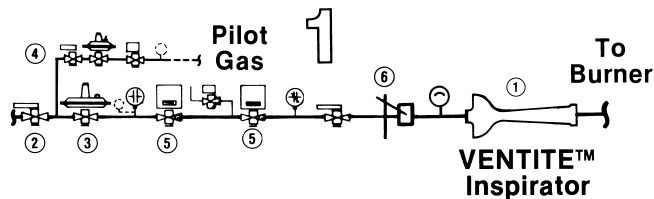


# Installation Instructions

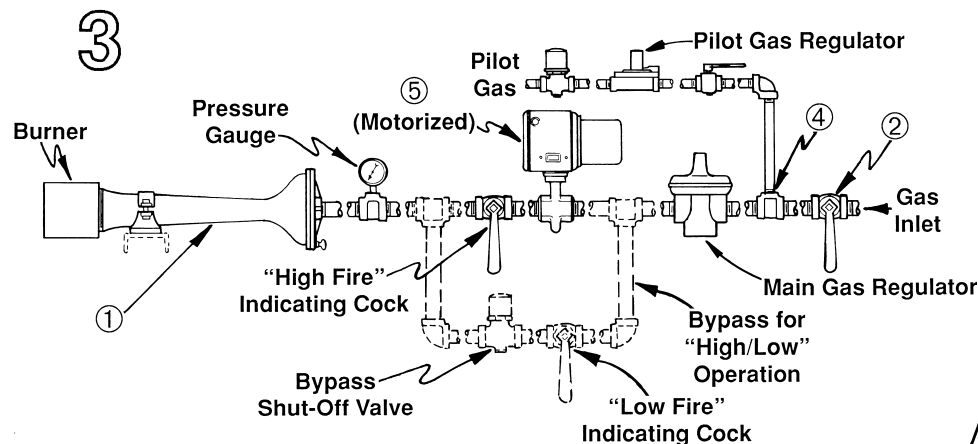
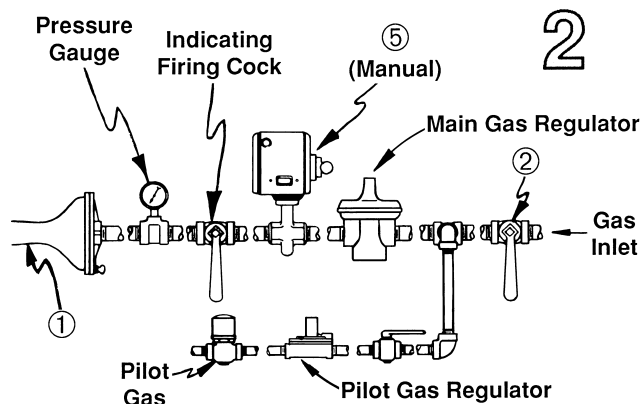
## General

VENTITE™ Inspirators are only a part of a complete combustion system.

Sketch 1 below summarizes the additional components that might typically be part of a complete modulated system. Use this sketch and the following comments as a check list prior to actual installation.



Maxon assumes no responsibility for the use or misuse of the piping layouts shown. Specific piping and wiring diagrams should always be submitted to the appropriate agencies for approval on each application.



Alternate operating modes are illustrated below: for **manual operation**, see sketch 2; for **on-off operation**, see sketch 3 (solid lines); for **high-low operation**, see sketch 3 (including dotted lines).

1. **Electrical service** must match the voltage, phase and cycle of all electrical system components.
2. **Gas supply piping** must be large enough to maintain required fuel pressures (as high as 30 PSIG depending on application) at the inspirator's inlet while burner is operating at full capacity. Anything more than minimum distance or piping turns may necessitate "oversizing" piping runs to keep pressure drops within acceptable ranges.
3. **Clean fuel lines** are essential to prevent blockage of pipe train components and inspirator burner gas ports. All dirt, scale and pipe dope should be blown out of any new gas line before actually connecting to the burner system.
4. **Main shut-off cock** ② should be upstream of both main gas regulator and pilot line take-off. Use it to shut off fuel to both pilot and main burner during shutdown periods of more than a few hours.
5. **Main gas regulator** ③ is essential to maintain a uniform system supply pressure. A separate regulator should be provided in the branch leading to each burner system if more than one is served by a common main. Size regulator for full system capacity at required pressure, including pipe train losses. Follow the instructions attached to the regulator for installation.

## Installation Instructions

6. **Pilot take-off** ④ should be upstream of main gas regulator but downstream of main gas cock. It should normally include its own pilot gas regulator, a solenoid valve and a shut-off cock. An adjustable orifice gas cock at the pilot inlet simplifies adjustment.  
Suitable pilots should be provided for the type of burner and control system being used.
7. **Fuel shut-off valve(s)** ⑤ (when properly connected to a safety control system) are designed to shut the fuel supply off when a hazardous operating condition is sensed. Manual reset valves require operator attendance each time the system is started up (or restarted after a trip-out). Motorized shut-off valves permit automatic start-restart when used with an appropriate control system.
8. **Fuel Control Valve** controls burner heat release by throttling gas flow to it. It should include provision for an adjustable minimum and throttling over a turndown range that matches burner capabilities. In manual systems, it may be an indicating cock. Maxon Control Valves are not intended for tight shut-off.
9. **Minimize pressure drop** between inspirator and burner(s). Inlet pipe leading to any burner should be a straight run of at least four pipe diameters in length. If the VENTITE™ Inspirator is supplying multiple burners or multiple inlets to a single burner element, care should be taken so that air/gas mixing piping gives minimal pressure drop and maximum uniformity.
10. **Test connections** are essential for burner adjustment. They should be provided downstream of the main regulator and at each burner inlet. Test connections must be plugged except when readings are being taken.

**Do not install any shut-off device in the air/gas mixture line.**



*Maxon practices a policy of continuous product improvement. It reserves the right to alter specifications without prior notice.*

## Start-up Instructions

Before proceeding, verify that all equipment has been installed in accordance with the general instructions found in the preceding pages.

**Initial adjustment and light-off should be undertaken only by trained and experienced personnel familiar with combustion systems, control/safety circuitry and overall installation. If Maxon instructions conflict with local codes or regulations, contact Maxon before start-up.**

### For initial system start-up:

1. **Disconnect control motor** from flow control valve (if applicable). Initial start-up should only be accomplished during a "manual" burner control mode.
2. **Purge furnace or oven.** Furnace doors, vents and flues should all be wide open and the purging allowed to continue until all possible accumulation of explosive vapors is dispersed. Twenty minutes or more may be necessary on large installations.

**CAUTION: Do not by-pass control panel timers typically controlling sequential operations.**

3. **Bleed air** out of gas line leading to main gas cock, taking care not to allow accumulation of flammable vapors.
4. **Open main and pilot gas cocks** and light pilots following instructions appropriate for the burner and pilot type. If multiple pilots are used, open individual cocks and adjust each in turn.
5. **Install manometer** to read mixture pressure at burner and to establish required minimum. With pilots burning, open fuel shut-off valve(s) and advance fuel control valve slowly from minimum setting until ignition of main flame occurs.

Refine main gas regulator setting, if necessary, and verify control valve setting which gives required minimum mixture pressure. Adjust minimum stop of control valves as needed (if applicable).

6. **Advance control valve** (or indicating firing cock) manually to high fire position (adjusting if necessary), observing burner performance.

**CAUTION: If burners go out, close shut-off valve or shut main gas cock at once. Return to minimum setting, re-light pilots if necessary, then turn main gas on again. Check carefully that every burner nozzle is lit before proceeding.**

7. **Adjust inspirator air shutter** opening (if necessary) to obtain desired flame character. Shutter will normally be wide open if spud orifice has been correctly sized.
8. **Cycle system** off and re-light several times. When burner performance is satisfactory and stable throughout the firing range, reconnect control valve linkage to control motor.

Control linkage travel must be such that control valve is moved throughout its complete travel, or cataloged capacities and turndowns will not be achieved.

If less than full-rated burner capacity is required, linkage can be adjusted to limit maximum output. **With interrupted pilot**, it may be necessary to set control for somewhat higher than minimum burner setting to permit hold-in of flame detection system without pilot.

**CAUTION: Internal drive mechanism within the control motor may be damaged if linkage is adjusted so as to cause binding.**

9. **Re-check differential gas pressure** with unit at operating temperature. Refine "high fire" setting if necessary, considering differential pressure, flame length, and appearance. Dust or contaminants in the air stream may affect flame appearance.
10. **Plug all test connections not in use to avoid dangerous fuel leakage.** Replace equipment cover caps and tighten linkage screws.
11. **Check out overall system operation** by cycling through light-off at minimum, interrupting pilot, and allowing temperature control system to cycle burner from minimum to maximum and return.

**Re-check all safety system interlocks** for proper setting and operation.

**WARNING: Test every UV installation for dangerous spark excitation from ignitors and other possible sources of direct or reflected UV radiation. Use only gas-tight scanner connections.**

12. **Before system is placed into full service, instruct operator personnel** on proper start-up, operation, and shut-down of system. Establish written instructions for their future reference.

## Start-Up Instructions

### For Low Pressure Gas Hand Torches

#### To start-up:

1. Open air valve to the desired degree.
2. With an ignition source at the hand torch nozzle, open gas valve until flame is established.
3. Adjust gas valve for the desired flame with sharp well-defined structure. A flame with long weak structure indicates a rich mixture and too much gas. A short light flame with hissing noise indicates a lean mixture with too little gas.
4. If higher or lower heat release is desired, re-adjust air valve first, then refine gas valve setting.

To shut-down, close the gas valve first, then the air valve.

**CAUTION: Always observe good judgement and common sense when operating a portable hand torch.**

## Maintenance Instructions

The Venturi tube and air shutter of the VENTITE™ Inspirator should be kept clean to assure normal operation.

Burner nozzles should be regularly inspected for possible deterioration and replaced if necessary. Generally, the higher the operating temperature, the more frequent the inspections should be.



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