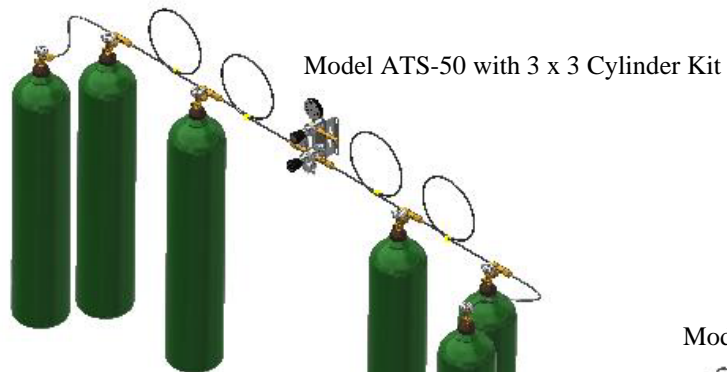
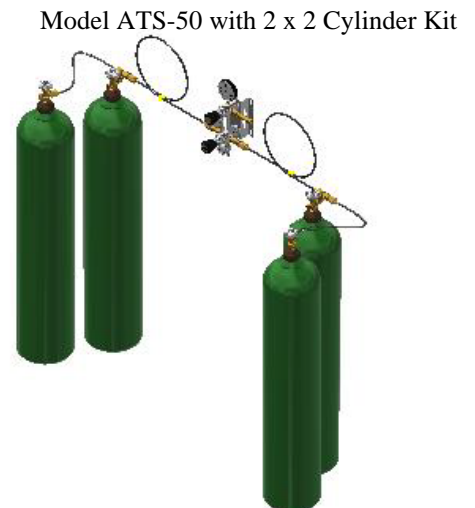


*Installation & Operating Instructions
for
ATS Series Auto Switch Manifolds*



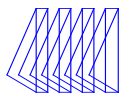
Model ATS-50 with 3 x 3 Cylinder Kit



Model ATS-50 with 2 x 2 Cylinder Kit



Model ATS-50 with 1 x 1 Cylinder Kit



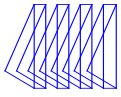
Features & Benefits

Ideal for dental and veterinary applications where automatic switching of cylinders or banks of cylinders is necessary. The unit automatically switches from a depleted cylinder or bank of cylinders to a full bank to provide an uninterrupted flow of gas. The Optional Audio/Visual Alarm kit or "T" Series Master Alarm indicates when a cylinder or bank of cylinders has been depleted and should be replaced. Systems are available for: *Nitrous Oxide, Carbon Dioxide, Nitrogen, Medical Air, and Oxygen.*

Features and Benefits

- **One-year parts and one-year labor limited warranty***
- Adjustable single stage line regulator 0 – 70 psi ▲
- 75 psi relief valve included on line regulator
- Flexible stainless braided pigtailed
- Rigid copper pigtailed also available for Oxygen Cylinders Kits
- 500 psi relief valve included on inlet regulator
- CGA gas specific pigtail connections
- Complete system cleaned for use with Oxygen
- Cylinder contents gauge and delivery pressure gauge included
- Outlet connection – 1/4 Female NPT
- Wall mounting bracket included
- Maximum inlet pressure 3,000 psi
- Optional alarm kit
- ▲ Contact Tri-Tech Medical for line regulator pressures up to 250 psi

* See Terms and Conditions, Document No. 99-0477, on our website at: www.tri-techmedical.com for complete details.



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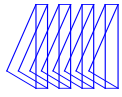
Wiring the Optional Manifold Alarm Kit to a
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Technical Assistance----

Phone: 800-253-8692 or 440-937-6244

Fax: 440-937-5060

E-mail: sales@tri-techmedical.com



General Instructions/Location

The ATS manifold is designed to be used indoors only. Carbon Dioxide and Nitrous Oxide ATS manifolds and cylinders should not be placed in a location where the temperature will exceed 130° F (54.4° C) or fall below 20° F (-7° C). The manifolds and cylinders for all other gas services should not be placed in a location where the temperature will exceed 130° F (54.4° C) or fall below 0° F (-18° C).

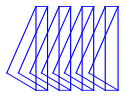
The ATS unit weighs approximately 10 lbs. Must be mounted to a suitable surface with fasteners that will support the weight and forces imposed during the installation if pipe thread fittings to the inlets and outlets.

Recommended mounting height is 6” above the top of the cylinder valves.

Caution

Failure to follow the following instructions can result in personal injury or property damage:

- Never permit oil, grease, or other combustible materials to come in contact with cylinders, manifold, and connections. Oil and grease may react with explosive force when ignited while in contact with some gases – particularly oxygen and nitrous oxide.
- Cylinder valves should always be opened very slowly. Heat of recompression may ignite combustible materials creating an explosive force.
- Pigtails should never be kinked, twisted, or bent into a radius smaller than 3 inches. Mistreatment may cause the pigtail to burst.
- Do not apply heat. Oil and grease may react with explosive force when ignited while in contact with some gases – particularly oxygen and nitrous oxide.
- Cylinders should always be secured with racks, chains, or straps. Unrestrained cylinders may fall over and damage or break off the cylinder valve which may propel the cylinder from its current position.
- Oxygen manifolds and cylinders should be grounded. Static discharges and lightning may ignite materials in an oxygen atmosphere, creating a fire or explosive force.
- Welding should not be performed near nitrous oxide piping. Excessive heat may cause the gas to dissociate, creating an explosive force.
- Remove all protective caps prior to assembly. The protective cap may ignite due to heat of recompression in an oxygen system.



Installing a 1 x 1 Cylinder Kit

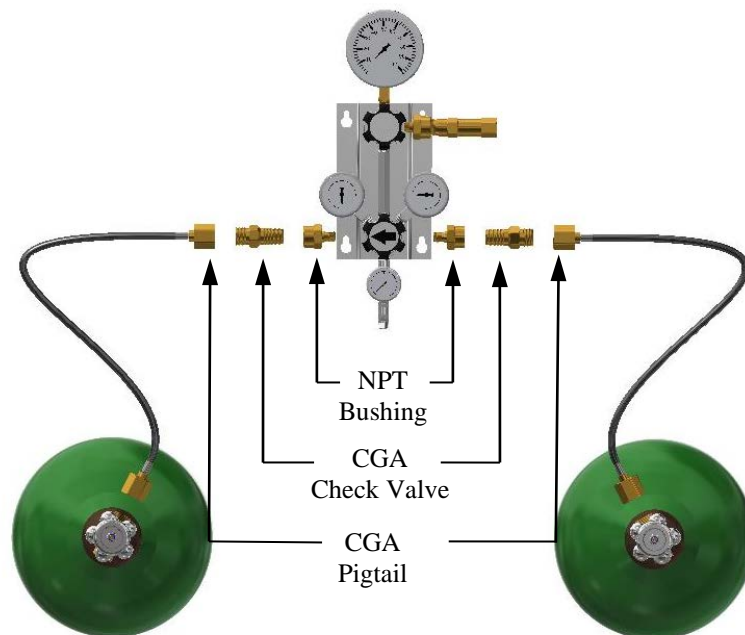
Refer to Diagram Below

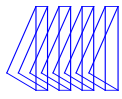
Note: Use Oxygen compatible thread sealing tape for all pipe thread joints.

(Do not apply sealing tape to CGA thread joints.)

If the optional Alarm Kit is being used on this manifold, install that per the instructions supplied with the Alarm Kit before proceeding.

1. Install the 1/4" male NPT x 1/2" female NPT bushing into one of the inlet ports on the lower end of the ATS manifold. The inlet ports will have the letter "H" marked adjacent to them.
2. Install one of the CGA gas specific check valves into the NPT bushing.
3. Repeat steps 1 and 2 for the opposite inlet port.
4. Secure the cylinders to the wall on each side of the manifold with racks, chains, or straps.
5. Remove any protective cap from the cylinder valves, and with the valve pointing away from you, briefly open the cylinder valve to clear any debris, then close the valve. Repeat for each valve.
6. Remove any protective caps from the CGA gas specific pigtails and attach one end to the CGA check valve inlet fitting and the other end to the cylinder valve. Do not kink or twist any pigtail during installation. The minimum bend radius is 3 inches.
7. Ensure all connections are wrench tight.
8. Continue with the Manifold Start Up procedure on page 8.





Installing a 2 x 2 Cylinder Kit

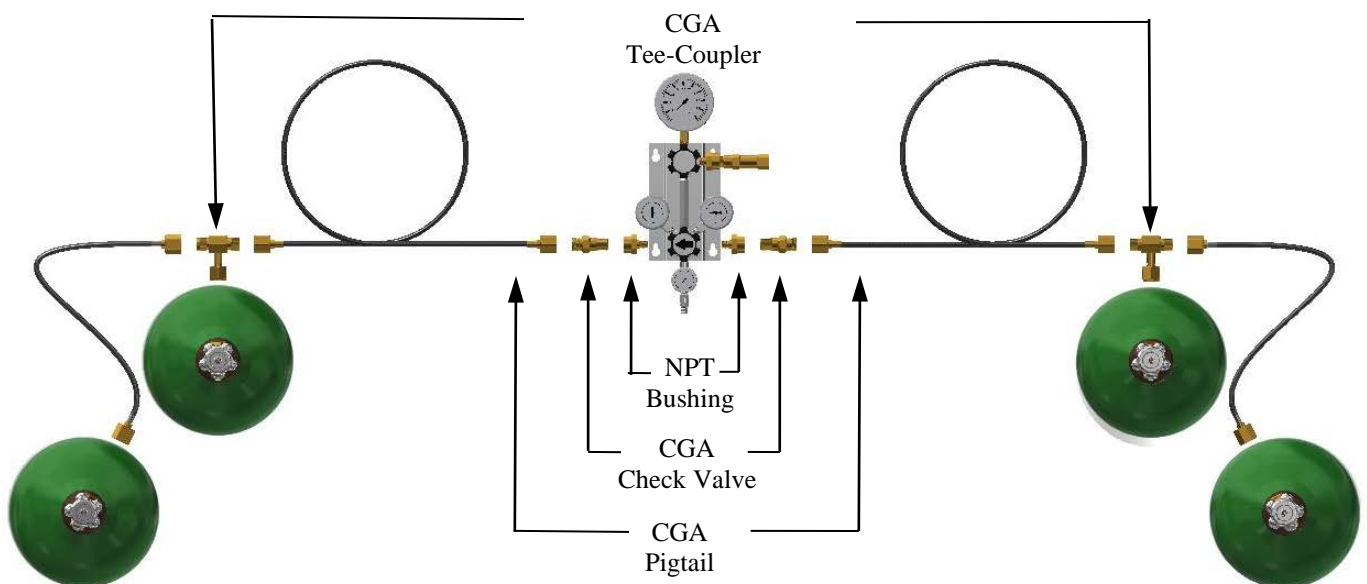
Refer to Diagram Below

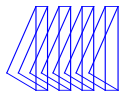
Note: Use Oxygen compatible thread sealing tape for all pipe thread joints.

(Do not apply sealing tape to CGA thread joints)

If the optional Alarm Kit is being used on this manifold, install that per the instructions supplied with the Alarm Kit before proceeding.

1. Install the 1/4" male NPT x 1/2" female NPT bushing into one of the inlet ports on the lower end of the ATS manifold. The inlet ports will have the letter "H" marked adjacent to them.
2. Install one of the CGA gas specific check valves into the NPT bushing.
3. Repeat steps 1 and 2 for the opposite inlet port.
4. Secure the cylinders to the wall on each side of the manifold with racks, chains, or straps.
5. Remove any protective cap from the cylinder valves, and with the valve pointing away from you, briefly open the cylinder valve to clear any debris, then close the valve. Repeat for each valve.
6. Install a CGA gas specific Tee-Coupler in each cylinder valve except the last one furthest from the manifold inlet.
7. Ensure all connections are wrench tight.
8. Remove any protective caps from the CGA gas specific pigtailed and attach one end to the CGA check valve inlet fitting and the other end to the Tee-Coupler on the first cylinder.
9. Ensure all connections are wrench tight.
10. Remove any protective caps from another pigtail and attach one end to the open port on the Tee-Coupler and the other end to the last cylinder valve.
11. Ensure all connections are wrench tight.
12. Repeat steps 5 thru 11 on the opposite side.
13. Continue with the Manifold Start Up Procedure on page 8.





Installing a 3 x 3 Cylinder Kit

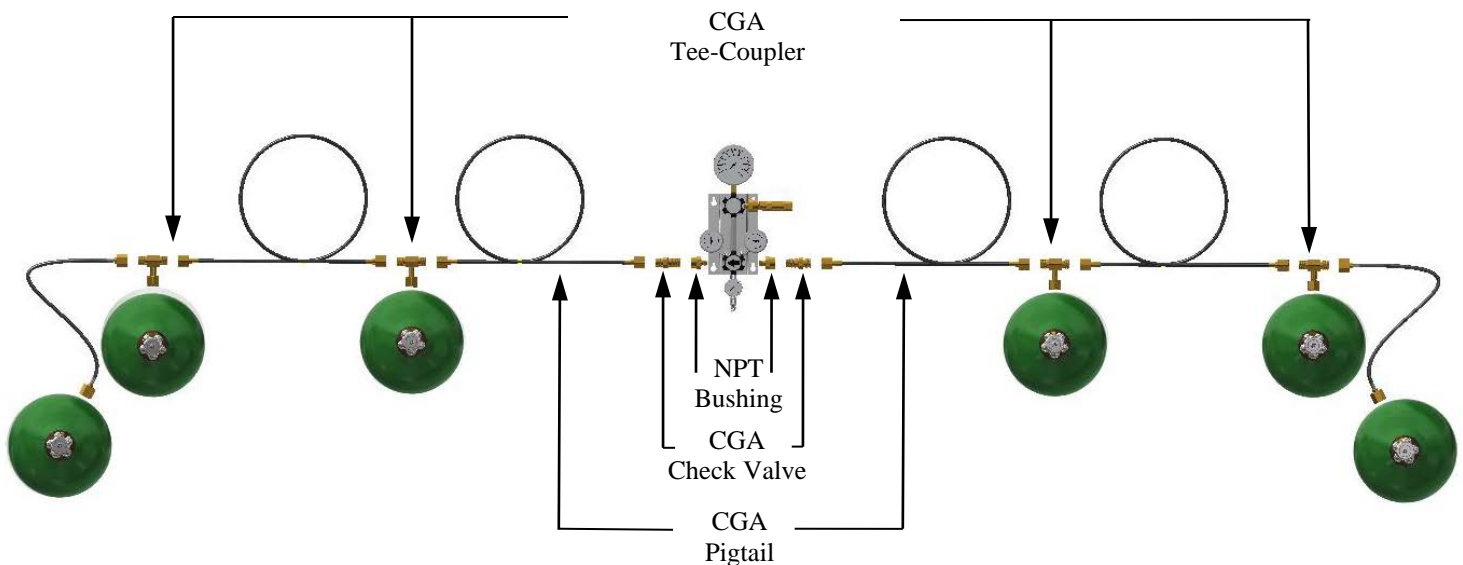
Refer to Diagram Below

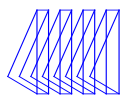
Note: Use Oxygen compatible thread sealing tape for all pipe thread joints.

(Do not apply sealing tape to CGA thread joints)

If the optional Alarm Kit is being used on this manifold, install that per the instructions supplied with the Alarm Kit before proceeding.

1. Install the 1/4" male NPT x 1/2" female NPT bushing into one of the inlet ports on the lower end of the ATS manifold. The inlet ports will have the letter "H" marked adjacent to them.
2. Install one of the CGA gas specific check valves into the NPT bushing.
3. Repeat steps 1 and 2 for the opposite inlet port.
4. Secure the cylinders to the wall on each side of the manifold with racks, chains, or straps.
5. Remove any protective cap from the cylinder valves, and with the valve pointing away from you, briefly open the cylinder valve to clear any debris, then close the valve. Repeat for each valve.
6. Install a CGA gas specific Tee-Coupler in each cylinder valve except the last one furthest from the manifold inlet.
7. Ensure all connections are wrench tight.
8. Remove any protective caps from the CGA gas specific pigtails and attach one end to the CGA check valve inlet fitting and the other end to the Tee-Coupler on the first cylinder. Do not kink or twist any pigtail during installation. The minimum bend radius is 3 inches.
9. Ensure all connections are wrench tight.
10. Remove any protective caps from another pigtail and attach one end to the first Tee-Coupler and the other end to the second Tee-Coupler.
11. Remove any protective caps from another pigtail and attach one to the open port on the Tee-Coupler and the other end to the last cylinder valve.
12. Ensure all connections are wrench tight.
13. Repeat steps 5 thru 12 on the opposite side.
14. Continue with the Manifold Start Up Procedure on page 8.

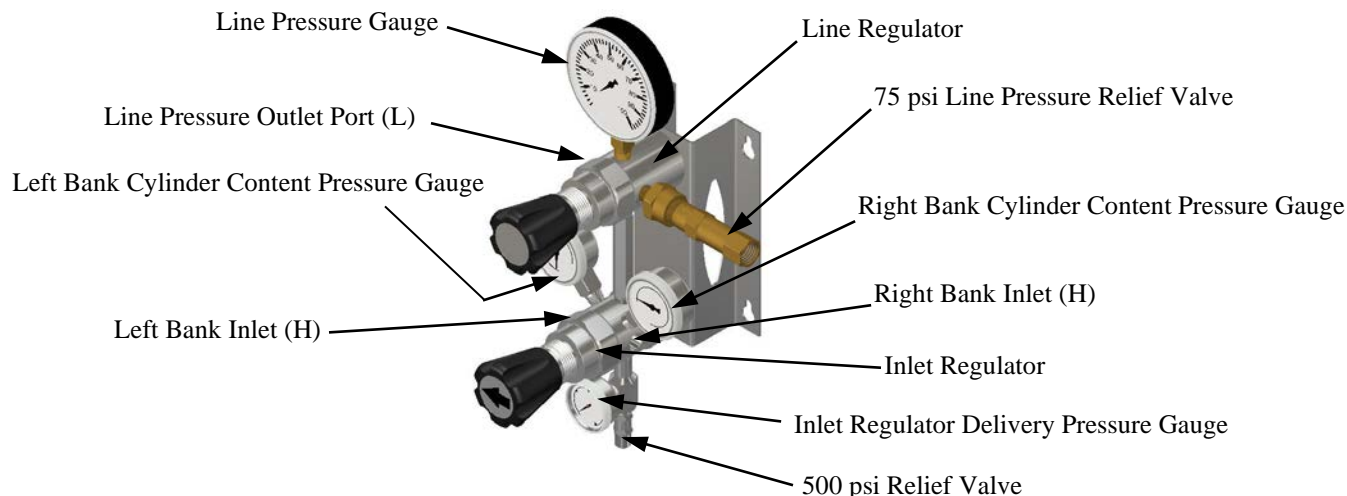




ATS Series Manifold Start-Up Procedure

Note: Complete the piping of the gas outlet from the left port of the top regulator on the ATS Manifold as needed, before opening any of the cylinder valves.

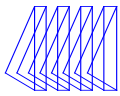
The ATS-50 Auto Switch Manifold is designed to automatically switch from the primary bank to the reserve bank when the primary bank cylinder pressure drops below 325 psi on the right or 275 psi on the left. The direction you select the arrow to point on the bottom inlet regulator knob will determine which bank is the primary.



1. After installation of the manifold system ensure all connections are wrench tight.
2. Back off the adjusting knob all the way (*counter-clockwise*) of the top line regulator.
3. Before pressurizing the system, ensure the arrow on the bottom inlet regulator knob is turned all the way to the right.
4. Slowly open the cylinder valve(s) on the right, primary, bank and check for leaks using an oxygen compatible leak testing solution.
5. Slowly open the cylinder valve(s) on the left, reserve, bank and check for leaks.
6. Correct any leaks before proceeding.
7. Adjust the top line regulator to the pressure needed. Turning the knob clockwise increases the delivery pressure.
8. Check all line regulator port connections as well as the line piping for leaks and correct as needed.

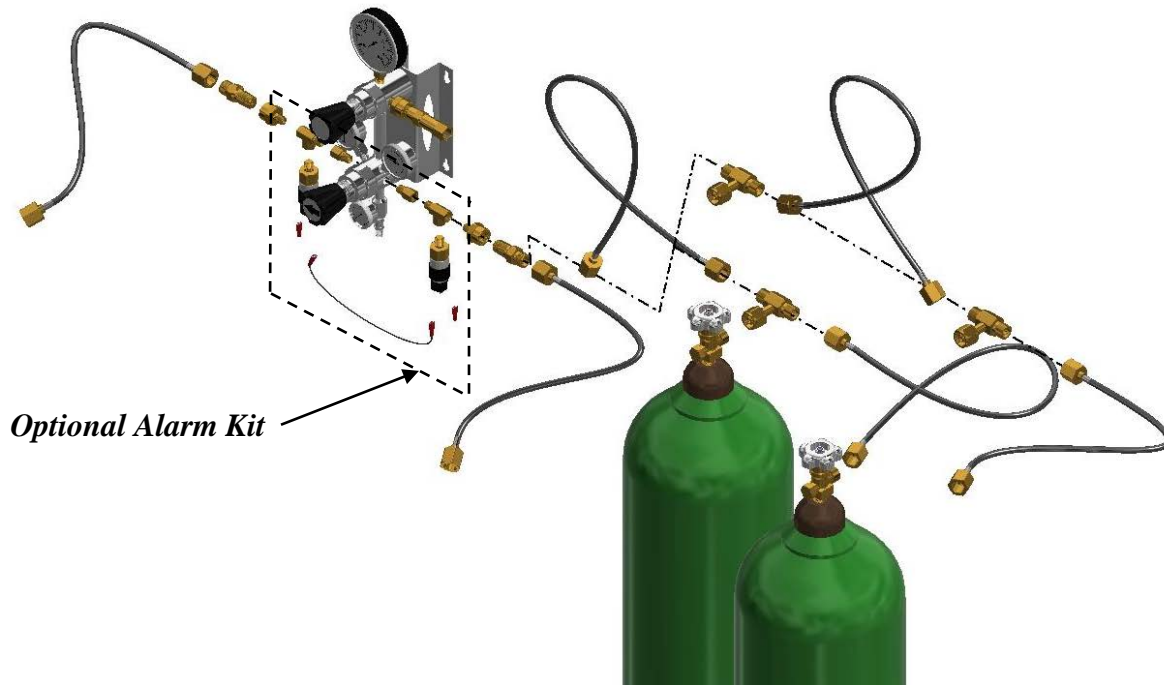
Normal ATS Manifold Cycling During Use:

1. After the primary bank has been depleted. The system will automatically switch over to the reserve bank. The cylinder content pressure gauge on the bottom inlet regulator for the primary bank will stop dropping.
2. Turn the knob on the bottom inlet regulator so the arrow points in the opposite direction making the bank of cylinders the arrow points to, the primary or "in use" bank.
3. Close all the cylinder valves fully on the depleted bank and remove the pigtail(s) from the cylinder valve(s) only. A small amount of gas will be vented when the first pigtail is loosened exhausting the residual pressure.
4. Replace the empty cylinders following the precautions on page 4 and the steps described in the cylinder kit installation portion of these instructions.
5. Slowly open the cylinder valve(s) and check for leaks. Correct as needed.
6. This is now the reserve bank.
7. Repeat steps 1 thru 6 whenever the primary bank has been depleted.



Appendix A

Auto Change Over Manifold Alarm Kit ASM250-Kit



Note: Use Oxygen compatible thread sealing tape for all pipe thread joints.
(Do not apply sealing tape to CGA thread joints)

Refer to the above piping diagram during assembly of the fittings.

The ATS Auto Change Over Manifold should be installed on the wall or suitable surface before installing this alarm kit. If this kit is being added to an existing Change Over Manifold, remove the pigtail, CGA check valve and NPT adaptor from the inlets of the manifold first. Be sure all gas pressure is exhausted before removing fittings.

Installation Procedure:

Install the 1/4" NPT M x F bushing into one of the inlet ports on the lower end of the Auto Change Manifold. Then install the street tee into the 1/4" NPT bushing.

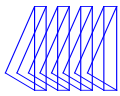
Tighten snug with the port 90° to the inlet facing down as shown.

Install one of the pressure switches into the port of the street tee that is facing down and tighten snug.

Install the 1/4" male NPT x 1/2" female NPT adaptor and then the CGA check valve to the street tee port 180° from the Auto Change Over Manifold inlet as shown.

Repeat the process for the opposite side of the manifold.

Refer to the appropriate Cylinder Kit Installation Instructions, shown on Pages 5 thru 7, to complete the installation.



Appendix B

Wiring the ASM250-Kit to a "T2" Series Master Alarm

Mount the "T2" Series Master Alarm where needed following the instructions provided with the alarm.

Caution: *Be sure the power is OFF to the "T2" Series Master Alarm before proceeding.*

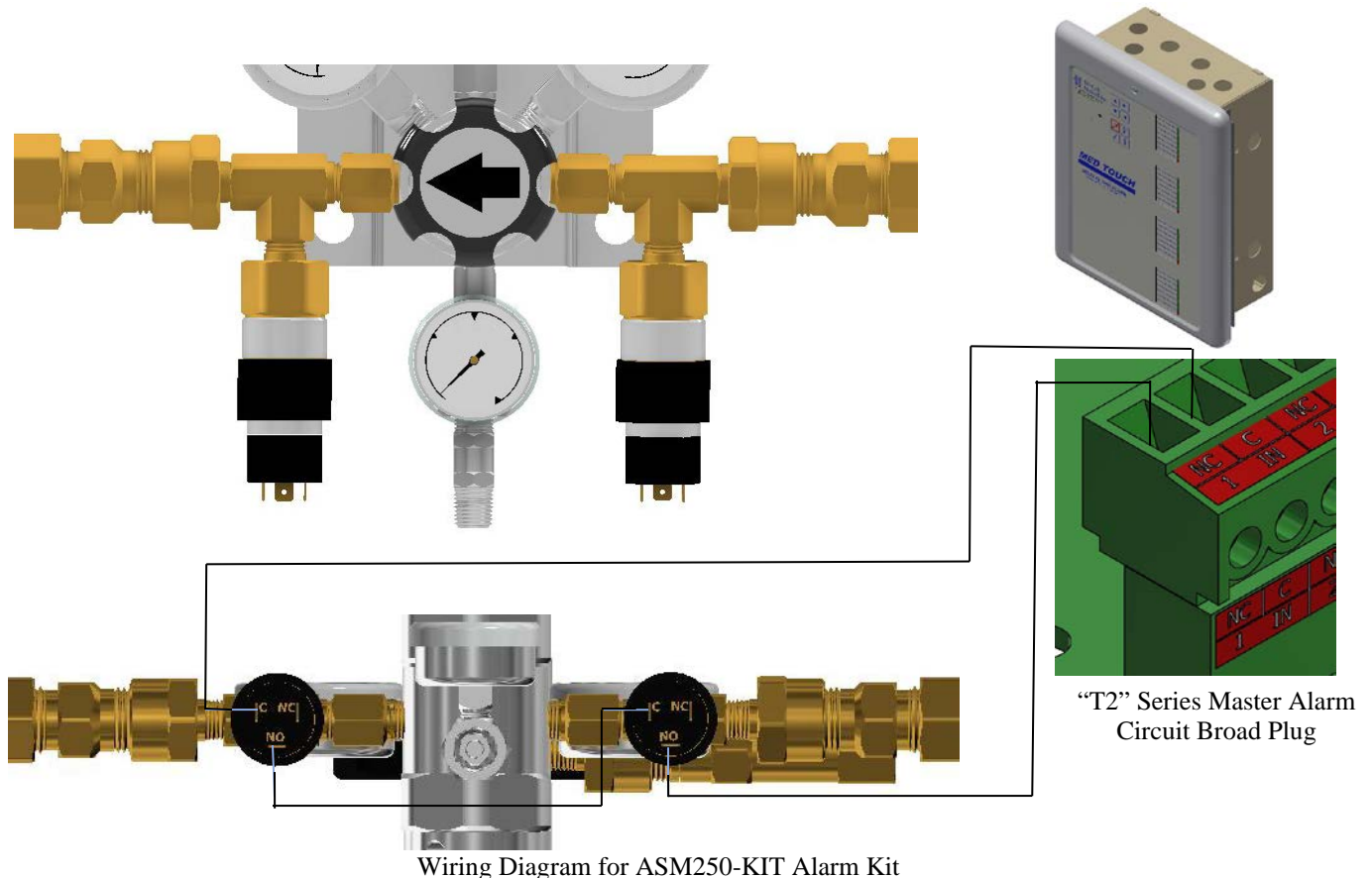
Note: *Single pair stranded wire Belden cable 8442 (22 AWG), 8205 (20 AWG), 8461 (18 AWG) or equivalent can be used to connect the Manifold Alarm Kit to the "T2" Series Master Alarm.*

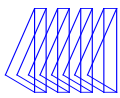
Following the wiring diagram below, connect the black jumper wire provided to the "C" terminal of the right pressure switch and the other end to the "NO" terminal of the left pressure switch.

Route the Belden cable (or two wires) from the pressure switches to the Master Alarm location. Crimp the provided shielded terminals to one end of each wire and connect to the pressure switch as shown on the wiring diagram below i.e. one wire to the "NO" terminal of the right pressure switch and the other wire to the "C" terminal of the left pressure switch.

Connect the wire from the right pressure switch "NO" to the NC gate in any of the 8 Signal IN positions of the Master Alarm circuit board plugs. Connect the other wire from the left pressure switch "C" to the C gate in the same signal position of the plug in the Master Alarm.

Secure the wires from the pressure switches to the Master Alarm and restore power to the Master Alarm.





Appendix C

Wiring the ASM250-Kit to a TAV-1 Audio/Visual Alarm

Mount the TAV-1 Remote Alarm, back plate only, where needed following the instructions provided with the alarm.

Note: Single pair stranded wire Belden cable 8442 (22 AWG), 8205 (20 AWG), 8461 (18 AWG) or equivalent can be used to connect the Manifold Alarm Kit to the TAV-1 Alarm.

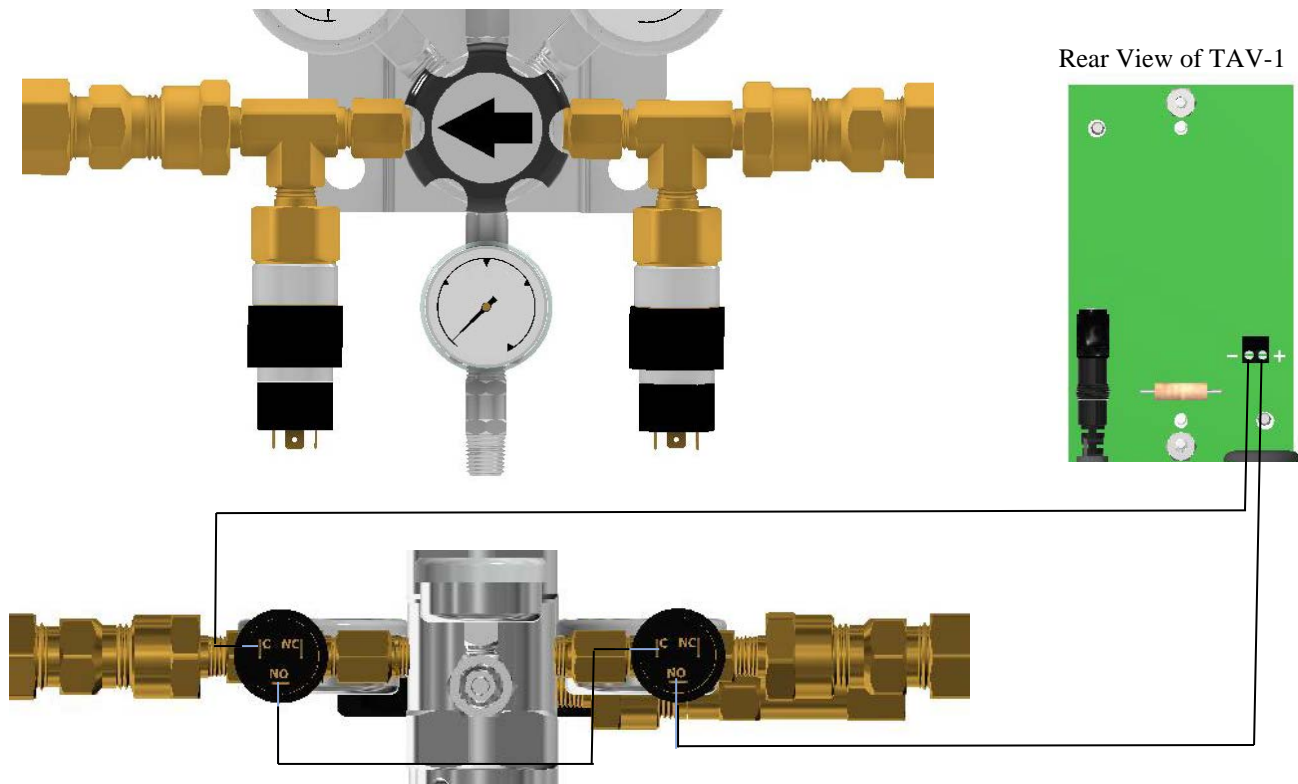
Following the wiring diagram below, connect the black jumper wire provided to the “C” terminal of the right pressure switch and the other end to the “NO” terminal of the left pressure switch.

Route the Belden cable (or two wires) from the pressure switches to the Remote Alarm location. Crimp the provided shielded terminals to one end of each wire and connect to the pressure switch as shown on the wiring diagram below. i.e. One wire to the “NO” terminal of the right pressure switch and the other wire to the “C” terminal of the left pressure switch.

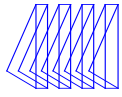
Connect the wire from the right pressure switch “NO” to the (+) gate in the remote alarm and the other wire from the left pressure switch “C” to the (-) gate in the remote alarm.

Complete the assembly of the TAV-1 Remote Alarm box.

Secure the wires from the pressure switches to the remote alarm and plug in the remote alarm power supply.



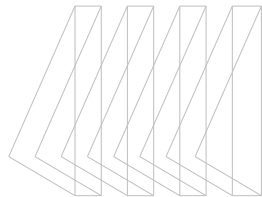
Wiring Diagram for ASM250-KIT Alarm Kit



**Tri-Tech
Medical Inc.**

*Manufacturer of Medical
Gas Pipeline Equipment*

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**Tri-Tech
Medical Inc.**

Tri-Tech Medical Inc., 35401 Avon Commerce Pkwy., Avon, Ohio 44011

Tel. 1-800-253-8692 -or- 440-937-6244 Fax. 440-937-5060

Web site www.tri-techmedical.com E mail address: sales@tri-techmedical.com