

Operating Manual

H-10 Pro

Universal Refrigerant Leak Detector (CFC, HCFC, HFC, and HFO)



Order No.: 3015-9005/03

Print Spec: 10000005389 (EO)

CR: 800000072476

⚠ WARNING!

These instructions must be provided to users before use of the product and retained for ready reference by the user. Read this manual carefully before using or maintaining the device. The device will perform as designed only if it is used and maintained in accordance with the manufacturer's instructions. Otherwise, it could fail to perform as designed, and persons who rely on this device could sustain serious injury or death.

The warranties made by MSA with respect to the product are voided if the product is not installed and used in accordance with the instructions in this manual. Please protect yourself and your employees by following the instructions.

Please read and observe the WARNINGS and CAUTIONS inside. For additional information relative to use or repair, call 1-800-MSA-2222 during regular working hours.

For countries of Russian Federation, Republic of Kazakhstan and Republic of Belarus, the gas detector will be delivered with a passport document that includes valid approval information. On the CD with manual instruction attached to the gas detector the user will find the documents "Type Description" and "Test Method" - appendixes to Pattern Approval Certificate of Measuring instrument, valid in the countries of use.

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1 Introduction

The H-10 Pro detects refrigerants to pinpoint small, medium, and large leaks quickly and efficiently.

1.1 Safety Information

WARNING!

- This instrument has not been designed to be intrinsically safe for use in areas classified as hazardous locations. DO NOT use it in hazardous (classified) locations.
- This device is not to be used in any application that is beyond its intended purpose or beyond the scope of its specifications. For details on appropriate use, refer to the rest of this manual. If unsure of the validity of a particular application, contact MSA prior to using in the application.
- This analyzer is not intended to be used on a continuous basis.
- Except for replacement of consumables such as sensors, filters, and battery, this analyzer should only be opened and/or serviced by authorized MSA personnel. Failure to comply may affect product performance and void the warranty.
- Do not store instrument or its sensors with solvents or products that contain solvents.
- Submerging the probe in liquid will damage the pump.
- Exposing the probe to pure refrigerant will severely reduce the life or destroy the sensor. Life of the sensor is directly proportional to the amount of refrigerant that it is exposed to.
- Exposure to high concentrations of refrigerant may require adjustment of sensor heat (see [3.1 Heater Adjustments](#)).

Failure to follow these warnings can result in serious personal injury or death.

1.2 Specifications

	Spec	Description
Battery	Type	12V lead-acid battery
	Life	3 hours (typical)
	Charging	3-4 hours with wall adapter (included)
Sensor	Type	Heated diode
	Life ¹	1 year (typical)
	Calibration	As needed (see 3.1 Heater Adjustments)
Flexible Probe		4.5 ft. (1.4 m) length with built-in filter
Response		1 second
Flow Rate		90 cc/min @ small setting (typical)
Refrigerants Detected		All CFCs, HFCs, HCFCs, and HFOs
Sensitivity ²		0.006 oz/yr, stationary
		0.1 oz/yr, moving per SAE J2791
Auto adjust to background		Yes, automatic mode only
Warm-up		2 min (typical)
Indication	Visual	Red LED in probe tip
	Audible	Internal beeper or stereo headphone jack
Weight		5.1 lb. / 2.3 kg
Dimensions (LxWxH)		10.5 x 8.3 x 5.4 in. / 267 x 211 x 137 mm
Operating Conditions		32 to 104 °F / 0 to 40° C
Approvals		CE A2L to A3 Safety: FM Technical Decision Form TD 221
Warranty ³		3 years

¹ Based on normal use. Consistent and/or constant exposure to high levels of refrigerant will deteriorate the sensor life more quickly. Increasing the sensor heater will also impact sensor life.

² Sensitivity for R12, R22, R134a, R410a, R404a and R507 when unit is set to small leak setting, manual mode.

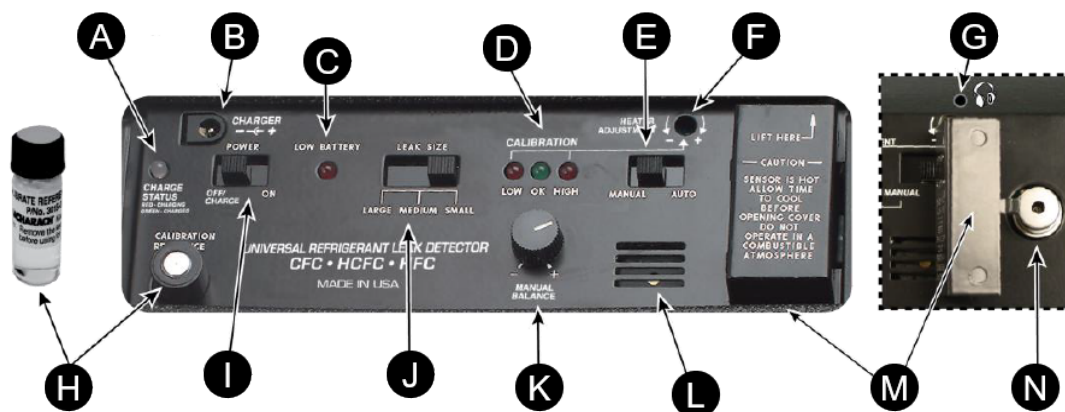
³ This warranty does not cover sensors, reference leaks, filters, airflow balls, lamps, batteries, or probe tips. This warranty does not cover damages caused by the user.

2 Operation

The H-10 Pro sensor uses positive ion emission technology, commonly known as a heated diode. It is very sensitive to only halon substances (refrigerants) making this product highly resistive to false alarming, while retaining superior sensitivity for pinpointing the most difficult to find refrigerant leaks.

A pump inside the unit draws air through the probe to the sensor. The presence of refrigerant(s) causes the H-10 Pro to sound a speaker and illuminate an LED in the probe. Sensitivity to pinpoint small, medium, and large leaks can be controlled by setting the Leak Size switch (see [2.1 Panel Controls](#)).

2.1 Panel Controls



- | | | |
|-------------------------------|----------------------------------|--|
| A - Battery Charge Status LED | F - Heater Adjust | K - Manual Balance Control |
| B - Battery Charger Socket | G - Headphone Jack | L - Speaker (Behind Grille) |
| C - Low Battery LED | H - Calibration Reference Bottle | M - Sensor Cover (Hinged on Left Side) |
| D - Heater Adjust LEDs (3) | I - Power Switch | N - Sensor |
| E - Mode Switch | J - Leak Size Switch | |

2.2 Before First Use

1. Remove the sticky-label disc from the cap of the calibration reference bottle.

NOTE: This disc can be reused to help seal the vial when the leak detector is not in use, or it can be discarded. DO NOT attempt to unscrew the cap, you may damage the bottle.

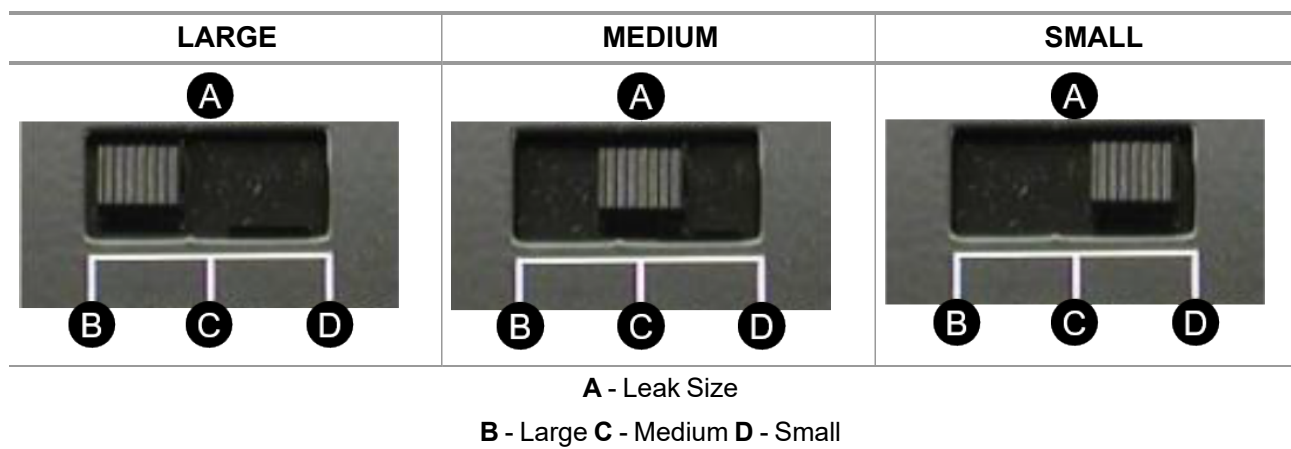
NOTE: The calibration reference bottle should last approximately six months.

2. With the Power switch in the OFF position, charge the battery using the wall adapter.

NOTE: Charge time is 3-4 hours or until the Full Charge LED turns green.

2.3 Adjusting the Sensitivity

Set the Leak Size switch as follows.



2 Operation

SMALL switch position is the highest sensitivity. The unit will indicate leak rates of 0.006 oz/yr or greater and is used for fluorine-based gases like R134 (HFC) or R454B (HFO). This position also assures highest repeatability for locating 0.1 oz/yr (or greater) leaks per SAE J2791 moving probe test conditions. It must always be used to verify performance and calibration when using the calibration reference bottle.

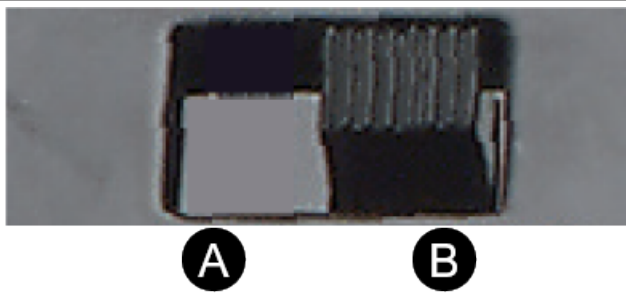
When using the small leak range position, a leak of HFC causing an audible signal equal to that produced by the leak vial has a leak rate of approximately 0.5 oz/year.

MEDIUM switch position is used for chlorine-based (CFC and HCFC) gases like R12 and R22. The medium setting will indicate approximately a 0.1 oz/yr (or greater) leak rate. This position supports finding leaks of approximately 0.5 oz/yr (per SAE J2791) or greater. It is also useful for locating larger HFC and HFO leaks.

When using the medium leak range position on a CFC or HCFC system, this leak rate would also be approximately 0.5 oz/year.

LARGE switch position is used to zero in on large leaks of any refrigerant. The large leak setting should be used in conjunction with manual mode.

2.4 Auto-Mode vs. Manual Mode

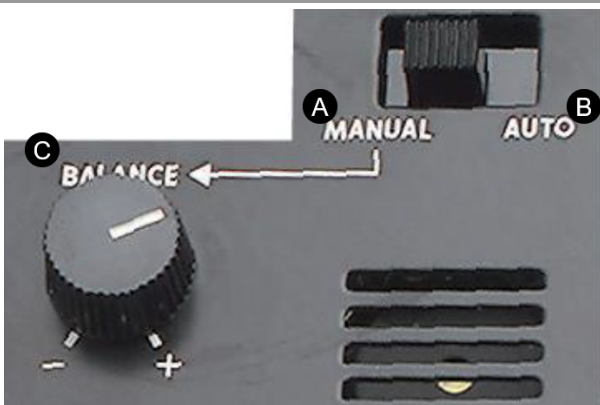


A - Manual B - Auto

Auto Mode enables the H-10 Pro to block out background levels of refrigerants. This greatly reduces and/or eliminates false alarms while retaining sensitivity to quickly locate small or medium size leaks. Pinpointing leaks in this mode requires continuous probe movement.

If the probe is held stationary over a leak, the unit will zero out the leak, going into the idle 1 tick/second condition. Briefly moving the probe away from the leak (1-2 seconds) permits the unit to re-establish sensitivity. Returning to the leak site, the unit will alarm again. Continuing this procedure will reliably and repeatedly pinpoint the leak with each pass over the leak site.

If a large leak is present, the auto zero circuit may reduce sensitivity to an unacceptable level to find small and medium sized leaks. If this condition exists, use the manual mode to pinpoint a large leak. The manual mode is also an effective means to determine if a large leak of any refrigerant exists prior to searching for leaks (see [2.3 Adjusting the Sensitivity](#)).

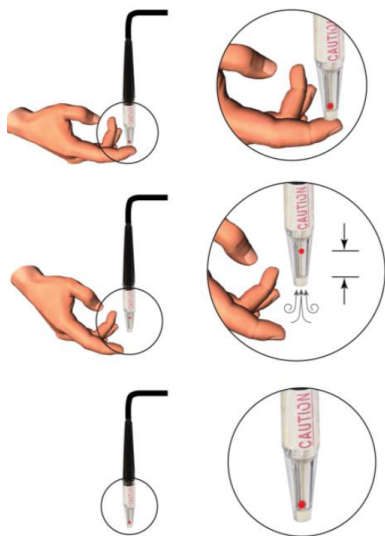


A - Manual B - Auto C- Balance

In **Manual Mode** the auto-zero circuit is disabled. The unit will not zero the leak if the probe is held over the leak site. This mode may require frequent readjustment of the Manual Balance control to maintain the required 1 tick per second that indicates proper adjustment and calibration for all three sensitivity switch positions. Manual mode provides greater sensitivity than auto mode.

2.5 Setup

1. Turn the unit on.
2. Slide mode switch to AUTO position.
3. Slide the sensitivity switch to the SMALL position.
4. Check Low Battery LED. If it glows red, the battery needs charging, or you may operate the unit using the supplied wall adapter.



NOTE: Use only the supplied charger with this device.

5. Check for sufficient airflow by pointing the probe tip toward the floor, covering it with your finger, then releasing your finger.

NOTE: If proper flow exists, the red ball should noticeably rise up into the probe when you uncover the probe tip.

NOTE: The actual height and final resting position of the red ball are not important. If the airflow ball does not rise:

- Tap the probe lightly to ensure the ball is not sticking.
- Check the filter in the probe tip (see [4.1 Replacing the Filter](#)).
- If the flow is still insufficient, then the unit should be sent for repair to the nearest Authorized Service Center.

6. Allow two minutes for the sensor to warm up, after which the flashing probe light and sound indicator will idle at approximately 1 click per second.
7. Test operation by quickly touching the probe tip to the top of the calibration reference bottle (make sure sticky label is removed). The unit should respond with a rapid flash rate and sound verifying correct operation and optimum sensitivity. If the unit does not respond correctly, see [3.1 Heater Adjustments](#).

2.6 Checking for Leaks

1. Set the range switch to the appropriate range to ensure maximum sensor life. If the leak size is unknown, start at the Large leak setting. This protects the sensor if a large amount of gas is present.

NOTE: Exposing the sensor to large amounts of refrigerant or holding the probe over a leak for a long period of time will significantly shorten sensor life.

2. Check for leaks in a logical progression through the entire system.
3. If surfaces are dirty or wet, wipe them off with a clean, dry cloth to reduce filter clogging and extend sensor life. **DO NOT** allow the unit to draw in moisture. Use of the supplied rubber probe tip helps prevent moisture from being drawn into the unit. Check for moisture before inserting the probe into areas to be checked for leaks.
 - a. If leaks *have not* been detected using the large leak setting: Try using the medium or small setting as appropriate.
 - b. If leaks *have* been detected using the large leak setting: After locating and repairing any leaks requiring the use of the LARGE switch setting, switch to the MEDIUM setting and verify the system is free of leaks.

NOTE: For HFC or HFO refrigerants, verify the system is leak free using the SMALL setting. For CFC and HCFC systems, the MEDIUM setting is typically sufficient to verify that the system is free of leaks that require repairing.

3 Calibration and Performance

4. After a leak is located and repaired, clear the area with shop air, set the unit on the small leak sensitivity, and double check equipment for small leaks.

3 Calibration and Performance

3.1 Heater Adjustments

The sensor heater circuit can be adjusted to control the sensitivity of the unit. A heat setting that is too high causes instability due to excessive sensitivity and shortens sensor life. A heat setting that is too low causes decreased sensitivity. The heater adjustment LEDs, heater adjustment, and calibration reference bottle is a unique system for setting the correct sensor heat (sensitivity) for optimum performance and long sensor life. Calibration should occur before each use to confirm the correct sensitivity of the unit.

To check the heater setting:

1. Slide the mode switch to AUTO, slide the leak switch to SMALL, turn ON the unit and allow it to stabilize (approximately 2 minutes).
2. When stabilized (at approximately 1 click per second), briefly touch the probe tip to the calibration reference bottle with the probe (ensure the sticky label disc is removed from the top of the bottle).
3. If adjusted properly, the red LOW LED will go out and the green OK LED will briefly glow. This indicates the sensor's heat/sensitivity is adjusted for optimum performance.
 - If the red LOW LED remains on when you briefly touch the bottle, the sensor heat is set too low and the Heater Adjustment must be turned slightly clockwise using a small screwdriver. Allow unit to stabilize about one minute and retest. Repeat this procedure until the green OK LED briefly glows.
 - If the red HIGH LED glows, the heat is set too high and the heater adjustment should be turned slightly counterclockwise using a small screwdriver. Allow the unit to stabilize for about 1 minute and then repeat the test. Repeat this procedure until the proper green OK LED is indicated.
 - After initial check for correct heater adjustment, disregard the calibration LEDs.

Over the usable sensor life, when heater adjustment is fully clockwise and the green OK LED will not come on, it is time to replace the sensor (see [4.3 Replacing the Sensor](#)).

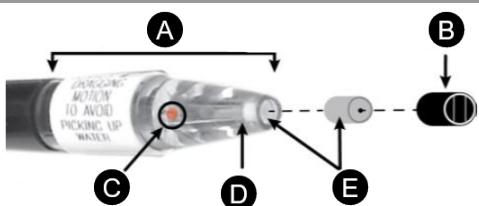
4 Maintenance

4.1 Replacing the Filter

NOTE: To protect the pump from damage due to foreign particles and moisture, replace the filter as it becomes dirty. With moderate use (15 to 30 minutes a day), it is recommended that the filter be replaced once per month. In dirty environments or with heavy use, replace the filter more frequently. Always replace the filter when it is visibly dirty or wet.

To replace the filter:

1. Remove the black rubber probe tip (B).
2. Pick out the filter (E) with a pin or tweezers. A fine screen (D) will remain in the tip of the probe nozzle (behind where the filter sits).
3. Insert the new filter (E) in the probe tip (B). Make sure that the filter is firmly seated against the screen.
4. Replace the rubber probe tip.



A - Clear Plastic Probe Nozzle **B** - Rubber Probe Tip
C - Airflow Indicator (Red Ball) **D** - Screen **E** - Filter

4.2 Replacing the Airflow Indicator

1. Remove the clear plastic section of the probe tip (B) by gently pulling and twisting.
2. Turn the probe tip (B) upside-down and tap on it to remove the old airflow indicator ball (C).
3. Insert the new airflow indicator ball (C) into the tip.
4. Reattach the probe tip (B) to the probe assembly.

4.3 Replacing the Sensor

The sensor needs to be replaced when the H-10 Pro no longer responds to the calibration reference bottle, even with the heater adjustment turned fully clockwise (make sure the reference bottle contains some refrigerant).

1. Turn the leak detector OFF.
2. Turn the heater adjustment to its full counterclockwise position.
3. Unplug the power cord and open the sensor cover.



Sensor Cover Closed Sensor Cover Open

4. Allow the sensor to cool before touching it.

⚠ WARNING!

Sensor temperature may cause a burn if not allowed to cool.

Failure to follow this warning can result in serious personal injury or death.

5. Unplug and discard the sensor.
6. Insert a new sensor and close the sensor cover.
7. Adjust the heater (see [3.1 Heater Adjustments](#)).

5 Troubleshooting

5.1 Diagnosing Issues

P = Problem **C/S**=Cause/Solution

P No response to calibration reference bottle.

C/S Heat Adjustment is set too low or bottle is empty. Readjust heater (see [3.1 Heater Adjustments](#)) or replace bottle (3015-0864). No air flow (indicator ball in probe doesn't float). Replace filter in probe tip (3015-0784). Check for proper pump operation. Sensor exposed to excessive amounts of halogen gas. Move probe to clean atmosphere for several minutes while sensor purges itself. Water is in the probe. Turn unit off and disconnect probe from chassis. Remove screws and take out chassis. Look at the underside of the leak detector and follow the probe to the pump. Remove this hose from the pump. Blow clean air (5 psi) into the probe tip for one or two minutes. Reassemble unit and replace the filter (3015-0784).

P Erratic response occurs in all leak positions.

C/S Filter is clogged. Replace the filter (3015-0784). Dirt is in the sensor. Remove sensor and blow it out with clean air (not over 10 psi). If unsuccessful, replace the sensor (3015-0486). Replace the filter (3015-0784). Sensor has a short circuit. Replace sensor (3015-0486). Atmosphere is contaminated with excessive refrigerant gas. Ventilate the area.

P Response is continuous (especially in SMALL leak switch position).

C/S Detector sensitivity is excessive. Readjust heater (see [3.1 Heater Adjustments](#)).

5.2 Repair Information

Should it become necessary to repair the H-10 Pro, contact an authorized service center. Units should be carefully packed to prevent shipping damage and shipped prepaid (see [5.4 Service Centers](#)).

5.3 Spare Parts

WARNING!

Use only genuine MSA replacement parts when performing any maintenance procedures provided in this manual. Failure to do so may seriously impair sensor and gas monitoring performance, alter flameproof/explosionproof characteristics or void agency approvals. Failure to follow this warning could cause the product to fail to perform as designed and persons who rely on this product for their safety could sustain serious personal injury or loss of life.

Repair or alteration of the leak detector, beyond the scope of the maintenance procedures provided in this manual or by anyone other than authorized MSA service personnel, could cause the product to fail to perform as designed and persons who rely on this product for their safety could sustain serious personal injury or loss of life.

Failure to follow these warnings can result in serious personal injury or death.

Part Number	Description
3015-8004	H-10 Pro Refrigerant Leak Detector, battery, charger, and North American plug
3015-8005	H-10 Pro Refrigerant Leak Detector, battery, charger, and plug set (North American and international)
3015-0326	14" flexible probe extension
3015-5812	Wall adapter with North American plug
3015-0119	Wall adapter with North American and international plugs
3015-0895	Battery clamp/cigarette adapter assembly
3015-0641	Clear probe tip
3015-5942	Rubber probe tip

Part Number	Description
3015-0486	Replacement sensor
3015-0781	Tune-up kit (sensor, 100 filters, 3 airflow balls, 3 rubber probe tips, and calibration bottle)
3015-0784	Maintenance kit (100 filters, 3 airflow balls, 3 rubber probe tips, and calibration bottle)
3015-0737	Maintenance kit (12 filters, 3 airflow balls)
3015-0864	Calibration reference bottle
3015-0103	Battery
3015-0095	Shoulder strap
3015-5941	Probe assembly

5.4 Service Centers

Replacement parts and service can be obtained by contacting one of the following MSA Service Centers.

Service and replacement parts can be obtained by contacting the MSA Service Centers listed below. Access <https://us.msasafety.com/service/bacharach> on the web for return materials authorization.

Location	Contact Information
United States	Phone: 1-800-736-4666 x 2 Email: RMA@msasafety.com
Europe	Phone: 1-800-736-4666 x 2 Email: RMA@msasafety.com
Canada	Phone: 1-800-328-5217 Email: BachCan.Support@msasafety.com

6 Limited Warranty

The purchaser is warranted that this leak detector will be free of defects in material and workmanship for 3 years from date of purchase. This warranty does not cover sensors, reference leaks, filters, airflow balls, lamps, batteries, or probe tips. Damages caused by the user will not be covered.

If any defects are discovered during the warranty period, an Authorized Service Center will repair or replace the unit at their option. The foregoing limited warranty is exclusive and in lieu of all other warranties, whether written or implied, and no warranty of merchantability or fitness for purpose will apply.