INSTRUCTIONS for

OXWELD®

R-601, R-602, R-603 & R-603B
LARGE CAPACITY
STATION REGULATORS

CAUTION

These INSTRUCTIONS are for experienced operators. If you are not fully familiar with the principles of operation and safe practices for oxy-fuel gas equipment, we urge you to read our booklet, “Precautions and Safe Practices for Gas Welding, Cutting, and Heating”, Form 2035. Do NOT permit untrained persons to install, operate, or maintain this equipment. Do NOT attempt to install or operate this equipment until you have read and fully understand these instructions. If you do not fully understand these instructions, contact your supplier for further information.

The regulators covered by these instructions are listed by Underwriter's Laboratories only when using parts manufactured by ESAB Welding & Cutting Products to the specifications on file with Underwriter's Laboratories, Inc., and when they are used in the gas service for which they are designed and listed. The use of other parts that cause damage or failure to the equipment will void the manufacturer's warranty.

INTRODUCTION - PRINCIPLES OF OPERATION

The R-601, R-602 and R-603 are pilot-operated station regulators. A pilot-operated regulator differs from the conventional type in that the pressure-adjusting spring force normally applied against the outer face of the diaphragm is applied instead by gas pressure supplied from a pilot regulator. The pilot regulator is adjusted in the same manner as a conventional regulator. When adjusted to the desired working pressure, the main regulator will deliver gas at the same pressure. A small passageway or bleed orifice in the main regulator diaphragm permits a continuous flow of gas through the pilot system. This flow of gas is discharged from the regulator along with the main flow.

The R-602 and R-603 are single-stage regulators in which the line pressure is reduced in a single step to the desired working pressure.

The R-601 is a two-stage, bronze constructed regulator. In the first stage, the line pressure is reduced to an intermediate pressure (usually 100 to 120 psi) by adjusting the first-stage pilot regulator. The intermediate pressure is then reduced to the desired working pressure which is obtained by adjusting the second-stage pilot regulator.

Two-stage regulators are recommended for operation requiring more critical delivery-pressure control than normally supplied by single-stage regulators or where a very large fluctuation in inlet pressure occurs.

TYPES OF PILOT REGULATORS

Two kinds of pilot regulators are available from ESAB for control of the R-601, R-602 and R-603 Regulators. The standard types, R-6101, R-6102, R8103 and R6104, function just like any other conventional one-stage regulator. All installation specifications and tables in this booklet are based on the use of this kind of pilot regulator.

For special conditions another kind of pilot regulator is available — the pressure-compensated variety. These pilot regulators (R-6109 through R-6113) have provision for varying the original pilot regulator delivery pressure inversely as the pressure at the point of rise rises.
These Safety Precautions are for your protection. They summarize precautionary information from the references listed in Additional Safety Information section. Before performing any installation or operating procedures, be sure to read and follow the safety precautions listed below as well as all other manuals, material safety data sheets, labels, etc. Failure to observe Safety Precautions can result in injury or death.

PROTECT YOURSELF AND OTHERS - Some welding, cutting and gouging processes are noisy and require ear protection. Hot metal can cause skin burns and heat rays may injure eyes. When training in the proper use of the processes and equipment is essential to prevent accidents. Also:

1. Always wear safety glasses with side shields in any work area, even if welding helmets, face shields, or goggles are also required.
2. Wear flameproof gauntlet type gloves, heavy long-sleeve shirt, cuffless trousers, high-top shoes, and a welding helmet or cap for hair protection, to protect against hot sparks and hot metal. A flameproof apron may also be desirable as protection against radiated heat and sparks.
3. Hot sparks or metal can lodge in rolled up sleeves, trouser cuffs, or pockets. Sleeves and collars should be kept buttoned, and open pockets eliminated from the front of clothing.
4. Protect other personnel from hot sparks with a suitable non-flammable partition or curtains.
5. Use goggles over safety glasses when chipping slag or grinding. Chipped slag may be hot and can travel considerable distances. Bystanders should also wear goggles over safety glasses.

FIRES AND EXPLOSIONS - Heat from a flame can act as an ignition source. Hot slag or sparks can also cause fires or explosions. Therefore:

1. Remove all combustible materials well away from the work area or completely cover the materials with a protective non-flammable covering. Combustible materials include wood, cloth, sawdust, liquid and gas fuels, solvents, paints and coatings, paper, etc.
2. Hot sparks or hot metal can fall through cracks or crevices in floors or wall openings and cause a hidden smoldering fire on the floor below. Make certain that such openings are protected from hot sparks and metal.
3. Do not weld, cut, or perform any other hot work on materials, containers, or piping until it has been completely cleaned so that no substances on the material can produce flammable or toxic vapors. Do not do hot work on closed containers. They may explode.
4. Have fire extinguishing equipment handy for instant use, such as a garden hose, a pail of water or sand, or portable fire extinguisher. Be sure you are trained in its use.
5. After completing operations, inspect the work area to be sure that there are no hot sparks or hot metal which could cause a later fire. Use fire watchers when necessary.
6. For additional information, refer to NFPA Standard 51B, “Fire Prevention in Use of Cutting and Welding Processes”, which is available from the National Fire Protection Association, Battery March Park, Quincy, MA 02269.

FUMES AND GASES - Fumes and gases, particularly in confined spaces, can cause discomfort or injury. Do not breathe fumes or gases from welding or cutting. Therefore:

1. Always provide adequate ventilation in the work area by natural or mechanical ventilation means. Do not weld, cut, or gouge on materials such as galvanized steel, stainless steel, copper, zinc, lead, beryllium, or cadmium unless positive mechanical ventilation is provided. Do not breathe fumes and gases from these materials.
2. If you develop momentary eye, nose, or throat irritation while operating, this is an indication that ventilation is not adequate. Stop work at once and take necessary steps to improve ventilation in the work area. Do not continue to operate if physical discomfort persists.

3. Refer to ANSI/ASC Standard Z49.1 listed below for specific ventilation recommendations.
4. WARNING: This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code §25249.5 et seq.)

EQUIPMENT MAINTENANCE - Faulty or improperly maintained equipment, such as torches, hoses and regulators, can result in poor work, but even more important, it can cause injury or death through fires. Therefore:

1. Always have qualified personnel perform the installation, troubleshooting, and maintenance work. Do not operate or repair any equipment unless you are qualified to do so.
2. Keep all oxy-fuel equipment free of grease or oil. Grease, oil, and other similar combustible materials, when ignited, can burn violently in the presence of oxygen.
3. Do not abuse any equipment or accessories. Keep equipment away from heat and wet conditions, oil or grease, corrosive atmospheres and inclement weather.
4. Keep all safety devices in position and in good repair.
5. Use equipment for its intended purpose. Do not modify it in any manner.

GAS CYLINDER HANDLING - Gas cylinders, if mishandled, can rupture or explode violently. Sudden rupture of a cylinder, valve or relief device can injure or kill you. Therefore:

1. Use the proper gas for the process and use the proper pressure reducing regulator designed to operate from the compressed gas cylinder. Do not use adaptors to mount the regulator on the cylinder. Maintain hoses and fittings in good condition. Follow manufacturer’s operating instructions for mounting the regulator to the gas cylinder.
2. Always secure cylinders in an upright position by chain or strap to suitable hand trucks, benches, walls, post, or racks. Never secure cylinders to work tables or fixtures where they may become part of an electrical circuit.
3. When not in use, keep cylinder valves closed. Have the valve protection cap in place on top of the cylinder if no regulators is installed. Secure and move cylinders by using suitable hand trucks. Avoid rough handling of cylinders.
4. Locate cylinders away from heat, sparks, or flame of a welding, cutting, or gouging operation. Never strike an arc on a cylinder.
5. For additional information, refer to CGA Standard P-1, “Precautions and Safe Practices for Gas Welding, Cutting, and Heating”, Form 2035. Gas apparatus safety guidelines are also available on video cassettes from your distributor.

ADDITIONAL SAFETY INFORMATION - For more information on safe practices for oxy-fuel welding and cutting equipment, ask your distributor for a copy of “Precautions and Safe Practices for Gas Welding, Cutting, and Heating”, Form 2035. Gas apparatus safety guidelines are also available on video cassettes from your distributor.

The following publications, which are available from the American Welding Society, 550 N.W. LeJuene Road, Miami, FL 33126, are recommended to you:

1. ANSI/AWS Z49.1 - “Safety in Welding and Cutting”
2. AWS F4.1 - “Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances”

MEANING OF SYMBOLS - As used throughout this manual: Means Attention! Be Alert! Your safety is involved.

DANGER
Means immediate hazards which, if not avoided, will result in immediate, serious personal injury or loss of life.

WARNING
Means potential hazards which could result in personal injury or loss of life.

CAUTION
Means hazards which could result in minor personal injury.
or falls. They are recommended only for use where demand rate changes abruptly and substantially, and when there is considerable piping volume between the regulator and the actual point of use.

**INSTALLATION**

Because of the variety of conditions under which these regulators are used, the main regulator assemblies, pilot regulator assemblies, and gauges are supplied separately. This arrangement permits selection of the main regulator and pilot regulator best suited for individual requirements. Listed below in Table 1 are the components grouped together to form complete regulating units.

Selection of complete regulating unit should be based on the desired maximum delivery pressure. If 17 psig maximum delivery pressure is desired with the R-601, use the pilots and gauges listed in the 20 psig maximum delivery pressure line. The 50, 65, and 90 psig delivery pressure grouping can be used but controlling delivery pressure at 17 psig or less will become more difficult from each higher delivery pressure grouping.

<table>
<thead>
<tr>
<th>Table 1 - Complete Regulating Unit Variations</th>
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<tr>
<td><strong>Max. Inlet Pressure, psig (bars)</strong></td>
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<tr>
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<tr>
<td>R-601 Oxygen Two-Stage Regulator - P/N 689247</td>
</tr>
<tr>
<td>350 (24.1)</td>
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<table>
<thead>
<tr>
<th>R-602 Oxygen Single-Stage Regulator - P/N 2112142</th>
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<tr>
<td>350 (24.1)</td>
<td>20 (1.4)</td>
<td>85,000 (38)</td>
<td>R-6103 - P/N 05X65</td>
<td>400 (27.6)</td>
<td>30 (2.1) - P/N 520076</td>
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<tr>
<td></td>
<td>65 (4.5)</td>
<td>150,000 (67)</td>
<td>R-6102 - P/N 05X64</td>
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<td></td>
<td>150 (10.4)</td>
<td>150,000 (67)</td>
<td>R-6101 - P/N 05X61</td>
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<table>
<thead>
<tr>
<th>R-603 Fuel Gas Single-Stage Regulator - P/N 05X25</th>
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<tr>
<td>Acetylene</td>
<td>15 (1.0)</td>
<td>25,000 (11)</td>
<td>R-6104 - P/N 05X66</td>
<td>30 (2.1) - P/N 520076</td>
<td>30 (2.1) - P/N 520076</td>
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<tr>
<td>Nat. Gas</td>
<td>15 (1.0)</td>
<td>32,000 (14)</td>
<td>R-6110 - P/N 689472</td>
<td>200 (13.8) - P/N 598481</td>
<td>30 (2.1)</td>
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<td>Nat. Gas</td>
<td>150 (10.3)</td>
<td>190,000 (85)</td>
<td>R-6112 - P/N 689474</td>
<td>200 (13.8) - P/N 598481</td>
<td>100 (6.9) - P/N 978152</td>
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</table>

* R-76-150-024 Oxygen Regulator, P/N 19151, may be used in place of the R-601 as a first stage pilot for the R-601 in applications where some variations in delivery pressure can be tolerated. Special fittings will be required for connections.

**WARNING**

Oil and grease are easily ignited and burn violently in the presence of oxygen under pressure. Handle oxygen apparatus only with clean hands or gloves. Never use oxygen as a substitute for compressed air.
Some typical installations . . . .

Fig. 1 - Pilot Installed on Single-Stage Regulator

Fig. 2 - Pilot Installed on Two-Stage Regulator

Fig. 3 - Pilot Installed Remotely from Single-Stage Regulator

Fig. 4 - Pilot Installed Remotely from Two-Stage Regulator

NOTE: Gauges and pilot regulators can be installed in either side of regulator.
A. MAIN REGULATOR

1. Install the main regulator in the line between the station oxygen filter (or acetylene hydraulic back-pressure valve) and the apparatus. (An oxygen filter or an acetylene hydraulic back-pressure should always be installed in the line upstream of the regulator. The size of the filter or hydraulic will depend on the flow requirements.)

2. Where flow requirements are greater than can be supplied by a single regulator, two or more regulators can be installed in parallel (Fig. 5).

B. PILOT REGULATOR

The pilot regulator can be installed on the main regulator (Figs. 1 and 2), or at some convenient location remote from the main regulator (Figs. 3 and 4).

Teflon tape or paste or an approved pipe compound must be used on all pipe threads.

1. To install the pilot on the main single-stage regulator (Fig. 1):
   a. Fit the pilot body with the two standard connections supplied with the pilot regulator. (P/N 3389 is supplied with oxygen regulators, P/N 3390 with fuel gas regulators.)
   b. Attach the pilot to the bracket (supplied with the pilot regulator) by means of the two 3/8" - 16 x 3/4-in. (19 mm) long hex head steel cap screws (supplied).
   c. Remove one cap screw from the main regulator cap. Replace the cap screw with the stud supplied with the pilot regulator. (The long end of the stud is screwed into the main regulator.)
   d. Place the bracket (with pilot attached) in position on the main regulator so that the free end of the stud protrudes through the hole in the bracket. Place the lock washer and nut (both supplied) on the stud and tighten the nut with a wrench.
   e. Screw the low-pressure gauge directly into the top hole in the side of the main regulator body. (An elbow or other connection can be used between the regulator and the gauge if desired).
   f. Screw the 1/4-in. close nipple (supplied) into the bottom hole in the side of the main regulator body. Screw the 1/4-in. pipe nipple (supplied) on the end of the nipple.
   g. Screw a 3389 (for oxygen) or 3390 (for fuel gas) connection into the top opening of the tee and screw the high-pressure gauge into the open end of the tee.
   h. Screw a 1/4-in. pipe nipple (supplied) into the opening in the top of the main regulator.
   i. Make up two suitable lengths of 5/16-in. O.D. (8mm) x No. 20 STUBS GA. (.035-in.) wall (0.9mm), brass tubing with 03Z28 nipples and 3380 (for oxygen) or 3381 (for fuel gas) nuts at each end. (Slide the nuts onto the tubing before silver soldering the nipples to the tubing.)

Copper tubing may be used for oxygen, inert...
gases, and fuel gases but NEVER acetylene. Tubing especially washed and cleaned for oxygen service, is available from ESAB in 25-, 50-, and 100-ft. coils (See WARNING on page 2.) Brass, aluminum, or stainless steel tubing may be used for acetylene.

j. Connect the tubing between the inlet of the pilot and the tee at the main regulator; and between the pilot outlet and the connection in the top of the main regulator.

k. Tighten all connections securely.

2. To install the pilot regulators on the two-stage regulator (Fig. 2):

   a. Instructions for installing the pilot on the first stage of the two-stage regulator are the same as given in B-1 for the single-stage regulator except that the tubing between the main regulator and the pilot inlet goes to the center hole (not the bottom hole) in the side of the main regulator body.

   b. Instructions for installing the second-stage pilot are the same as for the first-stage pilot, except the pilot inlet is connected to the top hole in the side of the main regulator body, and the pilot outlet is connected to the hole in the bottom (cap) of the main regulator.

3. To install the pilot remotely from the main regulator (Fig. 3 and 4):

   a. Except for the location of the Pilot(s) and gauges, instructions for installing the pilot regulators remotely are practically the same as those given in B-1 and 2 for installing the pilot(s) on the main regulator.

OPERATING INSTRUCTIONS

A. TO PUT THE REGULATING UNIT IN OPERATION

1. MAKE SURE the pilot regulator pressure-adjusting screw (the R-601 has two) is fully released by turning it counterclockwise as far as it will go.

2. SLOWLY open the station valve. NEVER stand in front of or behind regulator gauges when opening the station valve; always stand to one side.

3. Turn in the pilot regulator pressure-adjusting screw until the desired working-pressure is obtained. (On the R-601 adjust the first stage pilot regulator adjusting-screw until a reading of 100-120 psi is obtained on the intermediate pressure gauge. Then adjust the second-stage pilot regulator adjusting-screw until the desired working-pressure is obtained.)

4. Close the valves on the gas consuming apparatus.

5. Test all connections and joints with Leak Test Solution suitable for oxygen service, such as P/N 998771 (8 oz. container).

B. TO TAKE THE REGULATING UNIT OUT OF SERVICE

If work is to be stopped for a day or more, release pressure from the regulating unit as follows:

1. Close the main station valve.

2. Open the valves on the apparatus in use and release all pressure.

3. When delivery pressure gauge reading drops down to zero, close the apparatus valves.

   Follow the same procedure in removing the regulating unit from the installation.

   When storing the regulators, keep the openings suitably covered to prevent dirt from entering. Turn in the pilot regulator pressure-adjusting screw just enough to lift the valve seat off the nozzle.

MAINTENANCE INSTRUCTIONS

After each three months of continuous service, an examination and replacement of parts shown with a single asterisk (*) in the parts list on pages 10 and 12 is recommended. A yearly examination and replacement of parts shown with a double asterisk (**) is also recommended for best possible service.

In the second-stage of the two-stage (R-601) regulator certain parts are recommended for replacement at the end of each six months of continuous service. These parts are shown with a triple asterisk (***) in the parts list on page 12.

To follow these recommendations a stock of parts sufficient for one year's maintenance should be kept on hand. Where more than one part is used, the total number used in each assembly is indicated in parentheses at the end of the description in the parts list. The yearly maintenance will be one, two, or four times the total number of parts used in each case.

A. TO EXAMINE AND REPLACE PARTS IN THE R-602, R-603 AND R-603B

1. Disconnect the tubing from the pilot regulator at the main regulator.

2. Remove the main regulator cap.

3. Remove (lift off) the complete diaphragm assembly. (At the yearly overhaul, the diaphragm (30Z92) is removed from between the two diaphragm plates (689252 and 689253, or 30Z94 and 30Z95), and replaced with a new one.)

4. Remove (unscrew) the hold down nut (37Z95).

5. Remove the eight screws (6164-4087) which hold
the baffle plate (689277 or 68Z90) in place. Remove (lift out) the baffle plate.

6. Unscrew the four screws which hold the two nozzle clamps (152Z39). Lift off the clamps and pull out the nozzle (32Z79).

7. Remove (pull out) the valve seat and stem (33Y77). (At the yearly overhaul, this whole assembly is replaced; see 10 and 12 which follow.)

8. Remove the parts (washer, bearing segments and spring) located within the nozzle recess. (At the yearly overhaul, replace the spring and eight bearings segments.) Remove and discard "O" Ring (85W89).

9. Remove and discard the screw (34Z81) which holds the dampener in place. Discard the dampener (52Z17), but retain the two springs (28Z94) for further use. (At the yearly overhaul, replace the two springs.)

10. Wipe clean and examine the seating surface of the valve seat and stem (33Y77). If in good condition, continue to use it until the yearly overhaul, then replace it with a new one.

11. Assemble the springs, new dampener, and new screw to the valve seat and stem.

12. Place the new "O" ring (85W89) over the 3-3/4-in. diameter (95mm) of the nozzle so that it fits snugly against the underside of the largest diameter of the nozzle.

13. Place one washer (94Z57) in the bottom of the nozzle recess. Arrange the four bearing segments in the washer and around the stem. Slide a second washer (94Z57) down over the four bearing segments. Slide the spring (29Z43) down over the stem.

14. Slide the valve seat and stem assembly into position in the nozzle. Place a brass washer (94Z57) on top of the spring. Arrange the four remaining segments in the washer and around the stem. Place the remaining washer (94Z57) on top of the segments.

15. Screw the hold-down nut (37Z95) into position in the nozzle. Hand tighten. Check the fit of the seat and stem in the nozzle. It must fit snugly yet move in and out freely.

16. Insert the nozzle in the regulator. Attach the two clamps (152Z39) to the body with the four screws provided. Torque the screws to 190-in. -lbs. (215 N·m).

17. At this point it is advisable to test the nozzle for porosity and leakage past the seating surfaces. To do this: fill the nozzle with water, then admit 100 psi (6.9 bars) pressure into the regulator.

18. Wait about 10 minutes, then examine the nozzle for leakage (indicated by bubbles). Paint around the upper edge of the nozzle with a light film of Leak Test Solution. For porosity, release pressure and replace the nozzle with a new one. For other leaks, release pressure, disassemble, clean seating surfaces, replace "O" ring, reassemble, and retest.

19. Empty out all water and blow dry.

20. Install the baffle plate (689277) or 68Z90) and fasten it in position by means of the eight screws (6164-4087).

21. Install the hold down nut in the nozzle. Tighten it securely.

22. Install the diaphragm assembly and regulator cap. Torque hold-down cap screws to 300 in.-lbs. (339 N·m).

23. Reconnect the tubing from the pilot regulator to the main regulator cap.

24. Adjust the pilot regulator to the usual operating pressure and test around the main regulator cap and connections with Leak Test Solution. Check to make sure that the pointer on the delivery-pressure gauge does not climb excessively when the apparatus in use is shut off.

B. TO EXAMINE AND REPLACE PARTS IN THE R-601

Refer to Fig. 7 and Parts List on Page 12.

1. To replace first-stage parts:
   The first stage of the R-601 is the same as the R-602. After disconnecting the two pilots, follow the instructions given in Section A.

2. To replace second-stage valve parts:
   a. Remove (unscrew) the seat clamping flange (52Z87).
   b. Remove (lift out) the complete valve assembly.
   c. Remove the slip ring (93Z21), four bearing segments (52Z83), and spring guide (52Z82) from the top of the valve stem (33Y85). Discard the segments.
   d. Remove the spring (29Z68). Retain it for use until the yearly overhaul, then replace it with a new one.
   e. Remove (pull) the stem from the nozzle.
   f. Remove (unscrew) the locknut (136Z11). Remove and discard the seat (32Y41).
   g. Remove (unscrew) the nozzle cap (31Z99) from the bottom of the nozzle (32Z86).
   h. Remove the slip ring (93Z21), four bearing segments (52Z84), and spring guide (52Z82) from the bottom of the valve stem. Discard the segments.
   i. Remove the spring (29Z04). Retain it for use until the yearly overhaul, then replace it with a new one.
   j. Remove the spring washer (52Z84) from the stem.
k. Clean and examine the seating surface of the nozzle. If the surface is marred, replace the nozzle with a new one.

l. Using new parts for those discarded, reassemble as follows:

m. Place the valve seat on the holder portion of the stem. Screw the locknut into position and tighten it, snugly. (Using the flats provided on the seat holder portion of the stem, clamp the stem in a vise so that the sliding surface of the stem does not mar while tightening the locknut.)

n. Place the stem and seat assembly in the nozzle. Hold the stem by the short end (with nozzle on top) and assemble the washer, small (29Z04) spring, guide, four (4) bearing segments, and slip ring, in that order.

o. Screw the cap (31Z99) onto the nozzle. Tighten it snugly.

p. Invert the assembly then assemble the large (29Z68) spring, guide, four (4) bearing segments, and slip ring to the stem.

q. Replace the "O" ring (85W87) in the recess of the regulator body with a new one.

r. Place the assembly into the regulator recess.

s. Screw the flange (52Z87) into position. Tighten it securely.

t. Repeat for all four valves.

3. To replace the second-stage diaphragm (yearly):

   Directions for replacing the second-stage diaphragm are the same as for the first stage diaphragm except that access to it is obtained by removing the bottom cap of the regulator.

4. Replacement of gauges (yearly):

   Replacement of all pressure gauges at the end of each year's service is recommended. (See page 3, for the part numbers.)

   For Maintenance Instructions covering the pilot regulators, refer to F-9654 (R-6101 thru R-6104) or F-12736 (R-6109 thru R-6113) which is packed with each regulator.

R-602 - Single Stage Oxygen Station Regulator - 2112142
R-603 - Single Stage Fuel Gas Station Regulator - 05X25
R-603B - Single Stage Fuel Gas Station Regulator - 2243305

NOTE: The R-602 is now a bronze body constructed regulator equipped with brass diaphragm and baffle plates. The plates can replace the aluminum plates in the old R-602 aluminum body regulator. The bronze body has 3/4"—10 tapped holes at inlet and outlet for mounting standard ANSI 8-bolt flanges (not supplied, see below). The old R-602 aluminum body regulators were supplied with 4-bolt ammonia type flanges which are no longer available.

**Hardware**

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<th>Part No.</th>
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<th>Part No.</th>
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<tr>
<td>6060-1075</td>
<td>1/4—18 Hex Socket Stainless Steel Plug</td>
<td>6164-4107</td>
<td>1/4—20 x 7/8-in. Stainless Steel Flat Socket Head Cap Screw</td>
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<td>6134-1279</td>
<td>3/4-in.—10 x 1-3/4-in. Hex Head Cap Screw</td>
<td>6164-4133</td>
<td>3/8-in.—16 x 1-in. Lg. Flat Socket Head Stainless Steel Cap Screw</td>
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<td>6134-2189</td>
<td>1/2-in.—13 x 1-5/8-in. Lg. Steel Hex Socket Cap Screw</td>
<td>6360-0100</td>
<td>1/4-in.—20 Stainless Steel Hex Nut</td>
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<td>6164-4087</td>
<td>1/4-in.—20 x 1/2-in. Lg. Stainless Steel Flat Socket Head Cap Screw</td>
<td>6460-7946</td>
<td>1/4-in. External Type Shakeproof Lockwasher, Stainless Steel</td>
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*Not supplied with the R-602 or R-603B.*

**Parts Supplied**

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<th>Part No.</th>
<th>Description</th>
<th>Part No.</th>
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<td>&quot;B&quot; Size Oxygen Nut (8) (supplied with R-602)</td>
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<tr>
<td>0710-1075</td>
<td>1/4-in. N.P.T. Brass Close Nipple</td>
<td>6710-1075</td>
<td>1/4-in. N.P.T. Female Brass Coupling (2)</td>
</tr>
</tbody>
</table>

**Parts Not Supplied**

Commercial Flange (2 req'd), standard 8-bolt, 3-in. NPT, 300-pound forged steel, raised or flat face; cap joint, weld-neck or slip-on type. 1/4-in. N.P.T. Female Brass Coupling (2) 1/4-in. Brass Tee.
* Should be replaced every 3 months.
** Should be replaced every year.
NOTE: The R-601 regulator is now a bronze body constructed assemble equipped with brass dia-phragm and baffle plates. The plates can replace the aluminum plates in the old R-601 regulator. P/N 2224523 Equipment Package replaces R-601 regulator P/N 686931 (bronze body - 4 bolt).

### Hardware

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6060-1075</td>
<td>1/4—18 Hex Socket Stainless Steel Pipe Plug</td>
<td>6164-4133</td>
<td>3/8-in.—16 x 1-in. Lg. Flat Socket Hd. Stainless Steel Cap Screw</td>
</tr>
<tr>
<td>6134-2189</td>
<td>1/2-in.—13 x 1-5/8 Lg. Steel Hex Socket Cap Screw</td>
<td>6360-0100</td>
<td>1/4-in.—20 Stainless Steel Hex Nut</td>
</tr>
<tr>
<td>6164-4087</td>
<td>1/4—20 x 1/2-in. Lg. Stainless Steel Flat Head Socket Cap Screw</td>
<td>6460-7946</td>
<td>1/4-in. External Type Shakeproof Lock Washer, Stainless Steel</td>
</tr>
<tr>
<td>6164-4107</td>
<td>1/4-in.—20 x 7/8-in. Stainless Steel Flat Head Socket Cap Screw</td>
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</tbody>
</table>

### Parts Not Supplied

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
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<th>Description</th>
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</thead>
<tbody>
<tr>
<td>3380</td>
<td>&quot;B&quot; Size Oxygen Nut (14)</td>
<td>6330-0136</td>
<td>Nut - 3/8—16 Hex Steel Nut</td>
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<tr>
<td>3389</td>
<td>&quot;B&quot; Size Male Oxygen Connection (14)</td>
<td>6420-7275</td>
<td>3/4-in. Shakeproof External Tooth Lockwasher</td>
</tr>
<tr>
<td>03Z28</td>
<td>&quot;B&quot; Size Nipple (14)</td>
<td>6430-2125</td>
<td>3/8-in. x 1/8-in. x 3/32-in. Steel Lockwasher (2)</td>
</tr>
<tr>
<td>05Z70</td>
<td>25-ft. 5/16-in. x No. 20 (.035 wall) seamless annealed brass tubing</td>
<td>6710-1075</td>
<td>1/4-in. N.P.T. Brass Close Nipple (2)</td>
</tr>
<tr>
<td>05Z71</td>
<td>50-ft. 5/16-in. x No. 20 (.035 wall)</td>
<td>6812-0075</td>
<td>1/4-in. N.P.T. Female Brass Coupling (3)</td>
</tr>
<tr>
<td>6134-1279</td>
<td>3/4-in. 10 x 1-3/4-in. Hex Head Steel Cap Screw</td>
<td>6816-1103</td>
<td>1/4-in. N.P.T. Female Brass Tee (2)</td>
</tr>
<tr>
<td>6134-1287</td>
<td>3/4-in. 10 x 2-in. Hex Head Steel Cap Screw</td>
<td>Commercial</td>
<td>Flange (2 req’d), standard 8-bolt 3-in. pipe, 300-pound forged steel, raised or flat face; lap-joint, weld-neck, or slip-on type.</td>
</tr>
</tbody>
</table>
VALVE STEM & SEAT ASSEM.—33Y77 (Ref.)

(2) LOWER DIAPHRAGM PLATE—689252
(2) UPPER DIAPHRAGM PLATE—689253
(2) DIAPHRAGM—30Z92**

BLEEDER SCREW—34Z82
BAFFLE PLATE—689337 (2) SCREW—34Z81*

(2) SPRING—28Z94**
SPRING—28Z05
DAMPENER—52Z17*
(2) O-RING—690631
O-RING—85W89*
(16) 6164-4087
(4) PACKING WASHER—94Z57
(4) NUT—136Z11
(4) VALVE SEAT—32Y41***
(4) O-RING—85W87***
(4) SPRING—29Z04**
(4) FLANGE—52Z87
(4) VALVE SPRING—29Z68**
(4) NOZZLE—32Z86
(4) VALVE STEM—33Y85**
(4) SPRING WASHER—52Z84
(4) NOZZLE CAP—31Z99

* Should be replaced every 3 months.
** Should be replaced every year.
***Should be replaced every six months.

Fig. 8 - R-601 Two-Stage Oxygen Station Regulator - 689247
ESAB Welding & Cutting Products, Florence, SC Welding Equipment
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