

UNIVERSAL GAS VALVES

VE SERIES

CLASS "A" GAS VALVES

PRODUCT HANDBOOK



APPLICATION

These series class A gas valves are used for control and regulation of gaseous fluids in gas power burners, atmospheric gas boilers, melting furnaces, incinerators and other gas consuming appliances.

CONTENTS

General

Description	2
Features	3
Model chart	4

Technical

Specifications	5-6
Performance characteristics	7
Capacity curves	8-9
Dimensional drawing 1000 series	10
Dimensional drawing 3000 series	11

Installation and operation

Installation and final checkout	12
Construction and working principles	14

Various

Approvals and standards	15
Ordering information	16
Replacement parts and accessories	17

DESCRIPTION

The VE series gas valves offer a series of functionalities:

- Gas valves, Normally Closed, consisting of a direct ON/OFF operator for opening/closing of the valve.
- Gas valves for use with Honeywell V4055, V4062 and V9055 fluid power actuators.
- Relief valves with or without position indication switch, Normally Open, consisting of direct electric ON/OFF operator for opening/closing of the valve.

The VE series gas valves are suitable for the control of gaseous fluids in gas consuming appliances according to international standards.

The VE series gas valves meet the class A specification according to EN 161.

The VE series gas valves cover a wide range of pipe sizes from $\frac{3}{8}$ " (DN 10) up to and including 3" (DN 80).

The VE series gas valves have threaded connections from $\frac{3}{8}$ " (DN 10) up to and including $2\frac{1}{2}$ " (DN 65).

The VE series gas valves with pipe sizes $2\frac{1}{2}$ " (DN 65) and 3" (DN 80) have flange connection.

The VE series gas valves $\frac{3}{8}$ " (DN 10) and $\frac{1}{2}$ " (DN 15) have a maximum supply pressure of 350 mbar.

The VE series gas valves $\frac{3}{4}$ " (DN 20) up to and including 3" (DN 80) have a maximum supply pressure of 200 mbar.

The VE series gas valves have test points for inlet and outlet gas pressure.

The VE series gas valves have an inlet screen for protecting the valve against ingress of dirt.

FEATURES

- Class A valve for control of gas consuming appliances.
- The VE....X series gas valves except VE....S series have a spring loaded valve disc, closed when de-energized.
- The VE....S series gas valves have a spring loaded valve disc, opened when de-energized.
- Incorporating time proven design concepts assuring reliability.
- All VE.... series gas valves have an internal fine mesh screen.
- Two R^{1/4}" connections for inlet pressure at each side of the electro magnetic gas valve.
- The VE....X 1... series gas valves have a wrench boss as well on inlet side as on outlet side for pipe fitting incorporated in the valve housing.
- The VE.... series gas valves may be assembled on the pipe line with in plus or minus 90 degrees of the vertical axel.
- The VE....X 3... series gas valves (flange connection) have two (1/4") inlet pressure taps and two (1/4") outlet pressure taps at either side.
- The VE....X 3... and VE5...X 3... series gas valves have at inlet side two 1" ISO 7-1 connection taps.
- The VE....X 3... and VE5...X 3... series gas valves are equipped at both sides with mounting holes to adapt a pilot solenoid valve combination, to allow either internal or external pilot gas. Futhermore these valves are equipped with two M6 mounting holes to adapt an A4020A electronic leak test controller (see dimensional drawing page 11).
- The VEB series gas valves have an adjustable flow rate regulator on top of the coil.
- The VE series gas valves have a field replaceble coil.
- The VE series gas valves have a field replaceble rectifier board.
- The VEC series gas valves have adjustment for:
 - step pressure
 - flow rate and
 - opening speed on top of the coil.
- The VE....S series gas valves normaly open relief valves are equipped with or without a position indication switch.
- The VE5...X 3... series gas valves can be equiped with a wide range of Honeywell fluid power actuators. These fluid power actuators are field replaceable.
- The VE series solenoid gas valves have electrical connection by terminal block with incorporated rectifier board.
- The VE series solenoid gas valves have coils turnable over 360°.
- Cable strain relief can be achieved by PG 11 cable gland.
- The VE series gas valves cover a wide range of pipe sizes from DN 10 up to and including DN 80.

Electrical connection

- Supply voltages 24, 110, 220 and 240V 50/60 Hz.
- Electrical enclosure according to IP 54 unless other specification.
- Electrical enclosure VE....S 1... series gas valves with switch according to IP 50

MODEL CHART

Options	1000 series (internal threaded)	3000 series (flange connection)
Range: DN 10 3/8" DN 15 1/2" DN 20 3/4" DN 25 1" DN 32 1 1/4" DN 40 1 1/2" DN 50 2" DN 65 2 1/2" DN 80 3"	VE..10 VE..15 VE..20 VE..25 VE..32 VE..40 VE..050 VE..65 VE..80	- - - - - - - VE..65 VE..80
Non regulated ON/OFF (VE....A xxxx)	Standard	Not available
Flow regulator (VE....B xxxx)	Optional	Standard
Adjustable opening and flow regulator (VE....C xxxx)	Optional ¹⁾	Not available
Motorised opening: ON/OFF (VE5...A xxxx)	Not available	VE5065A 3xxx VE5085A 3xxx
Motorised opening: characterized (VE5...C xxxx)	Not available	VE5065C 3xxx VE5085C 3xxx
Safety relief valve, ON/OFF, Normally Open, with or without position indication switch (VE....S xxxx)	Optional for: VE..20 VE..25	Not available

¹⁾ Except VE..65/VE..80

SPECIFICATIONS

Models

The VE series consists of solenoid gas valves series and gas valves suitable for combining with Honeywell V4055, V4062 and V9055 fluid power actuators.

VE series solenoid gas valves

VE..10 (DN 10)
 VE..15 (DN 15)
 VE..20 (DN 20)
 VE..25 (DN 25)
 VE..32 (DN 32)
 VE..40 (DN 40)
 VE..50 (DN 50)
 VE..65 (DN 65)
 VE..80 (DN 80)

VE series suitable for fluid power actuators

VE5065 (DN 65)
 VE5080 (DN 80)

Pipe sizes 1000 series

Inlet and outlet $\frac{3}{8}$ " up to $2\frac{1}{2}$ " internal parallel pipe thread according to ISO 7-1

Pipe sizes 3000 series

Flanged connection DN 65 and DN 80

according to DN16 UNI 2223.

Torsion and bending stress

Pipe connections meet Group 2 according EN 161 requirements.

Ambient temperature

-15 °C ... 60 °C

Supply voltage

24 V, 50/60 Hz
 110 V, 50/60 Hz
 220 V, 50/60 Hz
 240 V, 50/60 Hz

The applicable voltage is led to the solenoid coil via a rectified circuit.

Dimensions

1000 series: See page 10
 3000 series: See page 11

Electrical connection

Wiring on terminal block on box
 Cable entry Pg 11.

Coil insulation solenoid valves

Insulation material according class F

Enclosure

IP 54 unless otherwise specified
 IP 50 for VE4...S 1... series with position indication switch

Capacity

See page 8 and 9

Maximum operating pressure

Model	Maximum operating pressure (mbar)
VE..10	350
VE..15	350
VE..20	200
VE..25	200
VE..32	200
VE..40	200
VE..50	200
VE..65	200
VE..80	200
VE..65	200
VE..80	200

Power Consumption (W) solenoid valves A version

Model number	24 Volt, 50/60 Hz		110 Volt, 50/60 Hz		220 Volt, 50/60 Hz		240 Volt, 50/60 Hz	
	At nominal voltage	At 110% of nominal voltage	At nominal voltage	At 110% of nominal voltage	At nominal voltage	At 110% of nominal voltage	At nominal voltage	At 110% of nominal voltage
VE..10A	14	17	14	17	16	20	16	20
VE..15A	14	17	14	17	16	20	16	20
VE..20A	21	25	18	22	20	24	21	25
VE..25A	21	25	18	22	20	24	21	25
VE..32A	41	51	41	50	40	49	46	56
VE..40A	41	51	41	50	40	49	46	56
VE..50A	41	51	41	50	40	49	46	56
VE..65A	n.a.	n.a.	69	83	68	81	72	87

Power Consumption (W) solenoid valves B, C and S version

Model number	24 Volt, 50/60 Hz		110 Volt, 50/60 Hz		220 Volt, 50/60 Hz		240 Volt, 50/60 Hz	
	At nominal voltage	At 110% of nominal voltage	At nominal voltage	At 110% of nominal voltage	At nominal voltage	At 110% of nominal voltage	At nominal voltage	At 110% of nominal voltage
VE..10B,C	14	17	14	17	16	20	16	20
VE..15B,C	14	17	14	17	16	20	16	20
VE..20B,C	21	25	18	22	20	24	21	26
VE..20S	14	17	14	17	16	20	16	20
VE..25B,C	21	25	18	22	20	24	21	26
VE..25S	14	17	14	17	16	20	16	20
VE..32B,C	43	52	47	57	43	53	45	54
VE..40B,C	43	52	47	57	43	53	45	54
VE..50B,C	48	58	48	58	51	62	54	65
VE..65B	n.a.	n.a.	60	72	60	70	65	78
VE..80B	n.a.	n.a.	125	150	120	140	115	138

PERFORMANCE CHARACTERISTICS

Maximum allowable leakage

Valve size	Test pressure 1 (mbar)	Test pressure 2 (mbar)	Maximum allowable leakage rate	
			Internal leakage (cm ³ /h)	External leakage (cm ³ /h)
DN 10	6	525	40	40
DN 15	6	525	40	40
DN 20	6	300	40	40
DN 25	6	300	60	60
DN 32	6	300	60	60
DN 40	6	300	60	60
DN 50	6	300	60	60
DN 65	6	300	60	60
DN 80	6	300	60	60

Opening time (except VE5... series)

A,B,S version: less than 1 second

C version: adjustable from 1 up to 30 seconds at rated capacity

The opening characteristic is factory set at approx 6 seconds at the following conditions:

- measured at 80 % of rated capacity

- 30 mbar supply pressure
- nominal voltage
- 20 °C
- 2,5 mbar pressure drop
- no step pressure

Due to the influence of ambient temperature (-15 ... 60 °C) the adjusted opening time of 6 seconds measured at 80% of adjusted flow rate can vary +/- 4 seconds.

D,E version: 5 or 30 seconds (depending of actuator)

Closing time VE...A,B, C and S series (except VE5... series)

Less than 1 second

Maximum working frequency

A,B,S version: 20 cycles per minute

C version: 1 cycle per minute

VE5... series: 1 cycle per 2 minutes

Duty cycle

Coil suitable for permanent energization

Operational voltage range

The gas valve will function satisfactory between 85% and 110% of the rated voltage.

Rated voltage:

- 24 V, 50/60 Hz
- 110 V, 50/60 Hz
- 220 V, 50/60 Hz
- 240 V, 50/60 Hz

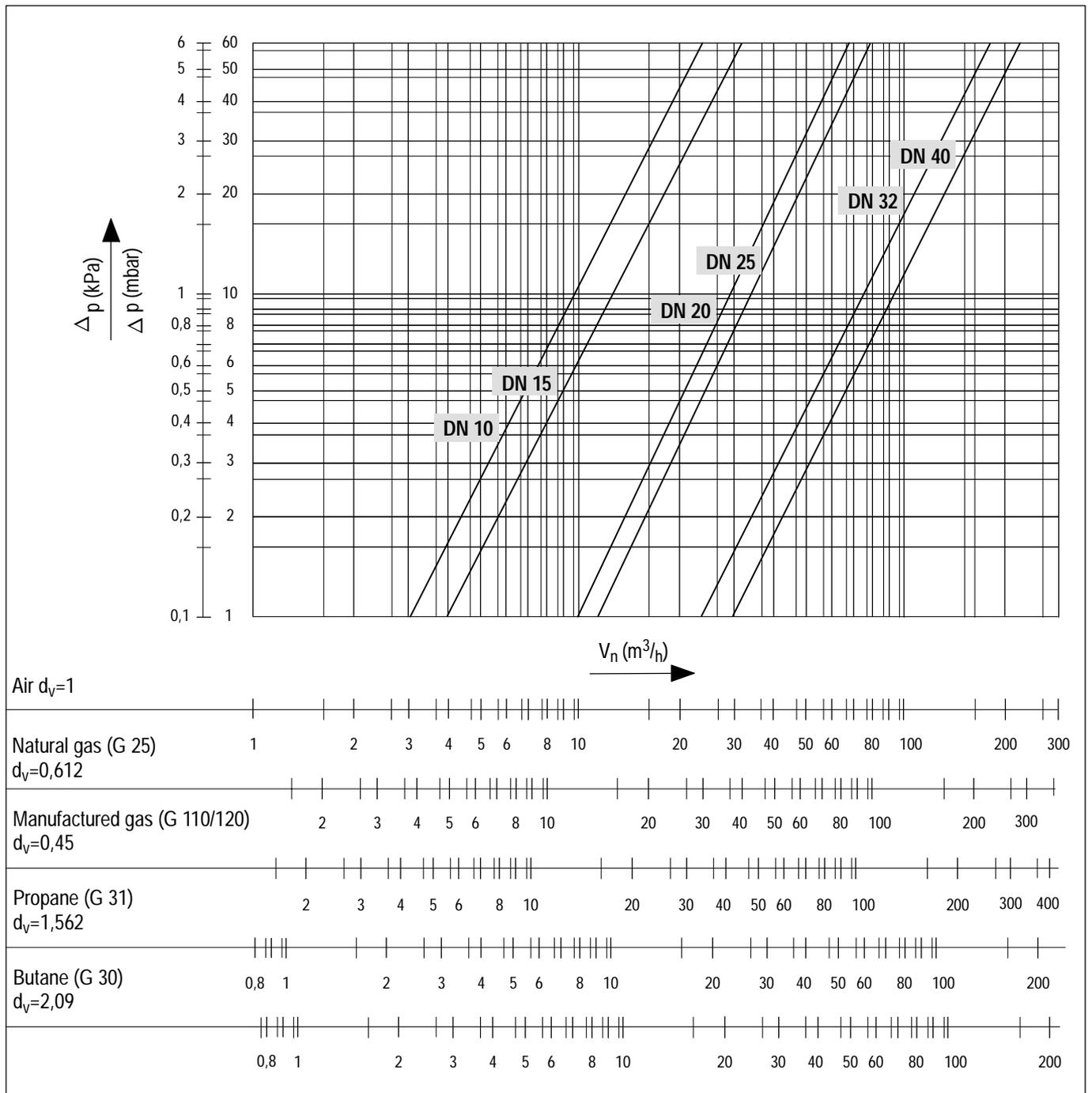
Design life

Model	Number of cycles
VE..10	200,000
VE..15	200,000
VE..20	200,000
VE..25	200,000
VE..32	100,000
VE..40	100,000
VE..50	100,000
VE..65	100,000
VE..80	100,000
VE5065	100,000
VE5080	100,000

CAPACITY CURVE DN 10, DN15, DN 20, DN 25, DN 32 AND DN 40 (THREADED CONNECTION)

Capacity in m³/h air at $\Delta p = 2,5$ mbar

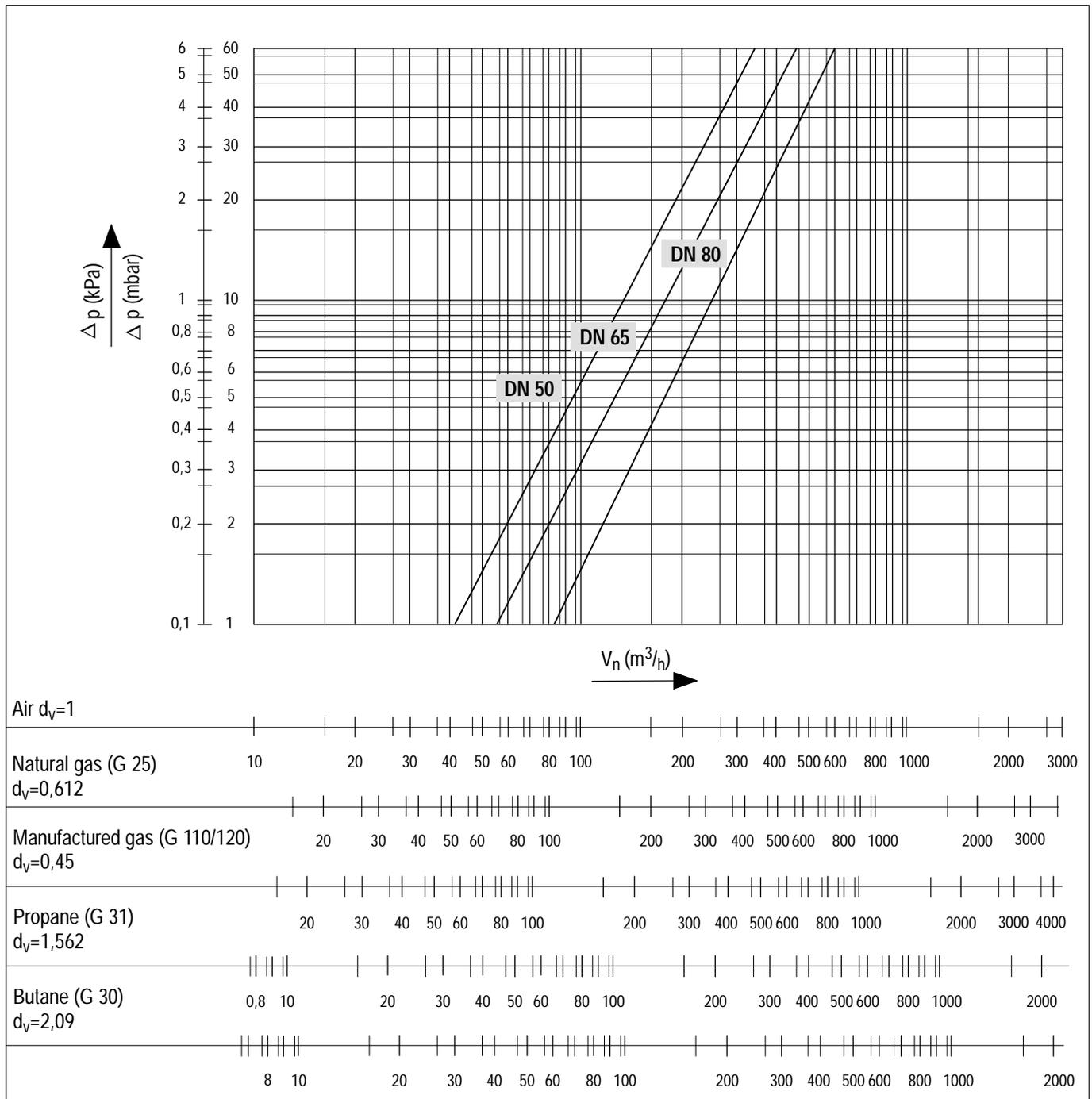
3/8" DN 10	1/2" DN 15	3/4" DN 20	1" DN 25	1 1/4" DN 32	1 1/2" DN 40
5	6,4	14,8	16,7	38,5	47,1



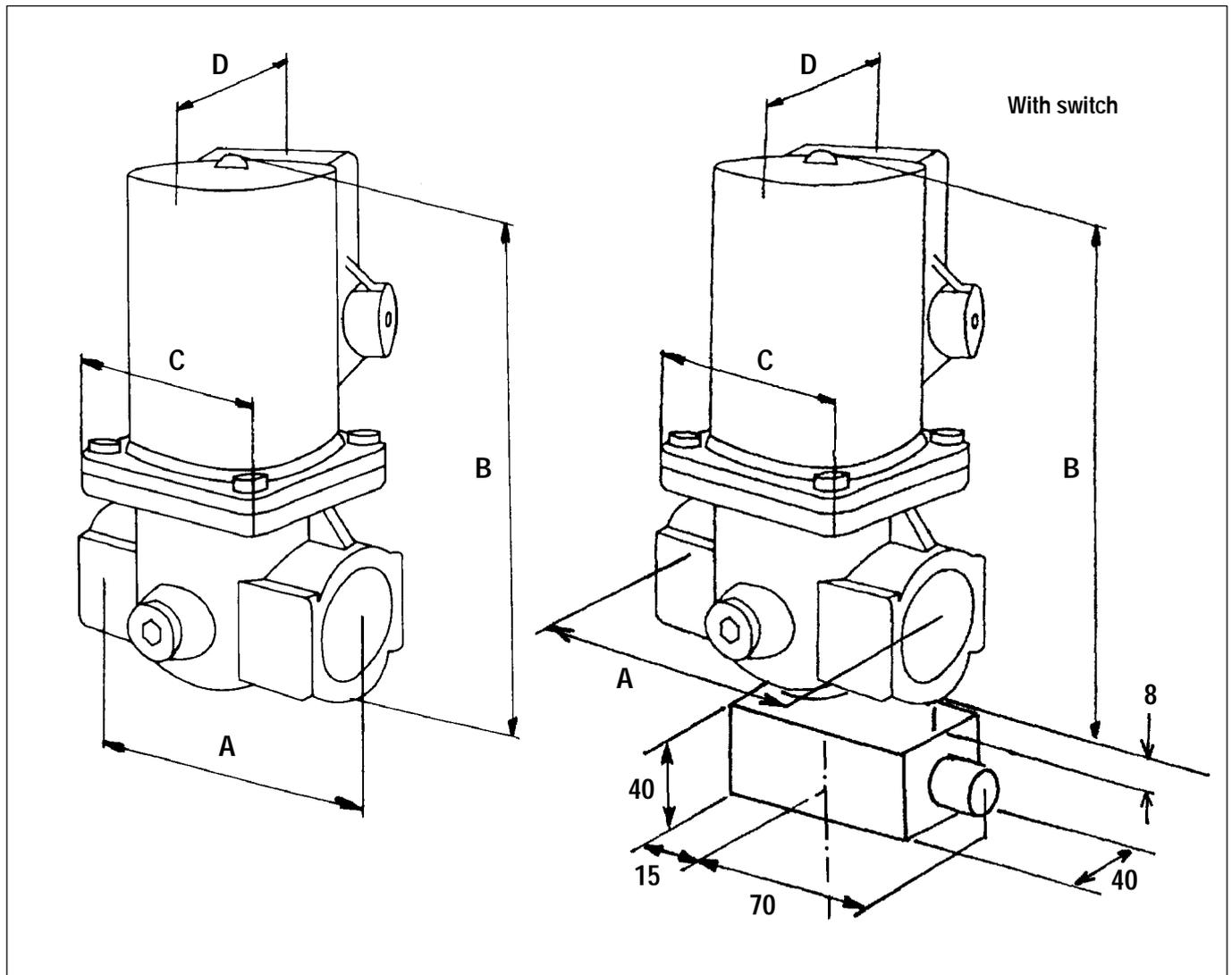
CAPACITY CURVE DN 50, DN 65 AND DN 80 (TREADED AND FLANGED CONNECTION)

Capacity in m^3/h air at $\Delta p = 2,5$ mbar

2" DN 50	2 ¹ / ₂ " DN 65	3" DN 80
66,7	94,2	131

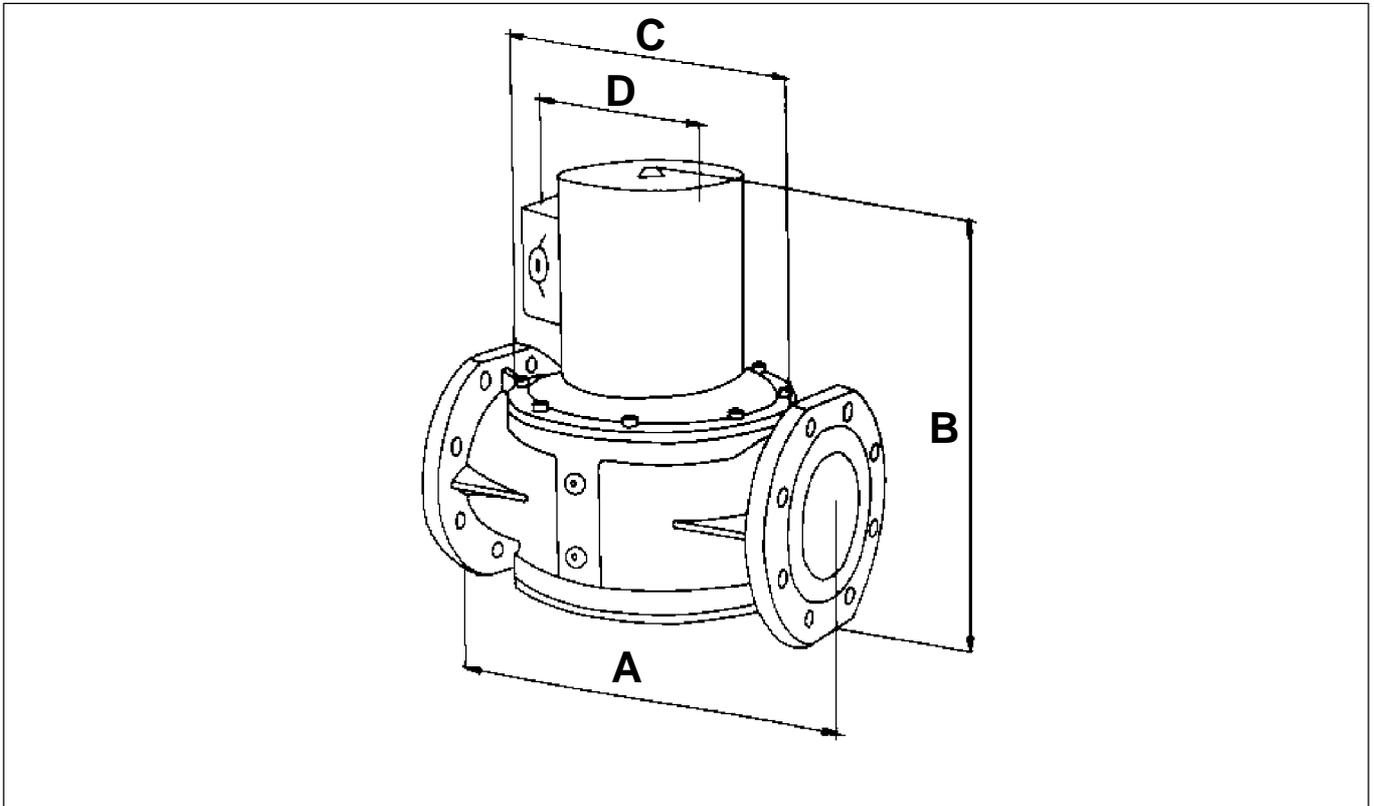


DIMENSIONAL DRAWING 1000 SERIES

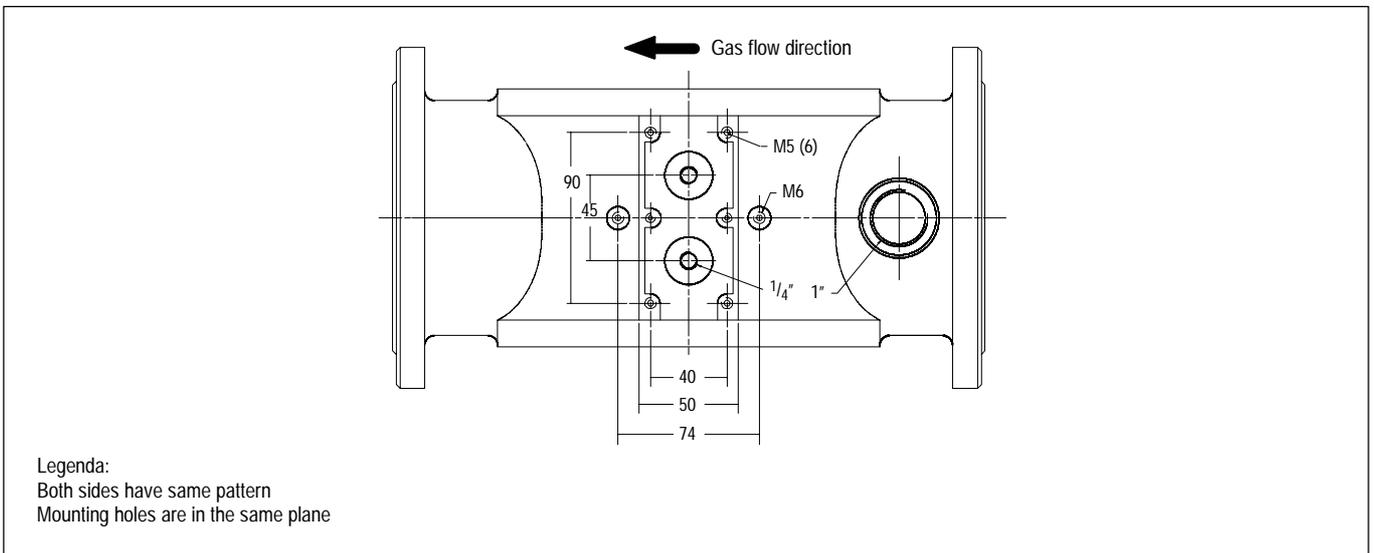


Model	Conne- ction	Dimensions (mm)						Weight (kg)		
		A	B ON/OFF	B Flow regulated	B Adjustable opening	C	D	ON/OFF	Flow regulated	Adjustable opening
VE..10	R _p 3/8"	72	125	148	-	52	85	1.1	1.1	1.2
VE..15	R _p 1/2"	72	125	148	-	52	85	1.1	1.1	1.2
VE..20	R _p 3/4"	86	145	168	200	70	87	1.9	1.9	2.3
VE..25	R _p 1"	100	145	168	200	75	87	2.0	2.0	2.4
VE..32	R _p 1 1/4"	150	225	248	275	110	123	5.8	5.8	6.1
VE..40	R _p 1 1/2"	150	225	248	275	110	123	5.8	5.8	6.1
VE..50	R _p 2"	170	240	263	290	135	123	6.4	6.4	6.7
VE..65	R _p 2 1/2"	225	290	313	-	170	145	13	-	-

DIMENSIONAL DRAWING 3000 SERIES



Model	Flanged connection	Dimensions (mm)				Weight (kg)
		A	B	C	D	
VE5065A,C 3xxx	2 1/2"	310	205	200	-	10
VE5080A,C 3xxx	3"	310	205	200	-	10
VE..65B 3xxx	2 1/2"	310	343	200	148	15
VE..80B 3xxx	3"	310	343	200	148	15



Legenda:
 Both sides have same pattern
 Mounting holes are in the same plane

INSTALLATION

Warning

- Take care that installer is a trained experienced service man.
- Turn off gas supply before starting installation.
- Disconnect power supply to prevent electrical shock and/or equipment damage.

Mounting position

The gas valve can be mounted plus or minus 90 degrees from the vertical.

Mounting location

The distance between the gas valve and the wall/ground, must be at least 30 cm.

Warning

- The outlet of a pressure relief valve (VE4000S series) must always be connected to open atmosphere.

Main gas connection threaded valves

- Take care that dirt cannot enter the gas valve during handling.
- Ensure the gas flows in the same direction as the arrow on the housing of the gas valve.
- Use a sound taper fitting with thread according to ISO 7-1 (BS 21, DIN

2999) or a piece of new, properly reamed pipe, free from swarf.

- Do not thread or tighten the pipe or pipe fitting too far. Otherwise valve distortion and malfunction could result.
- Apply a moderate amount of good quality thread compound to the pipe or fitting only, leaving the two end threads bare. PTFE tape may be used as an alternative.
- In order to tighten the pipe in the valve, do not use the actuator as a lever but use a suitable wrench operating on the wrench bosses.

Main gas connection flanged valves

- Take care that dirt cannot enter the gas valve during handling.
- Ensure the gas flows in the same direction as the arrow on the housing of the gas valve.
- Ensure that inlet and outlet flanges are in line and separated from each other enough to allow the valve to be mounted between them without damaging the gasket.
- Place gasket. If necessary grease it slightly to keep it in place.
- Mount gas valve between flanges using the bolts for each flange.

Warning

Tightness test after installation

- Paint all pipe connections and gaskets with a strong soap and water solution.
- Start the appliance and check for bubbles. If a leak is found in a pipe connection, remake the joint. A gasket leak can usually be stopped by tightening the mounting screws. Otherwise, replace the gas valve.

Electrical connection

Caution

- Switch off power supply before making electrical connections.
- Take care that wiring is in accordance with local regulations.

Use lead wire which can withstand 105 °C ambient.

The electric on/off operator is provided with a terminal block for electrical connections.

Wiring

Follow the instructions supplied by the appliance manufacturer.

ADJUSTMENTS AND FINAL CHECKOUT

Warning

Adjustments must be made by qualified persons only.

Caution

To ensure a safe closing of the valves, it is essential that voltage over the terminals of operators is reduced to 0 Volt.

VE.... B series (see fig 1.)

Flow rate adjustment

- Remove the cap screw from top of the coil.
- Place a socket head wrench into the adjustment nut.
- Turn wrench counter-clockwise to increase or clockwise to decrease flow rate.
- Replace cap screw.

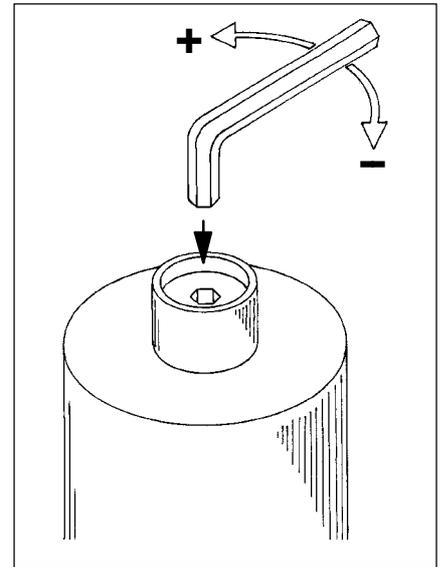


Fig. 1

VE.... C series

(see fig. 2 and 3)

The following characteristics can be adjusted:

- flow rate
- step pressure
- opening speed

Important

To ensure a satisfactory setting of the valve the pressure drop over the valve should be at least 10% of the supply pressure or 2,5 mbar which ever is the greatest.

Flow rate adjustment

- Remove the cap from top of the coil by loosening both screws.
- Place a wrench on the adjustment hexagon nut.

- Turn wrench counter-clockwise to increase or clockwise to decrease the flow rate .
- Replace cap on top of the coil.

Step pressure adjustment

- Remove the cap from top of the coil by loosening both screws.
- Place a screw driver in the slot of adjustment screw which is situated in center of the valve.
- Turn screw driver counter-clockwise to increase or clockwise to decrease step pressure.
- Replace cap on top of the coil.

Opening speed adjustment

- Remove the cap from top of the coil by loosening both screws.

- Place screw driver in the slot of adjustment screw which is of center line.
- Turn screw driver counter-clockwise to increase the opening speed and therefore the time till full opening will decrease.
- Turn screw driver clockwise to decrease the opening speed and therefore the time till full opening will increase.
- Replace cap on top of the coil.

Final checkout of the installation

Set appliance in operation after any adjustment and observe several complete cycles to ensure that all burner components function correctly.

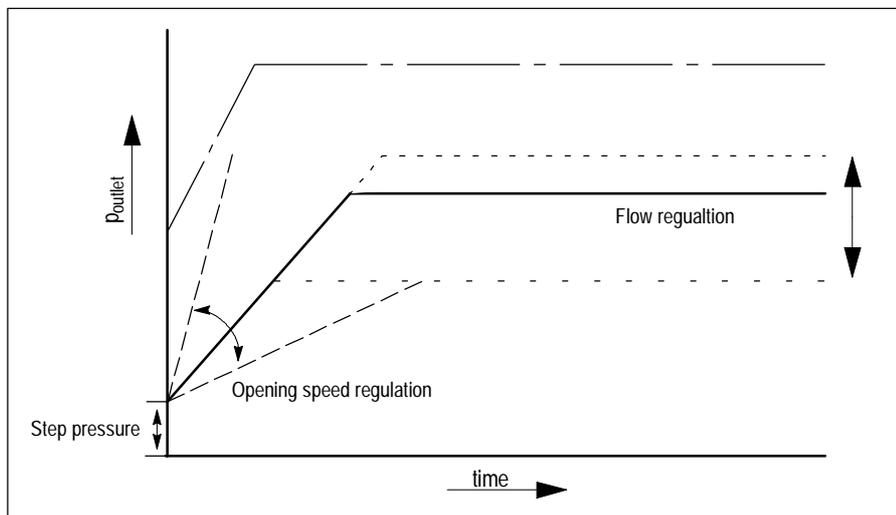


Fig. 2

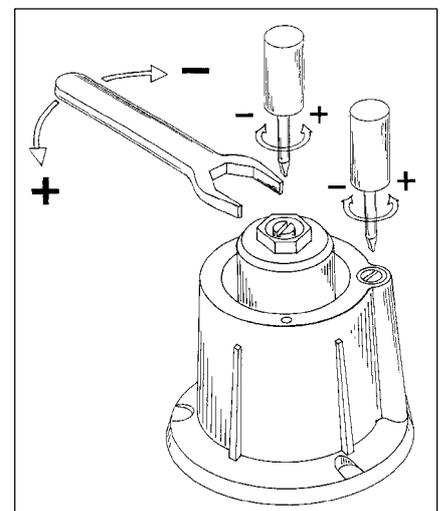


Fig. 3

CONSTRUCTION AND WORKING PRINCIPLES

The VE Normally Closed series gas valves are Class A fail safe shut-off valves.

The valve is opened by energizing the direct ON/OFF operator.

The direct ON/OFF operator consists of a coil and stop sleeve assy. Inside the top sleeve assy is a plunger which is able to move up and down and thus opening or closing the valve.

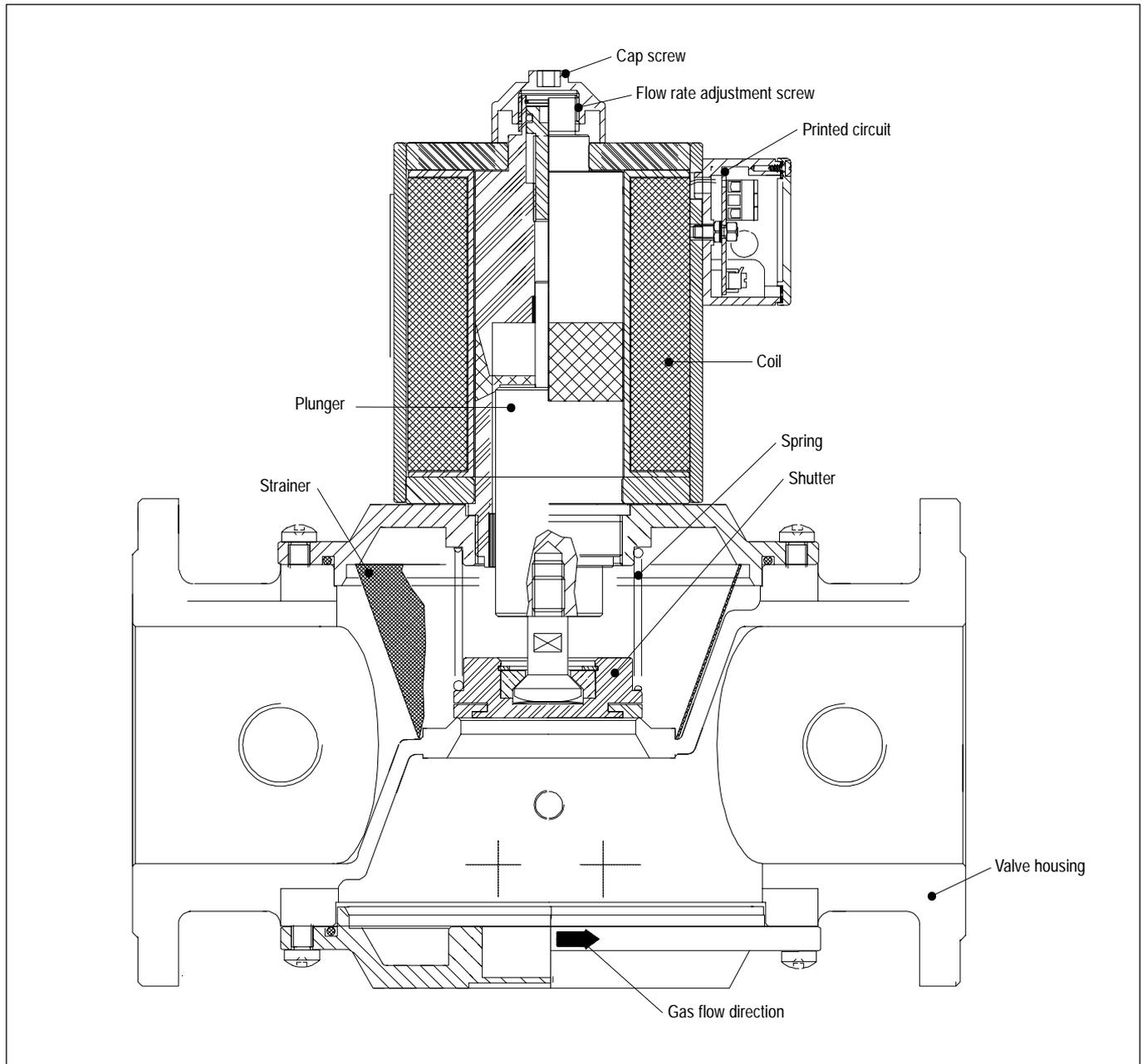
The plunger is gliding on two antifriction bearings.

Flow regulation is done by adjustable plunger stroke.

A strainer made out of steel AISI 303 is incorporated in the gas valve.

Valve closing spring is made out of steel AISI 302.

Seals and gaskets are manufactured out of hydrocarbon resistant NBR according to DIN 3535 and EN 291.



STANDARDS AND APPROVALS

Standards

The VE series gas valves have been designed to meet the European Standard EN 161.

The safety shut off valve meets class A requirements.

According to bending stress the gas valve meets the highest requirements.

Regarding electric safety, the VE series gas valves can be used in appliances according to European Standard for a household electrical requirements EN 60335 series and industrial applications.

The VE series gas valves also meet all Electro Magnetic Compatibility standards for non-industrial and industrial appliances.

Approvals

The VE series gas valves confirm with the following EC-directives:

- Gas Appliance Directive (90/396/EEC)
- Low Voltage directive (73/23/EEC)

The fact that the VE series gas valves are certified to European Standard EN

161 means that this series meets more stringent requirements than laid down in the essential requirements stated in the directives and therefore meets the requirements in all EC and EFTA countries.

Details can be found in the approvals list. In addition our controls have been certified by DIN-DVGW in Germany.

The registration number specific for each O.S. number is mentioned on the label of the control.

ORDERING INFORMATION

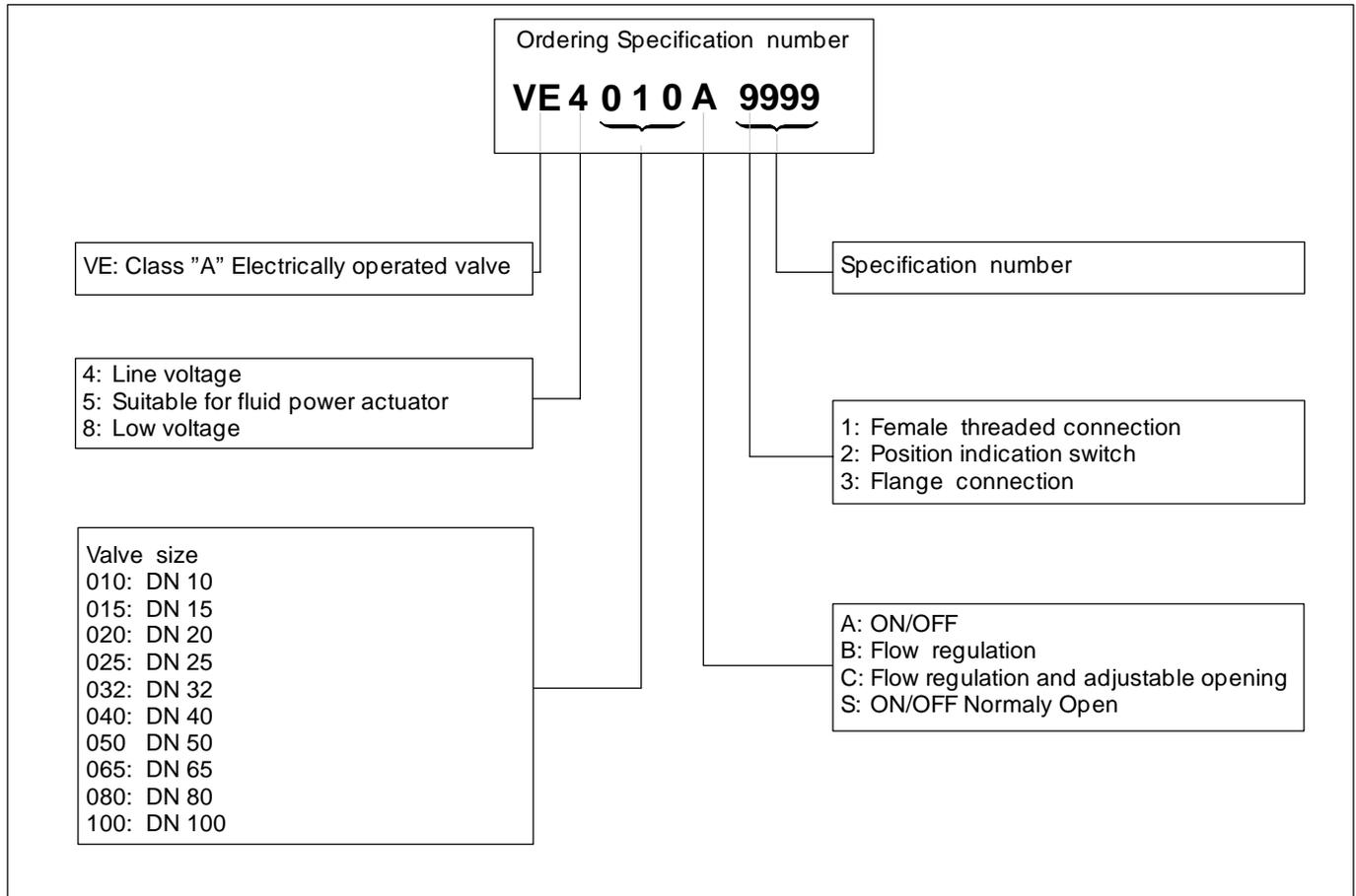
When ordering specify:

- Model number of VE series gas valve required: see model number chart below.

- Order numbers of replacement parts and accessories required, i.e. flanges, compression fittings: see replacement parts/accessories.

Note

Most models of valves, replacement parts and accessories will be available under "TRADELINE" label. Ask your wholesaler for details.



Model number chart

REPLACEMENT PARTS AND ACCESSORIES

Warning

Take care that only qualified persons carry out the installation of parts, accessories, and add on components.

Follow the installation instructions included in the package.

Check that the selected part, accessory or add on component is the correct one for the application in question. Specification of data is given in the instruction leaflet in the package.

Replace the old gaskets with the new ones supplied in the package and check for leakage when the supply is switched on again.

After installation and/or replacement has been completed, a gas leak test must be carried out.

Also check the gas valve for satisfactory operation after fitting accessories

Coils

Important

When ordering replacement coils include the complete valve O.S. number, in order to provide the coil with proper product identification sticker.

Description	Order number	Packing quantity
Coil for VE..10/..15A: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	BB052401 BB051101 BB052201 BB054201	1 1 1 1
Coil for VE..20/..25A: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	BB052425 BB051125 BB052225 BB054225	1 1 1 1
Coil for VE..32/..40/..50A: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	BB052403 BB051103 BB052203 BB054203	1 1 1 1
Coil for VE..65A: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	BB----- BB051165 BB052265 BB054265	1 1 1 1
Coil for VE..10/..15B/C: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	BB152401 BB151101 BB152201 BB154201	1 1 1 1
Coil for VE..20/..25B/C: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	BB152425 BB151125 BB152225 BB154225	1 1 1 1
Coil for VE..10/..15S: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	BB152401 BB151101 BB152201 BB154201	1 1 1 1

To be continued on page 18

Continued from page 17

Coil for VE..32/..40B/C: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	BB152440 BB151140 BB152240 BB154240	1 1 1 1
Coil for VE..50B/C: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	BB152403 BB151103 BB152203 BB154203	1 1 1 1
Coil for VE..65B 1.../3...: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	----- BB151165 BB152265 BB154265	1 1 1 1
Coil for VE..80B 1.../3...: 24 V, 50/60 Hz 110 V, 50/60 Hz 220 V, 50/60 Hz 240 V, 50/60 Hz	----- BB151180 BB152280 BB154280	1 1 1 1

Characterized opening mechanism

Characterized opening mechanism for model: VE...10/..15/..20/..25C VE..32/..40/..50C	GF0500001 GF0500002	1 1
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Rectifier boards

Rectifier board for 24 V, 50/60 Hz model: VE8010/8015/8020A/B/C/S	CS020012	10
Rectifier board for 110/220/240 V, 50/60 Hz model: VE4010/4015/4020A/B/C/S VE4032/4040/4050 VE4065/4080	CS020065	10