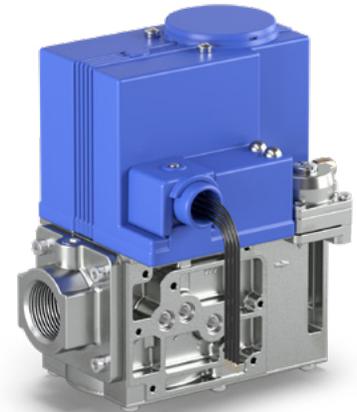


V4730C/V8730C/V4734C 1:1 gas/air servo regulated valves

TECHNICAL INFORMATION

- Wide modulation range (14% to 100% of burner load).
- 24 V AC and 120 V AC models.
- Fine mesh screen (strainer) between inlet flange and main body.
- Various pressure tap points.
- All adjustment and test points are accessible from one side.
- DIN 43650 plug connector with 36" (914 mm) lead wires included.
- Replaceable pipe flange adapters available.
- Two different stainless steel sensing tubes are available for ordering for use with or without ball valve accessory mounted between the gas valve and venturi mixing unit.
- LED visual indicator (2 LEDs) shows whether the gas valve is electrically powered.

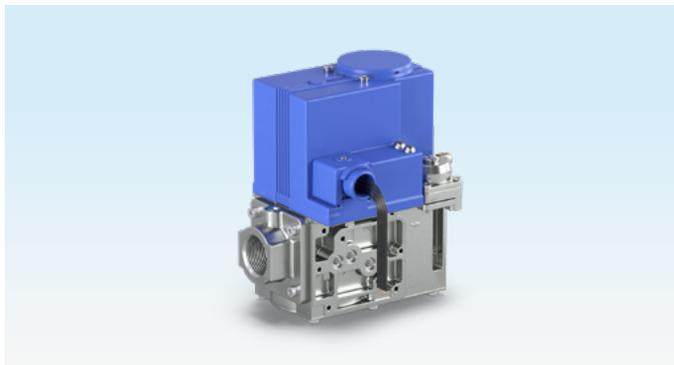


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1 Application

The 1:1 gas/air servo regulated gas valves V4730C/V8730C/V4734C are designed for modulating control of gaseous fuels.



With an additional venturi mixing unit (VMU) and blower, the system is used for modulating premixing, e.g. in gas burners, gas boilers, rooftop units, fresh air units and process applications.



The venturi mixing unit allows modulation of a premix burner with a constant gas/air ratio down to 14 to 17% of maximum load.

The 1:1 gas/air servo regulated valves are recognized by UL. For applications with valves specified according to EN 161, see TI VR400/VR800 Series, Class A servo regulated combination valves.

The modulation is accomplished by changing the fan speed. The fan is typically mounted downstream of the venturi. The outlet pressure of the gas valve is regulated to ambient pressure by the gas valve. The venturi generates a negative pressure against the ambient pressure by which the gas is drawn through the gas valve outlet.

The V4730C/V8730C/V4734C gas valve can be fitted directly on the venturi mixing unit. The venturi mixing unit is sealed with an O-ring to the fan. The O-ring is already installed in the venturi mixing unit.

All regulation adjustments are made on the gas valve. When necessary, a connection can be provided between the inlet of the venturi mixing unit and the gas pressure regulator to ensure a constant gas/air ratio in any circumstances.

Flexible mounting positions for gas control to venturi mixing unit and venturi mixing unit to fan.

2 Certification

2.1 Certificate download

Certificates – see www.docuthek.com

2.2 UL recognized



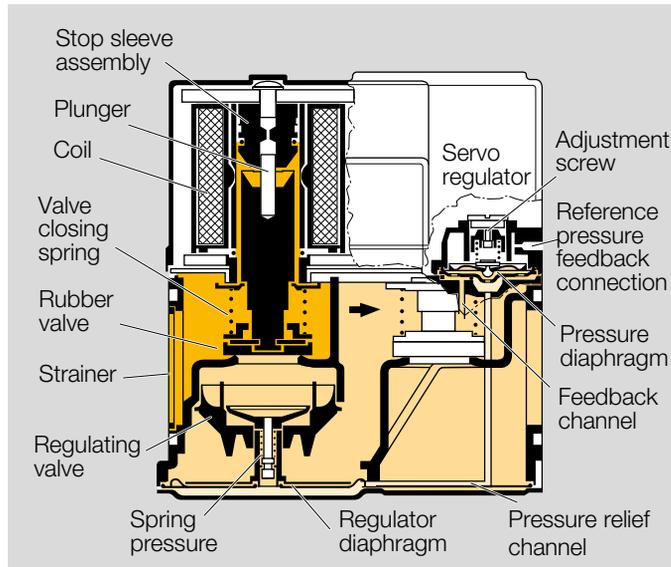
UL429 Electrically operated valves

2.3 ANSI/CSA approved

ANSI Z21.21 and CSA 6.5

3 Function

Servo pressure regulation working



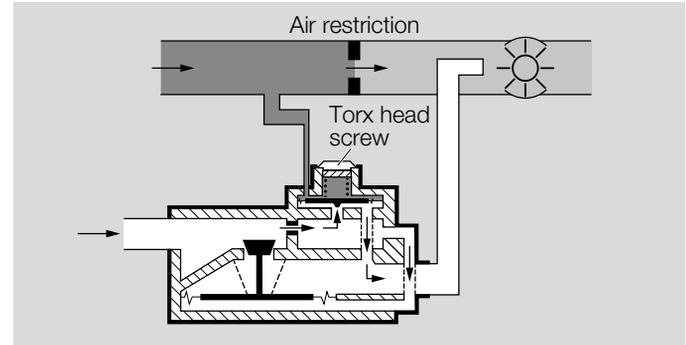
V4730C/V8730C/V4734C

The servo regulated combination gas valves comprise 2 x class A fail-safe shut-off valves. The valve is opened by energizing the direct ON/OFF operators. Each operator consists of a coil and a stop sleeve assembly. Inside the stop sleeve assy is a plunger which is connected to a rubber valve and which is able to move up and down, thus opening or closing the valve. The plunger is coated with an anti-friction material. Flow regulation is achieved by adjusting the plunger stroke.

A strainer made of AISI 303 is incorporated between inlet flange and main body. The valve closing spring is made of

AISI 302. Seals and gaskets are manufactured from hydrocarbon-resistant NBR according to EN 549.

3.1 Integrated gas/air 1:1



Working principle

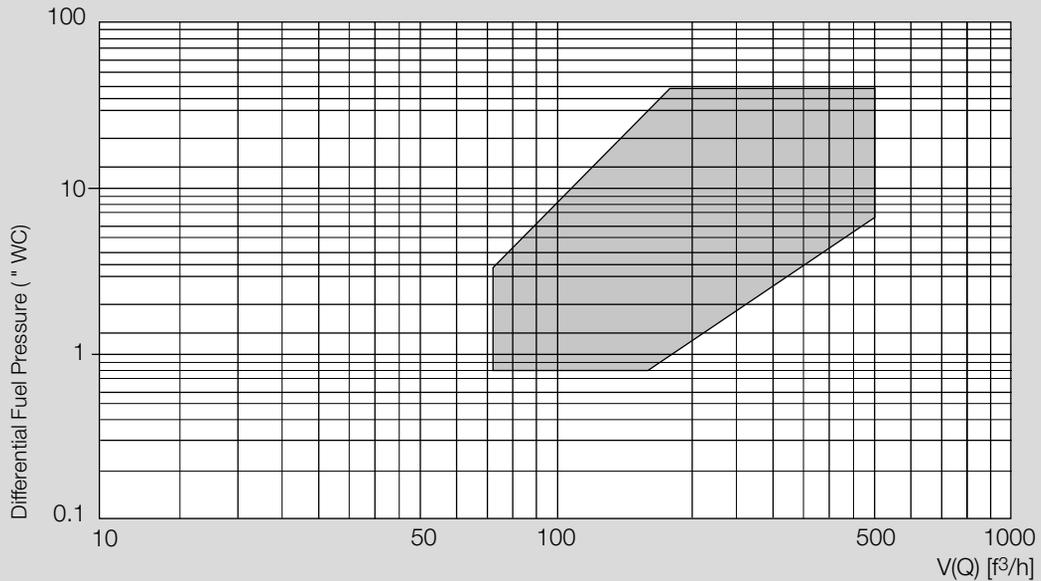
When used on the above mentioned gas controls series, the 1:1 gas/air regulator assembly provides the function of regulating/modulating the gas pressure drop equal to the air pressure drop.

The regulator has an air pressure connection and a torx head offset adjustment screw. The 1:1 gas/air regulator equals the gas pressure to the supplied air pressure. The offset can be adjusted using the offset adjustment screw. (Offset = $p_{\text{gas}} - p_{\text{air}}$)

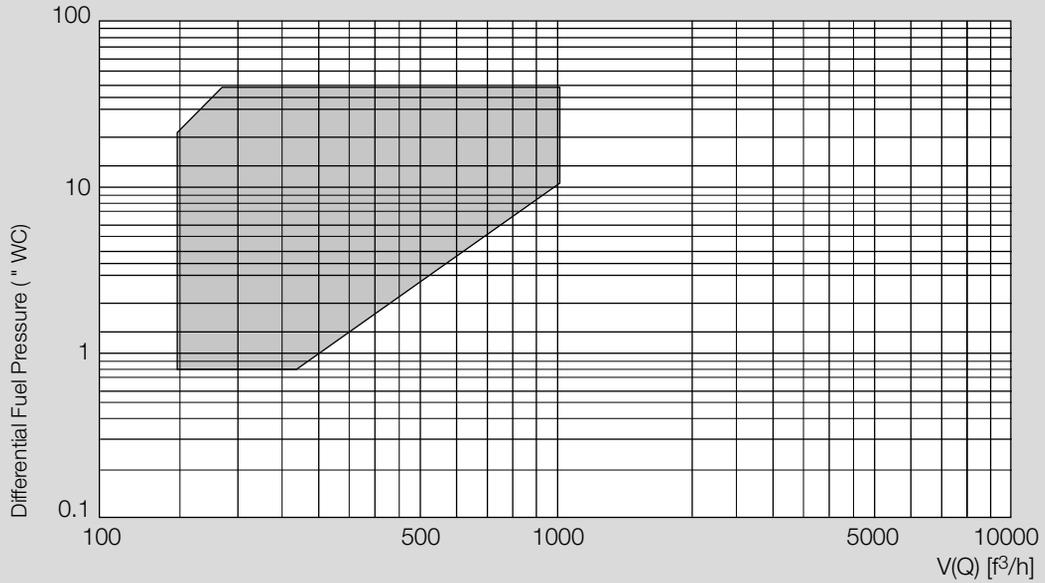
4 Capacity curves for combination gas valve and venturi mixing unit VMU

Natural gas

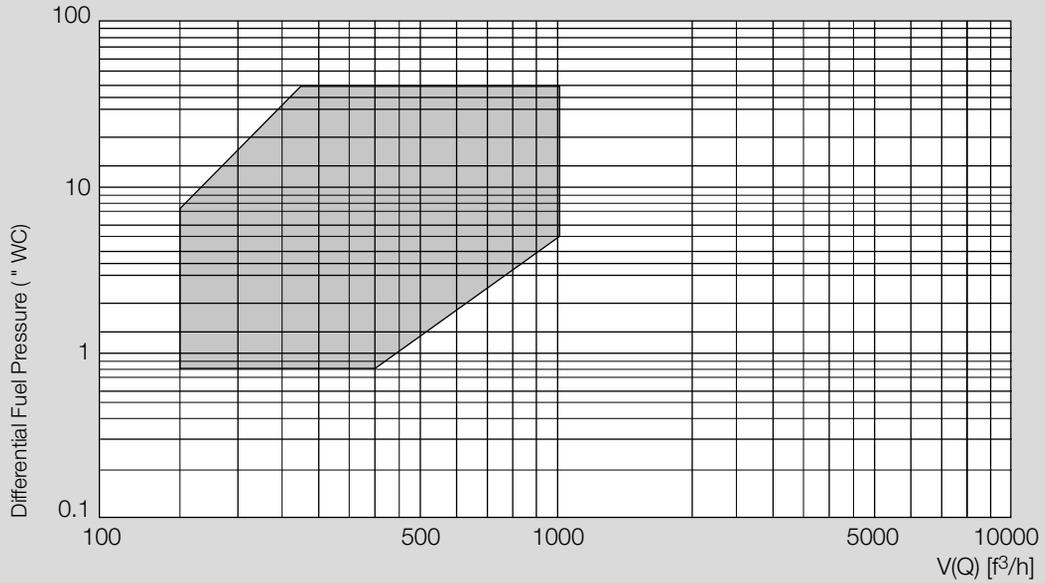
4.1 V4730C/V8730C and VMU150 venturi, 1/2 inch size



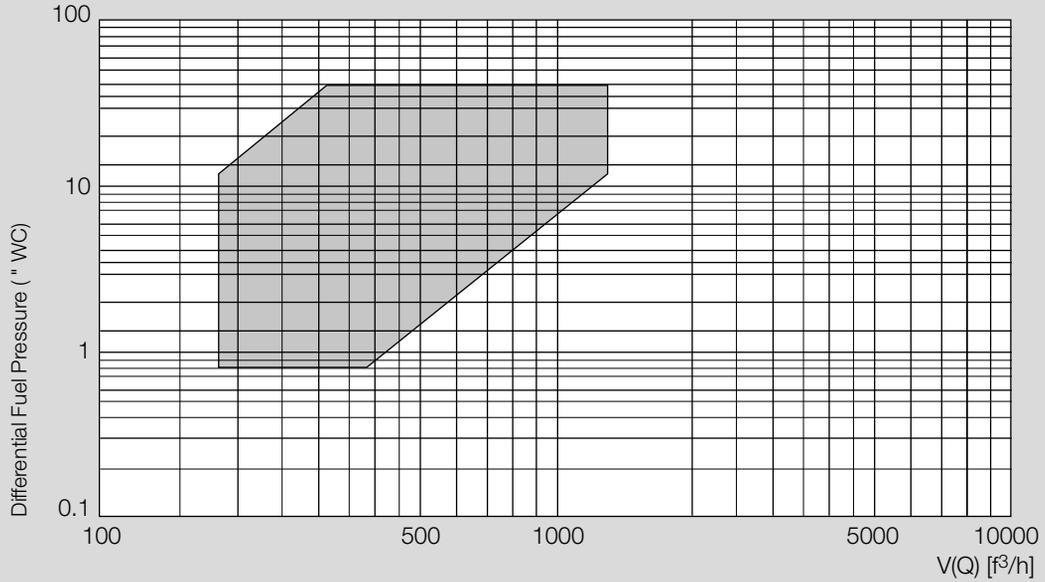
4.2 V4730C/V8730C and VMU300 venturi, 3/4 inch size



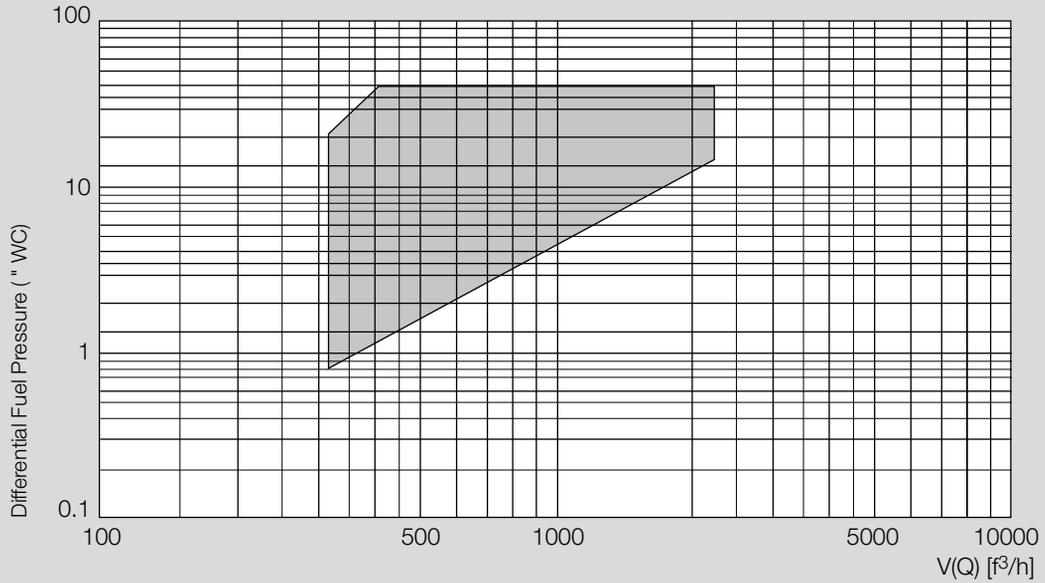
4.3 V4730C/V8730C and VMU300 venturi, 1 inch size



4.4 V4730C/V8730C and VMU335 venturi, 1-1/4 inch size



4.5 V4734C and VMU680 venturi, 1-1/4 inch size



5 Selection

5.1 Selection table

Description	Code	V4730	V4734	Condition
Safety shut-off valve	V	•	•	
Voltage				
Line voltage 120 V AC, 50/60 Hz	4	•	•	
Low voltage 24 V AC, 50/60 Hz	8	•		
Combination control	73	•	•	
Nominal size of valve seat (pipe size)				
Small body size model	0	1/2" (1/2" flange), 3/4" (3/4" flange), 1" (1" flange), 1" (1 1/4" flange)		Flange to be ordered separately, see page 16 (7 Accessories).
Large body size model	4		1 1/4" (1 1/4" flange)	
Type of pressure regulator				
Integrated gas/air 1:1	C	•	•	In combination with venturi mixing unit VMU
Specification numbers				
Internal specification	XXXX	•	•	Not selectable

Order example

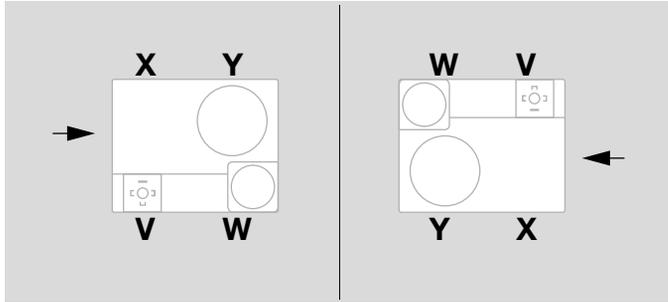
V4730CXXXX-0000

Order examples with accessories:

See page 12 (5.2 Selecting positions for accessories).

5.2 Selecting positions for accessories

Flange connections are provided on the main body to mount either pressure switches or a pilot valve. These additional option can be mounted in various positions on the main body.



Mounting positions for accessories

Use the 4 digits after the specification number to specify which option you need in which position. Observe the direction of the gas flow!

Type	Code	Position			
		V	W	X	Y
C60VRT40040 (2–16 "WC)	1	•	•	•	•

Examples:

With C60VRT40040 in position V, the full order number will be V4730CXXXX-1000.

With C60VRT40040 in position V and C60VRT40040 in position W, the full order number will be V4730CXXXX-1100.

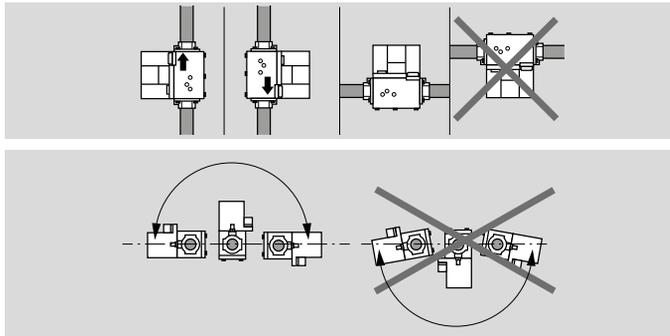
If you do not want any additional option, the order number will be V4730CXXXX-0000.

6 Project planning information

6.1 Installation position

Solenoid actuator in the vertical upright position or tilted up to the horizontal, not upside down.

Gas valves with integrated gas/air 1:1: the factory settings are made in a horizontal installation position. Vertical installation may require readjustments.



The distance between the gas valve and the wall/ground must be at least 12 inch/30 cm.

» The valve can be mounted up to ± 90 degrees from this position without affecting the fuel/air metering at medium and high firing rates (3000 to 5000 rpm of the blower), but at lower firing rates (1000 rpm), the fuel might be reduced up to 10% when the valve is not mounted in a horizontal position. To counter this, the low fire gas flow may be carefully field adjusted for non-horizontal mounting as described below.

6.2 Specifying application parameters (gas/air 1:1)

Define the maximum allowable deviation on Δp_{gas} at minimum Δp_{air} in new appliances for reliability reasons.

The application parameters can affect the offset adjustment accuracy during cycling and the life cycle of the control system.

These parameters are (in sequence of importance):

- Start pressure (the lower, the better)
- Ambient temperature (the lower, the better)

It is therefore advisable to verify the offset adjustment at service intervals by CO_2 measurement or Δp_{gas} (burner orifice pressure drop) at minimum Δp_{air} (pressure drop over air restriction).

Δp_{gas} measured on the pressure tap of the combination gas control (highest pressure) can deviate from the real Δp (burner orifice pressure drop) due to gas turbulence and/or restrictions in the application. The deviation should be defined and documented. The measurement accuracy should be ± 1 Pa.

6.3 Connections

There are 1/8 inch (3 mm) NPT pressure taps on the flanges. On the main body, flange connections are provided to mount:

- pressure switches (min. or max.) or
- valve proving system (VPS).

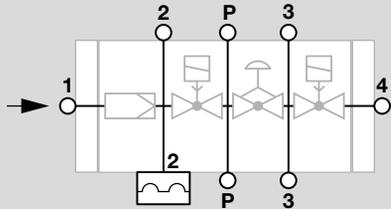
6.3.1 Pressure tap points

The following pressures can be measured:

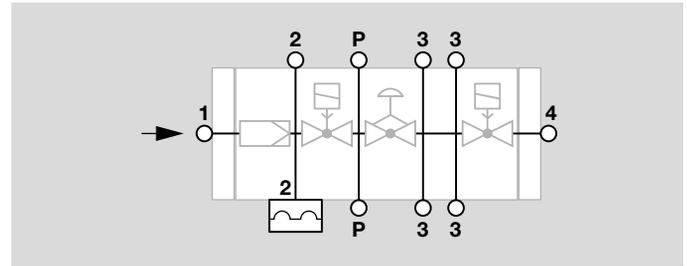
- 1** Inlet pressure
- 2** Inlet pressure
- 3** Interim pressure – unregulated (pressure between the two shut-off valves)
- 4** Outlet pressure – regulated
- P** Pilot gas pressure

» The corresponding numbers can be found on the sides of the valve. Pressure taps 1 and 4 are located on top of the flanges.

» A pressure switch can be mounted to 2, P or 3. (2 and 3 only)

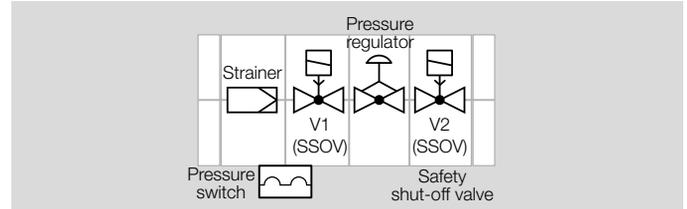


Pressure tap points for small body size models

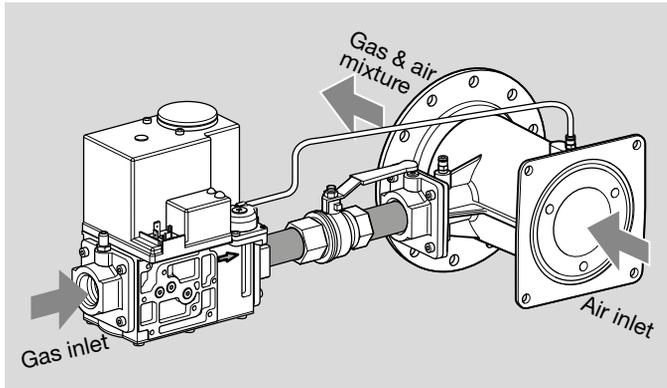


Pressure tap points for large body size models

6.3.2 Legend



6.4 Venturi mixing unit VMU



The venturi mixing unit VMU allows modulation of a premix burner with constant gas/air ratio down to 17% of maximum load. It is to be used in combination with a fan and a Honeywell 1:1 regulation gas valve. Modulation is accomplished by changing the fan speed.

The combination gas valve can be fitted directly on the venturi mixing unit in up to 3 positions. All regulation adjustments are made on the gas valve.

The venturi mixing unit is designed to be fitted in up to 12 positions on an EC (electronically commutated) fan.

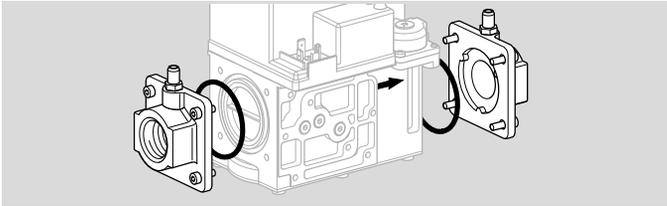
To ensure a constant gas/air ratio and safe function under all circumstances, a connection tube between the inlet of the venturi mixing unit and the gas pressure regulator is provided.

Accessories for VMU and sensing tube, see page 16 (7.3 Mixing unit VMU).

7 Accessories

7.1 Flange kit

Inlet flanges and outlet flanges are available as accessories. Valve comes with one kit only.



Scope of delivery:
 1 flange with sealing plug,
 1 O-ring and screws,
 1 pressure tap nipple fitted.

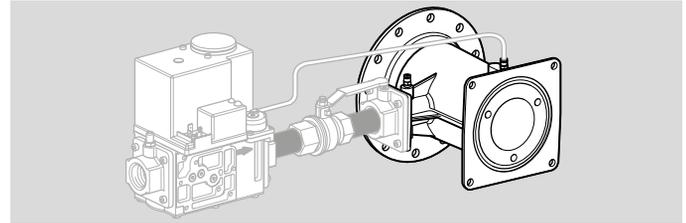
Flange kits:

Part number	Size (NPT)	Remarks
32006652-001	1/2"	1/8" pressure tap
32006652-002	3/4"	1/8" pressure tap
32006652-003	1"	1/8" pressure tap
32006652-004	1 1/4"	1/8" pressure tap

7.2 Valve connection plug

Standard DIN plug connector (black) according to DIN 43650 (Form A). Not included in the scope of delivery. Order No.: CO020012.

7.3 Mixing unit VMU



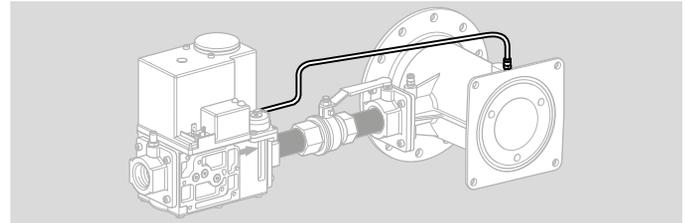
Integrated gas/air 1:1 with venturi mixing unit.

7.4 Venturi mounting kit

For flange mounting the venturi VMU. Order No.: 32006653-001.

Scope of delivery: O-rings/screws.

7.5 Sensing tube VMU



Short sensing tube for VMU150/185/300/335/400 kW venturi mixing units. Order No.: KTTBA001.

Long sensing tube for VMU500/680 kW venturi mixing unit. Order No.: KTTBA002.

7.6 Manual shut-off valve

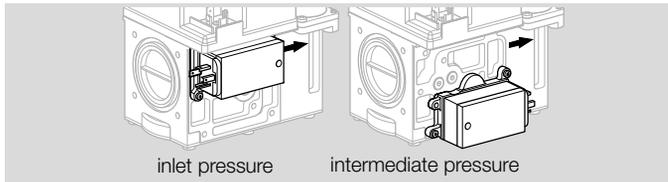
Manual shut-off valve kits can be ordered to provide manual shut-off function.

Order No.: 50002653-001, for 1 inch NPT or smaller valves.

Order No.: 50002653-002, for 1-1/4 inch NPT valve.

7.7 Pressure switch for gas

The pressure switch for gas monitors the inlet pressure or the interim pressure.



Scope of delivery:

- 1 x pressure switch for gas,
C60VRT = UL recognized,
C60VR = CE/UKCA certified,
- 2 x self-tapping retaining screws,
- 1 x sealing ring,
- 1 x protection cap.

7.7.1 Pressure switch connection plug

Standard DIN plug connector (grey) according to DIN 43650 (Form A). Not included in the scope of delivery.

Order No.: CO020014.

8 Technical data

The specifications in this section relate to the venturi mixing unit (VMU) and combination gas valve.

Valve and flange size:

Type	Valve size	Flange size
V4730C1006	1/2"	1/2"
V4730C1014	3/4"	3/4"
V4730C1022	1"	1"
V4730C1030	1"	1 1/4"
V4734C1002	1 1/4"	1 1/4"
V8730C1007	1/2"	1/2"
V8730C1015	3/4"	3/4"
V8730C1023	1"	1"
V8730C1031	1"	1 1/4"

Power consumption:

Type	Voltage	V1 + V2, total current
V4730C1006 V4730C1014	120 V AC, 50/60 Hz	0.26 A
V4730C1022 V4730C1030	120 V AC, 50/60 Hz	0.46 A
V4734C1002	120 V AC, 50/60 Hz	0.8 A at start-up (0.26 A ¹⁾)
V8730C1007 V8730C1015	24 V AC, 50/60 Hz	1.28 A
V8730C1023 V8730C1031	24 V AC, 50/60 Hz	3.0 A

¹⁾ First value during start-up, second value during normal operation

Capacity:

Type	VMU	Capacity (natural gas 0.64 kg/m ³)
V4730C1006	150	22–150 kW (73–512 kBtu/hr)
V4730C1014	185	26–185 kW (89–622 kBtu/hr)

Type	VMU	Capacity (natural gas 0.64 kg/m ³)
V4730C1022	300	43–300 kW (144–1009 kBtu/hr)
V4730C1022	335	48–335 kW (161–1127 kBtu/hr)
V4730C1030	300	43–300 kW (144–1009 kBtu/hr)
V4730C1030	335	48–335 kW (161–1127 kBtu/hr)
V4734C1002	400	55–382 kW (185–1300 kBtu/hr)
V4734C1002	500	71–500 kW (245–1710 kBtu/hr)
V4734C1002	680	97–680 kW (326–2287 kBtu/hr)
V8730C1007	150	22–150 kW (73–512 kBtu/hr)
V8730C1015	185	26–185 kW (89–622 kBtu/hr)
V8730C1023	300	43–300 kW (144–1009 kBtu/hr)
V8730C1023	335	48–335 kW (161–1127 kBtu/hr)
V8730C1031	300	43–300 kW (144–1009 kBtu/hr)
V8730C1031	335	48–335 kW (161–1127 kBtu/hr)

Maximum operating pressure (UL):

1.45 psi (100 mbar),

except for 1-1/4 inch size:

24 V: 1 psi (70 mbar),

120 V: 1.45 psi (100 mbar).

CSA approved up to 0.5 psi (34 mbar).

Torsion and bending stress:

Pipe connections meet group 2 according to EN 13611 requirements.

8 Technical data

Electrical connections:

Standard plug connector (according to DIN 43650) with 36 inch (914 mm) lead wires.

Valve position indicator lamps:

Inboard (closest to the valve body) – V1.

Outboard – V2.

Ambient temperature range:

5 to +40°F (-15 to +60°C).

Storage temperature = transport temperature:

-4 to +104°F (-20 to +40°C).

Coil insulation of solenoid valves:

Class F insulation system.

Body material:

Die-cast aluminum alloy.

Strainer:

Fine mesh screen (0.135 in. [0.34 mm] diameter). AISI 303 steel, serviceable after removing the inlet flange screws.

Meets EN 161 requirements for strainers.

Seals and gaskets:

Hydrocarbon-resistant NBR and Viton rubber types.

Enclosure: NEMA 1 (IP 40).

8.1 Tightening torque

Recommended tightening torques for the connection parts:

Screw type	Tightening torque
Throttle screw	max. 4.4 lb-in min. 0.35 lb-in
Flanges	max. 8.8 lb-in min. 0.04 lb-in
Pressure tap plug	62 ± 8.8 lb-in
Pressure switch mounting	22 ± 13 lb-in
Pressure switch cover	10.6 ± 1.8 lb-in
Inlet/outlet flange screw	38 ± 3.5 lb-in

8.2 Performance characteristics

Opening time:

Dead time max. 1 s.

First valve opening: < 0.5 s.

Second valve opening: 50% of the adjustable outlet pressure is reached within 5 seconds.

Maximum allowable leakage:

Outer wall, safety valve and main valve = 2.5 inch³/h (40 cm³/h for up to DN 25 and 3 inch³/h (50 cm³/h) for DN 32 at a test pressure of 0.87 psi (6 mbar) and 1.5 x maximum operating pressure.

High pressure test:

In the "OFF" condition, the valve will withstand 21.75 psi (1.5 bar) inlet pressure without damage.

Operating voltage range:

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

Gas valve connection to venturi (field-assembled):

Four screws and an O-ring are used to connect the gas valve to the venturi/manual shut-off valve.

The metal tube provided with the venturi must be connected between the venturi and the gas valve regulator.

Fan connection:

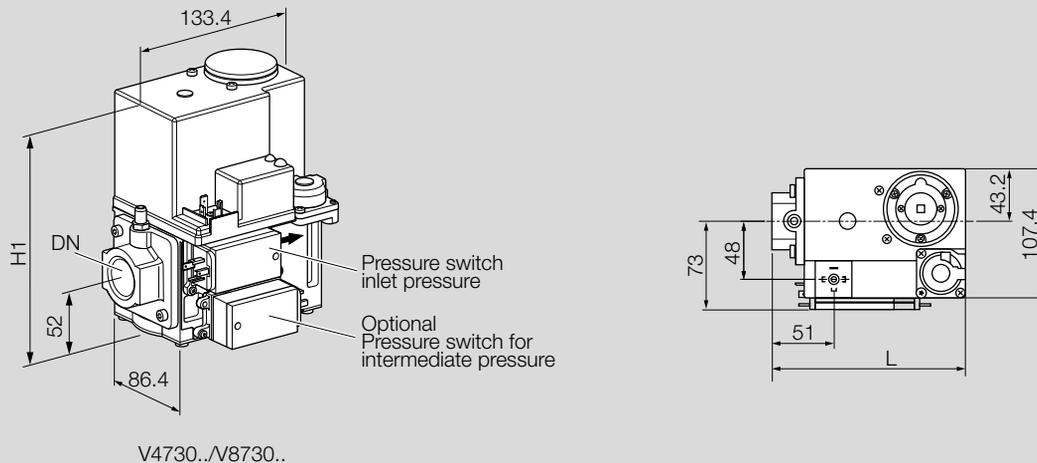
The venturi is connected to the fan using six bolts (which are included with VMU).

Minimum load:

The minimum load for which the system can be used is 14–17% of the reference load, which equals a minimum pressure differential of 0.2 inch WC (50 Pa) of the 1:1 venturi/servo regulator gas control.

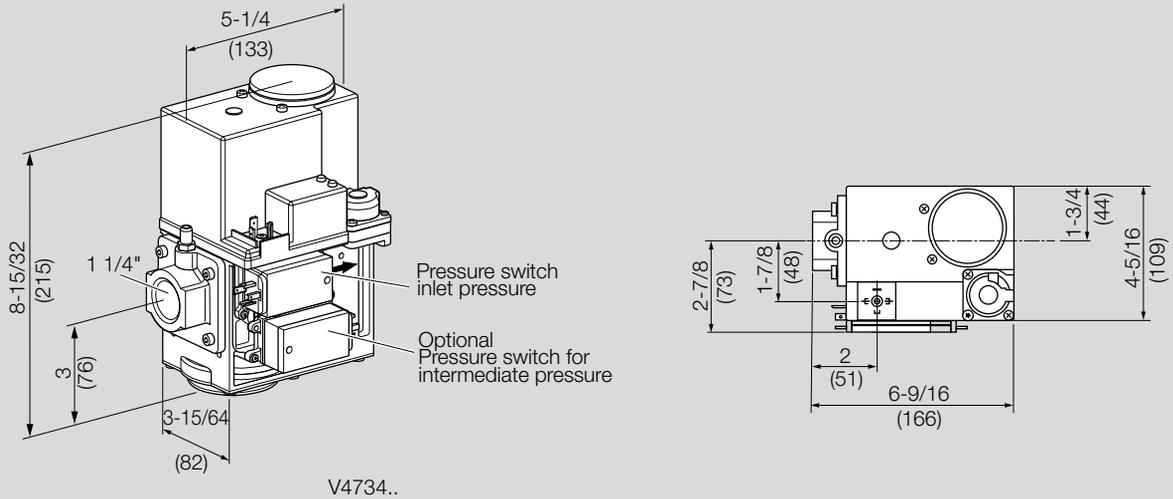
9 Dimensions

9.1 V4730, V8730

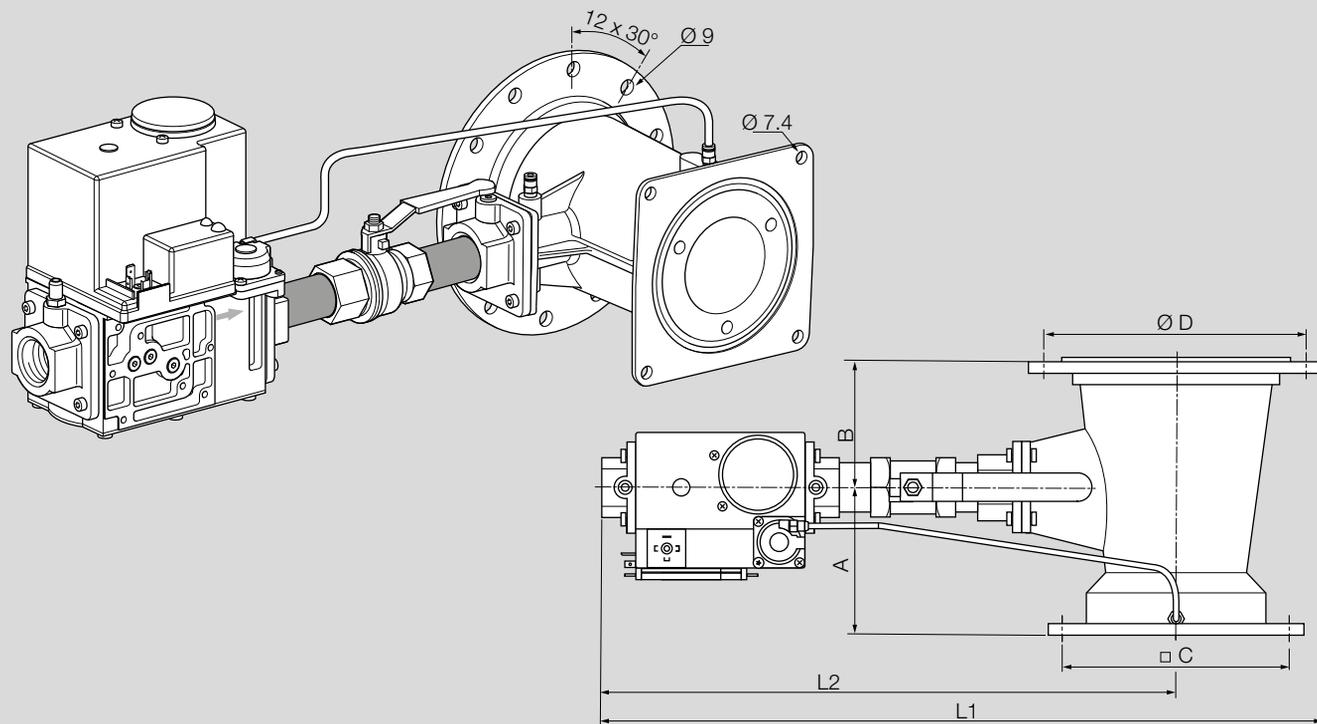


Size		H1		L	
inch	mm	inch	mm	inch	mm
1/2"	DN 15	6-1/2	165.5	6-1/8	156
3/4"	DN 20	6-1/2	165.5	6-1/8	156
1"	DN 25	7-5/16	190	6-1/8	166
1 1/4"	DN 32	7-5/16	190	6-9/16	166

9.2 V4734



9.3 Venturi VMU with gas valves and valve shut-off kit



Valve	Size inch	Venturi VMU kW	L1 inch	L1 mm	L2 inch	L2 mm	A inch	A mm	B inch	B mm	C inch	C mm	Ø D inch	Ø D mm
V4730/ V8730	1/2, 3/4, 1, 1 1/4	150 to 335	19-5/64	484.5	15-15/16	405	4-7/64	104.5	2-15/16	74.5	4-51/64	122	Ø 5-43/64	Ø 140
V4734	1 1/4	400	19-15/32	494.5	16-11/32	415	4-7/64	104.5	2-15/16	74.5	4-51/64	122	Ø 5-43/64	Ø 140
V4734	1 1/4	500, 680	22-1/8	562	17-31/64	444	4-41/64	118	3-5/16	100	7-3/32	180	Ø 8-21/32	Ø 220

10 Converting units

See www.adlatus.org

For more information

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