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VK42.. / VK82.. SERIES

PX42 GAS CONTROLS FOR PREMIX COMBUSTION SYSTEMS

PRODUCT HANDBOOK



APPLICATION

Energy preservation and reduction of CO₂ emissions are the main drivers for appliances with low emission premixed burners. **px42** is the name for the Resideo VK42../VK82 series gas control family. This gas control series has been developed for application in gas fired domestic central heating boilers, combi boilers and warm air furnaces or water heater appliances with automatic ignition and fully premix burners. The VK42../VK82.. series gas controls can be used in direct burner ignition applications.

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GENERAL

DESCRIPTION

pX42 Gas Valve

The **pX42** or VK42../VK82 series gas control-family includes a 1:1 gas/air regulator that has been specially developed for fully premixed gas appliances. The gas/air regulator provides the function of regulating/modulating the gas pressure drop equal to the air pressure.

The VK42../VK82.. series gas control comprises a standard body in two versions that differ in gas outlet connection. Several options can be factory included. These functional options are: throttle valve regulation, line or low voltage coil. The gas control has a first direct on/off operator for opening the class C valve according to EN161 and a second electric on/off servo operator for control of the main valve of class C according to EN161. The regulator is designed for accurate control in gas air ration systems.

The control is in accordance with EN 12067-1: Pneumatic Gas/air ratio controls for gas burners and gas burning appliances.

The gas control can handle the 1st, 2nd and the 3rd family gases.

Description of gas/air 1:1 system

In a boiler with a fully premixed burner, the air flow is controlled by a fan. In an air restriction or across a venturi the air flow generates an air pressure drop. The high air pressure is supplied to the gas control. In the working mode the gas pressure drops across the main burner injector is regulating and/or modulating equal to the air pressure drop across the air restriction. (see principle in fig. 1) The system is electronically controlled to provide programmed safe light up and is in supervision of the main burner.

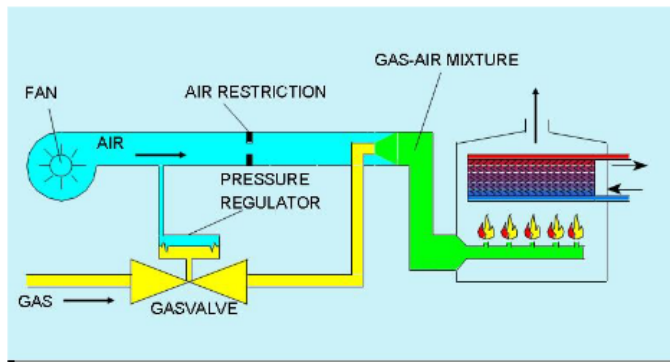


Fig. 1 principle gas air control 1:1

Description of 1:1 gas/air regulator

The 1:1 gas/air regulator is based on the servo regulation principle. The 1:1 gas/air regulator assembly has an air pressure connection and an offset adjustment screw. The 1:1 gas/air regulator equals the gas pressure to the supplied air pressure. With the offset adjustment screw it is possible to adjust the offset. (Offset = $P_{\text{gas}} - P_{\text{air}}$)

General

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

Standard conditions

- Pinlet 20 mbar nominal pressure, dry air of 20°C
- Pambient 1013 mbar
- Tambient 20°C
- Outlet orifice 4.3 mm
- Flow indication in $\text{m}^3_{\text{st}}/\text{h}$
- Recording of outlet pressure with a transducer connected to a 1/2" pipe with a length of 10 times the diameter of the pipe with a short hose at a length of 5 times the diameter of the pipe.
- Nominal voltage
- Sideward position, i.e. the position when the operators are 90 degrees from straight up in any direction.

Quality level of specifications

Unless otherwise specified the performance values correspond to $C_{pk} > 1.17$ (short term) and $C_{pk} > 0.7$ (long term) quality levels.

FEATURES

pX42 Gas Valve

- Inlet and outlet gas connections are straight through.
- The closing force of the valve is class: C+C.
- Low power and low noise actuators assure quiet operation.
- 24Vdc/rac and 230Vrac powered versions are available.
- Gas air servo pressure regulator provides stable outlet pressure in 1:1 gas air control systems.
- Air pressure connection M5 threaded.
- All adjustments are accessible from the top.
- 9 mm diameter pressure taps on top face for checking pressures.
- Three pressure taps, for inlet pressure, outlet pressure at zero test point and outlet pressure downstream of the optional throttle.
- An internal fine mesh screen is incorporated at the inlet of the gas control.
- Two mounting holes for self tapping screws are at the inlet of the gas control for rigid attachment to the appliance.
- Mounting orientation may be within 90° in any direction from the electric on/off operator upright position.

Functional option

Throttle valve versions are available

Gas connection options

Main gas inlet external thread: 3/4" (ISO-R228)

Main gas outlet external thread: 3/4" (ISO-R228) Alternatively the outlet connection can be quick- connect. For example to connect a Resideo mini venturi or PremiXengine venturi.

Fittings for 4 or 6 mm silicon tube can be mounted in the M5 thread in the regulator to feed the air signal to the gas air regulator.

Electrical connection options

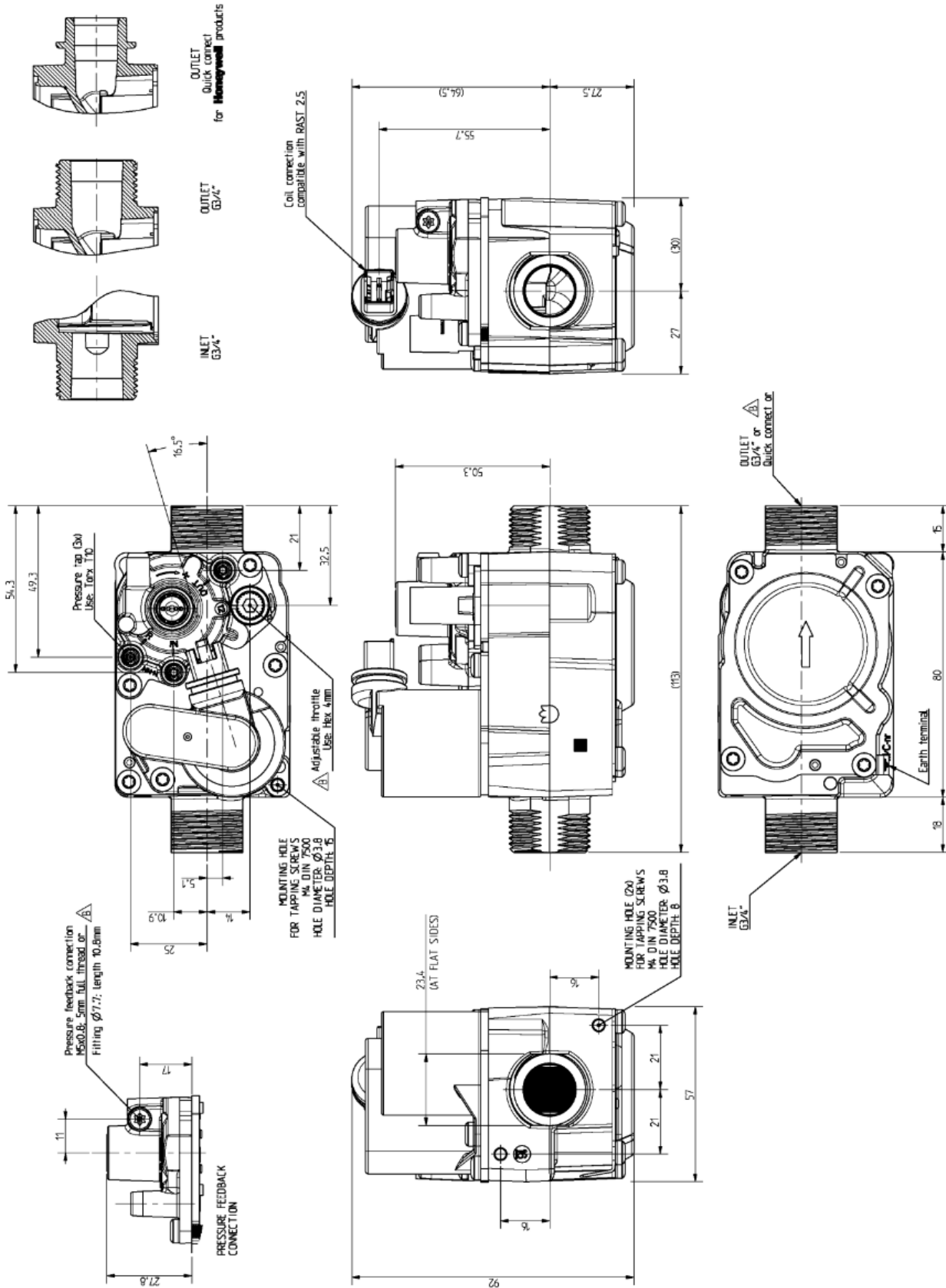
The coil is equipped with a keyed rast 2.5 connector. The rast 2.5 specification can be found at:

<http://www.zvei.org/index.php?id=613>

An optional protective rubber sleeve can be applied on the coil to prevent water and dirt access to the coil terminals.

DIMENSIONAL DRAWING

Dimensional drawing VK42.5VE/VK82.5VE (Throttle)



Tolerances according to installation drawing 50.050.562

Fig. 2 dimensional drawing

TECHNICAL

APPLICATION

The VK42.. / VK82.. series gas control have been specially developed for application in domestic appliances.

The VK42.. series gas control can be used in a system in conjunction with any ignition controller according EN298 with a 230 Vrac output.

The VK82.. series gas control can be used in a system in conjunction with any ignition controller according EN298 with a 24 Vdc or Vrac output.

The ignition controller must be of a construction that does not supply any residual voltage to the coil when it is switched off.

SPECIFICATIONS

Models

See model number chart figure 10 on page 16.

Main gas connection

Table 1. Gas connection options.

Inlet	Outlet	Body length
G 3/4"	G 3/4"	113 mm
G 3/4"	Quick Connect	113 mm

Connections with G 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

Connections with Quick connect are suitable for Resideo quick connection with o-ring seal and clip.

Ambient temperature

-15 ... 70 °C over life of the valve a maximum of 2500 hrs. may be exposed to 70°C max. For the remainder of the life the temperature may be 60°C max.

Humidity

95% RH max. at 40°C

Storage

-30 ... 70°C

Air signal connection

The gas air servo pressure regulator has an M5 thread connection for the air signal feedback.

Feedback fittings for 4 or 6 mm silicon tube can be mounted as an option.

To prevent water entering when the air connection is in upward position a protective cap can be mounted as an option.

Pressure taps

Three pressure taps are located at the top side of the control:

"IN" test point for inlet pressure

"R" test point for outlet pressure at regulated (zero) pressure

"OUT" test point for outlet pressure downstream of the optional throttle.

Dimensions

See page 4, fig 2 dimensional drawing and installation drawing 50.050.562

Offset range for gas air regulator

±30 Pa with coils in sideward position.

46 Pa to -14 Pa with coils on top.

Minimum regulation capacity

0.2 m³/h air

Minimum differential pressure

4 mbar.

Maximum operating pressure

60 mbar.

Maximum air pressure

8 mbar without outlet gas pressure (before ignition);

20 mbar with outlet gas pressure (after ignition)

Mounting holes

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

