

ROBINAIR

A/C Recovery & Recycling



As long as there's been air conditioning, there's been Robinair, the global leader in automotive and HVAC/R air conditioning (A/C) refrigerant recovery, recycling and recharge tools, equipment and accessories. Vehicle manufacturers (OEMs), dealership service departments, auto repair shops, industrial and commercial contractors have turned to Robinair for A/C service products since 1956.



Protect Your Investment

Robinair technical support, local service centers and flexible ToolGuard™ extended service coverage you can count on.

At Bosch Automotive Service Solutions Inc., we recognize that your purchase of Robinair tools and equipment is an important investment in your business.

Since 1956, Robinair has been and continues to be a world leader and trusted name in automotive A/C service equipment. We know you rely on the dependability of our products and the way we take care of you and your equipment after the sale. With a technical support team that is eager to help and hundreds of service centers throughout North America, we are able to quickly respond to your service needs.

Warranty Registration

Warranty registration is the most important step in helping us provide exceptional customer service for you. Registration is available online at www.robinair.com/support or call 1-800-822-5561 and follow the prompt for Robinair technical support.

ToolGuard™ Extended Service Contract

Robinair provides factory warranty coverage with your tool. However, we expect you will be using your tool well beyond your factory warranty. To continue protecting your investment and budget your maintenance costs, consider keeping your coverage with the ToolGuard™ Extended Service Contract.

To learn more about available coverage, visit us at robinair.com, e-mail us at toolguard@bosch-automotive.com or call us at 1-800-233-7055.

Warranty Replacement or Repair

RepairTrack offers you the ability to manage your warranty replacement or repair experience for the Robinair handheld products by providing you with an easy way to send your product in for replacement or repair and track it.

- › From the moment it leaves your facility to the moment it returns, you will have the latest information
- › Generate a Repair Return Authorization by printing out a UPS tracking number directly from this site
- › Review and approve Repair Estimates online
- › Make Credit Card payments for your Repairs online
- › Up to date warranty and service information include any special programs that exist with your product
- › Find out the latest repair policies and procedures, and where to go for additional information
- › Don't miss out on this valuable service

To learn more, log on to RepairTrack at repairtrack.bosch-automotive.com.

Robinair Technical Support - 1-800-822-5561
Office hours are M-F 8:00 am - 8:00 pm EST

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34288

Cool-Tech A/C Recover, Recycle, Recharge Machine

The 34288 combines simple operation with superior accuracy. It recovers, recycles, evacuates, leak tests and recharges R-134A quickly and accurately. Meets SAE J-2788 standards for accuracy: 95% refrigerant recovery and charging to +/- 1/2 oz.



34988

Cool-Tech A/C Recover, Recycle, Recharge Machine

Premium R134A Recover, Recycle and Recharge A/C machine that gives the user the ability to inject dye, flush a vehicle's A/C system, save before and after service data and print that data to provide service information the a customer. (34988-1 - 220V)

Combining Simple Operation With Superior Accuracy:

These machines will test, recover, and recharge R-134a automotive A/C systems quickly and accurately.

Features	34288	34988	34788NI	34788NI-H
Fully-Automatic Function: Program to recover, vacuum, leak test and charge without operating panel valves.		X	X	X
Automatic Dye Inject: Gives the user the ability to use the machine to inject UV dye into a vehicle's A/C system.		X		
Automatic Oil Drain: A display reminds you to empty the graduated container to show the amount of oil to replace.	X	X	X	X
Oil Inject: Automatically inject oil back into the vehicle's A/C systems.		X	X	
Refrigerant & Oil Database: A/C system capacities for North American market vehicles (Optional – not included with the machine)		Optional	Optional	Optional
A/C System Flush: Flushes a vehicle's A/C system with refrigerant, eliminating any residual oil or other liquid. (Flushing adapters not included)		X	X	X
Save & print before and after service data: Allows the user to store before and after service information by vehicle and print this information to provide to a customer.		X	X	X
Visual & Audible Alarm: Notifies the user when service is complete, or if a problem has occurred.		X	X	X
Vacuum Leak Test: Monitors level after evacuation, informs of possible leak.	X	X	X	X
Automatic Air Purge: Eliminates system-damaging air without monitoring gauges or opening valves.	X	X	X	X
Automatic Refrigerant Refill: Maintains a user-selectable amount of refrigerant in an internal vessel and signals when it's time to change supply tank, no monitoring required.		X	X	X
Vacuum Feature: Defaults to 15 mins, programmable up to 99 mins. "Remaining time" is displayed.	X	X	X	X
Display: Multilingual.	X	X	X	X
Refrigerant Charging: Select a charge mode from high or low side, or use both sides.		X	X	X
Refrigerant Management System: Displays refrigerant use and monitors remaining filter life. Prompts appear when 1/3 of filter life remains.	X	X	X	X
Electric Vehicle: Capable of servicing high voltage electric compressor A/C systems.				X
Printer		X	Optional	Optional
Refrigerant Identifier			Optional	Optional



34788NI

Premier R-134A Refrigerant Recovery, Recycling, and Recharging Machine

Recover, recycle, evacuate, leak-test and recharge R-134a vehicle A/C systems. Features a larger graphical display, leak testing, automatic refrigerant refill and automated oil drain/inject – putting A/C lubricant back into the system. 34788NI also boasts an ability to add a printer and refrigerant identifier. An optional refrigerant charge and oil capacities database is available for North American market vehicles.



34788NI-H

Premier R-134A Refrigerant Recovery, Recycling, and Recharging Machine for Hybrid and Non-Hybrid Vehicles

All of the same great features and functions included on the 34788NI, plus the added capability of servicing Hybrid vehicles that use high voltage electric compressors. Recover, recycle, evacuate, leak-test and recharge R-134a vehicle A/C systems. Features a larger graphical display, leak testing, automatic refrigerant refill and automated oil drain. An optional refrigerant charge and oil capacities database is available for North American market vehicles.

Replacement / Accessories / Maintenance Kits	34288	34988	34788NI	34788NI-H
Replacement Items				
34724 – Filter (See page 6)	X	X	X	X
18190A – Low Side (Blue) Coupler (See page16)	X	X	X	X
18191A – High Side (Red) Coupler (See page16)	X	X	X	X
Accessories				
34411-E – Refrigerant Capacities DB (See page 5)		X		
34412 – Refrigerant Capacities DB (See page 5)			X	X
16256 – Oil Injector (See page 5)	X			X
17492 – Dust Cover, fits 34288 and 34988 models. (See page 5)	X	X		
17499 – Dust Cover, fits 34788NI, 34788NI-H models. (See page 5)			X	X
Maintenance Kits				
13172 – Maintenance Kit (See page 5)	X	X		



AC1234-6

Service R1234yf refrigerant vehicles with Robinair's SAE-standard AC1234-6 ACS machine

The AC1234-6 was the first A/C machine in North America to fully meet SAE's requirement for recovering, recycling and recharging vehicle A/C systems that use the new R1234yf refrigerant. The AC1234-6 is a fully automatic ACS machine that comes with an integrated refrigerant identifier that samples the refrigerant in the vehicle's A/C system prior to recovery. A highly accurate and reliable machine, it can service both standard and hybrid vehicle A/C systems.



One piece of equipment is all you need for A/C and refrigeration service. Also great for in-plant maintenance!



Recovers, Recycles, Evacuates, and Recharges R-12, R-134a, R-22, R-502, MP and HP Blends – and many more!

Design certified by UL to meet SAE J-1770.

17800B

Multiple Refrigerant Recovery, Recycling, and Recharging Machine

The 17800B recovers, recycles, evacuates and recharges – all in one fast, continuous operation through one hook-up. It's ideal for refrigerated trailers, buses, RVs, and other vehicles that use more than one refrigerant. The Multi RRR machine is also great for fleet maintenance, covering a variety of makes and models since it has both R-12 and R-134a capabilities. In-plant maintenance departments will find it can handle the different types of refrigerants used in various systems.

Features

Fully automatic operation Program for service, walk away and return when complete.

95% Recovery efficiency.

Programmable vacuum Operation helps get to the necessary vacuum level in any condition quickly.

System leak Test to identify gross leaks in a system.

Charge Accuracy within +/- 1/2 oz.

Automatic oil drain Shows how much oil was removed from the system during service.

Automatic air purge Removes the potential of air accumulating in the internal tank.

Integrated refrigerant identifier Meets SAE J2927

Liquid refrigerant flushing function Can flush A/C systems or individual components using liquid refrigerant instead of harsh chemicals.

Automatic internal tank refill No stopping to fill the internal tank during service, or before service.

1/4 Color VGA display Large easy to read graphical display

On-board printer Capable of printing vehicle service report slips to present to customers.

Specifications

Compressor	1/3HP
Dimensions	107 cm x 61 cm x 76 cm
Filter Capacity	150 kg
Humidity	90°F (32.2°C), 86% RH non-condensing
Pressure Gauges	Ø 100 mm
Maximum Pressure	25 bar
Noise	<70dB(A)
Nominal Voltage	103V–127V, 60 Hz
Oil Drain Bottle	355 ml
Operating Temperature	50°F to 122°F (10°C to 50°C)
Power Consumption	1100 VA
Pump Free-Air Displacement	1.5 CFM (35 l/m)
Service Hoses	250 cm / SAE J2888
Tank Capacity	9.09 kg (20.04 lb.)
Weight	107kg (235lbs.)

Features

Microprocessor Controls functions; prompts lead you through programming and also signal when it's time to change the filter-drier, vacuum pump oil, and compressor oil.

Float chamber Automatically adjusts from liquid to vapor for most efficient recovery.

Electronic scale Makes it simple to recharge to factory specifications; also weighs recovered refrigerant and provides tank overflow protection.

CoolTech vacuum pump 6 CFM has the capacity to thoroughly evacuate the system, readying it for recharging.

Lockout panel Prevents mixing of refrigerants; rotates to one side for 1/4" fittings and to the other for 1/2" Acme fittings.

Single-pass recycling Makes an initial pass through the filter-drier; additional recycling can be programmed in case of compressor burn-out, or other conditions.

Heavy-duty filter-drier Removes moisture and acid from the refrigerant; can handle up to 200 pounds between change-overs. Comes with two 50 pound tanks, one with 1/4" fittings and the other with 1/2" Acme fittings. Also three sets of charging hoses are included – one for R-12, one for automotive R-134a (with field service couplers), and one for other refrigerants using 1/4" SAE fittings.

International Models

17801B – 220–240V 50 Hz, readout in kilograms.

Replacement Parts

19776 – Recycling filter-drier.

17506 – 50 lb. (23 kg) refillable tank, 1/4" fittings.

34750 – 50 lb. (23 kg) refillable tank, 1/2" ACME fittings.



19776

Specifications

Voltage	115V 60 Hz
Tanks	Two 50 lb. (23 kg) refillable
Operating Range	50° to 105° F (11° to 41° C)
Recovery Rate	Vapor – 1/2 lb./min. (.2 kg/min.) Liquid – 1 lb./min. (.4 kg/min.)
Recycling Rate	4 lbs./min. (1.8 kg/min.) flow rate
Recycling Filter-Drier	1150 g XH-9
Pump Free Air Displacement	6 cfm (142 l/m) at 50 Hz
Dimensions	47" H x 26" W x 30" D (119 cm x 66 cm x 77 cm)
Weight	256 lbs. (116 kg) without tank



17580

A/C flushing unit

Make flushing part of your regular A/C service

You know that not all A/C jobs are simple recharges – there are times when you need to flush a vehicle’s air conditioning system to ensure that it operates satisfactorily. These circumstances fall into three categories:

Routine Maintenance – As an air conditioning system ages, oil, sludge, and particulates build up, plug screens, expansion valves, and capillary tubes. Periodically, you should flush the system components to remove these contaminants.

Repairs – To be sure the system will operate properly, you should flush it whenever you repair or replace components. Failed components may contain metal shavings, sludge, and other debris that damage the system or affect the operation.

R-134a Retrofits – In some cases, conversion procedures call for complete removal of existing oil in an A/C system before changing fittings and recharging with R-134a. Flushing is the most thorough means of removing the oil, and it will also pick up any refrigerant residue in the system. Flushing, combined with pulling a deep vacuum, is your assurance the system is ready for the new refrigerant.

A/C Component Flusher

The 17580 makes flushing of lines, evaporators, and condensers fast and easy.

Features

Closed Loop Circulates solvent continuously through components (adapters are needed).

Pulsing Action Loosens dirt, corrosion, and other debris; by switching the hoses, you can also back flush.

Air Agitation Needle Valve Bubbles air into liquid stream to enhance cleaning action.

Hose Adapters Contains adapters to mate with 1/4" flare and 3/8" quick disconnect fitting kits.

Sight Glass To observe flow rates and cleaning process.

One gallon of solvent is needed for the flush procedure. The unit purges solvent from the component, collecting the used material in the collection tank. An activated charcoal filter limits emissions and odors during flushing and purging.

Adapter Kit

17607 – Universal A/C flushing adapter kit.

17581 – Adapter.

Specifications

Dimensions 52" H x 33" W x 20" D

Weight 110 lbs. (50 kg)

Supply Pressure 80–150 psi.



Vehicle Database Screens

- ▶ Electronic capacities database that provides A/C charge and oil lubricant amounts by vehicle for model years 1995-2015.
- ▶ Provides capacity information right at your finger tips when needed using your A/C RRR machine.
- ▶ Can be used with the Robinair 34988, 34788 and 34788-H A/C RRR machines.

34411-E – Use with the Robinair 34788, 34988, and 34788-H A/C RRR machines.

34412 – Use 34788NI and 34788NI-H A/C RRR machines.



34411-E



34412



13169

13172

Maintenance Kits

Keep recovery and recycling units operating at peak efficiency with a convenient maintenance kit. Contains one Quick Change filter-drier to be used on both R-12 and R-134a stations, and one 16-ounce bottle of our Premium High Vacuum Pump Oil.

13172 – Maintenance kit for models using No. 34724 filter-drier (34288, 34788, 34788-H, 34988, 17700A, 17700-2K, 34700, 34700-2K, 34700Z, 342000, 34711-2K, 34800, 34800-2K, 34900 series).

13169 – Maintenance kit for early models using No. 34430 filter-drier (AC375A, AC374C, AC374, 34134Z, 34134-2K, 17700A, 34700, 34300-2K, 34134Z, 34134-2K).

See your instruction manual if you have questions about which filter-drier to use.



16256

16258

Syringe-Type Injectors

Use these syringe-type injectors to add oil to a fully pressurized A/C system. Just fill the barrel with the amount of oil needed, connect the injector, and press the plunger.

16256 – R-134a oil injector, 1/2" Acme quick coupler.

16258 – Oil injector, 1/4" SAE fitting.

Not recommended for UV dye injection.



17492

17490

17499

Vinyl Dust Covers

Protect your investment with a heavy-duty vinyl cover. Features corded seams for durability; medium gray color with CoolTech logo.

17490 – Fits all 75700, 17800B, 34900, 34800-2K, series.

17492 – Fits all 34288, 34788, 34788-H, 34988, AC375C, AC375A, AC375, 342000, 17700-2K, 34700-2K, 34134Z, 34700Z, 34711-2K, 17700Z, 34702Z.

Dust Cover for A/C RRR Machines

17499 – Fits AC1234-6, 34788NI, 34788NI-H models.



18065

34065

Oil Injectors

It takes just seconds to transfer an oil charge while the system is in a vacuum. The injectors are great add-ons to recovery/recycling and charging.

- ▶ Installs in-line on the low side of the manifold.
- ▶ Made of durable polypropylene with oil levels marked in ounces and milliliters.
- ▶ Solid brass fitting with a Lexan® handwheel.

18065 – Oil injector with 1/4" SAE fitting.

34065 – R-134a oil injector with 1/2" Acme fitting.

*Not recommended for UV dye injection.



17630



17633



19776



34430



34724

Recycling Filter-Driers

Specially blended for maximum acid and moisture removal.

17630 – Inlet filter for 17625A, 34650.

17663 – Inlet filter for 17650A.

17777 – XH-9 filter drier for 17800A, 17800-2K series (not shown).

19776 – Quick change filter for 17800B.

34430 – Quick change filter for older 17700A, 34450, 34700 (1997), AC375, AC375A, AC375C, 34134Z.

34724 – Spin-on filter for 17700-2K, 34134A, 34134-2K, 342000, 34234, 34300-2K, 34700, 34700-2K, 34700Z, 34788, 34800, 34800-2K, 34900 series.

Refrigerant Tanks

17121 – 30 lb. tank, 1/4" fittings (25150, 25175, 25200B, 34234, 34300-2K, 34800 series).

17506 – 50 lb. tank, 1/4" fittings (17800A, 17800-2K, 17700A, 25150, 25175, 25200B series).

17605 – 30 lb. tank with float switch (17650A series).

17572 – 50 lb. tank with float switch.

17686 – 50 lb. tank with 3/8" fitting, float assembly for 17680A series.

34102 – 30 lb. tank for R-134a (34234, 34300-2K, 34800, 34134A, 34134-2K series).

34579 – 30 lb. tank (34650 series).

34750 – 50 lb. tank for R-134a (34700 series).



17121



17506



17605



17572



17686



34102



34579



34750



10986

Orifice Tube Remover

Use this handy tool to remove the orifice tube before flushing. Speeds service by removing the build-up of particulates on the orifice screen and restrictions that slow flushing. The basic tool works on GM and Ford vehicles and comes with: an extender body for 1985 and newer Ford models; an adapter for 1989-91 GM "J", "L", and "N" cars; and an adapter for 1991 and newer GM "C" and "K" trucks with #3096068 orifices.



17595

Flush Gun Kit

An economical means of flushing contaminants and scale from A/C system components, the flush gun uses dry shop air to pressurize the solvent. The process thoroughly cleans the part, removing oil, any refrigerant contaminants, and residue. The attached nozzle directs the flow of solvent without spray-back.



17565



17609

Power Flush Solvent

Gives you the cleaning power to flush particulates and system lubricant from A/C and refrigeration lines, evaporators, and condensers. An ideal substitute for CFC-113, it has excellent cleaning properties and good evaporation rate. Compatible with all CFC, HCFC, and HFC refrigerants. Meets ANSI/ASHRAE 97-1933.

17565 – Gallon, six per carton.

17609 – Quart, six per carton.

GAUGE ON PANEL SHOWS
SYSTEM PRESSURE



16910

CoolTech ID Plus Refrigerant Identifier

Critical for today's automotive A/C service

It's been estimated that one in 10 vehicles on the road has an A/C system with contaminated refrigerant. The only way to know for sure if you can safely recover these charges is with a refrigerant identifier. You may also save hundreds of dollars by checking bulk tanks for purity before use.

Robinair's CoolTech line shows you in just seconds if it's safe to recover or recharge the refrigerant. There's no guesswork, because a red light indicates "fail", while a green light is your signal to continue with service. For R-12 and R-134a vehicles.

Fast and Accurate – Displays test results in less than a minute and passes the refrigerant only if it's 98% pure. To ensure consistent, rapid results, the units are not pressure/temperature dependent.

Reliable Technology – The instruments use dependable infrared technology developed by Neutronics, Inc., to determine if the refrigerant is an acceptable type and is pure enough to be used.

Unique Case Design – Puts all the components up front where you can see them at a glance, including the filter. Contoured case can be held in either hand, and rubber feet protect the vehicle's finish.

Identifies refrigerant type and purges damaging air

In addition to dependable refrigerant identification, the ID Plus measures non condensable gases (air) in the refrigerant and purges them directly from the tank or system.

- › Displays the actual percentage of R-12, R-134a, R-22, and air in the system or tank.
- › Gives you the option of purging air if significant concentration is found.
- › Hydrocarbon alarm sounds if flammable substances are sensed.
- › On-board printer port allows you to connect a printer for a hard copy of testing results.

Replacement Parts

- 16913** – Replacement filter.
- 19713** – R-12 replacement hose.
- 19714** – R-134a low-side coupler, 1/2" Acme internal adapter.
- 19716** – R-134a replacement hose.

Specifications

Power Source	100- 220V
Dimensions	11" H x 9" W x 4-1/2" D (27.94 cm x 22.86 cm x 11.43 cm)
Weight	1.75 lbs. (740 g)



16009

DiscovR™ Refrigerant Identifier

How pure is your refrigerant?

Most technicians never question the purity of virgin refrigerant, and most assume the refrigerant in a vehicle is "pure enough" unless the A/C system has a mysterious cooling problem.

If a technician has no way of checking the refrigerant before they pull it out of a customer's vehicle into their recovery equipment it may contaminate their service equipment as well as other vehicles that are serviced with the contaminated equipment.

The first line of defense

The best defense against unknown refrigerant and the risks associated with unknown refrigerant is a refrigerant identifier. With the new Robinair 16009 DiscovR™ 134a refrigerant identifier you can:

Protect your A/C service equipment – Know whether or not you have acceptable R134a refrigerant before servicing the vehicle with the DiscovR™ refrigerant identifier.

Guard against costly recovery equipment repairs – Contaminated refrigerant can wreak havoc on any R134a recovery, recycle and recharge machine. The average repair cost is \$300, and in many cases contaminated refrigerant will void the product's warranty. Shield your RRR machine from contaminated refrigerant by using the DiscovR™ refrigerant identifier before connecting to the vehicle.

Uncover hard to find air contamination – DiscovR™ refrigerant identifier notifies you when the system contains excessive air.

Fast and Accurate – "Pass" and "Fail" lights clearly show if refrigerant is pure enough to be recovered.

Replacement Parts

- 16109** – Replacement hose and filter (3 pack).

Specifications

Refrigerant	R134a
Input Power	12 VDC
Accuracy	Pass/Fail - 95% pure R134a
Air Detection	Yes
Approvals	SAE J1771, UL/C



22791
InfraRed Refrigerant Leak Detector

The InfraRed Refrigerant Leak Detector uses infrared optics to create a refrigerant leak detector that combines sensitivity, speed, battery life, portability, and ease of use.

- › Advanced infrared sensor designed to last a minimum of 10 years.
- › Three sensitivity levels down to 0.15 oz./year.
- › Automatically recalibrates in highly contaminated areas to help pinpoint the exact location of the leak
- › Won't trigger on oil or moisture.
- › Senses CFC, HFC, HCFC blends and HFO-1234yf refrigerants.
- › 8-hour lithium Ion battery lasts all day long and beyond.
- › Visual alert and peak button make it easy to find leaks in noisy environments.
- › Audible alert with mute button.
- › Magnetic hanger to easily hang the unit during leak repair.
- › Durable carrying case let's you easily store leak detector and accessories.
- › Meets NEW SAE J2913 standard for 1234yf and previous SAE J2791 standard for 134A.

The InfraRed Refrigerant Leak Detector includes, wall charge, car charger, 5 filters, 3 O-rings, lithium-ion battery and blow-molded carrying case.

Optional Accessories

- 74367** – Extension Probe (9 inch)
- 74368** – Rigid Extension Probe

Replacement Parts

- 74361** – 100–240 VAC Charger
- 74362** – 12V DC Charger
- 74363** – Filters (5) and O-rings (3)
- 74364** – Lithium-ion Battery



Specifications

Gases measured	CFC, HFC, HCFC blends and HFO-1234yf
Sensing element	Infrared
Response time	0.5 to 1 second
Sensitivity levels	HIGH 0.15 oz./year and higher MEDIUM 0.25 oz./year and higher LOW 0.5 oz./year and higher
Accuracy	Meets current SAE J2791 and J2913 standards
Calibration	Automatic
Warm up time	30 seconds
Probe length	15 inches
Battery type	3.7VDC(nominal) rechargeable lithium-ion battery
Battery life	Approximately, 8 hours when fully charged

TIFZX
Heated Pentode® Refrigerant Detector

The TIFZX uses proven heated-pentode technology with an improved grip and easy-to-read display. The design of the TIFZX eliminates false alarms from moisture, solvents and cleaners. An improved, true mechanical pump allows for instant response and clearing.

- › Heated Pentode® sensor technology
- › Tri-color visual leak size indicator
- › Detects all CFC, HFC, HCFC's including R-12, R-22, R-123, R-134a, R-404a, R-407a, R-408a, and R-410a.
- › Tactile keypad controls with one-touch reset and adjustable sensitivity
- › True mechanical pump provides instant response and clearing
- › Battery test function
- › Sensor failure indication
- › Rechargeable batteries
- › Revolutionary design
- › Three year warranty

Specifications

Sensor Technology	Heated Pentode® (advanced heated diode)
Electronic Technology	Microprocessor-controlled circuit, including constant battery and sensor condition detector
Refrigerants detected	Detects all CFC, HFC, HCFC's including R-12, R-22, R-123, R-134a, R-404a, R-407a, R-408a, and R-410a
Sensitivity	Less than 0.1 oz/yr (3 gr/yr); as low as 0.05 oz/yr (R-12)
Warm-up Period	20 seconds
Excessive Refrig. Tolerance	Sensor cannot be poisoned by excessive refrigerant
Battery Life	5 to 6 hours, depending on sensor age. Integral constant power indication
Battery Technology	Rechargeable NiMH
Battery Recharge Time	2 hours, integral charge status indicator
Failed Sensor Indication	All LEDs flash red, pump off
Sensor Life	Up to 150 hours
Operating Environment	0°C to 50°C (32°F to 122°F), 0 to 95% RH non-condensing
Dimensions	26 cm L x 6.5 cm Dia. (10.25" L X 2.5" Dia.)
Weight	Approximately 452 grams (16 ounces)

Heated Pentode® Refrigerant Detector Kits



TIFZX includes:

- (1) ZX Refrigerant Leak Detector
- (1) Battery pack, nickel metal hydride (NiMH)
- (1) Battery charger
- (1) Soft carrying case
- (1) Owner's manual

International Models

- TIFZX-E** Same as TIFZX (220-240V)
- TIFZX-J** Same as TIFZX (90-110V)



TIFZXKIT includes:

- (1) ZX Refrigerant Leak Detector
- (2) Replacement sensors
- (5) Replacement filters
- (2) Battery pack, nickel metal hydride (NiMH)
- (1) Charging base
- (1) Battery charger
- (1) Cigarette lighter charger (12V)
- (1) Blow-molded carrying case
- (1) Owner's manual

International Models

- TIFZXKITE** Same as TIFZXKIT (220-240V)
- TIFZXKITJ** Same as TIFZXKIT (90-110V)

Replacement Parts & Accessories

- TIFZX-2** Replacement Heated Pentode® Sensor
- TIFZX-3** 110V-60 Hz Battery charger (North and South America)
- TIFZX-3E** 230V-50 Hz Battery charger (Europe, Asia)
- TIFZX-6** Remote Battery charging base, 110V-60 Hz (Optional)
- TIFZX-7** Nickel-Metal hydride (NiMH) battery pack
- TIFZX-10** Flexible probe (includes probe tip)
- TIFZX-11** 12V DC battery charger
- TIFZX-14** Filter and O-ring
- TIFZX-15** Filter elements (5 pack)
- TIFZX-55** Soft carrying case



TIFZX-2



TIFZX-3, TIFZX-3E



TIFZX-7



TIFZX-6, TIFZX-6E



TIFZX-10



TIFZX-55



TIFZX-14



TIFZX-15



TIFZX-11



TIFXP-1A



TIFRX-1A



TIFXL-1A



Design Certified by MET Laboratories, Inc., to meet SAE J1627 for R-134a, R-12, and R-22.

U.S. Patent Nos. Re: 32,552; 4,282,521; 5,400,015

CLASSIFIED BY UNDERWRITERS LABORATORIES INC® ONLY TO INTRINSIC SAFETY IN CLASS 1 GROUPS C & D HAZARDOUS LOCATIONS.

TIFXL-1A, TIFRX-1A, TIFXP-1A Leak Detectors

The revolutionary new “Generation X” line of TIF refrigerant leak detectors brings you tomorrow’s technology today. We not only changed the way our leak detectors look, but the way to look at leak detectors. Innovative MPC circuitry and Advanced Digital Signal Processing monitor the sensing tip up to 2000 times per second. Automatic reset, true mechanical pump, and visual indicators (TIF XP-1 and TIF RX-1) speed and simplify leak searches.

A completely re-designed sensing tip increases sensitivity, improves reliability, and lasts twice as long as its predecessor. This results in fewer comebacks, less hassle, and lower maintenance costs. We are so confident in the design and quality of these detectors that they are backed by a warranty of up to 3 years.

All Models Feature

- › Microprocessor controlled circuit with Advanced Digital Signal Processing.
- › Detects ALL halogenated refrigerants.
- › Certified to SAE J1627.
- › Variable frequency audible alarm.
- › CE approval.
- › UL classified.
- › Constant power indication.
- › Cordless and portable; operates on two C-cell batteries.
- › 14" (35.5 cm) flexible stainless steel probe with liner.
- › Carrying case included, optional holster.
- › Optional reference leak source.

Additional Features

TIFXL-1A

- › Single switch control.
- › Two-year warranty.

TIFRX-1A

- › Six-segment visual leak size indicator.
- › True mechanical pump provides positive airflow through sensing tip.
- › High and low sensitivity levels.
- › One touch reset.
- › Tactile keypad controls.
- › Two-year warranty.

TIFXP-1A

- › Tri-color, six-segment visual leak size indicator displays 18 alarm levels.
- › Seven levels of sensitivity adjustment provide an increase of up to 64x.
- › Battery test function with true voltage indication.
- › Mute feature silences audible alarm.
- › True mechanical pump provides positive airflow through sensing tip.
- › One touch reset.
- › Tactile keypad controls.
- › Three-year warranty.

Replacement Parts (all models)

- TIFXP-2 – Maintenance kit (3 tips, 3 protectors).
- TIFXP-5A – Battery cover.

Specifications	
Power Source	3V DC; 2 "C" cell alkaline batteries
Ultimate Sensitivity	TIFXL-1A - Less than 0.4 oz./yr. (11 g/yr.) TIFRX-1A - Less than 0.25 oz./yr. (7 g/yr.) TIFXP-1A - Less than 0.1 oz./yr. (3 g/yr.)
Sensing Tip Life	Approx. 20 hours
Operating Range	30° to 125° F (0° to 52° C)
Battery Life	TIFRX-1A and TIFXP-1A – Approx. 30 hrs. TIFXL-1A – Approx. 40 hrs.
Duty Cycle	Continuous
Response Time	Instantaneous
Reset Time	One second
Warm-up Time	Approx. 2 seconds
Unit Weight	1.2 lbs. (560 grams)
Unit Dimensions	9" x 2.25" x 2.25" (22.9 cm x 5.7 cm x 5.7 cm)
Fixed Probe Length	14" (35.5 cm)



**TIF8800X
Combustible Gas Detector**

The TIF8800X is a low maintenance, battery operated, combustible gas detector that provides a ticking signal that increases in frequency as the source of combustible gas or vapor is located. The TIF8800X is small enough to be operated with just one hand, yet loaded with the kind of advanced features service professionals demand. This tool allows you to pinpoint combustible gas leaks as small as 1 ppm quickly, while checking a relatively large area in a short amount of time with absolutely no calibration required.

Applications

The TIF8800X may be used in almost any situation where a combustible gas, vapor, or residue needs to be found. An ideal instrument for pinpointing combustible gas leaks in commercial, residential, and industrial applications.

- › Audible “ticking” signal
- › Leak strength indicating LEDs
- › Adjustable sensitivity
- › Cordless operation
- › Fast warm-up
- › Battery status indication
- › 15 inch flexible probe for hard-to-reach areas
- › One-year warranty



Kit includes: TIF8800X, battery, battery charger and soft case.

International models

TIF8800X-E – 220V

Replacement Parts

- TIF8801 – Sensor
- TIF8802 – A/C adapter
- TIF8802E – A/C adapter 220V
- TIF8802J – A/C adapter 90-100 r
- TIF8808 – Battery cover
- TIF8809 – Ni Mh battery pack
- TIF8818 – Rubber boot



Specifications

Power Source	4.8V NiMH rechargeable battery pack
Operation	Continuous
Time	Approximately 4 hours
Battery Pack	Lifetime Approximately 500 charge cycles
Warm-up	30 seconds
Duty Cycle	Continuous; no limitation
Response Time	Instantaneous
Sensitivity	Variable; as low as 1 ppm (gasoline)
Operating Environment	32°F to 104°F (0°F to 40°C)
Unit Weight	Approximately 16 ounces (454 grams)
Unit Dimensions	8 in. x 3 in. x 1.8 in. (20.3 x 7.6 x 4.6 cm)
Certifications	UL913 7th Edition (use in Class I, II, or III, Division 1 hazardous (classified) locations)

**16600
Electronic Leak Detector**

For all CFC, HCFC, and HFC Refrigerants
Robinair's electronic leak detector is ergonomically designed to fit in your hand. Holding it is natural and comfortable, and it fits into tight spots, so you can thoroughly check for leaks. No. 16600 is packed with features that help you pinpoint leaks quickly.
One-Hand Operation – The 16" gooseneck probe holds its position so you can operate the detector with one hand.

Audible and Visual Leak Indicators – An alarm increases in frequency as the tip gets close to a high concentration of refrigerant. LEDs are especially helpful when you're working in a noisy environment.

Threshold Balancing Control – Gives you infinite control for eliminating background contamination, so you can zero in on the leak site.

Volume Control – Adjust the audible leak signal to the volume that's right for the background noise in the shop or at the job site.

Reliable Technology = Dependable Leak Detecting

No. 16600 uses proven corona discharge technology to sense leaks. It works by creating a high voltage corona in the sensing tip. When this field is interrupted by refrigerant, the alarm is triggered. All corona discharge leak detectors are not the same, however – the quality of key components is critical in providing an effective instrument.

Transformer – To create the high voltage corona, the unit must “pump up” from the battery output to 2000 volts. It takes a specialized transformer to consistently provide this voltage, and ours is the result of years of testing and field use to ensure operation you can rely on.



Back View
The gooseneck probe clips into a holder on the back of the unit for protection during storage and transit.

Specifications

Power Source	Four AA Alkaline batteries (included)
Battery Life	Approximately 25 hours
Dimensions	8-1/2" L x 3-1/4" W x 2" D (21.59 cm x 8.26 cm x 5 cm)
Probe Length	16 in. (40.6 cm)
Weight	1.14 lbs. (.52 kg) with batteries

**16503
Sensing Tip**

The materials, shape, and finish of the sensor and surrounding shell are critical to the effectiveness and life of the tip. Specially engineered tip is built with a mirror finish for superior sensitivity and durability.



TIF8900

Combustible Gas Detector

The TIF8900 is a super-sensitive, cordless, combustible gas detector that detects a broad range of natural gases including propane, methanol, butane, and gasoline.

- › Solid-state sensor technology, long life, and precision.
- › Adjustable sensitivity levels; as low as 5ppm.
- › Audible “Geiger counter” signal.
- › Rechargeable battery and charger included.

International models

TIF8900-E – 220V.

Replacement Parts

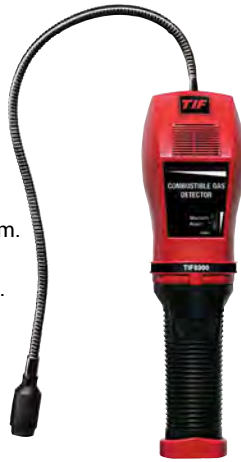
TIF8801 – Sensing tip.

TIF8803A – 115V battery charger.

TIF8805 – Cigarette lighter adapter.

TIF8806A – Rechargeable Ni-Cad batteries.

TIF8806B – 220V battery charger.



43240

Digital Thermometer

- › Sampling time is just one second; HOLD button freezes display for accuracy.
- › Easy-to-read display can be read even in direct sunlight.
- › Durable case includes a cover to protect the probe.
- › Min/Max display for reading temperature ranges.



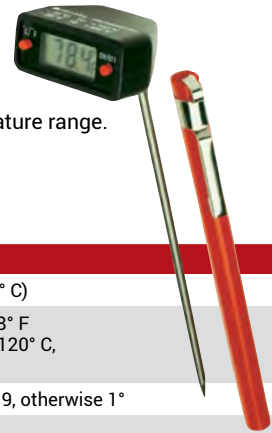
Specifications

Range	-40° to 390° F (-40° to 200° C)
Accuracy	± 2° F between -14° and 212° F ± 1° C between -10° and 100° C, Otherwise: ± 3° F (± 1° C)
Display Resolution	0.1° F (0.1° C) throughout range
Battery	One 1.5V x 1, Size LR44

43230

Swivel Head Digital Thermometer

- › 180° swivel head makes display easier to read in tight places.
- › Reliable readings over the entire temperature range.
- › Sampling time is just one second.
- › Durable case includes a pocket clip.
- › For surface, liquid, and air temperatures.



Specifications

Range	-58° to 302° F (-50° to 150° C)
Accuracy	± 2° F between -4° and 248° F q ± 1° C between -20° and 120° C, Otherwise: ± 4° F (± 2° C)
Display Resolution	0.1° between -19.9 to 199.9, otherwise 1°
Battery	One 1.5V x 1, Size LR44
Automatic Power OFF	After 10 minutes if ON/OFF is not pressed.

Specifications

Power Source	Two 2.4V Ni-Cad batteries (included)
Battery Life	Approx. 4 hours per charge
Dimensions	8-1/2" L x 2-1/2" W x 2" D (21.59 cm x 6.35 cm x 5.08 cm)
Operating Range	32° F to 105° F
Probe Length	16 inches, weights 12.3 oz.

16455

TruTrack Ultrasonic Leak Detector

Use TruTrack to identify:

- › Refrigerant leaks
- › Pressurized gas leaks
- › Vacuum leaks
- › Dry nitrogen gas leaks
- › Steam leaks
- › Failing solenoids, valves, bearings

Easy to Use – Just put on the headset, adjust the sensitivity level, and place the sensor near the suspected problem area; you can use the sensor alone or with one of the probes.

Positive Identification – You hear the sound of the leak in the headset with no beeps or squeals; the sound is loudest when you are near the leak.

Accurate – Wind, stray gases, or other contaminants will not trigger a false alarm; the unit suppresses most background noises.

Dependable – There are no clogged tips to clean, or sensors to replace, to get accurate readings.

Versatile – Ideal for a wide range of service and preventive maintenance applications. Taking regular readings of bearing or solenoid function, for instance, can show increased noise, which may be a sign the component is starting to fail.

16455 – Comes complete with padded carrying case, headset, solid contact probe, and flextube.

Replacement Parts

16452 – Flextube.

16956 – Contact probe.

16958 – Replacement headset.



Dial Thermometers

All pocket thermometers come with a pocket-clip carrying case for protection and easy access. Easy-to-read faces are available in a variety of sizes and ranges.

Part No.	Temperature	Size
10596	-40° to + 160°F	1" dial face
10597	0° to + 220°F	1" dial face
10945	0° to + 220°F	1-3/4" dial face
40859	-40° to + 70°C	1" dial face

16451

TruTrack Ultrasonic Sound Generator

An ideal accessory for Robinair's Model 16455 Ultrasonic Leak Detector, the sound generator detects seal failure in refrigerators, microwaves, vehicle passenger compartments, trunks, and any other location where there should be a good seal. Battery-operated unit emits special frequency from inside the test area; where the sound can be heard, a leak exists.



Specifications

Power Source	One 9V battery (included)
Dimensions	4-1/2" L x 3-3/8" W x 3/4" D (11.43 cm x 8.57 cm x 1.9 cm)
Weight	5 oz. (140 g)



UV Leak Detection

- › The easiest and most accurate gun available today.
- › One squeeze injects a pre-measured amount (1/8 oz.) of dye. No more adding too much dye.
- › Brightest dyes in the industry, exceeds all industry performance standards.
- › Most powerful light in its class. Fluorescent dye from up to 50ft away. (Light is only used in 16235 kit)
- › Meets the new SAE J2297 standard for use with both R134A and R1234YF.

16234
Injection gun.
Fluorescent leak detection dye.

16235
Injection gun.
Fluorescent light.
Fluorescent leak detection dye.
Fluorescent dye cleaner.
UV glasses and blow molded case.

16215
Fluorescent light.
UV glasses.



A/C Fluorescent Dyes

- › Exceeds all industry performance standards.
- › Compatible with all materials found in a vehicle's A/C system.
- › Meets the new SAE J2297 standard for use with both R134A and R1234YF.
- › REACH and CLP compliant.



16240
64 applications
One 8 oz. bottle



16241
64 applications
One 8 oz. bottle



16242
12 applications
Twelve 1/4 oz. bottles



16243
24 applications
Six 1 oz. bottles

UV Leak Detection

UV leak detection can be used for both automotive and HVAC-R systems, and dyes won't harm the system.

- › High intensity beam makes even small leaks visible and is bright enough to be used in daylight.
- › Rugged case and a shock-absorbing mounting mechanism protect the lamp during use and storage.
- › UV bulb is rated for 3000 hours and is economical to replace.
- › Comes with a 15' (4.57 m) long cord with battery clips for automotive use or with a transformer for 115V operation, doing away with heavy batteries and the need to recharge.
- › Designed with super luminescence, so leaks are easy to spot, even small ones.
- › Won't affect the viscosity of refrigerant lubricants and is safe for the entire A/C system.
- › Speeds service, since there's no need to recover the charge, add dye, and recharge, as with some other brands.

16350 – UV leak detection kit includes: Powerful 50-watt/12-volt UV lamp with 15' cord and battery clips. Injection gun with R-134a hose and R-12 adapter. Four universal A/C dye twist-on cartridges (No. 16356). Enough dye for 20 applications (OEM-approved and SAE-certified dye). UV enhancing glasses with dye cleaner.

16355 – UV injection kit include: Injection gun with R-134a hose and R-12 adapter, four universal A/C dye twist-on cartridges (No. 16356, 1 oz./ 30 ml each), and service stickers.

16356 – Universal A/C dyes includes: Four 1 oz./30 m twist-on cartridges. Enough dye for 20 applications (OEM-approved and SAE-certified dye). For kit Nos. 16350, 16380, and 16355.

16357 – Six 1/4 oz./7.5 ml twist-on cartridges. Enough dye for six applications (OEM-approved and SAE-certified dye). For kit Nos. 16350, 16380, and 16355.

UV Lamps

16296 – 12V UV lamp, UV shield/enhancer glasses, power cord with battery clips, CE approved.

16254 – Replacement 50 watt bulb for 16345.

16208 – On/Off switch for 16345.

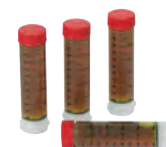
16249 – Replacement lens for UV lamp for 16345.

16348 – 120V battery charger,

16349 – 220V battery charger.



16296



16356



16357

TIF7620, TIF7612, TIF7610 IR Thermometer PRO

- › Complete IR design is incorporated inside of a single chip, reducing space and creating a compact and light weight product.
- › Innovative optical lens – accurate measurements; wide temperature range.
- › Laser pointer – Easy to define the target area to be measured.
- › Extend temperature – TIF7612 and TIF7620 have a thermocouple interface that can extend the temperature up to 1999°F.
- › Simple and easy to operate – Simply point at desired target and press the trigger button for a temperature reading.
- › Set alarm temperatures (Low and High Temperatures) to receive alert information when the you are measured out of the range (TIF7612 and TIF7620 only).
- › (MAX), (MIN), Difference between MAX and MIN (DIF), and average (AVG) modes are available in TIF7612 and TIF7620.
- › The new TIF IR thermometers incorporate visual low battery indication and simple operation of two “AAA” batteries.



Specification	TIF7610	TIF7612	TIF7620
Measurement Range	-76 to +932°F (-60 to +500°C)	-76 to +932°F (-60 to +500°C)	-76 to +1400°F (-60 to +760°C)
Thermocouple Measurement Range	N/A	83.2 to +1999°F (-64 to +1400°C)	83.2 to +1999°F (-64 to +1400°C)
Accuracy: Tobj = 59°-95°F (15-35°C) Tamb=77°F (25°C)	±1.8°F (1.0°C)	±1.8°F (1.0°C)	±1.8°F (1.0°C)
Accuracy: Tobj = -27-932°F (-33-500°C) Tamb= 73°F ±5°F (23 ± 3°C)	±2% of reading or 4°F (2°C) whichever is greater	±2% of reading or 4°F (2°C) whichever is greater	±2% of reading or 4°F (2°C) whichever is greater
Thermocouple Accuracy	N/A	±1% of reading or 1.8°F (1°C) whichever is greater (Test under Tamb=73±11°F[23+6°C])	±1% of reading or 1.8°F (1°C) whichever is greater (Test under Tamb=73±11°F[23+6°C])
Emissivity	0.95 fixed	Adjustable	Adjustable
Resolution: 14.2° F~199.9° F (-9.9~199.9°C)	0.1°F/0.1°C (1° below 9.9 and above 199.9)	0.1°F/0.1°C (1° below 9.9 and above 199.9)	0.1°F/0.1°C (1° below 9.9 and above 199.9)
Spectral Response	5 ~ 14µm	8 ~ 14µm	8 ~ 14µm
Response Time (90%)	.5 sec	.5 sec	.5 sec
Distance: Spot	10:1	12:1	20:1
Battery Life	Typ.18 hours	Typ.18 hours	Typ.18 hours
Dimensions	175.2 x 39.0 x 71.9mm	175.2 x 39.0 x 71.9mm	175.2 x 39.0 x 71.9mm
Weight	179 grams including batteries (AAA*2pcs)	179 grams including batteries (AAA*2pcs)	179 grams including batteries (AAA*2pcs)

TIF7201

Pocket IR Thermometer

- › System-on-a-chip SoC technology: compact and lightweight
- › Backlit LCD display w/ dual readings
- › °C / °F Switch and MAX function
- › Auto power off after 15 sec.
- › Battery level indication
- › Distance to spot (D/S): 1:1

Applications:

- › Automotive
- › Electrical
- › General home use
- › HVAC/R



TIF7201



TIF7201D



Available in 4pk. display:
TIF7201D
(Includes 4 of the TIF7201)

2-Way Brass Manifolds

Robinair brass manifold bodies are constructed from solid brass for added durability needed for repeated, tough daily use. Contoured easy to grip hand wheels are color coded for quick and easy identification.

- › Improved face seal valves. Better design provides a tighter seal, less wear and improved flow.
- › Double O-ring piston for extra reliability and longer service life.



44150

Dual R12/R134a Kit

- › Brass manifold with easy-to-grip handles.
- › R12/R134a gauges, PSI, and °F Temp.
- › 1/2" ACME bottom ports.
- › Rear R134a and 1/2" ACME fittings for holding hoses.
- › 90° manual couplers.
- › 72" R134a Hose Set (1/2" ACME x 14mm).
- › 72" R12 Hose Set (1/2" ACME x 1/4" MFL).
- › Blow molded carrying case.



2-Way Aluminum Manifolds

Manifold bodies are constructed from solid aluminum for added durability needed for repeated, tough daily use. Contoured easy to grip hand wheels are color coded for quick and easy identification.

- › Improved face seal valves. Better design provides a tighter seal, less wear and improved flow.
- › Double O-ring piston for extra reliability and longer service life.
- › Easy-to-read 3-1/8" gauges with Lexan lenses.
- › Aluminum Manifolds include sight glass.



47150

Dual R12/R134a Kit

- › Aluminum manifold.
- › 90° Manual couplers.
- › 72" R134a Hose Set (1/2" ACME x 14mm).
- › 72" R12 Hose Set (1/2" ACME x 1/4" MFL).
- › Blow-molded carrying case.



48510

R134a Manifold Hose Kit

- › Aluminum manifold.
- › 90° Manual couplers.
- › 72" R134a Hose Set (1/2" ACME x 14mm).
- › Blow-molded carrying case.

Digital Manifold Gauges

The low side gauge has a pressure scale of 30 inHg VAC to 250 psig and the high side gauge has a pressure scale of 0 to 800 psig. Gauges come with a backlight to enhance the view and make the gauges easy to see in low light conditions.

- › Includes profiles for 17 common refrigerants.
- › Detects vacuums in "Hg.
- › Selectable temperature and pressure units of measure.
- › Easy-to-read LCD screen with large digits.
- › Automatic shutdown after 15 minutes of inactivity.
- › Low battery indicator.



11910



11920



43180



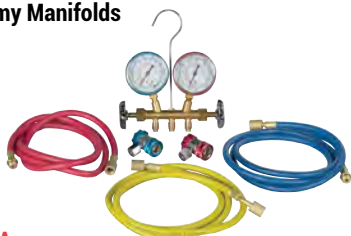
43186

45111

R134a Manifold Hose Kit

- › Brass manifold with easy-to-grip handles.
- › R12/R134a gauges, PSI, and °F Temp.
- › 1/2" ACME bottom ports.
- › Rear R134a and 1/2" ACME fittings for holding hoses.
- › 90° manual couplers.
- › 72" R134a Hose Set (1/2" ACME x 14mm).

Economy Manifolds



48134A

R134 brass manifold, 90° manual couplers and 60" R134a hose set.



48134B

R12 and R134 brass manifold, 90° manual couplers and 60" R12/R134a hose sets.



49134A

R134 aluminum manifold, 90° manual couplers, 60" R134a hose set and blow-molded case.



49134B

R12 & R134 aluminum manifold, 90° manual couplers, 60" R12/R134a hose sets and Blow-molded case.

Part No.	Description
11910	Low side digital gauge
11920	High side digital gauge
43180	2-Way Manifold with Digital Gauges - No hoses
43186	2-Way Manifold with Digital Gauges - and 60" Enviro-Guard hoses



11794



11795

Replacement Gauges

11794 – Replacement gauge (replaces 11692). Universal compound replacement gauge, psi/kPa pressure readings, R-22 and R-134a temperature readings in degrees Fahrenheit.

11797 – Replacement gauge. Universal compound replacement gauge, psi/kPa pressure readings, R-22 and R-134a temperature readings in degrees Celsius.

11795 – Replaces 11693. Universal pressure replacement gauge, psi/kPa pressure readings, R-22 and R-134a temperature. Temperature readings in degrees Fahrenheit.

11798 – Replacement gauge. Universal pressure replacement gauge, psi/kPa pressure readings, R-22 and R-134a temperature. Temperature readings in degrees Celsius.

11796 – Replacement gauge lens. Replacement gauge lens, quarter turn on-off.



40152

Side-Wheel Manifolds with 1/4" Fittings

Our popular side-wheel manifold is easy to use and designed for accuracy.

Bar – Solid forged brass for long life; handwheels are durable, color-coded Lexan™.

Universal Gauges – Clearly marked so they're easy to read and protected with Lexan™ lenses.

Field-Proven Face Seal Valve – Prevents leakage past the stem.

Models

40152 – Standard side-wheel manifold, color-coded gauges, Fahrenheit scale, brass bar, handwheels, and hanging hook– no hoses.

40151 – Standard side-wheel manifold, color-coded gauges, Celsius scale, brass bar, handwheels, and hanging hook– no hoses.

40153 – Standard side-wheel manifold set, includes three 36" standard hoses with 1/4" fittings.

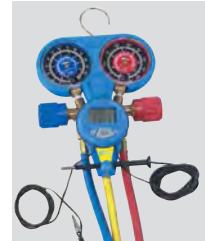
40169 – Standard side wheel manifold set, includes three 60" standard hoses with 1/4" fittings.



43310

A/C System Performance Calculator

- › Instant performance test under any ambient temperature condition.
- › Suspends from hood latch or attaches to your manifold gauge set.
- › Includes ambient and vent temperature probes.
- › Auto shut off.
- › Fahrenheit and Celsius scales.
- › Diagnostic flow chart and tech tips to guide you through the test.



18192

18341

19150

Service Couplers for Automotive R-134a

Field service couplers connect to our special Enviro-Guard hoses to allow access to service ports on automotive R-134a A/C systems. The quick-connect design has an integral safety sleeve, which protects against injury and refrigerant loss if the coupler is disconnected under pressure. The compact design easily fits into tight quarters, which is especially handy for retrofits. Six-ball couplers provide a more stable grip on the fitting than do couplers with four balls.

18190A – Low-side manual coupler, blue actuator.

18191A – High-side manual coupler, red actuator.

18192 – Set of manual service couplers.

18341 – High- and low-side automatic couplers.

19150 – O-ring kit for field service couplers.



18576

18019

Replacement Parts Kit for R-12 Manifold Gauges and Hoses

- › 6 hose gaskets.
- › 6 gasket adapters.
- › 2 stem repair kits.
- › 12 Quick Seal™ caps.
- › 12 valve core depressors, 1/4".
- › 4 Lexan® handwheels and screws.
- › O-rings to service Quick Seal™ fittings.
- › Valve core remover/installer with valve cores.

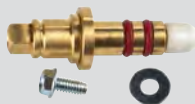
18576

Replacement Parts Kit for R-134a Manifold Gauges and Hoses

- › 4 manifold stems.
- › 6 o-rings, 14 mm.
- › 12 valve core depressors.
- › 12 hose gaskets, 1/4".
- › 12 manifold stem o-rings.
- › 6 Quick Seal™ o-rings for R-134a.
- › 2 caps with straps, 1/2" Acme.
- › O-ring lubricant (high vacuum grease).
- › Valve core remover/installer with 6 valve cores.
- › 4 color-coded Lexan® handwheels & screws.
- › Set of R-134a coupler o-rings, high- and low-side.

Stem Replacement Assembly Kit

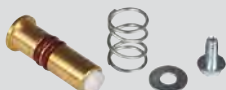
Kits include all necessary parts to service one manifold valve. To replace stems on both valves, order two kits.



40232
Stem assembly kit for manifolds with conical seal design.



13148
Face seal kit for side-wheel manifolds, includes stem with o-rings, spring, and screw. Will not fit sight glass manifold.



19695
Face seal kit for sight glass manifolds.



13067
High vacuum grease.

Replacement Handwheels



40449
Set of one red and one blue with 1/4" drive.



41698
Set of one red and one blue with 1/4" drive (barrel style).

Replacement Parts for Hoses and Adapters

Help's you keep your charging hoses and adapters in top working condition.



18180
O-rings for Quick Seal™ 1/4" fittings and adapters, package of six.



40531
O-rings for 10293 adapters, package of six.



40082
1/4" valve core depressors, package of six.



40083
1/4" gaskets, package of six.



40084
3/8" gaskets, package of six.



40677
3/16" gaskets, package of six.



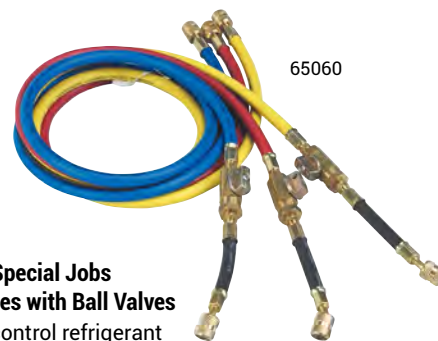
40653B
3/16" valve core depressors, package of six.



30072

Hoses

30072 – Standard hose (500/2500 psi) – 72", 1/4" SAE internal fitting x 1/4" SAE internal.



65060

Special Hoses for Special Jobs Enviro-Guard™ Hoses with Ball Valves

In-line ball valves control refrigerant flow, open and close in a quarter turn.

65060 – Set of three 60" hoses with ball valves.

65160 – 60" Enviro-Guard™ hose with ball valve, yellow.

65260 – 60" Enviro-Guard™ hose with ball valve, blue.

65360 – 60" Enviro-Guard™ hose with ball valve, red.



40333



10328

Hose Extension Coupler

Connect any number of hoses to get the extra length you need – there's no need to order special hose lengths.

40333 – 1/4" MFL x 1/4" MFL, no valve core.

10328 – 1/2" Acme external x 14 mm internal (for automotive R-134a).

20' Charging Hoses

68020 – Set of 20' Enviro-Guard™ red and blue, 1/4" fittings.

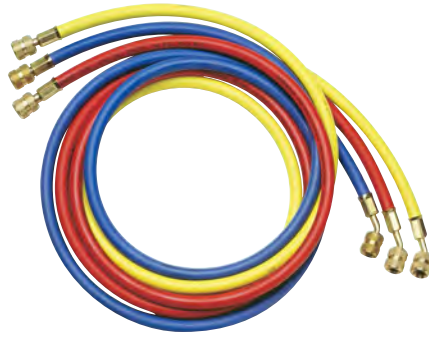
68420 – Set of 20' Enviro-Guard™ red and blue, Quick Seal™ fittings.



68020

Charging Hoses

Robinair premium refrigerant charging hoses are built for long life and dependability. A strong, six-sided crimp provides a reliable connection between the hose and barb, even at maximum pressure. The coupler nuts are deeply knurled for quick finger-tightening. Enviro-Guard™ hoses are ideal for high pressure applications, including R-410a systems.



Hose Selection Charts

1/4" Standard Hoses with Standard Fittings

Neoprene-coated for flexibility and wear resistance, with a valve core depressor and a 45° bend on one end for convenient access to the system.

500 psi working pressure; 2500 psi burst pressure.

Length (inches)	Yellow	Blue	Red	Pkg. Set (Blue, Red, Yellow)
36	31036	32036	33036	30036
60	31060	32060	33060	30060
72	31078	32072	31079	30072
96	31096	32096	33096	N/A

1/4" Standard Hoses with Quick Seal™ Fittings

500 psi working pressure; 2500 psi burst pressure.

Length (inches)	Yellow	Blue	Red	Pkg. Set (Blue, Red, Yellow)
72	38172A	38272A	38372A	39072A

1/4" Enviro-Guard™ Hoses with Quick Seal™ Fittings

Special barrier material prevents virtually any permeation of refrigerant, yet remains flexible. With 45° Quick Seal™ fittings.

740 psi working pressure; 3700 psi burst pressure.

Length (inches)	Yellow	Blue	Red	Pkg. Set (Blue, Red, Yellow)
36	68136A	68236A	68336A	69036A
60	68160A	68260A	68360A	69060A
72	68172A	68272A	68372A	69072A
96	68196A	68296A	68396A	69096A

Enviro-Guard™ Hoses for Automotive R-134a

Meets all specifications for low permeation construction. Clearly marked for R-134a. See page 16 for service couplers.

500 psi working pressure; 2500 psi burst pressure.

Length (inches)	Yellow 1/2" ACME x 1/2" ACME	Blue 14 mm x 1/2" ACME	Red 14 mm x 1/2" ACME	Pkg. Set (Blue, Red, Yellow)
60	61060	62060	62243	60060
72	61072	62072	62244	60072
96	61096	62121	63096	60096
240	NA	NA	NA	64240 (excl. yellow)
240	NA	NA	62246	NA
240	NA	62242	NA	NA

75240

Coolant and Battery Refractometer

This can be used for measuring the freezing point of either propylene and ethylene glycol based cooling systems. It can also be used for checking the strength of electrolyte solution in batteries. This precision instrument features high quality optics with ultra smooth focusing on the body. Coolant scale range: 32° F/0° C to -60° F/ -51° C.



75234 75134

Econo-Clean Coolant Service Accessories

To ensure coolant will provide adequate protection to the vehicle, the coolant should be adjusted to the manufacturer's specifications. These accessories will help you quickly test coolant.

75134 – Coolant test strips – Just dip a strip in coolant and it shows the freeze point and the pH; bottle of 50 strips.

75234 – 3-way heavy-duty truck coolant test strips – shows pH, freeze point, and nitrite (0–4000 ppm), pH <7.5–11+, glycol 0–60%.



75260

Coolant Refiller

- › 26" Hg vacuum refills cooling system without air lock.
- › Eliminates the need for "bleeding."
- › Checks for system leaks and utilizes OEM approved technology.
- › Universal "fits all" cone adapter.
- › Built-in gauge protector.

Works on both pressurized and non-pressurized cooling systems.

OUR 10-MINUTE EXCHANGE PROCESS MEANS NO MORE WAITING FOR THE ENGINE TO WARM UP



75700

Coolant Exchange Unit Designed with the user in mind.

Safety First

- › Our “engine off” feature removes pulleys, belts, and fan blades from the safety equation.
- › No additional ventilation required.
- › Vacuum mode creates a “push/pull” exchange process allowing the technician to safely remove high pressure in a hot system.
- › “Hands-off” transfer of used coolant to a bulk tank prevents spills and helps protect the technician.

Simple to Operate

- › Two clearly marked valves and an easy-to-read gauge make this machine very simple to use.
- › Sight glass clearly shows the amount of coolant in the waste tank.
- › One valve controls the flow of coolant; process is easy to understand—no special training needed.
- › No electricity required. 90 psi shop air drives the exchange process, as well as the 2 gpm pump on the waste tank.

Designed to Survive

- › Impact-resistant polypropylene cabinet will not scratch or dent vehicle.
- › Cabinet is impervious to chemicals commonly used in the shop.
- › Large, inflatable tires carry a well-balanced platform easily across any shop floor.
- › Easy to maneuver between bays and vehicles.

Extra Design Features

- › Two external new coolant supply tanks allow on-board storage of two different coolant types.
- › Graduations on tanks show user the amount of new coolant on board.
- › On-board storage of step adapters.
- › Adapter kit included.
- › No hoses to cut.
- › 96” hoses can be neatly stored on unit.
- › One-year warranty.

Replacement Parts and Accessories

- 75369** – Replacement coolant 5-gallon tank.
- 75360** – Heavy-duty adapter kit. Links the two tanks for 14 gal. capacity to service class A vehicles. (Note: must have 7-gallon tank No. 75370).
- 75370** – Replacement coolant 7-gallon tank.
- 17490** – Protect your investment with a heavy-duty vinyl dust cover.

Specifications

Power Supply	90 psi shop air
Tanks	– Internal waste – 15-gallon capacity – External supply (2) 7-gallon capacity (removable)
Dimensions	47” H x 26” W x 33” D (119 cm x 66 cm x 84 cm)
Medium Step Adapter	Two included; fits hose size 1-1/4”, 1-3/8”, and 1-1/2”
Large Step Adapter	Two included; fits hose size 1-3/4”, 2”, and 2-1/4”



Back View:
7-gallon capacity supply tanks allow storage of different coolants.

92500

Transmission Fluid Exchanger

- › Top-off feature. Add or subtract in 1/10 qt. increments.
- › “Low Fluid Alarm” and “Indicator Light” to alert operator.
- › “Drain Waste” feature automatically pumps used fluid from the machine into a waste oil container.
- › “Drain Pan” feature drains the pan for easy filter replacement. No mess.

Three modes of operations: Dipstick only, cooler line, or a combination of the two!

- › Unprecedented one-tenth quart flow metering for adding or subtracting fluid from the pan.
- › Complete set of cooler line adapters for most foreign and domestic vehicles.
- › Works with all types of automatic transmission fluid.
- › Integral performance designed hose and tool compartment with drain.

529734 – Replacement nylon tube.



Specifications

Electrical	12V DC
Exchange Accuracy	+/- 1/4 qt.
Controls	Microprocessor with digital keypad and LEDs
Fluid Tanks	32 quarts supply (24.6 liters), 34 quarts waste (26.6 liters)
Hoses	91” black & red (Exchange); 76” white transfer tube (Straw)
Fluid Types	Multiple fluid capability.
Adapter Set	Complete set for most applications. Standard adapters for Ford, GM, Chrysler, European, and Universal (covering most Asian imports).
Pump	Positive displacement gear pump, 2 gallons per minute maximum
Weight	158 lbs. (72 kg)
Dimensions	52” H x 33” W x 20” D (132 cm x 84 cm x 51 cm)
Process Time	Depends on mode
Warranty	1 year parts and labor

92001

Automatic Transmission Fluid Diagnostic Pads

Easy, quick way to test automatic transmission fluid to determine when service is necessary. Simply place a few drops of transmission fluid from transmission dipstick onto test pad. Pad will change color indicating condition of transmission fluid. Package contains 100 pads.



92000

Transflow Transmission Oil Cooler Flusher

Fix it right the first time... designed to measure oil flow capacity within the transmission oil cooler, and also has the capability to flush contaminated oil from the TOC after repairs.

- › Only unit in the industry that performs a flow rate test.
- › Flush and flow test time is 5 to 8 minutes.
- › 32-quart supply tank; 34-quart waste tank.
- › Supply and waste hoses each 10’ long.
- › 10’ long, 12V DC power cables with battery lead clips.
- › Requires shop air (90 psi, min.) and 12V DC source.





Premium High Vacuum Pump Oil

The performance of your pump depends largely on the quality and purity of the vacuum pump oil. Robinair's oil is engineered to maintain maximum viscosity at high running temperatures and to improve cold weather starts.

To keep the pump operating at peak efficiency, change the oil frequently. Moisture and other contaminants can quickly deteriorate the purity of the oil, thinning it, and reducing the pump's ability to reach deep vacuum conditions.

Thermally Stable

Laboratory tests prove that Robinair oil is more thermally stable in comparison to other leading brands, which means it resists breaking down due to heat for a longer period of time.

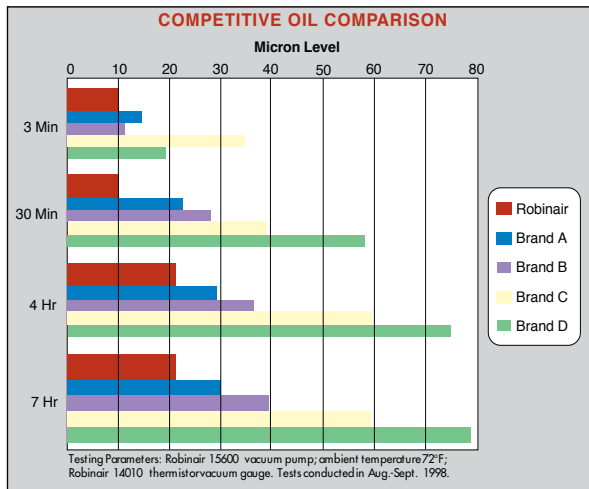
Lower Moisture Content

Robinair oil has a lower moisture content than other oils, thanks to our special packaging and handling procedures. Moisture degrades the oil's purity, thinning it, and reducing the pump's ability to reach a deep vacuum.

13119 – Pint bottle, 12 per case.

13203 – Quart bottle, 12 per case.

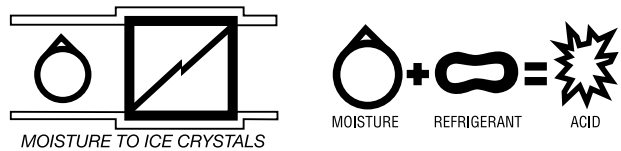
13204 – Gallon bottle, 4 per case.



Change Your Vacuum Pump Oil Frequently

Clean oil is important for peak vacuum pump performance. When the oil is contaminated, it reduces your pump's ability to remove moisture from a system. You should change the pump oil frequently, and especially in the following situations:

- › You have just evacuated a system that you suspect was overly moisture-laden.
- › You have just evacuated a system with a compressor burnout.
- › The pump oil looks cloudy or milky.
- › The pump will not pull to factory specifications when blanked off to an electronic thermistor vacuum gauge.
- › Every 10 hours of operation.



The Importance of Deep Vacuum

The purpose of a vacuum pump is to remove moisture and air from an A/C-R system. Modern systems are built tighter and charges are more critical. That means these systems have a greater sensitivity to moisture and other contaminants, making thorough evacuation more important than ever before.

Moisture in a refrigeration system, directly or indirectly, is the cause of most problems and complaints. First, moisture can cause freeze-up in a system. Moisture is picked up by the refrigerant and transported through the refrigerant line in a fine mist, with ice crystals forming at the point of expansion.

"Freeze-up" is not the only problem caused by moisture. It can also result in corrosion, the effects of which are not apparent until the real damage has occurred. Moisture alone is bad enough, but combined with refrigerants containing chlorine, hydrochloric acids can form. These greatly increase the corrosion of metals.

Also, refrigerant oil rapidly absorbs moisture. Water-formed acids combine with the refrigerant, forming a closely bonded mixture of fine globules. The effect is called sludging and it greatly reduces the lubricating ability of the oil.

A vacuum pump removes troublesome moisture by lowering the pressure within the system and vaporizing (or boiling off) the moisture, then exhausting it along with air.

CoolTech™ – The Inside Story

A vacuum pump that's fast and thorough saves you not only time, but also the expense of callbacks and dissatisfied customers. Robinair pumps perform better than other pumps in the industry, ensuring you complete dehydration before recharging.

Robinair pumps are engineered specifically to meet the needs of the kind of A/C work you're doing today, and to give you trouble-free operation. We've put our years of experience and know-how into developing pumps that help you do the job faster and better.

All Robinair pumps are backed by our exclusive "No Hassle" over-the-counter replacement warranty. You can return a pump to your Robinair distributor for an immediate exchange – with no hassle! (In U.S. and Canada only; in other locations, see your Robinair distributor.)

Robinair CoolTech vacuum pumps are designed for use on A/C-R systems using CFCs, HCFCs, and HFCs in conjunction with mineral oil, ester oil, alkylbenzene oil, and PAG oil as lubricants. Do not use them with ammonia or lithium bromide systems; not for use with flammable refrigerants.

U.S. Patent Numbers: 4,523,897; 4,631,006; 5,209,653.

› Oil Fill Port

Makes adding oil simple since the port is accessible from the front or either side. The sight glass on the front of the pump shows you when enough oil has been added.

› Two-stage Design

Cleans the system more thoroughly than a single-stage pump; the second stage starts pumping at a lower pressure so you can pull a deeper ultimate vacuum.

› Heavy Duty Motor

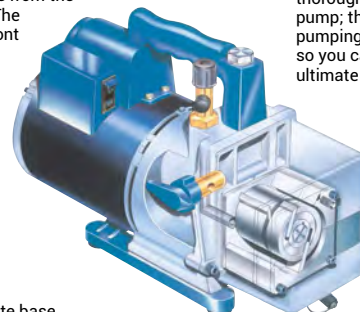
High torque design for easy startup and efficient operation.

› Molded Base

Durable polycarbonate base improves pump balance and minimizes vibration during operation.

› Iso-Valve™

Isolates the pump from the system with just a quarter-turn.



› Die-Cast Aluminum Housing

Cast aluminum housings make the pumps lightweight but durable.

› Oil Drain Valve

Positioned at the bottom of the oil reservoir and angled for faster, more complete draining.

› Offset Rotary Vanes

Our proven design builds a powerful compression within the pumping chamber to reduce system pressure and vaporize moisture, so it can be exhausted along with air.

Selecting the right size pump

The more air a pump moves, the faster it can reach an acceptable vacuum. A smaller pump takes more time to evacuate a system than one that's the correct size for the job.



Use this Chart as a Guide to Selecting the Right Size Pump.

System	Recommended Pump Size	
	Robinair® Pump	VacuMaster™ Pump
Up to 10 tons (35kW); Domestic Refrigeration, Passenger Cars	–	1.5 CFM (35 l/m)
Up to 30 tons (105kW); Residential A/C, Panel Trucks & RV's	4 CFM (93 l/m)	3 CFM (71 l/m)
Up to 50 tons (176kW); Rooftop A/C systems, Tractor/Trailers, Buses	6 CFM (142 l/m)	5 CFM (118 l/m)
Up to 70 tons (246kW)	10 CFM (236 l/m)	8 CFM

	Oil Fill Port	Heavy Duty Motor	Two-Stage Design	Molded Base	Die-Cast	Oil Drain Valve	Offset Rotary Vanes	Iso-Valve	Gas Ballast
Robinair® Pumps	•	•	•	•	•	•	•	•	•
VacuMaster® Pumps	•	•	•		•	•			

All Robinair pumps are backed by our exclusive “No Hassle” over-the-counter replacement warranty. You can return a pump to your Robinair distributor for an immediate exchange – with no hassle! (In U.S. and Canada only; in other locations, see your Robinair distributor.)

Robinair Vacuum Pumps

- › Power and capacity for a wide range of service applications.
- › High CFM rating for fast, thorough evacuation.
- › Two-stage rotary vane design.

Iso-Valve™ – Isolates the pump from the system with just a quarter-turn.

Gas Ballast – Moisture laden air passing through the pump mixes with relatively dry air so compression does not cause condensation.

Two-stage Design – Cleans the system more thoroughly than a single-stage pump; the second stage starts pumping at a lower pressure so you can pull a deeper, ultimate vacuum.

Oil Drain Valve – Positioned at the bottom of the oil reservoir and angled for faster, more complete draining.

Oil Fill Port – Makes adding oil simple since the port is accessible from the front or either side. The sight glass on the front of the pump shows you when enough oil has been added.

Heavy-Duty Motor – High torque design for easy startup and efficient operation.

Offset Rotary Vanes – Our proven design builds a powerful compression within the pumping chamber to reduce system pressure and vaporize moisture so it can be exhausted along with air.

Molded Base – Durable polycarbonate base improves pump balance and minimizes vibration during operation.

Die-Cast Aluminum Housing – Cast aluminum housings make the pumps lightweight but durable.



15120A – 10 CFM



15600 – 6 CFM,
15400 – 4 CFM, 15434 – 4 CFM

Model	Free Air Displacement	Factory Micron Rating	No. of Stages	Intake Fitting	Oil Capacity	Motor Size	Voltage	Approvals	Weight	Dimensions
Domestic Models										
15400	4 CFM	15 microns	2	1/4" MFL & 1/2" MFL	15 oz. (445 ml)	1/2 hp	115V 60 Hz	UL	27 lbs. (12.2 kg)	9.75" H x 5.625" W x 15.5" L 247 mm x 143 mm x 394 mm
15434	4 CFM	15 microns	2	1/4" MFL & 1/2" Acme	13 oz. (384 ml)	1/3 hp	115V 60 Hz	UL	29 lbs. (13 kg)	9.75" H x 5.625" W x 15" L 247 mm x 143 mm x 381 mm
15600	6 CFM	15 microns	2	1/4" MFL, 3/8" MFL, & 1/2" MFL	15 oz. (445 ml)	1/2 hp	115V 60 Hz	UL	27 lbs. (12.2 kg)	9.75" H x 5.625" W x 15.5" L 247 mm x 143 mm x 394 mm
15120A	10 CFM	15 microns	2	1/4" MFL, 3/8" MFL, & 1/2" MFL	16.5 oz. (488 ml)	1/2 hp	115V 60 Hz	UL	38 lbs. (17.24 kg)	10.75" H x 5.625" W x 16.5" L 273 mm x 143 mm x 419 mm
International Models										
15401	94 liters/minute	15 microns	2	1/4" MFL & 1/2" MFL	13.5 oz. (400 ml)	1/3 hp	115V/220-250V 50/60 Hz	CE	29 lbs. (13 kg)	9.688" H x 5.625" W x 15.75" L 246 mm x 143 mm x 400 mm
15424	94 liters/minute	20 microns	2	1/4" MFL & 1/2" Acme	13.5 oz. (400 ml)	1/3 hp	115V/220-250V 50/60 Hz	CE	32 lbs. (14.5 kg)	9.763" H x 5.625" W x 15.75" L 248 mm x 143 mm x 400 mm
15601	142 liters/minute	15 microns	2	1/4" MFL, 3/8" MFL, & 1/2" MFL	13.5 oz. (400 ml)	1/3 hp	115V/220-250V 50/60 Hz	CE	29 lbs. (13 kg)	9.688" H x 5.625" W x 16.5" L 246 mm x 143 mm x 419 mm
15121A	283 liters/minute	15 microns	2	1/4" MFL, 3/8" MFL, & 1/2" MFL	16.5 oz. (488 ml)	1/2 hp	115V/220V 50/60 Hz	CE	41 lbs. (18.60 kg)	10.75" H x 5.625" W x 17.5" L 273 mm x 143 mm x 445 mm

VacuMaster™

Economy Vacuum Pumps

- › Performance tested to meet Robinair's high standards
- › Power and capacity for a wide range of service applications.
- › High CFM rating for fast, thorough evacuation.
- › Two-stage rotary vane design.

Features:

Two-stage Design – Cleans the system more thoroughly than a single-stage pump; the second stage starts pumping at a lower pressure so you can pull a deeper, ultimate vacuum.

Oil Drain Valve – Positioned at the bottom of the oil reservoir and angled for faster, more complete draining.

Oil Fill Port – Makes adding oil simple since the port is accessible from the front or either side. The sight glass on the front of the pump shows you when enough oil has been added.

Heavy-Duty Motor – High torque design for easy startup and efficient operation.

Die-Cast Aluminum Housing – Cast aluminum housings make the pumps lightweight but durable.



15150 – 1.5 CFM
15300 – 3 CFM
15500 – 5 CFM



15800 – 8 CFM

Model	Free Air Displacement	Factory Micron Rating	No. of Stages	Intake Fitting	Oil Capacity	Motor Size	Voltage	Weight	Dimensions
Domestic Models									
15150	1.5 CFM	50 microns	2	1/4" MFL and 3/8" Acme 3/8" FFL x 1/2" Acme adapter	7.4 oz. (219 ml)	1/4 hp	115V 60Hz	22 lbs. (10 kg)	9.5" H x 4.75" W x 12.5" L 240 mm x 120 mm x 315 mm
15300	3 CFM	35 microns	2	1/4" MFL and 3/8" MFL 3/8" FFL x 1/2" Acme adapter	7.5 oz. (220 ml)	1/3 hp	115V 60Hz	28 lbs. (12.5 kg)	10" H x 5" W x 13" L 255 mm x 123 mm x 336 mm
15500	5 CFM	35 microns	2	1/4" MFL and 3/8" Acme 3/8" FFL x 1/2" Acme adapter	7.5 oz. (220 ml)	1/3 hp	115V 60Hz	28 lbs. (12.2 kg)	10" H x 5" W x 13" L 255 mm x 123 mm x 336 mm
15800	8 CFM	35 microns	2	1/4" MFL and 3/8" MFL	18.6 oz. (550 ml)	1 hp	115V 60Hz	37 lbs. (16.8 kg)	16" H x 6" W x 10" L 406" mm x 152mm x 254mm
International Models									
15301 3 CFM	71 liters/ minute	35 microns	2	1/4" MFL and 1/2" MFL 3/8" FFL x 1/2" Acme adapter	7.5 oz. (220 ml)	1/3 hp	220V 50Hz	28 lbs. (12.5 kg)	10" H x 5" W x 13" L 255 mm x 123 mm x 336 mm
15501 5 CFM	118 liters/ minute	35 microns	2	1/4" MFL and 1/2" Acme 3/8" FFL x 1/2" Acme adapter	7.5 oz. (220 ml)	1/3 hp	220V 50Hz	28 lbs. (12.5 kg)	10" H x 5" W x 13" L 255 mm x 123 mm x 336 mm

VacuMaster™

Single-Stage Vacuum Pumps

- › Performance tested to meet Robinair's high standards
- › High CFM rating for fast, thorough evacuation.

Features:

The one-stage rotary vane design – provides powerful, quiet, high vacuum capability and ensures moisture removal, while the high pumping capacity reduces evacuation time.

Oil Drain Valve – Positioned at the bottom of the oil reservoir and angled for faster, more complete draining.

Oil Fill Port – Makes adding oil simple since the port is accessible from the front or either side. The sight glass on the front of the pump shows you when enough oil has been added.

The intake screen – prevents foreign matter from entering the pumping chamber, and an internal exhaust filter separates oil vapor from the exhaust flow.

Aluminum housing and rotary vanes – keep the pump weight low, making it easy to carry.



15115 – 1.5 CFM



15310 – 3 CFM or 15510 – 5 CFM

Model	Free Air Displacement	Factory Micron Rating	No. of Stages	Intake Fitting	Oil Capacity	Motor Size	Voltage	Weight	Dimensions
Domestic Models									
15115	1.5 CFM	115 microns	1	1/4" flare and 1/2" Acme	10 oz. (300 ml)	1/5 hp	110V 60Hz	15 lbs. (6.9 kg)	11.25" H x 4.75" W x 11.375" L 286 mm x 124 mm x 288 mm
15310	3 CFM	75 microns	1	1/4" flare and 1/2" Acme	8.5 oz. (250 ml)	1/4 hp	110V 60Hz	18 lbs. (8.2 kg)	10" H x 4.875" W x 13.25" L 255 mm x 123 mm x 336 mm
15510	5 CFM	75 microns	1	1/4" flare and 1/2" Acme	10 oz. (300 ml)	1/2 hp	110V 60Hz	21 lbs. (9.7 kg)	10" H x 4.875" W x 13.25" L 255 mm x 123 mm x 336 mm



34970

Air-VacTM for R-12 and R-134a

Economical Air-Vac uses shop air to pull the system into vacuum and includes inlet fittings with 1/4" and 1/2" Acme sizes.

Easy-to-use – Unique venturi design runs on shop air.

Rugged Lexan® Case – Both oil- and scratch-resistant and comes with a convenient handle.

Low Maintenance – There's no oil or moving parts to replace.

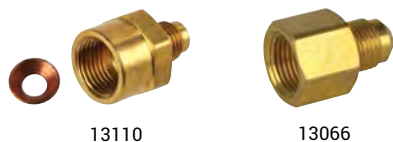
34977 – Replacement inlet tee, 1/4" MFL and 1/2" acme.

Specifications

Drive	Compressed air
Free Air Displacement	1 CFM
Input Pressure	75 psi
Vacuum Rating	29 in./Hg
Intake Fitting	1/4" MFL and 1/2" ACME
Dimensions	4-1/2" H x 4" W x 7-1/2" L
Weight	2 lbs./1 kg

Pump Intake Fittings

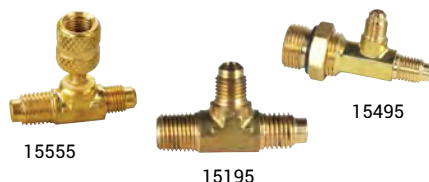
R-12/R-134a Dual Inlet Fittings Convert your pump to R-12 and R-134a. Solid brass tees replace inlet fittings on pump; includes a branch with a 1/4" MFL fitting for R-12 (and other refrigerants) and a branch with 1/2" Acme fittings for automotive R-134a.



Pump Intake Fitting Adapters:

13110 – Adapter, 3/8" FFL to 1/4" MFL.

13066 – Adapter, 1/2" FFL to 3/8" MFL.



Also Available:

15555 – Screw-on inlet adapter converts any pump, 1/4" FFL coupler x 1/4" MFL x 1/2" Acme.

15195 – 1/4" MFL/1/2" Acme combination inlet fitting for 15200 series vacuum pumps.

15495 – 1/4" MFL/1/2" Acme combination inlet fitting for 15400/15600 series vacuum pump.

The Importance of Measuring Vacuum

Moisture in an A/C system is a serious problem for the technician – it causes freeze-ups and corrosion, seriously damaging the A/C system. The most effective way to eliminate moisture is to create a vacuum deep enough to boil it away. For that, you need a high vacuum pump, and a tool to tell you when the vacuum is deep enough to adequately dehydrate the system.

Without a means of measurement, evacuation time is based on guesswork. The length of time required for thorough dehydration will vary from system to system because of several factors – so using a clock isn't foolproof. You risk not removing all the moisture – or wasting time by running the pump long after evacuation is complete.

Many service technicians rely on the compound gauge of the manifold to read vacuum. While the manifold is good for gross measurements, it's simply not accurate enough to determine exact vacuum levels. It's designed to read low pressures in inches of mercury, but there's no way to read exact levels when you're pulling the last, most critical inch of vacuum.

If you look at the compound gauge face, you can see that it's not possible to clearly differentiate between 29" Hg and 29.9" Hg, for example. But in microns – the precise measurements for the last inch of vacuum – that's the difference between roughly 23,000 and 250 microns.

A closed-end, U-tube, mercury manometer is capable of reading to 500 microns. However, it's a delicate instrument, more suited to a laboratory or controlled environment.

The most economical, effective, and easy-to-use option is an electronic thermistor vacuum gauge. It eliminates the guesswork by measuring the vacuum to precise micron

levels, ensuring the system is leak-free, moisture-free, and ready to be recharged. Although originally developed as a laboratory instrument, today's thermistor vacuum gauges are rugged enough – and reliable enough – for field service work.



14830A

Thermistor Vacuum Gauge

- ▶ Solid-state instrument constantly monitors and visually indicates the vacuum level in 10 segments from atmosphere to 50 microns.
- ▶ LCD screen can be read even in direct sunlight and minimizes battery consumption.
- ▶ No adjustments to make, no calibrations for atmospheric pressure or altitude.
- ▶ Durable carrying case protects the instrument and has a built-in compartment for storing the 24" charging hose (included).

Specifications

Range	25,000 to 50 microns in 10 segments
Power Supply	Four "D" cell batteries (not included) or optional A/C adapter
Display	Custom LCD, 10 segments
Weight	2.38 lbs. (1.08 kg) without batteries
Dimensions	10" H x 7.5" W x 3.375" D (25.4 cm x 19 cm x 8.6 cm)

14777

Compact Electronic Vacuum Gauge

Robinair's 14777 electronic vacuum gauge is just 2-1/2" x 3" in size, but accurate enough to clearly indicate when the system is free from moisture and ready for recharging. Specifically designed for use with a high vacuum pump, the 14777 measures to 10 microns.

Clearly Shows Vacuum Level – The display is an easy-to-read LCD type with readout showing the current vacuum level.

6' Lead for Service Flexibility – Hang the gauge in a location that's convenient for you to monitor vacuum level.

Mounting Magnet – Position the 14777 where it's easy-to-read the LCD.

14778 – Replacement thermistor tube.

Specifications

Power Supply	One 9V battery (included)
Vacuum Fitting	1/4" MFL
Length of Lead	6 feet (8.3 m)
Vacuum Rating	29 in./Hg
Dimensions	3" H x 2.5" W x 1" D (7.62 cm x 6.35 cm x 2.54 cm)

Reading Vacuum Tips

When reading vacuum, remember that the location of the vacuum gauge tube will affect the reading. The closer the gauge is to the vacuum pump, the lower the reading will be. Conversely, if you take the reading at a line far away from the pump, the reading will be on the high side.

The way to get the most reliable reading is to isolate the vacuum pump using a vacuum valve assembly. Allow the pressure to equalize throughout the system, then take a final reading.

A reading that's too high is a good indication of moisture in the system; continuing to evacuate will likely pull the system into a deeper vacuum. If the pressure will not equalize, you probably have a leak, which should be repaired.



Slimline Refrigerant Scales

The TIF Slimline scales offered industry leading accuracy and performance with the choice of getting the familiar usability and quality in either a 110 pound/50 kg. or 200 pound/100 kg. capacity.

Features

- › Touch Key controls.
- › Three display modes – Lbs./oz.; Decimal Lbs., Kilograms.
- › Extremely Accurate.
- › Auto Zero.
- › Removable platform and control box with prop stand/hanging hook.
- › Compact design, completely portable.
- › Removable control box with prop stand/hanging hook.
- › CE approved.
- › Two year warranty.
- › Blow molded case.



TIF9010A



TIF9020A



TIF9035
Charging Scale and Manifold Storage Combo

In many service situations two tools are almost always sure to be found, the charging scale, and the manifold and hose kit. This TIF9035 allows the charging scale, service manifold and hoses to be stored and carried to the work site in one convenient package. A tough plastic outer case helps protect your manifold gauge.

- › Molded design, easy to carry.
- › Integrated manifold and hose storage.
- › Can be used with ALL refrigerants.
- › High weight capacity, up to 200 Lbs.
- › Excellent accuracy and resolution.
- › Display provides Lbs/oz; decimals Lbs and Kg measurements.
- › Battery powered, one 9V battery.
- › Platform adapts to most existing tanks (9" x 9").
- › Multifunction LCD readout.
- › Color-coded tactile integrated keypad.
- › 3 Control keys: ON/OFF, zeroing and measurement units.
- › CE approved.
- › 1 Year Warranty.

Specifications	TIF9010A	TIF9020A
Range 15.8 oz., OR	0 lbs. 0.0 oz. to 110 lbs. 0.0 oz., 0.000 lbs. to 110.000 lbs., OR 0.000 kg to 55.000 kgs	0 lbs. 0.0 oz. to 199 lbs.0.000 lbs. to 199.990 lbs., OR 0.000 kg to 100.000 kg
Resolution	0.1 oz./0.005 lbs./2 grams	0.2 oz./0.010 lbs./4 grams
Accuracy	± 0.5% of reading	± 0.5% of reading ± 1 digit
Operating Temp	32° to 120°F (0° to 49°C)	32° to 120°F (0° to 49°C)
Power Supply	9VDC	9VDC
Battery Life	30 hours	30 hours
Coil Cord Length	6 ft. (1.8m)	6 ft. (1.8m)



TIF9031



TIF9030

Economy Digital Refrigerant Scale

- › Easy to carry and store.
- › Capacity up to 220 lbs. (100 kg). Display shows lbs./oz. and kg.
- › High accuracy (±0.5 oz.) and resolution (0.1oz).
- › 9-volt battery power.
- › Platform to adapt to most existing tanks (9" x 9").
- › Three control keys: On/Off, automatic zeroing, and measurement units.
- › Charging and recovery capabilities
- › CE approved.
- › One-year warranty.



TIF9030 – Economy digital refrigerant scale.

TIF9031 – Economy digital refrigerant scale carrying case.

TIF9055 Certified Refrigerant Scale

- › 220 pound / 100 kg capacity.
- › Allows automatic charging or recovery operations.
- › Color-coded keypad controls.
- › Three display modes – lbs./oz.; decimal lbs.; kilograms.
- › Very high resolution – 0.2 oz./0.010 lbs./4 grams.
- › Can be used with all refrigerants.
- › Advanced charge and recovery modes – uses tare weight and maximum capacity of cylinder to calculate maximum charge/recovery available.
- › User programmable memory for up to 99 different stored values.
- › "Repeat" charge feature.
- › Removable platform and control box with prop stand/hanging hook.
- › Compact design – completely portable, battery powered.
- › Low battery indicators.
- › Five-year warranty.



Specifications

Range	0 lbs. 0.0 oz. to 219.99 lbs. 0.0 oz., OR 0.000 lbs. to 219.990 lbs., OR 0.000 kg to 100.000 kg
Resolution	0.2 oz./0.010 lbs./4 grams
Accuracy	± 0.5% of reading
Power Supply	Four AA batteries & one 9V battery
Battery Life	30 hours
Max. Solenoid Operating Pressure	500 psi
Operating Temp.	32°F to 120°F (0°C to 49°C)
Inlet/Outlet Ports	1/4" MFL fittings with 1/2" ACME adapters
Weight	Approx. 7 lbs.

10994

Heater Blanket

Robinair's heater blanket speeds charging by maintaining a constant temperature, thus creating a positive pressure between the refrigerant tank and the A/C system.

- › Fits 30 and 50 pound refrigerant tanks.
- › Thermostat is set at 125°F (55°C).
- › 300 watts, 2.6 amps.
- › Thermal cut-off switch protects against overheating.



International Models

13184 – Heater blanket, 220V–240V 50 Hz, with internal IEC receptacle.



6512

Heavy-Duty Tubing Cutter

- › Works on tubing sizes 1/8" to 1-1/8" O.D. (3 mm to 29 mm).
- › Easily cuts copper, brass, aluminum, and steel brake lines.
- › Ream folds onto cutter body for storage.
- › Extra cutting wheel stored under ream.



42080, 42090

42071

Ratcheting Tubing Cutters

- Designed for confined spaces.
- Unique ratcheting action operates like a socket ratchet, but cuts copper, aluminum, stainless steel, and PVC.
- Spring-loaded adjusting screw applies continuous pressure while cutting.

42071 – Ratcheting tubing cutter for 1/8" to 1/2" tubing.

42080 – Ratcheting tubing cutter for 1/4" to 7/8" tubing.

42090 – Ratcheting tubing cutter for 1/4" to 1-1/8" tubing.



42022

Mini Tubing Cutter

With a short swing radius, this cutter makes quick work of cutting tubing in tight spots. The 42022 is especially versatile with its larger range: 1/8" to 1-1/8" O.D. tubing capacity.



42028

Tubing Cutter

Our roller-type cutter makes clean cuts in copper, aluminum, steel, and stainless steel tubing. Features easy action, wide capacity range, and a pencil reamer. For 1/4" to 1-1/2" O.D. tubing



Replacement Cutter Wheels

These top quality replacement cutter wheels are thinner for cleaner cuts with less effort. Made of high quality, shock-resistant, tool steel, the cutters are also heat treated to resist breakage and last longer. Cutter wheels are available to fit Robinair cutters, and can be used as replacements in nearly all other brands.



42024

Mini Tubing Cutter

With the smallest cutting radius in the industry, the 42024 is ideal for extremely tight places. A finer thread screw provides easier tightening. For 1/8" to 5/8" O.D. tubing.



42035

Slip-Adjust Tubing Cutter

- › All metal construction.
- › Spring-loaded cutting tool for faster cutting.
- › Two locations for spare cutting wheels (1 included).
- › For 1/4" to 2" tubing.
- › Includes attached reaming tool.



6514

Mini Tubing Cutter

- › Works on tubing sizes 1/8" to 5/8" O.D. (3 mm to 16 mm).
- › Easily cuts copper, brass, aluminum, and steel brake lines in hard-to-reach places.
- › Ream folds onto cutter body for storage.
- › Extra cutting wheel stored under ream.

Replacement Wheel Chart	
Model No.	Fits Cutter No.
42062	42028
42073	42071
42083	42080, 42090



42040
Single Blade Deburring Tool

This handy tool removes internal burrs in copper tubing. It features a high-speed steel, blade, aluminum handle, and pocket clip. Tubing size is unlimited.



13162
Deburring Tool

Quickly deburrs aluminum, copper, and steel tubing, and can work on any size tubing. It's made with a high-speed, steel blade and a durable aluminum handle. Three spare blades store in the handle.



45355
Fiber Optics Inspection Light with Magnetic Tip and Base

The applications for this handy tool are practically endless...check burners on heat exchangers for cracks, check coils for dirt and damage, look at serial numbers, fan motor tags, etc., on furnaces and condensing units. Fiber optics provide a bright light, but the shaft is just 7.6 mm in diameter. A durable cover fits over the 15" flexible shaft for protection. Powered by three AA batteries.



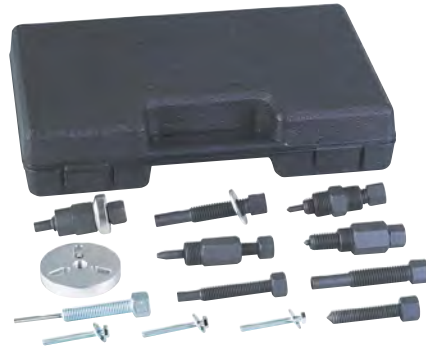
11009
Clutch Plate Remover

Designed to overcome resistance when removing the clutch plate.



4536
A/C Clutch Pulley Puller Set

- For removal of stubborn air conditioning clutch pulleys. Also used on many alternator, generator, power steering, and crankshaft pulleys, harmonic balancers, and fiber timing gears.
- Set includes drop-forged components: one 3/4"-16 x 5" live-center forcing screw, 5-1/2" crossbar with three spread settings, two pairs of jaws, and a clamp bolt.
- Spread: 3" to 5"; Reach: 1" to 5".
- Includes blow-molded plastic case.



4535
A/C Clutch Hub Remover/Installer Set

- For damage-free removal and installation of the clutch hubs on these air conditioning compressors: GM-Harrison DA-6, HR-5, V-5, A-6, and early R4; Nippondenso Ford/Chrysler A590, C171, FS-6, 6P148A (new style); Sanden & Sankyo; York/Tecumseh HR980; Zexel/Mitsubishi CH series.
- Set includes a removing flange, plus forcing screws and adapter assemblies to remove and install virtually all clutch hubs.
- Includes blow-molded plastic case.



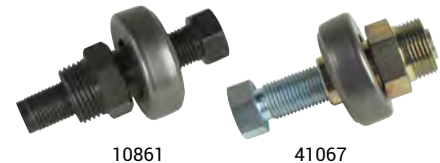
7238
Spring Lock Coupler Disconnect Set

Set includes four sizes for use on 3/8", 1/2", 5/8", and 3/4" tubes. Allows quick, safe disconnect of spring lock couplers on late model Ford systems and Tecumseh HR980 compressors.



6511
Fuel Line Disconnect Tool

Special low-profile design works in close quarters on GM, Ford, and Chrysler vehicles where there is limited clearance between the fuel line fittings and fuel filters, fuel rails, or sending units. This tool is designed to access the center port on the GM fuel tank sending unit. For 3/8" and 1/2" applications; will also service 2001 thru current 3/4- and 1-ton trucks with the Duramax Diesel engine.



Clutch Plate Remover/Installer

These compact tools are used both to remove the clutch for access to the shaft seal and to re-install it by simply inverting the nut and main bearing.

10861 – A6, R4. **41067** – V5, DA6, HR6.



4537
A/C Clutch Holding Tool

This three-stud spanner wrench keeps the A/C clutch from turning when loosening or tightening the retaining nut. Adjusts quickly with brass thumbscrews to fit various styles of A/C compressors used on GM, Ford, and Chrysler vehicles. Also fits a variety of other pulleys.



18548
Four-In-One Tube Bender

Effortlessly bends four different sizes of soft or annealed tubing without crimping, flattening, or scratching. Calibration allows duplication of any angle. Handles are 8-1/2" long, so extensions are not needed, and glass/plastic construction combines strength with lightweight durability.



18403
Fin Straightener

- › Clean and straighten condenser and evaporator coils.
 - › Compact design for confined spaces: the straightener head is 3-1/8" in diameter; the handle is 3-1/2" long.
 - › Includes 12 clearly marked combs
- Wheel 1: 8, 9, 10, 12, 14, & 15 fins per inch
Wheel 2: 10.5, 11, 13, 18, 20, & 22 fins per inch



18560
Valve Core Remover / Installer

Remove and install the valve core from a 1/4" male flare access fitting without the loss of refrigerant. Durable, solid brass tool has a ball valve that can be opened and closed in just a quarter-turn, rather than a stem-type valve. Designed with a stainless steel ball and brazed side fitting for durability and long life.



18561
Valve Core Remover / Installer

Replace leaking valve cores quickly and easily, or remove the valve core and hold it out of place for evacuation or charging. The 18561 features a solid brass body with convenient handle that opens and closes in a quarter-turn to speed service. The compact design easily fits most installations.



14773
Thread Chaser

For use with No. 18560 or 18561, valve core remover/ installer. This item actually repairs damaged threads on valve cores in the service line, without releasing refrigerant into the atmosphere.



14774
Pick Extractor

For use with No. 18560 or 18561, valve core remover/ installer, this extractor lets you remove damaged cores in the service line while the system is fully charged. There's no release of refrigerant into the atmosphere.

Access Valve Core Removers
Save Service Time

These handy tools remove valve cores without losing the system charge. They're designed specifically for use during evacuation or recharging on any system with valve core-type access ports. Removing the core restriction results in maximum flow, greatly reducing the time required for evacuation and charging.



11014
R-12 Valve Core Remover

Services late model GM cars with deeper valve cores.



10588
R-134a Valve Core Remover

Our popular valve core remover/installer has been engineered for use when servicing deeper core R-134a A/C systems.



13145
1/4" Valve Core Remover, pkg/6

Robinair's standard valve core remover includes six replacement valve cores which store in the tool's body.

18340

Valve Core Remover Kit

- › Standard valve core extractor.
- › 8 mm valve core extractor.
- › 10 mm valve core extractor.
- › GM high flow valve core extractor.
- › JRA valve core extractor.
- › R-134a low- and high-side body assemblies with side ports.
- › R-134a low- and high-side port adapters.
- › Plastic carrying case.
- › Usage chart.



Access Adapters

Robinair offers a complete selection of access adapters for hooking up A/C systems for evacuation and recharging. These adapters fit most systems, and sizes are available to fit most passenger cars. "A" models have longer valve core depressors to work on both standard and the deeper-set valve cores in some vehicles. Check manufacturer's specifications for specific applications.

90° Style Adapters

Solid brass fitting is ideal for tight spots or locations where making connections is difficult.

10469A – 1/4" MFL x 3/16" FFL.

40563A – 1/4" MFL x 1/4" FFL.



40563A

Straight Style Adapters

Straight adapter is versatile and easy to use. Made of solid brass.

10468A – 1/4" MFL x 3/16" FFL.

40560A – 1/4" MFL x 1/4" FFL.



10468A

Flexible Adapters

Flexible adapters feature brass fittings and a durable neoprene-coated hose, 6" long.

10293 – 1/4" MFL x 1/8" FFL, blue.

10470A – 1/4" MFL x 3/16" FFL, red.

10778 – 1/4" MFL x 1/4" FFL, yellow.

40531 – Replacement o-rings for 10293, pkg/6.

40677 – 3/16" gasket.

40653B – 3/16" valve core depressors.

40082 – 1/4" valve core depressors.

40083 – 1/4" hose gaskets.



14450

Heat Gun

A lightweight source of directed heat offering 500°F and 750°F settings, and also has a "cold" setting. This handy heat gun is ideal for many applications, including:

- › Fast heating/drying of materials.
- › Quick curing/drying of epoxies.
- › Applying shrink tubing.
- › Softening tubing for bending.
- › Speed-drying of touch-up paint to eliminate "haze."
- › Drying out condensation in motors, clutches, controls, etc. Shock-proof and cool-running with a tough Lexan® housing, the unit weighs just 2-1/2 lbs.
- › 115V 50/60 Hz.



Replacement parts

44996 – Carbon brush.

44997 – Switch assembly.



10237A

Fits-All Adapter Kit

Our access adapters have been combined into a kit that's ideal for accessing R-12 vehicle A/C systems, as well as other types of systems. Five different adapters are included with 1/4" fittings: three flexible adapters (part numbers 10293, 10470A, 10778) and two 90° brass adapters (part numbers 10469A and 40563A). See descriptions below for specifications.



18143

Straight Adapter

This straight adapter is designed specifically for General Motors vehicles with R-12 air conditioning systems featuring "Positive Seal" high-side charge valves. The adapter is made of brass with an easy-to-grip coupler nut, 1/4" MFL x 3/16" FFL.



10292

Quick Seal™ Adapters

Quick Seal fittings automatically shut off the charging hose when you disconnect it from the system, so any refrigerant left in the hose is not released. This also prevents "finger burn" and adds an extra measure of safety. Made of solid brass.

10292 – 1/4" MFL to 1/4" FFL.

10296 – 1/4" MFL to 3/16" FFL.

10250 – 1/4" MFL to 1/4" FFL, 90°.



18451

Quick Seal Repair Kits

18451 – 45° 1/4" Quick Seal™ kit.

40302 – 1/2" Acme Quick Seal™ kit.

18180 – 1/4" Quick Seal™ o-rings.



40572

Brass Caps

40572 – 1/4" solid brass caps have knurled ridges for easy gripping. Package of six.

4535.....	26	15600.....	21	19713.....	7	42083.....	25	92000.....	19
4536.....	26	15601.....	21	19714.....	7	42090.....	25	92001.....	19
4537.....	26	15800.....	22	19716.....	7	43180.....	15	92500.....	19
6511.....	26	16009.....	7	19776.....	4, 6	43186.....	15	529734.....	19
6512.....	25	16109.....	7	22791.....	8	43230.....	12	AC1234-6.....	4
6514.....	25	16208.....	13	30036.....	18	43240.....	12	TIF7201.....	14
7238.....	26	16215.....	13	30060.....	18	43310.....	16	TIF7201D.....	14
10237A.....	28	16234.....	13	30072.....	17	44150.....	15	TIF7610.....	14
10250.....	28	16235.....	13	30072.....	18	44996.....	28	TIF7612.....	14
10292.....	28	16240.....	13	31036.....	18	44997.....	28	TIF7620.....	14
10293.....	28	16241.....	13	31060.....	18	45111.....	15	TIF8800X.....	11
10296.....	28	16242.....	13	31078.....	18	45355.....	26	TIF8800X-E.....	11
10328.....	17	16243.....	13	31079.....	18	47150.....	15	TIF8801.....	11, 12
10468A.....	28	16249.....	13	31096.....	18	48134A.....	15	TIF8802.....	11
10469A.....	28	16254.....	13	32036.....	18	48134B.....	15	TIF8802E.....	11
10470A.....	28	16256.....	5	32060.....	18	48510.....	15	TIF8802J.....	11
10588.....	27	16258.....	5	32072.....	18	49134A.....	15	TIF8803A.....	12
10596.....	12	16296.....	13	32096.....	18	49134B.....	15	TIF8805.....	12
10597.....	12	16348.....	13	33036.....	18	60060.....	18	TIF8806A.....	12
10778.....	28	16349.....	13	33060.....	18	60072.....	18	TIF8806B.....	12
10861.....	26	16350.....	13	33096.....	18	60096.....	18	TIF8808.....	11
10945.....	12	16355.....	13	34065.....	6	61060.....	18	TIF8809.....	11
10986.....	6	16356.....	13	34102.....	6	61072.....	18	TIF8818.....	11
10994.....	25	16357.....	13	34288.....	2	61096.....	18	TIF8900.....	12
11009.....	26	16451.....	12	34411-E.....	5	62060.....	18	TIF8900-E.....	12
11014.....	27	16452.....	12	34412.....	5	62072.....	18	TIF9010A.....	24
11794.....	16	16455.....	12	34430.....	6	62121.....	18	TIF9020A.....	24
11795.....	16	16503.....	11	34579.....	6	62242.....	18	TIF9030.....	24
11796.....	16	16600.....	11	34724.....	6	62243.....	18	TIF9031.....	24
11797.....	16	16910.....	7	34750.....	4, 6	62244.....	18	TIF9035.....	24
11798.....	16	16913.....	7	34788NI.....	3	62246.....	18	TIF9055.....	24
11910.....	15	16956.....	12	34788NI-H.....	3	63096.....	18	TIFRX-1A.....	10
11920.....	15	16958.....	12	34970.....	23	64240.....	18	TIFXL-1A.....	10
13066.....	23	17121.....	6	34977.....	23	65060.....	17	TIFXP-1A.....	10
13067.....	17	17490.....	5, 19	34988.....	2	65160.....	17	TIFXP-2.....	10
13110.....	23	17492.....	5	34988-I.....	2	65260.....	17	TIFXP-5A.....	10
13119.....	20	17499.....	5	38172A.....	18	65360.....	17	TIFZX.....	8, 9
13145.....	27	17506.....	4, 6	38272A.....	18	68020.....	17	TIFZX-2.....	9
13148.....	17	17565.....	6	38372A.....	18	68136A.....	18	TIFZX-3.....	9
13162.....	26	17572.....	6	39072A.....	18	68160A.....	18	TIFZX-3E.....	9
13169.....	5	17580.....	5	40082.....	17, 28	68172A.....	18	TIFZX-6.....	9
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13177.....	28	17595.....	6	40084.....	17	68236A.....	18	TIFZX-10.....	9
13184.....	25	17605.....	6	40151.....	16	68260A.....	18	TIFZX-11.....	9
13203.....	20	17607.....	5	40152.....	16	68272A.....	18	TIFZX-14.....	9
13204.....	20	17609.....	6	40153.....	16	68296A.....	18	TIFZX-15.....	9
14450.....	28	17630.....	6	40169.....	16	68336A.....	18	TIFZX-55.....	9
14773.....	27	17663.....	6	40232.....	17	68360A.....	18	TIFZX-E.....	9
14774.....	27	17677.....	6	40302.....	28	68372A.....	18	TIFZX-J.....	9
14777.....	23	17686.....	6	40333.....	17	68396A.....	18	TIFZXKIT.....	9
14778.....	23	17800B.....	4	40449.....	17	68420.....	17	TIFZXKITE.....	9
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15121A.....	21	18143.....	28	40572.....	28	69096A.....	18		
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15300.....	22	18191A.....	16	40859.....	12	74363.....	8		
15301.....	22	18192.....	16	41067.....	26	74364.....	8		
15310.....	22	18340.....	28	41698.....	17	74367.....	8		
15400.....	21	18341.....	16	42022.....	25	74368.....	8		
15401.....	21	18403.....	27	42024.....	25	75134.....	18		
15424.....	21	18451.....	28	42028.....	25	75234.....	18		
15434.....	21	18548.....	27	42035.....	25	75240.....	18		
15495.....	23	18560.....	27	42040.....	26	75260.....	18		
15500.....	22	18561.....	27	42062.....	25	75360.....	19		
15501.....	22	18576.....	16	42071.....	25	75369.....	19		
15510.....	22	19150.....	16	42073.....	25	75370.....	19		
15555.....	23	19695.....	17	42080.....	25	75700.....	19		

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