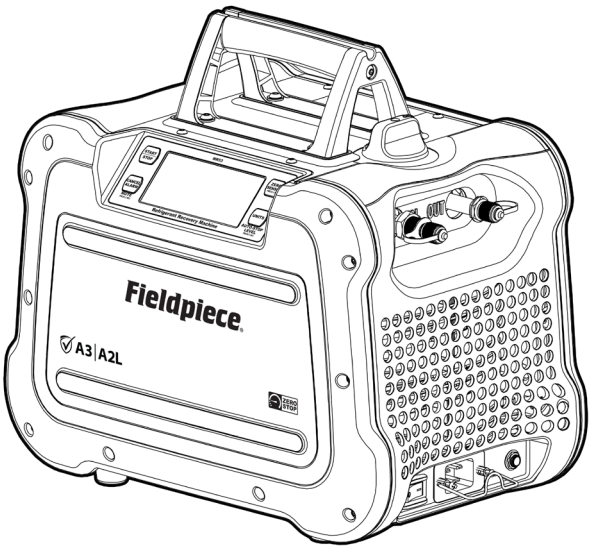
Fieldpiece®

Refrigerant Recovery Machine

OPERATOR'S MANUAL

Models MR53UK
MR53INT



Contents

Important Notice

This is not a consumer machine. Only qualified personnel trained in service and installation of A/C and/or refrigeration equipment shall use this refrigerant recovery machine.

Read, understand, and follow this entire manual, with special attention given to Warning and Caution statements before operating this machine.

For use only by qualified and certified technicians in the safe use, handling, and transporting of refrigerants. This machine has been updated to not only recover most CFC, HFC, HCFC and HFO refrigerants that have an A1 or A2L flammability rating, but also A3 refrigerants.

Please refer to flammable refrigerant safety guides, regional codes and legislation for more information.

Read operator manual.

Wear hearing protection.

Do not use in rain.

Unplug if cable is damaged.

(3.85) MPa

Maximum allowable pressure.

Flammable refrigerant.

Safety First!

RISK OF EXPLOSION. DANGER: This machine is for use only by qualified and certified technicians in the safe use, handling, and transporting of refrigerants. Please refer to flammable refrigerant safety guides, regional codes and legislation for more information. Read and understand this operator's manual in its entirety before using to prevent injury or damage to you or equipment.

⚠ WARNING – Failure to heed these hazards and actions while using this device can result in serious injury or death:

1. Electrical shock risk - Do not operate in wet environments, rain, or around any liquids.
2. Risk of property damage. The use of an undersized extension cord may cause voltage to drop resulting in power loss to the motor and overheating. Use 2.5 mm^2 (14 AWG) or thicker, up to 15 m (50 feet).
3. Always wear Personal Protective Equipment (PPE), including gloves, safety glasses and earplugs.
4. Know and understand the correct safety and handling requirements of the refrigerant, including those specified in the Safety Data Sheet (SDS).
5. Avoid breathing refrigerant and oil vapors. Inhalation of high concentrations of refrigerant vapor can block oxygen to the brain causing injury or death.
6. Handle hoses and equipment carefully as refrigerant may be under high pressure. Exposure to refrigerant can cause frostbite.
7. Perform leak detection in accordance with recommended practice to verify working environment is free from leaking refrigerant, as it can be toxic and/or flammable.
8. Only work in well-ventilated areas (minimum of 4 air exchanges per hour).
9. Avoid cross-contamination by not mixing refrigerants.
10. Inspect this machine prior to use. Do not use if there is obvious damage to the enclosure such that fingers or metallic objects might enter the casing.

⚠ WARNING: EXPLOSION HAZARD. This device is intended to be used strictly as a recovery machine. Below are additional safety instructions for handling A2L & A3 refrigerants in conjunction with other equipment.

1. Not for use with E170, R429A, R432A, R435A, R510A, R-610, R-702, R-717, R-744 or R-1150 refrigerants. See page 38.
2. WARNING: EXPLOSION HAZARD. To avoid risk of explosion, the MR53 may not be connected to mains power until after any A3 and/or A2L refrigerant released during purging operations has dissipated to below the lower flammable limit (%LFL)
   This might be accomplished by:
   - Moving the equipment outside prior to purging.
   - Venting the purge hose outside, near an opening to the outside, or into a highly ventilated space.
   - Using a fan to disperse any vented refrigerant.
   - Ensuring adequate ventilation, such as by opening doors or windows.
   - Using a combustible gas detector to verify a potentially explosive atmosphere is not present.
   - Waiting an appropriate period of time after purging to ensure the vented refrigerant has adequately dispersed and is no longer potentially explosive.
   - WARNING: It is not advised to allow refrigerant (flammable, toxic or otherwise) to be drawn directly into central heating / cooling systems, fans or blowers, or be vented near or towards any potential sources of ignition, unless such equipment is suitably rated for use in potentially explosive atmospheres.
3. To avoid risk of explosion, residual A3 and A2L refrigerant left in recovery machine, hoses, fittings and instruments must be vented outdoors, away from any potential sources of ignition. Disconnect machine from AC mains (at mains plug first) before venting.
4. When recovering A3 refrigerants or using the self purge function, DO NOT allow the inlet to go below atmospheric pressure (0 psi) in order to avoid mixing air with recovered refrigerant. DO NOT go past the default Auto-Stop setting (0 psi).
5. Always use a correctly grounded outlet. Plug and lock the supplied AC cord to the unit first. Plug into any extension cord and then plug into the mains outlet last. Follow in reverse for safe removal.
6. MR53UK 230V or 240V users must keep the cord plug outside the Temporary Hazardous Zone whenever the cord is live.
7. Ensure power and extension cords are in good working condition to prevent shock and spark hazards.
8. When an extension cord outlet is within the Temporary Hazardous Zone, it is recommended that users use a cord cover, or similar device, to reduce / eliminate the possibility of accidentally unplugging from the extension cord while the circuit is live.
9. Do not operate the unit in excessively dusty environments or environments where conductive dust is to be expected.
10. Do not connect or disconnect the power cord from the MR53 or extension cord when energized.
11. The 80% overfill protection (O.F.P.) port is intended only for the connection of integrated cylinder overfill switches installed on appropriately certified refrigerant recovery cylinders and having a suitable 6.35mm (1/4") plug. Total overfill sensor cable length may not exceed 10m (32'). Do not connect any other equipment to this port.
12. Ensure area around machine is free of debris that could enter air vents or fan and cause accidental sparking.
13. Fitting caps may exceed 10 pF. When handling A3 or A2L refrigerants, avoid handling the fitting caps when machine is operating.
14. When handling A3 or A2L refrigerants, operator must take all appropriate measures to avoid electrostatic discharge (ESD) to the machine or to other earthed objects in the Temporary Hazardous Zone.
15. Adhere to local occupational safety codes and possess detailed knowledge and skills when handling flammable refrigerants.
16. Have emergency, evacuation, and fire protection plans.
17. Always remain in attendance and observant when equipment is operating.
18. Do not mix flammable refrigerants with air.
19. Use an evacuated recovery tank that complies with local regulations.
20. Avoid overfilling recovery tanks by following refrigerant manufacturer's filling instructions and using a refrigerant scale.
21. After recovery, purge system with 100% nitrogen before opening system for repair.

⚠ CAUTION – Failure to heed these conditions can cause equipment damage.

1. Ensure that all equipment is in good working condition.
2. If the power cable is damaged, it must be replaced by the manufacturer or authorized service center.
3. Do not use on ammonia or salt water systems. Doing so may damage or contaminate your recovery machine.
4. Prevent prolonged exposure to direct sunlight. Store indoors.
5. The unit must be protected against severe impact. Solid objects must not be allowed to fall onto the unit.
6. Ensure mesh screen filter is installed & clean (page 34).
7. Do not run the machine without the mesh screen filter (page 34). Doing so will void the warranty and damage the machine.
8. Use a filter drier on the input port and change it often to protect machine from contaminated refrigerants.
9. Store with ports capped to prevent dust from entering.
10. Perform a self test periodically (page 26).

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Safety Information

Setup

1. Inspect the machine and ensure there is no physical damage.
2. Ensure power cord is not damaged and all equipment is grounded.
3. Ensure extension cord is grounded, 3 conductor, and is not damaged.
4. WARNING: Risk of property damage. The use of an undersized extension cord may cause voltage to drop resulting in power loss to the motor and overheating. Use 2.5 mm^2 (14 AWG) or thicker, up to 15 m (50 feet). DO NOT USE 0.75 mm^2 (18 AWG).
5. Use the correct AC plugging procedure. Plug and lock the supplied AC cord to the unit first. Plug into any extension cord and then plug into the mains outlet last.
6. Use the correct AC unplugging procedure. Unplug from the mains outlet, unplug any extension cord before finally unlocking and unplugging the AC cord from the unit.
7. DO NOT disconnect the AC cord from the unit while the cord is still plugged in to mains power, even if the unit is turned OFF (O).
8. The mains power receptacle must be located outside any areas that may potentially contain an explosive atmosphere; that is, outside the Temporary Hazardous Zones.

IEC Power Cord with Screw Locks

For protection, the recovery machine includes a screw lock for the unit's power cord.

1. With the unit switched OFF (O), twist the wire lock upwards and plug the female end of the power cord into the unit.
2. Twist the wire lock down over the power cord and use a screwdriver to tighten the screws and lock into place.
3. It is now safe to connect to the mains power in accordance with item #5, above.

Grounding Instructions

This product must be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. This product is equipped with a cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.

WARNING – Improper installation of the grounding plug may result in a risk of electric shock. Check with a qualified electrician or serviceman when the grounding instructions are not completely understood, or when in doubt as to whether the product is properly grounded.

Do not modify the plug provided; if it does not fit the outlet, have the proper outlet installed by a qualified electrician.

Not recommended to use with a GFI outlet. Circuit may trip, causing recovery to stop.

Specifications

For Use With: A3, A2L, and A1 Refrigerants
(For complete list, see pages 38-42.)
Not for Use With: E170, R429A, R432A, R435A, R510A, R-610, R-702, R-717, R-744 or R-1150
Display: Backlit LCD with status messages
Auto-Stop Levels:
0 bar (default) (0 psig or 0 kPa);
-0.34 bar (-10 inHg or -25 cmHg);
-0.68 bar (-20 inHg or -50cmHg)
WARNING: EXPLOSION HAZARD. When recovering A3 refrigerants, DO NOT use an Auto-Stop setting other that 0 psi (default), in order to avoid mixing air with recovered refrigerant.
Input Port High Pressure Cutoff: 26.0 bar (2600 kPa, 377 psig)
Output Port High Pressure Cutoff: 38.5 bar (3850 kPa, 558 psig)
Input and Output Port Pressure Sensor Range:
-1 bar to 50 bar (-30 inHg to 725 psig, -76 cmHg to 5000 kPa)
Pressure Sensor Accuracy:
± 0.15 bar (± 2.176 psig) above atmospheric pressure,
± 0.2 bar (± 6 inHg) vacuum
Final Recovery Vacuum: -0.51 bar (-38 cmHg, -14.9 inHg)
Compressor: Twin cylinder reciprocating (oil-less)
DC Motor: 1 HP (variable smart speed)
RPM: 3000
Nominal Power: 110V~50Hz (MR53UK); 220-240V~50/60Hz (MR53INT)
Nominal Current Draw:
14A @ 110V (MR53UK); 7A @ 230V (MR53INT)
Valve: Single dual-route ball valve
Input Port Filtration: 9 mm mesh screen, stainless
Unit Ingress Protection Rating: IP20
Dimensions: 376 mm x 250 mm x 344 mm (14.8" x 9.8" x 13.5")
Weight: 11 kg (24 lbs)
Operating Environment: 0°C to 40°C (32°F to 104°F)
Storage Environment: -20°C to 60°C (-4°F to 140°F)
US Patents: www.fieldpiece.com/patents

Certifications

Waste Electrical and Electronic Equipment
Do not dispose through typical waste streams.

CE Ex II 3 G Ex ic ec nC h IIA T3 Gc
0°C ≤ T_{AMB} ≤ +40°C

UKCA Ex II 3 G Ex ic ec nC h IIA T3 Gc
0°C ≤ T_{AMB} ≤ +40°C

RoHS Restriction of Hazardous Substances Compliant

Complies with: EN IEC 60079-0:2018, EN IEC 60079-7:2015+A1:2018, EN 60079-11:2012, EN IEC 60079-15:2019, EN ISO 80079-36:2016, EN ISO 80079-37:2016

Complies with: BS EN IEC 60079-0:2018, BS EN IEC 60079-7:2015+A1:2018, BS EN 60079-11:2012, BS EN 60079-15:2010, BS EN ISO 80079-36:2016, BS EN ISO 80079-37:2016, BS EN ISO 80079-37:2017

For EU and/or UK Declaration of Conformity:
1. Go to URL: https://fieldpiece-europe.com/products/mr53int-digital-recovery-machine/#downloads

Performance Data

Refrigerant Category	Category III	Category IV Including R290, R1270	Category V
Test Refrigerant	**R134A**	**R407C**	**R410A**
Liquid Recovery (kg/min)	2.9	5.1	5.6
Vapor Recovery (kg/min)	0.28	0.33	0.33
Final Recovery Vacuum (kPa)	50.8	50.8	50.8
Residual Trapped Refrigerant (kg)	0.008	0.004	0.005

For reference only. For a complete list of categorized refrigerants, see page 38.

Description

The MR53 is a recovery machine with a smart variable speed DC motor that accelerates during vapor recovery. It has an oversize compressor that allows you to pump refrigerant easily and quietly. The ports are positioned to let you easily connect your hoses without lifting the pump off the ground. Status messages and pressures can be viewed directly on the large backlit display.

Its lightweight size allows you to easily transport the machine to and from the job site. Turn the single rubberized control valve to route refrigerant through the MR53, and use the self-purge function to pump the last traces of refrigerant into the recovery cylinder instead of leaving it in the machine or releasing it into the environment.

The MR53 is A2L and A3 compatible for use in a wide range of jobs. To avoid contaminating recovered refrigerant, the MR53 automatically stops at 0 psig/bar by default.

Features

- **A3 and A2L Refrigerant Compatible**
- **ATEX Zone 2 Compliant**
- **Lightweight**
- **1 HP Smart Variable Speed DC Motor**
- **Smooth and Fast Operation**
- **Digital Display with Status Messages**
- **Reliable Rubberized Construction**
- **Easy to Access Port Design**
- **Hex Nut Secures Input Port During Hose Removal**
- **80% Overfill Protection Sensor Port**
- **Power Cord Storage**
- **Ceramic-Lined Cylinders**
- **Zero Stop (3 Selectable Auto-stop Levels)**
- **Self Purge**
- **Wide Operating Voltage**
  MR53UK: 85~135V 50HZ
  MR53INT: 185V~265V, 50HZ

What's Included

MR53 Refrigerant Recovery Machine
10 Extra Mesh Screens for Input Port
3 Extra O-rings for Input Port
Power Cord(s)
Operator's Manual
1 Year Warranty

Tech Tips

General

1. Store in the self purge or recover position. Do not store in the CLOSED position as trapped air and refrigerant can expand and damage components.
2. For extended storage, purge with nitrogen, set to RECOVER, and screw the provided fitting caps (or other suitable non-sealing caps) onto the ports.
3. Recovery machines are not vacuum pumps and should not be used for deep evacuations.
4. Do not run the machine without the mesh screen filter (page 34). Doing so will void the warranty and damage the machine.
5. Understand the refrigerant safety data sheet (SDS).

Setup

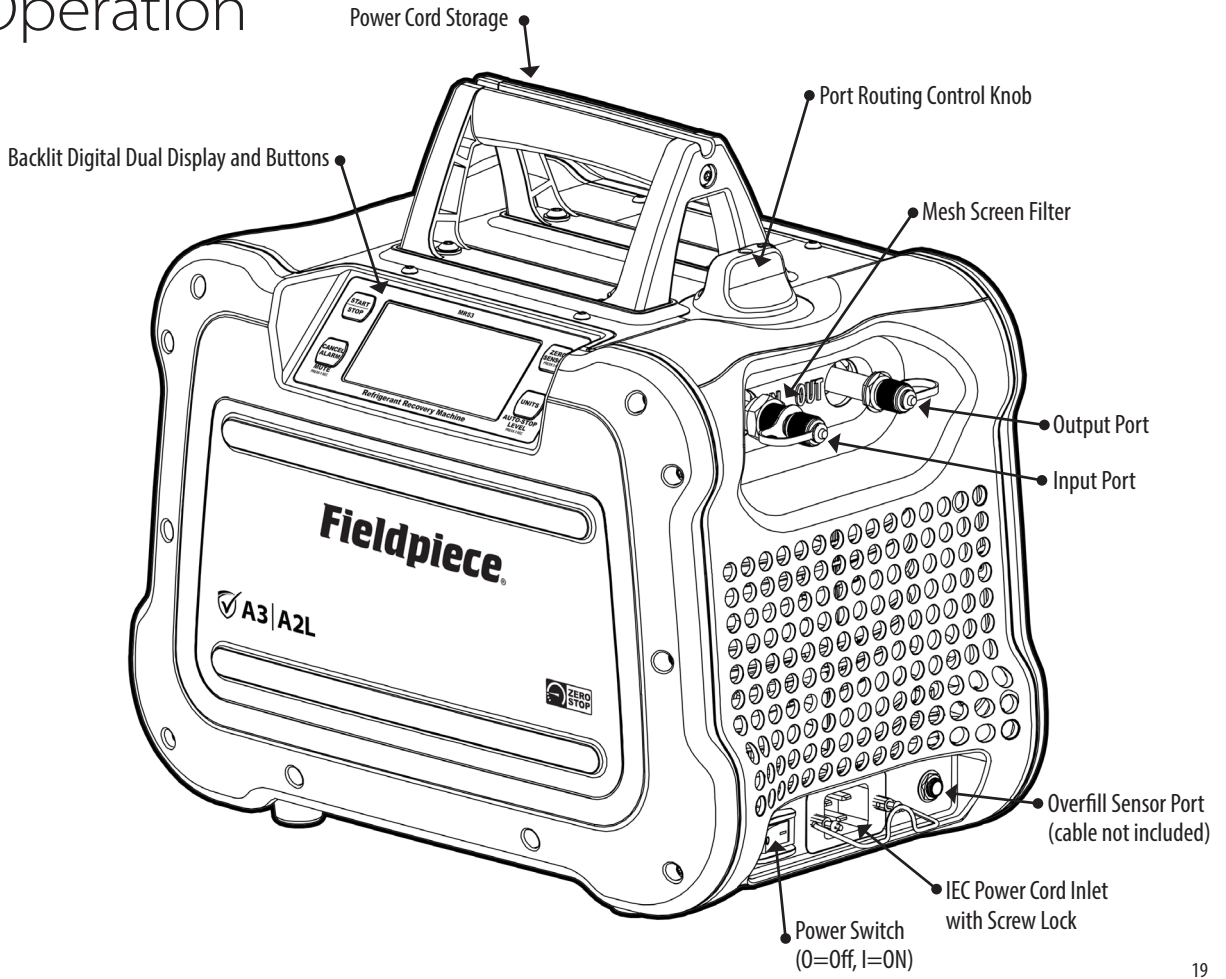
1. Know the refrigerant of the system and make sure your recovery cylinder matches that type.
2. Hoses:
    - Length as short as possible.
    - At least 3/8" hose with at least 1/4" fitting
    - Core depressors removed.
    - Ball valve shutoffs instead of low loss fittings.
    - Replace if worn.
3. Manifold gauges are not necessary for recovery but can make it more convenient and increase speed by having 2 system hook ups.
4. Use a Schrader valve core removal tool to temporarily remove valve cores from service valves.
5. Use the push-pull (page 31) method if recovering over 14 kg (30 lbs).
6. Evacuate your empty recovery cylinders to 75 cmHg (29.6 inHg) before use.
7. Know how much refrigerant you expect to recover before starting.

8. Ensure there's enough room in the recovery cylinder to not exceed 80% filled during the job, or monitor and have a second cylinder ready.
9. Always purge hoses before recovery. If cylinder is too hot, use an ice bath to reduce the temperature and pressure of the cylinder.
10. If cylinder pressure is higher than expected, you can purge non-condensables into another cylinder (page 27).

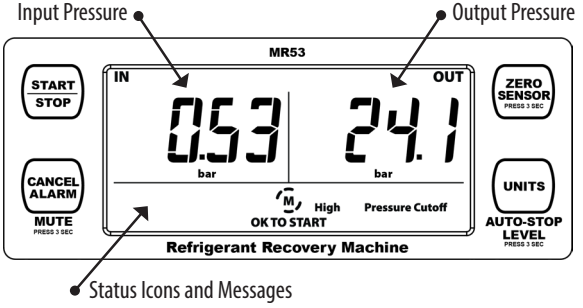
Operational

1. Recover as much liquid as possible before recovering vapor.
2. Recovery is faster when the recovery cylinder is cooler.
3. Recover from both suction and liquid lines at the same time for faster vapor recovery.

Operation


Power Cord Storage
Port Routing Control Knob
Backlit Digital Dual Display and Buttons
Mesh Screen Filter
Output Port
Input Port
Overfill Sensor Port
(cable not included)
IEC Power Cord Inlet
with Screw Lock
Power Switch
(O=Off, I=ON)
START
STOP
CANCEL
ALARM
MUTE
ERROR
MENU
UNITS
AUTO STOP
LEVEL
Refrigerant Recovery Machine
OUT
Fieldpiece
A3 | A2L
ZERO
STOP

Display and Buttons



START/STOP
Start or Stop the motor.

ZERO SENSOR (press 3 seconds)
Zero pressure sensors. Ports must be open to atmosphere.

CANCEL ALARM
Cancel alarm currently sounding (temporarily mute).

MUTE (press 3 seconds)
Toggle mute for all sounds (setting is saved).

UNITS
Select pressure/vacuum units.

AUTO-STOP LEVEL (press 3 sec to enter setup)
Once entered, press to change the pressure/vacuum level that triggers the first automatic stop: 0 bar (default), -0.34 bar, -0.68 bar, (0 psig, -10 inHg, -20 inHg or 0 kPa, -25 cmHg, -50 cmHg). Wait 5 seconds to exit setup, automatically saving desired setting.

Status Icons and Messages

The icon rotates when the motor is running.

The icon is shown when MR53 is set to MUTE.

OK TO START
Motor stopped. Temperatures, voltages, and pressures are currently safe to start the motor.

COMPLETE/Low Pressure Cutoff
Motor stopped. Input pressure/vacuum reached one of three auto-stop levels for 10 seconds: 0 bar (default), -0.34 bar, -0.68 bar, (0 psig, -10 inHg, -20 inHg or 0 kPa, -25 cmHg, -50 cmHg).

Tank 80% Full
Motor stopped. Overfill sensor triggered by liquid level of refrigerant in the recovery cylinder.

Input Closed
Cannot zero pressures. Open input port.

Output Closed
Cannot zero pressures. Open output port.

High Voltage Warning
Motor stopped. Voltage was above 135V (MR53UK); Voltage was above 265V (MR53INT).

Low Voltage Warning
Motor stopped. Voltage was below 85V (MR53UK); Voltage was below 185V (MR53INT).

High Pressure Cutoff
Motor stopped. Output (cylinder) approached dangerous pressure.

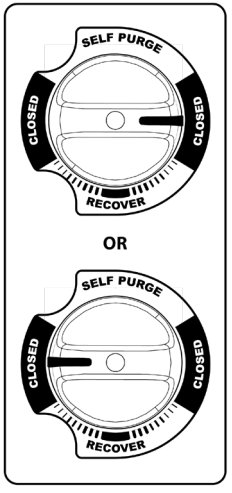
Motor Fault 1
Motor stopped. Motor temp. measured above operating range.

Motor Fault 2 ("throttle" shows on display)
Motor stopped. Motor current (amps) rose above operating range. Throttle RECOVERY to reduce cylinder pressure (page 23).

Motor Fault 3
Motor stopped for unknown reason.

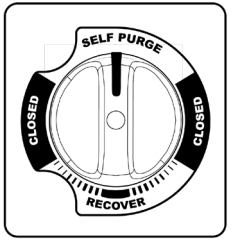
Fault 3 ("PLug O.F.S" shows on display)
80% overfill sensor not detected. Plug sensor cable into cylinder.

Port Routing Control



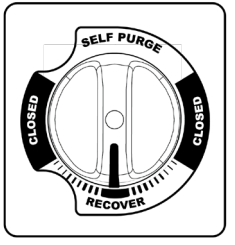
CLOSED

- Input and Output closed.
- Set to either closed position to close off both ports during setup or before purging.



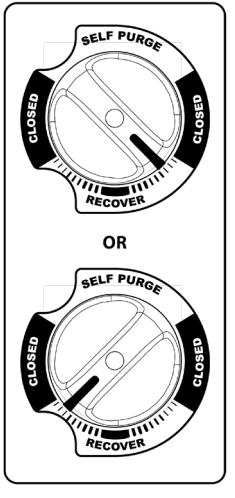
SELF PURGE

- Input closed, Output open.
- After recovery is complete and the motor has stopped, set to CLOSED before you START the purge.
- Press START and slowly rotate to SELF PURGE, closing the IN port and purging MR53.



RECOVER

- Input and Output fully open.
- Set to this fully open position for most of the recovery process.

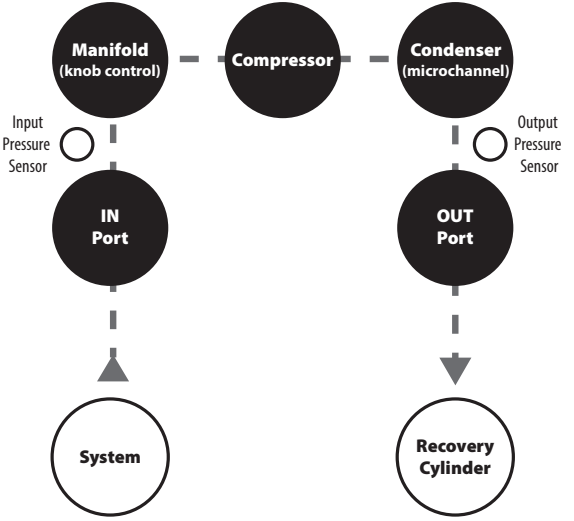


RECOVER (throttled)

- Input and Output partially open.
- Rotate away from RECOVER in either direction to reduce liquid slugging if knocking occurs. This slows the flow of refrigerant so the machine operates more smoothly.
- Only throttle as much as needed for smooth operation.

MR53 Refrigerant Flow

Refrigerant liquid and vapor are pulled through the machine by the pressure difference created by the compressor. For maximum performance, increase the IN pressure and reduce the OUT pressure. See Tech Tips (page 16).



Dynamic Pressure Measurement

MR53 pressure readings are designed only for monitoring pressures. Do not use MR53 for diagnostic pressure measurements.

If a system's pressure is stable, MR53 pressure readings will be close to your other pressure gauges.

If a system's pressure is changing, pressure measurements at different locations within that system will be different. For every meter of 1/4" hose, the pressure difference may be ± 150 kPa.

Functions

Self Test

Perform this test to ensure the high pressure cutoff and pump are operational.

1. Set knob to RECOVERY.
2. Open IN port to air.
3. Connect a ball valve to OUT port. (Included caps are not sealed.)
4. Close the ball valve.
5. Press START to create a pressure at the OUT port.
6. Press START a second time to continue if MR53 stops automatically after 10 seconds at 0 bar (0 psig), the default auto-stop level.
7. MR53 is working well if High Pressure Cutoff occurs around 38 bar (550 psig, 3.8MPa) within 45 seconds. Cutoff time can increase if a hose is placed in front of your ball valve.

Self Purge

Use the SELF PURGE feature at the end of every recovery to pump the last bit of refrigerant out of the MR53. Benefits include increased machine life, reduced environmental impact, and most importantly, prevention of refrigerant mixing.

WARNING: EXPLOSION HAZARD. When using the self purge function, DO NOT go past the default Auto-Stop setting (0 psi), in order to avoid mixing air with recovered refrigerant.

1. After recovery is complete, set knob to CLOSED.
2. Press START and slowly rotate the knob to SELF PURGE to empty the MR53 into the recovery cylinder without any sudden changes in pressure. This closes the IN port and routes the condenser to the intake of the compressor.
3. Once the machine reaches the auto-stop level that has been set (see page 20) for 10 seconds, the motor stops automatically.

Purging a Recovery Cylinder

When the cylinder pressure is higher than expected, you may have non-condensables at the top of the cylinder. Use a second deeply evacuated cylinder to pull out the non-condensables.

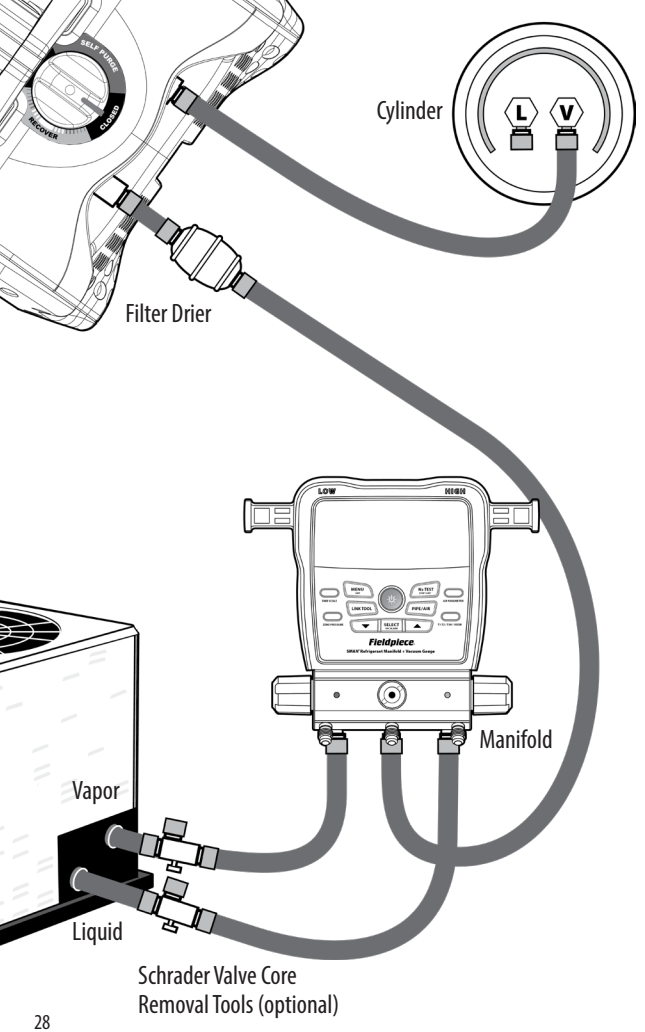
1. Leave pressurized cylinder undisturbed overnight.
2. Use a vacuum pump to evacuate another cylinder.
3. Use your manifold gauges to connect the closed vapor ports of the two cylinders.
4. Measure the vapor temperature of the pressurized refrigerant cylinder.
5. Use a P/T chart or digital manifold to find specified pressure.
6. Open the evacuated vapor port.
7. Open (purge) the pressurized vapor port until pressure is reduced to 0.35 bar (5 psi) above specified pressure.
8. Close valves.
9. If desired, repeat after 15 minutes to allow the tank to settle again.

80% Overfill Sensor Cable Port

Always use a scale as the primary indicator of how much refrigerant is in a container. An 80% overfill sensor (O.F.S.) cable (not provided) may be connected to the 6.35mm (1/4") port as an optional secondary indicator.

WARNING: EXPLOSION HAZARD. Only connect integrated cylinder overfill switches with a total cable length of ≤ 10m to the OFS port. See item (11), page 7.

1. Connect the overfill sensor cable to MR53's overfill sensor port.
2. Connect the overfill sensor cable to an equipped recovery cylinder.
3. See pages 28-31 for recovery setup and operation.
4. MR53 automatically stops when triggered by the overfill sensor.



Direct Liquid/Vapor Recovery

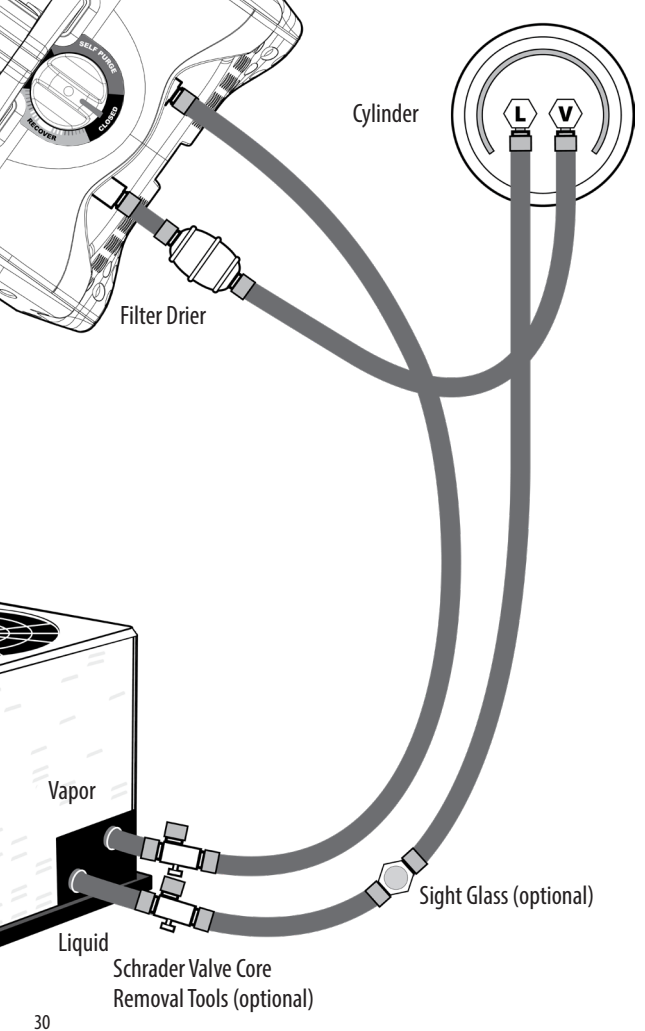
This is the typical recovery method. Vapor and liquid lines are routed through your manifold, into the MR53, and out to the recovery cylinder.

WARNING: When working with A2L or A3 refrigerants, review and follow all of the applicable warnings and cautions listed on pages 4-8.

1. Plug into power then switch to ON (I).
2. Close valves of recovery cylinder, MR53, and manifold.
3. Set up as shown in the diagram.
4. Open valves of hoses and removal tools.
5. Set MR53 to RECOVER.
6. Open high side of manifold for liquid recovery.
7. Purge air completely from refrigerant hoses.
8. Fully open vapor valve of recovery cylinder.
9. Press START to begin recovery.
10. Adjust the knob as needed to throttle refrigerant flow if liquid slugging (knocking) occurs.
11. When liquid recovery is complete, open low side of manifold for vapor recovery.
12. MR53 stops automatically at one of three auto-stop levels:
    0 bar (default) (0 psig or 0 kPa);
    -0.34 bar (-10 inHg or -25 cmHg);
    -0.68 bar (-20 inHg or -50cmHg)

DO NOT go below atmospheric pressure when recovering A3 refrigerants. If needed, press START to continue recovering until the next level is reached. Press STOP to manually halt recovery at any time. (If pressure rises back above a selected auto-stop level it re-activates that auto-stop level).

13. Set knob to CLOSED. Press START and slowly rotate to SELF PURGE to empty MR53 (stops automatically).
14. Close manifold and cylinder valves after self purge is complete.
15. Remove hoses from MR53, set knob to RECOVER, and cap ports.
16. Switch to OFF (0), then unplug from power.



Push/Pull Recovery

This method is only for larger systems with at least 14 kg of liquid refrigerant. It's used to recover liquid before recovering vapor.

WARNING: When working with A2L or A3 refrigerants, review and follow all of the applicable warnings and cautions listed on pages 4-8.

1. Before connecting, switch to OFF (0), then plug into power.
2. Switch to ON (I).
3. Close valves of recovery cylinder and MR53.
4. Set up as shown in the diagram.
5. Open valves of liquid hose and removal tool at liquid system port.
6. Purge air completely from refrigerant hoses.
7. Fully open liquid valve of recovery cylinder and allow to pressurize.
8. Set MR53 to RECOVER.
9. Press START to begin recovery.
10. Fully open vapor valve of recovery cylinder.
11. Purge air completely from refrigerant hoses.
12. Open valves of vapor hose and removal tool at vapor system port.
13. When liquid recovery is complete, press STOP to stop motor.
14. Close all valves and proceed to Direct Vapor Recovery (page 29).
15. Switch to OFF (0), then unplug from power.

Troubleshooting

Status Messages

"Tank 80% Full" is displayed and MR53 beeps

Overfill sensor indicated the recovery cylinder is at least 80% full.

Replace recovery cylinder.

Input Closed

Cannot zero the displayed pressure because pressure sensor not open to atmosphere. Open input port by turning the control knob to Recover or Self-Purge.

Output Closed

Cannot zero the displayed pressure because pressure sensor not open to atmosphere. Open output port by turning the control knob to Recover or Self-Purge.

High Voltage Warning (MR53UK)

Voltage was above 135V. Motor stopped. Ensure power network voltage is between 85 and 135V @ 60 Hz.

High Voltage Warning (MR53INT)

Voltage was above 265V. Motor stopped. Ensure power network voltage is between 185 and 265V @ 50 Hz.

Low Voltage Warning (MR53UK)

Voltage was below 85V. Motor stopped. Check power network to ensure voltage is between 85 and 135V @ 60 Hz.

Low Voltage Warning (MR53INT)

Voltage was below 185V. Motor stopped. Check power network to ensure voltage is between 185 and 265V @ 50 Hz.

High Pressure Cutoff

Output (cylinder) reached dangerous pressure. Motor stopped. Ensure all valves after the output port are open. The cylinder may need to be cooled or replaced to reduce pressure.

Low Pressure Cutoff

Input reached final recovery vacuum. Motor stopped. It's normal to see this after RECOVERY or SELF PURGE is complete. If unexpected, ensure valves before the input port are open and the knob is not set to CLOSED.

Motor Fault 1

Motor temperature measured above operating range. Motor stopped. Extremely high ambient temperature, extended liquid recovery time, or high cylinder pressure can be the cause. Allow time for the motor to cool down before resuming, and throttle the RECOVERY (page 23).

Motor Fault 2 ("throttle" shows on display)

Motor current (amps) rose above operating range. Motor stopped. Extremely high ambient temperature, harsh liquid slugging, extended recovery time, or high cylinder pressure can be the cause. Throttle RECOVERY and start the motor. If fault occurs again, throttle even more and start the motor (page 23).

Motor Fault 3

Motor stopped for unknown reason. If this occurs repeatedly, there may be something wrong with MR53.

Fault 3 ("Plug O.F.S" shows on display and MR53 beeps)

Check for loose connection. Overfill sensor may be broken. Verify overfill with scale. If overfill sensor is bad, mark tank for disposal.

Other Symptoms

MR53 never reaches -0.34 or -0.68 bar (-25 or -50 cmHg).

Press START to continue recovery if auto-stop level was reached.

Check for a leakage before the input port.

For -0.34 bar (-25 cmHg), the recovery cylinder should be below 32 bar.

For -0.68 bar (-50 cmHg), the recovery cylinder should be below 16 bar.

Input port shows frost or signs of leakage.

Ensure the grooved input fitting is hand tight before tightening the hex nut (page 34).

Recovery is slower than normal.

There could be an input blockage. Check mesh screen filter for blockage. Ensure knob is set to RECOVER.

Display does not turn on when plugged in.

Ensure power cord, extension cord and outlet are okay.

Ensure power switch is flipped ON after plugging into power.

Excessive noise during recovery or SELF PURGE.

MR53 is experiencing a high load. Slowly rotate the knob of MR53 to throttle the refrigerant flow.

Overfill sensor not working correctly.

Check for loose connection. Overfill sensor may be broken. Verify overfill with scale. If overfill sensor is bad, mark tank for disposal.

Maintenance

General

This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the machine by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the machine.

Wipe with a damp cloth to clean the exterior. Do not use solvents.

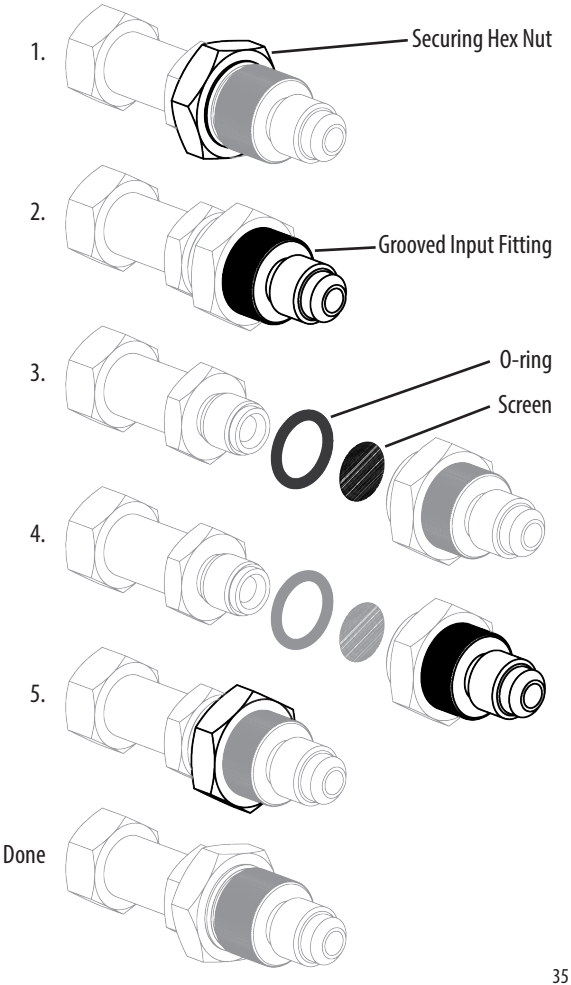
Mesh Screen Filter

When the mesh screen filter becomes dirty and clogged, the MR53 needs to work harder. Clean or replace this screen often. Visit our website for information on obtaining extra mesh screens.

1. Loosen (counter clockwise) the securing hex nut on the IN port.
2. Unscrew (counter clockwise) the grooved input fitting.
3. Clean or replace the mesh screen.
4. Hand tighten (clockwise) the grooved input fitting.
5. Tighten (clockwise) the securing hex nut with 1/8 turn with a wrench. **Do not overtighten.**

ATEX Compliance

MR53 units require service every 1200 operating hours to maintain ATEX compliance. Contact Fieldpiece for service. See page 37.



Limited Warranty

This machine is warranted against defects in material or workmanship for one year from date of purchase from an authorized Fieldpiece dealer. Fieldpiece will replace or repair the defective unit, at its discretion, subject to verification of the defect.

This warranty does not apply to defects resulting from abuse, neglect, accident, unauthorized repair, alteration, or unreasonable use of the machine.

Any implied warranties arising from the sale of a Fieldpiece product, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the above. Fieldpiece shall not be liable for loss of use of the machine or other incidental or consequential damages, expenses, or economic loss, or for any claim of such damage, expenses, or economic loss.

State and country laws vary. The above limitations or exclusions may not apply to you.

Obtaining Service

Visit **https://fieldpiece-europe.com/support/** for the latest information on how to obtain service.

For Europe / U.K. customers, warranty for products should be handled through your local distributor.

www.fieldpiece-europe.com/store-locator

Refrigerant List

CATEGORY	REFRIGERANT NAME	FLAMMABILITY
II	R124	A1
	R227ea	A1
	R236fa	A1
	R416A	A1
	R450A	A1
	R515A	A1
	R142b	A2
	R152a	A2
	R512A	A2
	R1234ze(E)	A2L
	R600a	A3
	R1234ze	A2L
	R1243zf	A2L
	RC318	A1
	RE143A	A1
III	R12	A1
	R134a	A1
	R401A	A1
	R401B	A1
	R401C	A1
	R407G	A1
	R409A	A1
	R409B	A1
	R414A	A1

CATEGORY	REFRIGERANT NAME	FLAMMABILITY
III	R414B	A1
	R417C	A1
	R420A	A1
	R423A	A1
	R426A	A1
	R437A	A1
	R453A	A1
	R456A	A1
	R500	A1
	R513A	A1
	R513B	A1
	R406A	A2
	R413A	A2
	R415B	A2
	R440A	A2
	R1234yf	A2L
	R444A	A2L
	R451A	A2L
	R451B	A2L
	R457A	A2L
	R430A	A3
	R436A	A3
	R436B	A3
	R441A	A3
	R405A	A1

CATEGORY	REFRIGERANT NAME	FLAMMABILITY
IV	R115	A1
	R218	A1
	R22	A1
	R402B	A1
	R403B	A1
	R404A	A1
	R407A	A1
	R407C	A1
	R407D	A1
	R407E	A1
	R408A	A1
	R407F	A1
	R417A	A1
	R417B	A1
	R421A	A1
	R421B	A1
	R422A	A1
	R422B	A1
	R422C	A1
	R422D	A1
	R422E	A1
	R424A	A1
	R425A	A1
	R427A	A1
	R434A	A1
	R438A	A1

CATEGORY	REFRIGERANT NAME	FLAMMABILITY
IV	R448A	A1
	R449A	A1
	R449B	A1
	R449C	A1
	R452A	A1
	R452C	A1
	R458A	A1
	R501	A1
	R502	A1
	R507A	A1
	R403A	A2
	R411A	A2
	R411B	A2
	R412A	A2
	R415A	A2
	R418A	A2
	R419A	A2
	R419B	A2
	R143a	A2L
	R444B	A2L
	R445A	A2L
	R454C	A2L
	R1270	A3
	R290	A3
	R431A	A3
	R433A	A3

CATEGORY	REFRIGERANT NAME	FLAMMABILITY
IV	R433B	A3
	R433C	A3
	R443A	A3
	R511A	A3
	R407H	A1
	R459B	A2L
	R460A	A1
	R460B	A1
V	R125	A1
	R402A	A1
	R407B	A1
	R410A	A1
	R410B	A1
	R428A	A1
	R442A	A1
	R509A	A1
	R439A	A2
	R32	A2L
	R446A	A2L
	R447A	A2L
	R447B	A2L
	R452B	A2L
	R454A	A2L
	R454B	A2L
	R455A	A2L
	R459A	A2L

Intentionally Blank

MR53UK
MR53INT

Scan the QR code to visit your Fieldpiece website and register your product.

EN, DE, FR, IT, ES, PT,
NL, NO, SE, DK, FI

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