

AEROTECH 0.991.019

USE AND INSTALLATION INSTRUCTIONS



Read the instructions before use. This control must be installed in accordance with the rules in force.

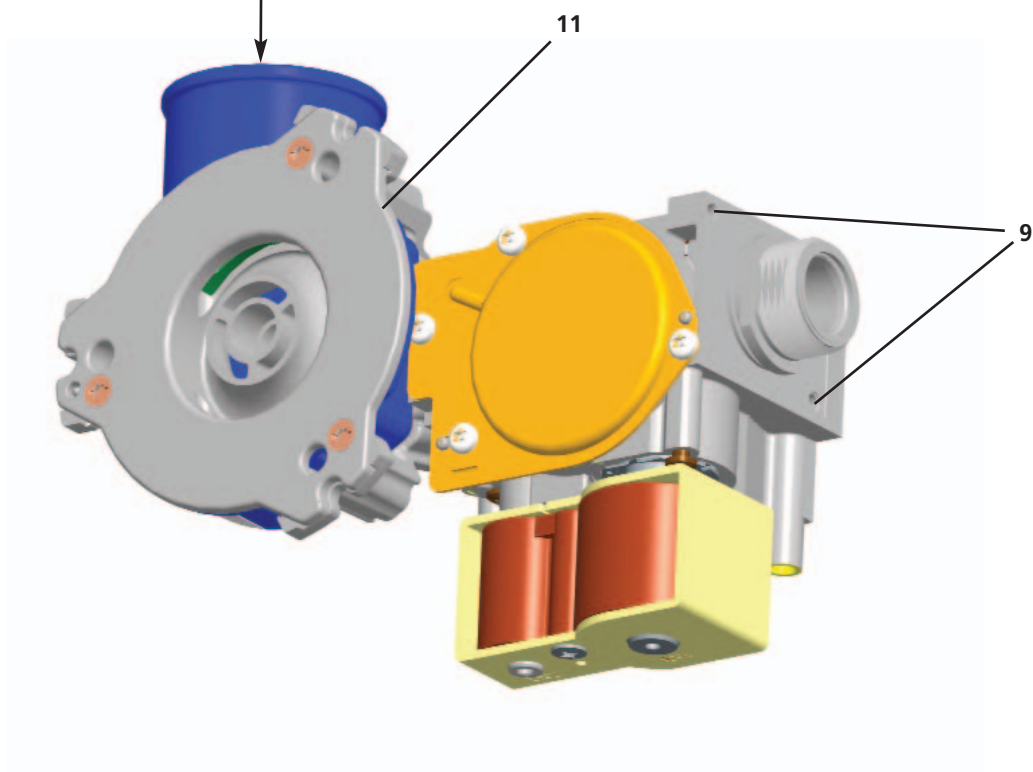
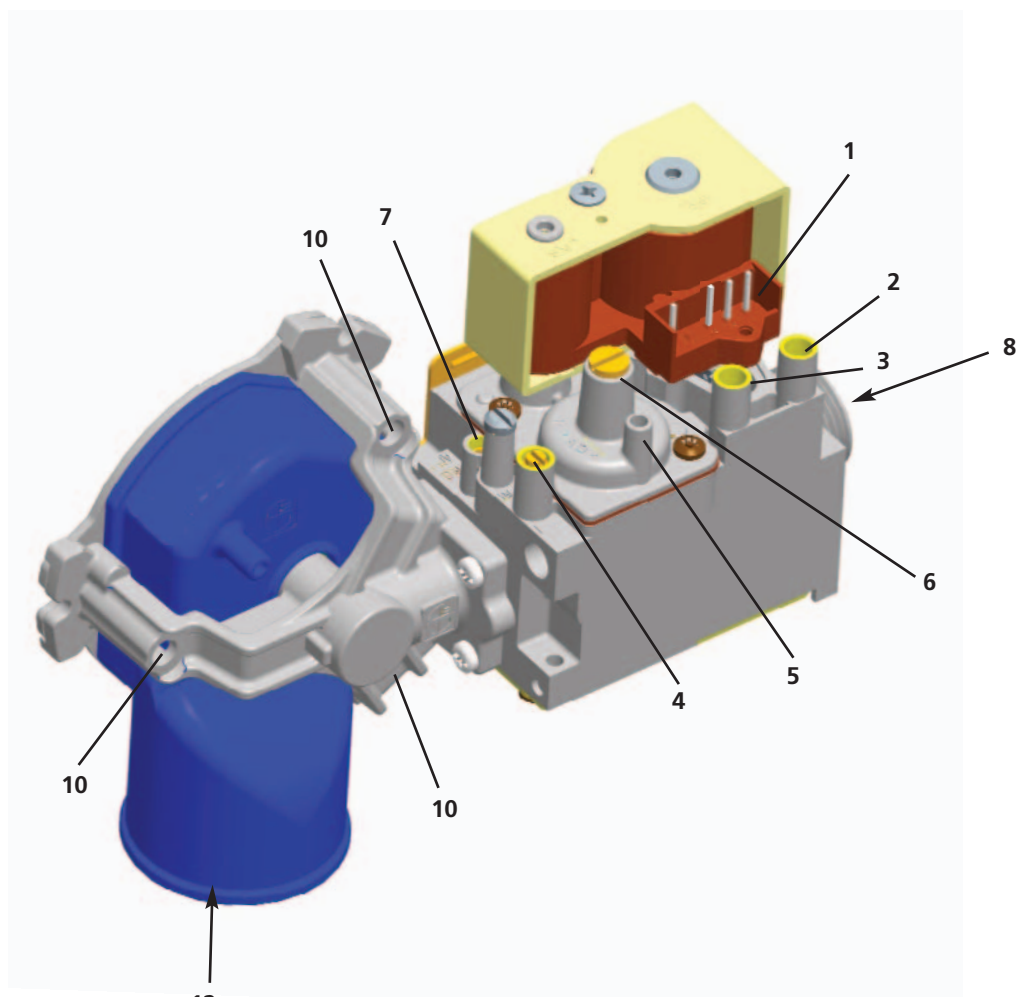


Fig. 1

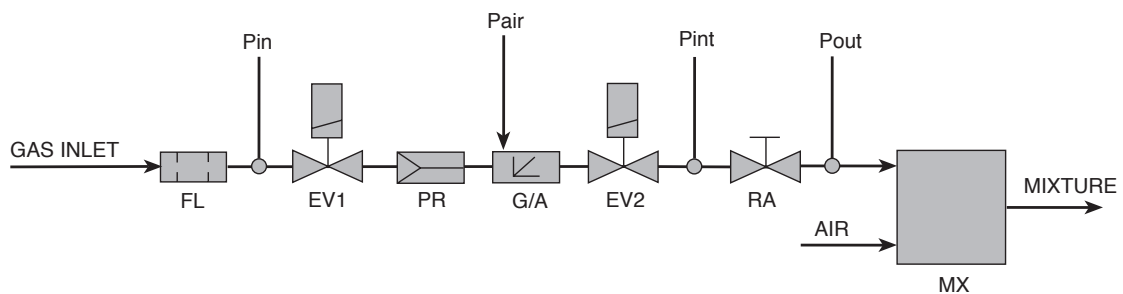
AEROTECH is an integrated system that performs the gas/air flow control and mixing.

AEROTECH consists of a multifunctional gas control with two automatic shut-off valves, a pressure regulator and a 1:1 gas-air ratio modulating control (848 SIGMA) and a mixing system.

AEROTECH is designed for use in domestic gas appliances using premix burners and automatic burner control system. It is suitable for direct burner ignition and for use with 2nd and 3rd gas families.

MAIN FEATURES

- Inlet filter (FL)
- Inlet, outlet and additional outlet pressure test points with “captive” screws (Pin, Pint and Pout)
- Two automatic shut-off valves (EV1 and EV2)
- Servo pressure regulator (PR)
- 1:1 gas/air ratio modulating control (G/A)
- Gas-air ratio adjuster (RA)
- Gas-air mixer (MX)



SYSTEM DESCRIPTION

See Fig. 1:

- | | |
|------------------------------------------------|------------------------------|
| 1 On-off solenoid valve EV1 and EV2 terminals | 7 Gas-air ratio adjuster |
| 2 Inlet pressure test point (Pin) | 8 Gas inlet |
| 3 Outlet pressure test point (Pint) | 9 Valve mounting holes |
| 4 Additional outlet pressure test point (Pout) | 10 Mounting holes to the fan |
| 5 Air signal connection port (Pair) | 11 Fan interface plate |
| 6 Zero adjustment (offset) | 12 Air inlet |

TECHNICAL DATA

The technical data specified below refers to the European standards, EN 126 " Multifunctional controls for gas-burning appliances" and EN 12067-1 "Gas/air controls for gas burner and gas-burning appliances". The pressure values refer to the atmospheric pressure.

Gas families	2 nd , 3 rd
Maximum gas inlet pressure	60 mbar
Ambient temperature range	0 to 60°C
Minimum allowed ambient temperature	-5° C for 30 minutes maximum
Maximum allowed ambient temperature peak	+75° C for 5 minutes maximum @ period of 1 hour, see Fig.2
Storage temperature range	-30 to +70 °C
Maximum Humidity	20 to 90% RH @ 40 °C
Torsion and bending resistance	Group 2
Assembly position	any position
Inlet gas connection	Male: compatible for G3/4 B ISO 228 connections or Union joint (accessory 0.982.001)
Pressure test point	Ø9 mm
Air box maximum leakage rate	5 litres/hour @ 15 mbar

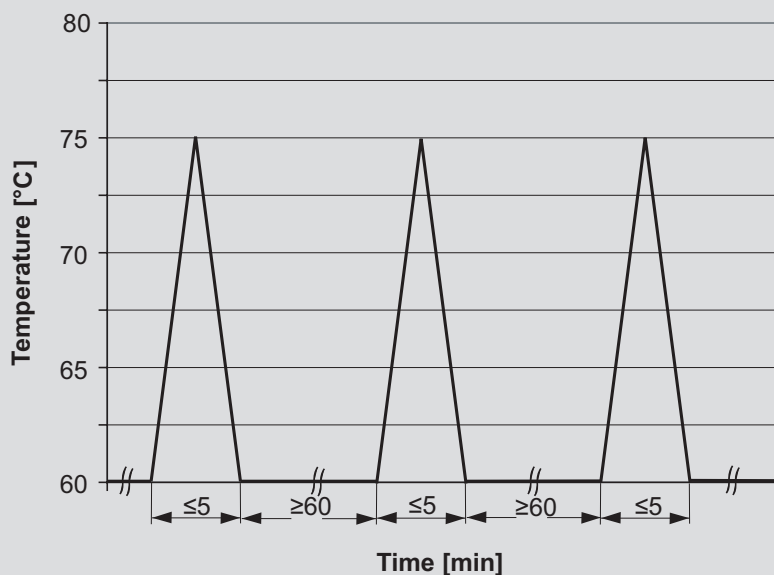


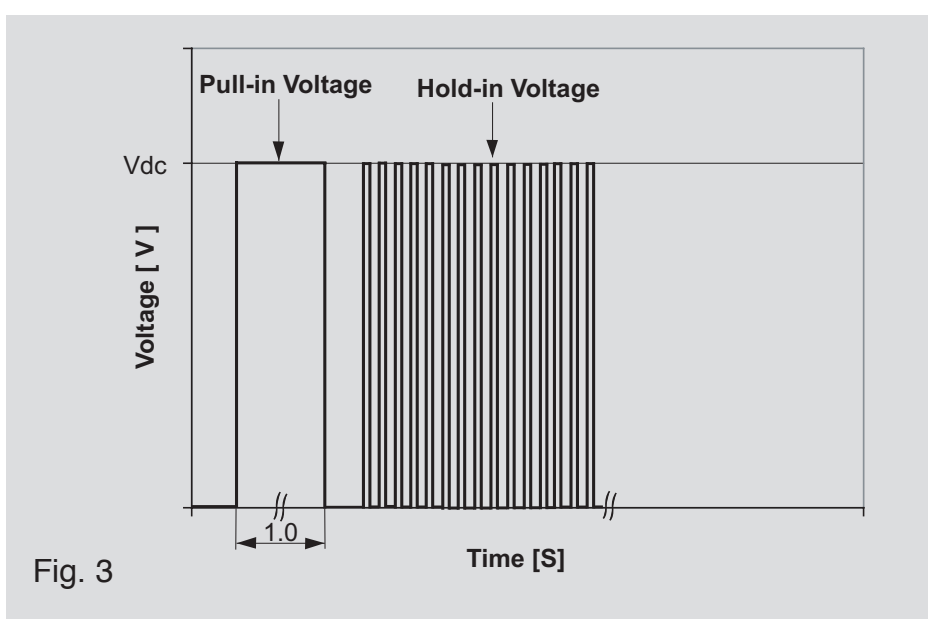
Fig. 2 - Maximum allowed ambient temperature peak

Gas flow control function

The two automatic shut-off valves are connected in series with the main gas line. The coils will be supplied in series.

Automatic shut-off valves	EV1 class B
	EV2 class C
Supply voltage	22 V dc
Current (power) @ nominal voltage and ambient temperature = 20 °C	520 mA (11.4 W)
Closing time	Less than 1 second
Electrical protection degree	IP40 with SIT connector
	IP44 with SIT connector and gasket

As alternative the automatic shut-off valves can be operated supplying the coils with pull-in and hold-in voltage, see fig. 3.



Pull-in is the voltage supplied to open the valves and is present for one second minimum.
Hold-in is the voltage supplied to hold the valves in open position after the pull-in voltage has been applied.

Pull-in voltage (Vdc range)	19.4 to 23 V
Hold-in voltage	PWM of Vdc @ 16 kHz and duty cycle of 55%

Pressure regulating function

This is obtained by means of the servo regulator type. The table below shows the maximum regulated gas flow.

Inlet pressure range [mbar]			Relative density	Gas Group	Maximum regulated flow [m ³ /h]
Nominal	Maximum	Minimum			
20	25	17	0.555	2H	7.5
25	20	30	0.612	2L	8.5

Pressure regulator	Class B
Maximum pressure difference Pint-Pair with closed shut-off valves	-12 to +12 mbar
Minimum gas flow	0.5 m ³ /h for 2 nd family gas (group H/L/E) 0.3 m ³ /h for 3 rd family gas (LPG)
Capacity @ 5 mbar pressure drop	More than 4 m ³ /h (G20)

Gas-air modulating function

The servo pressure regulator also incorporates a 1:1 gas-air ratio modulating control. 848 SIGMA keeps the pressure Pint equal to the air pressure signal Pair, increasing or decreasing according to the value adjustment with the offset screw.

Furthermore it is possible to fine adjust the CO₂ value of the appliance by mean of the Ratio Adjustment screw (see **SETTINGS AND ADJUSTMENTS**)

Offset (Pint – Pair) adjustment range	+ 0.3 to - 0.3 mbar
Maximum offset drift with ambient temperature from + 20 to + 60 °C	±3 Pa
Air signal connection port	Ø7 mm
Response time	Less than 2 seconds
Offset accuracy including transportation (*)	The offset characteristic Pint - Pair stays inside the area between the two lines, see fig.4
Maximum offset drift after 200.000 cycles (**)	±3 Pa
Minimum adjustable flow with Ratio Adjuster fully closed @ Pint - Pout = 10 mbar	0.5 m ³ /h for 2 nd family gas 0.3 m ³ /h for 3 rd family gas

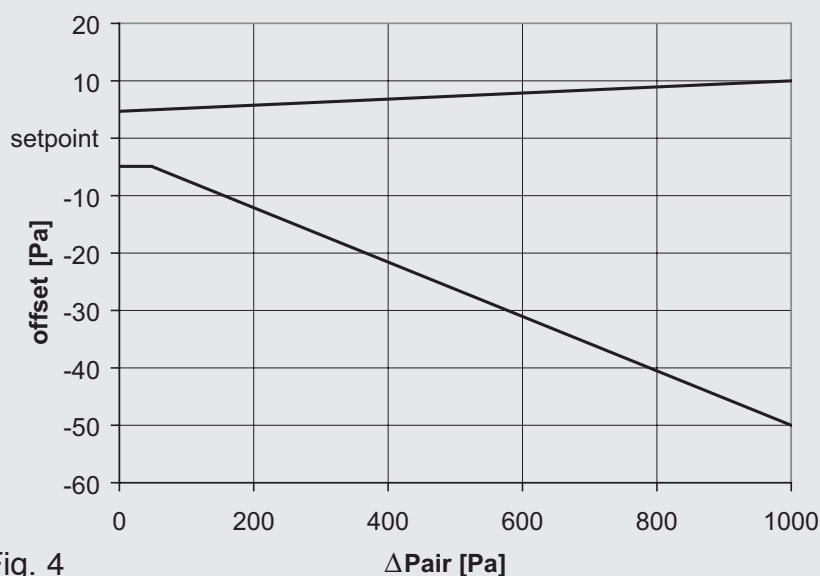


Fig. 4

(*) Test Condition (see Fig. 6).

Gas control in horizontal position.

Inlet pressure = 20 mbar, injector Ø5.7 mm

Set the offset at the setpoint with delta air pressure signal $\Delta P_{air} = (P_{air} - P_m) = 50 \text{ Pa}$

(**) Test Condition (see Fig. 6).

Inlet pressure = 20 mbar, injector Ø5.7 mm

ambient temperature varying from 0 to 60°C with cycle time of 2 hours

Cycles of $\Delta P_{air} = (P_{air} - P_m)$, EV1 and EV2 as per Fig. 5.

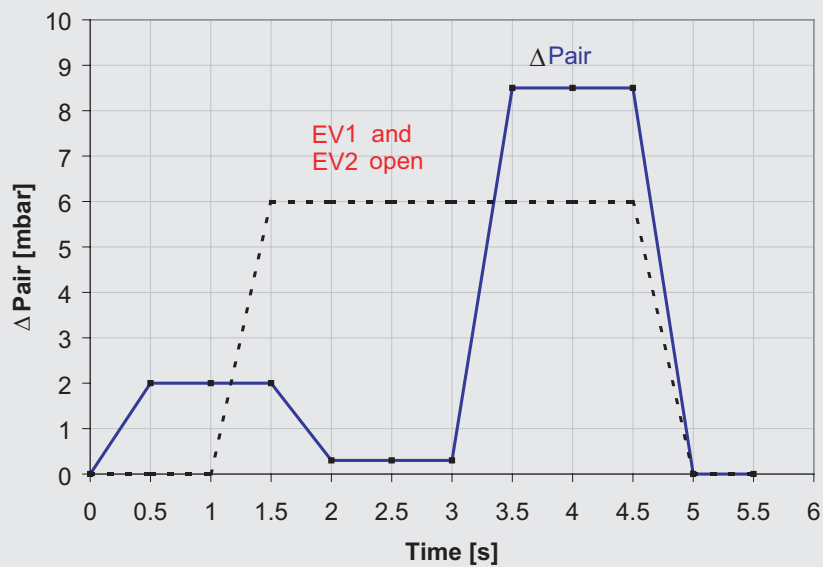


Fig. 5

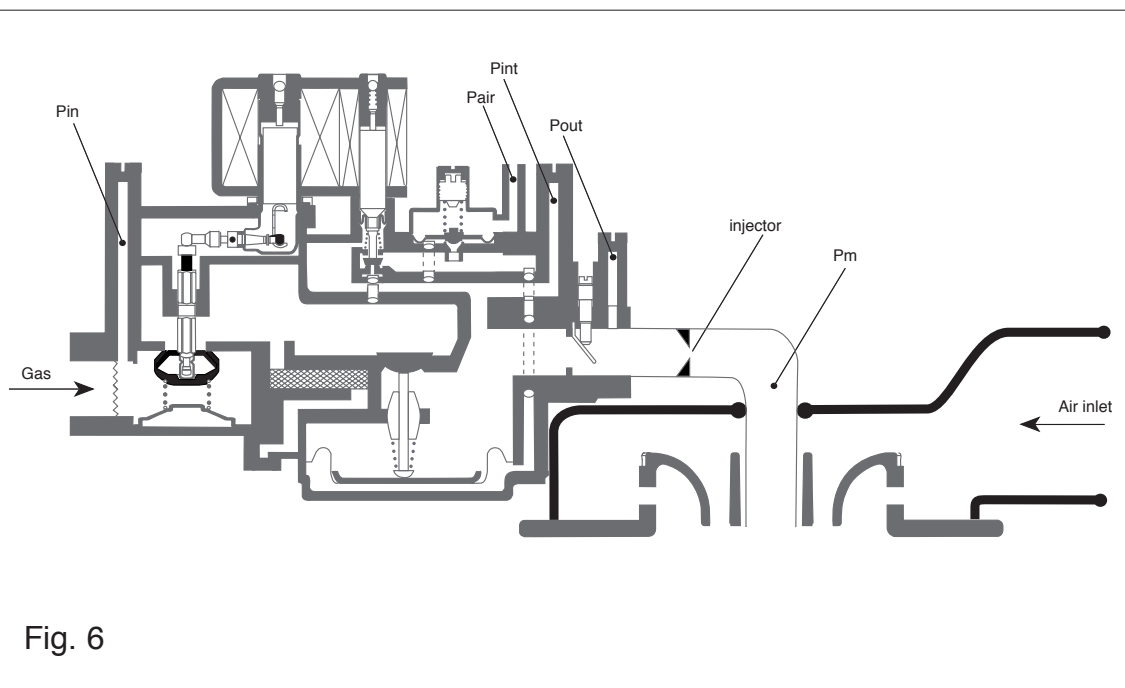


Fig. 6

IMPORTANT



Make sure that the offset drift of the valve is compatible with the CO₂ limits of the appliance, particularly at the minimum power.

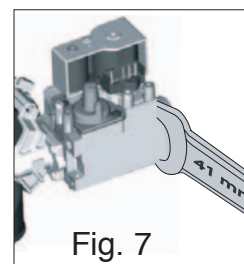
INSTALLATION

AEROTECH conforms to current safety standards. Installation in appliances must nevertheless be checked with respect to the specific installation requirements for the appliance. In particular it is necessary to check the requirements related to the number and class of the automatic shut-off valves. All the installation, setting and adjustment operations must be carried out exclusively by qualified personnel and on the basis of the specific characteristics of the user appliance and following the instructions given in this booklet. All other operations are absolutely forbidden.

The control is not suitable for outdoor operation.

General recommendations

- Do not tamper with sealed parts
- Do not slacken assembly screws
- Do not remove labels
- Avoid blows (knocks, falls etc.)
- Only remove dust caps when installing
- Do not exceed recommended torque
- Ensure that the gas flows in the direction shown by the arrow on the valve body
- Use only the specified spanner grips illustrated in Fig. 7 when making the connections
- Do not immerse in water or subject the valve to temperatures exceeding 80°C
- Turn off gas supply before starting installation



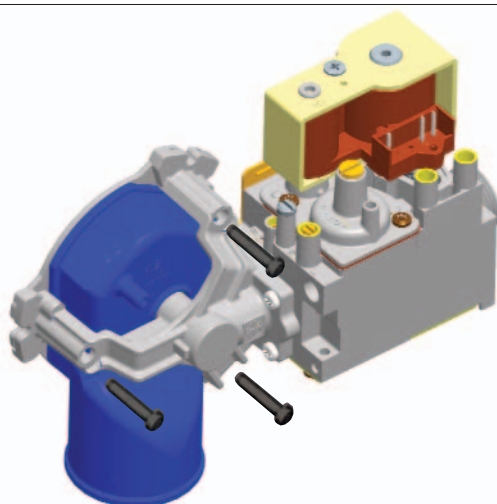
WARNING



**DO NOT SUBJECT THE VALVE TO BENDING IN EXCESS OF 35 NM
AND TORQUE IN EXCESS OF 25 NM**

Fixing Aerotech system to the fan

Use three screws M6 x 35mm, see Fig.8. Recommended torque: 3 Nm.



Inlet gas connection with gasket

Use gas pipes with a suitable flat annular surface to allow the use of a sealing gasket, see fig 9 A

The locking ring thread shall comply with ISO 228.

Ensure the gasket is suitable for the use.

Apply the proper torque to the locking ring, according to the washer characteristics, in order to ensure the seal.

Inlet gas connection with union joint

Use SIT joint 0.982.001, see Fig.9 B

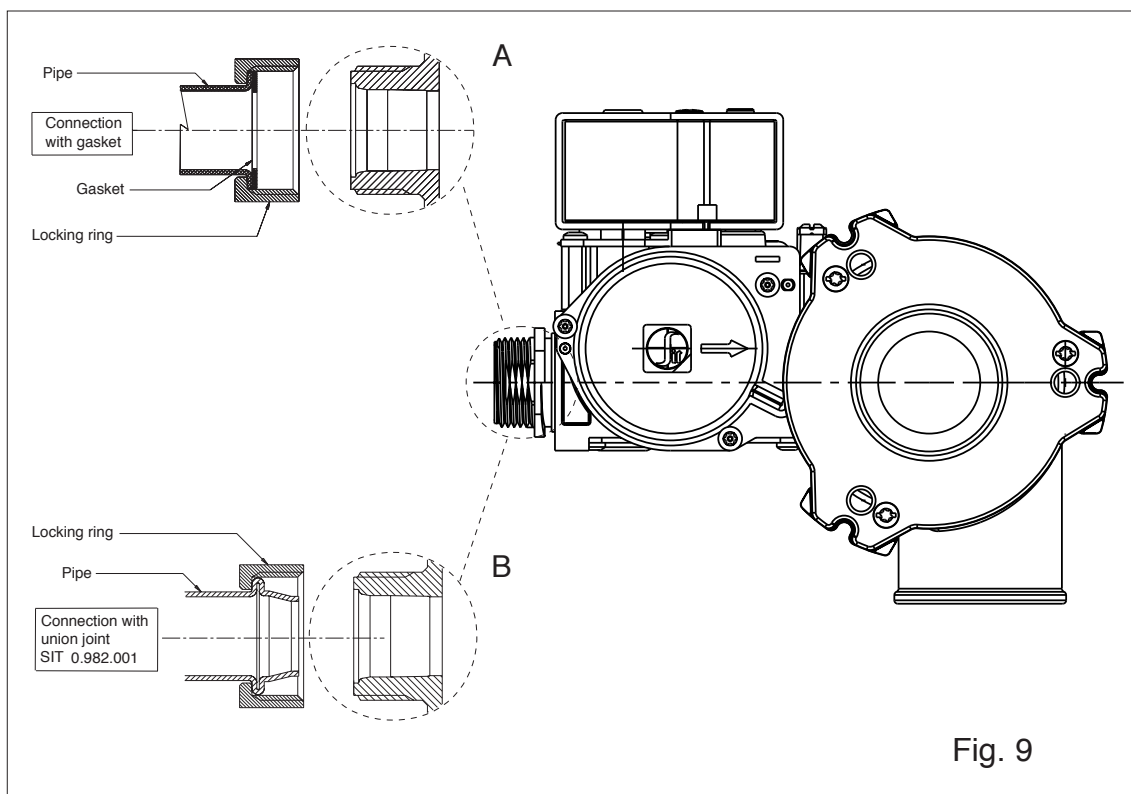
Ensure that the locking ring is properly engaged.

Recommended torque range: 40-60 Nm.

WARNING



DO NOT OVER-TIGHTEN THE LOCKING RING



Electrical connections

All electrical connections must be made in accordance with current electrical standards. Check that the voltage of the coils, given on the valve, is correct. Disconnect the power supply before starting installation.

Check that all connections are made properly.

Using an electrical connector, ensure that the fastening screws are never slack.

The automatic valves are supplied with a male contact 3003 Molex compatible, suitable for female Molex series 3001 connector.

Make the connections as specified in the technical instructions for the automatic burner control used and/or in the specific standards for the appliance.

Wiring diagram

The connection diagram is given in Fig. 10. The automatic shut-off valve EV1 and EV2 must be supplied in series connecting pins 1 and 4.

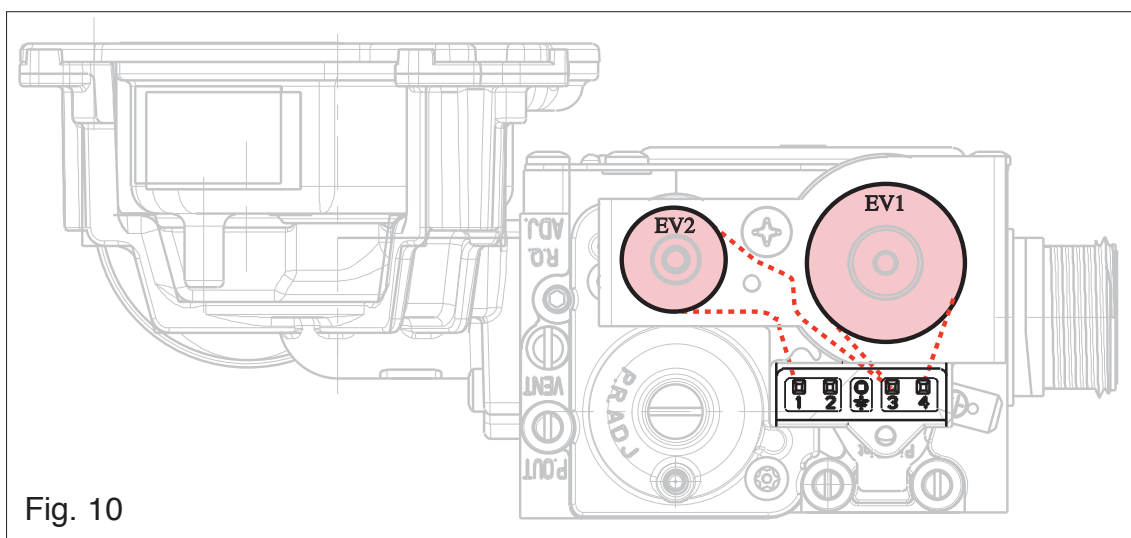


Fig. 10

SETTINGS AND ADJUSTMENTS

All adjustments must be made on the basis of the specific characteristics of the appliance. Check inlet and outlet pressure using the pressure test points provided. After setting, carefully seal test points ensuring gas soundness. Recommended torque: 1.0 Nm.

Zero (offset) and ratio adjustment

Using a 6.5 mm screwdriver for slot-head screws, remove the plug A, see Fig. 11. Connect a manometer as shown in Fig. 12.

Bring the appliance power to the minimum required value and using a 4 mm Allen wrench, move on to calibration of screw B in order to bring to the required value the difference in pressure $P_{int} - P_{air}$ (offset). Screw in to increase the offset.

After setting disconnect the manometer.

Move the appliance to get the maximum required power and, using a 2.5 mm Allen Wrench, move on to calibration of screw R in order to bring CO_2 to the required value. Reduce the appliance power to to the minimum required value and check for the correct CO_2 value and in case calibrate using the screw B. After setting put back the protective plug A. Recommended torque 1.0 Nm.

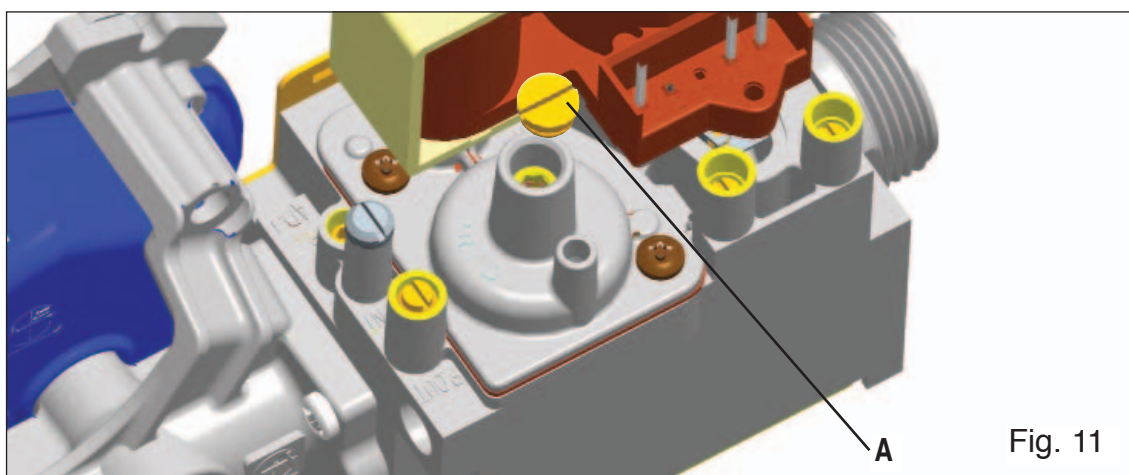


Fig. 11

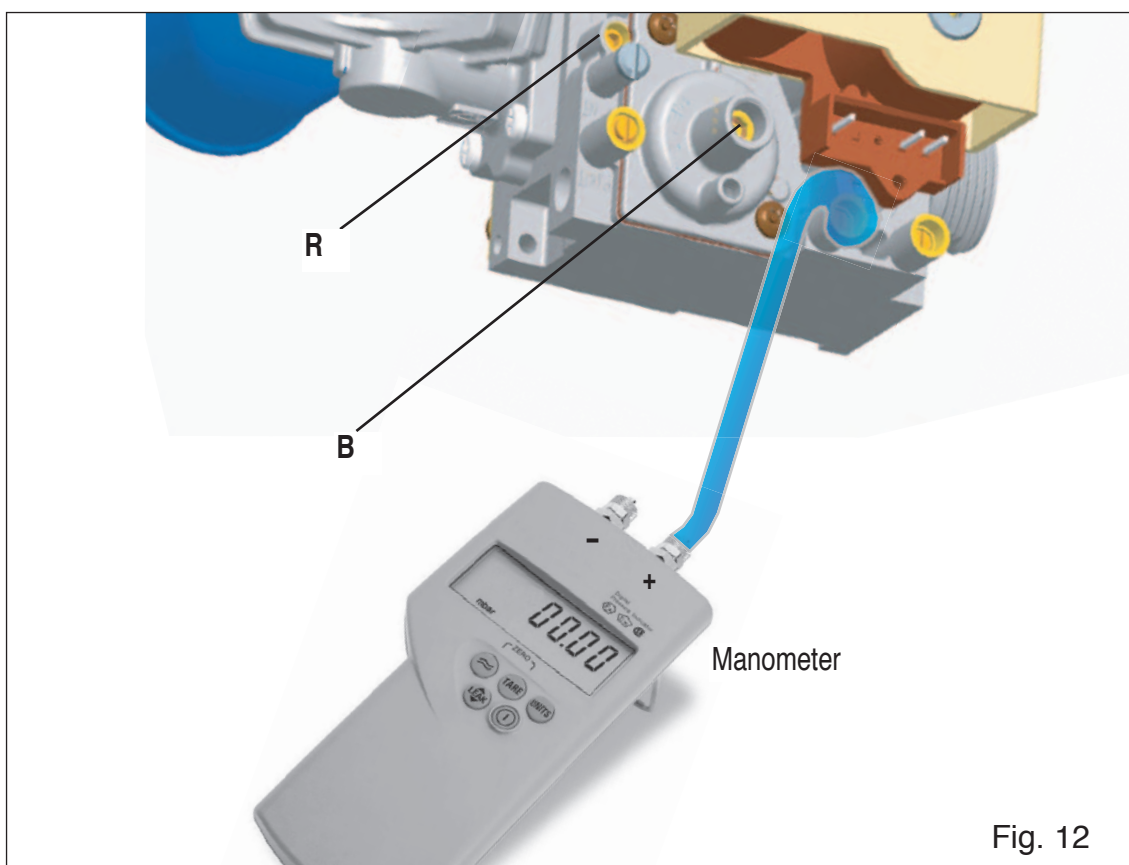


Fig. 12

Gas family change

Check that the appliance is suitable for operation with the gas family in question.

With reference to Fig. 13, remove the four screws (13) using a 5 mm screwdriver for slot-head screws or a Torx T20 screwdriver. Separate the flange (14) from the valve body (15). Using a 3 mm screwdriver for slot-head screws, remove the injector (16) making lever on the plane surface (17) of the injector. Replace the injector. Assemble the flange with the valve body, fix the four screws (13). Recommended torque: 3Nm. Perform a gas leak test.

Adjust the offset pressure and the gas air-ratio in accordance with the values given in the appliance instruction booklet only after having changed the gas injector of the appliance.

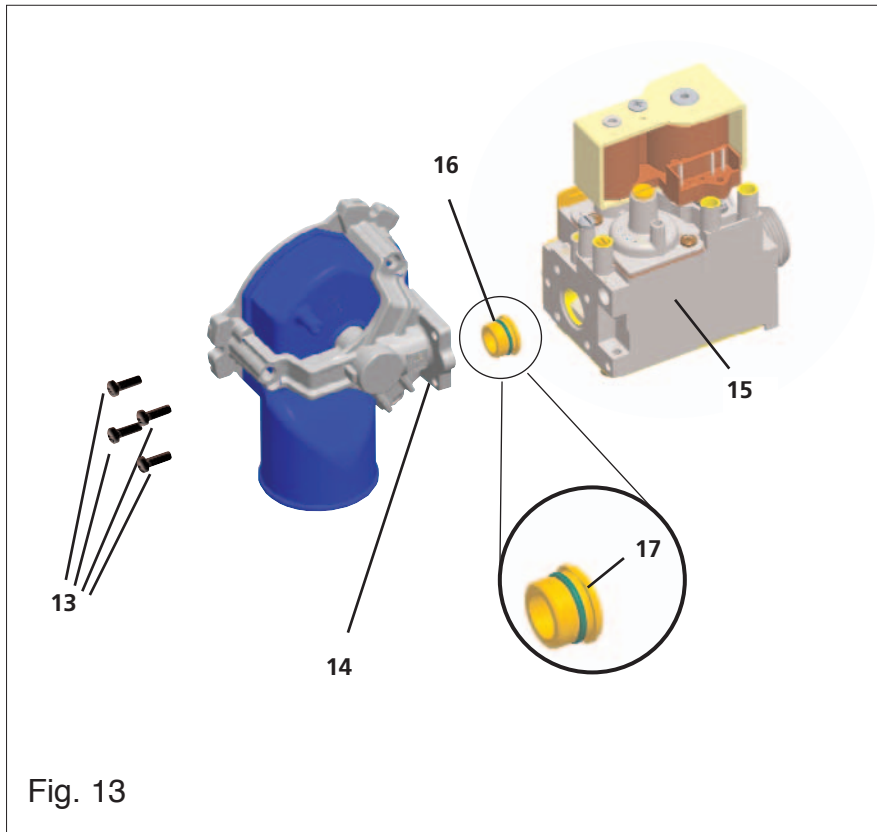


Fig. 13

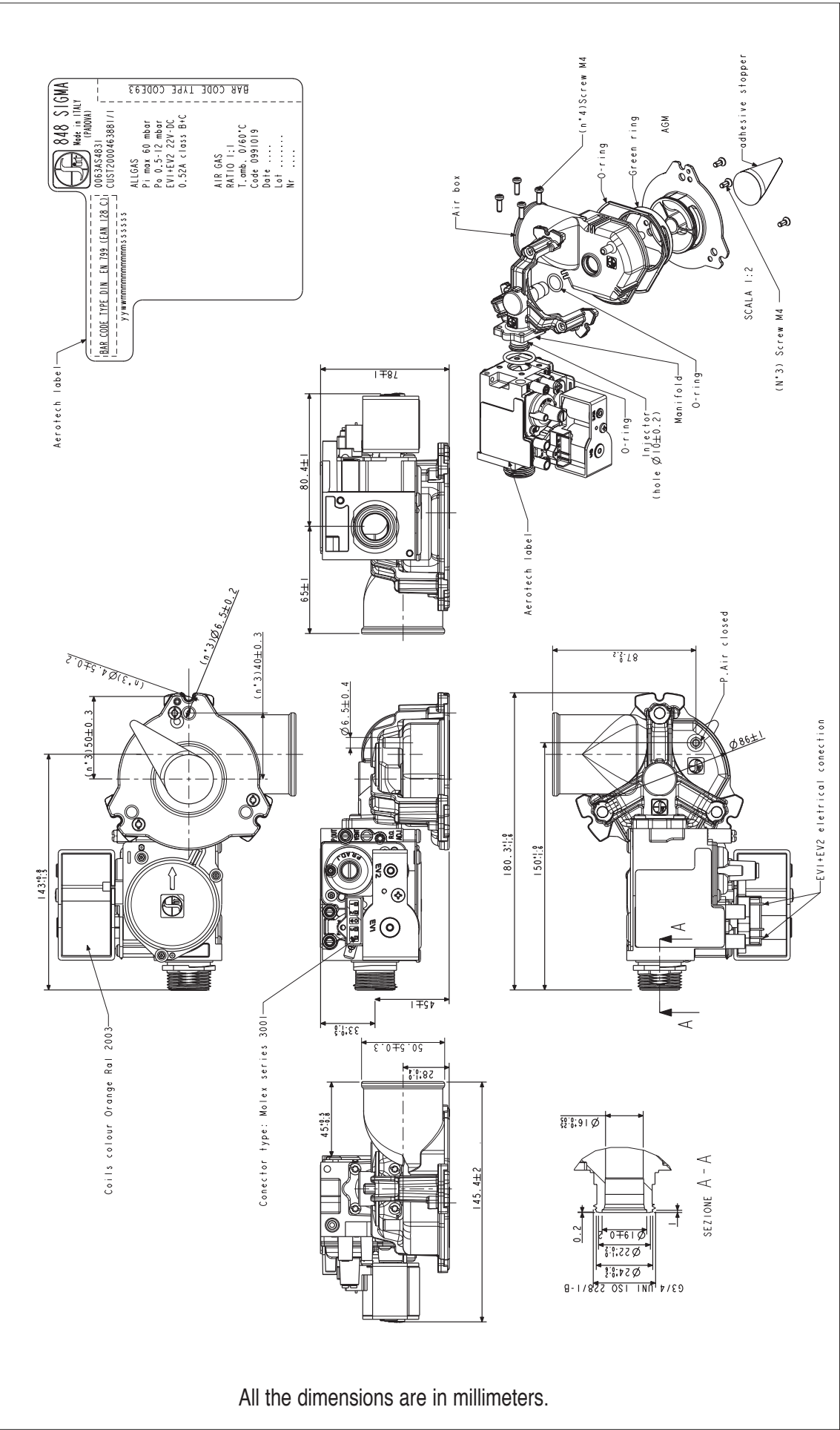
Changing gas group within the same family

Check that the appliance is suitable for operation with the gas group in question. Check in the appliance instructions if any operations are necessary when changing the gas group. Finally adjust the offset pressure and the gas-air ratio in accordance with the values given in the appliance instruction booklet, as stated previously.

IMPORTANT



At the end of all setting and adjustment operations, check electrical insulation, gas seals and the safety of the appliance. After carrying out all adjustments, fit the provided seals and/or block the setting screws with paint, taking care not to obstruct the vent orifice of the air signal connection. Finally ensure that the burner operates properly at the minimum and maximum power of the appliance.



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