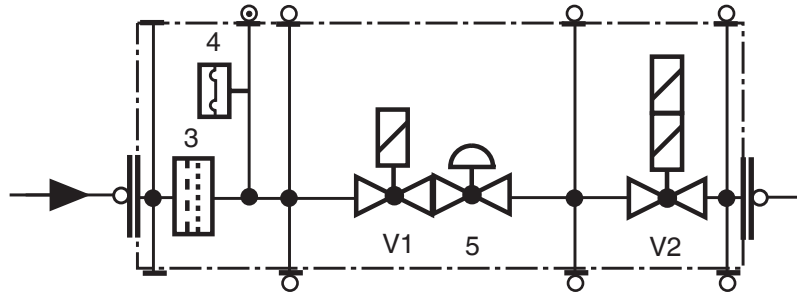
| Nominal diameters<br>Flange with pipe threads as per<br>ISO 7/1 (DIN 2999)                     | MB-ZR...405/407 B01<br>Rp 1/2, 3/4<br>and their combinations                                                                                                                                                                                                                                                                                                                                                                                                                                               | MB-ZR...410/412 B01<br>Rp 3/4, 1, 1 1/4<br>and their combinations                         |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------|-----------------|---------------------------|------------------------|-------|--------------|------|---------|--------|--------------|------|------|----------|--------------|------|------|---------|--------------|------|---------|
| <b>Max. operating pressure</b>                                                                 | <b>360 mbar (36 kPa)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| <b>Output pressure ranges</b>                                                                  | <b>MB-... S20/S22 p<sub>a</sub>: 4 mbar (0.4 kPa) to 20 mbar (2 kPa)</b><br><b>MB-... S50/S52 p<sub>a</sub>: 4 mbar (0.4 kPa) to 50 mbar (5 kPa)</b>                                                                                                                                                                                                                                                                                                                                                       |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| 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, microfilter, changing the filter is possible without removing the valve.                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| Pressure switches                                                                              | Types GW...A5, ÜB...A2 / NB...A2 to DIN EN 1854 may be attached.<br>For further information, refer to Datasheets 5.02 and 5.07 "Pressure Switches for DUNGS Multiple Actuators"                                                                                                                                                                                                                                                                                                                            |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| 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.<br>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, fast closing                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
|                                                                                                | <table border="1"> <thead> <tr> <th></th> <th>Valve V2 design</th> <th>Partial volume restrictor</th> <th>Main volume restrictor</th> </tr> </thead> <tbody> <tr> <td>MB-ZR</td> <td>fast opening</td> <td>with</td> <td>without</td> </tr> <tr> <td>MB-ZRD</td> <td>fast opening</td> <td>with</td> <td>with</td> </tr> <tr> <td>MB-ZRDLE</td> <td>slow opening</td> <td>with</td> <td>with</td> </tr> <tr> <td>MB-ZRLE</td> <td>slow opening</td> <td>with</td> <td>without</td> </tr> </tbody> </table> |                                                                                           |                        | Valve V2 design | Partial volume restrictor | Main volume restrictor | MB-ZR | fast opening | with | without | MB-ZRD | fast opening | with | with | MB-ZRDLE | slow opening | with | with | MB-ZRLE | slow opening | with | without |
|                                                                                                | Valve V2 design                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Partial volume restrictor                                                                 | Main volume restrictor |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| MB-ZR                                                                                          | fast opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | with                                                                                      | without                |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| MB-ZRD                                                                                         | fast opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | with                                                                                      | with                   |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| MB-ZRDLE                                                                                       | slow opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | with                                                                                      | with                   |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| MB-ZRLE                                                                                        | slow opening                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | with                                                                                      | without                |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| Measuring / Ignition gas connection                                                            | For G 1/8 as per DIN ISO 228, refer to Pressure taps on page 2                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| Burner pressure monitor p <sub>Br</sub>                                                        | Connection downstream of valve V2, pressure switch A2 mountable on adapter laterally                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| Voltage / Frequency                                                                            | 50-60 Hz 220-230 V AC -15 % +10 %<br>Other preferred voltages: 240 V AC, 110-120 V AC, 48 VDC, 24-28 VDC                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| Electrical connection                                                                          | Plug connection as per DIN EN 175301-803<br>for valves and pressure switches                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| Rating / Power consumption<br>Switch-on duration<br>Degree of protection<br>Radio interference | Refer to Dimensions on page 5<br>100 %<br>IP 54 as per IEC 529 (EN 60529)<br>Interference degree N                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| Materials of gas conveying parts                                                               | Housing<br>Diaphragms, seals<br>Solenoid drive                                                                                                                                                                                                                                                                                                                                                                                                                                                             | aluminium die casting<br>NBR basis, Silopren (silicone rubber)<br>steel, brass, aluminium |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| Installation position                                                                          | Solenoid vertically upright or lying horizontally as well as its intermediate positions.                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |
| Closed position signal contact                                                                 | Closed position signal contact, type K01/1 (DIN-tested), mountable on V2                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                           |                        |                 |                           |                        |       |              |      |         |        |              |      |      |          |              |      |      |         |              |      |         |



| Equipment variants<br>GasMultiBloc®...B01<br>Two-stage function | 405 B01 | 407 B01 | 410 B01 | 412 B01 |                                                                                                                    |
|-----------------------------------------------------------------|---------|---------|---------|---------|--------------------------------------------------------------------------------------------------------------------|
| MB-ZR                                                           | •       | •       | •       | •       |                                                                                                                    |
| MB-ZRD                                                          | •       | •       | •       | •       |                                                                                                                    |
| MB-ZRDLE                                                        | •       | •       | •       | •       |                                                                                                                    |
| MB-ZRLE                                                         | •       | •       | •       | •       |                                                                                                                    |
| Microfilter with sieve                                          | •       | •       | •       | •       |                                                                                                                    |
| Gas pressure switch<br>downstream of filter                     | •       | •       | •       | •       |                                                                                                                    |
| downstream of valve V2 on adapter laterally                     | •       | •       | •       | •       |                                                                                                                    |
| Pressure regulator                                              | •       | •       | •       | •       |                                                                                                                    |
| Valve V1, double seat                                           | •       | •       | •       | •       |                                                                                                                    |
| Valve V2, single seat                                           | •       | —       | •       | —       |                                                                                                                    |
| Valve V2, double seat                                           | —       | •       | —       | •       |                                                                                                                    |
| Valves opening together                                         | •       | •       | •       | •       | S 20, S 50                                                                                                         |
| Valves opening separately                                       | •       | •       | •       | •       | S 22, S 52                                                                                                         |
| Flange Rp 1/2                                                   | •       | •       | —       | —       | <ul style="list-style-type: none"> <li>• = possible</li> <li>(•) = on request</li> <li>- = not possible</li> </ul> |
| Flange Rp 3/4                                                   | •       | •       | •       | •       |                                                                                                                    |
| Flange Rp 1                                                     | —       | —       | •       | •       |                                                                                                                    |
| Flange Rp 1 1/4                                                 | —       | —       | •       | •       |                                                                                                                    |

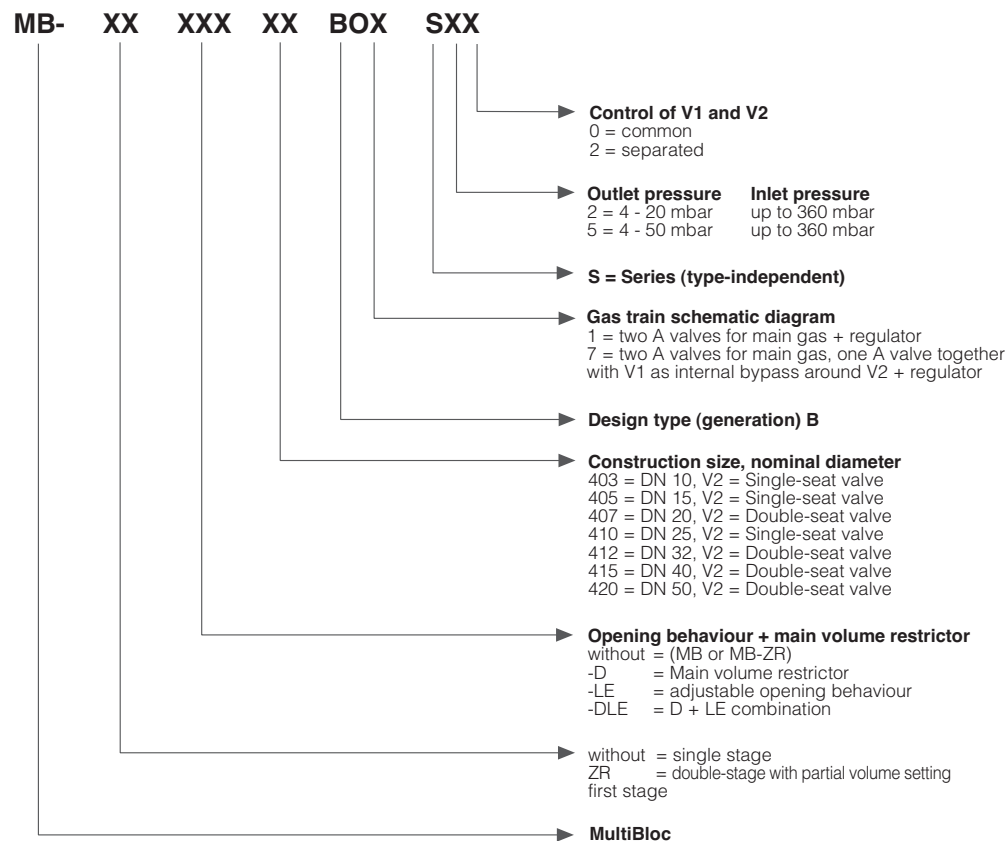
### MB-ZR...B01 version

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

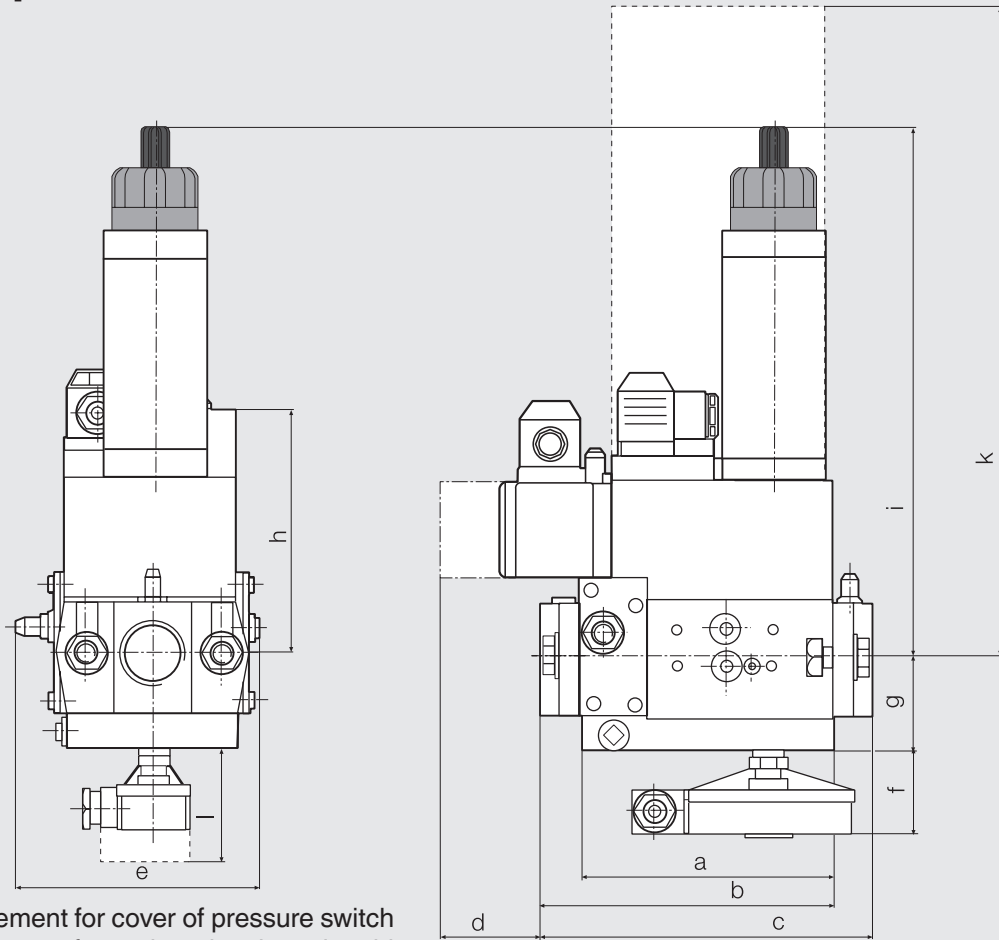


Mounting of VPS 504 valve proving system possible  
 Mounting of K01/1 closed position signal contact possible

### Type key of MultiBloc®



## Dimensions [mm]



d = Space requirement for cover of pressure switch  
 k = Space requirement for exchanging the solenoid  
 l = Space requirement for K01/1 closed position signal contact

| Type                 | Rp       | Opening time | Dimensions [mm] |       |     |    |     |    |    |     |     |     | Weight [kg] |     |
|----------------------|----------|--------------|-----------------|-------|-----|----|-----|----|----|-----|-----|-----|-------------|-----|
|                      |          |              | a               | b     | c   | d  | e   | f  | g  | h   | i   | k   |             | l   |
| MB-ZRD 405/407 B01   | Rp 1/2   | < 1 s        | 110             | 130.5 | 151 | 40 | 120 | 50 | 46 | 115 | 170 | 230 | 80          | 3.1 |
| MB-ZRDLE 405/407 B01 | Rp 3/4   | < 20 s       | 110             | 130.5 | 151 | 40 | 120 | 50 | 46 | 115 | 210 | 230 | 80          | 3.2 |
| MB-ZRD 410/412 B01   | Rp 1     | < 1 s        | 140             | 162.5 | 185 | 40 | 145 | 50 | 55 | 135 | 225 | 300 | 80          | 6.4 |
| MB-ZRDLE 410/412 B01 | Rp 1 1/4 | < 20 s       | 140             | 162.5 | 185 | 40 | 145 | 50 | 55 | 135 | 260 | 300 | 80          | 6.5 |

## Rating/power consumption

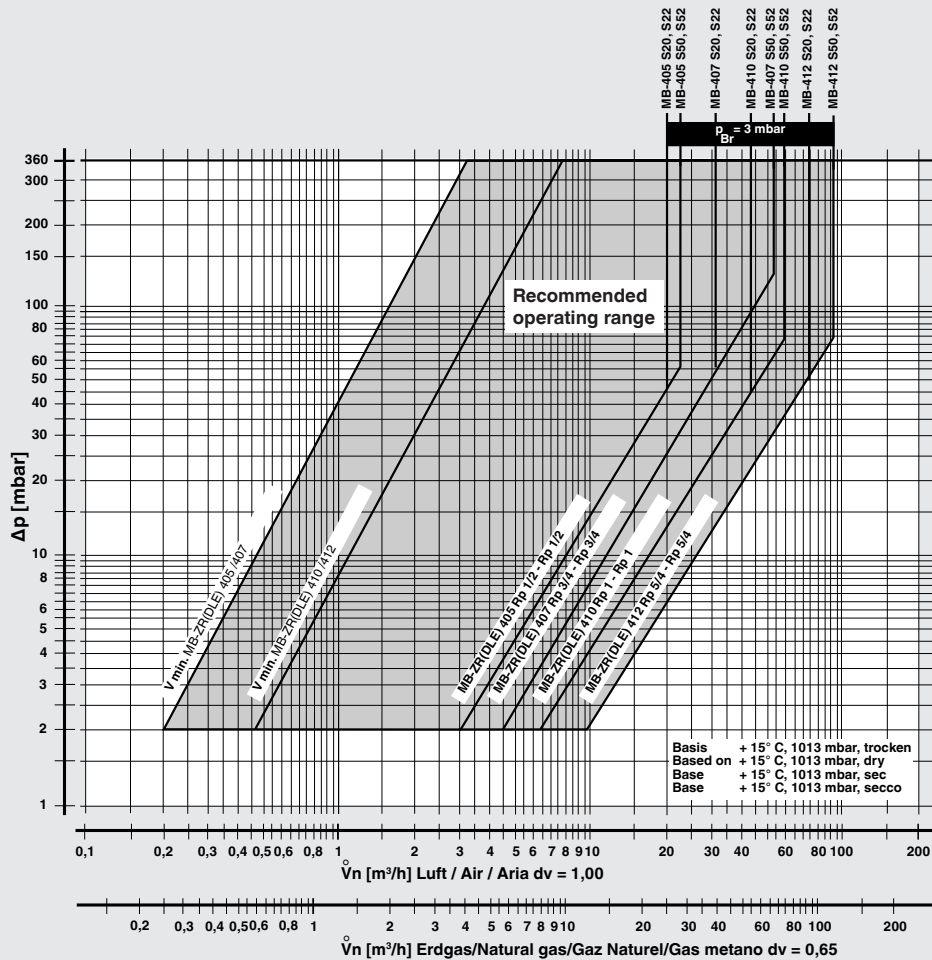
[VA] 230 V AC; +20 °C:

|                    |     |
|--------------------|-----|
| MB-ZR 405/407 S 20 | 65  |
| MB-ZR 405/407 S 50 | 65  |
| MB-ZR 405/407 S 22 | 70  |
| MB-ZR 405/407 S 52 | 70  |
| MB-ZR 410/412 S 20 | 80  |
| MB-ZR 410/412 S 50 | 80  |
| MB-ZR 410/412 S 22 | 120 |
| MB-ZR 410/412 S 52 | 120 |

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

**MB-ZRD(LE) 405 - 412 B01**

**Volumetric flow pressure loss characteristics in regulated state with microfilter**



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

| 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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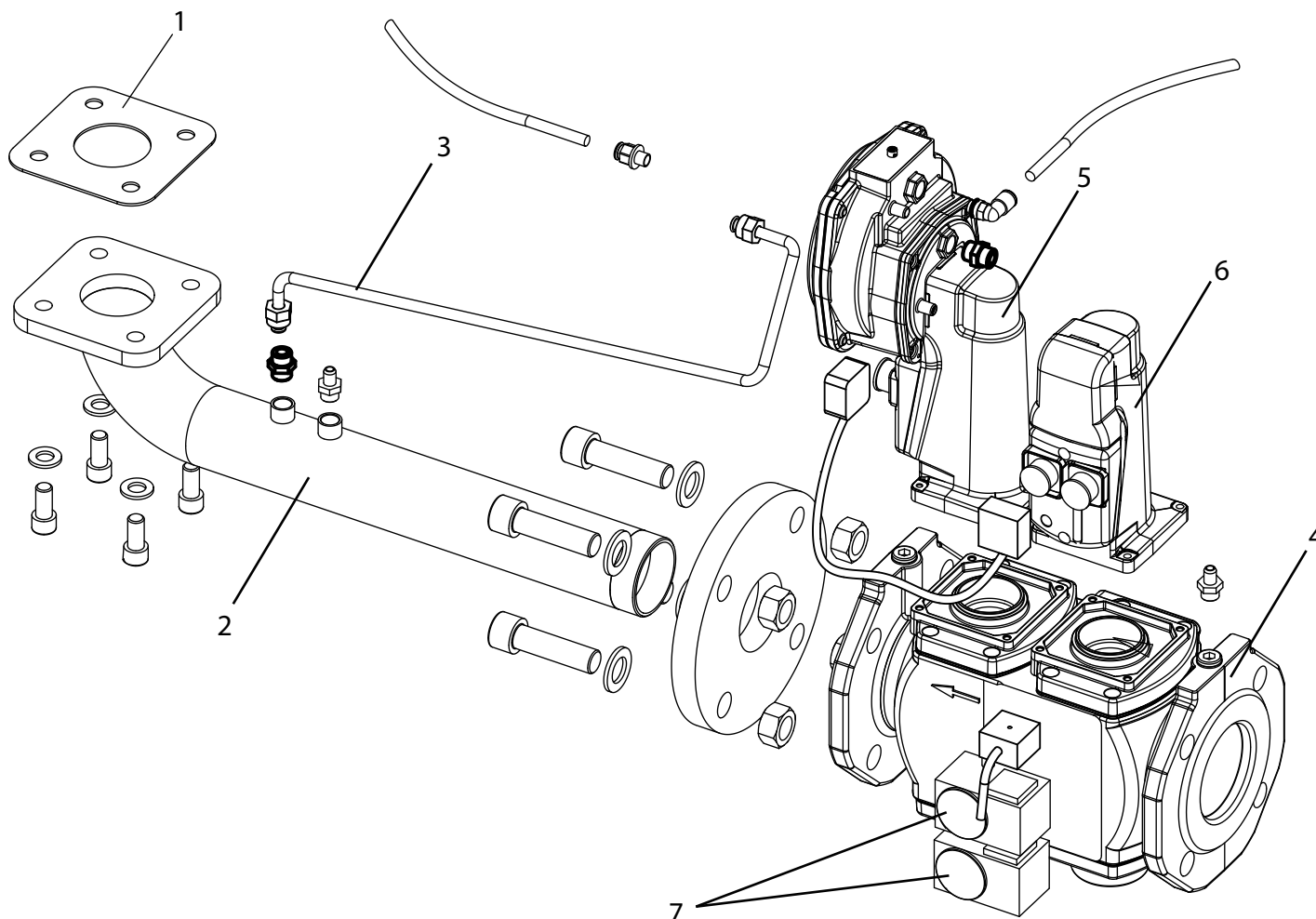
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**Postfach 12 29**  
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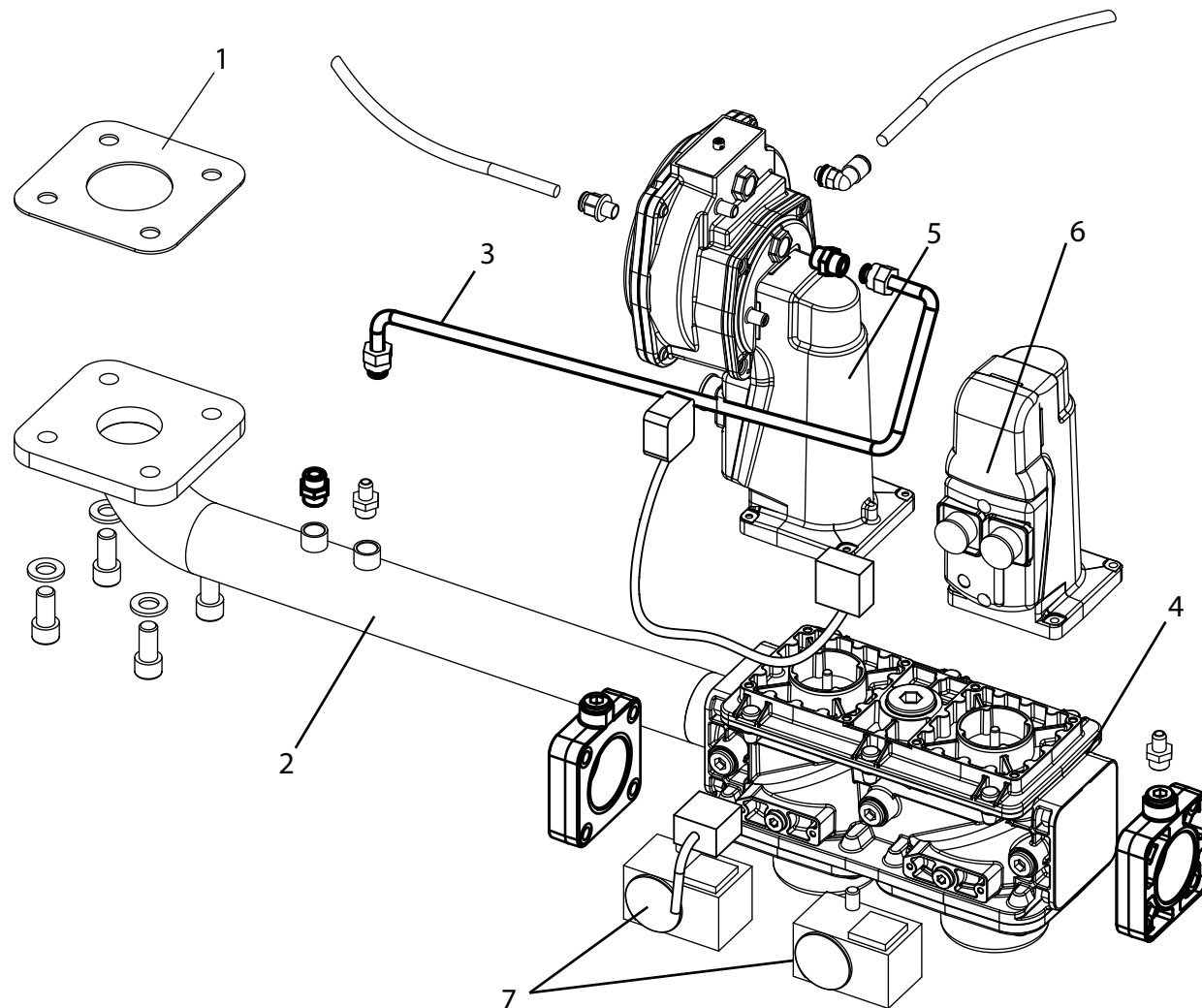
## KIT GRUPPO VALVOLA VGD 40.065



- 1 - 3981B110 Прокладка фланца (Z301134670)
- 2 - 01135780 Труба 2" DN65
- 3 - 3981E330 Трубка отбора газа (Z301135870)
- 4 - 3981E340 Газовый клапан VGD 40.065 (Z304043440)
- 5 - 3981D900 Сервопривод SKP 75.003E2 (Z304043180)

- 6 - 3981D910 Сервопривод SKP 15.000E2 (Z304043190)
- 7 - 3981E350 Прессостат DUNGS GW50A5(Z304039940)

## **KIT GRUPPO VALVOLA VGD 20.503**



**1 - 3981B110** Прокладка фланца (Z301134670)

**2 - 01135880** Труба 2"

**3 - 01139910** Трубка отбора газа

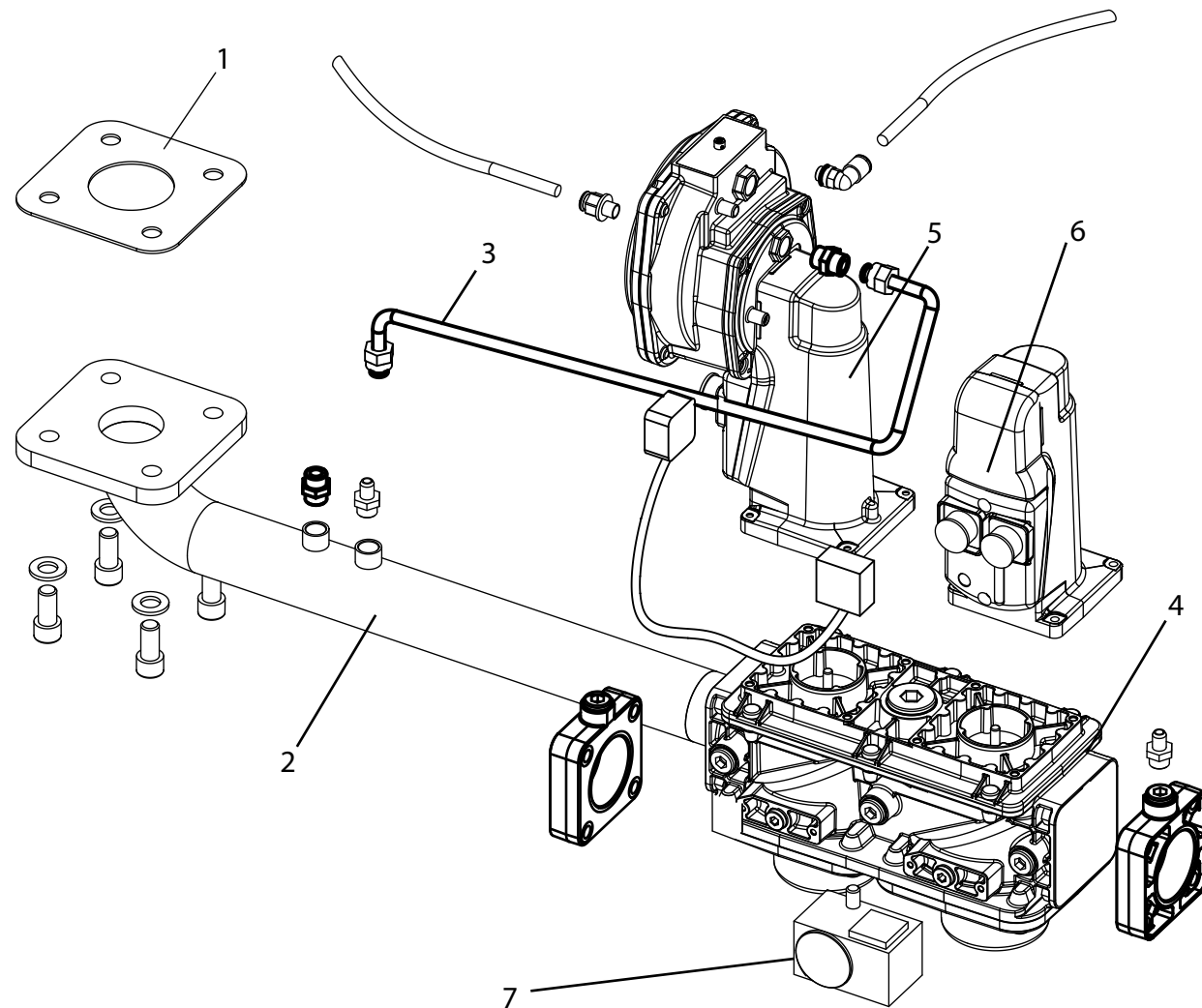
**4 - 3981E310** Газовый клапан VGD 20.503 (с фланцами AGA51)

(Z304044370)

**5 - (Z304043180)** Сервопривод SKP 75.003E2

**6 - 3981D910** Сервопривод SKP 15.000E2 (Z304043190)

**7 - 3981D920** Прессостат DUNGS GW50A6 (Z304040790)

**KIT GRUPPO VALVOLAVGD 20.403**

**1 - 3981B110** Прокладка фланца (Z301134670)

**2 - 01135880** Труба 2"

**3 - 3981D880** Трубка отбора газа (Z301134680)

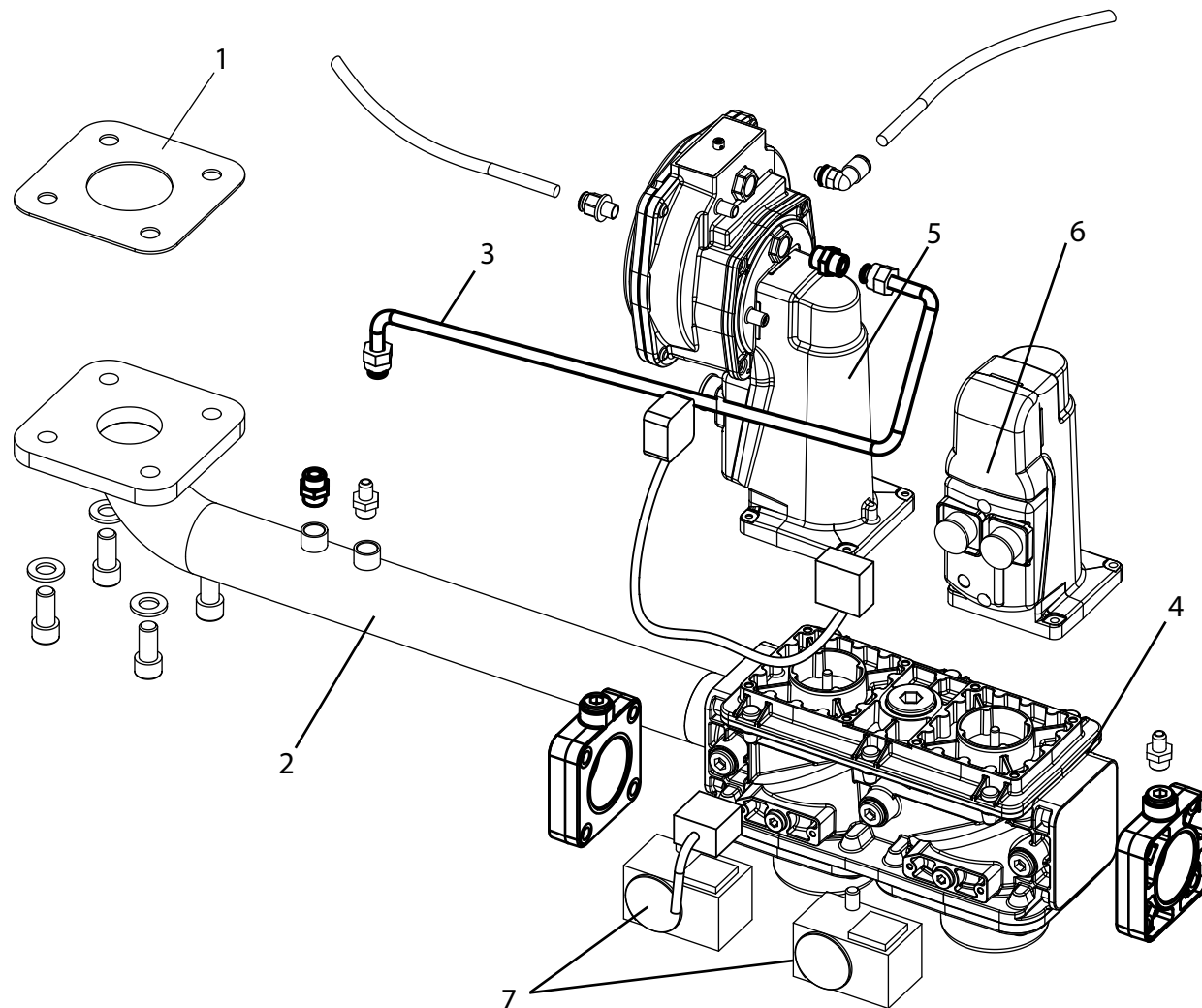
**4 - 3981D890** Газовый клапан VGD 20.403 (с фланцами AGA51)  
(Z304043160)

**5 - 3981D900** Сервопривод SKP 75.003E2 (Z304043180)

**6 - 3981D910** Сервопривод SKP 15.000E2 (Z304043190)

**7 - 3981D920** Прессостат DUNGS GW50A6 (Z304040790)

## **KIT GRUPPO VALVOLA VGD 20.503**



**1 - 3981B110** Прокладка фланца (Z301134670)

**2 - 01135880** Труба 2"

**3 - 01139910** Трубка отбора газа

**4 - 3981E310** Газовый клапан VGD 20.503 (с фланцами AGA51)

(Z304044370)

**5 - (Z304043180)** Сервопривод SKP 75.003E2

**6 - 3981D910** Сервопривод SKP 15.000E2 (Z304043190)

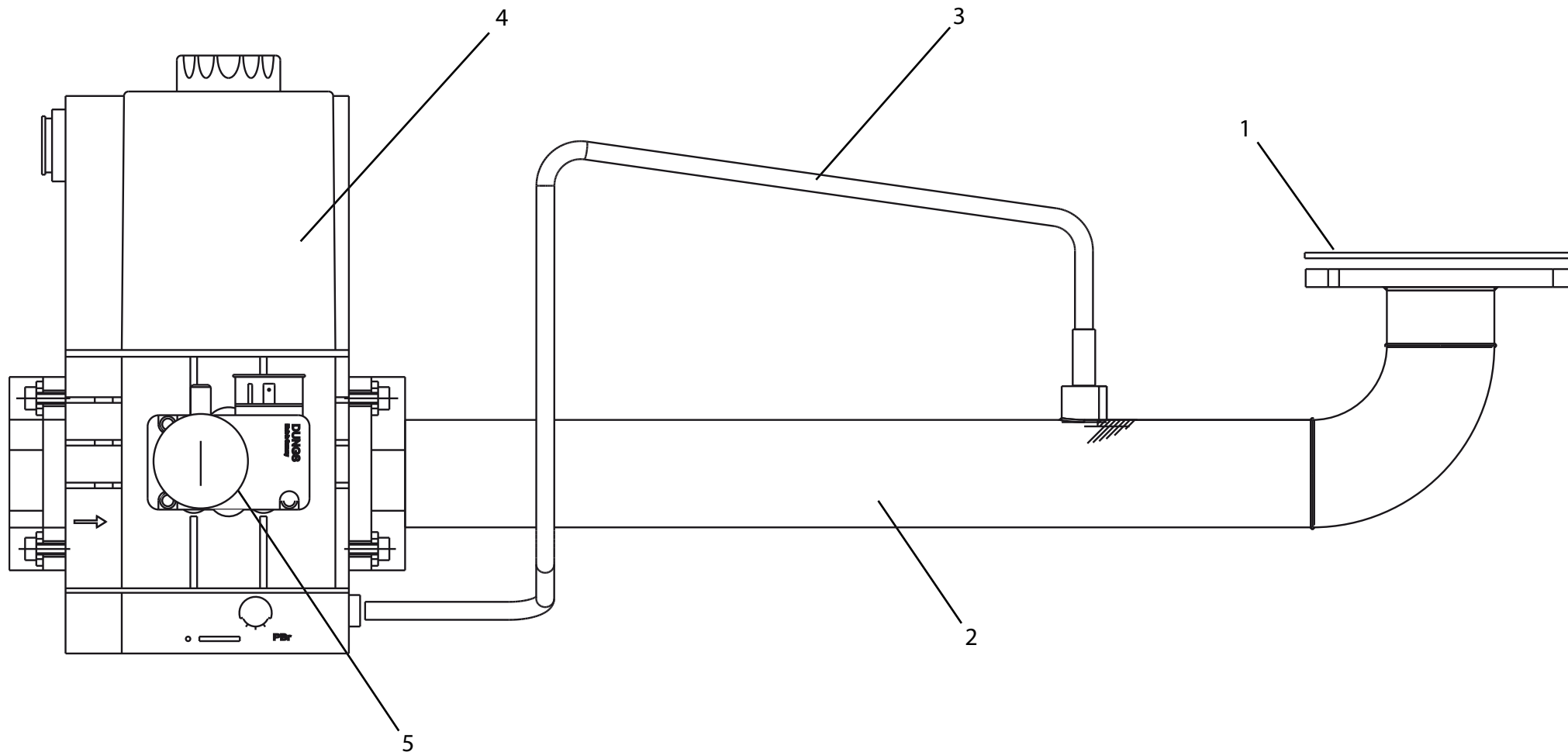
**7 - 3981D920** Прессостат DUNGS GW50A6 (Z304040790)



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## **KIT GRUPPO VALVOLA MBC 700 VEF**



**1** - 3981B110 Прокладка фланца (01134670 )

**2** - Z301134660 Труба 2"

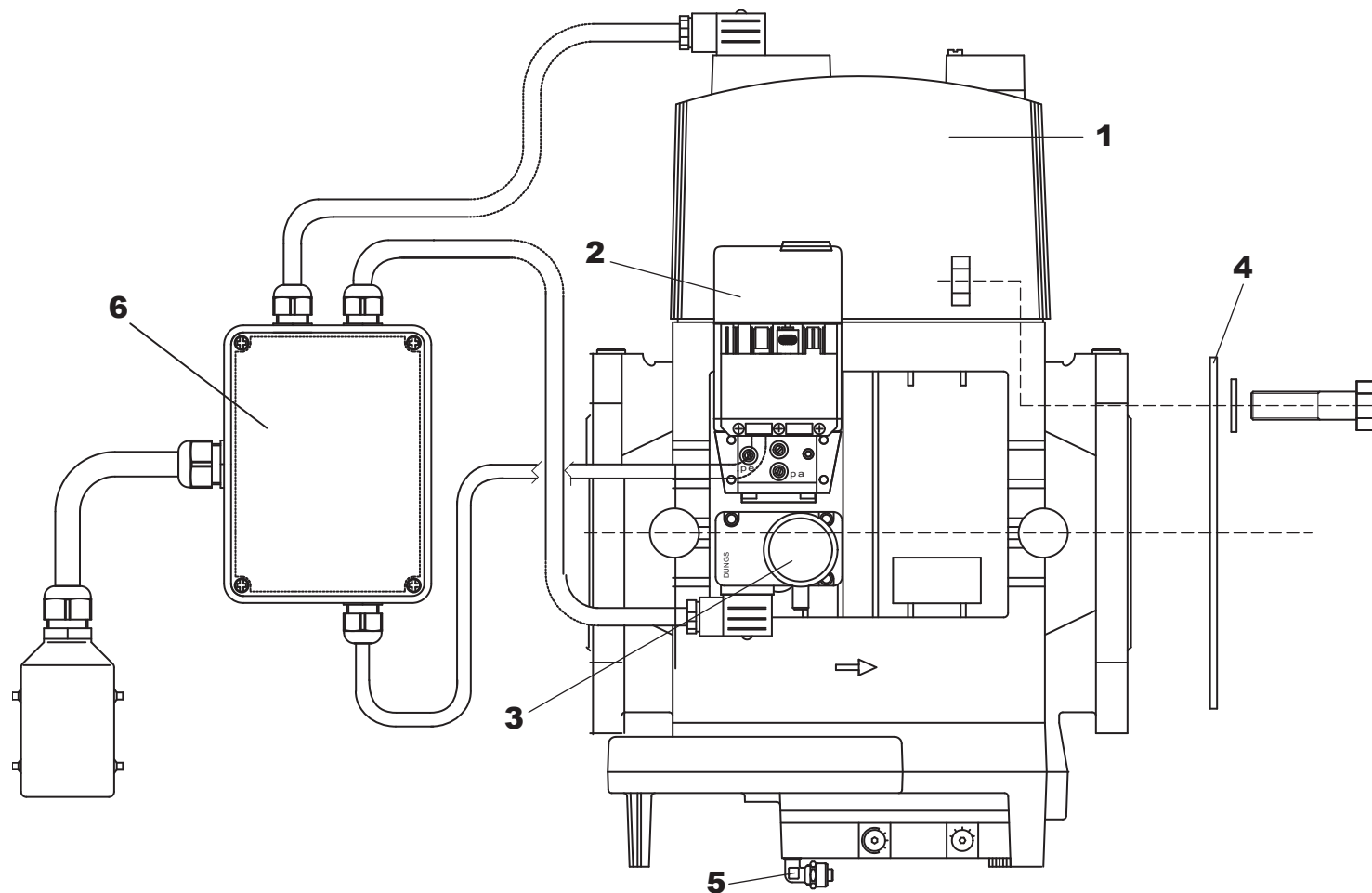
**3** - 1137100 Трубка отбора газа

**4** - Z304042120 Газовый клапан MBC700 (с фланцами AGA51)

**5** - Z304041750 Прессостат DUNGS GW150A5



## KIT RAMPA GAS MBC 5000 VEF-CT

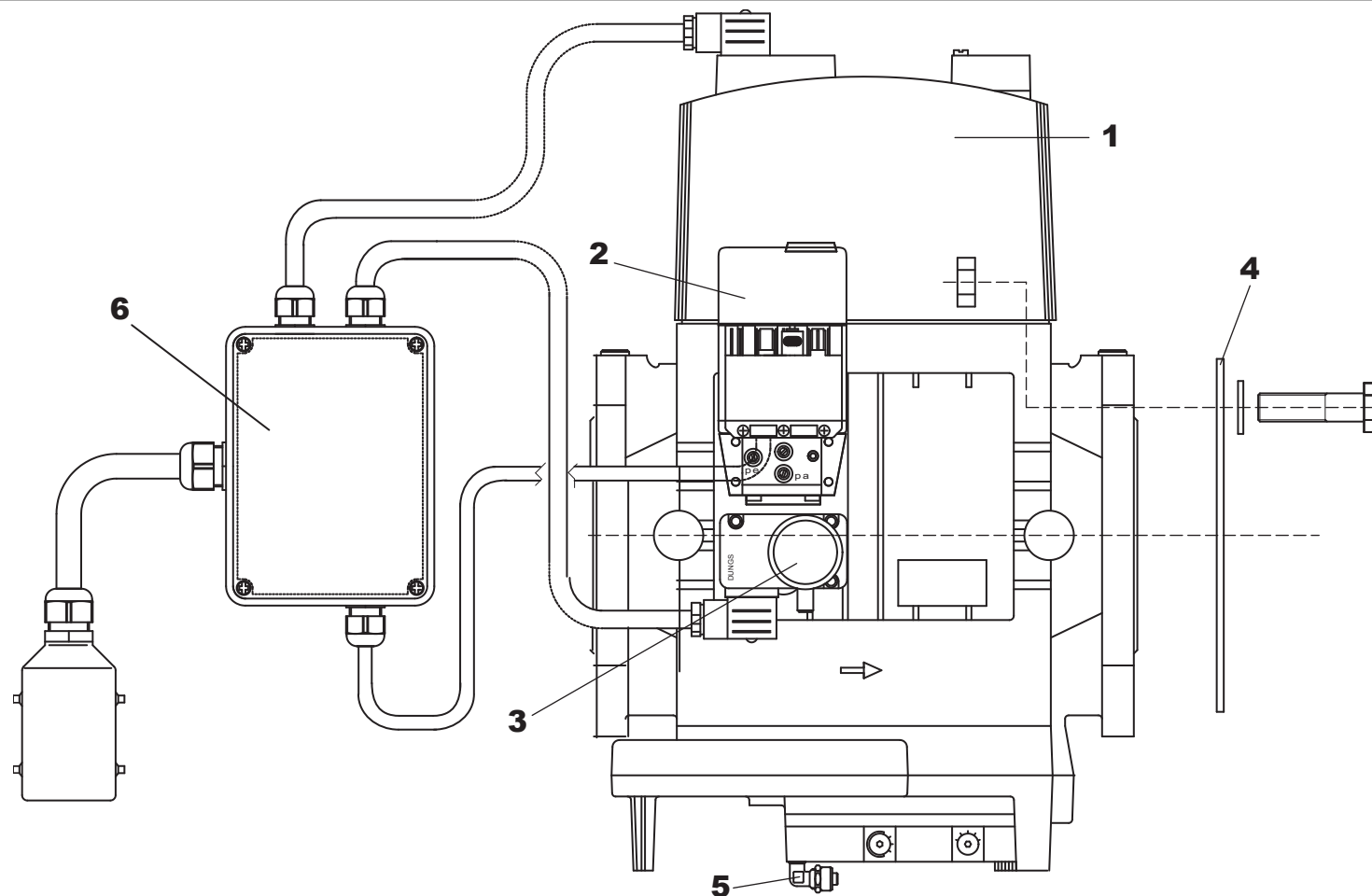


- 1 - Z304044610 Газовый клапан MBC 5000 VEF (DN100)
- 2 - 04044620 Система контроля Dungs VPS 508
- 3 - Z30404175 Прессостат Dungs GW 150 A5
- 4 - Z309004180 Прокладка DN100
- 5 - 04036200 Штуцер 1/8 "
- 6 - 08028100 Коммутационная коробка



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**Liste Pieces Detaches / Lista Piezas De Repuesto**  
**KIT RAMPA GAS MBC 3100 VEF-CT**

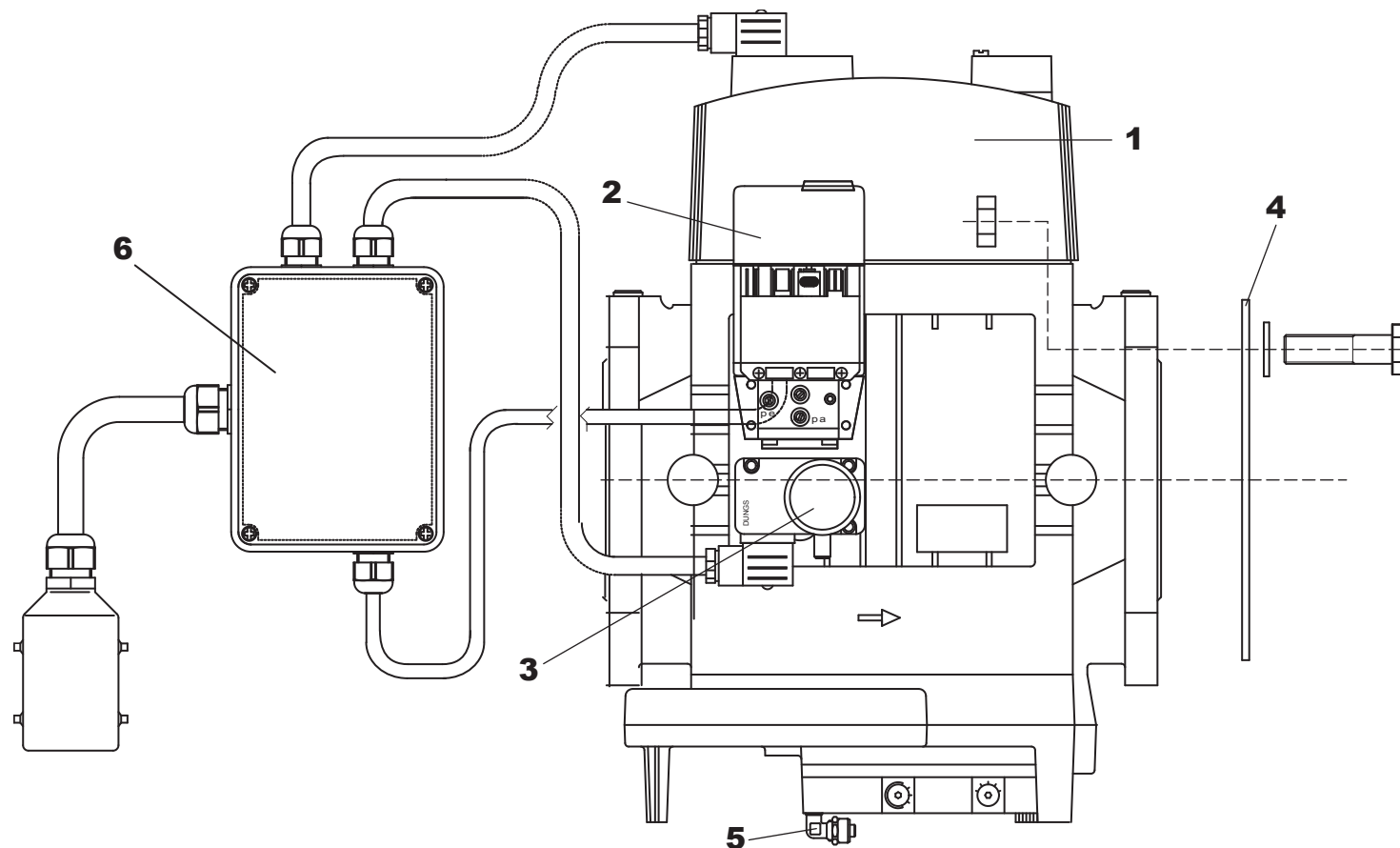


- 1 - Z304042040 Газовый клапан MBC 3100 VEF (DN80)
- 2 - Z304034430 Система контроля Dungs VPS 504
- 3 - Z304041750 Прессостат Dungs GW 150 A5
- 4 - 09004070 Прокладка DN80
- 5 - 04036200 Штуцер 1/8 "
- 6 - 08028100 Коммутационная коробка



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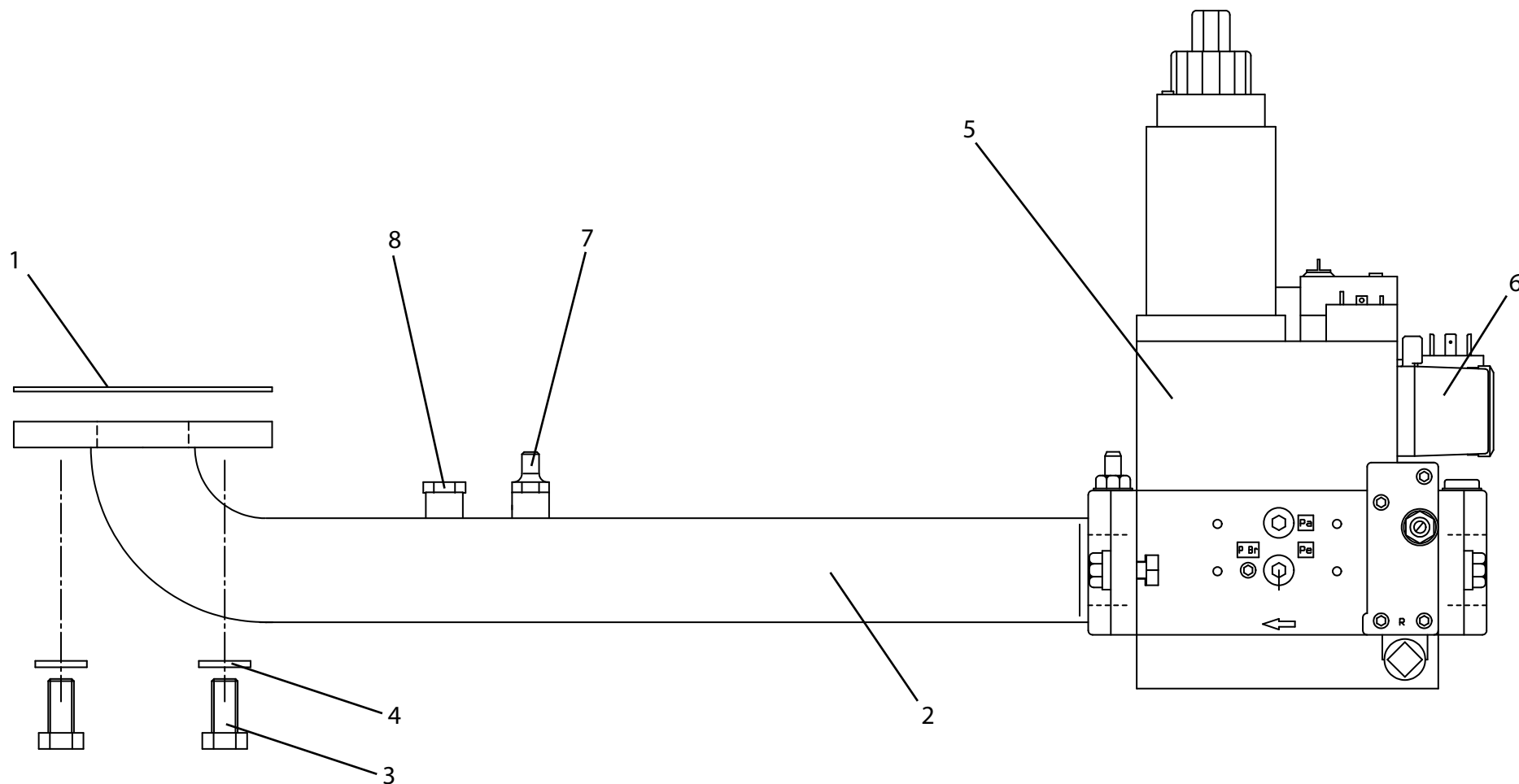
**Lista Pezzi / Spare Parts / Ersatzteile / List Onderdelen**  
**Liste Pieces Detaches / Lista Piezas De Repuesto**  
**KIT RAMPA GAS MBC 1900 VEF-CT**



- 1 - Z304042030 Газовый клапан MBC 1900 VEF (DN65)
- 2 - Z304034430 Система контроля Dungs VPS 504
- 3 - Z304037250 Прессостат Dungs GW 150 A6
- 4 - Z309000970 Прокладка DN65
- 5 - 04036200 Штуцер 1/8 "
- 6 - 08028100 Коммутационная коробка



**Lista Pezzi / Spare Parts / Ersatzsteile / List Onderdelen**  
**Liste Pieces Detaches / Lista Piezas De Repuesto**  
**KIT GRUPPO VALVOLA MB-ZRDLE 415 - L**  
**KIT GRUPPO VALVOLA MB-ZRDLE 415 - F**



- 1 - 3981B110 Прокладка фланца
- 2 - 01134660 Труба 1"1/2
- 3 - 02273990 Болт M12x55
- 4 - Z302280070 Шайба D13

- 5 - Z304037200 Газовый клапан MB-ZRDLE 415 (с фланцами)
- 6 - Z304041750 Прессостат DUNGS GW150A5
- 7 - Z304018930 Штуцер замера давления
- 8 - 3981B130 Заглушка

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