

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

DUNGS®
 Combustion Controls

neovità
 nouveaunew

- 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 thread 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.

If the inlet pressure drops below the desired value set on the pressure switch, the switch opens in the direction of the gas burner control system.

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

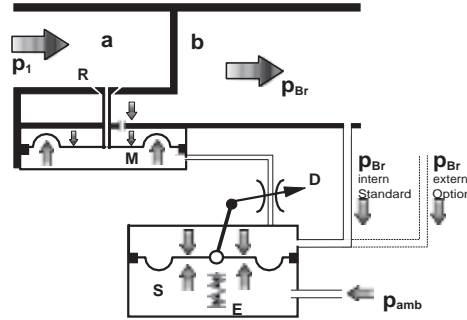
Valves V1 and V2 can be controlled electrically and separately. Each valve preloads its own compression spring when the plunger opens. When the two valves are open, a pressure pulse runs below the working diaphragm. The size of the pressure pulse changes as a factor of the variable restrictor position 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} .

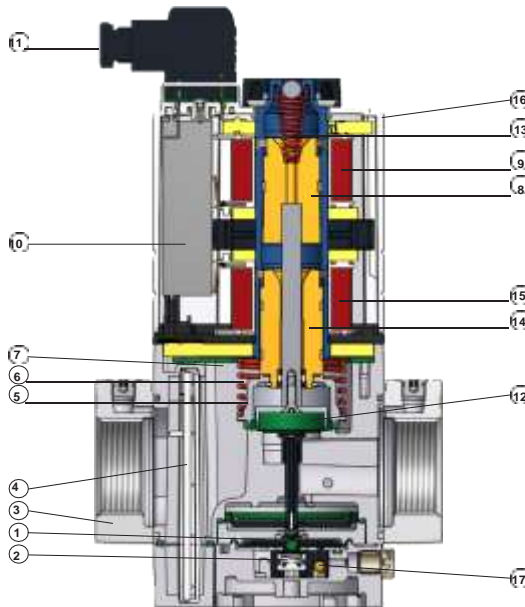
Changes in the equilibrium of forces lead to a change in flow cross-section. The pressure under the working diaphragm re-adjusts itself. The regulator unit adapts the free valve cross-section to the new flow requirement.

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

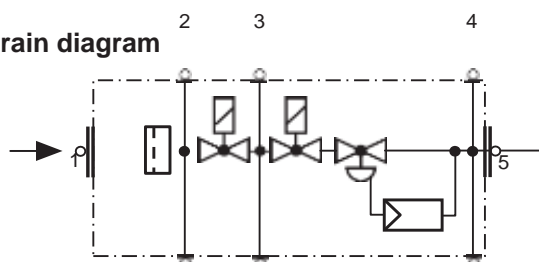


- | | | | |
|----------|---|-------------|--|
| M | Working diaphragm | a, b | Pressure chambers in flow direction |
| D | Restrictor | p_1 | Inlet pressure |
| S | Servo diaphragm | p_{br} | Burner pressure, outlet pressure |
| E | Setting spring for outlet pressure p_{br} | p_{amb} | Ambient pressure |
| 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: |
| 4 | Micro-filter | 11 | Electrical connection | | - Gas pressure p_{br} |
| 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



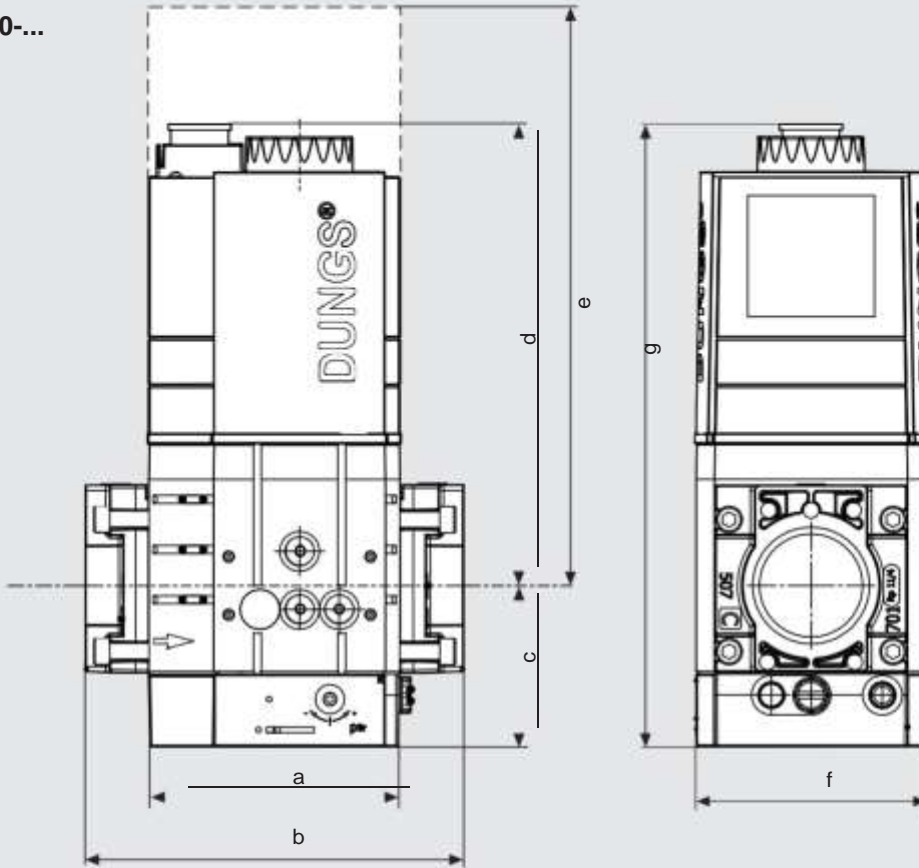
1, 2, 3, 4, 5 Screw plug G 1/8

Technical Data

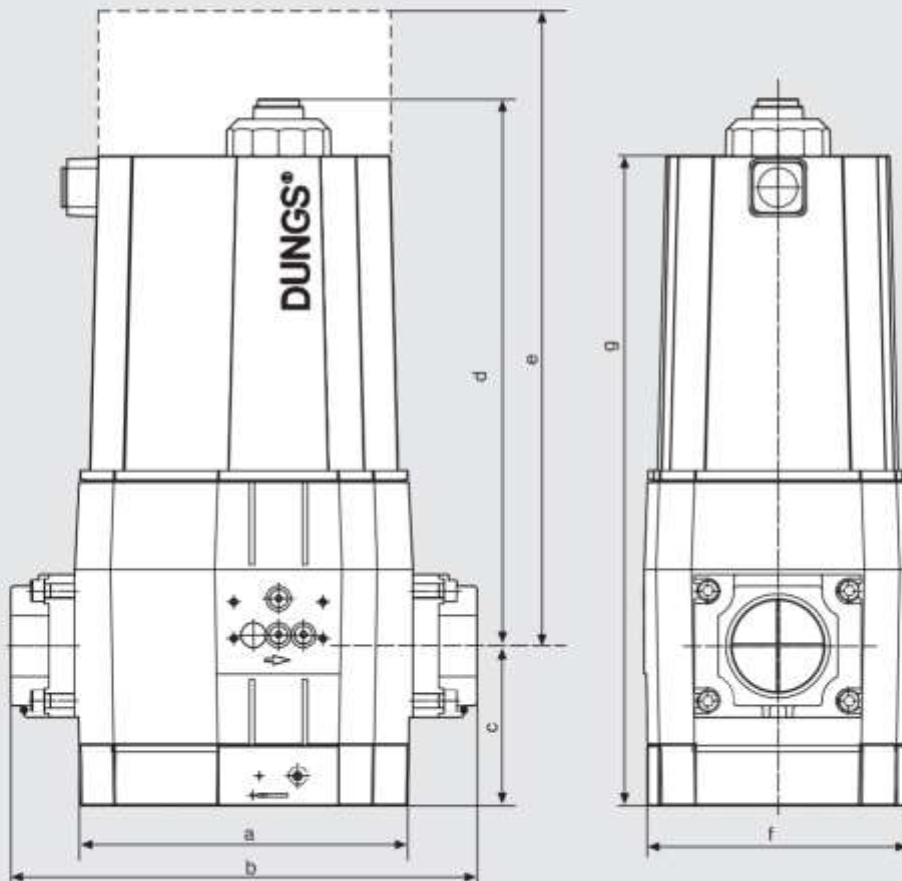
Nominal widths Flanges with pipe threads to ISO 7/1 (DIN 2999)	MBC-300-SE Rp1/2,3/4,1,1 1/4 andtheircombinations	MBC-700-SE Rp1,1 1/4,1 1/2,2 andtheircombinations	MBC-1200-SE Rp1,1 1/4,1 1/2,2 and their combinations
Max. operating pressure	360 mbar (36 kPa)		
Inlet pressure ranges	S22/S82:	$p_e = 15 - 360 \text{ mbar (1.5 - 36 kPa)}$	
	S302:	$p_e = 35 - 360 \text{ mbar (3.5 - 36 kPa)}$	
	S02/N:	$p_e = 15 - 100 \text{ mbar (1.5 - 10 kPa)}$	
Burner pressure ranges	S22:	$p_{Br} = 4 - 20 \text{ mbar (0.4 - 2 kPa)}$	
	S82:	$p_{Br} = 5 - 80 \text{ mbar (0.5 - 8 kPa)}$	
	S302:	$p_{Br} = 30 - 300 \text{ mbar (3 - 30 kPa)}$	
	S02/N:	$p_{Br} = 0 \pm 2 \text{ mbar (0} \pm 0.2 \text{ kPa)}$	
Media	Gases of gas families 1, 2, 3 and other inert gaseous media		
Ambient temperature	-15°Cupto+70°C(inLPGplants,donotoperateMBC...SEbelow0°C.Only suitableforgaseousLPG, liquidhydrocarbonsdestroythesealmaterials)		
Dirt trap device	Micro-filtermadeofchopped-strandnonwovenfabric.Filterreplaceablewithout removing fitting		
Pressure switch	Types GW A5, NB A2, ÜB A2 as per DIN EN 1854 retrofitable. Forfurtherinformationreferto DataSheets„PressureswitchforDUNGSmultiple actuators“ 5.03 and 5.12		
Servo pressure regulator	Servopressureregulatorwithadjustableburnerpressure,asperDINEN88 Class A, Group2 Versions for constant pressure and zero pressure available		
Solenoid valve V1, V2	ValvesasperDINEN161 ClassA Group2, fast-closing, fast-opening		
Measuring gas connection	G 1/8 DIN ISO 228, at inlet and outlet flanges, onbothsidesdownstreamoffilter,betweenV1andV2,downstreamofV2 (fitting pressure switch may partially exclude measuring gas connection)		
Voltage/frequency	~(AC)50-60Hz230V-15%+10%,othervoltagesonrequest. Standardvoltages: ~(AC)100V-120V,=(DC)24V-28V		
Electrical connection	Plug-in connection as per DIN EN 175301-803		
Rating/power consumption	at~(AC)230V;+20°C:seetypesummary		
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-conveyingparts	Housing	die-cast aluminium	
	Diaphragms, seals	on NBRbase	
	Solenoid drive	steel, aluminium	
Installation position	S22/S82/S302: Verticalwithuprightsolenoidorhorizontalwithhorizontalsolenoid, as well as their spacers.		
	S02/N:	Vertical with upright solenoid	

Mounting dimensions [mm]

MBC-300/700-...



MBC-1200-...




e = space requirement for solenoid replacement

Type Version	Order No. DN 230 VAC	DN Rp	Opening time	Mounting dimensions [mm]							Solenoid Switch- No.	ing 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

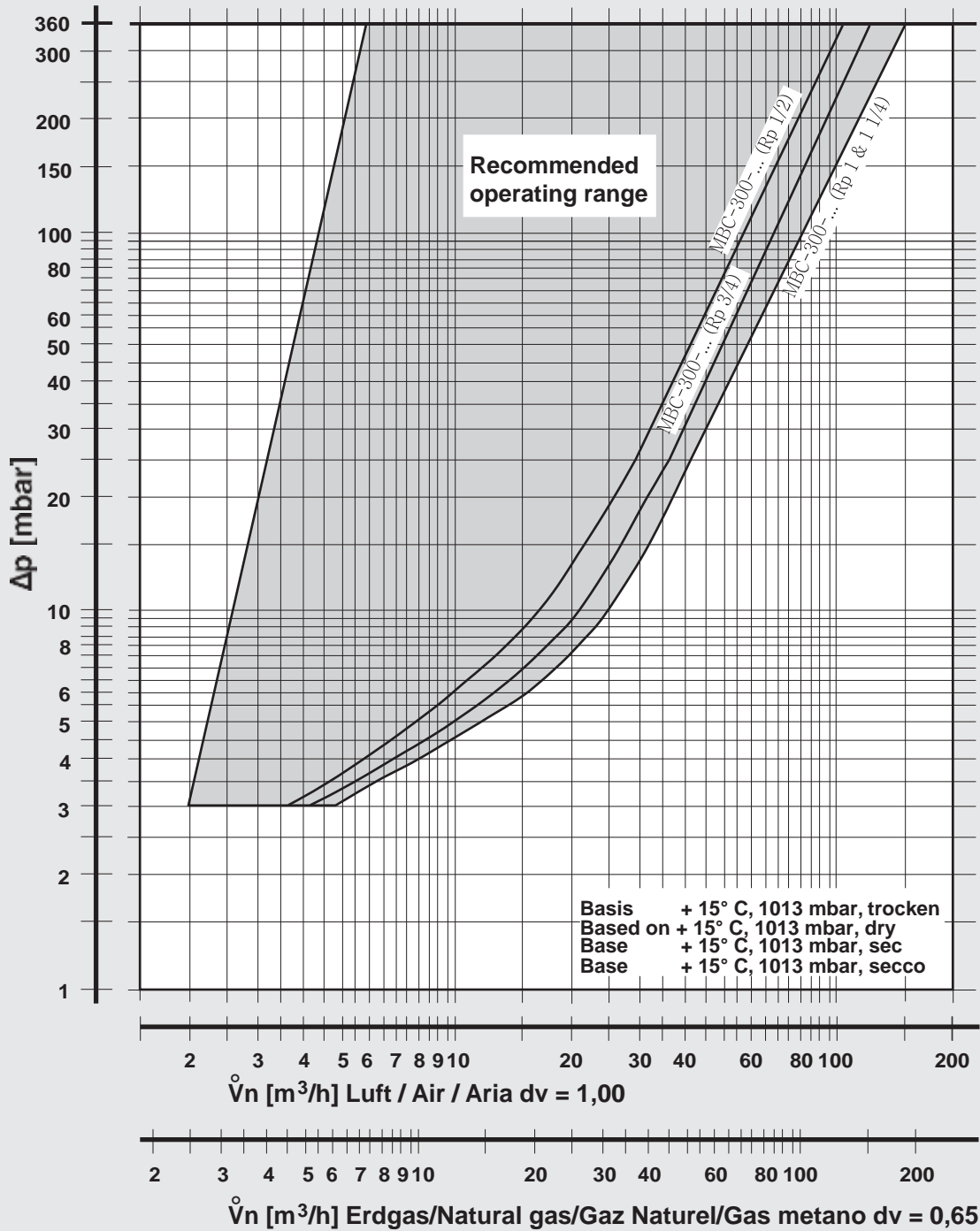
$P_{max.}$ [VA] for t = 3 s $P_{max.}$ [VA] Operation

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	Line socket	3pole+PE 210 319
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	Adapter, pressure gauge flange set G1/2 Adapter GW A with G1/4 Adapter p _B Adapter GW A on flange	216 675 222 982 214 975 221 630
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	 Flanges, plug-in connection and system accessories must be ordered separately.	
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		

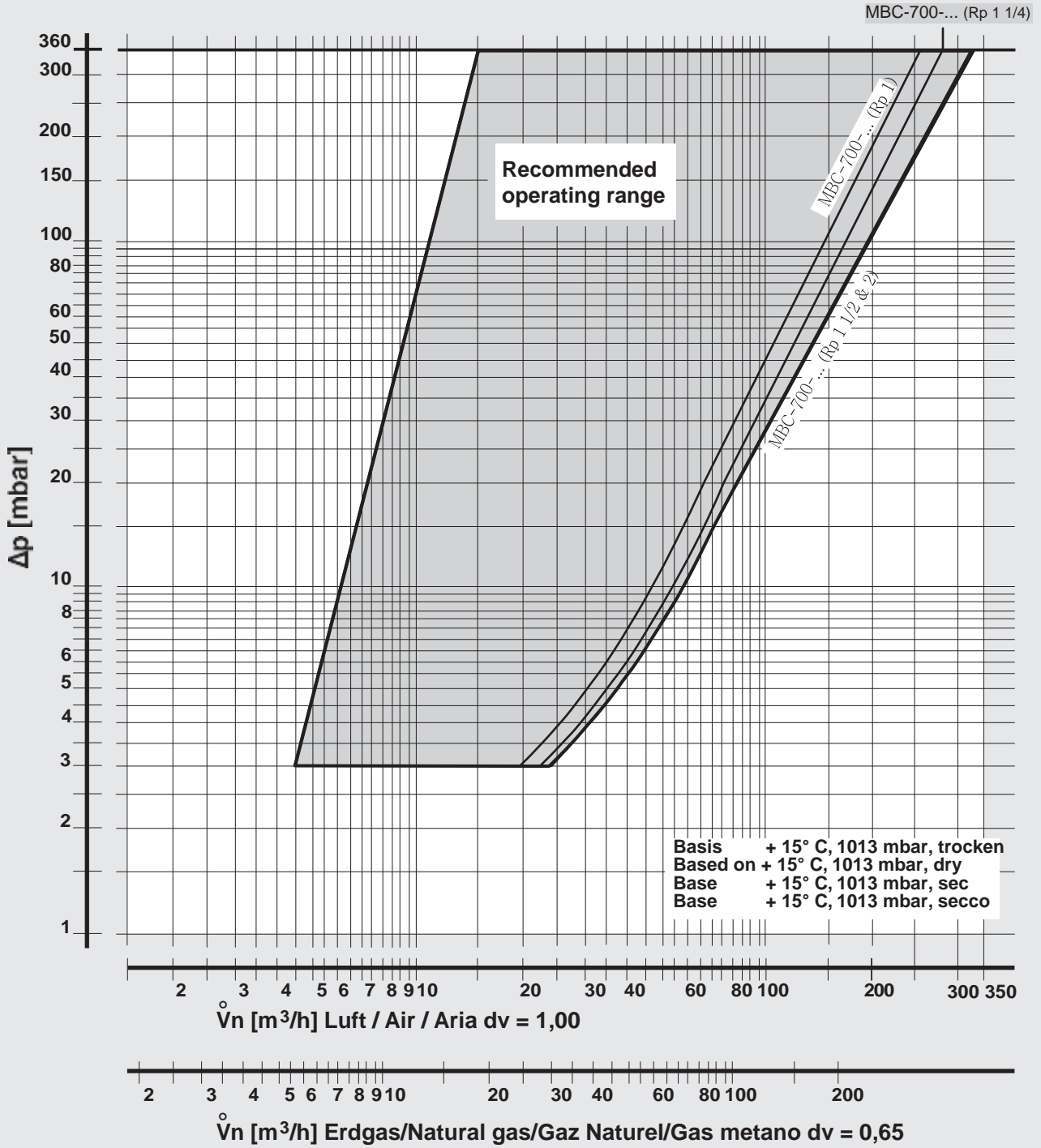
Volume flow pressure difference characteristics in steady state with microfilter.

MBC-300-...



Volume flow pressure difference characteristics in steady state with microfilter.

MBC-700-...



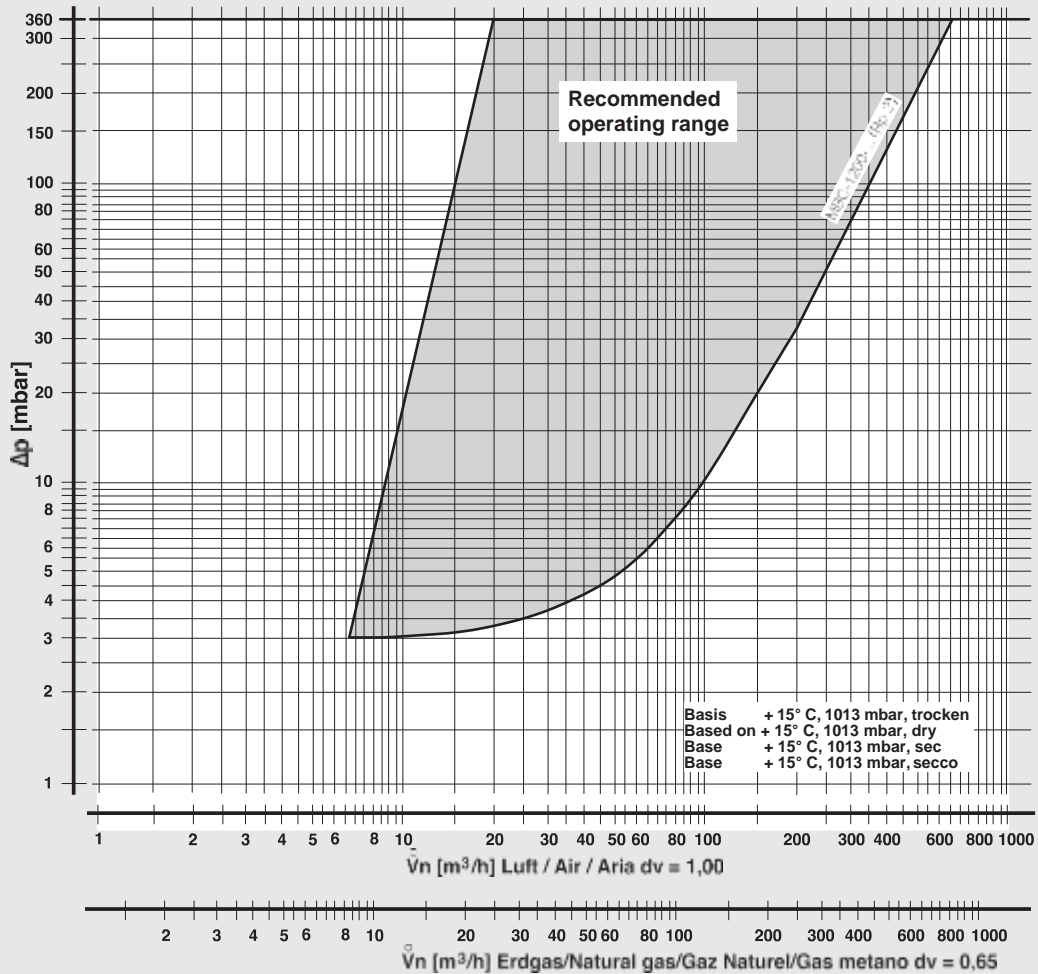
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 Combined servo pressure regulator and safety shut-off valves

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]	d_v	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