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## OPERATING INSTRUCTIONS

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*IntellaSense II*  
REFRIGERANT LEAK DETECTOR

MODEL#-55900

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## 55900

# REFRIGERANT LEAK DETECTOR INSTRUCTIONS

### PRODUCT OVERVIEW

You have purchased an intelligent electronic leak detector model 55900. At the heart of this leak detector is a new low power metal oxide gas sensor with superior performance properties such as lower current consumption and sensor longevity. The new sensor is characterized by high sensitivity and a fast response in detecting the presence of extremely small levels of chlorofluorocarbon gases. For this reason, this sensor was selected and integrated into the 55900 Leak Detector.

A powerful microprocessor automatically selects the best operating condition for the sensor to ensure optimum performance throughout the life of the product. Upon turn on, the unit momentarily displays the option(s) that were in use when the unit was turned off. This information is displayed by one or more of the six (6) LEDs. Following this, the sensor is prepared for readiness in a warm up sequence that lasts a minute or less. The warm up sequence is displayed by six green vertical LEDs that are extinguished sequentially down until only one green (READY) LED is lighted. This indicates the end of the warm-up sequence is reached and the unit is ready for use. The color of the LED indicators indicate the sensitivity range that is selected by the user; green is for the least sensitive level, yellow for medium sensitivity level and red is for the most sensitive level. The default sensitivity level of the unit is GREEN upon initial turn-on.



### WARNING

This symbol is intended to alert the user of the presence of important operating and maintenance or servicing instructions in the literature accompanying this product.

### IMPORTANT GUIDELINES FOR AUTOMOTIVE TECHNICIANS

The following SAE Recommended Practice applies to this instrument and to the use of generally available leak detection methods to service motor vehicle passenger compartment air conditioning systems.

1. The 55900 leak detector shall be operated in accordance to the equipment manufacturer's operating instructions.
2. Leak test with the engine OFF.
3. The AC system shall be charged with sufficient refrigerant to have a gauge pressure of at least 50 PSI (340 Kpa) when not in operation. At ambient pressures below 15°C (59°F), leaks may not be measurable because the pressure may not be reached.
4. A high degree of caution shall be used whenever cleaning agents or solvents are employed to clean refrigerant lines. The table in this manual identifies the automotive chemicals that can potentially contaminate the probe tip and the surfaces that are exposed to such chemicals. Always wipe away dirt or potential false triggering chemicals, using towels or shop air.
5. Visually trace the entire refrigerant system and inspect for signs of air conditioning lubricant leakage, damage and corrosion on all lines, hoses and components. Each questionable area shall be carefully checked with the detector probe as well as fittings, hose-to-line couplings, refrigerant controls, service ports with caps in place, brazed or welded areas and areas around attachment points and hold-downs on lines and components. If looking for an apparently larger leak, check first at the Medium 7g/yr or Low 14 g/yr sensitivity setting.
6. Always follow the refrigerant system around in a continuous path so that no area of potential leaks is missed. If a leak is found, always continue to test the remainder of the system.
7. Recheck service valves with caps removed. Blow shop air over service valve to clear immediate area and then check with the detector set at 7 g/yr (0.25 oz/yr) Medium sensitivity.
8. Move the detector at a rate of no more than 75 mm/sec (3 in/sec) and as close as possible to 9.3 mm (3/8 in) from the surface, completely encircling each test position (switch, sensor, refrigerant tubing connection etc).
9. Slower movement and closer approach of the probe improves the probability of finding a leak. However, detectors made to meet this standard are required to air sample and detect a leak from a distance of 9.5mm (3/8 in) distance. Therefore, retest is advised at the most sensitive setting, when a leak appears to be found, particularly if the probe was in a static position on a joint or making physical contact with a joint as it was moving. Repeat with a moving probe test at that location, taking care to maintain a small gap (9.5 mm or 3/8 in) to confirm that the leak is of a repairable size. Using a 7 g/yr (0.25 oz/yr) Medium sensitivity setting on the detector, after finding an apparent leak with the 4 g/yr (0.15 oz/yr) High sensitivity setting, may also be very helpful.

### SPECIFICATIONS

Sensing Element:	Tin Oxide Element
Sensor Life:	2000 hours
Refrigerants:	Detects all refrigerants (HFC, CFC, HCFC, and blends)
Sensitivity Levels:	HIGH: 0.15 oz/yr (4 g/yr) LED Color: Red MEDIUM: 0.25 oz/yr (7 g/yr) LED Color: Yellow LOW: 0.50 oz/yr (14g/yr) LED Color: Green
Response Time:	Less than 1 second
Battery:	2 C Alkaline 6000 mAh batteries
Battery Life:	30 Hours
Operating Temperature Range:	0°F to 120°F
Weight:	1.08 Lbs

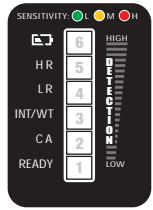
"Super Sensitive Function" allows the unit further sensitizing beyond the standard settings for locating small leaks with gases such as R1234yf and R407C.

### Probe Properties

- Intelligent tip, with environment sensing
- Flexible 15.5 inch probe length

### Display Properties

- Status Indicators: Three (3) vertical LED indicators display the condition and state of the unit immediately after the unit is turned ON. Status display duration is approximately 3 seconds.
  - LED #6: Identifies a LOW BATTERY condition
  - LED #5: Identifies HIGH RANGE (HR) setting is enabled
  - LED #4: Identifies LOW RANGE (LR) setting is enabled
- Warm-Up Status: Initially, all (6) vertical LED indicators are ON during the warm-up stage and gradually sequence down to one GREEN LED. The warm-up sequence takes less than 1 minute.



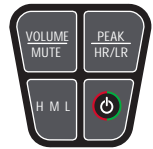
LED Indicators

### DEFINITION OF DISPLAY LEGENDS

- BATTERY SYMBOL: The battery symbol LED #6 is illuminated when the battery reaches a near end of life condition.
- HR: The High Range (HR) should be selected for the detection of hard to detect refrigerant gas, such as R1234yf.
- LR: The Low Range (LR) should be selected for the detection of easy to detect refrigerants, such as R134a.
- INT/WT: Conditions such as excessive air turbulence, or the accidental touching of the probe or by blowing one's breath at the probe, trigger the interference (INT/WT) detector.
- CA: The Contaminated Atmosphere (CA) LED will turn on when the presence of contamination is detected for a period of time.
- READY: Indicates that the unit is ready for use.

### KEYPAD FUNCTIONS

- ON/OFF: Turns the unit ON and OFF in a push on and push off sequence.
- PEAK/HR/LR: The PEAK/HR/LR key serves a dual purpose:
  - (1) To assist the user in locating the "largest leak" in a system with multiple leaks present.
  - (2) To enable the user to switch between HR (high range) and LR (low range) modes.
- VOLUME/MUTE: The VOLUME/MUTE key sequentially selects the audible "beep" level for the unit. The choices are: normal, low or mute. All alarms are heard at the maximum level, even in mute.
- HML (HIGH/MEDIUM/LOW SENSITIVITY): The HML key selects the sensitivity range of the unit. The color of the LED and the tone of the "beep" change for each sensitivity selected. (High=Red, Medium=Orange, Low=Green)



Keypad

### DISPLAYING THE STATUS SETTINGS

- Depress the ON/OFF key, upon initial turn-on, the unit will momentarily display the status conditions of the unit. This information will be displayed for approximately 3 seconds. One or more LED's will be ON during this brief time to display the following information:
  1. If LED #6 is ON, the battery is reaching end-of life and should be replaced before the unit's operation is affected.
  2. If LED #5 is ON, the unit is in the High Range setting which enables the unit to detect refrigerants that are difficult to detect. (R1234yf & R407C)
  3. If LED #4 is ON, the unit is in the Low Range setting which enables the unit to detect easy to detect refrigerants. (R134a, R410A, etc.)

### DISPLAYING THE WARM-UP STATUS

- All six (6) LEDs turn ON and sequentially become extinguished until only one GREEN LED remains. At this point, the audible "beep" begins (unless the unit is muted), which is an indication that the unit is ready for use. This process takes less than 1 minute.
- The unit always defaults to LOW sensitivity upon initial turn-on, as indicated by the GREEN LED.

### CHANGING THE AUDIBLE LEVEL

- The Volume/Mute key enables the user to change the audible "beep" level in a sequential manner. Successive depression alters the audible level from Normal, Low and Mute. Upon each depression, the unit visually displays (for less than 1 second) the selected audible level as follows:
  1. In Normal, six LED's are flashed briefly and the "beep" resumes at the maximum audible level
  2. In Low, three LED's are flashed briefly and the "beep" resumes at a lower audible level
  3. In Mute, only the READY LED stays ON and the audible is muted.
  4. The selected audible level will remain stored in the unit unless changed.

### CHANGING THE SENSITIVITY

- Depressing the HML key alters the sensitivity of the unit sequentially in the following manner:
  1. When in High Sensitivity, the LED #1 (READY) changes to RED
  2. When in Medium Sensitivity, LED #1 changes to YELLOW
  3. When in Low Sensitivity, LED #1 changes to GREEN.

4. During the detection of a leak, all the LED'S follow the color of the READY light.

## CHANGING THE OPERATING RANGE FROM HR TO LR

- After the unit has warmed up and the READY indicator is ON, press and hold down the PEAK/HR/LR key until all LED's are off. Release the key. The unit will perform a new warm-up sequence with the new operating range.

## REDUCING FALSE LEAK DETECTION

### Under Adverse Conditions

To discriminate between false alarms and actual leak detection that may occur in the presence of excessive air turbulence or accidental touching of the probe tip, the interference detector creates a momentary interruption in the leak detector for several seconds, resulting in the following:

- When interference is detected, the audible beep stops and the INT/WT light LED #3 and the READY LED #1 begin to flash briefly. When the unit is ready to resume operation, LED #3 extinguishes, the READY LED #1 turns ON and the audible resumes.

### In a Contaminated Environment

When a contaminated area is detected by the unit lasting for a duration of time during a leak search, the sensor detects the change and will respond in the following manner:

- The READY indicator LED #1 will extinguish, the audible will stop (unless muted) and the INT/WT indicator LED #3 will turn ON.
- The unit performs a re-calibration for the contaminated environment. When done, the CA indicator LED #2 turns ON, the READY indicator LED #1 turns ON and the audible returns, indicating that the unit is ready for use to detect leaks in a contaminated environment.

## QUICK START TIPS ON HOW TO FIND LEAKS

A sudden whipping action of the probe or blowing into the sensor may cause the leak detector to false alarm. Electronic sensors are incorporated into the product to detect such activity and to reduce and minimize such false alarm. In the event such interference is detected, the LED #3 will begin to flash indicating interference then normal operation can resume after the READY LED appears.

1. When starting the search for leaks, without a general knowledge of the magnitude of the leak, set the instrument sensitivity to LOW. The LOW sensitivity will enable the unit to locate medium as well as large size leaks.
2. Slowly move the probe approximately 3/8 inch (9 mm) above the area of suspected leaks. Move the probe past the leak to allow the probe to clear if a leak is detected. Do not hold the probe at the site of a leak. For verification, return the probe to the same area where a leak was detected.
3. In the event no leaks were found with a LOW sensitivity setting, increase the sensitivity to MEDIUM and repeat step (2) above.
4. For locating extremely small leaks; 0.1 oz/yr (2.8 grams) or less, the HIGH sensitivity scale should be used. Due to the extremely small leak size, the tip of the probe should be moved as close to the surface as possible (without physically touching any object). Physical touching of an object will be detected by the probe sensors resulting in a brief interruption in the leak detector. When probing for a leak in an contaminated environment, the sensor will detect the contaminated area and will automatically adjust for the new conditions.

## MAINTENANCE

### To Install or Replace the Alkaline Batteries

Remove the battery cover as shown in Figure 1 and remove the existing batteries. It may be beneficial to turn the unit vertically and shake out both batteries. Install two C size alkaline batteries with the polarities shown in Figure 1. Re-install the battery cover and secure with the cover screw.

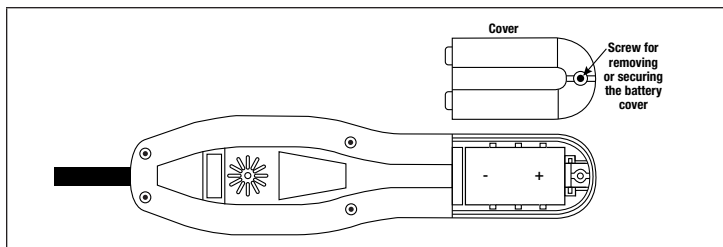


Figure 1

### Replacing the Sensor

To replace the sensor, firmly grasp the flexible probe near the end with one hand and use the other hand to unscrew the nozzle portion from the threaded probe tip in a counter-clockwise direction. Next, remove the metal washer, the rubber washer and the sensor in that order. Observe the orientation of the key on the sensor being removed. It would be advisable to replace the filter inside the nozzle at the same time. To remove the micro-filtration membrane from inside the nozzle, the assistance of a long thin object such as an o-ring pick or equivalent will be required.

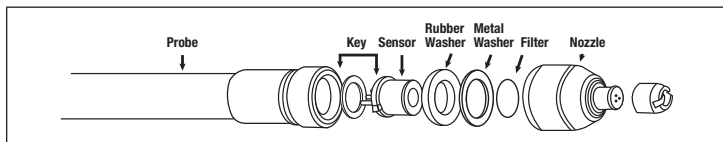


Figure 2

When installing a new sensor, orient the tab key on the sensor with the keys slot on the probe, making certain that the 3 pins of the sensor are inserted into the appropriate pins inside the probe end. Verify that the sensor has been properly inserted into the probe. Next install the rubber washer as shown in Figure 2, followed by the metal washer. Insert new filter and screw

on the nozzle while firmly holding the probe end with the other hand. DO NOT USE ANY TOOLS in tightening the tip assembly, firmly hand tighten only.

### LEAK TEST VIAL

A Leak Test Vial is supplied with your leak detector to verify that the leak detector is operating correctly.

1. Turn the leak detector ON and wait until the unit completes its warm-up sequence. The READY LED will be displayed and the audible “beep” will begin, unless muted. Set the sensitivity level to MEDIUM.
2. Remove the vinyl cap from the vial to expose the small leak hole as shown in Figure 3A below. DO NOT UNTWIST THE BLACK CAP FROM THE BOTTLE.

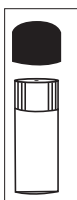


Figure 3A

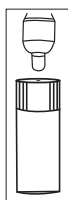


Figure 3B

3. Briefly place the probe tip close to the small hole, as shown in Figure 3B until an audible alarm is generated. This will be an indication that the unit is operating properly. Reseal the vial with the previously removed vinyl cap and return to the case.

### PRECAUTION!

If the test vial is held in close proximity of the probe tip for an extended period of time, the probe sensor can saturate. The leak detector will interpret this as a contaminated atmosphere associated with a large refrigerant leak.

This precaution also applies when locating leaks. Refer to **Quick Start Tips On How To Find Leaks**, step #2 for further clarification.

If the above precaution is not followed, the CA (contaminated atmosphere) LED may appear on the display, after a self-calibration process. The unit can be used to detect leaks provided the READY LED appears on the display. The CA LED indication will eventually disappear when the unit returns to a non-contaminated environment and undergoes a self-calibration process.

### SENSITIVITY TO AUTOMOTIVE CHEMICALS

Due to the chemical similarity between the miscellaneous automotive products listed below and the chemical properties of refrigerants, some of these chemicals will interfere with the effort of isolating refrigerant leaks in automobiles. For this reason, the chemicals that the leak detector responds to should not be present in close proximity of the suspected leak location.

BRAND OR CHEMICAL NAME	RESPONSE	CLEAR IN 20 SEC
Windshield Washer Solvent	Yes	Yes
Motorcraft Spot & Stain Remover	Yes	Yes
Motorcraft Metal Brake Parts Cleaner	Yes	Yes
Motorcraft Penetrating and Lock Lubricant	Yes	Yes
Motorcraft Break Parts Cleaner	Yes	Yes
Motorcraft Clear Silicone Rubber	Yes	Yes
Antifreeze/Coolant	Yes	Yes
Gunk Liquid Wrench	Yes	Yes
Motorcraft Natural Citrus Hand Cleaner	Yes	Yes
Motorcraft DOT3 Brake Fluid	No	N/A
Motorcraft Spray Carburetor Tune-Up Cleaner	Yes	Yes
Motorcraft Door Latch Grease	No	N/A
Loctite Biodegradable Cleaner & Degreaser	Yes	Yes
Dexron ATF	No	N/A
Mineral Engine Oil	No	N/A
Silicon Brake Grease	Yes	Yes
3M Gasket Adhesive	Yes	Yes

### REPLACEMENT PARTS

Replacement parts and accessories for the 55900 Leak Detector are available through the same dealer from whom you purchased the instrument or from Mastercool Inc.

REF. #	DESCRIPTION	MC PART #
1.	Blow Molded Plastic Box	55800-PB
2.	Leak Test Vial	55800-VL
3.	Battery Cover	55900-BATCOV
4.	Sensor	55800-SEN
5.	2 “C” Batteries	BATTERY “C”
6.	Sensor Protector	55100-10042
7.	Replacement Filters (3)	55800-FILTER

