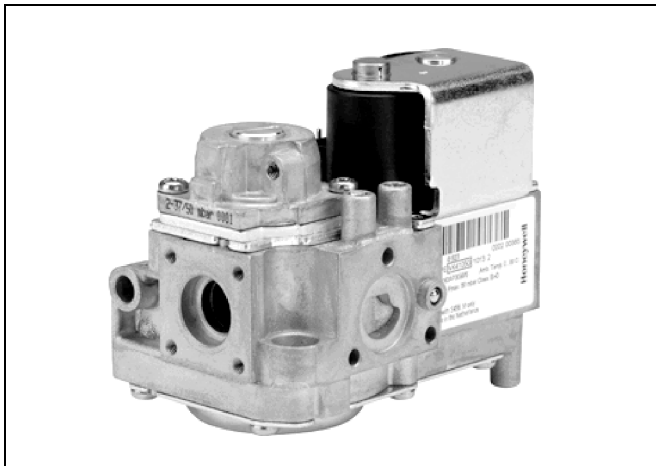


VK4105G SERIES

GAS CONTROLS FOR COMBINED VALVE AND IGNITION MODULATING SYSTEM

PRODUCT HANDBOOK



APPLICATION

The VK4105G and S4565.M, Combined Valve and Ignition modulating system (CVI-m), have specially been developed for application in gas fired appliances with direct burner ignition that require electric modulating control of the gas input like instantaneous hot water combi boilers and air heating appliances.

For this system, the VK4105G series gas control has been designed to have a S4565.M series ignition control attached directly onto the valve.

The combined system then provides programmed safe light up, flame supervision, regulation, modulation or Hi-Lo control of the gas flow to the main burner of the appliance.

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DESCRIPTION

The **CVI-m** system comprises a modulating gas control with on/off regulating and modulating function and an ignition control with integrated power supply for the electric modulating operator.

The power supply for the modulating current is generated by the ignition control.

The **CVI-m** gas control comprises a standard body to which a range of features can be factory included to give various functional options. These functional options include: servo pressure regulation, modulating control to fulfil a range of control applications.

The **CVI-m** gas control has a first direct on/off operator for opening the safety valve of class B according to EN 161 and a second electric on/off servo operator for control of the main valve of class J according to EN 161 (for explanation class J, see chapter Standards and approvals page 16).

The second electric operator also includes the modulation function. The minimum gas flow can be set by means of an adjustable throttle.

The pressure regulator is in accordance with class B requirements of EN 88.

The **CVI-m** can handle natural gas and LP gas.

Valves

The **Combined Valve and Ignition modulating (CVI-m)** system controls and performs all the functions required for safe ignition, flame supervision and for safely regulating the gas flow to the main burner.

The construction of the VK4105G valve is optimized and dedicated to function in combination with the S4565.M ignition control.

General

All measurements are carried out under standard conditions listed below unless otherwise is indicated.

Standard conditions

- P_{inlet} 25 mbar nominal pressure, dry air of 20°C
- $P_{ambient}$ 1013 mbar
- $T_{ambient}$ 20°C
- Outlet orifice 4.3 mm
- Flow indication in m^3/h
- Recording of outlet pressure with a transducer connected to a $1/2"$ pipe with a length of 10 times the diameter with a short hose at 5 times the diameter.
- Nominal voltage
- 90° tilted, i.e. the position when the operators are lying horizontal.

FEATURES

General

- All burner control safety functions concentrated in one reliable and optimized system.
- Specially designed to provide the optimum system solution in gas appliances with a DBI to light the main burner.
- VK4105G gas control incorporates time proven design concepts assuring reliability.
- ON/OFF control of main burner by electric operator and electric servo operator directly energized from ignition control.
- Easy assembly of ignition control on gas control by plugging it on from the top.
- Mounting orientation must be 90° in any direction from the electric on/off operator upright position.
- Incorporated electric modulating or Hi-Lo regulation.
- Throttle for minimum flow setting

Gas control

- Closing force: B + J
- Servo pressure regulator provides stable outlet pressure.
- Pressure feedback on maximum setting ensures constant burner pressure in relation to combustion chamber pressure.
- All adjustments are accessible from the top.
- 9 mm diameter pressure taps on top face for checking inlet and outlet pressure
- Two mounting holes for thread forming screws are at the bottom of the gas control for rigid attachment to the appliance.

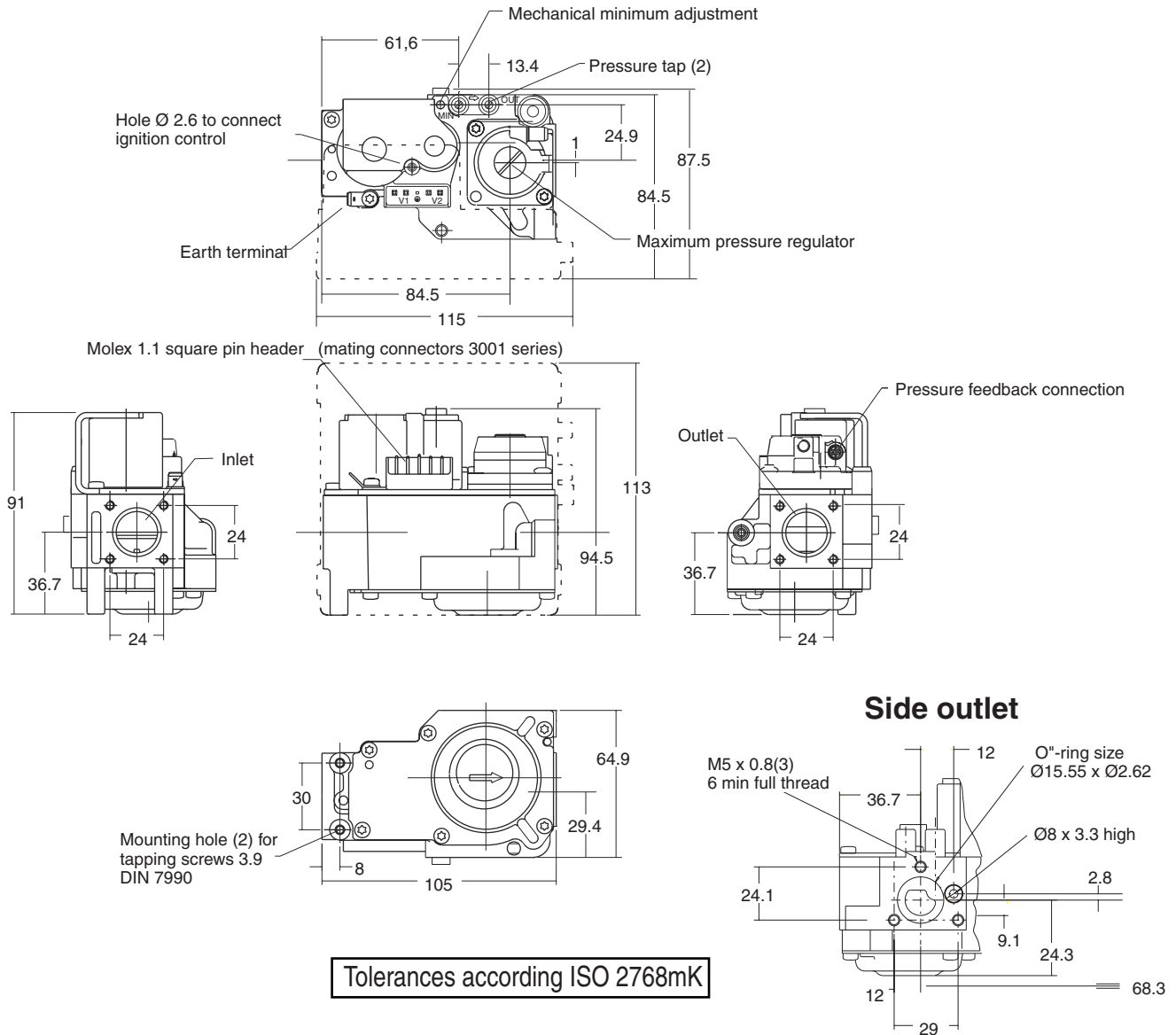
Gas connection options

- Inlet \varnothing 18.6 mm and outlet \varnothing 18.6 mm are straight through and can receive flanges.
- Internal thread (ISO 7-1):
 - $3/8"$ inlet and $3/8"$ end outlet; body length 115 mm.
 - $1/2"$ inlet and $1/2"$ end outlet; body length 115 mm.
 - $1/2"$ NPT inlet and flanged end outlet; body length 115 mm.
- External thread :
 - $1/2"$ inlet and $1/2"$ end outlet; body length 135 mm
 - $1/2"$ inlet and standard flanged end outlet; body length 120 mm
 - $3/4"$ inlet and $3/4"$ end outlet; body length 135 mm
 - $3/4"$ inlet and standard flanged end outlet; body length 120 mm
 - $3/4"$ inlet and standard flanged side outlet; body length 120 mm
- The side outlet can only be connected to a flanged burner manifold.
- Pressure feedback fittings for 4 or 6 mm silicon tube can be mounted.

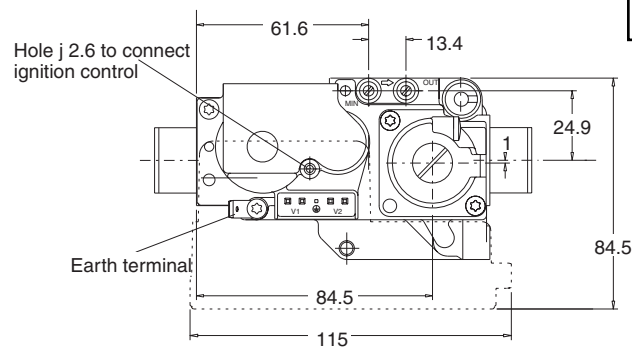
Electrical connection

- The appropriate ignition control can be connected to the valve by plugging it on.

DIMENSIONAL DRAWING STANDARD CONNECTION

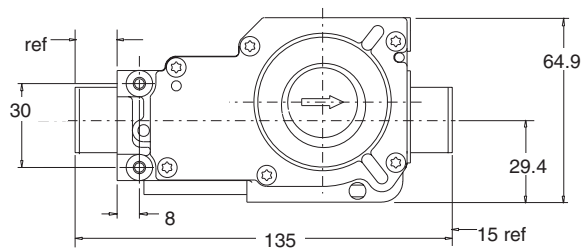
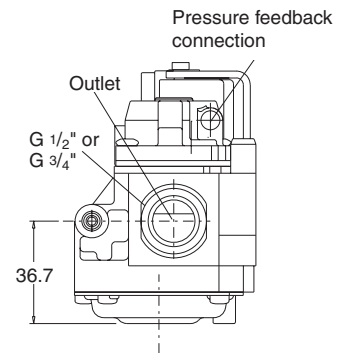
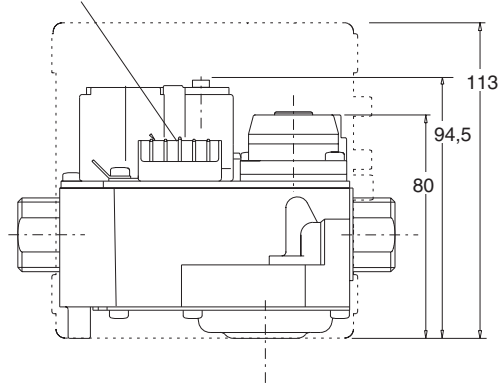
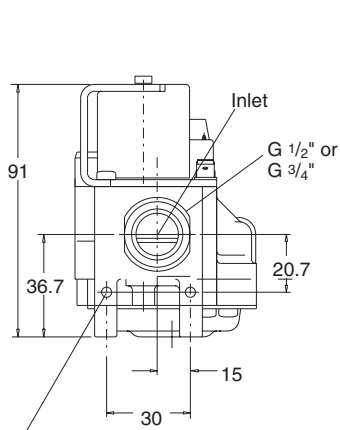


DIMENSIONAL DRAWING EXTERNAL THREAD CONNECTION



Tolerances according ISO 2768mK

Molex 1.1 square pin header (mating connectors 3001 series)



SPECIFICATIONS

Models

See model number chart on page 14

Main gas connection

- Standard see table 2. page 5
- Optional see table 3. page 5
- Side outlet can be fitted direct to a flanged burner manifold.

Inlet and outlet with $\frac{3}{8}$ " or $\frac{1}{2}$ " ISO 7-1 internal pipe thread and straight or elbow flanges with $\frac{3}{8}$ " or $\frac{1}{2}$ " ISO 7-1 internal pipe thread are according to the torsion and bending stress of EN126 group 2

Connections with G $\frac{1}{2}$ " or G $\frac{3}{4}$ " external thread fitted with nuts according to ISO 228-1 in combination with applicable sealing(s) withstand the torsion and bending stress of EN 126 group 1

Ambient temperature

-15 ... 60°C

Humidity

95% RH max. at 40°C

Storage

- 30 ... 70°C

Pressure feedback connection

The servo pressure regulator has an M5 thread connection for pressure feedback on maximum pressure setting.

Dimensions

See dimensional drawing on page 3 and page 4

Minimum capacity

The minimum rate is adjustable with a throttling screw from 0.2 m³/h air up to 0.92 m³/h air at $\Delta P = 17$ mbar

Outlet pressure range

1.5 ... 32 mbar

Minimum rate range

1.5 ... 7 mbar

Maximum inlet pressure

60 mbar

Modulation characteristics

In fig 1. and fig 2. the modulation performance of the CVI-m system is reflected at 20 mbar and 37 mbar.

Closing time

< 1 second

Electrical data

Power consumption: see table 1.

Max modulation current at nominal voltage: 30 mA

Valve classification

1st valve: class B, 50 mbar backpressure

2nd valve: class J, 0 mbar backpressure

Maximum operating pressure

The P_{max} = 60 mbar indication on the housing of the gas control is the maximum pressure at which it functions safely.

Mounting position

90° tilted (i.e. with coils horizontal) in any direction from the upright, deviation $\pm 5^\circ$ max.

NOTE: Upright position is not applicable

Mounting holes

Two mounting holes for thread forming M4 screws are located on the bottom of the gas control.

For versions with external thread there are two additional mounting holes for thread forming screws at the inlet side of the gas control.

The four holes at inlet and outlet for mounting a flange on the gas control are provided with M4 thread with a minimum of 6 mm full thread.

In case of side outlet the three holes for mounting the flange are provided with M5 thread with a minimum of 6 mm full thread.

Table 1: Power consumption (W)

Power consumption 1 st + 2 nd operator			
Nominal voltage to S4565.M 230 V, 50 Hz		110% nominal voltage to S4565.M 253 V, 50 Hz	
VA	W	VA	W
7.2	8.7	7.9	9.6

Table 2: Standard valve connection

Inlet	End outlet	Side outlet	Body length (mm)
Flanged	Flanged	--	105
Flanged	--	Flanged	105
Internal $\frac{3}{8}$ " ISO 7-1	--	Flanged	115
Internal $\frac{1}{2}$ " ISO 7-1	--	Flanged	115
Internal $\frac{1}{2}$ " ISO 7-1	Internal $\frac{1}{2}$ " ISO 7-1	--	115

Table 3: External valve connection (optional)

Inlet	End outlet	Side outlet	Body length (mm)
G $\frac{1}{2}$ "	G $\frac{1}{2}$ "	--	135
G $\frac{1}{2}$ "	Flanged	--	120
G $\frac{3}{4}$ "	G $\frac{3}{4}$ "	--	135
G $\frac{3}{4}$ "	Flanged	--	120
G $\frac{3}{4}$ "	--	Flanged	120

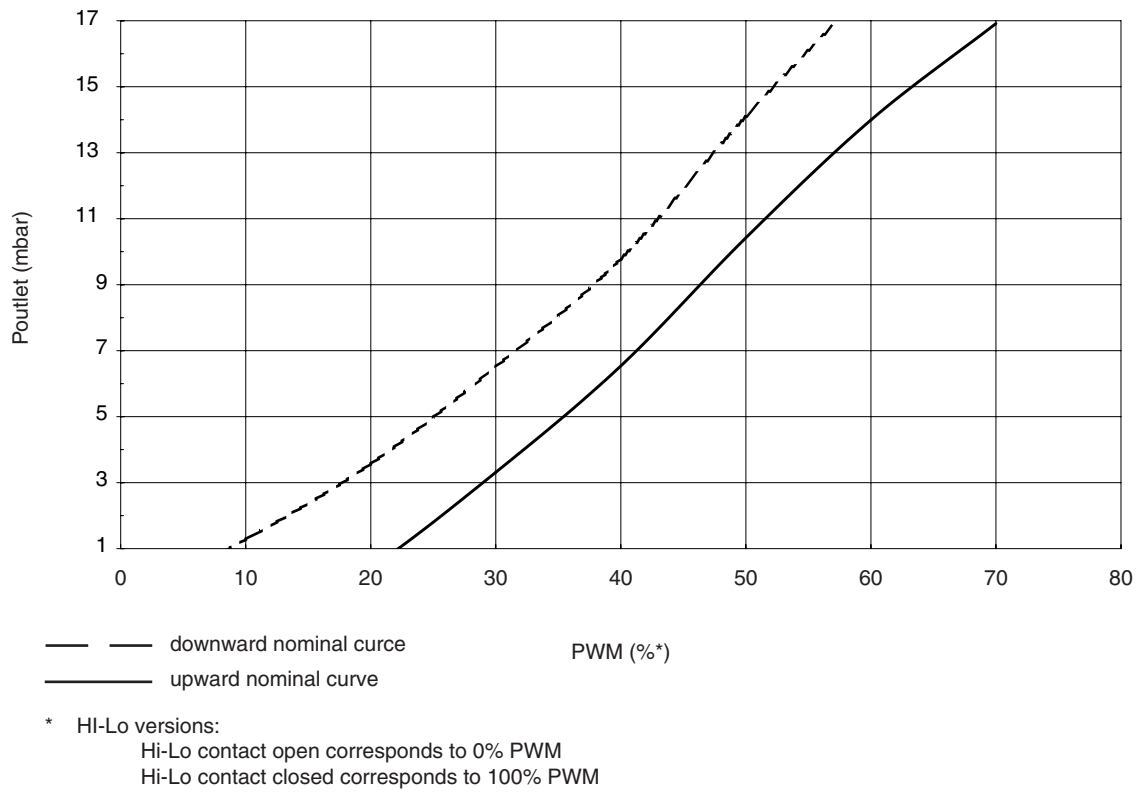


Fig. 1. Tolerance graph modulating performance at 20 mbar inlet pressure, Ø 4.3 mm outlet restriction (VK4105G + S4565.M)

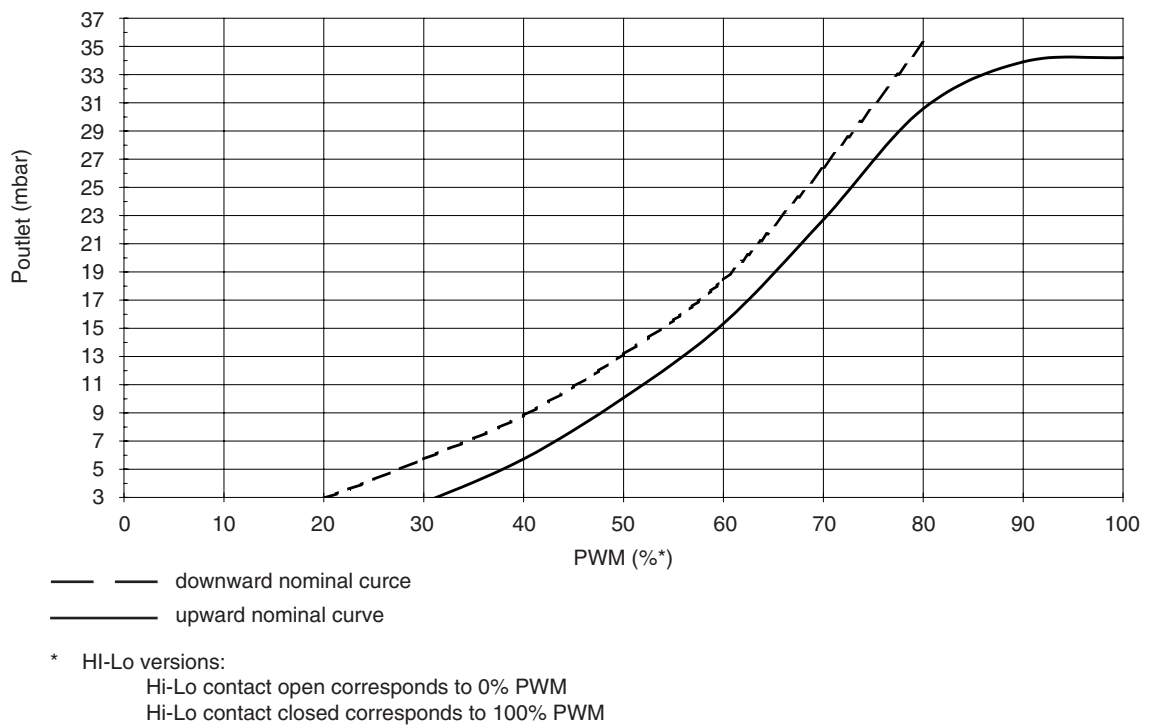


Fig. 2. Tolerance graph modulating performance at 37 mbar inlet pressure, Ø 2.8 mm outlet restriction (VK4105G + S4565.M)

PERFORMANCE CHARACTERISTICS

Maximum allowable leakage

Each gas control is factory tested to meet the following leakage requirements:

- outerwall: 50 cm³/h at test pressure of 150 mbar.
- safety valve: 40 cm³/h at test pressure of 6 and 150 mbar.
- main valve (plus operator inlet valve): 40 cm³/h at test pressure of 6 and 150 mbar.

Outlet pressure adjustment range capability

Natural/LP gas: 1.5 ... 32 mbar

Minimum capacity

The minimum rate is adjustable with a throttling screw from < 0.2 m³/h air up to 0.92 m³/h air at ΔP = 17 mbar

High pressure test

In the "OFF" condition, the gas control will withstand 3 bar (air) inlet pressure without damage. Attempts to operate the gas control, while in this fault condition will not damage it.

Operable voltage range

The gas control will function satisfactory between 85% and 110% of the rated voltage on S4565.M.

Table 4: Operable voltage range

Rated voltage	Operable voltage
230 V, 50 Hz	196 ... 253 V

Valve closing characteristics

The VK4105G will close within 1 second from operator de-energization, (at an inlet pressure of 22.5 mbar and minimal 2.5 mbar pressure drop).

Main valve opening characteristics (measured with gas)

Under conditions where the supply pressure is at least 2.5 mbar above the outlet pressure setting, the dead time shall be 0.5 s maximum.

The outlet pressure will reach 80% of the rated flow within 1 second from start of flow.

Full outlet pressure will be reached within 5 seconds.

Oscillation

The difference between maximum and minimum outlet pressure must be equal or less than 0.5 mbar.

Test conditions:

- maximum inlet pressure in accordance with regulator range.
- outlet orifice 2.8 dia (this means 0.3 m³/h air at 2 mbar outlet pressure)
- recording of outlet pressure with a transducer connected to a 1/2" pipe with a length of 10 d. with a short hose at 5 d.
- attenuation X-Y recorder must be switched on zero.
- other pressure gauges or flow meters must be disconnected.
- Ambient temperature 20°C

Tap sensitivity of maximum outlet pressure set point

For all gases the maximum deviation may be 1 mbar or 10% whichever is the greatest.

Repeatability of maximum outlet pressure set point

For all gases the maximum deviation from set point is: ± 0.5 mbar or ± 3% of the set point value, whichever is the greatest.

Total set point shift

Table 5: Total set point shift

Pressure range (mbar)	Tolerance
1.5 ... 32	6% of the set point value or 1 mbar whichever is the greatest

Design life

500.000 cycles for safety and main valve operator.
Cycle frequency maximum 100 cycles /hour.

INSTALLATION

IMPORTANT

Take care that installer is a trained experienced service person.

Turn off gas supply before starting installation.

Disconnect power supply to prevent electrical shock and/or equipment damage.

Do not remove seals over inlet and outlet until the device is ready to be installed.

Take care that dirt cannot enter the gas control during handling.

Mounting position

90° tilted (i.e. with coils horizontal) in any direction from the upright, deviation ±5° max.

NOTE: Upright position is not applicable

Main gas connection

Gas controls with internal thread

- Take care that dirt cannot enter the gas control during handling.
- Use a sound taper fitting with thread according to ISO 7-1 or a piece of new, properly reamed pipe, free from swarf.
- Do not thread or tighten the pipe or pipe fitting too far (see table below). Otherwise distortion and malfunction could result.

Pipe size (inch)	Max. length of pipe thread (mm)
3/8	14
1/2	18.6

- 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.
- Tighten gas control using the right open end wrench. See fig. 3.

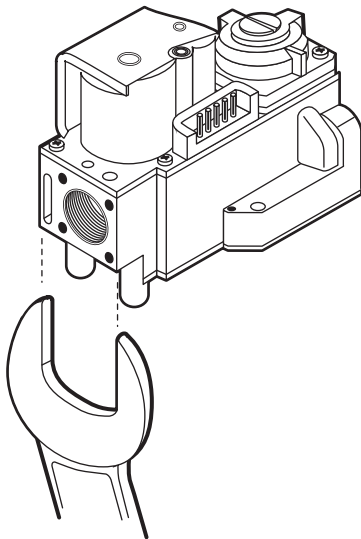


Fig. 3.

- Ensure the gas flows in the same direction as the arrow on the bottom of the gas control.

Gas controls for flange connection

- Insert "O"-ring in the groove of each flange. If necessary grease "O"-ring slightly to keep it in place.
- Mount gas control between flanges using the four screws for each flange.

Gas controls with external thread connection

IMPORTANT

Fastening torque flat sealing ring only applicable for type Klingsil C4324

Olives for this application are not supplied by Honeywell

Torque of olive applications may differ depending on olive dimensions.

- With 1/2" nut and flat sealing ring for pipe 14 mm (see fig. 4.)
 Nut: order number: 45.006.583-005
 Flat sealing ring according to DIN 3535-6 with size Ø18 x Ø12 x 1.5 mm
 order number..... 45.006.582-002
 Fastening torque: maximum 40 Nm
 minimum 25 Nm
 Pipe end construction: see fig. 7.
- With 1/2" nut and flat sealing ring for pipe 15 mm (see fig. 4.)
 Nut: order number: 45.006.583-004
 Flat sealing ring according to DIN 3535-6 with size Ø18 x Ø12 x 1.5 mm
 order number..... 45.006.582-002
 Fastening torque: maximum 40 Nm
 minimum 25 Nm
 Pipe end construction: see fig. 8.

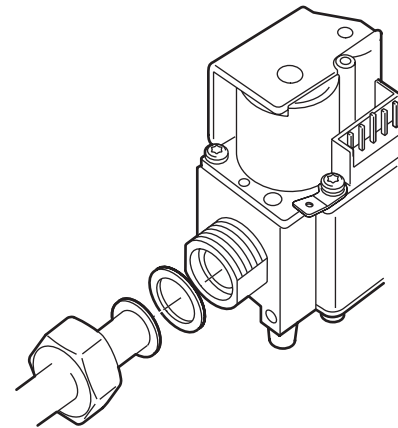


Fig. 4. External thread connection with nut and flat sealing ring

- With 3/4" nut and olive (see fig. 5.)
 Pipe diameter: 15 mm
 Nut: order number: 45.006.583-003
 Fastening torque: maximum 50 Nm
 minimum 30 Nm
 Pipe end construction: square off end of tubing and remove burrs.

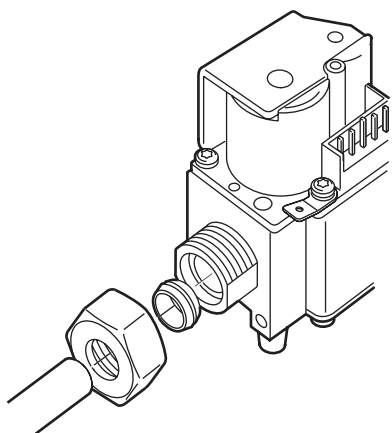


Fig. 5. External thread connection with nut and olive

- ④ With $\frac{3}{4}$ " nut and "O"-ring (see fig. 6.)
 Pipe diameter: 15 mm
 Nut: order number:45.006.583-003
 "O"-ring size: $\varnothing 14.3 \times \varnothing 2.4$ mm
 order number45.001.528-048
 Fastening torque: maximum 50 Nm
 minimum 10 Nm
 Pipe end construction: see fig. 9.

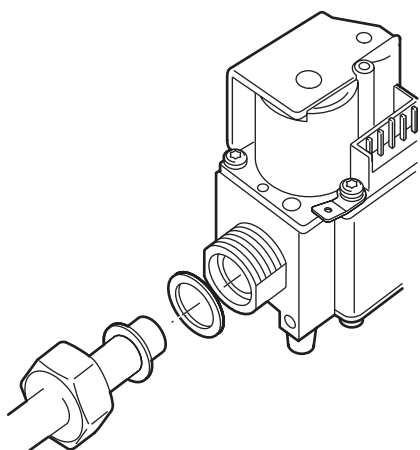


Fig. 6. External thread connection with nut and "O"-ring

- ⑤ With $\frac{3}{4}$ " nut and flat sealing ring for pipe 15 mm (see fig. 4.)
 Nut: order number:45.006.583-003
 Flat sealing ring according to DIN 3535-6 with size $\varnothing 24 \times \varnothing 16 \times 1.5$ mm:
 order number45.006.582-001
 Fastening torque: maximum 50 Nm
 minimum 30 Nm
 Pipe end construction: see fig. 10.

- ⑥ With $\frac{3}{4}$ " nut and flat sealing ring for pipe 18 mm (see fig. 4.)
 Nut: order number: 45.006.583-002
 Flat sealing ring according to DIN 3535-6 with size $\varnothing 24 \times \varnothing 16 \times 1.5$ mm
 order number 45.006.582-001
 Fastening torque: maximum 50 Nm
 minimum 30 Nm
 Pipe end construction: see fig. 11.

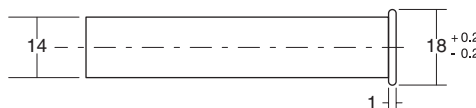


Fig. 7. Pipe (dia 14 mm) for flat sealing ring connection

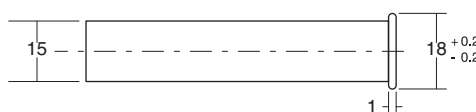


Fig. 8. Pipe (dia 15 mm) for flat sealing ring connection

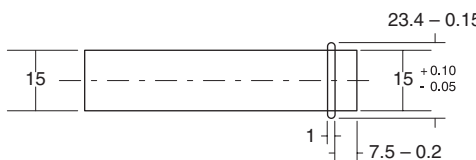


Fig. 9. Pipe end for "O"-ring connection

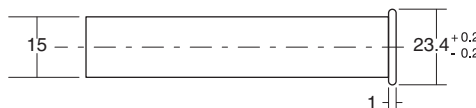


Fig. 10. Pipe (dia 15 mm) for flat sealing ring connection



Fig. 11. Pipe (dia 18 mm) for flat sealing ring connection

Pressure feedback connection



WARNING

To avoid decreasing of performance of pressure regulator by pinching off the pressure feedback tubing, it is recommended to use a tube material which will not kink.

Pilot gas connection (if applicable)

- Square off the end of tubing and remove burrs.
- Slip compression fitting over tubing.
- Insert tubing into gas control housing until it bottoms, slide fitting into place and turn finger tight.
- Use a wrench to tighten fitting about 1¹/₂ turn beyond finger tight to shear of the olive.

Do not use jointing compound.

Connect other end of tubing to pilot burner according to the manufacturer's instructions.



CAUTION

Do not bend tubing at gas control after compression fitting has been tightened, as this may result in gas leakage at the connection.

Perform gas leak test



WARNING

FIRE OR EXPLOSION HAZARD CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY OR DEATH

Check for gas leaks with a rich soap and water solution any time work is done on a gas control.

Gas leak test

- Paint all pipe connections upstream of the gas control with a rich soap and water solution. Bubbles indicate a gas leak.
- If a gas leak is detected, tighten the pipe connection.
- Stand clear while lighting the main burner to prevent injury caused from hidden gas leaks, which could cause flashback in the appliance vestibule. Light the main burner.
- With the main burner in operation, paint all pipe joints (including adapters) and gas control inlet and outlet with with a rich soap and water solution an approved leak detection fluid.
- If another gas leak is detected, tighten adapter screws, joints and pipe connections.
- Replace the part if gas leak can not be stopped.



CAUTION

Keep soap and water solution away from electrical connections.

ELECTRICAL CONNECTION

IMPORTANT

Disconnect power supply to prevent electrical shock and/or equipment damage.

Wiring must be in accordance with local regulations.

The appliance manufacturer's instructions should always be followed when provided. If such instructions are not provided see the connection diagrams for typical systems.

Before installing or replacing any control check that type number is correct for the application.

Ensure combustion chamber is free of gas before start up.

Conduct a thorough check out when installation is completed.

Electrical connection details

See Product Handbook EN2R-9028

ADJUSTMENTS, FINAL CHECKOUT AND MAINTENANCE

Adjustment

WARNING

Adjustments must be made by qualified persons only. If the appliance manufacturer supplies checkout and/or service and maintenance instructions carefully follow them. If these instructions are not provided then use the procedure outlined below.

NOTE: For adjustment of additional electrical minimum setting and/or gas outlet pressure during ignition see appropriate Product Handbook of ignition control.

Pressure tap

The gas control is provided with a pressure tap of 9 mm outer diameter. at inlet and outlet side.

When checking the pressure undo the screw a half turn and slip tube over nipple.

Ensure that screw is retightened after making test.

Maximum outlet pressure adjustment (see page 3)

- Disconnect pressure feedback connection (if applicable)
- Start-up appliance in order to have gas input to burner and make sure appliance is running at maximum heat demand.
- Check gas input to the appliance using a clocking gas meter or alternatively a pressure gauge connected to the outlet pressure tap.
- Remove cap screw from maximum pressure regulator to expose pressure regulator adjustment screw.
- Slowly turn pressure regulator adjustment screw with a suitable screw driver until the burner pressure required is recorded on the pressure gauge. Turn adjustment screw clockwise to increase or counter-clockwise to decrease gas flow to the burner.
- Replace pressure regulator cap screw.
- Connect pressure feedback connection (if applicable).

Setting of mechanical minimum rate (see page 3)

- Disconnect PWM input signal.
- Make sure appliance is running.
- Check gas input to the appliance using a clocking gas meter or alternatively a pressure gauge connected to the outlet pressure tap.
- Turn mechanical minimum adjustment screw counter-clockwise to increase the gas flow to the desired value.
- Connect PWM input signal.

Final checkout

After installation and any adjustment start the appliance and observe a complete cycle to ensure that all burner components function correctly.

Maintenance and service

Under normal circumstances no maintenance or service is required.

Screws on the valve that have been sealed must never be removed.

CONSTRUCTION AND WORKING PRINCIPLES

The VK4105G gas control contains a first direct electric ON/OFF safety valve (A) and a second ON/OFF and modulating servo operated main valve (B).

The modulating valve maximum output pressure can be limited by a maximum pressure regulator (C). The minimum output can be adjusted by a throttle adjustment screw (D).

Description of the direct electric operator

The direct electric operator (RAC) is built up with a valve seat that is machined in the die cast body (E), the coil plate assy that forms the upper part of the product (F) and the plunger assy as moving part (G).

A sleeve (H) guides the plunger assy (G) and is assembled between body and coil plate assy. If the solenoid is energized the plunger is pulled-in and moves upwards. So the safety valve, which is directly attached to this plunger, is opened. The impact of the plunger on the stop is damped by a rubber silencer in the plunger.

Description of the servo operated modulating main valve

The main valve (B) is a spring closed and diaphragm (J) actuated valve located in the main gas passageway between the direct operated safety valve and the outlet of the gas control.

The main valve is opened by the servo systems "working gas" acting against the main valve diaphragm (J). So the position of the main valve (B) is controlled by the "working gas" pressure in the servo system.

The "working gas" is obtained from the main gas stream through the servo valve (K) and a supply orifice.

The servo valve is located parallel to the main valve and is

operated by the 2nd coil (M). This 2nd coil also operates the integrated modulation function by loading an integrated regulator diaphragm (N) with the required force through applying the appropriate current (based on % PWM input) which is determined in the electronic circuit that is connected to the gas control.

When the 2nd coil is energized at heat demand, but a 0% PWM input, the plunger is moved down and the servo valve opens. At this moment "working gas" can flow to the supply orifice (O). At the same moment the minimum rate gas can flow through the servo valve (K) and the minimum rate adjustment screw (D) directly to the outlet.

When now the PWM input (heat demand) rises, the current rises, the load on the regulator (N) rises and the pressure of "working gas" in the servo system is being built up. At a certain point this pressure opens the main valve (B) and the outlet pressure rises. Now the main valve is modulating and the outlet pressure is controlled by the balance between generated force on the plunger and outlet pressure through the regulator diaphragm. The higher the force becomes, the higher the outlet pressure will be and vice versa.

The outlet pressure can be limited to a maximum value by setting of the maximum servo pressure regulator (C). This maximum regulator is parallel to the integrated modulating regulator. This means that the lowest of both settings will determine the actual outlet pressure.

When the 2nd coil (M) is de-energized, the servo valve closes and the supply of minimum rate gas and "working gas" are shut off. The load of the regulator diaphragm is released, the "working gas" can bleed to the outlet through the regulator seat and the main valve closes.

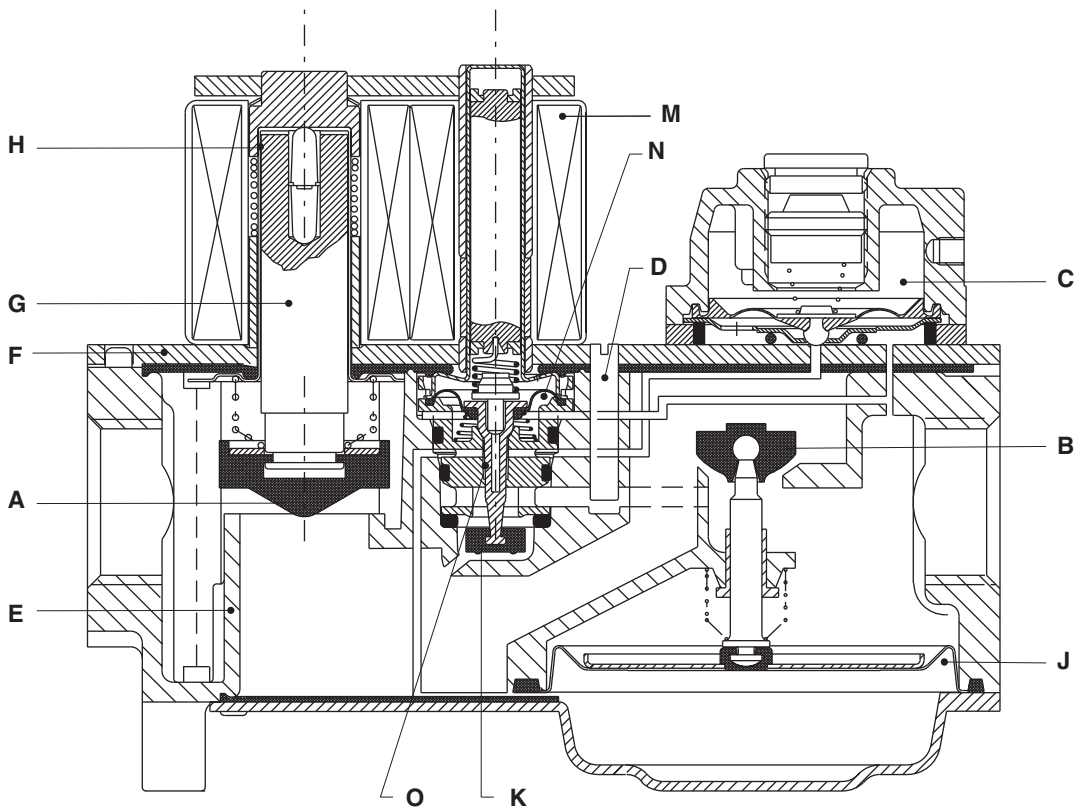


Fig. 12. Servo pressure regulation working

QUALITY ASSURANCE STATEMENT

Products are manufactured under an ISO 9001 (1994) based and certified Quality System.

The quality system is described in the Honeywell Combustion Controls Center Quality Assurance Programme and its related operational procedures and instructions.

The quality system is approved by Gastec against certificate number 9.302/2.

The quality organisation is responsible for defining, maintaining, improving and verification of the quality systems in the field of design, production process and field quality service.

Assembly processes are guided by work instructions. Patrol inspections form part of the assembly processes.

At the end of the assembly phase, **all** gas controls are leakage and performance tested/adjusted.

Assembly inspection is performed by employees of the quality control department, using their own authorised equipment.

All inspections (incoming and assembly) are performed by trained personnel and according to inspection procedures.

STANDARDS AND APPROVALS

Standards:

The VK4105G has been designed to meet the European Standards:

- EN 88: Pressure governors
- EN 126: Multifunctional controls.
- EN 161: Automatic shut off valves

The safety shut off valve meets **class B** requirements.

The servo operated main valve meets **class J** requirements.

A class J valve as mentioned in EN 161; 1997 is equal or better than a class D' valve as mentioned in EN 297 and EN 483 and class D valves as mentioned in other standards.

According to bending stresses the gas control meets the highest requirements (group 2).

The pressure governor meets class B performance.

Regarding electric safety, the gas control can be used in appliances according to European Standard for household electrical requirements EN 60335 series.

The gas control also meets all Electro Magnetic Compatibility standards for non-industrial appliances.

Approvals

The gas control conforms with the following EC - Directives:

- Gas Appliance Directive (90/396/EEC)
- Low Voltage Directive (73/23/EEC)
- Electro Magnetic Compatibility Directive (89/336/EEC)

The fact that the gas control is certified to European Standard EN 88 EN 126 and EN161 means that the gas control meets the requirements in all EC and EFTA countries.

Details per O.S. number can be found in the Approvals List.

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 CVI gas control component required: see model number chart below.
- The correct pilot burner for the installation concerned: refer to Honeywell ignition products guide EN0R-0038.

NOTE: Complete gas control, replacement parts and accessories will be available under "TRADELINE" label. Ask your wholesaler for details.

NOTE: An up-to-date product survey, with details of all new and existing products in these series, is available. Contact your local Honeywell sales representative for more information.

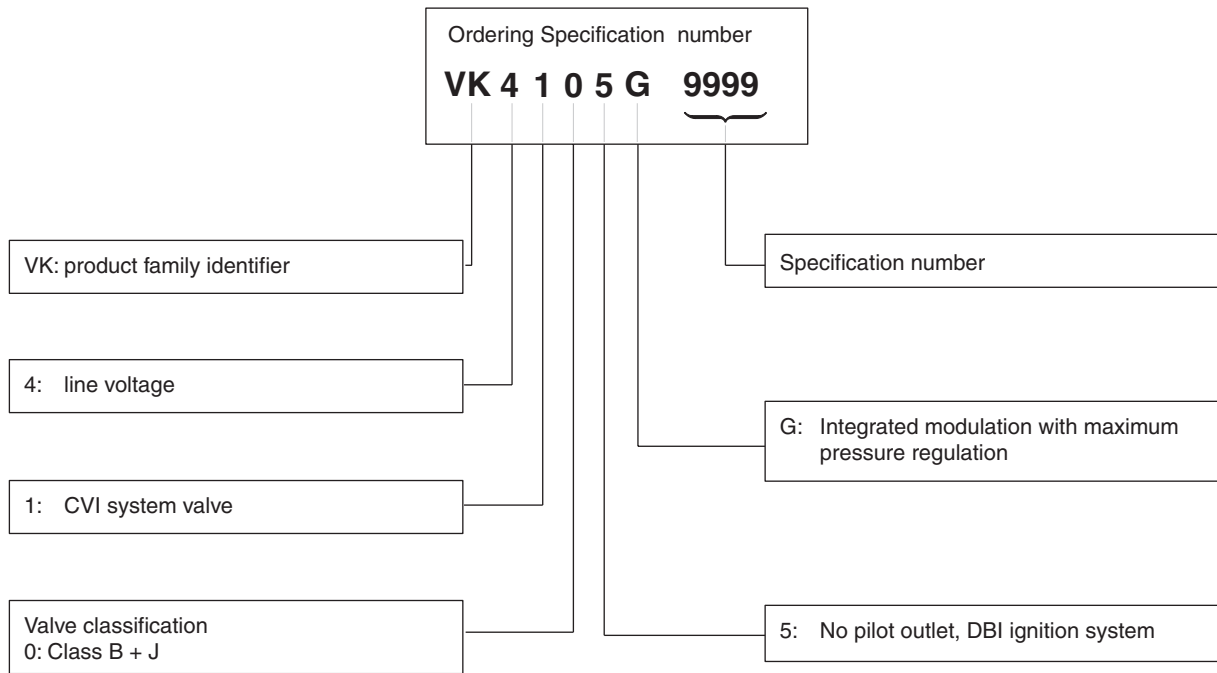


Fig. 13. Model number chart VK4105G

REPLACEMENT PARTS AND ACCESSORIES

Flange assemblies

Connection size	Configuration		"O"-ring	Screws	Packing quantity (pcs)	Order number
	Straight	Elbow				
3/8" BSP.PI	X	-	YES	YES	200	45.900.400-101
3/8" BSP.PI ¹⁾	-	X	YES	YES	200	45.900.400-103
3/8" BSP.PI ¹⁾	-	X	YES	NO	200	45.900.400-129
1/2" BSP.PI	X	-	YES	YES	200	45.900.400-102
1/2" BSP.PI	X	-	NO	NO	200	45.900.400-106
1/2" BSP.PI	X	-	YES	NO	200	45.900.400-131
1/2" BSP.PI ¹⁾	-	X	YES	YES	200	45.900.400-104
1/2" BSP.PI ¹⁾	-	X	NO	NO	200	45.900.400-108
1/2" BSP.PI ¹⁾	-	X	YES	NO	200	45.900.400-130
1/2" NPT	X	-	YES	YES	200	45.900.400-122
1/2" NPT ¹⁾	-	X	YES	YES	200	45.900.400-132
3/4" NPT ¹⁾	-	X	YES	YES	200	45.900.400-146
Ø 18.4 mm	X	-	YES	YES	200	45.900.400-123

1) Not applicable for mounting over pilot outlet.

2) Applicable for mounting in all directions.

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