INSTRUCTIONS
for
OXWELD
TRADE MARK
M-25
SINGLE-REGULATOR
OXYGEN MANIFOLD

IMPORTANT

This booklet contains instructions for installing and operating the OXWELD M-25 Oxygen Manifold. Read it and keep it for future use. If you are not familiar with the general principles of operation and safe practices, which should be understood before using this type of equipment, we recommend that you also read Linde's booklet, "Precautions and Safe Practices," (Form 2055) which you can obtain without charge from any Linde office.

Use no oil or grease on this manifold. Oil or grease, if subjected to oxygen under pressure, may ignite and burn with explosive violence. Oxy-acetylene apparatus does not require lubrication.

Oxygen manifolds should be installed and operated in accordance with National Fire Protection Association Standard No. 51 (available from National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass).

For complete information covering the design and installation of oxygen piping and distribution systems, we recommend that you see Form 5110, "Instructions for Design and Installation of Oxygen Distribution and Piping Systems." This booklet is available without charge from any Linde office.

Introduction

Purpose

The OXWELD M-25 Single-Regulator Oxygen Manifold is designed to furnish an almost continuous supply of LINDE oxygen to distribution piping systems in industrial shops, welding schools and other installations whose operations will not be hindered by the slight service interruption encountered in shutting down an empty bank of cylinders and cutting in a full bank.

The M-25 has two separate "headers" or cylinder banks, each of which can be cut in or out of service by opening or closing its header valve. The two banks can therefore be operated alternately or simultaneously, and the manifold can continue in operation even if one bank is cut out for repairs or maintenance.

Description

A complete M-25 manifold installation consists of:

a. A manifold control assembly, consisting of two header valves, an inlet tee assembly, through which both headers feed oxygen into a two-stage regulator, and then into an outlet block assembly.

b. Two "headers," each consisting of a number of threaded extensions determined by the number of cylinders to be manifolded, and the type of layout desired. Each extension accommodates one cyl-
NOTE "A" — 4 ft. 3⅜-in. for LINDE "K" cylinder. For other types of cylinders, this dimension is obtained by subtracting 1-1/8-in. from the distance between the floor and the centerline of the cylinder valve outlet.

FIG. 1 — Wall Mounting of M-25 Single-Regulator Oxygen Manifold
inder lead, the last extension will also take another lead parallel to the mounting surface, but this requires careful rebending of the manifold-to-cylinder lead. If not used, the last connection is sealed with the plug assembly provided.

Straight extensions (Part No. 25X03) are employed to build up rows of cylinders along the mounting surface; a curved extension (Part No. 25X05) is used to extend a header around a corner, as shown in Fig. 1. Where wall space is not available, a floor-type installation on an "A" frame can be set up, using "tee" extensions to establish a second row of cylinders parallel to the first. For further information on this type of arrangement, consult your Linde representative.

c. Manifold-to-cylinder leads (Part No. 25X09) One lead is required for each cylinder.

d. A globe-type pipeline shutoff valve and a safety relief valve, as described in Sec. I-C.

I. Installation Procedure

NOTE: The procedure described here is for a simple wall mounting as shown in Fig. 1. Where sufficient wall space is not available, consult your Linde representative for information on a floor-type mounting on an "A" frame.

A. Mount the Control Assembly on the Wall

1. Mark the position of the mounting bolts on the wall, as shown in Fig. 1. Work from floor level to establish the position of one bolt, and align the other one with it, using a level.

2. Drill holes of appropriate size in the wall for the mounting bolts. In concrete or brick walls, use 3/8-in. bolts and expansion shields. In hollow tile walls, the 3/8-in. bolts should pierce the entire wall, and be anchored with a nut behind a steel plate on the far side.

3. Take up the slack in the bolts until only about 1/4-inch of shank length is visible on the panel side.

4. Carefully lift the control assembly into the position at which the enlarged portion of each of the slotted holes in the control back plate can pass cleanly over the bolt heads. Allow the control assembly to slide gently down into place so that the shanks of the mounting bolts are in the narrow part of the mounting slots, supporting the entire weight of the control assembly.

5. Secure the control assembly firmly to the wall by tightening each bolt with a wrench.

B. Attach the inlet adaptor to the inlet tee on the manifold control, and attach the outlet tube to the outlet block, in the position indicated in Fig. 4 by broken lines. Now attach the regulator to the inlet adaptor and the outlet tube, following the procedure described in the Maintenance Instructions, Sec. III-D, on page 8.

Although Fig. 4 actually shows the mounting arrangement for the R-64 and R-65 Regulators, mounting for the R-2428 regulator is equally simple; it uses a straight inlet adaptor to connect the inlet tee to the inlet fitting at the back of the regulator body, rather than the 90° inlet adaptor used to engage the inlet fitting on the side of the R-64 and R-65 bodies, as shown in Fig. 4.

C. Connect the manifold outlet block to the distribution piping system. A pressure relief valve and a globe-type pipeline shutoff valve must be installed in the piping system at the manifold outlet block. The pressure relief valve should be between the manifold outlet and the pipeline shutoff valve.

D. Mount the required extensions and manifold-to-cylinder leads.

1. Insert the nipple end of the first wall extension in each bank as far as it will go into the manifold inlet connections on each side of the control assembly. Tighten the connection nuts with a wrench. Mark the location of the extension mounting holes, and then disconnect the extensions.

2. Drill mounting holes in the wall for the extension mounting bolts.

3. Reassemble the extensions to the manifold control, and bolt them firmly to the wall.

4. Follow the same procedure with all subsequent extensions; never connect another extension until the previous one has been firmly bolted to the wall. Seal the last extension in each header with the plug provided.

5. Attach the manifold-to-cylinder leads to the connections on each header, and tighten the connection nuts with a wrench.

CAUTION: Do not use excessive force in tightening extension or cylinder lead connection nuts with a wrench. The connections have metal-to-metal seats; too much torque may distort their threads or seats.

LEAK TESTING of all manifold connections is carried out after the manifold-to-cylinder leads have been attached to the cylinders (see Sec. II-A-7). In addition, all cylinder connections in a bank are tested after each change of cylinders (see Sec. II-C-4). A detailed description of leak testing procedure is included in the Maintenance Instructions (Sec. III-A, B).
II. Operating Instructions (Refer to Figs. 2 and 3)

Each of the two manifold banks feeds through a separate header valve into the regulator, which controls the pressure delivered to the distribution piping system. Either bank may be cut out of service by merely closing its header valve, and the two banks may therefore be used either alternately or simultaneously.

The instructions given here are for alternate operation, in which the service interruption is limited to the time needed to shut down the empty bank and cut in the full bank. Simultaneous use of both banks will provide longer periods of uninterrupted service, but the manifold will be out of service completely while both empty banks of cylinders are replaced.

A. Initial Starting

1. Before attaching the manifold-to-cylinder leads to the cylinders, open or "crack" each cylinder valve slightly for an instant, to blow out any dirt which may be lodged in the cylinder valve outlet; then close the valve. Place the cylinders in position with their valve outlets facing outward.

2. Connect the cylinders to the extensions by means of the manifold-to-cylinder leads. Tighten the connection nuts at both ends of the leads with a wrench.

3. Release the pressure-adjusting screw on the regulator by turning it counter-clockwise until it turns freely.

FIG. 2 – Schematic Diagram of M-25 Single-Regulator Manifold

FIG. 3 – Operating Controls of M-25 Single-Regulator Oxygen Manifold
4. Fully open one of the header valves.
5. Close the pipeline shut-off valve.
6. Slowly open the valves on all cylinders in both banks of the manifold, starting with the valves on the cylinders nearest the regulator.
7. Test both banks of the manifold for leaks, as described in Maintenance Instructions, Secs. III-A and B.
8. Turn the regulator pressure-adjusting screw clockwise until the delivery pressure gauge indicates a pressure 5 lb. per sq. in. above the desired delivery pressure. (Because this regulator adjustment is made under no-flow conditions, it is not possible to set up the exact delivery pressure desired. In practice, a 5 lb. oversetting will give approximately the desired delivery pressure when flow is established.)
9. Make sure all outlet valves on the distribution piping system are closed.
10. When operations are ready to begin, open the pipeline shut-off valve.

The manifold is now ready to deliver oxygen. The operating bank will feed oxygen to the piping system until the pressure in its cylinders becomes insufficient to supply the piping system at the required pressure. The reserve bank must then be cut in, and the empty cylinders replaced with full ones.

B. To Set the Reserve Bank in Operation
1. Close the header valve on the empty bank. Leave the pressure-adjusting screw in its normal operating position.
2. Open the header valve on the full bank.

C. To Replace the Empty Cylinders
1. Close the valves on all empty cylinders.
2. Disconnect the cylinders from the manifold-to-cylinder leads.
3. Connect full cylinders to the manifold-to-cylinder leads, as described in Secs. II-A-1 and 2.

D. Shutting Down the Manifold
1. Close the header valves. Leave the pipeline shut-off valve open.
2. Leave the regulator pressure-adjusting screw in its normal operating position. If the pressure-adjusting screw is released for a long period of time while pressure remains in the chamber of the regulator, the regulator valve seat may become distorted.
3. For long shutdowns (those over one day) close the cylinder valves.
4. Tag the operating bank so that it can be identified as the bank which is supplying oxygen, when service is resumed.

E. To Start the Manifold Up Again
Before proceeding to place the manifold in service, make sure that all station outlet valves on the piping system are closed, and that no one will attempt to supply oxygen-consuming equipment from them until normal operating conditions are re-established.
1. Be sure that the pipeline shut-off valve is open.
2. Slowly open the header valve on the operating (tagged) bank only.
3. Slowly open the valves on all cylinders in both banks of the manifold, starting with the valves on the cylinders nearest the regulator.
4. When the piping system has been filled to normal pressure, give notice that the system is in operating condition.
5. After use of oxygen has begun, check the reading on the delivery pressure gauge for the regulator, to make sure the regulator is adjusted to supply the piping system at the desired pressure. Disregard any small increase in delivery pressure, but if it has decreased, slowly turn the regulator pressure-adjusting screw clockwise until the gauge indicates the desired delivery pressure.

III. Maintenance Instructions

A. Checking the Manifold for Leaks
1. Close all outlet valves on the distribution piping system.
2. Open all the cylinder valves on both sides of the manifold.
3. Make sure the header valve is open for the bank which is in operation.
4. Turn the pressure-adjusting screw clockwise about 1/8 of a turn.
5. Apply OXWELD No. 23 Leak Test Solution or a solution of Ivory soap and water to all connections on the cylinders, leads, extensions, and to all connections on the manifold control, and examine them closely for leaks.
6. If a leaking connection is found, release all pressure from the bank. Then tighten the connection without using excessive force. Retest. If the connection still leaks, disconnect the parts, and wipe the metal seating surfaces of each half of the connection with a clean, grease-free, lint-free rag. If either of the seating surfaces is scored, replace the damaged part. Make up the connection again and retest as described above.

B. Header Valves (see Fig. 6)

1. Test both header valves for leakage by applying OXWELD No. 23 Leak Test Solution or a solution of Ivory Soap and water to the threaded connections between the valve body and the stuffing box (Part No. 52Z77), between the stuffing box and the packing screw (Part No. 4215), and between the packing screw and the valve stem (Part No. 48Z63). Bubbling of the solution indicates leakage.

2. To disassemble a header valve, first back off the valve stem slightly by turning the handwheel counter-clockwise. Then remove the handwheel and unscrew the entire valve stem unit by unscrewing the stuffing box (Part No. 52Z77) from the valve body.

3. Examine the gasket (Part No. 94Z06) for defects, and replace it if necessary.

4. Unscrew packing screw from stuffing box. Now unscrew valve stem from stuffing box, thus removing the packing set (Part No. 637514). Replace the nylon seat (Part No. 5278472) in the valve stem.

5. Reassemble, using a new packing set and making sure that gasket 94Z06 is seated in the valve body before the stuffing box is screwed into the valve body.

NOTE: If valve stem does not have a replaceable nylon seat, but has a ball seat, replace stem, if necessary, with Part No. 33Y84.

6. Sandwich the packing (Part No. 4217) between the two washers (Part No. 4216) and slip all three parts onto the handwheel end of the valve stem (Part No. 33Y84). Now screw the valve stem into the stuffing box.

7. Slipping the packing screw (Part No. 4215) onto the valve stem, screw it into the stuffing box, and tighten it in place.

8. Retest the header valves for leakage, as previously described in Step #1.

C. Removal of Regulator for Repair (Fig. 4)

1. Close the header valves.

2. Turn in the regulator pressure-adjusting screw.

3. Close the pipeline shutoff valve.

4. Slowly loosen the connection nut near the regulator on the outlet tube to relieve the pressure inside the regulator; then remove the outlet from the regulator.

5. Loosen the connection nut between the inlet adaptor assembly and the regulator, and lift the regulator off.

6. For regulator repair parts, see F-12-306 (R-64 or R-65) or F-11-565 (R-2428).

D. To Replace the Regulator after it has been Repaired

1. Position the regulator so that the nipple ends of the outlet tube and the inlet adaptor assembly can be inserted into the matching connections of the regulator. Run the connection nuts onto the regulator connection threads by hand as far as possible. Tighten both nuts with a wrench.

General Precautions

A. NEVER, NEVER use oxygen for compressed air, or as a source of pressure.

B. Oxygen should NEVER be used in pneumatic tools, in oil preheating burners, to start internal combustion engines, to blow out pipelines, to "dust" clothing or work, as a substitute for air in ventilation, or for head pressure in a tank of any kind.

C. Always call oxygen by its proper name - "oxygen." Oxygen should never be called "air" and should never be confused with compressed air.

D. Never lubricate any part of the manifold. Oil or grease, if subjected to oxygen under pressure, may ignite and burn with explosive force.

E. Do not attempt to operate an oxygen manifold which is in need of repair. For repairs and replacements other than those mentioned in the M-25 Instruction Booklet, send the apparatus to the nearest Linde repair station or to your Linde Distributor.
FIG. 4 – M-25 Single-Regulator Oxygen Manifold Control Assembly – Part No. 25X17
FIG. 5 - Inlet Connection Assembly - Part No. 25X01

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<th>PARTS SUPPLIED</th>
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<tbody>
<tr>
<td>PART NO.</td>
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<tr>
<td>24787</td>
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<td>6331-100C</td>
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*6-32 x 1" L.G. MACH. SCREW, SLOTTED OVAL HEAD, STEEL, WITH NYLOCK INSERT

21X59 Header Valve

Lithographed in U.S.A.
F-9426-E 4/73 5C