

# **SCOTT** **S A F E T Y**



**HUSH Air Compressor**



**Simple Air Compressor**

## **Stationary Air Compressor Systems** *Operating Instructions*



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**Stationary Air Compressor Systems**  
**Operating Instructions**  
**SCOTT P/N 595134-01 REV C 1/12**

## IMPORTANT SAFETY INSTRUCTIONS

To reduce the risk of fire, electrical shock, injury to persons, or damage when using this equipment, follow basic precautions including the following:

1. Read and follow ALL user instructions and recommended procedures and safety precautions as provided in this manual. Failure to do so could result in serious injury or death.
2. Read and follow all **DANGER**, **WARNING**, and **CAUTION** statements in this instruction. Failure to do so could result in serious injury or death. These statements use the following pattern:

**DANGER**

Danger is used to indicate the presence of a hazard that **will** cause severe personal injury, death, or substantial equipment damage if the warning is ignored.

**WARNING**

Warning is used to indicate the presence of a hazard which **may** cause severe personal injury or substantial component damage if the warning is ignored.

**CAUTION**

Caution is used to indicate the presence of a hazard which can cause minor personal injury or component damage if the warning is ignored.

**NOTE**

Notes are used to notify the operator of installation, operation, or maintenance information that is important but not hazard-related.
3. Do not operate this equipment while under the influence of drugs, alcohol, or any medications or substances which may affect vision, dexterity, or judgment. Users of this equipment must be in good physical and mental health in order to operate safely. Do not use this equipment when fatigue prevents safe operation. Stay alert when operating this equipment. Inattention or carelessness while operating this equipment may result in serious injury or death.
4. Training is required before use of this equipment. Improper use may result in serious injury or death. Improper use includes, but is not limited to, use without adequate training, disregard of the warnings and instructions contained herein, use of the equipment for purposes not included in these instructions, and failure to inspect and maintain the equipment.
5. All electrical connections shall be installed by a qualified electrician in accordance with applicable electrical codes and shall include proper grounding of the equipment.
6. All service must be performed by qualified trained technicians. When servicing, disconnect power from the equipment and follow all necessary Lock-Out/Tag-Out procedures and safety procedures.
7. Hot surfaces can cause serious injury. Allow the equipment to cool before servicing.
8. Establish a schedule for performing routine maintenance as outlined in these instructions.
9. Refer to the Material Safety Data Sheet (MSDS) for instructions on the safe handling of any chemicals used in the maintenance or servicing of this equipment.
10. Moving parts can cause serious injury. Be sure all guards and covers are in place and secure before starting the unit.
11. High pressure air is dangerous. Handle the high pressure air connections and hoses with care to prevent serious injury or death.
12. The air produced by this equipment must be recertified periodically as meeting CGA Grade D or better breathing quality air. Regular recertification to this standard is the responsibility of the user.
13. If this equipment does not operate as described in these instructions, **DO NOT USE THE EQUIPMENT**. Follow your procedures to remove the equipment from service including any "Lock-out/Tag-out" procedures to prevent use of the equipment. Contact authorized personnel to inspect and service the equipment.
14. If you have any questions or concerns regarding the installation, use, or maintenance of this equipment, contact your authorized SCOTT distributor, or contact SCOTT at 1-800-247-7257 (or 704-291-8300 outside the continental United States) or visit our web site at [www.scottsafety.com](http://www.scottsafety.com).

**SAVE THESE INSTRUCTIONS.**

## Safety Notations

The following types of safety notations are used throughout this manual:



Danger is used to indicate the presence of a hazard that will cause severe personal injury, death, or substantial equipment damage if the warning is ignored.



Warning is used to indicate the presence of a hazard which may cause severe personal injury or substantial component damage if the warning is ignored.



Caution is used to indicate the presence of a hazard which can cause minor personal injury or component damage if the warning is ignored.

### **NOTE**

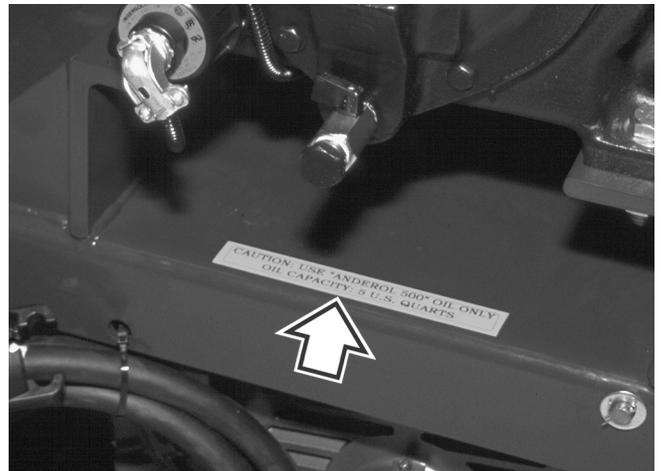
Notes are used to notify the operator of installation, operation, or maintenance information that is important but not hazard-related.

## **IMPORTANT**

**Follow ALL recommended procedures and safety precautions as provided in this manual.** Federal, State and local codes mandate safety precautions and procedures for the handling and production of breathable air. Consult State and local occupational health and industrial safety ordinances for additional requirements.

## Safety Labels

Note the safety labels that are affixed to the unit as a reminder of important safety precautions. Always read and understand all safety labels prior to operating the unit. Safety labels should never be removed, defaced, or covered.



SHS-HAC-0401-G250

**Read and follow all safety labels on the unit.**

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## **Limited Warranty**

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### **SCOTT SAFETY**

#### **Limited Warranty on Scott Stationary Breathing Air Compressor Products**

Scott Safety (SCOTT), a division of Scott Technologies, Inc., warrants all of its STATIONARY BREATHING AIR COMPRESSOR PRODUCTS to be free from defects in workmanship and materials for a period of one (1) year from the date of original manufacture by SCOTT, with the exception of its HUSH AIR COMPRESSOR PRODUCTS. SCOTT HUSH AIR COMPRESSOR PRODUCTS are warranted to be free from defects in workmanship and materials for a period of two (2) years from the date of original manufacture by SCOTT. This warranty applies to all components of these products except expendable components such as oil or oil filters. SCOTT's obligation under this warranty is limited to replacement or repair (at SCOTT's option) of these products when shown to be defective in either workmanship or materials.

Only SCOTT personnel or, when directed by SCOTT, SCOTT authorized agents are permitted to perform warranty obligations. This warranty does not apply to defects or damage caused by repairs of or alterations to SCOTT STATIONARY BREATHING AIR COMPRESSOR PRODUCTS (including HUSH AIR COMPRESSOR PRODUCTS) made by owner or any third party unless expressly permitted by SCOTT product manuals or by written authorization from SCOTT. To obtain performance under this warranty, and as a condition precedent to any duty of SCOTT, the purchaser must present such products to SCOTT, a SCOTT authorized distributor, or a SCOTT authorized service center. Any product returned to SCOTT shall be sent FOB destination to Scott Safety (Attn. Warranty Claim Department) 4320 Goldmine Road, Monroe, NC 28111.

This warranty does not apply to any malfunction of or damage to these products resulting from accident, alteration, misuse, or abuse, which includes and is not limited to failure to perform preventative maintenance recommended by SCOTT.

**THIS WARRANTY IS MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN ADDITION, SCOTT EXPRESSLY DISCLAIMS ANY LIABILITY FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IN ANY WAY CONNECTED WITH THE SALE OR USE OF SCOTT SAFETY PRODUCTS AND NO OTHER FIRM, OR PERSON IS AUTHORIZED TO ASSUME SUCH LIABILITY.**

## **1 - Introduction**

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Congratulations on your purchase of a SCOTT Safety Stationary Air Compressor System. SCOTT Safety provides a full line of breathing air system components and related accessories for the safe production and storage of compressed breathing air.

This manual provides instructions for the operation of the Stationary Air compressor including the control panel, compressed air storage systems, and some optional accessories. Use of the charging station is covered in a separate user instruction.

These instructions are categorized by component, since configurations of breathing air systems will vary depending on selected options. Operators of these units must become familiar with their particular system configuration and refer to the proper instructions as covered in this manual.

This air compressor and equipment are intended for charging breathing air cylinders for use in respirators or self-contained breathing apparatus (SCBA). The compressor and purification system are designed to purify air to meet or exceed recognized air standards as specified by the Compressed Gas Association (CGA G-7.1) and National Fire Protection Association (NFPA 1989).

Proper installation of the Stationary Air Compressor System must be performed in accordance with SCOTT Safety requirements, for optimum performance and adequate warranty coverage. Maintenance of the system beyond the instructions provided herein must be performed by a SCOTT trained and certified technician.



Before use, this equipment must be properly installed and inspected by a SCOTT Safety trained and certified technician. Do not operate if the equipment has not been prepared by a SCOTT authorized service technician. Use of this equipment without proper set up may result in serious personal injury, death, or permanent equipment damage.

For additional information regarding the design, operation, or service of the Stationary Air Compressor System, contact SCOTT Safety at 1-800-247-7257.

**1 - Introduction**

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**HUSH Air Compressor**

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**Simple Air Compressor**

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## 2 - Features

### General Description

The standard Stationary Air Compressor System is equipped with a heavy-duty, three- or four-stage, air-cooled compressor. The system also includes an automatic condensate drain system, compressor stage gauge panel, and a low oil shut-off switch. When properly maintained, the air purification system is designed to provide breathing air that meets Grade D/E of the CGA breathing air standard G-7.1. Be sure you understand the breathing air requirements and maintenance procedures of your respiratory protection program.

Additional accessories available for the Stationary Air Compressor System include a Cab Air cabinet enclosure, choice of system controller, breathing air cylinder fill station and compressed air storage cylinders.

These Operating Instructions apply to the following SCOTT Breathing Air Compressor Systems:

#### The Simple Air Compressor Systems

5 HP	5000 psi	Three Stage
7.5 HP	5000 psi	Three Stage
7.5 HP	6000 psi	Four Stage
10 HP	6000 psi	Four Stage

#### The HUSH Air Compressor System

20 HP	6000 psi	Four Stage
15 HP	6000 psi	Four Stage

*Illustrations of the two compressors follow on the next pages.*

### Routine Maintenance

The reliable operation of this equipment depends on proper care and routine maintenance.

The operator must be trained by an authorized SCOTT Safety technician in the proper operation of the stationary breathing air system. The operator must read, understand, and adhere to all safety precautions and pre-operation tasks as described in this manual.

All scheduled maintenance beyond the scope of this manual must be noted by the operator to be performed by a SCOTT trained and certified service technician. A Maintenance Record page is provided in this instruction.

When ordering spare parts, note the unit model and compressor serial number. This information will avoid delays and the possibility of incorrect parts being provided. The Stationary Air Compressor System model number is stamped on the system identification tag. The location of this tag will vary with the system model. The compressor serial number is stamped on a metal plate attached to the crankcase of the compressor.



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#### **Compressor System Model Number (Actual appearance and location may vary)**

To order replacement components, call 1-800-247-7257 or contact an authorized SCOTT Safety distributor.

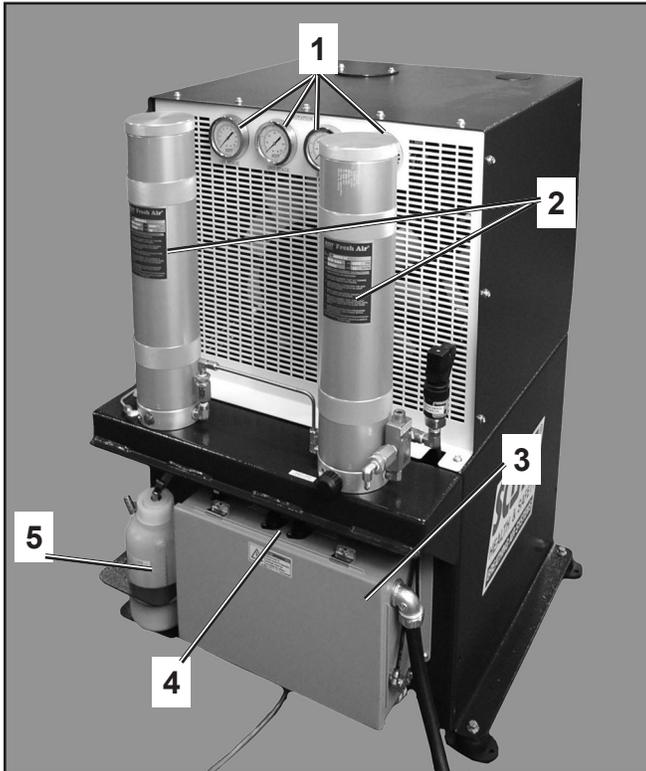


### **CAUTION**

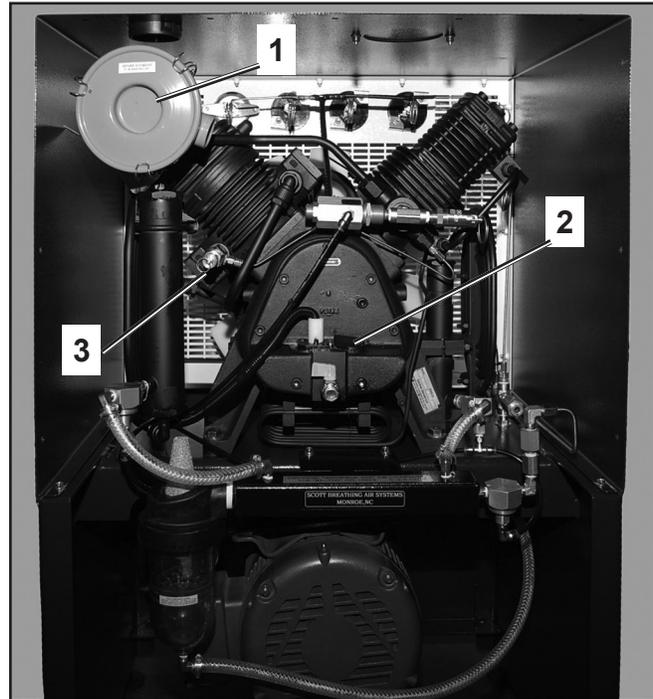
Use only SCOTT approved parts and supplies when servicing this compressor system. Use of unapproved parts or supplies may result in reduced performance or damage to the equipment.

## 2 - Features

### Simple Air System Components



- 1) Stage Gauges (Four Stage Compressor shown)
- 2) Purification Filters
- 3) Electric Box (Fuse Location)
- 4) Fuses (2)
- 5) Condensate Container



- 1) Inlet Filter
- 2) Oil Fill Cap
- 3) Interstage Relief Valve

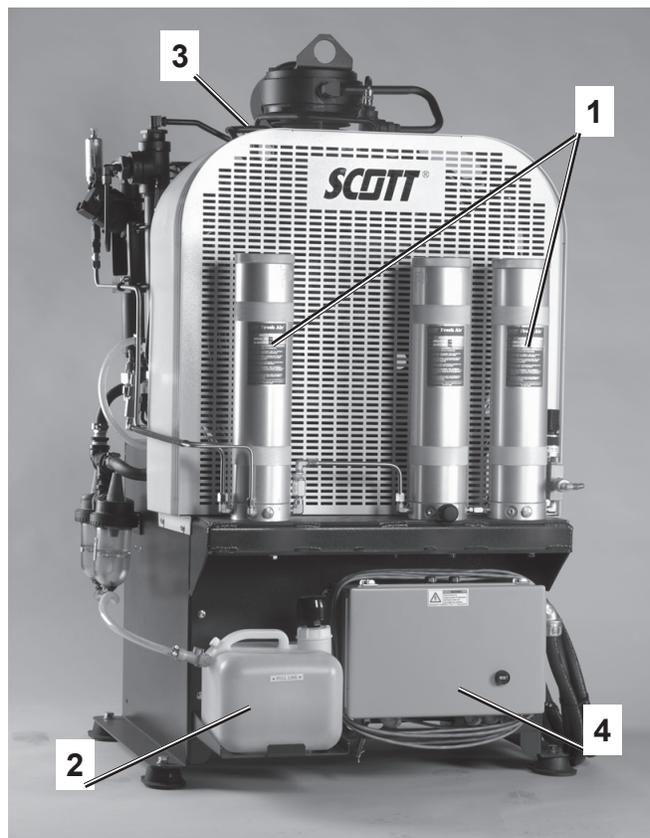


Model Number - Open Units

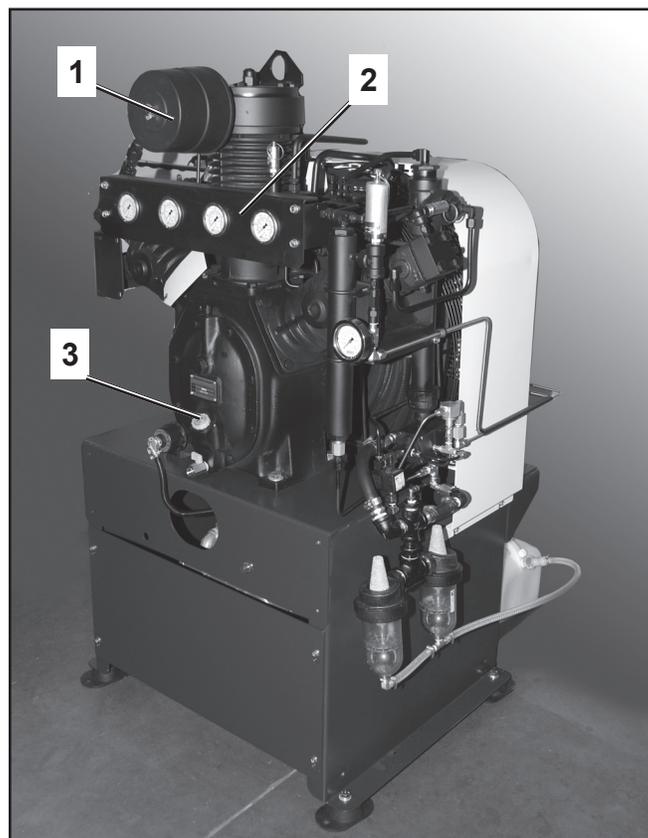
#### NOTE

The actual appearance of the equipment may vary depending on the model and options installed.

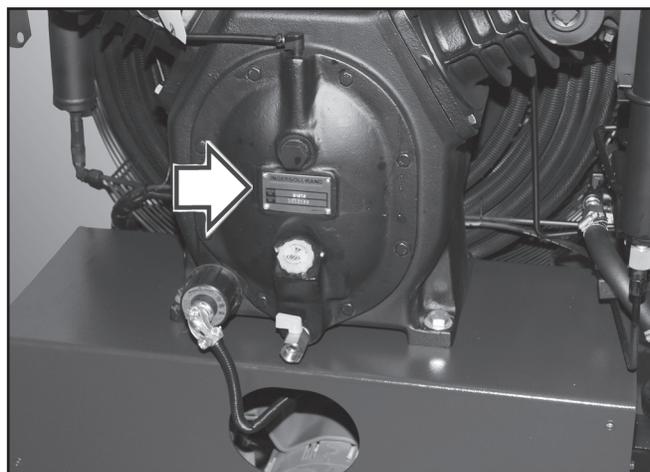
**HUSH Air Compressor System Components**



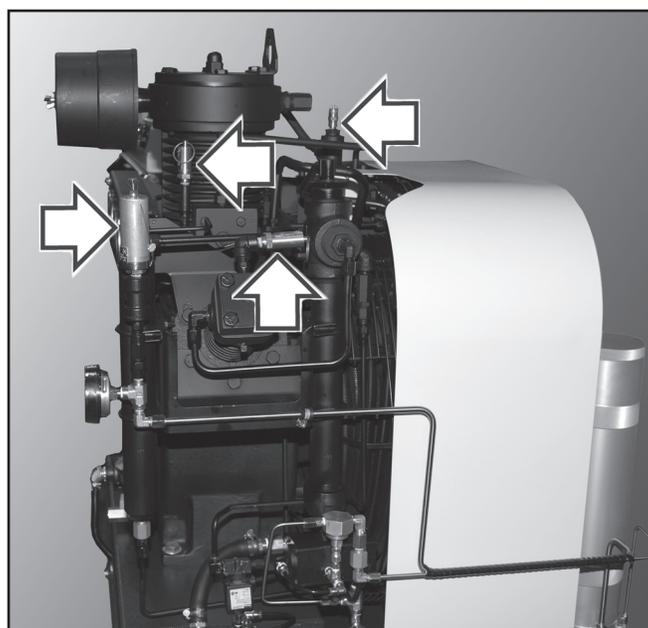
- 1) Purification Filters
- 2) Condensate Container
- 3) Pressure Relief Valve
- 4) Electrical Box (Fuse Location)



- 1) Inlet Filter
- 2) Stage Gauge Panel
- 3) Oil Fill Cap



**Compressor Serial Number**



**HUSH Air Pressure Relief Valves**

## 2 - Features

### Principle of Operation

The production of high-pressure breathing air can be divided into four categories:

**Compression** - accomplished by a multi-stage compressor assembly.

**Purification** - accomplished by mechanical filtration and chemical purification.

**Storage** - accomplished in DOT or ASME certified storage cylinders.

**Handling and Charging** - accomplished with equipment used to connect and fill the breathing air cylinders.

Electrical current (available as 208 or 230 VAC single phase, or 208, 230, or 460 VAC, 3-phase) delivers power to a motor that drives the compressor through a Vee-Belt.

Ambient air is filtered and then compressed to the maximum system pressure in three or four stages. Each stage is equipped with a standard safety valve, set slightly above the normal working pressure of the stage; the valve will release high pressure air to protect the system in case of mechanical failure. All stage pressure readings are indicated on the front panel (Simple Air) or on the compressor gauge panel (HUSH Air).

An air-circulating fan mounted on the flywheel is used to blow cooling air through the four stage air coolers and over the compressor head cooling fins. Air passing through the air coolers serves to lower the air temperature to increase compressor efficiency.

Moisture separators continuously remove moisture from the compressor intercooler and aftercooler air circuits. During normal operation, the dump solenoid valves are activated automatically every 15 minutes. The condensate container collects the moisture from the moisture separators; the container must be manually drained when full.

When the discharge pressure reaches the maximum preset level, the compressor is unloaded. The moisture traps open, and the compressor continues to run without compressing air. Prior to stopping, the compressor will run unloaded through a cool-down cycle while draining the moisture separators and cooling down the compressor stages. This prevents the development of rust in the compression cylinders and also provides for an unloaded compressor restart.

After the pressurized air leaves the compressor, it passes through a multi-stage purification system. The number of stages depends on the horse power, and therefore the air output capacity of the compressor. The higher the air output, the more purification elements are needed. The purification system further dries the air and removes other impurities.

From the purification system, the air can go directly to charging breathing air cylinders, or can be sent to high pressure storage cylinders and maintain the pressure in the storage for charging several breathing air cylinders before the compressor restarts to refill the storage.

### Breathing Air Quality

The X4 Controller is available in several configurations. The full-feature controller model includes monitors for both Carbon Monoxide (CO) and Moisture (Dew Point or DP) levels along with the standard monitors for high discharge air temperature and low oil conditions. These monitors give an indication of the quality of the breathing air being produced. If monitored conditions are out of tolerance, the controller emits a visual and audible alarm and will subsequently shut down the compressor.

*On compressor systems where the SCOTT CO or Dew Point monitors are not installed or operational, it is the responsibility of the organization using this equipment to establish procedures to assure the breathing air quality to the end user in the time between the routine air samples. Failure to establish procedures to monitor the breathing air quality could result in undetected problems that could lead to production of air that does not meet the CGA breathing air standards cited on Page 7 of this instruction.*

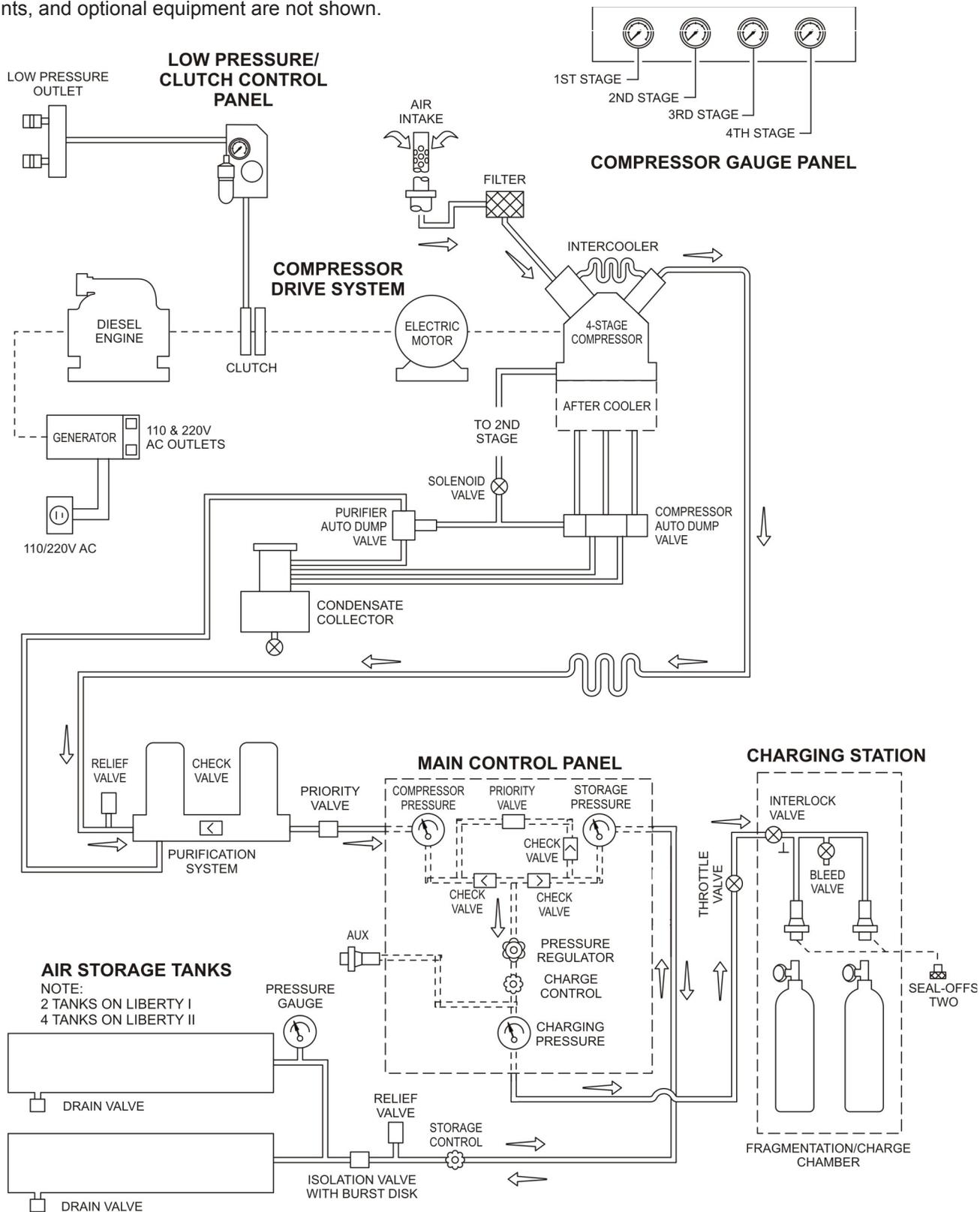


On compressor systems where the CO or Dew Point monitors are not installed, it is also the responsibility of the organization using this equipment to establish procedures or to install test equipment to assure the breathing air quality to the end user in the time between the routine air samples. Failure to establish procedures or to install test equipment to monitor the breathing air quality could result in undetected problems that could lead to production of air that does not meet the breathing air standards which could lead to serious injury or death of the respirator users.

*It is also the responsibility of the System Administrator to inform the Operator what features are installed and enabled and to train the Operator in their use. It is the Operator's responsibility to notify the System Administrator of any alarms or shutdown warnings that occur during the operation of the compressor system.*

### Simplified System Diagram

**NOTE:** The illustration represents a simplified diagram for the purposes of basic operation. Outlets, connection points, and optional equipment are not shown.



## 2 - Features

### X4 Controller

The Stationary Air Compressor System is equipped with an X4 Controller to start and stop the compressor and to provide information about the compressor's performance and condition to the Operator. The X4 Control Panel features an LCD display, a key pad, and warning lights for ALARM, SHUTDOWN, SERVICE, and PURGE.

Four models of the X4 are available for a Stationary Air compressor system:

**The Basic controller** has warning indicators for high discharge air temperature and low oil conditions.

**The CO Only controller** has the same features as the Basic controller but adds a monitor for high carbon monoxide (CO) levels in the breathing air.

**The Dew Point Only controller** has the same features as the Basic controller but adds a monitor for excessive moisture levels (Dew Point or DP).

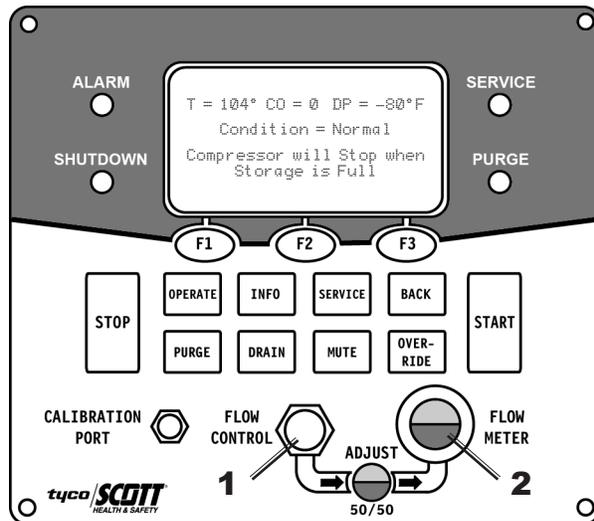
**The Full Feature controller** includes BOTH the Carbon Monoxide (CO) monitor AND the moisture level monitor (Dew Point or DP) along with warning indicators for high discharge air temperature and low oil conditions.

*It is the responsibility of the System Administrator to inform the Operator what features are installed and enabled and to train the Operator in their use. It is the Operator's responsibility to notify the System Administrator of any alarms or shutdown warnings that occur during the operation of the compressor system.*

#### NOTE

If the CO or Dew Point monitor is not installed on your system, the X4 Controller will display "N/A" after the parameter on the LCD screen.

*On compressor systems where the CO or Dew Point monitors are not installed, it is also the responsibility of the organization using this equipment to establish procedures to assure the breathing air quality to the end user in the time between the routine air samples. Failure to establish procedures to monitor the breathing air quality could result in undetected problems that could lead to production of air that does not meet the breathing air standards.*



**On X4 Controllers equipped with either CO or Dew Point monitoring, the following features will be present:**

- 1) Flow Control Dial
- 2) Air Flow Adjustment Eye

If monitored conditions are out of tolerance, the controller emits a visual and audible alarm and will subsequently shut down the compressor.

The controller allows the system to run in either AUTO or MANUAL mode. In AUTO mode, the compressor will automatically restart when storage pressure drops approximately 500 psi below the maximum system pressure. When in MANUAL mode, the compressor stops after purging and must be restarted manually.

### Purification

After leaving the compressor, compressed air passes through a series of purification chambers.

The Stationary Air compressor is available rated for either 5000 or 6000 psi working pressure to purify up to 84,000 SCF of air (based on 70°F/21°C inlet temperature). A mechanical filter separator removes oil, moisture, and airborne foreign particles from the pressurized air. The remaining purifier chambers remove additional chemical particles from the air before being released for use.

After the air has been compressed and purified, it is directed either to a charging station for filling breathing air cylinders or to storage cylinders, depending upon system options.

## Storage

The Stationary Air compressor may be configured to direct compressed air to an optional air storage system.

Storage systems can meet peak demands for compressed air without the requirement of full-time compressor operation. Stored air can also be used to carry on operations in the event of compressor failure, loss of power to run a compressor, or in areas where compressors are not available.

### Storage Cylinders

A standard air storage system consists of a set of two, four, or six ASME or DOT certified storage cylinders. ASME cylinders are designed and constructed in accordance with Section Eight of the American Society of Mechanical Engineers (ASME) code for Unfired Pressure Vessels. ASME cylinders may be installed vertically or horizontally, depending upon system options. All storage systems are equipped with a service valve and a relief device.

DOT cylinders meet the standards set by the Department of Transportation (DOT); these cylinders are generally lighter in weight (approximately 200 lbs each) and are always installed vertically.

Each DOT cylinder stores 509 standard cubic feet at 6000 psi. Each ASME cylinder has the capacity to store 454 standard cubic feet (SCF) at 5000 psi, or 525 SCF at 6000 psi.

**DOT cylinders** must be visually inspected and hydrostatically tested by a licensed cylinder re-tester in accordance with the appropriate US Department of Transportation (DOT) specification or applicable DOT exemption, or in accordance with the appropriate Transport Canada (TC) Permit of Equivalent Level of Safety. Depending on when the DOT storage cylinders were purchased, this may be five (5) or ten (10) years. Verify the required re-test schedule for your DOT storage cylinders and establish a procedure for having the cylinders re-tested to that schedule.

The date of manufacture marked on the cylinder is also the date of the first hydrostatic test. Subsequent test dates are indicated by labels affixed to the cylinder.

If the required hydrostatic test date has expired for the DOT cylinder, DO NOT USE the cylinder. Notify a supervisor or other certified personnel responsible for cylinder inspection.

**ASME cylinders** do not require hydrostatic testing, but include a drain valve and gauge. If installed, safety valves on ASME cylinders must be tested on an annual basis. ASME safety valves can be identified by a tag or label showing traceability to the National Bureau of Standards (NB) and a tamper evident seal. Some SCOTT storage systems with ASME storage cylinders are protected by single use rupture disks that cannot be tested.

Refer to specific ASME or DOT safety standards for additional testing information.



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**DOT Storage Cylinders**

### Bulk vs. Cascade Storage Systems

Storage receivers can be configured together as a single bulk storage bank, or separately in a cascade system. When configured as a single bank, cylinders are “piped” together into a single volume. Storage pressure is indicated by a single gauge on the main control panel.

Cylinders in a cascade system are plumbed separately which allows for more efficient use of compressed air since each cylinder can be isolated when accessing system air. With a manual cascade system, a cascade panel with individual fill control valves and gauges for each cylinder or bank require the operator to control the selection and flow of air from each bank.



**Manual Cascade Air Storage - Control Panel**

With the SCOTT Smart Fill Auto Cascade cylinder filling system, the selection and flow are managed automatically. Instructions for use of a cascade storage system are included in the separate procedures for filling breathing air cylinders.

## 2 - Features

### Handling and Charging

Compressed air may be directed to a charging station for charging breathing air cylinders. Two SCOTT models are available: the RevolveAir and the Guardian. Both stations include a control panel, a secure fragmentation chamber, and rigid "fast-attach" charge adapters for quick and safe breathing air cylinder charging.

The RevolveAir charging station is identified by a turntable device that allows for simultaneous charging of two breathing air cylinders to any pre-selected pressure not to exceed the rated pressure of the cylinders being charged. Meanwhile, a second set of cylinders can be attached and made ready on the outside of the chamber.

The Guardian is a closed-lid, bottom vent, total containment fill station. The design allows for simultaneous charging of two breathing air cylinders to any pre-selected pressure not to exceed the rated pressure of the cylinders being charged.

Separate User Instructions are provided with the selected Charging Station.

### Dual Pressure Regulator

Some SCOTT charging stations may be equipped with an optional Dual Pressure Regulator for controlling the maximum fill pressure when charging breathing air cylinders. The dual pressure regulator allows for two standard fill pressure settings for breathing air cylinders, such as 2216 psi and 4500 psi.

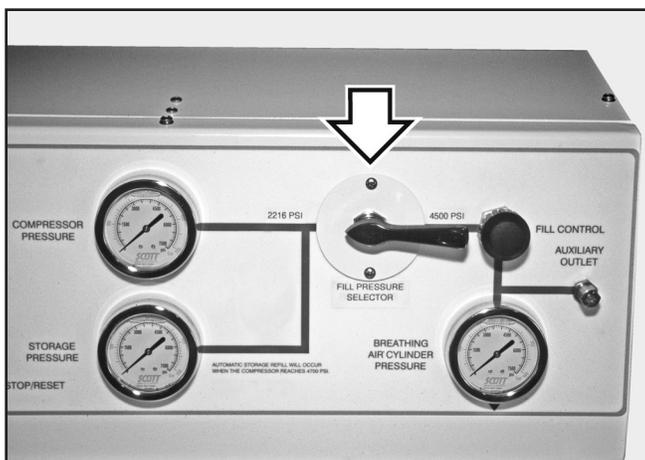
The two pressure settings are factory-set, and can be adjusted only by a SCOTT trained and certified service technician. See the procedure on filling breathing air cylinders for instructions on operating the dual pressure regulator.

### Auxiliary Air Outlets and Gauges

The standard charging station control panel is equipped with two auxiliary air outlets that can be used to serve a variety of compressed air needs. These outlets may be located on the front or on the back of the control panel.

Additional air outlets are also available in a number of configurations, and may include associated gauges and control valves. For example, a high pressure auxiliary air outlet can be provided that allows for charging remote air storage cylinders at varying pressure ratings up to the maximum system pressure. These optional auxiliary outlets and related controls are normally installed on a designated control panel established for this option.

For information on the operation of the auxiliary air outlets, refer to Auxiliary Air Outlets in Chapter 5 of this manual.



**Dual Pressure Regulator Option**

*Illustration shows pressure set for 2216 psi*

## **3 - Starting and Operating the Stationary Air Compressor System**

### **Introduction**

The operator of the Stationary Breathing Air System must be fully trained before operating the equipment. The operator is responsible for:

- Pre-Operational Checks,
- Safe operation of the compressor including checking all installed system monitors (such as CO or dew point),
- Reporting any service notices for routine maintenance or any notices for out-of-tolerance conditions,
- Responding promptly and properly to any out-of-tolerance conditions that may occur,
- Proper shutdown of the equipment.

The operator must be trained in charging breathing air cylinder as well as the hazards of working with compressed air.

The System Administrator who has the responsibility for setup and maintenance of this equipment must inform the operator what features have been ENABLED and are available to the operator including System Overrides.

### **DANGER**

Training is required before use of this equipment. Improper use of this equipment may result in serious injury or death. Improper use includes, but is not limited to, use without adequate training, disregard of the warnings and instructions contained herein and failure to inspect and maintain this equipment.

### **Working with Compressed Air**

**High-pressure air can be dangerous.**

**NEVER** tighten, loosen, or adjust any type of fitting that is under pressure.

**NEVER** adjust a safety relief valve. The valve is installed to prevent overloading the air compressor and related system components. Interfering with this setting can result in serious damage or injury.

**NEVER** perform any service on this equipment unless the electric power is switched OFF at the main terminal, the compressor is completely stopped, and all residual air pressure has been released from the system. Follow the recommendations of the OSHA Lock Out/Tag Out procedures or your organization's safety procedures.

**NEVER** pass in front of an air outlet when compressed air is being released. High pressure air could cause injury.

**NEVER** attempt to straighten or reuse bent tubes or utilize any damaged fittings.

**NEVER** charge a breathing apparatus or ASME storage cylinder beyond the rated working pressure.

**NEVER** fill a breathing air cylinder that has not been inspected according to this instruction and verified to be acceptable for filling.

**REMEMBER** - Compressed air can kill. Treat it with respect.

### **DANGER**

The misuse of compressed air can cause severe injury or death. Take every precaution in the use of compressed air. Always remember to release all residual air pressure from the compressor system before repairing or doing maintenance work.

## 3 - Starting and Operating

### Pre-Operation Checks

#### IMPORTANT

Perform all pre-operation checks prior to starting the unit. Establish and maintain a pre-operation inspection procedure for the compressor and related accessories. Routine inspection of the equipment is the responsibility of the organization using the equipment, and must be in accordance with technical and service guidelines provided by SCOTT Safety.



#### DANGER

NEVER perform service on this equipment unless the electric power is switched OFF at the main terminal, the compressor is completely stopped, and all residual air pressure has been released from the system. Follow your organization's safety procedures or the recommendations of the OSHA Lock Out/Tag Out procedures. Failure to secure the equipment may result in exposure to high pressure air or electrical current that may result in serious injury or death.



#### DANGER

Consult the manufacturer's material safety data sheets (MSDS) for any chemicals or fluids used in the operation of this equipment. Failure to do so may result in exposure to toxic chemicals leading to serious personal injury.

#### NOTE

The actual appearance of the equipment may vary depending on the model and options installed.

### Removing the Cab Air Cabinet Enclosure

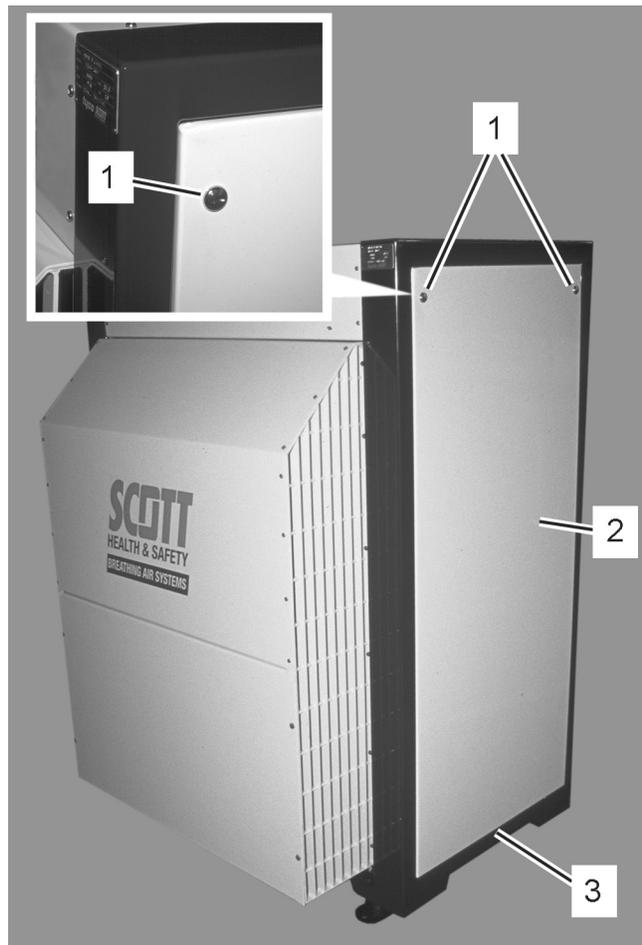
#### (For enclosed units only)

It may be necessary to remove the optional Cab Air cabinet enclosure prior to performing pre-operation checks. There are two styles of cabinet panels: Quarter-Turn Screws and Finger Screws.

#### Quarter-Turn Screws

Be sure to lift up on the panels when removing them from the unit. The bottom edge of the panel is held in place by pins that may be bent and damaged if the panel is not removed properly.

1. Use a flat-blade screwdriver (or flat edge of a coin) to loosen the 1/4-turn fasteners on the top left and right of the access panel.



2. Tilt the top of the panel slightly forward, approximately 2 or 3 inches away from the enclosure.
3. Lift the panel up to remove the bottom edge from the protruding pins. Be careful not to bend the enclosure pins. Place the access panel in a safe place while performing the pre-operation checks.

**ALWAYS replace the panel prior to starting the compressor.** To replace the enclosure panel:

1. Tilting the panel at an angle, place the bottom edge of the panel onto the pins. Do not replace the panel without first setting the bottom pins correctly.
2. Position the top of the panel flush with the enclosure.
3. Secure the 1/4-turn fasteners at the top-left and top-right of the panel using a flat-blade screwdriver or coin.

### Finger Screws

Only the access panel over the purification filters is removable on this version. There are eleven (11) finger screws that hold the panel in place: four (4) on each side and three (3) across the bottom. There are three (3) non-removable screws across the top that hold the internal locator bar.

1. Use fingers or a flat-blade screwdriver to loosen the eleven (11) finger screws on the access panel.



2. Tilt the bottom of the panel out slightly away from the enclosure.
3. Pull the panel straight out to remove. Place the access panel in a safe place while performing the pre-operation checks.

**ALWAYS** replace the panel prior to starting the compressor. To replace the enclosure panel:

1. Tilting the panel at an angle, position the internal locator bar in the top of the opening.
2. Make sure the finger screws all align with their mating holes in the fixed panel.
3. Secure the eleven (11) finger screws. If necessary, using a flat-blade screwdriver to snug the screws. **DO NOT OVER TIGHTEN.**

## 3 - Starting and Operating

### Pre-Operation Check Procedures

1. **Verify that the maintenance schedule is up-to-date for the unit.** Proper routine maintenance and documentation are the responsibility of the organization using the equipment. Maintenance must be performed in accordance with service guidelines provided by SCOTT Safety.
2. **Check the electrical power source.** Ensure that the compressor unit is connected to a suitable electrical power supply, and that there are no maintenance procedures in process that would necessitate a Lock Out/Tag Out of the circuit breaker or master switch.
3. **Make sure there is nothing close to or on top of the compressor that could interfere with air flow.** For proper operation, the minimum clearance established at installation on all sides and above the compressor must be maintained.
4. **Make sure nothing is operating in the vicinity of the compressor air intake which might contaminate the fresh air supply,** such as vehicle exhaust, chimney smoke, ventilator fumes, or other source of contamination.
5. **Check the high pressure connections.** Ensure that the high pressure outlet(s) are properly connected to a suitable high pressure air receiver. If any connection is loose or damaged, DO NOT start the compressor until all connections have been properly repaired and thoroughly inspected.
6. **Check the compressor oil level.** Check the compressor oil level prior to each use. To check the oil, remove the oil fill cap and check the oil level reading. Replenish as necessary, using only Anderol 500 oil or XL-700 oil, available from your local SCOTT Safety distributor.



### WARNING

All maintenance beyond the scope of this manual must be performed ONLY by a SCOTT trained and certified service technician. Unauthorized maintenance or service without proper training can void the warranty, lead to permanent equipment damage, and/or serious personal injury.



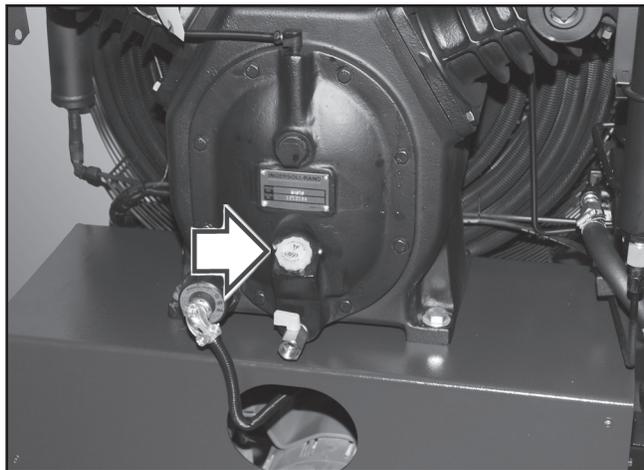
### WARNING

Be sure that the input electrical power supply is correct for the system to be powered. All electrical supply wiring must be performed by a qualified electrician and conform to the National Electric Code, and must comply with all State and local codes and regulations. Use of incorrect electrical power input may permanently damage the equipment and could cause serious injury or death to the user.

### USE OF APPROVED COMPRESSOR LUBRICATING OIL

For compressor lubricating oil, SCOTT Safety recommends the use of either of the following:

- ANDEROL 500<sup>1</sup>
- XL-700<sup>2</sup>



Compressor Oil Fill Cap

<sup>1</sup>ANDEROL 500 is a registered trademark of ANDEROL, Inc., East Hanover, NJ.

<sup>2</sup>XL-700 is a registered trademark of Ingersoll-Rand Company, Montvale, NJ

**NOTES**

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## 3 - Starting and Operating

### Operation of the Compressor System

An electric motor serves as the primary source of power for the compressor system.

The operator must never leave the Stationary Compressor Breathing Air System unattended while the compressor system is operating or in use.

Hearing protection may be required when using the Stationary Air Compressor system for extended periods of time. Refer to the personal safety guidelines or requirements of your organization.



### DANGER

NEVER leave the Stationary Air Compressor system unattended while the compressor is in use. A SCOTT trained and certified operator must monitor the system gauges at all times and take immediate action to guard against equipment failure. This equipment is intended for providing breathable air to save lives. Failure to monitor the system may lead to permanent equipment damage, serious personal injury or death.



### WARNING

Hearing protection may be required when using the Stationary Air Compressor system for extended periods of time. Refer to the personal safety guidelines or requirements of your organization. Exposure to high sound levels may cause temporary or permanent hearing loss in some individuals.

### Compressor Rotation

On compressor systems with 3-phase power supplies, verify the correct compressor rotation before operation on initial start-up after installation or after any service that involves the wiring of the power source to the compressor system. Rotation should be **counterclockwise** when facing the compressor fan. See the arrows on the compressor belt guard.



### CAUTION

Verify the correct compressor rotation before operation. Rotation should be **counterclockwise** when facing the compressor fan. See the arrows on the compressor belt guard. If the rotation is incorrect, DO NOT use the power source until the phasing has been modified by a certified electrical technician. After modification, recheck the rotation.

### X4 Control Panel

The X4 Controller control panel may be located on a separate wall-mounted module or on the breathing air cylinder charging station. The X4 control panel contains controls for operating the compressor system.

Follow the directions on the X4 Controller display screens. You will be instructed to either press one of the buttons on the keypad (START, OPERATE, PURGE, etc.) or one of the Function buttons directly below a selection on the display (F1, F2, or F3).

Before operating the Stationary Air Compressor breathing air system, the operator must be familiar with the location and function of all controls and gauges.

During operation, the X4 Controller will display service notices regarding required service activities such as compressor service or replacement of the Purifying Filters. The operator is responsible for notifying the System Administrator of any messages or alerts regarding service or maintenance requirements.



### DANGER

Training is required before use of this equipment. Improper use of this equipment may result in serious injury or death. Improper use includes, but is not limited to, use without adequate training, disregard of the warnings and instructions contained herein and failure to inspect and maintain this equipment.

Four models of the X4 are available for a Stationary Air compressor system:

**The Basic controller** has warning indicators for high discharge air temperature and low oil conditions.

**The CO Only controller** has the same features as the Basic controller but adds a monitor for high carbon monoxide (CO) levels in the breathing air.

**The Dew Point Only controller** has the same features as the Basic controller but adds a monitor for excessive moisture levels (Dew Point or DP).

**The Full Feature controller** includes BOTH the Carbon Monoxide (CO) monitor AND the moisture level monitor (Dew Point or DP) along with warning indicators for high discharge air temperature and low oil conditions.

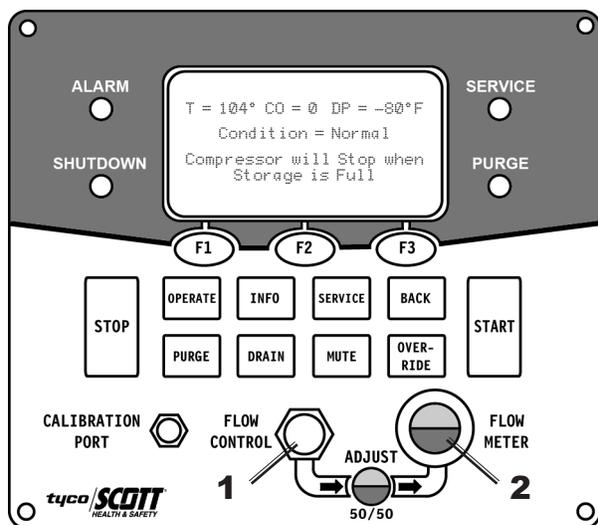
If monitored conditions are out of tolerance, the controller emits a visual and audible alarm and will subsequently shut down the compressor.

**NOTE**

If the CO or Dew Point monitor is not installed on your system, the X4 Controller will display "N/A" after the parameter on the LCD screen.

The controller allows the system to run in either AUTO or MANUAL mode. In AUTO mode, the compressor will automatically restart when storage pressure drops approximately 500 psi below the maximum system pressure. When in MANUAL mode, the compressor stops after purging and must be restarted manually.

*On compressor systems where the SCOTT CO or Dew Point monitors are not installed or operational, it is the responsibility of the organization using this equipment to establish procedures to assure the breathing air quality to the end user in the time between the routine air samples. Failure to establish procedures to monitor the breathing air quality could result in undetected problems that could lead to production of air that does not meet the CGA breathing air standards cited on Page 7 of this instruction.*



**On X4 Controllers equipped with either CO or Dew Point monitoring, the following features will be present:**

- 1) Flow Control Dial
- 2) Air Flow Adjustment Eye

*It is the responsibility of the System Administrator to inform the Operator what features are installed and enabled and to train the Operator in their use. It is the Operator's responsibility to notify the System Administrator of any alarms or shutdown warnings the occur during the operation of the compressor system.*

**! DANGER**

On compressor systems where the CO or Dew Point monitors are not installed, it is also the responsibility of the organization using this equipment to establish procedures to assure the breathing air quality to the end user in the time between the routine air samples. Failure to establish procedures to monitor the breathing air quality could result in undetected problems that could lead to production of air that does not meet the breathing air standards which could lead to serious injury or death of the respirator users.

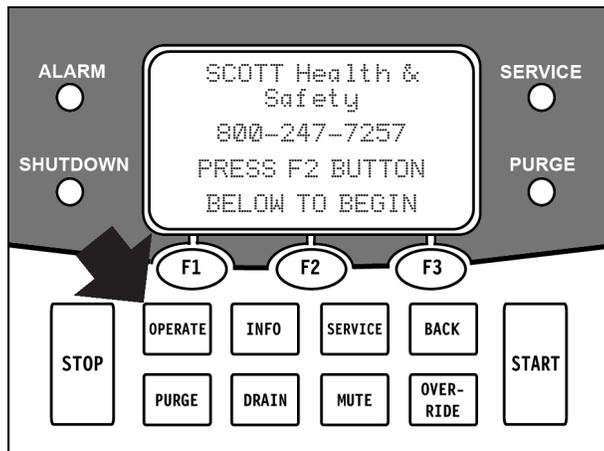
**Operating the Compressor  
continued on the next page...**

## 3 - Starting and Operating

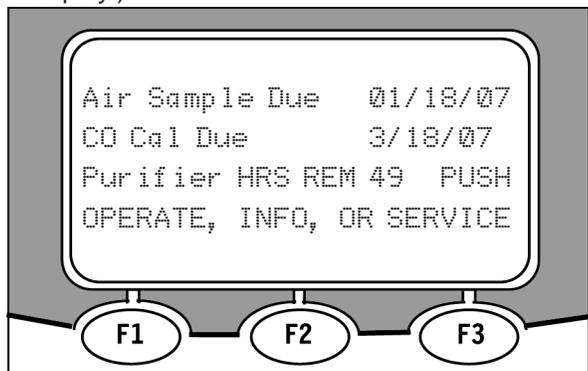
### Operating the Compressor Continued...

#### Operating the Compressor

1. Turn the external power source ON (wall-mounted switch).
2. After the X4 Controller completes the system boot, the display will say, "Press F2 Button Below to Begin." Press the F2 key directly below the X4 Controller digital display.



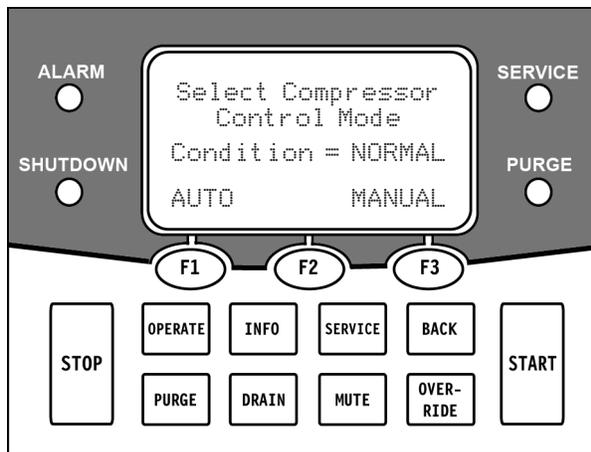
3. The display will show the current Service Due dates and say, "Push Operate, Info, or Service." Press OPERATE on the keypad. (Remember, you can press BACK at any time to return to the previous display.)



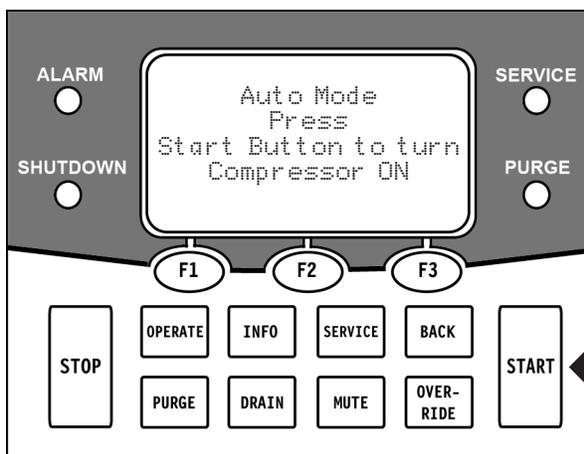
4. The display will read AUTO or MANUAL. Select by pressing the key below the desired mode:

**AUTO** - F1 Key - recommended for "on-site" operation when a constant supply of compressed air is needed. In this mode, the unit will automatically restart when system pressure drops approximately 500 psi below the maximum pressure.

**MANUAL** - F3 Key - used for a single compression cycle. In this mode, the unit will bring the ASME storage cylinders up to maximum system pressure, but will not automatically restart as the pressure is depleted. The unit must be restarted when storage pressure has dropped below a usable level.



5. For normal operation, select AUTO. The following screen will appear:



Press the START button to turn the compressor ON.

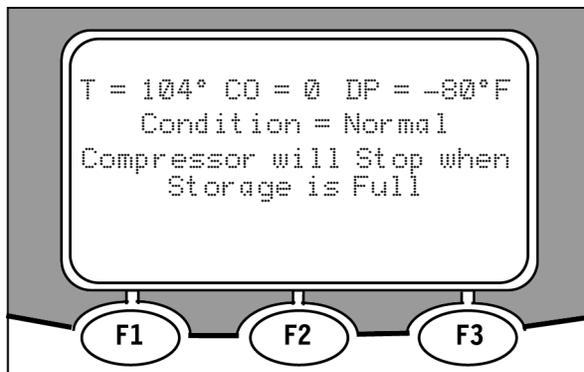
The X4 Controller display will show the compressor discharge temperature ( $T = ^\circ\text{F}$ ) and, if installed, the carbon monoxide concentration ( $\text{CO} = \text{ppm}$ ) and dew point level ( $\text{DP} = ^\circ\text{F}$ ) of the discharge air. Refer to the **System Tolerances and Overrides** section on Page 28. If any of the *Compressor Operating Parameters* are out-of-tolerance, run a Purge cycle as instructed in the **Use of the Purge** section of this instruction.

#### NOTE

The X4 Controller will shut down the compressor if operational tolerances exceed factory-set limits. See the "System Tolerances and Overrides" section of this instruction.

#### NOTE

If the CO or Dew Point monitor is not installed on your system, the X4 Controller will display "N/A" after the parameter on the LCD screen.

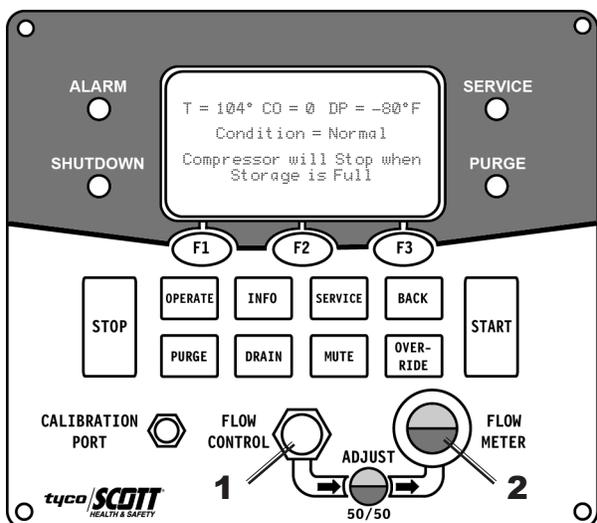


- Continue to monitor the unit during operation, noting the Compressor Pressure and Storage Pressure gauge readings. Also monitor the **Compressor Stage Gauge Readings** as instructed on Page 26 of this instruction.

### Operational Checks

The operator must monitor the breathing air system at all times during operation. See the sections "Compressor Stage Gauge Readings" and "System Tolerances and Overrides."

- When the system pressure reaches approximately 2500 psi, adjust the Flow Control to obtain a 50/50 (red/green) reading in the Flow Meter (only on units with either the SCOTT CO or DP monitors). This provides the correct sample flow rate to the carbon monoxide monitor and/or dew point monitor.



- Flow Control Dial
- Air Flow Adjustment Eye

To verify that the moisture separators are operating properly, press the DRAIN button on the controller. This will activate a fifteen (15) second drain cycle to remove condensation from the moisture separators. Check the Compressor Stage Gauges to verify that they all drop pressure and recover pressure simultaneously.

The compressor will automatically activate a fifteen-second drain cycle at regular intervals to remove condensation. However, a manual fifteen-second drain cycle can be activated at any time by pressing the DRAIN button on the controller.

Pressing STOP will activate a cool-down cycle and stop the compressor.

- When the system reaches maximum pressure, the compressor will run in a cool-down cycle for two (2) minutes. During this time, the compressor will run unloaded while draining the moisture separators, and cooling down the compressor stages. After the cool-down cycle, the compressor will stop.

If the system is in the AUTO mode, the compressor will restart to refill the storage when the system pressure drop approximately 500 psi below maximum pressure.

If the system is in the MANUAL mode, the you must press the START button after the storage pressure drops approximately 500 psi from full to restart the compressor to refill the storage.

**Operating the Compressor  
continued on the next page...**

## 3 - Starting and Operating

### Operating the Compressor Continued...

9. If the X4 Controller is in AUTO mode, the compressor will restart when pressure drops approximately 500 psi below maximum system pressure.

If the storage pressure was already FULL when the system was started, the display will say "Storage Full" and the compressor will still restart automatically when the pressure drops.

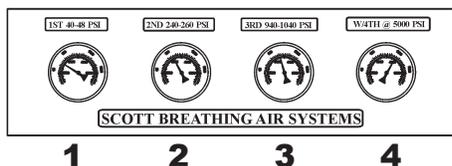
If all Compressor Operating Parameters are in tolerance, the system is ready to fill breathing air cylinders. Proceed to the instructions for charging breathing air cylinders provided with your cylinder charging station (**SCOTT RevolveAir or Guardian**).



NEVER attempt to perform service while the compressor system is in use in the AUTO mode. When the compressor system is in the AUTO mode, the compressor will restart when the storage pressure drops approximately 500 psi below maximum pressure. This can happen at any time without warning. Failure to observe this warning could result in serious injury or death.

### Compressor Stage Gauge Readings

Each of the four compression stages operates in a specific range of pressure to build to the maximum output pressure. On the HUSH Air compressor, the compressor stage gauges are located on the back of the compressor, the side opposite the air purifying filters. On the Simple Air Compressor, the stage gauges are located on the front of the compressor system enclosure above the air purifying filters.



**Stationary Air Compressor Stage Gauges**

- 1) First Stage Pressure Gauge
- 2) Second Stage Pressure Gauge
- 3) Third Stage Pressure Gauge
- 4) Fourth Stage Pressure Gauge

The operator must check these gauges periodically while the compressor is running to verify that the compressor is operating properly. Each stage is equipped with a suitable pressure relief safety valve designed to protect the compressor.

Note the following stage pressure readings when the compressor reaches its maximum pressure:

#### HUSH Air Stage Gauge Pressure Readings

##### **4-Stage 6000 psi compressor:**

<b>1st Stage</b>	40 - 48 psi (2.8 - 3.3 bar)
<b>2nd Stage</b>	240 - 260 psi (16 - 18 bar)
<b>3rd Stage</b>	1000- 1175 psi (68 - 81 bar)
<b>4th Stage</b>	6000 psi (414 bar)
<b>Purifier Pressure</b>	6000 psi (414 bar)

#### **NOTE**

The HUSH Air Compressor is equipped with a fifth gauge at the Purifier Coalescer.

#### Simple Air Stage Gauge Pressure Readings

##### **3-Stage 5000 psi compressor:**

<b>1st Stage</b>	70 psi (5 bar)
<b>2nd Stage</b>	570 psi (40 bar)
<b>3rd Stage</b>	3200 - 5000 psi (225 - 330 bar)

##### **4-Stage 6000 psi compressor:**

<b>1st Stage</b>	78 psi (5.4 bar)
<b>2nd Stage</b>	445 psi (30.7 bar)
<b>3rd Stage</b>	1220 psi (84.1 bar)
<b>4th Stage</b>	6000 psi (414 bar)*

If system pressure is not building properly, check all four stage pressure gauge readings on the Compressor Stage Pressure Panel. If any gauge does not reach its stage pressure reading, notify your SCOTT authorized service technician.

During a fifteen-second drain cycle or a two (2) minute cool-down cycle, the four gauges should all drop pressure simultaneously. If any one gauge does not drop along with the others, notify your SCOTT authorized service technician.

After a fifteen-second drain cycle, or an automatic restart, all four gauges should return to their stage pressures together.

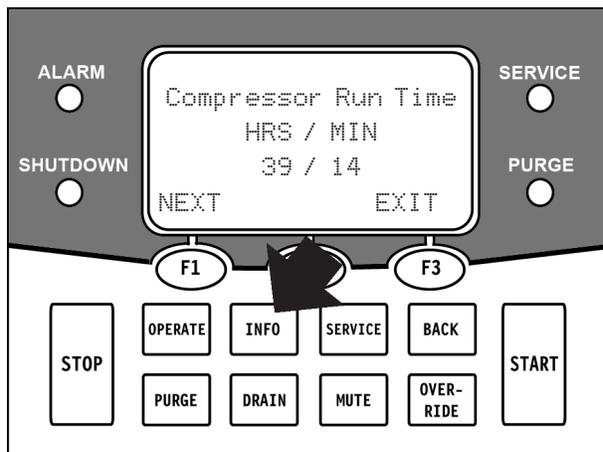
**Information Button**

After initial system boot, the operator may press the INFO button on the X4 Controller to access current Run Time and Schedule information for the compressor system.

**NOTE**

The INFO function is not available when the compressor is operating.

1. Turn the external power source ON (wall-mounted switch).
2. After the X4 Controller completes the system boot, the display will say, "Press F2 Button Below to Begin." Press the F2 key directly below the X4 Controller digital display.
3. The display will show the current Service Due dates and say, "Push Operate, Info, or Service." Press INFO on the keypad. (Remember, you can press BACK at any time to return to the previous display.)



4. Press the F1 button under NEXT to see the available screens. The sequence of displays is as follows:
  - Total Hours of Compressor Run Time, HRS / MIN,
  - Output Air Temp / CO Level / Dew Point,
  - Hour Meter HRS / MIN,
  - Hours Remaining on Purifier Filters, HRS / MIN,
  - Air Sample Due MM/DD/YY,
  - CO Sensor Installation Date, MM/DD/YY,
  - DP Sensor Installation Date, MM/DD/YY,
  - Time Remaining for Compressor Service , HRS,
  - Carbon Monoxide Calibration Due, MM/DD/YY

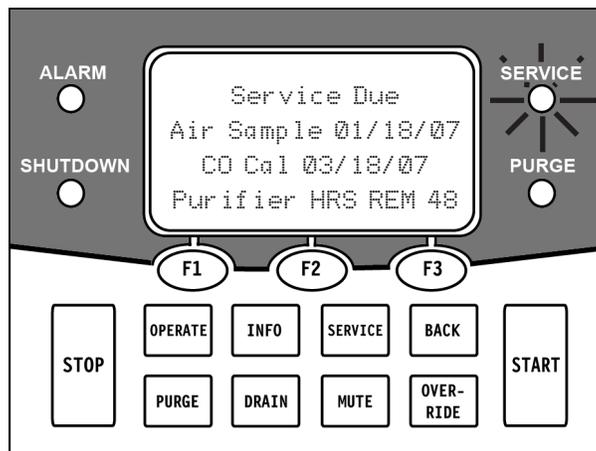
After the complete sequence, select REPEAT to start the sequence, or EXIT.

**NOTE**

If the CO or Dew Point monitor is not installed on your system, the X4 Controller will display "N/A" after the parameter on the LCD screen.

**Service Notifications**

The system will light the SERVICE light on the X4 Controller panel when one of the service requirements is due. The operator should report any approaching service requirements to the System Administrator in a timely manner so that the necessary service can be scheduled and performed.



The X4 Controller tracks the primary Service intervals for several important service functions including:

- Total Hours of operation time,
- Hours since last compressor service\*,
- Hours remaining on Purifier Filters\*,
- When the next Air Sample is due\*,
- When the next Carbon Monoxide Calibration is due\*.

\*The system will light the SERVICE light on the X4 Controller panel when one of these service requirements is due.

The operator must report any Service Due notifications to the System Administrator in a timely manner so that the necessary service can be scheduled and performed.

Refer to the Service Schedule section of Chapter 4, OPERATOR MAINTENANCE CHECKS, for details of the service activities required at prescribed service intervals.

***Operating the Compressor  
continued on the next page...***

## 3 - Starting and Operating

### Operating the Compressor Continued...

#### System Tolerances and Overrides

The X4 Controller monitors certain system conditions during compressor operation including the following:

- Compressor oil level or pressure is measured within the compressor,
- Compressor discharge air temperature (°F) is measure at the final stage outlet of the compressor,
- Carbon Monoxide (CO) is measured after the final air purifier,
- Dew Point level (DP) is measured after the final air purifier.

The system will alarm if conditions approach out-of-tolerance limits, and will subsequently shutdown the compressor when the limits are exceeded.

Compressor Operating Parameters			
Parameter	Alarm	Shut-down	Override Maximum
Air temperature (°F)	470°	495°	550°
Dew Point-DP (°F)	-64°	-55°	-10°
Carbon Monoxide (CO)	4 ppm	6 ppm	30 ppm

**These are the factory pre-set alarm and shutdown set points. Other set points may be programmed by the System Administrator.**

An out-of-tolerance condition indicates a problem or potential problem with the compressor system that must be checked and corrected as soon as possible.

- Low compressor oil level or pressure indicates insufficient oil to operate the compressor.
- High compressor discharge air temperature may indicate a high ambient air temperature condition OR a problem in the compressor. Determine the cause of the problem as soon as possible.
- High CO may indicate the presence of a source of vehicle exhaust in proximity to the compressor air intake.
- High dew point may indicate moisture accumulation in the air intake, residual moisture in the system from non-use of the compressor, a problem with the condensation drain system, or a need to replace the purification filters.

The X4 Controller displays readings for the discharge outlet temperature, the CO level, and the dew point while the compressor is running. The operator must watch these readings for indications that conditions may approach out-of-tolerance levels. The system PURGE can be used at any time and may correct some temporary out-of-tolerance conditions.

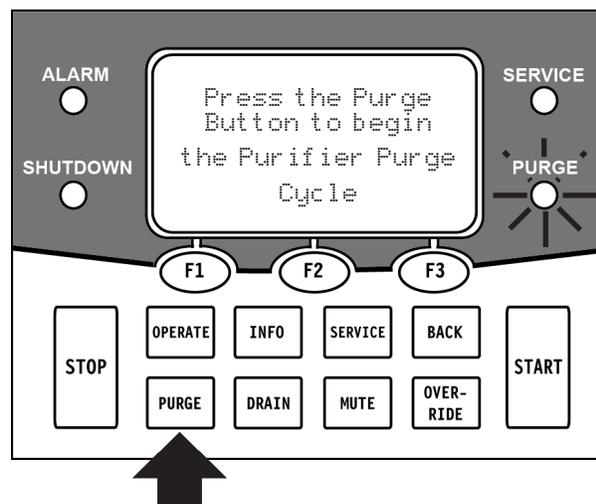
When the readings reach ALARM levels, the operator has the option to Purge the suspect air which may correct the problem, or to keep operating the compressor. When the readings reach the SHUTDOWN levels, the operator must select OVERRIDE to continue producing air for a limited time. Again, use of the PURGE may correct some temporary out-of-tolerance conditions and prevent another Shutdown warning.

The *Overrides* should only be used in emergency situations where there is a compelling reason to continue producing breathing air, such as to save a life. The Override capability must be ENABLED by the System Administrator who has the responsibility for maintenance of this equipment.

#### Use of the Purge

When the CO or dew point readings approach or reach a shutdown the Purge function can be used to expel suspect air after the air purifiers before it goes into the storage cylinders.

To activate the Purge cycle, press the PURGE button on the X4 Controller keypad and follow the instructions on the display. The Purge light on the panel will go on and the air in the purifiers will be vented to the atmosphere.



The display will continue to show CO and dew point levels and will let you know when they are back in an acceptable range. The Purge cycle will NOT end automatically unless the CO AND the dew point levels are below the alarm levels. You must press the STOP button and follow the instructions on the display to end the Purge cycle and return to normal operation.

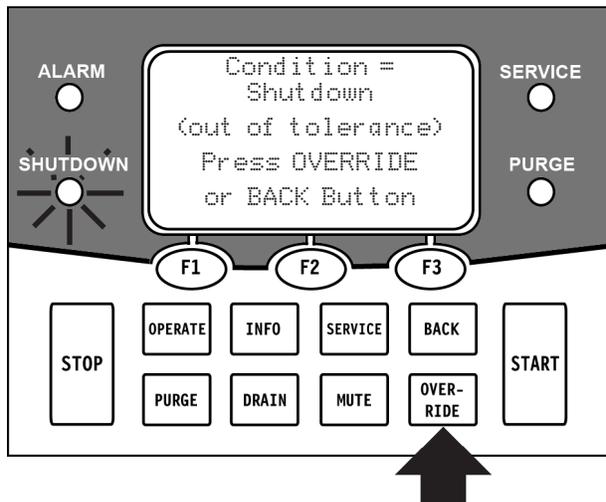
The operator must continue to watch the CO, dew point, and temperature readings for indications that conditions may again approach or reach out-of-tolerance levels.

#### NOTE

DO NOT use the Purge Cycle to attempt to “dry out” the air when the dew point readings are already out of tolerance.

**Overrides**

The X4 Controller also includes limited shutdown override capability for high dew point, high air temperature, high carbon monoxide levels, and low oil level or pressure. Override allows the system to continue running out-of-tolerance up to a maximum preset tolerance, or for one hour, whichever occurs first. The OVERRIDE capability is password protected and may be ENABLED or DISABLED as determined by the System Administrator who has the responsibility for maintenance of this equipment.



The operator must be trained as to whether the override capability is ENABLED and how to use it.

**WARNING**

ONLY use the system override capability in the event of an extreme emergency, or to save a life. During an override condition, the operator must monitor the system at all times. Operating the system beyond factory-set parameters may lead to irreparable component damage, and/or personal injury in the case of system failure.

If the Override capability is ENABLED, press the OVERRIDE key on the X4 Controller to engage the override during a shutdown condition. As long as the maximum preset tolerance is not reached, the override will stay in effect for one (1) hour. After the one hour, the system will again go into a shutdown condition.

**NOTE**

Once the OVERRIDE key is pressed, the Override will stay in effect for the full hour even if the compressor is restarted.

The operator may again press the OVERRIDE key for an additional one hour of operation. After three (3) hours in the override condition, the override capability will be DISABLED and the password is required to re-enable the override capability.

**DANGER**

On compressor systems where the CO or Dew Point monitors are not installed, it is also the responsibility of the organization using this equipment to establish procedures to assure the breathing air quality to the end user in the time between the routine air samples. Failure to establish procedures to monitor the breathing air quality could result in undetected problems that could lead to production of air that does not meet the breathing air standards which could lead to serious injury or death of the respirator users.

**System Shutdown**

1. Press the STOP button. The compressor will run in a cool-down cycle for two (2) minutes. During this time, the compressor will run unloaded while draining the moisture separators, and cooling down the compressor stages. After the cool-down cycle, the compressor will stop.

**CAUTION**

Always allow the compressor to fully charge the storage system, unload and go through a cool-down cycle before final shutdown. Failure to do so can lead to premature wear and/or damage to the compressor and its components.

2. Turn OFF the external power source (wall-mounted switch).

**Emergency Shutdown**

**In case of emergency, push in the red Emergency Shutdown button. This will automatically stop the compressor. The compressor will be locked out and unavailble for four (4) minutes after the Emergency Shutdown button is pushed.**

**WARNING**

Use of the Emergency Shutdown button will stop the compressor immediately without the benefits of a two minute cool-down cycle. In the Emergency Shutdown mode, the compressor will be locked out and unavailble for four (4) minutes. Repeated use of the Emergency Shutdown will result in residual moisture in the system which may result in serious damage to the equipment.

## 3 - Starting and Operating

### Operating the Compressor Continued...

#### Charging the Storage System

The compressor may be equipped with either ASME or DOT air storage cylinders, which are available from SCOTT in a number of configurations. Regardless of the storage configuration, SCOTT storage cylinders **MUST** be installed by a SCOTT trained and certified service technician and inspected periodically prior to use.

#### IMPORTANT

Establish and maintain an inspection procedure for cylinders. Routine inspection of the equipment is the responsibility of the organization using the equipment, and must be in accordance with technical and service guidelines provided by SCOTT Safety.

#### Charging Storage Cylinders

1. If the storage cylinders have been visually inspected, and are found to be in good operating condition, allow the compressor to charge to the maximum system pressure. Compressed air will automatically be directed to the storage cylinders.

2. Monitor the storage pressure gauges.

**Bulk volume:** the storage gauge is located on the main control panel.

**Cascade volume:** individual storage gauges are identified on the Cascade Control Panel.

The time required for charging the air storage system will depend on the number and pressure rating of the storage cylinders. If cylinder pressure does not build properly, contact a SCOTT certified service technician to troubleshoot the system.

#### Cascade Volume Operation

The Cascade Control Panel includes individual gauges and control valves for monitoring and controlling the flow of compressed air in each cylinder. Each cylinder may be isolated, or "shut off" to prevent compressed air from entering or exiting the cylinder.

To isolate a cascaded cylinder, simply turn the control valve *clockwise* to shut off the air flow. Turn the valve *counterclockwise* to allow the compressed air to flow as normal.

#### Storage Cylinder Inspection

**Inspect the storage cylinders and verify the latest inspection date.** Storage cylinder inspection should be performed on a routine basis, as determined by specific organization requirements.

**DOT cylinders** must be visually inspected and hydrostatically tested by a licensed cylinder re-tester in accordance with the appropriate US Department of Transportation (DOT) specification or applicable DOT exemption, or in accordance with the appropriate Transport Canada (TC) Permit of Equivalent Level of Safety. Depending on when the DOT storage cylinders were purchased, this may be five (5) or ten (10) years. Cylinders that must be tested every five (5) years are stamped with the **DOT and TC** numbers around the top of the cylinder. Cylinders that must be tested every ten (10) years are stamped with the number **ISO9809-02** around the top of the cylinder. Verify the required re-test schedule for your DOT storage cylinders and establish a procedure for having the cylinders re-tested to that schedule.

The date of manufacture marked on the cylinder is also the date of the first hydrostatic test. Subsequent test dates are indicated by labels affixed to the cylinder.

If the required hydrostatic test date has expired for the DOT cylinder, **DO NOT USE** the cylinder. Notify a supervisor or other certified personnel responsible for cylinder inspection.



Do not refill any cylinder that is damaged or not within the prescribed hydrostatic test date as determined by the appropriate US Department of Transportation (DOT) specification or the applicable DOT exemption or in accordance with the appropriate Transport Canada (TC) Permit of Equivalent Level of Safety. Damaged cylinders may suddenly leak or rupture if charged with compressed air. Failure to inspect for damage and to empty the air from damaged cylinders may result in personal injury or death.

**ASME cylinders** do not require hydrostatic testing, but include a drain valve and gauge. If installed, safety valves on ASME cylinders must be tested on an annual basis. ASME safety valves can be identified by a tag or label showing traceability to the National Bureau of Standards (NB) and a tamper evident seal. Some SCOTT storage systems with ASME storage cylinders are protected by single use rupture disks that cannot be tested.

Refer to specific ASME or DOT safety standards for additional testing information.

## 4 - Operator Maintenance Checks

### Operator Maintenance Checks

To ensure reliability of the system, the operator is responsible for observing the unit during operation and performing necessary maintenance checks as described in this section. Maintenance and service procedures beyond the scope of these instructions should ALWAYS be performed by a SCOTT trained and certified service technician.



### WARNING

Do not perform maintenance tasks beyond the scope of this manual unless authorized as a SCOTT trained and certified service technician. Performing service procedures without proper training may lead to permanent equipment damage or personal injury.

The operator should perform the following checks each time the Stationary Compressor System is used or, at a minimum, once a week.

#### WITH THE SYSTEM OFF:

- Check the level of the compressor oil. Refer to the Material Safety Data Sheet (MSDS) for instructions on the safe handling of any chemicals used in the maintenance or servicing of this equipment
- Check the Belt condition and tension
- Check for loose components
- Check the Remote Air Intake for leaks

#### WITH THE SYSTEM RUNNING:

- Run the compressor system to operating temperature (approximately 30 minutes) and verify operation of the auto drain system.

#### NOTE

SCOTT recommends that the compressor system should be operated for at least thirty (30) minutes once a week to maintain optimum performance and to identify any problems.

### Service Schedules

Maintenance and service procedures for the Stationary Air Compressor breathing air system must be performed by a SCOTT trained and certified service technician. The operator is responsible for monitoring the compressor run time and notifying the System Administrator when the intervals of fifty (50) and one hundred (100) hours occur. The compressor run time and service due information is available from the X4 Controller using the Information Button (INFO) as described in Chapter 3, STARTING AND OPERATING.

After every fifty (50) hours of compressor running time, the following maintenance should be performed by a trained technician:

- Replace the Air Purifier elements
- Change the break-in compressor oil (perform subsequent oil changes every one hundred (100) hours of compressor run time)
- Check the tightness of all major fasteners including Head Bolts, valve retainers, mounting bolts, etc.

After every one hundred (100) hours of compressor running time, the following maintenance should be performed by a trained technician:

- Replace the air intake filter element
- Change the compressor oil
- Check the Auto Drain system
- Check all other auxiliary systems

The air quality produced by the LIBERTY System should be checked regularly at the following intervals:

Every thirty (30) days:

- If installed, calibrate the Carbon Monoxide Monitor using SCOTT Test Kit P/N AB16-0533.

Every ninety (90) days:

- Take an air sample to verify air quality meets or exceeds CGA Grade E breathing air.

An air sample is required after installation and any service to the system that effects the breathing air path, that is, from the air purifier filters on. For example, changing the air filters would require taking an air sample.

Other major compressor maintenance is required at specific time intervals depending on the make and model of the compressor. The operator should keep the System Administrator informed as to the total compressor run time so these maintenance tasks can be scheduled.

## 4 - Operator Maintenance

### Condensate Container

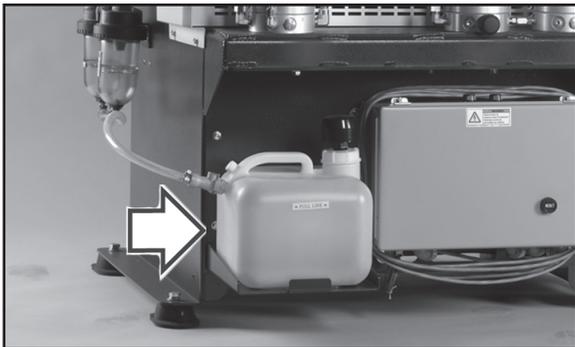
If operating the compressor for an extended period of time, be aware of the level of condensate in the condensate container. The container should be drained when it is approximately three-quarters (3/4) full.



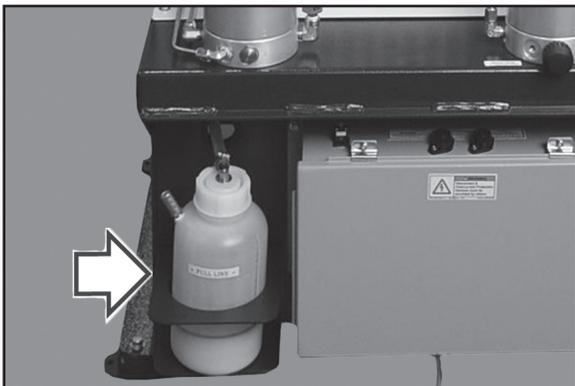
### CAUTION

Compressor condensate contains lubricating oil and/or substances which must be disposed of in accordance with local, State, and Federal laws and regulations.

1. If the compressor is running, press the STOP key on the control panel to stop the compressor.
2. Remove the container from under the compressor frame and pour condensate out from the hose connection spout.
3. Dispose of condensate according to hazardous waste regulations.



**HUSH Air Condensate Container**



**Simple Air Condensate Container**

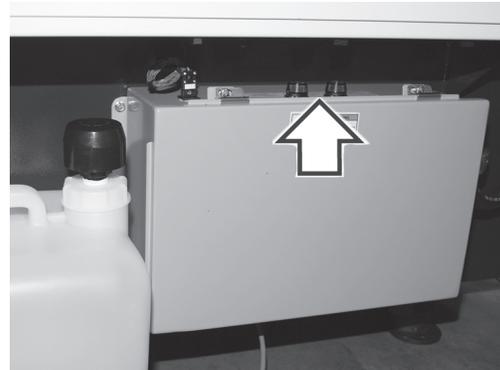
### Electrical Fuses

If the compressor electrical motor is inoperative, check the coil fuses (2) on the outside of the electrical control box. Also check the circuit breaker on the power supply circuit board. Only use replacement fuses with the same size and rating as the fuse being replaced. After replacing any fuse, be sure to notify a SCOTT trained and certified service technician to schedule a thorough system check as soon as possible.

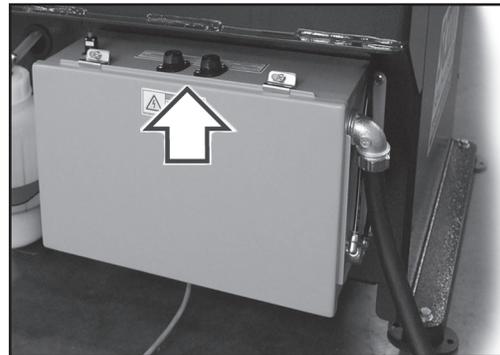
If the replaced fuse blows in a short time, secure the compressor system with your lock-out/tag-out procedures and notify a SCOTT trained and certified service technician to perform a thorough system check before using the system again.

### NOTE

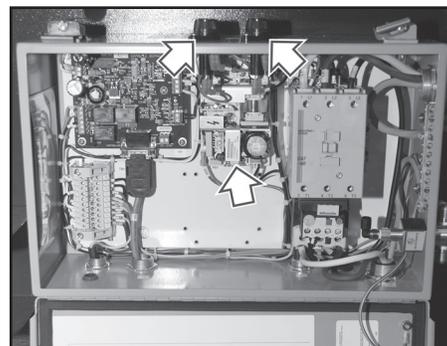
Never use a fuse that is not of the proper rating.



**Hush Air Coil Fuses**



**Simple Air Coil Fuses**

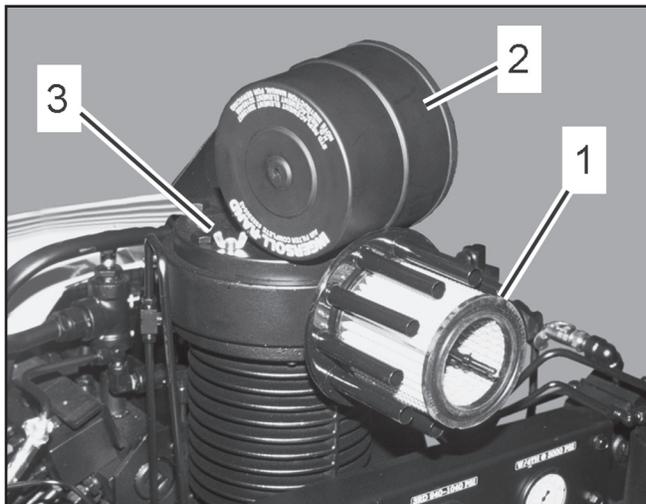


**Power Supply Circuit Breaker and Fuses**

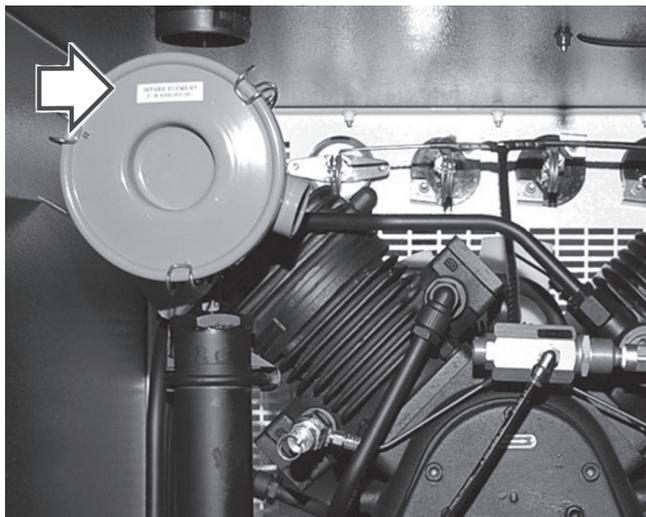
### Inlet Filter

The operator should check the inlet filter located on top of the compressor after prolonged use (approximately 100 hours of operation in normal conditions, or 50 hours if operating in dusty or dirty environments). To change the filter:

1. Loosen the wing nuts to open the filter housing.
2. Remove the cover and inspect the element for excessive build up of dirt and particles.
3. Install a new element as needed and replace the cover.



- 1) **HUSH Inlet Filter Element** (SCOTT P/N AB281277)  
(with Remote Intake, SCOTT P/N ABE065387)
- 2) Filter Cover
- 3) Wing Nut



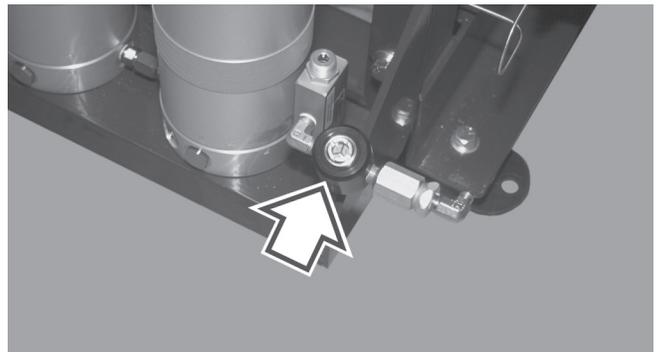
**Simple Air Inlet Filter Cap**

(Part number appears on Filter Housing)

### Purification System Moisture Indicator

If the optional Purification System moisture indicator is installed, the operator should check the indicator after every 10 hours of operation.

If the indicator is white, the entire set of cartridge filters must be changed IMMEDIATELY. DO NOT operate the compressor system if the purification filter moisture indicator is white. Notify a SCOTT trained and certified service technician to have the cartridges inspected and changed according to approved maintenance procedures. If the indicator is blue, all cartridges are in good operating condition. However, the purification filters should be changed every 50 hours of operation even if the indicator is still blue.



SHS-HAC-0312-G189

**Optional Purification Moisture Indicator**  
(Indicator may be located at the output end of the hose)

### Compressor Drive Belt

The compressor drive belt has automatic tensioning.

When the compressor is not running, check the condition of the compressor belt. If the belt is frayed or damaged, do not use the compressor until the belt is replaced.

Contact a SCOTT certified and trained technician for drive belt service and maintenance.

**CAUTION**

Use only SCOTT approved parts and supplies when servicing this compressor system. Use of unapproved parts or supplies may result in reduced performance or damage to the equipment.

**NOTES**

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## 5 - Additional Features

The following additional features pertain to SCOTT breathing air cylinder charging stations such as the RevolveAir or the Guardian. Refer to the user instructions provided with your charging station for complete details.

### Auxiliary Air Outlets (Standard)

**High-pressure air can be dangerous.** Refer to “Working with Compressed Air” in Chapter 3 before operating the auxiliary air outlets. Read and follow all guidelines in this section regarding auxiliary air outlet use and any additional instructional material provided with your unit.

Depending upon selected options, the charging station may be equipped with auxiliary air outlets intended for a variety of compressed air needs. On a standard charging station, one full pressure outlet is located on the back left of the control panel. This full pressure outlet provides the full available pressure from the compressor system. For example, if system pressure is built up to 4700 psi, this is the pressure of the air provided by the full pressure outlet.

Another outlet on the front of the control panel provides regulated system-pressure air. The pressure reading for this outlet is indicated by the fill pressure gauge located on the front of the control panel.

All outlets on the SCOTT Safety charging stations provide CGA Grade D/E breathing air. These outlets may be used to fill remote storage tanks or breathing air cylinders using a suitable receiver or apparatus designed to accept a high pressure air source.

### DANGER

ALWAYS make sure that the auxiliary air outlet is connected to a suitable receiver or apparatus designed to accept a high pressure air source. Inappropriate use of this equipment may cause equipment damage or failure, and can lead to serious personal injury.

### DANGER

NEVER use any auxiliary air outlet to charge a self-contained breathing air (SCBA) cylinder while the SCBA is being worn unless during an extreme emergency situation. Persons operating the air supply and wearing the respirator will be in close proximity to the cylinder and valve assemblies. If any of these components fails, there is an increased risk of serious personal injury or death.

### DANGER

Never use any auxiliary air outlet to charge a self-contained breathing air (SCBA) cylinder while the SCBA is being worn in an atmosphere which is considered Immediately Dangerous to Life or Health (IDLH), where the respirator is required to support life. If any of the components fail, there is an increased risk of serious personal injury or death.

### DANGER

Never use any auxiliary air outlet to charge an SCBA air cylinder while the SCBA is being worn if the SCBA or the cylinder is known or suspected of having been dropped, exposed to direct flame, impingement, or damaged in any way. Using such equipment increases the risk of cylinder failure, which may result in serious personal injury or death.

## 5 - Additional Features

### Regulated Pressure Outlet (Optional)

The charging station may also be equipped with an optional regulated **High** and/or **Low Pressure Outlet** and associated controls. A regulated pressure outlet is indicated by a regulator, auxiliary air outlet connection, control valve, and pressure gauge, installed on a separate control panel established for this purpose.

Always follow all guidelines in this manual regarding auxiliary air outlet use. Refer to "Working with Compressed Air" in Chapter 3 before operating the low pressure air supply.

### Regulated High Pressure Outlet and Gauge

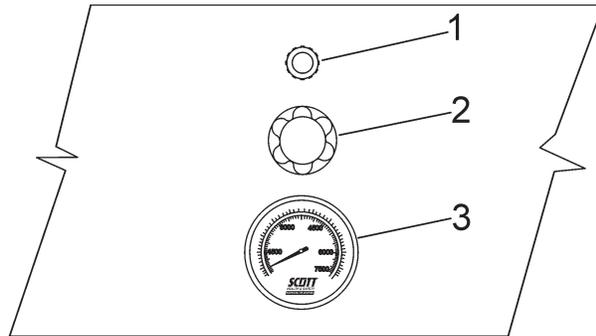
The optional high pressure air outlet provides Grade D/E breathing air up to the maximum system pressure. For example, if the compressor system air pressure equals 4700 psi, the high pressure outlet will provide compressed air up to a maximum pressure of 4700 psi.

The high pressure outlet control panel includes an air outlet, inlet control valve and a 10,000 psi pressure gauge and outlet pressure regulator. Use the inlet control valve to regulate the flow of compressed air:

1. Before operating the high pressure outlet and controls, first ensure that sufficient air pressure exists in the compressor system to fill the intended air receiver.
2. Attach a suitable air receiver to the auxiliary outlet according to the manufacturer's user instructions for the air receiver. Use the High Pressure Gauge to determine existing pressure in the receiver.
3. To access high pressure air, **SLOWLY** turn the Variable Pressure Regulator valve.
4. When finished, hand-tighten any bleed valves and carefully remove the selected air source from the high pressure outlet.

### **DANGER**

This system is providing unregulated air up to the maximum system pressure capacity (5000 psi or 6000 psi, depending on system). Use extreme care with all connections and operation of the high pressure receiver. Careless handling of compressed air can cause serious injury or death.



SHS-HAC-0401-G245

### Regulated (High Pressure) Controls

- 1) Inlet Control Valve
- 2) Variable Pressure Regulator
- 3) High Pressure Gauge

**High Pressure Outlet is located on the back of the control panel (not shown)**

### **DANGER**

ALWAYS make sure that the auxiliary air outlet is connected with suitable high pressure hose or piping to a suitable receiver or apparatus designed to accept a high pressure air source. Inappropriate use of this equipment may cause equipment damage or failure, and can lead to serious personal injury.

### **DANGER**

NEVER use any auxiliary air outlet to charge a self-contained breathing air (SCBA) cylinder while the SCBA is being worn unless during an extreme emergency situation. Persons operating the air supply and wearing the respirator will be in close proximity to the cylinder and valve assemblies. If any of these components fails, there is an increased risk of serious personal injury or death.

**Low Pressure Outlet and Gauge on next page...**

**Regulated Low Pressure Outlet and Gauge**

The optional low pressure outlet provides compressed, breathable air at a maximum preset pressure, no higher than approximately 300 psi (normally set to a maximum 200 psi). The low pressure outlet control panel includes an air outlet, inlet control valve and a 400 psi gauge.

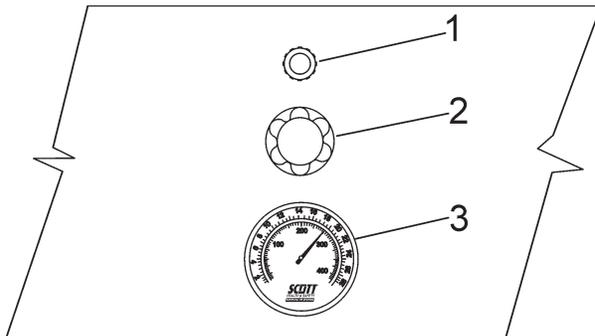
Always follow the guidelines in this section regarding auxiliary air outlet use. Refer to “Working with Compressed Air” in Chapter 3 before operating the low pressure air supply.

The auxiliary low pressure outlets may be used to supply respirators or pneumatic tools. Refer to the user instructions for the supplied air respirators and/or pneumatic tools before use.

**NOTE**

The low pressure air supply is breathing air quality and is NOT lubricated.

1. Ensure that adequate air pressure is available to use the low pressure outlet. Attach a suitable receiver to the outlet.
2. To access low pressure air, SLOWLY turn the Pressure Regulator valve.
3. When finished, hand-tighten any bleed valves and carefully remove the selected air source from the low pressure outlet.



SHS-HAC-0401-G247

**Regulated (Low Pressure) Controls**

- 1) Inlet Control Valve
- 2) Variable Pressure Regulator
- 3) Low Pressure Gauge

**Low Pressure Outlet is located on the back of the control panel (not shown)**

**! DANGER**

If the low pressure air supply outlets are used for pneumatic tools, DO NOT use the outlets to supply respirators unless the outlets are cleaned and the air quality from the outlets is verified as acceptable according to ANSI/CGA specification G-7.1, Grade D or better. Lubricants from the pneumatic tools or tool air lines may contaminate the low pressure air supply outlets for breathing air usage which can result in serious injury or death to respirator users.

**! DANGER**

NEVER use hoses to supply respirator air if they have been used to supply air to pneumatic tools. The pneumatic tool hoses may be contaminated with lubricant making them unsuitable for supplying breathing air.

**! DANGER**

If the auxiliary low pressure outlet is used to supply air for pneumatic tools, the air supply must still be maintained to breathing air standard. Lubrication for the pneumatic tools must be added after the auxiliary low pressure outlets. Failure to follow this precaution may contaminate air supply, which can result in personal injury or death.

# NOTES

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## 6 - System Administrator Responsibilities

The System Administrator who has responsibility for this equipment has certain responsibilities and tasks beyond the normal Operator Maintenance. Access to these is protected by a USER PASSWORD in the X4 Controller. The responsibilities and tasks include:

### To Modify System Settings:

- Changing the USER PASSWORD
- Enabling or Disabling the Override function

### To Perform System Service:

- Recording the date of an approved Breathing Air Sample
- Calibrating the Carbon Monoxide (CO) monitor (when installed)

The System Administrator must be thoroughly familiar with starting and operating the Breathing Air Compressor system according to the Operator's Instructions provided with the system.

These tasks can only be accessed when the compressor system is powered up but the compressor itself is not running.

Follow the prompts on the display screen for each operation. Remember, you can press BACK at any time to return to the previous display.

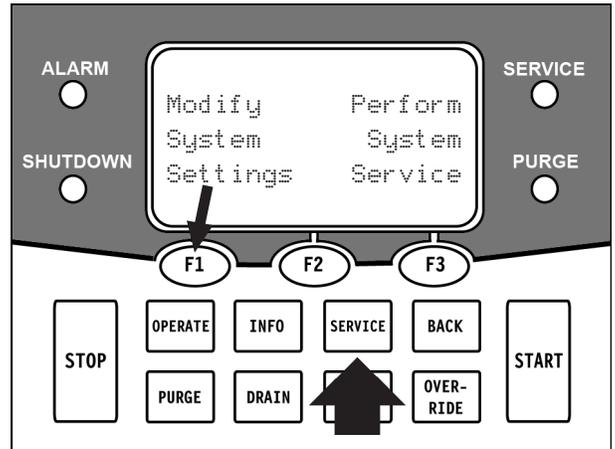
### Modify System Settings

#### USER PASSWORD and OVERRIDE Feature

##### To Change the USER PASSWORD

1. Turn the external power source ON (wall-mounted switch).
2. After the X4 Controller completes the system boot, the display will say, "Press F2 Button Below to Begin." Press the F2 key directly below the X4 Controller digital display.
3. The display will show the current Service Due dates and say, "Push Operate, Info, or Service." Press SERVICE on the keypad. (Remember, you can press BACK at any time to return to the previous display.)

4. Select "Modify System Settings" (F1).



5. You will be asked to enter the USER PASSWORD. The display will show a "1" above F1, a "2" above F2, and a "3" above F3. The factory installed password is 111111. To enter this, press the F1 button six times. (If you enter the wrong password, the display will say, "Invalid Password – Wait for five seconds and reenter password.")
6. The display will say, "CHANGE USER PASSWORD?" Select YES (F1 button). If you select NO (F3 button), you will proceed to the OVERRIDE FEATURE below.
7. Enter a six digit number made up of 1's, 2's, and/or 3's by pressing the F1, F2, and/or F3 buttons below the display. (Keep a record of your new password in a safe place.) When finished, press the START button on the keypad.
8. The display will ask you to reenter the new password and press the START button on the keypad again. If the second entry matches the first, the display will say, "PASSWORD WAS SUCCESSFULLY CHANGED – PRESS CONTINUE. You will proceed to the OVERRIDE Feature below.

## 6 - System Administrator Responsibilities

### Overrides

The OVERRIDE capability is password protected and may be DISABLED or ENABLED as determined by the System Administrator who has the responsibility for maintenance of this equipment. The X4 Controller includes limited shutdown override capability for high dew point, high air temperature, high carbon monoxide levels, and low oil level or pressure. Override allows the operator to continue running the system in an out-of-tolerance condition up to a maximum preset tolerance, or for one hour, whichever occurs first.

The System Administrator must decide whether to DISABLE or ENABLE the Override function.

Disabling the Override function assures the System Administrator that the breathing air produced by the system will always fall within the established limits.

Enabling the Override function permits the Operator to continue producing breathing air in the event of a life threatening emergency where breathing air is required and it is determined to accept the associated risks.



### WARNING

ONLY use the system override capability in the event of an extreme emergency, or to save a life. During an override condition, the operator must monitor the system at all times. Operating the system beyond factory-set parameters may lead to irreparable component damage, and/or personal injury in the case of system failure.

The operator must be trained as to whether the Override capability is DISABLED or ENABLED. If the Override is ENABLED, the Operator must be trained in its use.

### To Enable/Disable the **OVERRIDE** Feature

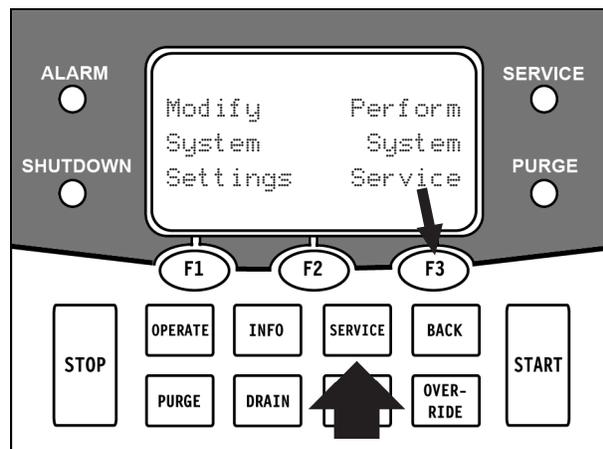
1. After Password section, the display will tell you whether the OVERRIDE Feature is ENABLED or DISABLED, and ask you if you want to change the setting. The factory default setting is for the OVERRIDE Feature to be DISABLED.
2. If you select YES (F1 button) the setting will be switched to the opposite setting: from ENABLED to DISABLED, or from DISABLED to ENABLED.
3. If you select NO (F3 button), the setting will stay as it was originally displayed.
4. The X4 Controller will exit the Modify System Settings and return the display to the start-up screen that says "SCOTT Safety, 800-247-7257, PRESS F2 BUTTON BELOW TO BEGIN" as when first starting the compressor system.

### Perform System Service

#### Record Air Sample Date and Calibrate Optional CO Monitor

#### To Record the Current Air Sample Date

1. Turn the external power source ON (wall-mounted switch).
2. After the X4 Controller completes the system boot, the display will say, "Press F2 Button Below to Begin." Press the F2 key directly below the X4 Controller digital display.
3. The display will show the current Service Due dates and say, "Push Operate, Info, or Service." Press SERVICE on the keypad. (Remember, you can press BACK at any time to return to the previous display.)
4. Select "Perform System Service" (F3).



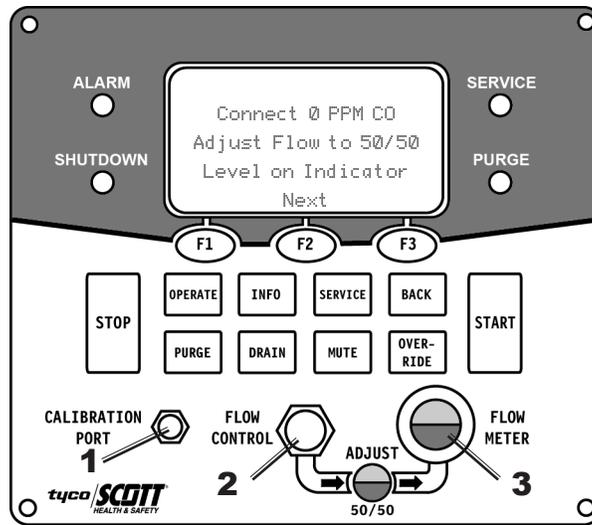
5. You will be asked to enter the USER PASSWORD. The display will show a "1" above F1, a "2" above F2, and a "3" above F3. The factory installed password is 111111. To enter this, press the F1 button six times. If you have changed the password already, enter your new password. (If you enter the wrong password, the display will say, "Invalid Password – Wait for five seconds and reenter password.")
6. The display will say, "Was an Air Sample Taken Since the Last Compressor Operation?" Select YES (F1 button) if an air sample has been taken and certified to meet the breathing air requirements for your respiratory protection program. This will automatically set the current date as the air sample service date.
7. If the CO Sensor is installed and you select NO (F3 button), you will proceed to the CO Calibration procedure below.

**WARNING**

Follow the CARBON MONOXIDE Calibration procedure carefully. Improper calibration of the CARBON MONOXIDE MONITOR could result in operating the system outside the applicable standards or codes which may lead to serious injury or death.

**CAUTION**

Thread the hose connection carefully onto the calibration port. Do not cross thread or force which may cause damage to the connector and result in inaccurate calibration.



- 1) Calibration Port
  - 2) Flow Control Dial
  - 3) Air Flow Adjustment Eye
- b. Adjust the Flow Meter to 50/50 with the Flow Control knob and select NEXT (F2 button).
  - c. The display will ask, "If Flow Indicator is at 50/50 Level, Press CAL Button." Select CAL (F2 button).
  - d. Display will read, "0 PPM Calibration in Process, Time Remaining XX Seconds." This process will take 60 seconds. When prompted for the next step, CLOSE the Zero Gas cylinder valve and disconnect the cylinder from the Calibration Port.

**To Calibrate the Optional Carbon Monoxide (CO) Monitor**

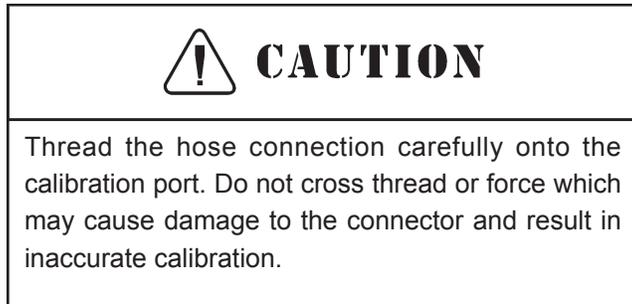
1. After the Air Sample section, the display will ask you if a CO Calibration is to be performed at this time. For this, you must have the SCOTT CO Calibration Kit, P/N AB16-0533. THIS WILL ONLY APPEAR IF THE OPTIONAL CARBON MONOXIDE MONITOR IS INSTALLED ON YOUR SYSTEM.
2. If you select YES (F1 button), you will be prompted to perform the steps of the CO Calibration using the 0 PPM CO (Zero Gas) and 20 PPM CO calibration gas cylinders from the Calibration Kit.
  - a. Connect the 0 PPM CO (Zero Gas) Cylinder to the Calibration Port on the X4 Control Panel and OPEN the cylinder valve.

***Calibrating the CO Monitor  
continued on the next page...***

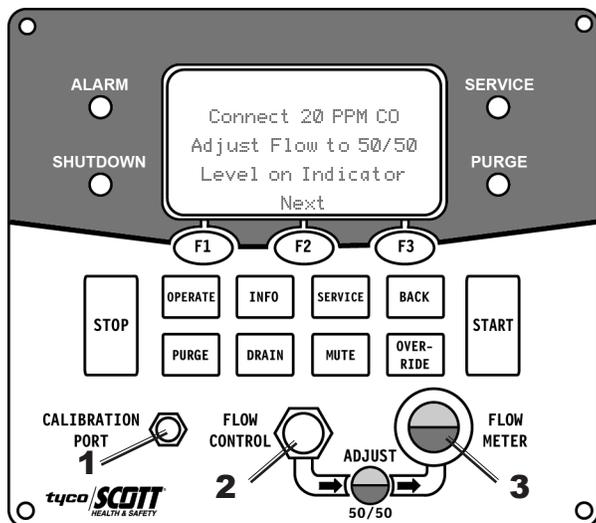
## 6 - System Administrator Responsibilities

### Calibrating the CO Monitor Continued...

- e. Connect the 20 PPM CO Cylinder to the Calibration Port on the X4 Control Panel and OPEN the cylinder valve.



- j. Select DONE (F2 button). The X4 Controller will exit the Perform System Service and return the display to the start-up screen that says "SCOTT Safety, 800-247-7257, PRESS F2 BUTTON BELOW TO BEGIN" as when first starting the compressor system.
3. If you select NO (F3 button) to the CO Calibration, the X4 Controller will exit the Perform System Service and return the display to the start-up screen that says "SCOTT Safety, 800-247-7257, PRESS F2 BUTTON BELOW TO BEGIN" as when first starting the compressor system.



- 1) Calibration Port  
2) Flow Control Dial  
3) Air Flow Adjustment Eye
- f. Adjust the Flow Meter to 50/50 with the Flow Control knob and select NEXT (F2 button).
- g. The display will ask, "If Flow Indicator is at 50/50 Level, Press CAL Button." Select CAL (F2 button).
- h. Display will read, "20 PPM Calibration in Process, Time Remaining XX Seconds." This process will take 60 seconds.
- i. After the 60 seconds, the display will read, "Calibration Complete – DONE." Close the 20 PPM CO cylinder valve and disconnect the cylinder from the Calibration Port.

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**Stationary Air Compressor Systems  
Operating Instructions  
SCOTT P/N 595134-01 REV C 1/12**

# Maintenance Record

	Task	Date	Initials	Notes
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## NOTES

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**Scott Safety**  
ISO 9001 REGISTERED

Manual Price: \$25.00

P/N 595134-01 REV C 1/12

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