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Butterfly valves BVG, BVA, BVH, BVHS, BVHM

Technical Information · GB
3.1.6.2 Edition 12.08

- For gas, air, hot air and flue gas
- Low leakage rate and pressure loss
- High control accuracy
- BVG and BVA with reduced nominal diameters
- BVG and BVA with reduced nominal diameters
- Butterfly valve can be mounted directly onto the actuators IC 20 or IC 40
- Suitable for intermittent operation
- Low-maintenance operation
- BVG: EC type-tested and certified
- BVHM: FM approved

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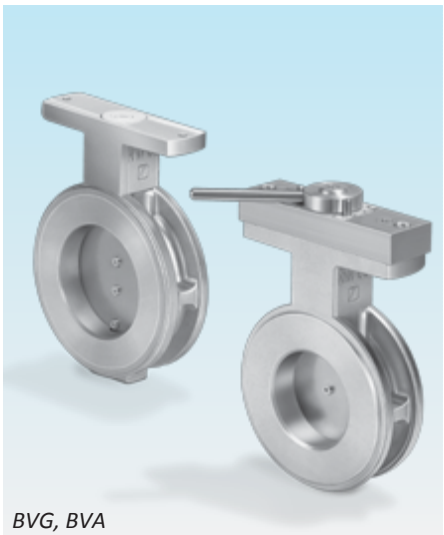

BVG, BVA

BVG for gas, BVA for air These butterfly valves can be fitted with a lever, an adapter set with square shaft or with free shaft end.

1 Application

The butterfly valves BVG, BVA, BVH, BVHM and BVHS are de- signed to adjust volumes of gas, cold and hot air and flue gas on various appliances and flue gas lines. They are designed for control ratios up to 1:10, and with the mounted actuator IC 20 or IC 40 they are suitable for regulating flow rates for modulating or stage-controlled combustion processes.

Flow rates can be set and fixed using a lever, for example to limit the high-fire rate on the burner. A scale indicates the set angle of opening.

BVG, BVA

Butterfly valves with reduced nominal diameter (reduced by one or two nominal sizes) can be used to achieve higher control accuracy. This will mean that complex reducing fittings will no longer be required.

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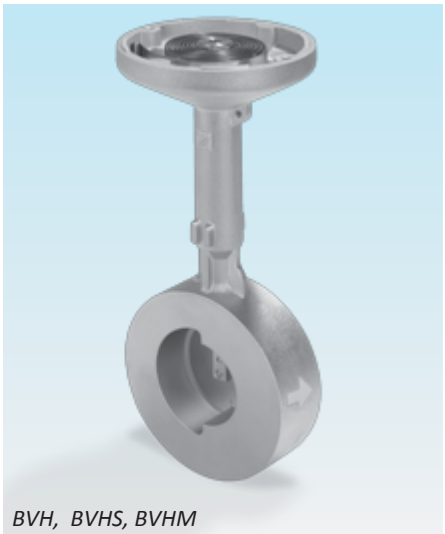
BVH, BVHM, BVHS for hot air and flue gas



BVH, BVHS, BVHM

BVH

The butterfly valve BVH is used for processes that require the very precise adjustment of the flow rate or low leakage. In conjunction with the stop bar, the valve disc ensures very low leakage rates.

Using a spiral spring which compensates for the play in com- bination with the actuator IC 40 it is possible to move the valve disc to the required angle with almost zero hysteresis.

BVHS

The butterfly valve BVHS with safety closing function is used with the actuator IC 40S in systems where it is important that in the event of a mains voltage failure the valve closes preventing air streaming into the furnace without being under control.

BVHM

Well suited to intermittent operation due to the large number of operating cycles in conjunction with the solenoid actuator MB 7.

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Butterfly valve with actuator

Roller hearth kiln in the ceramics industry

Forging furnace

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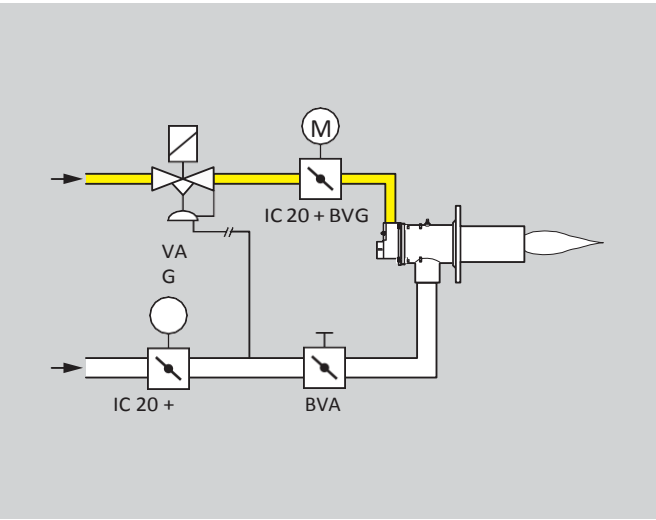
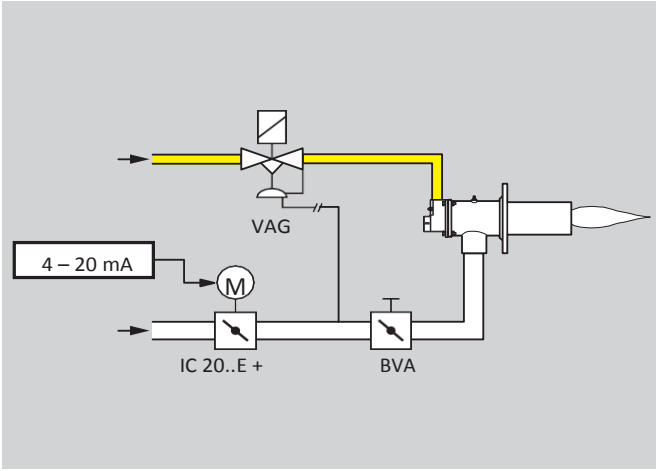


1 .1 Example applications

1 .1 .1 BVG, lambda correction

If the burner is to be operated with excess gas or air for reasons of the Process operation, the butterfly valve BVG can be used to correct the lambda value.

The butterfly valve with manual adjustment is used to adjust the high-fire rate.



1.1.2 BVA, adjusting the burner output

In pneumatic systems the butterfly valve with mounted actuator IC 20..E determines the air volume for the required burner output.

The butterfly valve with manual adjustment is used to adjust the high-fire rate.

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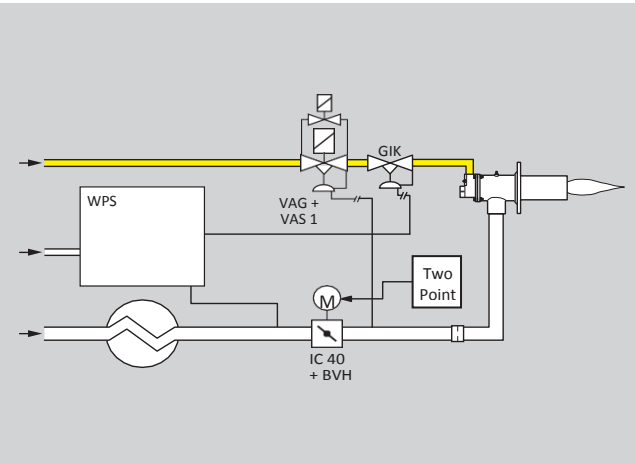
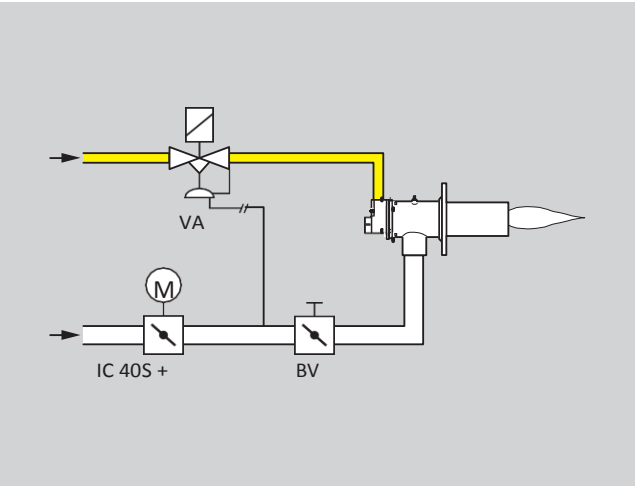


1.1.3 BVH, hot air compensation

The butterfly valve BVH is used on burners that are operated with preheated combustion air at temperatures of up to 450 °C (840 °F).



1.1.4 BVHS, safety closing function in the event of a mains voltage failure

The safety closing function ensures that in the event of a mains voltage failure air cannot stream into the furnace without be- ing under control.

The BVHS is installed on the air side together with the actua- tor IC 40S.

The butterfly valve with manual adjustment is used to adjust the high-fire rate.

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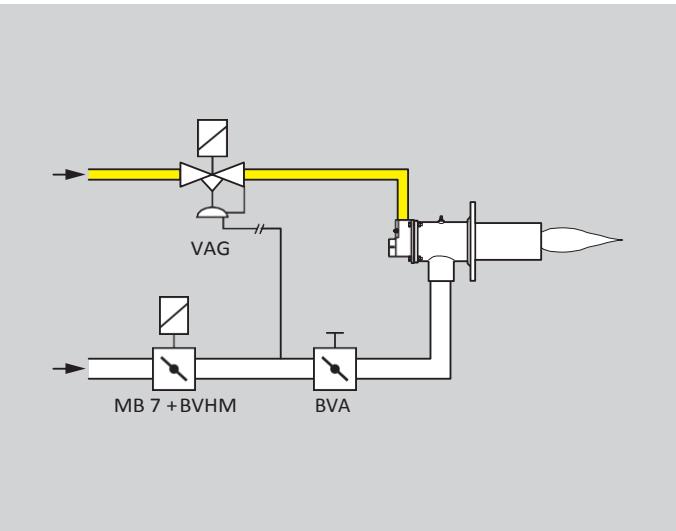

1.1.5 BVHM, large number of operating cycles for intermittent operation

The butterfly valve BVHM features flow adjustment for low-fire and high-fire rate. The valve stop ensures low leakage rates. With fitted solenoid actuator MB 7, the valve is suitable for intermittent operation.

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CE

FM APPROVED

2 Certification

BVG

The butterfly valve BVG is EC type-tested and certified pursu- ant to

– Gas Appliances Directive (90/396/EEC) on the basis of EN 13611/EN 161.

BVHM

FM approved

Factory Mutual Research Class: 7400 Process Control Valves

Designed for applications pursuant to NFPA 85 and NFPA 86.

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3Function

BVG, BVA, BVH, BVHM, BVHS

Butterfly valves BVG, BVA and BVH are designed on the basis of the free-flow principle (no deflection of the flow). They release a cross-section for the flowing medium, depending on a rotary movement between 0 and 90°.

Butterfly valves BVG and BVA are with disc clearance. BVH is equipped with a mechanical stop bar. The valve disc of the butterfly valves BVH, BVHS, BVHM features a twin disc and, together with the mechanical stop bar, ensures very low leakage.

BVG, BVA and BVH are specifically designed to fit the Elster Kromschröder actuators IC 20 and IC 40. The butterfly valves feature very easy action. Consequently, the actuator requires only a low torque.

BVHM is tailored to the Elster Kromschröder solenoid actuator MB 7.

BVG, BVA

Butterfly valves with reduced nominal diameter (reduced by up to two nominal sizes) can be used to achieve higher control accuracy. This will mean that expensive reducing fittings will no longer be required.

Various adapter sets with square shaft, free shaft end or lever are available as accessories. Flow rates can be set and fixed using a lever, for example to limit the high-fire rate on the burner. A scale indicates the set angle of opening.

BVHM, BVHS

The butterfly valves BVHM, BVHS feature a safety closing func- tion. They are used in systems where it is important that in the event of a mains voltage failure the valve closes preventing air streaming into the furnace without being under control.

A pre-tensioned spiral spring moves the valve disc against the mechanical stop of the butterfly valve in the event of a solenoid valve/motor defect, within the closing time.

The safety closing function of butterfly valve BVHS is possible only in conjunction with the actuator IC 40S.

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4Replacement possibility for butterfly valves

4 .1 DKG is to be replaced by BVG

Type			Typ
DKG	Butterfly valve	Butterfly valve	BVG
25			–
32			–
40			40
50			50
65	Nominal diameter DN	Nominal diameter DN	65
80			80
100			100
125			125
150			150
/15-/125	Reduced to nominal diameter DN	Reduced to nominal diameter DN	/25-/125
T	T-product	T-product	T
Z	For fitting between two DIN flanges	For fitting between two flanges to EN-1092	Z
W	For fitting between two ANSI flanges	For fitting between two ANSI flanges	W
flanges			
03	p_e max. 300 mbar (4,35 psi)	p_e max. 500 mbar (7,25 psi)	05
H	With manual adjustment	Adapter set with manual adjustment	O
V	With square shaft	Adapter set with square shaft	O
F	With free shaft end	Adapter set with free shaft end	O
60	Temperature range 60 °C (140 °F)	Temperature range 60 °C (140 °F)	●
D	With disc clearance	With disc clearance	●
DKG 80Z03H60D	**Example**	**Example**	BVG 80Z05 +adapter set with manual adjustment

● *standard,* O *available*

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4.2 DKL is to be replaced by BVA

Type			Type
DKL	Butterfly valve	Butterfly valve	BVA
25			–
32			–
40			40
50			50
65	Nominal diameter DN	Nominal diameter DN	65
80			80
100			100
125			125
150			150
/15-/125 DN	Reduced to nominal diameter	Reduced to nominal diameter DN	/25-/125
T	T-product	T-product	T
Z	For fitting between two DIN flanges	For fitting between two flanges to EN-1092	Z
W	For fitting between two ANSI flanges	For fitting between two ANSI flanges	W
flanges			
03	p_e max. = 300 mbar (4,35 psi)	p_e max. = 500 mbar (7,25 psi)	05
H	With manual adjustment	Adapter set with manual adjustment	O
V	With square shaft	Adapter set with square shaft	O
F	With free shaft end	Adapter set with free shaft end	O
100	Temperature range 100 °C (210 °F)	Temperature range 60 °C (140 °F)	●
D	With disc clearance	With disc clearance	●
DKL 40Z03F100D	**Example**	**Example**	BVA 40Z05+ Adapter set with free shaft end

●*standard,* O *available*

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4.3 K is to be replaced by BVHM

Type			Type
K	Valve	Butterfly valve for solenoid actuator MB 7	BVHM
40*			40
50			50
65	Nominal diameter DN	Nominal diameter DN	65
80			80
100			100
T	T-product	T-product	T
Z	For fitting between two DIN flanges	For fitting between two flanges to EN-1092	Z
W	For fitting between two ANSI flanges	For fitting between two ANSI flanges	W
	p_e max. 130 mbar (1.89 psig) p_e max. 150 mbar (2.18 psig)		01
	Temperature range 0 – 550 °C (0 – 1020 °F)	Temperature range 0 – 450 °C (0 – 840 °F)	●
A	With stop	With stop	A
K 80ZA	**Example**	**Example**	BVHM 80Z01A

** Nominal size DN 40 only with disc clearance*

●*standard,* O *available*

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4.4 K is to be replaced by BVHS

Type			Type
K	Valve	Butterfly valve	BVH
		Safety closing function **	S*
40*			40
50			50
65	Nominal diameter DN	Nominal diameter DN	65
80			80
100			100
–			–
–			–
T	T-product	T-product	T
Z	For fitting between two DIN flanges	For fitting between two flanges to EN-1092	Z
W	For fitting between two ANSI flanges	For fitting between two ANSI flanges	W
●	p_e max. 130 mbar (1.89 psi)	p_e max. 150 mbar (2.18 psi)	01
●	Temperature range 0 – 550 °C (0 –1020 °F)	Temperature range 0 – 450 °C (0 – 840 °F)	●
A	With stop	With stop	A
K 65ZA	**Example**	**Example**	BVHS 65Z01A

* *Nominal size DN 40 only with disc clearance*
** *Safety closing function only in conjunction with actuator IC 40S*
● *standard,* O *available*

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4.5 DKR is to be replaced by BVH

Type			Type
DKR	Butterfly valve	Butterfly valve	BVH
25			–
32			–
40			40
50			50
65	Nominal diameter DN	Nominal diameter DN	65
80			80
100			100
125			–
150			–
T	T-product	T-product	T
Z	For fitting between two DIN flanges	For fitting between two flanges to EN-1092	Z
W	For fitting between two ANSI flanges	For fitting between two ANSI flanges	W
03	p_e max. 300 mbar (4.35 psi)	p_e max. 150 mbar (2.18 psi)	01
H	With manual adjustment	–	–
F	With free shaft end	–	–
100	Temperature range 100 °C (210 °F)		
450	Temperature range 450 °C (840 °F)	Temperature range 0 – 450 °C (0 – 840 °F)	●
650	Temperature range 650 °C (1200 °F)		
D	With disc clearance	With stop	A
DKR 65Z03F450D	**Example**	**Example**	BVH 65Z01A

● *standard,* O *available*

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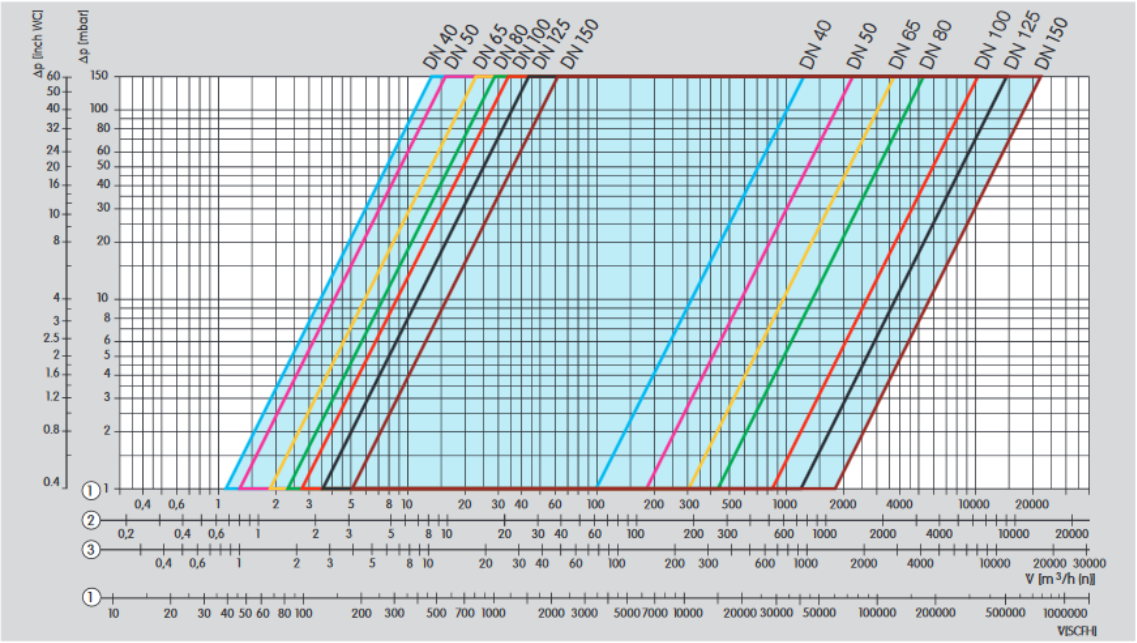

5 Flow rate

5 .1 Flow rate curves for BVG, BVA

5 .1 .1 With full bore = nominal diameter

①= Natural gas, dv = 0.62,
②= LPG, dv = 1.56,
③= Air, dv = 1.00

The characteristic curves are measured at 15°C (59 °F) with a measurement set-up in accordance with the applicable standard EN 13611/ EN 161. This involves measuring the pres- sure 5 x DN upstream and downstream of the unit under test. The pressure drop of the pipe is also measured but is not compensated for.

Left curve: Leakage volume at a 0° opening angle. Right curve: Max. flow rate at a 90° opening angle.

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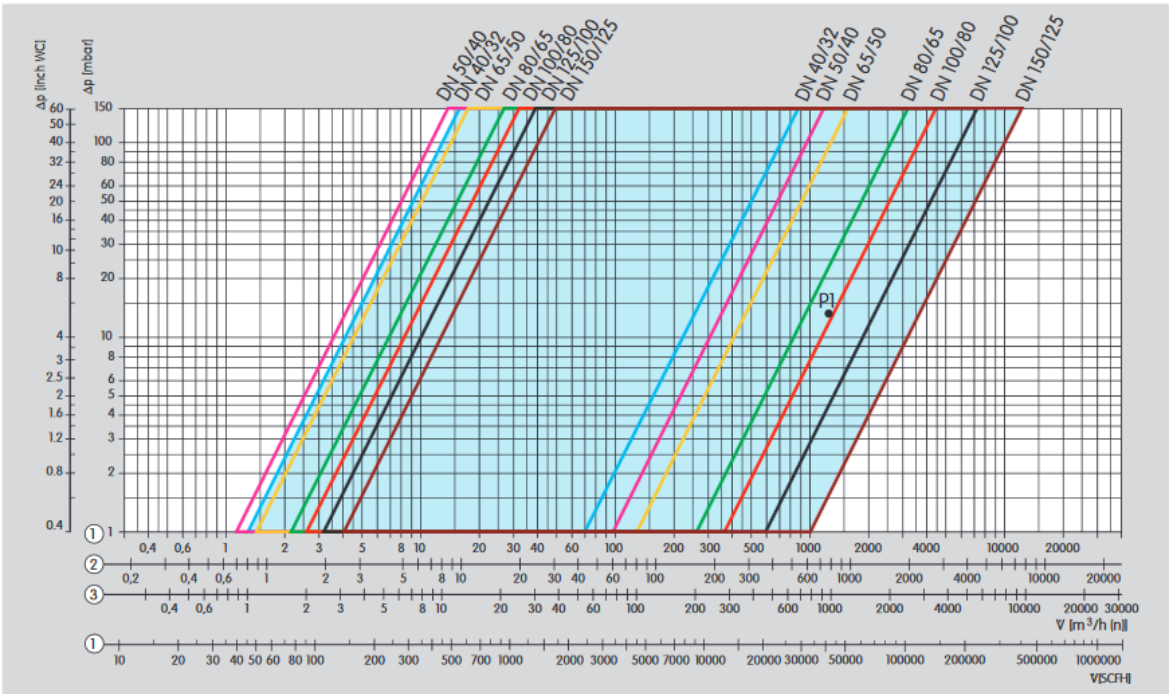

5.1.2 With 1x reduced bore

=Nduardiggs, dv=0.62

=LRG dv=1.56 =Air, dv=1.00

The characteristic curves are measured at 15°C (59 °F) with a measurement set-up in accordance with the applicable standard EN 13611/EN 161. This involves measuring the pres- sure 5 x DN upstream and downstream of the unit under test. The pressure drop of the pipe is also measured but is not compensated for.

Left curve:
Leakage volume at a 0° opening angle. Right curve:
Max. flow rate at a 90° opening angle.

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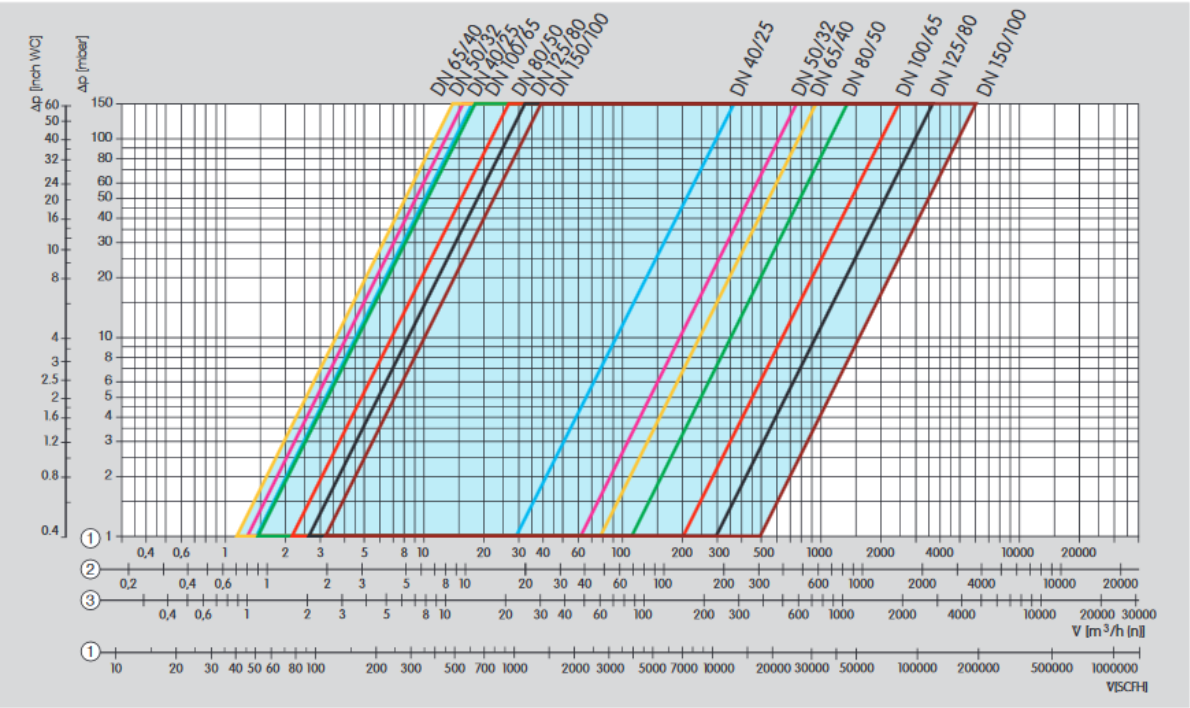

5.1.3 With 2x reduced bore

①= Natural gas, dv = 0.62

②= LPG, dv = 1.56, ③ = Air, dv = 1.00

The characteristic curves are measured at 15°C (59 °F) with a measurement set-up in accordance with the applicable standard EN 13611/EN 161. This involves measuring the pres- sure 5 x DN upstream and downstream of the unit under test. The pressure drop of the pipe is also measured but is not compensated for.

Left curve:
Leakage volume at a 0° opening angle. Right curve:
Max. flow rate at a 90° opening angle.

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5.1.4 kV values

With full bore = nominal diameter

	Opening angle									
	0	10°	20°	30°	40°	50°	60°	70°	80°	90°
BVG/BVA 40	1.0	1.5	3.6	7,3	13	23	37	56	77	90
BVG/BVA 50	1.2	1.6	4.0	9,3	17	31	51	82	123	167
BVG/BVA 65	1.7	2.7	7.3	16	32	57	94	144	210	281
BVG/BVA 80	2.1	3.2	9.8	24	47	83	132	202	296	405
BVG/BVA 100	2.5	3.4	12	33	59	133	214	331	517	792
BVG/BVA 125	3.4	7.4	25	78	145	244	385	583	910	1132
BVG/BVA 150	4.7	13	58	132	229	369	583	882	1557	1696

With 1x reduced bore

BVG/BVA 40/32	1.2	1.4	2.8	5.4	9.5	16	27	41	57	63
BVG/BVA 50/40	1.1	1.5	3.2	7.1	13	21	34	52	73	90
BVG/BVA 65/50	1.3	1.6	4.3	9.5	17	29	46	68	97	120
BVG/BVA 80/65	2.0	2.4	7.0	16	31	55	89	132	185	243
BVG/BVA 100/80	2.4	3.3	9.8	23	49	88	140	203	275	335
BVG/BVA 125/100	2.9	5,2	17	48	103	173	262	364	478	561
BVG/BVA 150/125	3.8	6,6	25	89	180	288	422	586	771	940

With 2x reduced bore

BVG/BVA 40/25	1.3	1.3	2.2	3.9	6.6	11	16	20	24	27
BVG/BVA 50/32	1.2	1.4	2.8	5.4	9.6	16	26	38	50	56
BVG/BVA 65/40	1.1	1.5	3.3	7.1	13	20	32	46	61	71
BVG/BVA 80/50	1.3	1.6	4.0	9.0	16	28	44	64	85	101
BVG/BVA 100/65	2.0	2.9	7.7	17	32	55	86	122	162	185
BVG/BVA 125/80	2.4	3.4	8.7	22	47	85	133	185	237	273
BVG/BVA 150/100	2.9	4.2	15	42	95	160	237	319	397	458

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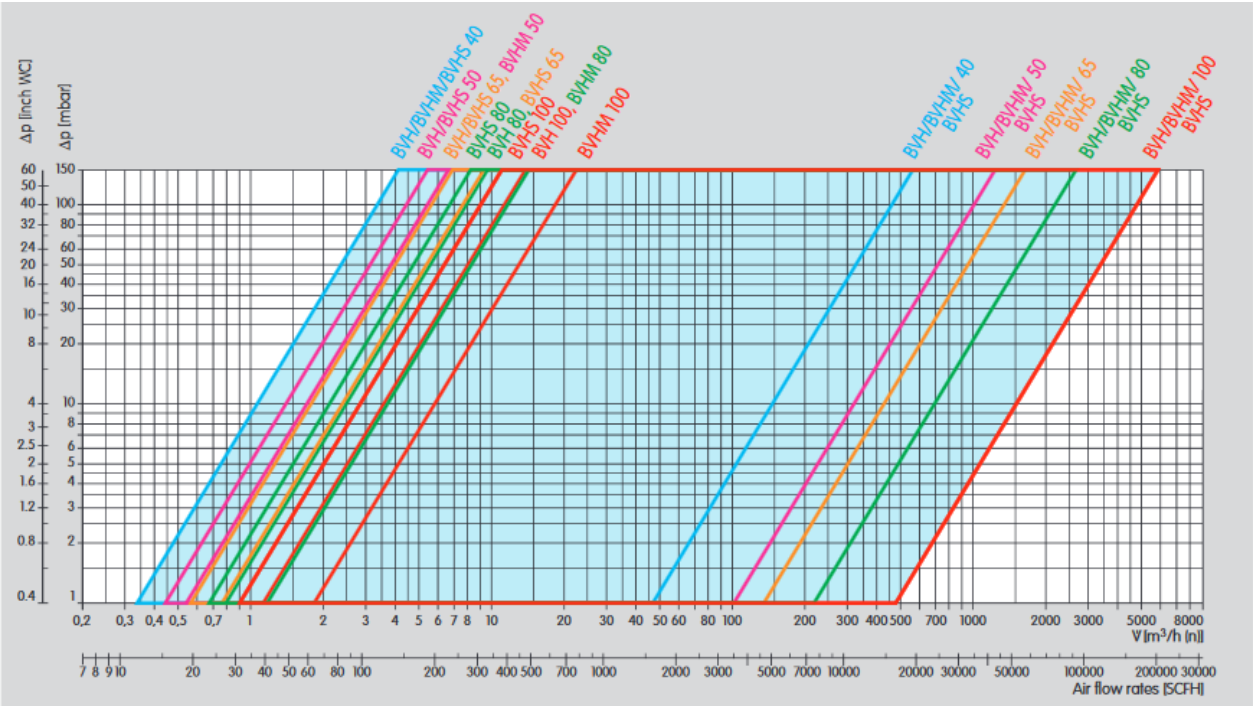

5.2 Flow rate curve for BVH, BVHM, BVHS

For air, dv = 1.00

The characteristic curves are measured at 15 °C (59 °F) with a measurement set-up in accordance with the applicable standard EN 13611/EN 161.

The pressure is measured 5 × DN upstream and downstream of the unit under test. The pressure drop of the pipe is also measured but is not compensated for.

Left curve:
Leakage volume at a 0° opening angle.

Right curve:
Max. flow rate at a 90° opening angle.

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5.2.1 k_V values

	Opening angle									
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
BVH 40	0.4	6.4	12	18	24	31	38	47	53	55
BVH 50	0.5	10	19	29	40	56	73	95	116	120
BVH 65	0.7	12	21	32	48	67	92	128	156	160
BVH 80	0.8	20	34	52	73	103	143	192	238	250
BVH 100	1.1	27	47	74	111	170	255	374	525	560
BVHM 40	0.4	6.4	12	18	24	31	38	47	53	55
BVHM 50	0.5	10	19	29	40	56	73	95	116	120
BVHM 65	0.7	12	21	32	48	67	92	128	156	160
BVHM 80	1.1	20	34	52	73	103	143	192	238	250
BVHM 100	2.1	27	47	74	111	170	255	374	525	560
BVHS 40	0.4	6.4	12	18	24	31	38	47	53	55
BVHS 50	0.5	10	19	29	40	56	73	95	116	120
BVHS 65	0.7	12	21	32	48	67	92	128	156	160
BVHS 80	0.8	20	34	52	73	103	143	192	238	250
BVHS 100	1.1	27	47	74	111	170	255	374	525	560

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6 Selection

	40	50	65	80	100	125	150	/25–/125	T	Z	W	01	05	A*
BVG	●	●	●	●	●	●	●	●		●			●	
BVG	●	●	●	●	●	●	●	●	●		●		●	
BVA	●	●	●	●	●	●	●	●		●			●	
BVH	●	●	●	●	●					●		●		●
BVH	●	●	●	●	●				●		●	●		●
BVHS	●	●	●	●	●					●		●		●
BVHS	●	●	●	●	●				●		●	●		●
BVHM	●	●	●	●	●					●		●		●
BVHM	●	●	●	●	●				●		●	●		●

** If "none", this specification is omitted.*

Example:

BVA 50Z05

6 .1 Type code

Code	Desciption
BVG	Butterfly valve for gas
BVA	Butterfly valve for air
BVH	Butterfly valve for hot air and flue gas up to 450 °C
BVHS	Butterfly valve for hot air and flue gas up to 450°C with safety closing function (only in conjunction with actuator IC 40S)
BVHM	Butterfly valve for hot air and flue gas up to 450°C (only in conjunction with solenoid actuator MB 7)
DN 40 – 150	Nominal diameter DN
DN /25 – 125	Reduced to nominal diameter
DN	
T	T-product
Z	For fitting between two flanges to EN-1092
W	For fitting between two ANSI flanges
	Max. inlet pressure $p_{e\ max}$
01	150 mbar (2.18 psig)
05	500 mbar (7.25 psig)
A*	With stop bar *

** If "none", this specification is omitted.*

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6.2 Determining the nominal size

6.2.1 BVG, BVA

p on the butterfly valve is determined using the control char-

acteristic a and the outlet pressure p_a for normal operation.

A control characteristic of a = 0.3 provides good control properties.

Select the required nominal size from the flow rate diagram on the basis of the desired flow rate $\dot{V}$ and the calculated p.

Example

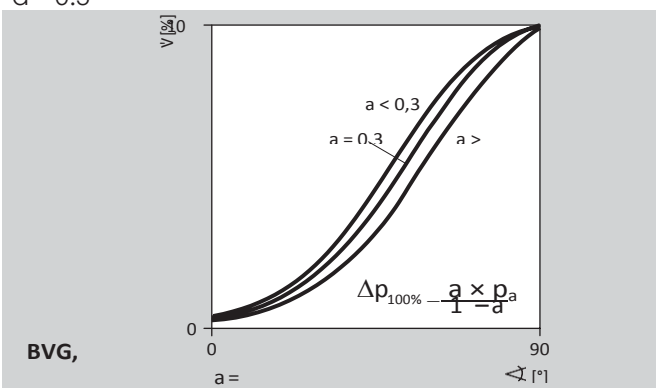
We want to find the nominal size of the butterfly valve BVA for air to be used for modulating control of a gas burner.

Outlet pressure: p_a = 30 mbar

Air flow rate: V = 1000

m3/h(n) Control characteristic:

a = 0.3



$$= \Delta p_{100\%} \frac{0.3 * 30}{\text{mbar } 1-} = 12.9 \text{ mbar} = 13 \text{ mbar}$$
$$0.3$$

The flow velocity in the pipes exercises a considerable influ- ence on the pressure loss and the noise development. When designing the butterfly valve, it is recommended that the flow velocity of 30 m/s is not exceeded – see Flow velocities in pipes.

A flow rate V = 1000 $m^3/h_{(n)}$ results in a pipe of DN 100.

A butterfly valve with reduced bore is selected in order to ob- tain the pressure loss p = 13 mbar that has been calculated using the control characteristic:

DN BVA 100/80 – see **P1** flow rate, flow rate curves for BVG, BVA with 1× reduced bore.

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6.2.2 BVH, BVHS, BVHM

We want to find a butterfly valve BVH for staged control of a gas burner. In order to regulate accurately between loads, the opening angle for high-fire and low-fire rates is calculated using the k_V value.

$$k_V = \frac{\dot{V}_{(n)}}{514} \cdot \sqrt{\rho_{(n)} \cdot T / (\Delta p \cdot p_a)}$$

$$\dot{V}_{(n)} = \frac{k_V \cdot 514}{\sqrt{\rho_{(n)} \cdot T / (\Delta p \cdot p_a)}}$$

Example

Selecting the high-fire opening angle

Outlet pressure for high fire: $p_{a\ Gr}$ = 30 mbar

Absolute outlet pressure: $p_{a\ Gr}$ absolute = 1.043 bar

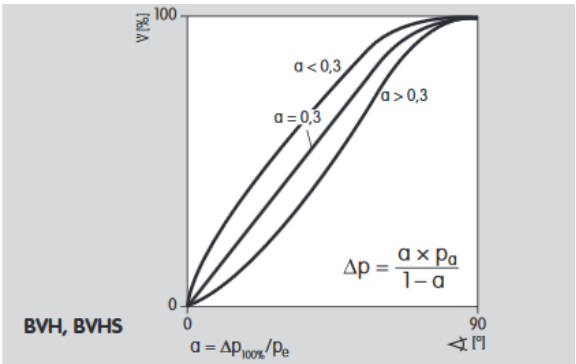
Air flow rate for high fire: $\dot{V}_{(n)\ Gr}$ = 430 m³/h

Density $_{(n)}$ for air: 1.29 kg/m³

Air temperature: 35°C (95 °F)

Control characteristic: a = 0.3

Firstly, p_{Gr} is determined using the control characteristic a and the outlet pressure $p_{a\ Gr}$. A control characteristic of a = 0.3 provides good control properties.



$T_{absolut}$ = 35 + 273 K = 308 K

$$k_V = \frac{\dot{V}_{(n)\ Gr}}{514} \cdot \sqrt{\rho_{(n)} \cdot T / (\Delta p_{Gr} \cdot p_{a\ Gr})}$$

$$k_V = \frac{430}{514} \cdot \sqrt{\frac{1{,}293 \cdot 308}{0{,}013 \cdot 1{,}043}}$$

k_V = 144

Select a similar k_V value in the k_V values table for the BVH, BVHS design, allowing for nominal diameter (see Flow velocities) and butterfly valve position. Wherever possible, an opening angle greater than 50° should be selected in order to achieve a wider control range. For example, the selected k_V value for the butterfly valve BVH, DN 65 with 70° opening is k_V = 138 – see Flow rate, BVH, BVHM, BVHS, k_V values.

The ranges between the opening angles, which are listed in the k_V values table in 10° steps, can be considered as linear. After linear interpolation of the k_V values between 70 and 80°, the selected opening angle of the butterfly valve BVH for high fire is: k_V = 144 approx. 72°.

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6.2.3 Conversion factors

US unit ×	multiplier =	SI unit
SCFH	0.0283	m^3/h
psi	0.0689	bar
psi	68.89	mbar
"WC	2.5	mbar
lb/ft^3	16.0184	kg/m^3
ft/s	0.3048	m/s

$°C = (°F - 32) \times 5/9$

$°F = (°C \times 9/5) + 32$

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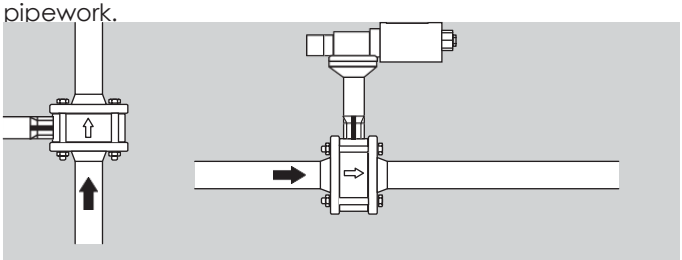
7 Project planning information

7 .1 Installation

The butterfly valve must be installed in-between two flanges in accordance with EN-1092, PN 16. The length of the inlet and outlet section should be 2 × DN.

For design of the butterfly valve, it is advisable not to exceed a flow velocity of 30 m/s (5905 ft/min) in the pipework.



Installation position

Vertical or horizontal, not upside down. When built into a vertical pipe, dirt may accumulate on the stop bar, which may prevent the valve from closing properly. This is why we recommend selecting the direction of flow from bottom to top.

If pipe fittings (reducing fittings) are installed in the pipework, the additional pressure loss must be taken into account.

If the valve is used with hot air, the pipeline should be ad- equately insulated so as to reduce the ambient temperature

– the flanges and the butterfly valves BVH, BVHS or BVHM must be kept free of insulating material. Install the butterfly valve in such a way that rising hot air does not circulate around the actuator.

Butterfly valves BVG, BVA and BVH and actuators IC 20 and IC 40 are supplied separately or assembled. Easy assembly with the actuator using 2 screws can be carried out either before or after installation of the butterfly valve in the pipework.

The butterfly valve BVHM and the solenoid actuator MB 7 are delivered separately. Easy assembly with the solenoid actuator using the installation set can be carried out either before or after installation of the butterfly valve in the pipework.

In conjunction with butterfly valves BVH, BVHS or BVHM for hot air, the actuators can be used in temperatures of up to 250°C (480°F), with additional heat deflectors it can be used in temperatures of up to 450°C (840°F).

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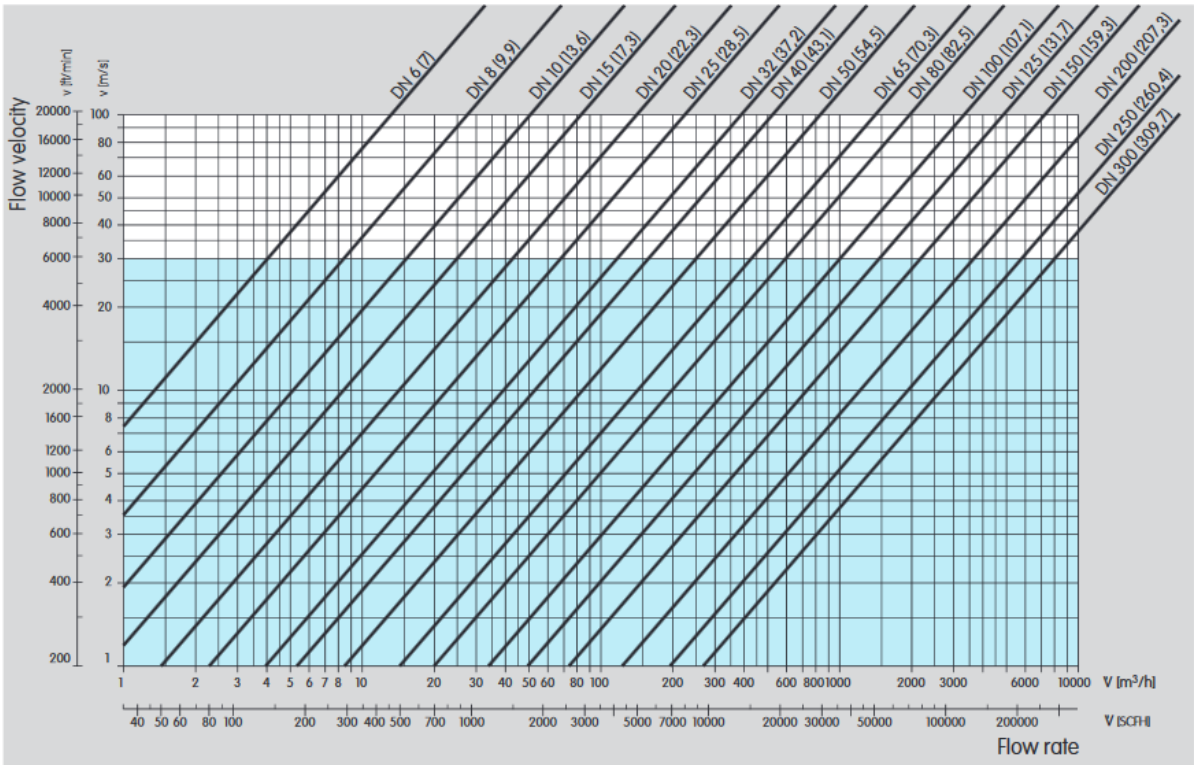

7.2 Flow velocities in pipes

It is recommended that flow velocities of 30 m/s (5905 ft/min) are not exceeded.The details on the internal diameter correspond to the con-ventional dimensions for gas pipes as stipulated in the DIN standards DIN 2440 and DIN 2450. Different cross-sections will result in flow velocities that differ correspondingly.

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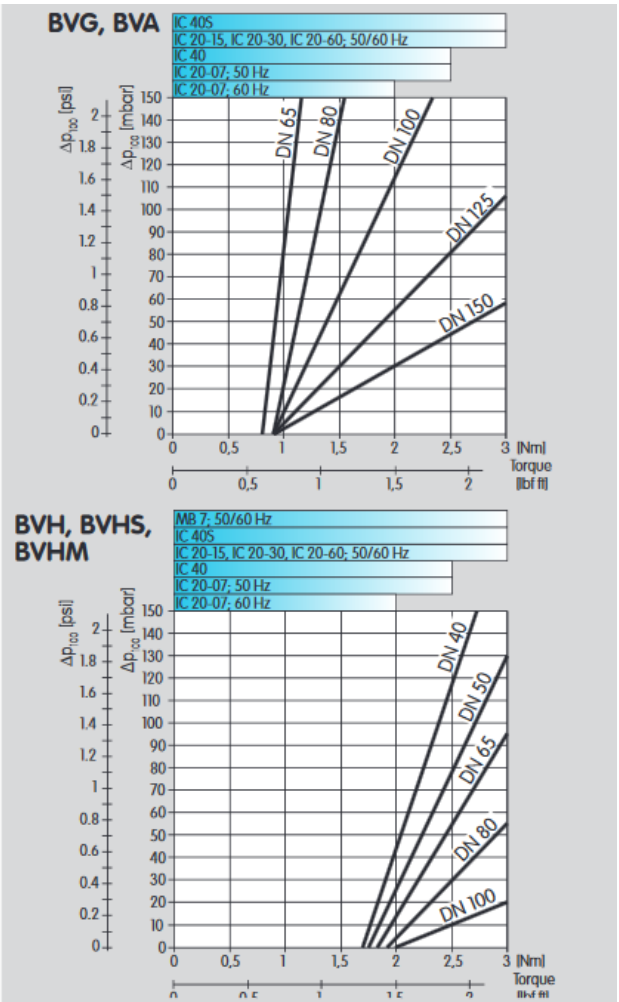

7.3 Actuator selection

Butterfly valves BVG, BVA and BVH are controlled by actuator IC 20 or IC 40.

Butterfly valve BVHS is controlled by actuator IC 40S.

Butterfly valve BVHM is controlled by solenoid actuator MB 7.

7.3.1 IC 20, IC 40

The characteristic curves relate to the maximum torque pro- duced by the flow rate. In general, maximum torque is reached at approx. 70°.

IC 20

The running time of the actuator per 90° depends on the re- quired torque.

Example:

Any running time could be used for a butterfly valve BVG of nominal diameter DN 65.

The running time is reduced by a factor of 0.83 at a frequency of 60 Hz on the actuator.

IC 40

Torque and running time are mutually independent on actuators IC 40 and IC 40S.

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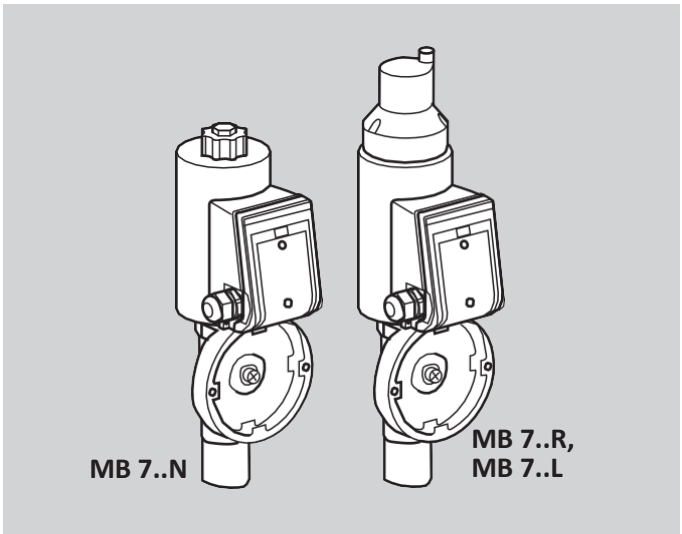

7.3.2 MB 7

MB 7..N: quick opening: < 1 s, quick closing: < 1 s, MB 7..R: slow opening: 2 – 4 s, slow closing: 2 – 4 s, MB 7..L: slow opening: 2 – 4 s, quick closing:

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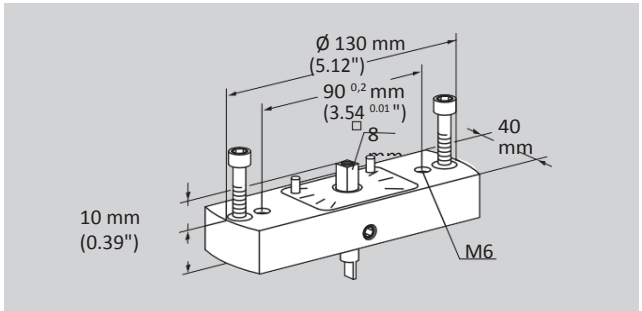

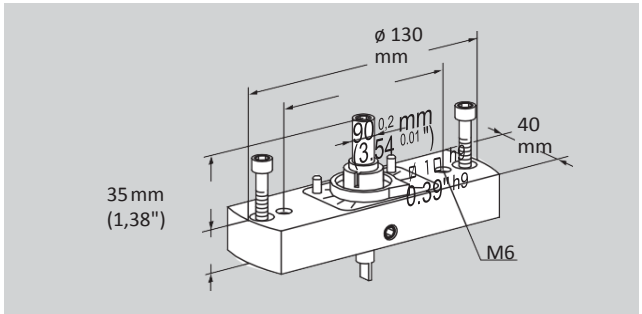

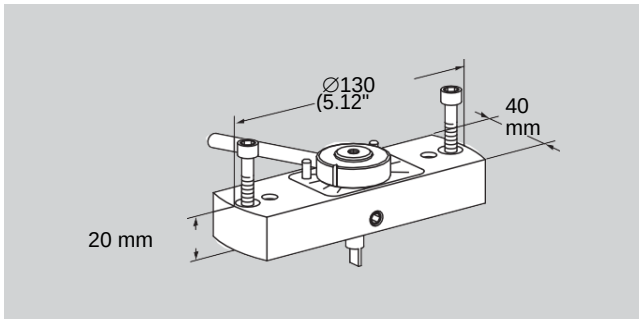

8 Accessories

8 .1 For BVG, BVA

Adapter set with square shaft

This adapter set is required if the butterfly valve is mounted onto actuators other than IC. The actuator must have a square shaft end.

Adapter set	Order No.
Fitted	74921675
Enclosed	74921674

Adapter set with free shaft end

This adapter set is required if the butterfly valve is mounted onto actuators other than IC. The actuator must have a Ø 10 mm shaft end.

Adapter set	Order No.
Fitted	74921677
Enclosed	74921676

Adapter set with manual adjustment

This adapter set is required if the butterfly valve is to be opened and closed manually. The valve can be locked in position.

Adapter set	Order No.
Fitted	74921679
Enclosed	74921678

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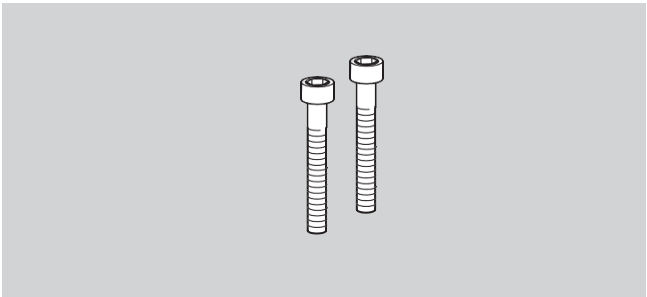

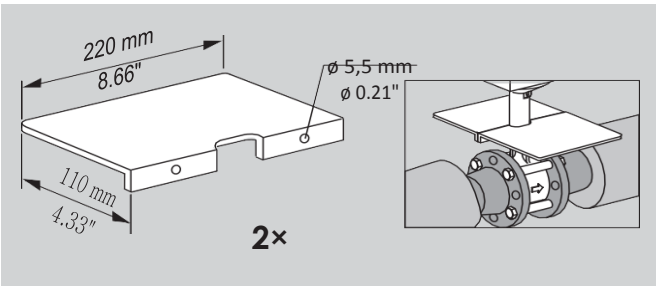

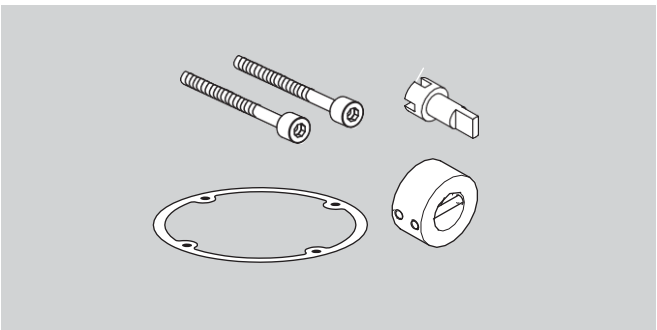

8.2 For BVG, BVA, BVH and BVHS

Fastening set

To attach an IC 20 or IC 40 to the butterfly valve.

If the actuator and butterfly valve are pre-assembled, the fastening set will already be fitted; otherwise, it will be enclosed as an additional item.

Fastening set	Order No.
IC – BVA/BVG/BVH /E (fitted)	74921084
IC – BVA/BVG/BVH /B (enclosed)	74921082

8.3 For BVH, BVHM and BVHS

Heat deflectors

Butterfly valves BVH, BVHM or BVHS for hot air can be used in temperatures of up to 250°C (480 °F), with additional heat deflectors they can be used in temperatures of up to 450°C (840 °F).

Order number: 74921670

8.4 For BVHM

Fastening set

This is required to attach the solenoid actuator MB 7 to the butterfly valve BVHM. The fastening set is delivered enclosed as an additional item.

Order number: 74922222

9 Technical data

BVG, BVA

Gas type:

BVG: Natural gas, town gas, LPG and other non-aggressive fuel gas,
BVA: Air.

Housing material: AlSi,
Valve disc: Aluminium,
Drive shaft: Stainless steel,
Seals: HNBR.

DN: 40 to 150, Reduction by 2 nominal sizes is possible.

Inlet pressure p_e: max. 500 mbar (7.25 psi).
Pressure differential between inlet pressure p_e and outlet pressure p_a: max. 150 mbar (2.16 psi).

Medium temperature: -20 to 60 °C (-4 to +140 °F),
Ambient temperature: -20 to +60 °C (-4 to +140 °F).

BVH, BVHM, BVHS

Gas type: Air and flue gas.

DN: 40 to 100.

Housing material: GGG,
Valve disc: Stainless steel,
Drive shaft: Stainless steel.

Inlet pressure p_e: max. 150 mbar (2.16 psi).
Pressure differential between inlet pressure pe and outlet pressure p_a: max. 150 mbar (2.16 psi).

Medium temperature: -20 to 450 °C (-4 to +840 °F),
Ambient temperature: -20 to +60 °C (-4 to +140 °F).

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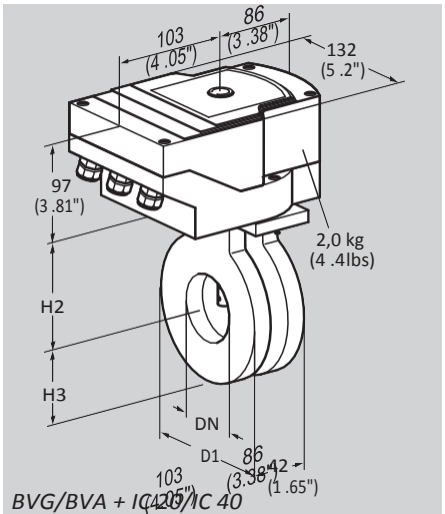
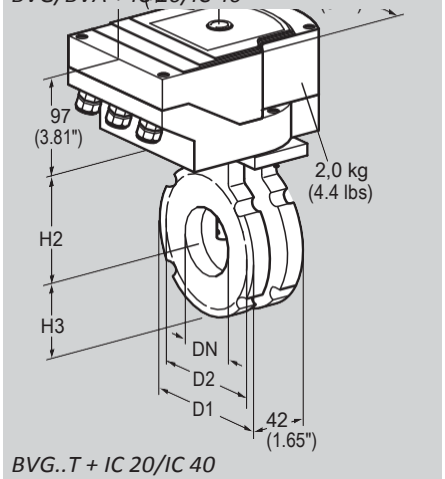


BVG/BVA + IC 20/IC 40



BVG..T + IC 20/IC 40

9 .1 Dimensions BVG/BVA + IC 20/IC 40

9 .1 .1 With full bore = nominal diameter

Type	DN	H2 mm (inch)	H3 mm (inch)	D1 mm (inch)	D2 mm (inch)	Weight kg (lb)
BVG/BVA 40 + IC 20/IC 40	40	96 (3.78)	51 (2.01)	92 (3.62)	85.7 (3,37)	2.9 (6.39)
BVG/BVA 50 + IC 20/IC 40	50	100 (3.94)	59 (2.32)	107 (4.21)	105 (4.13)	3.0 (6.61)
BVG/BVA 65 + IC 20/IC 40	65	108 (4.25)	69 (2.72)	127 (5)	124 (4.88)	3.3 (7.28)
BVG/BVA 80 + IC 20/IC 40	80	115 (4.53)	76 (2.99)	142 (5.59)	137 (5.39)	3.5 (7.71)
BVG/BVA 100 + IC 20/IC 40	100	125 (4.92)	86 (3.39)	162 (6.38)	–	3.8 (8.38)
BVG/BVA 125 + IC 20/IC 40	125	138 (5.43)	101 (3.98)	192 (7.56)	–	4.2 (9.26)
BVG/BVA 150 + IC 20/IC 40	150	150 (5.9)	114 (4.49)	218 (8.58)	–	4.5 (9.92)

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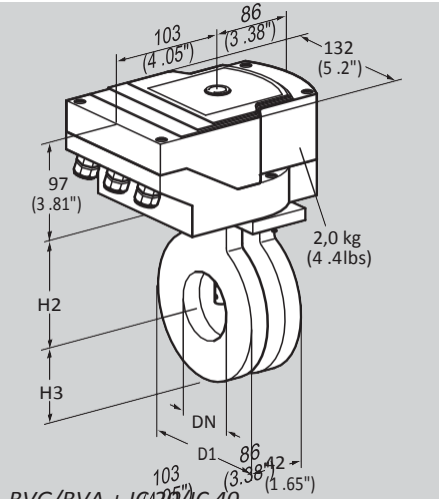
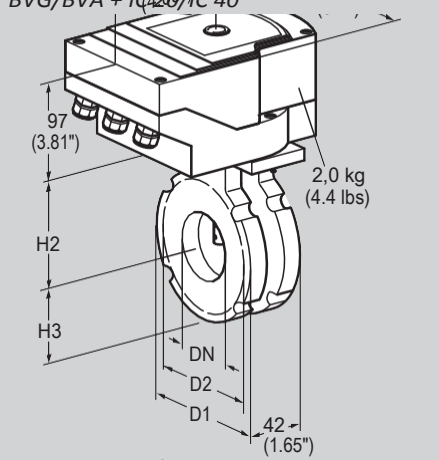


BVG/BVA + IC 20/IC 40



BVG..T + IC 20/IC 40

9.1.2 With 1x reduced bore

Type	DN	H2 mm (inch)	H3 mm (inch)	D1 mm (inch)	D2 mm (inch)	Weight kg (lb)
BVG/BVA 40/32 + IC 20/IC 40	32	96 (3.78)	51 (2.01)	92 (3.62)	85.7 (3.37)	2.9 (6.39)
BVG/BVA 50/40 + IC 20/IC 40	40	100 (3.94)	59 (2.32)	107 (4.21)	105 (4.13)	3.1 (6.38)
BVG/BVA 65/50 + IC 20/IC 40	50	108 (4.25)	69 (2.72)	127 (5)	124 (4.88)	3.4 (7.5)
BVG/BVA 80/65 + IC 20/IC 40	65	115 (4.53)	76 (2.99)	142 (5.59)	137 (5.39)	3.7 (8.15)
BVG/BVA 100/80 + IC 20/IC 40	80	125 (4.92)	86 (3.39)	162 (6.38)	–	4.0 (8.81)
BVG/BVA 125/100 + IC 20/IC 40	100	138 (5.43)	101 (3.98)	192 (7.56)	–	4.6 (10.14)
BVG/BVA 150/125 + IC 20/IC 40	125	150 (5.9)	114 (4.49)	218 (8.58)	–	5.0 (11)

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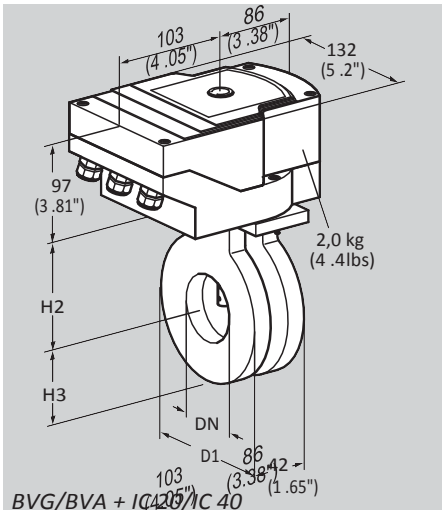
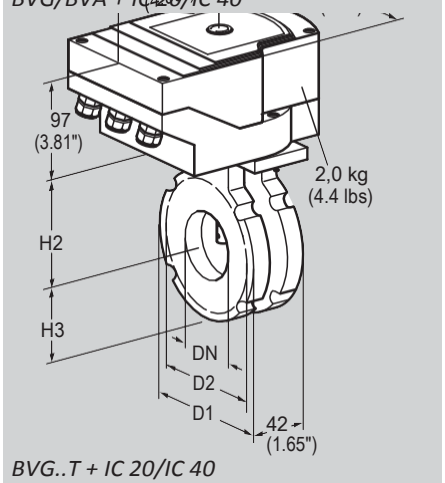


BVG/BVA + IC 20/IC 40



BVG..T + IC 20/IC 40

9.1.3 With 2x reduced bore

Type	DN	H2 mm (inch)	H3 mm (inch)	D1 mm (inch)	D2 mm (inch)	Weight kg (lb)
BVG/BVA 40/25 + IC 20/IC 40	25	96 (3.78)	51 (2.01)	92 (3.62)	85.7 (3.37)	3.0 (6.61)
BVG/BVA 50/32 + IC 20/IC 40	32	100 (3.94)	59 (2.32)	107 (4.21)	105 (4.13)	3.2 (7.05)
BVG/BVA 65/40 + IC 20/IC 40	40	108 (4.25)	69 (2.72)	127 (5)	124 (4.88)	3.5 (7.71)
BVG/BVA 80/50 + IC 20/IC 40	50	115 (4.53)	76 (2.99)	142 (5.59)	137 (5.39)	3.8 (8.37)
BVG/BVA 100/65 + IC 20/IC 40	65	125 (4.92)	86 (3.39)	162 (6.38)	–	4.2 (9.26)
BVG/BVA 125/80 + IC 20/IC 40	80	138 (5.43)	101 (3.98)	192 (7.56)	–	4.9 (10.8)
BVG/BVA 150/100 + IC 20/IC 40	100	150 (5.9)	114 (4.49)	218 (8.58)	–	5.5 (12.13)

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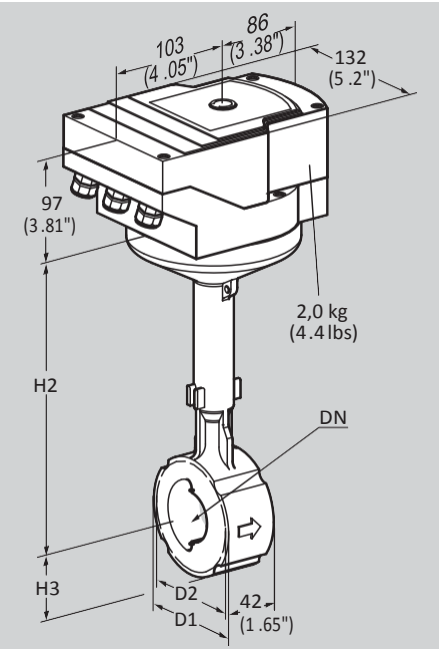

BVH/BVHS + IC 20/IC 40

9.2 Dimensions BVH, BVHS + IC 20/IC 40

Type	DN	H2 mm (inch)	H3 mm (inch)	D1 mm (inch)	D2 mm (inch)	D2 ANSI mm (inch)	Weight kg (lb)
BVH/BVHS 40 + IC 20/IC 40	40	234 (9.2)	46 (1.8)	92 (3.6)	–	85.7 (3.37)	5.4 (11.9)
BVH/BVHS 50 + IC 20/IC 40	50	239 (9.4)	54 (2.1)	107 (4.2)	–	105 (4.13)	5.9 (13)
BVH/BVHS 65 + IC 20/IC 40	65	243 (9.5)	64 (2.5)	127 (5)	–	124 (4.88)	6.8 (15)
BVH/BVHS 80 + IC 20/IC 40	80	254 (10)	71 (2.8)	142 (5.6)	–	137 (5.39)	7.3 (16.1)
BVH/BVHS 100 + IC 20/IC 40	100	265 (10.4)	88 (3.4)	175 (6.9)	162 (6.4)	–	8.5 (18.7)

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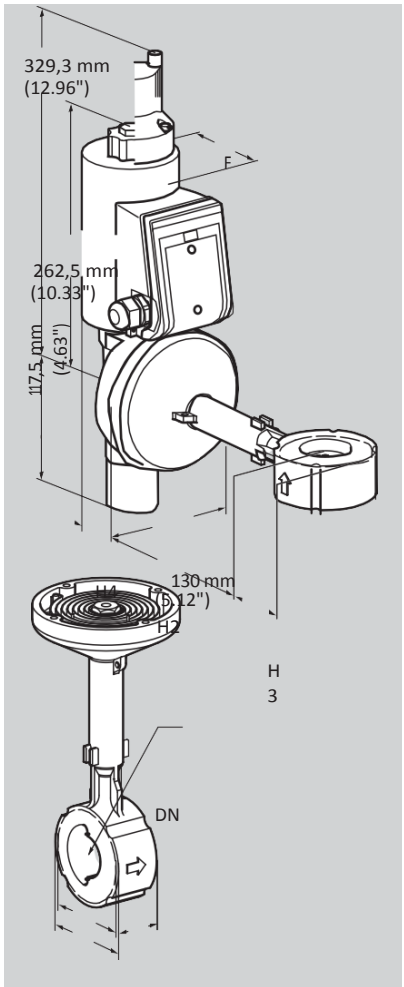

9.3 MB 7 + BVHM dimensions

Type	DN	H2 mm (inch)	H3 mm (inch)	H4 mm (inch)	D1 mm (inch)	D2 DIN mm (inch)	D2 ANSI mm (inch)	F mm (inch)	Weight kg (lb)
BVHM 40 + M 5B	40	234 (9.21)	46 (1.81)	91.5 (3.58)	92 (3.62)	86 (3.39)	85.7 (3.37)	90 (3.54)	10.9 (24)
BVHM 50 + M 5B	50	239 (9.40)	54 (2.12)	91.5 (3.58)	107 (4.21)	105 (4.13)	105 (4.13)	90 (3.54)	11.4 (25.13)
BVHM 65 + M 5B	65	243 (9.56)	64 (2.51)	91.5 (3.58)	127 (5)	127 (5)	124 (4.88)	90 (3.54)	12.3 (27.11)
BVHM 80 + M 5B	80	254 (10)	71 (2.80)	91.5 (3.58)	142 (5.59)	137 (5.39)	137 (5.39)	90 (3.54)	12.8 (28.22)
BVHM 80 + M 6B	80	254 (10)	71 (2.80)	91.5 (3.58)	142 (5.59)	162 (6.38)	–	127 (5)	17.8 (39.24)
BVHM 100 + M 6B	100	265 (10.43)	88 (3.46)	110 (4.33)	175 (6.89)			127 (5)	19.0 (41.89)

10 Maintenance cycles

The butterfly valves BVG, BVA, BVH, BVHM and BVHS require little maintenance.

We recommend a function check once a year.

11 Glossary

11 .1 Control characteristic, valve authority

In order for the butterfly valve to be able to influence the flow rate, a proportion of the pressure loss Δp from the entire system has to be caused by the butterfly valve. Taking into consideration that the overall pressure loss Δp should be kept to a minimum, a valve authority a = 0.3 is recommended for the butterfly valve.

This means that of the overall pressure loss Δp there is a 30% drop on the fully open butterfly valve.

11.2 Interpolation (linear)

Mathematical production of interim values at equal distance to the adjacent value.

11.3 Hot air compensation

The volume of air increases with the addition of hot air. The oxygen content contained in the air reduces with every m^3.In order to maintain a constant oxygen content, additional air has to be added to the combustion gas.