Installation—general

A1. Install a gas shutoff valve upstream of regulator.

A2. Mount 7218 Regulator horizontally with diaphragm case below gas line—regulator cannot function if the diaphragm is not horizontal. Arrow on body must point in direction of gas flow.

A3. Allow sufficient clearance above floor or other piping to permit adjustment.

A4. Install regulators in clean pipe lines of adequate size, free from dirt, scale, and chips. Mount regulator close enough to mixers or burners to avoid excessive pressure drop. Install unions or flanges to permit removal for servicing.

Protect regulator from excessive heat. If ambient temperature exceeds 180 F, use Viton diaphragms.

Avoid welding near regulator when installing adjacent piping: Weld spatter may roll through pipe into a regulator and burn holes through the diaphragm.

Apply pipe compound to threaded pipe ends, not to threads on regulator body.

A5. One regulator must not supply more burners than are controlled by one air valve.

A6. For nozzle-mix systems, gas inlet pressure should be greater than air impulse pressure by at least 2 osi, or pressure drop for regulator size selected. Inlet pressure should not exceed 32 osi except in special cases.

A7. When cross-connecting regulator vent to main air line or to combustion chamber or outside, use ⅛" tubing for up to 10 ft, ⅜" or larger for longer runs.

A8. To attach cross-connection or impulse line to an air line, weld a half coupling on top or side of air pipe; then drill a hole through pipe (⅛" hole if bleeder is used, otherwise about the ID of tubing selected in step A7 above). Remove burrs from the inside.

To minimize turbulence effects, locate connection on the air line at least 5 pipe diameters downstream and 3 diameters upstream of any valve or fitting. Hole should be drilled so drill is parallel to shaft of valve.

Installation, For Nozzle-Mix Burners

B1. Install a limiting orifice valve between regulator and burner.

B2. If minimum gas inlet pressure exceeds maximum air pressure by 2 or more osi, simply cross-connect regulator vent to main air line downstream of control valve (Figure 1).

B3. If minimum gas pressure at regulator inlet is not at least 2 osi more than maximum air pressure at the burner, install a bleeder in air pressure impulse line as shown in Figure 2. Amount of bleed is set so maximum impulse pressure is 2 osi less than gas inlet pressure (see Bleeder bulletin). Use this arrangement only when combustion chamber pressure is atmospheric.

B4. If gas and air pressures are not known, make a "trial and error" setting of bleeder by lighting burner and bringing it to high fire. Then reduce impulse to regulator by using bleed until you find a bleeder setting that produces an effect on the flame. This is the correct bleeder setting for all firing rates.

Readjust limiting orifice gas valve. (If inlet gas pressure is not reasonably constant, set bleeder for lowest expected inlet pressure.)

B5. If combustion chamber pressure is not atmospheric and if gas pressure is less than air pressure, use a 3-pipe bleeder as shown in Figure 3. This arrangement allows fluctuations in combustion chamber pressure to be neutralized by applying them to both sides of regulator controlling diaphragm.

To check regulator operation, use ¼" pipe taps provided on body for inlet and outlet pressure readings.
Installation, For Premix Burners

For an open type premix burner, regulator vent can be left open or piped outdoors. For a sealed-in premix burner, vent should be cross-connected to combustion chamber to correct regulator action for difference between furnace and atmospheric pressure. When one regulator is used for each burner, connect vent through burner mounting plate (Figure 4) or to combustion chamber.

Lightup and Adjustment

D1. **Light the burner.** Start blower per instructions. All gas lines to 7218 Regulators must be purged. Light pilot per instructions. Open gas shutoff valve.

If burner does not light in a few seconds, close nearest upstream gas shutoff valve to prevent accumulation of unburned gas. Purge chamber for a few minutes; then open limiting orifice gas valve a few more turns and reopen gas shutoff valve.

Repeat this procedure until main flame lights.

D2. **Adjust high fire air/gas ratio.** Slowly turn air valve to high fire position while adjusting limiting orifice gas valve as needed to maintain desired air/gas ratio. Replace limiting orifice valve cover.

D3. **Adjust low fire air/gas ratio** only after step D2 is completed. Turn air valve to low fire position. Remove gas diaphragm cover plug on the bottom of the regulator. Use a screwdriver to turn spring adjusting plug (clockwise for more gas, counterclockwise for less gas) to obtain desired low fire air/gas ratio. Replace gas diaphragm cover plug.

D4. **On-Off Control.** Set regulator to closed position by following the procedure in step D3, turning spring adjusting plug counter-clockwise until spring compression is relaxed. The 7218 Regulator is not intended to be used for on-off control. To obtain enhanced shutoff capabilities, a 7216 Regulator is recommended. The 7216 uses an extension spring to achieve good on-off control with zero impulse pressure. The 7216, however, is not intended to be a tight shutoff device. For extended periods at no flow conditions, an approved shutoff valve should be used to prevent fuel leakage into furnace.

D5. **Dual-Fuel™ Burners.** A Dual-Fuel burner operated on gas with atomizing air left on may require gas to match the atomizing air, plus a varying amount to match main air at any firing rate.

To adjust regulator for this situation, first operate on main air only and follow instructions for nozzle-mix burners. Turn off main air (flame may go out), and turn on atomizing air. Remove gas diaphragm cover plug and turn spring adjusting plug clockwise until pilot relights burner and desired air/gas ratio is reached. Replace cover plug.

Then adjust the regulator atomizing air plus main air at any firing rate. (If burner cannot be lighted on atomizing air only, adjust spring adjusting plug with main air at low fire setting.)

Trouble-Shooting, Failure to Close

Individual steps to determine problem:

- **Make sure regulator has been adjusted to closed position at zero impulse (Step D4).**
- **Remove air impulse connection to make sure there is no impulse during off period.**
- **Attach manometer to 1/8” outlet test tap to test for possible suction from furnace draft.** To correct for this, cross-connect regulator vent to combustion chamber per Figure 3 or 4.
- **Shut off gas supply. Remove body plug. Apply air impulse (about 16 osi) to the vent to raise regulator valve off seat. Wipe seat surfaces with cloth to remove pipe scale, dirt, pipe thread chips, or other foreign matter. Turn off air impulse and re-install body plug.**
- **Shut off gas supply. Remove body plug and 1/4” inlet test tap plug.** While pressing gently downward on regulator valve to hold it closed, blow through a rubber tube attached to inlet test tap. If backpressure does not build up, balancing diaphragm is ruptured and must be replaced.

Trouble-Shooting, Regulator Not Responsive

Make sure thread protection cap was removed from vent.

If impulse line is used, make sure it is not clogged, undersized, or inoperative due to bad installation. Disconnect impulse line from regulator vent and connect it to a gauge to observe impulse magnitude and changes; or use a tee in impulse line (per Figure 1), with gauge attached to third port.

If premixer is used, test suction by shutting off gas supply and reading manometer attached to outlet test tap while air flows through mixer.

If suction or impulse is satisfactory but regulator still is not responsive, shut off gas supply; remove outlet test plug, connect rubber tube to regulator vent and blow through tube. If pressure does not build up in the tube, gas diaphragm is ruptured and must be replaced.

Please refer to Fives North American Company’s *Practical Pointers* booklet for further details.

**WARNING:** Situations dangerous to personnel and property may exist with the operation and maintenance of any combustion equipment. The presence of fuels, oxidants, hot and cold combustion products, hot surfaces, electrical power in control and ignition circuits, etc., are inherent with any combustion application. Parts of this product may exceed 160°F in operation and present a contact hazard. Fives North American Combustion, Inc. urges compliance with National Safety Standards and insurance Underwriters recommendations, and care in operation.