

**SPX**

**ROBINAIR**

*Operating Manual*

**COOLTECH**  
**ID**



**Model 16900**

CoolTech ID Refrigerant Identifier



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# Safety Precautions



## **WARNING : To prevent personal injury:**



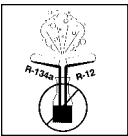
- Study, understand, and follow all warnings in this manual before operating this unit. If the operator cannot read these instructions, operating instructions and safety precautions must be read and discussed in the operator's native language.

—*Si el operador no puede leer las instrucciones, las instrucciones de operación y las precauciones de seguridad deberán leerse y comentarse en el idioma nativo del operador.*

—*Si l'utilisateur ne peut lire les instructions, les instructions et les consignes de sécurité doivent lui être expliquées dans sa langue maternelle.*



- The Identifier is not capable of direct detection and indication of the presence of hydrocarbon compounds, which present a flammability hazard when present in sufficient concentrations. Whenever the identifier indicates unknown contaminants are present, the potential exists for a hydrocarbon flammability hazard.



- Operate this unit with either R-12 or R-134a refrigerant. Cross-contamination with other refrigerant types causes severe damage to the A/C system, to service tools, and equipment. Do NOT attempt to adapt the unit for another refrigerant. Do NOT mix refrigerant types through a system or in the same container.



- DO NOT breathe refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose, and throat. Use recycling equipment certified to meet the requirements of SAE J2210 to remove refrigerant from the A/C system. If accidental system discharge occurs, immediately ventilate the work area. There must be adequate ventilation in the vehicle servicing area.



- When testing vehicle air conditioning systems, the vehicle ignition must be turned OFF. This action prevents EMI/RFI problems as well as eliminates potential user hazards from moving parts of the vehicle.



- The air detection sensor is a chemical fuel cell sensor that will eventually expire. The user must replace the air detection sensor whenever the instrument indicates as such. Failure to replace the air detection sensor will result in non-functionality of the instrument.



- Wear eye and skin protection when working with refrigerants. Escaping refrigerant vapors can freeze upon contact. Do NOT direct refrigerant escaping from the sample hose toward exposed skin or toward the face.



- Connection to power sources greater than 14V DC could cause "out of warranty" damage. Connection to a battery which is not fully charged, or is smaller than a typical vehicle battery, may cause errors in reading.
- If using the wall power adapter, the adapter's voltage rating must match the AC power source. Do NOT use a wall power adapter in areas where it could get wet.
- To reduce the risk of battery explosion due to spark generation : First connect the RED clip to the positive 12-volt battery terminal; then connect the BLACK clip to a metal ground location away from the battery.

### **CAUTION: To prevent equipment damage,**

- **Sample Filter:** Inspect the outside diameter of the white sample filter element before and after each use of this instrument. As soon as red spots begin to appear on any portion of the white element outside diameter, the filter requires replacement. Failure to replace the filter when so indicated may result in “out of warranty” damage to the instrument.
- **Sample Input:** This instrument requires connection of the sample hose to the low, or vapor, side port of the source vehicle or refrigerant cylinder. Connection of the sample hose to the high, or liquid, port of the source vehicle or refrigerant cylinder will result in “out of warranty” damage to the instrument. Additionally, the low side or vapor port shall not emit sample gas in excess of 300 psig or sample gas that contains oil or liquids.
- **Sample Hose:** Inspect the sample hose before and after each use of the instrument. Immediately replace the hose if it appears cracked, obstructed, or fouled with oil.
- **Never use a sample hose other than those approved for use with the Identifier. The use of other hose types may introduce errors and excessive refrigerant loss.**
- **Verify the refrigerant source to be tested will not emit oil or liquid refrigerant before connecting the Identifier sample hose.**
- **Never connect the Identifier to any refrigerant source that exceeds 300 psi pressure.**
- **Do not use the coupling supplied on the Identifier R-134a sample hose for any purpose other than Identifier sampling. The coupler supplied on the R-134a hose does not contain check valves and will continually vent refrigerant.**
- **Never obstruct the sample exhaust or air intakes—located on the front and top of the instrument—during use of this tool.**
- **Do not throw, drop, immerse in liquid, or mistreat the instrument.**
- **Store the instrument in its storage case when not in use.**
- **Maintain the cleanliness of the instrument to prevent contamination and prolong its life.**

### **DESCRIPTION OF THE 16900 IDENTIFIER**

Contamination of refrigerant in air conditioning systems or storage cylinders can lead to component corrosion, component destruction, elevated system head pressure, and system failures when used by unsuspecting technicians. The ability of a technician to determine refrigerant type and purity is severely hampered by the presence of air when attempting to use pressure-temperature relationships. The development of substitute refrigerants further complicates refrigerant identification and purity determination based on pressure-temperature relationships.

The CoolTech ID Refrigerant Identifier provides a fast, easy, and accurate means to determine refrigerant type and purity in refrigeration systems and refrigerant storage cylinders. The instrument utilizes a combination of infrared and chemical fuel cell technologies to determine purity and contamination levels of refrigerant R-12 and R-134a, as well as air concentrations in both refrigerant types.

The instrument is supplied in a rugged, hand-held, injection-molded, nylon case housed in a corrugated storage case. The storage case will also house all accessories supplied with the instrument: R-12 sample hose, R-134a sample hose, R-134a tank adapter fitting, battery power adapter, and wall power adapter.

Sample gas is admitted into the instrument through the supplied sample hose and presented to the sensing devices. The instrument provides a digital readout of refrigerant purity, a pass or fail condition, and the amount of contamination.

A sample is considered to be pure, or passed, if the concentration has been determined to be 98% or greater by weight of a single refrigerant (R-134a or R-12). The instrument also provides an indication of unknown compounds that may be R-22, hydrocarbons, or other refrigerants commonly used in blended refrigerant types.

Operating instructions are provided to the user through display prompts to avoid mistakes and erroneous readings.

The Identifier provides the refrigerant technician with knowledge of refrigerant purity and protection against equipment and air conditioning system damage resulting from contamination.

## HARDWARE

The instrument houses the following basic components required to operate the Identifier:

1. **Case:** An injection molded plastic housing that contains all internal components.
2. **Hanger:** Connects into the top of the case and provides the user a means to hang the instrument above the working area for hands-free operation.
3. **Sample Filter:** Filters oil mists and particulate from the sample gas admitted into the instrument to provide trouble-free function of the detection and sampling components.
4. **Control Panel:** Consists of a two-line, 16-character, digital display and two pushbutton switches. The display conveys analysis results and instructions to the user. The switches provide a means by which the user can communicate with the instrument microprocessor during use.
5. **Air Intake Port:** Admits fresh air into the sampling system to permit calibration of the infrared and chemical fuel cell detection devices. Do NOT block or restrict the port hole during use of the instrument.
6. **Sample Exhaust Port:** Emits sample gas that has been analyzed by the instrument. Do NOT block or restrict this port during use of the instrument.
7. **Sample Inlet Port:** Permits the connection of either an R-12 or R-134a sample hose to the instrument.

8. **Air Detection Sensor:** A chemical fuel cell that detects the amount of air contained within a refrigerant sample.
9. **Control Circuit Board:** Directs all activities of the instrument through the embedded microprocessor. The infrared detection device is also contained on this circuit board and provides all detection of refrigerant components of the sample gas.
10. **Purge Pump:** Draws ambient air through the air intake port for the purpose of detection device calibration and instrument sample system purging.
11. **Power Connector:** Accepts installation of either the standard 12V DC vehicle battery adapter, or the wall power adapter, to provide operating power.

### SAMPLE HOSES

1. **R-12 Sample Hose:** This is a 6-foot hose made of a nylon inner tube surrounded by a polyurethane outer tube. The hose contains the instrument connection fitting on one end and a 1/4" SAE female flare nut on the other end. This hose is used when sampling from an R-12 vehicle system or storage cylinder.
2. **R-134a Sample Hose:** This is a 6-foot hose made of a nylon inner tube surrounded by a polyurethane outer tube. The hose contains the instrument connection fitting on one end and an R-134a low-side coupler on the other end. This hose is used when sampling from R-134a vehicle systems or storage cylinders.

## POWER HARNESSSES

1. **Vehicle Battery Adapter:** This is a 6-foot power cable that has an instrument mating connector on one end and vehicle battery connection clips on the other end. This harness is used to connect power from the vehicle battery to operate the instrument and avoid the use of extension cords.
2. **Wall Power Adapter:** This is a 6-foot power cable that has an instrument mating connector on one end and a plug-in power transformer on the other end. This harness is used to connect power from a standard 120 wall power outlet to provide operating power to the instrument.



### WARNING



Verify the wall power adapter AC inlet voltage is either 115 or 230 so that it matches the AC power available.

## R-134A TANK ADAPTER FITTING

1. This adapter provides a conversion of standard R-134a cylinder ACME threaded ports to a R-134a low-side coupler stub. This conversion permits the use of the instrument R-134a sample hose during refrigerant cylinder sampling.

## STORAGE CASE

1. The storage case is a corrugated case that will house the instrument and all accessories, including sample hoses, adapter fitting, power adapters, and the operating manual.

## PRE-OPERATION INSPECTION

1. Inspect the outside diameter of the white element contained within the sample filter for any signs of red spots. The appearance of red spots anywhere on the outside diameter of the element indicates the filter requires replacement to avoid fouling the instrument.
2. Select the R-12 or R-134a sample hose as dictated by the application. Inspect the hose for cracks, signs of wear, obstruction, or fouling. Do NOT use a hose that has any signs of wear. Install the sample hose onto the sample inlet port of the instrument by hand-threading the hose end onto the connector.
3. Inspect the air intake port hole, located on the top of the instrument, and the sample exhaust port, located on the center bottom edge of the instrument, to verify they are not clogged or obstructed.
4. Inspect the port of the air conditioning system or storage vessel from which the sample will be taken. Verify the port will emit vapor only and will not emit liquids or oil.
5. Install the vehicle battery adapter or the wall power adapter harness into the power connector of the instrument.

## OPERATING PROCEDURE

1. Power the instrument by connecting the power harness to the vehicle battery or by plugging the wall power adapter transformer into an appropriate wall outlet.
2. Allow the instrument to warm up for two minutes.

## Operating Procedure

3. During the warm-up period, enter your local elevation above sea level into the instrument memory. The instrument is sensitive to elevation changes of 500 feet (152 meters), and the local elevation must be entered into the instrument memory upon initial use. Normal barometric variations do not affect the performance of the instrument. Once the elevation has been entered, it does not require entry again unless the instrument is moved to a new elevation.

To locate your local elevation, call your area airport, library, or use the internet address of [www.topozone.com](http://www.topozone.com) and follow the on-screen prompts.

The screen **USAGE ELEVATION <<<NOT SET>>>** is displayed during warm-up if the elevation has not been set. Set the elevation as follows:

- A. During the warm-up period, depress and hold the **B** pushbutton until the display reads **USAGE ELEVATION, 400 FEET**. This is the factory default of 400 feet (122 meters).
- B. Use the **A** and **B** pushbuttons to adjust the elevation reading, to the nearest 100-foot (30-meter) increment, to the local elevation. The **A** button increases the elevation setting in 100-foot (30-meter) increments. The **B** pushbutton decreases the elevation setting in 100-foot (30-meter) increments. The elevation setting is adjustable from 0-9000 feet (0-273 meters) and is displayed during adjustment.
- C. When the correct setting is reached, allow the instrument to sit for approximately 20 seconds. Do not push either of the buttons. The setting is automatically stored into the instrument memory.

***NOTE:** Failure to correctly enter the local elevation may result in detection errors.*

4. The instrument draws in ambient air through the air intake port for approximately one minute. Ambient air is used to calibrate the detection devices and purges the instrument plumbing of residue refrigerant vapors.

***NOTE:** For a correct calibration, the surrounding ambient air must be clear of refrigerant vapors, hydrocarbons, and oxygen-depleting compounds such as carbon dioxide or carbon monoxide.*

5. When prompted by the instrument, connect the free end of the sample hose to the vehicle air conditioning system or refrigerant storage cylinder port. Press the **A** pushbutton. Sample gas immediately begins to flow into the instrument. The instrument requires approximately one minute to complete the sample gas analysis.
6. When the analysis is complete, immediately disconnect the sample hose from the refrigerant source.

***NOTE:** The instrument does not contain automatic shut-off, and refrigerant vapors continue to flow out of the source as long as the hose is connected. To conserve refrigerant stores and prevent excess refrigerant venting, do NOT leave the instrument unattended during analysis cycles. Disconnect the sample hose from the source immediately after being prompted by the instrument.*

## Operating Procedure

7. The results of the analysis are now presented to the user on the instrument display.

**PASS:** Displayed when a sample is detected to have 98% or greater of R-12 or R-134a by weight. The refrigerant type and air concentration are also displayed.

**FAIL:** Displayed when a sample is detected to be a blend of R-12 and R-134a refrigerants with neither R-12 or R-134a having 98% or greater concentration. The weight percentages of R-12, R-134a, and air are displayed.

**FAIL CONTAMINATED:** Displayed when unknown refrigerant types, such as R-22 or hydrocarbons, have been detected in concentrations of 4% or greater by weight. No weight concentrations of refrigerants or air are provided in this mode.

**NO REFRIGERANT—CHK HOSE CONN:** Displayed when a sample is detected containing 90% or greater air by weight. This condition usually occurs when the R-134a sample hose coupler has not been opened, the sample hose has not been connected to the sample source, or if there is no refrigerant present in the sample source.

8. The instrument keeps the analysis results on the display until the user presses the **A** button. Once the **A** button is pressed, follow the directions on the screen.
9. If another sample run is desired, follow instructions from Step 5.  
If another sample run is not desired, disconnect the power harness from the vehicle or wall outlet to the end the routine.

## POST-OPERATION PROCEDURE

1. Disconnect the sample hose from the instrument sample inlet port. Inspect the hose for signs of wear, cracking, oil fouling, or obstruction, and replace if necessary. Clean the outside of the hose, and coil and stow it in the storage case.
2. Inspect the sample filter white element outside diameter for the presence of red spots. If any red spots are found, replace the sample filter, as directed in the *Maintenance Procedures* on page 17.
3. Disconnect the power harness from the instrument, clean, coil, and stow it in the storage case.
4. Clean any dirt, grime, oil, etc., from the outside of the instrument with a moist rag. Do not use cleaning solutions or water on the instrument. Stow the instrument in the storage case.

## **ERROR CODES AND CORRECTIVE ACTIONS**

The instrument is supplied with self-diagnostic software to aid in determining problems. The software will supply error messages that direct the user toward specific corrective actions in the event of system failure. Should corrective measures not correct the problem, the user is advised to contact Robinair at 1-800-822-5561 for assistance.

**SAMPLE FAULT:** Signifies unstable infrared readings due to inconsistent sample gas supply or interference from strong electrical fields.

### **Corrective Actions:**

1. If the error code occurs during a sample cycle, verify the sample hose is receiving sample gas from the source connection of at least 5 psig. Also verify the instrument sample exhaust port and air intake port are not clogged or restricted.
2. If the error code occurs during a calibration cycle, verify the air intake port and sample exhaust port of the instrument are not clogged or obstructed.
3. Keep the unit away from sources of strong electrical fields, such as large compressors, running vehicles, etc. Move the instrument 3–5 feet away from the electrical field source, and try again.
4. If the instrument is being used outside of the operating temperature range of 39–122°F (4–50°C), allow the instrument to warm or cool to the operating temperature range, and try again. The instrument may require additional warm-up time after “power up” before use.
5. To clear the error code, power down the instrument. The error code automatically clears.

**DETECTOR FAULT:** Signifies internal infrared sensor failure due to temperature extremes.

**Corrective Actions:**

1. Allow the instrument to stabilize at room temperature for at least 30 minutes before attempting use.
2. To clear the error code, power down the instrument. The error code automatically clears.

**CALIBRATION FAULT:** Signifies an infrared calibration fault.

**Corrective Actions:**

1. Verify the air intake port and sample exhaust port of the instrument are not clogged or obstructed.
2. If the instrument is being used in an enclosed area, refrigerant vapors may build up in the surrounding atmosphere and be drawn into the intake port during calibration. Move the instrument to a location with fresh ambient air, free of refrigerant vapors.

Use the instrument in locations that provide adequate ventilation to prevent the accumulation of refrigerant vapors in the surrounding atmosphere.

3. Hang the unit so there is a flow of fresh air around it.
4. To clear the error code, power down the instrument. The error code automatically clears.

**AIR SENSOR FAULT:** Signifies an air detection sensor calibration fault.

**Corrective Action:**

1. Verify the air intake port and sample exhaust port of the instrument are not clogged or obstructed.
2. If the instrument is being used in an enclosed area, oxygen depleting compounds, such as carbon dioxide or carbon monoxide, may accumulate in the surrounding atmosphere and be drawn into the intake port during calibration. Move the instrument to a location with fresh ambient air, free of oxygen depleting compounds.

Use the instrument in locations that provide adequate ventilation to prevent the accumulation of oxygen depleting compounds in the surrounding atmosphere.



### **WARNING**



**If error codes indicate that oxygen depleting compounds are in the surrounding atmosphere, take immediate action to rid the area of these compounds, and provide adequate ventilation to prevent such accumulations. The accumulation of oxygen-depleting compounds in the surrounding atmosphere present a hazard to human health.**

3. To clear the error code, power down the instrument. The error code automatically clears.

**RECALIBRATION REQUIRED:** The prior calibration is too old and requires refreshing. This message appears whenever a 3-minute period elapses from the prior calibration.

**Corrective Action:**

1. Remove the sample hose connection from the refrigerant source if so connected. Depress the **A** button to initiate a new calibration.

## **MAINTENANCE PROCEDURES**

### **SAMPLE FILTER REPLACEMENT**

**Inspection Frequency:** Inspect the sample filter before and after each use of the instrument. Failure to replace the sample filter when so indicated may result in out-of-warranty damage to the instrument.

**What To Look For:** Inspect the outside diameter of the white element for the appearance of red spots or discoloration, which indicate the sample filter requires replacement. *Note: Inspect only the outside diameter. It is normal to see red indicating dye at the ends of the filter element.*

#### **Replacement Procedure:**

1. Power down the instrument, and disconnect the sample hose.
2. Obtain replacement filter, Robinair part no. 16912.
3. Remove existing filter by pulling it straight up and out of the retaining clip, and disconnecting the tube connections. Do not allow the free tube ends to slip back into the instrument.
4. Discard the existing filter.
5. Install the free ends of the instrument tube onto the ends of the replacement filter, aligning the filter flow arrow with the arrow on the instrument case.
6. Carefully slide the tubes back into the instrument case, and position the filter into its retaining clip on the instrument case.
7. Inspect the sample hoses for signs of oil entrapment. The need to replace the sample filter may indicate oil contamination in the sample hoses. Replace or flush the sample hose(s) if oil entrapment is found.

## SAMPLE HOSE INSPECTION AND CLEANING

**Inspection Frequency:** Inspect sample hose(s) before and after each use of the instrument and after every replacement of the sample filter.

**What To Look For:** Inspect the inside diameter of the inner tube for signs of cracking, fouling, oil entrapment, kinks, or other signs of wear. Oil contamination is cleansed by flushing the hose(s) as described below. Immediately replace hoses that show signs of wear.

### Sample Hose Flushing Procedure:

1. Remove the hose from the instrument; flush it with isopropyl alcohol.



### **WARNING**



**To prevent personal injury, flush hoses away from sparks, open flames, or any other ignition source and in an area with appropriate ventilation.**

2. Dry the hose by blowing clean, dry, oil-free nitrogen or shop air through the inner tube, or allow the hose to air-dry for several hours. Do NOT dry the hose with lubricated shop air.
3. When the hose is completely dry, inspect for signs of wear.

## **AIR DETECTION SENSOR REPLACEMENT**

**Inspection Frequency:** The Identifier informs the user of possible air detection replacement requirements by displaying AIR SENSOR FAULT.

### **Air Detection Sensor Replacement Procedure:**

Refer to *Error Codes and Corrective Actions*, and try each suggested action. If the instrument still shows the error code, the air detection sensor needs to be replaced.

1. Power down the instrument, and remove the sample hose from the instrument sample inlet port.
2. Remove the sample filter, and unthread the two screws located on the filter retainer clip.
3. Turn the instrument onto its face, and remove the four large Phillips head screws from the rear countersunk holes around the outer edge of the instrument.
4. Remove the instrument case front to expose the internal components.
5. Disconnect the air sensor harness (from circuit board located in front half of instrument case) by pulling it straight out of the connector.
6. Unthread the air detector sensor from its housing. Discard the spent sensor.
7. Obtain a replacement air detection sensor, Robinair part no. 19712, and thread it into the housing hand-tight. Verify the o-ring is seated around the threaded end of the air detector sensor.
8. Route the sensor harness to the circuit board, and plug it into the sensor harness header of the circuit by pressing it straight in. The harness is keyed and fits securely in one direction only.
9. Verify the circuit board is correctly positioned onto the mounting studs of the instrument case.
10. Position the housing halves together, and secure with two small screws located under the filter location and four large rear screws. Replace the sample filter onto the instrument.

## REPLACEMENT PARTS

Replacement parts are available directly from Robinair distributors. To find the nearest distributor, visit the website at [www.robinair.com](http://www.robinair.com) or call 1-800-822-5561.

<b>Part Description</b>	<b>Part No.</b>
Sample Filter (pkg. of two)	16912
R-12 Sample Hose	19713
R-134a Sample Hose	19716
R-134a Tank Adapter Fitting	19714
R-134a Sample Hose Coupling	19715
Air Detection Sensor	19712
Vehicle Battery Power Adapter	19718
Wall Power Adapter, 120 V AC	19719

## SPECIFICATIONS

**Sample Parameters:** Vapor only, oil and liquid free, 300 psig (2 MPa) maximum.

**Detected Compounds:** R-12, R-134a, air, and unknown compounds.

**Sensor Technologies:** Non-dispersive infrared and chemical fuel cell.

**Refrigerant Sample Size:** 0.12 ounces (3.5 grams) per typical sample—weight of vapor loss.

**Power (standard or optional):** Powered by vehicle battery through clip-on adapter harness (10–14V DC), or powered by line power through plug-in wall adapter harness (120V AC, 60 Hz).

**Operational Temperature Range:** 39–122°F (4–50°C)

**Instrument Weight:** 2.8 lbs. (1278 grams)

**R-12 / R-134a Purity Setpoint:** PASS if a single refrigerant, R-12 or R-134a, is detected in concentrations equal to or greater than 98% by weight.

**Unknown Refrigerant Purity Setpoint:** In the presence of detected unknown refrigerant types, R-12 or R-134a are considered pure if detected in concentrations equal to or greater than 96% by weight.

**Effect of Air Concentrations:** Air is not considered a contaminate and will be removed from the weight concentration determination of refrigerants. Air concentrations are reported only for blends of R-12 and R-134a refrigerants.

**SAE1771:** If the refrigerant being tested is identified as contaminated, any visual percentages displayed of CFC-12 (R-12) or HFC-134a (R-134a) outside the design certified value is informational and may not be accurate.

**SAE CERTIFICATION NOTE:** This equipment has not been design-certified for contaminate detection of R-124 or R142B.







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## **Warranty**

This product is warranted to be free from defects in material and workmanship under normal use and service for a period of one year after the sale of the product. Exceptions to this policy will be individually identified. Sole obligation under this Warranty shall be to repair or replace any defective product or parts thereof, which are returned to Seller's factory, transportation charges prepaid within the period mentioned above, and which upon examination are provided to Seller's satisfaction to be defective.

The warranty shall not apply to any product or part which has been subject to misuse, negligence, or accident. The Seller shall not be responsible for any special or consequential damages, and the Warranty as set forth is in lieu of all other warranties either expressed or implied. However, Seller makes no warranty of merchantability in respect to any products for any particular purpose other than that stated in this literature, and any applicable manufacturer's shop or service manuals referred to therein, including any subsequent service bulletins.

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Visit our web site  
at  
**www.robinair.com**  
or  
call our Toll-Free  
**Technical Support Line at**  
**800-822-5561**  
in the continental U.S. or Canada.

In all other locations, contact your local distributor. To help us serve you better, be prepared to provide the model number, serial number, and date of purchase.

To validate the warranty, complete the warranty card attached to the unit, and return it within ten days from date of purchase.

Due to ongoing product improvements, we reserve the right to change design, specifications, and materials without notice.



*SPX Corporation  
655 Eisenhower Drive  
Owatonna, MN 55060-0995 USA  
Technical Services: 1-800-822-5561  
Fax: 1-412-690-2001  
Customer Service: 1-800-533-6127  
Fax: 1-800-322-2890  
Website: www.robinair.com*