

VR46.5V(A/B)/VR86.5V(A/B) SERIES

COMPACT COMBINATION GAS CONTROLS WITH INTEGRATED 1:1 GAS/AIR REGULATOR FOR AUTOMATIC IGNITION SYSTEMS

INSTRUCTION SHEET



SPECIFICATIONS

Models

VR46.5 /VR86.5 series:
two automatic shut off valves for direct spark ignition (DSI) or hot surface ignition (HSI) applications.
VR46.5 series line voltage
VR86.5 series low voltage

Suffix letter

V: fast opening, with integrated 1 : 1 gas/air regulation, medium capacity.
VA: fast opening, with integrated 1 : 1 gas/air regulation, low capacity
VB: fast opening, with integrated 1 : 1 gas/air regulation, high capacity

Dimensions

See fig. 1.

Ambient temperature

0 ... 60°C (except some VA types)

Pressure regulation function

Class C according to EN 88

Pipe size

Pipe connections are designed to meet the bending stress of group 2 according to EN 161.

Standard:

Inlet and outlet: $\frac{1}{2}$ " ISO 7-1 internal parallel pipe thread.
Inlet and outlet can also be made with straight or elbow flanges.
VB version: inlet and outlet ϕ 23 mm

Air pressure connection

Servo pressure regulator has an M5 threaded hole to make connection between regulator and appliance.

Maximum air pressure

8 mbar without outlet gas pressure (before ignition)
20 mbar with outlet gas pressure present (after ignition)

APPLICATION

VR46.5V(A)/VR86.5V(A) compact combination gas controls are used in a system context in conjunction with fan control, a direct spark ignition (DSI) control module and associated devices to provide programmed safe light-up and supervision of the main burner of an appliance.

VR46.5V(A)/VR86.5V(A) compact combination gas controls are intended to be used for natural gas.

VR46.5V(A)/VR86.5V(A) compact combination gas controls are approved in accordance with existing european standards.

DESCRIPTION

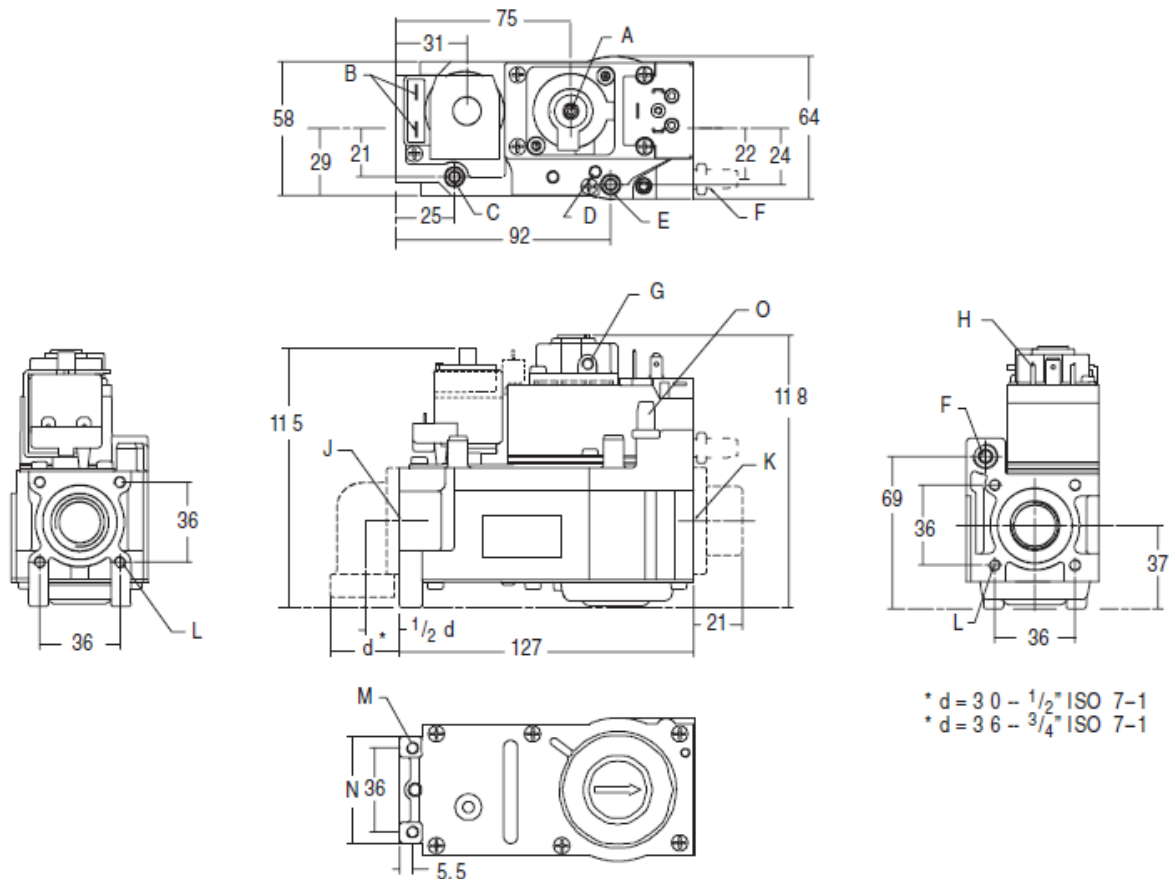
VR46.5V(A)/VR86.5V(A) compact combination gas controls perform all the functions required to safely regulate gas flow to the main burner of domestic central heating equipment, warm air furnaces, back boilers and water heaters.

VR46.5V(A)/VR86.5V. compact combination gas controls consist of a first direct electric ON/OFF operator for opening the safety valve of class A or B according to EN 161 and a second electric ON/OFF servo operator valve for opening the main valve of class C or J according to EN 161.

Minimum regulation capacity across the main burner injector at

$\Delta p=0.5$ mbar

Model	Maximum operating pressure (mbar)	Minimum regulation capacity (m ³ air/h)
VR46.5VA / VR86.5VA	60	0.5
VR46.5V / VR86.5V	60	1.5
VR46.5VB / VR86.5VB	60	1.5



- A - Cap screw/offset adjustment screw
- B - 6.3 AMP terminals
- C - Inlet pressure tap
- D - Throttle adjustment screw
- E - Outlet pressure tap
- F - Gas pressure tap upstream of throttle (throttle versions only)
- G - M5 air pressure connection

- H - Terminals according to DIN 43650
- J - Inlet
- K - Outlet
- L - M5 mounting holes for mounting the flange
- M - M5 mounting holes for mounting the valve
- N - Surface to be clamped
- O - Outlet pressure tap (VR8615V 1006 only)

Fig. 1. Adjustment points and dimensions

Minimum operating gas pressure

15 mbar

Offset range

- 0.4 mbar ... + 0.2 mbar
combination gas control in 90° from upright position (first coil horizontal)
- 0.25 mbar ... + 0.2 mbar
combination gas control in upright position (first coil vertical)

Maximum operating gas pressure

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



WARNING

High inlet pressures as used for gas G30 or G31, can cause oscillation. This is dependent on type of appliance.

The oscillation shall not exceed 10 % of the outlet pressure, measured at maximum inlet pressure according to EN 483.

The oscillation has to be verified for the complete modulation band of the appliance.

Please contact your Resideo representative if the maximum of 10 % is exceeded.

Oscillation outlet pressure to be recorded with oscilloscope etc. via transducer without damping.

Capacity

In m³/h air; measured with throttle open, 1013 mbar and 15°C. Curves are available on request.

Model	Δp (mbar)	Capacity
VR4615VA/VR8615VA ¹⁾	10	4.2
VR4645VA/VR8645VA ²⁾	10	4.2
VR4615V/VR8615V	10	7.5
VR4645V/VR8645V ³⁾	10	7.5
VR4615VB/VR8645VB	10	8.1

Electrical data

Model	Nominal voltage	Power consumption at nominal voltage (W)		Current at nominal voltage (mA)	
		1 st operator	2 nd operator	1 st operator	2 nd operator
VR8615VA	24 V, 50 Hz	3.5	3.8	280	211
VR8615VA	24 V, 60 Hz	4.9	4.7	400	266
VR4615VA	230 V, 50 Hz	4.8	4	42	23
VR4615VA	220 V, 60 Hz	4.9	3.5	45	21
VR4615VA	115V, 60 Hz	8.3	5	113	60
VR8645VA	24 V, 50 Hz	4.8	3.8	420	211
VR8615V	24 V, 50 Hz	7	3.8	450	211
VR8615V	24 V, 60 Hz	8.3	4.7	550	266
VR4615V	230 V, 50 Hz	8.35	4	60	23
VR4615V	220 V, 60 Hz	8.3	3.5	57	21
VR8645V	24 V, 50 Hz	9.1	3.8	700	211
VR8615VB	24 V, 50Hz	9.1	3.8	700	211
VR4615VB	220 V, 50Hz	8.35	4	60	23
VR4615VB	115 V, 60Hz	8.3	5	113	60

Timing

Closing time: ≤1 s

Opening time: ≤1 s from start of flow till outlet pressure is 1 mbar.

Enclosure

IP 40: when used with covers or plugs

IP 44: when used with DIN plugs according to DIN 43650

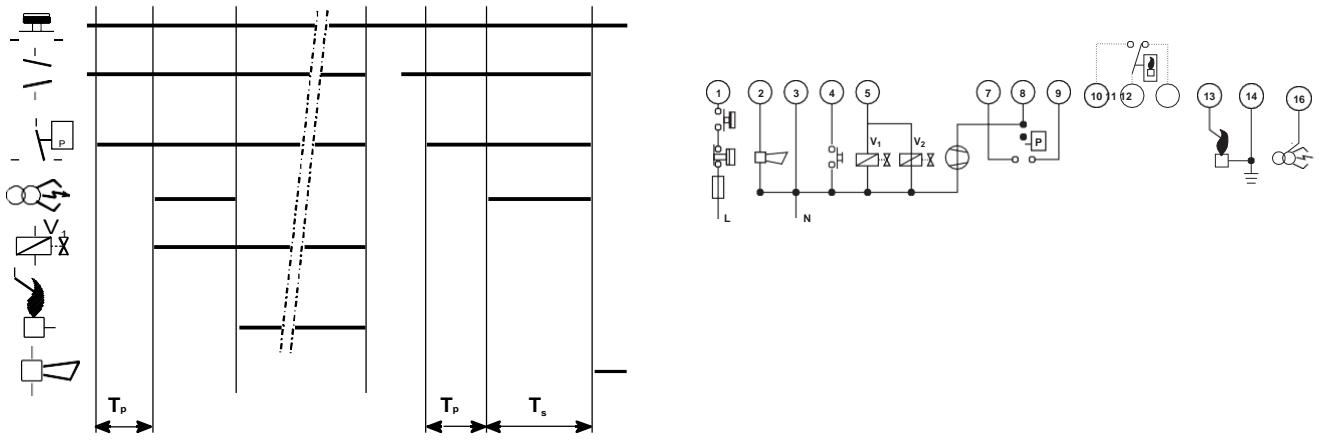
Valve classification

Type	Class	
	1 st valve	2 nd valve
VR4615 VR8615	Class B	Class C
VR4645 VR8645	Class A	Class C

Mounting holes

Two M5 mounting holes are located on the bottom of the combination gas control.

The four holes at inlet and outlet side for mounting the flange to the combination gas control are provided with M5 thread with min. 6.5 mm full thread.



Thermostat	Gas valve	Ignition	Flame rod	Fan	Limiter	Reset switch	Flame indication relay	Alarm	Airproving switch

Fig. 2. Functional diagram and wiring of S4560

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.
 If M5 air pressure connection is not to be used, it is recommended to push a dust cap into the hole.

Mounting position

The combination gas control can be mounted 0 to 90° in any direction from the upright position, i.e. from the position when electric operators are on top.

Main gas connection

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

Pipe size	Max. length of pipe thread
1/2"	18.6 mm

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

Electrical connection

⚠ CAUTION

Switch off power supply before making electrical connections. Take care that wiring is in accordance with applicable codes and local regulations. To ensure a safe closing of the valve, it is essential that the voltage is reduced to 0 Volt.
Ensure that cut-off function of limit control de-energizes both valves.

Use lead wire which can withstand 105°C ambient.

The electric on/off operator is provided with:

6.3 mm quick connect terminals suitable for 6.3 mm receptacles (e.g. "Series 250" AMP fasteners) and special plugs.

The electric servo on/off operator/regulator is provided with:

quick connect terminals suitable for a female connector according to DIN 43650 and special plugs.

Wiring combination gas controls in direct spark ignition (DSI) systems

The appliance manufacturer's instructions should always be followed when provided. If not available see fig. 4. for typical systems using Resideo S4560 ignition control.

Tightness test after installation

- Paint all pipe connections and gaskets with a strong soap and water solution. **Do not use an aggressive soap.**
- 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 gasket.
- Be careful not to clog bleed vent parts with soap solution residue. Remember bleed vents will discharge air during gas valve opening or closing giving false indication of leakage.

ADJUSTMENTS



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 such instructions are not provided then use the procedure outlined below.

Adjustment can only be made with a special tool.

Pressure tap

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

The combination gas control with throttle valve have an extra pressure tap to measure the gas pressure upstream of the throttle valve.

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

Ensure that screw is retightened after making test.



CAUTION

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

To prevent gas leakage mount the gas pressure tap upstream the throttle (see fig. 3. "F") before gas is connected to the combination gas control.

Offset adjustment servo regulated versions (see fig. 3.)

- Remove cap screw with a screw driver to expose offset adjustment screw.
- Check gas supply pressure to the appliance using a pressure gauge connected to the inlet pressure tap.
- Start fan and check air flow.
- Energize both electric operators in order to have gas input to burner and ignite boiler.
- Adjust CO₂ % at the desired value at low output with offset adjustment screw. Turn offset adjustment screw clockwise to increase CO₂ %.
- Operate boiler on high output. (Only modulating applications).
- Replace cap screw and tighten pressure taps.

Offset adjustment throttle valve versions on modulating applications (see fig. 3.)

- Remove cap screw with a screw driver to expose offset adjustment screw.
- Check gas supply pressure to the appliance using a pressure gauge connected to the inlet pressure tap.
- Start fan and check air flow.
- Energize both electric operators in order to have gas input to burner and ignite boiler.
- Operate boiler on high output.
- Adjust CO₂ % with throttle adjustment screw at the desired value. Turn screw driver **either way** to increase CO₂ %.
- Operate boiler on low output
- Adjust the CO₂ % at the desired value at low output with offset adjustment screw. Turn offset adjustment screw clockwise to increase CO₂ %.
- Replace cap screw and tighten pressure tap

CHECKOUT

Final checkout of the installation

- After any adjustment check pressure taps and gas connections with an approved leak detection fluid for gas leakage.
- After any adjustment set appliance in operation and observe several complete cycles to ensure that all burner components function correctly.

MAINTENANCE

Maintenance and service

Under normal circumstances no maintenance or service is required.



WARNING

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

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